Appendix 15-2

Traffic Management Plan

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Shronowen Wind Farm

Preliminary Traffic Management Plan

ISSUE FORM	
Project number	19876
Document number	6010
Document revision	A
Document title	Preliminary Traffic Management Plan
Document status	**Draft**
Document prepared by	Paul Nealon
Document checked by	Paddy Curran and Ken Fitzgerald

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1 INTRODUCTION

This preliminary traffic management plan outlines the procedures to be implemented during the construction of Shronowen Wind Farm.

Prior to works commencing, a detailed traffic management plan will be produced by the appointed contractor.

2 TRANSPORT MANAGEMENT PRINCIPLES

The two core principles for planning, developing, and implementing transport management proposals are:

- To maximise the safety of the workforce and the travelling public.
- To keep traffic flowing as freely as possible and reduce the impact of the construction traffic and road works to a minimum.

For the purposes of the works to be carried out in order to ensure that there is minimal effect on the commercial and socio-economic life of the surrounding areas, the appointed contractor will have regard to the above principles. The appointed contractor shall endeavour to meet these objectives by proper planning of the project and by compliance with the relevant procedures as outlined in Section 6. Against this background and in the context of the construction of the wind farm the appointed contractor shall properly plan and manage the project to ensure that:

- Any works within the road network do not result in a safety hazard to road users or the workforce involved in the project.
- Any resulting increase in traffic delays and congestion are minimised.

The appointed contractor will liaise with An Garda Síochána and Kerry County Council in the event of other planned construction schemes in the area. The appointed contractor will recognise that other external factors such as severe weather events can affect traffic flow close to the project and will endeavour to minimise the effect of the works on traffic in the planning and programming of the works at construction stage.

2.1 WORKING HOURS

Construction is proposed to occur within the following hours:-

- 7.00am – 7.00pm* (Monday – Friday)
- 7.00am – 2.00pm* (Saturday)

There will be restrictions between these hours to facilitate the residents and ensure public safety.

* The working day may extend occasionally at times when critical elements of work need to be advanced. Longer working days will occur for concrete pours for turbine bases and for turbine erection works which may spill over into weekends depending on how low wind windows fall.

3 EXISTING ROAD NETWORK

The existing road network in the general vicinity of the wind farm site is outlined below and shown in Figure 3-1.

3.1.1 Motorway Network

The general area surrounding the wind farm site is not served by any Motorways.

3.1.2 National Primary Road Network

The general area surrounding the wind farm site is not served by any National Primary roads.

3.1.3 National Secondary Road Network

The N69 National Secondary road running from the city of Limerick to Tralee, County Kerry will be used for the delivery of turbine components to site and as a haulage route for materials required to construct the wind farm.

3.1.4 Regional Road Network

The following sections of Regional roads in County Kerry will be used for the delivery of turbine components to the wind farm site:

- R551: Single carriageway running from Tarbert to Junction of L-1013 Local road at Cross of the Wood

The following Regional roads in County Kerry will be used as a haulage route for materials required to construct the wind farm:

- R551: This is a single carriageway which runs from Tralee to Tarbert
- R552: This is a single carriageway which runs from Listowel to Ballylongford

3.1.5 Local Road Network

The following sections of Local roads in County Kerry will be used for the delivery of turbine components to the wind farm site:

- L-1013: Single carriageway running from Cross of the Wood to Junction of the L-6021 Local road
- L-6021: Single carriageway running from Junction of the L-1013 Local road to site entrance at Shronowen

The following Local roads in County Kerry will be used as a haulage route for materials required to construct the wind farm:

- L-1009: This is a single carriageway which runs from the Junction of the R552 Regional road at Kilgarvan to the Junction of the R552 Regional road at Coolkeragh
- L-1012: This is a single carriageway which runs from the Junction of the R551 Regional road at Ballymacasy to Leitrim Cross on the N69 National Secondary road
- L-1013: This is a single carriageway which runs from Tarmon Cross on the N69 National Secondary road to the Junction of the L-6021 Local road at Cross of the Wood
- L-6021: This is a single carriageway which runs from the Junction of the L-1013 Local road at Cross of the Wood to the Junction of the L-1009 Local road at Tullamore Cross

Figure 3-1 Road Network around Wind Farm Site

4 CONSTRUCTION WORKS

4.1 WIND FARM

Shronowen Wind Farm is located within the townlands of Shronowen, Tullamore and Ballyline West in County Kerry. The proposed development consists of 12 no. wind turbines and all associated infrastructure including crane hardstands, access roads, a permanent meteorological mast, 2 no. temporary site construction compounds, underground cables, substation compound etc.

Construction of this wind farm will result in an increase in traffic on the L-1009 and L-6021 Local roads as all traffic entering and exiting the site will do so via a temporary site entrance on the L-1009 Local road and an existing site entrance on the L-6021 Local road. In addition, access will be required for the proposed substation compound via a proposed new access point from the L-6021 Local road. The wind farm site is connected to the R552 Regional road via the L-1009 Local road and the R551 Regional road via the L-6021 Local road. See Figure 4-1.

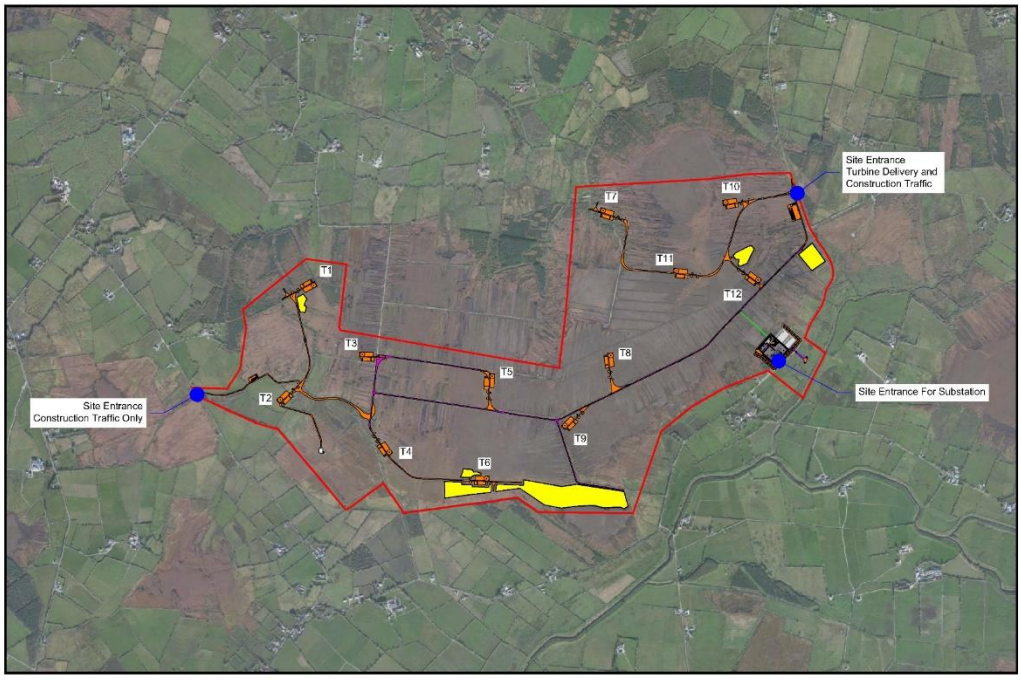


Figure 4-1 Location of site access points

4.1.1 Mitigation Measures

The construction phase of the wind farm will require the delivery of turbine components, concrete, steel and aggregate to the site via the public road network. The key timing periods when use of the public road network will be at its peak for residents is between 8.30am and 10am when school and commuter related traffic is at its peak. It is proposed to allow routine deliveries such as aggregate into the site between 8.00am and 8.30am. The initial early morning delivery trucks will exit the wind farm site empty with the run of traffic but they will be prohibited from delivering again until 10am.

The nuisance 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 proprietary wheel wash facility to be installed on the exits of the wind farm site as illustrated in Figure 4-2. In addition to this a road sweeper will operate on the L-1009 and L-6021 Local roads on a full time basis for

the duration of the importation of aggregates and concrete and at regular intervals for the duration of the project. A water bowser will be employed to spray the local roads with water during dry periods when there is a risk of dust nuisance.

Appropriate signage will be maintained for the duration of the project with clear warning signage at all site entrances along the L-1009 and L-6021 Local roads.

4.1.2 Road Safety and Courtesy Protocol

A road safety and courtesy protocol will be implemented for the duration of the wind farm construction. 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 and speed limits along public roads and within the wind farm site. Fundamental to the protocol is courtesy for other road users. In these vehicles will always give way to oncoming residential traffic and will always slow down or stop as appropriate for pedestrians and cyclists.

Figure 4-2 Typical wheel wash using the dry ramp system

4.1.3 Schools

Table 4—1 lists the schools within the area of the wind farm. The proposed works at the wind farm are not expected to impact on any school due to their distance from the main site entrance.

Name of School	Distance from Main Site Entrance
Leanamore National School	3.6km
St Oliver's National School, Ballylongford	5.5km
Coolard National School	7.7km
Murhur National School, Moyvane	7.8km
Tarbert Comprehensive School	8.9km

St Michael's College, Listowel	9.1km
Knockanure National School	11.5km
Lisselton National School	11.9km
Asdee National School	11.9km

Table 4—1 List of schools within area of wind farm site

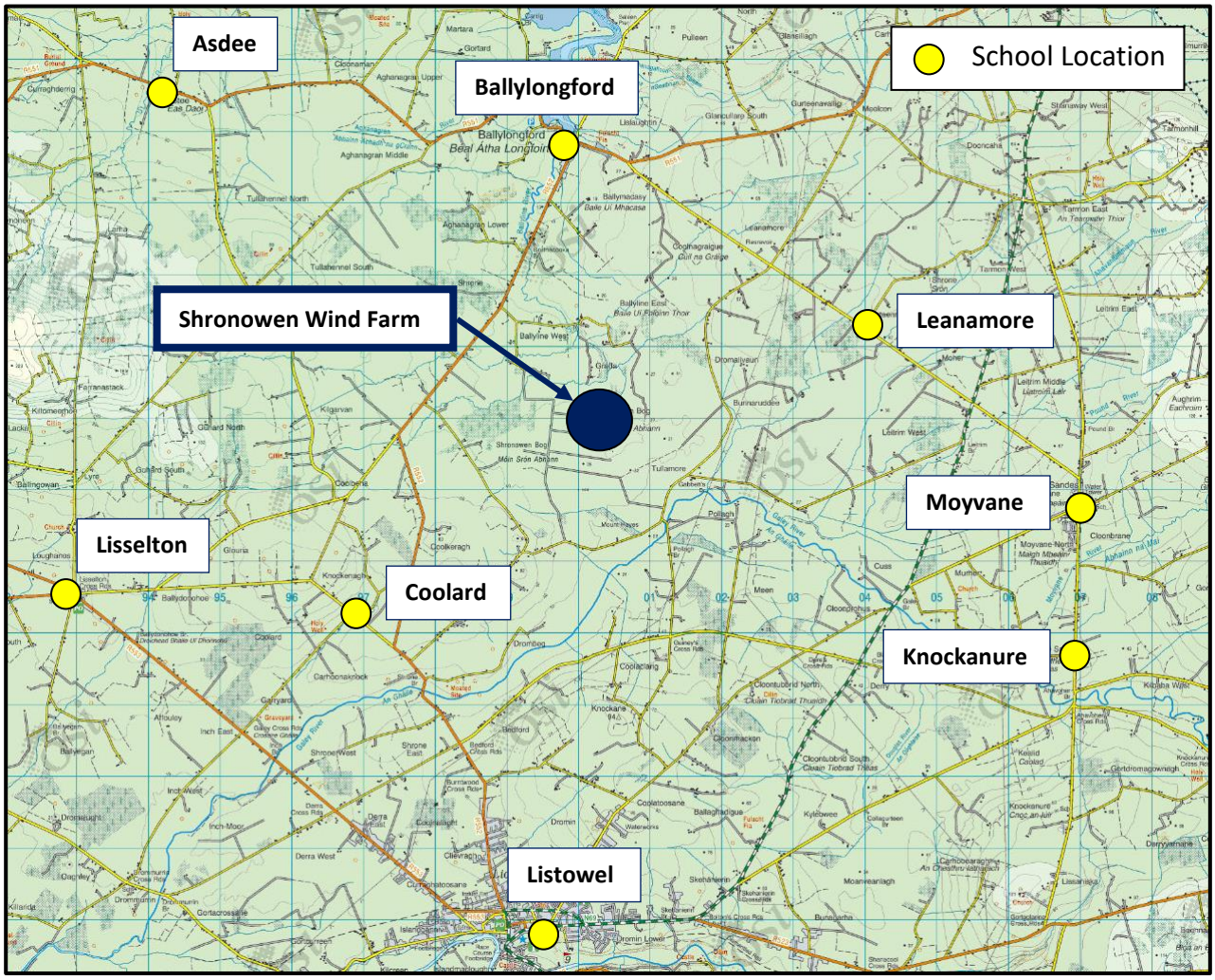


Figure 4-3 Location of schools within area of wind farm site

4.1.4 Parking Management

It is not envisaged that works for this project will have a significant effect on any parking facilities in the surrounding area. Due to the linear nature of wind farms it is normal for operatives and plant operatives to drive and park up close to their work area within the wind farm at either the crane hardstands or on layby areas along the internal access roads. In addition, sufficient parking facilities will be made available for operatives and visitors at the temporary site compounds within the site during the construction of the wind farm and substation compound. Operatives will be prohibited from parking on any public road outside of the site throughout the construction phase. However some parking restrictions may be required on public roads in order to facilitate the delivery of wind turbine components to site.

4.1.5 Construction Phasing

The phases of the development can be broadly summarised in terms of traffic management in 4 steps:

1. Access road / crane hardstand / substation construction
2. Turbine base construction
3. Turbine erection
4. Grid connection

4.1.5.1 Access Road / Crane Hardstand / Substation Construction

All construction transport including deliveries of quarry and building materials will use the L-1009 and L-6021 Local roads as the designated delivery routes for the wind farm which will likely be accessed via the L-1012 Local road, the L-1013 Local road, the R551 Regional road, the R552 Regional road and the N69 National Secondary road. During the construction of the access roads, crane hardstands and substation buildings, a worst case scenario estimates that the maximum number of loads to be delivered to the wind farm work area would be approximately 30,556 as shown in Table 6—1. This includes loads of aggregate stone and capping material, concrete, reinforcing steel, geo-textiles, electrical cabling, timber logs and general building materials. It is proposed to source imported stone and capping aggregate from local quarries in the area.

Construction traffic will be limited to an appropriate speed limit to be set by the appointed contractor along local roads. As described in Section 4.1.2 a construction traffic safety and courtesy protocol will be implemented to manage the traffic for delivery of materials. A traffic coordinator will be employed full time during this construction period to implement speed limitations and construction traffic safety and courtesy protocol.

In order to reduce two-way construction vehicle movements on local roads, it is proposed that all general construction delivery vehicles enter the wind farm site via the eastern entrance on the L-6021 Local road and exit the site via the western access on the L-1009 Local road. This will be implemented once an access road has been constructed within the wind farm that connects the eastern and western entrances to each other.

4.1.5.2 Turbine Base Construction

A wind turbine with a ground bearing concrete foundation will require a concrete pour of circa 800m^3 during its construction. This volume of concrete will require between 95 and 100 loads of concrete in one day to complete. This is the same level of traffic use as a 40Ha silage harvest. There will be 12 of these pours within the wind farm. The pours would generally start early in the morning and be complete in early afternoon. Normal deliveries will be curtailed during concrete pours until the pour is completed. Concrete pours are weather dependant but are normally planned and scheduled in advance and written notice of each base pour can be hand posted to residents along the local access roads a day in advance. During pours a second escort vehicle will be utilised to maintain construction traffic safety and courtesy.

4.1.5.3 Turbine Erection

4.1.5.3.1 Turbine Delivery Route

The components for the 12 no. turbines will be delivered by cargo ships to Foynes Port in County Limerick. The components for each turbine will be delivered in separate loads, some of which are abnormal in terms of their width and length. The components will be transported from Foynes Port to the site along the National, Regional and Local road network.

Pre- and post-construction surveys will be carried out to ensure the structural integrity of the selected haulage route. Repairs will be carried out on the public road network, as necessary, during the construction phase, to ensure that the condition does not deteriorate below a standard that could affect the use of the site, as required. Following completion of construction, the condition of the public road network will be of at least the same standard as it was prior to commencement of construction.

A permit for moving abnormal loads to the wind farm site will be sought from An Garda Síochána and the applicable local authorities on the selected haulage route with a transportation plan for the time of deliveries established at construction stage.

The road route for starting at Foynes Port is as follows as shown in Figure 4-4:

I. Starting at Foynes Port;
II. N69 National Secondary road to the R551 Regional road at Tarbert;
III. Tarbert to the Junction of the R551 Regional road / L-1013 Local road at Cross of the Wood;
IV. Junction of the L-1013/ L-6021 Local roads to the site entrance at Shronowen.

The delivery of turbine components normally takes place overnight due to the oversize 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.

Turbine erection is entirely weather dependant with the scheduling of component delivery being entirely subject to wind conditions. Advance notice of delivery to residents is difficult in this circumstance but component delivery is a highly controlled low impact activity of very short duration to any residential property it passes. Once turbine components have been delivered delivery vehicles will exit the site via the western access point on the L-1009 Local road in order to reduce two-way traffic along the local road network.

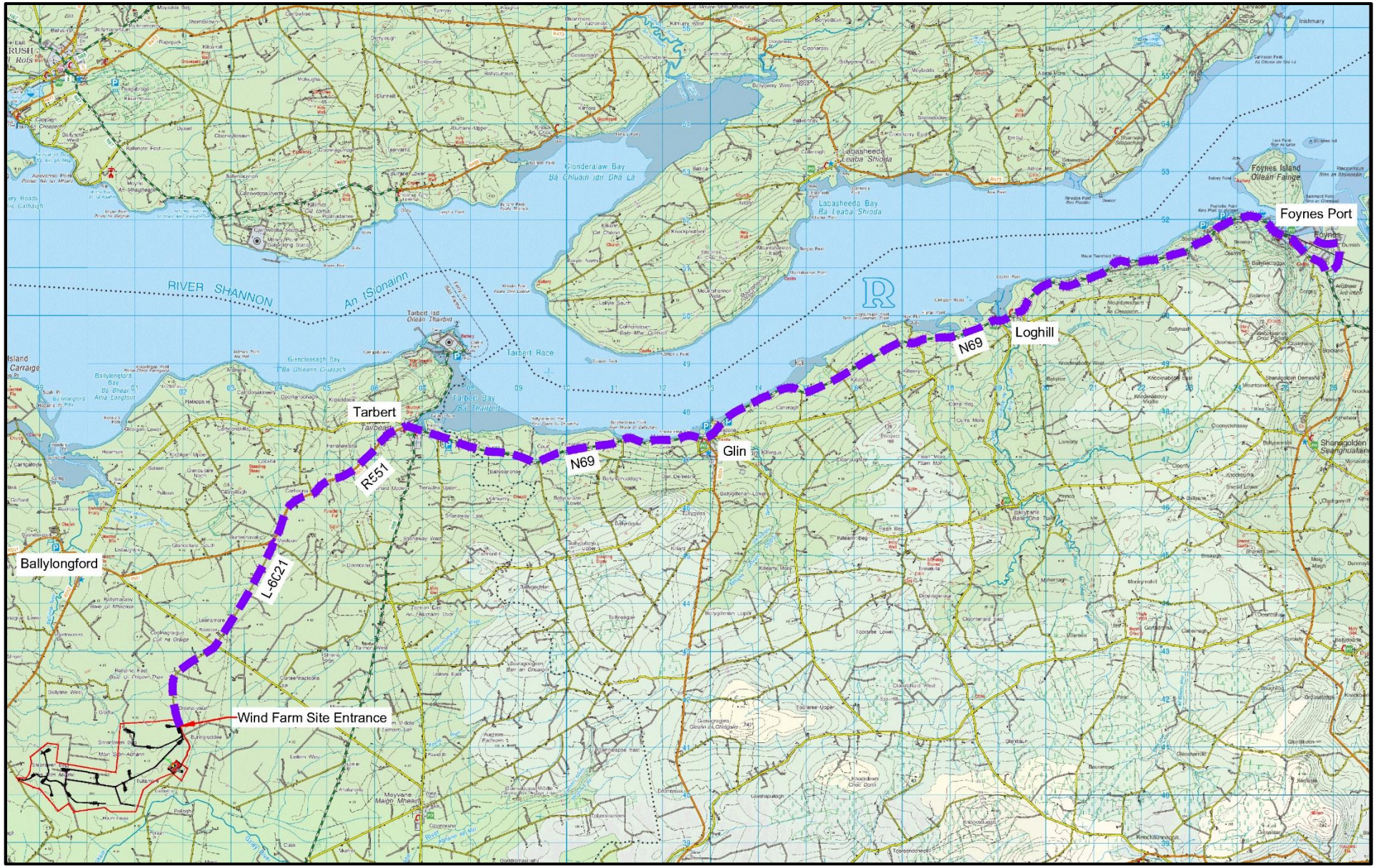


Figure 4-4 Turbine Delivery Haulage Route Map

4.1.5.3.2 Public Road Works for Turbine Delivery

The L-6021 Local road from its junction with the L-1013 Local road at Cross of the Wood to Shronowen has a paved width of between 3.0m to 4.0m between there and the site entrance. Sections of the L-6021 Local road have been previously widened to facilitate deliveries to the nearby Leanamore Wind Farm but in advance of construction a trial run of the proposed delivery route will be carried out by the appointed turbine supplier to determine if any localised road widening is required to the agreement of Kerry County Council.

The existing site entrance to the wind farm on the L-6021 Local road will require widening on its northern side to allow the long turbine component loads turn south at this point. The widened area of the junction will be cordoned off to a radius of 10m for normal traffic and the space will only be made available specifically for turbine delivery. Following completion of the project the widened area will remain in place by cordoning off the area with a permanent fence installed to a 10m junction radius. This area will only be made available for any replacement turbine component deliveries. The design of the widened junction for the turning movement of the longest load, which is the turbine blade truck, has been verified using swept path analysis software.

Permanent access to the wind farm during the operational phase will only be from the L-6021 Local road entrance. The entrance to the west of the site on the L-1009 Local road will not be used for permanent access as it will be cordoned off following completion of the wind farm.

The majority of the turbine delivery route will follow National Secondary and Regional roads as described in Section 4.1.5.3.1. There may be a requirement, pending final confirmation of the transport delivery configuration at construction stage, for the temporary removal of road signage and/or temporary widening of grass road verges in order to cater for the swept path of these abnormal delivery vehicles. The developer shall consult with the Road / Area Engineers of the relevant local authorities to temporarily remove any road signage and provide temporary grass verge widening where this may be required.

4.1.5.4 Grid Connection

As part of the project the Shronowen Wind Farm will be connected by a grid connection cable that will allow the electrical energy generated from the wind farm to be exported onto the national grid. This will be done via an underground grid connection from the proposed wind farm substation to the existing 110kV overhead transmission line due east of the wind farm site or

The underground cable between the Shronowen Wind Farm and the exisitng 110kV transmission line is shown in Figure 4-5.

A temporary road closure of the L-6021 Local road will be required by the appointed contractor to facilitate the installation of a trench for the cable across the public road. Temporary guarding of this crossing may also be erected. The appointed contractor will endeavour to complete these works within the shortest timeframe and the traffic management plan will be updated at construction stage to take account of the nature and timing of these works.

Figure 4-5 Proposed Route of Underground Grid Connection Option

The goal of a traffic management plan is to provide a safe working environment for cable workers and efficient passage of traffic and other road users through the cable works site along the public road network. The procedures to be implemented by the appointed contractor will include the provision of facilities for the safe passage of pedestrian and vehicular traffic and measures to separate them from the construction work.

The appointed contractor will ensure traffic management controls are in accordance with Chapter 8 of the *Traffic Signs Manual 2019* and the *Temporary Traffic Management Design Guidance, Third Edition 2019.*

This traffic management plan is for planning purposes only and a final traffic management plan will be produced at construction stage by the appointed contractor pending final selection of the grid connection option.

4.1.5.4.1.1 Construction Programme for Alternative Underground Grid Connection Option

The active construction area along the underground grid connection route option will generally minimal as the cables only need to cross the road perpendicularly at one point. The works for the underground route are estimated to take approximately 1.5 months (Approx 1 week of which will be on the public roadway). During the first stage of works the cable trenches will be constructed. The second stage of works will involve sequentially pulling electrical cables through ducts and then joining each cable together. Construction activities along the underground route option would operate between the hours 7:00 a.m. and 7:00 p.m., Monday to Friday, and between the hours 7:00 a.m. to 2:00 p.m. on Saturday (if required). Any deviations to these times will be agreed in advance with Kerry County Council. It is expected that the civil works for the underground grid connection option will require at least 10 personnel to complete the works. The electrical works will require less heavy machinery but more labour personnel.

4.1.5.4.1.2 Description of Works for Construction of Underground Grid Connection Option

The installation of the underground grid connection option along the public roads will involve the following process:

- Prior to works commencing the area where excavations are planned will be surveyed and all existing services will be identified. All relevant bodies i.e. ESB Networks, EirGrid, Gas Networks Ireland, Eir, Kerry County Council etc. will be contacted and drawings for all existing services sought. A road opening licence will be obtained where required from Kerry County Council for the relevant road sections. All plant operators and general operatives will be inducted and informed as to the location of any services.
- Prior to works commencing a dilapidation survey will be carried out photographing and noting any existing damage or defects to structures or road surfaces. A copy of this survey will be submitted to Kerry County Council prior to works commencing.
- Prior to works commencing the route will be inspected and marked out on the ground. Standard good practice preparatory measures are then put in place along the extent of the route. This would include any required warning notices, temporary barriers, etc.
- Prior to works commencing a detailed traffic management plan will be prepared by the appointed contractor and agreed with Kerry County Council.
- During construction works, the trench will be excavated down through the existing stone in the road using an excavator machine. As stone fill is removed it is temporarily stockpiled adjacent to the trench for re-use in backfilling. In some instances some soil or unsuitable material may be encountered in the trench and this is removed from site and brought to an appropriate licensed facility for disposal.
- The trench is then prepared to receive concrete bedding and surround for the ducts. The ducts are surrounded by concrete with adequate cover over the duct.
- Once the concrete is suitability set, appropriate imported stone material is placed over the concrete surround and filled back up to the top of trench. Suitable warning tapes will also be installed in the trench. Once the trench is filled, the trenching and ducting process will move along the road in planned stages.
- The trench surface receives a temporary surface dressing of either spray and chip or macadam. Once the overall scheme is completed, the underground grid connection route and associated road areas will receive a new permanent macadam finish as agreed with Kerry County Council.
- The as-built location of the ducting will be surveyed using a total station / GPS. Marker posts will be installed along the grid connection route to also denote the location of ducting on the ground.
- A condition survey will be carried out on the roads impacted by the underground grid connection route, both pre and post construction. This will include a video survey of the road extent with any significant dilapidations further recorded by photography and local surveying as required.

4.1.6 Schedule of Wind Farm Construction Works / Construction Schedule

The proposed duration for the wind farm works would be of the order of 18 months. The construction work will be phased as outline in Table 4—2 below. A number of these phases will however run concurrently as follows.

- As the internal site access roads are constructed up to each turbine, hardstand areas for the crane, turbine foundations will be prepared.
- Once the roads are completed, the trenching and laying of underground cables adjacent to the roads will begin.
- Construction of the site substation compound and substation buildings will commence so that they will be ready to export power as turbines are commissioned.

Phase	Activity
Phase 1	Clear felling (to be complete ahead of construction site mobilisation)
Phase 2	Prepare site, Pre-construction activities, construct two site entrances, construct two temporary compounds, and set up the six permanent peat storage areas
Phase 3	Access road construction + Drainage plan implementation
Phase 4	Hard standing construction for turbines
Phase 5	Turbine Foundation construction
Phase 6	Trenching and ducting (underground electrical collection system)
Phase 7	110kv Substation construction
Phase 8	Permanent meteorological mast erection
Phase 9	Grid Connection to 110kV transmission line to the east of the site, or Alternative Underground Grid Connection to 110kV Drombeg substation
Phase 10	Turbine delivery
Phase 11	Turbine erection
Phase 12	Wind Farm Commissioning

Table 4—2 Typical Development Phasing

5 DUTIES AND RESPONSIBILITEIS

The following parties will have an input into traffic management and will be kept informed by the appointed contractor of developments in relation to traffic management:

- Appointed Contractor
- Project Supervisor Construction Stage (PSCS)
- Project Supervisor Design Process (PSDP)
- An Garda Síochána
- Road Engineers for Local Authority (Kerry County Council)
- Emergency Services

5.1.1 Appointed Contractor

The appointed contractor shall consult with An Garda Síochána, the emergency services and all other relevant parties listed above during the preparation of any traffic management proposals. The appointed contractor whether as their role as PSCS will co-ordinate the implementation of the developed traffic management. Where any issues arise with the traffic management plan, they shall consult with the relevant parties to revise or modify the traffic management plan to each party's satisfaction.

5.1.2 An Garda Síochána

An Garda Síochána shall have final authority regarding day-to-day traffic control. The appointed contractor will comply with all directions, instructions and requirements of An Garda Síochána.

5.1.3 Road Engineers for Local Authority

Road Engineers for Kerry County Council are primarily engaged in the maintenance and management of the road network and its services in the area of the wind farm. In respect of all works on, under, and above the road network, they are empowered as officers of the Road Authority to issue directions to undertakers of all works in relation to timing, the manner in which works are carried out, reinstatement and satisfactory completion. The appointed contractor will always ensure to work with the Roads Department of Kerry County Council.

5.1.4 Emergency Services

In relation to accidents occurring on or caused by the works, the appointed contractor will provide all necessary assistance to deal with any emergency to An Garda Síochána, Ambulance and Fire Brigade services. The appointed contractor will consult with the emergency services providers regarding the traffic proposals for work in public areas/on public roads and within the wind farm site.

Where a road closure may be active, the emergency services will be notified of suitable diversions. If the emergency is located along the works area, the appointed contractor will allow the emergency services to pass the works area by removing machinery from the road in an orderly fashion and allowing the emergency services pass under the supervision of the team leader. In the event of an emergency along the underground grid connection route option, steel road plates will be available at the applicable works area to span the cable trench in the event of an emergency.

6 TRAFFIC MANAGEMENT AND CONTROL PROCEDURES

The following traffic management procedures in this section will be adopted by the appointed contractor for the construction of the works.

6.1.1 Categories

The different categories of construction related traffic that will visit the wind farm 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.
- Traffic associated with on-site construction personal.

6.1.2 Programming

In order to reduce impacts on local communities and residents adjacent to the proposed wind farm, it is proposed that:

- The appointed contractor will liaise with the management of any nearby construction projects and Kerry County Council to co-ordinate deliveries where necessary.
- The appointed contractor will schedule deliveries in such a way that construction activities and delivery activities do not run concurrently e.g. avoiding the delivery and pouring of concrete for the turbine foundations on the same day as any other construction activities in order to reduce the possibility of numbers of construction delivery vehicles arriving simultaneously, resulting in build-up of traffic on the public road network.
- The appointed contractor will be required to schedule deliveries to and from the proposed temporary site construction compounds so that traffic volumes on the surrounding road network are kept to a minimum.
- HGV deliveries to the wind farm site will be suspended on days of any major agricultural shows, sports events, etc. that have the potential to cause larger than normal traffic volumes. The appointed contractor will be required to interact with members of the local community to ensure that deliveries will not conflict with sensitive events such as funerals.
- Construction activities will be undertaken during daylight hours for all construction stages where applicable. It is not anticipated that construction works will be carried out on Sunday, or Bank Holidays or that any construction works at the wind farm will be carried out, if possible, in hours of darkness.

6.1.3 Condition of Public Road Network

The extent of the heavy vehicle traffic movements and the nature of the payload may create problems of:

- Fugitive losses from wheels, trailers or tailgates
- Localised areas of subgrade and wearing surface failure

The appointed contractor will ensure that:

- The local roads forming part of the haul routes will be monitored visually throughout the construction period and a truck mounted vacuum mechanical sweeper will be assigned to roads along the haul route as required.
- The transportation contractor shall take all reasonable measures while transporting imported materials likely to cause fugitive loses from a vehicle during transportation to the site, including but not limited to:
    - Covering of all material with suitably secured tarpaulin / covers to prevent loss;
    - Utilisation of enclosed units to prevent loss.

In addition, the contractor shall, in conjunction with Kerry County Council:

- Undertake inspections and reviews of the roads forming the haul routes prior to construction and record the condition of these roads at that particular time.
- Throughout the course of the construction of the wind farm, ongoing visual inspections and monitoring of the haul roads will be undertaken.

Upon completion of the development, the surveys carried out at pre-construction phase shall be repeated and a comparison of the pre and post construction surveys carried out. Where such comparative assessments identify a section of road as having been damaged or as having deteriorated as a result of construction traffic, the road will be repaired to the pre-construction standard or better.

6.1.4 Haul Route for Construction Traffic

The proposed wind farm site is surrounded by a comprehensive road network with numerous routing options available via a temporary site entrance on the L-1009 Local road and an existing site entrance on the L-6021 Local road. Access will also be required for the proposed substation compound via a proposed new access point from the L-6021 Local road. All construction traffic for the wind farm and substation will enter at these access points.

The proposed haul routes for the delivery of materials associated with the construction of the wind farm are outlined in Figure 6-1. Construction deliveries will use the L-1009 and L-6021 Local roads as the designated delivery routes for the wind farm which will likely be accessed via the L-1012 Local road, the L-1013 Local road, the R551 Regional road, the R552 Regional road and the N69 National Secondary road. The haul routes are primarily along national secondary and regional roads, with additional local roads leading to the site.

From the North:

- R551 / N69 junction at Tarbert to the L-1013 / R551 junction at Cross of the Wood
- L-1013 / R551 junction to the L-6021 / L-1013 junction at Cross of the Wood

- L-6021 / L-1013 junction at Cross of the Wood to the western access point on the L-6021 or to the eastern access point on the L-1009

From the East:

- L-1012 / N69 junction at Leitrim Cross to the L-6021 / L-1012 junction at Leanamore Cross
- L-6021 / L-1012 junction at Leanamore Cross to the western access point on the L-6021 or to the eastern access point on the L-1009

From the South:

- L-1009 / R552 junction to the L-6021 / L-1009 junction at Shronowen
- L-6021 / L-1009 junction at Shronowen to the western access point on the L-6021 or to the eastern access point on the L-1009

In order to reduce two-way construction vehicle movements on local roads, it is proposed that all general construction delivery vehicles enter the wind farm site via the eastern entrance on the L-6021 Local road and exit the site via the western access on the L-1009 Local road. This will be implemented once an access road has been constructed within the wind farm that connects the eastern and western entrances to each other. See Figure 6-2.

It is anticipated that a succession of 20T and/or 8m³ trucks will transport the material at a peak frequency of 8 to 12 trucks/hour. Peaks in construction traffic are typically associated with the pouring of turbine foundations. Specialist vehicles will be used for the delivery of the wind turbine components and substation transformer. Other materials are expected to be delivered on flatbed trucks (whether 40ft or smaller depending on size of deliveries). Hours of operation will be limited for HGV movements in order to allow for residents to avoid non-coinciding commuting during the morning and evening peak hours, during local school start and finish times.

The grid connection option will require a temporary access point and road to be constructed from the L-6021 Local road in order to facilitate the construction within private lands. Once the construction is complete the temporary access point and road will be fully reinstated to its original condition.

6.1.5 Quarries

Material required for the construction of the wind farm roads, crane hardstands, substation compound and grid connection options are expected to come from local quarries. Material to be delivered to site will mainly consist of stone aggregate for the construction of access roads and hardstands, limestone capping material for roads and hardstands, and concrete for the construction of the 12 no. turbine bases and substation infrastructure. There are currently five licensed quarry facilities in the surrounding 40km likely to used, but not limited to, including Ardfert Quarry Products located circa 26km southwest of the development in Sackville, Ardfert; O' Mahoney Quarries located circa 24km southwest in Ballintobeenig, Tralee; P. Galwey Quarries located circa 26km south of the development in Fahaduff; William McAuliffe Ltd. Sand and Gravel located circa 40km east/southeast in Kilmeedy, County Limerick and Joseph Hogans Roadstone Quarry located circa 35km east/northeast of the development in Ballylin, Foynes, County Limerick. These quarries are shown in Figure 6-3.

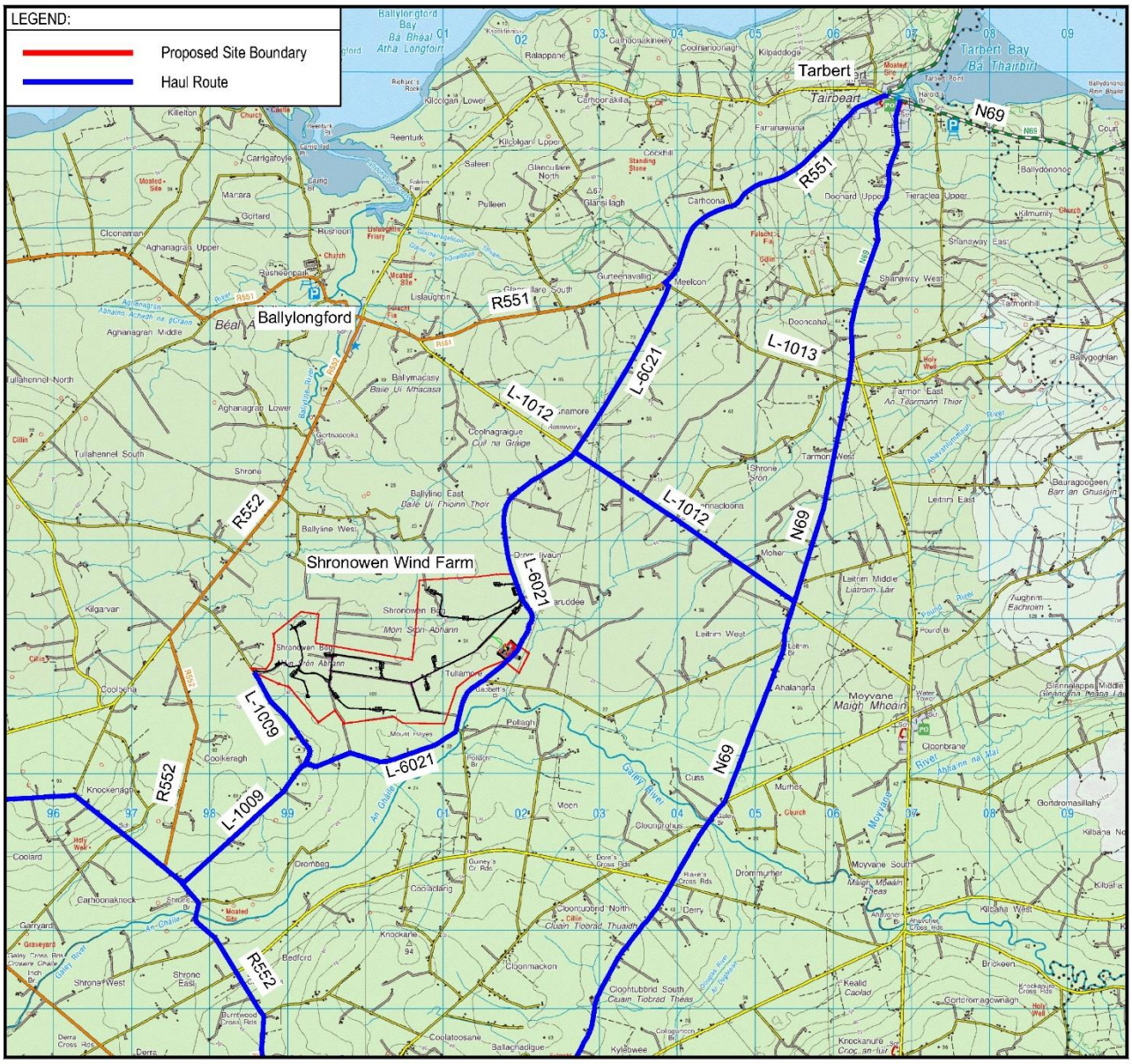


Figure 6-1 Haul Route Map

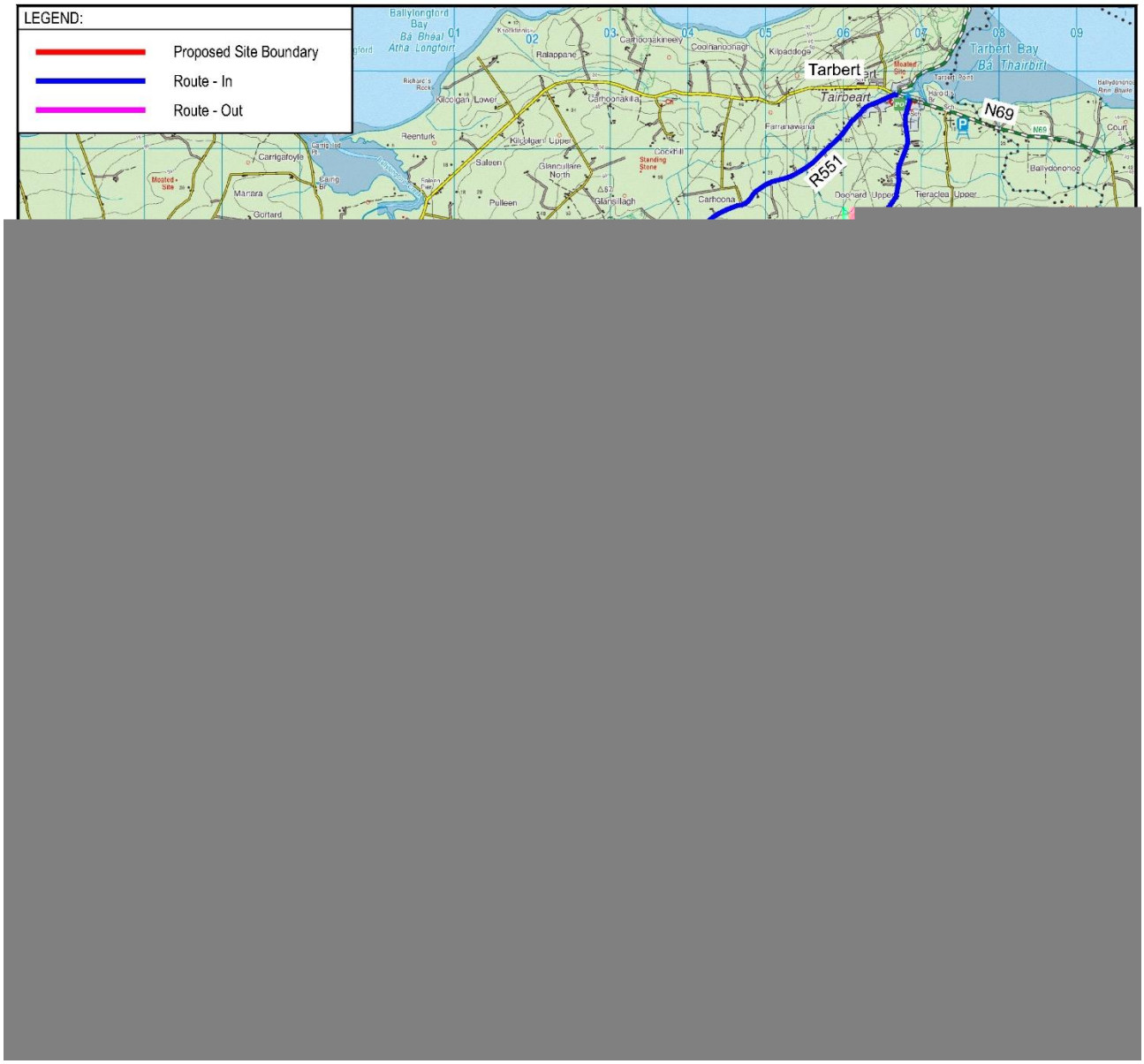


Figure 6-2 Construction Traffic Route System

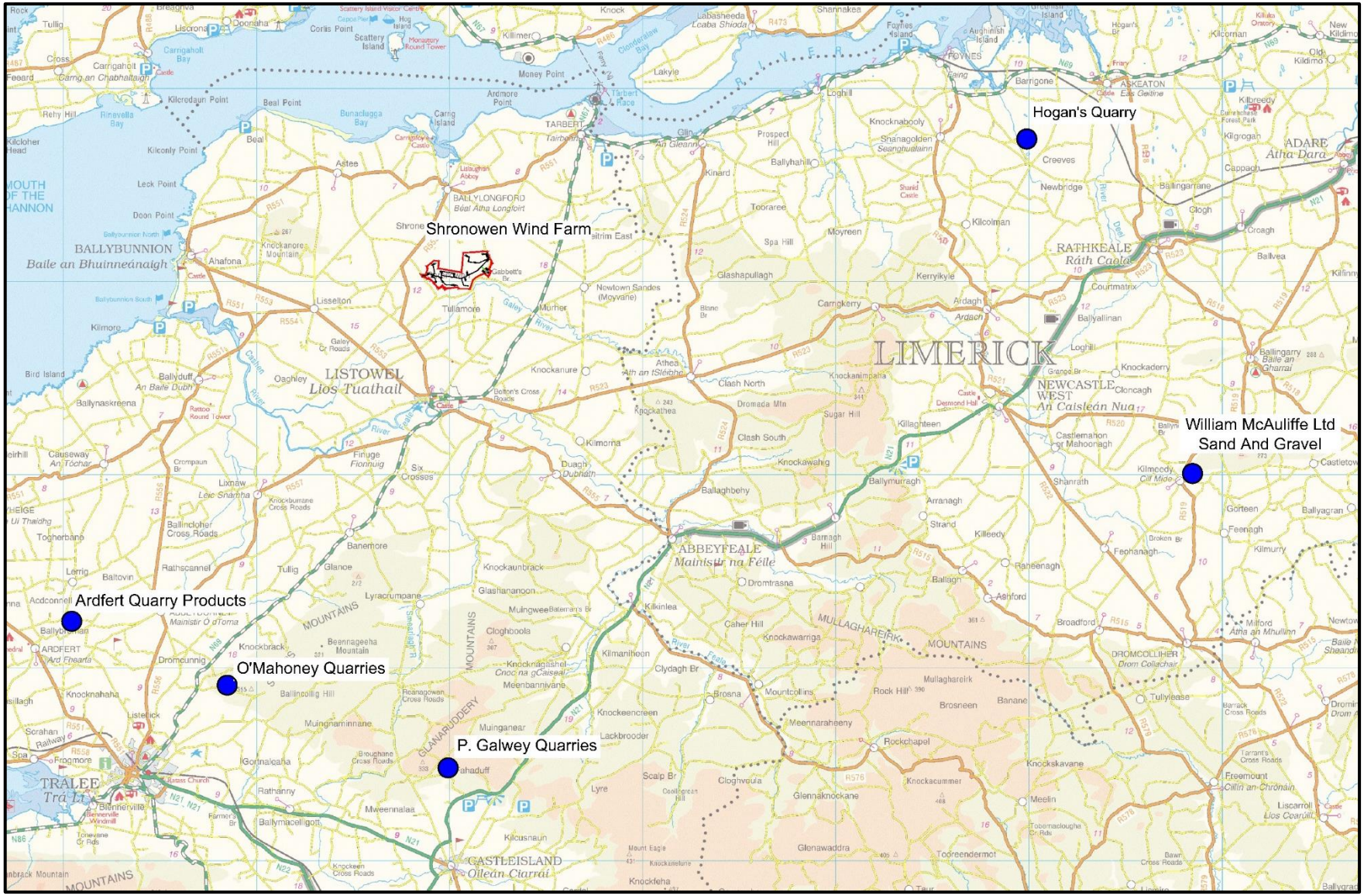


Figure 6-3 Quarry Map

6.1.6 Construction Traffic Volumes

Construction traffic shall access and egress the works via the delivery routes as outlined in Section 6.1.4. A summary of the approximate number of truck deliveries to the wind farm site is outlined in Table 6—1 below.

Elements	No. of Approximate Deliveries / Loads
Concrete Construction of turbine foundations, substation, meteorological mast etc. Each turbine foundation will have approximately 800m³ of concrete	1,210
Reinforcing Steel Each turbine foundation will have approximately 85 tonnes of reinforcing steel	68
Wind Turbine Components Deliveries Delivery of steel towers, turbine blades, nacelle, rotor hub etc. from port to site	120
Crane Deliveries to site, including ballast, booms etc. Cranes of 750 to 1,200 tonnes lifting capacity will be required to erect the turbines. Ballast is also normally employed for craneage. Smaller cranes of 150 to 200 tonnes lifting capacity will be required to assist with the removal of tower sections from delivery trailers and to operate as "tailing cranes"	20
Imported Stone Aggregate Material Construction of wind farm infrastructure including access roads, hardstands and substation Compound with imported Class 6F material. Crushed stone will be sourced locally.	28,813
Imported Timber Logs Construction of floated access roads with imported timber Logs	275
Substation Compound Transformer Delivery of substation transformer using specialist delivery vehicle	1
TOTAL APPROXIMATE DELIVERIES / LOADS FOR WORKS	**30,507**

Table 6—1 Estimated Deliveries for Wind Farm and Grid Connection Works

6.1.7 Traffic Control Tools

The appointed contractor may use a range of traffic control tools that will be confirmed at construction stage. These tools may include temporary road closures, temporary traffic lights, stop/go boards, two-way radios, safety barriers, cones, signage etc for the construction of the works. Each crew on site will have personnel on site trained in Signing Lighting and Guarding/Health and Safety at Road Works. Communication/Instruction of the Traffic Management Plan will come from the Project Manager and communicated to site personnel with the relevant training. A detailed traffic management plan will be produced by the appointed contractor prior to the construction of the wind farm and will be submitted to Kerry County Council.

6.1.8 Developed Traffic Management Plan

The appointed contractor will forward a formal application to Kerry County Council for a road opening licence for the required site entrances to the wind farm and for any additional roadworks which may arise at construction stage. Should the traffic management plan or formal application be rejected, it will be revised and re-submitted following consultation with the relevant bodies.

6.1.9 Lane Width Restrictions

Where lane width restrictions may be necessary due to the wind farm works, the appointed contractor will advise Kerry County Council of the following details:

- Reasons for lane width restrictions.
- Details of restricted width of traffic lane.
- Details of associated signage and warnings to motorists and pedestrians, including road markings.
- Details of proposed system of public communications and public liaison.
- Temporary footpaths.

The appointed contractor will ensure that procedures and works for single lane closures are in accordance with Section 0.5.2 of the *Temporary Traffic Management Design Guidance, Third Edition 2019* and temporary traffic management and roadwork signs are to Chapter 8 of the *Traffic Signs Manual 2019.* Sample information relating to single lane closures can be found in Appendix 2.

6.1.10 Road Closures

Where a road closure may be necessary to carry out works associated with the wind farm, the appointed contractor will seek a Temporary Closing of Roads Order. The appointed contractor will advise Kerry County Council of the following:

- Name of the road to be closed.
- Location of closing points.
- Date and period of closure required.
- Reasons for closure.
- Details of alternative routes.
- Details of method of traffic management and maintenance of alternative routes, including sign posting and traffic control plans.

The appointed contractor will ensure that procedures and works for road closures are in accordance with Section 0.5.2.9 of the *Temporary Traffic Management Design Guidance, Third Edition 2019* and temporary traffic management and roadwork signs are to Chapter 8 of the *Traffic Signs Manual 2019.* Sample information relating to road closures can be found in Appendix 2.

6.1.11 Traffic Diversions

Where traffic diversions may be necessary due to temporary road closures associated with the wind farm works, the appointed contractor will advise Kerry County Council of the following details:

- Location of proposed diversion.
- Reasons for specific traffic diversion.
- Duration of proposed diversion.
- Plan of diversion routes.
- Details for management and control of proposed method of diversion route traffic, including sign posting layouts and locations.
- Details of proposed system of diversion route maintenance and repair, including existing carriageway and street furniture etc.
- Details of proposed system of public communications and public liaison.

Alternative routes where traffic is to be diverted on will require an inspection prior to diverting traffic. These will need to be inspected again closer to the time of the works to ensure no hazards have occurred since the traffic management plan was developed. The appointed contractor will ensure that procedures and works for diversions are in accordance with Section 0.5.2.9 of the *Temporary Traffic Management Design Guidance, Third Edition 2019* and temporary traffic management and roadwork signs are to Chapter 8 of the *Traffic Signs Manual 2019.* Sample information relating to diversions can be found in Appendix 2.

6.1.12 Public Notices

Public notices in respect of any required road closures or other traffic management tools are the responsibility of the Roads Authority (Kerry County Council) who will undertake to publish such notices.

6.1.13 Underground Grid Connection Route Option

It is envisaged that a system of road closures will be implemented for the underground grid connection route option in the public roadway. This is to ensure that the underground grid connection route option can be constructed safely to protect construction workers and members of the public.

If the underground grid connection route option is selected at construction stage the appointed contractor will apply to Kerry County Council for a Road Opening Licence prior to works commencing and follow the relevant procedures as outlined in Sections 6.1.13.1 to 6.1.13.5. Excavation, backfilling and reinstatement of trenches in roads will be completed within the shortest possible time frame. The planning of road closures and traffic diversions will ensure that reinstatement of the trenches, joint bays, launch and reception pits are completed, and all temporary traffic measures (road closures/diversions) are removed in progressive stages.

6.1.13.1 Road Closures for Underground Grid Connection Route Option

Roads closures will be implemented where there is insufficient space on the existing public roadway to implement a lane closure for the underground grid connection route option. A road closure will be controlled by way of diversions but local access will be accommodated on the route where possible with all residents on the route informed of the programme for a road closure. Road closures are to be planned on a rolling basis so when works on a section of the underground grid connection route option are complete then roads will re-open. This will ensure roads are not closed for longer than necessary. The appointed contractor will ensure that procedures and works for closures are in accordance with Section 0.5.2.9 of the *Temporary Traffic Management Design Guidance, Third Edition 2019.* Temporary traffic management and roadwork signs will be to Chapter 8 of the *Traffic Signs Manual 2019.*

It will be envisaged, pending final selection of the grid connection option and the final traffic management plan to be produced by the appointed contractor at construction stage, that the following roads will have road closures during construction of the underground grid connection route with approximate lengths shown:

Proposed Local Road Closures in County Kerry

- L-6021 (1st Section): The L-6021 / L-1012 junction at Leanamore Cross to the L-6021 / L-6025 junction at Shronowen Cross (3.0 kilometres)

- L-6021 (2nd Section): The L-6021 / L-6025 junction at Shronowen Cross to the L-6021 / L-6033 junction at Pollagh Cross (750 metres)
- L-6021 (3rd Section): The L-6021 / L-6033 junction at Pollagh Cross to the L-6021 / L-1009 junction at Tullamore Cross (2.1 kilometres)
- L-1009: The L-6021 / L-1009 junction at Tullamore Cross to the L-1009 / R552 junction at Coolkeragh Cross (2.2 kilometres)

6.1.13.2 Traffic Diversions for Alternative Underground Grid Connection Route Option

Diversions will be implemented to provide an alternative route where road closures are required during construction of the underground grid connection route option. Road closures will be sequenced in order to prevent unnecessary delays to the public and allow the appointed contractor to achieve their construction timeline. Information and directional signage will be provided to inform the public of road closures and direct them along diversion routes. Local access will be maintained for residents where possible. The appointed contractor will ensure that procedures and works for diversions are in accordance with Section 0.5.2.9 of the *Temporary Traffic Management Design Guidance, Third Edition 2019.* Temporary traffic management and roadwork signs will be to Chapter 8 of the *Traffic Signs Manual 2019.*

It will be envisaged, pending final selection of the grid connection option and the final traffic management plan to be produced by the appointed contractor at construction stage, that the following roads will provide a diversion for the proposed road closures where approximate diversion lengths are shown. See Appendix 3 for preliminary drawings of proposed traffic diversions for the underground grid connection route option.

See Drawings 19876-MWP-00-00-DR-C-5101 to 5104 for map of below proposed traffic diversions.

- L-6021 (1st Section): Diversion to be made via the L-1012 Local road, the N69 National Secondary road and the L-6025 Local road in County Kerry (8.1 kilometres)
- L-6021 (2nd Section): Diversion to be made via the L-6025 Local road, the N69 National Secondary road, the L-1018 Local road, the L-1017 Local road and the L-6033 Local road in County Kerry (13.3 kilometres)
- L-6021 (3rd Section): Diversion to be made via the L-6033 Local road, the L-1017 Local road, the R552 Regional road and the L-1009 Local road in County Kerry (8.6 kilometres)
- L-1009: Diversion to be made via the R552 Regional road and the L-1009 Local road in County Kerry (6.6 kilometres)

6.1.13.3 Joint Bays

It may be necessary that joint bays on the underground grid connection route option are required to be left open overnight for pulling cables through the ducts and jointing the cables together. Joint bays will be individually assessed to determine what type of traffic management system will be required at each location. Safety barriers or fencing will be erected around each open joint bay with either a priority yield or temporary traffic light system utilised to safely navigate vehicles around.

The appointed contractor will ensure traffic management controls are in accordance with Chapter 8 of the *Traffic Signs Manual 2019* and the *Temporary Traffic Management Design Guidance, Third Edition 2019.*

6.1.13.4 Personnel Traffic for Underground Grid Connection Works

All traffic arising from personnel (appointed contractors, sub-appointed contractors, site operatives etc.) working on the underground grid connection option will park their vehicles at the appointed contractors site compound within the wind farm site. This will be done so as to prevent traffic disruption to local residents and construction activities along the local road network.

6.1.13.5 Access for Residents

The appointed contractor shall make provision for safe access at all times to private residences in proximity to the underground grid connection route option should this requirement be necessary. Local access will be maintained along a road closure and steel plates or stone will be made available to allow access to residential properties over any cable trenches where necessary. This will be done in co-operation / communication with local residents in the area. The appointed contractor will inform local residents of the programme of works in their area where possible.

6.1.14 Communications

The developer is committed to providing a high level of communication with the relevant local authorities and to the general public and business community regarding the extent and duration of the project. The appointed contractor will co-operate with the developer in this regard.

Such communications shall include:

- Submissions of proposed traffic management measures;
- Updates to construction programming;

The appointed contractor shall also ensure that the local community is informed of any proposed traffic management measures in advance of their implementation. Such information shall be disseminated by posting advertisements in local newspapers of by delivering leaflets to nearby houses. Such information shall contain contact information for members of the public to obtain additional information and to provide knowledge such as on local events, sports fixtures etc. which may conflict with any proposed traffic management measures.

In the event of potential conflicts arising from construction activities, such conflicts shall be resolved, if possible, in consultation with Kerry County Council, the appointed contractor and where necessary An Garda Síochána. The appointment of a PSCS for the construction works will consider any other works which could interact with the project.

6.1.15 Access to Commercial / Business Properties

The appointed contractor shall make provision for safe access to commercial and business premises for employees, customers, the general public and for deliveries should this requirement be necessary at construction stage.

6.1.16 Pedestrian Safety

The appointed contractor shall ensure that throughout the course of the works its operations do not put pedestrians at any risk.

- Where the construction work necessitates the restriction or partial closure of a pedestrian walkway where they may exist, the appointed contractor shall provide adequate safety barriers, signposts, lighting and temporary surfacing (if applicable) to ensure safe passage for pedestrians.
- Where the construction work necessitates the closure of a pedestrian walkway, the appointed contractor shall provide a safe and reasonable alternative. The appointed contractor shall provide adequate safety barriers, signposts, and lighting (if applicable) to direct pedestrians and ensure their safe passage.
- With respect to pedestrians, the appointed contractor shall refer to and observe the requirements of the updated version of the Traffic Signs Manual 2019 titled Temporary Traffic Measures and Signs for Roadworks.

6.1.17 Signage

The appointed contractor shall undertake consultation with Kerry County Council for the purpose of identifying and agreeing signage requirements. Such signage shall be installed prior to works commencing on site.

Proposed signage will include warning signs to provide warning to road users of the work access / egress locations and the presence of construction traffic. All signage shall be provided in accordance with Chapter 8 of the *Traffic Signs Manual 2019* as shown in Appendix 1.

The appointed contractor shall ensure that:

- All sign faces are to be retro-reflective material to Class Ref 2 of EN 12899. The colours, chromaticity and luminance factors shall be as specified in Specification TS4.
- Signage shall be inspected at least twice daily by the appointed contractor to ensure that it is in place, secure and appropriately fitted with warning lights as required.

6.1.18 Operator Training

The appointed contractor will provide training to operatives in the traffic control systems being used on site. The importance of transport management, the safety of motorists, pedestrians and site staff shall be emphasised to all construction staff.

There must always be at least one competent person with a valid Construction Skills Registration Card on site when work is being carried out on roads.

6.1.19 Emergency Crew

The appointed contractor's emergency contact telephone number shall be displayed at the appointed contractor's site office and shall be notified to the Local Authority Roads Engineer, Utility companies and the Emergency Services Providers. This telephone will be manned by the appointed contractor's Project Manager or by an authorised deputy capable of making decisions in an emergency.

The appointed contractor shall set up an emergency crew, led by an experienced foreman or an engineer, for dealing with emergencies arising as a result of the works. The emergency crew shall be available to respond to an event seven days a week.

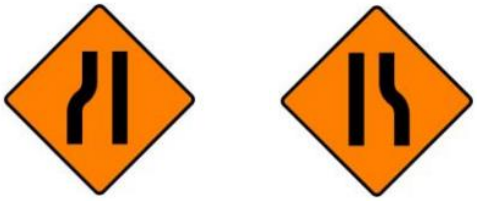
The appointed contractor will issue the emergency crew with contact details for the emergency services and the utility companies if they are required.

The appointed contractor shall report all callouts and events, both orally and in writing, to the client on the first working day following the event. The report shall include details such as, inter alia, the nature of the event, the time it occurred, the extent and duration of event, the cause of the event and the actions taken.

Appendix 1

Sample Schedule of Traffic Management Signs

WK 001 - Roadworks Ahead / End



WK 032 / 033 - Road Narrows on Left / Right

WK 052 / 053 - Site Access on Left / Right

WK 091 - Diverted Traffic

WK 061 - Flagman Ahead

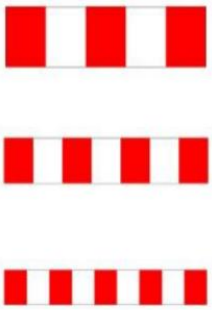
WK 060 - Temporary Traffic Signals

WK 090 - Detour

WK 092 - End of Detour

WK 094 - Road Closed

WK 095 - Stop Here on Red

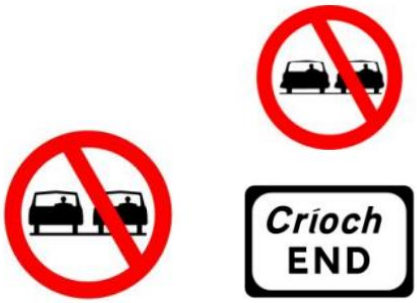


W 183 / 184 / 185 - Barrier Boards

RUS 060 / 061- Stop and Go

RUS 001 - Keep Left

RUS 002 - Keep Right



RUS 014 - No Overtaking / End

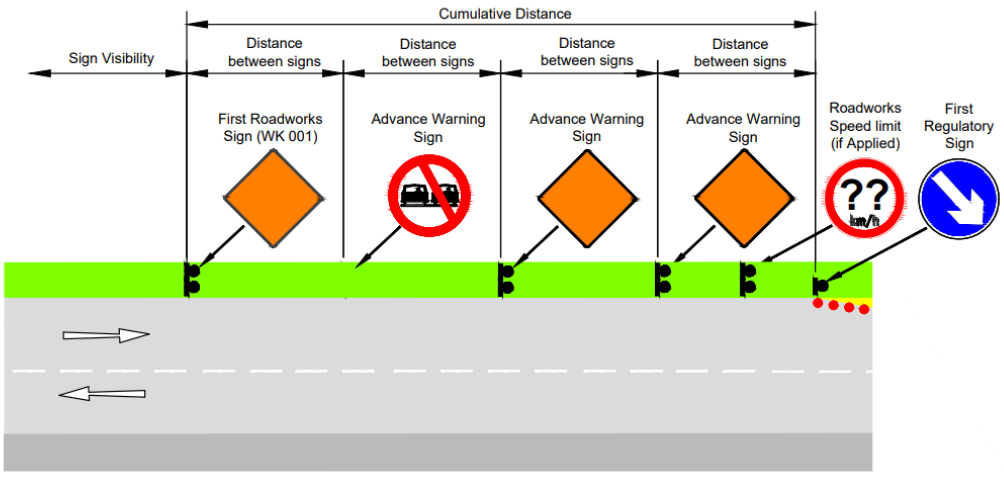
WK 071 - Uneven Surface

WK 073 - Loose Chippings

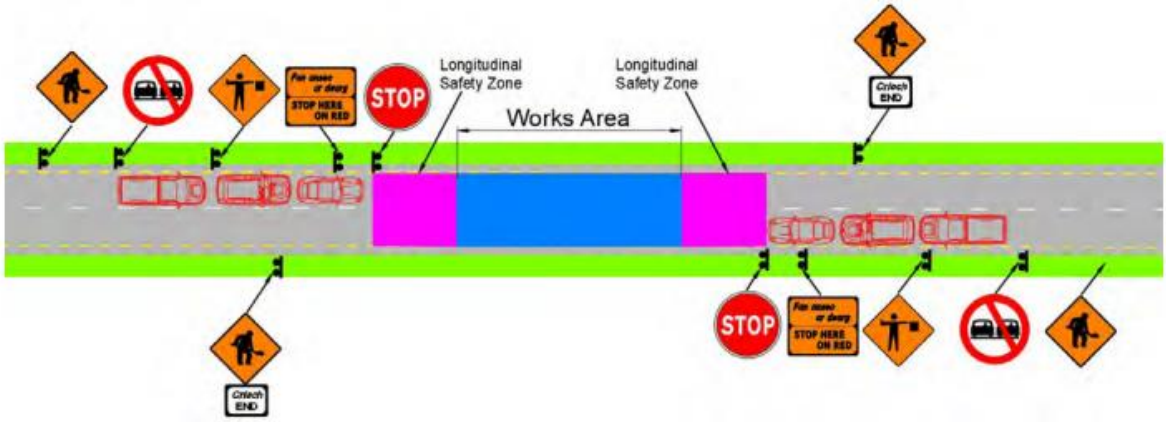
WK 052 - Site Access

Appendix 2

Sample Traffic Management Drawings and Check Sheets

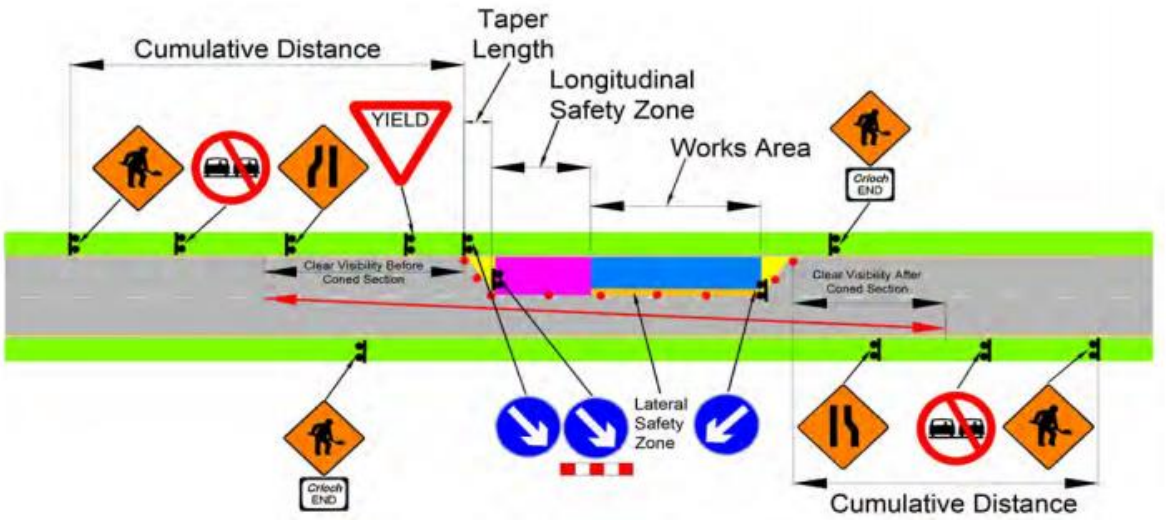


Required Locations for Advance Warning Signs to Roadworks



Level	Longitudinal Safety Zone (m)
2(i)	45
2(ii)	60

Example Layout of an "All Stop" Traffic Operation



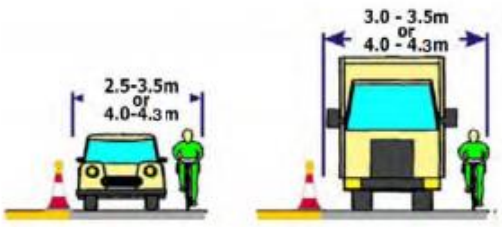
Roadworks Type	Speed (km/h)	No. Adv. Warning Signs	Cumulative Distance (m)	Sign Visibility (m)	Longitudinal Safety Zone (m)	Lateral Safety Zone (m)	Max Cone / Lamp Spacing (m)
Level 2 (i) A	80	4	480	90	45	1.2	12 / 24
Level 2 (i) B	80	3	360	90	45	1.2	12 / 24
Level 2 (ii) A	100	4	800	120	60	1.2	12 / 24
Level 2 (ii) B	100	3	600	120	60	1.2	12 / 24

Summary Criteria

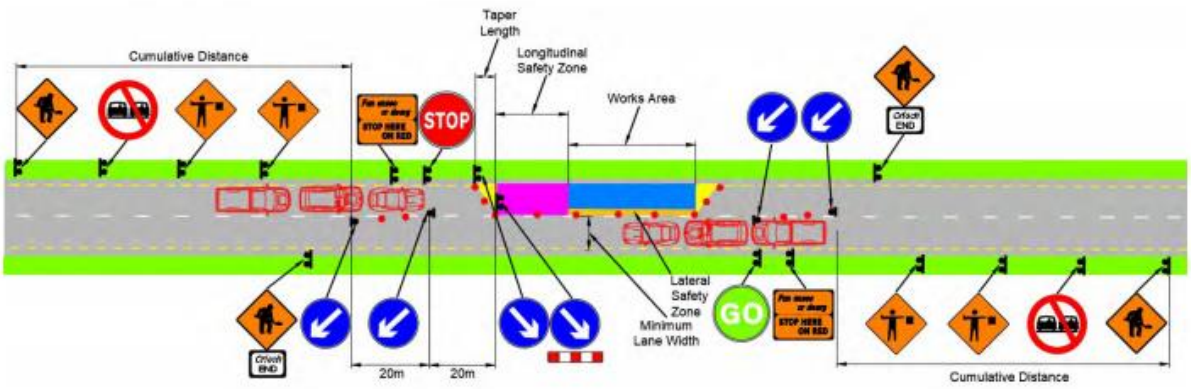
Speed (km/h)	Coned Area Length	Max Traffic Flow (3 min count)	Clear Visibility Before and After Coned Area (m)
80	80m maximum	40 vehicles	80
100			100

Lane Widths

Cars only	≥ 2.5m
HGVs present	≥ 3.0m
Preferred width	3.3m
Preferred (with cyclists)	4.0 - 4.3m



Example Layout of a Priority Yield Operation



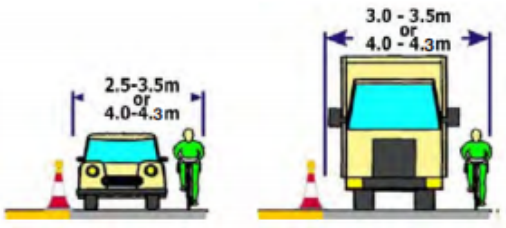
Roadworks Type	Speed (km/h)	No. Signs	Cumulative Distance (m)	Sign Visibility (m)	Longitudinal Safety Zone (m)	Lateral Safety Zone (m)	Max Cone / Lamp Spacing (m)
Level 2 (i) A	80	4	480	90	45	1.2	12 / 24
Level 2 (i) B	80	3	360	90	45	1.2	12 / 24
Level 2 (ii) A	100	4	800	120	60	1.2	12 / 24
Level 2 (ii) B	100	3	600	120	60	1.2	12 / 24

Summary Criteria

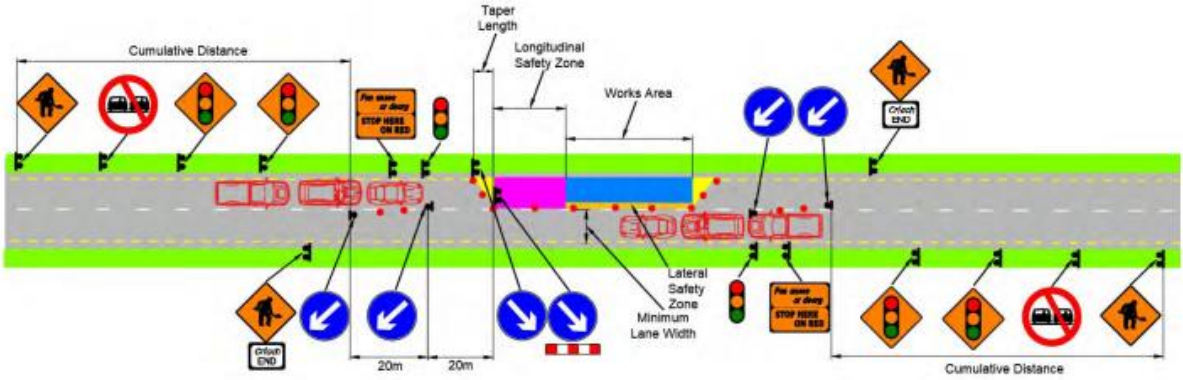
Shuttle Length	Maximum Traffic / 3 mins	Notes
500m	45	Shall be 2 operators, 2 discs when ≥ 200m
400m	50	
300m	55	
200m	60	May be 1 operator with remote discs. Operator must be ≤ 100m from each disc and have clear view of each
100m	70	
20m	25	May be 1 operator, 1 disc

Lane Widths

Cars only	≥ 2.5m
HGVs present	≥ 3.0m
Preferred width	3.3m
Preferred (with cyclists)	4.0 - 4.3m



Example Layout of a Stop and Go Operation



Roadworks Type	Speed (km/h)	No. Adv. Warning Signs	Cumulative Distance (m)	Sign Visibility (m)	Longitudinal Safety Zone (m)	Lateral Safety Zone (m)	Max Cone / Lamp Spacing (m)
Level 2 (i) A	80	4	480	90	45	1.2	12 / 24
Level 2 (i) B	80	3	360	90	45	1.2	12 / 24
Level 2 (ii) A	100	4	800	120	60	1.2	12 / 24
Level 2 (ii) B	100	3	600	120	60	1.2	12 / 24

Signal Checks

- Batteries
- Bulb / LEDs operating
- Signals communicating with each other
- Housing is in good condition

Signal Heights

Signal Sequence

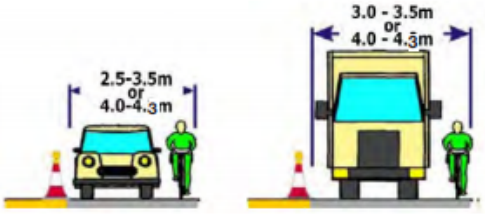
- Red - time is set by Operative
- Green - time is set by Operative
- Amber - 3 seconds

Summary Criteria

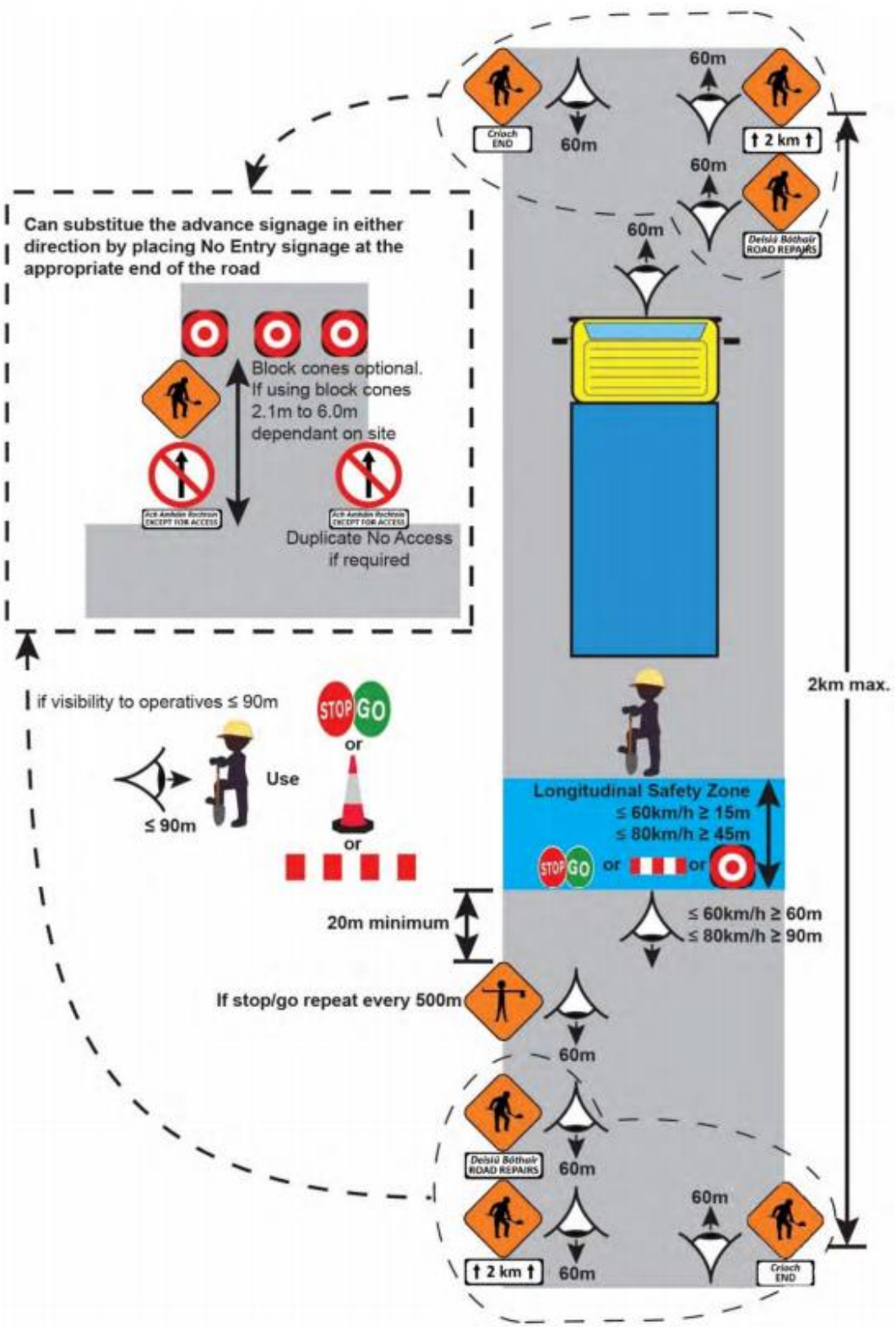
Max Speed Limit (km/h)	Max Coned Area Length (m)	Max Traffic Flow
60	500	No Restrictions

Lane Widths

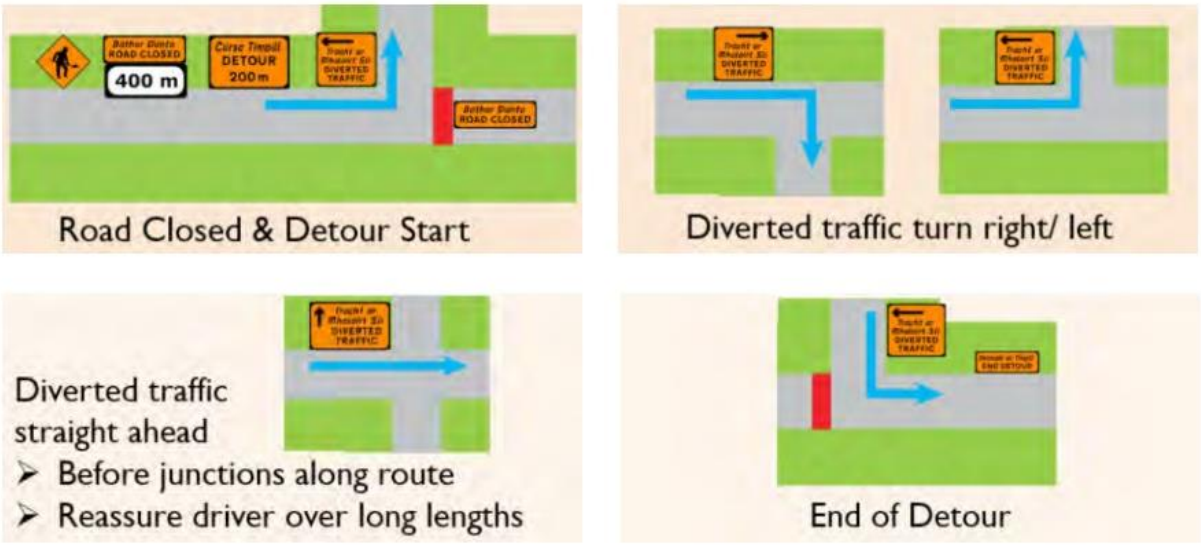
Cars only	≥ 2.5m
HGVs present	≥ 3.0m
Preferred width	3.3m
Preferred (with cyclists)	4.0 - 4.3m

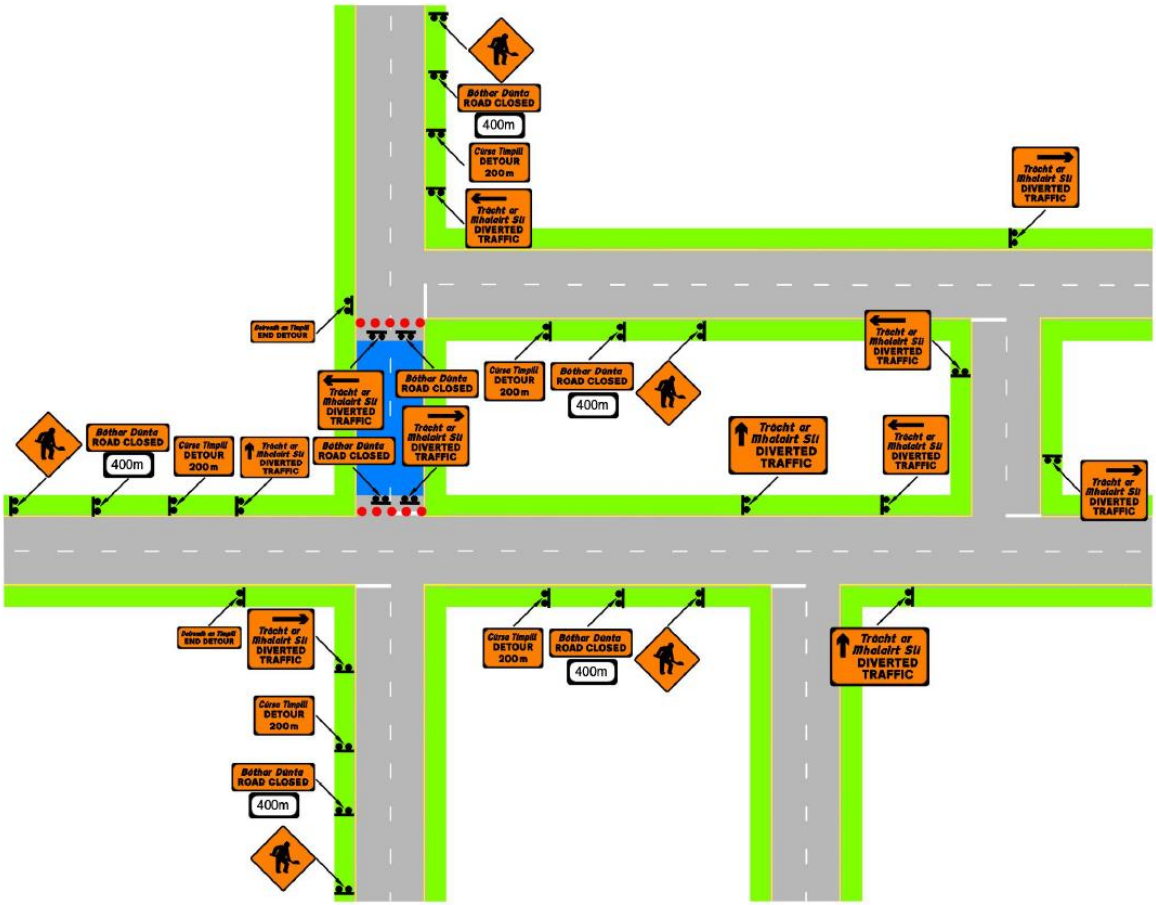


Example Layout for a Temporary Traffic Signals Operation



Example of a Road Opening Works Operation





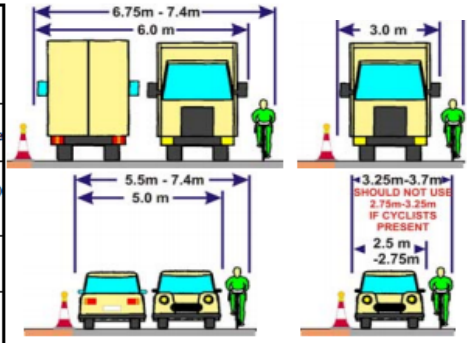
Example of a Road Detour and Signage Operation

PLANNED WORKS TRAFFIC MANAGEMENT DESIGN SHEETS

TRAFFIC MANAGEMENT LAYOUT PARAMETER DESIGN SHEET

STEP 1: SELECT TRAFFIC MANAGEMENT TYPE

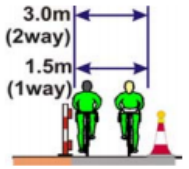
Road Closure	When: 1) Adequate Safety Zone + Lane Width cannot be achieved, or 2) Alternative Safe Method of Work cannot be implemented, or 3) Semi Static Operation for Minor Roads not applicable, or 4) Convoy Working cannot be implemented	
	24/7 detour	Where RESIDUAL risks on Road Works Section are greater than on the Detour even when active works are not taking place
	Working hours detour	Where RESIDUAL risks on Road Works Section are greater than on the Detour when works are active AND where the RESIDUAL risks on Road Works Section are less than on the Detour when works are not active
Two-Way	Abs Min. Minimum Maximum	5.0m (Cars and light vehicles only) 6.0m Combined lane width should not exceed 7.4m
Lane/ Shuttle	Abs Min. Minimum Maximum Cyclists	2.5m 3.0m 3.7m DO NOT USE lane width between 2.75m and 3.25m
Marshall	Shuttle with mainly light vehicles and alternatives not suitable	
Convoy	Select Where: 1) Adequate Safety Zone +Lane Width cannot be achieved 2) Alternative Safe Method of Work cannot be implemented 3) Semi Static Operations for Minor Roads not applicable	
Semi-Static Management	> On Minor Roads use for Surface Dressing > For moving single vehicle operations	
Roadworks Speedlimit	Refer to Section 4.3	
Cautionary Speed Plate	See Section 4.3	
All Stop	short duration (<10 min typically) and 300 veh/hr or less	



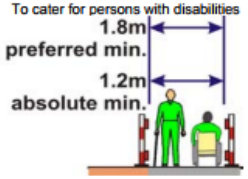
STEP 2: SHUTTLE OPTIO

Method	Max Speed Limit (km/h)	Length of Works (m)	Traffic Flow (veh/hr)	Notes	
Give and Take See 4.5.1	50	50	400	Visibility	
Priority	100	80	850	Speed	Distance
				50 km/h	60m
				60 km/h	70m
				80 km/h	80m
				100 km/h	100m
	If used at night, will require flashing lamps				
Stop/Go					
1 Sign	100	20	500	1 Person/ 1 Sign	
1 Person	100	100	1400	1 Person/ Auto Signs	
1 Person	100	200	1250	1 Person/ Auto Signs	
2 Person	100	300	1050	2 Person/ 2 Signs	
2 Person	100	400	950	2 Person/ 2 Signs	
2 Person	100	500	850	2 Person/ 2 Signs	
Traffic Lights	100	500	n/a	Vehicle Actuated	

> Limit Shuttle lengths to 500m generally (+/- at junctions/ specific reasons)
> Use Vehicle Actuated Traffic Lights
> Notify Gardaí if using Traffic Lights/ Stop-Go boards



To cater for persons with disabilities



VULNERABLE ROAD USERS

Footway Desirable minimum width	1.8m
Vulnerable users' minimum width	1.2m
Minimum width at obstacle	1.0m
Minimum width at bus stop	3.0m
Minimum width at shop front	3.5m
Cycle track desirable minimum width	1.5m
Cycle track absolute minimum width	1.3m
Combined minimum width	3.0m
Desirable minimum clearance height	2.5m
Absolute minimum clearance height	2.3m

STEP 3: SELECT PARAMETERS

Type of Road	Type of Works	Advance Sign Distance (D) (m)	Min. Number Of Advance Signs	Min. clear visibility of Signs (m)	Min. size of signs (mm)	Min. height of cones (mm)	Long. Safety Zone (L) (m)	Side. Safety Zone (S) (m)	Long. Cone Space	Long. Lamp Space	Hard Shoulder Taper Multiply Factor	2 WAY Lane Taper Multiply Factor	2 WAY Lane Taper Cone Spacing	Lane Taper Lamp Spacing	Lane Lead-in cone tapers Recommended lengths	Width of hazard (including safety zone) NOTE: WHERE TWO TRAFFIC MAINTAINED 1m	2m	3m	4m
Single carriageway road, 30km/h	All works	50	1 (rwa) 1 (tm)	50	600	750	5	0.5	6	12	5	10	3	6	Length of taper (T) in (m)	10	20	30	40
															Minimum no. of Cones	5	8	12	15
															Minimum no. of Lamps	3	5	7	8
	Single Vehicle	25	1 (rwa)	50	600	750	5	0.5	6	12	5	5	3	6	Length of taper (T) in (m)	5	10	15	20
															Minimum no. of Cones	3	5	7	8
															Minimum no. of Lamps	2	3	4	5
Single carriageway, 31km/h to 60km/h	All Works	75	1 (rwa) 2 (tm)	50	600	750	25	0.5	6	12	10	15	3	6	Length of taper (T) in (m)	15	30	45	60
															Minimum no. of Cones	7	12	17	22
															Minimum no. of Lamps	4	7	9	12
	Single Vehicle	50	1 (rwa) 1 (tm)	50	600	750	5	0.5	6	12	5	5	3	6	Length of taper (T) in (m)	5	10	15	20
															Minimum no. of Cones	3	5	7	8
															Minimum no. of Lamps	2	3	4	5
Single Carriageway 61 to 100 km/h	All Works	800	1 (rwa) 1 (no) 2 (tm)	120	600* 750*	750	60	1.2	12	12	30	55	3	6	Length of taper (T) in (m)	55	110	165	220
															Minimum no. of Cones	20	38	57	75
															Minimum no. of Lamps	11	20	29	38
	Single Vehicle	600	1 (rwa) 1 (no) 1 (tm)	120	600* 750*	750	45	1.2	12	12	20	40	3	6	Length of taper (T) in (m)	40	80	120	160
															Minimum no. of Cones	15	28	42	55
															Minimum no. of Lamps	8	15	22	28

* Use 600mm signs where Vehicles Per Day < 5,000. Use 750mm signs where Vehicles Per Day > 5,000

Tapers at Shuttles to be at 45 degrees with 1m cone spacings.

PLANNED WORKS TRAFFIC MANAGEMENT DESIGN SHEETS

SITE SPECIFIC SHEET _____ OF _____

HEALTH, SAFETY AND RISK ASSESSMENT MASTER SHEET

Works Name: TDRAM -

Job Location	
PSDP (CMO)	
PSCS (CMO)	
Job Code	
Budget Holder	
Budget	
Total No. Work Days	
Tot. No. Person Days	
Work Days > 30 or Person Days > 500 then Notify HSA	

Works	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10	Period 11	Period 12

Physical Data

Brief Description of Works:	
Road Classification	
Road ID (incl. Seg)	
Road Width	
Works Length	
Roadside Development:	

Traffic Data

AADT	
% HCV	
Speed Limit	
Operating Speed	

Traffic Management Items

Accident History	
Pedestrians	
Schools	
Shops	
Cyclists	
Equestrian/Rail Crossing	
Vulnerable Road Users	
Bus Route/School Route	

Particular Risk Items

Burial	☐	Underground works	☐
Fall from height	☐	Diving	☐
Chemical/Biological	☐	Compressed air	☐
Radiation	☐	Explosives	☐
HV Power Lines	☐	Heavy components	☐
Drowning	☐	Other	☐

Identified Items (For Map Reference see overleaf)

Map Ref.	Item	Hazard	Risk Hi	Risk Med	Risk Lw	Control	Residual Risk Hi	Residual Risk Med	Residual Risk Lw

Design Prepared By: _____

PLANNED WORKS TRAFFIC MANAGEMENT DESIGN SHEETS

SITE SPECIFIC SHEET _____ OF ____

TRAFFIC MANAGEMENT DESIGN CIVIL WORKS SHEET

Works Name:

TDC -

Traffic Management Selection

Road Closure: 24/7 - Working Hours		
Detour		
Two Way		
Shuttle:	Give & Take	
	Priority	
	Stop/Go	
	Traffic Lights	
Marshall		
Convoy		
Semi-Static Roadworks		
Roadworks Speedlimit		
Cautionary Speed Plate		
All Stop		

Notes

Layout Parameters

Advance Distance	
Number of Advance Signs	
Min. Advance Sign Visibility	
Size of Signs	
Height of Cones	
Taper Length	
Sideways Safety Zone	
Longways Safety Zone	
Lane Width/ Carriageway Width	
Longitudinal Cone/ Lamp Spacing	
Taper Cone/ Lamp Spacing	
Maximum Length of Shuttle	
Repeater Sign Distances	

Inspections

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

Consultation

Buses/School Buses ☐ Milk Lorries ☐
Local Residents ☐ Emergency Services ☐
Gardaí for Roadworks Speedlimit ☐ /or Positive TM ☐

Sign Ref	Sign	Quantity	Supplement/ Additional Info	No.
WK 001	Roadworks Ahead		km/h / m	
RUS 014	No Overtaking			
RUS 039-044	Roadworks Speedlimit		Specify Speed Both Sides	
WK 032	Road Narrows Left		m	
WK 033	Road Narrows Right		m	
WK 034	Road Narrows Both		m	
WK 060	Temporary Traffic Signal		m	
WK 061	Flagman Ahead		m	
WK 062	Queues Likely		m / m	
WK 094	Road Closed			

Sign Ref	Sign	Quantity	Supplement/ Additional Info	No.
WK 071	Uneven Surface		Go Real SLOW / km/h	
RUS 001	Keep Left			
RUS 002	Keep Right			
W 062L	Chevron Left			
W 062R	Chevron Right			
W183 W184 W185	Barrier Board			
RUS 060/ 061	Stop and Go		SG-M=Manned Stop/Go SG-A=Auto/Controlled Stop/Go delete as appropriate	
TL	Temporary Traffic Signal			
WK 095	Stop Here on Red			
WK 030	Single Lane Shuttle			

Sign Ref	Sign	Quantity	Supplement/ Additional Info	No.
WK 070	Hump or Ramp		m	
WK 050	Side Road Left		Oscail Cheilte CONCEALED ENTRANCE	
WK 051	Side Road Right		Oscail Cheilte CONCEALED ENTRANCE	
WK 052	Site Access Left		Oscail Cheilte CONCEALED ENTRANCE	
WK 053	Site Access Right		Oscail Cheilte CONCEALED ENTRANCE	
WK 074	Soft Verge			
WK 080	Pedestrians Cross Left			
WK 081	Pedestrians Cross Right			
PB	Pedestrain Barrier			
PF	Herace Style Fencing			

Sign Ref	Sign	Quantity	Supplement/ Additional Info	No.
WK 001 P010	Roadworks End			
RUS 014 P010	No Overtaking End			
C	Cone			
WB	Workman Barrier			
LS	Steady State Lamp			
LF	Flashing Warning Lamp			
RR	Rotating Reflector			
RUS 026	Priority Signage			

Design Prepared By:_____

PLANNED WORKS TRAFFIC MANAGEMENT DESIGN SHEETS

SITE SPECIFIC SHEET _____ OF _____

TRAFFIC MANAGEMENT DESIGN DETOUR SHEET

Works Name:

TDD -

Traffic Management Selection

Road Closure: 24/7 - Working Hours	
Detour	
Roadworks Speedlimit	
Cautionary Speed Plate	

Notes

Layout Parameters

Advance Distance	
Number of Advance Signs	
Min. Sign Visibility	
Size of Signs	
Height of Cones	
Diversion Width	
Repeater Sign Distances	

Inspections

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

Detour Risk Assessment

Length	Shops
Capacity	Cyclists
Speed > Limit	Equestrian
Accident History	Rail
Pedestrians	Vulnerable Users
Schools	Bus/School Route

Consultation

Buses/School Buses ☐ Milk Lorries ☐
Local Residents ☐ Emergency Services ☐
Gardaí for Roadworks Speedlimit ☐ /or Positive TM ☐

Sign Ref	Sign	Quantity	Supplement/ Additional Info	No.
WK 001	Roadworks Ahead		km/h m	
RUS 014	No Overtaking			
RUS 039-044	Roadworks Speedlimit		Specify Speed Both Sides	
WK 090	Detour Ahead			
WK 061	Flagman Ahead		m	
WK 094	Road Closed			
MB	Manned Road Block			
WK 091S	Diverted Traffic Straight			
WK 091 L	Diverted Traffic Left			

Sign Ref	Sign	Quantity	Supplement/ Additional Info	No.
WK 091 KL	Diverted Traffic Keep Left			
WK 091 R	Diverted Traffic Right			
WK 091 KR	Diverted Traffic Keep Right			
WK 092	End of Detour			
RUS 001	Keep Left			
RUS 002	Keep Right			
W 062L	Chevron Left			
W 062 R	Chevron Right			
W183 W184 W185	Barrier Board			
WK 080	Pedestrian Cross Left			

Sign Ref	Sign	Quantity	Supplement/ Additional Info	No.
WK 081	Pedestrians Cross Right			
W 647	Slippery Road		km/h	
W 644	Hump or Ramp		m	
W 645	Hollow		m	
W 620 L	Dangerous Corner Left		km/h	
W 620 R	Dangerous Corner Right		km/h	
W 622	Series Dangerous Corners		km/h	
W 626L	Road Narrows Left			
W 626 B	Road Narrows Both			
W 603 L	Side Road Left		m	

Sign Ref	Sign	Quantity	Supplement/ Additional Info	No.
W 603 R	Side Road Right		m	
W 652	Caution Children			
PB	Pedestrian Barrier			
PF	Herace Style Fending			
WK 001 P010	Roadworks Ends			
RUS 014 P010	No Overtaking Ends			
C	Cone			
LS	Steady State Lamp			
LF	Flashing Lamp			

Design Prepared By:_____

PLANNED WORKS TRAFFIC MANAGEMENT SITE INSPECTION SHEET					
PROJECT NAME:			Phase:		
Date:		Time:	1).	2).	
1) TRAFFIC MANAGEMENT SET-UP/ MODIFICATION, INSPECTIONS					
1-1) Installation Checks					
Does the Traffic Management conform to the Design Layout and Parameters?					
Have all hazards been addressed in the Traffic Management Plan?					
Has allowance been made for the delivery and removal of materials?					
Have Gardaí been informed of any Traffic Lights/ Stop-Go Boards in use?					
Have Gardaí been informed of Roadworks Speed Limits being introduced?					
2) TRAFFIC MANAGEMENT OPERATION INSPECTIONS					
2-1) Operation Checks				1	2
Are Safety Zones being kept clear of operatives, plant and materials?					
Are all the signs in good condition/ are all cones in good condition with sleeves?					
Are sign vision lines free from bends, hills/dips in the road, parked vehicles, hedges etc?					
Will the site be safe at night or in wind, fog, snow or rain? (delete as appropriate)					
Are all misleading permanent signs and road markings covered?					
Is the carriageway/footway being kept clear of mud and surplus equipment?					
Are materials/ plant that are left on verges or lay-bys being properly guarded and lit?					
2-2) Traffic Checks					
Is there safe access to adjacent premises?					
Does Signing and Guarding meet the (changing) conditions?					
Are traffic control arrangements working at the optimum level to reduce traffic delays?					
If present, are the needs of cyclists or horse riders incorporated into the layout?					
2-3) Pedestrian and Vulnerable Road User Checks					
Have the needs of pedestrians and vulnerable road users been addressed in the layout?					
If pedestrian route blocked, has a suitable alternative route been provided?					
Are pedestrian routes clearly evident/ indicated?					
If a footway in the road is to be used, are ramps to the kerb provided?					
Are pedestrian hazards sufficiently GUARDED at night?					
3) TRAFFIC MANAGEMENT CESSATION INPECTIONS					
3-1) Works Complete Checks					
Have all signs, cones, barriers, and lamps been removed?					
Have any covered permanent signs been restored?					
Have Gardaí been informed that Speedlimits/ Traffic Signals/ Stop-Go removed?					
4) EXCEPTIONS REPORT (Append attachments as necessary)					
Check Completed By:					

HEALTH AND SAFETY AUTHORITY

SAFE SYSTEM OF WORK PLAN (SSWP)

WORKING ON ROADS

Plan No. ☐

PART 1

Job Details	Resources Required	Emergency Details
Employer Name: _____	Worker Skills: _____	Contact Names & Tel No.
Responsible Person/Supervisor: _____	_____	1. _____
Number of Workers: _____	_____	2. _____
Specific Location: _____	_____	3. _____
Description of Works: _____	Plant/Equipment: _____	First Aider: _____
_____	_____	_____
_____	_____	Location of First Aid Box:
_____	_____	_____
Start Date: _____	Hazardous Materials: _____	**WORK PERMITS REQUIRED**
NOTE: A new SSWP must be completed when the task or the environment changes.	_____	Hot ☐ Electricity ☐ Excavation ☐
	_____	Confined Space ☐ Other ☐
		Method Statement Yes ☐ No ☐

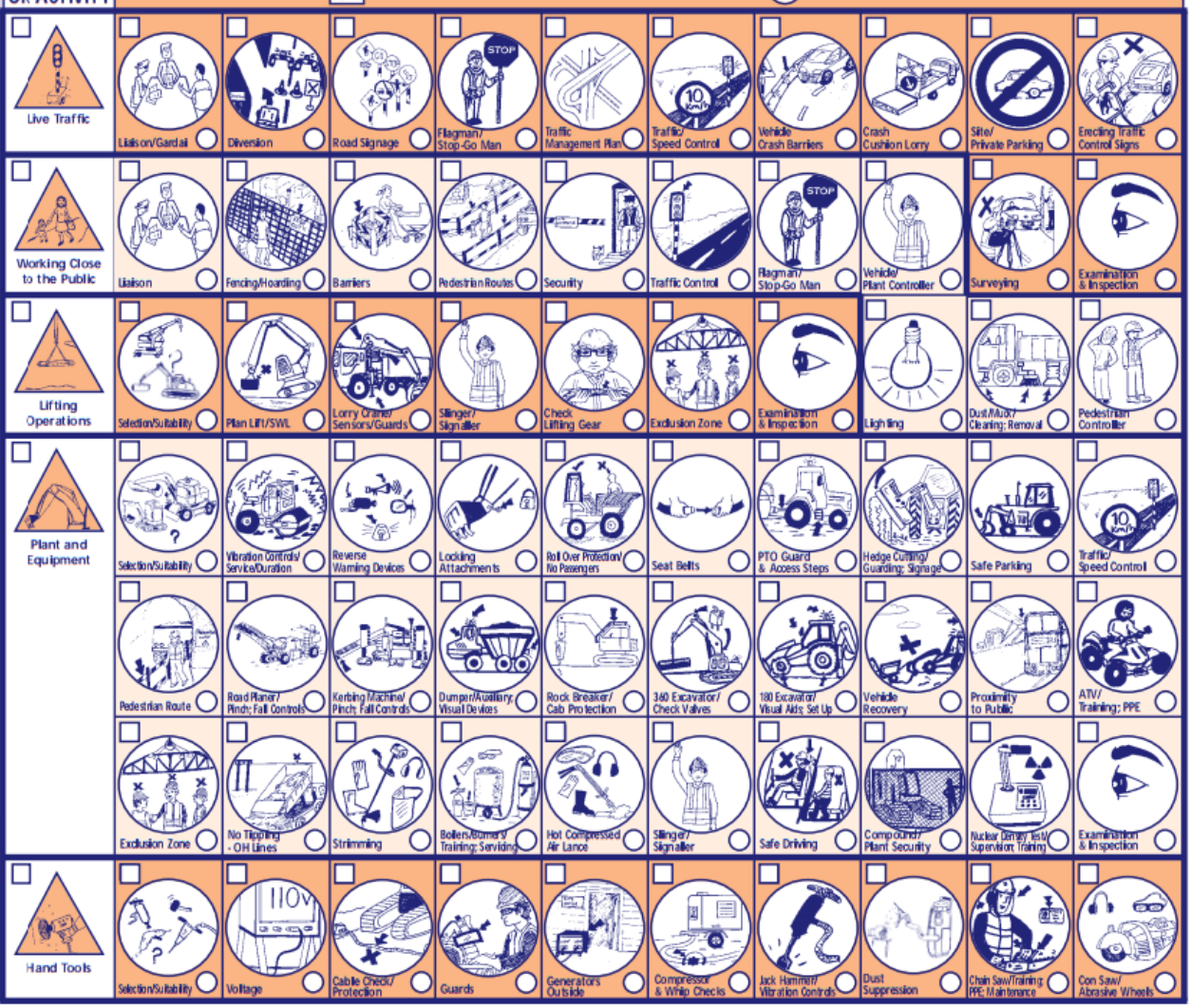
Before Works Starts the following MUST be in place Tick the ✔ circle when confirmed

PART 2

SELECT HAZARD OR ACTIVITY — **SELECT CONTROL**

All controls identified below must be in place before work starts

Tick the ☑ box to identify controls required; Tick the ✔ circle when control is in place.



LA1

PART 2

HAZARD OR ACTIVITY	CONTROL — Tick the ☑ box to identify controls required; Tick the ✓ circle when control is in place.									
Excavation	Batter Back	Trench Box	Sheet Piling	Shoring	Environment Risk Assess	Back Fill	Spoil Back	Chock	No Undermining	Ladder/ Access/Egress
	Exclusion Zone	Barriers	Covers	Pumping	Safe Stacking	Propping	Lighting	Examination & Inspection	Weather	Warning Signs
Falls and Falling Objects	Risk Assess	Scaffolding	Working Platform	Trestle Platform	Edge Protection	MEWP	Safe Ladder	Tie Ladder	Open Holes	Propping
Sewers/Culverts/ Mains/Services	Service Supplier	Divert / Off	Survey Map	Detect & Mark	Permit to Work	Hand Dig	Over Head Lines	Barriers	No Flames	Gas Bottle Storage
Working Close to Water	Edge Protection	Working Platform	Safety Line/Grab Line	Personal Flotation Device	Life Ring	Boat	Fall Arrest & Rescue	Diving	Coffer Dam	Platform & Crane
Substances	Storage/Labels	Safety Data Sheet	Hand Wash	No Eating	Biological Agents	Survey/Risk Assess	Permit to Work	Litter Picker	Cover Cuts	Wash Hands
Asbestos Cement Water Pipes	Identity/Survey	Risk Assess	Procedure	Dust/Wetting	Waste Removal	Examination & Inspection	Confined Space	Risk Assess	Survey	Permit to Work
Other Items	Housekeeping	Lighting	Ground Conditions	Degassing/Purging	Street Structures/ Drawings	Fire Control/Assembly	Emergency Procedures	Detect/Monitor	Tripod	Communication
Health	Assess Health Effects	Health Surveillance	Manual Handling	Risk Assess	Mechanical Aids	Work Organisation	Training	Identify	Other	Other
PPE	Safety Helmet	Safety Boot/Hi-Vis	Eye Protection	Safety Gloves	Ear Protection	Dust Mask	Respiratory Equipment	Face Protection	Safety Harness	Other

PART 3

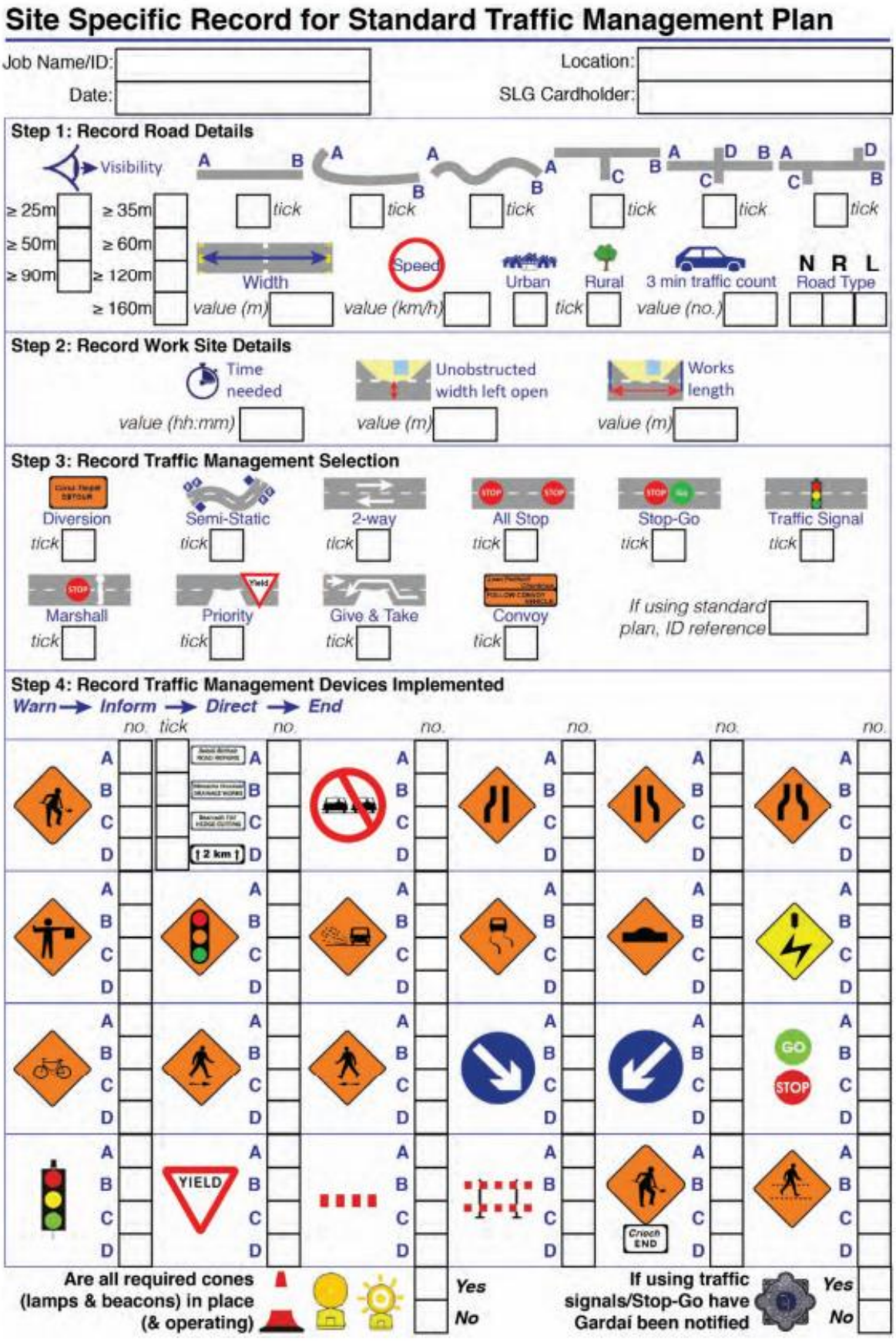
Hazards, activities and controls on this SSWP identified by: _____ Date: _____ Time: _____

Controls put in place by: _____ Date: _____ Time: _____

I have been made aware of the hazards & controls for this activity. Signed by Team:

NOTE: This list of Hazards and Controls is not exhaustive and is in no particular order.

IF IT'S NOT SAFE DON'T DO IT AND INFORM SITE MANAGEMENT


Site Specific Record for Standard Traffic Management Plan
Job Name/ID:
Location:
Date:
SLG Cardholder:
Step 1: Record Road Details
Visibility
≥ 25m
≥ 35m
≥ 50m
≥ 60m
≥ 90m
≥ 120m
≥ 160m
A B
A B C
A B C D
tick
Width
value (m)
Speed
value (km/h)
Urban
Rural
tick
3 min traffic count
value (no.)
N R L
Road Type
Step 2: Record Work Site Details
Time needed
value (hh:mm)
Unobstructed width left open
value (m)
Works length
value (m)
Step 3: Record Traffic Management Selection
Diversion
Semi-Static
2-way
All Stop
Stop-Go
Traffic Signal
Marshall
Priority
Give & Take
Convoy
tick
If using standard plan, ID reference
Step 4: Record Traffic Management Devices Implemented
Warn → Inform → Direct → End
no.
tick
A
B
C
D
↑2 km↑
YIELD
GO
STOP
Crash END
Are all required cones (lamps & beacons) in place (& operating)
Yes
No
If using traffic signals/Stop-Go have Gardaí been notified
Yes
No

Appendix 3

Preliminary Traffic Diversion Drawings for Underground Grid Connection Option

Legend :

Road Closure (L-6021: 3.0km)

Diversion (8.1km)

Note: Local Access will be available to Local Residences on Road Closure

Ballymacasy
Baile Uí Mhacasa
Leanamore
Resrevoir
Coolnagraigue
Cúil na Gráige
Gortnacooka Br
Shrone
Ballyline East
Baile Uí Fhloinn Thoir
Ballyline West
Graffa
Shronowen Bog
Móin Srón Abhann
Tullamore
Gabbett's Br.
Coolkeragh
Mount Hayes
Pollagh
Pollagh Br
An Ghaile
Galey River
Meen
Cloonprohus
Cuss
Murher
Galey Br
Church
Moyvane
Tarmon East
An Tearmann Thi
Tarmon West
Shrone
Srón
Gurteennacloona
Sch
Moher
Leitrim
Leitrim Middle
Liatroim Láir
Leitrim West
Leitrim Br
Ahalahana
Moyvane
Maigh Mheáin
Water Tower
PO
Cloonbra
Pound
Pound Br
Well
Aharanlum
River Abha
L-1012
L-6021
L-6025
N69
R552
98
99
01
02
03
04
05
06
07

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REV	DATE	DESCRIPTION	BY	APP
P01	16/11/20	Issued for Report	PN	KF

CLIENT: Shrowowen Wind Farm Limited

PROJECT: Shronowen Wind Farm

TITLE: Proposed Road Closure at L-6021 Local Road (1st Section) Preliminary Traffic Management Plan

DRAWN: PN	CHECKED: PN	APPROVED: KF
DATE: 16/11/2020	SCALE @ A3: NTS	
PROJECT NUMBER: 19876		DRAWING STATUS: S2
DRAWING NUMBER: 19876-MWP-00-00-DR-C-5101		REV: P01

N:\projects\19876 - Shronowen WF\Drawings\Active\19876-MWP-00-00-DR-C-5101-P01.dwg

Legend :

Road Closure (L-6021: 750m)

Diversion (13.3km)

Note: Local Access will be available to Local Residences on Road Closure

Ballyline East
Baile Uí Fhloinn Thoir
Graffa
Dromalivaun
Gurteennacloona
Sch
Moher
Leitrim Middle
Liatroim Láir
Bunnaruddee
Shronowen Bog
Móin Srón Abhann
Leitrim West
Leitrim Br
Shronowen Bog
Móin Srón Abhann
R552
Tullamore
Gabbett's Br.
L-6021
L-6025
Ahalahana
Moyvane
Maigh Mheáin
Water Tower
Sch
PO
N69
Pollagh
Mount Hayes
Coolkeragh
Pollagh Br
L-6033
Galey River
Cuss
Murher
Church
Meen
Cloonprohus
Galey Br
L-1018
L-1017
Suiney's Cr. Rds.
Dore's Cross R.
Blake's Cross Rds
Drommurher
Moyvane South
Maigh Mheáin Theas
Drombeg
An Ghaile
Coolaclarig
Shrone Br
Moated Site
An Ghaile
Cloontubbrid North
Cillín
Cluain Tiobrad Thuaidh
Derry
Ahavoher Br
Ahavoher Cross Rds
Knockane
94
Bedford
Cloonmackon
Shrone East
Bedford Cross Rds
Douglas River
Dúghlaise
Galey River
Moyvane
River
00 01 02 03 04 05 06 07 98 99

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REV	DATE	DESCRIPTION	BY	APP
P01	16/11/20	Issued for Report	PN	KF

CLIENT: Shrowowen Wind Farm Limited

PROJECT: Shronowen Wind Farm

TITLE: Proposed Road Closure at L-6021 Local Road (2nd Section) Preliminary Traffic Management Plan

DRAWN:	CHECKED:	APPROVED:
PN	PN	KF
DATE: 16/11/2020	SCALE @ A3: NTS	
PROJECT NUMBER: 19876		DRAWING STATUS: S2
DRAWING NUMBER: 19876-MWP-00-00-DR-C-5102		REV: P01

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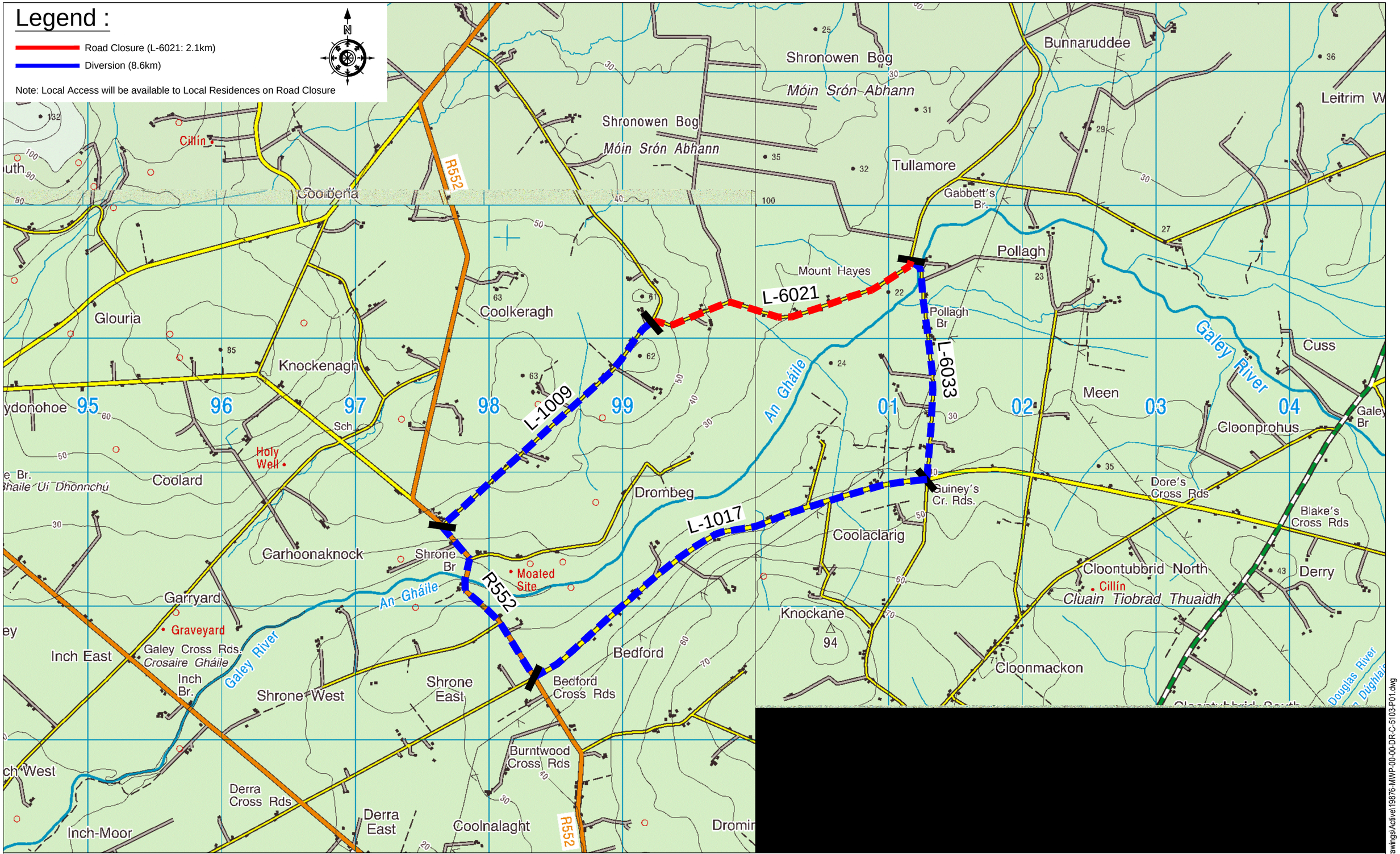
Legend :

Road Closure (L-6021: 2.1km)

Diversion (8.6km)

Note: Local Access will be available to Local Residences on Road Closure



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REV	DATE	DESCRIPTION	BY	APP
P01	16/11/20	Issued for Report	PN	KF

CLIENT: Shrowowen Wind Farm Limited

PROJECT: Shronowen Wind Farm

TITLE: Proposed Road Closure at L-6021 Local Road (3rd Section) Preliminary Traffic Management Plan

DRAWN:	CHECKED:	APPROVED:
PN	PN	KF
DATE: 16/11/2020	SCALE @ A3: NTS	
PROJECT NUMBER: 19876		DRAWING STATUS: S2
DRAWING NUMBER: 19876-MWP-00-00-DR-C-5103		REV: P01

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Legend :

Road Closure (L-1009: 2.2km)

Diversion (6.6km)

Note: Local Access will be available to Local Residences on Road Closure

N

Ballyline West
Graffa
Dromalivaun
Bunnaruddee
Shronowen Bog
Móin Srón Abhann
Tullamore
Gabbett's Br.
Pollagh
Mount Hayes
Pollagh Br
Meen
Kilgarvan
Guhard North
Guhard South
Cillín
Coolbeha
R552
L-1009
Coolkeragh
Knockenagh
Ballydonohoe
Sch
Holy Well
Ballydonohoe Br.
Droichead Bhaile Uí Dhonnchú
Coolard
R553
Carhoonaknock
Shrone Br
Moated Site
An Ghâile
Drombeg
Guiney's Cr. Rds.
Coolaclarig
Dore's Cross Rds
Cloontubbrid North
Cillín
Cluain Tiobrad Thuaidh
Knockane
Cloonmackon
Garryard
Graveyard
Affouley
Inch East
Galey Cross Rds.
Crosaire Ghâile
Inch Br.
Galey River
Shrone West
Shrone East
Bedford
Bedford Cross Rds
Galey
Glouria
Eiltín
94 95 96 97 98 99 01 02 03

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REV	DATE	DESCRIPTION	BY	APP
P01	16/11/20	Issued for Report	PN	KF

CLIENT: Shrowowen Wind Farm Limited

PROJECT: Shronowen Wind Farm

TITLE: Proposed Road Closure at L-1009 Local Road Preliminary Traffic Management Plan

DRAWN: PN	CHECKED: PN	APPROVED: KF
DATE: 16/11/2020	SCALE @ A3: NTS	
PROJECT NUMBER: 19876		DRAWING STATUS: S2
DRAWING NUMBER: 19876-MWP-00-00-DR-C-5104		REV: P01

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