



DESIGNING AND DELIVERING  
A SUSTAINABLE FUTURE

## APPENDIX 4

Description of the  
Development

Appendix 4.1 – Construction Environmental Management Plan (CEMP)

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## APPENDIX 4.1

### Construction Environmental Management Plan (CEMP)



DESIGNING AND DELIVERING  
A SUSTAINABLE FUTURE

# ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) FOR THE PROPOSED LITTLETON WIND FARM, CO. TIPPERARY

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## Construction and Environmental Management Plan (CEMP)

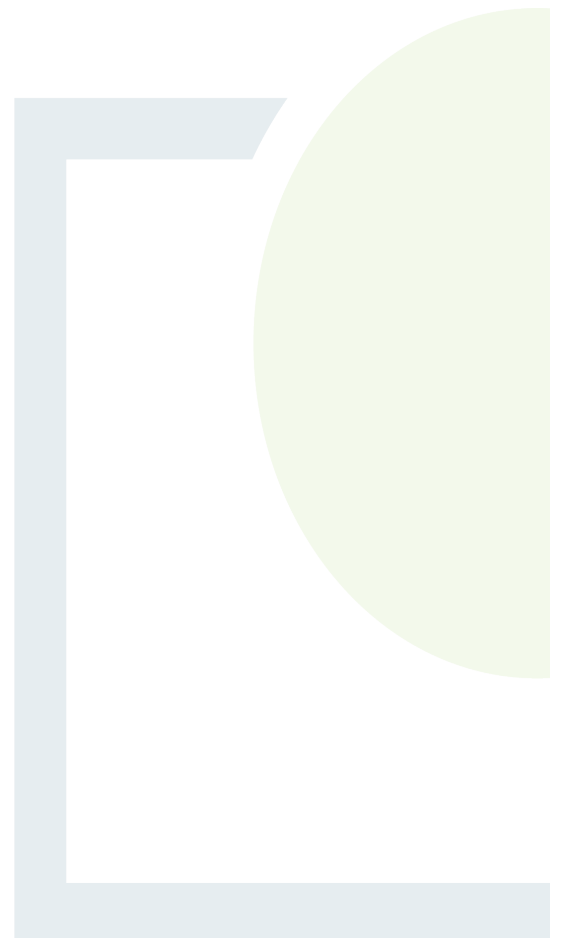
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## CONSTRUCTION AND ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

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**Abstract:** This document is the Construction and Environmental Management Plan (CEMP) for the Proposed Littleton Wind Farm Development and has been prepared by Fehily Timoney and Company (FT) on behalf of Littleton Wind Farm DAC. This document identifies the key environmental management issues associated with the construction of the Proposed Development and sets out measures to ensure that potential adverse effects on the environment are managed. This CEMP has been prepared to supplement an Environmental Impact Assessment Report (EIAR) for the Proposed Development.

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## 1. INTRODUCTION

### 1.1 General Introduction and Purpose

This document is the Construction and Environmental Management Plan (CEMP) for the Proposed Littleton Wind Farm ('the Proposed Development') and has been prepared by Fehily Timoney and Company (FT) on behalf of Littleton Wind Farm DAC.

The CEMP will be a key construction contract document, and the appointed contractor will be obliged to implement it in full. It will be updated by the Contractor prior to construction to take account of any relevant conditions attached to the planning permission and will be implemented for the duration of the construction phase of the Proposed Development. The CEMP also includes measures for the operational and decommissioning phase of the Proposed Development. The measures in the CEMP will be implemented in full and further measures may be added as may be identified from the auditing and site inspections.

This CEMP sets out the key construction and environmental management issues associated with the construction, operation and decommissioning of the Proposed Development, to ensure that during these phases of the development, the environment is protected and impacts on the environment are minimised.

The CEMP should be read in conjunction with the EIAR. In the case of any ambiguity or contradiction between this CEMP and the EIAR, the EIAR shall take precedence.

The document is divided into six sections:

**Section 1:** *Introduction* provides an overview of the existing site and the Proposed Development.

**Section 2:** *Existing Site Environmental Conditions* provides details of the main existing geotechnical, hydrological, ecological and archaeological conditions onsite. These conditions will be considered by the contractor in the construction, operation and decommissioning of this Proposed Development.

**Section 3:** *Overview of Construction Works*, this section provides an overview of the construction works proposed, including drainage and sediment controls to be installed.

**Section 4:** *Environmental Management Plan (EMP)*, this section outlines the main requirements of the EMP and outlines operational controls for the protection of the environment including soil management, habitat and species, site drainage control, archaeology, construction traffic, site reinstatement and decommissioning, waste management.

**Section 5:** *Safety & Health Management Plan*, this section defines the work practices, procedures and management responsibilities relating to the management of safety and health during the design, construction and operation of the Littleton Wind Farm.

**Section 6:** *Emergency Response Plan* contains predetermined guidelines and procedures to ensure the safety, health and welfare of everybody involved in the Proposed Development and to protect the environment during the construction phase of Littleton Wind Farm.



## 1.2 Statement of Authority

This CEMP was completed by Fehily Timoney and Company Engineers under the supervision of Trevor Byrne.

Trevor is an Associate Director at Fehily Timoney and a chartered member of Engineers Ireland with over 15 years of industry experience and extensive experience in the preparation of Construction and Environmental Management Plans for large scale renewable energy developments. Trevor holds a Master's degree in Sustainable Energy Systems from the University of Edinburgh and a first-class honours degree in Civil and Environmental Engineering following his studies at Edinburgh Napier University and Cork Institute of Technology.

Aoife Hurd is a Senior Project Engineer at Fehily Timoney and Company working in the Energy and Planning Department. She holds a First-Class Honours Bachelor's Degree and Master's Degree in Civil, Structural and Environmental Engineering from Trinity College Dublin. She is a member of Engineers Ireland (EI) and has experience working on residential, infrastructure and renewable energy projects at all stages from concept to construction. Aoife provides technical and engineering support to the EIAR teams for a variety of commercial scale renewable energy projects.

Aoife has over 3.5 years' experience in the preparation of Traffic and Transportation assessments, Air and Climate Assessments, as well as other technical chapters associated with EIAR's and environmental reports for renewable energy projects ranging from wind farms, solar farms, grid connections, battery energy storage systems and ancillary grid infrastructure projects. She also has experience in the design of renewable energy developments.

Eoin Downing is a Project Engineer with a Bachelors Degree in Civil Engineering from University of Limerick and a Master's Degree in Sustainable Resource Management: Policy and Practice following his studies at University of Limerick and University of Galway. Eoin is a member of the engineering team within the Planning and Energy division at FT and has 1.5 years' experience in the preparation of Construction and Environmental Management Plans for large scale renewable energy developments.

## 1.3 The Proposed Development

The Proposed Development assessed in the EIAR comprises the following elements:

- The 'Proposed Wind Farm' (also referred to in the EIAR as the '**Site**');
- The 'Proposed Grid Connection' (also referred to in the EIAR as the '**GC**');
- The 'Turbine Delivery Route' (also referred to in the EIAR as the '**TDR**');
- The 'Biodiversity Enhancement and Management Plan Lands' (also referred to in the EIAR as the '**BEMP Lands**');

The location of the Proposed Development is shown in Figure 4.1, contained within Volume 4 of the EIAR. The general layouts of the Proposed Wind Farm, Grid Connection (GC) route and Turbine Delivery Route (TDR) are presented in Figures 4.2 to 4.4, contained within Volume 4 of the EIAR.



### 1.3.1 The Site

The Proposed Wind Farm will consist of 11 no. wind turbine generators (WTG's), 1 no. permanent onsite 110 kV electrical substation compound and associated infrastructure to facilitate connection to the existing Ballyragget 110kV substation. In addition, 1 no. on-site construction borrow pit is proposed which will be backfilled and restored for agricultural use. There are 6 no. dedicated peat and spoil deposition areas, 5 no. temporary construction compounds, and 1 no. permanent meteorological mast along with ancillary civil, drainage and electrical infrastructure. The Site also contains BEMP Lands and recreational amenity trails.

Please refer to Chapter 4 of the EIAR for a detailed description of the Proposed Development. The location of the Site is shown in Figure 4.1, contained within Volume 4 of the EIAR. The general layouts of the Proposed Wind Farm is presented in Figures 4.2 to 4.4, contained within Volume 4 of the EIAR.

### 1.3.2 Turbine Delivery Route

The Turbine Delivery Route (TDR) is presented in Figures 4.2 to 4.4, contained within Volume 4 of the EIAR. Large components associated with the Proposed Development construction e.g. turbine blades and tower sections, will be transported to site via the identified turbine delivery route (TDR). The proposed route to site is summarised as follows:

- Loads will exit the Port of Entry (PoE) of Foynes Port and join the N69 heading east;
- At Limerick, they will join the N18 heading northeast and merge onto the M7;
- Loads will exit at Junction 17 Portlaoise Interchange and perform a U-turn to re-join the M7 heading southwest;
- They will merge onto the M8 and continue southwest;
- At the M8 Junction 4 East Roundabout loads will turn left to join the R693;
- At the following roundabout loads will turn right onto the R639 then drive through Urlingford;
- To the southwest of Urlingford loads will turn left at the proposed site entrance.

A substation transformer unit will be transported to site which will be categorised as an abnormal load. As a result, an abnormal load permit will be sought for this movement. Multiple transformers have already been delivered to ESNB substations in the area without any impact on the structures along the road network.

The TDR will be confined to the public road corridor except for locations where temporary accommodation works will be required to facilitate the delivery of abnormal loads. The works to facilitate the delivery of turbine components to the Site are detailed in Chapter 4 of the EIAR. Further details and assessment of these works are provided in Chapter 15 of the EIAR. A Traffic Management Plan is included in Section 4.3.7 of this CEMP. Additionally, see Turbine Delivery Route Survey Report shown in Appendix 4.2, Volume 3.

### 1.3.3 Grid Connection

The route of the Grid Connection (GC) is presented in Figures 4.2 to 4.4, contained within Volume 4 of the EIAR. The proposed GC route will consist entirely of underground 110kV cable and will connect the on-site substation at Littleton Bog to the existing Ballyragget substation within the townland of Ballyragget, Co. Kilkenny.

The proposed GC route will be 30.9 km in length, with 28.4 km to be constructed within the existing road corridor.



Connection works from the onsite substation to Ballyragget substation will involve the installation of ducting, joint bays and ancillary infrastructure and the subsequent running of cables along the existing road network. This will require delivery of plant and construction materials, followed by excavation, laying of cables and subsequent reinstatement of trenches and road surfaces.

For cable trenches located in public roads, the contractor will excavate cable trenches and then lay high density polyethylene (HDPE) ducting in the trench in a surround of cement bound material. A rope will be inserted into the ducts to facilitate cable-pulling later. The as-constructed detail of the cable duct locations will be carefully recorded. Cable marker strips will be placed above the ducts and two communication ducts will also be laid. An additional layer of cable marker strips will be laid above the communication ducts and the trench backfilled. Back-filling and reinstatement in public roads will be to a specification to be agreed with the road authority, at a minimum matching the pre-construction surface.

A minimum separation distance of 300mm will be maintained between existing services and new cable ducts. New cable ducts will be laid below existing services wherever possible.

In advance of the construction phase cable detection tools, a ground penetrating radar and slit trenches will be used, as appropriate, to verify the exact locations of existing services. The final locations of the proposed cable routes in the public roads and in the verge along the public road will be within the area indicated and assessed in the EIAR and will minimise conflicts with other services.

It is expected that full road closures will be put in place to facilitate cabling works in combination with lane closures, partial road closures and stop/go systems. This will enable the works to be completed as quickly and as safely as possible, with minimal disruption time for residents of the area. These works shall be undertaken on a rolling basis with short sections closed for short periods before moving onto the next section. This is described in more detail in Chapter 15 of the EIAR. See the Traffic Management Plan (TMP) contained in Section 4.3.7 of this CEMP for proposed traffic management measures.



## 2. EXISTING ENVIRONMENT

### 2.1 Existing Environment Descriptions

#### 2.1.1 Wind Farm Site

The Wind Farm Site is located within the jurisdiction of Tipperary County Council. The majority of settlements closest to the site are situated to the west of the site. Ballinunty is the nearest, c.2 km southeast of the proposed turbine array. The village of Gortnahoe lies c. 2.5 km northeast of the site at its closest point, while New Birmingham is situated c. 2 km to the east. The small centre of population of Ballysloe is also located to the east, at just over 3 km from the nearest turbine. Littleton and Twomileborris are the only settlements within the central study area situated to the west of the site, located c. 2.6 km and c. 2 km from the proposed turbine array, respectively. The village of Killenaule lies c. 4 km southeast of the site and Horse and Jockey is c. 4.7 km to the west.

Urlingford is located c. 6.8 km north of the site and Johnstown c. 10.5 km to the north

The most notable settlements within the area are Thurles and Cashel. Thurles is located c. 9 km west of the site, while Cashel is c. 17 km to the southwest.

The Wind Farm Site is located within a bog group and includes lands in the townlands of Longfordpass North Longfordpass South, Leigh, Bawnreagh, Clonoura, Noard, Derryhogan, Derryvella, Ballybeg, Lanespark, Newhill and Killeen, County Tipperary. Refer to Figure 4.1, contained within Volume 4 of the EIAR, for the location of the Proposed Development.

The BEMP Lands are contained within the Wind Farm Site.

The Proposed Wind Farm Site boundary extends for approximately 10km from north to south and ranges between 1km (at north end) and 2km<sup>2</sup> (at south end) from east to west. The elevation of the Site ranges from approximately 120-130m altitude above sea level. A large proportion of the Site is regenerating cutaway (heath, scrub, woodland) but includes open areas with large bodies of open water. Areas of remnant high bog occur scattered along the boundaries.

There is an extensive network of roads in the area. The M8 motorway and the R639 run to the northwest/west of Littleton bog. The R689 and R690 run to the east and the L4101 runs to the south. The main site access points are at the north and south ends of the bog adjacent to the railway line. Large components associated with the wind farm construction will be transported to site via the identified turbine delivery route (TDR).

The Littleton Labyrinth is an existing amenity route developed by Tipperary County Council which provides a shared walking and cycling route connecting the village of Horse and Jockey (4.7km west of the Site) to Lough Derryvilla (adjacent to the Site). From Horse and Jockey, it follows a mixture of public roads and the Derrynaflan greenway before joining 7.2km of newly constructed trail along the former Bord na Móna railway line between Derrynaflan and Derryvilla. The route overlaps the proposed Wind Farm Site between the Former Bord na Mona Factory trailhead and Lough Derryvilla. An amenity car park was built as part of the Labyrinth on the proposed Wind Farm Site also at the Former Bord na Mona Factory trailhead.

The layout of the proposed wind farm site is shown on Site Layout Figure 4.2, contained within Volume 4 of the EIAR.

A detailed description of the existing site environment can be found in Chapter 4 of the EIAR.



## 3. OVERVIEW OF CONSTRUCTION WORKS

### 3.1 Construction Period

The construction of the Proposed Development in its entirety is expected to take 24 months.

### 3.2 Overview of the Construction Sequence

The construction of a wind farm is a major infrastructural development. The construction of the Proposed Development will involve many inter-related, inter-dependent and overlapping elements of a complex nature.

The following section outlines the construction methodology for the Proposed Development. Subject to Planning Permission being granted for the Proposed Development, tree felling, construction of the borrow pit, upgrading of existing site tracks and the provision of new site tracks will precede all other activities. Drainage infrastructure will be constructed in parallel with the access track construction in accordance with the Surface Water Management Plan. This will be followed by the construction of the turbine hardstanding areas and foundations.

In parallel with these works the on-site electrical works i.e., the sub-station and internal cable network as well as off-site connection works to the national grid will be completed.

The BEMP measures will be implemented at the end of the 24-month construction programme.

The proposed construction programme is presented in Table 3-1 below:



**Table 3-1: Proposed Construction Programme**

Activity	Month																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mobilisation and site setup	█																							
Site clearance and felling	█	█																						
Internal access tracks (incl. amenity trails)	█	█	█	█	█	█	█	█	█															
Turbine hard standings			█	█	█	█	█	█	█	█														
Turbine foundations				█	█	█	█	█	█	█	█													
TDR accommodation works							█																	
Turbine Installation										█	█	█	█	█	█	█								
Onsite substation							█	█	█	█	█	█	█	█	█	█	█	█						
Permanent Met Mast												█												
Grid connection cable works						█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█		
Private electrical network																		█	█	█	█	█	█	█
Landscaping, reinstatement, demobilisation, BEMP measures																						█	█	



### 3.3 Construction Working Hours

The hours of construction activity will be limited to avoid unsociable hours where possible as per Section 8.5 (d) of the code of practice for BS 5228: Part 1: 1997. Construction operations will generally be restricted to between 07:00 - 19:00 hours Monday to Friday and 07:00 - 13:00 on Saturdays. It should be noted that it may be necessary to commence turbine base concrete pours earlier due to time constraints incurred by the concrete curing process. Work on Sundays or public holidays will only be conducted in exceptional circumstances or in an emergency. Additional emergency works may also be required outside of normal working hours as quoted above.

### 3.4 Overview of Construction Methodology

Method statements are presented below for the key elements of the construction process. The contractor for the main construction works will, following appointment, take ownership, expand upon and generally develop these method statements appropriately for the construction stage, in accordance with this CEMP.

The proposed construction methodology is summarised under the following headings:

- Mobilisation and Site Clearance;
- Site Entrances;
- Vegetation Clearance;
- Temporary Site Compounds;
- Concrete Washout and Wheel Washing;
- New Site Access Tracks;
- Upgrade of Existing Internal Access Tracks;
- Drainage and Watercourse Crossings;
- Borrow Pit Construction;
- Crane Hardstandings;
- Turbine Foundations;
- Substation Compound;
- Electrical Works;
- Internal Wind Farm Cable Works;
- Turbine Installation;
- Grid Connection Cabling Works;
- TDR Temporary Accommodation Works.

#### 3.4.1 Mobilisation and Site Clearance

Initial works will include the delivery of plant and equipment to the Site, followed by site clearance using excavators. This will involve widening existing entrances, creating a gap in the hedgerow for access, and setting up the initial site compound with welfare facilities and storage.



### 3.4.2 Site Access Points

Access to the proposed Wind Farm Site shall be taken from the public road network at 6 no. points. These are a combination of existing bog operations accesses which shall be upgraded and proposed access points to be created to facilitate the construction and operation of the proposed wind farm. The individual access points are described as follows:

- 1 no. site access point (Access Point 1) in the south of the Site from the Local Road L-2201 to Lanespark at Ballybeg comprising the re-use and upgrading of an existing bog operations rail line and vehicular access crossing point. This access point shall be used during the construction phase only for general construction traffic;
- 2 no. access points (Access Point 2 and 3) between Lanespark and Littleton Bog from the Local Road L-4153 at Derryhogan comprising the re-use and upgrading of an existing bog operations vehicular access road crossing point. These access points shall form a public road crossing. For Access Point 3 a minor realignment of a private gate and hedgerow is also proposed to allow for an appropriate sightline. A letter of consent for this is included. This shall be used as a crossing point for turbine components, and during the construction and operation phases of the Proposed Development;
- 2 no. access points (Access Point 4 and 5) within Littleton Bog off the Local Road L-4114 at Longfordpass North comprising the creation of two new access points on opposite sides of the public road. These access points shall form a public road crossing with the northern of these acting as a crossover point for HGVs, oversized loads and component deliveries only. The southern access point off the L-4114 local road shall be used during the construction and operation phases of the Proposed Development and will be the main access for day-to-day operations of the wind farm;
- 1 no. access point (Access Point 6) in the north of the site from the R639 at Longfordpass North comprising the creation of a new access point. This shall act as the primary access point to the site for the delivery of large turbine components and shall be used during the construction and operation phases of the Proposed Development. Access shall be via left turn only. It will not be used for general construction or operations traffic.

The access points have been selected with consideration for safety of public road users and construction staff and to ensure they can be constructed to comply with the requirements of both Tipperary County Council and TII design requirements for direct accesses. Each of the access points are described in detail in Chapter 4 and Chapter 15 of the EIAR.

All HGV traffic travelling to the site shall only be permitted to use approved transport routes and site access points as identified in the Traffic Management Plan (TMP) contained in Section 4.3.7 of this CEMP.

Site entrance designs and minimum visibility splays to be provided for the construction and operation of the Proposed Development are shown in planning application site layout drawings, Series No. 0103. Site entrances will be constructed using the same methodology as the construction of the wind farm tracks as described in section 3.3.1.5.

For detail on the proposed access points to the Site, please refer to Chapter 15.



### 3.4.3 Temporary Site Compounds

During the construction phase, it will be necessary to provide temporary facilities for construction personnel. 5 no. temporary site construction compounds shall be created to facilitate the construction of the Proposed Development. The locations of the temporary site compounds are shown on the Site Layout Figure 4.2, contained within Volume 4 of the EIAR. Wheel wash facilities will be provided within the site near the site entrance points.

Temporary compounds shall be aggregate hard standings. Temporary facilities will be removed, and the lands reinstated on completion of the construction phase.

Facilities to be provided in the temporary site compounds will include the following:

- Facilities to be provided in the temporary site compound will include the following:
- Site office portacabins;
- Employee parking;
- Portable toilets with sealed contained foul drainage holding tanks;
- Bunded fuel storage;
- Bottled water for potable supply;
- Contractor lock-up facility;
- Water tanks to supply water used for other purposes;
- Diesel generator;
- Canteen facilities;
- Waste management areas;
- Material/non-fuel storage areas.

The temporary site compound shall be aggregate hard standings surrounded by security fencing, located as shown on the accompanying drawings. Temporary facilities will be removed, and the lands reinstated on completion of the construction phase.

### 3.4.4 Concrete Washout Area and Wheel Washing

Detailed measures to control concrete runoff during the Construction stage of the Proposed Development are included in Chapter 9 - Hydrology, Hydrogeology and Water Quality and in the SWMP in Appendix 9.3, Volume 3 of the EIAR. A summary is provided hereunder.

All concrete will be delivered to site via ready-mix trucks from a local supplier. Concrete trucks will not be washed out on Site. Where chutes, hoppers/skids and equipment (e.g. vibrating wands) associated with concrete works need to be washed down this will be done into a sealed mortar bin / skip with the appropriate capacity, and which has been examined in advance for any defects. The location of wash down areas will be set back as far as practically possible from any drain or watercourse, and a minimum of 50m. The residual liquids and solids will be disposed of off-site at an appropriate licenced waste facility, as shown in Section 4.3.6 of this CEMP. This is in accordance with best practice.



Each wheel wash will come with an additional water tank which will be filled regularly. These units will be self-contained and will filter the waste for ease of disposal. Silt will be removed from each unit and from site by a licensed contractor.

#### 3.4.5 New Site Access Tracks

The Proposed Wind Farm will include the construction of 15.45 km of new internal access tracks and the upgrading of 2.95 km of existing bog operations tracks and associated drainage infrastructure. The proposed internal site track layout will permit access for vehicles during the construction phase, for maintenance during the operational phase and for vehicles to decommission the turbines at the end of the life of the Proposed Development.

All access tracks serving wind turbines will be 6 m wide along straight sections and wider junctions and turning areas as required as shown on accompanying planning application drawings in accordance with wind turbine manufacturer requirements. Access tracks serving the permanent met mast and onsite borrow pits shall also be 6 m wide.

Internal wind farm access tracks shall be constructed by a combination of founded and floating methods as required. The locations of floated sections of access track have been determined by geotechnical walkovers and detailed site investigations.

The proportion of access track construction within the Site is as follows:

- Total length of new founded access track: 2.1 km;
- Total length of upgraded existing bog operations track: 2.95 km;
- Total length of new floating access track: 13.35 km.

Access track formation will consist of a minimum 500 mm compacted hardcore on geo-textile membrane with a capping layer of compacted granular stone (CL 804) to form a suitable running surface. The proposed construction methodology for newly constructed tracks is outlined below.

Excavated soil will be placed along the side of sections of the tracks in suitable locations as identified in the Soil Management Plan and where appropriate to blend in with surrounding landscaping and partially obscure visibility of the track during operation. Surplus spoil material shall be deposited in designated construction borrow pits and deposition areas as identified in the Soil Management Plan.

The stone required for the construction of the internal access tracks will be sourced from within the Site construction borrow pit and from licenced quarries in the vicinity of the Proposed Development. The location of licensed quarries and haulage routes are identified in Chapter 15 and in Figure 15.6, contained within Volume 4 of the EIAR.

Internal access track drawings are presented in the Site Layout planning application drawings in Volume 4.

A drainage system will be installed adjacent to the internal access tracks. Existing drainage infrastructure will be maintained and upgraded where necessary. Existing drainage channels will be upgraded to the same standard as the proposed drainage infrastructure in accordance with the drainage design and Surface Water Management Plan (SWMP) which can be found in Appendix 9.3, Volume 3 of the EIAR.

Refer to the Peat and Spoil Management Plan in Appendix 8.2, Volume 3 of the EIAR for quantities of usable rock that can be excavated from the borrow pit.



Drainage infrastructure will be constructed in parallel with the access track construction. Drainage ditches will be formed, within the excavated width and along the sides of the internal access tracks. The layout of the proposed drainage system can be found in planning application drawings P1617-1\_D101 to P1617-1\_D502, Volume 4.

#### 3.4.5.1 *Founded Method*

This method will consist of either one or two layers of stone depending on the load bearing capacity of the base layer. Where the underlying layer is mineral subsoil, two layers of stone are used; a stone capping layer and running layer. Construction details are outlined in the planning drawings.

In areas where the load bearing layer is rock, the capping layer is omitted, and the running layer is installed directly onto the rock surface. Drainage runs and associated settlement ponds will be installed.

Track construction details will be implemented as follows:

- Establish alignment of the new site tracks from the construction drawings and mark out the centrelines with ranging rods or timber posts.
- The access tracks will be of single-track design with an overall width of 6m. There will be some local widening on the bends as shown on the design drawings, junctions and around Turbine Foundations for the safe passage of large vehicles. All bends have been designed to suit the requirements of the delivery vehicles.
- All machinery shall work within the consented areas as identified on planning and contract drawings.
- All access for construction vehicles within the site will follow the proposed internal access tracks as shown in planning drawings.
- Topsoil/subsoil will be stripped back to required levels. Excavated material will be placed along the side of sections of the tracks and dressed to blend in with surrounding landscaping and partially obscure sight of the track.
- The soil will be excavated down to a suitable formation layer of either firm subsoil or rock.
- The formation will be prepared to receive the geotextile membrane.
- Well-graded granular fill will be spread and compacted in layers to provide a homogeneous running surface. The thickness of layers and amount of compaction required will be decided by the Site Manager based on the characteristics of the material and the compaction plant to be used.
- Batters will have a slope of between 1:1 and 1:5 (depending on depth and type of material) and will be left as cut to re-vegetate naturally with local species.

Refer to the Peat and Spoil Management Plan in Appendix 8.2, Volume 3 and Series 600 Drawings, Volume 4 of the EIAR for founded track design.

#### 3.4.5.2 *Floating Method*

Floating tracks are constructed without excavating the existing ground. They will consist of a layer of combined geotextile and geogrid laid directly on the existing surface. Layers of stone will then be placed on top with additional geogrid reinforcement as required. A layer of compacted CI 804 material will be placed on top to provide a suitable running surface. It is anticipated that the stone required for the construction of the internal access tracks will be sourced from the on-site borrow pits and quarries in the vicinity.



Typically, the track formation will consist of a minimum 500 mm hardcore on geo-textile membrane. The likely construction methodology for newly constructed tracks will be as follows:

- The formation will be prepared to receive the geotextile membrane.
- Stone will be placed and compacted in layers to minimum 500 mm depth.
- A drainage ditch will be formed, within excavated width, along sides of the track.
- Surplus excavated material will be placed along the side of sections of the tracks and dressed to blend in with surrounding landscaping and partially obscure sight of the track.

Where the underlying peat has insufficient bearing capacity or due to topographic restrictions an excavate and replace type access track may be more suitable, although this is not anticipated at the location of the floated access tracks. Refer to the Peat and Spoil Management Plan in Appendix 8.2, Volume 3 and Series 600 Drawings, Volume 4 of the EIAR for floated track design.

#### 3.4.6 Upgrade of Existing Internal Access Tracks

Existing track upgrades shall follow the same outline methodology as for new access tracks and the existing tracks to be upgraded will be widened as necessary. Refer to the Peat and Spoil Management Plan in Appendix 8.2, Volume 3 and Series 600 Drawings, Volume 4 of the EIAR for upgraded track design.

A drainage system will be installed adjacent to the internal access tracks. Existing drainage infrastructure will be upgraded where necessary and to the same standard as the proposed drainage infrastructure in accordance with the drainage design and Surface Water Management Plan which can be found in Appendix 9.3, Volume 3 of the EIAR.

#### 3.4.7 Drainage and Watercourse Crossings

A Surface Water Management Plan (SWMP) has been prepared which can be found in Appendix 9.3, Volume 3 of the EIAR. It contains methodology for drainage, water quality management and silt control. The measures contained within the plan will be applied by the Contractor

Watercourse crossings can be classified as follows:

- Existing structures (bridges or culverts) that need to be crossed by infrastructure (access tracks or cables) associated with the Proposed Development, without a need to modify the existing structure;
- Installation of new structures to facilitate the crossing of existing watercourses by infrastructure associated with the Proposed Development;
- Existing structures that need to be either replaced or upgraded to facilitate the crossing of existing watercourses by infrastructure associated with the Proposed Development;
- Crossing of existing open streams or drains by cable ducts.

Within the Site there are 2 no. WFD watercourse crossings, both of which are proposed to be crossed by an existing culvert.



The GC cable route contains 11 no. watercourse crossings. 10 no. crossings will be traversed using horizontal directional drilling (HDD). The remaining crossing will be traversed by undercrossing or overcrossing methods, depending on the depth of the culvert or using open trenching.

A list of the watercourse crossings within the Proposed Development is located within the SWMP in Appendix 9.3, Volume 3 of the EIAR. Drainage design and watercourse crossing details can be found on planning drawings P1617-1\_D101 to P1617-1\_D502, Volume 4.

The following sections outline construction methodologies to be used for the various watercourse crossing scenarios in the context of crossings associated with the Proposed Development.

The water quality protection measures for in-stream works are set out in Chapter 9 of the EIAR and will be adhered to for Construction.

All in-stream works if required will be carried out under dry works conditions i.e. the works area will be isolated from the waterbody flow by means of temporarily over pumping or fluming the flow in accordance with IFI (2016) 'Guidelines on protection of fisheries during construction works in and adjacent to waters'.

Instream works will only take place during the period July to September (as required by IFI for instream works).

Operation of machinery in-stream will be kept to an absolute minimum and avoided wherever possible. All construction machinery operating in-stream will be mechanically sound to avoid leaks of oils, hydraulic fluid, etc. Machinery will be checked prior to commencement of in-stream works.

Before contact with water is made, any equipment or machinery that will be used in the water, including Personal Protective Equipment (e.g. footwear, gloves), will undergo the Clean-Check-Dry biosecurity protocol: <https://www.fisheriesireland.ie/Biosecurity/biosecurity.html>. This will similarly be carried out upon completion of the work or moving the equipment or machinery from the water.

#### 3.4.7.1 Drain Crossing Construction Methodology

Drains within the Site which are crossed by the wind farm infrastructure will be appropriately culverted or collected by interceptor drains and carried under the access track by cross drains. Further details on the locations of such cross drains are provided in the Surface Water Management Plan (SWMP) in Appendix 9.3, Volume 3 of the EIAR and on accompanying planning application drawings.

Cross drains will comprise appropriately sized pipes buried in the sub-base of the access track at the necessary invert level to ensure ponding or pooling doesn't occur above or below the cross drain and water can continue to flow as necessary.

For drain crossings the following will be employed:

- The access track construction will finish at least 10m from the nearside bank of the minor drain.
- All environmental mitigation measures, described in detail in Chapter 9 and Chapter 6, will be implemented locally in advance of the works, in accordance with the measures outlined in the SWMP in Appendix 9.3, Volume 3 of the EIAR.
- The pipe is laid in one lift or in sections using a lifting mechanism attached to an excavator.
- Rock armour headwalls will be constructed where necessary to protect pipe ends and the base of slope embankments on either side of the track.



Operation of machinery in-stream will be kept to an absolute minimum and avoided wherever possible. All construction machinery operating in-stream will be mechanically sound to avoid leaks of oils, hydraulic fluid, etc. Machinery will be checked prior to commencement of in-stream works.

Before contact with water is made, any equipment or machinery that will be used in the water, including Personal Protective Equipment (e.g. footwear, gloves), will undergo the Clean-Check-Dry biosecurity protocol: <https://www.fisheriesireland.ie/Biosecurity/biosecurity.html>. This will similarly be carried out upon completion of the work or moving the equipment or machinery from the water.

### 3.4.7.2 Culvert Construction Methodology

Piped culverts will only be used over very short stretches i.e. at track crossings. Pipe culverts will be sized to take the 1 in 100-year flood flow with a 20% allowance for Climate Change. Concrete or HDPE pipes may be used depending on the size of the watercourse to be crossed.

Minor drains will be crossed using minimum 450 mm diameter pipes.

Where cross drains are to be provided to convey the drainage across the track at regular intervals, the sizes of these cross drains are 225 mm diameter pipes.

Silt Protection Controls (SPCs) are proposed at the location of the drain crossings. SPCs will consist of a minimum of silt traps containing filter stone and filter material staked across the width of the swales and upstream of the outfall to any watercourse.

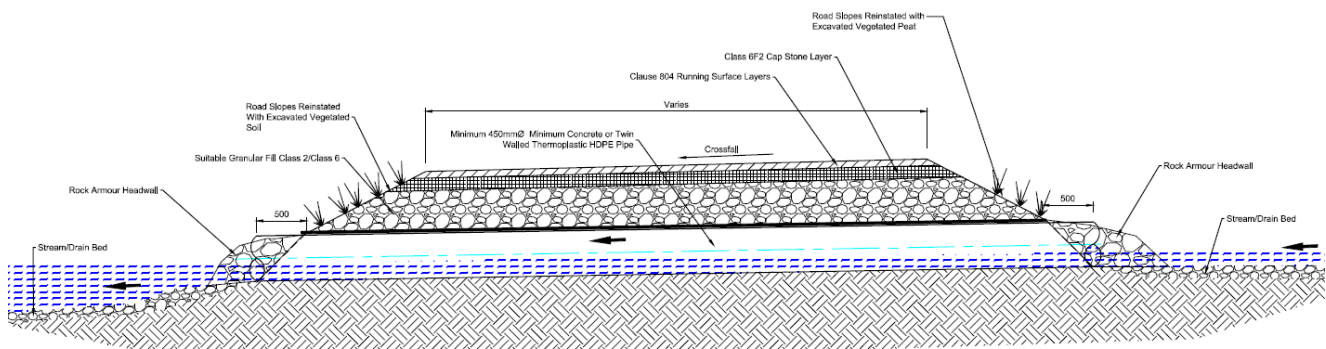


Figure 3-1: Piped Culvert Crossing Long Section

For a drain crossing using a piped culvert, the following methodology will be used:

- The access track construction will finish at least 2.5m from the nearside bank of the minor watercourse/drain;
- Use of weather forecasts will be made, and works will be planned when a dry spell of weather is forecasted;
- Work will not be undertaken during periods of high rainfall. This will minimise the risk of entrainment of suspended sediment in surface water runoff and transport via this pathway to surface water bodies;
- Where there is a requirement to disturb either the bed or bank as a result of the construction/replacement works, the watercourse/drain will be dammed upstream and diverted prior to work commencing;



- A temporary berm (i.e. sandbags and/or rectangular straw bales) will be placed along the edge of the track to prevent loose material being dislodged or washed into the water body;
- All environmental mitigation measures will be implemented locally in advance of the works, in accordance with the environmental management plan outlined in Section 4. of this CEMP. Instream works and temporary diversions where required shall be carried out in accordance with the SWMP in Appendix 9.3, Volume 3 of the EIAR.;
- The bed of the channel in which the culvert will be laid will be prepared using a mechanical digger and hand tools to the required levels in accordance with the design;
- A bedding layer will be laid in the base of the minor watercourse/drain using Class 6 aggregate material and blinding to the desired levels in accordance with the design;
- The pipe is laid in one lift or in sections using an excavator in accordance with an approved lift plan;
- Bedding material is placed and compacted around the pipe to the desired levels in accordance with the design;
- Suitable bedding material in the form of clean round gravel between 10-100mm diameter, shall be laid in the base of the pipe in accordance with the recommendations set out in Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Watercourses from Inland Fisheries Ireland;
- The pipe is covered using compacted Class 6N fill material in accordance with the design up to the levels required by the access track sub formation;
- Rock armour headwalls will be constructed where necessary to protect pipe ends and the base of slope embankments on either side of the track;
- For small drain crossings, pipes of suitable diameter will be laid directly into the bed of the drain.

Box culverts will be made of precast units which will be sized specific to the hydraulic capacity required relative to the characteristics of the watercourse to be crossed. The crossing angle for the culverts will be set out in relation to access track alignment and the existing watercourse channel. The project engineer will determine the required gradient of the culvert. Standard details for piped and bottomless culverts are provided in the accompanying planning application drawings.

The access track on the approach to the channel will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of the culvert crossings.

The culverts will be installed on-line (i.e. within the existing channel) and the works will be carried out under dry conditions in accordance with IFI (2016) 'Guidelines on protection of fisheries during construction works in and adjacent to waters. If present, watercourse flow will be diverted by over pumping or by fluming the flow as appropriate to facilitate construction of the culvert in dry conditions.

The construction methodology for the box culvert will be the same as a piped culvert with the only difference being a box being used instead of a pipe.

#### 3.4.8 Borrow Pit Construction and Peat / Spoil Deposition Areas

The civil engineering assessment of the Proposed Development indicates the requirement for approximately 316,148m<sup>3</sup> of stone across the Site to provide for the internal access tracks, hard standings, upfill to foundations and construction of the temporary compounds. Further details are provided in the Peat and Spoil Management Plan contained in Appendix 8.1 and Chapter 8 – Land, Soils and Geology.



One (1 no.) construction borrow pit has been identified within the Site. The construction borrow pit shall also act as peat deposition areas as part of the Spoil and Peat Management Plan for the Proposed Development.

Upon removal of the rock from the borrow pit, it is proposed to restore the borrow pit using excavated peat and spoil within cells located inside the borrow pit. The excavated rock from the borrow pit will be used in the construction of the wind farm infrastructure elements (turbine bases, access tracks, earthworks etc). The contractor excavating the rock will be required to develop the borrow pit in a way which will allow the excavated peat and spoil to be contained safely.

Weaker rock will be extracted using a hydraulic excavator and a ripper. Where stronger rock is encountered and cannot be extracted using an excavator, then rock breaking equipment will be employed. This will typically involve the use of a hydraulic excavator with a rock breaker.

Excavated rock will be crushed on site using a mobile crusher and crushed down into the correct grade for use in the construction.

The borrow pit construction methodology is presented in the Peat and Spoil Management Plan, in Appendix 8.1 in Volume 3 of the EIAR. The location and design of each of the construction borrow pits are shown can be found on the planning application site layout drawings in Volume 4.

Surplus topsoil/peat and spoil will be deposited in berms for reinstatement purposes around turbine bases, hardstandings and within proposed designated Peat Deposition Area (PDAs), shown in Figure 4.2 in Volume 4 of the EIAR. Details of peat and spoil management are presented in Appendix 8.1 – Peat and Spoil Management Plan in Volume 3 and Chapter 8 – Land, Soils and Geology.

The proposed drainage system shall extend to the borrow pit which shall include interceptor drains, collector drains and settling ponds in accordance with the SWMP in Appendix 9.3, Volume 3 of the EIAR. Drainage system shall be implemented in advance of excavation works. The topographical and hydrogeological setting of the proposed borrow pit locations means no significant groundwater dewatering will be required. Thereby, no regional groundwater flow regime, i.e. large volumes of groundwater flow, will be encountered at the proposed borrow pit excavations.

Moreover, direct rainfall and surface water runoff will be the main inflows that will require pumping and water quality management. Drainage management from the borrow pit will be to the west into Littleton Bog, and from there treated water will flow with bog drainage before discharging to the north and into the Drish River. Borrow pit settlement ponds have been designed to allow a 24hr retention time as per EPA guidance (2006), which is the highest level of protection recommended by the EPA with regard to retention time.

#### 3.4.9 Turbine Hardstands

All crane pads and associated lay down areas consist of a compacted stone structure in accordance with the detailed engineering designs and employer's requirements.

All crane pads will be formed from a suitably stiff layer of subsoil or rock. The finished crane pad surface will provide a minimum bearing capacity of 260kN/m<sup>2</sup>.

Turbine hardstanding formation will consist of either 1 or 2 layers of suitable fill material depending on the properties of the underlying load bearing layer. Where the underlying layer is soft soil, 2 layers of suitable fill formation will be used and the stone capping layer. In areas where the load bearing layer is rock, the capping layer will be omitted, and the running layer will be installed directly onto the rock surface.



A turbine hardstanding area consists of a main crane pad hardstanding of 88 m x 30 m with a number of additional smaller hard standings that act as ancillary crane pads and set down and assembly areas, located as shown on the accompanying planning drawings. The crane pads will have a maximum cross and longitudinal fall tolerance of 2%.

The hardstandings will be constructed using a typical excavation method. The excavation method can be summarised as follows:

#### *Excavation Method:*

All environmental mitigation measures will be implemented locally in advance of the works, in accordance with the measures outlined in the environmental management plan in Section 4. of this CEMP.

- Establish alignment of the hardstandings from the construction drawings and mark out the corners with ranging rods or timber posts.
- Drainage runs and associated settlement ponds will be installed.
- Topsoil and subsoil stockpiles will be formed, and the side compacted to prevent silt run off during heavy rain or airborne dust during dry periods.
- Batters will have a slope of between 1:1 and 1:5 (depending on depth and type of material) and will be left as cut to re-vegetate naturally with local species.

#### 3.4.10 Turbine Foundations

Following detailed site investigations, it has been determined that the wind turbine foundations at the proposed Wind Farm Site will be a combination of standard shallow and piled reinforced concrete foundations. The turbine foundation bases are circular in shape, 31 m in diameter for shallow foundations, 27 m in diameter for piled foundations, and 3.65 m in depth.

The turbine foundations shall be constructed using standard reinforced concrete construction techniques. A section of reinforced concrete foundation called a plinth shall protrude above ground to which the turbine tower will be bolted.

Turbine foundations will be designed to Eurocode Standards. Foundation loads will be provided by the wind turbine supplier, and factors of safety will be applied to these in accordance with European design standards:

- EN 1992-1-1: Eurocode 2: Design of concrete structures.
- BS EN 61400-1:2005: Wind Turbines Design Requirements.

The tower of the turbine is a conical steel tube, delivered to site in sections and bolted together using flanged connections.

Once the turbine components arrive on site they will be placed on the hard standing and lay down areas prior to assembly. The towers will be delivered in sections, and each blade will be delivered in a separate delivery. Once there is a suitable weather window the turbine will be assembled.



The first (base) section is bolted to a steel frame, which is cast into the turbine concrete foundation. The upper sections of the tower are bolted to the lower ones in sequence. The base of the tower is approximately 6.5m in diameter, tapering to approximately 4m where it is attached to the nacelle. The first floor of the tower is approximately 2-3m above ground level it is accessed by a galvanised steel staircase and a steel hatch door which will be kept locked except during maintenance. Access to the top platform in the tower is by a ladder or service lift. Access to the nacelle from the top platform is by ladder. Access to the transformer room in the nacelle is controlled with an interlock.

The wind turbine foundations will be constructed using standard reinforced concrete construction techniques.

The turbine will be anchored to the foundation as per the turbine manufacturer's guidelines which will be incorporated in the civil foundation design.

The turbine foundations will be constructed as follows:

#### 3.4.10.1 Standard Excavated Reinforced Concrete Base:

- a) The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter.
- b) The excavated material will be stored at the borrow pit/soil storage location. Topsoil and subsoil stockpiles will be formed, and the side compacted to prevent silt run off during heavy rain or air bourn dust during dry periods.
- c) No material will be removed from site and storage areas will be stripped of vegetation prior to stockpiling placement in line with best working practises.
- d) Around the perimeter of the foundation formation a shallow drain will be formed to catch ground water entering the excavation. The drain will direct the water to a sump if required where it will be pumped out to a settlement pond away from the excavation.
- e) A layer of concrete blinding will be laid approximately 75mm thick directly on top of the newly exposed formation, tamped and finished with a screed board to leave a flat level surface. If required, geogrid and soil replacement will be laid according to the foundation design, followed by placement of the concrete blinding layer.
- f) If soil replacement is required, the aggregate used will be tested and approved by the project geotechnical engineer.
- g) High tensile steel reinforcement will be fixed in accordance with the designer's drawings & schedules. The foundation anchorage system will be installed, levelled and secured to the blinding using steel box section stools.
- h) Ductwork will be installed as required, and formwork erected around the steel cage and propped from the backside as required.
- i) The foundation anchorage system will be checked both for level and line prior to the concrete being installed in the base.
- j) Concrete will be placed using a concrete pump and compacted using vibrating poker to the levels and profile indicated on the construction drawings.
- k) Upon completion of the concreting works the foundation base will be covered from the elements that could cause hydration cracking and/or delay setting in any way.
- l) Steel shutters will be used to pour the upper plinth section.
- m) The foundation will be backfilled with a cohesive material, where possible using the material arising during the excavation and landscaped using the top-soil set-aside during the excavation. The suitability of backfill material will be approved by the project geotechnical engineer.



- n) A gravel footpath will be formed from the access track to the turbine door and around the turbine for maintenance.

#### 3.4.10.2 Piled Foundation and Hardstand Method:

This system involves:

- a) Construction of the founded hard standing as per the above methodology.
- b) Piles will be positioned to match the outrigger pads of the turbine crane and as agreed with the turbine supplier. Geotechnical analysis of the site investigation information will dictate the type of pile to be used. There are several methods however the most likely will either be pre-cast driven piles and auger bored piles.
- c) A reinforced concrete pad will be constructed on top of the piles. Shuttering will be used lined with polythene and an antibleeding admixture used to prevent any concrete leachate.

#### 3.4.11 Substation Compound

The total area of the on-site substation compound is 9,375 m<sup>2</sup> and consists of 3 no. sub-compounds as follows:

- TSO compound measuring 25 m x 18 m;
- IPP compound measuring 29.2 m x 9.3 m; and
- Ancillary services equipment compound measuring 36.7 m x 12.2 m.

The substation compound will include 2 no. substation control buildings and electrical components necessary to export the electricity generated from the wind farm to the national grid. The substation compound will be surrounded by a ca. 2.5-metre-high steel palisade fence and internal fences will also be provided to segregate different areas within the main substation compound. EV Parking and charging is also proposed adjacent to the IPP compound.

The substation's main function is to provide housing for switchgear, control equipment and monitoring equipment necessary for the proper functioning of the substation and wind farm.

Lighting will be required on site, and this will be provided by lighting poles located around the substation and exterior wall mounted lights on the control buildings.

Details of the proposed substation compound and equipment can be found in Chapter 4 of the EIAR and can be found on the planning application site layout drawings, Volume 4

##### 3.4.11.1 *Drainage of Substation*

The substation will be drained via an underground piped surface water drainage network. The network will also utilise linear drainage channels and filter drains. The network will discharge overland via a Class 1 Full Retention Oil Separator at a restricted greenfield rate. Attenuation for flows exceeding this rate will be provided within an underground tank.

In accordance with SuDS best practice, a rainwater harvesting tank will be included. Rainwater will be filtered and stored within the underground tank for reuse. There will also be no discharge of foul flows from welfare units within the substation, with water stored in tanks and removed from site by a contractor.



The Surface Water Management Plan contains methodology for drainage, water quality management and silt control (refer to Appendix 9.3, Volume 3 of the EIAR). Refer to planning application drawings for the drainage design of the substation.

#### 3.4.12 Internal Wind Farm Cabling Works

The specification for cable trenches is based on cable voltage, location and existing land use. If, subject to confirmatory surveys, the land is not as expected, the route may need to be varied within the parameters set out and assessed in the EIAR. The proposed cable trench construction details are presented in planning application drawings.

Internal cable trench section types associated with on-site electrical cabling are presented in the accompanying planning application drawings.

The following describes the construction methodology for cable installation works inside the Site. Some cables will be buried directly, and some will be ducted. Direct buried cables will be used in non-load bearing areas and ducts will be used in load bearing areas.

For direct buried cables, the following methodology will be implemented:

- All environmental mitigation measures will be implemented locally in advance of the works, in accordance with environmental management plan outlined in Section 4 of this CEMP.
- The line of the cable trench will run beside the site access tracks until it exits to the public road.
- The ground will be excavated using a mechanical digger. The top layer of soil will be removed and placed to one side. It will be used for landscaping the top of the backfilled cable trench following the laying of the cables. The remaining subsoil, excavated to the required depth, will be placed separately and used as backfill for the trench.
- Safe ladder access/egress to trenches will be provided into the trench.
- The cables will be laid directly onto a bed of suitable material, free from sharp stones and debris\*.
- A suitable material will be placed over the top of the cables to protect them during backfilling\*.
- Warning tape and plates will be installed by hand in accordance with the trench design and ESBN specifications and the engineer's design.
- On completion, the ground will be reinstated, and marker posts will be positioned at centres to the side of the trench highlighting the presence of cables below.
- Trenches will vary in width depending on the number of cables in the circuit. Where there is more than one set of cables they will be separated as per cable manufacturers requirements.



Where ducting is required within the Site (i.e., for areas where cables will be laid under access tracks or other loaded surfaces), suitable ducting will be required to protect the cables. In this scenario, tasks marked by an asterisk (\*) in the above methodology will be replaced by the following steps:

- Ducts will be placed into the trench manually, having been delivered to trackside embankment/verge by tractor and pipe trailer and then offloaded by hand.
- Approved bedding material will be used to surround the ducts. It will be delivered straight from a concrete truck or by skid steer along the route.
- Approved fill material will be compacted above and below the power cable ducting as per the engineer's design.
- Exposed duct ends will be capped.
- A 12mm Draw rope will be blown through the ducting at later date.
- Small jointing pits will be located along the route of the trench which will be left open until jointing takes place. A protective handrail/ barrier will be placed around each pit for health and safety reasons.
- Once the cables are joined and sealed the jointing container will be removed and the cables at the joint-bay locations will be back-filled in the same manner as the rest of the cable trench.
- The cables will connect the turbines to the substation. Ducts will be cast into each turbine foundation to provide access for the cables Likewise, at the substation, ducts will be cast through the building foundation to provide access for the cables.
- There are no existing buried services expected within the site however the appointed contractor will be responsible for carrying out pre-construction confirmation surveys ahead of construction.
- Prior to commencement of the works, up to date records of services such as watermains, sewers, gas mains and other power cables will be obtained from the relevant service providers. Cable detection tools, ground penetrating radar and slit trenches will be used, as appropriate, to find the exact locations of existing services. The final locations of the cable trenches will be selected to minimise conflicts with other services.
- Trenches where ducts are laid will be back filled every evening. During excavation works signage will be erected at each location warning of the dangers.

#### 3.4.13 Turbine Installation

Each wind turbine will have an associated turbine hardstanding area and temporary laydown area adjacent to the foundation to accommodate the delivery and temporary storage of the turbine components prior to their erection and to support the cranes during erection.

Once the turbine components arrive on site they will be placed on the hardstanding and lay down areas prior to assembly. The towers will be delivered in sections, and each blade will be delivered in a separate load within the convoys. Once there is a suitable weather window, the turbine will be assembled.

It is anticipated that the turbine installation works will take place over the course of 5 months. This is based on a total of 7 no. loads per turbine to deliver blades, tower sections and nacelles, with each convoy consisting of components for two turbines at a time.



#### 3.4.14 Grid Connection Cabling Works

The following describes the outline construction methodology for cable installation works along the grid connection route between the wind farm onsite substation and the Ballyragget substation.

The Proposed GC route is shown in Figure 4.3, Volume 4 and described in Section 1.3.3.

- Agreement will be sought from local authorities with respect to the location of trenches on roads to ensure no damage is caused to stormwater drains, water-mains or other services. All drain and culverts affected by the works are to be re-instated to the satisfaction of the Local Authorities. Particular care will be taken in order to minimise disruption to local residents and public road users.
- The location of the cable route will be set out by GPS (RTK enabled) equipment in accordance with the design drawings prepared for the site.
- Prior to any construction works commencing, a pre-commencement road survey will be carried out on the public roads in the vicinity of the works. The area where excavations are planned will be surveyed with a cable-avoiding scanning tool, by a person trained in Location of Underground Services. Location equipment to be calibrated within the previous 12 months.
- All environmental mitigation measures will be implemented locally in advance of the works, in accordance with the measures outlined in Section 4. of this CEMP.
- Traffic management measures will be implemented prior to works commencing accordance with the construction stage TMP and measures outlined in Section 4. of this CEMP.
- Overhead lines will be identified and overhead clearance limiting measures will be put in place at the start of each day. Machinery will also include automatic limiters to safeguard against interaction with overhead lines.
- Underground services may be encountered during the trenching works the locations and depth of these underground services the locating of these services will include the reviewing of service drawings, investigations along the trenching route, and consultation with the various service providers.
- All environmental buffer zones shall be identified and set out prior to construction works advancing. Where necessary a stock proof timber post and wire fence shall be erected to establish these areas and thus prevent the entry of contractor's plant within these buffers during construction works. It is noted that given the presence of large sections of the cable route on public roads, extensive adherence to buffer zones is unlikely.
- The cable infrastructure will follow the existing road infrastructure where possible as shown on accompanying planning application drawings and Figure 4.3 within Volume 4 of the EIAR. Cables will be laid underground using standard trenches, with pre-excavation drainage works in place prior to trench excavation.
- In areas where the cable trench route runs within a public road carriageway, temporary reinstatement of the road surface will be carried out at the end of the working day to allow safe re-opening of the road for public traffic. See below for sequence of works for temporary road reinstatement.
- A 360-degree excavator will first remove the top layer from the route along the roadside. It will be loaded onto a haulage truck. The material will be recycled. The excavation of trench will commence. A trained spotter will be used to assist machine operators while reversing or when their visibility becomes restricted.
- Trench to be dug to agreed drawing specifications. All plant and stored material will be kept a safe distance back from the trench edges.



- No open trench will be left unattended. Pedestrian barriers will be erected to prevent unintentional entry occurring by the open trench. Cones and/or barriers will be used on rural roads to maintain a safety zone in proximity to the trench.
- Safe ladder access/egress to trenches will be provided into the trench.
- Ducts will be placed into trench manually, having been delivered to the roadside embankment/verge areas by tractor and pipe trailer and then offloaded by hand.
- Approved bedding material will be used to surround the ducts and delivered straight from a concrete truck.
- Approved fill material will be compacted at the base, again above the power cable ducting as per the engineer's design.
- Warning tape and plates will be installed by hand in accordance with the trench design and Eirgrid specifications.
- Backfill materials will be delivered to the site in tipper trucks and offloaded at agreed designated set down areas where it will be either loaded into site dumpers or a stoning cart then brought to the trench area that requires being backfilled. Main material deliveries such as ducting and pre-cast joint bay sections will be to the temporary site compound and moved to the work area as required.
- Backfill materials will be compacted using suitable compaction equipment to prevent future settlement as per NRA Specification for Roadworks Series 600 – Earthworks, 2013.
- Hand digging will be used when within 500mm of any known existing services.
- Trenches where ducts are laid will be back filled every evening. During excavation works signage will be erected local to the works warning of the dangers. Traffic safety barriers will also be erected along the works area.
- Exposed duct ends will be capped.
- Spoil will be disposed of at a licenced facility.
- Unauthorised access will be monitored and prevented.
- A 12mm draw rope will be blown through the ducting at a later date.
- The trench and the working strip will be reinstated to the satisfaction of the local authority and TII standards for public roads.
- Where the trench strip passes through agricultural land, the surface will be reinstated to the area's pre-existing condition.

#### 3.4.14.1 Installation of Joint Bays and Link Box Chambers

- Setting out and location of services will be carried out in the same manner as for trench excavations.
- Traffic management to be set up as per the construction stage traffic management plan.
- A tracked excavator will be used for the excavation of the joint bay pits in accordance with detailed design drawings.
- A Tractor/dump trailer and/or tipper truck shall be used to remove excavated spoil from the work area. Spoil shall be removed to a licensed waste facility.
- A watchman will be used to assist machine operators while reversing or when their visibility is restricted.



- Where joint bays are located, the excavation shall be adequately protected with fencing with signage erected, warning of deep excavation.
- Safe ladder access/egress to excavation shall be in place. The ladder will be footed at the base and tied at the top.
- Base materials will be placed by the excavator from a truck and placed in the base of the excavation.
- Precast chamber sections will arrive on site via articulated lorries accompanied by a crane truck. The crane truck will load each unit separately from the articulated truck.
- The precast units will be transported to site and a flatbed trailer, and a truck mounted crane will lift the section into position.
- A lift plan /DJSP will be required for all Joint Bay installations.
- When the joint bays are in place, the sections will be back filled using approved fill material. The road surface will be reinstated using cold tar/surface dressing.
- Unauthorised access will be monitored and prevented.

#### 3.4.15 Fencing and Site Security

Temporary Heras fencing will be erected surrounding the construction compounds. Access will be gated to prevent unauthorised access. CCTV will be in operation.

Permanent palisade fencing will be constructed around the on-site substation. Fence details are shown on the accompanying planning application drawings.

#### 3.4.16 Biodiversity Enhancements

The measures set out in the BEMP (in Appendix 6.1 of Volume 3 of the EIAR) include those designed to protect and enhance existing habitats. Higher value habitats will be actively managed to maintain and improve their value and lower value habitats will see specific interventions designed to improve their attractiveness for a range of species.

The BEMP programme will run for the lifetime of the Proposed Development and many of the proposed features (e.g. tree and hedgerow planting) will have a longer-lasting biodiversity benefit.

It is expected that measures associated with the implementation of the proposed BEMP will be equivalent to typical agricultural activities and will be maintained by BnM.

Please note that irrespective of the consenting of the Proposed Wind Farm the remaining measures outlined in the Rehabilitation Plans, i.e. monitoring of the Littleton, Longfordpass and Lanespark Phase 1 measures and enhanced Phase 2 measures at nearby Ballybeg and Derryvella bogs, will continue to be implemented by BnM in agreement with the EPA. Please see Appendix 2.1 (Volume 3 of the EIAR) and Section 2.2.1 of Chapter 2 of the EIAR for further detail.



## 4. ENVIRONMENTAL MANAGEMENT PLAN

### 4.1 Introduction

This Environmental Management Plan (EMP) defines the work practices, environmental management procedures and management responsibilities relating to the construction of the proposed Littleton Wind Farm. This plan should be read in conjunction with the EIAR.

This EMP describes how the Contractor for the main construction works will implement a site Environmental Management System (EMS) on this Proposed Development to meet the specified contractual, regulatory and statutory requirements and identified mitigation measures. All contractors will be required to implement the EMS. This plan may be subject to minor amendments following the grant of planning permission and appointment of the Contractor for the main construction works (in accordance with the parameters and measures set out in this EMP). It is the Contractor's responsibility to implement an effective EMS to ensure that environmental requirements for the construction of this Proposed Development are met. See the Invasive Species Management Plan (ISMP) in Appendix 6.5 for information on invasive species found on the site.

All site personnel will be required to be familiar with the EMP's requirements as related to their role on site. The plan describes the project organisation, sets out the environmental procedures that will be adopted on site and outlines the key performance indicators for the site.

- The EMP is a controlled document and will be reviewed and refined as necessary (to comply with planning conditions or other local authority requirements).
- A copy of the EMP will be located at the compound, on the site H&S notice board.
- All employees, suppliers and contractors whose work activities cause/could cause impacts on the environment will be made aware of and understand the EMP and its contents.

This section includes the mitigation measures which will be implemented by the contractor and client during the construction, operation and decommissioning of the Proposed Development as per the EIAR and NIS.

### 4.2 Proposed Development Obligations

In the construction of the Proposed Development there are a number of environmental management obligations on the developer and the contractor. As well as statutory obligations, there are several specific obligations set out in the EIAR and NIS. This CEMP will be updated by the main contractor following appointment and will only be revised as set out above. The contractor and all of its sub-contractors will be fully aware of and in compliance with these environmental obligations.

#### 4.2.1 EIAR/NIS Obligations

The EIAR and NIS identified mitigation measures that will be put in place to mitigate the potential environmental impacts arising from construction of the Proposed Development. Measures identified in the EIAR and NIS are detailed in this CEMP and listed in the Schedule of Commitments which accompany the EIAR. It should be noted that this Schedule of Commitments also includes operational phase and decommissioning phase commitments which are not relevant to the construction phase. The CEMP will be read in conjunction with the EIAR and NIS. In the case of any ambiguity or contradiction between this CEMP and the EIAR and NIS, the EIAR and NIS shall take precedence.



#### 4.2.2 Planning Permission Obligations

All planning conditions attached to the Proposed Development's planning permission will be adhered to. All pre-commencement planning conditions will be discharged fully by the project owner prior to commencement of construction.

#### 4.2.3 Other Obligations

The Developer and/or Contractor for the main construction works will liaise directly with relevant Bodies in relation to securing any necessary permits to allow the works to take place including for example (non-exhaustive list):

- Commencement notice;
- Special Permits in relation to oversized vehicles on public roads;
- Temporary Road Closures (if required);
- Road Opening Licence;
- Building control approval;
- Trade effluent discharge licence / Tankered wastewater agreement;
- Section 50 consent for the construction of bridges or culverts on any drain or watercourse;
- Abstraction licence – registration with EPA;
- Licence, permit or certificate of registration required by the waste producer, haulier and waste facility;
- Tree Felling Licence;
- Licence from National Monuments Service (noting that the need for same has not been identified at planning stage);
- Protected Species licence (noting that the need for same has not been identified at planning stage).

The Developer will also liaise closely with the local residents, especially homeowners and landowners along the local access routes in relation to works and all reasonable steps will be taken to minimise the impact of the development on such persons. A traffic management plan is included in Section 4.3.7 of this CEMP.



### 4.3 Environmental Management Programme

This section outlines the EMP associated with the Proposed Development.

Table 4-1 below describes the Management Plans that have been prepared as part of the EIAR that are included in the Appendices to the EIAR (given their size they are not included in this section). The Management Plans should be read in conjunction with the EIAR. The contents of the Management Plans will be updated for the construction phase in line with any planning conditions that may apply.

**Table 4-1: Management Plans**

Management Plan	Location	Description
Peat and Spoil Management Plan	Appendix 8.2, Volume 3 of the EIAR	The purpose of this is to provide a peat and spoil management plan for the construction phase of the Proposed Development. The intention of the report is to describe how peat and spoil which will be excavated from infrastructure locations such as turbine bases and tracks and will be handled and placed/reinstated on site in an appropriate manner.  The peat and spoil management plan contains drainage guidelines for construction works and for management of peat on site. It should be noted that the control of water quality and drainage measures for site is outlined in detail in Chapter 8 of the Environmental Impact Assessment Report (EIAR).
Surface Water Management Plan (SWMP)	Appendix 9.3, Volume 3 of the EIAR.	The SWMP contains methodology for drainage, water quality management and silt control. The measures contained within the plan will be applied when working near water.
Biodiversity Enhancement & Management Plan (BEMP)	Appendix 6.1 of Volume 3 of the EIAR	The BEMP provides an overview of the important habitats and species within the Site and collates all information on the proposed biodiversity enhancement, management and monitoring measures.  The measures set out in the BEMP include those designed to protect and enhance existing habitats. Higher value habitats will be actively managed to maintain and improve their value and lower value habitats will see specific interventions designed to improve their attractiveness for a range of species. Appropriate planting will increase the available feeding, roosting and nesting cover for wildlife.  The BEMP programme will run for the lifetime of the Proposed Development and many of the proposed features (e.g. tree and hedgerow planting) will have a longer-lasting biodiversity benefit.

#### 4.3.1 Dust Management Plan

This Dust Management Plan (DMP) outlines the sources of dust during the works, identifies measures to minimise dust during the works and the complaints procedure for dust.

Construction stage mitigation measures to minimise dust and emissions will be implemented as follows:

- Construction vehicles and machinery will be serviced and in good working order;



- Receptors which receive dusting and soiling on the haul routes that experience dust soiling, where appropriate, and with the agreement of the landowner, will have the facades of their dwelling cleaned if required should soiling have taken place;
- Ensure all vehicles switch off engines when stationary – no idling vehicles; and
- Exhaust emissions from vehicles operating within the site, including trucks, excavators, diesel generators or other plant equipment, will be minimised through regular servicing of machinery.

#### 4.3.1.1 Dust Generation and Control

The principal sources of potential air emissions during the construction of the Proposed Development will be from the Site, GC and TDR; from dust arising from earthworks, trench excavation along cable routes, construction of the new access tracks, the temporary storage of excavated materials, the construction of the proposed substation, the movement of construction vehicles, loading and unloading of aggregates/materials and the movement of material around the site.

The following dust control measures will be put in place during construction and decommissioning works:

- The internal access tracks will be constructed prior to the commencement of other major construction activities. These tracks will be finished with high quality graded aggregate;
- A water bowser will be available to spray work areas and haul roads, especially during periods of excavations works coinciding with dry periods of weather, in order to suppress dust migration from the site;
- All loads which could cause a dust disturbance will be covered to minimise the potential for fugitive emissions during transport;
- Construction vehicles and machinery will be serviced and maintained in good working order to avoid hydrocarbon (fuel/lubricant) leaks;
- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- The access and egress of construction vehicles will be controlled to designated locations, along defined routes, with all vehicles required to comply with onsite speed limits, which shall be reduced in periods of dry, windy weather;
- Wheel washing facilities will be provided at the two main entrance/exit points of the Proposed Development site;
- Receptors which have the potential to receive dusting and soiling due to temporary works at TDR nodes located adjacent to dwellings that experience dust soiling, where appropriate, and with the agreement of the landowner, will have the facades of their dwelling cleaned if required should soiling occur;
- Ensure all construction vehicles will be required to switch off engines when stationary and no idling of vehicles will be permitted.

#### 4.3.1.2 Complaints Procedure

At the main site entrance, the contact details for the site will be available so that local residents are encouraged to contact the Contractor in the event of an off-site dust impact.

The contractor on site will need to be immediately informed of the incident so that fugitive dust complaints can be substantiated.



In all instances, a complaint will be logged by the environmental manager and each complaint will be assigned a discrete complaint number in the Environmental Log.

The environmental manager will maintain the complaints register and any complaints received will be investigated and the dust suppression methods employed will be reviewed. Suitable remedial action will be undertaken as necessary.

#### 4.3.2 Noise and Vibration Management

The predicted noise levels from on-site activity from the Proposed Development are below the noise limits in BS 5228-1:2009+A1:2014. Nonetheless, several mitigation measures will be employed to minimise any potential impacts from the Proposed Development.

The noise impact for construction works traffic will be mitigated by generally restricting movements along access routes to the project specific working hours and exclude Sundays and public holidays, unless specifically agreed with the local planning authority. For example, during turbine erection, an extension to the working day may be required but this would be necessary only on a relatively small number of occasions. The hours of construction activity will be as described in Section 3.3.

It will be ensured that vehicles on local roads do not wait outside residential properties with their engines idling during turbine deliveries. Local residents and the local authority will be consulted in advance of any activities likely to occur outside of normal working hours. The transport of large transport loads generates low levels of noise and vibration as trucks performing such tasks move at very low speeds. Construction activity is temporary and unlikely to generate noise issues at any receptor. Construction noise including ground vibration impacts are predicted as insignificant.

Consultation with the local community is important in minimising the impacts and therefore construction will be undertaken in consultation with the local authority as well as the residents being informed of construction activities through the Community Liaison Officer.

The construction works on site will be carried out in accordance with the guidance set out in BS 5228:2009+A1:2014. Proper maintenance of plant will be employed to minimise the noise produced by any site operations.

The on-site construction and decommissioning noise levels will be below the relevant noise limit of 65 dB LAeq,1hr for operations exceeding one month, and therefore construction noise impacts are not considered to be significant.



In terms of specific mitigation for Borrow pit activities, the construction noise limit has the potential to be exceeded at 150m from the works, assuming all plant operates at once. In terms of mitigation, a temporary earth bund to the south of the site is required to mitigate noise from the site. This is south of the borrow pit area and has a minimum height of 3m above ground level. In addition to the northeast of the borrow pit a 3m high bund will be installed to screen activities in the southern section of the borrow pit from properties to the northeast. This bund extends between the inert quarry area at the centre of the borrow pit and the eastern edge of the borrow pit area. The eastern edge of the main borrow pit area will not be used simultaneously with the northwest section of the borrow pit to avoid potential cumulative noise at the properties northeast of the borrow pit. With the borrow pit works, there is potential for cumulative noise from the northwest section of the borrow pit and the main borrow pit affecting properties northeast of the borrow pit. Therefore, borrow pit activities at these locations will not occur simultaneously to prevent potential cumulative impacts. See Chapter 8 - Land, Soils and Geology and Chapter 11 - Noise and Vibration for more detailed information on borrow pit design and noise barriers. For exact locations of the noise barriers, refer to the planning application drawing P20-211-0600-0019.

The operation of plant and machinery, including site vehicles, is a source of potential impact that will require mitigation at all locations within the site. Proposed measures, which are the same as those proposed for the construction phase, to control noise include:

- Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts.
- Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All plant and equipment to be used on-site will be modern equipment and will comply with the S.I. No. 359/1996 - European Communities (Construction Plant and Equipment) (Permissible Noise Levels) (Amendment) Regulations.
- Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works.
- Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machines, which are used intermittently, will be shut down during those periods when they are not in use.
- Training will be provided by the Site Manager to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation.

For further information, refer to Chapter 11 of the EIAR.

#### 4.3.3 Biodiversity / Flora and Fauna / Invasive Species Management

The primary objectives of biodiversity / flora and fauna / invasive species management over the construction, operation and decommissioning phases of the Proposed Development are as follows:

- Promote the conservation of habitats on site through the establishment of management and/or mitigation;
- Provide management and mitigation for aquatic habitats and water quality;
- Provide management and mitigation for avifauna;



- Provide management and mitigation for bats and terrestrial mammals;
- Provide management and mitigation for invasive species;
- Monitor the usage of the Site by birds post construction;
- Monitor for any collision by birds at the Site post construction;
- Monitor for any collision by bats at the Site post construction.
- An Ecological Clerk of Works (ECoW) will be appointed for the duration of the construction works

For mitigation measures associated with the protection of terrestrial and aquatic ecology please refer to Chapter 17 - Schedule of Mitigation and Monitoring Measures, of the EIAR.

#### 4.3.4 Surface Water Management Plan (SWMP)

A SWMP can be found in Appendix 9.3, Volume 3 of the EIAR.

The SWMP should be read in conjunction with the EIAR and shall be finalised in accordance with this plan following the appointment of the contractor for the main construction works. The plan contains methodology for drainage, water quality management and silt control. The measures contained within the plan will be applied when working near water.

#### 4.3.5 Archaeological Management Plan

A suitably qualified archaeologist will be employed to oversee the construction phase of the Proposed Development and will advise on and establish appropriate Exclusion Zones around the external most elements of Heritage Assets. Exclusion zones shall be fenced off or demarcated for the duration of construction works in the vicinity of the monuments and will be agreed in advance with the National Monuments Service. No groundworks of any kind (including but not limited to advance geotechnical site investigations) and no machinery, storage of any materials or any other activity related to construction will be permitted within Exclusion Zones. Construction within the BnM lands will be undertaken in accordance with the relevant Code of Practice agreed between the Department of Housing, Local Government and Heritage, the National Monuments Service and BnM.

A systematic advance programme of archaeological field-walking surveys will be undertaken within all construction areas to confirm whether there are any surface traces of any potential unrecorded archaeological or architectural heritage sites exist within areas inaccessible due to the presence of thick tree cover. Archaeological monitoring of ground excavation works during the construction phase will then be carried out within all areas of the Site under licence by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage. The Archaeologist will advise on the need for geophysical survey in advance of ground excavation.

The proposed location of the substation area is within the proximity of the recorded location of a togher site (TN042-039004-). As noted in Section 14.3.2.13, no surface traces of this site were noted within the substation area during the site inspection. The vegetation growth at this area is low and a programme of pre-construction archaeological test trenching will be carried out at the location of the proposed substation to ascertain if any subsurface remains of this site are present.



The recorded locations of two togher sites (TN042-039008- and TN042-039009-) are situated c.20m to the north of a proposed peat deposition area (Figure 14.2a). Their recorded locations will be cordoned off during the construction phase and traffic to the peat deposit area to the south will be excluded from their recorded location.

There were no surface traces of any potential archaeological sites noted within the proposed borrow pit area which is located within green field lands, but the potential exists for the presence of subsurface archaeological sites in this area. The ground conditions within this area do not form a constraint for advance archaeological investigations and, therefore, a programme of advance geophysical survey followed by targeted test trenching investigations of any identified features of archaeological potential will be carried out in advance of the construction phase. In the event that any archaeological sites, features or objects are identified during these advance site investigations, they will be securely cordoned off and recorded. The NMS will then be notified and consulted to determine further appropriate mitigation measures, which may include preservation in situ by avoidance or preservation by record through systematic, licensed archaeological excavations.

A suitably qualified archaeologist will be employed to monitor construction phase ground works, including advance geotechnical investigations, turbine foundations, site access tracks (including profiling for floating roads), cable trenches, compounds, under licence by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage within overgrown areas of the Site. This will include archaeological supervision of vegetation clearance works and inspection of cleared areas in advance of ground excavation works within the Site. In the event that any archaeological sites, features or objects are identified during monitoring of ground works will halt at the relevant location, and the archaeological remains will be securely cordoned off and recorded. The NMS will then be notified and consulted to determine further appropriate mitigation measures, which may include preservation in situ by avoidance or preservation by record through a systematic, licensed archaeological excavation.

For the Grid Connection, a programme of licensed archaeological monitoring of ground works during the construction phase will be carried out within sections of road within the environs of the recorded archaeological sites

In the event that any archaeological sites are identified during monitoring, ground works will halt at the location and the archaeological remains will be recorded and cordoned off. The NMS will then be consulted to determine further appropriate mitigation measures, which may include preservation in situ by avoidance or preservation by record through systematic archaeological excavations licensed by the NMS.

#### 4.3.6 Waste Management Plan

It will be the objective of the Developer in conjunction with appointed contractor to prevent, reduce, reuse and recover as much of the waste generated on site as practicable and to ensure the appropriate transport and disposal of residual waste off site. This is in line with the relevant National Waste Management Guidelines and the European Waste Management Hierarchy, as enshrined in the Waste Management Act 1996, as amended.

Any waste generated during the construction phase will be collected, source separated and stored in dedicated, labelled and covered receptacles at the temporary compound during construction pending removal to an appropriately licensed waste facility.

A Construction Waste Management Plan has been prepared for the Proposed Development in line with the "Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects" (2021) as published by the Department of the Environment, Community and Local Government.



The Waste Management Plan will be finalised in accordance with this plan following the appointment of the contractor for the main construction works. This plan should be read in conjunction with the EIAR. The Construction Waste Management Plan will comply with the Statutory requirements of the National Waste Management Plan for a Circular Economy.

#### 4.3.6.1 Assignment of Responsible Personnel

It will be the responsibility of the contractor for the main construction works (when appointed) to nominate a suitable site representative such as a Project Manager, Site Manager or Site Engineer as Waste Manager who will have overall responsibility for the management of waste. The waste manager will have overall responsibility to instruct all site personnel including sub-contractors to comply with on-site requirements. They will ensure that at an operational level each crew foreman is assigned direct responsibility.

#### 4.3.6.2 Waste Generated

It is envisaged that the following categories of waste will be generated during the construction of the Proposed Development:

- municipal solid waste (MSW) from the office and canteen;
- construction waste including concrete;
- waste oil/hydrocarbons;
- paper/cardboard;
- timber;
- steel.

A fully authorised waste management contractor will be appointed prior to construction works commencing. This contractor will provide appropriate receptacles for the collection of the various waste streams and will ensure the regular emptying/and or collection of these receptacles.

#### 4.3.6.3 Waste Minimisation/Reduction

All efforts will be made by site management to minimise the creation of waste throughout the construction of the Proposed Development.

This will be done by:

- material ordering will be optimised to ensure only the necessary quantities of materials are delivered to site
- material storage areas will be of a suitable design and construction to adequately protect all sorted materials to ensure no unnecessary spoilage of materials occurs which would generate additional waste
- all plant will be serviced before arriving on site. This will reduce the risk of breakdown and the possible generation of waste oil/hydrocarbons on site
- all operators will be instructed in measures to cut back on the amount of wastage for trimming of materials etc. For example, cutting of plywood, built into the amount ordered
- educating foremen and others to cut/use materials such as ply wisely for shutters etc.



- prefabrication of design elements will be used where suitable to eliminate waste generation on site
- where materials such as concrete are being ordered, great care will be practiced in the calculation of quantities to reduce wastage.

#### 4.3.6.4 Waste Reuse

When possible, materials shall be re used onsite for other suitable purposes e.g.

- re-use of shuttering etc. where it is safe to do so;
- re-use of rebar cut-offs where suitable;
- re-use of excavated soil for screening, berms etc.;
- re-use of excavated rock or stone – where possible will be used as suitable fill elsewhere on site for the new site tracks, the hardstanding areas and embankments where possible.

#### 4.3.6.5 Waste Recycling & Recovery

In accordance with national waste policy, source separation of recyclable material will take place. Receptacles will be clearly labelled, signposted and stored in dedicated areas in the construction compound. Waste management records will be kept on Site.

The following sourced segregated materials container will be made available on site in the construction compound:

- timber;
- ferrous metals;
- aluminium;
- dry mixed recyclables;
- packaging waste;
- food waste.

The materials will be transported off-site by a licensed contractor to a licensed recovery centre and these materials will be processed through various recovery operations. A list of nearby licensed waste management facilities is shown in Table 4-2:



**Table 4-2: Nearby Waste Management Facilities**

Licensed Waste Facility	Location	Straight Line Distance from Site (km)	Type of Waste
Pride Point Ltd.	Monakeeba, Mill Road, Thurles, Co. Tipperary, E41 YR79	≈9.2 northwest	Concrete, bricks, packaging, tiles and ceramics, iron and steel, mixed metals, soils and stones.
Killeenyarda Construction Ltd.	Cabragh Business Park Ballycurrane Thurles, Co. Tipperary	≈11.3 east	Mixture of concrete, bricks, tiles and ceramics, wood, mixed metals, mixed construction and demolition wastes, plastics, biodegradable waste, mixed municipal waste, bulky waste.
Roadstone Quarry Killough	Gaile, Holycross Co. Tipperary, E41 T622	≈13.3 northwest	Concrete, bricks, tiles and ceramics.
Clonmel Waste Disposal Ltd.	Lawlesstown Clonmel Co. Tipperary	≈26.3 south	Soil and stones, mixed construction and demolition wastes, bulky waste, sawdust, shavings, cuttings, wood, particle board and veneer, metals.

#### 4.3.6.6 Waste Disposal

Residual waste generated on-site will require disposal. This waste will be deposited in dedicated receptacles and collected by the licensed waste management contractor and transported to an appropriate facility. All waste movements will be recorded, which records will be held by the waste manager on-site.

#### 4.3.6.7 Contaminated Material

Any contaminated soils will be handled, removed and disposed of to an authorised facility in accordance with statutory requirements for the handling, transportation and disposal of waste. In particular, the following measures will be implemented:

- Contaminated material will be left in-situ and covered, where possible until such time as WAC (Waste Acceptance Criteria) testing is undertaken in accordance with recommended standards and in-line with the acceptance criteria at a suitably licenced landfill or treatment facility. This will determine firstly the nature of the contamination and secondly the materials classification i.e. inert, non-hazardous or hazardous,
- If the material is deemed to be contaminated, consultation will take place with the respective local authority and/or EPA on the most appropriate measures. Such materials will be excavated, transported by a contractor with a valid waste collection permit and recovered/disposed of at an appropriate facility.

#### 4.3.6.8 Waste Management Training

Copies of the construction waste management plan will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the Waste Management Plan and informed of the responsibilities that fall upon them as a consequence of its provisions.



It will be the responsibility of the contractors appointed Waste Manager to ensure that all personnel are made aware of their responsibilities under the plan via a toolbox talk or otherwise.

#### 4.3.7 Traffic Management Plan

This section is a Traffic Management Plan (TMP) for the Proposed Development. A construction stage TMP shall be finalised in accordance with this plan following the appointment of the Contractor for the construction works and the turbine supply contract. The appointed contractor will prepare a site-specific TMP prior to the construction works commencing.

Some items in this plan can only be finalised with appropriate input from the contractor who will be appointed to carry out and schedule the works. Furthermore, it is appropriate that the Project Supervisor Construction Stage (PSCS), when appointed, should have an active role in the preparation/review of the Traffic Management Plan.

This plan should be read with reference to Chapter 15, Volume 2 of the EIAR.

The contractor is required to prepare the necessary site-specific Traffic Management Plans prior to the construction works commencing in accordance with Chapter 8 of the Traffic Signs Manual 2019 and subject to load permits.

The contractor will be responsible for the implementation of all agreements between the developer and the County Council and local residents with the objective that the transportation needs for the Proposed Development will have a minimal impact on the road network and local communities.

Construction traffic will require regular access to the site at varying times throughout the construction phase. The aim of this TMP is to put in place procedures to manage traffic effectively on site and in the immediate vicinity of the Proposed Development, to ensure the continued movement of traffic on the public roads and to minimise disturbance during transportation of materials particularly oversize loads. The correct implementation of this TMP will ensure that appropriate procedures are in place to minimise any effects on the safety and movement of the general public.

Prior to the commencement of construction, the TMP will be reviewed by the main contractor (and any sub-contractors) and will be updated as necessary.

##### 4.3.7.1 *Construction Stage Traffic Management Measures*

The contractor will be responsible for the implementation of all agreements between the Applicant and Tipperary County Council with the objective that the transportation needs for the Proposed Development will have a minimal impact on the road network and local communities.

The proposed accesses will be created allowing adequate visibility sightlines in accordance with TII Standards DN-GEO-03060: Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated, and compact grade separated junctions), May 2023, DN-GEO-03031: Rural Road Link Design, May 2023, and in accordance with County Development Plan. Required sightlines will be maintained in both directions at the site entrance and existing hedgerows will be trimmed and removed as necessary.

Public roads shall be kept free of mud, dust, spillages and debris from the construction site, construction plant or haulage vehicles. Any necessary measures shall be put in place at the site entry/exit points.



Adequate signage shall be installed on approach to the proposed site entrance advising of the presence of a 'site access ahead' and 'construction traffic ahead'. The above signage shall be removed following completion of the construction phase.

All construction related parking shall be accommodated within the site. Construction related vehicles will not be permitted to park on public roads. Turning space will be provided in the temporary site compound and within the compound hardstanding areas.

Traffic movements for the construction of the development will be discussed with local community representatives and where necessary off-peak deliveries will be accommodated where possible.

#### 4.3.7.2 *Construction Plant and Vehicles*

The typical construction plant and vehicles used as part of the construction of a wind farm are as follows (non-exhaustive):

- Hydraulic Excavators;
- Dump Trucks;
- General construction delivery vehicles (e.g., steel reinforcement bar, electrical components etc.);
- Concrete trucks and pumps;
- Cranes of various lifting capacities (up to 1000 tonnes);
- Oversized articulated delivery vehicles (for turbine component transport);
- Site Jeeps (off-road 4x4 all purpose vehicles);
- Private vehicles of those employed on site for the construction phase.

It should be noted however that final selection of construction plant and vehicles may vary depending on suitability, availability, and contractor's choice, etc.

Plant operators will be responsible for the upkeep and maintenance of construction plant and vehicles, ensuring good working order prior to use. Should emergency maintenance be carried out on site, this will be carried out at a designated area away from sensitive receptors and will ensure that a spill kit is nearby. Refer to the SWMP in Appendix 9.3, Volume 3 of the EIAR for details on the required locations and contents of spill kits.

#### 4.3.7.3 *Consultation and Notification*

##### 4.3.7.3.1 *An Garda Síochána*

The contractor will liaise directly with an Garda Síochána in relation to the TMP. Any concerns/requirements they have will be incorporated into the plan. This may include details in relation to the escorting of oversized loads.

The necessary permits (including approved route permits) will be applied for and obtained from an Garda Síochána.



#### 4.3.7.3.2 Local Authorities

The contractor will liaise directly with the Local Authorities of Tipperary County Council and Kilkenny Country Council, in relation to the traffic management plan. Any concerns/requirements they have will be incorporated into the plan.

The necessary permits (including standard permits) will be applied for and obtained from the relevant local authorities.

Construction commencement dates will be made known to the Planning Authority by way of formal Commencement Notice.

#### 4.3.7.3.3 Local Residents

The following measures will be used to communicate the necessary information to the households along the local road to be used as a haul road:

- Information signs will be erected in advance of the construction/transportation works.
- A flyer drop will be carried out to advise households along the local road leading to the site in relation to the programme of construction works and especially in relation to oversized load movements.
- Residents will be consulted with regarding the finalisation of the detailed traffic management plans developed by the contractor ahead of construction of the Proposed Development.
- Contact details for a Liaison Officer will be provided so that any concerns can be raised, logged and be easily channelled to the Developer to be dealt with.
- A project website will be in place for the duration of the construction phase which will include regular project programme status updates, contact details, facilities for community feedback/observations as well as a complaints procedure.

Complaints will be entered into the site complaints log, and the relevant members of the contractor's staff will arrange to meet with those affected. The situation will be acted upon immediately and reviewed by the Project Manager.

#### 4.3.7.3.4 Key Personnel and Responsibility

Once prepared and agreed with the local County Council and an Garda Síochána the contractor will implement the Proposed Development specific Traffic Management Plan (TMP).

Please note that some items in this plan can only be finalised with appropriate input from the contractor who will carry out and schedule the works. Furthermore, it is appropriate that the Project Supervisor Construction Stage (PSCS), when appointed, should have an active role in the preparation/review of the Traffic Management Plan.



Typically, the following members of the contractors' staff will have responsibility for adherence to the TMP as follows:

- **Traffic Management Coordinator:** The Traffic Management Coordinator will be responsible for maintaining regular contact with an Garda Síochána, Tipperary County Council, the statutory bodies and the client concerning traffic control, interference with services and co-ordination of crossings at roads, rivers and railways. The Transport Officer will contact the relevant bodies in relation to developing method statements prior to the work taking place. The Transport Officer will be responsible for instructing the Construction Manager, Foreman and all other personnel on the information in the agreed method statement prior to the work commencing and ensuring that the method statement is adhered to. The Transport Officer will be responsible for ensuring that the Traffic Management Plan will be implemented in full.
- **Safety Officer:** The Safety Officer will be responsible for implementing all safety requirements detailed in the Project Safety Plan. Ensure that all operatives receive site safety induction prior to commencing work on site. They will ensure that all plant, particularly lifting equipment, on site has the relevant certification and are checked regularly by a competent person. The Safety Officer will carry out safety audits and checks on a regular basis and amend procedures where necessary.
- **Construction Manager:** A suitability qualified Construction Manager (CM) will be appointed by the Employer and will have overall responsibility for overseeing the construction of the Proposed Development in accordance with regulatory and environmental requirements. The CM will ensure that sufficient resources are available to meet the programme and that the necessary information is provided to the appropriate staff.
- **Foreman:** The Foreman is responsible for ensuring that the crew carry out the work in accordance with the method statement and contract specifications and drawings using good working practices in a safe manner. They will supervise construction personnel ensuring their competence. They will check all plant and equipment on a regular basis ensuring it is maintained and in good working order.

#### 4.3.7.4 Construction Traffic

The different categories of construction related traffic that will visit the Proposed Development Site during the construction phase are as follows:

- Specialist delivery vehicles transporting turbine components and an electrical transformer.
- HGVs importing construction materials, including concrete, aggregate stone, timber logs, building materials, drainage/ducting materials, reinforcing steel, cabling, steel lattice tower sections, site boundary fencing, electrical switchgear, etc.
- HGVs delivering plant/cranes and fuel.
- LGV Traffic for on-site construction personnel.

All construction transport including deliveries of quarry and building materials will use the designated delivery routes for the wind farm which are shown on Figure 15.2, contained within Volume 4 of the EIAR.

As described in Section 4.3.7, a construction traffic safety and courtesy procedure will be implemented to manage the traffic for delivery of materials. Construction traffic will be limited to an appropriate speed limit to be set by the appointed contractor along local roads. A traffic coordinator will be employed full time during the construction period to implement the construction traffic safety courtesy protocol and speed limitations.



#### 4.3.7.4.1 Site Entrance

Access to the proposed Wind Farm Site shall be taken from the public road network at 6 no. points. The individual access points are described as follows:

- 1 no. site access point in the south of the Site from the Local Road L2201 to Lanespark at Ballybeg comprising the re-use and upgrading of an existing bog operations rail line and vehicular access crossing point. This access point shall be used during the construction phase only for material deliveries to the Site;
- 2 no. access points between Lanespark and Littleton Bog from the Local Road L4153 at Derryhogan comprising the re-use and upgrading of an existing bog operations vehicular access road crossing point. These access points shall form a public road crossing. This shall be used as a crossing point for turbine components, and during the construction and operation phases of the Proposed Development;
- 2 no. access points within Littleton Bog off the Local Road L4114 at Longfordpass North comprising the creation of two new access points on opposite sides of the public road. These access points shall form a public road crossing and shall be used during the construction and operation phases of the Proposed Development;
- 1 no. access point in the north of the site from the R639 at Longfordpass North comprising the creation of a new access point. This shall act as the primary access point to the site for the delivery of large turbine components and shall be used during the construction and operation phases of the Proposed Development.

The layout of the site access points is shown on the planning application site layout plan drawings.

The access points have been selected with consideration for safety of public road users and construction staff and to ensure they can be constructed to comply with the requirements of both Tipperary County Council and TII design requirements for direct accesses (DN-GEO-03060).

The proposed entrances will require trimming/removal of hedgerows and vegetation to achieve the desired sightlines, in accordance with TII design guidelines DN-GEO-03060. Following this, hedgerow and vegetation maintenance may be required periodically in both directions to ensure the desired sightlines are maintained.

#### 4.3.7.4.2 Haul Routes

The Proposed Development is surrounded by a comprehensive road network with several routing options available. For this development, 3 no. haul routes are proposed for the deliveries of construction materials from quarries using HGVs such as concrete and aggregates. Indicative haul routes for the Proposed Development are shown in Figure 15.2, contained within Volume 4 of the EIAR.

The licenced quarries which are proposed to be utilised for the construction of the Proposed Development include:

- Maher Quarries Ltd., located in Thurles, Co. Tipperary, approximately 3.45km north-west of the Site.
- Gleeson Quarries, located in Thurles, Co. Tipperary, approximately 4.7km south of the Site.
- Roadstone Quarry Killough, located in Thurles, Co. Tipperary, approximately 9.5km south-west of the Site.



These quarries can provide aggregates for both road construction and concrete. The location of these licensed quarries and the haul routes to the Proposed Development are shown in Figure 15.2, contained within Volume 4 of the EIAR. Consideration has been made to keep loads on the highest road class for most of the route to minimise traffic disruption.

It is anticipated that a succession of 20T and/or 8m<sup>3</sup> trucks will transport the material at a peak frequency of 16 trucks/hour across the 6no. entrances. Peaks in construction traffic are typically associated with the pouring of turbine foundations. Hours of operation will be limited for HGV movements in order to allow for residents to avoid noncoinciding commuting during the morning and evening peak hours, during local school start and finish times.

#### 4.3.7.4.3 Oversized Loads Deliveries

Most loads associated with this Proposed Development are of standard size and can navigate the national road network without transport issues. The turbine components are expected to be delivered by sea to the Port of Foynes in County Limerick, and transported to site along the national, regional and local road network. Oversized loads associated with wind turbine components shall approach the site from Junction 4 of the M8 Motorway. The oversized transformer load required for the Grid Connection follow the same route to site as the Turbine Delivery Route. Specialist vehicles will be used for the delivery of the wind turbine components and substation transformer. These components will follow the Turbine Delivery Route outlined in Chapter 15, Volume 2. Other materials are expected to be delivered on flatbed trucks (whether 40ft or smaller depending on size of deliveries).

Due to their abnormal size, blades and towers will be delivered at night to avoid disruption to peak day time traffic. The turbine blades will be the longest components to be transported from port to Site. Pinch points have been identified along the route where temporary accommodation works will be required. Details of the TDR and related proposed works to address the pinch points are provided in the Turbine Delivery Route Survey Report (shown in Appendix 4.2, Volume 3).

The delivery of substation components gantries, towers, transformers, will utilise the same route when being delivered to the site. The same related mitigation measures will apply to these deliveries.

The proposed route to site is summarised as follows:

- Loads will depart the Port of Entry (PoE) of Foynes and navigate to the M8 motorway;
- Loads approaching from the south will depart the M8 at Junction 4 and contra flow through the western roundabout;
- Loads approaching from the south will continue along the R693 straight through the east roundabout;
- Loads approaching from the north will depart the M8 at Junction 4 and turn left at the east roundabout;
- Loads will continue towards the R693 / R639 Roundabout and turn right at the roundabout;
- Loads will continue along the R639 through Urlingford;
- Loads will continue south-west along the R639 through Longford Pass to the proposed site entrance located to the left.



Pre- and post-construction surveys will be carried out to ensure the structural integrity of the structures and pavement along the selected haulage route. Maintenance will be carried out on the public road network during the construction phase, as necessary, to ensure that the condition does not deteriorate below the standard documented prior to construction. All roads and structures along the TDR and haulage routes will be reinstated to their pre-works condition or better post-construction. A permit for moving abnormal loads to the Site will be sought from An Garda Síochána and the applicable local authorities on the selected TDR and haulage route with a transportation plan for the time of deliveries established at construction stage.

There will be an objective to maintain the strategic capacity and safety of the carriageways at all times, cognisant of the National Development Plan, 2021 – 2030, with key sectoral priorities for maintaining the national road network to a robust and safe standard for users. The detailed design will be carried out with full stakeholder engagement and all concerns that may arise will be addressed through this process.

The delivery of turbine components normally takes place overnight due to the oversized nature of some of the components such as tower sections and blades. As mentioned above deliveries are done under a permit system from An Garda Síochána and are fully escorted for the entire delivery. Turbine delivery normally consists of three trucks in convoy with their escorts. The convoy will proceed along the local access roads at speeds less than 25km/h but such that they will not cause any undue delay to any encountered resident.

Wind turbine component deliveries, cranes, 110kV Transformer for the onsite substation and all large plant associated with turbine installations will use the designated turbine delivery route.

Mitigation measures proposed for the TDR include:

- **Programme of Deliveries:** a programme of deliveries will be submitted to the roads authority in advance of deliveries of turbine components to the site. The programme will include details of the dates and times of each component delivery along with the route to be taken. Turbine component deliveries will be carried out during off-peak times and will be done using a convoy and a specialist heavy haulage company.
- **Garda Escort:** Turbine deliveries will be escorted by an Garda Síochána. This will ensure the impacts of the turbine deliveries on the existing road network are minimised.
- **Reinstatement:** Any area affected by the works to facilitate turbine delivery will be fully reinstated to its original condition.
- **Consultation:** Consultation with the local residents and Tipperary County Council will be carried out in advance to manage turbine component deliveries.

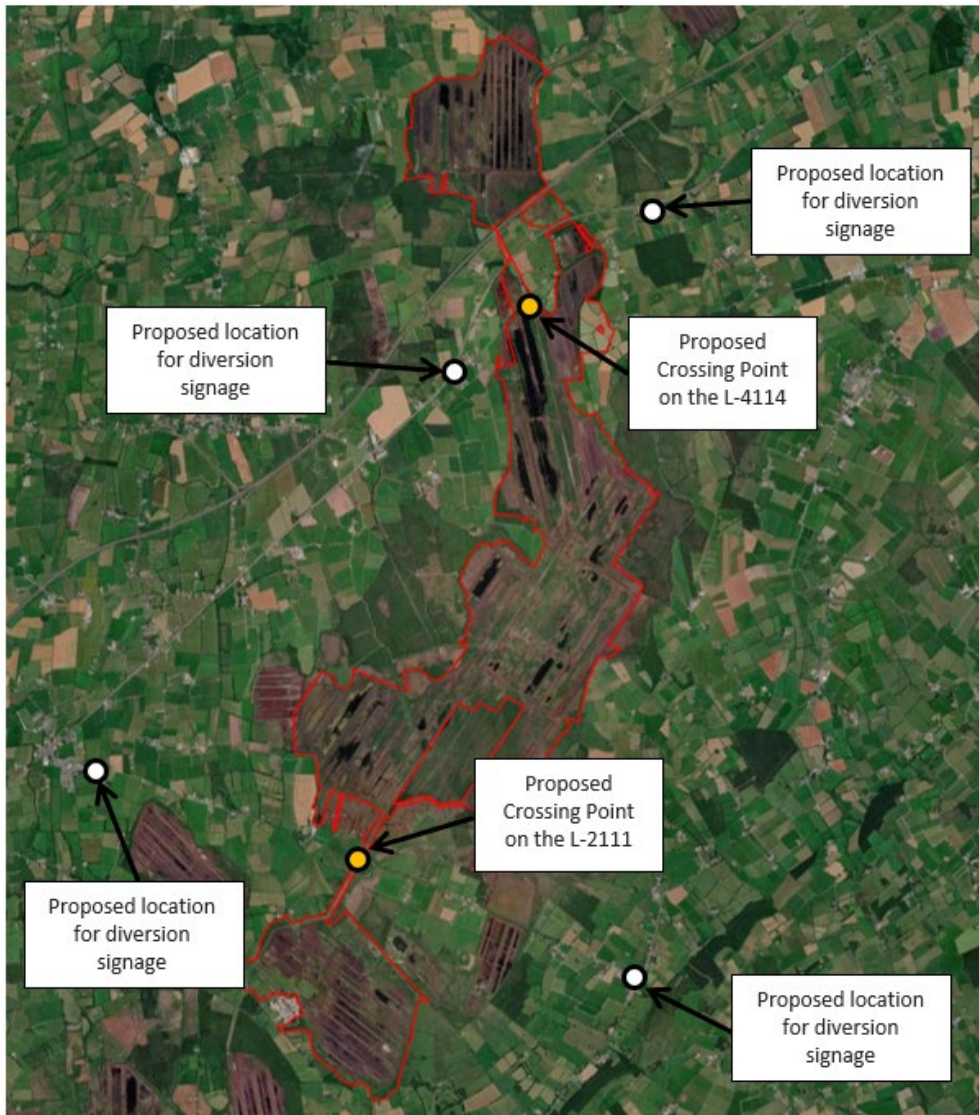
#### 4.3.7.5 Road Closures, Diversions and Safety Measures for Road Crossings

It is envisaged that a single, short-term road closure will be necessary for carrying out a portion of the cable trenching associated with the internal interconnector cabling where it crosses the L4114 and the L2111. It is estimated that this crossing can take place in one day and will not create disruption to the wider road network as local access can be maintained at all times.

The consent of Tipperary County Council will be required and the necessary road diversions together with the appropriate signage will be put in place. As there is a good network of local roads, it is anticipated that there are a number of options available for diverting traffic which will allow flexibility during this process of construction and maintain local access at all times during this element of the works. Diversion signage will also be implemented at appropriate locations to advise local road users.



Temporary signage and traffic management will be implemented for works in rural single carriageway roads in accordance with Chapter 8 of the Traffic Signs Manual. Figure 4-1 shows a proposed layout for diversion signage location for crossing point work.



**Figure 4-1: Diversion Signage Location for Crossing Point Work**

Access points will be secured and locked when not in use. The proposed crossing point will be managed appropriately to allow the safe passage of construction vehicles in, out and across the public road. Priority will be maintained for public traffic. Stop and Go discs will be used to control the crossing point. See Figure 4-2 for acceptable type in accordance with Chapter 8 of the Traffic Signs Manual. If it is required to stop both streams of traffic at the one time, then a disc displaying Stop on both sides shall be used.

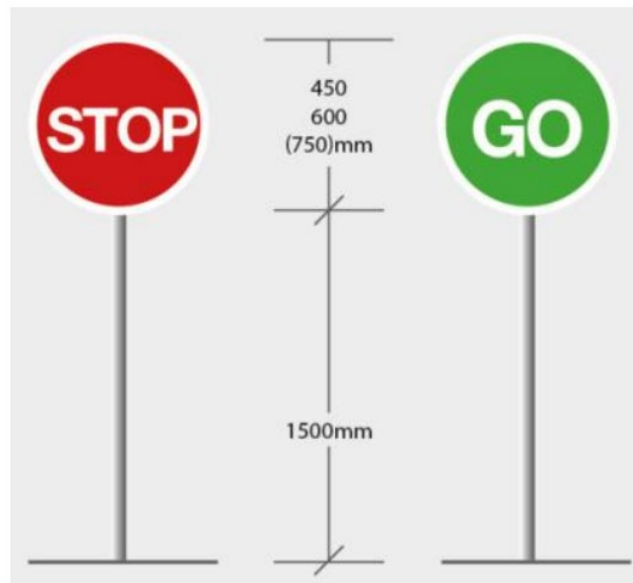


Figure 4-2: Acceptable Stop-Go Discs

At site crossing points, a single operator may be used to control the traffic using a double-sided Stop disc. The operator stops both flows of traffic to allow the construction vehicle to cross the public road and then leaves the carriageway and signals to the traffic to proceed.

A concrete apron will be provided on both sides of each crossing point during the construction phase, constructed 40mm below road level and overlaid with surface course material.

#### 4.3.7.5.1 Road Safety

A road safety and courtesy procedure will be implemented for the duration of the construction of the Proposed Development. All companies delivering to site will have to sign up to this protocol as part of their supply contract. The protocol will consist of restricted delivery hours, speed limits along public roads and within the site. Fundamental to the procedure is courtesy for local road users. Construction vehicles will always give way to oncoming residential traffic and will always slow down or stop as appropriate for pedestrians and cyclists.

#### 4.3.7.6 Road Cleaning

Public roads shall be kept free of mud, dust, spillages and debris from the construction site, construction plant or haulage vehicles. Any necessary measures shall be put in place at the site entry/exit points.

The construction phase of the Proposed Development will require the delivery of turbine components, concrete, steel and aggregate to the site via the public road network. The disturbance of dirt on the local road network during wet weather and dust during dry weather is an area of identified concern where the primary mitigation measure for this impact will be in the form of a wheel wash facility to be installed on the exit of the wind farm.

In addition, a road sweeper will be available if any section of the public roads were to be dirtied by trucks associated with the Proposed Development.



A water bowser will be employed to spray the local roads with water during dry periods when there is a risk of dust disturbance. Appropriate signage will be maintained for the duration of the construction and operation phases with clear warning signage at the site entrance.

Concrete washout will be carried out in dedicated areas at the temporary construction compounds. Only the washing of chutes will be permitted. Chutes will be washed out at the designated area with a settlement lagoon provided to receive all run-off.

See the Surface Water Management Plan located in Appendix 9.3, Volume 3 of the EIAR for more detail on this topic.

#### 4.3.7.7 *Carriageway/ Road Reinstatement*

A pre-condition survey of haul routes, consisting of a video survey and photographs, shall be carried out and a copy submitted to Tipperary County Council.

At the time of writing, it is anticipated that the proposed haul routes are capable of accommodating the construction traffic associated with the Proposed Development. In the event that there are concerns around the structural capacity of a road on a proposed haul route ahead of construction, a structural survey shall be carried out to determine suitability of the existing roads to carry the loading. Where the structural survey indicates that a proposed haul route is not in a suitable condition, details of any upgrading works required shall be submitted to Tipperary County Council for approval. The developer shall upgrade the road or junction in advance of haulage operations.

Any damage caused to the road shall be repaired to its previous condition, to the satisfaction of Tipperary County Council. Any defects that appear during the haulage period shall be rectified by the project owner.

#### 4.3.7.8 *General Traffic Management Measures*

General measures that shall be addressed in the TMP shall include:

- **Traffic Management Co-Ordinator:** A dedicated Traffic Management Coordinator will be appointed for the duration of the Proposed Development, and this person will be the main point of contact for all matters relating to traffic management on the Proposed Development.
- **Roads and Routes:** The final TMP will clearly identify roads that will be used to access the Proposed Development site and roads that are not to be used.
- **Road Condition Survey:** A pre-condition survey will be carried out on all public roads that will be used in connection with the development to record the condition of the public roads in advance of construction commencing. A post-construction survey will also be carried out after the works are completed. The specification and timing of the surveys will be agreed with the roads authority. Joint surveys shall be completed if the roads authority requests. Local sections of the TDR will be upgraded prior to construction starting.
- **Road Reinstatement:** All roads will be reinstated expeditiously on completion of the construction works. Roads will be reinstated to their pre-works condition or better and to the satisfaction of the roads authority.
- **Site Inductions:** All workers will receive a comprehensive site induction which will include a section on traffic management and clear guidance on the routes to be used/not used to access the site.



- **24-Hour Emergency Contact:** A 24-hour emergency phone number will be maintained for the duration of the construction works and the number will be noted on temporary signage at each works area and the site entrance for the wind farm site.
- **Traffic Management Guidance:** All necessary temporary traffic management will be planned and executed in accordance with best practice, including Chapter 8 of the Traffic Signs Manual published by the Department of Transport in 2019.
- **Community Liaison:** A Proposed Development website will be in place for the duration of the construction phase which will include regular Proposed Development programme status updates, contact details, facilities for community feedback/observations as well as a complaints procedure. A community liaison will be appointed by the contractor in advance of the commencement of the construction phase who will have responsibility for consulting with members of the public and act as a first point of contact for the project management team. Letter drops will be carried out to notify members of the public living near the proposed site and cable route to advise them of any particular upcoming traffic related matters e.g. temporary lane/road closure or delivery of turbine components.
- **Signage:** Clear signage relating to the development, both temporary and permanent, will be provided for accessing the site.
- **Wheel washing facilities:** Temporary wheel washing facilities will be located at the site entrances, subject to agreement with the planning authority, to prevent soil/dirt from being transported onto the public road network.
- **Road Sweeping:** Appropriate steps will be taken to prevent soil/dirt generated during the works from being transported on the public road. When, if necessary, a road sweeper will be used to maintain the public roads in a clean condition during the construction activities of the Proposed Development.
- **Site Entrances:** The entrances to the site will be secured when the site is not in use. When necessary, a flagman will be used to assist traffic movements at the site entrance or in other areas as required. For example, during turbine blade and tower deliveries.
- **Temporary Road Crossing Points:** Site entrances from and to the wind farm will be secured and locked when not in use. Where required, the entrances will be controlled by flagmen to assist traffic movements. The proposed crossing point will be managed appropriately to allow the safe passage of construction vehicles in, out and across the public road. Priority will be maintained for public traffic. A concrete apron will be provided on both sides of the crossing point during the construction phase, constructed 40mm below road level and overlaid with surface course material. This road is a very quiet public road with extremely low traffic volumes.
- **Abnormal Load Deliveries:** Abnormal loads will require an abnormal load permit prior to delivery and will be delivered mostly at nighttime as agreed with local authority and an Garda Síochána.

#### 4.3.8 Decommissioning Plan

The decommissioning phase works will be completed to approved standards, which include specified materials, standards, specifications and codes of practice (at the time decommissioning takes place).

An experienced main contractor will be appointed to undertake the decommissioning of the wind farm development. The main contractor will comply with the Construction and Environmental Management Plan (CEMP) prepared for the construction phase and the Operation and Environmental Management Plan (OEMP) implemented during operation and any revisions made to those documents throughout the phases in which they were adopted. The contractor will produce a detailed and site-specific Decommissioning Plan prior to commencement of decommissioning.



The key site targets are as follows:

- Ensure decommissioning works and activities are completed in accordance with mitigation and best practice approach presented in the accompanying Environmental Impact Assessment Report (EIAR) and associated planning documentation;
- Ensure decommissioning works and activities have minimal impact/disturbance to local landowners and the local community;
- Ensure decommissioning works and activities have minimal impact on the natural environment;
- Adopt a sustainable approach to decommissioning;
- Provide adequate environmental training and awareness for all project personnel.

The key site objectives are as follows;

- Using recycled materials if possible, e.g. soil and overburden material for backfilling and reinstatement;
- Ensure sustainable sources for materials supply where possible;
- Avoidance of any pollution incident or near miss as a result of working around or close to existing watercourses and having emergency measures in place;
- Avoidance of vandalism;
- Keeping all watercourses free from obstruction and debris;
- Correct implementation of the sustainable drainage system (SuDS) drainage design principles;
- Keep impact of decommissioning works to a minimum on the local environment, watercourses, and wildlife;
- Correct fuel storage and refuelling procedures to be followed;
- Good waste management and house-keeping to be implemented;
- Air and noise pollution prevention to be implemented;
- Monitoring of the works and any adverse effects that it may have on the environment.
- Decommissioning methods will be altered where it is found there is the potential to have an adverse effect on the environment.

An overview of the anticipated decommissioning methodologies is provided below.

#### 4.3.8.1 *Wind Turbines*

Prior to any works being undertaken on wind turbines, they will be disconnected from the grid by the site operator in conjunction with ESB Networks and EirGrid. The dismantling and removal of wind turbines of this scale is a specialist operation which will be undertaken by the turbine supplier that completed the installation where possible. Turbine dismantling will be undertaken in reverse order to methodology employed during their construction. A number of large-scale cranes will be brought back to site utilising the existing hard stand areas. The dismantling of turbines will be bound by the same safety considerations as was the case during construction in terms of weather conditions where works will not be undertaken during adverse weather conditions and in particular not during high winds.



The turbines will most likely be removed from site in a similar manner to how they were transported to the site originally in extended articulated trucks. The destination of the turbines post decommissioning is unclear at this time as a re-use option may be sourced if early decommissioning occurs. Therefore, the removal of turbines from site is considered in terms of all turbine components being removed intact and as they transported to site.

The transport of disassembled turbines from the site will be undertaken in accordance with a Decommissioning Transport Management Plan which will be issued to and agreed with the competent authority at that time as part of a permit application for the delivery of abnormal loads using the local roads under the Road Traffic (Special Permits for Particular Vehicles) Regulations 2007. The Transport Management Plan will provide for all necessary safety measures, including a convoy and Garda escort as required, off-peak turning/reversing movements and any necessary safety controls.

The temporary accommodation works along the TDR will not be required for the decommissioning phase as turbine components can be dismantled on site and removed using standard HGVs.

#### 4.3.8.2 *Turbine Foundations*

On the dismantling of turbines, it is not intended to remove the concrete foundation from the ground. The foundation pedestals will be covered over and allowed to re-vegetate naturally. Leaving the turbine foundations in situ is considered a more environmentally sensible option as to remove the reinforced concrete associated with each turbine would result in environmental disturbances such as noise and vibration and dust.

Therefore, the turbine foundations will be backfilled and covered with soil material which will comprise the usable soil or overburden material on the site after construction. The soil will be spread and graded over the foundation using a tracked excavator and revegetation allowed to occur naturally.

It is proposed that all internal site access tracks and turbine hard standings will be left in place. Turbine hard standings will be covered using original stripped topsoil, which would have been placed adjacent to the works area and landscaped during the construction stage, and allowed to revegetate naturally.

#### 4.3.8.3 *Underground Cabling*

The 33kV electrical and fibre optic cabling will be removed from the cable ducting. The cabling will be pulled from the cable duct using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at each of the joint bays/pull pits along the cable. The track will be excavated using a mechanical excavator at each cable pulling pit location and will be fully re-instated once the cables are removed. A decommissioning phase Traffic Management Plan will be prepared for these works. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation.

Grid connection infrastructure including the on-site substation and ancillary electrical equipment will form part of the national grid and will be left in situ.

The meteorological mast will be decommissioned using a similar methodology as the construction except in reverse.

It is expected that the decommissioning phase will take no longer than 6 months to complete.

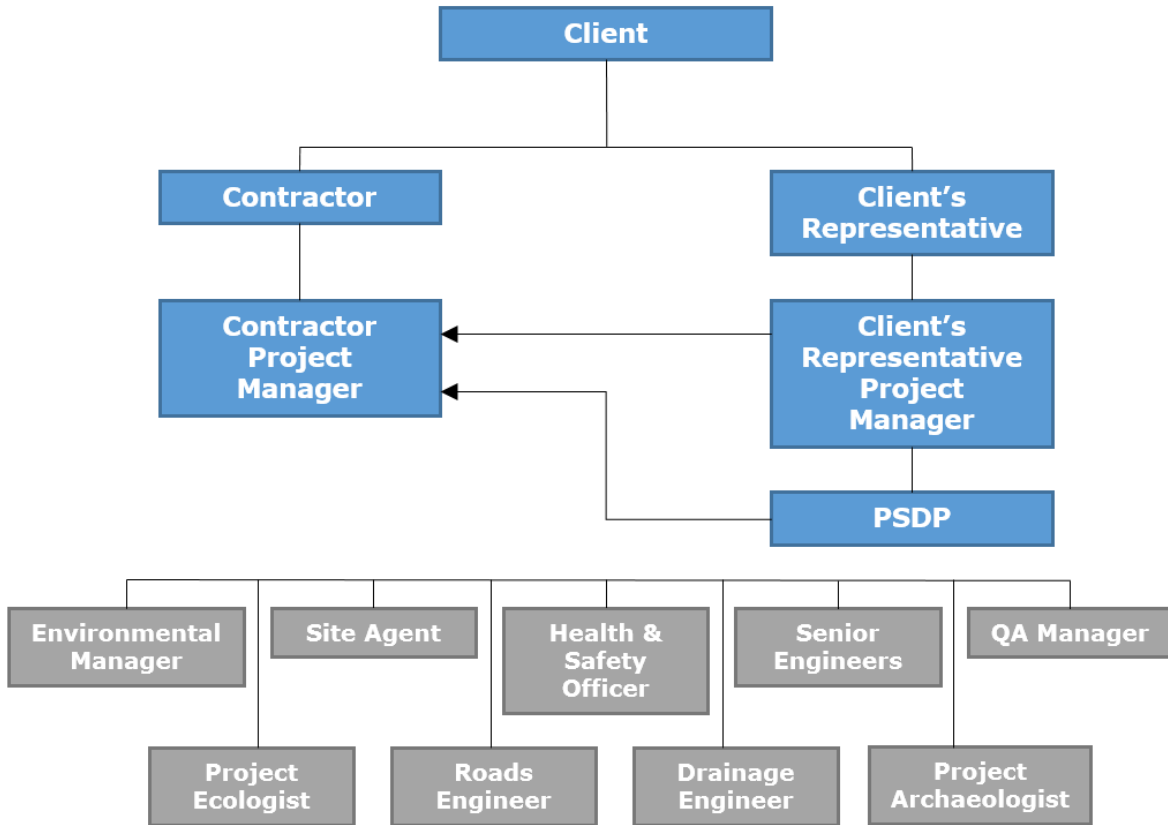


#### 4.4 Environmental Management Team - Structure and Responsibility

A preliminary organisation chart is included hereunder.

The Contractor’s Project Manager will be responsible for the delivery of all elements of the Environmental Management Plan.

The Contractor’s Project Manager will retain all responsibility for issuing, changing and monitoring the Environmental Management Plan throughout.



**Figure 4-3: Project Management Team Organogram**

#### 4.5 Training, Awareness and Competence

All site personnel will receive environmental awareness information as part of their initial site briefing. The detail of the information will be tailored to the scope of their work on site.

The contractor for the main construction works will conduct the environmental awareness training at the same time as Health and Safety Training (often referred to as Site Inductions). As the works progress, the Contractor will hold ongoing Toolbox Talks.

This will ensure that personnel are familiar with the environmental aspects and impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures.



The CEMP will be available in the main site compound during the construction of the Proposed Development. The environmental performance at the site is on the agenda of the monthly project management meetings for the Proposed Development.

Elements of the CEMP will be discussed at these meetings including objectives and targets, the effectiveness of environmental procedures etc. Two-way communication will be encouraged by inviting all personnel to offer their comments on environmental performance at the site.

#### **4.6 Environmental Policy**

The contractor is responsible for preparing and maintaining an Environmental Policy for the site. The policy will be appropriate to the Proposed Development, commit to continuous improvement and compliance with legal requirements and provide a framework for objectives and targets. This will be communicated to all site personnel and will be available on-site notice boards

#### **4.7 Register of Environmental Aspects**

The contractor is responsible for preparing and maintaining a Register of Environmental Aspects pertaining to the site. This register will identify the environmental aspects associated with activities onsite and determine which aspects have or can have a significant impact on the environment. This will be adopted from the Schedule of Mitigation Measures set out in Chapter 17 of the EIAR.

#### **4.8 Register of Legislation**

The contractor is responsible for preparing and maintaining a register of key environmental legislation pertaining to the site. This register will reference all current environmental legislation and will be inspected, reviewed and updated regularly to ensure compliance.

#### **4.9 Objectives and Targets**

Objectives and targets will be set to ensure that the Proposed Development can be constructed and operated in full accordance with the EIAR, planning conditions and legislative requirements, with minimal impact on the environment.

Environmental objectives are the broad goals that the contractor must set in order to improve environmental performance. Environmental targets are set performance measurements (key performance indicators or KPI's) that must be met in order to realise a given objective.

#### **4.10 Non-Conformance, Corrective and Preventative Action**

Non-Conformance Notices will be issued where there is a situation where limits associated with activities on the Proposed Development are exceeded, or there is an internal/external complaint associated with environmental performance.

Non-Conformance is the situation where essential components of the EMS are absent or dysfunctional, or where there is insufficient control of the activities and processes to the extent that the functionality of the EMS is compromised, in terms of the policy, objectives and management programmes. A Non-Conformance register will be controlled by the contractor.



The EMS and all its components will be required to conform to the EMP. In the event of non-conformance with any of the above, the following must be undertaken:

- Assess cause of the non-compliance;
- Develop a plan for correction of the non-compliance;
- Determine preventive measures and ensure they are effective;
- Verify the effectiveness of the correction of the non-compliance;
- Ensure that any procedures affected by the corrective action taken are revised accordingly.

Responsibility will be designated for the investigation, correction, mitigation and prevention of non-conformance.

#### **4.11 EMS Documentation**

The Contractor is required to keep the following documentation in relation to the environmental management of the construction of the Proposed Development (as a minimum):

- Construction Environmental Management Plan;
- Register of Environmental Impacts;
- Register of Planning Conditions;
- Monitoring Records;
- Minutes of Meetings;
- Training Records;
- Audit and Review Records.

All these documents and records will be available for inspection in the site office. The documentation will be kept up to date and will be reviewed on a regular basis with revisions controlled in accordance with the site quality plan.

#### **4.12 Control of Documents**

The Contractor will establish, implement and maintain a procedure to control CEMP documents and records so they are clearly identifiable, organised, current, easily located and revised when necessary.



## 5. SAFETY & HEALTH MANAGEMENT PLAN

### 5.1 Introduction

This Safety and Health Management Plan (SHMP) defines the work practices, procedures and management responsibilities relating to the management of health and safety during the design, construction and operation of the Proposed Development and will be read in conjunction with the Preliminary Safety & Health Plan prepared for the Proposed Development by the Project Supervisor for the Design Process. The Safety and Health Management Plan for the construction stage will be finalised in accordance with this plan following the appointment of the contractor for the main construction works.

This SHMP describes how the contractor for the main construction works will implement a site safety management system (SMS) on this Proposed Development to meet the specified contractual, regulatory and statutory requirements, environmental impact assessment report and natura impact statement mitigation measures and planning conditions. The contractor will be required to implement an effective safety management system and will be required to appoint a health and safety officer to ensure that the developer's safety requirements for the construction of this Proposed Development are met.

All site personnel will be required to be familiar with the requirements of the safety management plan as related to their role on site. The plan describes the project organisation and sets out the health and safety procedures that will be adopted on site.

- The Safety and Health Plan is a controlled document and will be reviewed and revised as necessary.
- A copy of the Safety and Health Plan will be located on/near the site H&S notice board.
- All employees, suppliers and contractors whose work activities cause/could cause impacts on the environment will be made aware of the SHMP and its contents.

### 5.2 Proposed Development Obligations

The construction of the Proposed Development will impose numerous safety management obligations on the developer, designer and contractor. As well as statutory obligations, there are several specific obligations set out in the EIAR for the Proposed Development. These obligations are set out below. The contractor for the main construction works and all its sub-contractors are to ensure that they are fully aware of and in compliance with these safety obligations.

#### 5.2.1 Planning Permission Obligations

Planning permission obligations will be fully outlined in this CEMP once it is updated if planning permission is granted.

#### 5.2.2 Statutory Obligations

The Safety, Health and Welfare at Work Act 2005 (as amended) and the Safety, Health and Welfare at Work (Construction) Regulations 2013 (as amended) place a responsibility on the Developer as the "Client", the Designer, the Project Supervisors and the Contractor.



The Client will:

- Appoint a competent and adequately resourced Project Supervisor for the Design Phase (PSDP);
- Appoint a competent and adequately resourced Supervisor for the Construction Stage (PSCS);
- Be satisfied that each designer and contractor appointed has adequate training, knowledge, experience and resources for the work to be performed;
- Co-operate with the project supervisor and supply necessary information;
- Keep and make available the safety file for the completed structure;
- Provide a copy of the safety and health plan prepared by the PSDP to every person tendering for the Proposed Development;
- Notify the Authority of the appointment of the PSDP.

Designers must:

- Identify any hazards that their design may present during construction and subsequent maintenance;
- Eliminate the hazards or reduce the risk;
- Communicate necessary control measures, design assumptions or remaining risks to the PSDP so they can be dealt with in the safety and health plan;
- Co-operate with other designers and the PSDP or PSCS;
- Take account of any existing safety and health plan or safety file;
- Comply with directions issued by the PSDP or PSCS.

The PSDP must:

- Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the Proposed Development;
- Where possible, eliminate the hazards or reduce the risks;
- Communicate necessary control measure, design assumptions or remaining risks to the PSCS so they can be dealt with in the safety and health plan;
- Ensure that the work of designers is coordinated to ensure safety;
- Organise co-operation between designers;
- Prepare a written safety and health plan for the Proposed Development and deliver it to the client prior to tender;
- Prepare a safety file for the completed structure and give it to the client.

The PSCS must:

- Co-ordinate the identification of hazards, the elimination of the hazards or the reduction of risks during construction;
- Develop the Safety and Health Plan initially prepared by the PSDP before construction commences;



- Co-ordinate the implementation of the construction regulations by contractors;
- Organise cooperation between contractors and the provision of information;
- Co-ordinate the reporting of accidents to the Authority;
- Notify the Authority before construction commences;
- Provide information to the site safety representative;
- Co-ordinate the checking of safe working procedures;
- Co-ordinate measures to restrict entry on to the site;
- Co-ordinate the provision and maintenance of welfare facilities;
- Co-ordinate arrangements to ensure that craft, general construction workers and security workers have a Safety Awareness card, e.g. Safe Pass and a Construction Skills card where required;
- Co-ordinate the appointment of a site safety representative where there are more than 20 persons on site;
- Appoint a safety adviser where there are more than 100 on site;
- Provide all necessary safety file information to the PSDP;
- Monitor the compliance of contractors and others and take corrective action where necessary;
- Notify the Authority and the client of non-compliance with any written directions issued.

The Contractor must:

- Co-operate with the PSCS;
- Promptly provide the PSCS with information required for the safety file;
- Comply with directions of the project supervisors;
- Report accidents to the Authority and to the PSCS where an employee cannot perform their normal work for more than 3 days;
- Comply with site rules and the safety and health plan and ensure that employees comply;
- Identify hazards, eliminate the hazards or reduce risks during construction;
- Facilitate the site safety representative;
- Ensure that relevant workers have a safety awareness card and a construction skills card where required;
- Provide workers with site specific induction;
- Appoint a safety officer where there are more than 20 on site or 30 employed;
- Consult workers with site specific induction;
- Monitor compliance and take corrective action.

Consequently, at all stages of construction of the Proposed Development there are statutory requirements for the management of safety, health and welfare of all involved in or affected by the development. This CEMP and specifically the Safety and Health Management Plan address key construction management issues associated with the construction of the Proposed Development. This plan will be developed further at the construction stage, on the appointment of the Contractor for the main construction works.



### 5.2.3 The Preliminary Safety and Health Plan

In accordance with the requirements of the Safety, Health & Welfare at Work (Construction) Regulations 2013 (as amended) a Preliminary Safety & Health Plan will be required as part of the design process. This plan will be further developed by the PSCS on appointment and maintained as a live document during construction and commissioning of the Proposed Development.

The safety and health plan is required to include the following information:

- a general description of the Proposed Development;
- details of other work activities taking place on site;
- works involving particular risks;
- the timescale for the construction phase and the basis on which the time frame was established;
- conclusions drawn by designers and the PSDP having taken into account the General Principles of Prevention and any relevant Safety and Health Plan or Safety File;
- the location of electricity water and sewage connections so as to facilitate early establishment of welfare facilities.

In accordance with the PSDP's procedures the Preliminary Safety & Health Plan for the Proposed Development will include the following sections and subsections to ensure the PSCS is aware of the health and safety issues at tender stage and enable them to price accordingly:

Preamble:

- 1 General Proposed Development Information:
  - 1.1 Title;
  - 1.2 Description of the Proposed Development;
  - 1.3 Employer;
  - 1.4 Designers / Other Consultants;
  - 1.5 Project Supervisor Design Process;
  - 1.6 Drawings, Specifications and Other Documents;
  - 1.7 Intended Contract Commencement Date;
  - 1.8 Intended Contract Completion Date;
  - 1.9 Basis for Contract Duration;
  - 1.10 Restrictions on Working Hours;
  - 1.11 Notification of Proposed Development;
  - 1.12 Termination of the PSCS Appointment.
- 2 The Existing Environment:
  - 2.1 Site Location;
  - 2.2 Relevant Adjoining Land Uses;
  - 2.3 Site Restrictions;
  - 2.4 Restrictions on Access;
  - 2.5 Hazardous Area Classification;
  - 2.6 Existing Services;
  - 2.7 Ground Conditions;
  - 2.8 Existing Hazards;
  - 2.9 Liaison with Statutory Bodies.



- 3 Other Work Activities:
  - 3.1 Other Contracts Which May Affect Work;
  - 3.2 Occupation of Site;
  - 3.3 Building Activities;
  - 3.4 Other Work Activities;
  - 3.5 Emergency Procedures in Place on Site.
  
- 4 Particular and Residual Risks:
  - 4.1 Works Which Put Persons at Work at risk;
  - 4.2 Work Which Puts Persons at Risk from Chemical or Biological Substances;
  - 4.3 Work with Ionising Radiation;
  - 4.4 Work near High Voltage Power Lines;
  - 4.5 Work Exposing Persons at Work to the Risk of Drowning;
  - 4.6 Work on Wells, Underground Earthworks and Tunnels;
  - 4.7 Work Carried Out by Divers at Work Having a System of Air Supply;
  - 4.8 Work Carried Out by Divers at Work Having a System of Air Supply;
  - 4.8 Work Carried Out in a Caisson with a Compressed Air Atmosphere;
  - 4.10 Work Involving the Assembly or Dismantling of Heavy Prefabricated Components;
  - 4.11 Work Involving Hazardous Material;
  - 4.12 Residual Risks.
  
- 5 Additional Information:
  - 5.1 Existing Documents;
  - 5.2 Site Possession;
  - 5.3 Site Rules;
  - 5.4 Site Specific Safety Objectives;
  - 5.5 Phasing of Works;
  - 5.6 Permits / Authorisation Required;
  - 5.7 Maintenance;
  - 5.8 Continuing Liaison;
  - 5.9 Specific Recommendations.
  
- 6 Information Required for Safety File:
  - 6.1 Information Required for Safety File from PSCS.

#### 5.2.4 The Management of Health and Safety during the Construction Phase

The selection criteria for the Contractor for the works will be based on the ability to construct the works in a manner that will not endanger the safety, health and welfare of any parties and competence to fulfil the role of PSCS.

The contract will be awarded on the basis of assessment of the candidates against relevant health and safety criteria including experience of similar projects, knowledge of the construction processes involved and training of their management and staff who will be involved in carrying out the works.



### 5.2.5 The Construction Stage Safety and Health Plan

In accordance with the requirements of the Safety, Health & Welfare at Work (Construction) Regulations 2013 (as amended) the preliminary Safety & Health Plan prepared by the PSDP will be further developed by the PSCS before the commencement of the construction work and updated on a regular basis during the construction phase of the Proposed Development.

The document will include the following sections and subsections to ensure the management of health and safety during the construction phase of the Proposed Development:

1. Description of Proposed Development:
  - Proposed Development description and programme details;
  - details of client, PSDP and PSCS, designers;
  - main contractor and other consultants;
  - extent and location of existing records and plans;
  - arrangements for communicating with Contractors, PSDP and others as appropriate.
  
2. Communication and Management of the Work:
  - management structure and responsibilities;
  - safety and health goals for the Proposed Development and arrangements for monitoring and review of safety and health performance.
  - arrangements for:
    - regular liaison between parties on site;
    - consultation with the workforce;
    - the exchange of design information between the Client, Designers, Project Supervisor for the Design Process, Project Supervisor Construction Stage and Contractors on site;
    - handling design changes during the Proposed Development;
    - the selection and control of contractors;
    - the exchange of safety and health information between contractors;
    - security, site induction, and on-site training;
    - welfare facilities and first aid;
    - the production and approval of risk assessments and method statements;
    - the reporting and investigation of accidents and other incidents (including near misses);
  - site rules;
  - fire and emergency procedures.
  
3. Arrangements for Controlling Significant Site Risks:
  - safety risks:
    - services, including temporary electrical installations;
    - preventing falls;
    - work with or near fragile materials;
    - control of lifting operations;
    - dealing with services (water, electricity and gas);



- the maintenance of plant and equipment;
  - poor ground conditions;
  - traffic routes and segregation of vehicles and pedestrians;
  - storage of hazardous materials;
  - dealing with existing unstable structures;
  - accommodating adjacent land use;
  - other significant safety risks.
- Health risks:
    - removal of asbestos;
    - dealing with contaminated land;
    - manual handling;
    - use of hazardous substances;
    - reducing noise and vibration;
    - other significant health risks.

The construction stage safety and health plan will be maintained on site by the PSCS and will be communicated to all relevant parties on an ongoing basis through inductions, site safety meetings and toolbox talks etc. as required.



## 6. EMERGENCY RESPONSE PLAN

### 6.1 Introduction

This section of the CEMP presents an Emergency Response Plan (ERP) for the Proposed Development. The Emergency Response Plan shall be finalised in accordance with this plan following the appointment of the contractor for the main construction works and following detailed design development.

This ERP contains predetermined guidelines and procedures to ensure the safety, health and welfare of everybody involved in the Proposed Development and to protect the environment during the construction phase of the Proposed Development. This outlines the immediate response to an emergency situation and will be developed by the main construction works contractor and PSCS as part of their construction stage Safety and Health Plan.

An emergency is any disruptive or harmful event that endangers people, environment, property or assets. Emergencies can be small, as in a fire contained by employees using firefighting equipment or large, as in damage resulting from a storm.

In the context of the Proposed Development, examples of Emergency Response Plan emergency events are:

- medical emergency;
- explosion;
- overheated equipment;
- chemical and fuel spill;
- fire;
- loss of power;
- vehicle incidents;
- land slippage.

Example sources of emergency or disaster events are:

- unstable/inappropriate stockpiles on site;
- faulty or incorrect use of equipment;
- falls from height;
- storm/adverse weather;
- power failure;
- fuel spill;
- road failure;
- serious vehicle collisions or overturning.

An emergency response plan deals with the immediate physical effects of a disaster and outlines the initial response.



## 6.2 Emergency Response Liaison

The contractor/PSCS will designate an individual to serve as the Emergency Response Liaison for this Proposed Development. The emergency response liaison will coordinate the emergency response for the duration of any emergency at or nearby the Site.

The local authority, An Garda Síochána and the HSE Ambulance Co-ordinator will be provided with the construction programme and the onsite contact information from the Emergency Response Liaison prior to construction.

The Emergency Response Liaison will be immediately reachable at all times during Proposed Development construction. The Liaison will coordinate with the above agencies to establish emergency procedures for access to and within the site in the event of an emergency.

## 6.3 Reporting Emergencies

In the event of fire, storm, flood, serious injury or other emergency, contact:

**ALL ON SITE EMERGENCIES DIAL 999**

## 6.4 Designated Responder

A map depicting turbine tower locations with the emergency meeting point will be furnished to the local County Council Fire Department and HSE ambulance co-ordinators.

Upon arrival on the scene, the senior EMS Officer will set up the incident command structure. The Emergency Response Liaison and all contractor's personnel will cooperate with directions of the incident commander and assist as directed.

The nearest emergency services, ambulance and Accident & Emergency (A&E) facilities are:

Service:	Contact Details:	
Accident & Emergency (A&E)	St Lukes Hospital Kilkenny	(056) 778 5000
Ambulance Service	Dial 112 or 999	
Fire Services	Dial 112 or 999	
Garda Station	Littleton Garda Station	+3536723255
District HQ:	Thurles Garda Station	+353 504 25116
Divisional HQ:	Thurles Garda Station	+353 504 25111

Each member of the contractor's site team who are First-Aid and Cardiopulmonary Resuscitation (CPR) trained personnel will be identifiable with a hard hat sticker indicating their training and identified on the site noticeboard at the site compound.



## 6.5 Emergency Alarm

The emergency alarm will be raised on site as soon as an emergency situation is detected, the alarm will be identified (contractor to check those that apply):

	Air Horn		Radio		Voice		Hand Signals		Siren
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## 6.6 Emergency Reporting

In the event of an emergency the nearest supervisor with radio equipment/mobile phone will be notified. The degree of emergency will be reported to the Emergency Response Liaison who will contact the Emergency Services and request the appropriate emergency service.

## 6.7 Medical Protocol

In the event of a major medical emergency, the emergency centre (999) will be notified, and an ambulance and emergency medical team will respond to the scene. All major medical cases require professional (ambulance) transportation. In the event of a minor medical case, the affected employee can be transported via company vehicle in the escort of a foreman or site engineer (with first aid training).

## 6.8 Emergency Response

Upon notification, the Emergency Response Liaison will respond to the emergency scene and manage emergency operations:

- 1. Assess hazards and make the area safe** – If you cannot enter the area without risking your safety, don't do it, call the Emergency Services immediately and wait for them. If you think you can safely enter the area, look around the emergency scene for anything that can be dangerous or hazardous to you, the casualty, or anyone else at the scene. Bystanders can help with making the area safe. First aid kits will be available on site. Operators that have been first aid/CPR/AED trained will be listed on site and easily identifiable by a hard hat sticker.
- 2. Take charge of the situation** – if you are the first-aid provider on the scene act fast. If someone is already in charge, briefly introduce yourself and see if that person needs any help. If there is any chance the casualty could have a head or spinal injury, tell them not to move.
- 3. Get Consent** – always identify yourself as a first-aid provider and offer to help. Always ask for consent before touching a conscious adult casualty. Remember to protect yourself first by wearing gloves and eye protection.
- 4. Assess Responsiveness** – is the casualty conscious or unconscious? Note their response while you are asking them for their consent. If they respond, continue with the primary survey, and if they don't respond, be aware that an unconscious casualty is or has the potential of being a breathing emergency.



**5. Call out for help** – this will attract bystanders. Help is always useful in an emergency situation. Someone can be called over to phone for medical help. Others can bring blankets if needed, get water, etc. a bystander can help with any of the following:

- Make the area safe.
- Find all the casualties.
- Find the first aid kit, or any useful medical supplies.
- Control the crowd.
- Call for medical help.
- Help give first aid, under your direction.
- Gather and protect the casualty's belongings.
- Take notes, gather information, be a witness.
- Reassure the casualty's relatives.
- Lead the ambulance attendants to the scene of the emergency.
- Notify Emergency Services as soon as you can. Either send a bystander or call yourself.

In the event of a major medical emergency the Emergency Response Liaison, as the person-in-charge of the emergency scene, will dispatch someone to the site access point nearest the emergency scene to direct and lead arriving outside responders to the emergency scene. The designated meeting point will be agreed prior to the commencement of construction. Emergency personnel will be met at this meeting point communicated by management during the 999 call. The emergency personnel escort will use the hazard lights on their vehicle, so they are easily identified.

## 6.9 Escape and Evacuation Procedure

Dependent upon the degree of the emergency and if safe to do so, employees will evacuate to the designated assembly area where the designated wardens shall account for all employees and determine if anyone still remains within the emergency scene. Designated assembly areas will be clearly indicated on a map in the main compound and signage posted at each assembly area.

Should a wild land fire or peat slippage occur, and the designated assembly area is compromised other locations will be designated as secondary assembly areas.

Wind turbines shall be fitted with fire suppression systems and will have emergency escape procedures in place for operational staff in the event of fire in a wind turbine.

## 6.10 Turbine Tower rescue Procedure

In the event personnel are trapped or injured in an elevated turbine tower position the following protocol will be initiated:

1. The Emergency protocol will be initiated.
2. Emergency Response Liaison will be notified.
3. Tower Rescue Team will be activated and respond to the scene.
4. Outside medical and Rescue Teams will be notified and respond to the scene.



### 6.10.1 Tower Rescue Procedure

1. Upon learning of an emergency, the on-scene foreman shall assess the emergency and ascertain its degree, location and the extent of any injuries.
2. Upon confirming that an emergency exists the on-scene foreman notifies the Emergency Response Liaison and the project Office.
3. Upon notification of the emergency the Emergency Response Liaison shall notify senior project supervision and the local emergency centre (999) of the emergency.
4. The Emergency Response Liaison shall inform the dispatcher of the location, tower number, the degree of the emergency and the extent of injuries.

### 6.11 Prevention of Illness/Injury Due to Weather/Elements

1. All employees will have access to shelter and heat in the event of inclement weather.
2. Employees will have access to at least a litre of water at all times.
3. High wind warnings and weather forecast will be discussed every morning with the crews. Weather conditions and forecast will be monitored regularly by management.
4. No Employee will work alone. A buddy system will be used so employees can contact a supervisor in case of an emergency.

### 6.12 Environmental Emergency Procedure - Pollution Control

An emergency preparedness and response procedure is required to prevent environmental pollution incidents.

#### **Accidental spillage from leaking or damaged fuel lines**

Emergency spill kits with oil boom and absorbent materials will be kept on-site in the event of an accidental spill. Spill kits will be kept in construction compound, the 4x4 vehicle transporting the fuel bowser and smaller spill control kits will be kept in all construction machinery. All construction personnel will be notified of where the spill kits are located as part of the site induction and will be trained on the site procedures for dealing with spills.

In the event of a leak or a spill in the field, the spill kits will be used to contain and absorb the pollutant and prevent any further potential contamination. The absorbed pollutants and contaminated materials will be placed into leak proof containers and transferred to a suitable waste container for hazardous materials in the construction compound. Where a leak has occurred from machinery, the equipment will not be permitted to be used further until the issue has been resolved.

The SHEQ Officer (or equivalent appointed person) will be notified of any spills on-site and will determine the requirement to notify the authorities.

Typically, the following procedures will be followed in the event of an incident:

- Works will stop immediately where safe to do so,
- The ECoW (or equivalent appointed person) will be contacted,
- The size of the incident will be assessed and determined if it can be controlled by site staff or if emergency services are required to attend,
- The appropriate enforcing authority will be contacted,



- The SHEQ Officer (or equivalent appointed person) will investigate after the incident,
- The findings will be sent to the appropriate authority; and
- An action plan will be prepared to set out any modifications to working practices required to prevent a recurrence.

### Accidental break out of silt from settlement ponds

The settlement ponds will be equipped with a spillway to control overflow scenarios related to the not manageable storm events (more extreme than the design return period provided for the settlement ponds). To ensure to avoid potential erosion due to the overflow, scour protection (rip-rap or equivalent) will be provided along and the outfall location of the spillway.

The drainage engineer shall be contacted if there is an accidental spillage or break out of silt on the Site.

In the case of water pollution in addition to the Local Authority, Inland Fisheries Ireland will also be informed immediately.

### 6.13 Emergency Response Plan - Haul Routes

Emergency Response Procedure relating to transportation of plant, equipment and materials to site to be developed by the main contractor during the construction phase of the Proposed Development.

### 6.14 Emergency Response Plan - Fire

A site evacuation/fire drill procedure will be in place for carrying out the immediate evacuation of all site personnel in the event of an emergency with might include fire on site or within adjacent lands. The following steps will be taken:

- Notification of the emergency situation. Provision of a siren to notify all personnel of an emergency situation.
- An assembly point will be designated in the construction compound area and will be marked with a sign. All site personnel will assemble at this point.
- A roll call will be carried out by the Site Security Officer to account for all personnel on site.
- The Site Security Officer will inform the Site Supervisor/Construction Manager when all personnel have been accounted for. The Site Supervisor/Construction Manager will decide the next course of action, which will be determined by the situation that exists at that time and will advise all personnel accordingly.
- All personnel will be made aware of the evacuation procedure during site induction. The Fire Services Acts of 1981 and 2003 require the holding of fire safety evacuation drills at specified intervals and the keeping of records of such drills.

Fire Safety awareness will be provided as part of general safety induction to the Site. Specific fire training will be provided to all relevant fire wardens/ officers /representatives. Fire officers will ensure that used or partially used Fire Extinguishers are immediately refilled or replaced.

Smoking will be restricted on site to designated areas within the construction compounds only.



Stockpiling of cleared vegetation / brash will not take place during periods of high fire risk.

Machinery will be parked in a manner that allows them to be moved in an emergency and will be parked a reasonable distance apart from each other to avoid the risk of a fire spreading to adjacent machines.

Areas must be left safe from the threat of fire following hot works. Hot work will only be undertaken by competent and trained personnel under a permit to work system and a fire risk assessment carried out for all hot works.

## 6.15 Emergency Events - Wind Turbine Damage/Failures

Each wind turbine, incorporating the tower, blades, gearbox and ancillary equipment in the tower and nacelle is a machine under the European Machinery Directive [2006/42/EC]. The duties of designers and manufacturers of machinery are set out in the Machinery Directive, which has been transposed into national law by the 2008 European Communities (Machinery) Regulations [S.I.No.407/2008] (as amended). All wind turbines will be CE marked, which is in effect, a mark of assurance that the wind turbine complies with the essential health and safety requirements (EHSRs) of EU supply law. In all cases, the manufacturer or the manufacturer's authorised representative will compile information in a technical file confirming how the machine complies with these requirements. The commissioning of turbines and ancillaries will only be carried out by competent, trained and qualified personnel. The system of work for commissioning must be planned, organised, maintained and revised to ensure safety of personnel.

Potential emergency events associated with wind turbines include:

- Blade loss;
- Fire;
- Wind turbine toppling (due to foundation or tower failure);
- Wind turbine rotational failure in extreme wind conditions (due to control system or rotor break failure).

The primary mitigation against an emergency catastrophic event that may endanger the health and safety of the public is implemented at design stage through adequate siting of wind turbines which provide sufficient set back distances from occupied buildings and other infrastructure to avoid the risk of impact in the event of wind turbine collapse.

Peat slippage contingency measures have been included in Section 6.16 below in the unlikely event of landslide scenario.



## 6.16 Land Slippage Contingency Measures

### 6.16.1 Excessive Movement

Where there is excessive movement or continuing peat movement recorded at a monitoring location or identified at any location within the site but no apparent signs of distress to the peat (e.g. cracking, surface rippling) then the following shall be carried out.

1. All activities (if any) shall cease within the affected area.
2. Increased monitoring at the location shall be carried out. The area will be monitored, as appropriate, until such time as movements have ceased.
3. Re-commencement of activities shall only start following a cessation of movement and a review by an experienced geotechnical engineer.



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## APPENDIX 4.2

### Abnormal Indivisible Load Route Survey Report

Pell Frischmann

Littleton Wind Farm

Route Survey Report

February 2026

10110880

This report is to be regarded as confidential to our Client and is intended for their use only and may not be assigned except in accordance with the contract. Consequently, and in accordance with current practice, any liability to any third party in respect of the whole or any part of its contents is hereby expressly excluded, except to the extent that the report has been assigned in accordance with the contract. Before the report or any part of it is reproduced or referred to in any document, circular or statement and before its contents or the contents of any part of it are disclosed orally to any third party, our written approval as to the form and context of such a publication or disclosure must be obtained.

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Rev	Suit	Description	Date	Originator	Checker	Approver
01		Draft	22/01/2026	A Dimitrov	T Lockett	T Lockett
02		Final	06/02/2026	A Dimitrov	T Lockett	T Lockett
Ref. reference. Rev revision. Suit suitability.						

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- Appendix A Points of Interest
- Appendix B Swept Path Assessment Drawings
- Appendix C ESDAL Correspondence

# 1 Introduction

## 1.1 Purpose of the Report

Pell Frischmann (PF) have been commissioned by Littleton Wind Farm DAC (LWFDAC) to undertake a route access review of potential delivery routes for wind turbine Abnormal Indivisible Loads (AIL) associated with the construction and development of Littleton Wind Farm, located to the southeast of Thurles, County Tipperary, Ireland.

The Route Survey Report (RSR) has been prepared to help inform LWFDAC on the likely issues associated with the development of the site with regards to off-site transport and access for AIL traffic. The report identifies the key issues associated with AIL deliveries and notes what remedial works, either in the form of physical works or as traffic management interventions will be required to accommodate the predicted loads. Most works will be temporary in nature subject to discussions with land owners and the local road authorities.

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The detailed assessment and subsequent designs of any remedial works are beyond the agreed scope of works between PF and LWFDAC at this point in time.

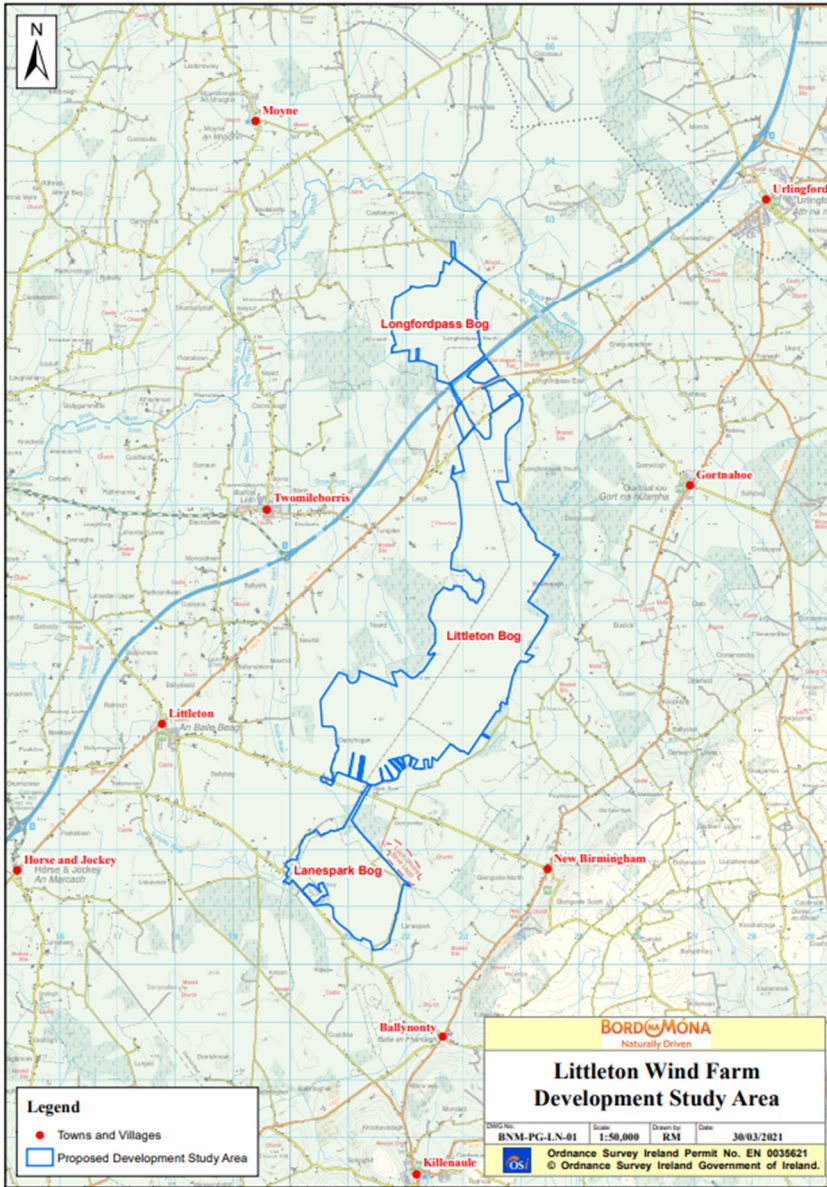
It is the responsibility of the wind turbine supplier to ensure that the entirety of the proposed access route is suitable and meets with their satisfaction. The turbine supplier will be responsible for ensuring that the finalised proposals meet with the appropriate levels of health and safety consideration for all road users has been made in accordance with the relevant legislation at the time of delivery.

## 2 Site Background

### 2.1 Site Location

The development site is located to the east and southeast of Thurles. Figure 2-1 below illustrates the general site location.

Figure 2-1: Site Location Plan



### 2.2 Candidate Turbine

LWFDAC have indicated that they wish to consider the worst case components from a Vestas V162 turbine. The details of the components have been provided by Vestas and are listed in Table 2-1 below.

Table 2-1: Turbine Components Summary

Component	Length (m)	Width (m)	Height / Min Diameter (m)	Weight (t)
V162 Blade	80.184	4.500	4.292	29.241
Worst Case Tower	30.000	4.800	4.800	c.83.000

## 2.3 Proposed Delivery Equipment

LWFDAC have requested that the assessment is based on the assumption that all blades would be carried using a Dolly Clamp trailer as shown in Figure 2-1.

Towers would be carried in a 4+7 clamp adaptor style trailer as shown in Figure 2-2, whereas loads such as the hub, nacelle housing and top towers would be carried on a six-axle step frame trailer.

Figure 2-2: Blade Clamp and Dolly Trailer



Figure 2-3: Tower Trailer



### 3 Access Route Review

#### 3.1 Port of Entry

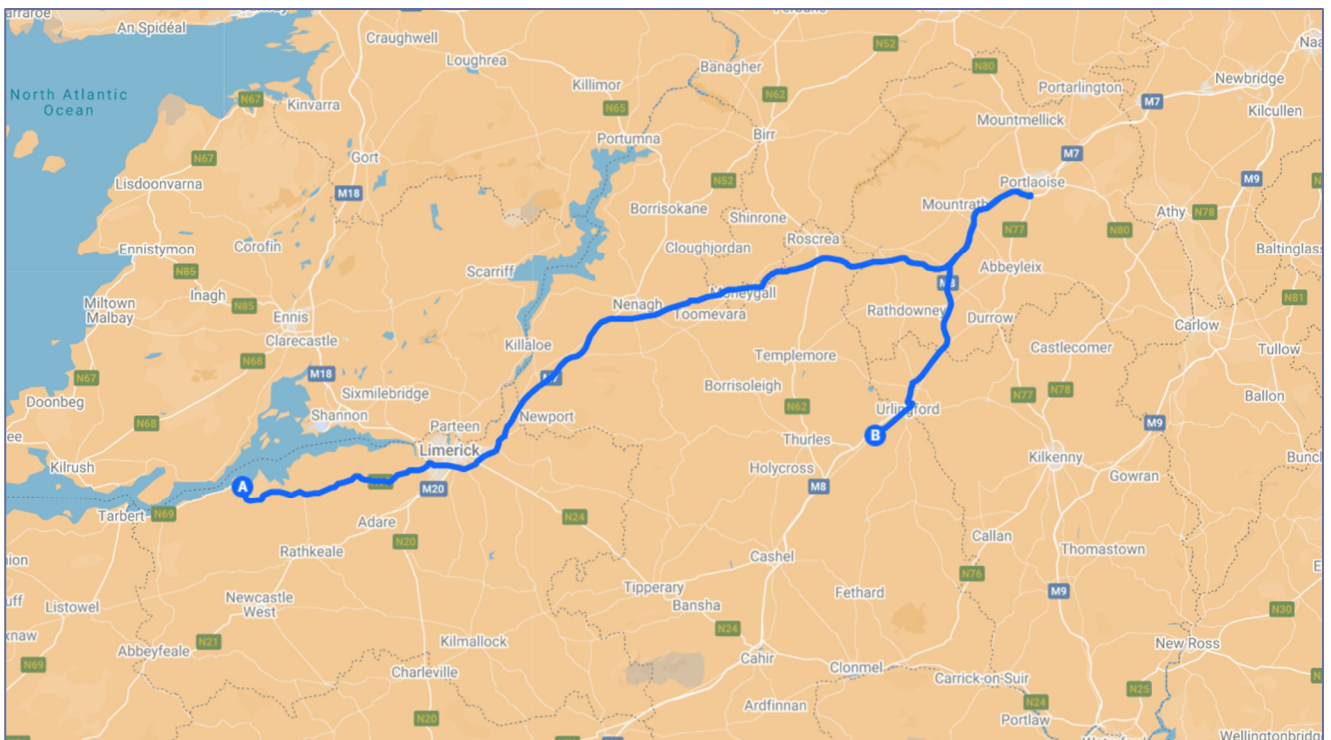
It is proposed that all components are transported into Foynes Port. The port has sufficient quay and storage space and is well located for the strategic road network. Loads can be offloaded by geared vessel or onshore mobile cranes, and this port has been used for the delivery of components for a number of wind farm projects and is well-proven as being capable of dealing with AILs of the size considered in this RSR.

#### 3.2 Proposed Access Route

The proposed route from Foynes Port to the site access junction is as follows:

- Loads will exit Foynes Port and join the N69 heading east;
- At Limerick, they will join the N18 heading northeast and merge onto the M7;
- Loads will exit at Junction 17 Portlaoise Interchange and perform a U-turn to re-join the M7 heading southwest;
- They will merge onto the M8 and continue southwest;
- At the M8 Junction 4 East Roundabout loads will turn left to join the R693;
- At the following roundabout loads will turn right onto the R639 then drive through Urlingford;
- To the southwest of Urlingford loads will turn left at the proposed site entrance.

Figure 3-1: Proposed Access Route







### 3.3 Route Constraints

The constraints noted on the route are provided in Table 3-1 below. No consideration of the transport issues within the development site have been undertaken. Plans illustrating the location of the constraints are provided in Appendix A.

**Table 3-1: Constraint Points and Details**





POI	Key Constraint	Details
1	<p><b>Foynes Port Exit</b></p> 	<p>Loads will exit Foynes Port onto the L6188 and head south.</p>
2	<p><b>L6188 Durnish Level Crossing</b></p> 	<p>Loads will continue on the L6188 over Durnish level crossing.</p> <p>Early discussions with Irish Rail are required to ensure the safe of road and rail users during AIL deliveries.</p>
3	<p><b>L6188 / N69 Junction</b></p> 	<p>Loads will turn left onto the N69 and continue south.</p> <p>A load bearing surface should be laid in the southeastern verge to allow loads to overrun and oversail. Two lighting columns, one road sign, one bollard and a wall should be removed. Vegetation should be cleared. <b>Third party land</b> is required to the southeast.</p> <p>Loads will oversail the northern verge at the junction where no further mitigation is required.</p> <p>Document reference: 10110880-PF-SPA-01 (Appendix A).</p>
4	<p><b>N69 S-Bend North of Sroolane</b></p> 	<p>Loads will remain on the N69 and head east through a double bend.</p> <p>They will oversail the southern verge through the second bend where trees and vegetation should be trimmed.</p> <p>Document reference: 10110880-PF-SPA-02 (Appendix A).</p>


POI	Key Constraint	Details
5	<p><b>N69 / L1222 Junction</b></p> 	<p>Loads will continue on the N69 eastbound.</p> <p>It is strongly recommended that a full overhead utility search is carried out at this location and along the entire route prior to deliveries to ensure that height clearances are suitable for normal temperature ranges.</p>
6	<p><b>N69 Barrigone LH Bend</b></p> 	<p>Loads will head north on the N69 through a left-hand bend.</p> <p>They will oversail the western verge. One road sign and a wall should be removed. Vegetation should be cleared. <b>Third party land</b> is required to the west.</p> <p>It may be possible for the wall to be oversailed subject to confirmation during the test run.</p> <p>Document reference: 10110880-PF-SPA-03 (Appendix A).</p>
7	<p><b>N69 Barrigone RH Bend</b></p> 	<p>Loads will head northeast on the N69 through a right-hand bend.</p> <p>One road sign and one set of chevron signs should be removed from the western verge where vegetation should be trimmed.</p> <p>A fence, gate and utility marker should be removed from the eastern verge where loads will oversail a wall. Vegetation should be cleared. <b>Third party land</b> is required.</p> <p>One road sign should be removed from the northern verge where vegetation should be trimmed.</p> <p>Document reference: 10110880-PF-SPA-04 (Appendix A).</p>
8	<p><b>N69 Kilcornan RH Bend</b></p> 	<p>Loads will head east on the N69 through a right-hand bend.</p> <p>One road sign should be removed from the western verge where trees and vegetation should be trimmed.</p> <p>A load bearing surface should be laid in the northern verge where vegetation should be trimmed and one road sign should be removed.</p> <p>One road sign should be removed from the southern footway. One bollard in the southern verge will be oversailed.</p> <p>Document reference: 10110880-PF-SPA-05 (Appendix A).</p>

POI	Key Constraint	Details
9	<p><b>N69 Kildimo RH Bend</b></p> 	<p>Loads will continue east on the N69 through a right-hand bend.</p> <p>It is recommended that a traffic management plan is developed to control load movements through Kildimo New.</p> <p>One road sign and two bollards should be removed from the southern verge through the bend.</p> <p>Parking should be suspended during deliveries to allow loads safe passage.</p> <p>Document reference: 10110880-PF-SPA-06 (Appendix A).</p>
10	<p><b>N69 Ferry Bridge</b></p> 	<p>Loads will cross the River Maigue driving over Ferry Bridge then head northeast on the N69 through a left-hand bend.</p> <p>One solar sign should be removed from the northern ghost island west of the bridge.</p> <p>The vertical profile of the bridge at this location is pronounced and should be reviewed on a topographical survey base to confirm if tar wedges are required to prevent grounding.</p> <p>The clearance to the bridge parapets should be confirmed sufficient on the topographical survey base.</p> <p>Document reference: 10110880-PF-SPA-07 (Appendix A).</p>
11	<p><b>N69 West of Clarina Village RH Bend</b></p> 	<p>Loads will continue northeast on the N69 through a right-hand bend.</p> <p>They will oversail both verges through the bend. One road sign should be removed from the eastern verge.</p> <p>Document reference: 10110880-PF-SPA-08 (Appendix A).</p>
12	<p><b>N69 Clarina Village Roundabout</b></p> 	<p>Loads will take the second at the roundabout and continue on the N69.</p> <p>One bollard should be removed from the northern footway of the entry arm.</p> <p>One road sign should be removed from the entry arm splitter island.</p> <p>A load bearing surface should be laid on the central island to allow loads to overrun and oversail. One set of chevron signs and six decorative planters should be removed. Vegetation should be cleared.</p> <p>One bollard should be removed from the exit arm splitter island. Loads will oversail the northern footway of the exit arm.</p> <p>Document reference: 10110880-PF-SPA-09 (Appendix A).</p>

POI	Key Constraint	Details
13	<p><b>N69 / Moore's Road Junction Splitter Island</b></p> 	<p>Loads will continue on the N69 heading northeast.</p> <p>They will oversail the northern footway and verge as well as the northeastern splitter island; however, no physical mitigation is required.</p>
14, 15	<p><b>N69 / N18 Jct 2 Roundabouts</b></p> 	<p>Loads will take the third exit at Dock Rd W Roundabout then the third exit at the following roundabout to join the N18 heading southeast.</p> <p>A load bearing surface should be laid on the central island of Dock Rd Roundabout to allow loads to drive across. One set of chevron signs should be removed. Trees should be cleared.</p> <p>One road sign should be removed from the northern verge of the exit arm.</p> <p>A load bearing surface should be laid on the entry splitter island of the second roundabout where one lighting column and three road signs should be removed.</p> <p>Three road signs should be removed from the southern verges at the second roundabout.</p> <p>Loads will overrun and oversail the central island of the second roundabout where a load bearing surface should be laid.</p> <p>A load bearing surface should be laid in the eastern verge of the exit arm to allow loads to overrun and oversail. Two lighting columns, one road sign and a safety barrier should be removed. Trees and vegetation should be cleared.</p> <p>Document reference: 10110880-PF-SPA-10 (Appendix A).</p>
16	<p><b>Mid Link M7 / M8 Toll Plaza</b></p> 	<p>Loads will continue on the M7 through the toll plaza using the wide load lane.</p> <p>They will head northeast on the initial approach and after performing a U-turn at Portlaoise Interchange (POI 17) they will return and travel through the southern wide load lane to head southwest on the M7. No physical mitigation is required.</p> <p>Document reference: 10110880-PF-SPA-11 (Appendix A).</p>

POI	Key Constraint	Details
<p>17</p>	<p><b>M7 Jct 17 Portlaoise Interchange</b></p> 	<p>Loads will take the fifth exit at Portlaoise Interchange to rejoin the M7 heading southwest.</p> <p>One road sign should be removed from the northern verge of the entry arm where loads will oversail a safety barrier. Trees should be trimmed.</p> <p>Four lighting columns, four sets of chevron signs and a bridge railing should be removed from the central island where trees should be trimmed.</p> <p>Two road signs should be removed from the eastern verge of the fourth exit arm.</p> <p>Loads will oversail the southern verge of the fifth exit arm.</p> <p>Document reference: 10110880-PF-SPA-12 (Appendix A).</p>
<p>18</p>	<p><b>M8 / R693 Roundabout</b></p> 	<p>Loads will take the first exit at the roundabout and head southeast on the R693.</p> <p>One road sign should be removed from the western verge of the entry arm where a safety barrier will be oversailed.</p> <p>Two lighting columns and five road signs should be removed from the eastern verge of the entry arm where a safety barrier will be oversailed and trees and vegetation should be cleared.</p> <p>A load bearing surface should be laid on the central island to allow loads to overrun and oversail. Vegetation should be cleared.</p> <p>Loads will overrun the exit arm splitter island where a load bearing surface should be laid, four road signs should be removed, and vegetation should be cleared.</p> <p>Document reference: 10110880-PF-SPA-13 (Appendix A).</p>

POI	Key Constraint	Details
19	<p><b>R693 / R639 Roundabout</b></p> 	<p>Loads will take the third exit at the roundabout and head south on the R639. They will undertake a contraflow manoeuvre.</p> <p>A load bearing surface should be laid in the northern verge of the roundabout entry arm. Two lighting columns, two road signs and a safety barrier should be removed. Trees and vegetation should be cleared.</p> <p>Two lighting columns and one road sign should be removed from the southern verge of the entry arm. A safety barrier will be oversailed. Trees and vegetation should be cleared.</p> <p>Loads will overrun and oversail the central island where a load bearing surface should be laid. One set of chevron signs should be removed. Vegetation should be trimmed.</p> <p>Four road signs should be removed from the entry and exit arm splitter islands and load bearing surfaces laid to allow loads to overrun. Vegetation should be cleared.</p> <p>Document reference: 10110880-PF-SPA-14 (Appendix A).</p>
20	<p><b>R639 Splitter Island</b></p> 	<p>Loads will head southwest on the R639 into Urlingford.</p> <p>At this location, traffic calming measures have been put in place by way of a traffic island with two bollards. The bollards should be removed and a load bearing surface should be laid to allow loads to drive over the islands.</p>
21	<p><b>L639 Urlingford</b></p> 	<p>Loads will continue through Urlingford. It is recommended that a traffic management plan is developed to control load movements through the town.</p> <p>The swept path assessment indicates that loads will negotiate the bend without the need for physical mitigation.</p> <p>Document reference: 10110880-PF-SPA-15 (Appendix A).</p>
22	<p><b>L639 Longford Pass</b></p> 	<p>Loads will continue along Longford Pass</p> <p>The swept path assessment indicates that loads will negotiate the bend without the need for physical mitigation.</p> <p>Document reference: 10110880-PF-SPA-16 (Appendix A).</p>

POI	Key Constraint	Details
23	<p><b>Site Entrance</b></p> 	<p>Loads will turn left and proceed into the site.</p> <p>The tracking of the proposed new site entrance shows that loads will oversail the northeastern verge the proposed access track which should be cleared of obstacles.</p> <p>Document reference: 10110880-PF-SPA-17 (Appendix A).</p>

### 3.4 Swept Path Assessment Results and Summary

The detailed Swept Path Assessment (SPA) drawings for the locations assessed are provided in Appendix B for review. The drawings illustrate tracking undertaken for the worst-case loads at each location.

The colours illustrated on the swept paths are:

- Grey / Black – Ordnance Survey (OS) / topographical base mapping;
- Cyan – Indicative road edge;
- Green – Vehicle body swept path envelope;
- Red – Wheel swept path envelope;
- Magenta – Load swept path envelope.

Where mitigation works are required, the extents of the overrun and oversail areas are illustrated and fully detailed on the SPA drawings. Additional land areas to those indicated in the SPA drawings may be required to facilitate the construction of the proposed physical mitigation measures depending on the site conditions and topography. The extent of any additional areas required to construct the mitigation works highlighted within this study and the detailed design of said mitigation works is beyond the scope of this study and should be confirmed on detailed topographical survey data.

Please note that where SPA have been undertaken using OSI base mapping, AutoCAD based aerial mapping and historic topographical data, there can be errors in these data sources.

Where provided by the client, topographical data has been utilised. Please note that PF cannot accept liability for errors on the data source, be that OSI base mapping, aerial mapping, historic topographical surveys or client supplied data. Where applicable, mapping has been augmented with aerial imagery for illustration only. The accuracy of this mapping cannot be confirmed by PF.

Please note that turbine supplier guidance suggests that the minimum road width for the safe transport of AIL components is 4.5 m. All public roads and onsite access tracks should comply with this standard unless a relaxation has been agreed with suppliers.

The need to widen public roads will require engagement with the relevant road authority and may constitute permanent or temporary surfacing.

### 3.5 Third Party Land

A review of third party land should be undertaken by the client to ensure that no additional land rights are required to enable deliveries or mitigation works. PF accept no responsibility for the accuracy of land ownership assumptions, all of which should be confirmed across the entire access route by a qualified land agent.

### 3.6 Land Ownership

The limits of road adoption can vary depending upon the location of the site and the history of the road agencies involved. The adopted area is generally defined as land contained within a defined boundary where the road agency holds the maintenance rights for the land. In urban areas, this usually defined as the area from the edge of the footway across the road to the opposing footway back edge.

In rural areas the area of adoption can be open to greater interpretation as defined boundaries may not be readily visible. In these locations, the general rule is that the area of adoption is between established fence / hedge lines or a maximum 2m from the road edge. This can vary between areas and location.

### 3.7 Summary Issues

It is strongly suggested that following a review of the RSR, LWFDAC should undertake the following prior to the delivery of the first abnormal loads, to ensure load and road user safety:

- A review of axle loading on structures along the entire access route with the various road agencies is undertaken immediately prior to the loads being transported in case of last-minute changes to structures;
- A review of clear heights with utility providers and the transport agencies along the route to ensure that there is sufficient space to allow for loads plus sufficient flashover protection (to electrical installations);
- That any verge vegetation and tree canopies which may foul loads is trimmed prior to loads moving;
- That a review of potential roadworks and or closures is undertaken once the delivery schedule is established in draft form;
- That a test run is completed to confirm the route and review any vertical clearance issues; and
- That a condition survey is undertaken to ascertain the extents of road defects prior to loads commencing to protect the developer from spurious damage claims.

## 4 Summary

### 4.1 Summary of Access Review

PF have been commissioned by Littleton Wind Farm DAC to prepare an RSR to examine the issues associated with the transport of AIL turbine components to Littleton Wind Farm.

This report identifies the key points and issues associated with the proposed routes and outlines the issues that will need to be considered for successful delivery of components.

This report has been based on a worst case of Vestas V162 turbine sections and has been undertaken on the basis of a clamp and dolly trailer.

The report is presented for consideration to Littleton Wind Farm DAC. Various road modifications, structural reviews and interventions are required to successfully access the site. A number of areas have been identified where topographical surveys are required to confirm the feasibility of the routes.

### 4.2 Further Actions

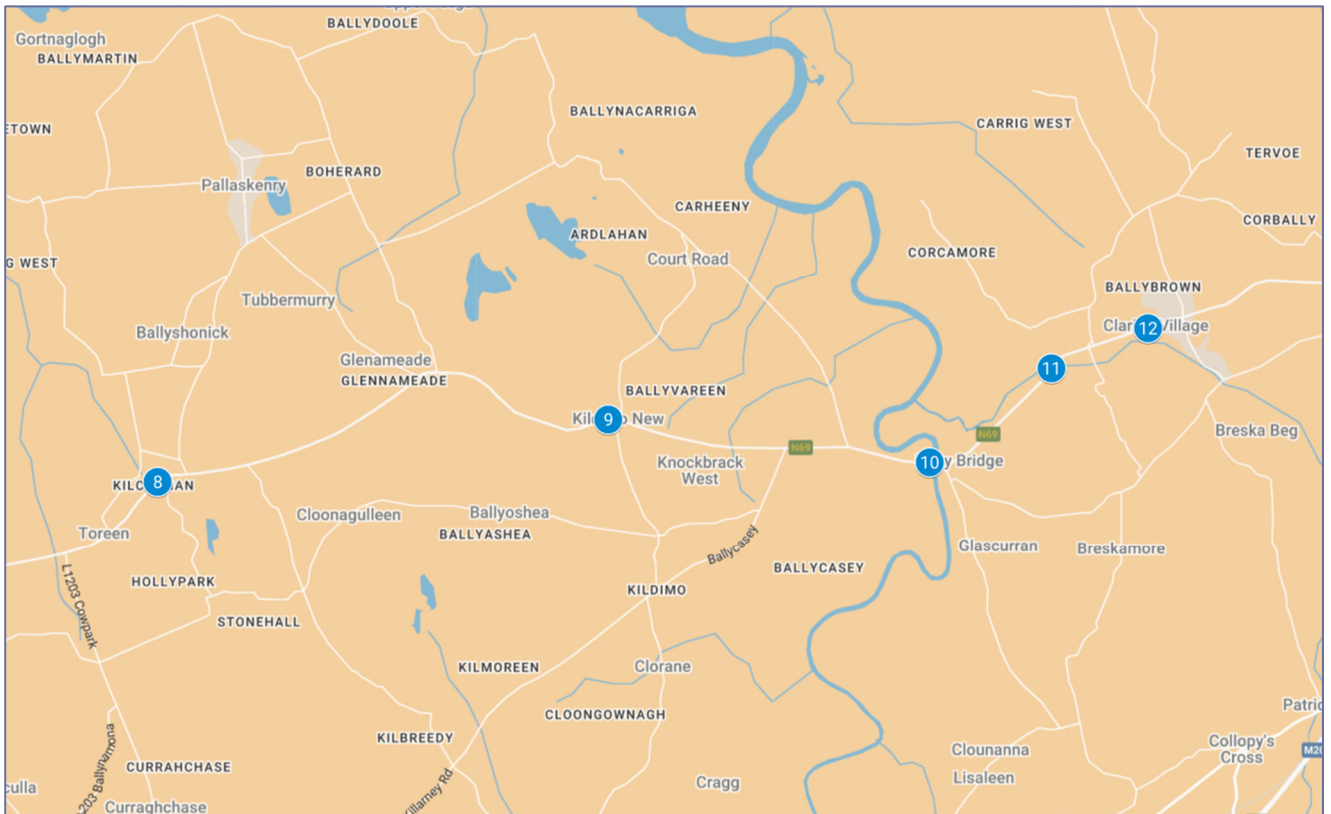
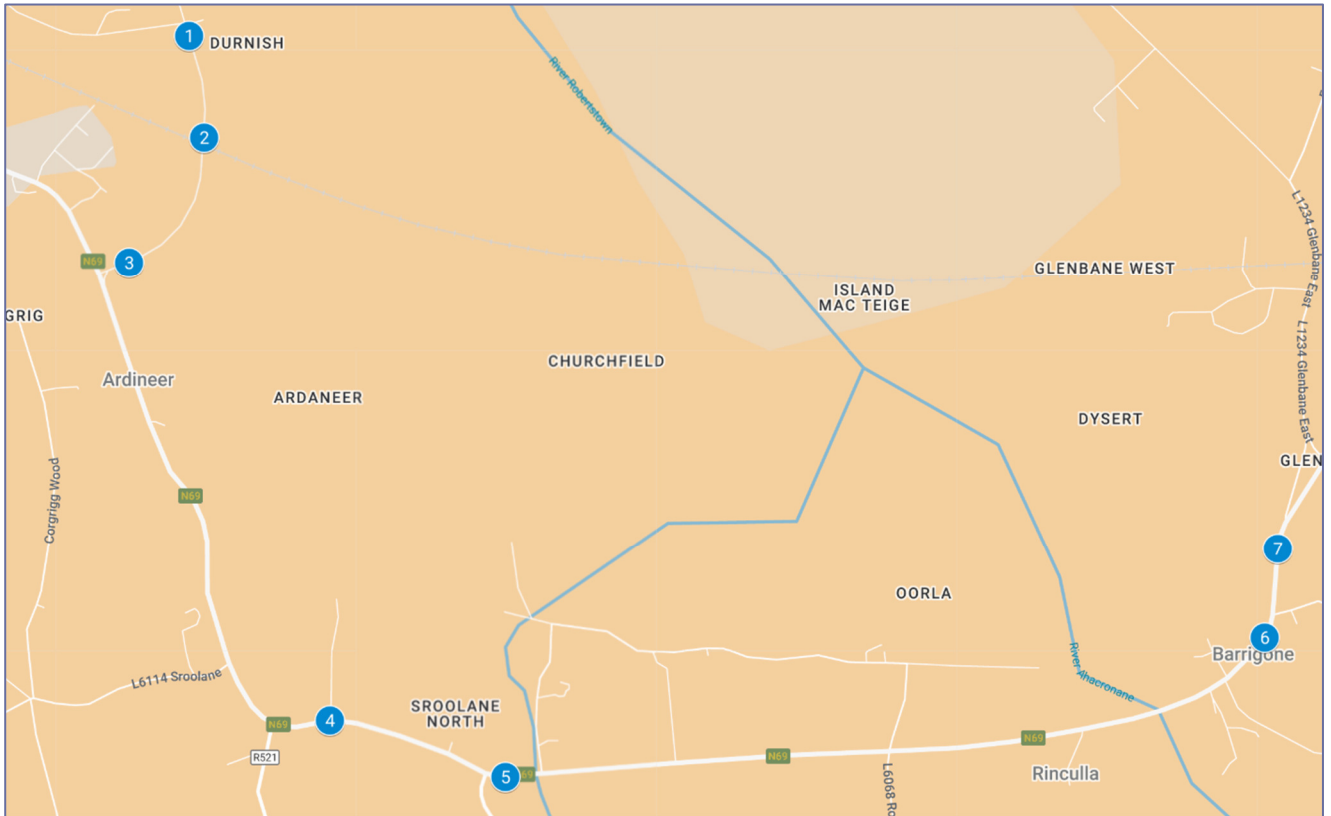
The following actions are recommended to pursue the transport and access issues further:

- Prepare detailed mitigation design proposals to help inform the land option / consultee discussions;
- Obtain the necessary land options and permissions;
- Undertake discussion with the affected utility providers and roads agencies;
- Obtain the necessary statutory licences to enable the mitigation measures; and
- Develop a detailed operational Transport Management Plan to assist in transporting the proposed loads.

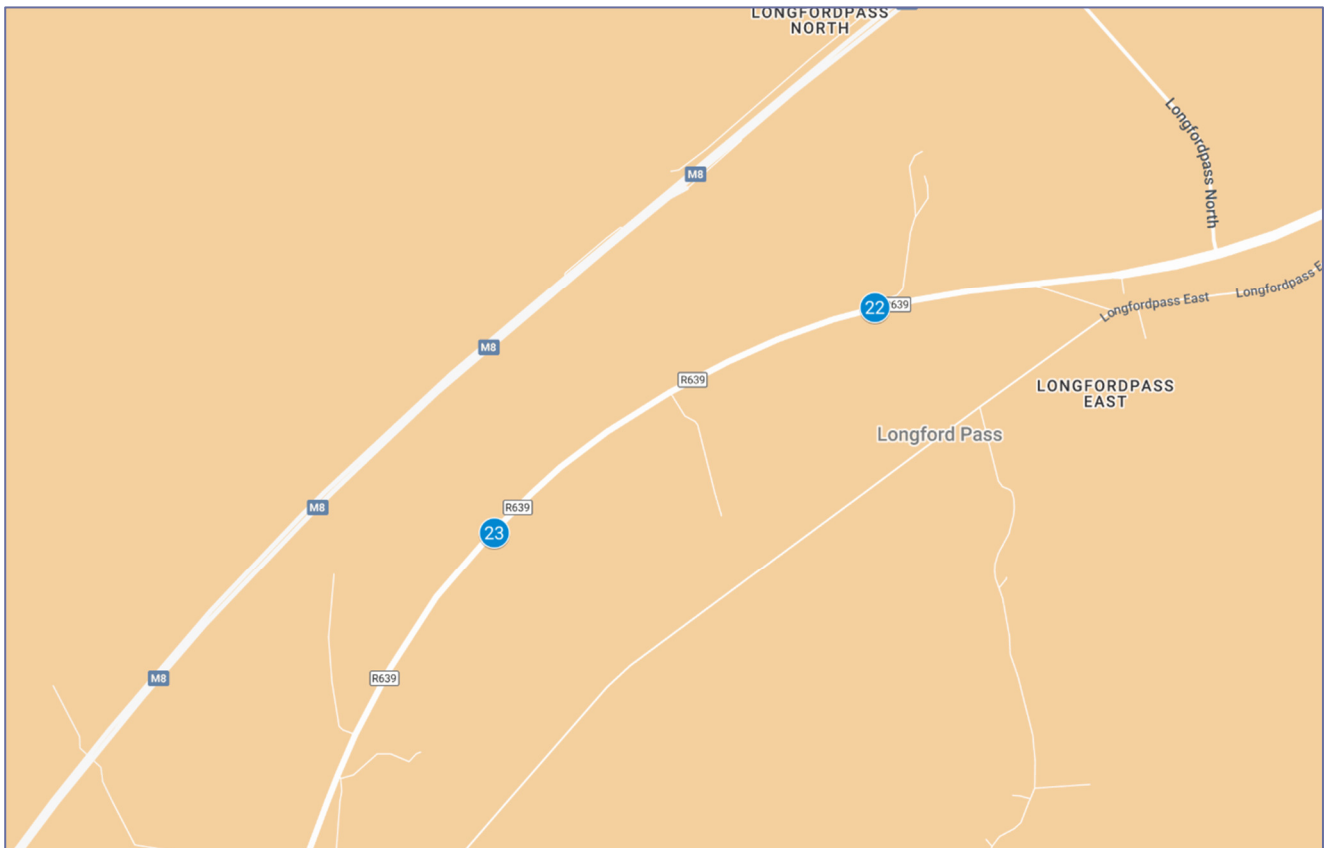
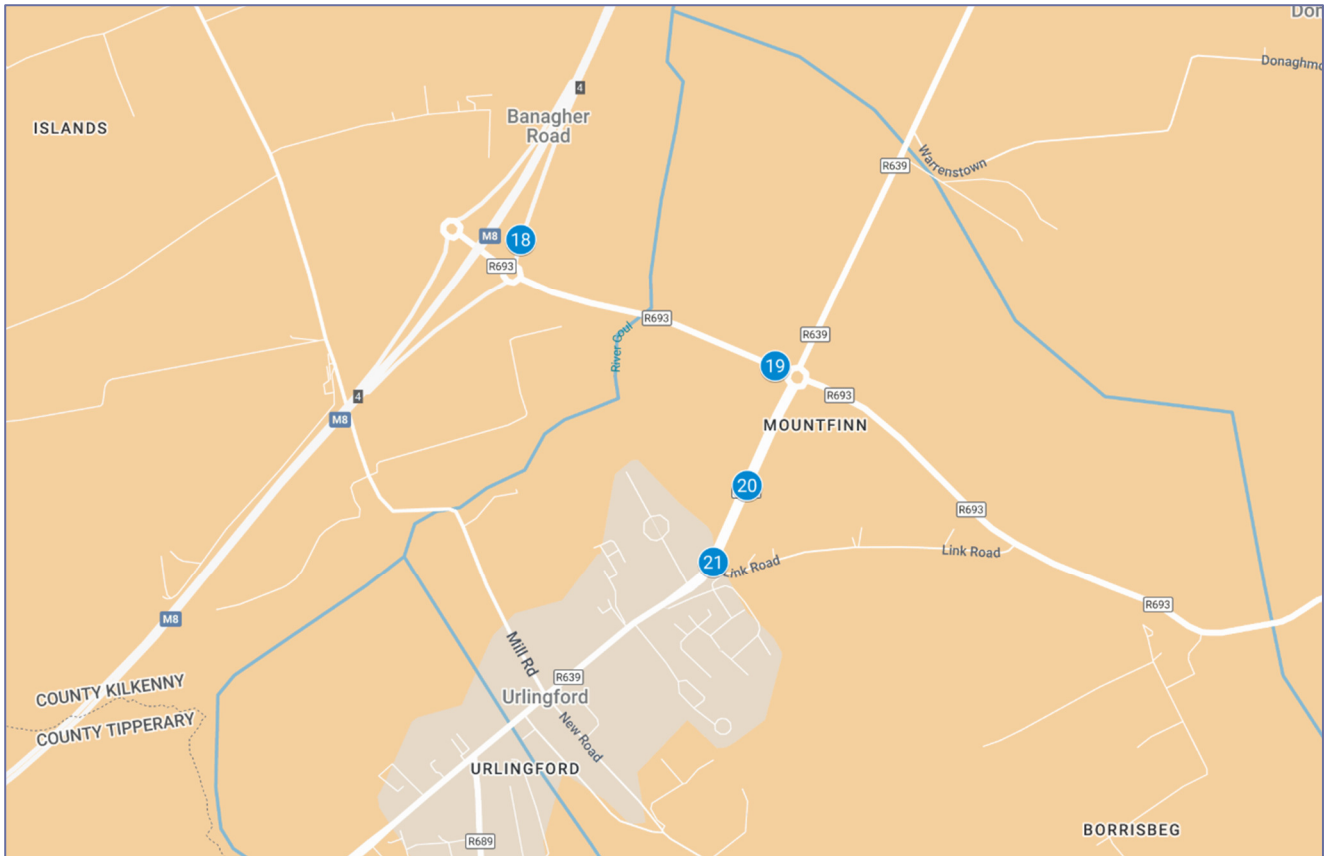


An electronic version of the POI plan can be found below:

[https://www.google.com/maps/d/edit?mid=1xE8g\\_f6OfXFQu111bTa-1JrTkToOEck&usp=sharing](https://www.google.com/maps/d/edit?mid=1xE8g_f6OfXFQu111bTa-1JrTkToOEck&usp=sharing)



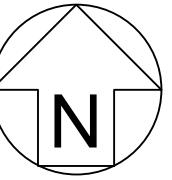




## Appendix B Swept Path Assessment Drawings

Blade

Tower



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Project Littleton Wind Farm

POI 3 SPA Location L6188 / N69 junction

Notes  
 1. All mitigation is subject to confirmation through a test run.  
 2. This is not a construction drawing and is intended for illustration purposes only.  
 3. Do not scale from this drawing.

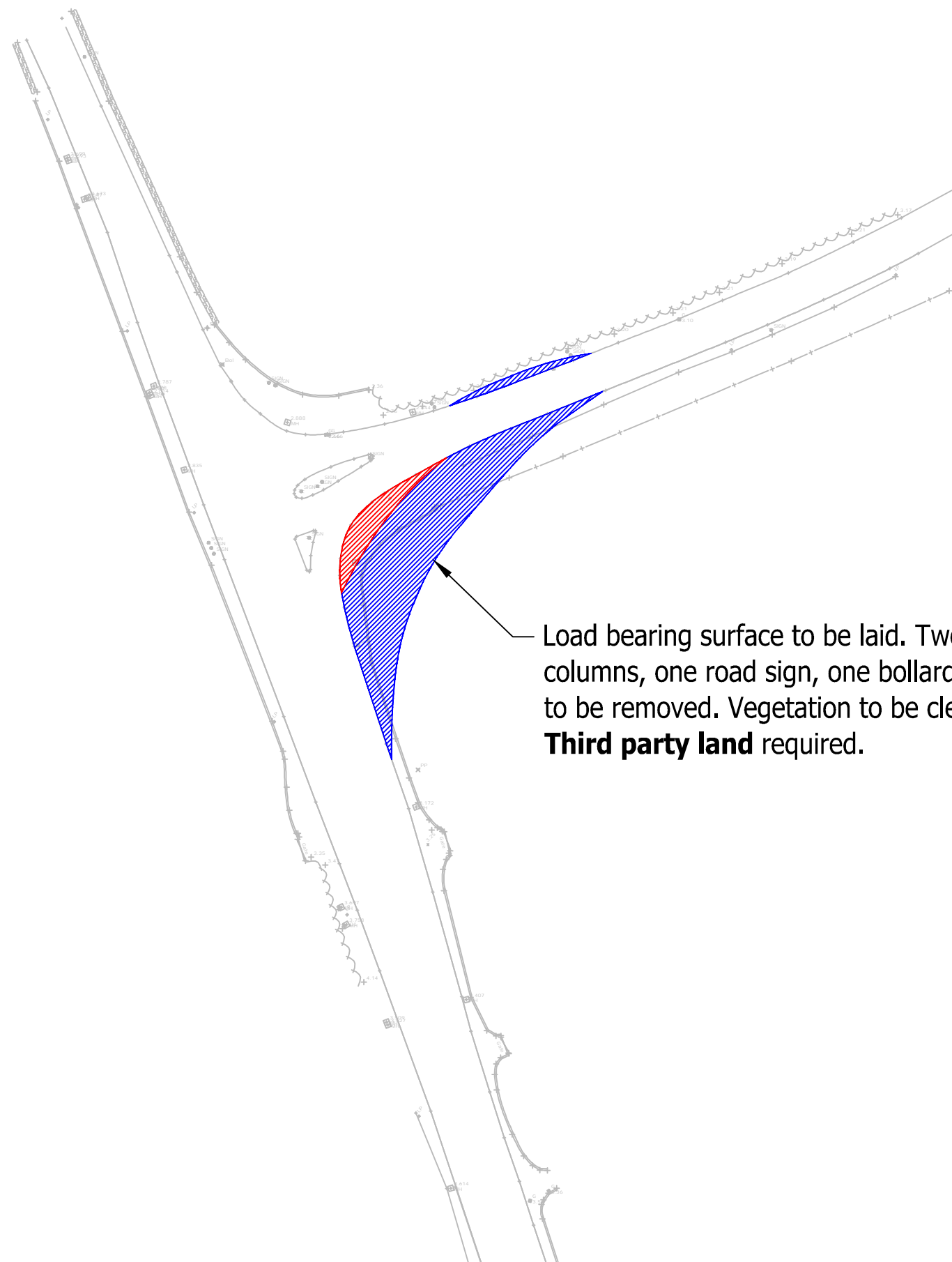
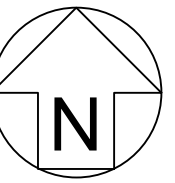
Drawing Title V162 Blade and Tower

Rev	Description	Drn	App	Date
-	-	-	-	-

Drawn AD Approved TL Date 22/01/2026

Status	Draft	<b>Key</b> <span style="color: red;">—</span> Wheel SPA <span style="border: 1px solid red; padding: 2px;"> </span> Overrun <span style="color: green;">—</span> Body SPA <span style="border: 1px solid blue; padding: 2px;"> </span> Oversail <span style="color: magenta;">—</span> Load SPA <span style="color: cyan;">↙</span> DoT
Revision	00	
Scale	1:1000 @ A3	

Drawing No. 10110880 - PF - SPA - 01



Load bearing surface to be laid. Two lighting columns, one road sign, one bollard and wall to be removed. Vegetation to be cleared.  
**Third party land required.**

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Client

Littleton Wind Farm DAC

Project

Littleton Wind Farm

Drawing Title

V162 Blade and Tower

POI

3

SPA Location

L6188 / N69 junction

Notes

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Rev	-			Drn	App	Date
Drawn	AD	Approved	TL	Date	22/01/2026	
Status	Draft		Key		Overrun	
Revision	00		Wheel SPA	Overrun		
Scale	1:1000 @ A3		Body SPA	Oversail		
Drawing No.	10110880 - PF - SPA - 01A					
			Load SPA	DoT		
			Indicative			

Blade



Tower



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Client Littleton Wind Farm DAC

Project Littleton Wind Farm Drawing Title V162 Blade and Tower

POI 4 SPA Location N69 S-Bend North of Sroolane

Notes  
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Rev	-			Drn	App	Date	-
Drawn	AD	Approved	TL	Date	22/01/2026		
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Scale	1:1000 @ A3		Body SPA	Oversail			
Drawing No.	10110880 - PF - SPA - 02						
		Load SPA	Indicative	DoT			

Mitigation



Trees and vegetation to be trimmed.

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Client Littleton Wind Farm DAC

Project Littleton Wind Farm Drawing Title V162 Blade and Tower

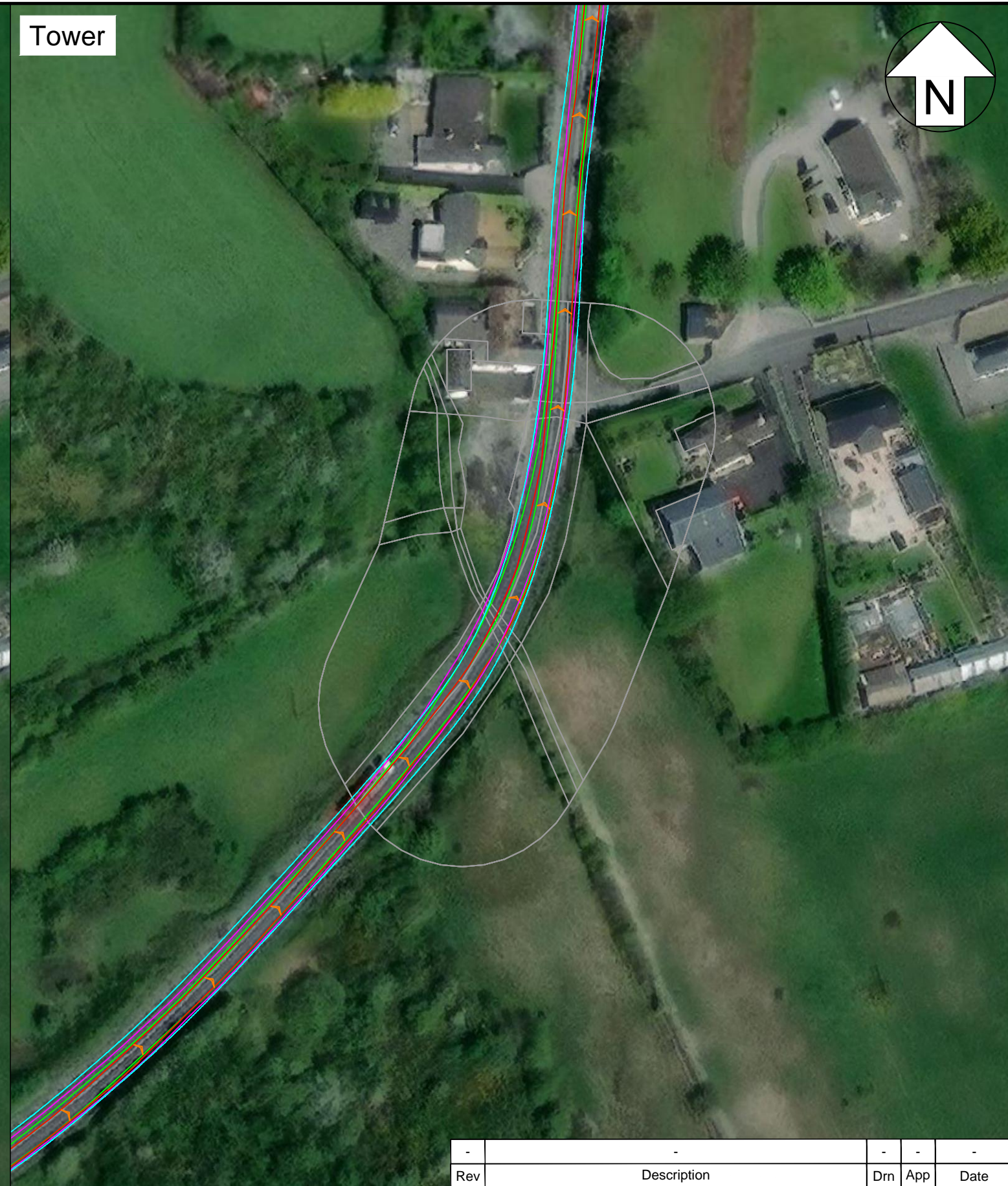
POI 4 SPA Location N69 S-Bend North of Sroolane

Notes  
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-	-	-	-	-
Drawn	AD	Approved	TL	Date 22/01/2026
Status	Draft	Key		
Revision	00	Wheel SPA	Overrun	
Scale	1:1000 @ A3	Body SPA	Oversail	
		Load SPA	DoT	
		Indicative		
Drawing No.		10110880 - PF - SPA - 02A		

Blade

Tower



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Client: Littleton Wind Farm DAC

Project	Littleton Wind Farm		Drawing Title	V162 Blade and Tower	
POI	6	SPA Location	N69 Barrigone LH bend		
Notes	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only. 3. Do not scale from this drawing.				

Rev	-			Drn	App	Date
Drawn	AD	Approved	TL	Date	22/01/2026	
Status	Draft		Key			
Revision	00		Wheel SPA	Overrun		
Scale	1:1000 @ A3		Body SPA	Oversail		
Drawing No.	10110880 - PF - SPA - 03					
			Load SPA	DoT		
			Indicative			



One road sign and wall to be removed. Vegetation to be cleared. **Third party land** required. It may be possible to oversail the wall subject to confirmation during the test run.



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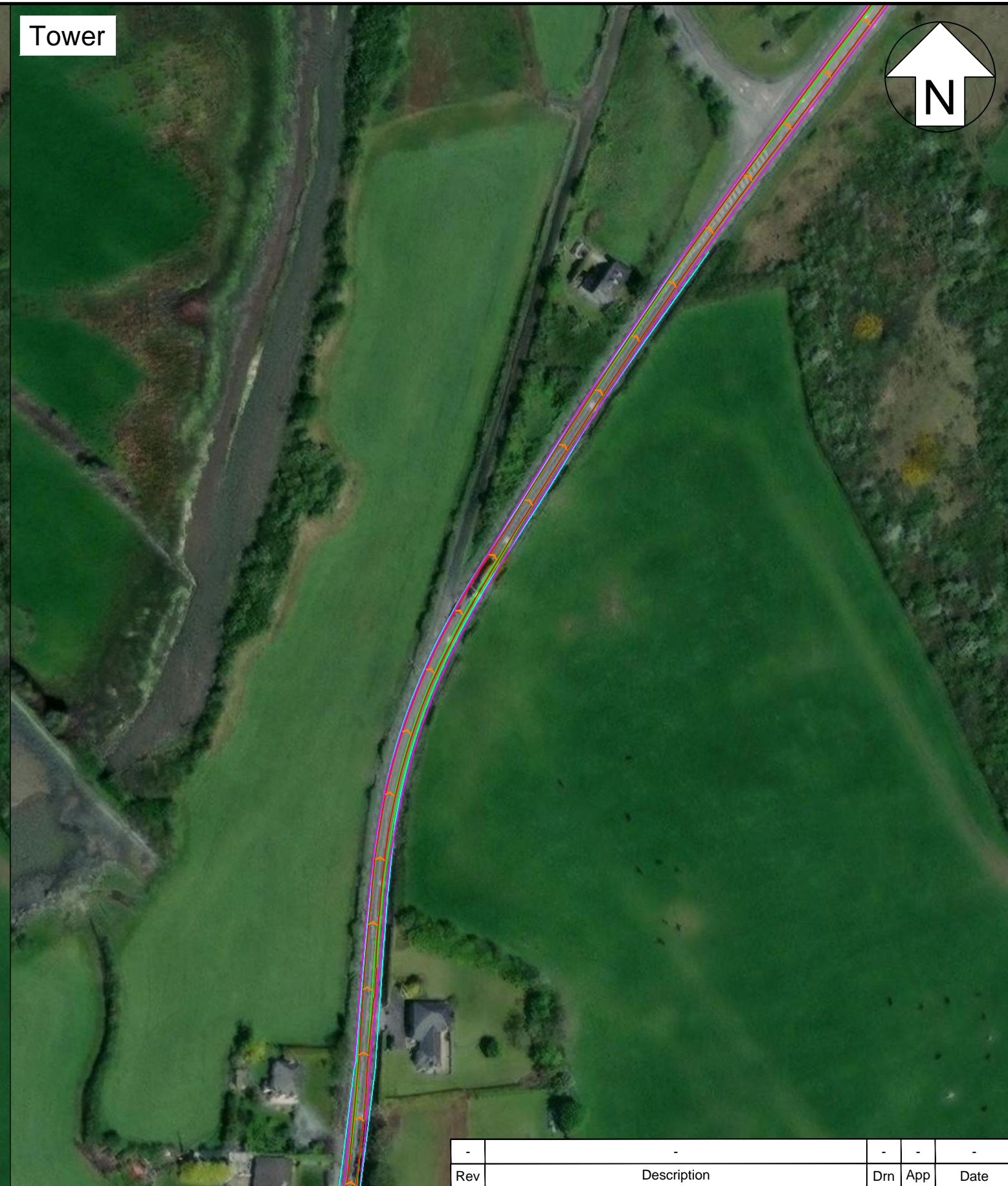
Client: Littleton Wind Farm DAC

Project	Littleton Wind Farm	Drawing Title	V162 Blade and Tower
POI	6	SPA Location	N69 Barrigone LH bend
Notes	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only. 3. Do not scale from this drawing.		

Rev	-	Description	-	Drn	-	App	-	Date	-
Drawn	AD	Approved	TL	Date	22/01/2026				
Status	Draft		Key						
Revision	00		Wheel SPA	Overrun					
Scale	1:1000 @ A3		Body SPA	Oversail					
			Load SPA	DoT					
			Indicative						
Drawing No.			10110880 - PF - SPA - 03A						

Blade

Tower



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Client

Littleton Wind Farm DAC

Project

Littleton Wind Farm

POI

7

SPA Location

N69 Barrigone RH bend

Notes

1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.
3. Do not scale from this drawing.

Drawing Title

V162 Blade and Tower

Rev	Description	Drn	App	Date
-	-	-	-	-

Drawn	AD	Approved	TL	Date	22/01/2026
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Status	Draft	<b>Key</b> <span style="color: red;">—</span> Wheel SPA <span style="color: green;">—</span> Body SPA <span style="color: magenta;">—</span> Load SPA <span style="color: cyan;">—</span> Indicative Overrun Oversail DoT
Revision	00	
Scale	1:1500 @ A3	

Drawing No.	10110880 - PF - SPA - 04
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One road sign to be removed.  
Vegetation to be trimmed.

Vegetation to be trimmed.

Fence, gate and utility marker to be removed.  
Wall to be oversailed. Vegetation to be cleared.  
**Third party land** required.

One road sign and one set of chevron signs to  
be removed. Vegetation to be trimmed.

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Client: Littleton Wind Farm DAC

Project	Littleton Wind Farm	Drawing Title	V162 Blade and Tower
POI	7	SPA Location	N69 Barrigone RH bend
Notes	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only. 3. Do not scale from this drawing.		

Rev	-			Drn	App	Date
Drawn	AD	Approved	TL	Date	22/01/2026	
Status	Draft		Key			
Revision	00		Wheel SPA	Overrun		
Scale	1:1500 @ A3		Body SPA	Oversail		
Drawing No.	10110880 - PF - SPA - 04A					

Blade



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Client: Littleton Wind Farm DAC

Project	Littleton Wind Farm	Drawing Title	V162 Blade and Tower
POI	8	SPA Location	N69 Kilcornan RH Bend
Notes	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only. 3. Do not scale from this drawing.		

Rev	-	Description	-	Drn	-	App	-	Date	-
Drawn	AD	Approved	TL	Date	22/01/2026				
Status	Draft		Key						
Revision	00		Wheel SPA	Overrun					
Scale	1:1000 @ A3		Body SPA	Oversail					
Drawing No.	10110880 - PF - SPA - 05								
			Load SPA	DoT					
			Indicative						

Tower



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Client: Littleton Wind Farm DAC

Project	Littleton Wind Farm	Drawing Title	V162 Blade and Tower
POI	8	SPA Location	N69 Kilcornan RH Bend
Notes	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only. 3. Do not scale from this drawing.		

Rev	-	Description	-	Drn	-	App	-	Date	-
Drawn	AD	Approved	TL	Date	22/01/2026				
Status	Draft	Key		— Wheel SPA     Overrun — Body SPA     Oversail — Load SPA     DoT — Indicative					
Revision	00								
Scale	1:1000 @ A3								
Drawing No.	10110880 - PF - SPA - 05A								

Mitigation



Load bearing surface to be laid.  
One road sign to be removed.  
Vegetation to be trimmed.

One road sign to be removed.  
One bollard to be oversailed.

One road sign to be removed. Trees  
and vegetation to be trimmed.

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Project	Littleton Wind Farm	Drawing Title	V162 Blade and Tower
POI	8	SPA Location	N69 Kilcornan RH Bend
Notes	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only. 3. Do not scale from this drawing.		

Client: Littleton Wind Farm DAC

Rev	-	Description	-	Drn	-	App	-	Date	-
Drawn	AD	Approved	TL	Date	22/01/2026				
Status	Draft		Key						
Revision	00		Wheel SPA	Overrun					
Scale	1:1000 @ A3		Body SPA	Oversail					
Drawing No.	10110880 - PF - SPA - 05B								
			Load SPA	DoT					
			Indicative						

Blade



Tower



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Client Littleton Wind Farm DAC

Project Littleton Wind Farm Drawing Title V162 Blade and Tower

POI 9 SPA Location N69 Kildimo RH bend

Notes  
1. All mitigation is subject to confirmation through a test run.  
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3. Do not scale from this drawing.

Rev	-			Drn	App	Date
Drawn	AD	Approved	TL	Date	22/01/2026	
Status	Draft		Key			
Revision	00		— Wheel SPA	▨ Overrun		
Scale	1:1000 @ A3		— Body SPA	▨ Oversail		
Drawing No.	10110880 - PF - SPA - 06					
			— Load SPA			
			— Indicative			◁ DoT



Parking to be suspended during deliveries.

One road sign and two bollards to be removed.

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Client

Littleton Wind Farm DAC

Project	Littleton Wind Farm	Drawing Title	V162 Blade and Tower
POI	9	SPA Location	N69 Kildimo RH bend

Notes  
 1. All mitigation is subject to confirmation through a test run.  
 2. This is not a construction drawing and is intended for illustration purposes only.  
 3. Do not scale from this drawing.

Rev	-	Description	-	Drn	-	App	-	Date	-
Drawn	AD	Approved	TL	Date	22/01/2026				
Status	Draft		Key						
Revision	00		Wheel SPA	Overrun					
Scale	1:1000 @ A3		Body SPA	Oversail					
Drawing No.	10110880 - PF - SPA - 06A								

- Wheel SPA
- Body SPA
- Load SPA
- Indicative
- Overrun
- Oversail
- DoT

Blade



Tower



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Client

Littleton Wind Farm DAC

Project	Littleton Wind Farm	Drawing Title	V162 Blade and Tower
POI	10	SPA Location	N69 Ferry Bridge

Notes	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only. 3. Do not scale from this drawing.
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Rev	-	Description	-	Drn	-	App	-	Date	-
Drawn	AD	Approved	TL	Date	22/01/2026				
Status	Draft		Key		— Wheel SPA       Overrun — Body SPA         Oversail — Load SPA         DoT — Indicative				
Revision	00								
Scale	1:1000 @ A3								
Drawing No.	10110880 - PF - SPA - 07								



One solar sign to be removed.

Vertical assessment of bridge deck profile required.

Clearance to bridge parapets to be confirmed sufficient on a topographical survey base.

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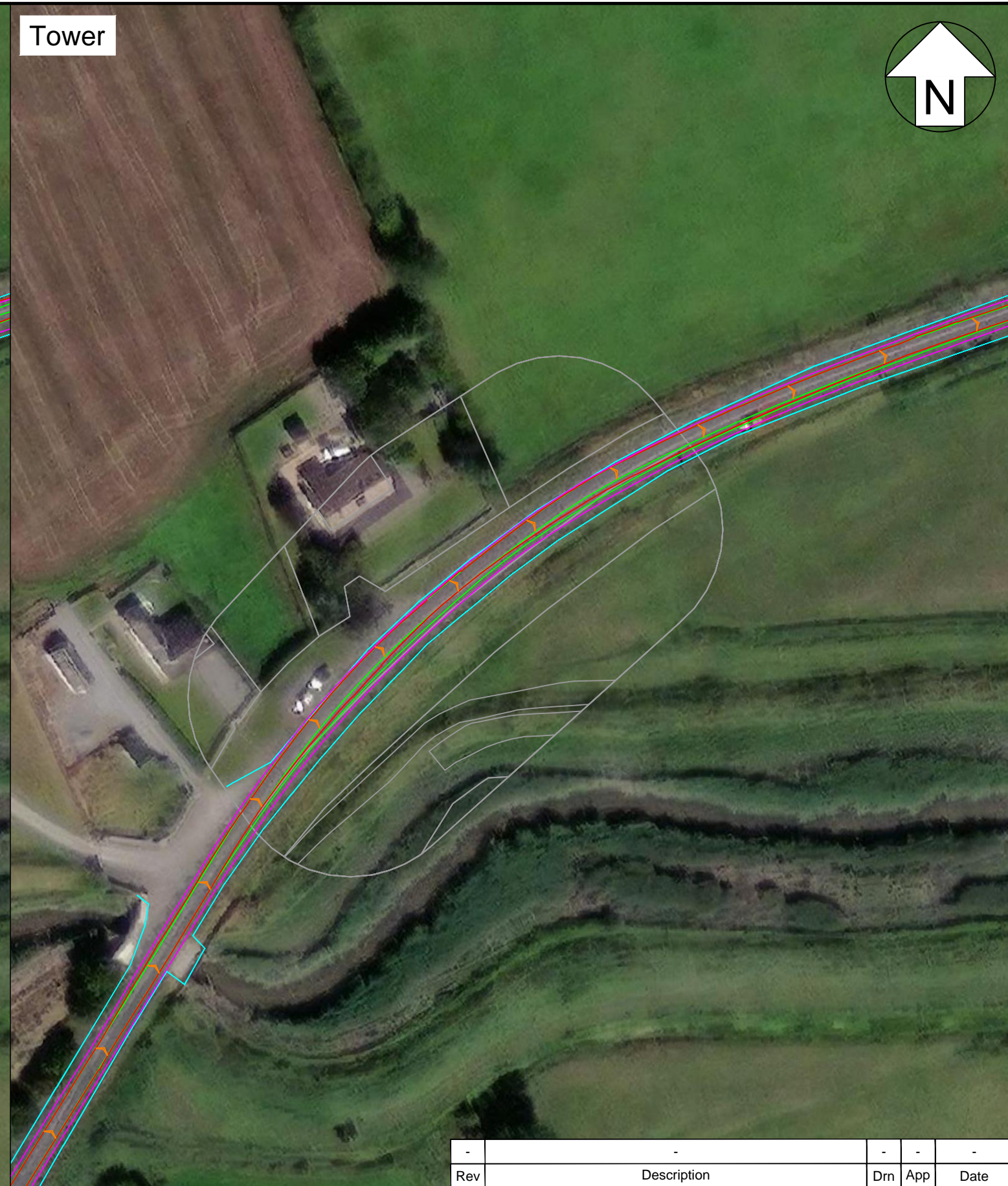
Client: Littleton Wind Farm DAC

Project		Littleton Wind Farm		Drawing Title		V162 Blade and Tower	
POI	10	SPA Location				N69 Ferry Bridge	
Notes							
1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only. 3. Do not scale from this drawing.							

Rev	-	Description	-	Drn	-	App	-	Date	-
Drawn	AD	Approved	TL	Date		22/01/2026			
Status	Draft	Key		Wheel SPA (Red line) Body SPA (Green line) Load SPA (Magenta line) Indicative (Cyan line) Overrun (Red hatched) Oversail (Blue hatched) DoT (Orange arrow)					
Revision	00	Scale		1:1000 @ A3					
Drawing No.		10110880 - PF - SPA - 07A							

Blade

Tower



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Client Littleton Wind Farm DAC

Project Littleton Wind Farm

POI 11 SPA Location N69 West of Clarina Village RH Bend

Notes  
1. All mitigation is subject to confirmation through a test run.  
2. This is not a construction drawing and is intended for illustration purposes only.  
3. Do not scale from this drawing.

Drawing Title V162 Blade and Tower

Rev	Description	Drn	App	Date
-	-	-	-	-

Drawn AD Approved TL Date 22/01/2026

Status	Draft	<b>Key</b> <span style="color: red;">—</span> Wheel SPA <span style="border: 1px solid red; display: inline-block; width: 10px; height: 10px; transform: rotate(45deg);"></span> Overrun <span style="color: green;">—</span> Body SPA <span style="border: 1px solid green; display: inline-block; width: 10px; height: 10px; transform: rotate(45deg);"></span> Oversail <span style="color: magenta;">—</span> Load SPA <span style="border: 1px solid magenta; display: inline-block; width: 10px; height: 10px; transform: rotate(45deg);"></span> <span style="color: cyan;">—</span> Indicative <span style="color: orange;">↖</span> DoT
Revision	00	
Scale	1:1000 @ A3	

Drawing No. 10110880 - PF - SPA - 08

Mitigation



One road sign to be removed.

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Client Littleton Wind Farm DAC

Project	Littleton Wind Farm	Drawing Title	V162 Blade and Tower
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POI	11	SPA Location	N69 West of Clarina Village RH Bend
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Notes  
 1. All mitigation is subject to confirmation through a test run.  
 2. This is not a construction drawing and is intended for illustration purposes only.  
 3. Do not scale from this drawing.

Rev	-	Description	-	Drn	-	App	-	Date	-
Drawn	AD	Approved	TL	Date	22/01/2026				
Status	Draft	Key		Wheel SPA <span style="color:red">—</span> Overrun					
Revision	00	Body SPA <span style="color:green">—</span> Oversail							
Scale	1:1000 @ A3	Load SPA <span style="color:magenta">—</span> DoT							
Indicative	<span style="color:cyan">—</span>								
Drawing No.	10110880 - PF - SPA - 08A								



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Project	Littleton Wind Farm		Drawing Title	V162 Blade and Tower	
POI	12	SPA Location	N69 Clarina Village Roundabout		
Notes	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only. 3. Do not scale from this drawing.				

Rev	-			Drn	App	Date
Drawn	AD	Approved	TL	Date	22/01/2026	
Status	Draft		Key			
Revision	00		Wheel SPA	Overrun		
Scale	1:1000 @ A3		Body SPA	Oversail		
Drawing No.	10110880 - PF - SPA - 09					

Mitigation

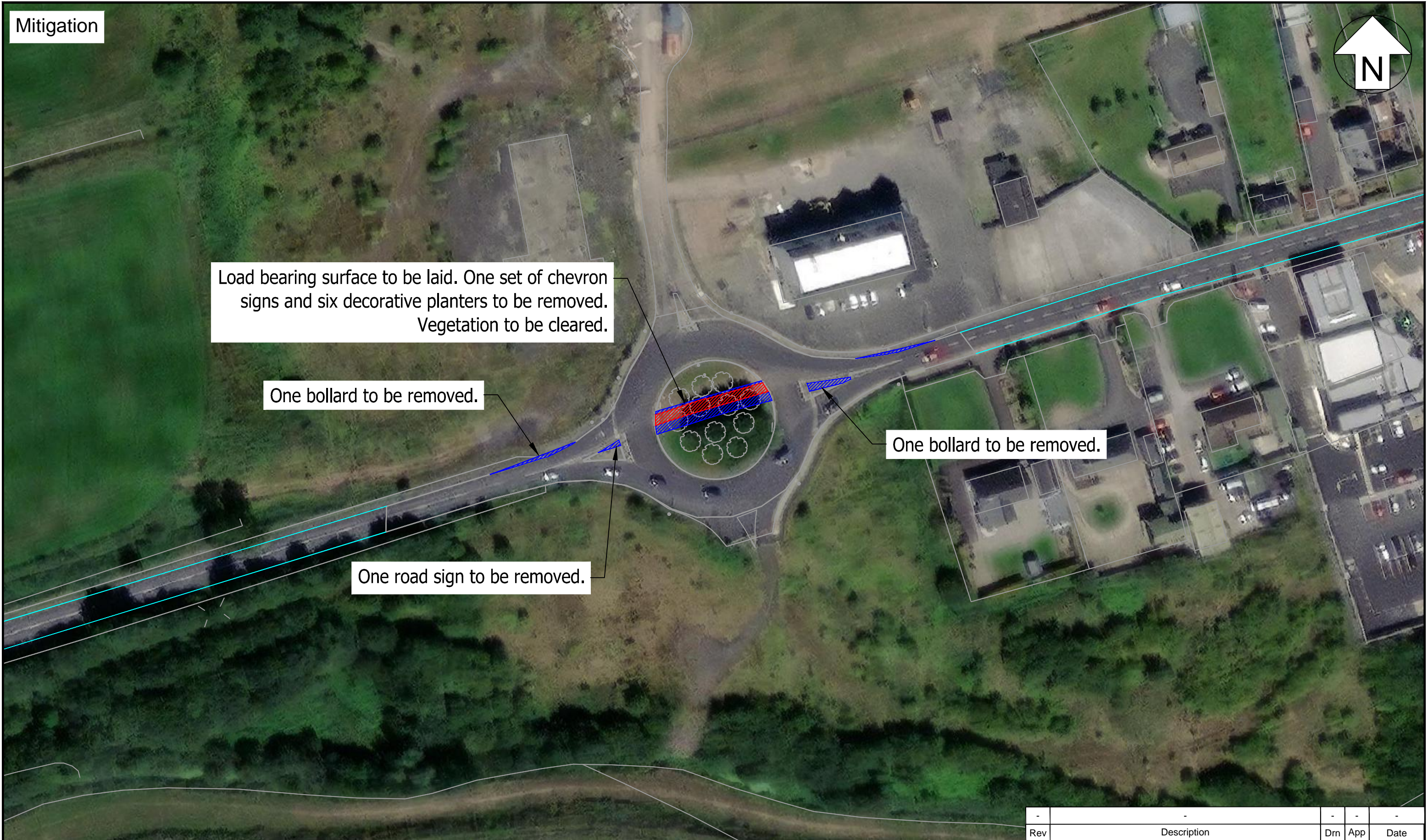


Load bearing surface to be laid. One set of chevron signs and six decorative planters to be removed. Vegetation to be cleared.

One bollard to be removed.

One bollard to be removed.

One road sign to be removed.



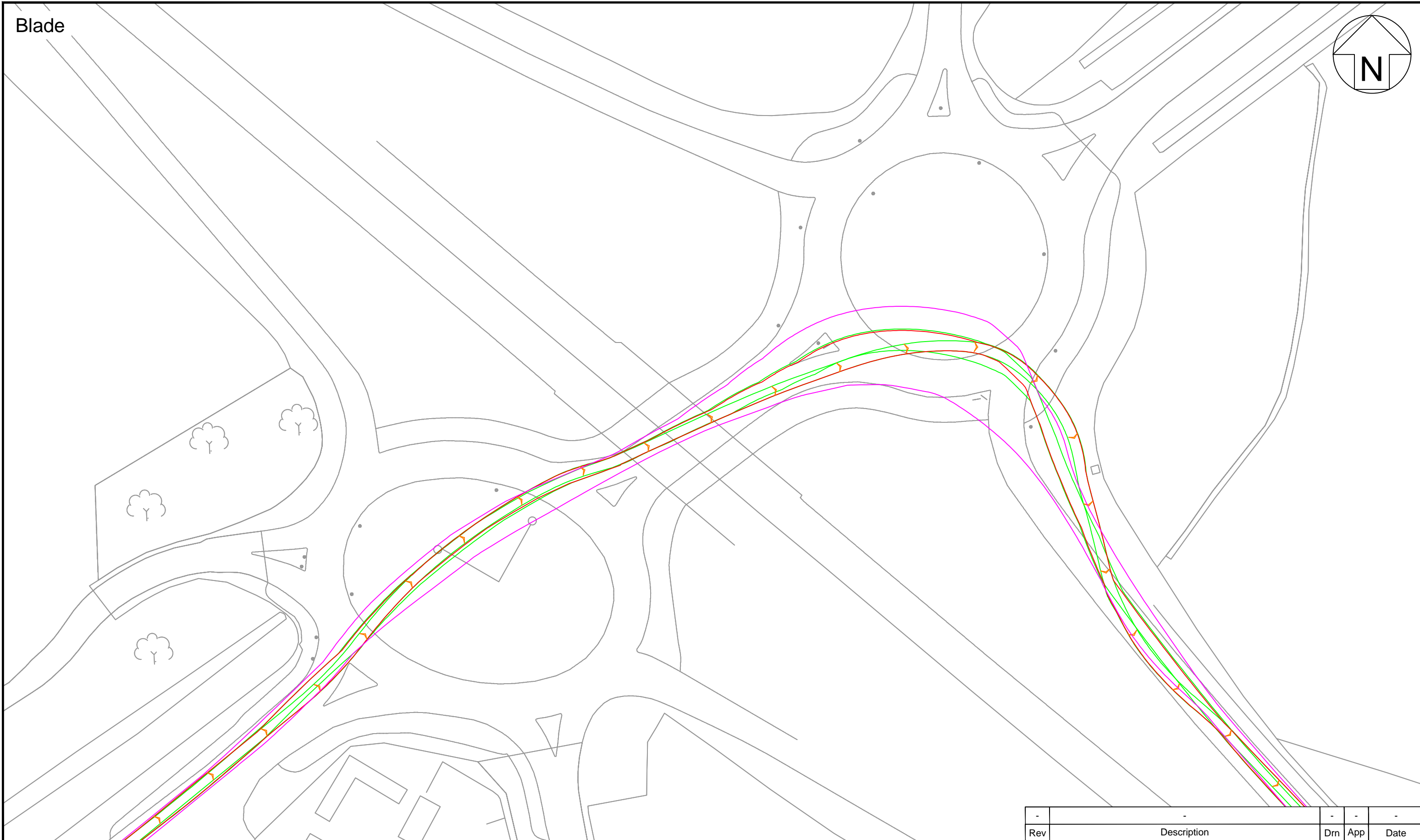
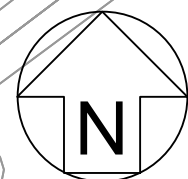
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Client: Littleton Wind Farm DAC

Project	Littleton Wind Farm	Drawing Title	V162 Blade and Tower
POI	12	SPA Location	N69 Clarina Village Roundabout
Notes	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only. 3. Do not scale from this drawing.		

Rev	-			Drn	App	Date
Drawn	AD	Approved	TL	Date	22/01/2026	
Status	Draft		Key			
Revision	00		Wheel SPA	Overrun		
Scale	1:1000 @ A3		Body SPA	Oversail		
Drawing No.	10110880 - PF - SPA - 09A					
			Load SPA	DoT		
			Indicative			

Blade



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Client

Littleton Wind Farm DAC

Project

Littleton Wind Farm

Drawing Title

V162 Blade and Tower

POI

14, 15

SPA Location

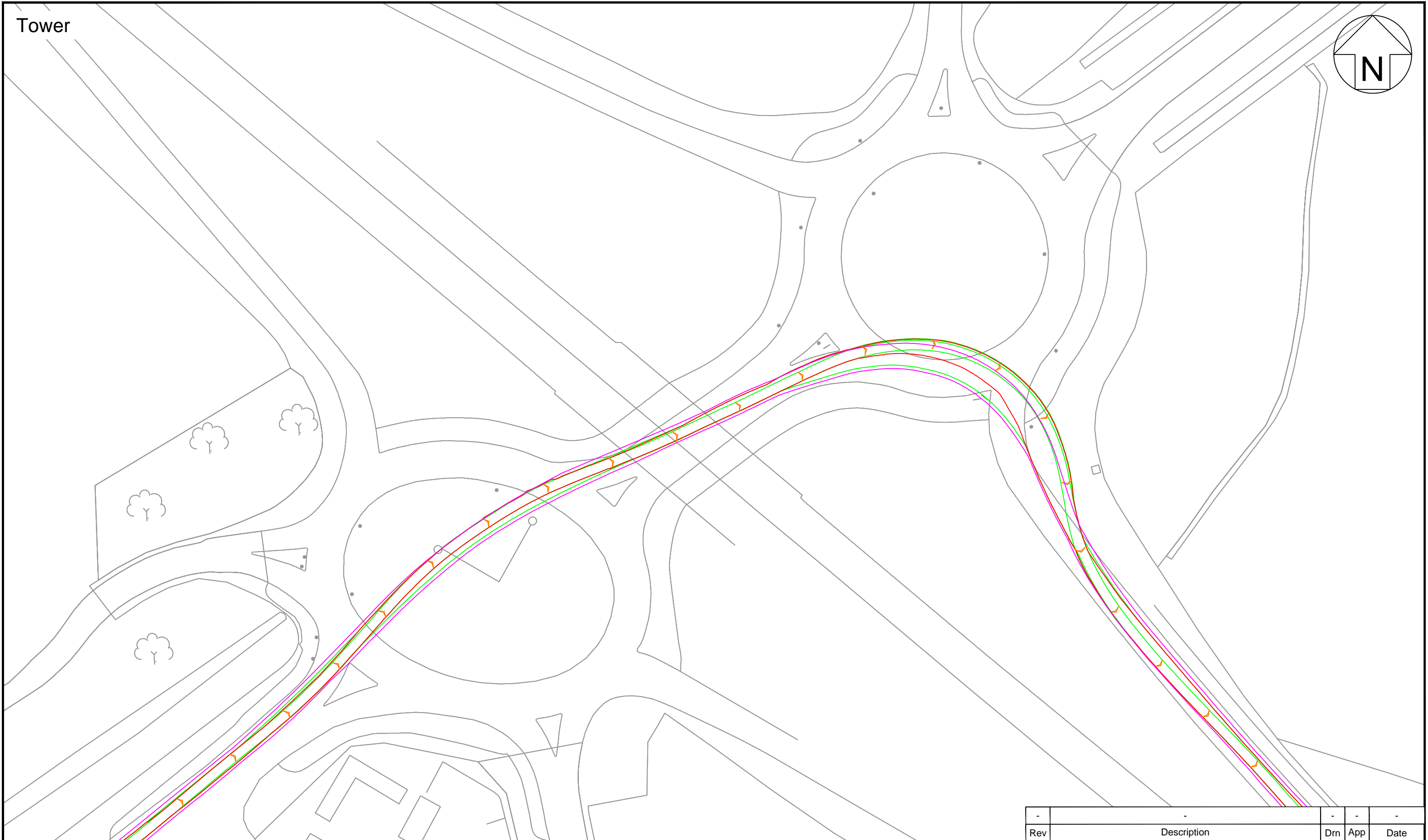
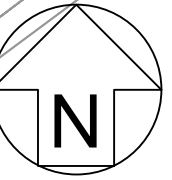
N69 / N18 Jct 2 Roundabouts

Notes

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Rev	-			Drn	App	Date
Drawn	AD	Approved	TL	Date	22/01/2026	
Status	Draft		Key			
Revision	00		<span style="color: red;">—</span>	Wheel SPA		Overrun
Scale	1:1000 @ A3		<span style="color: green;">—</span>	Body SPA		Oversail
Drawing No.	10110880 - PF - SPA - 10		<span style="color: magenta;">—</span>	Load SPA		DoT
			<span style="color: cyan;">—</span>	Indicative		

Tower



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Client **Littleton Wind Farm DAC**

Project **Littleton Wind Farm**

Drawing Title **V162 Blade and Tower**

POI **14, 15**

SPA Location **N69 / N18 Jct 2 Roundabouts**

- Notes
1. All mitigation is subject to confirmation through a test run.
  2. This is not a construction drawing and is intended for illustration purposes only.
  3. Do not scale from this drawing.

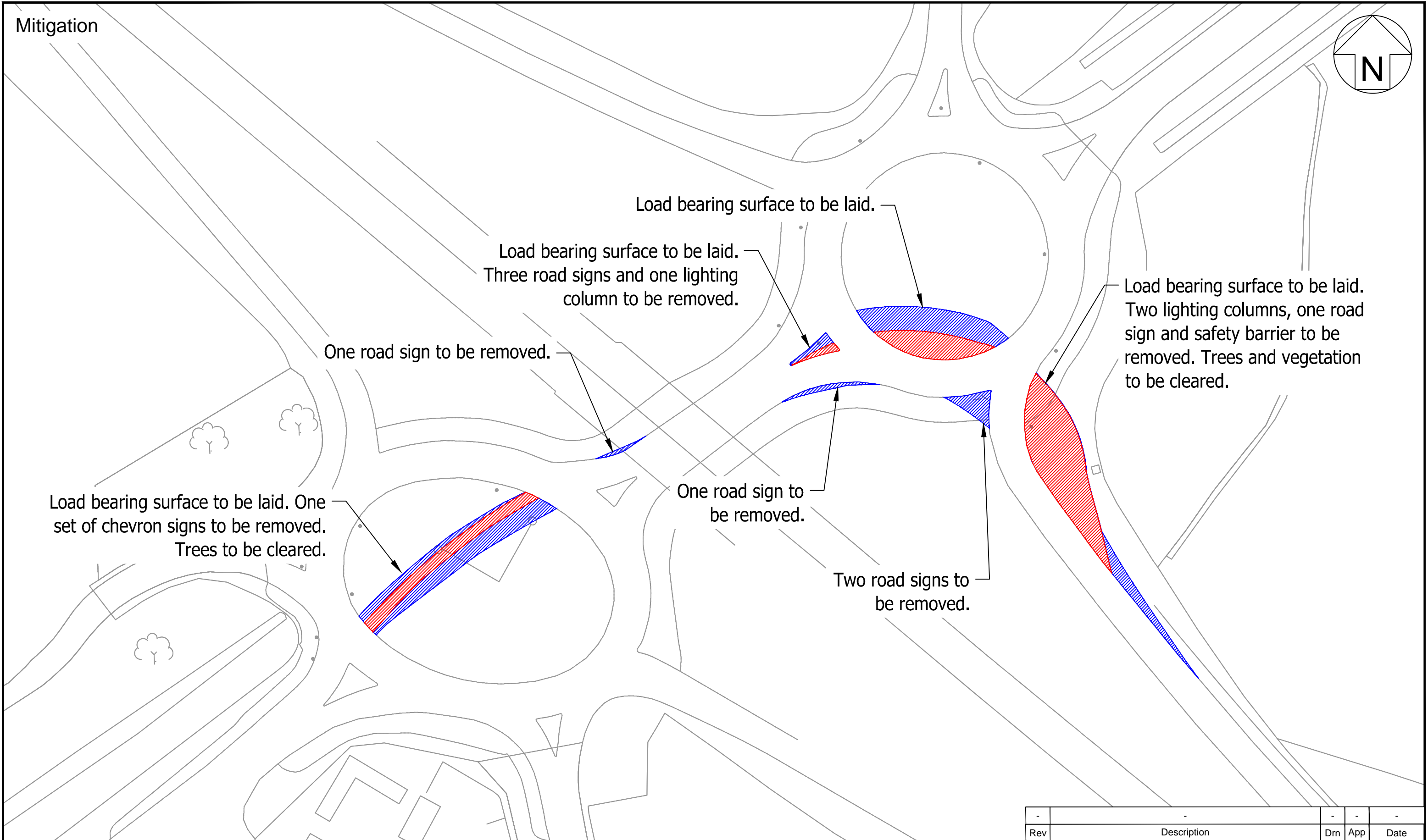
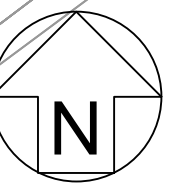
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-	-	-	-	-

Drawn **AD** Approved **TL** Date **22/01/2026**

Status	Draft	Key	
Revision	00	Wheel SPA	Overrun
Scale	1:1000 @ A3	Body SPA	Oversail
		Load SPA	DoT
		Indicative	

Drawing No. **10110880 - PF - SPA - 10A**

Mitigation



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Client

Littleton Wind Farm DAC

Project

Littleton Wind Farm

Drawing Title

V162 Blade and Tower

POI

14, 15

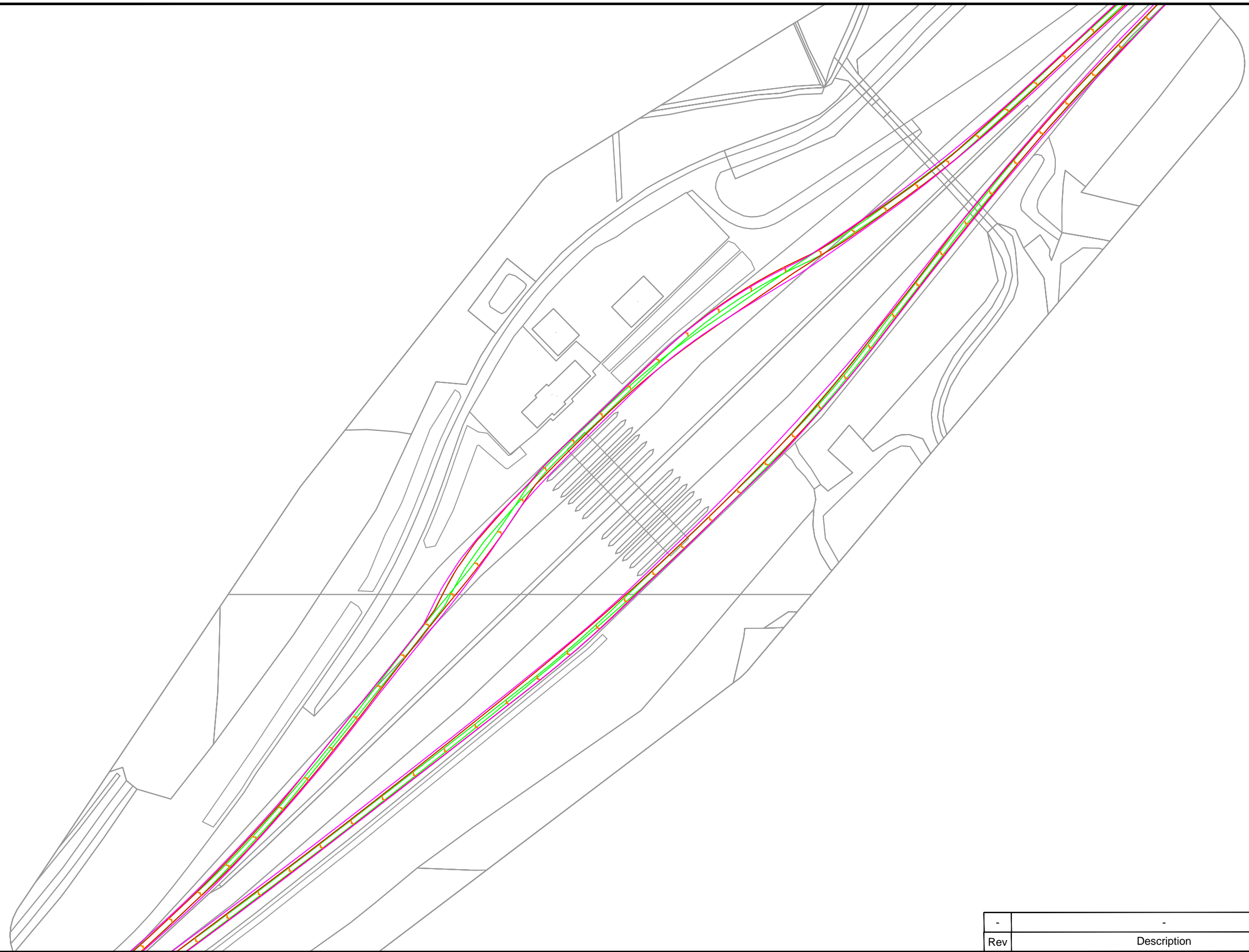
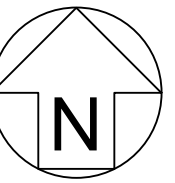
SPA Location

N69 / N18 Jct 2 Roundabouts

Notes

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3. Do not scale from this drawing.

Rev	Description	Drn	App	Date
-	-	-	-	-
Drawn	AD	Approved	TL	Date
				22/01/2026
Status	Draft	Key		
Revision	00	Wheel SPA	Overrun	
Scale	1:1000 @ A3	Body SPA	Oversail	
		Load SPA	DoT	
		Indicative		
Drawing No.	10110880 - PF - SPA - 10B			



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Client

Littleton Wind Farm DAC

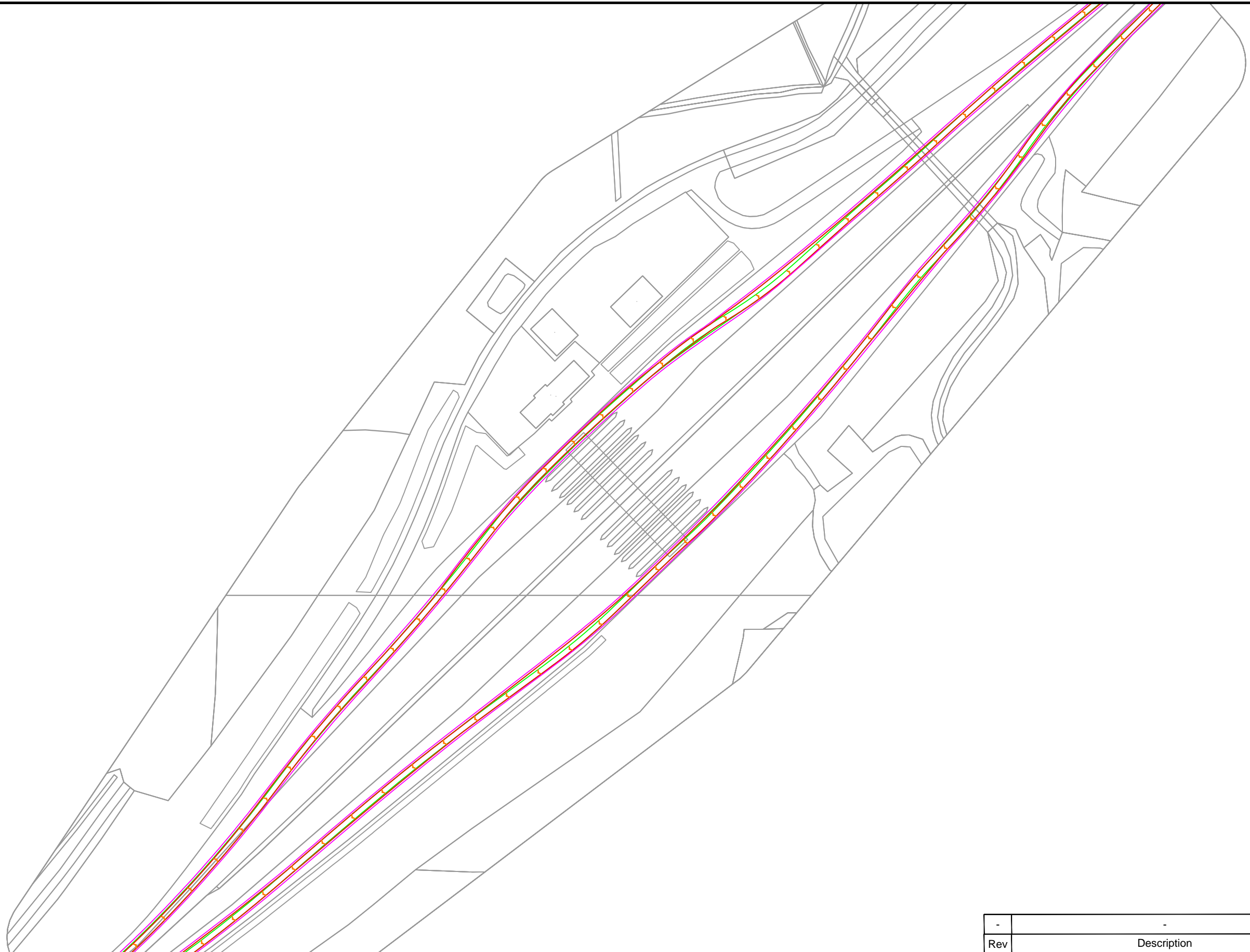
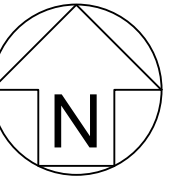
Project	Littleton Wind Farm	Drawing Title	V162 Blade and Tower
POI	16	SPA Location	Mid Link M7 / M8 Toll Plaza

**NO MITIGATION REQUIRED**

- Notes
1. All mitigation is subject to confirmation through a test run.
  2. This is not a construction drawing and is intended for illustration purposes only.
  3. Do not scale from this drawing.

Rev	-	Description	-	Drn	-	App	-	Date	-
Drawn	AD	Approved	TL	Date	22/01/2026				
Status	Draft		Key		Wheel SPA (Red line) Body SPA (Green line) Load SPA (Magenta line) Indicative (Cyan line) Overrun (Red hatched) Oversail (Blue hatched) DoT (Orange arrow)				
Revision	00								
Scale	1:2000 @ A3								
Drawing No.	10110880 - PF - SPA - 11								

Tower



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Client Littleton Wind Farm DAC

Project Littleton Wind Farm Drawing Title V162 Blade and Tower

POI 16 SPA Location Mid Link M7 / M8 Toll Plaza **NO MITIGATION REQUIRED**

Notes  
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 2. This is not a construction drawing and is intended for illustration purposes only.  
 3. Do not scale from this drawing.

Rev	Description	Drn	App	Date
-	-	-	-	-

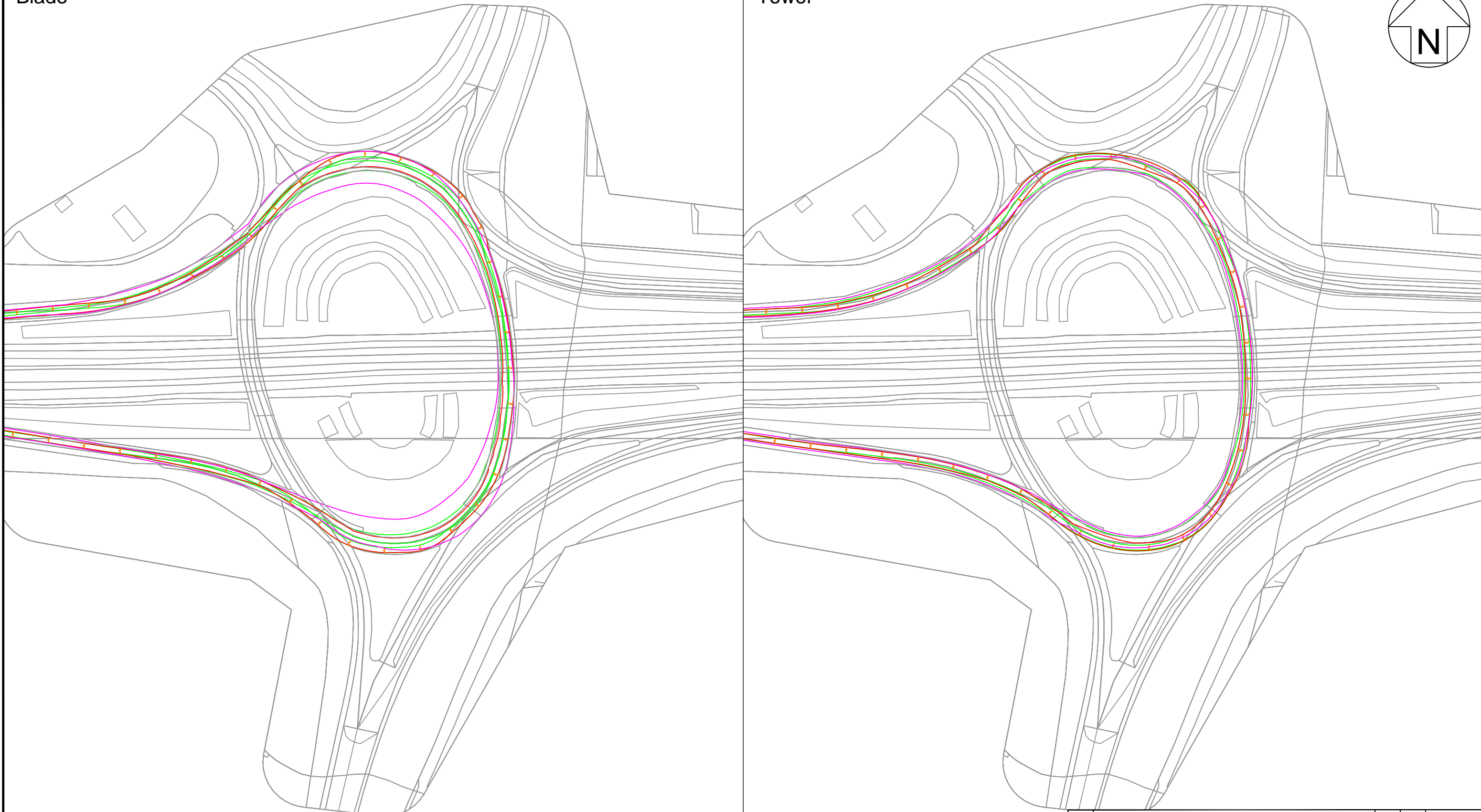
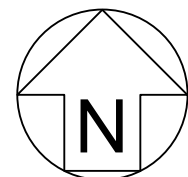
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<span style="color: red;">—</span> Wheel SPA	Overrun									
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<span style="color: cyan;">—</span> Indicative										
Scale	1:2000 @ A3									

Drawing No. 10110880 - PF - SPA - 11A

Blade

Tower



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Client

Littleton Wind Farm DAC

Project  
**Littleton Wind Farm**

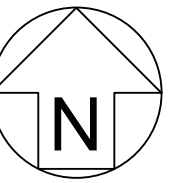
POI  
**17**

SPA Location  
**M7 Jct 17 Portlaoise Interchange**

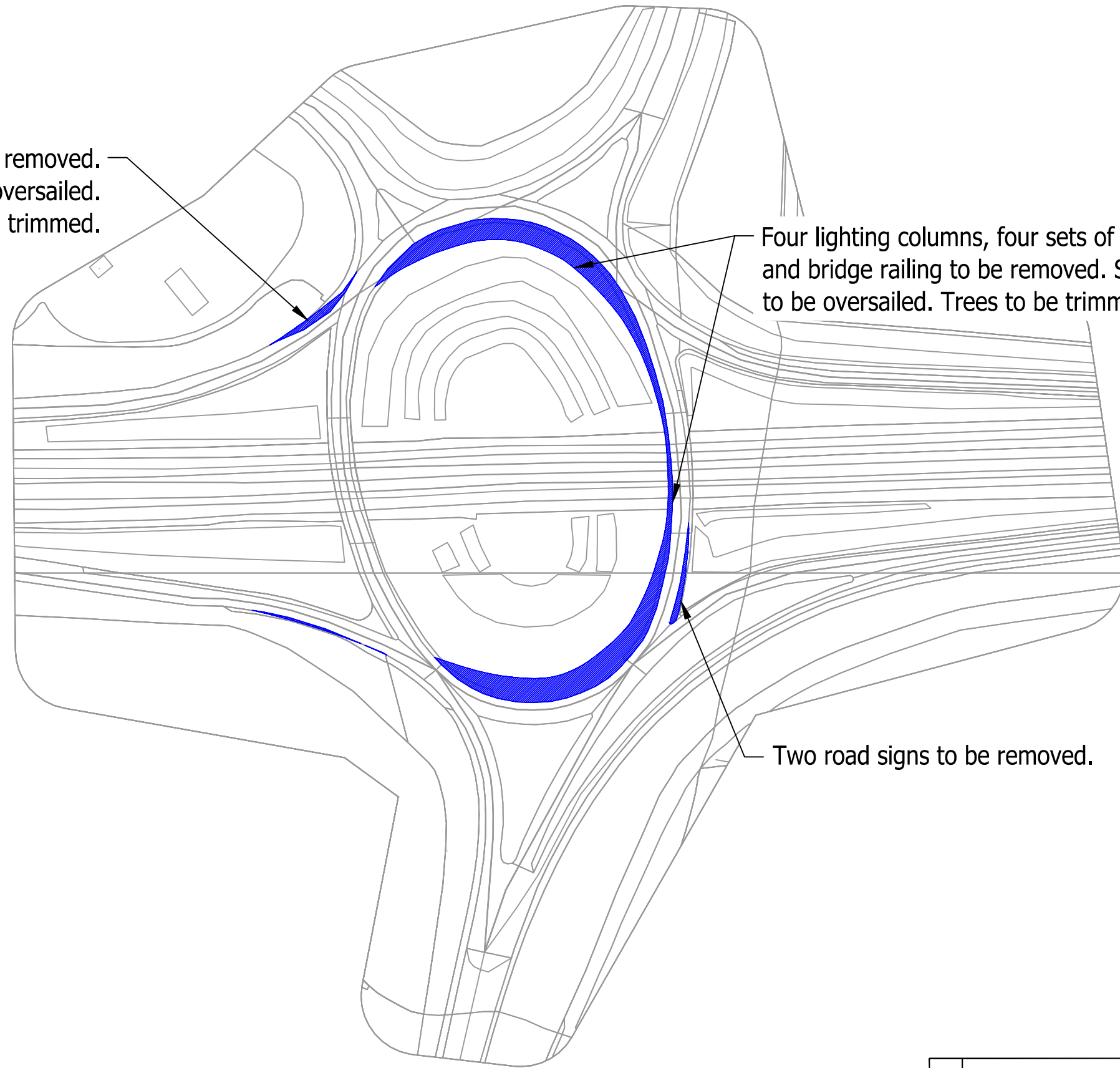
Notes  
 1. All mitigation is subject to confirmation through a test run.  
 2. This is not a construction drawing and is intended for illustration purposes only.  
 3. Do not scale from this drawing.

Drawing Title  
**V162 Blade and Tower**

Rev	-			Drn	-	App	-	Date	-
Drawn	AD	Approved	TL	Date	22/01/2026				
Status	Draft		Key		<span style="color: red;">—</span> Wheel SPA <span style="border: 1px solid red; display: inline-block; width: 10px; height: 10px; transform: rotate(45deg);"></span> Overrun <span style="color: green;">—</span> Body SPA <span style="border: 1px solid blue; display: inline-block; width: 10px; height: 10px; transform: rotate(45deg);"></span> Oversail <span style="color: magenta;">—</span> Load SPA <span style="color: cyan;">—</span> DoT				
Revision	00								
Scale	1:2000 @ A3								
Drawing No.	10110880 - PF - SPA - 12								



One road sign to be removed.  
Safety barrier to be oversailed.  
Trees to be trimmed.



Four lighting columns, four sets of chevron signs  
and bridge railing to be removed. Safety barriers  
to be oversailed. Trees to be trimmed.

Two road signs to be removed.

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Client

Littleton Wind Farm DAC

Project

Littleton Wind Farm

Drawing Title

V162 Blade and Tower

POI

17

SPA Location

M7 Jct 17 Portlaoise Interchange

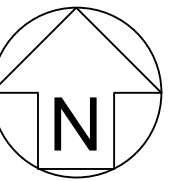
Notes

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Rev	Description	Drn	App	Date
-	-	-	-	-
Drawn	AD	Approved	TL	Date
Status	Draft	22/01/2026		
Revision	00	Key		
Scale	1:2000 @ A3	Wheel SPA	Overrun	
Drawing No.	10110880 - PF - SPA - 12A	Body SPA	Oversail	
		Load SPA	DoT	
		Indicative		

Blade

Tower



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Client

Littleton Wind Farm DAC

Project

Littleton Wind Farm

POI

18

SPA Location

M8 / R693 Roundabout

Notes

1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.
3. Do not scale from this drawing.

Drawing Title

V162 Blade and Tower

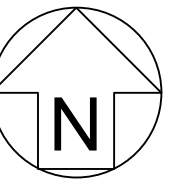
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Drawn	AD	Approved	TL	Date	22/01/2026
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Revision	00	
Scale	1:1000 @ A3	

Drawing No.	10110880 - PF - SPA - 13
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Mitigation



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Client

Littleton Wind Farm DAC

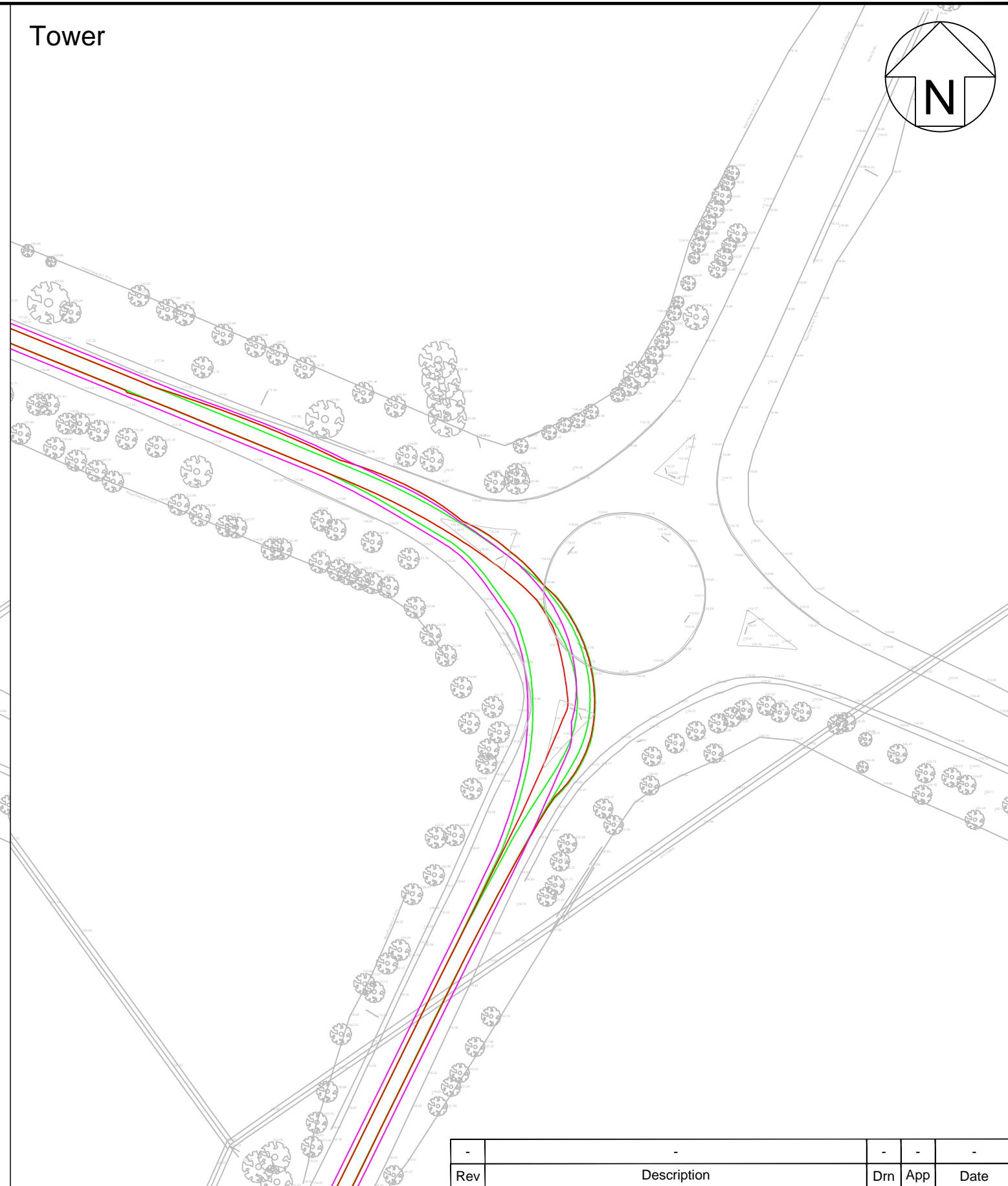
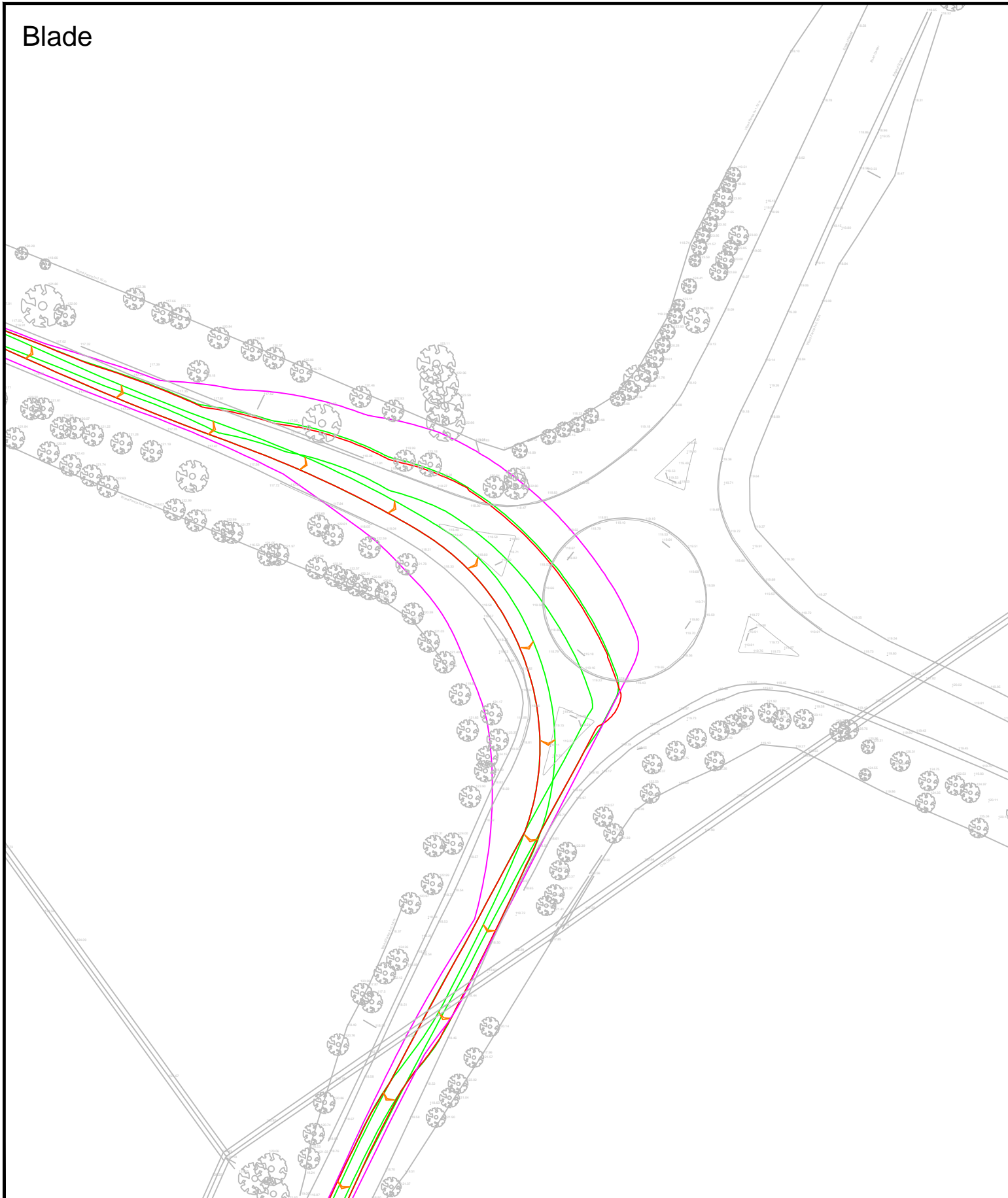
Project <b>Littleton Wind Farm</b>		Drawing Title <b>V162 Blade and Tower</b>	
POI <b>18</b>	SPA Location <b>M8 / R693 Roundabout</b>		

Notes  
 1. All mitigation is subject to confirmation through a test run.  
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Rev	Description			Drn	App	Date
Drawn	AD	Approved	TL	Date	22/01/2026	
Status	Draft		Key			
Revision	00		Wheel SPA	Overrun		
Scale	1:1000 @ A3		Body SPA	Oversail		
Drawing No.			Load SPA	DoT		
			Indicative			
10110880 - PF - SPA - 13A						

Blade

Tower



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Client

Littleton Wind Farm DAC

Project  
**Littleton Wind Farm**

POI  
**19**

SPA Location  
**R693 / R639 Roundabout**

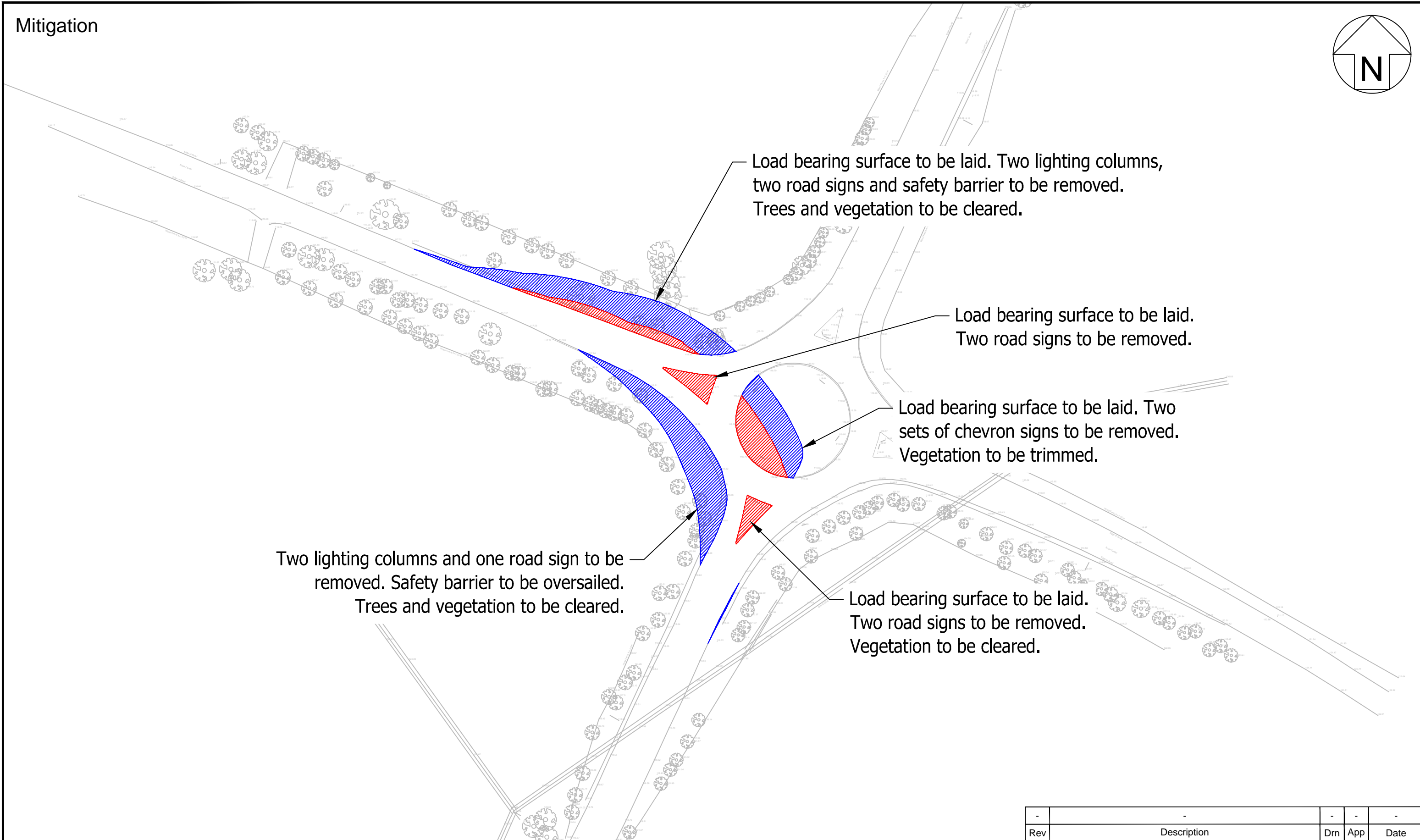
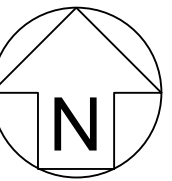
Notes  
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Drawing Title  
**V162 Blade and Tower**

Rev	Description	Drn	App	Date
-	-	-	-	-
Drawn	AD	Approved	TL	Date
				22/01/2026

Status	Draft	Key	
Revision	00	— Wheel SPA	▨ Overrun
Scale	1:1000 @ A3	— Body SPA	▨ Oversail
		— Load SPA	◁ DoT
		— Indicative	

Drawing No. **10110880 - PF - SPA - 14**



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Client

Littleton Wind Farm DAC

Project

Littleton Wind Farm

Drawing Title

V162 Blade and Tower

POI

19

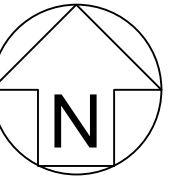
SPA Location

R693 / R639 Roundabout

Notes

1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.
3. Do not scale from this drawing.

Rev	Description	Drn	App	Date
-	-	-	-	-
Drawn	AD	Approved	TL	Date
Status	Draft	22/01/2026		
Revision	00	Key		
Scale	1:1000 @ A3	Wheel SPA	Overrun	
Drawing No.	10110880 - PF - SPA - 14A	Body SPA	Oversail	
		Load SPA	DoT	
		Indicative		



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Client

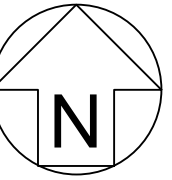
Littleton Wind Farm DAC

Project <b>Littleton Wind Farm</b>		Drawing Title <b>V162 Blade and Tower</b>	
POI <b>21</b>	SPA Location <b>R639 Urlingford</b>		
<b>NO MITIGATION REQUIRED</b>			

Notes  
 1. All mitigation is subject to confirmation through a test run.  
 2. This is not a construction drawing and is intended for illustration purposes only.  
 3. Do not scale from this drawing.

Rev	Description			Drn	App	Date
Drawn	AD	Approved	TL	Date	22/01/2026	
Status	Draft		Key			
Revision	00		Wheel SPA	Overrun		
Scale	1:1000 @ A3		Body SPA	Oversail		
			Load SPA	DoT		
			Indicative			
Drawing No.			<b>10110880 - PF - SPA - 15</b>			

Tower



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Client Littleton Wind Farm DAC

Project Littleton Wind Farm Drawing Title V162 Blade and Tower

POI 21 SPA Location R639 Urlingford **NO MITIGATION REQUIRED**

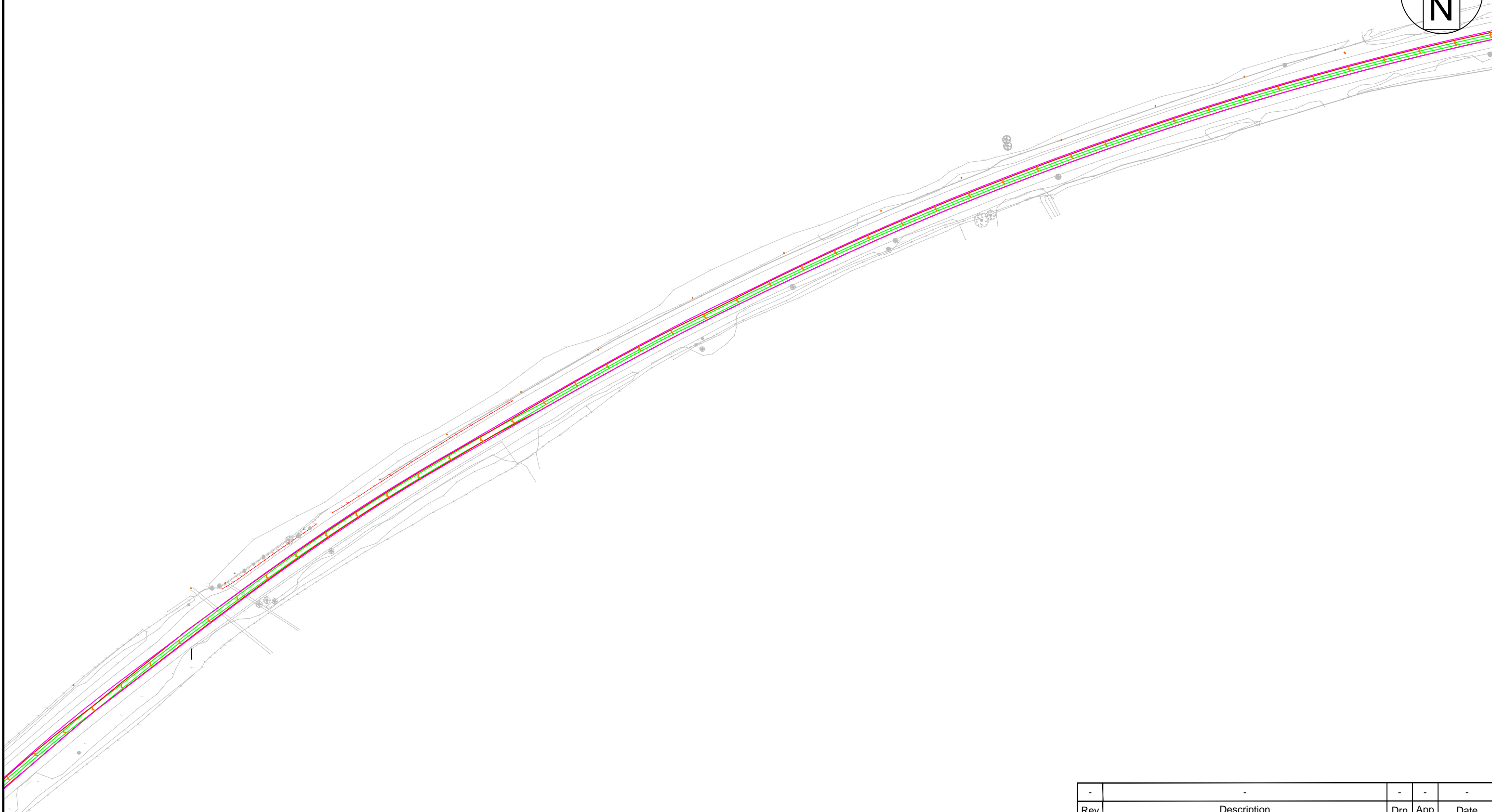
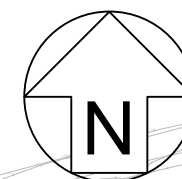
Notes  
 1. All mitigation is subject to confirmation through a test run.  
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Rev	Description	Drn	App	Date
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Drawn AD Approved TL Date 22/01/2026

Status	Draft	Key	
Revision	00	— Wheel SPA	▨ Overrun
Scale	1:1000 @ A3	— Body SPA	▨ Oversail
		— Load SPA	◁ DoT
		— Indicative	

Drawing No. 10110880 - PF - SPA - 15A



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Client

Littleton Wind Farm DAC

Project

Littleton Wind Farm

Drawing Title

V162 Blade and Tower

POI

22

SPA Location

R639 Longford Pass

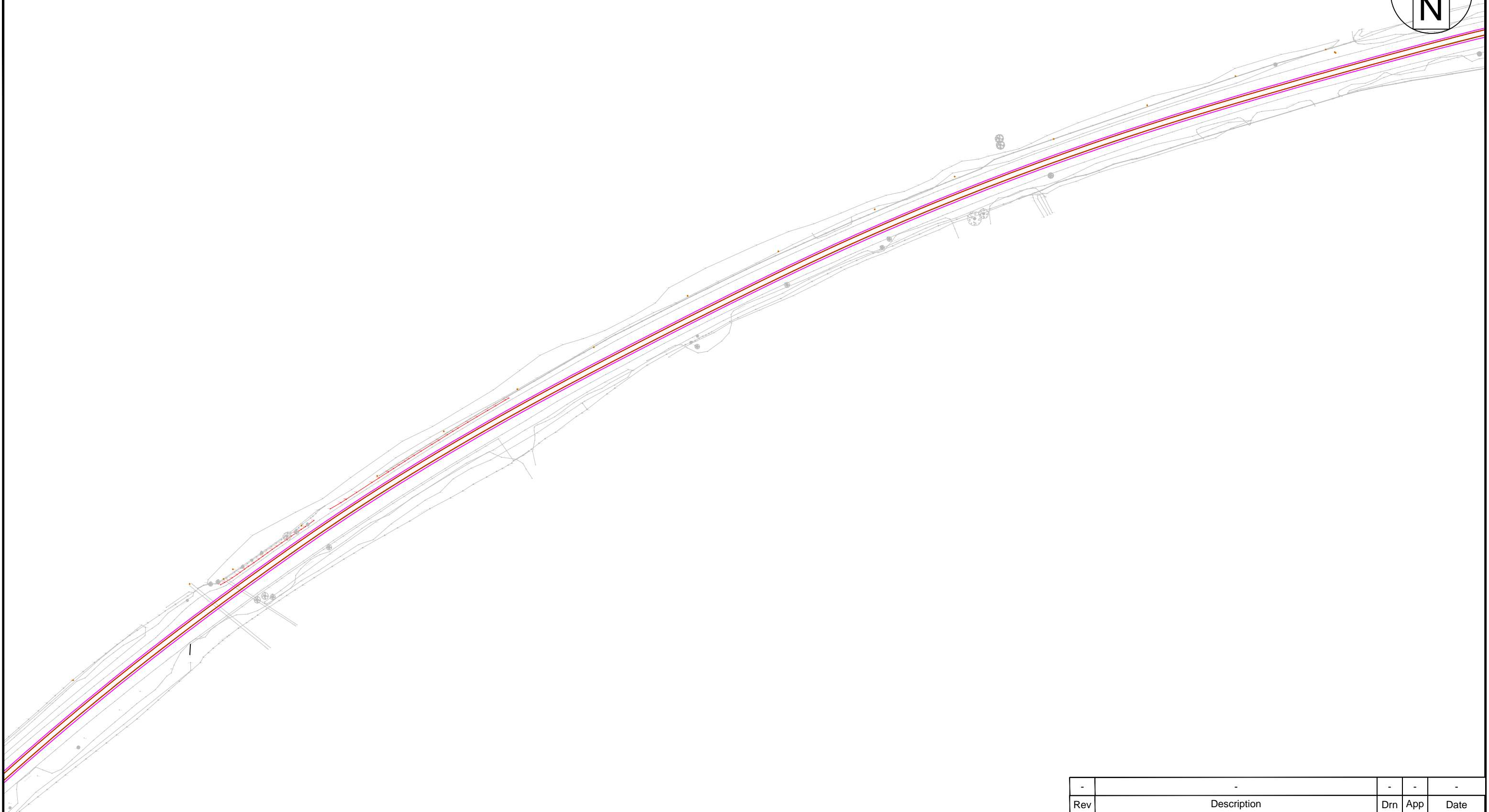
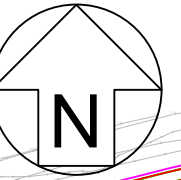
NO MITIGATION REQUIRED

Notes

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3. Do not scale from this drawing.

Rev	-			Drn	App	Date
Drawn	AD	Approved	TL	Date	22/01/2026	
Status	Draft		<b>Key</b> <span style="color: red;">—</span> Wheel SPA <span style="color: green;">—</span> Body SPA <span style="color: magenta;">—</span> Load SPA <span style="color: cyan;">—</span> Indicative Overrun Oversail DoT			
Revision	00					
Scale	1:2000 @ A3					
Drawing No.	10110880 - PF - SPA - 16					

Tower



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Client Littleton Wind Farm DAC

Project Littleton Wind Farm Drawing Title V162 Blade and Tower

POI 22 SPA Location R639 Longford Pass **NO MITIGATION REQUIRED**

Notes  
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Rev	Description	Drn	App	Date
-	-	-	-	-

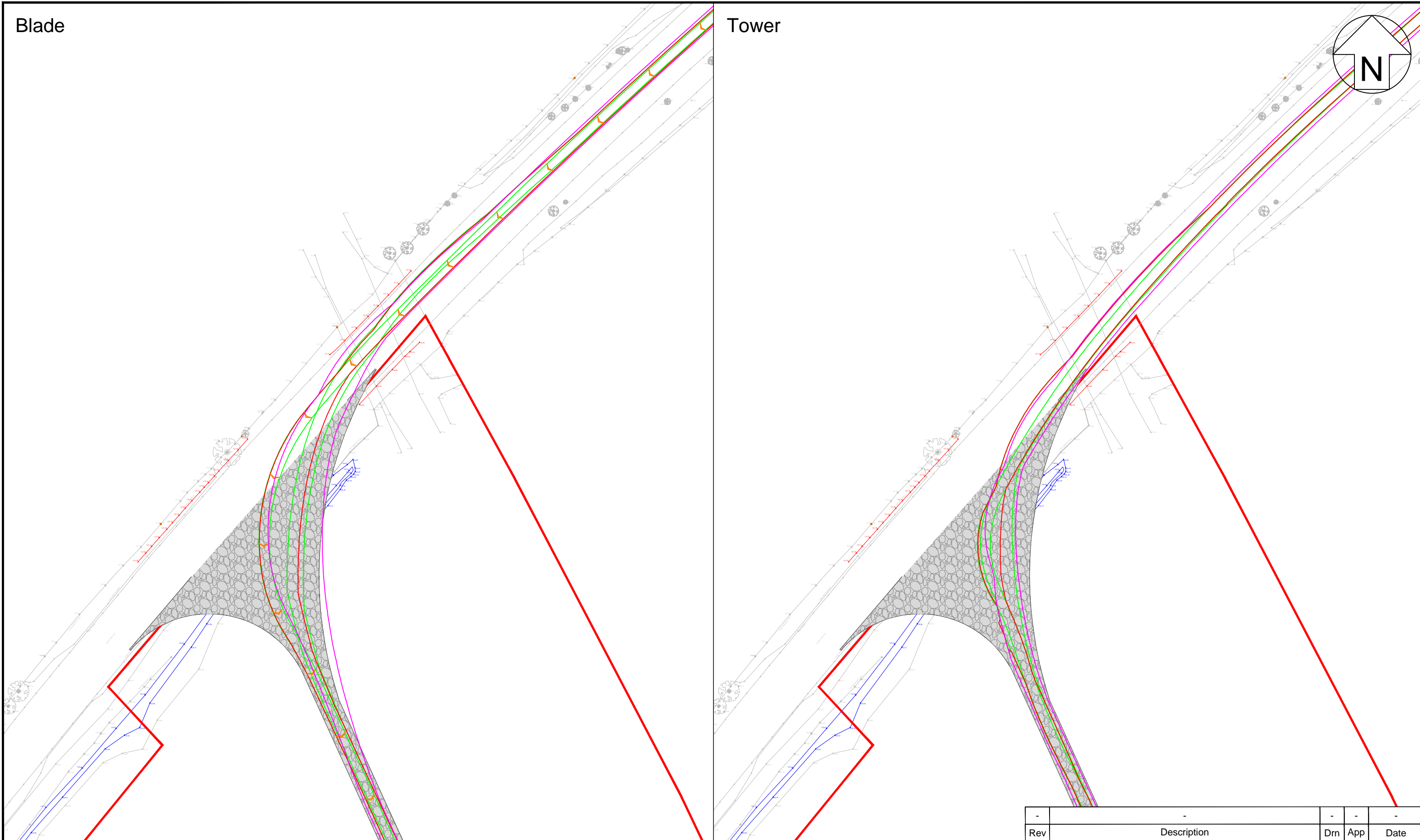
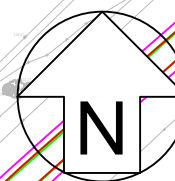
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<span style="color: cyan;">—</span> Indicative										
Scale	1:2000 @ A3									

Drawing No. 10110880 - PF - SPA - 16A

Blade

Tower



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Client

Littleton Wind Farm DAC

Project

Littleton Wind Farm

POI

23

SPA Location

Drawing Title

V162 Blade and Tower

Site Entrance

Notes

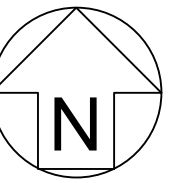
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Rev	Description	Drn	App	Date
-	-	-	-	-

Drawn	AD	Approved	TL	Date	22/01/2026
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Revision	00	
Scale	1:1000 @ A3	

Drawing No.	10110880 - PF - SPA - 17
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Client

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Project	Littleton Wind Farm	Drawing Title	V162 Blade and Tower
POI	23	SPA Location	Site Entrance

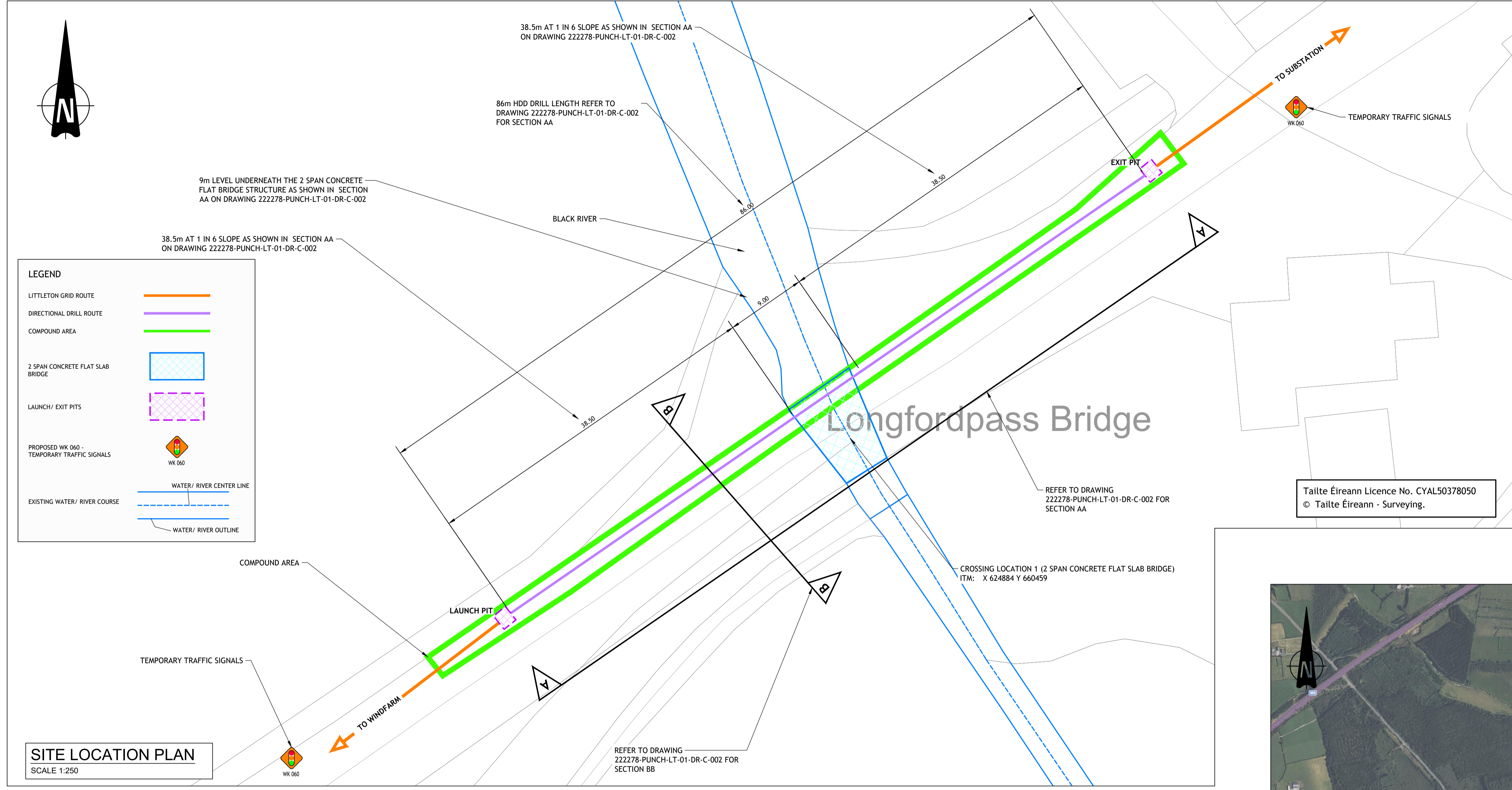
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Revision	00	
Scale	1:1000 @ A3	

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Rev	-	Description	-	Drn	-	App	-	Date	-
Drawn	AD	Approved	TL	Date	22/01/2026				
Drawing No.	10110880 - PF - SPA - 17A								

## APPENDIX 4.3

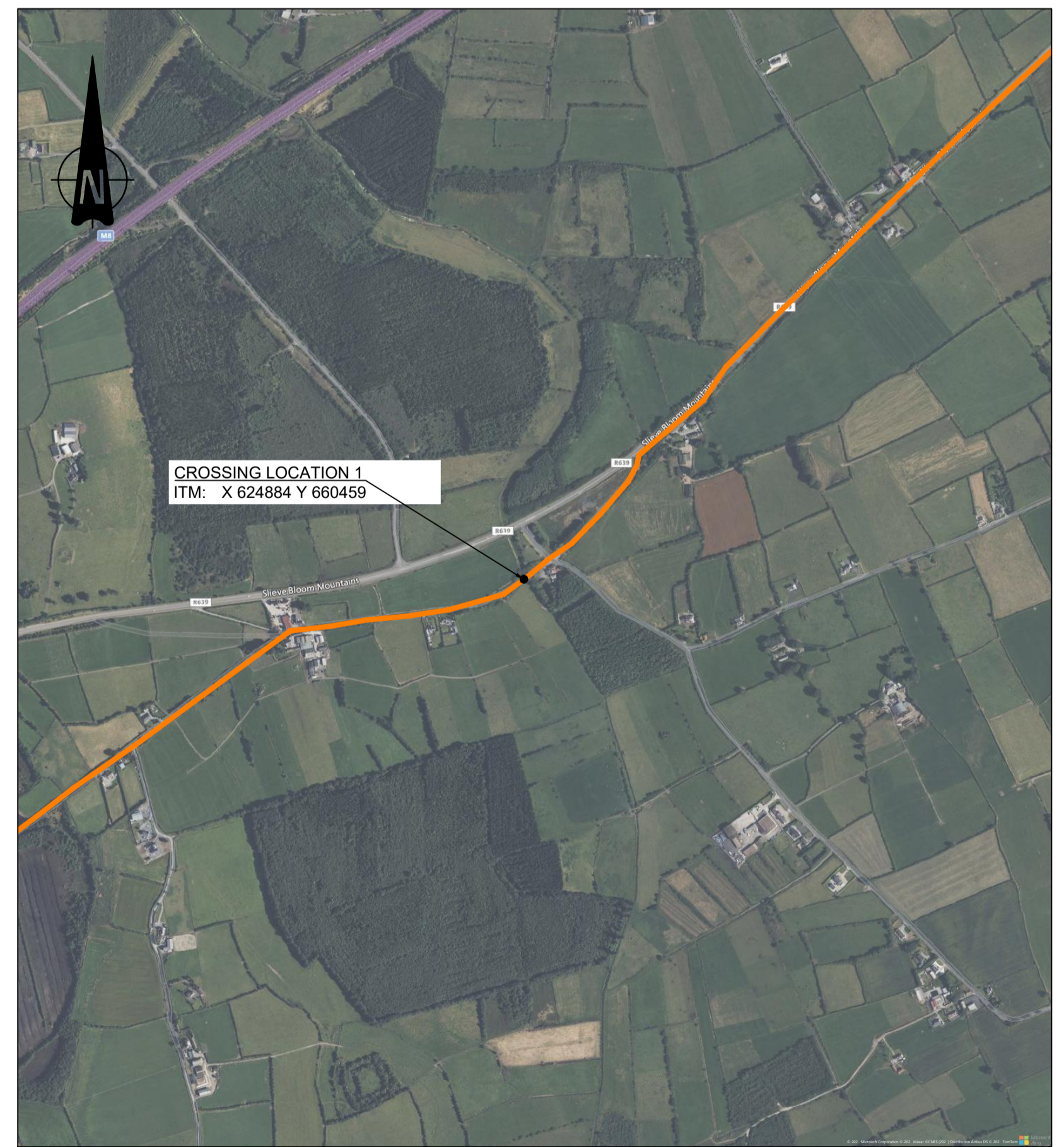
### Grid Connection Drawings



- NOTES**
1. ALL LEVELS SHOWN ARE RELATIVE TO MALIN HEAD DATUM
  2. DRAWINGS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.
  3. DO NOT SCALE USE FIGURED DIMENSIONS ONLY.
  4. THIS THE CONTRACTORS RESPONSIBILITY TO VERIFY OR DETERMINE ALL DIMENSIONS AND LEVELS REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION OR PRODUCTION OF FABRICATION DRAWINGS.
  5. CONTRACTOR TO COMPLY WITH ALL CONSTRUCTION REQUIREMENTS OF STRUCTURAL SPECIFICATIONS AND RELEVANT DRAWINGS.
  6. TEMPORARY WORKS, INCLUDING TEMPORARY DRAINING STRUCTURE, BUNDS, SUPPORT STRUCTURES, DEWATERING ETC. ARE TO BE DESIGNED BY THE CONTRACTOR, WITH DETAILED METHOD STATEMENT SUBMITTED PRIOR TO COMMENCEMENT OF WORKS.
  7. PRIOR SITE INVESTIGATION INCLUDING DETAILED GEOTECHNICAL INVESTIGATIONS WILL ENSURE THAT HDD WILL ONLY BE CARRIED OUT WHERE THE SOIL & GEOTECHNICAL CONDITIONS ARE SUITABLE.
  8. DRILLING PROCESS TO BE CONSTANTLY MONITORED TO DETECT ANY POSSIBLE LEAKING & BREAK OUT OF BENTONITE INTO THE SURROUNDING GEOLOGY.
  9. ALL SOLIDS REMOVED FROM THE DRILLING FLUID TO BE DIVERTED INTO SKIPS FOR SAFE DISPOSAL, IN ACCORDANCE WITH CONTRACTORS WASTE MANAGEMENT PLAN.
  10. DRILLING FLUIDS TO BE RE-CIRCULATED TO KEEP THE VOLUME OF FLUIDS REQUIRED TO A MINIMUM.
  11. CONTRACTOR TO SUPPLY FULL TEMPORARY TRAFFIC MANAGEMENT PLAN PRIOR TO WORKS COMMENCING.
  12. DRILLING FLUIDS TO BE RE-CIRCULATED TO KEEP THE VOLUME OF FLUIDS REQUIRED TO A MINIMUM.
  13. EXCESS DRILLING FLUIDS TO BE STORED ON SITE PENDING SAFE DISPOSAL IN ACCORDANCE WITH CONTRACTORS WASTE MANAGEMENT PLAN.
  14. HDD PROPOSAL IS INDICATIVE AND SUBJECT TO DETAILED DESIGN. ITS FINAL PITS LOCATION CAN VARY WITHIN THE DEMARCATED COMPOUND AREA.

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**SITE LOCATION PLAN**  
SCALE 1:250



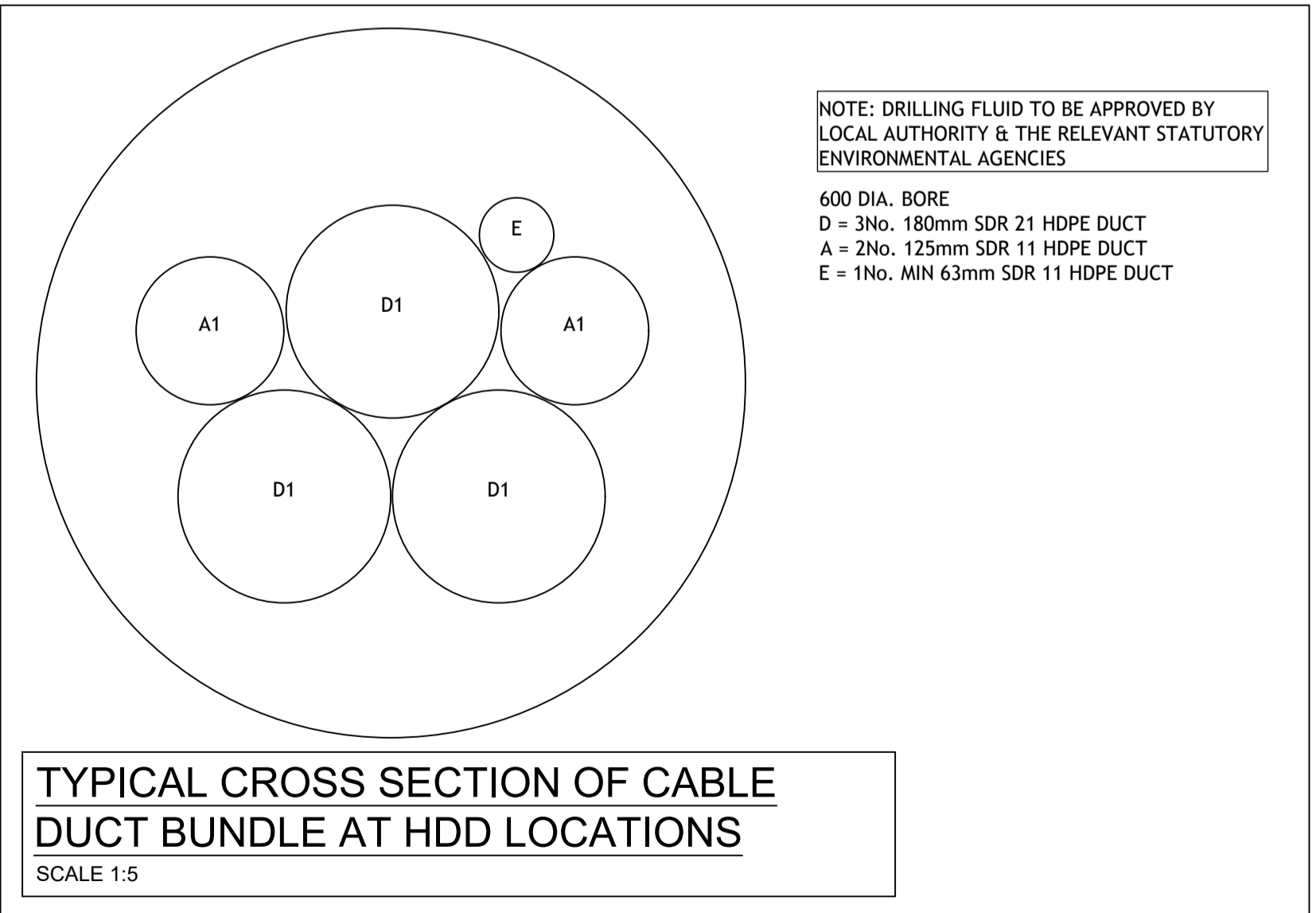
**CABLE ROUTE KEY PLAN**  
SCALE 1:10,000



**PHOTO OF 2 SPAN CONCRETE FLAT BRIDGE**



**PHOTO OF 2 SPAN CONCRETE FLAT BRIDGE**



**TYPICAL CROSS SECTION OF CABLE DUCT BUNDLE AT HDD LOCATIONS**  
SCALE 1:5

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All drawings remain the property of the Consultants.  
Figured dimension only to be taken from this drawing.  
Consultants to be informed immediately of any discrepancies before work proceeds.



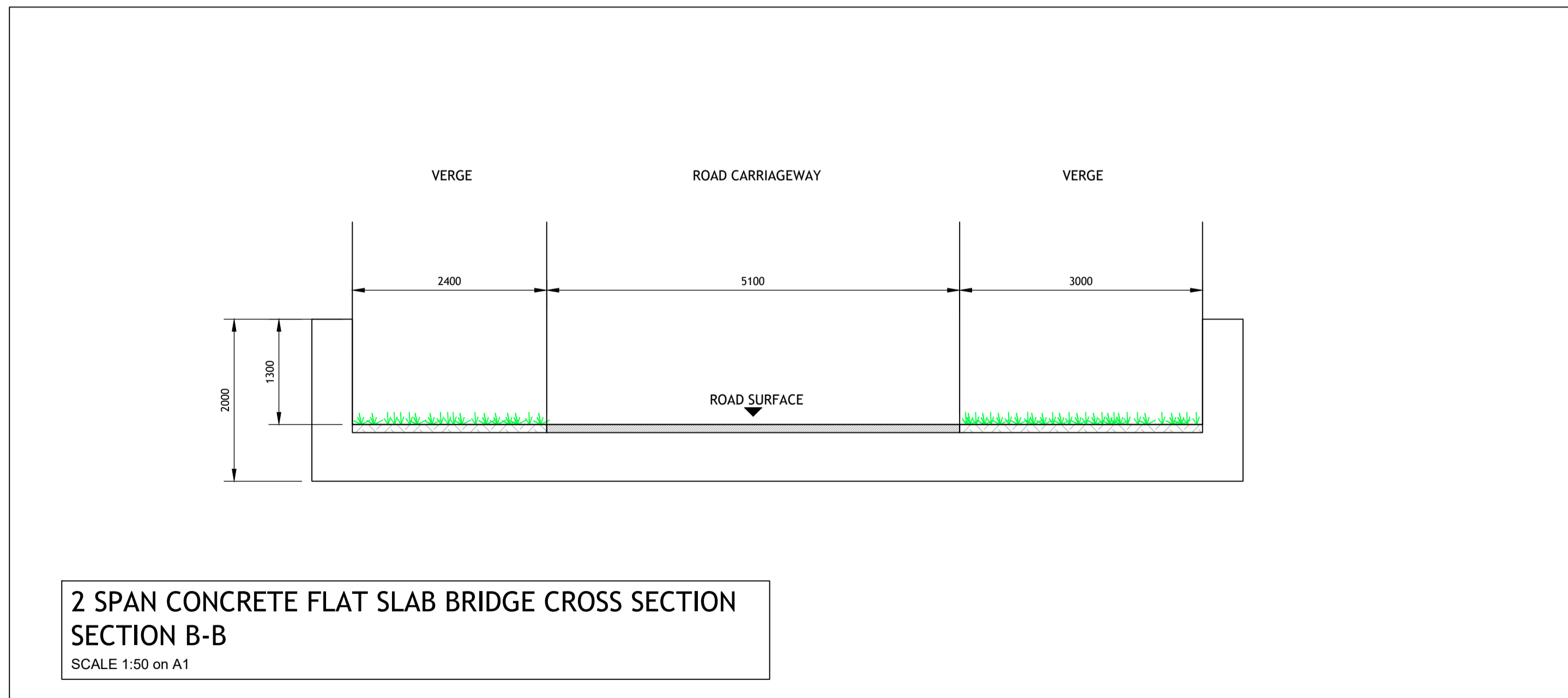
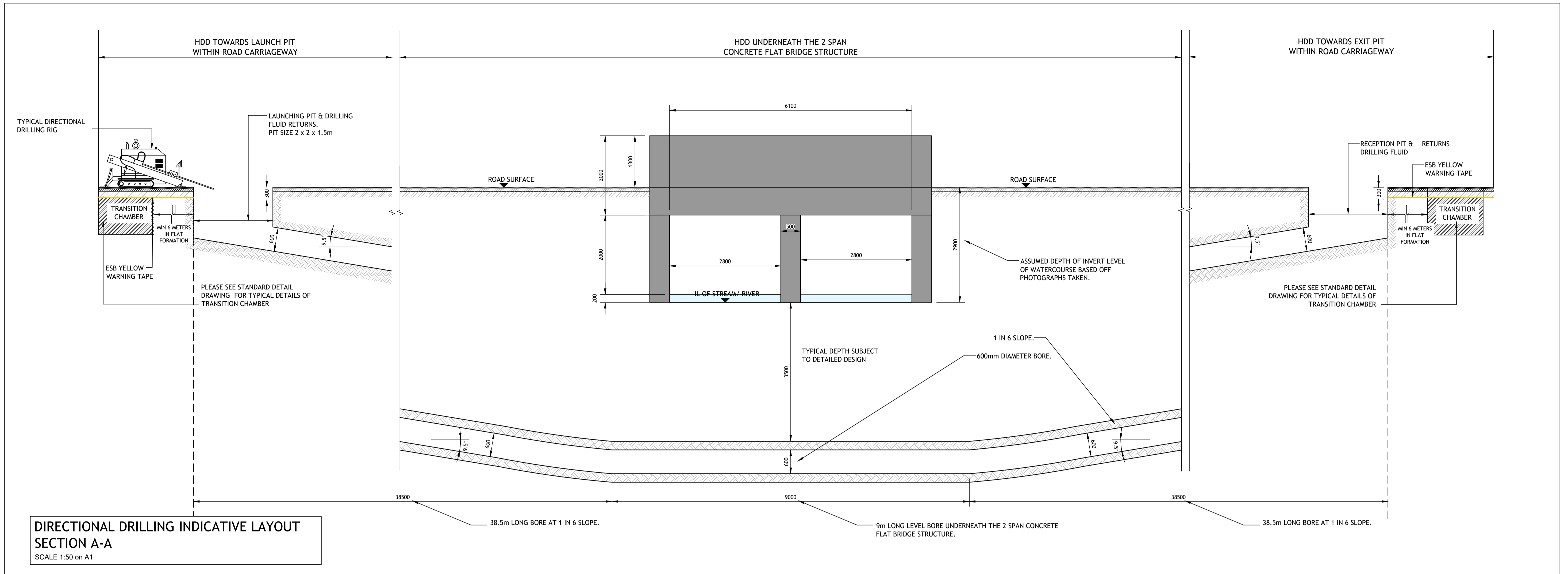
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P01	ISSUED FOR COMMENT	DM	25.09.23				
P02	ISSUED FOR COMMENT	DM	29.11.23				
P03	ISSUED FOR COMMENT	DM	27.08.24				

Rev	Amendment	By	Date

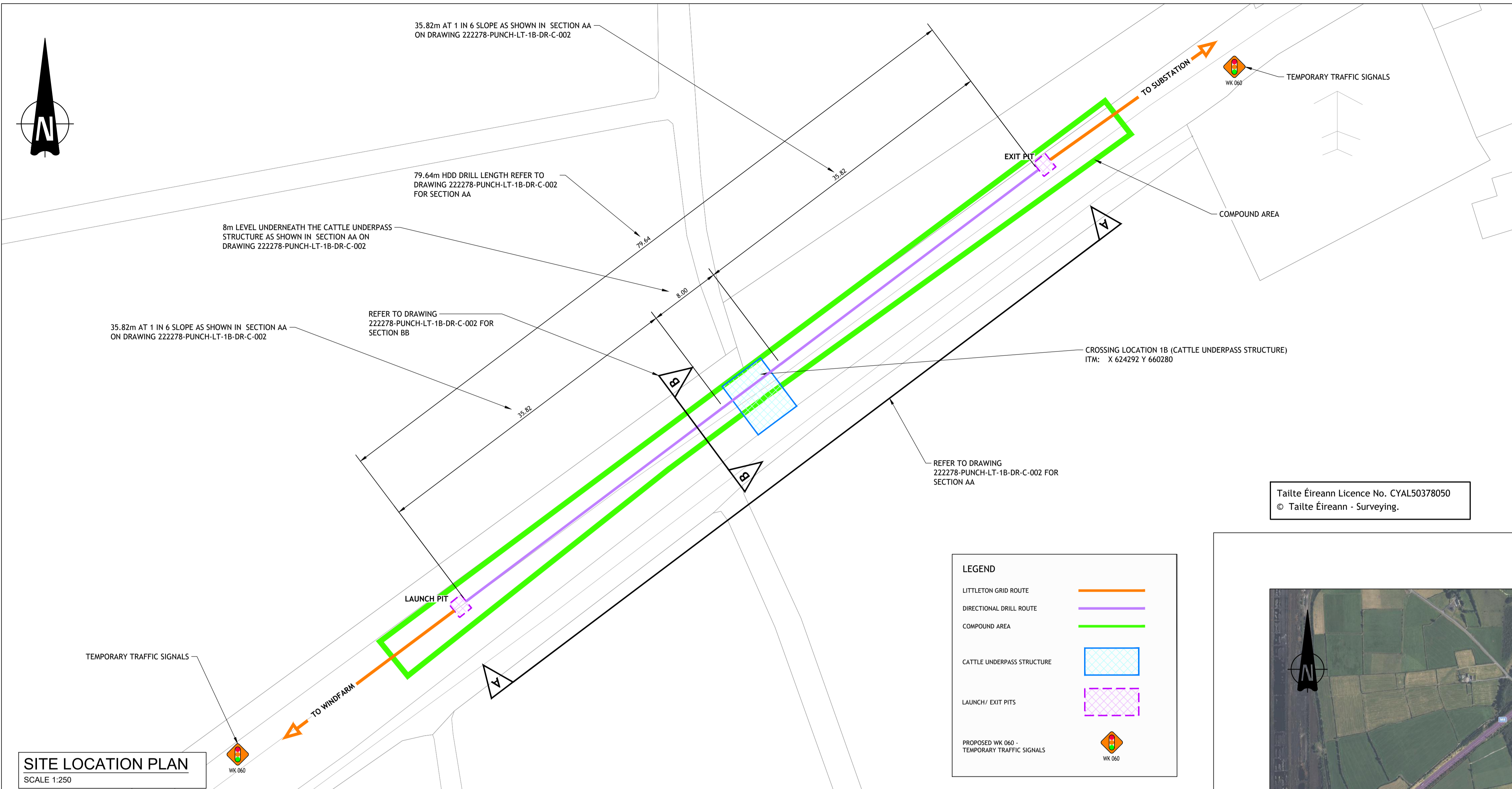


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Dun Laoghaire, Co. Dublin, A96 CTW7  
t +353 1 271 2200 | w punchconsulting.com

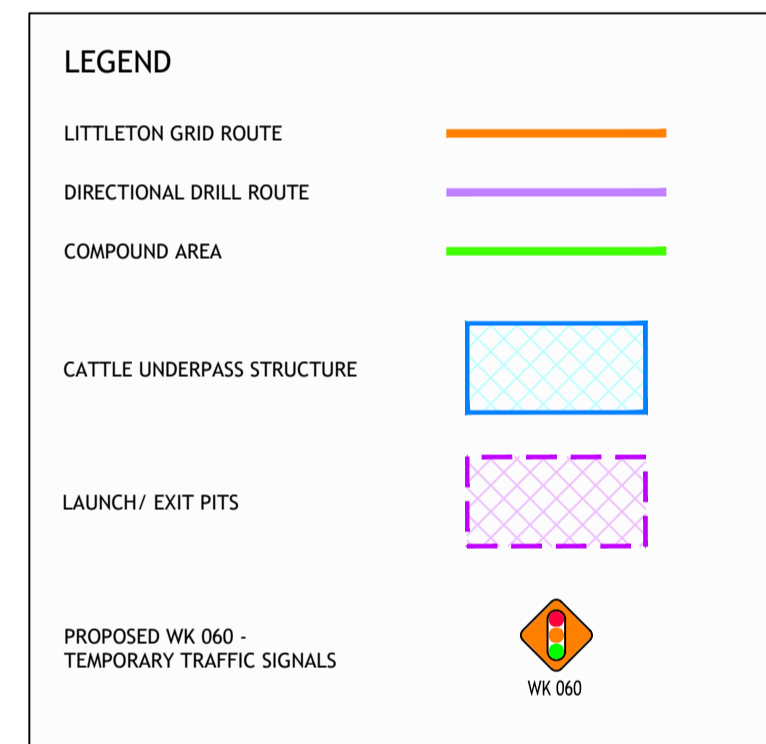
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Title: CROSSING NO. 1 SHEET 1 OF 2	
Drawn: D.M.	Date drawn: SEPTEMBER 2023
Project No: 222278	Model Ref: 222278-PUNCH-LT-01-M2-C-001-002
Scale: AS SHOWN	Document No: 222278-PUNCH-LT-01-DR-C-001
Technician Check: N/A	Approved: K.O.R.
Engineer Check: K.O.R.	Drawing Status: S3
Revision No: P03	



Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	25.09.23				
P02	ISSUED FOR COMMENT	DM	29.11.23				
P03	ISSUED FOR COMMENT	DM	27.08.24				

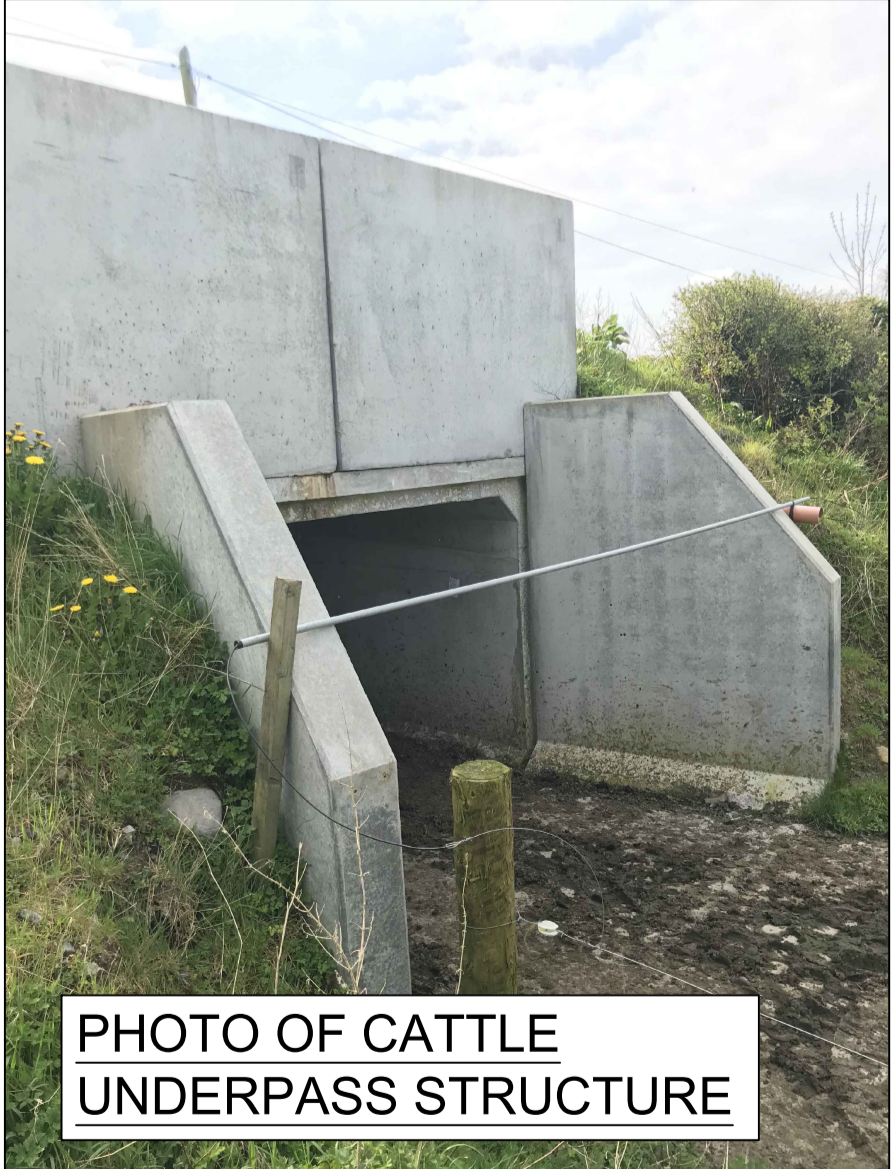


**SITE LOCATION PLAN**  
SCALE 1:250

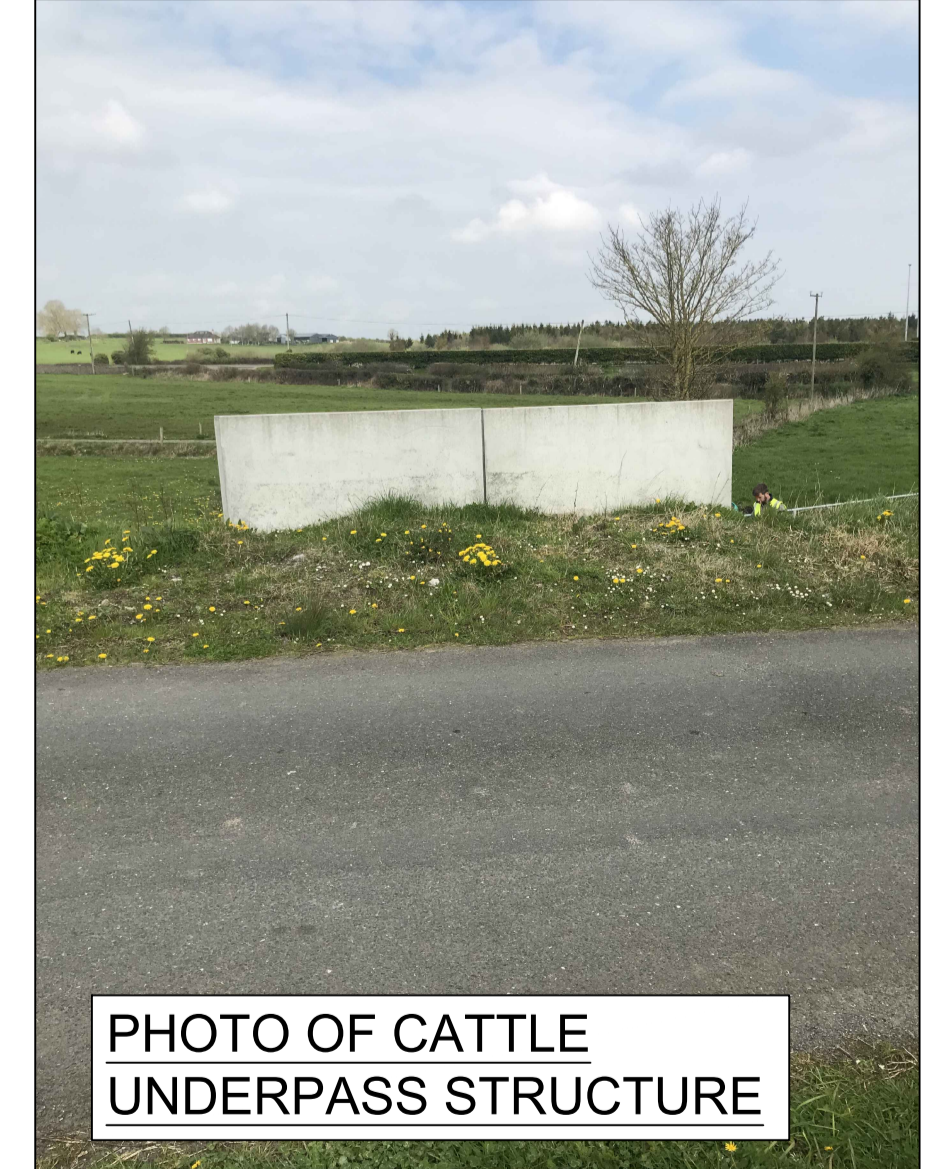


- NOTES**
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  - CONTRACTOR TO COMPLY WITH ALL CONSTRUCTION REQUIREMENTS OF STRUCTURAL SPECIFICATIONS AND RELEVANT DRAWINGS.
  - TEMPORARY WORKS, INCLUDING TEMPORARY DRAINING STRUCTURE, BUNDS, SUPPORT STRUCTURES, DEWATERING ETC. ARE TO BE DESIGNED BY THE CONTRACTOR, WITH DETAILED METHOD STATEMENT SUBMITTED PRIOR TO COMMENCEMENT OF WORKS.
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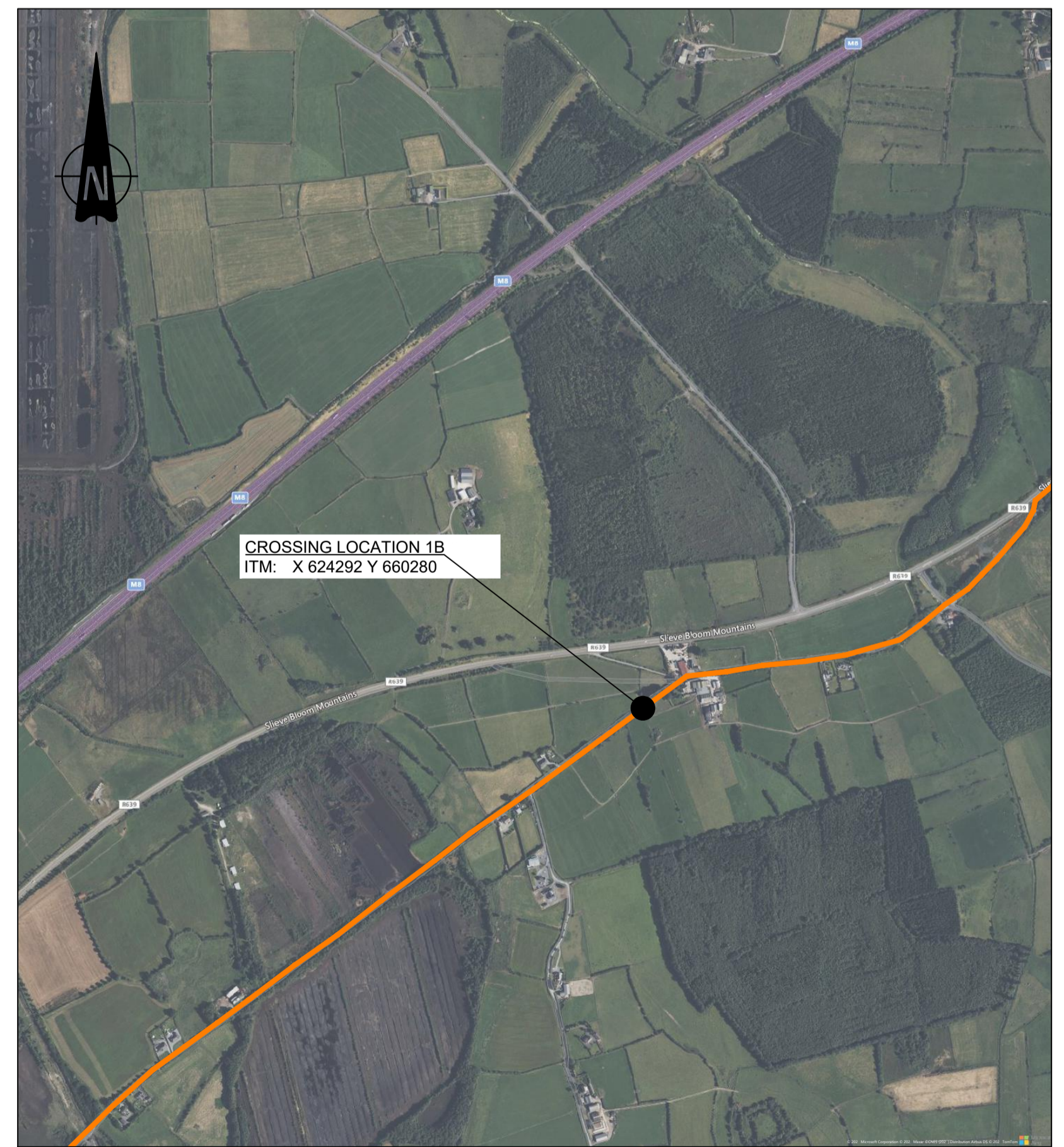
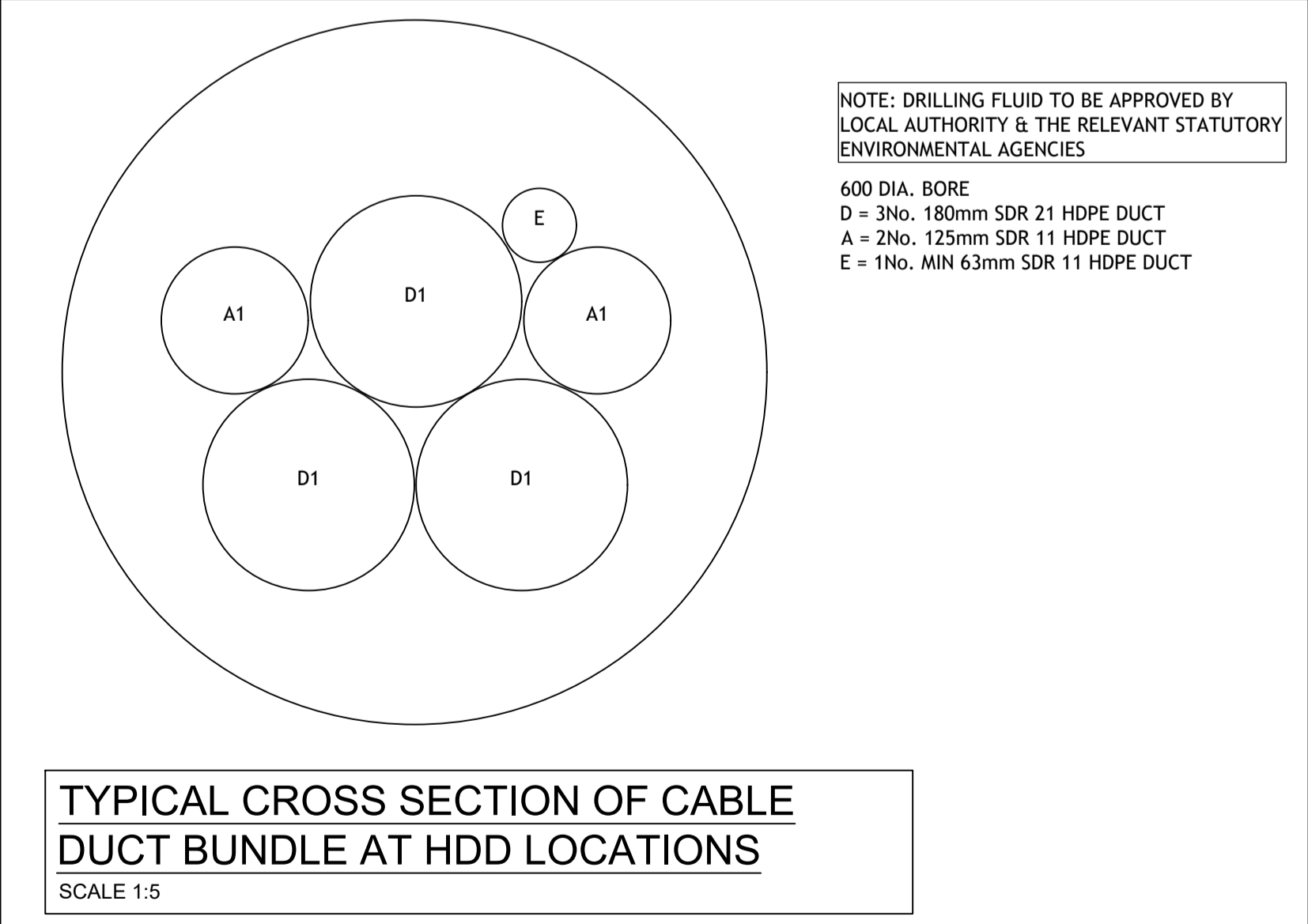
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**PHOTO OF CATTLE UNDERPASS STRUCTURE**



**PHOTO OF CATTLE UNDERPASS STRUCTURE**

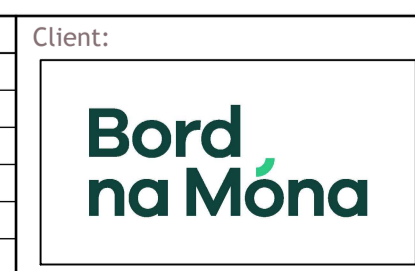


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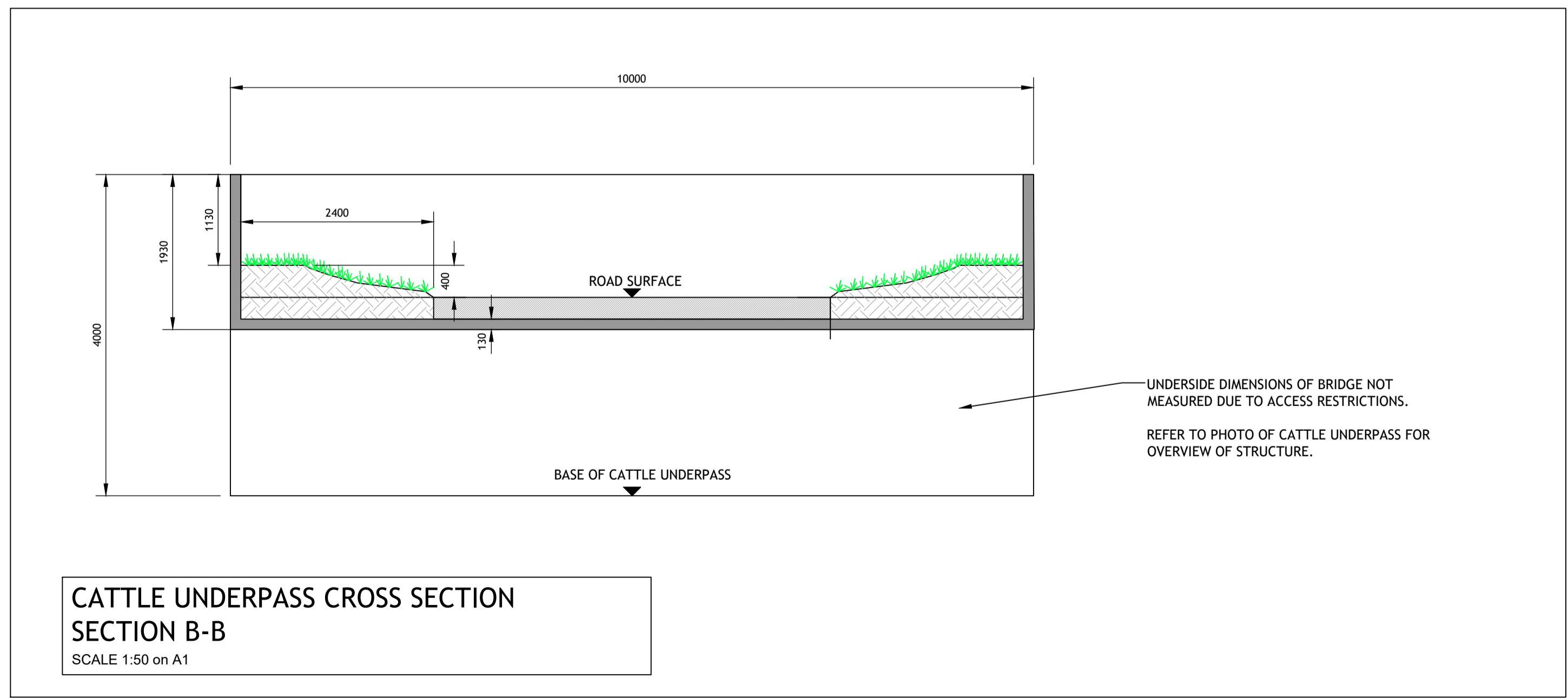
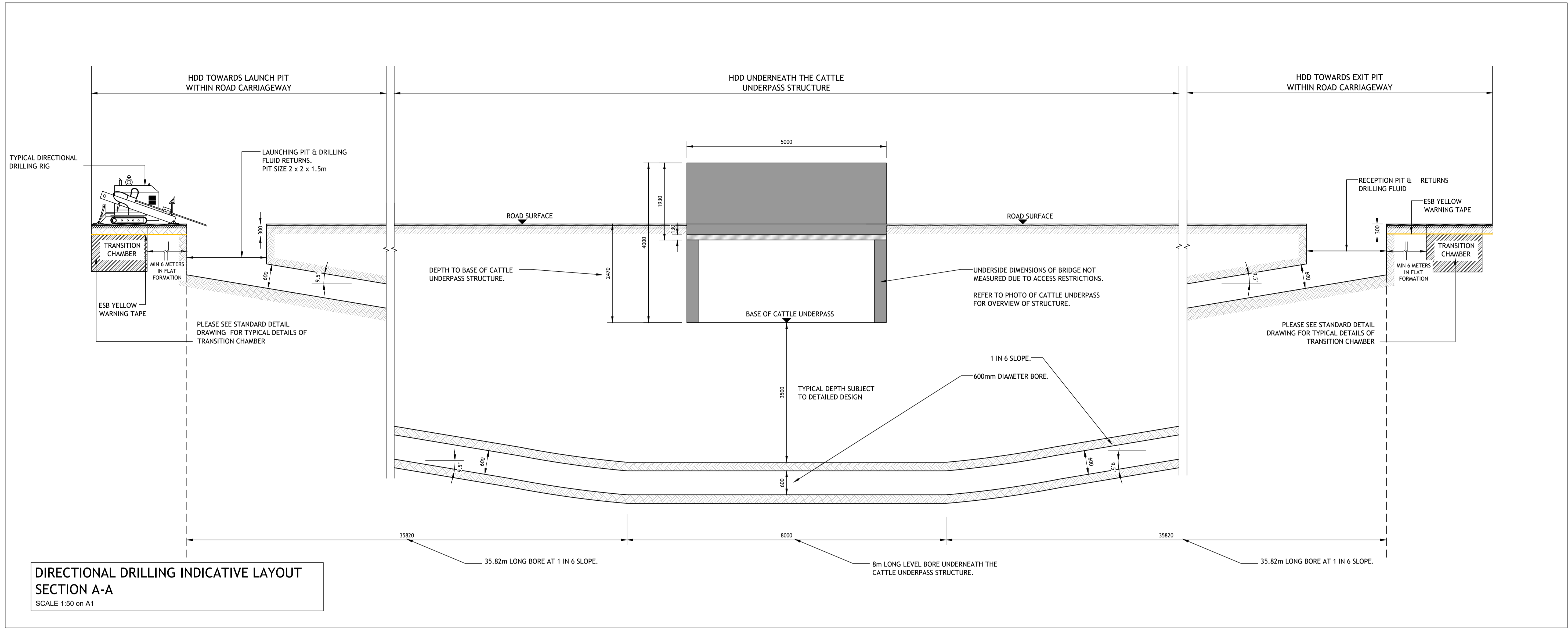
Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	25.09.23				
P02	ISSUED FOR COMMENT	DM	29.11.23				
P03	ISSUED FOR COMMENT	DM	27.08.24				

Rev	Amendment	By	Date

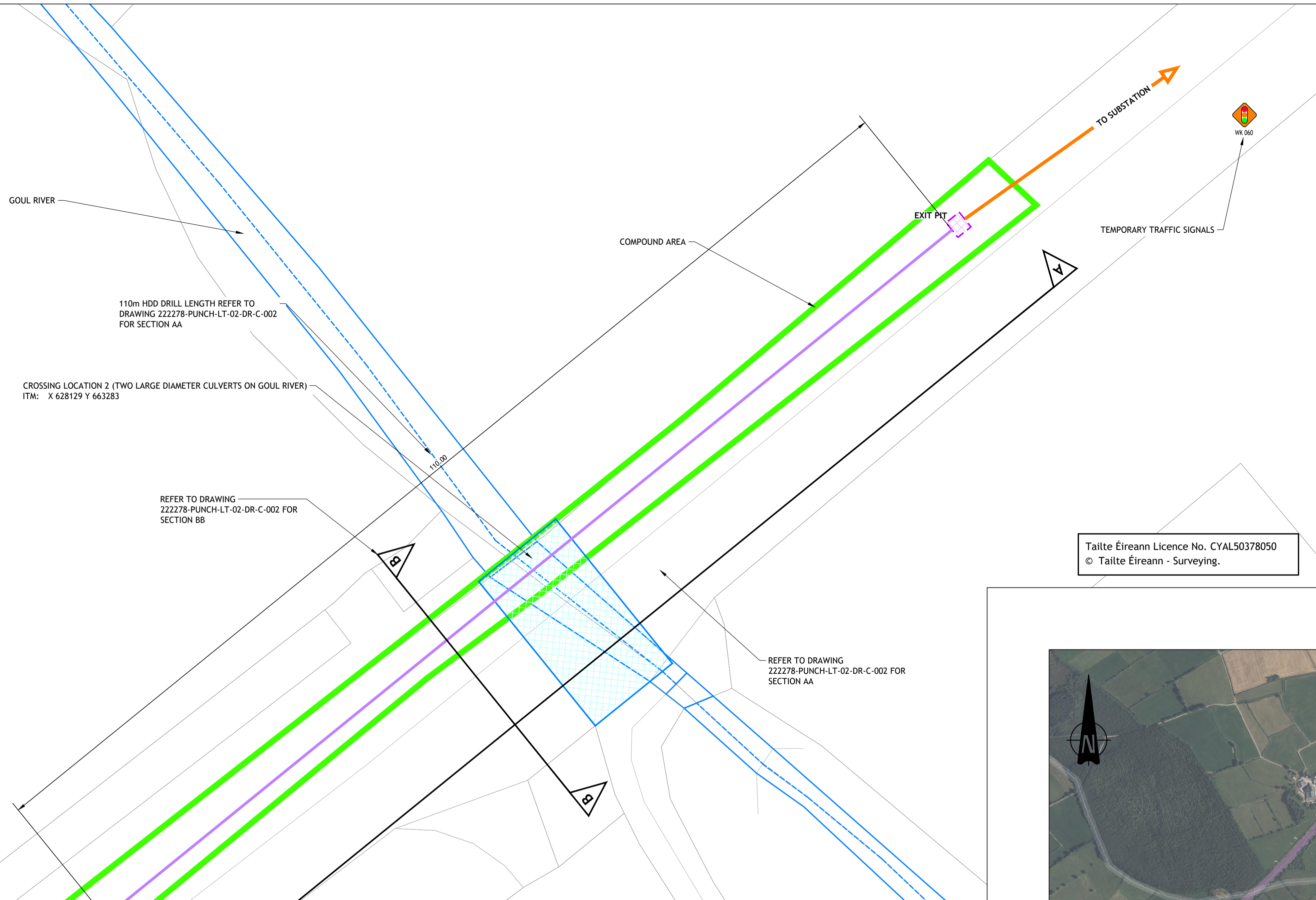
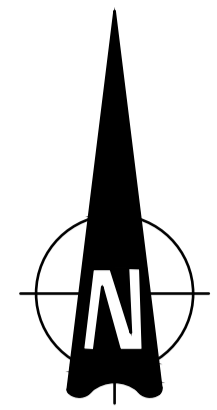


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Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM			
Title: CROSSING NO. 1B SHEET 1 OF 2			
Drawn: D.M.	Date: AUGUST 2023	Technician Check: N.H.	Approved: K.O.R.
Project No: 222278	Model Ref: 222278-PUNCH-LT-1B-M2-C-001-002	Engineer Check: K.O.R.	Drawing Status: S3
Scale: AS SHOWN	Document No: 222278-PUNCH-LT-1B-DR-C-001	Revision No: P03	



Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	25.09.23				
P02	ISSUED FOR COMMENT	DM	29.11.23				
P03	ISSUED FOR COMMENT	DM	27.08.24				



**LEGEND**

- LITTLETON GRID ROUTE
- DIRECTIONAL DRILL ROUTE
- COMPOUND AREA
- 2 SPAN CONCRETE FLAT BRIDGE STRUCTURE
- LAUNCH/ EXIT PITS
- PROPOSED WK 060 - TEMPORARY TRAFFIC SIGNALS
- EXISTING WATER/ RIVER COURSE
  - WATER/ RIVER CENTER LINE
  - WATER/ RIVER OUTLINE

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**SITE LOCATION PLAN**  
SCALE 1:250



**PHOTO OF 2 LARGE DIAMETER CULVERTS ON GOUL RIVER**



**PHOTO OF 2 LARGE DIAMETER CULVERTS ON GOUL RIVER**



**CABLE ROUTE KEY PLAN**  
SCALE 1:10,000

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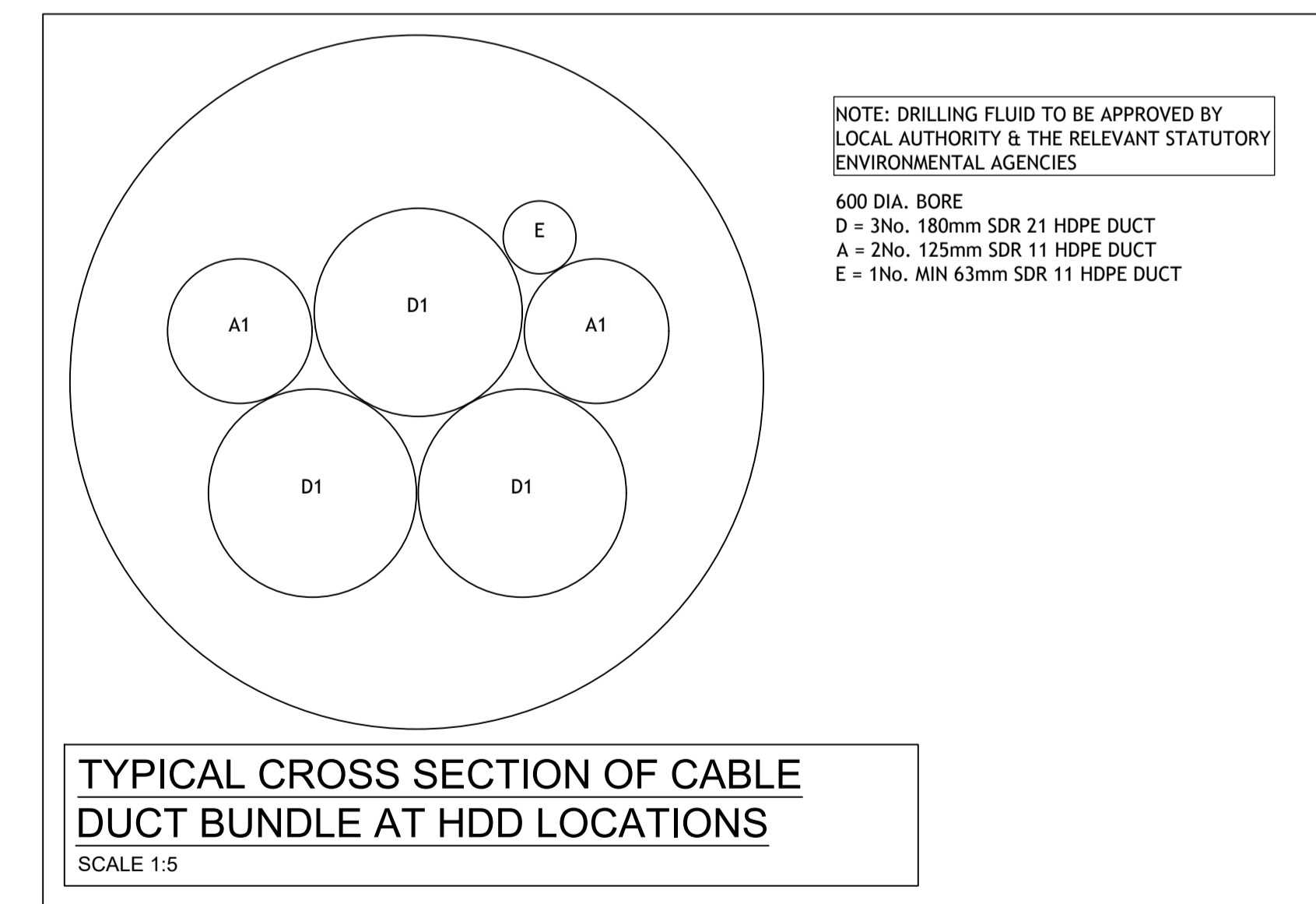
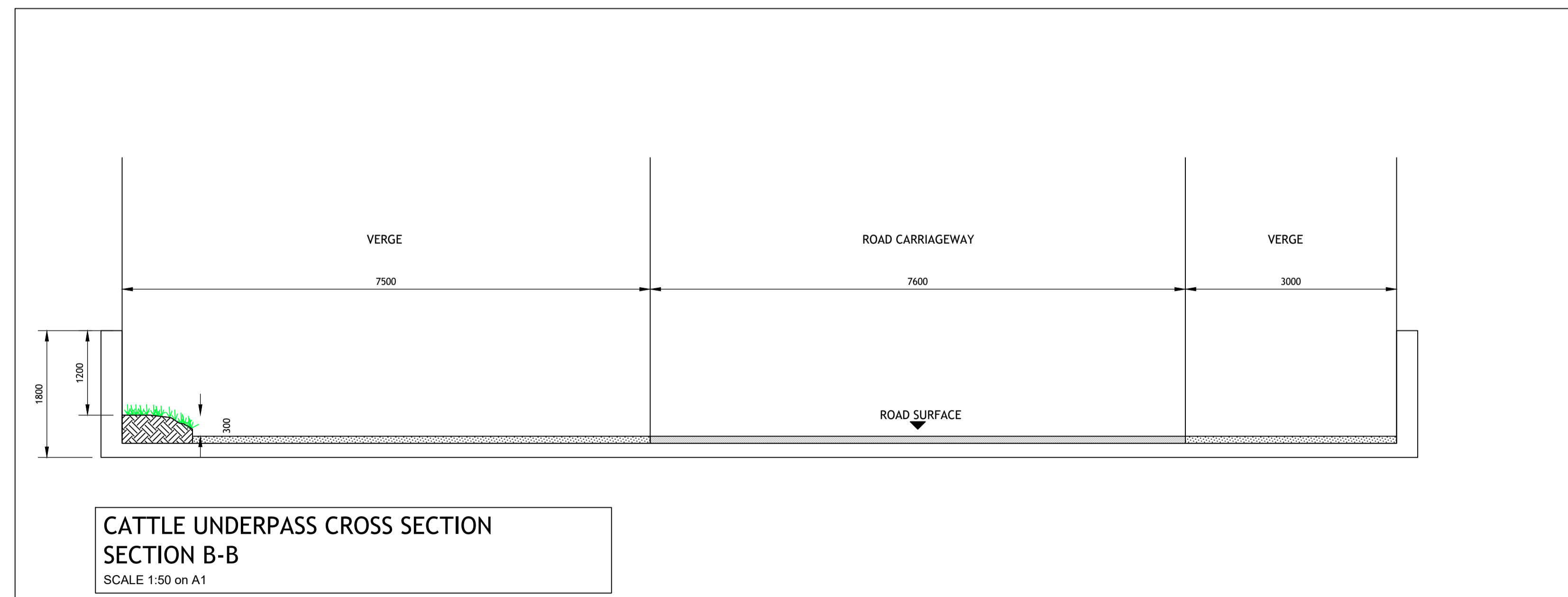
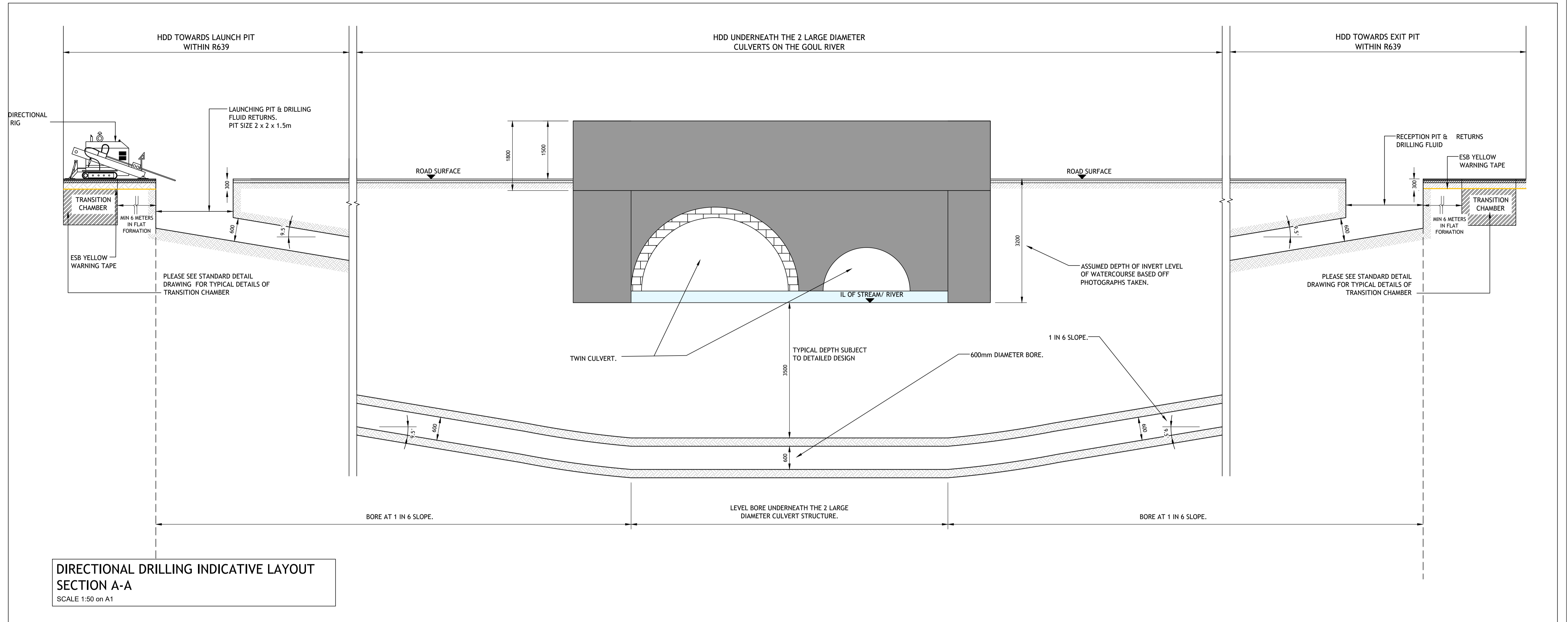
Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	25.09.23				
P02	ISSUED FOR COMMENT	DM	29.11.23				
P03	ISSUED FOR COMMENT	DM	27.08.24				

Rev	Amendment	By	Date

Client:  
**Bord na Móna**

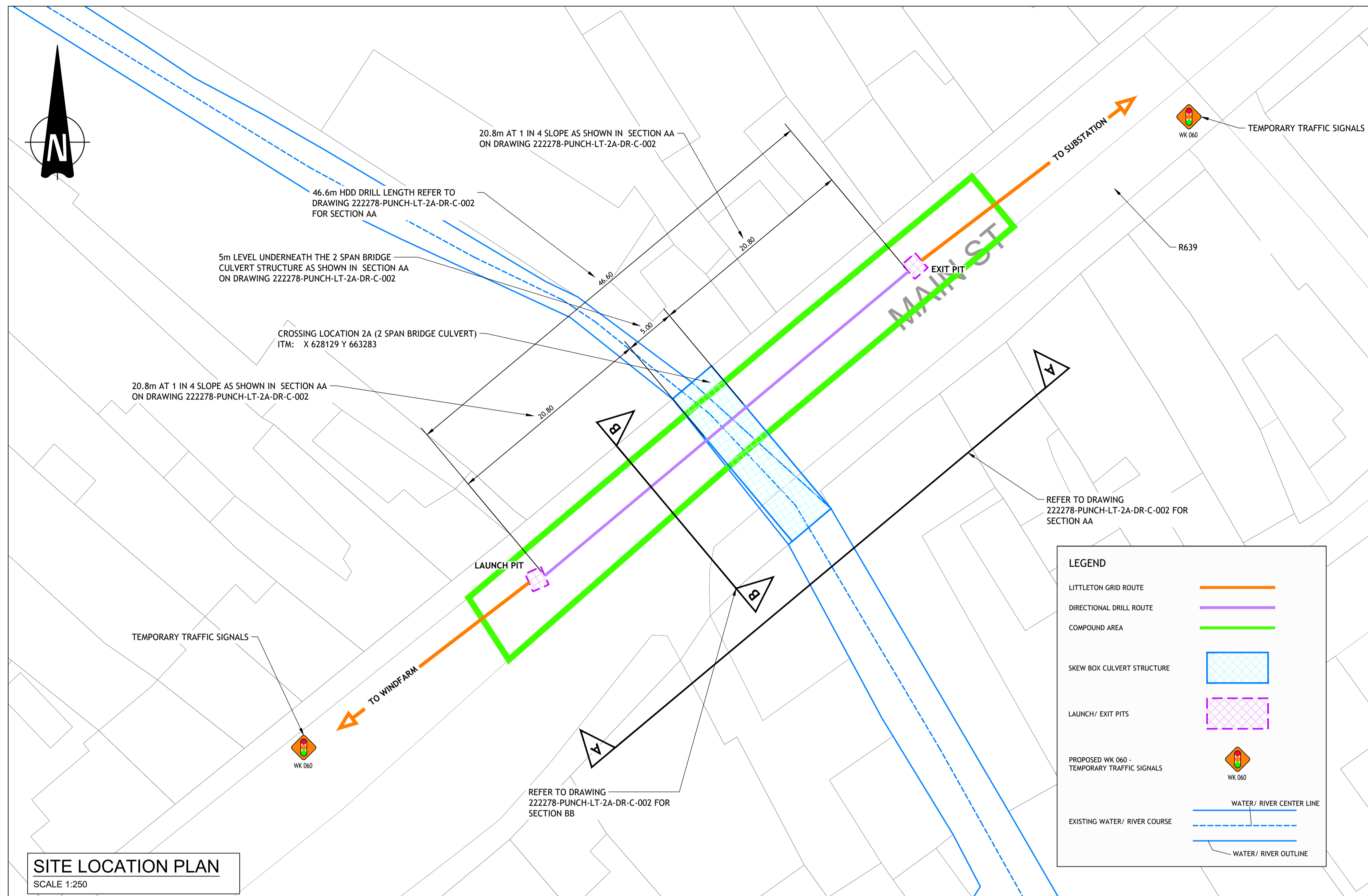
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Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM	
Title: CROSSING NO. 2 SHEET 1 OF 2	
Drawn: D.M.	Date drawn: SEPTEMBER 2023
Project no: 222278	Model Ref: 222278-PUNCH-LT-02-M2-C-001-002
Scale as shown: AS SHOWN	Revision No: P03



Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	25.09.23				
P02	ISSUED FOR COMMENT	DM	29.11.23				
P03	ISSUED FOR COMMENT	DM	27.08.24				

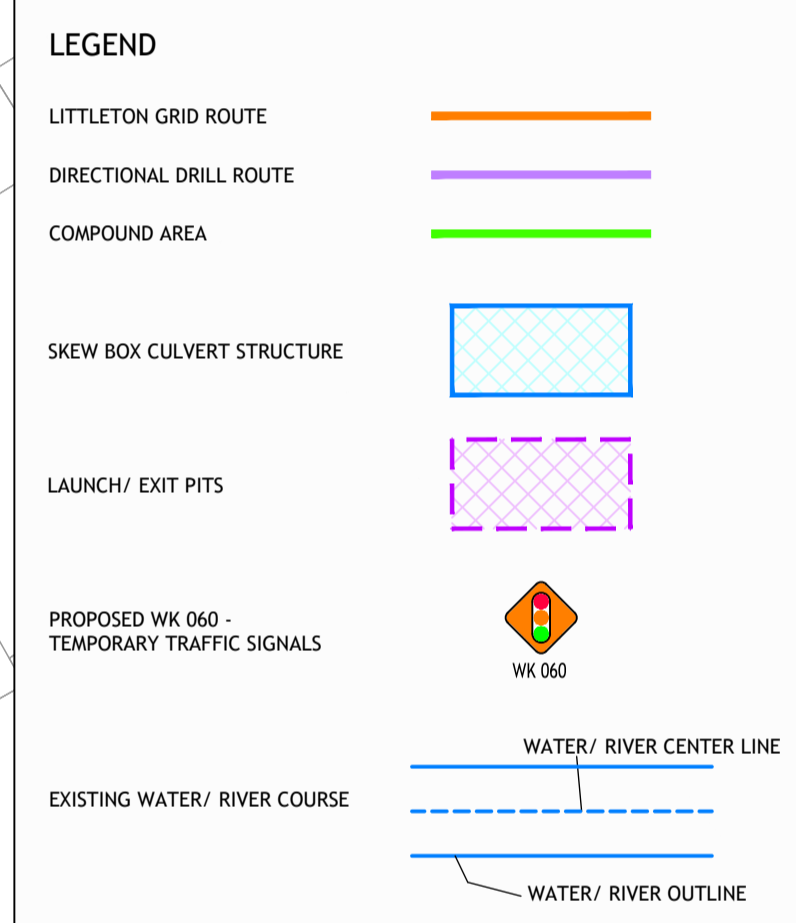
Rev	Amendment	By	Date



**SITE LOCATION PLAN**  
SCALE 1:250

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**CABLE ROUTE KEY PLAN**  
SCALE 1:10,000



**PHOTO OF 2 SPAN BRIDGE CULVERT**



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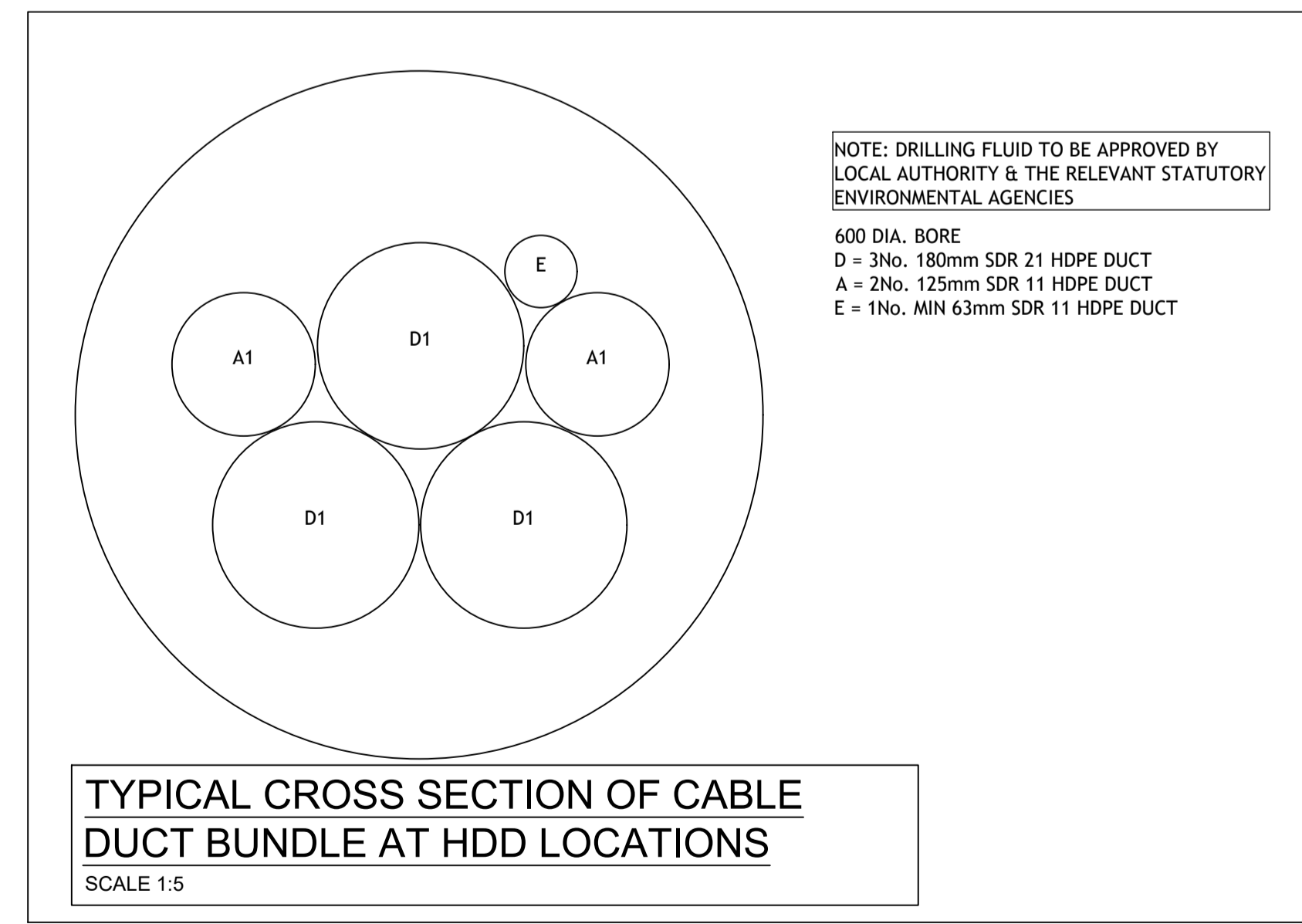
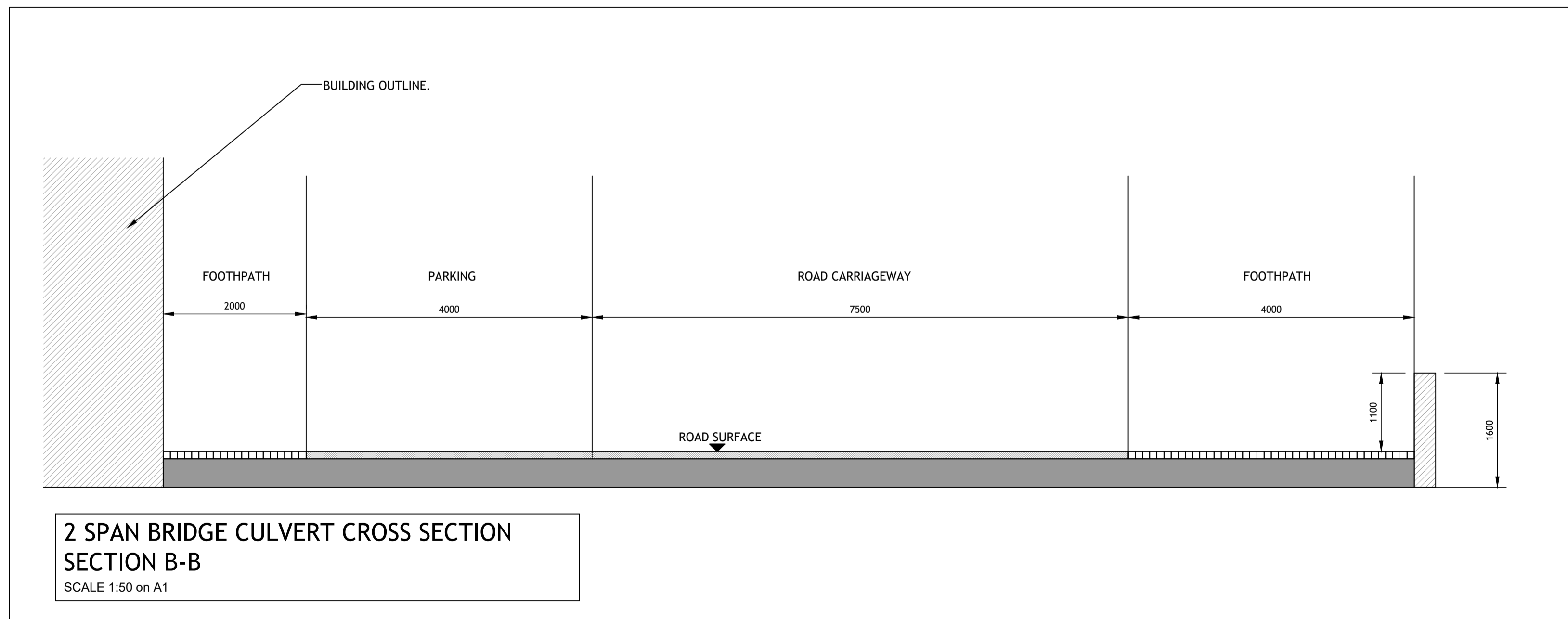
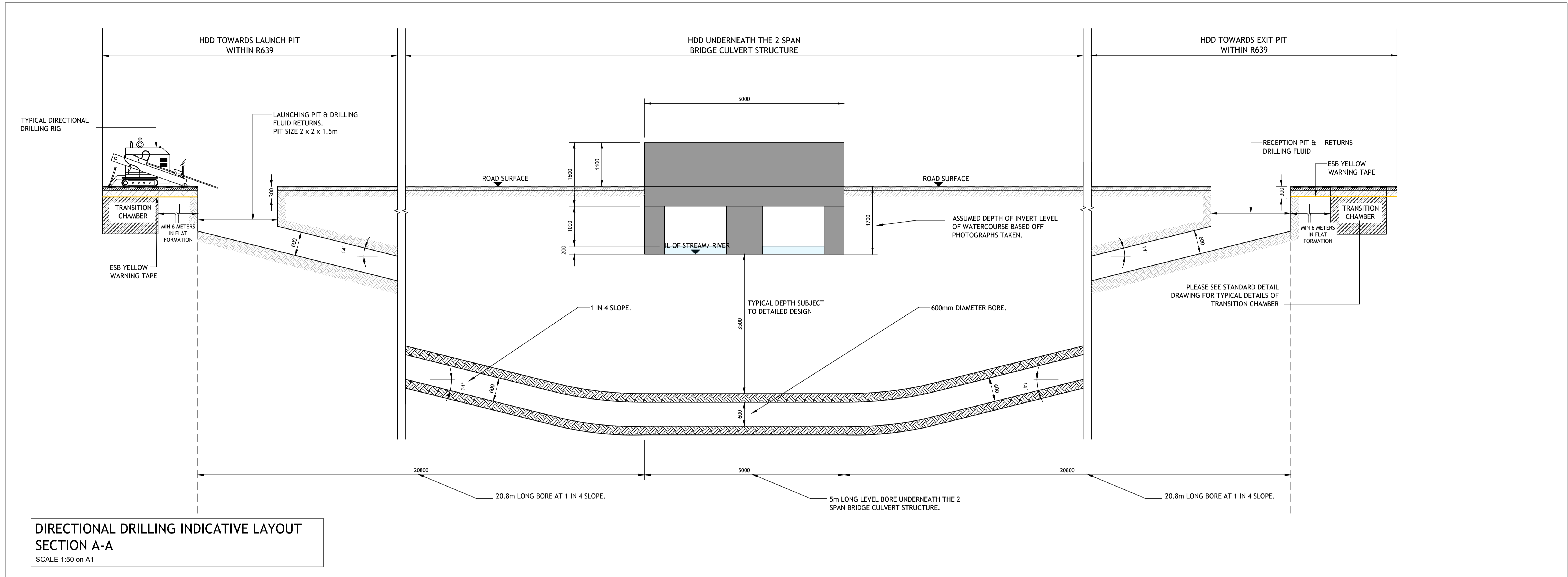
Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	29.11.23				
P02	ISSUED FOR COMMENT	DM	27.08.24				

Rev	Amendment	By	Date

Client:  
**Bord na Móna**

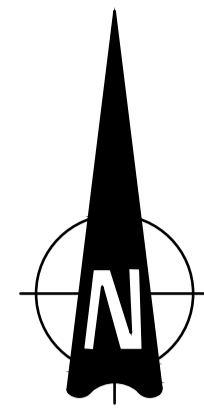
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Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM			
Title: CROSSING NO. 2A SHEET 1 OF 2			
Drawn: D.M.	Date: 22 NOVEMBER 2023	Technician Check: N.N.	Approved: K.O.R.
Project No: 222278	Model Ref: 222278-PUNCH-LT-2A-M2-C-001-002	Engineer Check: K.O.R.	Drawing Status: S3
Scale: AS SHOWN	Document: 222278-PUNCH-LT-2A-DR-C-001	Revision No: P02	



Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	29.11.23				
P02	ISSUED FOR COMMENT	DM	27.08.24				

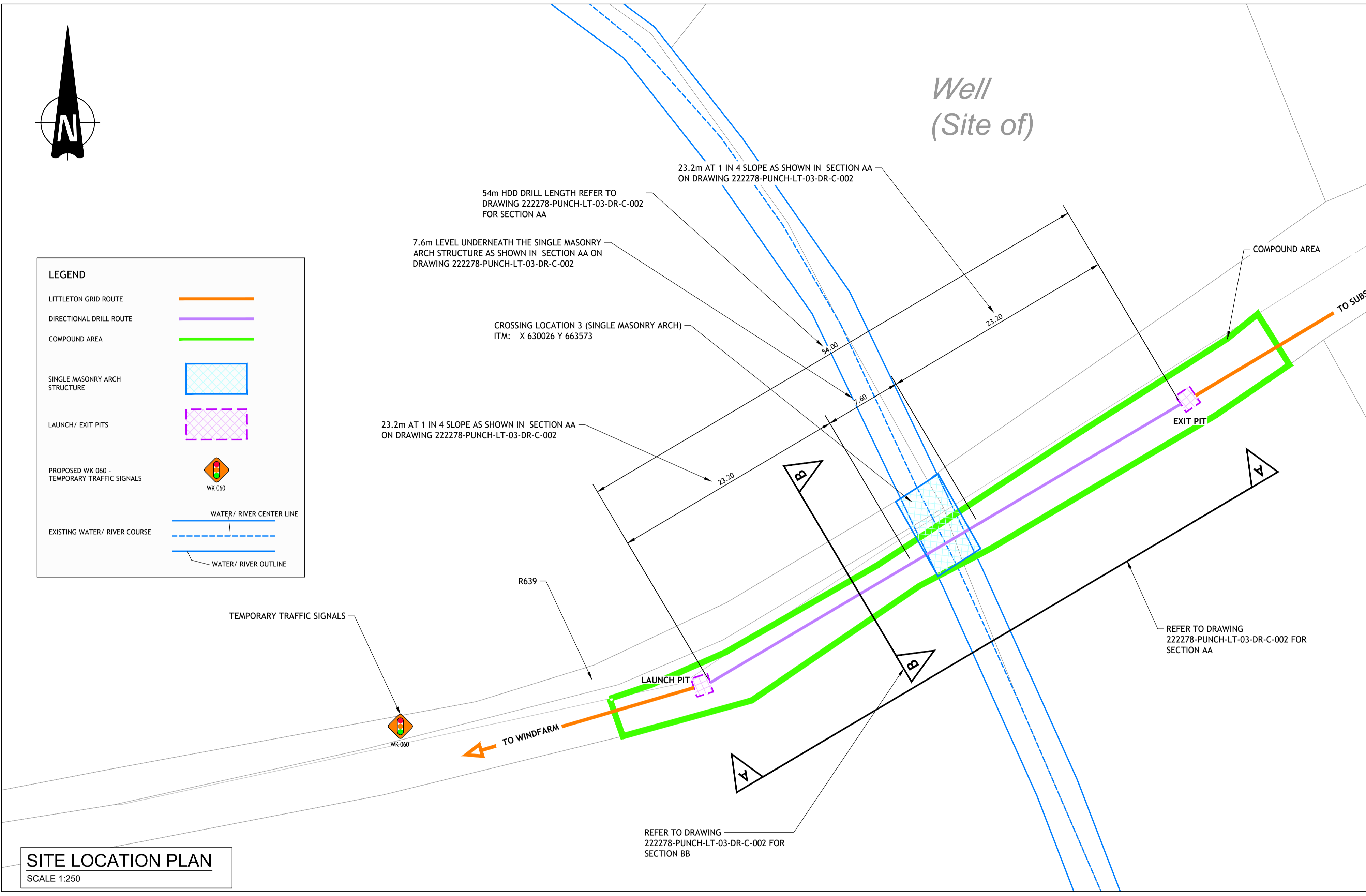
Rev	Amendment	By	Date



Well  
(Site of)

**LEGEND**

- LITTLETON GRID ROUTE
- DIRECTIONAL DRILL ROUTE
- COMPOUND AREA
- SINGLE MASONRY ARCH STRUCTURE
- LAUNCH/ EXIT PITS
- PROPOSED WK 060 - TEMPORARY TRAFFIC SIGNALS
- EXISTING WATER/ RIVER COURSE
- WATER/ RIVER CENTER LINE
- WATER/ RIVER OUTLINE



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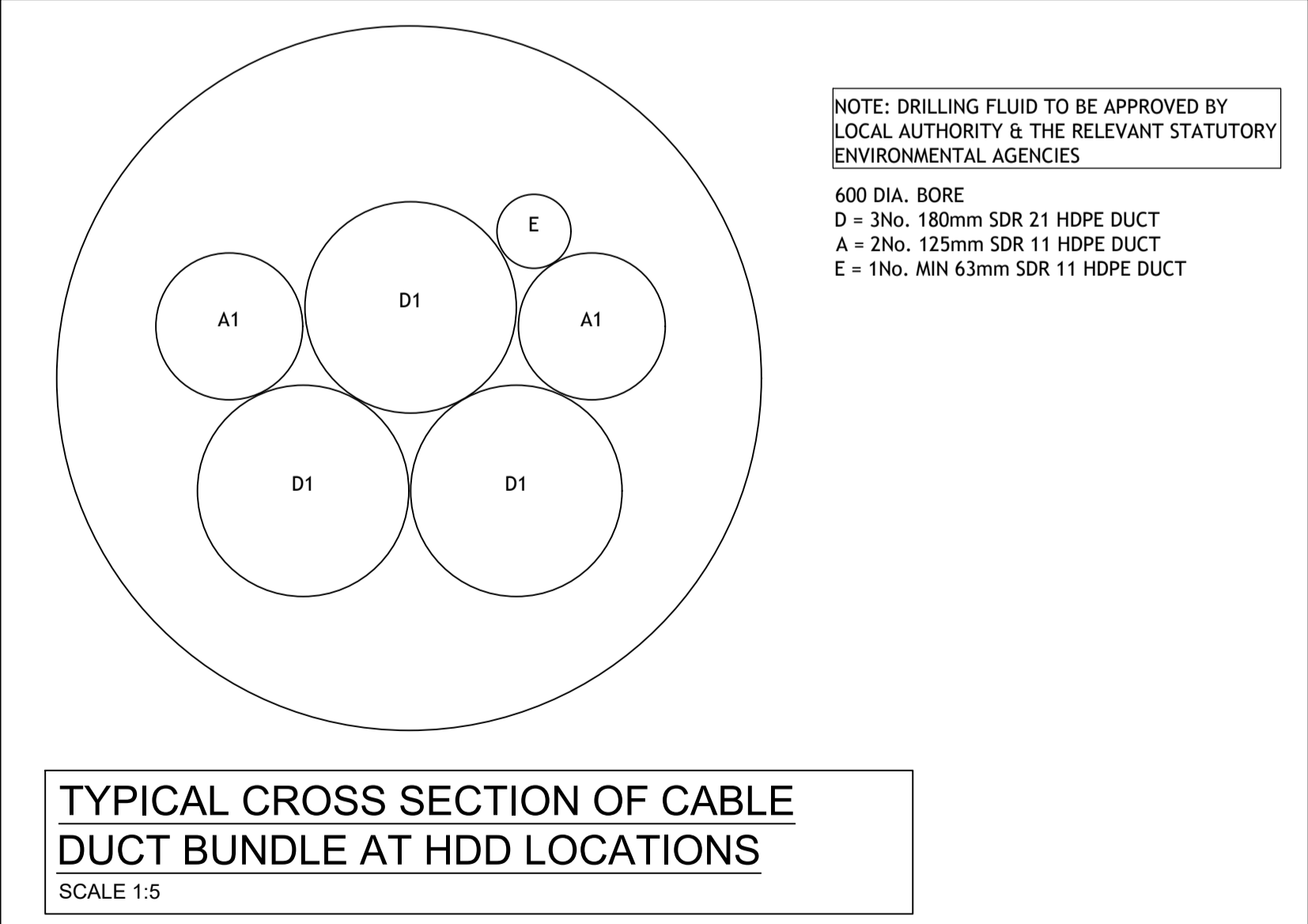
**SITE LOCATION PLAN**  
SCALE 1:250



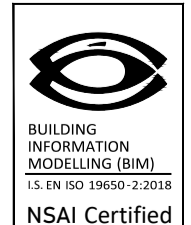
**PHOTO OF SINGLE MASONRY ARCH**



**PHOTO OF SINGLE MASONRY ARCH**

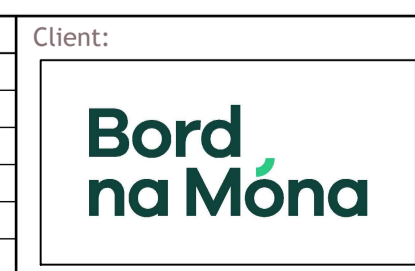


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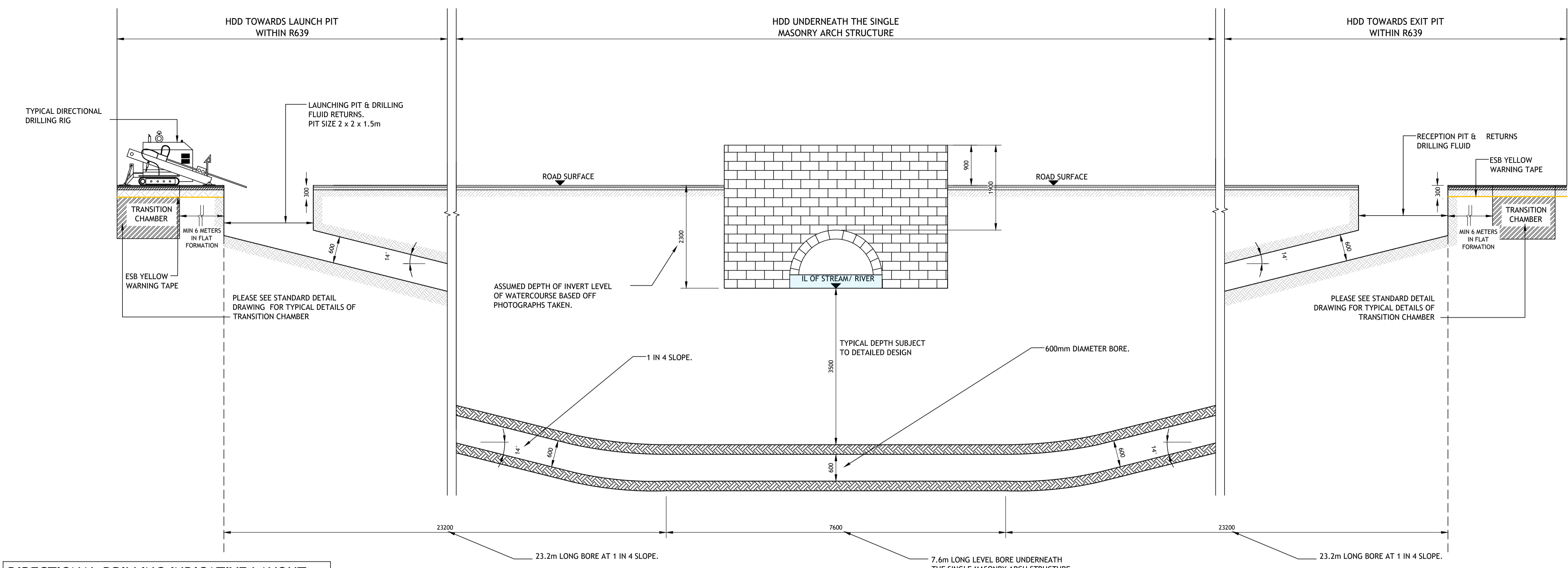
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P01	ISSUED FOR COMMENT	DM	25.09.23				
P02	ISSUED FOR COMMENT	DM	29.11.23				
P03	ISSUED FOR COMMENT	DM	27.08.24				

Rev	Amendment	By	Date

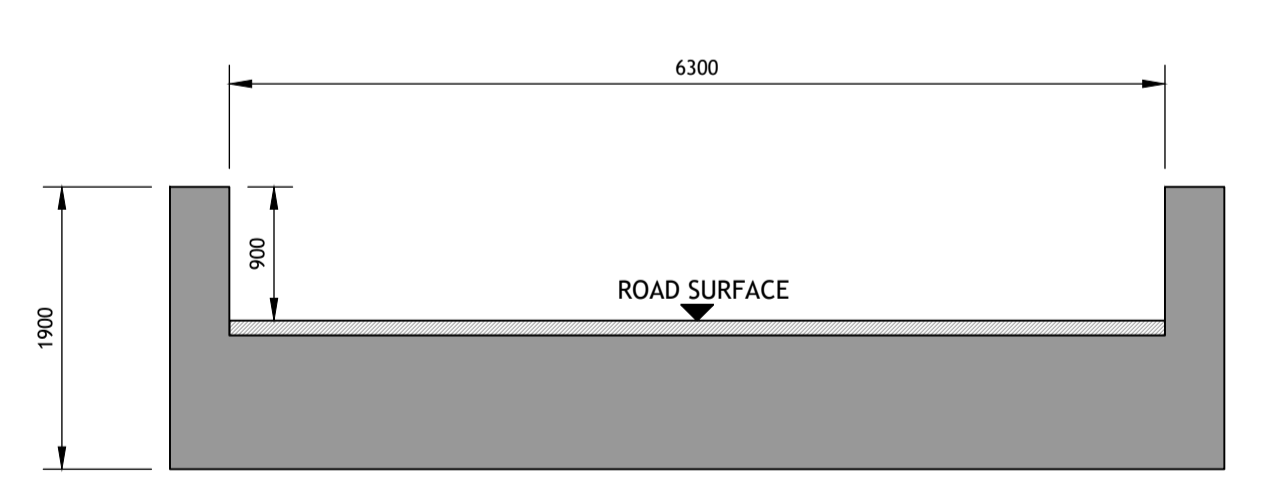


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Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM			
Title: CROSSING NO. 3 SHEET 1 OF 2			
Drawn: D.M.	Date drawn: SEPTEMBER 2023	Technician Check: N.M.	Approved: K.O.R.
Project No: 222278	Model Ref: 222278-PUNCH-LT-03-M2-C-001-002	Drawing Status: S3	
Scale as SHOWN	222278-PUNCH-LT-03-DR-C-001	Revision No: P03	



**DIRECTIONAL DRILLING INDICATIVE LAYOUT SECTION A-A**  
SCALE 1:50 on A1



**SINGLE MASONRY ARCH CROSS SECTION SECTION B-B**  
SCALE 1:50 on A1

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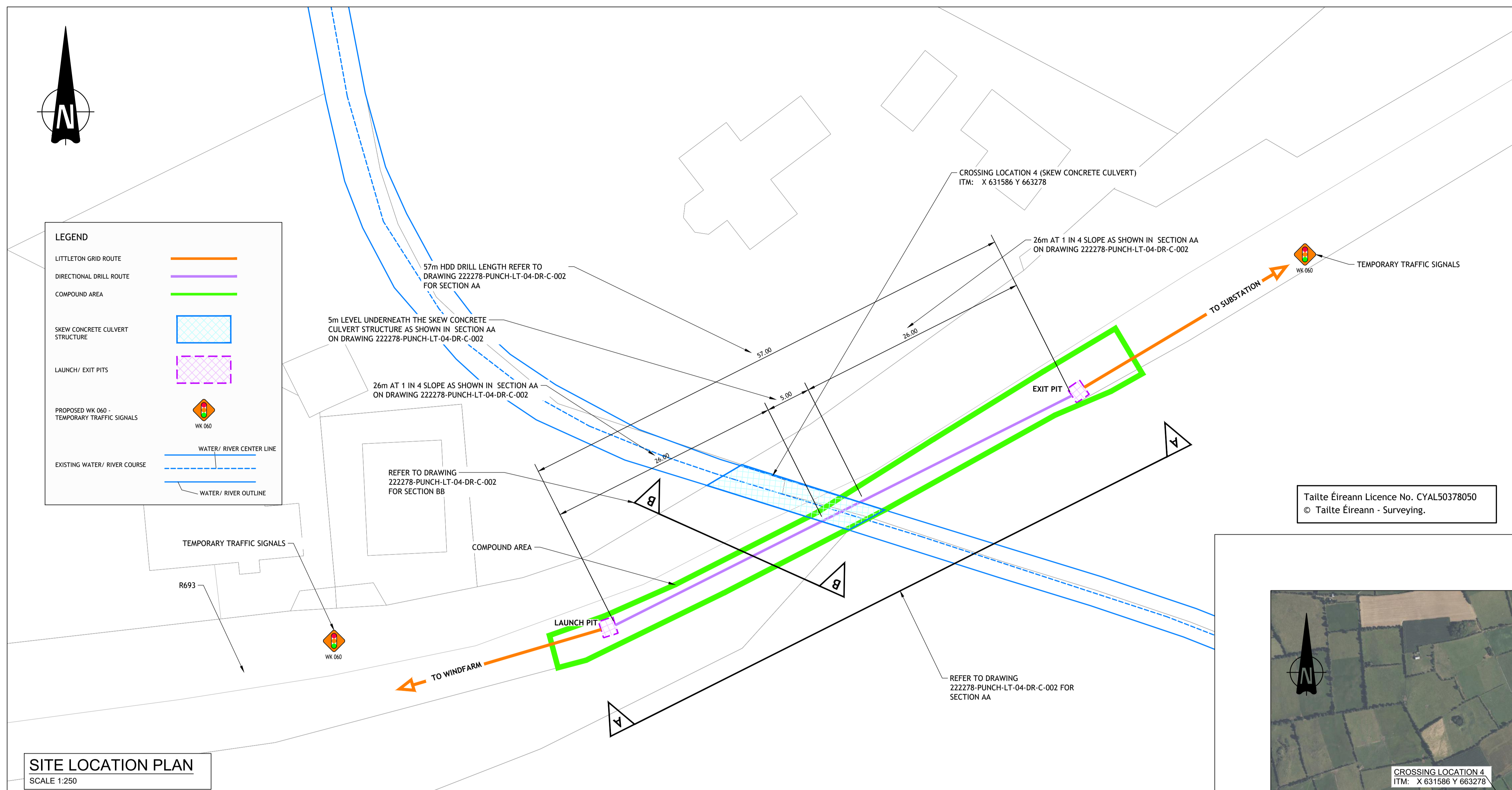
Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	25.09.23
P02	ISSUED FOR COMMENT	DM	29.11.23
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Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM			
Title: CROSSING NO. 3 SHEET 2 OF 2			
Drawn: D.M.	Date drawn: SEPTEMBER 2023	Technician Check: N.H.	Engineer Check: K.O.R.
Project No: 222278	Model Ref: 222278-PUNCH-LT-03-M2-C-001-002	Drawing Status: S3	Approved: K.O.R.
Scale as shown	Document No: 222278-PUNCH-LT-03-DR-C-002	Revision No: P03	



**SITE LOCATION PLAN**  
SCALE 1:250

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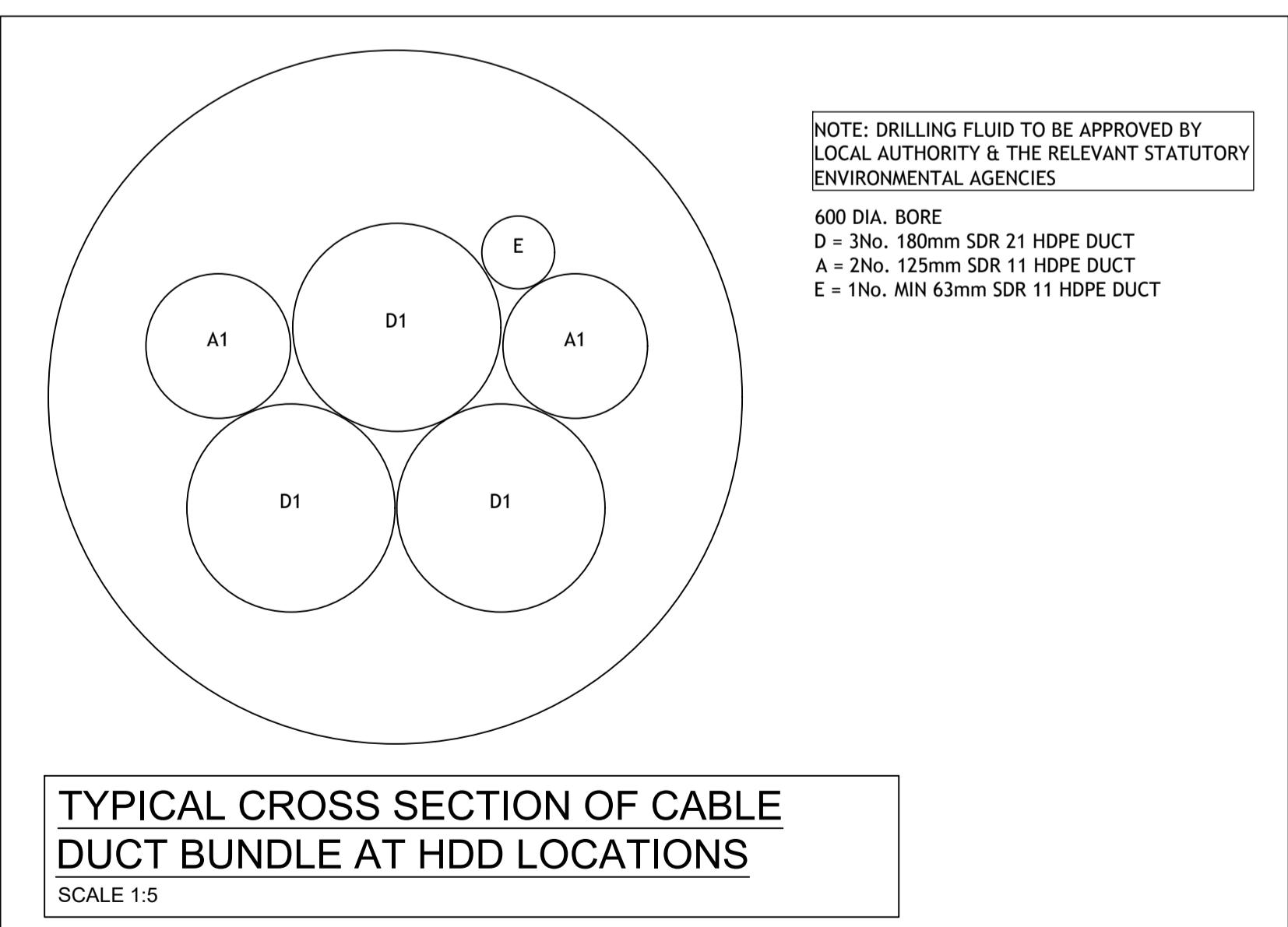
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**PHOTO OF SKEW CONCRETE CULVERT**



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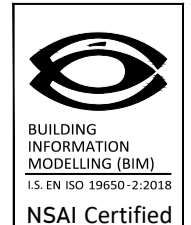


**TYPICAL CROSS SECTION OF CABLE DUCT BUNDLE AT HDD LOCATIONS**  
SCALE 1:5



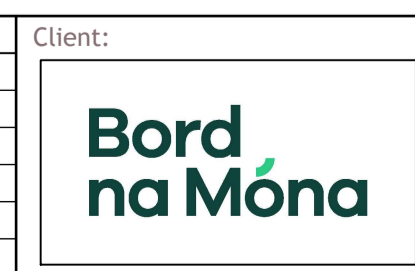
**CABLE ROUTE KEY PLAN**  
SCALE 1:10,000

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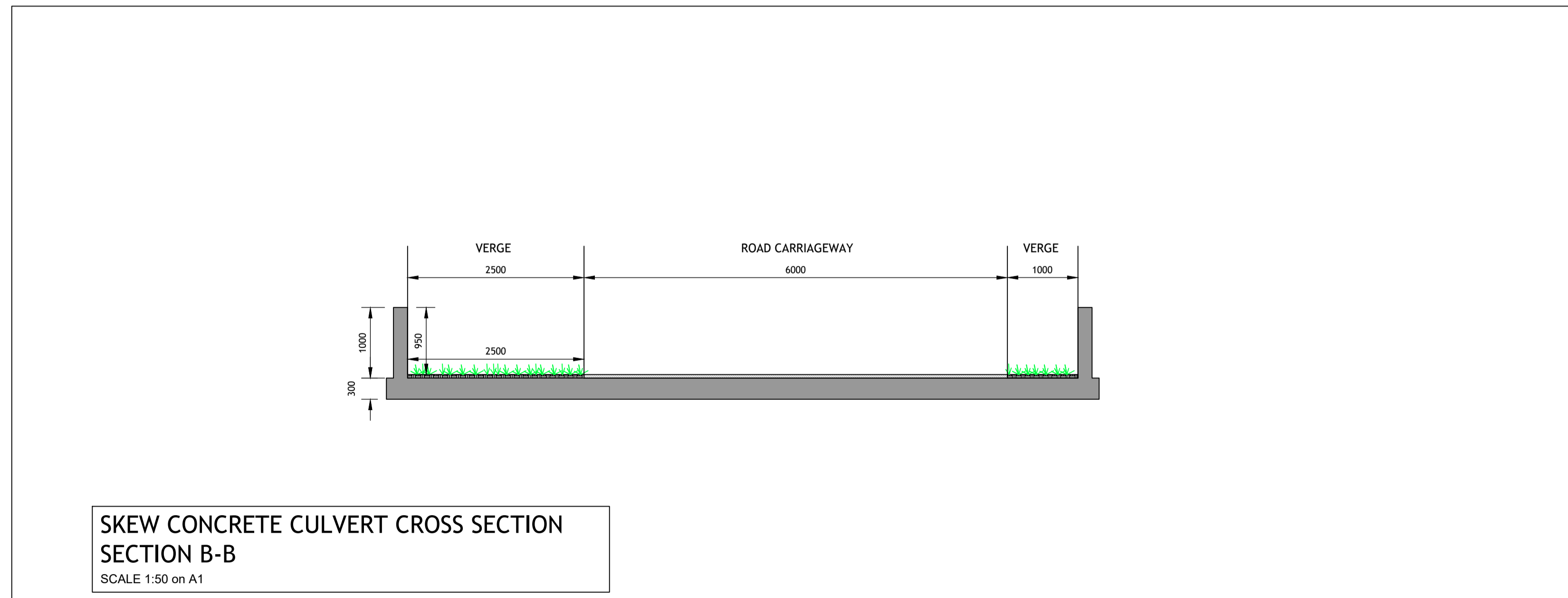
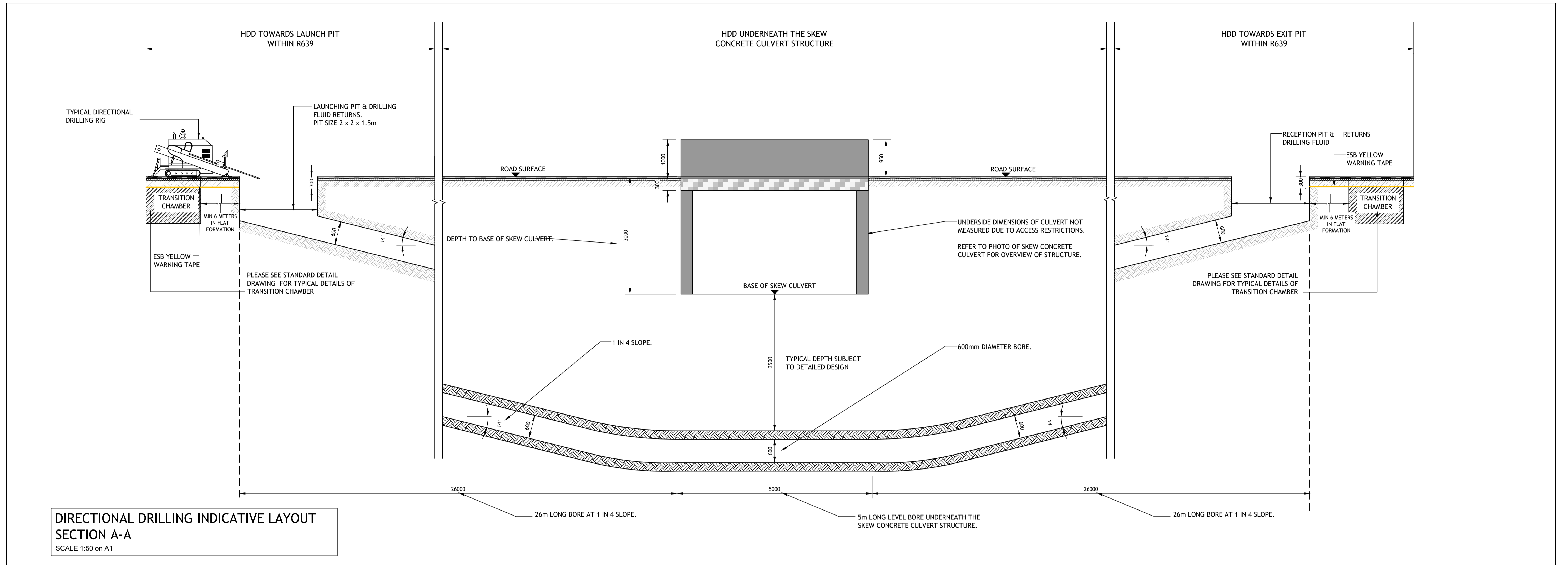
Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	25.09.23				
P02	ISSUED FOR COMMENT	DM	29.11.23				
P03	ISSUED FOR COMMENT	DM	27.08.24				

Rev	Amendment	By	Date



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Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM			
Title: CROSSING NO. 4 SHEET 1 OF 2			
Drawn: D.M.	Date drawn: SEPTEMBER 2023	Technician Check: N.N.	Approved: K.O.R.
Project No: 222278	Model Ref: 222278-PUNCH-LT-04-M2-C-001-002	Engineering Check: K.O.R.	Revision No: P03
Scale as shown: AS SHOWN	Document: 222278-PUNCH-LT-04-DR-C-001	Drawing Status: S3	



Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	25.09.23				
P02	ISSUED FOR COMMENT	DM	29.11.23				
P03	ISSUED FOR COMMENT	DM	27.08.24				

Rev	Amendment	By	Date

Client:  
**Bord na Móna**

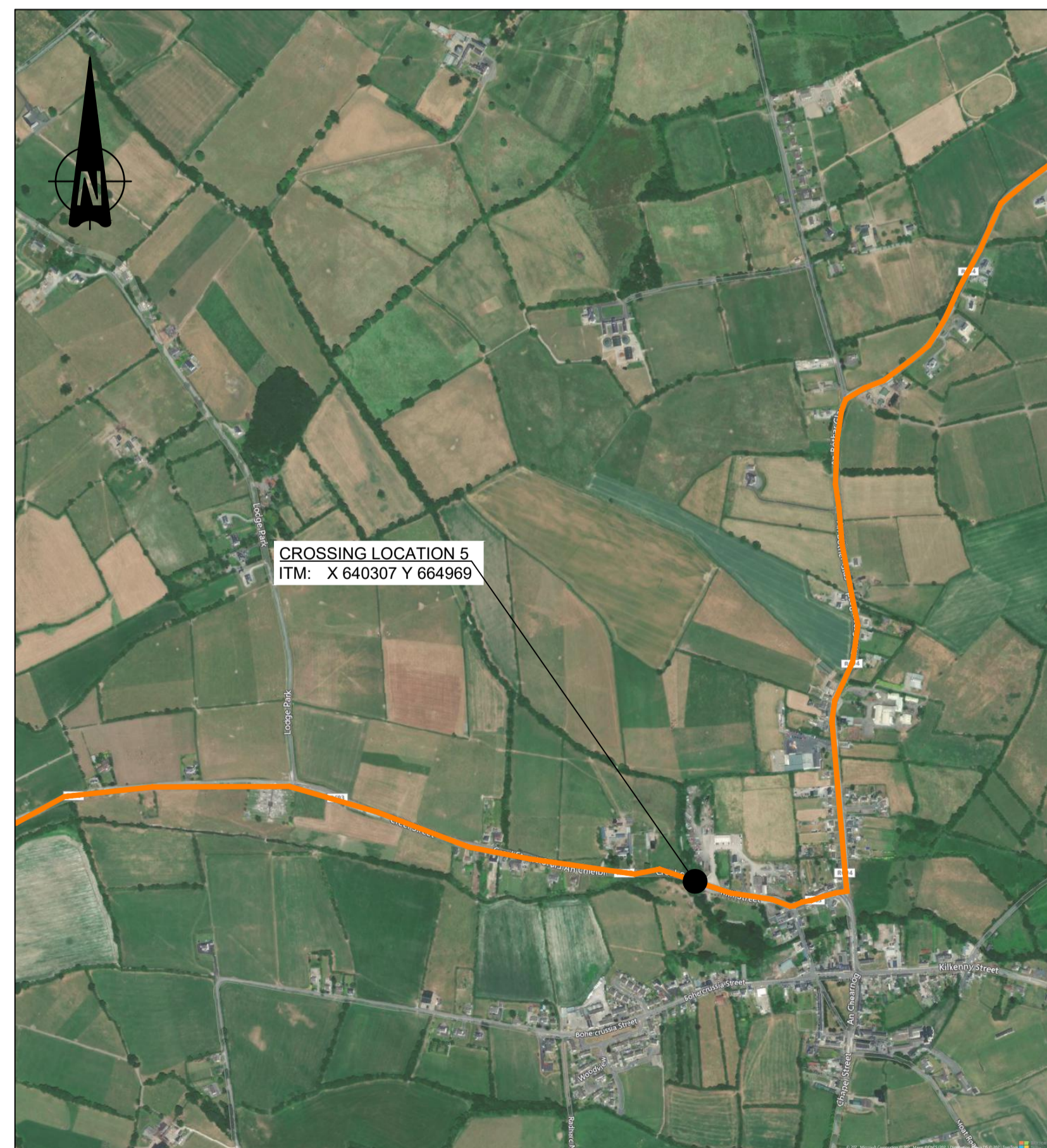
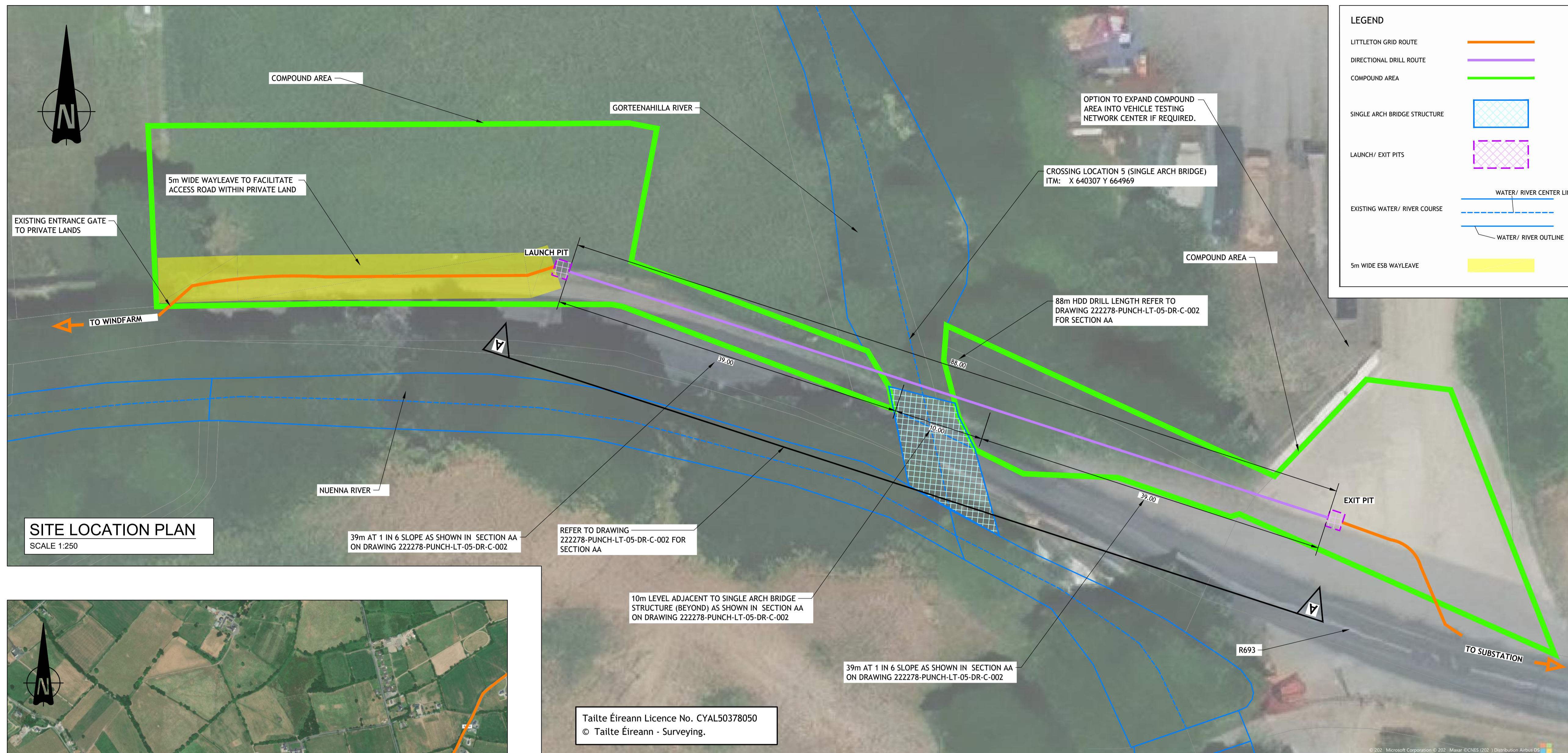


PHOTO OF SINGLE ARCH BRIDGE

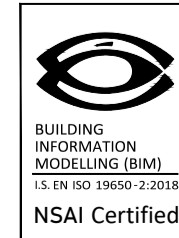


PHOTO OF NUENNA RIVER RUNNING PARALLEL TO THE R693



PHOTO OF VIEW FROM R693 TOWARDS THE SINGLE ARCH BRIDGE

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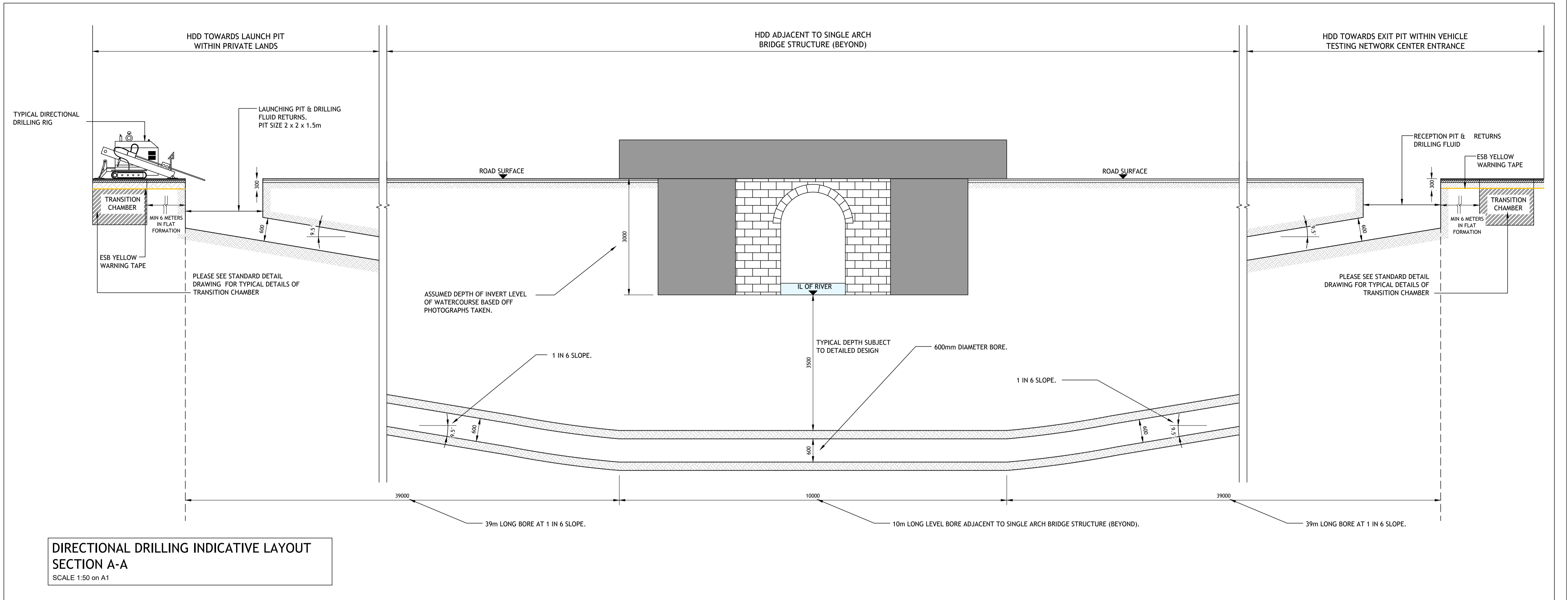
Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	27.09.23				
P02	ISSUED FOR COMMENT	DM	29.11.23				
P03	ISSUED FOR COMMENT	DM	10.07.24				
P04	ISSUED FOR COMMENT	DM	19.07.24				
P05	ISSUED FOR COMMENT	DM	27.08.24				

Rev	Amendment	By	Date

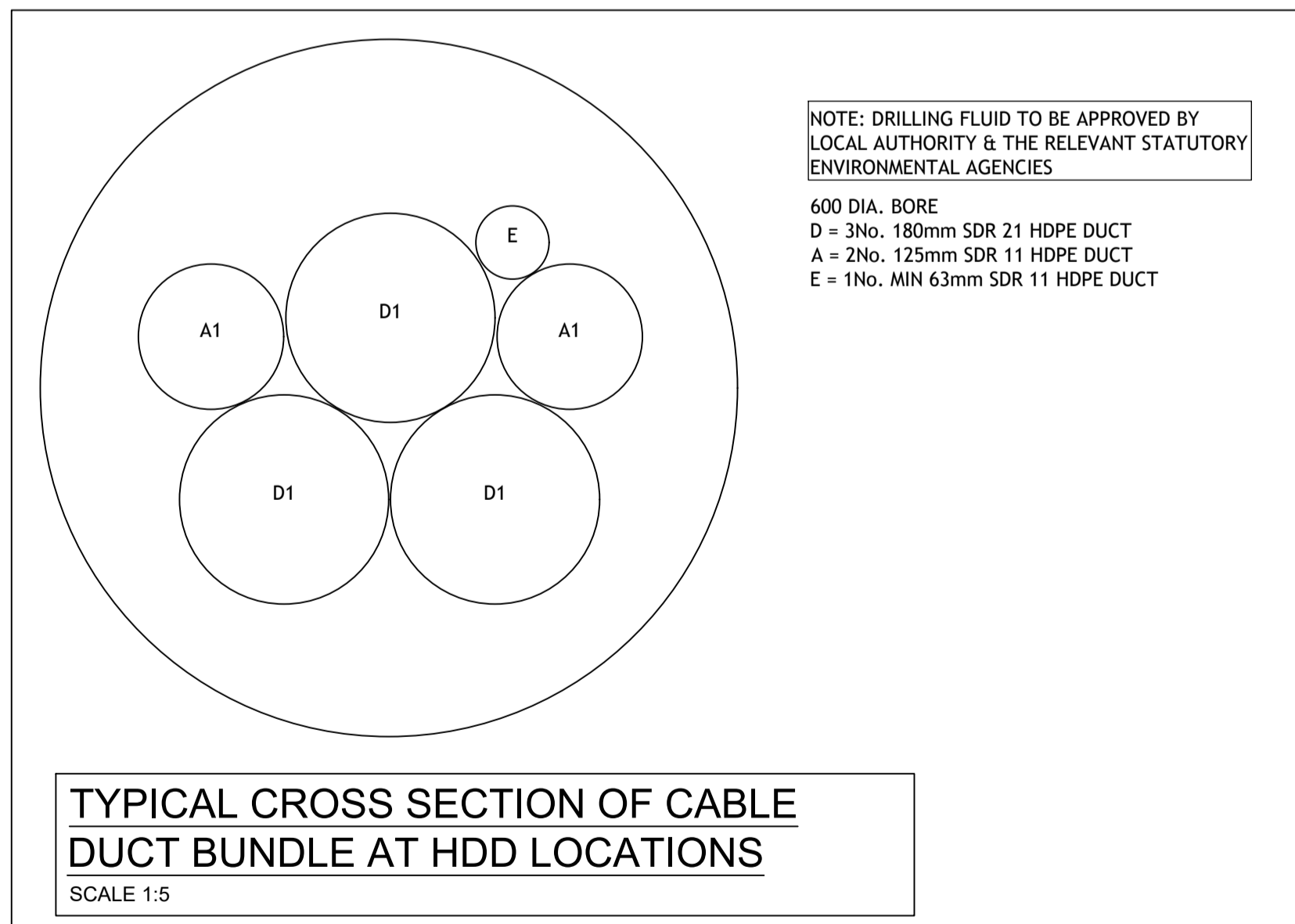
Client:  
**Bord na Móna**

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Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM			
Title: CROSSING NO. 5 SHEET 1 OF 2			
Drawn: D.M.	Date drawn: 15 SEPTEMBER 2023	Technician Check: N.H.	Approved: K.O.R.
Project no: 222278	Model Ref: 222278-PUNCH-LT-05-M2-C-001-002	Drawing Status: S3	Revision No: P05
Scale: AS SHOWN	Document No: 222278-PUNCH-LT-05-DR-C-001		



**DIRECTIONAL DRILLING INDICATIVE LAYOUT SECTION A-A**  
SCALE 1:50 on A1



**TYPICAL CROSS SECTION OF CABLE DUCT BUNDLE AT HDD LOCATIONS**  
SCALE 1:5



**PHOTO OF EXISTING ACCESS GATE FROM R693 TO PRIVATE LANDS.**



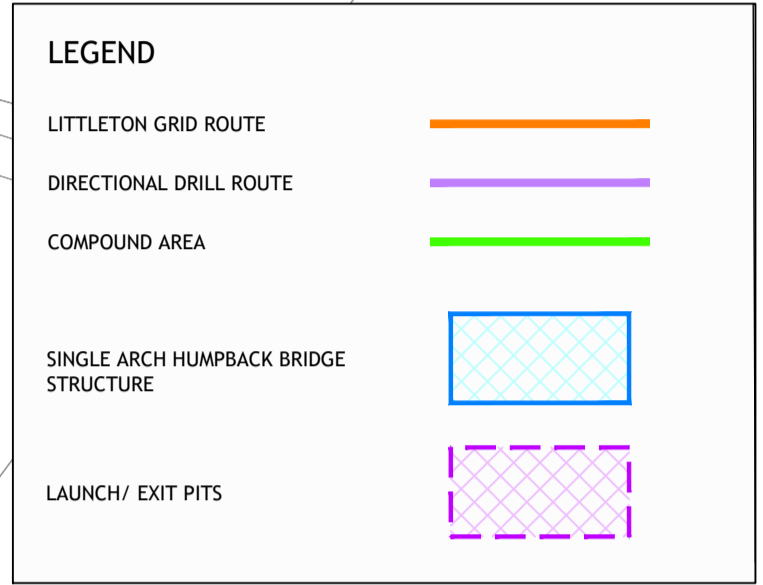
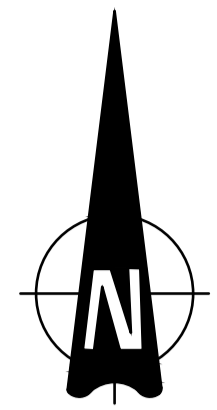
**PROPOSED 5m WIDE WAYLEAVE TO FACILITATE ACCESS ROAD TO RUN TIGHT AGAINST EXISTING BOUNDARY WALL & STOPPING AT HDD LAUNCH PIT LOCATION.**



**PROPOSED HDD EXIT PIT TO BE LOCATED WITHIN VEHICLE TESTING CENTER ENTRANCE.**

Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	27.09.23				
P02	ISSUED FOR COMMENT	DM	29.11.23				
P03	ISSUED FOR COMMENT	DM	10.07.24				
P04	ISSUED FOR COMMENT	DM	27.08.24				

Rev	Amendment	By	Date



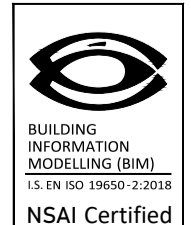
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- NOTES**
- ALL LEVELS SHOWN ARE RELATIVE TO MALIN HEAD DATUM
  - DRAWINGS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.
  - DO NOT SCALE USE FIGURED DIMENSIONS ONLY.
  - THIS THE CONTRACTORS RESPONSIBILITY TO VERIFY OR DETERMINE ALL DIMENSIONS AND LEVELS REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION OR PRODUCTION OF FABRICATION DRAWINGS.
  - CONTRACTOR TO COMPLY WITH ALL CONSTRUCTION REQUIREMENTS OF STRUCTURAL SPECIFICATIONS AND RELEVANT DRAWINGS.
  - TEMPORARY WORKS, INCLUDING TEMPORARY DRAINING STRUCTURE, BUNDS, SUPPORT STRUCTURES, DEWATERING ETC. ARE TO BE DESIGNED BY THE CONTRACTOR, WITH DETAILED METHOD STATEMENT SUBMITTED PRIOR TO COMMENCEMENT OF WORKS.
  - PRIOR SITE INVESTIGATION INCLUDING DETAILED GEOTECHNICAL INVESTIGATIONS WILL ENSURE THAT HDD WILL ONLY BE CARRIED OUT WHERE THE SOIL & GEOTECHNICAL CONDITIONS ARE SUITABLE.
  - DRILLING PROCESS TO BE CONSTANTLY MONITORED TO DETECT ANY POSSIBLE LEAKING & BREAK OUT OF BENTONITE INTO THE SURROUNDING GEOLOGY.
  - ALL SOLIDS REMOVED FROM THE DRILLING FLUID TO BE DIVERTED INTO SKIPS FOR SAFE DISPOSAL, IN ACCORDANCE WITH CONTRACTORS WASTE MANAGEMENT PLAN.
  - DRILLING FLUIDS TO BE RE-CIRCULATED TO KEEP THE VOLUME OF FLUIDS REQUIRED TO A MINIMUM.
  - CONTRACTOR TO SUPPLY FULL TEMPORARY TRAFFIC MANAGEMENT PLAN PRIOR TO WORKS COMMENCING.
  - DRILLING FLUIDS TO BE RE-CIRCULATED TO KEEP THE VOLUME OF FLUIDS REQUIRED TO A MINIMUM.
  - EXCESS DRILLING FLUIDS TO BE STORED ON SITE PENDING SAFE DISPOSAL IN ACCORDANCE WITH CONTRACTORS WASTE MANAGEMENT PLAN.
  - HDD PROPOSAL IS INDICATIVE AND SUBJECT TO DETAILED DESIGN. ITS FINAL PITS LOCATION CAN VARY WITHIN THE DEMARCATED COMPOUND AREA.

**SITE LOCATION PLAN**  
SCALE 1:250



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P02	ISSUED FOR COMMENT	DM	29.11.23				
P03	ISSUED FOR COMMENT	DM	27.08.24				

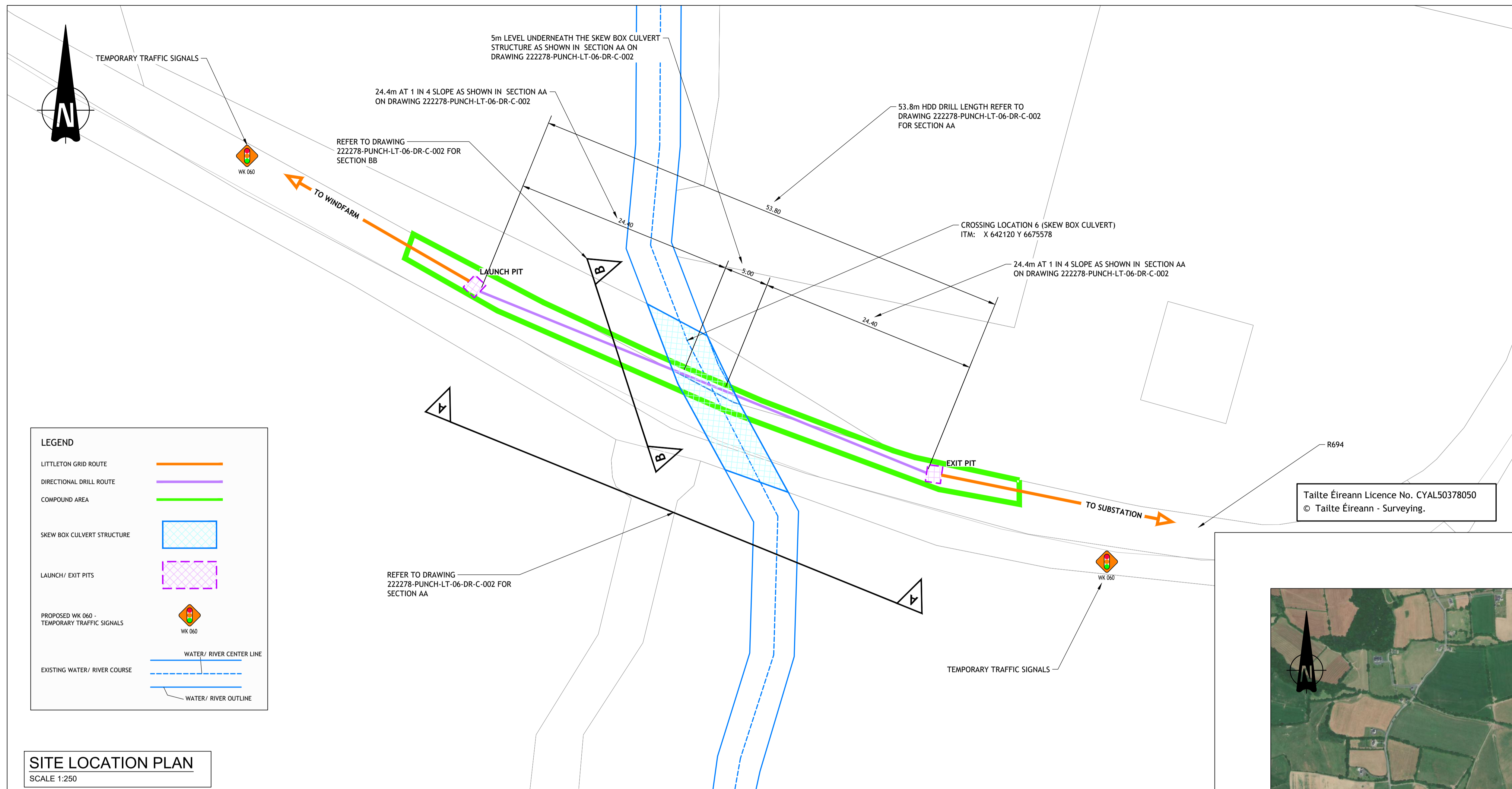
Rev	Amendment	By	Date

Client:  
**Bord na Móna**

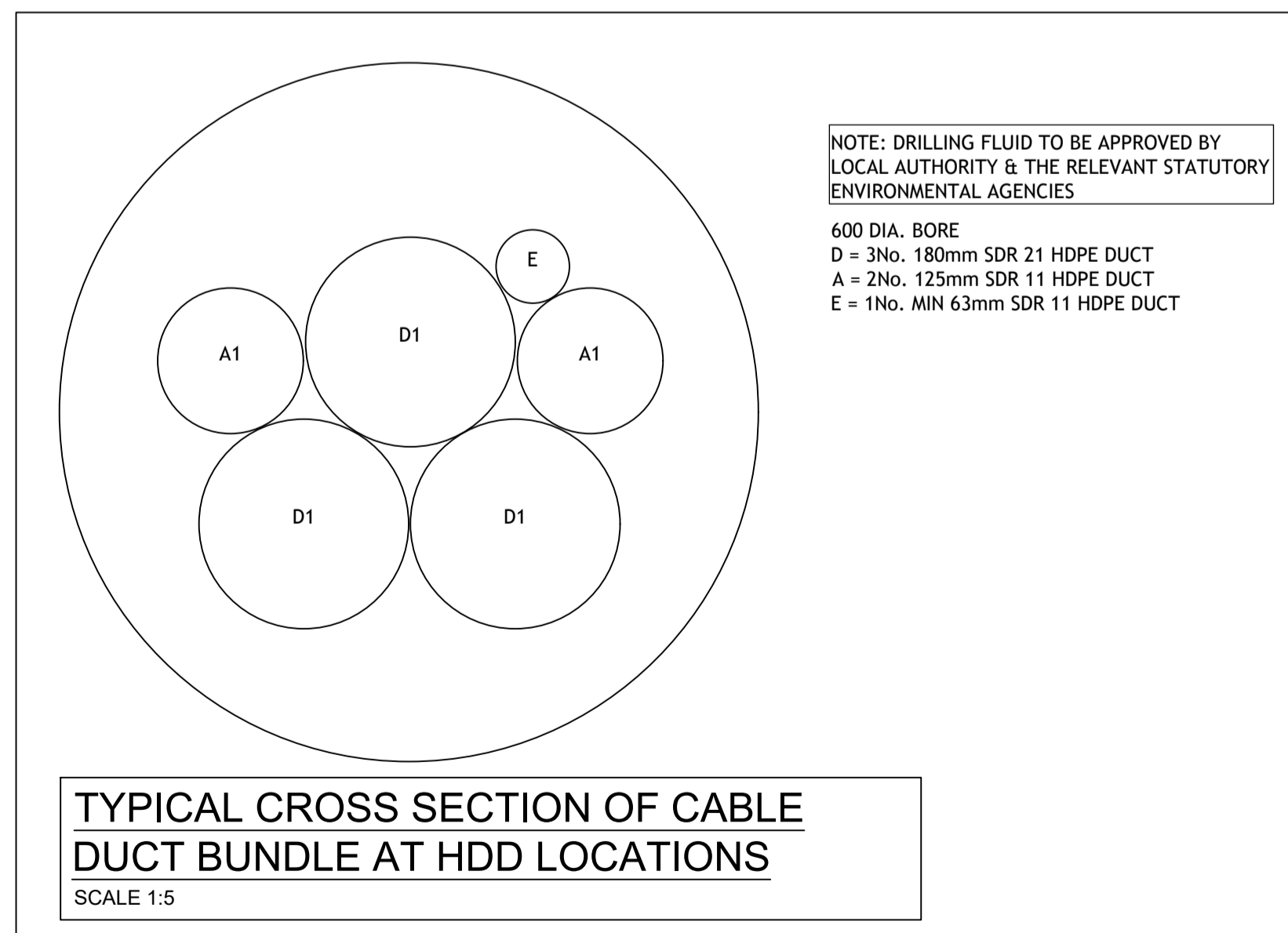
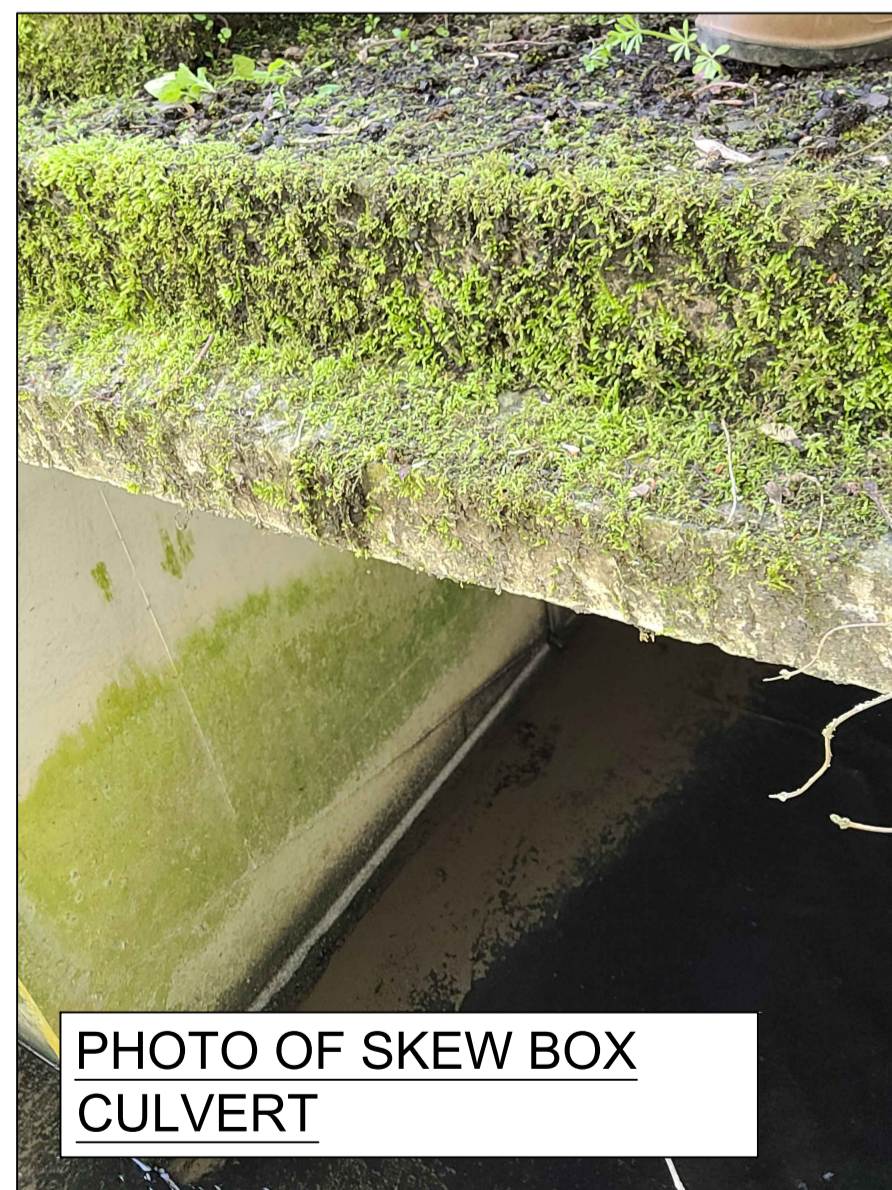
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Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM	
Title: CROSSING NO. 5A SHEET 1 OF 2	
Drawn: D.M.	Date drawn: SEPTEMBER 2023
Project no: 222278	Model Ref: 222278-PUNCH-LT-5A-M2-C-001-002
Scale: AS SHOWN	Document No: 222278-PUNCH-LT-5A-DR-C-001
Technician Check: N.N.	Approved: K.O.R.
Engineer Check: K.O.R.	Drawing Status: S3
Revision No: P03	

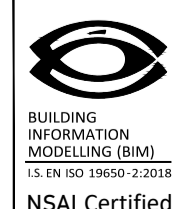




- NOTES**
- ALL LEVELS SHOWN ARE RELATIVE TO MALIN HEAD DATUM
  - DRAWINGS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.
  - DO NOT SCALE USE FIGURED DIMENSIONS ONLY.
  - THIS THE CONTRACTORS RESPONSIBILITY TO VERIFY OR DETERMINE ALL DIMENSIONS AND LEVELS REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION OR PRODUCTION OF FABRICATION DRAWINGS.
  - CONTRACTOR TO COMPLY WITH ALL CONSTRUCTION REQUIREMENTS OF STRUCTURAL SPECIFICATIONS AND RELEVANT DRAWINGS.
  - TEMPORARY WORKS, INCLUDING TEMPORARY DRAINING STRUCTURE, BUNDS, SUPPORT STRUCTURES, DEWATERING ETC. ARE TO BE DESIGNED BY THE CONTRACTOR, WITH DETAILED METHOD STATEMENT SUBMITTED PRIOR TO COMMENCEMENT OF WORKS.
  - PRIOR SITE INVESTIGATION INCLUDING DETAILED GEOTECHNICAL INVESTIGATIONS WILL ENSURE THAT HDD WILL ONLY BE CARRIED OUT WHERE THE SOIL & GEOTECHNICAL CONDITIONS ARE SUITABLE.
  - DRILLING PROCESS TO BE CONSTANTLY MONITORED TO DETECT ANY POSSIBLE LEAKING & BREAK OUT OF BENTONITE INTO THE SURROUNDING GEOLOGY.
  - ALL SOLIDS REMOVED FROM THE DRILLING FLUID TO BE DIVERTED INTO SKIPS FOR SAFE DISPOSAL, IN ACCORDANCE WITH CONTRACTORS WASTE MANAGEMENT PLAN.
  - DRILLING FLUIDS TO BE RE-CIRCULATED TO KEEP THE VOLUME OF FLUIDS REQUIRED TO A MINIMUM.
  - CONTRACTOR TO SUPPLY FULL TEMPORARY TRAFFIC MANAGEMENT PLAN PRIOR TO WORKS COMMENCING.
  - DRILLING FLUIDS TO BE RE-CIRCULATED TO KEEP THE VOLUME OF FLUIDS REQUIRED TO A MINIMUM.
  - EXCESS DRILLING FLUIDS TO BE STORED ON SITE PENDING SAFE DISPOSAL IN ACCORDANCE WITH CONTRACTORS WASTE MANAGEMENT PLAN.
  - HDD PROPOSAL IS INDICATIVE AND SUBJECT TO DETAILED DESIGN. ITS FINAL PITS LOCATION CAN VARY WITHIN THE DEMARCATED COMPOUND AREA.



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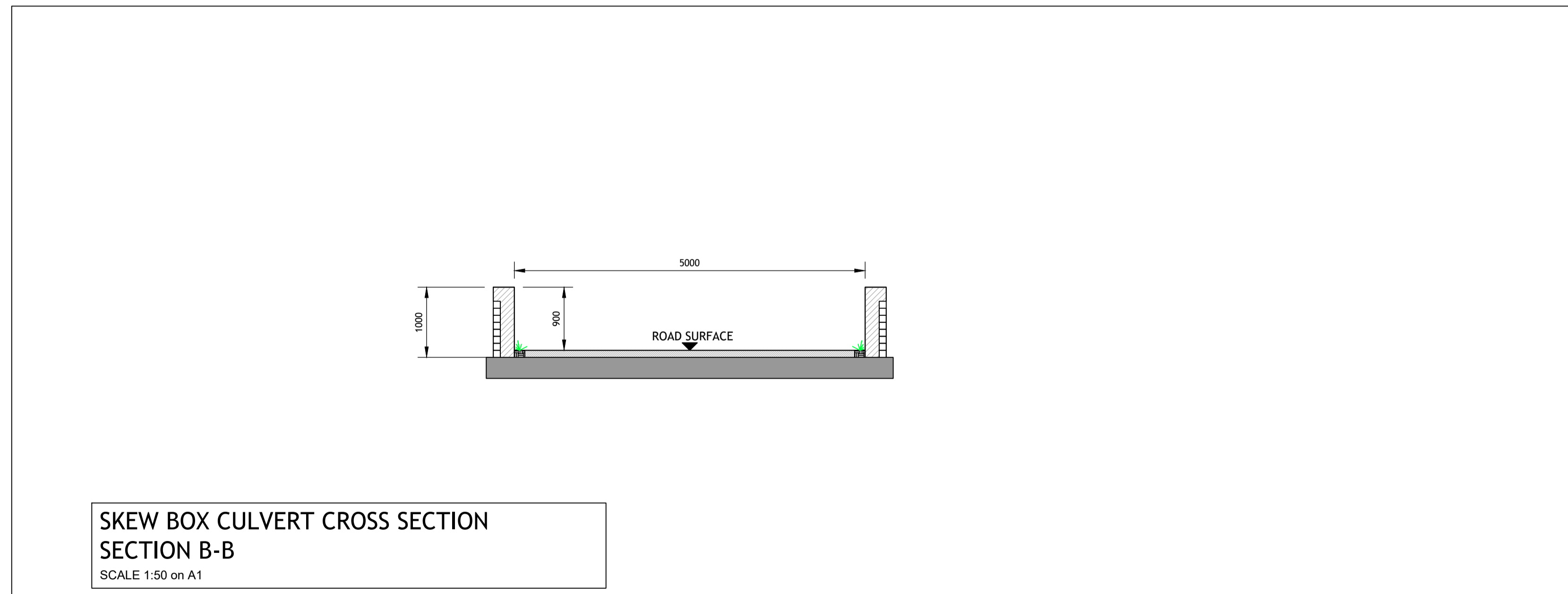
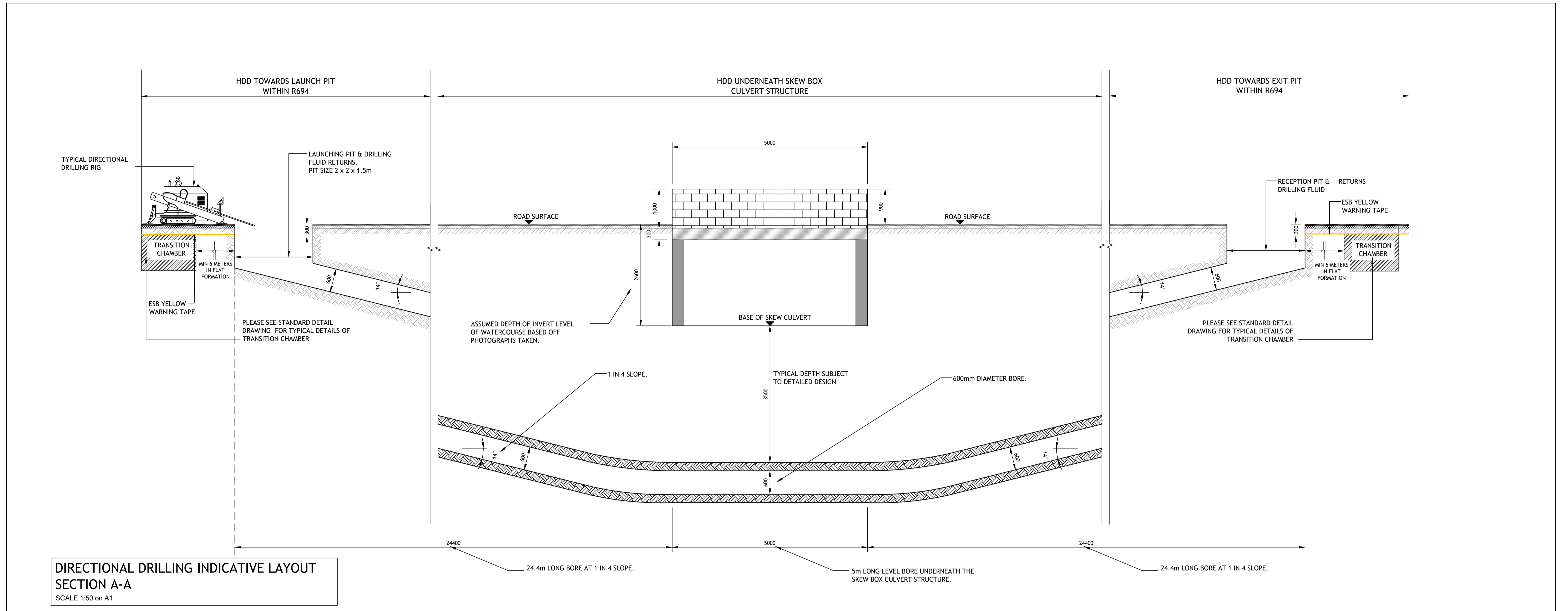
Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	29.11.23				
P02	ISSUED FOR COMMENT	DM	27.08.24				

Rev	Amendment	By	Date

Client:  
**Bord na Móna**

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Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM			
Title: CROSSING NO. 6 SHEET 1 OF 2			
Drawn: D.M.	Date: 29.11.23	Technician Check: N.R.	Approved: K.O.R.
Project No: 222278	Model Ref: 222278-PUNCH-LT-06-M2-C-001-002	Drawing Status: S3	
Scale: AS SHOWN	Document: 222278-PUNCH-LT-06-DR-C-001	Revision No: P02	

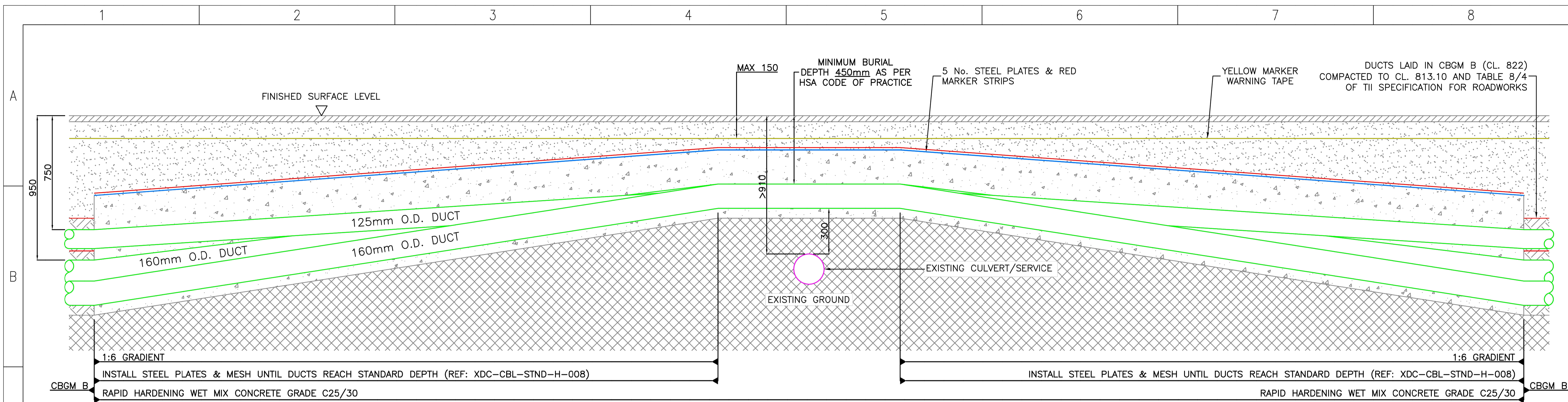


Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	29.11.23				
P02	ISSUED FOR COMMENT	DM	27.08.24				

Rev	Amendment	By	Date

Client:  
**Bord na Móna**

Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM			
Title: CROSSING NO. 6 SHEET 2 OF 2			
Drawn: D.M.	Date drawn: OCTOBER 2023	Technician Check: N.H.	Engineer Check: K.O.R.
Project No: 222278	Model Ref: 222278-PUNCH-LT-06-M2-C-001-002	Drawing Status: S3	Approved: K.O.R.
Scale: AS SHOWN	Document No: 222278-PUNCH-LT-06-DR-C-002	Revision No: P02	

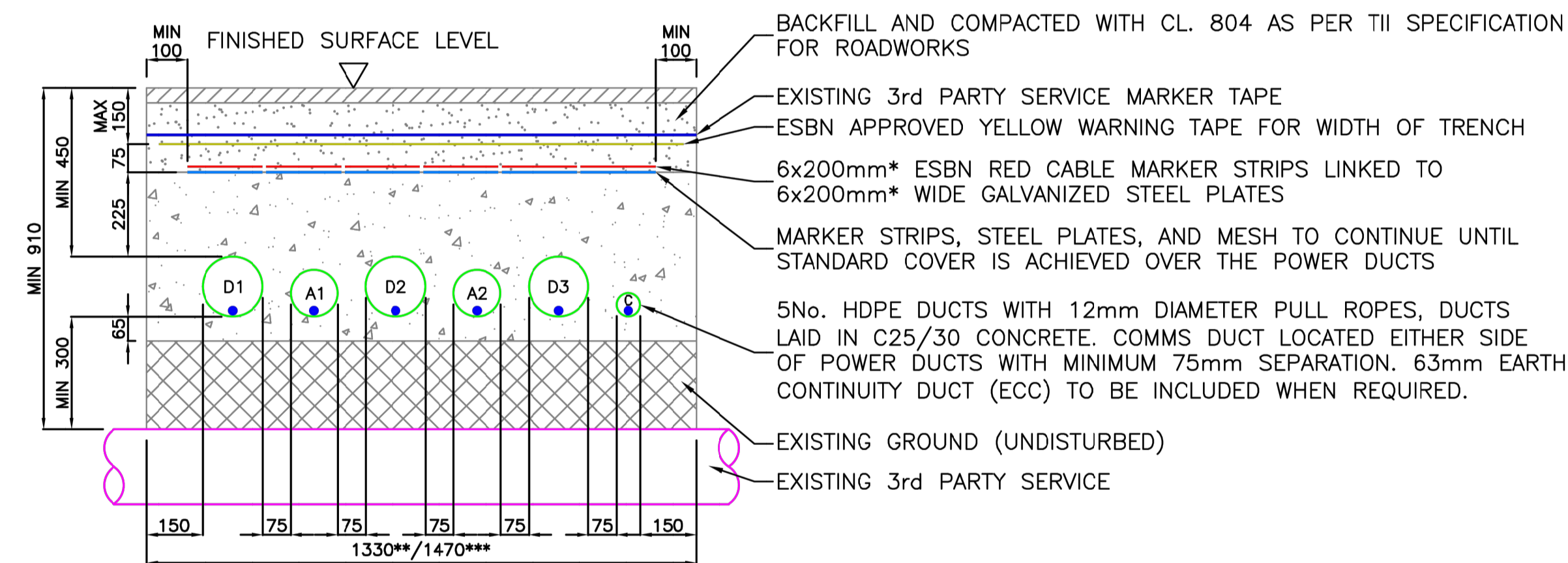


**NOTES:**

- ALL PRODUCTS AND MATERIALS TO BE UTILISED DURING CONSTRUCTION TO COMPLY WITH EIRGRID FUNCTIONAL SPECIFICATION, ESNB STANDARDS, TII SPECIFICATION FOR ROAD WORKS AND ALL RELEVANT IRISH (EUROPEAN) AND BRITISH STANDARDS.
- 300mm MINIMUM VERTICAL AND HORIZONTAL CLEARANCES TO BE OBSERVED BETWEEN CABLE DUCTS AND THIRD PARTY SERVICES (e.g. GAS PIPES, WATER MAINS, CULVERTS, etc.) IN THE CASE OF HIGH RISK 3rd PARTY SERVICES, GREATER CLEARANCES MAY BE REQUIRED. DESIGNER TO CONSULT EIRGRID AND 3rd PARTY SERVICE OWNERS FOR GUIDANCE.
- STEEL PLATES MUST COVER DUCTS. NO OVERLAP IS REQUIRED HOWEVER STANDARD DIMENSIONS MAY RESULT IN AN OVERLAP. SPACING OF 10mm TO BE MAINTAINED BETWEEN STEEL PLATES TO PREVENT THE TRANSFER OF STRAY CURRENT.
- THE MINIMUM CLEARANCE BETWEEN ALL HV AND COMMUNICATION DUCTS IS 75mm, BUT INCREASED SPACING MAY BE REQUIRED IN ORDER TO ACHIEVE THE CABLE RATING (TO BE CONFIRMED BY DESIGNER CABLE RATING CALCULATIONS).
- DRAWING IS INDICATIVE ONLY, TO BE USED TO AID IN THE DESIGN OF THE RELEVANT INFRASTRUCTURE.
- TEMPLATES ARE TO BE USED AT 5m INTERVALS DURING DUCT INSTALLATION IN CBGM. PRE-MADE 75mm WIDE CONCRETE SPACERS TO BE USED DURING DUCT INSTALLATION IN WET CONCRETE.
- MINIMUM BURIAL DEPTH IS 450mm.
- HAND DIG WITHIN 500mm OF EXISTING SERVICE.
- WHERE AN EARTH CONTINUITY CONDUCTOR (ECC) IS REQUIRED, A MIN 63mm DUCT TO BE INSTALLED OUTSIDE OF PHASE DUCT.

- RED MARKER STRIP
- YELLOW MARKER WARNING TAPE
- EXISTING SERVICE MARKER STRIP
- 6mm GALVANISED STEEL PLATE
- RAPID HARDENING WET CONCRETE C25/30
- CBGM B (CL. 822), COMPACTED TO CL. 813.10
- BACKFILL, COMPACTED (CL. 804)
- EXISTING GROUND

**FULL FLAT FORMATION – REDUCED DEPTH FOR CROSSING OVER 3RD PARTY SERVICE**



A= 125mm O.D. HDPE DUCT FOR COMMUNICATIONS  
 D= 160mm O.D. HDPE DUCT FOR HV CABLE  
 C= 63mm O.D. HDPE DUCT FOR EARTH CONTINUITY CONDUCTOR

\* 5x200mm STEEL PLATES AND RED MARKER WHERE AND ECC IS NOT REQUIRED  
 \*\* MIN 1225mm WHERE ECC NOT REQUIRED  
 \*\*\* SEE NOTE 9

00	FIRST ISSUE	DA	DG	CF	09/03/2020
REV	DESC	DRAWN	CHECKED	APPROVED	DATE

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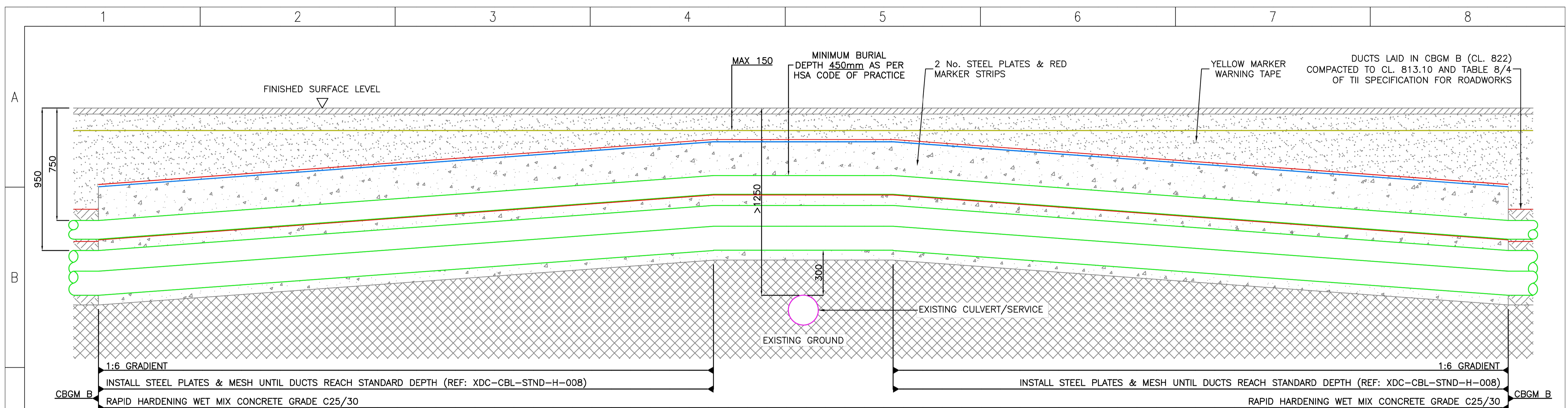
**STANDARD 110kV CABLE DRAWINGS**

DRAWING TITLE  
**STANDARD 3rd PARTY CROSSING ABOVE IN FULL FLAT FORMATION 160mm HV DUCTS**

No of Shts	3	SIZE	A3	SCALE	N/A
DRAWING NUMBER	XDC-CBL-STND-H-002	SHEET	002	REV	00

Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	14.09.23				
P02	ISSUED FOR COMMENT	DM	02.10.24				

By	Date	Client:
		<b>Bord na Móna</b>

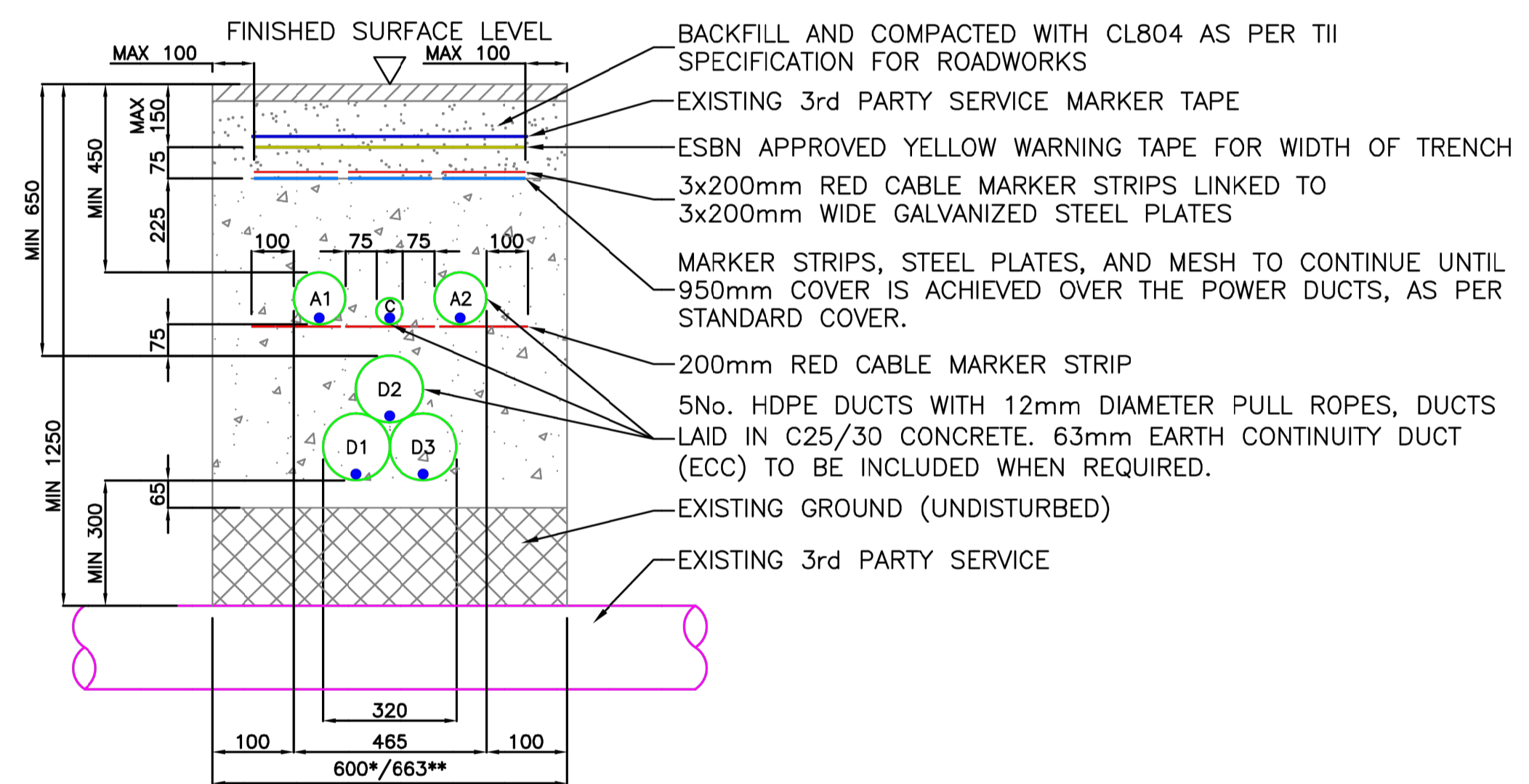


**NOTES:**

- ALL PRODUCTS AND MATERIALS TO BE UTILISED DURING CONSTRUCTION TO COMPLY WITH EIRGRID FUNCTIONAL SPECIFICATION, ESNB STANDARDS, TII SPECIFICATION FOR ROAD WORKS AND ALL RELEVANT IRISH (EUROPEAN) AND BRITISH STANDARDS.
- 300mm MINIMUM VERTICAL AND HORIZONTAL CLEARANCES TO BE OBSERVED BETWEEN CABLE DUCTS AND THIRD PARTY SERVICES (e.g. GAS PIPES, WATER MAINS, CULVERTS, etc.) IN THE CASE OF HIGH RISK 3rd PARTY SERVICES, GREATER CLEARANCES MAY BE REQUIRED. DESIGNER TO CONSULT EIRGRID AND 3rd PARTY SERVICE OWNERS FOR GUIDANCE. STEEL PLATES MUST COVER DUCTS. NO OVERLAP IS REQUIRED HOWEVER STANDARD DIMENSIONS MAY RESULT IN AN OVERLAP. SPACING OF 10mm TO BE MAINTAINED BETWEEN STEEL PLATES TO PREVENT THE TRANSFER OF STRAY CURRENT.
- THE MINIMUM CLEARANCE BETWEEN ALL HV AND COMMUNICATION DUCTS IS 75mm, BUT INCREASED SPACING MAY BE REQUIRED IN ORDER TO ACHIEVE THE CABLE RATING (TO BE CONFIRMED BY DESIGNER CABLE RATING CALCULATIONS).
- DRAWING IS INDICATIVE ONLY, TO BE USED TO AID IN THE DESIGN OF THE RELEVANT INFRASTRUCTURE.
- TEMPLATES ARE TO BE USED AT 5m INTERVALS DURING DUCT INSTALLATION IN CBGM. PRE-MADE 75mm WIDE CONCRETE SPACERS TO BE USED DURING DUCT INSTALLATION IN WET CONCRETE.
- MINIMUM BURIAL DEPTH IS 450mm.
- HAND DIG WITHIN 500mm OF EXISTING SERVICE.
- WHERE AN EARTH CONTINUITY CONDUCTOR (ECC) IS REQUIRED, A MIN 63mm DUCT TO BE INSTALLED OUTSIDE OF PHASE DUCT.

- RED MARKER STRIP
- YELLOW MARKER WARNING TAPE
- EXISTING SERVICE MARKER STRIP
- 6mm GALVANISED STEEL PLATE
- RAPID HARDENING WET CONCRETE C25/30
- CBGM B (CL. 822), COMPACTED TO CL. 813.10
- BACKFILL, COMPACTED (CL. 804)
- EXISTING GROUND

**TREFOIL FORMATION – REDUCED DEPTH FOR CROSSING OVER 3RD PARTY SERVICE**



- A= 125mm O.D. HDPE DUCT FOR COMMUNICATIONS
- D= 160mm O.D. HDPE DUCT FOR HV CABLE
- C= 63mm O.D. PVC DUCT FOR EARTH CONTINUITY CONDUCTOR

- \* MIN 600mm WHERE ECC NOT REQUIRED
- \*\* SEE NOTE 9

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 Fax: +353 1 661 5375  
 Email: info@eirgrid.com  
 Web: www.eirgrid.com

**STANDARD 110kV CABLE DRAWINGS**

DRAWING TITLE  
**STANDARD 3rd PARTY CROSSING ABOVE IN TREFOIL FORMATION 160mm HV DUCTS**

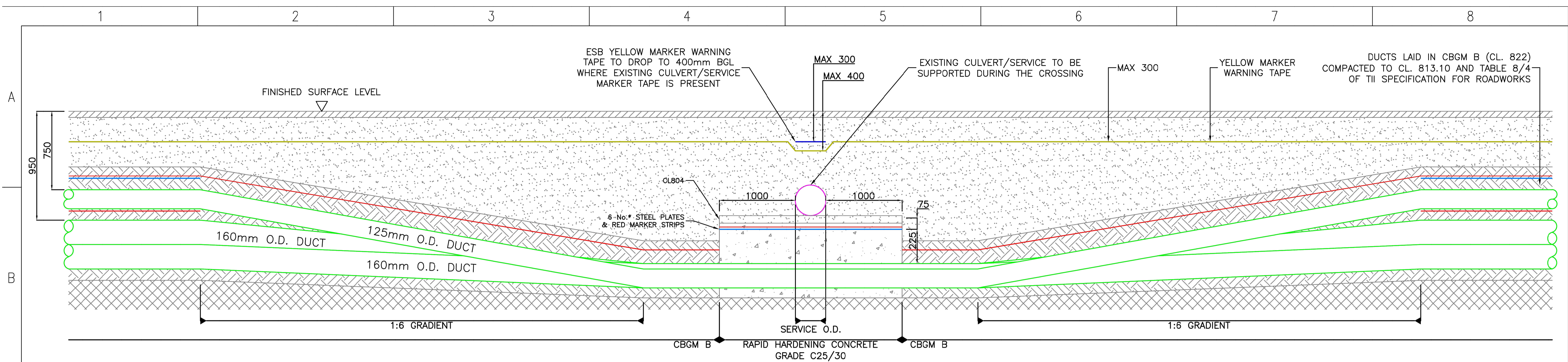
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No of Shts	3	SIZE	A3	SCALE	N/A
DRAWING NUMBER	XDC-CBL-STND-H-002	SHEET	003	REV	00

00	FIRST ISSUE	DA	DG	CF	09/03/2020
REV	DESC	DRAWN	CHECKED	APPROVED	DATE

Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	14.09.23				
P02	ISSUED FOR COMMENT	DM	02.10.24				

By	Date	Client:
		<b>Bord na Móna</b>

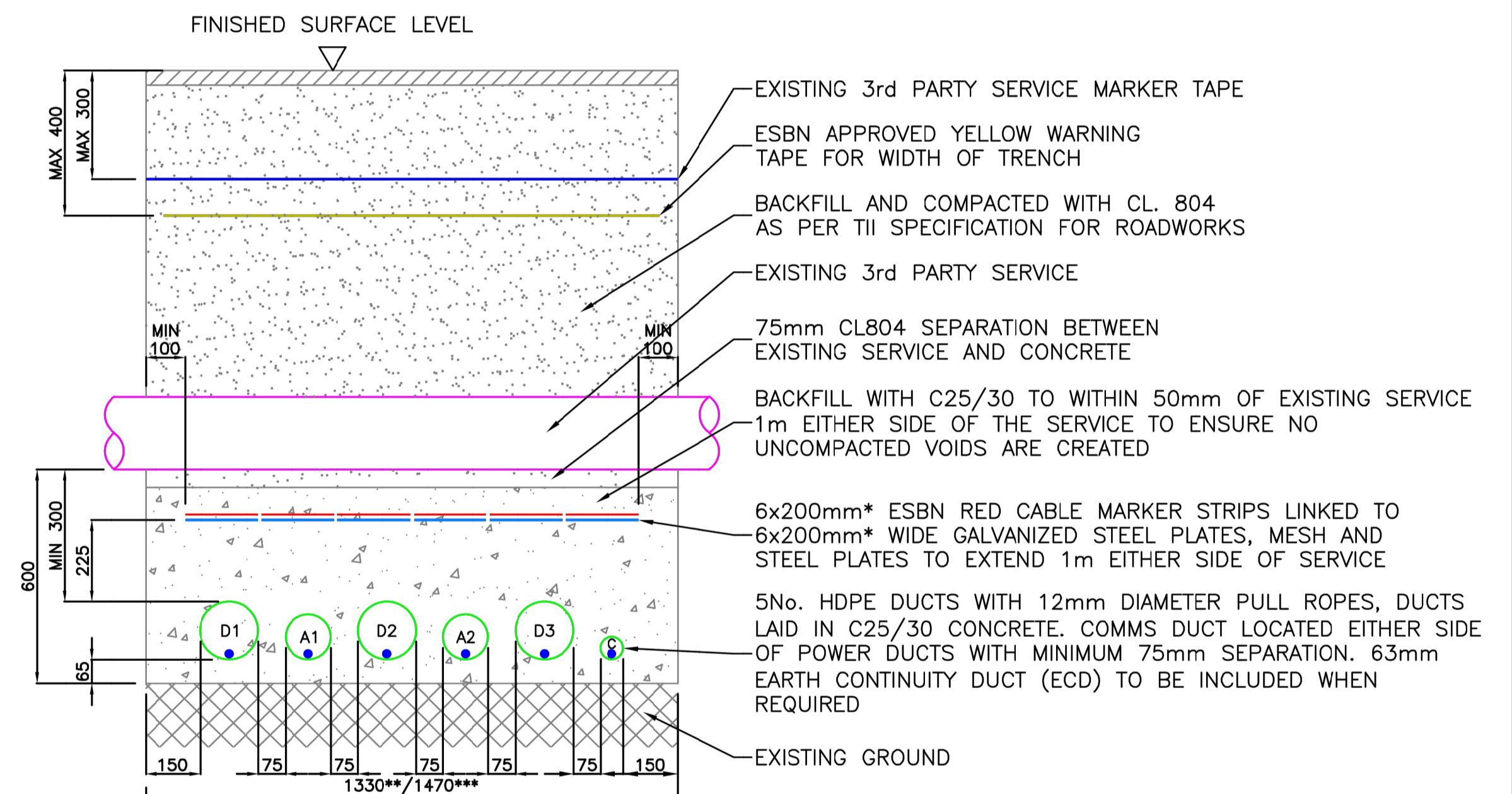


**NOTES:**

1. ALL PRODUCTS AND MATERIALS TO BE UTILISED DURING CONSTRUCTION TO COMPLY WITH EIRGRID FUNCTIONAL SPECIFICATION, ESNB STANDARDS, TII SPECIFICATION FOR ROAD WORKS AND ALL RELEVANT IRISH (EUROPEAN) AND BRITISH STANDARDS.
2. 300mm MINIMUM VERTICAL AND HORIZONTAL CLEARANCES TO BE OBSERVED BETWEEN CABLE DUCTS AND THIRD PARTY SERVICES (e.g. GAS PIPES, WATER MAINS, CULVERTS, etc.) IN THE CASE OF HIGH RISK 3rd PARTY SERVICES, GREATER CLEARANCES MAY BE REQUIRED. DESIGNER TO CONSULT EIRGRID AND 3rd PARTY SERVICE OWNERS FOR GUIDANCE.
3. STEEL PLATES MUST COVER DUCTS. NO OVERLAP IS REQUIRED HOWEVER STANDARD DIMENSIONS MAY RESULT IN AN OVERLAP. SPACING OF 10mm TO BE MAINTAINED BETWEEN STEEL PLATES TO PREVENT THE TRANSFER OF STRAY CURRENT.
4. THE MINIMUM CLEARANCE BETWEEN ALL HV AND COMMUNICATION DUCTS IS **75mm**, (CABLE RATING CALCULATIONS TO BE PROVIDED FOR ACCEPTANCE).
5. DRAWING IS INDICATIVE ONLY, TO BE USED TO AID IN THE DESIGN OF THE RELEVANT INFRASTRUCTURE.
6. TEMPLATES ARE TO BE USED AT 5m INTERVALS DURING DUCT INSTALLATION IN CBGM. PRE-MADE 75mm WIDE CONCRETE SPACERS TO BE USED DURING DUCT INSTALLATION IN WET CONCRETE.
7. MINIMUM SPACING BETWEEN POWER DUCTS TO BE CONFIRMED WITH RATING CALCULATION.
8. HAND DIG WITHIN 500mm OF EXISTING SERVICE.
9. WHERE AN EARTH CONTINUITY CONDUCTOR (ECC) IS REQUIRED, A MIN 63mm DUCT TO BE INSTALLED OUTSIDE OF PHASE DUCT.
10. IF EXISTING SERVICE MARKER TAPE IS NOT PRESENT, THE ESNB YELLOW MARKER TAPE SHOULD BE INSTALLED AT MAXIMUM 300mm BELOW FINISHED SURFACE LEVEL.

- RED MARKER STRIP
- YELLOW MARKER WARNING TAPE
- EXISTING SERVICE MARKER STRIP
- 6mm GALVANISED STEEL PLATE
- RAPID HARDENING WET CONCRETE C25/30
- CBGM B (CL. 822), COMPACTED TO CL. 813.10
- BACKFILL, COMPACTED (CL. 804)
- EXISTING GROUND

**FULL FLAT FORMATION FOR CROSSING BELOW 3RD PARTY SERVICE**



A= 125mm O.D. HDPE DUCT FOR COMMUNICATIONS  
 D= 160mm O.D. HDPE DUCT FOR HV CABLE  
 C= 63mm O.D. HDPE DUCT FOR EARTH CONTINUITY CONDUCTOR

- \* 5x200mm STEEL PLATE AND RED MARKER WHERE ECC IS NOT REQUIRED
- \*\* MIN 1330mm WHERE ECC NOT REQUIRED
- \*\*\* SEE NOTE 9

<p><b>EirGrid plc</b>          The Oval, 160 Shelbourne Road,          Ballsbridge, Dublin 4, Ireland</p> <p>Telephone: +353 1 677 1700          Fax: +353 1 661 5375          Email: info@eirgrid.com          Web: www.eirgrid.com</p>	STANDARD 110kV CABLE DRAWINGS	
	<p>DRAWING TITLE</p> <p>STANDARD 3rd PARTY CROSSING          160mm BELOW IN FULL FLAT          FORMATION</p>	
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<p>DRAWING NUMBER</p> <p>XDC-CBL-STND-H-004</p>		<p>SHEET REV</p> <p>002 00</p>

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REV	DESC	DRAWN	CHECKED	APPROVED	DATE

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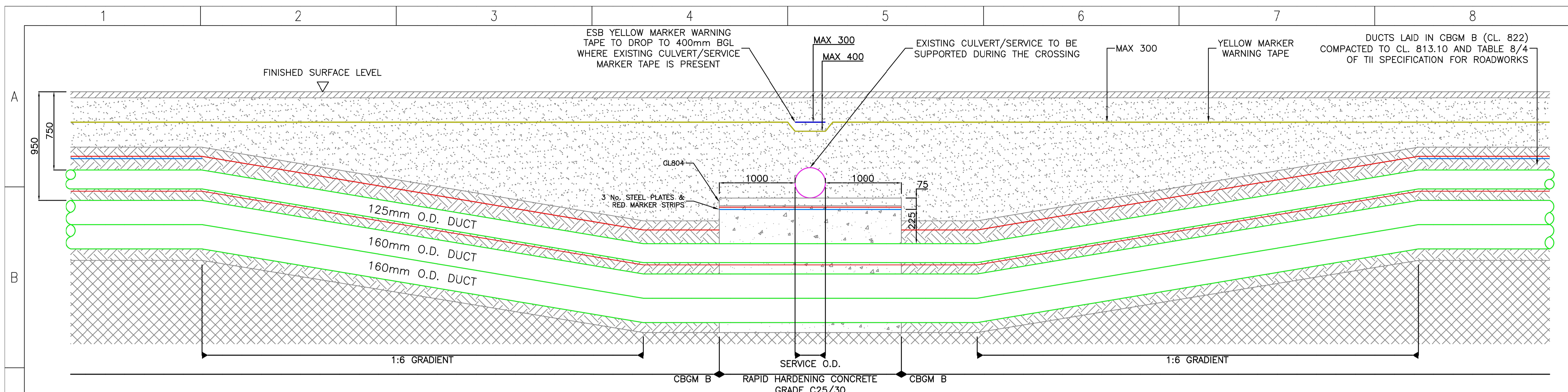
COLOUR DRAWING

Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	14.09.23				
P02	ISSUED FOR COMMENT	DM	02.10.24				

Client: **Bord na Móna**

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Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM  
 Title: STANDARD DETAILS - SHEET 3 OF 6  
 Drawn: D.M    Date drawn: SEPTEMBER 2023    Technician Check: N.H    Engineer Check: K.O.R    Approved: K.O.R  
 Project No: 222278    Model Ref: 222278-PUNCH-LT-SD-M2-C-001-006    Drawing Status: 53  
 Scale @ A1: NTS    Document No: 222278-PUNCH-LT-SD-DR-C-003    Revision No: P02

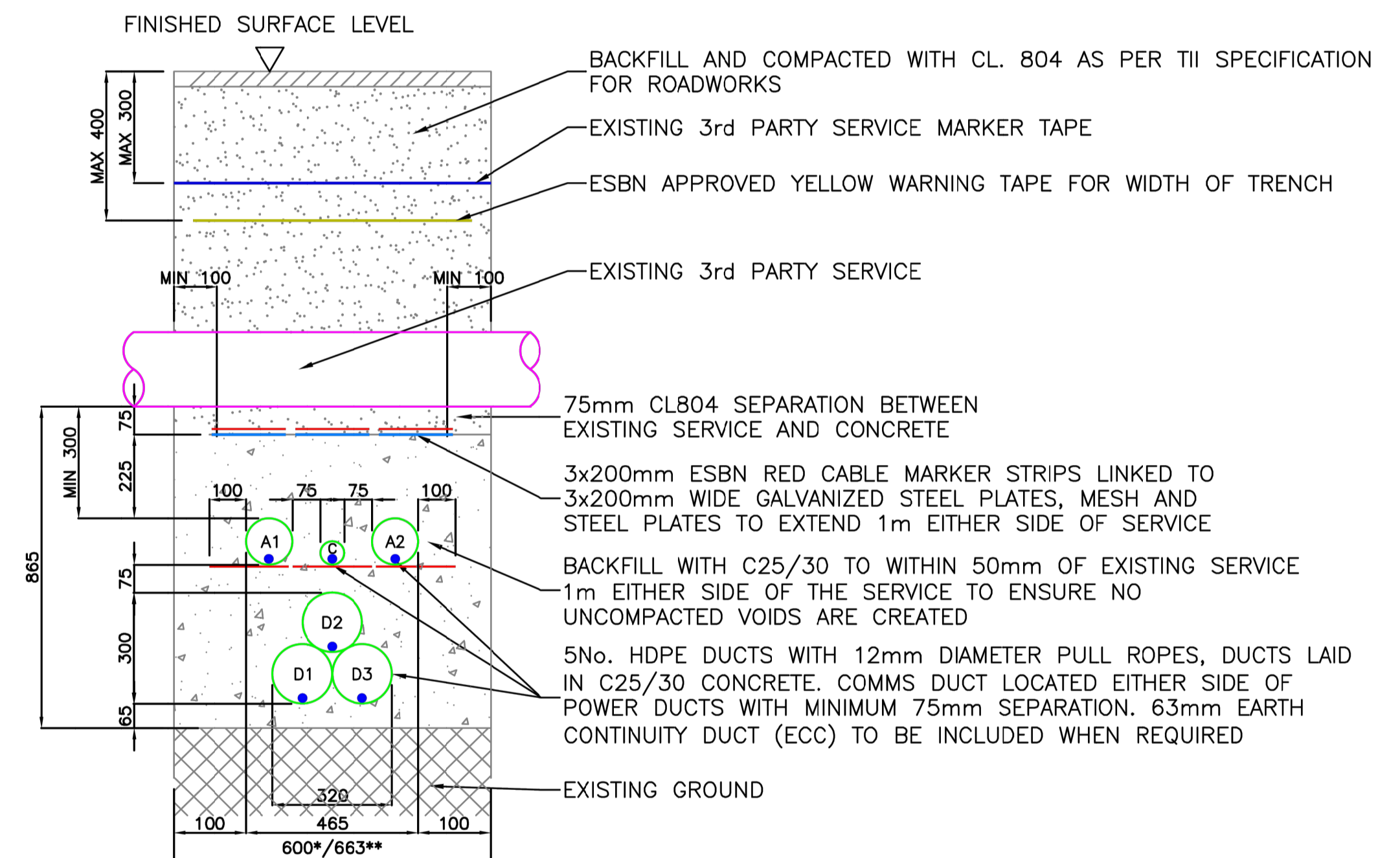


**NOTES:**

1. ALL PRODUCTS AND MATERIALS TO BE UTILISED DURING CONSTRUCTION TO COMPLY WITH EIRGRID FUNCTIONAL SPECIFICATION, ESBN STANDARDS, TII SPECIFICATION FOR ROAD WORKS AND ALL RELEVANT IRISH (EUROPEAN) AND BRITISH STANDARDS.
2. 300mm MINIMUM VERTICAL AND HORIZONTAL CLEARANCES TO BE OBSERVED BETWEEN CABLE DUCTS AND THIRD PARTY SERVICES (e.g. GAS PIPES, WATER MAINS, CULVERTS, etc.) IN THE CASE OF HIGH RISK 3rd PARTY SERVICES, GREATER CLEARANCES MAY BE REQUIRED. DESIGNER TO CONSULT EIRGRID AND 3rd PARTY SERVICE OWNERS FOR GUIDANCE.
3. STEEL PLATES MUST COVER DUCTS. NO OVERLAP IS REQUIRED HOWEVER STANDARD DIMENSIONS MAY RESULT IN AN OVERLAP. SPACING OF 10mm TO BE MAINTAINED BETWEEN STEEL PLATES TO PREVENT THE TRANSFER OF STRAY CURRENT.
4. THE MINIMUM CLEARANCE BETWEEN ALL HV AND COMMUNICATION DUCTS IS 75mm, (CABLE RATING CALCULATIONS TO BE PROVIDED FOR ACCEPTANCE).
5. DRAWING IS INDICATIVE ONLY, TO BE USED TO AID IN THE DESIGN OF THE RELEVANT INFRASTRUCTURE.
6. TEMPLATES ARE TO BE USED AT 5m INTERVALS DURING DUCT INSTALLATION IN CBGM. PRE-MADE 75mm WIDE CONCRETE SPACERS TO BE USED DURING DUCT INSTALLATION IN WET CONCRETE.
7. MINIMUM SPACING BETWEEN POWER DUCTS TO BE CONFIRMED WITH RATING CALCULATION.
8. HAND DIG WITHIN 500mm OF EXISTING SERVICE.
9. WHERE AN EARTH CONTINUITY CONDUCTOR (ECC) IS REQUIRED, A MIN 63mm DUCT TO BE INSTALLED OUTSIDE OF PHASE DUCT.
10. IF EXISTING SERVICE MARKER TAPE IS NOT PRESENT, THE ESBN YELLOW MARKER TAPE SHOULD BE INSTALLED AT MAXIMUM 300mm BELOW FINISHED SURFACE LEVEL.

- RED MARKER STRIP
- YELLOW MARKER WARNING TAPE
- EXISTING SERVICE MARKER STRIP
- 6mm GALVANISED STEEL PLATE
- RAPID HARDENING WET CONCRETE C25/30
- CBGM B (CL. 822), COMPACTED TO CL. 813.10
- BACKFILL, COMPACTED (CL. 804)
- EXISTING GROUND

**TREFOIL FORMATION FOR CROSSING BELOW 3RD PARTY SERVICE**



- A = 125mm O.D. HDPE DUCT FOR COMMUNICATIONS
- D = 160mm O.D. HDPE DUCT FOR HV CABLE
- C = 63mm O.D. HDPE DUCT FOR EARTH CONTINUITY CONDUCTOR
- \* MIN 600mm WHERE ECC NOT REQUIRED
- \*\* SEE NOTE 9

**EIRGRID**  
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**STANDARD 110kV CABLE DRAWINGS**

DRAWING TITLE  
**STANDARD 3rd PARTY CROSSING  
 160mm BELOW IN TREFOIL FORMATION**

No of Shts	3	SIZE	A3	SCALE	N/A
DRAWING NUMBER	XDC-CBL-STND-H-004	SHEET	003	REV	00

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COLOUR DRAWING

NSAI Certified

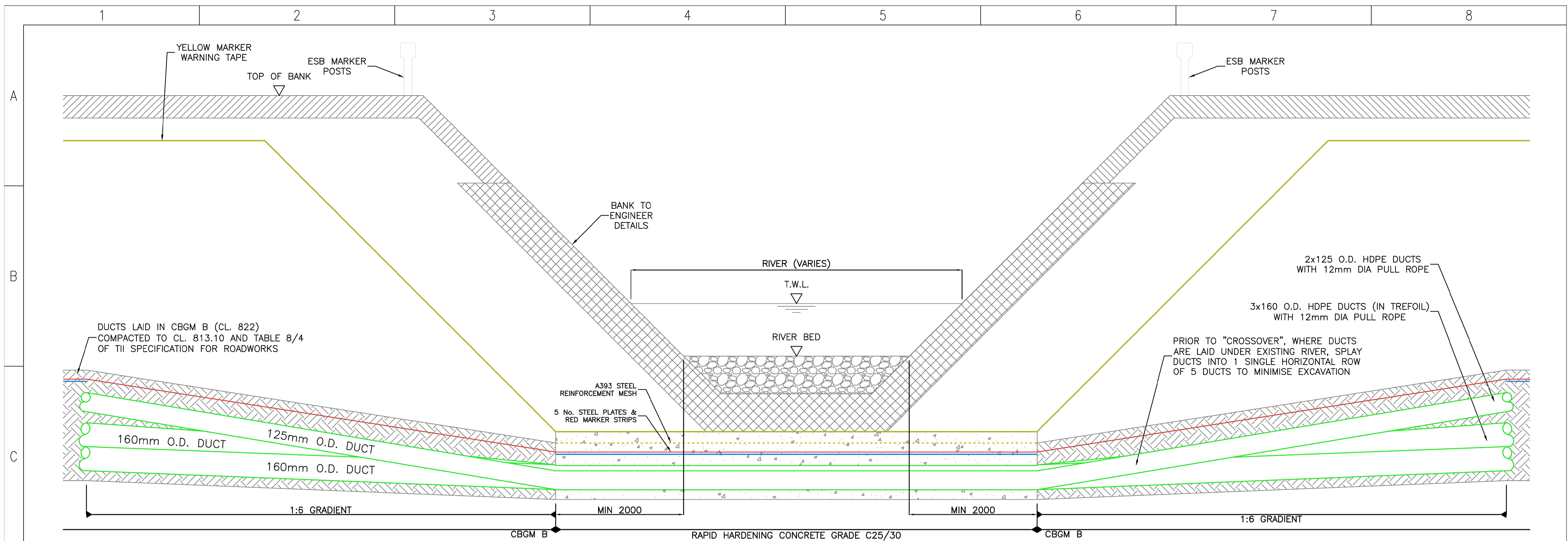
Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	14.09.23				
P02	ISSUED FOR COMMENT	DM	02.10.24				

REV	DESC	DRAWN	CHECKED	APPROVED	DATE
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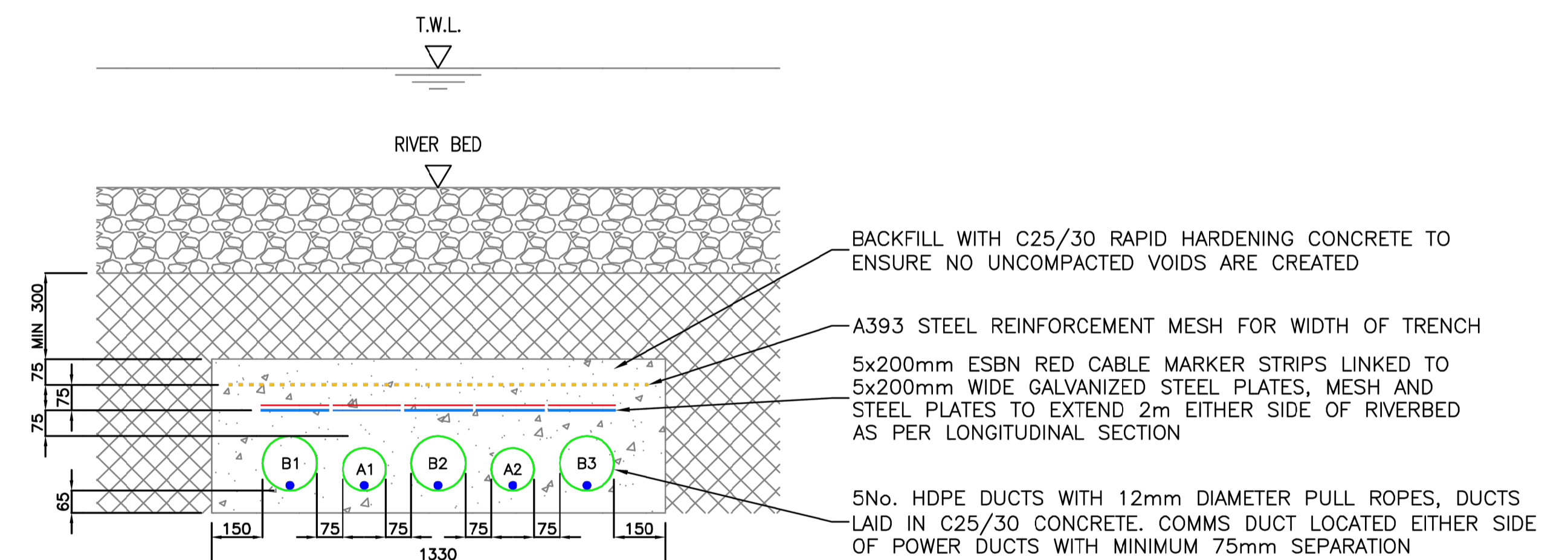
Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM  
 Title: STANDARD DETAILS - SHEET 4 OF 6  
 Drawn: D.M. Date: SEPTEMBER 2023 Technician Check: N.H. Engineer Check: K.O.R. Approved: K.O.R.  
 Project No: 222278 Model Ref: 222278-PUNCH-LT-SD-M2-C-001-006 Drawing Status: S3  
 Scale @ A1: NTS Document No: 22278-PUNCH-LT-SD-DR-C-004 Revision No: P02



**NOTES:**

1. ALL PRODUCTS AND MATERIALS TO BE UTILISED DURING CONSTRUCTION TO COMPLY WITH EIRGRID FUNCTIONAL SPECIFICATION, ESNB STANDARDS, TII SPECIFICATION FOR ROAD WORKS AND ALL RELEVANT IRISH (EUROPEAN) AND BRITISH STANDARDS.
2. 300mm MINIMUM VERTICAL AND HORIZONTAL CLEARANCES TO BE OBSERVED BETWEEN CABLE DUCTS AND THIRD PARTY SERVICES (e.g. GAS PIPES, WATER MAINS, CULVERTS, etc.) IN THE CASE OF HIGH RISK 3rd PARTY SERVICES, GREATER CLEARANCES MAY BE REQUIRED. DESIGNER TO CONSULT EIRGRID AND 3rd PARTY SERVICE OWNERS FOR GUIDANCE.
3. STEEL PLATES MUST COVER DUCTS. NO OVERLAP IS REQUIRED HOWEVER STANDARD DIMENSIONS MAY RESULT IN AN OVERLAP. SPACING OF 10mm TO BE MAINTAINED BETWEEN STEEL PLATES TO PREVENT THE TRANSFER OF STRAY CURRENT.
4. THE MINIMUM CLEARANCE BETWEEN ALL HV AND COMMUNICATION DUCTS IS 75mm, BUT INCREASED SPACING MAY BE REQUIRED IN ORDER TO ACHIEVE THE CABLE RATING (CABLE RATING CALCULATIONS TO BE PROVIDED FOR ACCEPTANCE).
5. DRAWING IS INDICATIVE ONLY, TO BE USED TO AID IN THE DESIGN OF THE RELEVANT INFRASTRUCTURE.
6. TEMPLATES ARE TO BE USED AT 5m INTERVALS DURING DUCT INSTALLATION IN CBGM. PRE-MADE 75mm WIDE CONCRETE SPACERS TO BE USED DURING DUCT INSTALLATION IN WET CONCRETE.
7. MINIMUM SPACING BETWEEN POWER DUCTS TO BE CONFIRMED WITH RATING CALCULATION.
8. MINIMUM CLEARANCE BETWEEN CABLE TRENCH CONCRETE AND RIVER BED TO BE AGREED WITH RELEVANT AUTHORITY.
9. STANDARD ESB MARKER POSTS TO BE INSTALLED AT EITHER SIDE OF RIVER CROSSING.

- RED MARKER STRIP
- YELLOW MARKER WARNING TAPE
- A393 STEEL REINFORCEMENT MESH
- 6mm GALVANISED STEEL PLATE
- RAPID HARDENING WET CONCRETE C25/30
- CBGM B (CL. 822), COMPACTED TO CL. 813.10
- EXISTING GROUND
- REINSTATED RIVERBED



A = 125mm O.D. HDPE DUCT FOR COMMUNICATIONS  
 B = 160mm O.D. HDPE DUCT FOR HV CABLE

<b>EirGrid plc</b> The Oval, 160 Shelbourne Road, Ballsbridge, Dublin 4, Ireland Telephone: +353 1 677 1700 Fax: +353 1 661 5375 Email: info@eirgrid.com Web: www.eirgrid.com	<b>STANDARD 110kV CABLE DRAWINGS</b>	
	DRAWING TITLE <b>STANDARD RIVERBED CROSSING          160mm RIVERBED CROSSING</b>	
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DRAWING NUMBER <b>XDC-CBL-STND-H-005</b>		SHEET: 003 REV: 00

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REV	DESC	DRAWN	CHECKED	APPROVED	DATE

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COLOUR DRAWING

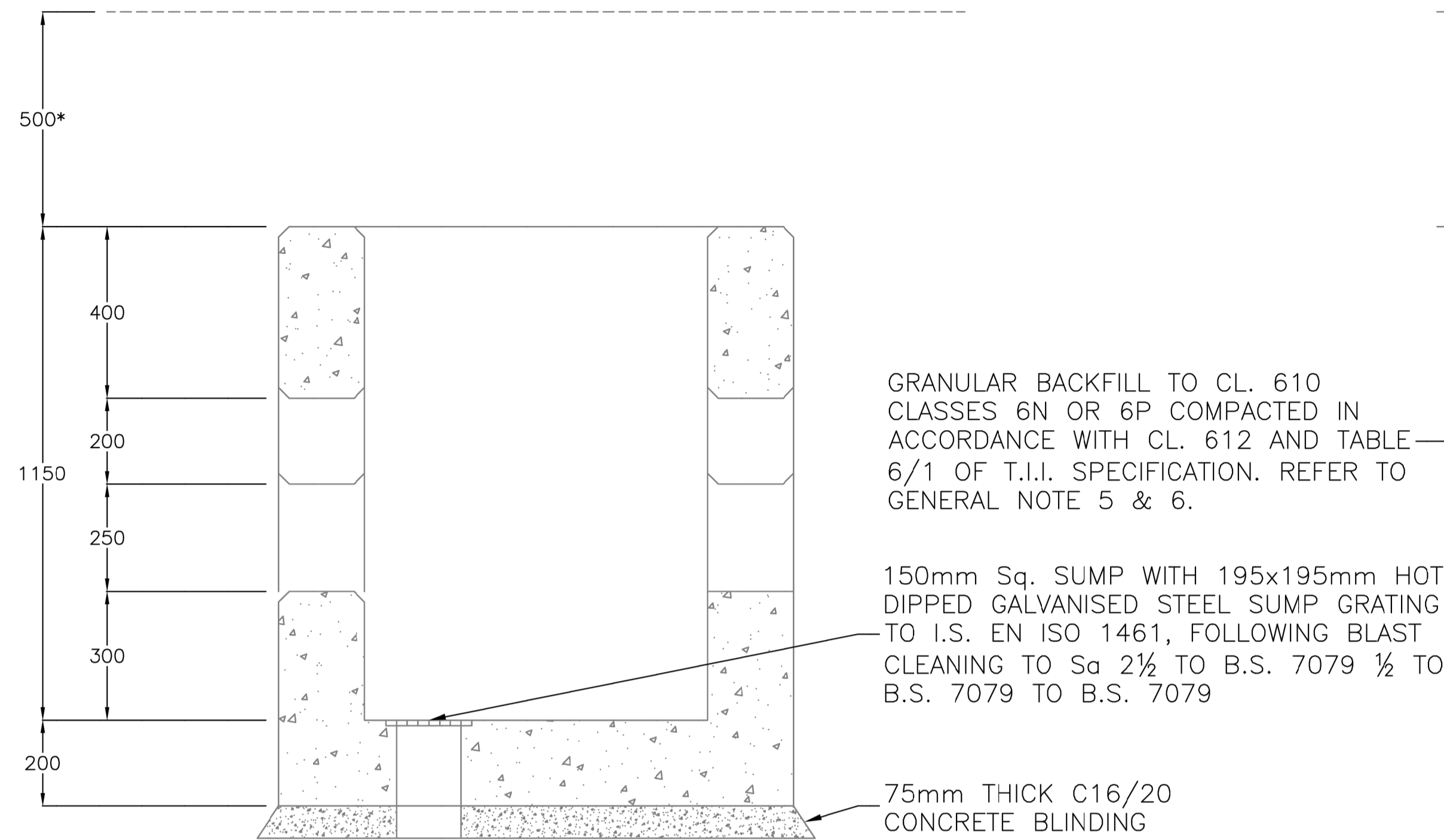
Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	14.09.23				
P02	ISSUED FOR COMMENT	DM	02.10.24				

Client: **Bord na Móna**

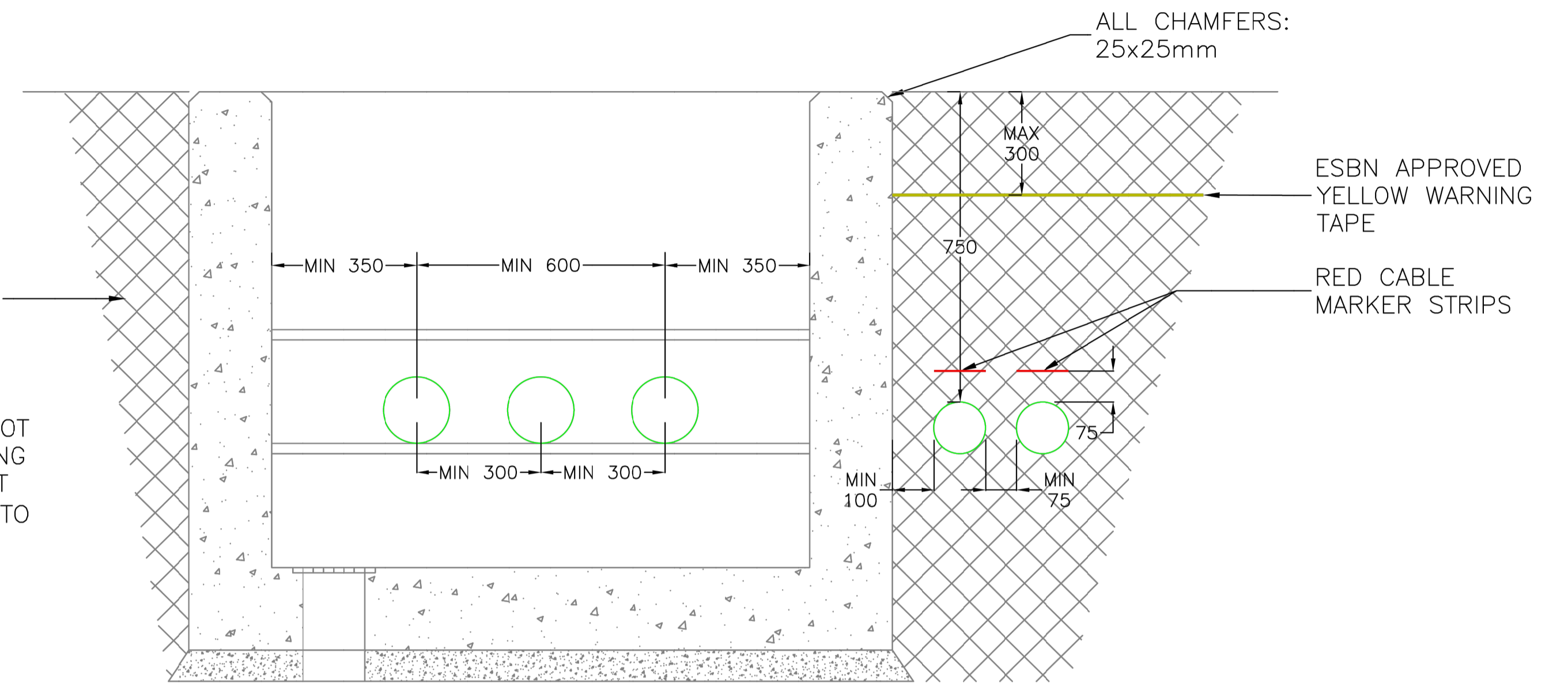
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 Carnegie House Library Road,  
 Dun Laoghaire, Co. Dublin, A96 CTW7  
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Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM  
 Title: STANDARD DETAILS - SHEET 5 OF 6  
 Drawn: D.M. Date: SEPTEMBER 2023  
 Project No: 222278  
 Scale @ A1: NTS  
 Model Ref: 222278-PUNCH-LT-SD-M2-C-001-006  
 Document No: 222278-PUNCH-LT-SD-DR-C-005  
 Engineer Check: K.O.R. Approved: K.O.R.  
 Drawing Status: 53  
 Revision No: P02

\*COVER: REFER TO GENERAL NOTE 14 (SHEET 005)

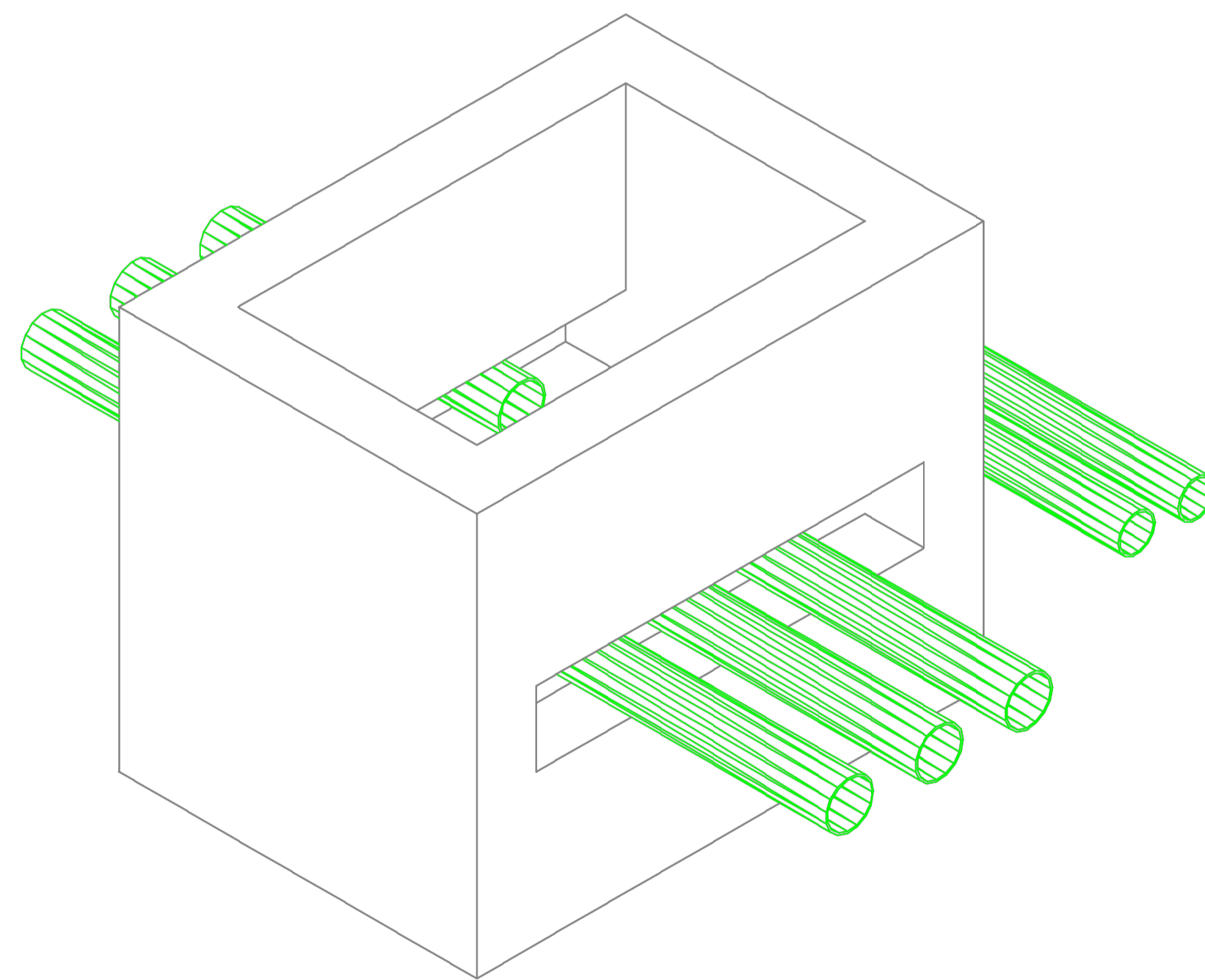


SECTION A  
SCALE 1:20



SECTION B  
SCALE 1:20

REFER TO SHEET 005 FOR GENERAL AND PRECAST CONCRETE NOTES



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<b>EirGrid plc</b> The Oval, 160 Shelbourne Road, Ballsbridge, Dublin 4, Ireland  Telephone: +353 1 677 1700 Fax: +353 1 661 5375 Email: info@eirgrid.com Web: www.eirgrid.com	PROJECT STANDARD 110kV CABLE DRAWINGS					
	DRAWING TITLE TRANSITION CHAMBER SECTION DETAILS					
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	DRAWING NUMBER	XDC-CBL-STND-H-013		SHEET	003	REV

Rev	Amendment	By	Date	Rev	Amendment	By	Date
P01	ISSUED FOR COMMENT	DM	14.09.23				
P02	ISSUED FOR COMMENT	DM	02.10.24				

By	Date	Rev	Amendment	By	Date	Client:
						Bord na Móna

Project: UNDERGROUND CABLE GRID ROUTE - LITTLETON WIND FARM			
Title: STANDARD DETAILS - SHEET 6 OF 6			
Drawn: D.M.	Date: SEPTEMBER 2023	Technician Check: N.H.	Engineer Check: K.O.R.
Project No: 222278	Model Ref: 222278-PUNCH-LT-SD-M2-C-001-006	Drawing Status: S3	Approved: K.O.R.
Scale @ A1: NTS	Document No: 222278-PUNCH-LT-SD-DR-C-006	Revision No: P02	

A

**NOTES:**

1. BASE COURSE AND WEARING COURSE TO BE IN ACCORDANCE WITH TII (NRA) SPECIFICATION FOR ROADWORKS SERIES 900.
2. ALL PRODUCTS AND MATERIALS TO BE UTILISED DURING CONSTRUCTION TO COMPLY WITH EIRGRID FUNCTIONAL SPECIFICATION, TII SPECIFICATION FOR ROAD WORKS AND ALL RELEVANT IRISH (EUROPEAN) AND BRITISH STANDARDS.
3. DRAWING IS INDICATIVE ONLY, TO BE USED TO AID IN THE DESIGN OF THE RELEVANT INFRASTRUCTURE.
4. FOR DETAILS OF CABLE TRENCH LAYOUT, REFER TO XDC-CBL-STND-H-008.
5. THIS IS A TYPICAL CROSS SECTION DETAIL FOR SHALLOW PEAT INSTALLATION. SPECIFIC CONSTRUCTION DESIGN SHALL COMPLY WITH CDS-HFS-01-001.

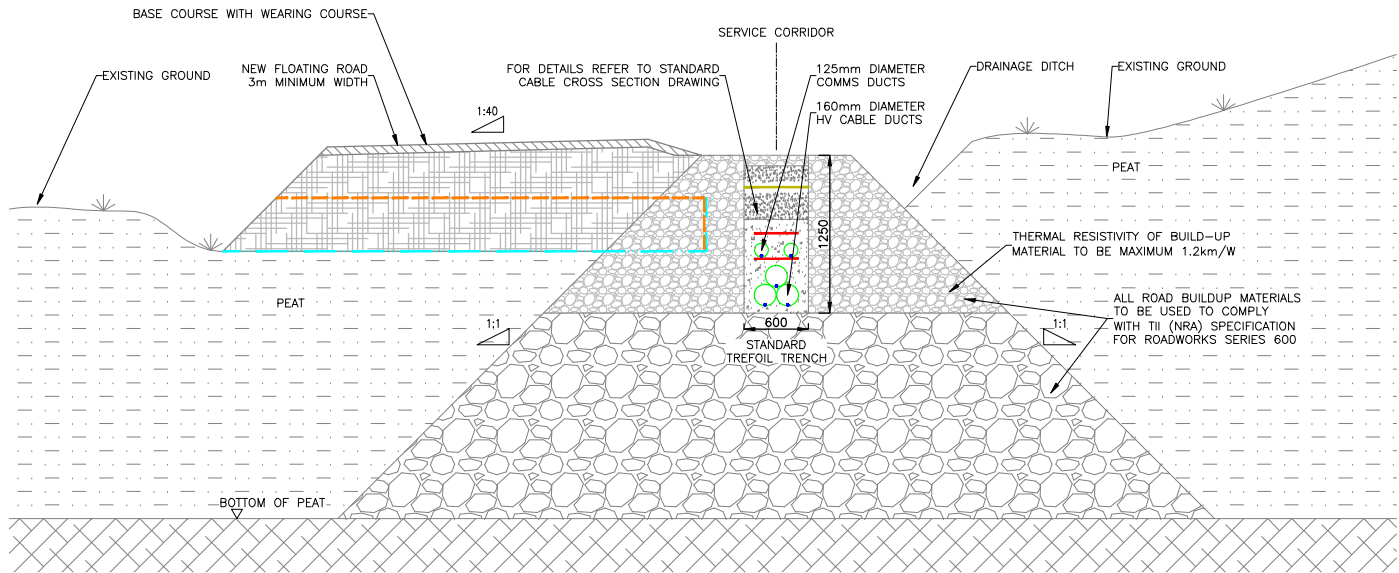
B

C

D

E

F



**LEGEND:**

- GEOTEXTILE
- GEOGRID
- RED MARKER STRIP
- YELLOW MARKER WARNING TAPE

SECTION THROUGH CABLE TRENCH BUILT TO SOLID (FLOATING ROAD)  
PEAT DEPTH <2.5m  
SCALE 1:50

	<b>EirGrid plc</b> The Oval, 160 Shelbourne Road, Ballsbridge, Dublin 4, Ireland  Telephone: +353 1 677 1700 Fax: +353 1 661 5375 Email: info@eirgrid.com Web: www.eirgrid.com	STANDARD 110kV CABLE DRAWINGS	
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		DRAWING TITLE TYPICAL SECTION THROUGH SOLID CABLE TRENCH (FLOATING ROAD) PEAT DEPTH <2.5m	No of Shts 4 SCALE N/A
		DRAWING NUMBER XDC-CBL-STND-H-007	SHEET REV 002 00

00	FIRST ISSUE	DA	DG	CF	09/03/2020
REV	DESC	DRAWN	CHECKED	APPROVED	DATE





PLAN  
Scale 1:200



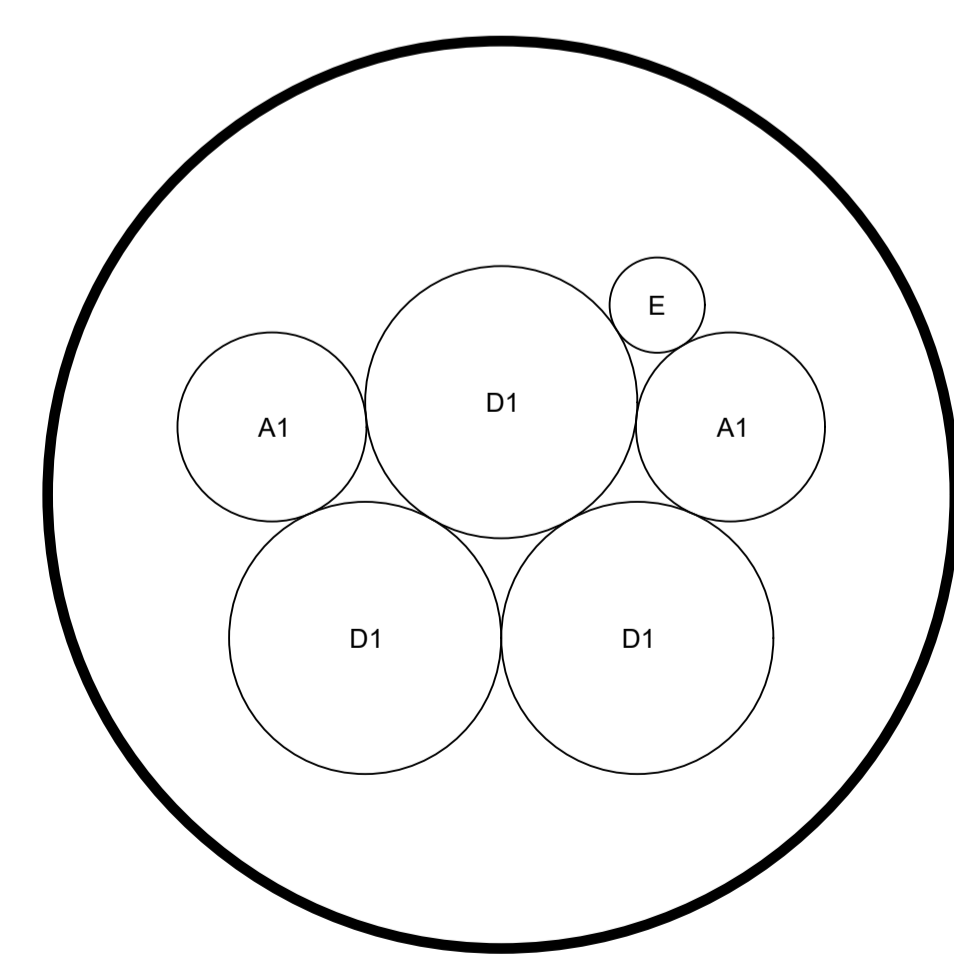
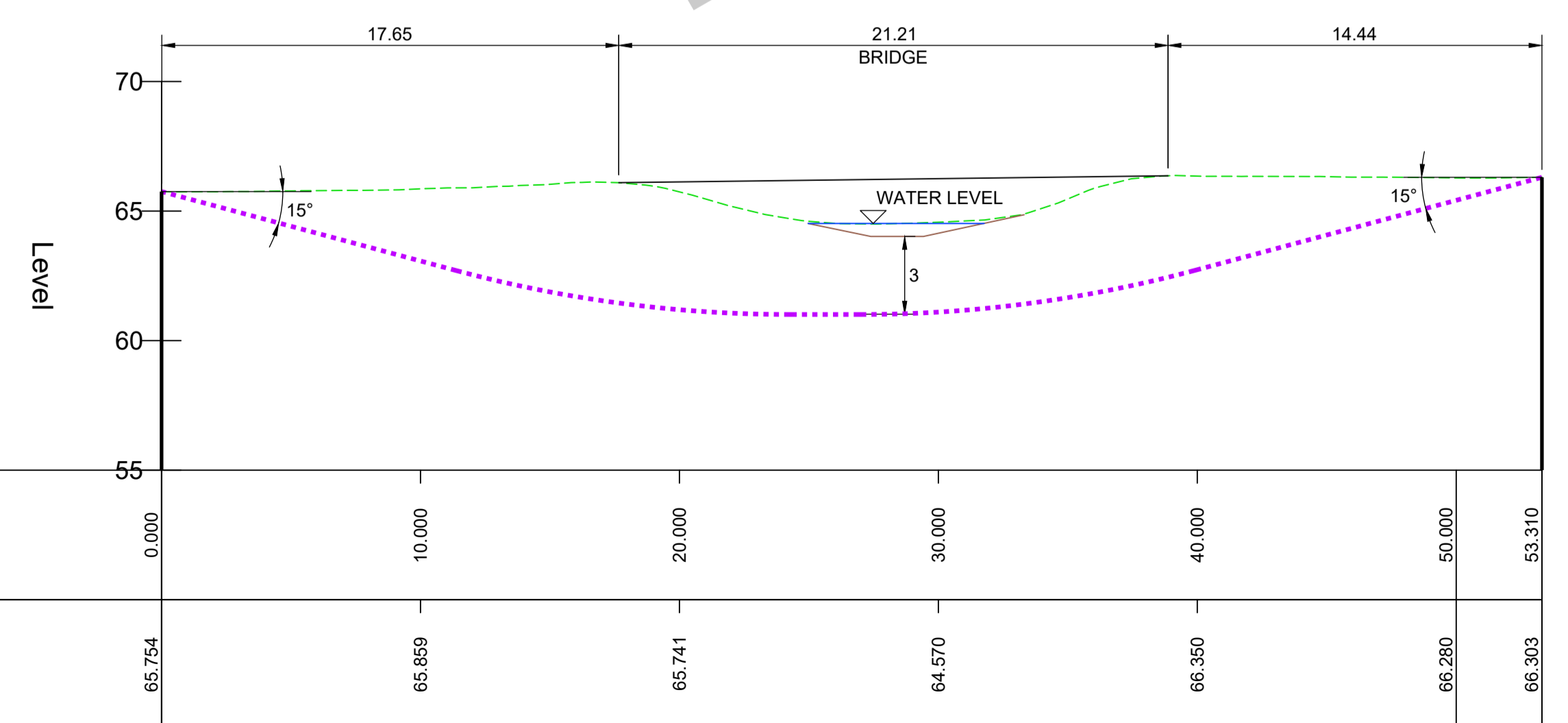
KEY PLAN  
Scale 1:5000

- LEGEND**
- LITTLETON GRID ROUTE
  - DIRECTIONAL DRILL ROUTE
  - COMPOUND AREA
  - LAUNCH / EXIT PITS
  - SPECIAL AREA OF CONSERVATION (SAC)

- NOTES**
1. INDICATIVE ONLY.
  2. DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.

- PRELIMINARY DESIGN ONLY - DETAILED DESIGN TO BE UNDERTAKEN.
- PRELIMINARY DESIGN FOR THE PURPOSE OF EIA ASSESSMENT FOR THE WINDFARM ONLY AND NOT TO BE USED FOR GRID ROUTE PLANNING APPLICATION.
- PRELIMINARY DESIGN HAS NOT CONSIDERED BURIED SERVICES OR EXISTING GROUND CONDITIONS.

**BRIDGE - LONGSECTION**  
SCALE: H 1:200, V 1:200. DATUM: 55.000

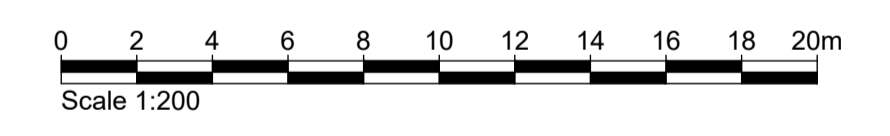
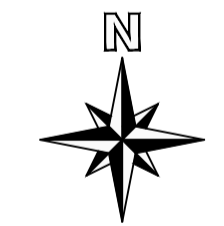


TYPICAL CROSS SECTION OF CABLE DUCT AT HDD LOCATIONS  
Scale 1:5

NOTE: DRILLING FLUID TO BE APPROVED BY LOCAL AUTHORITY & THE RELEVANT STATUTORY ENVIRONMENTAL AGENCIES

- 600 DIA. BORE
- D = 3No. 180mm SDR 21 HDPE DUCT
- A = 2No. 125mm SDR 11 HDPE DUCT
- E = 1No. MIN 63mm SDR 11 HDPE DUCT

Scale 1:5



02	04/12/25	INFORMATION.	DL	LM	DK
01	11/11/25	INFORMATION.	DL	LM	DK
Rev	Date	Status	Drwn	Chkd	Appd



**LITTLETON WIND FARM**

**CROSSING 9 - CROSSING OF RIVER LISDOWNEY**

Status: INFORMATION  
Scale: 1:100

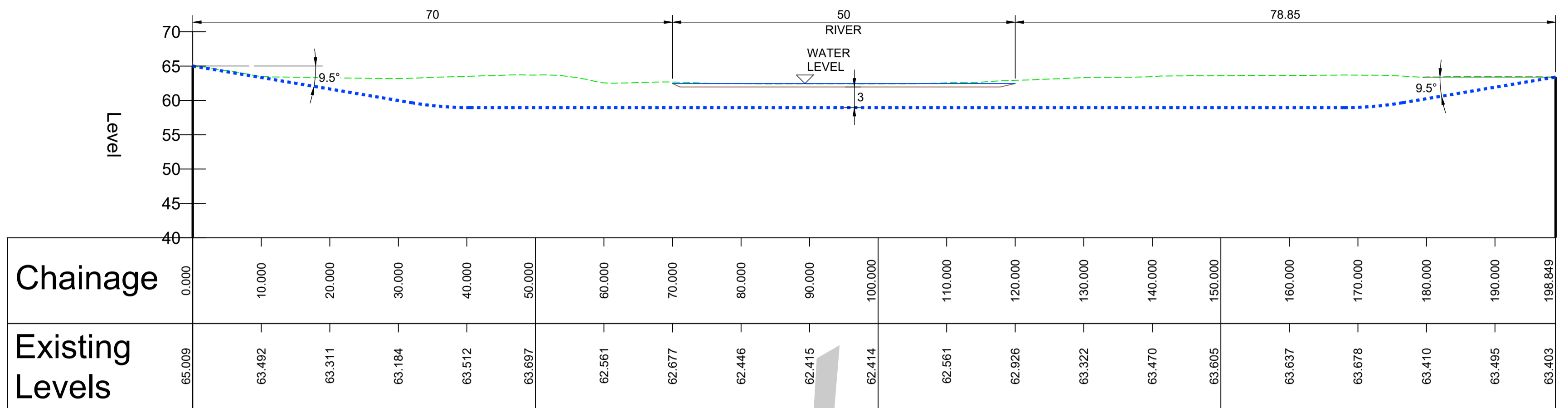
Contractor Drawing number: -  
Contractor Revision: -

SSE Drawing number: **WLN-CVL-SK-0008**  
Sheet No.: **001 OF 001**  
Revision: **02**



PLAN  
Scale 1:500

CROSSING 10 - LONGSECTION  
SCALE: H 1:500, V 1:500. DATUM: 40.000

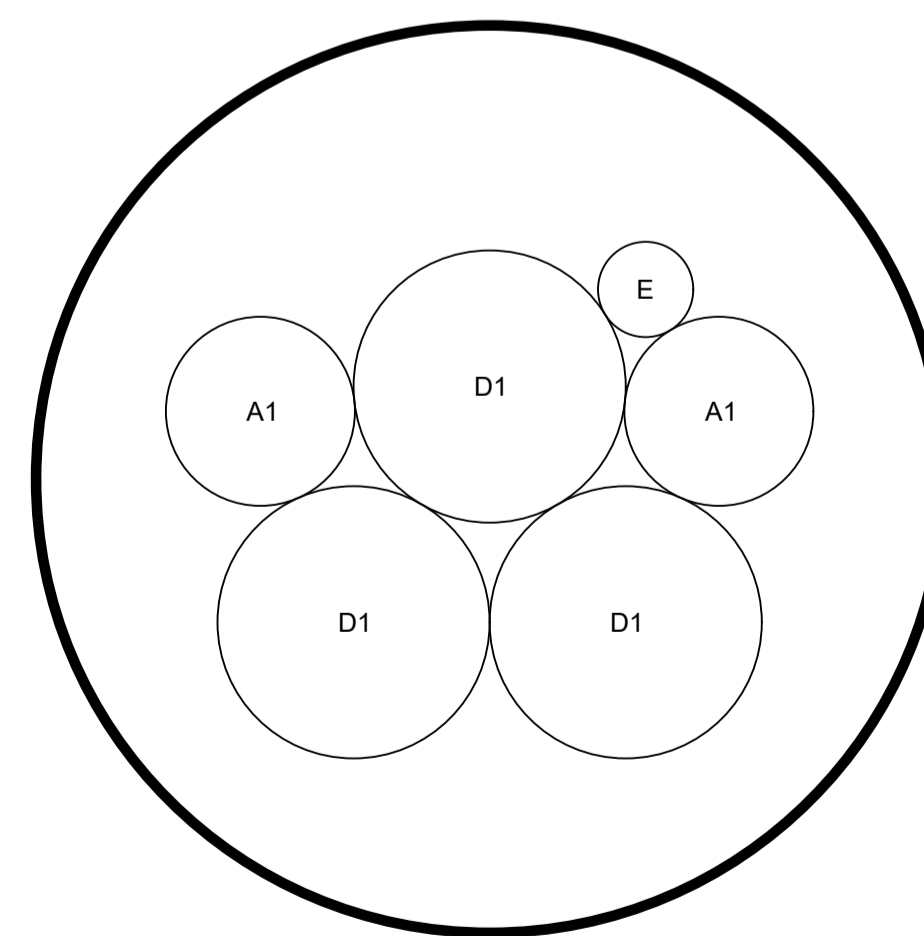


KEY PLAN  
Scale 1:5000

- LEGEND
- LITTLETON GRID ROUTE
  - DIRECTIONAL DRILL ROUTE
  - COMPOUND AREA
  - LAUNCH / EXIT PITS
  - SPECIAL AREA OF CONSERVATION (SAC)

- NOTES
1. INDICATIVE ONLY.
  2. DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.

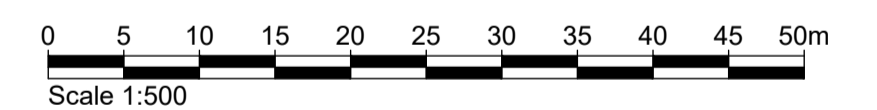
- PRELIMINARY DESIGN ONLY - DETAILED DESIGN TO BE UNDERTAKEN.
- PRELIMINARY DESIGN FOR THE PURPOSE OF EIA ASSESSMENT FOR THE WINDFARM ONLY AND NOT TO BE USED FOR GRID ROUTE PLANNING APPLICATION.
- PRELIMINARY DESIGN HAS NOT CONSIDERED BURIED SERVICES OR EXISTING GROUND CONDITIONS.



TYPICAL CROSS SECTION OF CABLE  
DUCT AT HDD LOCATIONS  
Scale 1:5

NOTE: DRILLING FLUID TO BE APPROVED BY LOCAL AUTHORITY & THE RELEVANT STATUTORY ENVIRONMENTAL AGENCIES

600 DIA. BORE  
D = 3No. 180mm SDR 21 HDPE DUCT  
A = 2No. 125mm SDR 11 HDPE DUCT  
E = 1No. MIN 63mm SDR 11 HDPE DUCT



02	04/12/25	INFORMATION.	DL	LM	DK
01	11/11/25	INFORMATION.	DL	LM	DK
Rev	Date	Status	Drwn	Chkd	Appd



Project  
**LITTLETON WIND FARM**

Title  
**CROSSING 10 - CROSSING OF RIVER NORE**

Status  
**INFORMATION**

Scale  
**AS SHOWN**

Contractor Drawing number  
-

Contractor Revision  
-

SSE Drawing number  
**WLN-CVL-SK-0009**

Sheet No.  
**001 OF 001**

Revision  
**02**