Ballyvatta 110kV Substation and Grid Connection

Outline Construction Traffic Management Plan

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Document Control

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1 Introduction

1.1 General

PUNCH Consulting Engineers were appointed by Tom Phillips + Associates (TPA) on behalf of the Applicant (Ballyvatta Solar Farm Limited), to prepare this Outline Construction Traffic Management Plan (OCTMP) for the proposed 110kV substation development in Ballyvatta, Co. Cork.

This OCTMP sets out guidelines on traffic management during the construction phase of the development. It has been prepared prior to the appointment of a contractor. It will be the responsibility of the appointed contractor to prepare and submit a full detailed Construction Traffic Management Plan (CTMP) to Cork County Council and An Garda Síochána for agreement and approval, prior to commencement of construction.

The CTMP will be a live document that will be updated throughout the project lifecycle by the Appointed Contractor if required. Regardless of the form of contract, the Contractor will be contractually bound by any conditions arising from the site constraints identified and specified, all Statutory Regulations governing the works, and any additional measures or modifications that may be imposed on the proposed development by Cork County Council.

1.2 Purpose and Scope

This OCTMP is a critical construction contract document, aiming to minimize potential impacts during the proposed scheme's construction. Its objectives include:

1. Outlining minimum traffic management measures for site access/egress points and their approaches during the works,
2. Outlining traffic management options for cable laying within roads during the works,
3. Demonstrating to the Developer, Contractor and Suppliers the need to adhere to the relevant guidance documentation for such works,
4. Providing a basis for the Contractor to develop the OCTMP into a comprehensive CTMP.

The Developer or the Employer's Representative will be responsible for ensuring that the Contractor develops this OCTMP into a CTMP and manages the construction activities in accordance with the CTMP.

Objectives and measures are also included for the management, design and construction of the project to control the traffic impacts of construction as it may affect the environment, local residents and the public in the vicinity of the construction works.

The goal of this OCTMP is to minimize residual impacts on the public road network during the construction phase of the proposed development, ensuring transport-related activities are conducted with maximum safety and minimal disruption to other road users.

The OCTMP has also been prepared to identify safe and suitable methods of access for construction traffic to the proposed development. It outlines traffic management strategies for transporting construction materials, equipment, and personnel along the public road network to facilitate the development's construction. Site operatives will primarily use light vehicles, while Heavy Goods Vehicles (HGVs) will transport general construction materials like fill material, concrete, poles, cables etc., to the site and remove excavated material for off-site disposal.

1.3 Legislation & Guidelines

The appointed contractor shall consult the following documents when developing the CTMP:

- Traffic Signs Manual – Chapter 8 – Temporary Traffic Measures and Signs for Roadworks - Department of Transport
- Temporary Traffic Management Design Guidance – Department of Transport
- Guidance for the Control and Management of Traffic at Roadworks – Department of Transport, N.R.A and Local Government Management Services Board
- Guidelines for Working on Roads – Health and Safety Authority, 2009 (Practical guidance on the Safety, Health and Welfare at Work (Construction) (Amendment) (No. 2) Regulations 2008)

These Guideline documents shall be read in conjunction with primary Safety Health & Welfare at Work legislation including the 2005 Act, the Safety, Health and Welfare (Construction) Regulations 2013, and any amendment to them (the Construction Regulations).

1.4 Existing Site

The subject location is a greenfield site in Ballyvatta, Co. Cork. The substation site is situated at 578033 Easting and 578416 Northing to Irish Transverse Mercator (ITM) falling under the jurisdiction of Cork County Council, which is the local authority responsible for the area.

The proposed site is bounded by the existing 220kV substation and L6989 Ballynanelagh Local Road to the south, and greenfield sites to the north, east and west. Access to the site is provided via the L6989 local road. The L6989 is a 2-way road with a width of approximately 4 metres. Grass verges line both sides of the road and there is no hard shoulder. The location of the site is shown in Figure 1-1.

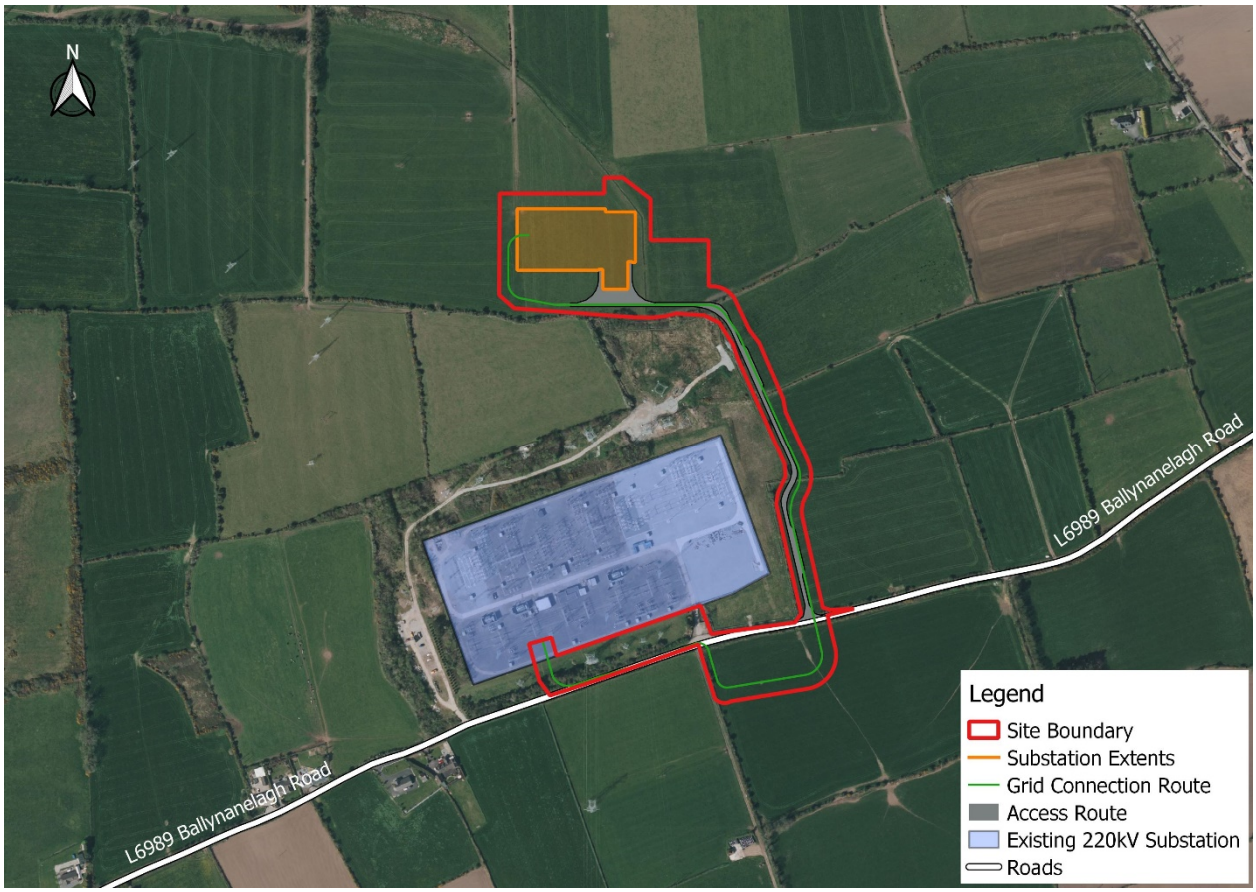

Figure 1-1: Location of the Proposed development

Figure 1-2: L6989 Local Road

1.5 Nature of the Proposed Development

The proposed development comprises the construction of a new 110kV substation and associated grid connection route and access road in Ballyvatta, Co. Cork. The proposed substation location is on a greenfield site currently used for agricultural purposes.

The total planning application area including the substation, grid connection route and access road is 5.35 hectares. The substation itself covers approximately 0.8692 hectares. The grid connection route is 1.09km in length.

The access road will be constructed along the eastern boundary of the existing 220kV substation for deliveries and maintenance. The proposed grid connection will follow the proposed site access road until it meets the L6989, where it will cross under the existing road and utilities (using horizontal directional drilling to the greenfield area to the south of the road and return to the L6989 where it will connect into the existing 220kV Substation.

2 Traffic Control

The following section contains a non-exhaustive list of traffic control measures that are expected as part of the project. It is the responsibility of the appointed contractor to consult the legislation and guidance listed above to determine the appropriate traffic control measures. Anticipated requirements are outlined in Section 5 below.

2.1 Two-Way Traffic

Two-way traffic should be maintained where possible and is the preferred method of traffic management for this project due to the desired low impact on traffic. This type of traffic control is only allowable when the minimum carriageway widths shown in Table 3-1 are achievable. Guidance on the implementation is available in Section 0.5.2.1 of the Temporary Traffic Management Design Guidance.

Table 2-1: Minimum Carriageway Widths for Two Way Working (Guidance for the Control and Management of Traffic at Road Works, 2010)

Normal traffic including buses and HGVs	Cars and light vehicles only
6.75 m desirable minimum	5.5 m desirable minimum
6.0 m absolute minimum	5.0 m absolute minimum

2.2 Shuttle Working

Where two-way traffic cannot be maintained then shuttle working should be employed as traffic control measure full guidance on the requirements is available in Part 1 of Temporary Traffic management Design Guidance however Table 3-2 shows the basic requirements.

Table 2-2: Minimum Carriageway Widths for Shuttle Working (Guidance for the Control and Management of Traffic at Road Works, 2010)

Normal traffic including buses and HGVs	Cars and light vehicles only
3.25 m desirable minimum	2.75 m desirable minimum
3.0 m absolute minimum	2.5 m absolute minimum

2.3 Road Closures

Road closures are envisaged for short periods to facilitate the installation of the grid connection along the public road. Road closures will be carried out in accordance with Section 0.2.5.4 of the Temporary Traffic Management Design Guidance.

When road closures are required alternative routes and diversions will be well signposted in accordance with Section 8.2.4 of the Traffic Signs Manual.

3 Traffic Management Requirements

3.1 Road Opening License

Where works are carried out on sections of public roads including but not limited to carriageways, footpaths and grass verges a Road Opening License is required prior to the commencement of works. The Contractor is entirely responsible for obtaining Road Opening Licenses as necessary to enable him to fulfil his contractual obligations.

3.2 Public Notices

The Contractor shall liaise with the Roads Authority in respect of any temporary road closures, lane closures, and other traffic management controls required to be carried out to ensure the safety of the workforce and the general public during the duration of the works. The advertising of such notices in local press, local radio, and leaflet drops will be required to warn motorists and local businesses and residents of the changes involved and new road layouts to be expected.

3.3 Road Closures

The requirements for the temporary closure of a public road are set out in Section 75 of the Roads Act 1993 and Article 12 of the Road Regulations 1994. A specified process under the 1993 Act must be followed involving public advertisement and consultation. The appointed contractor and TMP designer should consult Cork County Council with regard to the details of the road closure application.

3.4 Alternative Routes / Diversions

All diversions and alternative routes are to be carried out in accordance with Section 0.5.2.9 of the Temporary Traffic Management Design Guidance. Final diversions and alternative routes should be identified and developed by the appointed contractor.

4 Other Measures

4.1 Emergency Access

Access for emergency vehicles via the primary haul roads must be maintained at all times. Where a Stop/Go system is in operation, competent personnel shall be operating same and shall give priority to emergency vehicles to ensure they are not unduly delayed.

4.2 Traffic Signage

All traffic signage used throughout the project must comply with Chapter 8 of the Traffic Signs Manual.

4.3 Variable Message Signs (VMS)

The Contractor shall allow for variable message signs (VMS) in accordance with Section 8.2.4 of the Traffic Signs Manual on approach routes affected by traffic management measures, restrictions, or road closures.

VMSs should be used to advise motorists of the upcoming works at least 2 weeks before traffic management measures are implemented to alert motorists of the upcoming works.

4.4 Temporary Road Surfaces

All reinstatement be it temporary or permanent shall be carried out in accordance with Guidelines for Managing Openings in Public Roads - Department of Transport, Tourism and Sport 2017.

4.5 Loading/Unloading Locations

Vehicles must be loaded and unloaded within the site area (i.e. within red line site boundary). Contractors are not permitted to carry out loading or unloading on the public roadway. This approach reduces the risk to the public, reduces congestion, and minimises disruption and risk to any passing vehicles on the highway. All deliveries and collections will be overseen and managed for the Contractor by a nominated competent person.

4.6 Potential Interface with Other Projects

The proposed works may have an interface with other projects within the locality. There may be a number of PSCS's operating in the locality at any one time on individual sites. It will be the responsibility of the appointed Contractor as PSCS to ensure that delivery and haul routes, site access and egress points and potential crossing points associated with the site are fully coordinated and agreed with other Contractors in advance of the works commencing.

4.7 Lighting

Where floodlighting of the works area is required in poor daylight conditions, the positioning of the lighting units must not be such as to cause glare to drivers. Workmen should be protected from stepping inadvertently from the illuminated area into an unilluminated traffic lane.

In addition to lighting, signs, chevrons, barriers, and other devices should be reflectorised. Reflectors should be used to ensure that the work area is adequately marked if the lighting is vandalised or otherwise fails.

4.8 Communications and Local Stakeholder Management

The Main Contractor will, as required, liaise with owners of the local properties in advance of works commencing on site. The Main Contractor will use a competent sign provider and all signage used will

meet the requirements of the Safety, Health & Welfare at Work (General Applications) Regulations 2007 and Chapter 8 Traffic Signs Manual.

4.9 Working Hours

The proposed hours of work on site will be 07:00 hrs to 19:00 hrs Monday to Friday and 08:00 hrs to 16:30 hrs Saturday unless otherwise specified by planning conditions. It is anticipated that construction working hours will be stipulated in the planning conditions attached to the planning grant. Any working hours outside the normal construction working hours will be agreed with Cork County Council. The planning of such works will take consideration of sensitive receptors, in particular any nearby homes and businesses.

4.10 Abnormal Loads

It is anticipated that there will be three abnormal loads delivered to substation site during the construction phase. This includes the delivery of the transformers and use of cranes to install the transformers.

The abnormal loads will be transported via an appropriate haulage route. The relevant authorities will be given appropriate written notice in advance of abnormal load deliveries and permits will be secured ahead of the construction stage.

5 Outline Construction Traffic Management Plan Site Specifics

The following sets out the Outline Construction Traffic Management Plan (OCTMP) for the proposed development. This OCTMP sets out how the works will be constructed ensuring minimal adverse impact on external interfaces in the local environment. This plan will be issued to the successful contractor for the works for use as a basis for a construction stage traffic management plan. Any subsequent use or development of the plan shall be the responsibility of the contractor alone.

5.1 Construction Programme

It is anticipated that the construction programme will have a duration of 18 months.

The construction of the Project contains three main elements.

1. Construction of the access road
2. Construction of the substation itself
3. Construction of underground cable connections

Works in each area may be carried out in parallel.

5.2 Site Access

The Main Contractor will be responsible for all site access and works activity and must ensure the continued operation of the surrounding local road network as a result of its construction traffic.

It is proposed that construction vehicles will access the development via a new entrance located along the L6989 local road to the south of the proposed substation site. Access to the L6989 will be from the intersection with the L2966 and L3604 to the east of the site.

Two possible routes for construction related vehicles, travelling along the M8 motorway, to reach the proposed substation site are as follows:

- Route Option 1: Construction related traffic will take Junction 17 off the M8 motorway, and use the L3011, L1540, L3602, L7609, L3604 and L6989 local roads to reach the site. Junction 17 is approximately a 12-minute drive from the site.
- Route Option 2: Construction related traffic will take Junction 18 off the M8 motorway and use the R639 regional road through Glanmire followed by the L2966 and L6989 local roads to reach the site. Junction 17 is approximately a 17-minute drive from the site.

These construction access route options are shown in Figure 5-1. The proposed routes outlined above are subject to agreements with Cork County Council and any associated third parties and will be based upon the Main Contractor's CTMP submission. The site will be adequately hoarded and gated to ensure security and safe working. Within the site, enough space will be set aside for material deliveries and craneage points for installation of large components.

Several additional routes were assessed while identifying appropriate paths for construction related vehicles travelling to and from the substation site. Among these was the option to access the site from the west via the L6989. However, limited carriageway width towards the western end of the L6989 renders this route unsuitable. Approaching the Ballyvatta/Knockraha area from the L3004 to the south via the L2968 was also deemed unsuitable for construction related vehicles due to a height restriction caused by a bridge in Glounthaune village.

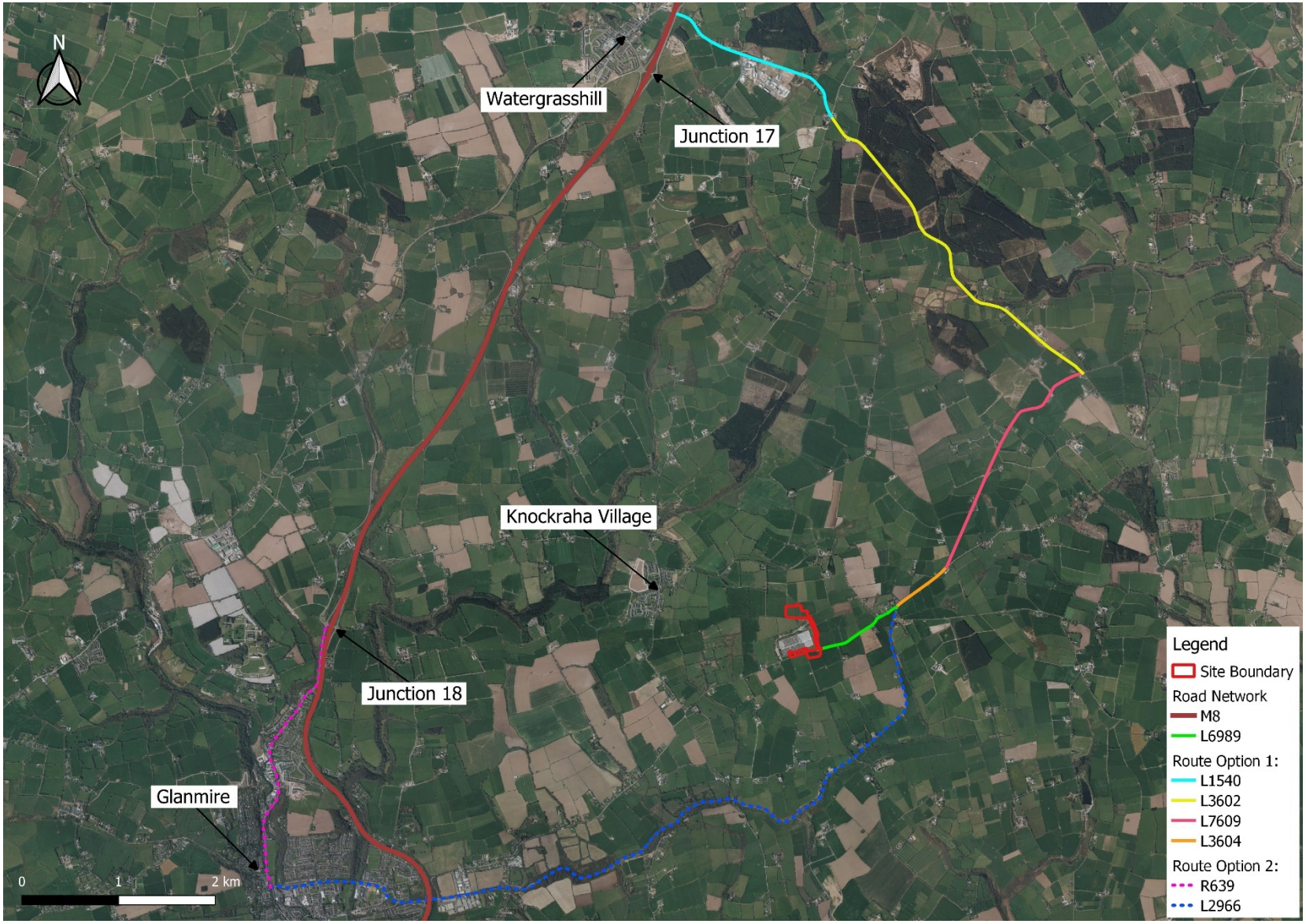

Figure 5-1: Construction Access Route Options

Figure 5-2: Existing junction between the L6989, L3604 and L2966

The management of construction traffic on the L6989 local road is a critical part of the overall project and must be actively managed by the Contractor. The Contractor must submit a detailed CTMP to the Local Authority for approval. Construction traffic movements will be fully coordinated to comply with the requirements of the agreed plan:

a) Construction vehicles must not stop or park along public routes at any time;

b) Haulage vehicles must not travel in convoys greater than two vehicles at any time;

c) Site entrance to remain free of parked or stationary vehicles at all times;

d) Surrounding roads and property entrances to remain free of parked or stationary vehicles at all times;

e) All loading of waste material will occur within the site boundary;

f) All off-loading of deliveries will take place within the site, remote from the public roads;

g) The contractor will be required to ensure pedestrian safety on the L6989;

h) Temporary car parking facilities for the construction workforce will be provided within the site. These car parking spaces will be located adjacent to the site compound. The surface of this car park will be prepared and finished to a standard sufficient to avoid mud spillage onto adjoining roads.

i) Monitoring and control of construction traffic will be ongoing during construction works. Construction traffic will be scheduled to minimise movements during peak hours.

j) Construction Traffic routes minimising traffic impact on surrounding developments will be used by construction vehicles.

Construction traffic means the following vehicles:

HGVs & haul trucks – i.e. vehicle with 6 tyres or more as set out in the RSA publication 'Guidelines on Maximum Weights and Dimensions of Mechanically Propelled Vehicles and Trailers, Including Manoeuvrability Criteria'. Site machineries such as excavators, tippers, bulldozers, Concrete trucks etc.

5.3 Management of Construction Traffic around the Proposed Works

The Contractor is required to control construction traffic in and around the proposed works location. The Contractor must adhere to the following:

a) Communicate clearly to all construction staff and subcontractors that they are bound by these restrictions.

b) Schedule site traffic in advance to ensure that these restrictions are adhered to.

c) Monitor construction traffic at key points remote from the site to check compliance.

d) Details of the Contractor's traffic management plan must be submitted to Cork County Council and approved by same prior to commencement on site.

e) A special permit for moving oversized and hazardous loads will be obtained from Cork County Council/An Garda Síochána prior to any such movements.

f) Daily construction programmes will be planned to minimise the number of disruptions to surrounding roads by staggering HGV movements.

g) There will be limited parking, sufficient only to serve those directly involved with the works.

h) Construction vehicles will follow the road hierarchy as much as practicable – i.e. construction vehicles will be directed away from local or minor streets and roads and will be required to use designated primary national and regional routes for accessing the site.

i) The Contractor will appoint a Traffic Management Coordinator who will be responsible for the coordination of all traffic safety/traffic management and pedestrian/cyclist safety/traffic management matters. The Traffic Management Coordinator will ensure that all traffic management requirements are met.

5.4 Proof of Compliance with Traffic Restrictions

The Contractor will track the transit of construction traffic in the area for the duration of the works. The Contractor will control traffic movements using the following procedures;

a) Develop a 'Restrictions and Adherence Form' that all lorry drivers and site operatives will sign.
b) All traffic movements to and from the site to be managed by the Contractor's traffic management coordinator.
c) Appointed person located at the site entrance to issue dockets and record all traffic entering and leaving the site.
d) Records to be reviewed periodically by the site manager and must make these records available upon request from the Local Authority/Client.
e) Prior to any new contractors starting on site, all persons must sign up to restrictions and prequalification forms.
f) A certified flagman must be present to coordinate the traffic entering and leaving the site.

5.5 Loading/Unloading Locations

Vehicles must be loaded and unloaded within the site area (i.e. within red line site boundary). Contractors are not permitted to carry out loading or unloading on the public roadway. This approach reduces the risk to the public, reduces congestion, and minimises disruption and risk to any passing vehicles on the roadway. All deliveries and collections will be overseen and managed for the Contractor by a nominated competent person.

Contractors must consider and explain how to manage the impacts on cyclists, pedestrians, other road users, and any affected roadway infrastructure.

5.6 Material Storage and Delivery

The Main Contractor will ensure that the delivery of materials is coordinated to minimise impacts to adjacent properties. The Main Contractor will ensure that all materials are adequately stored and secured in their site compound.

The Main Contractor will ensure the roads adjacent to the site are kept clean and free of debris.

5.6.1 Reduction of Traffic Movements

Construction traffic movements will be reduced and minimised by:

1. Consolidating loads.
2. Use of precast and prefabricated materials where possible.
3. Scheduling deliveries and removals outside normal traffic peaks.
4. Ensuring that there is sufficient on-site storage of materials.
5. Ensuring deliveries of large elements are done on a just in time basis to reduce the need for queuing of trucks awaiting offloading.

5.6.2 Reduction of Adverse Impact on the Local Roads

To reduce the amount of deleterious material being deposited on roads adjacent to the site road, road sweeping will be conducted as necessary. Wetting down facilities will be provided as required, to ensure that dust nuisance will not be an issue. Wheel washing facilities will be provided for vehicles prior to leaving site.

5.6.3 Routing

The proposed routing of large vehicles is outlined in Section 5.2 above. Routing of vehicles will be via signposted routes where necessary.

5.6.4 Construction Traffic Generation

5.6.4.1 Overview

The potential temporary impacts of the scheme on the wider and local road network are as follows:

1. Temporary impacts during construction due to the excavation of materials in order to facilitate construction, and the associated movements of excavation vehicles;
2. Temporary impacts associated with the importing of construction materials, equipment, etc. to the works areas, and the relevant movements of delivery and construction vehicles and construction personnel;
3. Temporary impacts during construction due to road closures, lane closures and diversions;
4. Construction staff commuting to and from the cable route corridor and working areas;
5. General service traffic associated with construction activities (i.e. plant deliveries, visitors, traffic between working areas, etc.)

5.6.4.2 Staff Type and Transportation Options

The staff anticipated are considered in 3 categories:

1. Staff associated with excavations and underground cable laying,
2. Staff associated with horizontal directional drilling (HDD) if necessary,
3. Staff associated with erection of utility poles and above ground cable installation across the fields adjoining the local access roads.

Given the rural location of the site, transportation to and from the site is expected to be by car. Staff are instructed not to park on public roads except within designated cable works areas, as further described in below sections.

5.6.4.3 Working Areas and Staffing Levels

An upper limit of 30 no. construction staff is expected to be involved during construction at any given time. A car occupancy rate of 1.5 individuals per vehicle has been considered, accounting for potential carpooling among teams working closely together. This results in an estimated total of 20 vehicles arriving and departing each day. Typically, these vehicles will arrive before 8am and depart after 4pm.

The Main Contractor will be required to submit a site layout plan that will detail the various construction stages. The Main Contractor will ensure that each active working area will be serviced as required and will be secured with appropriate fencing/hoarding. Materials, plant and equipment, and worker welfare facilities will be located within the site. As Project Supervisor Construction Stage (PSCS), the Main Contractor will be responsible for site security, and to ensure that the site and working areas are adequately secured at all times.

5.6.5 Traffic Circulation within the Site

The operation of the site will ensure that after site traffic enters the construction area it will not interfere with the local road network until it leaves the site. No car or HGV parking will be permitted off site. Vehicular and pedestrian routes within the site will be established by the contractor and signage on site will be erected as appropriate. Vehicular traffic and pedestrian routes within the site will be altered as the construction progresses depending on the nature of the works.

5.6.6 Road Closure Requirements

Due to the limited road width and the circa 1.7m wide cross section of the cable route required along the R6989, it is anticipated that the portion of the local road highlighted in Figure 5-3 will be closed for the laying of the cable. The appointed contractor and TMP designer should consult Cork County Council with regard to the details of the road closure application.

5.6.7 Alternative Routes/Diversions

Preliminary diversions and alternative routes for the project have been shown in Figure 5-3. Final diversions and alternative routes should be identified and developed by the appointed contractor. There is 1 no. dwelling located along the length of the L6989 where the underground cable is proposed. These works will be phased to ensure that access to this property is maintained at all times.

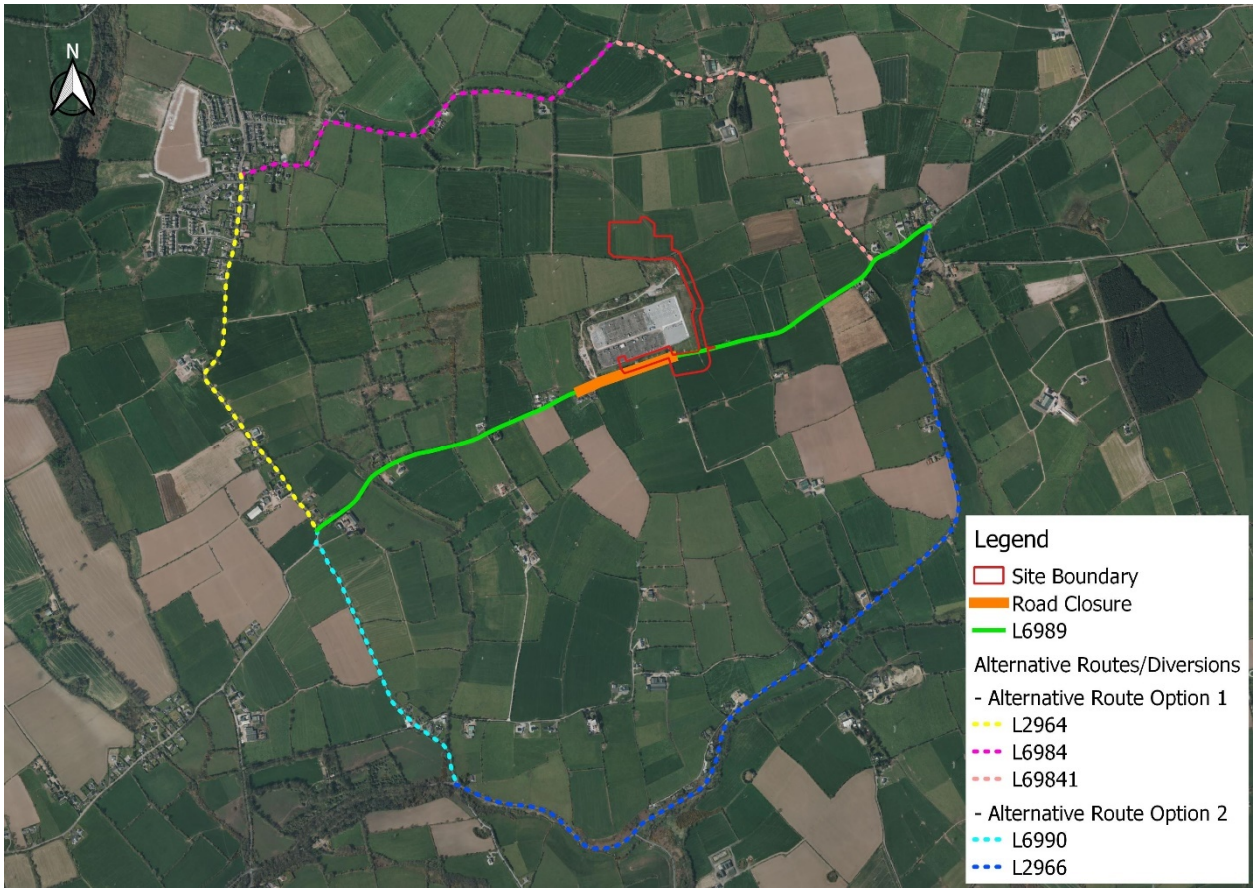

Figure 5-3: Road Closure Requirement and Preliminary Diversion Options

5.7 Abnormal Load Deliveries

Transformer component deliveries and the cranage requirements for installation of the transformers, will involve specialist vehicles, and will constitute abnormal indivisible loads. It is anticipated that there will be three abnormal loads delivered to the substation site during the construction phase. It is noted that abnormal load vehicles typically retract to standard length vehicles for the return journey. All abnormal loads will be transported overnight, and, as such, any associated disruption to the road network operation will be minimal.

5.7.1 Abnormal Loads Haulage Route

For the abnormal loads associated with the substation development, it is assumed that the transformer component will be transferred from sea to land at Ringaskiddy Port. It will then travel to the site via the following route:

Ringaskiddy - N28 - Shanbally - Shannonpark Roundabout - Carr's Hill - Bloomfield Interchange - N40 - Jack Lynch Tunnel - Dunkettle Interchange - M8 - Junction 18 - R639 - L3012 - L3011 - L1540 - L3602 - L7609 - L3604 - L6989.

There is also the potential for the components to be transferred from other ports such as Dublin Port, and these will arrive via the M8 Junction 18 and local route described above.

5.7.2 Notification

Notifications for abnormal loads are required where loads or vehicles exceed maximum vehicle weight, axle weight or dimensions as set out by the Road Traffic (Construction and Use of Vehicles) Regulations 2003. The relevant authorities will be given appropriate written notice of abnormal load deliveries and updates will be provided as the delivery timetable is finalised with the supplier during the delivery period. In advance of construction, details of the vehicle dimensions, maximum weights and axle loadings

of the abnormal loads will be submitted to An Garda Síochána. Permit requirements and processes as per the current Road Traffic (Permits for Specialised Vehicles) Regulations will also be followed.