APPENDIX H-2

Traffic Management Plan

Appendix H-2

Traffic Management Plan

CONTENTS

1 INTRODUCTION

This traffic management plan outlines the traffic management procedures to be implemented on the public road during the construction of Drumnahough Wind Farm and delivery of the wind turbine components.

As set out in EIAR Volume 2 Chapter 2, the project considers two grid connection point options. Both grid connection options will consist of the construction and operation of an underground electrical cable. The grid connection route option to the consented Lenalea substation and would involve construction of an underground collector circuit cable on the public road for approximately 750m, and traffic management procedures are outlined for this as part of the traffic management plan.
The alternative grid connection option via a new 110kv substation within the wind farm site will not involve any additional works on public roads.

The exact final detail and specifications of the grid connection route and method for the proposed development will ultimately be decided by ESB/EirGrid.

In the event An Bord Pleanála (the Board) decides to grant permission for the proposed development, the final TMP will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned by the Board. Prior to works commencing, the final traffic management plan for construction traffic using the public road will be produced by the appointed contractor and agreed with Donegal County Council.

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 be required under its contract to have regard to the above principles. The appointed contractor shall endeavour to meet these objectives by proper planning of the works and by compliance with the relevant procedures as outlined in Section 5.2. Against this background, and in the context of the construction of the wind farm and collector circuit connection cable route, the appointed contractor shall properly plan and manage the works to ensure that:

- 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 Donegal County Council to plan and implement the traffic management plan. The appointed contractor will liaise with other contractors, An Garda Síochána and Donegal 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 site and will endeavour to minimise the effect of the works on traffic in the planning and programming of the works at construction stage.

3 CONSTRUCTION WORKS

3.1 WIND FARM

The proposed Drumnahough Wind Farm is in a rural upland area of central Donegal, approximately 12.5km south west of Letterkenny and 11km northwest of the twin towns of Ballybofey/Stranorlar. The project consists of 12 No. wind turbines and all associated infrastructure including crane hardstands, access roads, a permanent meteorological mast, substation and battery storage area, underground cables etc. The site will be accessed via two entrances, from the L-10142 local road (South Entrance Junction A) and L-1622-1 (North Entrance Junction B) Local Roads.

3.1.1 Mitigation Measures

The construction phase of the wind farm will require HGV and non-HGV traffic travelling to the site via the existing public road network. The key timing periods when use of the public road network will be at its peak for local residents is between 7.00am and 8.30am when school and commuter related traffic is at its peak. Where possible, deliveries will be scheduled outside this time frame, and the appointed contractor will liaise with local stakeholders on the delivery schedule.

The nuisance of dirt on the local road network during wet weather and dust during dry weather is an area of identified concern. The primary mitigation measure for this impact will be in the form of a proprietary wheel wash facility to be installed on the exit of the wind farm. In addition to this a road sweeper will operate in the vicinity of the site entrances as required for the duration of the importation of aggregates and concrete and at regular intervals for the duration of the project. Similarly 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 signage at all junctions and distances to passing areas clearly indicated along the L-1622-1 and L-10142 Local roads.

3.1.2 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 be required to sign up to this protocol as part of their supply contract. The protocol will consist of restricted delivery hours and adherence to designated speed limits along public roads and within the wind farm site. Fundamental to the protocol is courtesy for other road users.

3.1.3 Dedicated Delivery Routes

The proposed project has two entrances, which will be utilised by HGV and non- HGV traffic to access the site. The primary access, noted as Junction A in **Figure 3-1.**, is located on the south east of the site. This will be utilised for HGV and non-HGV traffic relating to the installation of all 12 No. wind turbines. There are two proposed delivery routes associated with this primary access, as shown in **Figure 3-2.**

To travel to the development from Letterkenny / north of the site, the following route is proposed:

Route B

I. Starting in Letterkenny/north of the site;
II. L-1114 Local Road to L-1044 Local Road;
III. L-1044 Local Road to the L-1034 Local Road;
IV. L-1034 Local Road to LP-1044 Local Road;
V. LP-1044 Local Road to L-10142 Local Road; and
VI. L-10142 to the site entrance, Junction A.

To travel to the development from the south / south east of the site, the following route is proposed:

Route C

I. N13 National road to L-2744 Local Road;
II. L-2744 Local Road to entrance to Meentycat Wind Farm;
III. Existing private wind farm roads through Meentycat and Cark Wind Farms to the L-10142; and
IV. L-10142 Local Road to the site entrance, Junction A.

The entrance at Junction A will also be utilised as part of the turbine delivery route for the delivery of the wind turbine components, which will be abnormal loads.

The second proposed access to the development, shown as Junction B in **Figure 3-1** is located in the north of the site from the Local Road L-1622-1. HGV and non-HGV traffic to the north-eastern access will be minimal. This entrance will be used temporarily for mobilisation and construction at the onset of the project.

Route A

I. R251 / R250 Regional Roads to R250 Regional Road
II. R250 Regional Road to L2073 Local Road; and
III. L-1622-1 Local Road to the site entrance, Junction A.

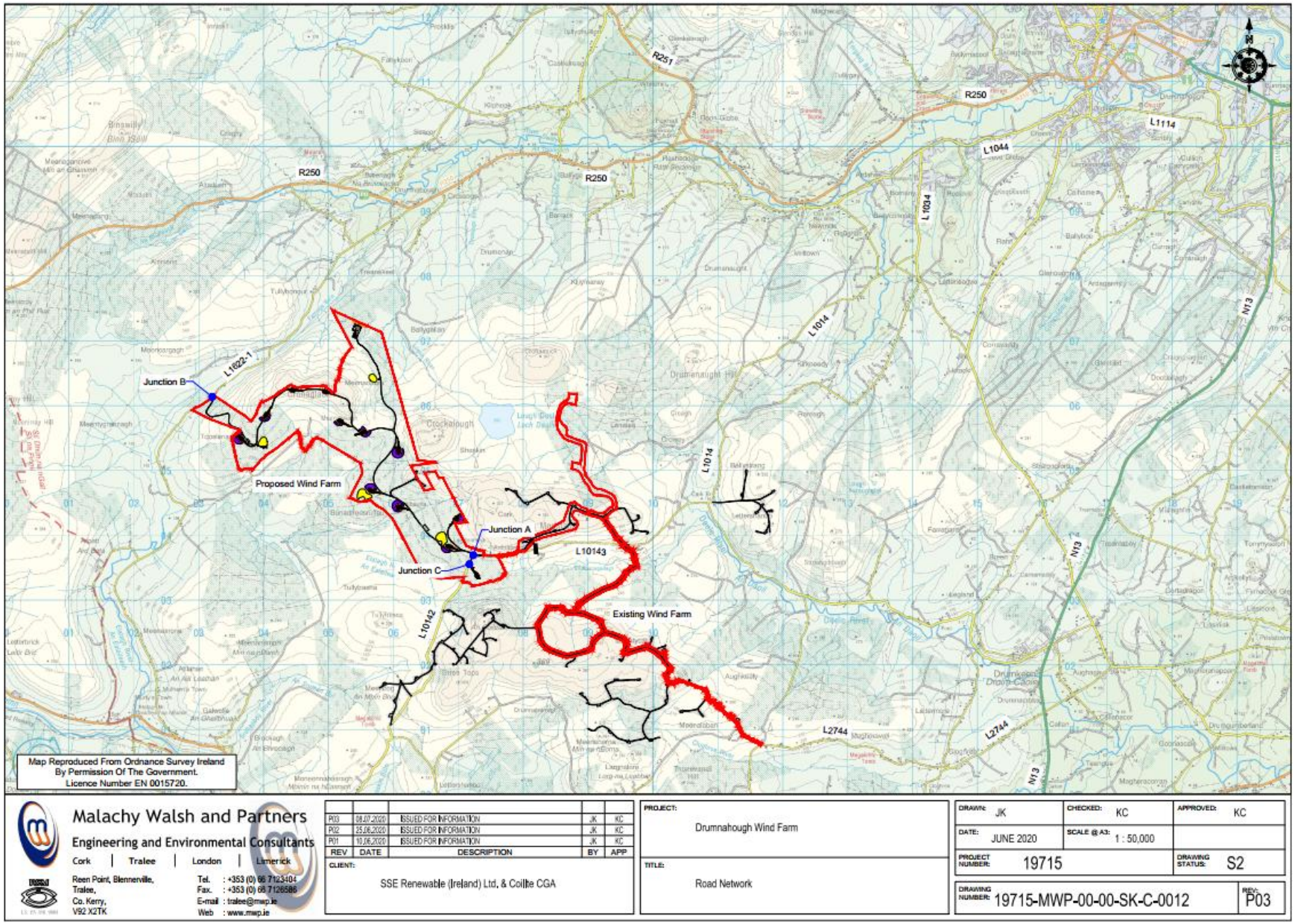

Figure 3-1Local road network with development entrances

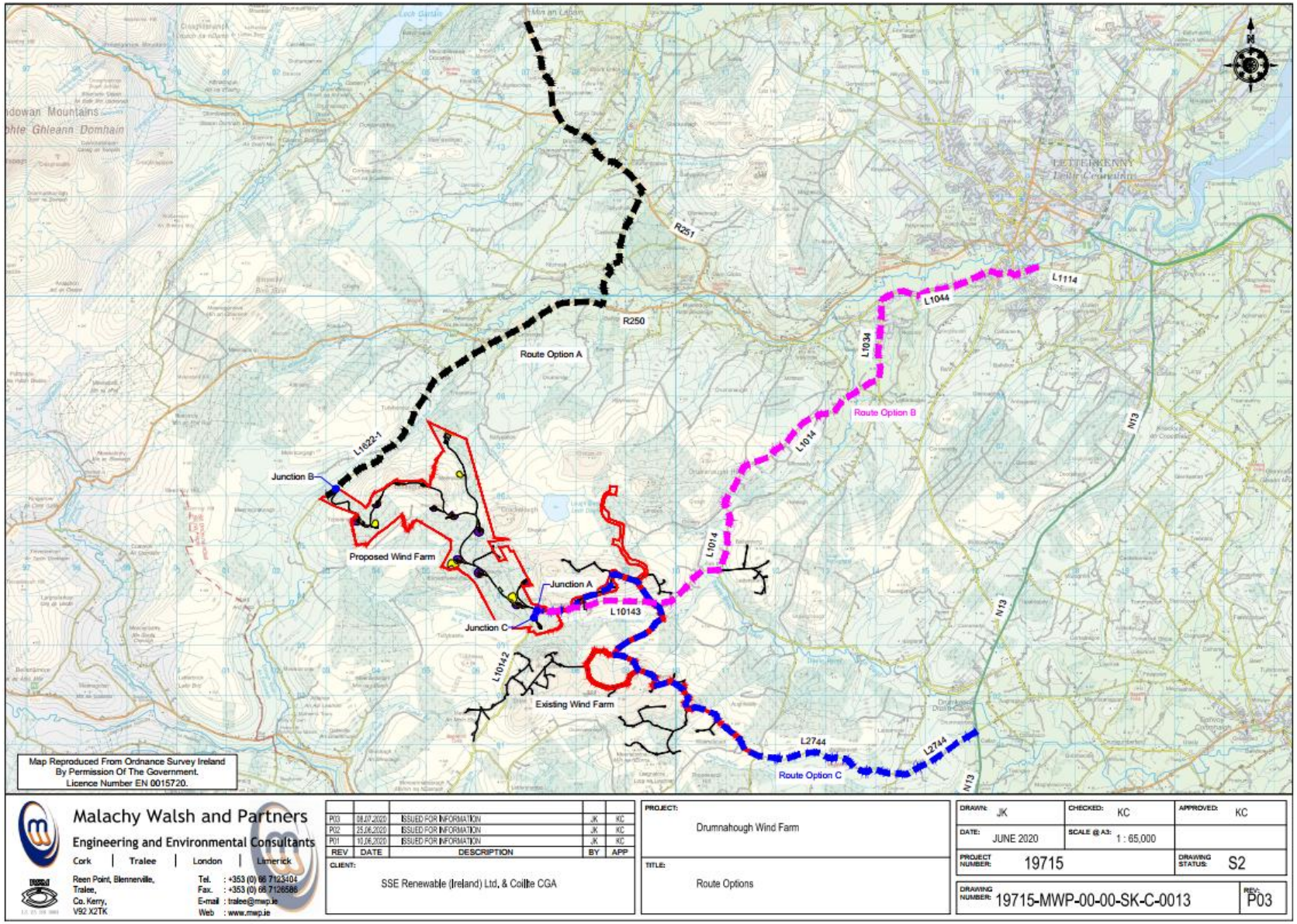

Figure 3-2Proposed delivery routes

The majority of material required for the construction of the roads, crane hardstands and the substation and battery compound will come from stone aggregate extracted from four proposed on-site borrow pits. Material to be delivered to site will mainly consist of higher grade materials not available to be won on site, limestone capping material for roads and hardstands, and concrete for the construction of the 12 No. turbine bases and substation infrastructure. The following quarries in County Donegal are in proximity to the proposed site (distance from the site in brackets):

- Bonar's Quarry (20km);
- Churchill Stone (18km);
- Letterkenny Concrete & Quarry Products Limited (17km).

These sources to be used, will be confirmed by the appointed contractors. The proposed delivery routes to the wind farm site for all materials are shown in Figure 3-2. It is anticipated that a succession of 20T (tonne) and/or 8m³ trucks will transport the material at a peak frequency of 8 No. to 12 No. trucks/hour. Peaks in construction traffic are typically associated with the pouring of turbine foundations. The selection of the delivery route will be confirmed by the appointed contractor and will depend on the location of the source material. Specialist vehicles will be used for the delivery of the wind turbine components and substation transformers. These specialist vehicles will only use the haul route of the N13 and L2744 (shown as Route C in Figure 3-2 and described in Section 3.1.4.3.1).

3.1.4 Construction Phasing

The phases of the development can be broadly summarised in terms of traffic management in 3 No. steps:

1. Access road / crane hardstand / substation and battery storage area construction
2. Turbine base construction
3. Turbine erection

3.1.4.1 Access Road / Crane Hardstand / Substation Construction/ Battery Storage Area

Construction transport including deliveries of quarry and building materials, will use the routes described in Section 3.1.3. As the designated delivery routes for the wind farm. During the construction of the access roads, crane hardstands, substation buildings and battery storage area a worst case scenario estimated maximum number of loads to be delivered to the wind farm site will be approximately 13,070 over 14 months (total for Civil & Electrical Works) as shown in Table 3. This includes loads of aggregate capping material, concrete, reinforcing steel, geo-textiles, electrical cabling, switchgear and general building materials. Approximately 70% of the stone for the access road subbase construction within the wind farm will be sourced from the proposed 4 No. onsite borrow pits which will reduce the number of haulage deliveries required along the existing local road network. It is proposed to source any imported capping aggregate from local quarries in the area. Over the 14 month construction programme, approximately 319 loads of waste will be removed.

3.1.4.2 Turbine Base Construction

A wind turbine with a ground bearing concrete foundation will require a concrete pour of circa 700m^3 during its construction. The volume of concrete will require an estimated 80 to 90 HGV trips

in one day to complete. For comparison purposes, this is the same level of traffic use as would result from a 35 hectare silage harvest. There will be 12 No. of these pours within the wind farm at Drumnahough. A typical pour would generally start outside normal working hours, early in the morning and be complete in early afternoon. Normal deliveries will be curtailed to prioritise 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 will be hand posted to residents along the local access roads a day in advance.

3.1.4.3 Turbine Erection

3.1.4.3.1 Outline Turbine Component Delivery Route

The components for the 12 No. turbines will be delivered by cargo ships to Killybegs Port, County Donegal. 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 Killybegs Port to the site along the National, Regional and Local road network.

The proposed route and entry port is subject to change, but will be finalised by the appointed contractor prior to the start of construction.

The proposed route has been utilised in the past for numerous other previous wind farm developments. Pre and post-construction surveys will be carried out to confirm the structural integrity of the selected haulage route as per Donegal County Council and Transport Infrastructure Ireland (TII) requirements. 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 and its use by other road users, 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 Donegal County Council on the selected haulage route with a transportation plan for the time of deliveries established at construction stage.

The initial outline road route for turbine deliveries starting at Killybegs, which is shown in Figure 3-3, is as follows:

I. Starting at Killybegs Port;
II. Travelling northbound along the Shore Rd (R263) to the junction between R263 to N56;
III. Follow the N56 eastbound to the junction with the N15 near Donegal town;
IV. Follow the N15 north / northeast to the junction with the N14 in Lifford;
V. Follow the N14 north / northwest to the junction with the N13;
VI. Follow the N13 west and then south to the junction with the L-2744 Local Road;
VII. Follow L-2744 westbound to the entrance of the existing Meentycat;
VIII. Follow existing wind farm roads through the Meentycat and Cark Extension Wind Farms to the L-10142; and
IX. Follow the L-10142 westbound to the site entrance.

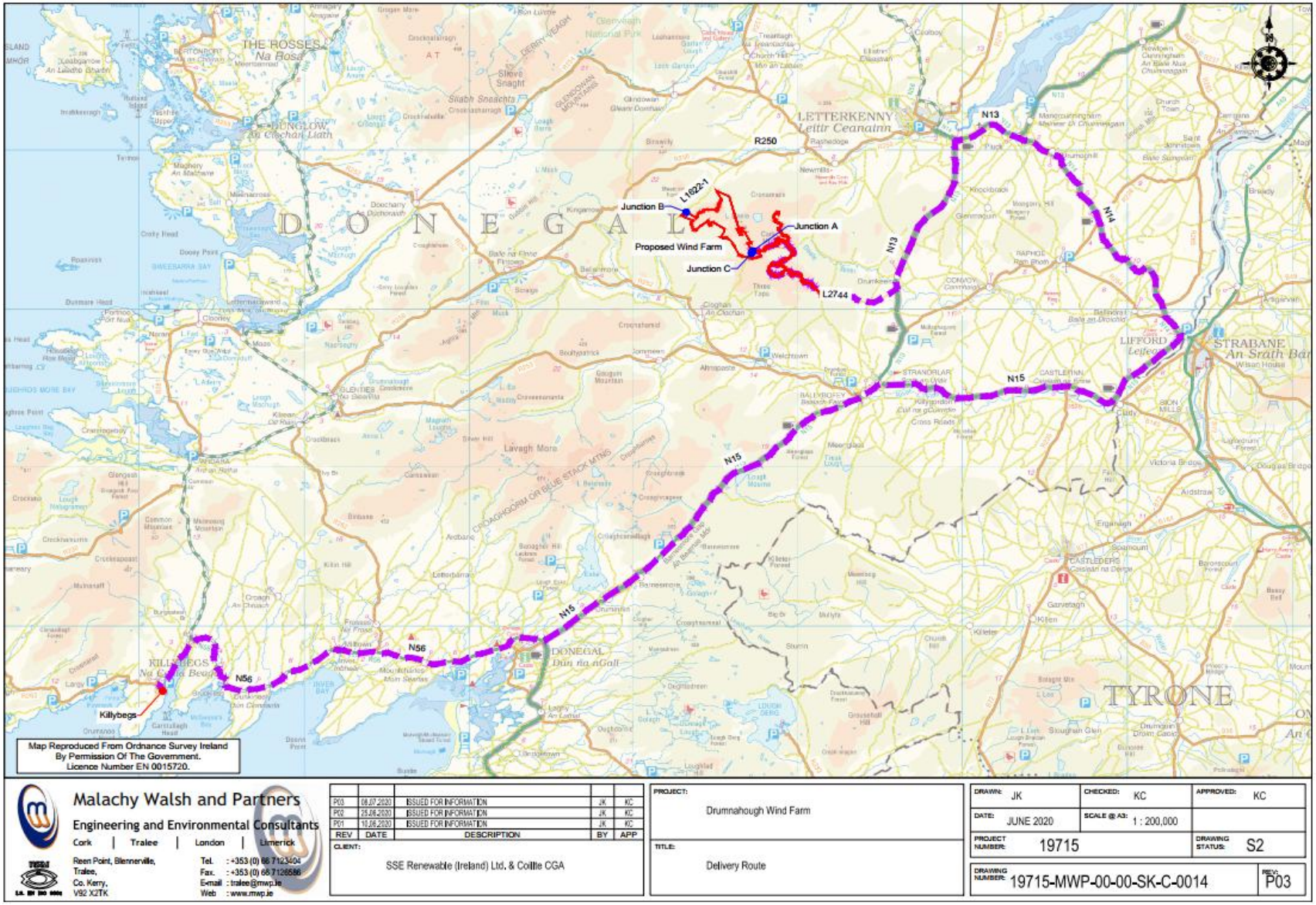

Figure 3-3Initial outline route for turbine deliveries

The delivery of turbine components takes place overnight (as required as part of the abnormal load licence) 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 Donegal Council and are fully escorted for the entire delivery. Turbine delivery normally consists of three trucks in convoy with their escorts.

Turbine erection is entirely weather dependant with the scheduling of component delivery being subject to wind conditions. Every effort will be made to provide advance notice of delivery to residents. Component delivery is a highly controlled low impact activity of very short duration to any residential property it passes.

3.1.4.4 Public Road Works for Turbine Delivery

The proposed haul route for the wind turbine components has been previously utilised for numerous other wind farm developments in the area, including Meentycat Wind Farm. A meeting was held in December 2019 with Donegal County Council's Roads Department where the proposals for the turbine delivery route were outlined by the applicant. Wind turbine components will be delivered along this described route and will only use the south eastern entrance to the site, Junction A.

The majority of the turbine delivery route will follow National Primary and Regional Roads as described in Section 3.1.4.3.1 and as outlined in EIAR Volume 3 Appendix B-3: Turbine Delivery Route Assessment Report. As such, it is not anticipated that any significant widening or strengthening of roads will be required along the transport routes apart from the works described in Table 1. There may be a requirement, pending final confirmation of the transport delivery configuration at construction stage, for the temporary removal of road signage, temporary widening of grass road verges and vegetation trimming in order to cater for the swept path of these abnormal delivery vehicles. The developer shall consult with the Road / Area Engineers within Donegal County Council to temporarily remove any road signage and provide temporary grass verge widening where this may be required.

Table 1 Description of Turbine Delivery Route road works

Drawing reference	Location	Description of the works
19715-MWP-00-00-DR-C-5501-P01	N56 Roundabout near Killybegs	Temporary removal of fences, lighting poles, telecoms poles, signs and other street furniture.
19715-MWP-00-00-DR-C-5502-P01	N56 bend near Killybegs	Temporary removal of fences, lighting poles, telecoms poles, signs and other street furniture.
19715-MWP-00-00-DR-C-5503-P01	N56 Roundabout on Western Side of Donegal Town	Temporary removal of fences, lighting poles, telecoms poles and other street furniture.
19715-MWP-00-00-DR-C-5504-P01	N56 Roundabout on Eastern Side of Donegal Town	Temporary removal of fences, lighting poles, telecoms poles, signs and other street furniture.
19715-MWP-00-00-DR-C-5505-P01	N15 Ballybofey/Stranorlar Bridge	Temporary removal of lighting poles, telecoms poles, signs and other street furniture.
19715-MWP-00-00-DR-C-5506-P01	N15 Stranorlar - Street through town	Temporary removal of lighting poles, telecoms poles, signs and other street furniture.
19715-MWP-00-00-DR-C-5507-P01	N15 - Killygordon	Temporary removal of lighting poles, telecoms poles, signs and other street furniture.

Drawing reference	Location	Description of the works
19715-MWP-00-00-DR-C-5508-P01	N14 - Lifford - Roundabout	Temporary removal of lighting poles, telecoms poles, signs and other street furniture.
19715-MWP-00-00-DR-C-5509-P01	N14-N13 Junction Roundabout	Temporary removal of lighting poles, telecoms poles, signs and other street furniture. Removal of tress in centre of roundabout.
19715-MWP-00-00-DR-C-5510-P01	N13 - N14 Roundabout to the East of Letterkenny	Temporary removal of lighting poles, telecoms poles, signs and other street furniture.
19715-MWP-00-00-DR-C-5511-P01	N13 - Local Road (L-2744) Junction	Temporary removal of fence. Hardening of soft verge with compacted granular material. Existing drains to be piped. Temporary removal of telecoms poles.
19715-MWP-00-00-DR-C-5512-P01	L-2744	Minor works to harden narrow areas of soft verge with granular fill. Any existing drains in areas requiring stone to be piped
19715-MWP-00-00-DR-C-5513-P01	L-2744	Minor works to harden narrow areas of soft verge with granular fill. Any existing drains in areas requiring stone to be piped. Telecoms poles to be removed temporarily
19715-MWP-00-00-DR-C-5514-P01	L-2744	Minor works to harden areas of soft verge with granular fill. Any existing drains in areas requiring stone to be piped. Existing bank to the north of the road to be removed. Telecoms poles, electrical poles, overhead cables, fences to be removed temporarily
19715-MWP-00-00-DR-C-5515-P01	L-2744	Minor works to harden areas of soft verge with granular fill. Any existing drains in areas requiring stone to be piped. Existing bank to the north of the road to be removed locally. Widening of embankment to the south of the road into a field. Telecoms poles, electrical poles, overhead cables, fences to be removed temporarily
19715-MWP-00-00-DR-C-5516-P01	L-2744	Minor works to harden areas of soft verge with granular fill. Any existing drains in areas requiring stone to be piped. Existing bank to the north of the road to be removed locally. Widening of embankment to the south of the road into a field. Telecoms poles, electrical poles, overhead cables, fences to be removed temporarily
19715-MWP-00-00-DR-C-5517-P01	L-2744	Minor works to harden areas of soft verge with granular fill. Any existing drains in areas requiring stone to be piped. Existing bank to the north of the road to be removed locally. Widening of embankment to the south of the road into a field. Telecoms poles, electrical poles, overhead cables, fences to be removed temporarily
19715-MWP-00-00-DR-C-5518-P01	L-2744	Minor works to harden areas of soft verge with granular fill. Any existing drains in areas requiring stone to be piped. Existing bank to the north of the road to be removed locally. Telecoms poles, electrical poles, overhead cables, fences to be removed temporarily
19715-MWP-00-00-DR-C-5519-P01	L-2744	Minor works to harden areas of soft verge with granular fill. Any existing drains in areas requiring stone to be piped. Widening of embankment to the south of the road into a field. Telecoms poles, electrical poles, overhead cables, fences to

Drawing reference	Location	Description of the works
		be removed temporarily
19715-MWP-00-00-DR-C-5520-P01	L-2744	Minor works to harden areas of soft verge with granular fill. Any existing drains in areas requiring stone to be piped. Fence to be removed temporarily on north side of road. Some trees to be removed.
19715-MWP-00-00-DR-C-5521-P01	L-2744	Minor works to harden areas of soft verge with granular fill. Any existing drains in areas requiring stone to be piped. Fence to be removed temporarily on north side of road.
19715-MWP-00-00-DR-C-5522-P01	L-2744	Minor works to harden areas of soft verge with granular fill. Any existing drains in areas requiring stone to be piped. Some trees to be removed to the south of the road. Telecoms poles, electrical poles, overhead cables, fences to be removed temporarily. Overhead electrical cable may need to be removed.

3.1.5 Schedule of Wind Farm Construction Works / Construction Schedule

The proposed project duration for the wind farm will be of the order of 14 months. The construction work will be phased as outlined in Table 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 and turbine foundations and battery system storage area will be prepared.
- Once the internal site access 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.

Table 2 Typical Development Phasing

Phase	Activity
Phase 1	Clearfelling (to be complete ahead of construction site mobilisation)
Phase 2	Prepare site, Pre-construction activities, Site entrance, temporary compound
Phase 3	Borrow pit development, 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	Substation and BESS construction
Phase 8	Permanent meteorological mast erection
Phase 9	Turbine delivery
Phase 10	Turbine erection
Phase 11	Wind Farm Commissioning

3.2 UNDERGROUND COLLECTOR CIRCUIT CABLING

In the context of the traffic management plan, the aim is to provide a safe working environment for cable workers and efficient passage of traffic and other road users through the cable works site. 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.* The referenced material can be obtained from the Department of Tourism, Sport and Transport's website https://www.trafficsigns.ie/.

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 and agreed with Donegal County Council. In the event the Board decides to grant approval for the proposed development, the final TMP will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned by the Board. Key to the implementation of the final TMP is the dedication of an on-site construction manager nominated by the contractor. All site personnel are required to ensure compliance with the requirements of the site's TMP.

3.2.1 Underground Collector Circuit Cable Route

To facilitate a grid connection and export electricity to the National Electricity Grid (NEG), the project considers two grid connection point options. Both grid connection options will consist of construction and operation of an underground electrical cable. The exact final detail and specifications of the grid connection route and method for the proposed development will ultimately be decided by ESB/EirGrid. The proposed grid routes and connection points are outlined as follows:

- **Connection via Permitted Lenalea Substation:** The wind farm's underground collector circuit cables will connect to the permitted 110kV Lenalea substation and the permitted loop-in connection at Lenalea. The wind farm's underground collector circuit cables will follow the public road L-10142 at the south east of the site before diverting north along private access tracks to the permitted 110kV Lenalea substation.

- **Connection via new on-site 110kv Substation:** The wind farm's underground collector circuit cables will connect via new loop-in connection to the existing Binbane to Letterkenny 110kV overhead line. This will require the construction of a new 110kV substation, located at the north of the site adjacent to the existing Binbane to Letterkenny 110kV overhead line.

Grid Connection via the permitted Lenalea substation involves limited construction works of approximately 750m of underground collector circuit cable on the public road. If this grid connection option is progressed, the following sections outline the traffic management procedures that are required. A final traffic management plan will be produced by the appointed contractor prior to

construction and agreed with Donegal County Council. In the event the Board decides to grant approval for the proposed development, the final TMP will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned by the Board.

Construction work on the public road will also be required to connect one turbine (T1) to the remaining collector circuit. This will be on the public road L-10142.

3.2.2 Construction Programme

If grid connection option via the permitted Lenalea substation is progressed, the overall construction length of the collector circuit cable on the L-10142 is approximately 750m. The active construction area along the collector circuit cable route will generally be only along a 100-200m stretch of any roadway at any one time.

The overall works for the cable route are estimated to take approximately 6 No. months in total. During the first 3 No. months the cable trenches will be constructed. The second 3 No. months will involve sequentially opening up all joint bays (these are pre-cast concrete chambers that will be required along the collector circuit cable route over its entire length) and pulling electrical cables through ducts and then joining each cable together. It should be noted that the works on the public roadway for this grid connection option are anticipated to take 1 No. month. No works on public roadways would be required for the alternative grid connection option via a new 110kv substation within the site. Construction work on the public road L-10142 will also be required to connect one turbine (T1) to the remaining collector circuit.

For works associated with the grid connection option to the permitted Lenalea substation, there are anticipated to be up to 3 No. joint bays in the local roadway with 2-3 days' work involved at each. Construction will typically occur within the hours: 07.00am – 7.00pm, Monday to Friday and 07.00am to 2.00pm on Saturdays. During summer periods the working day may extend at times when critical elements of work need to be advanced. Longer working days can also occur when there is a phased construction programme with some elements such as commissioning overlapping with final site construction activity. Working hours will be confirmed at the outset of the project and any changes in hours will be agreed with the Local Authority. Working hours on public roads would be from 9.00 a.m. to 5.00 p.m. Monday to Friday and 9.00 a.m. to 2.00 p.m. on Saturday. A permit for moving abnormal loads will be sought from An Garda Síochana and a transportation plan for the timing of deliveries will be established. No work on Sunday or bank holidays unless preapproved with the relevant bodies. Any deviations to these times will be agreed in advance with Donegal County Council. It is expected that the civil works for the collector circuit cable route will require at least 10 No. personnel to complete the works. The electrical works will require less heavy machinery but would require more labour personnel.

3.2.3 Description of Works for Construction of Collector Circuit Cable Route

For works associated with grid connection option to the permitted Lenalea substation, the installation of the collector circuit cable along the public road L-10142 involves the following process:

- Prior to works commencing the area where excavations are planned (750m in length) will be surveyed and all existing services will be confirmed. All relevant bodies i.e. ESB Networks, EirGrid, Gas Networks Ireland, Eir, Donegal County Council etc. will be contacted and up-to-date drawings for all existing services sought. A road opening licence will be obtained where required from Donegal 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 the existing condition of structures and road surfaces. A copy of this survey will be submitted to Donegal 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 would then be put in place along the extent of the route. This will include any required warning notices, temporary barriers, etc.
- Prior to works commencing a traffic management plan will be prepared by the appointed contractor and agreed with Donegal 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. Refer to EIAR Volume 2 Chapter 2 for details of licensed facilitates.
- 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 suitably set, appropriate imported stone material is placed over the concrete surround and filled back up to the top of trench. Appropriate 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 collector circuit cable route and associated road areas will receive a new permanent macadam finish as agreed with Donegal County Council.
- 3 No. joint bays are to be installed where required along the collector circuit cable route in the public road or along the grass margin of the public road. Once installed they are temporarily reinstated until they are opened again to allow for pulling cables through the ducts and jointing the cables afterwards. The joint bays will then be permanently backfilled and reinstated to the satisfaction of Donegal County Council.
- Directional drilling will be used where there is insufficient cover on a bridge crossing to allow the collector cable route pass over the crossing in a standard trefoil formation. The launch and reception pits to be made in the public road or grass margin will be permanently backfilled and reinstated to the satisfaction of Donegal County Council. There is a total of 1 No. major watercourse crossings along the proposed collector cable route on the public road road (grid connection option to the permitted Lenalea substation only).
- The as-built location of the ducting will be surveyed using a total station / GPS. Marker posts will be installed along the collector circuit route to denote the location of ducting on the ground.
- A confirmatory condition survey will be carried out on the roads impacted by the collector circuit 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.

3.3 CONSTRUCTION TRAFFIC VOLUMES

Construction traffic shall access and egress the works via the haul route as outlined in Section 3.1.3. A summary of the material volumes required is outlined in Table 3 below. The approximate number of truck deliveries to the wind farm and collector cable route construction are 13,070 No. trucks.

This is the worst case estimated numbers based on large construction elements. During the first three months of the construction programme, 3,144 HGV loads are estimated to be delivered to site, along with 385 HGV loads to remove felled trees. Over the following five months, 7,051 HGV loads are estimated to be delivered to site during the construction of the turbine bases, hardstands and internal loads. During the remaining 6 months, up to 2,492 HGV loads are estimated to be delivered to site for the construction of the cable route, substation and other remaining elements. Over the total 14 month programme, 319 loads of waste will be removed.

Table 3 Estimated deliveries for construction works

19715 Drumnahough Wind Farm Rev G

Estimated Material Volumes for EIAR

Item	Unit	Quantity	Notes
Length of new internal roads	m	7,400	
Length of upgraded internal roads	m	2,400	
Excavation for internal roads	m^3	50,000	
Excavation for turbine bases	m^3	42,000	
Excavation for crane hardstands	m^3	230,000	
Excavation for substation	m^3	45,000	
Excavation for cable route	m^3	8,000	
Excavation for met mast	m^3	1,200	
Excavation for construction compound	m^3	13,750	
Volume of peat to be excavated	**m^3**	**255,300**	To be stored in designated peat deposition areas.
Volume of subsoil and rock to be excavated	**m^3**	**120,900**	
Total volume of excavated material	**m^3**	**376,200**	Peat Deposition Areas And Reuse Onsite
Stone for roads	m^3	125,000	
Stone for turbine bases	m^3	34,000	
Stone for crane hardstands	m^3	150,000	
Stone for deposition area berms	m^3	6,000	
Stone for substation compound	m^3	55,000	
Stone for cable route trenches	m^3	8,000	
Stone for construction compound	m^3	17,250	
Stone for met mast	m^3	1,400	
Total Stone Volume	**m^3**	**396,650**	
Imported Volume	**m^3**	**112,395**	
Volume from Borrow Pits	**m^3**	**284,255**	
Concrete for bases (12 @ 900 m^3 each)	m^3	10,800	
Concrete for substation foundation	m^3	100	
Met Mast Foundation	m^3	25	
Reinforced steel for turbine bases (12 @ 100 tonnes each)	tonnes	1,200	
Tree felling	ha	37.9	

Estimated Truck Movements Based On Material Volumes

Truck Loads - Stone Import - Based on 20t rigid tipper (Volume = 10.0 m3)		11240
Truck Loads - Concrete Delivery - based on 8m3 per load		1366
Reinforcement delivery based on 15t per delivery		80
Tree felling - based on 1 load per 10.15 ha		385
	Total	**13070**

4 EXISTING ROAD NETWORK

A summary of works for the wind farm and collector circuit cable route on the public road for each type of road network is described below.

4.1.1 Motorway Network

There are no Motorways directly affected by the wind farm and collector circuit cable route works.

4.1.2 National Primary and Secondary Road Network

The following National Roads will be affected by the wind farm turbine delivery route works at the following locations, along with a brief description of the works

- N56 Roundabout near Killybegs (Temporary removal of lighting poles, telecoms poles, signs and other street furniture);
- N56 bend near Killybegs (Temporary removal of lighting poles, telecoms poles, signs and other street furniture);
- N56 Roundabout on Western Side of Donegal Town (Temporary removal of lighting poles, telecoms poles, signs and other street furniture);
- N56 Roundabout on Eastern Side of Donegal Town (Temporary removal of lighting poles, telecoms poles, signs and other street furniture);
- N15 Ballybofey/Stranorlar Bridge (Temporary removal of lighting poles, telecoms poles, signs and other street furniture);
- N15 Stranorlar - Street through town (Temporary removal of lighting poles, telecoms poles, signs and other street furniture);
- N15 – Killygordon (Temporary removal of lighting poles, telecoms poles, signs and other street furniture);
- N14 - Lifford – Roundabout (Temporary removal of lighting poles, telecoms poles, signs and other street furniture);
- N14-N13 Junction Roundabout (Temporary removal of lighting poles, telecoms poles, signs and other street furniture, Removal of trees in centre of roundabout);
- N13 - N14 Roundabout to the East of Letterkenny (Temporary removal of lighting poles, telecoms poles, signs and other street furniture);
- N13 - Local Road (L-2744) Junction (Temporary removal of fence. Hardening of soft verge with compacted granular material. Existing drains to be piped. Temporary removal of telecoms poles.);

4.1.3 Regional Road Network

There are no Regional Roads directly affected by the wind farm and collector circuit cable route works.

4.1.4 Local Road Network

The following Local Roads will be affected by the wind farm and collector circuit cable route works over the approximate lengths shown:

- L-10142, for the collector circuit cable installation (750m)
- L-10142, at the proposed entrance, Junction A (900m)

- L-10142, at the proposed entrance, Junction C (900m)
- L-1622-1, at the proposed entrance, Junction B (900m)
- L-2744 (Works to harden narrow areas of soft verge with granular fill, any existing drains in areas requiring stone to be piped, local widening, Telecoms poles, electrical poles, overhead cables, fences to be removed temporarily)

5 TRAFFIC MANAGEMENT PLAN

5.1 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 (Donegal County Council)
- Emergency Services

5.1.1 Appointed Contractor

The appointed contractor shall consult with An Garda Síochána, the local authority, the emergency services and all other relevant parties listed above during the preparation of any traffic management proposals. The appointed contractor 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 with regard to day-to-day traffic control along the public road network associated with the proposed development. 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 Donegal County Council are primarily engaged in the maintenance and management of the road network and its services in the area of the wind farm and collector circuit cable route. In respect of all works on, under, and above the road network, they are empowered as officers of Donegal County Council 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 ensure to work with the Roads Department of Donegal County Council at all times.

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.

In the event that emergency services need to travel past the works area where a road closure is not active, the existing traffic management system, be it stop/go or traffic lights, may need to be cancelled and priority given to the emergency vehicle.

Where a road closure is active, the emergency services will have been 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. During construction of a road crossing, steel road plates will be available at the works area to span the trench in the event emergency access is required.

5.2 TRAFFIC MANAGEMENT PROCEDURES

5.2.1 Traffic Control Tools

The appointed contractor will use a range of traffic control tools, including temporary road closures, temporary traffic lights, stop/go boards, two-way radios, safety barriers, cones, signage etc. 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 will be communicated to site personnel with the relevant training.

5.2.2 Road Closures

Should a road closure be necessary to carry out works, the appointed contractor will seek a Temporary Closing of Roads Order. The appointed contractor will advise Donegal 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.

5.2.3 Traffic Diversions

Where traffic diversions are necessary due to temporary road closures associated with the wind farm and collector circuit cable works, the appointed contractor will advise Donegal 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 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.

5.2.4 Lane Width Restrictions

Where lane width restrictions are necessary due to the construction of the collector circuit cable route, the appointed contractor will advise Donegal 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.

5.2.5 Public Notices

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

5.2.6 Communications

The applicant are committed to providing a high level of communication to the general public and business community regarding the extent and duration of the project. The appointed contractor will be obliged to co-operate with the developer in this regard.

The developer / appointed contractor will provide advice to the public in relation to:

- Commencement and duration periods for the works.
- Current and proposed road closures or other traffic management tools.
- Alternative routes.
- Provision for access / egress.

In the event of potential conflicts arising from construction activities, such conflicts shall be resolved, if possible, in consultation with Donegal County Council, the appointed contractor and where necessary An Garda Síochána.

5.3 TRAFFIC MANAGEMENT AND CONTROL PROCEDURES

5.3.1 General

- 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 (lane and road closures/diversions) are removed in progressive stages.

5.3.2 Access for Residents

- The appointed contractor shall make provision for safe access at all times to private residences in proximity to the construction works.
- Steel plates or stone will be made available to allow access to residential properties. 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 and local access will be catered for where possible.

5.3.3 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.

5.3.4 Pedestrian Safety

- The appointed contractor shall ensure that throughout the course of the works its operations do not put pedestrians at any risk.
- With respect to pedestrians, the appointed contractor shall refer to and observe the requirements of the updated version of the *Traffic Signs Manual 2019 Chapter 8* titled *Temporary Traffic Measures and Signs for Roadworks*.

5.3.5 Signage

- 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 so as to ensure that it is in place, secure and appropriately fitted with warning lights as required.

5.3.6 Cleanliness of Roads

- The appointed contractor will provide sufficient resources on site, including road sweeping equipment, to ensure the cleanliness of the adjacent road network.

5.3.7 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 be at least one competent person with a valid Construction Skills Registration Card on site at all times when work is being carried out on roads.

5.3.8 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 situation.
- 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 on roads outside of normal working hours. 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, in the event that they are required.

5.4 TRAFFIC MANAGEMENT PLAN FOR WIND FARM WORKS

Traffic management will be required to construct the site entrances to the wind farm in order to allow construction transport and personnel to access the wind farm. Traffic management will ensure that the required site entrances can be constructed safely to protect construction workers and members of the public.

The appointed contractor will apply to Donegal County Council for a Road Opening Licence prior to works commencing and follow the relevant procedures as outlined in Section 5.2 of this document.

The type of close required for construction works is subject to change. Prior to works commencing, a final traffic management plan for construction traffic using the public road will be produced by the appointed contractor and agreed with Donegal County Council.

5.4.1 Single Lane Closures

Single lane closures will be implemented for the construction of the site entrances on the L-1622-1 and L-10142 and for construction works associated with the turbine delivery route. The single lane closure will be controlled by way of either a stop-go system, a priority yield system or by temporary traffic lights. The appointed contractor will ensure that procedures and works for single lane closures are in accordance with Section 0.5.2 Static Operations 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 confirmation at construction stage, that the following roads will have single lane closures during the construction of the entrances to the wind farm with approximate lengths shown:

- L-1622-1 (900m)
- L-10142 (900m)

It will be envisaged, pending confirmation at construction stage, that the following roads will have single lane closures during the construction works for the turbine delivery route:

- L-2744 (various locations along the route)

5.4.2 Road Closures

It is not envisaged at this time that any road closures will be required for construction works within the wind farm.

Roads closures will be implemented where there is insufficient space on the existing public roadway to implement a single lane closure. 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. 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.*

5.5 TRAFFIC MANAGEMENT PLAN FOR COLLECTOR CIRCUIT CABLE WORKS

Traffic management will be required for the grid connection option to the permitted Lenalea substation along the c. 750m of underground collector cable route on the L-10142 in the public roadway. This is to ensure the cable route can be constructed safely to protect construction workers and members of the public.

The appointed contractor will apply to Donegal County Council for a Road Opening Licence prior to works commencing and follow the relevant procedures as outlined in Section 5.2 of this document.

5.5.1 Single Lane Closures

Single lane closures will be implemented as the construction of the cable trench progresses along the cable route on the L-10412. It is envisaged that 100 - 200m of the cable route will be constructed each day and therefore single lane closures will move with the works. The single lane closure will be controlled by way of either a stop-go system, a priority yield system or by temporary traffic lights. 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.* Temporary traffic management and roadwork signs will be to Chapter 8 of the *Traffic Signs Manual 2019.*

It is envisaged, pending confirmation at construction stage, that the following roads will have single lane closures during the construction of the cable route with approximate lengths shown:

- L-10142 – (750m)

5.5.2 Road Closures

Roads closures will be implemented where there is insufficient space on the existing public roadway to implement a single lane closure. 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 collector cable route 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 confirmation at construction stage, that the following roads will have road closures for a short time period if required during construction of the collector circuit cable route with approximate lengths shown:

Proposed Local Road Closures in County Donegal

- L-1012 – (750m)

5.5.3 Diversions

Diversions will be implemented to provide an alternative route for any road closures during construction. The road closure will be implemented only if required, 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.*

If a road closure is necessary, pending confirmation at construction stage, that the following roads will provide a suitable diversion for the proposed road closures with the approximate diversion length:

- L-10142: Diversion to be made via the R252 Regional Road, the L-2073, the R250 Regional Road, the L-5594 Local Road, the L-1034 Local Road, the LP-1044 and L-1014 in Donegal (32km).

5.5.4 Road Crossings

Where the collector circuit cable route is planned to cross the public road on the L-10412 the appointed contractor will decide on the best method for controlling traffic in consultation with Donegal County Council Roads Department. A single lane closure may be utilised, in accordance with Section 0.5.2 of the *Temporary Traffic Management Design Guidance, Third Edition 2019* where works are carried out and controlled by a stop-go system. The ducting shall cross the road in two

phases. Phase one will construct the trench as far as the centre line of the carriageway and then have the road and trench temporarily reinstated.

Once the work has been completed on the closed lane, the area is inspected and traffic management procedures will switch to the opposite lane for phase two. An "All Stop" system, in accordance with Section 0.5.2.6 of the *Temporary Traffic Management Design Guidance, Third Edition 2019* may be used to control traffic and to allow the works commence on the other lane. Once the work has been fully complete, the trench and road can be temporally reinstated.

5.5.5 Joint Bays

It may be necessary that joint bays on the collector circuit cable route 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. Parameters will include the location of the joint box with regards to the road layout and carriageway width, the size of the joint box and the construction method which will be determined by the Contractor. 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.*

5.5.6 Construction Personnel Traffic

All traffic arising from construction personnel (appointed contractors, sub-appointed contractors, site operatives etc.) will park their vehicles at the appointed contractor's main site compound within the wind farm site. This will be done so as to prevent traffic disruption to construction and to local residents by prohibiting personal vehicles being parked along the local road network.