

15. MATERIAL ASSETS

Material Assets are defined in the ‘Guidelines on the Information to be contained in Environmental Impact Assessment Reports’ (EPA, 2022) ‘as *‘built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure’*. They may be either of human or natural origin. The cultural assets of Archaeology and Cultural Heritage are addressed in Chapter 13 of this Environmental Impact Assessment Report (EIAR). Economic assets of natural heritage include non-renewable resources such as minerals or soils, and renewable resources such as wind and water. These assets are addressed in Chapter 8: Land, Soils and Geology, Chapter 9: Water, Chapter 10: Air Quality, and Chapter 11: Climate. Tourism and amenity resources, which are also considered material assets, are addressed in Chapter 5 on Population and Human Health. The Population and Human Health chapter also addresses existing land-uses (economic assets), including forestry and agriculture.

This chapter of the EIAR addresses the likely significant effects of the Proposed Project on transportation infrastructure (Section 15.1 Traffic and Transport), on Telecommunications and Aviation (Section 15.2) and Other Material Assets (Section 15.3), which are economic assets of human origin. Waste Management is also considered within the EPA 2022 Guidelines as part of Material Assets. EPA Waste Management pertaining to the construction, operation and decommissioning of the Proposed Project is summarised in Section 4.3.4.6 of Chapter 4 of the EIAR. Traffic volumes generated by the removal of waste from the Proposed Project to fully authorised waste facilities, is considered in Section 15.1 below.

This chapter of the EIAR has been prepared in accordance with the requirements of the EIA legislation and guidance outlined in Chapter 1: Introduction.

15.1 Traffic and Transport

15.1.1 Introduction

15.1.1.1 Background and Objectives

The purpose of this section is to assess the effects on roads and traffic and transport of the traffic movements that will be generated during the construction, operational and decommissioning phase of the Proposed Project.

For developments of this nature, the construction phase is the critical period with respect to the traffic effects experienced on the surrounding road network in terms of the additional traffic volumes that will be generated on the road network, and the geometric requirements of the abnormally large loads associated with the wind turbine components. The requirements of the additional traffic and abnormal loads generated during the construction stage were assessed for the external highway network that will provide access to the Proposed Wind Farm. Locations where remedial measures are required to accommodate the abnormal loads are identified.

The magnitude of the increase in traffic volumes experienced on the surrounding network is identified during the various construction stages of the Proposed Project. A preliminary traffic management plan is also provided in Section 15.2.16.2 aimed at minimising the traffic impact on the local highway network. Refer also to Appendix 15-2 of this EIAR, for the Traffic Management Plan.

15.1.1.2 Statement of Authority

This section of the EIAR has been prepared by Alan Lipscombe of Alan Lipscombe Traffic and Transport Consultants Ltd. Alan is a competent expert in traffic and transport assessments. In 2007 Alan set up a traffic and transportation consultancy providing advice for a range of clients in the private

and public sectors. Prior to this Alan was a founding member of Colin Buchanan’s Galway office having moved there as the senior transportation engineer for the Galway Land Use and Transportation Study. Since the completion of that study in 1999, Alan has worked throughout the West of Ireland on a range of projects including: major development schemes, the Galway City Outer Bypass, Limerick Planning Land-Use and Transportation Study, Limerick Southern Ring Road Phase II, cost benefit analyses (COBA) and various studies for the University of Galway. Before moving to Galway in 1997, Alan was involved in a wide variety of traffic and transport studies for CBP throughout the UK, Malta and Indonesia. He has particular expertise in the assessment of development related traffic, including many wind farm developments including the following; Ardderroo, Derryadd, Derrinlough, Knocknamork, Shehy More, Cloncreen, Derrykillew, Coole, Ballyhorgan, Cahermurphy, Lettergull, Barnadivane, Cleanrath and Knockalough.

Alan has a BEng (hons) Degree in Transportation Engineering (Napier University, Edinburgh, 1989), is a member of Engineers Ireland and of the Institute of Highways and Transportation and is a TII accredited Road Safety Audit Team Member.

Traffic counts were undertaken by Traffinomics Ltd, which is an Irish traffic survey company with a comprehensive knowledge of traffic data collection methods. The company, which is 10 years old, is headed by Simon Wheeler, who has been in the traffic survey data collection business for 35 years. Previously Simon worked with Count On Us Ltd, followed by Abacus Transportation Surveys Limited, Ireland’s first lens based traffic data collection business. Clients of Traffinomics Ltd. include TII, Local Authorities and many leading retailers.

15.1.1.3 Guidance on Assessment of Effects

This section of the EIAR has been completed in accordance with the EIA guidance set out in Chapter 1 Introduction. The assessment uses standard terminology to describe the likely significant effects associated with the Proposed Project. Further information on the classification of effects used in this assessment is presented in Section 1.7.2 of this EIAR.

15.1.1.4 Scoping and Consultation

Transport Infrastructure Ireland

Transport Infrastructure Ireland (TII) responded to scoping by emails on the 14th of June 2023, in which it provided a list of recommendations to be followed when preparing the EIAR. All relevant TII guidelines and policies have been adopted in the preparation of this assessment, including the following;

- PE-PDV-02045, Transport Assessment Guidelines, Transport Infrastructure Ireland, May 2014
- PE-PAG-02017, Project Appraisal Guidelines, Unit 5.3, Travel Demand Projections, Transport Infrastructure Ireland, October 2021
- DN-GEO-03060, Geometric Design of junctions, Transport Infrastructure Ireland, May 2023.
- GE-STY-01024, Road Safety Audit Guidelines, December 2017.

Specific issues raised by TII include the following;

Table 15-1 Issues raised by TII in relation to the Proposed Project and Responses

ID	TII Scoping Response	Response
1	Consultations should be had with relevant Local Authority / National Roads Design Offices with	It is confirmed that consultation has been undertaken with Galway County

ID	TII Scoping Response	Response
	regards to locations of existing and future national roads schemes.	Council as set out in Section 15.1.1.4 below
2	TII would be specifically concerned as to potential significant impacts the development would have on the national road network (and junctions with national roads) in the proximity of the Proposed Project, including the potential haul route. In accordance with the provisions of Section 28 Ministerial Guidelines ‘Spatial	The impacts of the Proposed Project on the delivery routes in terms of link flows are set out in Section 15.2.6.1 and 15.2.6.2 of the EIAR, while an assessment of the capacity of the N83 / L-61461 junction is set out in Section 15.2.6.4. An assessment of the impacts during the construction of the Proposed Grid Connection underground cable route is set out in Section 15.2.7 while a swept path analysis undertaken for the abnormally large loads on the Turbine Delivery Route is set out in Section 15.2.9 of the EIAR. The assessment sets out the temporary local measures that will be required on the national, regional and local road networks during the construction of the Proposed Project.
3	The developer should assess visual impacts from existing national roads.	The visual impacts of the Proposed Project are set out in Chapter 14 of this EIAR.
4	The developer should have regard to any EIAR / EIS and all conditions and or modifications imposed by An Bord Pleanála regarding road schemes in the area. The developer should, in particular, have regard to any potential cumulative impacts.	It is confirmed that all An Bord Pleanála conditions will be adhered to, and the cumulative traffic related impacts are assessed in Section 15.2.16.1.
5	The developer, in preparing an EIAR, should have regard to TII Publications (formerly DMRB and the Manual of Contract Documents for Road Works).	It is confirmed that the design of the access junction is in accordance with TII guidelines.
6	The developer, in preparing an EIAR, should have regard to TII’s Environmental Assessment and Construction Guidelines, including the ‘Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes’ (NRA, 2006).	It is confirmed that the impacts of the Proposed Project with regards air quality is set out in Chapter 10 of this EIAR.
7	The EIAR should consider the ‘Environmental Noise Regulations 2006’ (SI 140 of 2006) and , in particular, how the development will affect future action plans by the relevant competent authority. The developer may need to consider the incorporation of noise barriers to reduce noise impacts (see ‘guidelines for the Treatment of	It is confirmed that the impacts of the Proposed Project with regards noise set out in Chapter 12 of this EIAR.

ID	TII Scoping Response	Response
	Noise and Vibration in National Road Schemes' (1st Rev, NRA 2004).	
8	<p>It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment be carried out in accordance with relevant guidelines, noting traffic volumes attending the Proposed Wind Farm site and traffic routes to/from the Site with reference to impacts on the national road network and junctions of lower category roads with national roads. In relation to national roads, the Authority's Traffic and Transport Assessment Guidelines (2014) should be referred to in relation to proposed development with potential impacts on the national road network. The scheme promoters are advised to have regard to Section 2.2 of the NRA/TII TTA Guidelines which addresses requirements for sub-threshold TTA. Any improvements required to facilitate development should be identified. It will be the responsibility of the developer to pay for the costs of any improvements to national roads to facilitate the private development proposed as TII will not be responsible for such costs.</p>	<p>It is confirmed that the assessment presented in Chapter 15 of the EIAR is undertaken in accordance with Traffic and Transport Assessment Guidelines, TII (2014).</p>
9	<p>The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required.</p>	<p>It is noted that there are no new access junctions proposed on the national road network and that minor temporary works are proposed at an existing junction in order to accommodate the abnormally sized loads. A Road Safety Audit has been undertaken in accordance with TII Guidelines and is discussed in Section 15.1.10 of the EIAR, with the full Stage 1 Road Safety Audit Report included as Appendix 15-3.</p>
10	<p>In the interests of maintaining the safety and standard of the national road network, the EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network.</p>	<p>All construction will be undertaken in accordance with current guidelines including the "<i>Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works</i>" (DoT now DoTT&S) and "<i>Guidance for the Control and Management of Traffic at Roadworks</i>" (DoTT&S).</p>
11	<p>TII recommends that that applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed. Where abnormal 'weight' loads are proposed, separate structure approvals/permits and other licences</p>	<p>The proposed haul routes are identified in this Chapter 15 of the EIAR. While it is proposed that the delivery stage of the Proposed Project will involve abnormally large loads, the axle loadings</p>

ID	TII Scoping Response	Response
	may be required in connection with the proposed haul route and all structures on the haul route through all the relevant County Council administrative areas should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal 'weight' load proposed.	will not exceed accepted limits. A program of pre-delivery condition and structural assessment of the route is however proposed, as set out in the Traffic Management Measures, included set out in Section 15.2.16.2.
12	The haul route should be assessed to confirm capacity to accommodate abnormal 'length' loads and any temporary works required.	It is confirmed that a geometric assessment was undertaken, as set out in Section 15.2.9.
13	The applicant/developer should also consult with all PPP Companies, Motorway Maintenance and Renewals Contractors (MMaRC) and road authorities over which the haul route traverses to ascertain any operational requirements, including delivery timetabling, etc. to ensure that the strategic function of the national road network is safeguarded.	The applicant agrees with this condition.
14	Where temporary works within any MMaRC Contract Boundary are required to facilitate the transport of turbine components to the Site, the applicant/developer shall contact thirdpartyworks@tii.ie in advance, as a works specific Deed of Indemnity will be needed by TII before the works can take place.	The applicant agrees with this condition.
15	Additionally, any damage caused to the pavement on the existing national road arising from any temporary works due to the turning movement of abnormal loads (e.g. tearing of the surface course, etc.) shall be rectified in accordance with TII Pavement Standards and details in this regard shall be agreed with the Road Authority prior to the commencement of any development onsite.	The applicant agrees with this condition, as set out in Section 15.2.16.2 of this EIAR.
16	It is noted that any grid connection and cable routing proposals should be developed to safeguard proposed road schemes as TII will not be responsible for costs associated with future relocation of cable routing where proposals are catered for in an area of a proposed national road scheme. In that regard, consideration should be given to route options, use of existing crossings, depth of cable laying etc.	The applicant agrees with this condition.

Department of Transport

A response to scoping was received from The Department of Transport on the 14th June 2023. The response refers to issues relating to the Proposed Grid Connection underground cabling route works within the public road network as follows:

- Their presence within the public road could significantly restrict the Road Authority in carrying out its function to construct and maintain the public road and will likely add to the costs of those works.
- Their installation within the lands associated with the public road may affect the stability of the road. In particular where the road is a “legacy road” (where there is no designed road structure, and the subgrade may be poor or poorly drained) the design needs to take account of all the variable conditions and not be based on a sample of the general conditions.
- The possible effect on the remaining available road space (noting that there may be need to accommodate other utilities within the road cross-section in the future).
- The necessity to have the power in the cables switched off where the Road Authority considers this necessary in order to carry out its function to construct and maintain the public road.

The Department of Transport requests that the Proposed Grid Connection underground cabling route should consider the following;

- Examination of options other than the routing of cables along the public road,
- Examination of options for connection to the national grid network at a point closer to the wind farm in order to reduce the adverse impact on public roads.
- Details of where within the road cross section cables are to be placed so as to minimise the effect on the Roads Authority in its role of construction and maintenance,
- Examination of details of any chambers proposed within the public road cross section so as to minimise the effect on the Roads Authority in its role of construction and maintenance,
- Examine the possible elimination of jointing bays to protect the integrity of the road structure for the safety of those driving on the public road by eliminating hard spots and also preserve the road width for other utilities and,
- Rationalisation of the number of cables involved (including existing electric or possible future cables) and their diversion into one trench, in order to minimise the impacts on the road network and the environment along the road boundary (hedgerows).

It is confirmed that the above points raised by the Department of Transport have been considered in the route selection and design of the Proposed Grid Connection underground cable route as set out in Chapter 4 of this EIAR.

The Department of Transport considers the following should be considered when applying conditions to any approval;

- A condition requiring the specific approval of the local authority to the detail of the final route of cables through the public road space. If during construction, there is a need to deviate from the detailed design then the approval of the local authority would again be sought. This would assist in minimising the impact on the public road.
- A condition requiring the developer to comply with all appropriate standards and, inter alia the Guidelines for Managing Openings in Public Roads, 2017 in order to ensure orderly development.

- A condition requiring that the location of the cables would be recorded as exactly as possible (maybe using BIM type technology) so as to facilitate the further use of road space for utilities and the maintenance/construction of the public road by the Roads authority. This record should be lodged with the local authority and with the ESB Networks for retention on their records.
- A condition to require the elimination of jointing bays and the use of temporary removable jointing bays instead, to protect the integrity of the road structure, thereby improving safety for those driving on the public road by eliminating hard spots and preserving the road width for other utilities.
- A condition requiring the developer to route cables away from bridge structures and specifically preventing the developer from attaching cables to road bridges. This would allow for the future maintenance of bridges without interruption of the electricity supply along the cables.
- A condition requiring the developer to notify the Roads Authority of the owner of the cables (Owner) and the controller (Power Controller) of the power transmitted along the cables. In addition, the condition should require Owner and Power Controller to notify the Roads Authority of any change in ownership of the cables or change of Power Controller transmitting power along the cables. In all instances the Owner and Power Controller should be required to maintain an agreed contacts list with the Roads Authority.

It is confirmed that the Applicant will accept the above conditions set out by the Department of Transport.

15.1.1.5 Pre-planning Meetings

Galway County Council

A pre-planning meeting was held with Galway County Council (GCC) on 26th of October 2023. As detailed in Chapter 2, Section 2.7.2, there reference was made to the use of the N83 both during construction, but also for laying of the Proposed Grid Connection underground cable route to Cloon 110kV substation. GCC noted requirement for engagement with the Roads Engineer and TII. A meeting was consequently held onsite with (CLO) James Crowley of Enerco Energy Ltd. and John Coyle of Galway County Council on Friday 10th January to discuss the Proposed Project access locations and Proposed Grid Connection underground cable route. The main points to note from the meeting are as follows;

- The exact cable route proposed from the substation back to the N83 should be agreed with GCC following further investigation at road opening licence stage. Reinstatement will vary, depending on the road condition. A road condition survey will need to be carried out prior to commencement of construction.
- Likely reinstatement measures from Cloon to the N83 will be trench width with overlap, followed by 1 layer of tar & chip across the full width of the road, although the detailed design should be progressed in agreement with GCC.
- No concerns were raised in principle regarding the proposed entry and exit pit location for directional drilling under the M17 motorway. It was advised that the Applicant should contact TII for the design details of the road construction at the proposed crossing point.
- It was noted that GCC propose to overlay 10km of the N83 in the next few years. These works may be scheduled to be undertaken at the same time as the construction of the grid connection.
- In general, no concerns in principle were raised by GCC relating to the proposed grid connection.
- In relation to the proposed temporary access between the N83 and the L-61461, no concerns were raised in principle by GCC.

- It was agreed that concrete mixers on the 8 foundation pouring days may exit and enter the temporary road provided that adequate traffic management measures are in place.
- It was agreed that general stone lorries and other HGVs may enter the Site via the temporary road but should exit via the existing L-61461 / N83 junction.

It was noted that GCC has undertaken preliminary consultation regarding the upgrade of the existing L-61461 / N83 junction and that they hope to progress this to design stage in the future. It was confirmed that the applicant would support the upgrade of the junction at construction stage in consultation with GCC & TII.

It was noted that the N83 speed limit may be reduced to 80km/h on a temporary basis during construction and that a reduction in the speed limit along the L-61461 to 60km/h may be applied for.

It was recommended that VMS boards should be erected along with sufficient signage and that cones on the N83 centre line should be introduced to avoid overtaking.

It was noted that no issues of principle were raised with regards the proposed measures from the N83 to the access junction on the L-61461. It was agreed that Traffic Management Measures should be provided and agreed with GCC.

15.1.1.6 Methodology and Section Structure

The report adopts the guidance for such assessments set out by Transport Infrastructure Ireland, or TII, in the document number PE-PDV-02045 *'Traffic and Transport Assessment Guidelines, May 2014'*.

The geometric requirements of the transporter vehicles were assessed using AutoCAD and Autotrack.

The Traffic and Transport Section of the EIAR is set out as follows:

- A review of the existing and future transport infrastructure in the vicinity of the Proposed Project, including the proposed turbine delivery route, an assessment of 2023 traffic flows and traffic forecasts during an assumed construction year of 2030 (Section 15.1.2 Receiving Environment and 15.1.3 – Existing Traffic Volumes),
- A description of the nature of the Proposed Project and the traffic volumes that it will generate during the different construction stages and when it is operational (Section 15.1.4 – Proposed Project Traffic Generation),
- A description of the abnormally large loads and vehicles that will require access to the Site (Section 15.1.5 Construction Traffic Vehicles),
- A review of the effects of development generated traffic on links and junctions during construction and when the facility is operational (Section 15.1.6 –Traffic Effects During Construction and Operation),
- An assessment of the effects during the Proposed Grid Connection underground cable route (Section 15.1.7 – Effect on Network of Grid Connection),
- Traffic management of large deliveries and a geometric assessment of the routes and their capacity to accommodate the abnormal loads associated with the Proposed Project (Section 15.1.8 – Traffic Management of Large Deliveries and Section 15.1.9– Abnormal Load Route Assessment),
- A review of the Road Safety Audit undertaken for the Proposed Project (Section 15.1.10 – Road Safety),
- An assessment of the provision for sustainable modes of travel (in this case primarily with respect to the transport of construction staff) (Section 15.1.11 – Provision for Sustainable Modes of Travel),
- A description of potential significant effects on Roads and Traffic (Section 15.1.12 – Likely and Significant Effect and Associated Mitigation Measures).

15.1.2 Receiving Environment

15.1.2.1 Site Location

The Proposed Project is located in County Galway in the townlands listed in Table 1-1 of Chapter 1. The Proposed Project is located within a rural setting in northwest Galway, approximately 8km southwest of Tuam and 10km north of Claregalway. The N83 National Road runs in a north-south direction directly to the east of the Proposed Wind Farm site. Land use currently comprises a mix pastoral agricultural land and smaller areas of scrub and exposed rock. The surrounding land use is primarily pastoral agricultural lands, as well as one-off rural housing. Existing access is via the N83 onto the L61461 Local Road in a westerly direction, a temporary access road between the N83 and the L61461 will facilitate construction stage access to the Proposed Wind Farm site.

15.1.2.2 Proposed Abnormal Size Load Delivery Route

The proposed port of entry for the large wind turbine components is Galway Harbour in Galway City. The proposed Turbine Delivery Route (TDR) from Galway Port Harbour to the Proposed Wind Farm site is shown in Figure 15-1.

The proposed TDR is as follows;

- From Galway Harbour the route travels northeast on Lough Atalia Road and the R339 for approximately 2.4kms to the signalised junction adjacent to Thermo King.
- The route continues left at this junction to travel north for approximately 0.3 kms to the junction adjacent to the Trappers Inn.
- At this point the route turns right onto the R336 to travel approximately 0.3 kms to the junction between the R336 / the N6 Bothar na dTreabh / N83.
- From this point the route travels straight through the R336 / the N6 Bothar na dTreabh / N83 junction onto the N83 and continues for approximately 19.4 kms through the village of Claregalway to the existing junction with the L-61461.
- At a point approximately 80m south of the L-61461 the TDR turns left where it is proposed that the abnormally sized loads will be accommodated on a new temporary access road of approximately 70m in length, before it connects into the L-61461 at a point approximately 70m to the west of the existing N83 / L-61461 junction.
- From this point the route travels west on the L-61461 for approximately 300m to the location of a new junction on the north side of the L-61461 that will provide access to the Proposed Wind Farm site.

An assessment of the turning requirements of the abnormally large loads transporting the turbine components was undertaken at the various pinch points along the TDR, as identified in Figure 15-2a. The swept path assessment undertaken for these locations is discussed in Section 15.2.9.

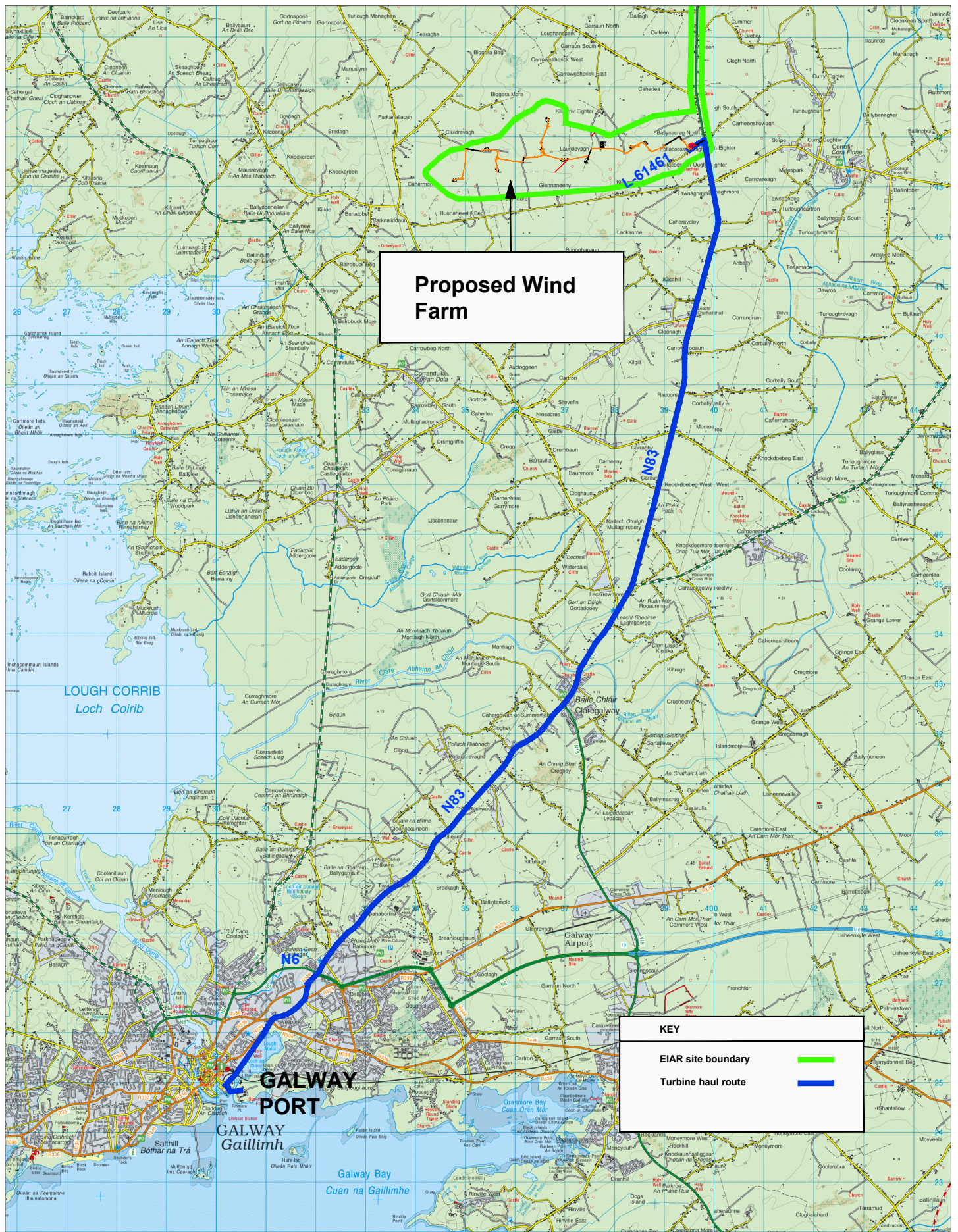


Figure 15-1 Site location and turbine delivery route

PROJECT: Laurclavagh Renewable Energy Development

CLIENT: Laurclavagh Ltd

SCALE: NTS

PROJECT NO: 9730

DATE: 05.03.24

DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS

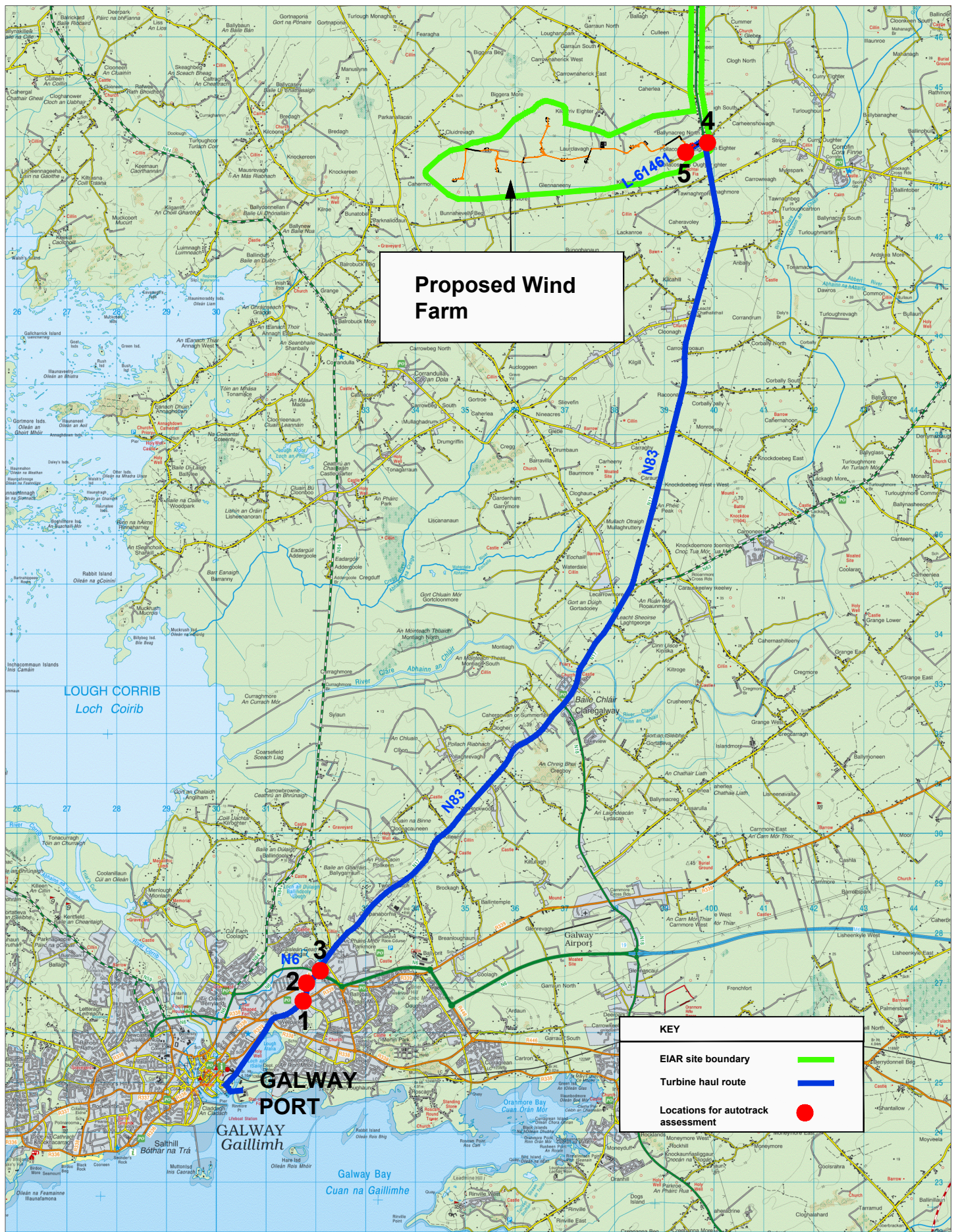


Figure 15-2a Route assessment location plan

PROJECT: Laurclavagh Renewable Energy Development

CLIENT: Laurclavagh Ltd

SCALE: NTS

PROJECT NO: 9730

DATE: 16.01.24

DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS

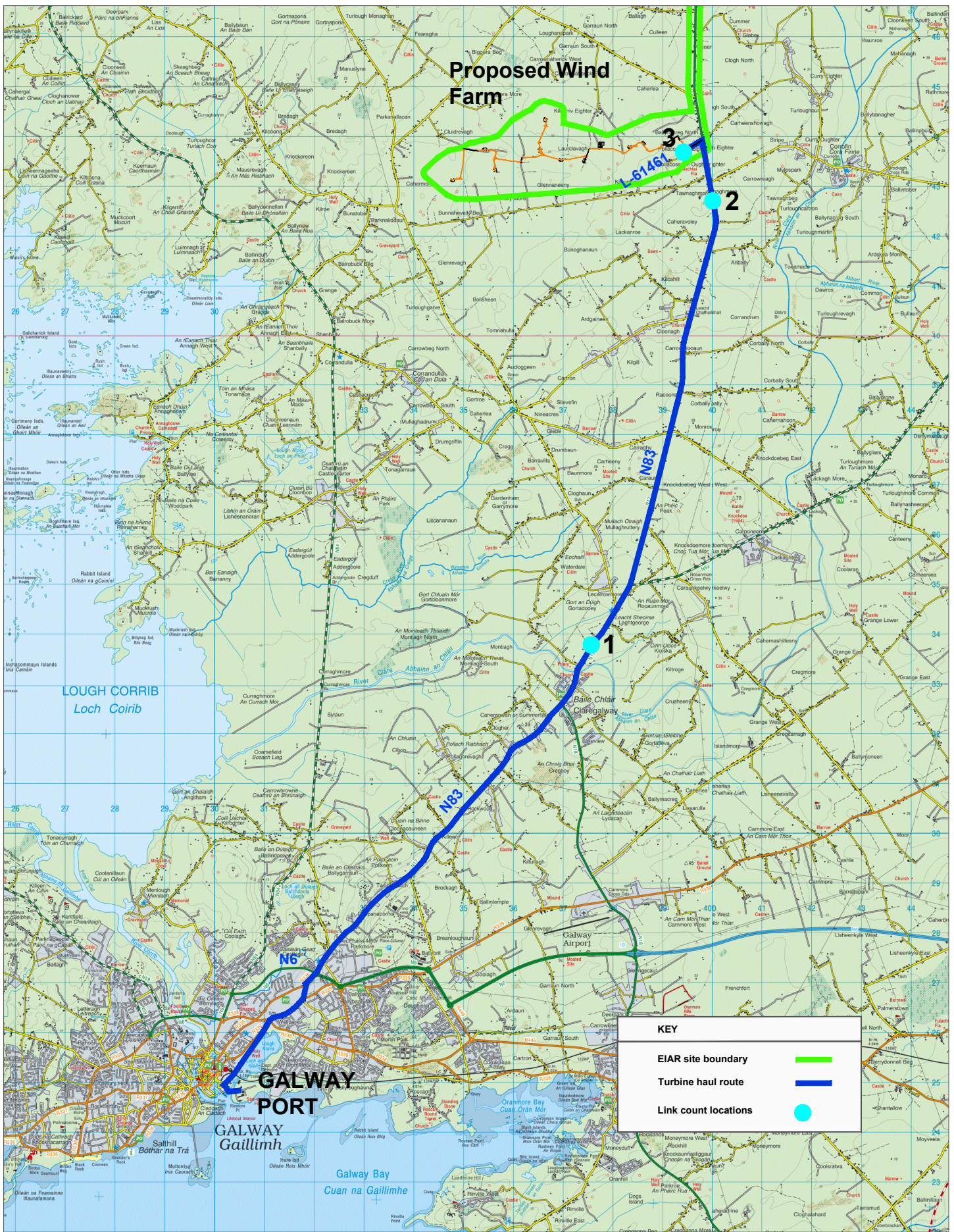


Figure 15-2b Link count locations

PROJECT: Laurclavagh Renewable Energy Development

CLIENT: Laurclavagh Ltd

SCALE: NTS

PROJECT NO: 9730

DATE: 16.01.24

DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS

15.1.2.3 Proposed Construction Traffic Haul Route

Stone, sand and cement required for the construction of the Proposed Wind Farm and the Proposed Grid Connection infrastructure will be sourced from local, appropriately authorised quarries. Potential quarries are shown on Figure 4-24. Quarries are located to the north and south of the site and all materials provided by these quarries will enter the site via the temporary road, off the N83. The smaller turbine components will arrive at the port in Galway City and travel to the site via the TDR as shown in Figure 15-1. All general construction traffic generated during the construction of the Proposed Project will travel to the site via the TDR and N83.

15.1.2.4 Proposed Grid Connection Route

The Proposed Grid Connection includes for the proposed onsite 110kV substation, temporary construction compound and an associated 110kV underground cabling route connecting to the existing 110kV Cloon Substation, located in the townland of Cloonascragh. The Proposed Grid Connection underground cabling route measures approximately 14.3km, of which approx. 12km is located within the public road corridor. The Proposed Grid Connection and associated traffic related impacts are discussed in Section 15.1.7.

15.1.3 Existing Traffic Volumes

Traffic volumes are discussed in terms of either vehicle numbers, or Passenger Car equivalent Units (PCUs), where each vehicle is expressed in terms of its demand on the network relative to the equivalent number of cars. For example, an articulated HGV was given a factor of 2.4 passenger car units (as per TII Project Appraisal Guidelines for National Roads Unit 5.2), while one of the extended HGVs transporting the large turbine components was assigned a value of 10.

15.1.3.1 Background Traffic Flows

The 3 locations included in the link flow assessment and for which base year 2023 traffic count data was collated are shown in Figure 15-2b. The locations included in the assessment are as follows,

- › Link 1 – N83 between Claregalway and Loughgeorge,
- › Link 2 – N83 south of L-61461,
- › Link 3 – L-61461 leading to the site.

Two sources of data were used to provide all day traffic flows for the links included in the assessment, as set out in Table 15-1. For Link 1 on the N83 between Claregalway and Loughgeorge data obtained from automatic traffic counters maintained by Transport Infrastructure Ireland (TII) was used. For the remaining 2 links, all day traffic counts were undertaken at the N83 / L-61461 junction to provide 2-way links flows and junction turning count data. The traffic counts were undertaken by Traffinomics Ltd on Tuesday 21st November 2023. All base year Traffic count data is included as Appendix 15-1.

The all-day traffic flows observed for the base year 2023 are shown in terms of vehicle numbers in Table 15-2. As would be expected the figures show that there is a considerable range in existing traffic volumes on the proposed turbine delivery route and construction traffic routes, ranging from 18,637 vehicles per day on the N83 between Claregalway and Loughgeorge, to 10,231 vehicles per day of the N83 just south of the L-61461, to just 86 vehicles per day on the L-61461.

While link capacities are discussed for the construction year in 2030 in further detail in Section 15.2.6.2, it is worth noting that the link flows observed on the N83 on the TDR were observed to be high in the year 2023, as set out in Table 15-2 and summarized below.

- Link 1 – N83, between Claregalway and Loughgeorge, all day traffic flow = 18,637 vehicles, link capacity = 8,600, and therefore currently operating at 217% of capacity
- Link 2 – N83 south of L-61461, all day traffic flow = 10,231 vehicles, link capacity = 11,600, and therefore currently operates at 88% of capacity.

As they leave the urban area, the link capacity for each link may be estimated based on road types and widths as set out in the TII Standards document DN-GEO-03031 Road Link Design, Table 6/1. Based on the capacities and the flows above, it may be determined that Link 1 (N83 between Claregalway and Loughgeorge) is currently operating at 217% of capacity in the year 2023, with Link 2 (N83 south of the L-61461) operating at 88% of capacity. While the traffic flows observed on these links are high it is important when considering the impacts of the Proposed Project to consider the relative increase compared to background traffic levels. This issue is discussed further in Section 15.2.6.2.

Table 15-1 Count locations and data source.

Link	Data source
1 - N83 between Claregalway and Loughgeorge	TII ATC site
2 - N83 south of L-61461	Classified count
3 - L-61461 leading to site	Classified count

Table 15-2 All day traffic flows by location, year 2023 (2-way vehicles)

Link	2023
1- N83 between Claregalway and Loughgeorge	18,637
2 - N83 south of L-61461	10,231
3 - L-61461 leading to site	86

15.1.3.2 Background Traffic Volumes for the Assumed Construction Year 2028

This section describes the process adopted to produce background traffic forecasts for an assumed construction year of 2028.

Revised guidelines for forecasting annual growth in traffic volumes were produced by TII in October 2021, as set out by count in the Project Appraisal Guidelines (Unit 5.3 – Travel Demand Projections). The annual growth rates for light vehicles for County Galway and factors for the years relevant to this study are shown in Tables 15-3 and 15-4. Based on TII growth rates it is estimated that traffic volumes will increase by 13.6% during the period from 2023, when the base traffic data was collected, and the year 2028, when the construction of the Proposed Project is forecast to take place. Year 2023 and 2028 all day traffic flows on the study area network are compared in Table 15-5.

It should be noted that while the assumed construction year of 2028 may vary within the 10-year period for which planning permission is sought, this will not alter the forecast outcomes and effects presented in this section of the EIAR. This is due to the annual growth rate for background traffic being just 1.09% by the year 2028 (as shown in Table 15-3 as 1.0109) and the traffic volumes generated by the Proposed Project will remain unchanged regardless of construction year, as presented subsequently in Section 15.2.4. For example, in the event that the construction year is 2030 rather than 2028, background traffic volumes will increase from the base year of 2023 by 17.9% rather than 13.6%, as also shown in Table 15-3.

TII traffic count data recorded at the TII count site on the N83, together with the classified traffic count undertaken for the purpose of this assessment, were also used to determine the existing percentage of HGVs on the proposed delivery routes. The observed percentage of HGVs are shown in Table 15-6 and range from a minimum of 2.7% observed on Link 1 on the N83 between Claregalway and Loughgeorge, to a maximum of 11.6% observed on the L-61461 leading to the Proposed Wind Farm site.

Table 15-2 TII traffic growth forecasts, growth per annum and cumulative, County Galway

Year	Lights – Annual Factor			Lights – Cumulative Factor		
	Low	Medium	High	Low	Medium	High
2023	1.0243	1.0259	1.0294	1.000	1.000	1.000
2024	1.0243	1.0259	1.0294	1.024	1.026	1.029
2025	1.0243	1.0259	1.0294	1.049	1.052	1.060
2026	1.0243	1.0259	1.0294	1.075	1.080	1.091
2027	1.0243	1.0259	1.0294	1.101	1.108	1.123
2028	1.0243	1.0259	1.0294	1.128	1.136	1.156
2029	1.0243	1.0259	1.0294	1.155	1.166	1.190
2030	1.0087	1.0109	1.0148	1.165	1.179	1.207

Table 15-3 TII traffic growth rates by growth scenario

Period	New Factors		
	Low	Medium	High
2023 - 2028	1.128	1.136	1.156

Table 15-4 All day traffic flows by location and year (2-way vehicles)

Link	2023	2028
1- N83 between Claregalway and Loughgeorge	18,637	21,172
2 - N83 south of L-61461	10,231	11,622
3 - L-61461 leading to site	86	98

Table 15-5 All day flows, percentage HGVs and flows by vehicle type, year 2028.

Link	All day flow (vehs)	% HGV's	Vehicles		PCUs		Total
			HGVs	Cars / lgvs	HGVs	Cars / lgvs	
1 - N83 between Claregalway and Loughgeorge	21,172	2.7%	572	20,600	1,372	20,600	21,972
2 - N83 south of L-61461	11,622	4.8%	558	11,065	1,339	11,065	12,403

Link	All day flow (vehs)	% HGV's	Vehicles		PCUs		
			HGVs	Cars / lgvs	HGVs	Cars / lgvs	Total
3 - L-61461 leading to site	98	11.6%	11	86	27	86	114

15.1.4 Proposed Project and Traffic Generation

15.1.4.1 Proposed Access Junctions

While the design of the junctions that will provide access to the Proposed Wind Farm is discussed in Sections 15.1.9, a summary of the proposed access junctions is provided below.

Temporary Road between N83 and L-61461

It is proposed that a temporary road will be constructed linking the N83 to the L-61461 at a location approximately 80m south of the existing N83 / L-61461 junction. This link will facilitate the delivery of the turbine components, which will be accompanied by a Garda escort, and the access of all standard HGV deliveries to the Proposed Wind Farm site, which will be controlled by on traffic management measures and flagmen. On the 8 days that the concrete foundations are poured this link will also be used for these vehicles to exit the site. All other HGV movements will exit the Site via the existing L-61461 / N83 junction. All staff vehicles will use the existing N83 / L-61461 junction.

Once the construction of the Proposed Project is complete the temporary road will be closed by means of fencing and the land and existing boundary treatments re-instated. The proposed link will only be re-opened for the replacement of turbine components.

Construction and Operational Entrance off the L-61461

The construction and operational entrance will be off the L-61461, approximately 370m west of the N83. This entrance will be established for construction traffic and construction staff access and will be retained during the life of the Proposed Project for operational phase access. On completion of the construction phase, the Site entrance will be reduced in size and gated for security.

15.1.4.2 Development Trip Generation – During Construction

For the purpose of assessing the effects of traffic generated during the construction of the Proposed Project, the construction phase is in the following stages.

- Stage 1 – Proposed Project construction: groundworks, construction of temporary construction compounds, turbine foundations, met mast foundations, onsite 110kV substation, internal electrical cabling and construction of the Proposed Grid Connection underground cable route.
- Stage 2 – Wind turbine component delivery and construction.

For the purpose of the traffic impact assessment, projections based on trip generation data collected from other wind farm construction projects regarding the numbers of trips per quantum of material, the number of turbine component parts based on 8 turbines, the length of the construction phase and work periods etc. were made to inform the assessment. These projections allow for assessment using the precautionary principle but should not be inferred as prescriptive limitations to the construction phase. There are numerous variables which can affect a construction project programme, including weather.

The construction phase of the Proposed Project will be carried out in accordance with the CEMP, included as Appendix 4-5 of this EIAR, which will be agreed, where required, with the relevant Local Authority.

The traffic generation estimates set out in the following paragraphs is based on a total construction period of 18-24 months. The shortest potential construction phase duration of 18 months was assumed for the construction of the Proposed Project in order to test a precautionary scenario. The shortest construction period will give rise to higher volumes of construction traffic using the public road network at any one time. For assessment purposes a standard 255 working days per annum was adopted equating to 383 working days for over an 18-month construction period. The total number of deliveries made to the Proposed Project site during that period are shown in Table 15-7. It is estimated that a total of 9,707 deliveries by truck or standard articulated HGVs will be made to the Site during this period.

The numbers of deliveries made to the Site is further split in Table 15-7 between materials delivered for the construction of the Proposed Wind Farm and materials delivered for the construction of the Proposed Grid Connection, As discussed further below.

15.1.4.2.1 **Stage 1 – Site Preparation and Groundworks**

For assessment purposes, this stage of the Proposed Project construction, which includes the site preparation and ground works, construction of temporary construction compounds, turbine foundations, met mast foundations, and internal electrical cabling is assumed to last approximately 11 months (235 days), during which a total of 7,265 deliveries will be made to the site. During this construction phase there will be two distinct types of days with respect to trip generation. A total of 8 days will be used to pour the 8 concrete wind turbine foundations. Foundations will likely be poured one per day, with circa 80 concrete loads required for each turbine delivered to the Proposed Wind Farm over a 12-hour period, resulting in 7 HGV trips to and from the Site per hour.

On the remaining 227 working days for this stage other general materials will be delivered to the Proposed Wind Farm site.

The estimated additional daily traffic generated on the road network during these days are shown in Tables 15-8 and 15-9. The figures show that on the 8 days that concrete will be delivered to the Site, an additional 384 two-way PCUs will be added to the network (comprising 80 two-way HGV trips with 2.4 PCUs per movement), as shown in Table 15-8. Similarly, on the 227 days when other materials will be delivered to the Site, traffic volumes on the local network will increase by an average of 140 PCUs, as set out in Table 15-9.

15.1.4.2.2 **Stage 1 – Proposed Grid Connection**

This stage of the Proposed Project construction, includes works related to the construction of the Proposed Grid Connection, including, construction of the temporary construction compound, the onsite 110kV substation and the underground cable route. The construction of the of the Proposed Grid Connection is discussed further in Section 15.1.7 of the EIAR. It is forecast that the construction of the Proposed Grid Connection and associated works will take 118 working days during which a total of 2,442 HGV trips will travel to and from the site, as shown in Table 15-7. Similarly, on the 118 days when deliveries for the Proposed Grid Connection and associated works will be delivered to the site, traffic volumes generated by deliveries on the local network will increase by an average of 99 PCUs, as set out in Table 15-10.

Table 15-6 Trip generation - Stage 1 - Site preparation and groundworks – total loads – Proposed Project

Material	Total no. Truck Loads	Truck type
Proposed Wind Farm		
Concrete	640	Trucks

Material	Total no. Truck Loads	Truck type
Delivery of plant	35	Large artic
Fencing & gates	3	Large artic
Compound setup	32	Large artic
Steel	22	Large artic
Sand / binding / stone / pile foundation	175	Trucks
Ducting and cabling (internal)	235	Large artic
Crane (to lift steel)	1	Large artic
Cranes for turbines	12	Large artic
Refuelling for plant	165	Large artic
Stone for Proposed Wind Farm	5,745	Trucks
Site maintenance	120	Large artic
Miscellaneous	80	Large artic
Proposed Wind Farm - Total	7,265	
Proposed Grid Connection		
Stone for Grid Connection	618	Trucks
Stone for Substation	652	Trucks
Stone for Temporary construction compound	138	Trucks
Materials for Proposed Grid Connection	1,034	Large artic
Proposed Grid Connection - Total	2,442	
Total	9,707	

Table 15-7 Trip generation - Stage 1 – Concrete foundation pouring – total movements and volumes per delivery day – Proposed Wind Farm

Material	Total Truck Loads	Truck type	PCU Value	Total PCUs	PCU Movements /day*	2- way PCUs/day
Concrete	640	Trucks	2.4	1,536	192.0	384.0

Material	Total Truck Loads	Truck type	PCU Value	Total PCUs	PCU Movements /day*	2- way PCUs/day
* Estimation based on 8 concrete pouring days						

Table 15-8 Trip generation - Stage 1 – Site preparation and groundworks – total movements and volumes per delivery day – Proposed Wind Farm

Material	Total Truck Loads	Truck type	PCU Value	Total PCUs	PCU Movements /day*	2-way PCUs/day
Proposed Wind Farm						
Delivery of plant	35	Large artic	2.4	84.0	0.37	0.47
Fencing & gates	3	Large artic	2.4	7.2	0.03	0.06
Compound setup	32	Large artic	2.4	76.8	0.34	0.68
Steel	22	Large artic	2.4	52.8	0.23	0.47
Sand / binding / stone / pile foundation	175	Truck	2.4	420.0	1.85	3.70
Ducting and cabling (internal)	235	Large artic	2.4	564.0	2.48	4.97
Crane (to lift steel)	1	Large artic	2.4	2.4	0.01	0.02
Stone for Proposed Wind Farm	5,745	Truck	2.4	13,788.0	60.74	121.48
Cranes for turbines	12	Large artic	2.4	28.8	0.13	0.25
Refuelling for plant	165	Large artic	2.4	396.0	1.74	3.49
Site maintenance	120	Large artic	2.4	288.0	1.27	2.54

Material	Total Truck Loads	Truck type	PCU Value	Total PCUs	PCU Movements /day*	2-way PCUs/day
Miscellaneous	80	Large artic	2.4	192.0	0.85	1.69
Total	6,625			15,900.0	70.04	140.09

Table 15-9 Trip generation - Stage 1 – Construction of grid connection – total movements and volumes per delivery day – Proposed Grid Connection

Material	Total Truck Loads	Truck type	PCU Value	Total PCUs	PCU Move ments /day*	2-way PCUs/d ay
Stone for Grid Connection	618	Truckc	2.4	1,483.2	12.57	25.14
Stone for Substation	652	Truck	2.4	1,564.8	13.26	26.52
Stone for Temporary construction compound	138	Truck	2.4	331.2	2.81	5.61
Materials for Proposed Grid Connection	1,034	Truck	2.4	2,481.6	21.03	42.06
Total				5,860.8	49.7	99.3

15.1.4.2.3 Stage 2 – Turbine Construction

During the turbine construction stage, including delivery and assembly, there will be deliveries to the Proposed Wind Farm site made by abnormally large vehicles, referred to in this section as *extended artics*, transporting the component parts of the turbines (nacelles, blades and towers). There will also be deliveries made by standard large HGVs, transporting cables, tools and smaller component parts. The types of load and associated numbers of trips made to the Proposed Wind Farm site during the turbine construction period are shown in Table 15-11, which summarises that a total of 64 trips will be made to and from the Site by extended artics, with a further 32 trips made by standard large articulated HGVs.

Table 15-10 Trip generation - Stage 2 – Wind turbine plant – total loads – Proposed Wind Farm

Material	Units	Quantity per Unit	Total Quantity	Quantity per Truck	Total Truck Loads	Truck type
Nacelle	8	1	8	1	8	Extended Artic
Blades	8	3	24	1	24	Extended Artic
Towers	8	4	32	1	32	Extended Artic
Sub total					64	

Material	Units	Quantity per Unit	Total Quantity	Quantity per Truck	Total Truck Loads	Truck type
Transformer	8	1	8	1	8	Large Artic
Drive train and blade hub	8	1	8	1	8	Large Artic
Base and other deliveries	8	2	16	1	16	Large Artic
<i>Sub total</i>					32	
Total					96	

For the purposes of this assessment, it is assumed that the turbine delivery element will progress at the rate of 3 extended artic trips made by convoy to the Proposed Wind Farm on 5 days per week, which is a common delivery frequency for large turbine components from the port of entry to the site. This will result in this stage taking 22 days spread over a 5-week period with all deliveries made during the night. The actual trip number will be determined following consultations with An Garda Síochána. On a further two days per week, lasting for approximately 4 weeks, the remaining equipment required during this phase will be delivered to the Proposed Wind Farm site. The additional traffic movements for these two types of days are summarised in Tables 15-12 and 15-13. In Table 15-12 a PCU equivalent value of 10 was allocated to each extended artic movement, resulting in an additional 60 PCUs on the study network on these 22 days, while an additional 19.2 PCUs are forecast to be on the network on 8 other days, as shown in Table 15-13, during the turbine construction phase.

Table 15-11 Trip generation - Stage 2 – Wind turbine plant, extended artics – total movements and volumes per delivery day – Proposed Wind Farm

Material	Units	Truck Type	PCU Value	Total PCUs	2-way PCUs/ day
Nacelle	1	Extended Artic	10	10.0	20.0
Blades	3	Extended Artic	10	30.0	60.0
Towers	4	Extended Artic	10	40.0	80.0
Total per turbine	8			80.0	160.0
Total per delivery day	3			30.0	60.0

*Estimation based on 3 abnormal sized loads being delivered per day on 5 days per week (total 64 loads will take 22 nights spread over 5 weeks)

Table 15-12 Trip generation - Stage 2 - Wind turbine plant, standard artic HGVs - total movements and volumes per delivery day – Proposed Wind Farm

Material	Quantity per Unit	PCU Value	2-way PCUs / day
Transformer	1	2.4	4.8
Drive train and blade hub	1	2.4	4.8
Base & other deliveries	2	2.4	9.6
Total	4		19.2

*Estimation based on equipment for 2 turbines being moved per week spread over 2 days for 4 weeks

Construction Employee Traffic

During the construction of the Proposed Project, it is estimated that 100 jobs will be created. Of this total it is estimated that up to 70 staff members will be employed at any one time during the site preparation and groundworks stage of construction, reducing to a maximum of 45 staff at any one time during the turbine construction stage. If a precautionary scenario is assumed that all staff will travel to / from the Site by car, at an average of 2 persons per car, then a total of 70 PCU movements (each trip is two way) will be added to the network during the groundworks stage (Stage 1) of the Proposed Project, reducing to 45 PCU trips during the turbine construction stage (Stage 2).

15.1.4.3 Development Trip Generation – During Operation

It is estimated that the Proposed Wind Farm will be unmanned once operational and will be remotely monitored. The only traffic associated with the operational phase of the Proposed Wind Farm will be from maintenance personnel. While there will be no scheduled trips required for the Proposed Grid Connection underground cabling, maintenance may be required, although this will occur rarely generating a modest number of trips.

It is estimated that the traffic volumes that will be generated by the Proposed Wind Farm once it is operational will be minimal, with an estimated 1-2 staff employed on the Proposed Wind Farm site at any time. The impact on the network of these trips during the operational stage is discussed in Section 15.1.12

15.1.4.4 Development Trip Generation – During Decommissioning

Traffic generation to the Proposed Wind Farm site during decommissioning will be similar but significantly less than the trip generation estimates presented for the construction phase presented above. This is because much of the materials brought into the Proposed Wind Farm during construction will be left in-situ during the decommissioning stage.

There will be no traffic generation as a result of the Proposed Grid Connection as it will not be decommissioned.

15.1.5 Construction Traffic Vehicles

The delivery of turbine components including blades, tower sections and nacelles is a specialist operation owing to the oversized loads involved. As detailed in in Chapter 4 of this EIAR, the turbine model to be installed on the Proposed Wind Farm site will have an overall ground-to-blade tip height of 185 metres; blade rotor diameter of 163 metres and hub height of 103.5 metres. The turbine blades are the longest

turbine component and a blade length of 81.5 metres has been assessed for the turbine delivery assessment for the Proposed Wind Farm.

The critical vehicles in terms of size and turning geometry requirements and used in the detailed route assessment discussed in Section 15.1.2.2 are the blade transporter, the blade transporter with the blade lifted at the tip and the tower transporter vehicles, with the geometry of each shown in Figures 15-3a for the blade transporter and 15-3b for the tower transporter.

The key dimensions are as follows:

Transport of Blades – Standard articulated HGV with 10m blade overhang at rear (See Figure 15-3a)

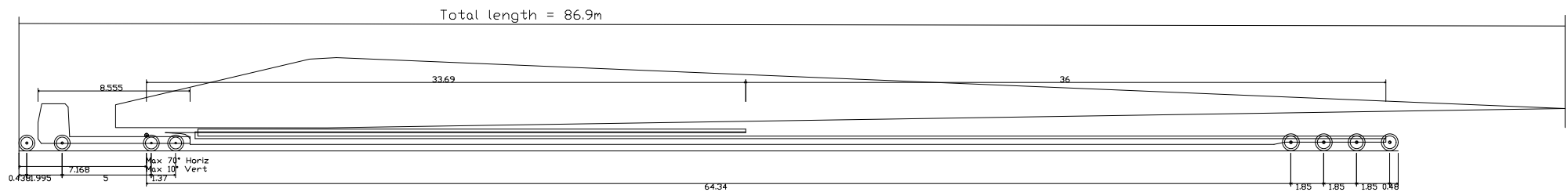
Total length	86.9 m
Length of blade	81.5 m
Inner radius	28.0 m

Transport of Tower – Using low-bed or drop deck trailers (See Figure 15-3b)

Total length (with load)	46.7 m
Length of load	29 m
Inner radius	25.0 m

The vehicles used to transport the nacelles will be similar to the tower transporter although will be shorter in length.

All other vehicles requiring access to the Site will be standard HGVs or LGVs and will be significantly smaller than the design test vehicles. Standard HGVs and LGVs will navigate the National and Regional Road networks and access the Site off the proposed temporary road off the N83.



81.5m blade
 Overall Length excluding blade 77.537m
 Overall Length including blade 86.900m
 Overall Width 2.500m
 Overall Body Height 2.661m
 Min Body Ground Clearance 0.375m
 Track Width 2.500m
 Lock to Lock Time 6.00s
 Wall to Wall Turning Radius 9.800m

NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

FIGURE 15-3a Design blade extended artic profile

PROJECT: Laurclavagh Renewable Energy Development

CLIENT: Laurclavagh Ltd

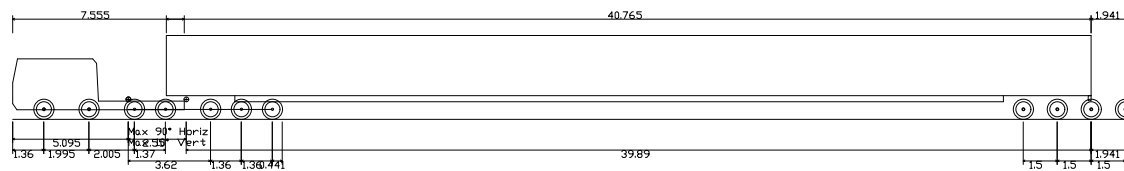
SCALE: NTS

PROJECT NO: 9730

DATE: 10.01.24

DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS



Tower	
Overall Length	49.476m
Overall Width	2.550m
Overall Body Height	3.695m
Min Body Ground Clearance	0.427m
Max Track Width	2.520m
Lock to Lock Time	6.00s
Wall to Wall Turning Radius	9.800m

NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

FIGURE 15-3b Design tower extended artic profile

PROJECT: Laurclavagh Renewable Energy Development

CLIENT: Laurclavagh Ltd

SCALE: NTS

PROJECT NO: 9730

DATE: 10.01.24

DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS

15.1.6 Traffic Effects During Construction, Operation and Decommissioning of the Proposed Project

As detailed below, transportation of large turbine components will be carried out at night when traffic is at its lightest and in consultation with the relevant Roads Authorities and An Garda Síochána with deliveries accompanied by Garda escort.

It should be noted that for the purpose of the assessment all vehicles travelling to and from the site of the Proposed Wind Farm have been assumed to do so from the same single direction. The assessment is therefore based on a precautionary scenario, where all traffic generated by the Proposed Wind Farm travels to/from the Site on the same route with the maximum increase in traffic volumes assessed on each link shown in Figure 15-2b.

15.1.6.1.1 Effect on Link Flows – During Construction

Background traffic volumes and Proposed Wind Farm generated traffic volumes are shown for the four typical construction stage scenarios, discussed in Section 15.1.3.1 and shown in Tables 15-14 to 15-18, with the forecast effects, in terms of the percentage increase in traffic flows in PCUs and the number of days affected, set out in Tables 15-19 to 15-23. As stated previously in this section the actual figures presented in the tables will be subject to change, however, they are considered a robust estimation of likely traffic volumes and effects.

In terms of daily traffic flows the potential effects may be summarised as follows:

During Stage 1 – Wind Turbine Foundation Concrete Pouring

For 8 days when the concrete foundations are poured an additional 454 PCUs will travel to/from the Proposed Wind Farm site.

During the delivery of the concrete, it is forecast that the increase in traffic volumes will range from +2.1% on the N83 between Claregalway and Loughgeorge (Link 1), to +3.7% on the N83 just to the south of the L-61461 (Link 2) to a 5-fold increase in traffic flows (+399.8%) on the L-61461 leading to the Proposed Wind Farm site (Link 3), which is currently lightly trafficked.

During Stage 1 – Site Preparation and Groundworks

For 227 days when the general construction and groundworks are undertaken an additional 210 PCUs will travel to/from the Proposed Project.

On these days it is forecast that the increase in traffic volumes will range from +1.0% on the N83 between Claregalway and Loughgeorge (Link 1), to +1.7% on the N83 just to the south of the L-61461 (Link 2) to a 184.9% increase on the L-61461 leading to the Proposed Wind Farm site (Link 3).

During Stage 1 – Construction of Grid Connection

For 118 days when the Proposed Grid Connection and associated works is constructed an additional 144 PCUs will travel to/from the site.

On these days it is forecast that the increase in traffic volumes will range from +0.7% on the N83 between Claregalway and Loughgeorge (Link 1), to +1.2% on the N83 just to the south of the L-61461 (Link 2) to a 126.8% increase on the L-61461 leading to the Proposed Wind Farm site (Link 3).

During Stage 2 – Wind Turbine Construction Stage – Delivery of large equipment using extended articulated vehicles.

On the 22 days / nights that the abnormal loads carrying the large turbine components travel to the Proposed Wind Farm, an additional 105 PCUs will travel to/from the site.

On these days it is forecast that the increase in traffic volumes will range from +0.5% on the N83 between Claregalway and Loughgeorge (Link 1), to +0.8% on the N83 just to the south of the L-61461 (Link 2) to a 92.5% increase on the L-61461 leading to the Proposed Wind Farm site (Link 3).

During Stage 2 – Wind Turbine Construction Stage – Other deliveries using conventional articulated HGVs

For 8 days an additional 64 PCUs will travel to/from the Proposed Wind Farm site. On these days it is forecast that the increase in traffic volumes will range from +0.3% on the N83 between Claregalway and Loughgeorge (Link 1), to +0.5% on the N83 just to the south of the L-61461 (Link 2) to a 56.4% increase on the L-61461 leading to the Site (Link 3).

Table 15-13 Daily traffic volumes on during concrete pouring – background, Proposed Wind Farm generated and total (PCUs)

Link	Background PCUs			Proposed Project PCUs			Total PCUs (Background + Proposed Wind Farm)		
	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
1 – N83 between Claregalway and Loughgeorge	20,600	1,372	21,972	70	384	454	20,670	1,756	22,426
2 – N83 south of L-61461	11,065	1,339	12,403	70	384	454	11,135	1,723	12,857
3 – L-61461 leading to site	86	27	114	70	384	454	156	411	568

Table 15-14 Daily Traffic volumes during site preparation and groundworks – background, Proposed Wind Farm generated and total (PCUs)

Link	Background PCUs			Proposed Project PCUs			Total PCUs (Background + Proposed Wind Farm)		
	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
1 – N83 between Claregalway and Loughgeorge	20,600	1,372	21,972	70	140	210	20,670	1,512	22,182
2 – N83 south of L-61461	11,065	1,339	12,403	70	140	210	11,135	1,479	12,613
3 – L-61461 leading to site	86	27	114	70	140	210	156	1679	324

Table 15-15 Daily Traffic volumes during site preparation and groundworks – background, Proposed Grid Connection generated and total (PCUs)

Link	Background PCUs			Proposed Project PCUs			Total PCUs (Background + Proposed Wind Farm)		
	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
1 – N83 between Claregalway and Loughgeorge	20,600	1,372	21,972	45	99	144	20,645	1,471	22,116
2 – N83 south of L-61461	11,065	1,339	12,403	45	99	144	11,110	1,438	12,547
3 – L-61461 leading to site	86	27	114	45	99	144	131	126	258

Table 15-16 Daily traffic volumes during turbine construction, extended artic – background, Proposed Wind Farm generated and total (PCUs)

Link	Background PCUs			Proposed Project PCUs			Total PCUs (Background + Proposed Wind Farm)		
	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
1 – N83 between Claregalway and Loughgeorge	20,600	1,372	21,972	45	60	105	20,645	1,432	22,077
2 – N83 south of L-61461	11,065	1,339	12,403	45	60	105	11,110	1,399	12,508
3 – L-61461 leading to site	86	27	114	45	60	105	131	87	219

Table 15-17 Daily traffic volumes during turbine construction – standard artic HGVs, background, Proposed Wind Farm generated and total (PCUs)

Link	Background PCUs			Proposed Project PCUs			Total PCUs (Background + Proposed Wind Farm)		
	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
1 – N83 between Claregalway and Loughgeorge	20,600	1,372	21,972	45	19	64	20,645	1,391	22,036
2 – N83 south of L-61461	11,065	1,339	12,403	45	19	64	11,110	1,358	12,467

Link	Background PCUs			Proposed Project PCUs			Total PCUs (Background + Proposed Wind Farm)		
3 – L-61461 leading to site	86	27	114	45	19	64	131	46	178

Table 15-18 Summary daily effects of Proposed Wind Farm traffic – concrete pouring - % increase and number of days

Link	Background	Proposed Project	Total	% increase	Estimated No. of days
1 – N83 between Claregalway and Loughgeorge	21,972	454	22,426	2.1%	8
2 – N83 south of L-61461	12,403	454	12,857	3.7%	8
3 – L-61461 leading to site	114	454	568	399.8%	8

Table 15-19 Summary daily effect of traffic – site preparation and ground works - % increase and number of days

Link	Background	Proposed Project	Total	% increase	Estimated No. of days
1 – N83 between Claregalway and Loughgeorge	21,972	210	22,182	1.0%	227
2 – N83 south of L-61461	12,403	210	12,613	1.7%	227
3 – L-61461 leading to site	114	210	324	184.9%	227

Table 15-20 Summary daily effect of traffic – Proposed Grid Connection construction - % increase and number of days.

Link	Background	Proposed Project	Total	% increase	Estimated No. of days
1 – N83 between Claregalway and Loughgeorge	21,972	144	22,116	0.7%	118
2 – N83 south of L-61461	12,403	144	12,547	1.2%	118
3 – L-61461 leading to site	114	144	258	126.8%	118

Table 15-21 Summary daily effect of Proposed Wind Farm traffic – turbine construction, extended artic - % increase and number of days

Link	Background	Proposed Project	Total	% increase	Estimated No. of days
1 – N83 between Claregalway and Loughgeorge	21,972	105	22,077	0.5%	22
2 – N83 south of L-61461	12,403	105	12,508	0.8%	22
3 – L-61461 leading to site	114	105	219	92.5%	22

Table 15-22 Summary daily effects of Proposed Wind Farm traffic- turbine construction, standard artic HGVs – % increase and number of days

Link	Background	Proposed Project	Total	% increase	Estimated No. of days
1 – N83 between Claregalway and Loughgeorge	21,972	64	22,036	0.3%	8

Link	Background	Proposed Project	Total	% increase	Estimated No. of days
2 – N83 south of L-61461	12,403	64	12,467	0.5%	8
3 – L-61461 leading to site	114	64	178	56.4%	8

15.1.6.2 Link Capacity Assessment

An assessment of the impact on link capacity on the delivery route was undertaken for the various construction stages as set out in Tables 15-24 to 15-26 with the capacity of the links on the route options, as shown in Table 15-24, varying from 11,600 vehicles per day on the N83 south of the L-61461, down to <5,000 vehicles per day for local L-61461 leading to the site. Capacities are based on road types and widths as set out in the TII Standards document DN-GEO-03031 Road Link Design, Table 6/1. There are no available capacity estimates for the narrow section of the L-61461 which will be less than 5,000 vehicles per day, and for the purpose of this assessment is assumed to be 3,000 vehicles per day.

It is noted that the link capacities adopted from the TII guidelines correspond to a Level of Service D, which the guidelines describe as being the level where:

“Speeds begin to decline slightly with a slight increase of flows and density begins to increase somewhat more quickly. Freedom to manoeuvre within the traffic streams is more noticeably limited, and the driver experiences reduced comfort levels”.

Background traffic flows are compared to flows forecast for the various construction delivery stages, in Table 15-25, with the percentage capacity reached for each stage shown in Table 15-26.

Based on this assessment, it is forecast that with the exception of the L-61461 leading to the Site (4%), the remaining links on the delivery route are forecast to operate over capacity by the construction year 2028 without the additional traffic forecast to be generated by the Proposed Project. For these links it is forecast that the level of capacity utilised by background traffic flows by the year 2028 will range from +107% on the N83 just to the south of the L-61461, to +255% on the N83 between Claregalway and Loughgeorge.

As was set out previously in Section 15.1.3.1, it is important to consider the relative increase due to the Proposed Project.

Based on this assessment, it is forecast that the N83 just to the south of the L-61461 (Link 2) is forecast to operate at 107% of capacity by the year 2028 with background traffic only, increasing to a maximum of 111% for the 8 days during which the concrete foundations are poured. For all other construction days, the link is forecast to operate at a maximum of 109% capacity or 2% points above background levels. Similar levels of increases are forecast for the N83 between Claregalway and Loughgeorge (Link 1) with background traffic comprising 255% of link capacity, increasing to 261% during concrete pours, reducing to maximum of 258%, or 3% points above background levels during remainder of construction period).

Table 15-23 Delivery route link type and link capacity (at Level of Service D)

Link	Link type	Link capacity (Level of Service D)
1 – N83 between Claregalway and Loughgeorge	Type 2 single	8,600
2 – N83 south of L-61461	Type 1 single	11,600

Link	Link type	Link capacity (Level of Service D)
3 – L-61461 leading to site	Local	3,000

Table 15-24 Delivery route link capacity and summary of link flows by construction delivery stage

Link	Link capacity (Level of Service D)	Construction delivery stage					
		Background traffic	Concrete pour	Proposed Wind Farm works	Proposed Grid Connection works	Turbine plant	Turbine equipment
1 – N83 between Claregalway and Loughgeorge	8,600	21,972	22,426	22,182	22,116	22,077	22,036
2 – N83 south of L-61461	11,600	12,403	12,857	12,613	12,547	12,508	12,467
3 – L-61461 leading to site	3,000	114	568	324	258	219	178

Table 15-25 Delivery route link capacity and % of link capacity by construction delivery stage

Link	Link capacity (Level of Service D)	Construction delivery stage					
		Background traffic	Concrete pour	Proposed Wind Farm works	Proposed Grid connection works	Turbine plant	Turbine equipment
1 – N83 between Claregalway and Loughgeorge	8,600	255%	261%	258%	257%	257%	256%
2 – N83 south of L-61461	11,600	107%	111%	109%	108%	108%	107%
3 – L-61461 leading to site	3,000	4%	19%	11%	9%	7%	6%

15.1.6.3 Effect on Link Flows – During Operation

Once the Proposed Wind Farm is operational it is estimated that there will be 1-2 staff members employed on site with a similar number of vehicle trips. As stated previously it is likely that the Proposed Project will attract some recreational trips, although it is expected that visitor numbers will be low. It is considered that the traffic impact during this phase will be imperceptible.

15.1.6.4 Effect on Junctions – During Construction

The junction most affected on the delivery route will be the junction between the N83 and the L-61461 which leads to the Proposed Wind Farm site access junction. As set out above, the N83 is forecast to operate over link capacity adjacent to the L-61461 (as shown in Table 15-26) and the traffic volumes on the L-61461 (Link 3) are forecast to increase by 399.8% during the 8 days that the foundations are poured (see Table 15-19) and by 209.6% during the general groundworks and construction period (see Table 15-20). For this reason a detailed junction capacity test was undertaken for the N83 / L61461 junction and is included as Appendix 15-3.

Junction capacity tests were undertaken using the industry standard junction simulation software PICADY, which permits the capacity of any junction to be assessed with respect to existing or forecast traffic movements and volumes for a given time period. The capacity for each movement possible at the junction being assessed is determined from geometric data input into the program with the output used in the assessment as follows:

- Queue – This is the average queue forecast for each movement and is useful to ensure that queues will not interfere with adjacent junctions.
- Degree of Saturation or Ratio of Flow to Capacity (% Sat or RFC) – As suggested, this offers a measure of the amount of available capacity being utilised for each

movement. Ideally each movement should operate at a level of no greater than 85% of capacity, in accordance with TII requirements.

- Delay – Output in minutes, this gives an indication of the forecast average delay during the time period modelled for each movement.

15.1.6.4.1 Scenarios Modelled

The greatest effect in terms of traffic will be experienced during peak hours when, during peak construction periods, approximately 70 workers (35 cars) will pass through it. It is assumed that deliveries of materials to the Proposed Wind Farm site will take place during the day after the workers have arrived, and before they leave at the end of the day and will therefore not occur at the same time.

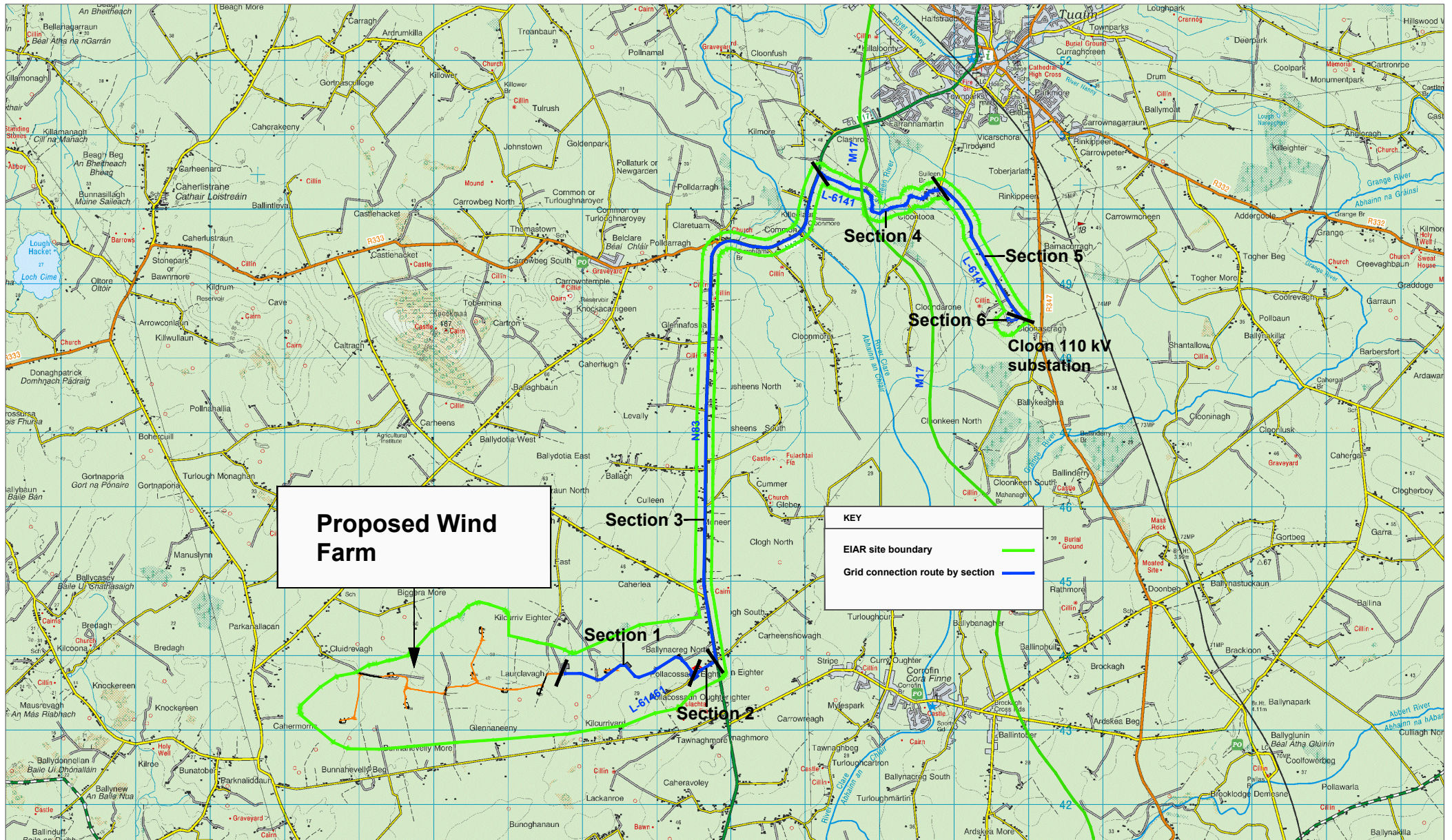
15.1.6.4.2 N83 / L-61461 Junction Capacity Test Results – Proposed Project

The AM and PM peak hour traffic flows for the base year 2028 and the proposed construction year of 2028 are shown in Figures 15-5a and 15-5b respectively. The additional traffic movements that are forecast to be generated by construction workers are shown in Figure 15-5c, with proposed construction year 2028 traffic flows including the additional construction traffic shown in Figure 15-5d. The results of the junction capacity tests are shown in Table 15-27 and show that the additional car trips passing through the junction will have a slight effect on the operation of the junction, increasing the maximum ratio of flow to capacity (RFC) at the junction from 5.05.5% to 8.6% during the AM peak hour, and from 4.4% to 16.4% for the movement affected during the PM peak hour. The assessment shows that the junction is forecast to operate well within the acceptable limit of 85% as specified by TII in the Traffic and Transport Assessment Guidelines.

Table 15-26: Junction capacity test results, N83 / L-61461 junction, AM and PM peak hours, without and with construction traffic, by time period, year 2028.

Period	Location	Without construction traffic			With construction traffic		
		RFC	Queue (vehicles)	Delay (minutes)	RFC	Queue (vehicles)	Delay (minutes)
AM	From L-6146 - right turn	5.0%	0.05	0.26	5.2%	0.05	0.27
	From L-6146 - left turn	4.0%	0.04	0.14	4.0%	0.04	0.14
	From L-61461 – left turn	0.4%	0.00	0.16	0.5%	0.00	0.17
	From L-61461 – right turn	1.1%	0.01	0.24	1.1%	0.01	0.25
	From N83 south – right turn	1.8%	0.02	0.10	1.9%	0.02	0.10
	From N83 north – right turn	0.0%	0.00	0.00	8.6%	0.09	0.15
PM		RFC	Queue (vehicles)	Delay (minutes)	RFC	Queue (vehicles)	Delay (minutes)

Period	Location	Without construction traffic			With construction traffic		
	From un-named local road - right turn	4.4%	0.05	0.23	4.6%	0.05	0.24
	From un-named local road - left turn	3.0%	0.03	0.12	3.0%	0.03	0.12
	From L-61461 - left turn	0.3%	0.00	0.14	10.3%	0.11	0.17
	From L-61461 - right turn	0.0%	0.00	0.00	16.4%	0.19	0.31
	From N83 south - right turn	3.2%	0.04	0.07	3.2%	0.04	0.07
	From N83 north - right turn	0.0%	0.00	0.00	0.0%	0.00	0.00



Proposed Wind Farm

KEY

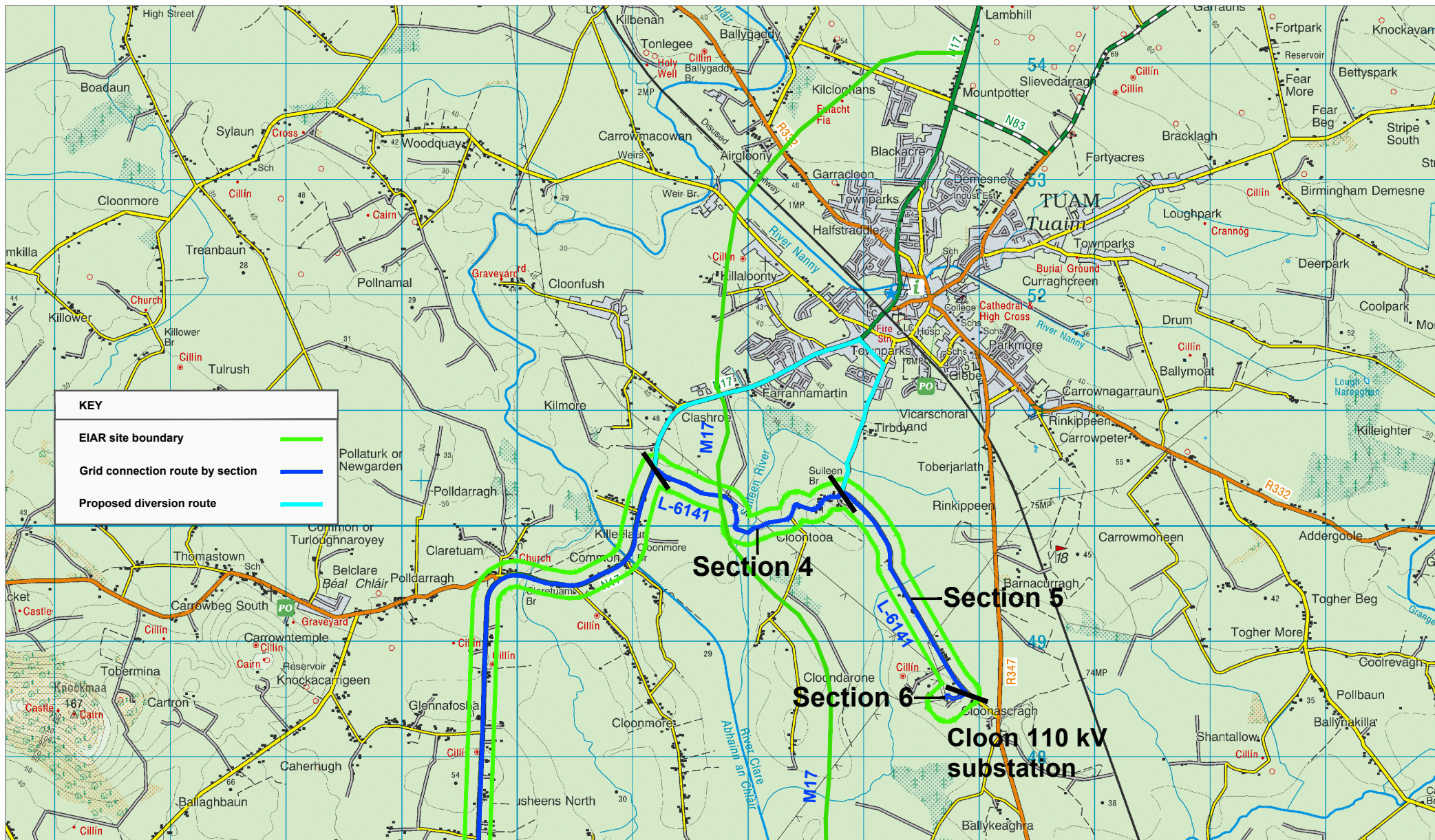
- EIA site boundary (Green line)
- Grid connection route by section (Blue line)

NOTES:
 PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES
 Base mapping provided by MKO

Figure 15-4a Proposed Grid Connection route

PROJECT: Laurclavagh Renewable Energy Development	
CLIENT: Laurclavagh Ltd	SCALE: NTS
PROJECT NO: 9730	DATE: 05.03.24
DRAWN BY: AL	

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TRAFFIC & TRANSPORT CONSULTANTS



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 Base mapping provided by MKO

Figure 15-4b Proposed Grid Connection route - diversion route for Section 4

PROJECT: Laurclavagh Renewable Energy Development

CLIENT: Laurclavagh Ltd

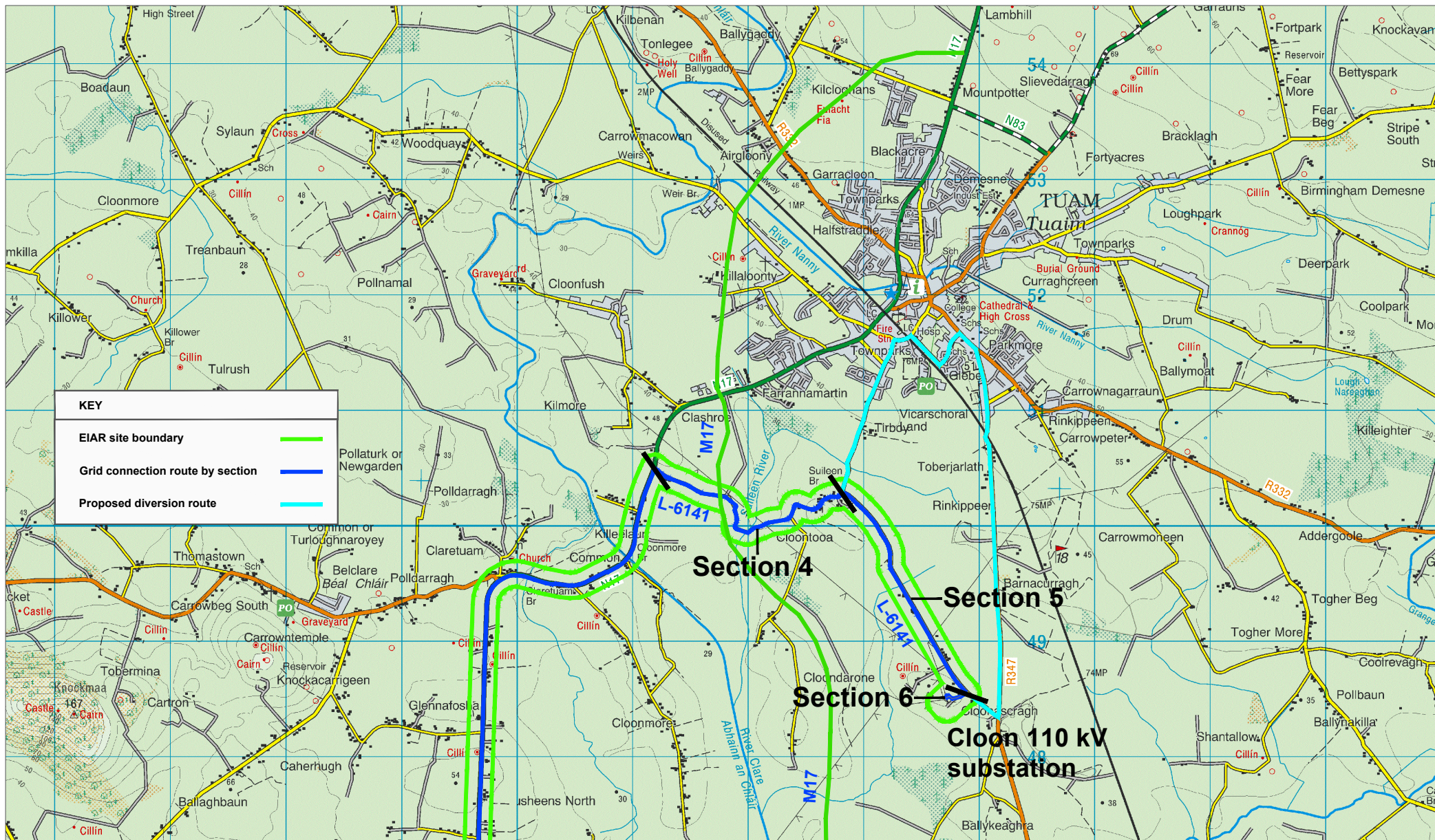
SCALE: NTS

PROJECT NO: 9730

DATE: 05.03.24

DRAWN BY: AL

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Base mapping provided by MKO

Figure 15-4c Proposed Grid Connection route - diversion route for Section 5

PROJECT: Laurclavagh Renewable Energy Development

CLIENT: Laurclavagh Ltd

SCALE: NTS

PROJECT NO: 9730

DATE: 05.03.24

DRAWN BY: AL

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15.1.6.4.3

Effect on Junctions – During Operation

As discussed in Section 15.1.12 it is forecast that once operational, the Proposed Wind Farm is expected to generate 1 to 2 trips per day for maintenance purposes. It is therefore concluded that the Proposed Wind Farm will have an imperceptible effect on the local network once constructed.

15.1.7

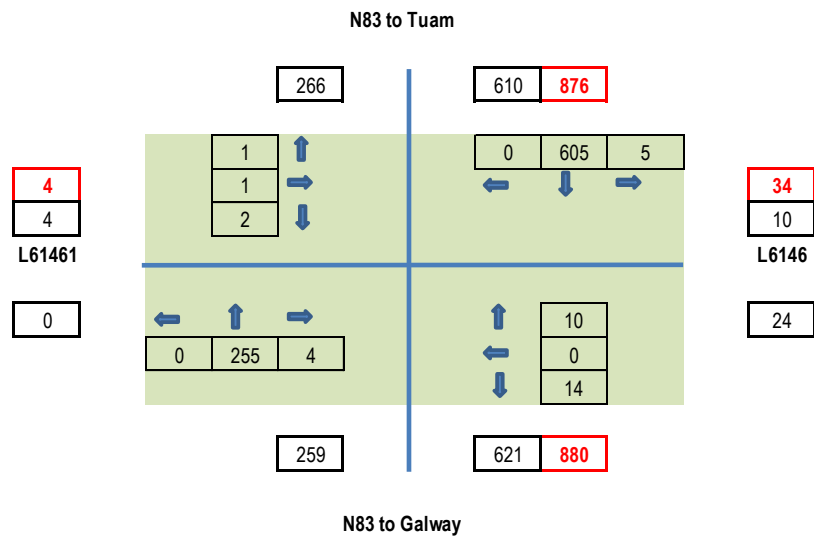
Effect on Network of Proposed Grid Connection Underground Cabling Route

A detailed description of the Proposed Grid Connection is provided in Chapter 4 of this EIAR. It is proposed that the 110kV onsite substation is connected by means of an underground 110kV electricity cable to the existing 110kV Cloon Substation. The underground cabling route measures approximately 14.3km of which approximately 12km is located within the public road corridor.

The 110kV onsite substation and temporary construction compound have been considered in Section 15.1.6 above. The volumes of stone that will be delivered to the Site for the purpose of the Proposed Grid Connection underground cabling route is also considered in Section 15.1.6. All traffic for the Proposed Grid Connection and the onsite 110kV substation will be delivered via the L-61461 and the N83 the southeastern end of the grid route.

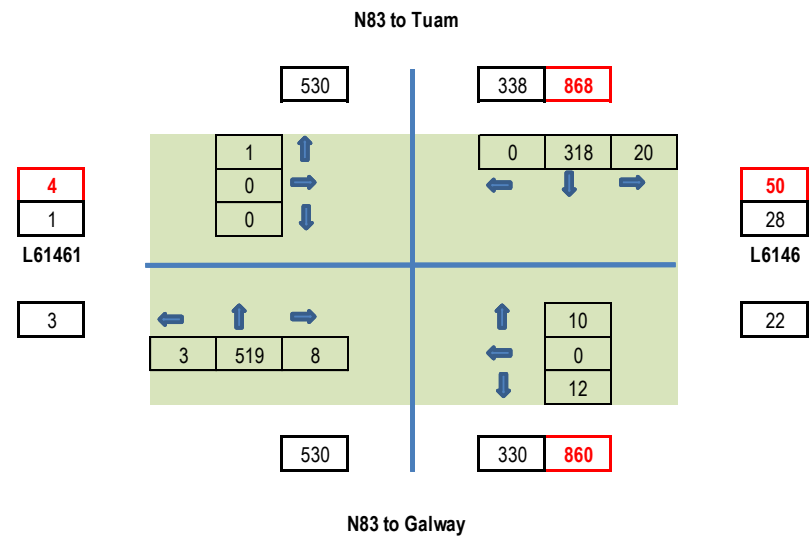
For the extent of the underground cabling route that will impact on the public road network, this is considered in the following 6 sections, as indicated in Figure 15-4a and summarised in Table 15-27.

AM Peak hour - 07:00 to 08:00



All flows in pcus

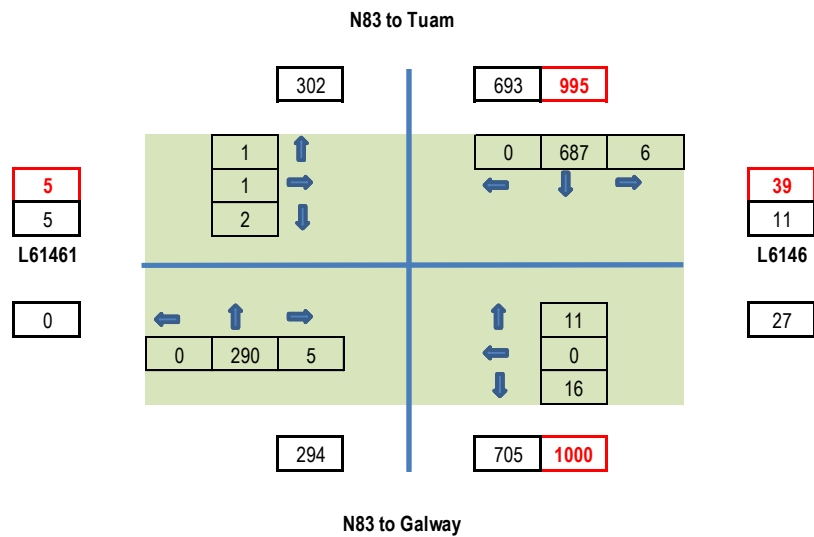
PM Peak hour - 16:00 to 17:00



All flows in pcus

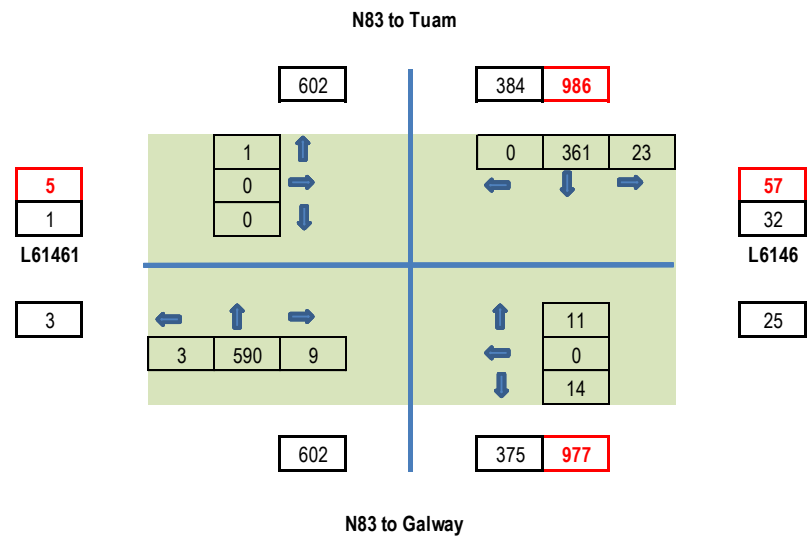
Figure 15.5a Observed traffic flows, N83 / L-61461 junction, AM and PM peak hours, Year 2023, pcus

AM Peak hour - 07:00 to 08:00



All flows in pcus

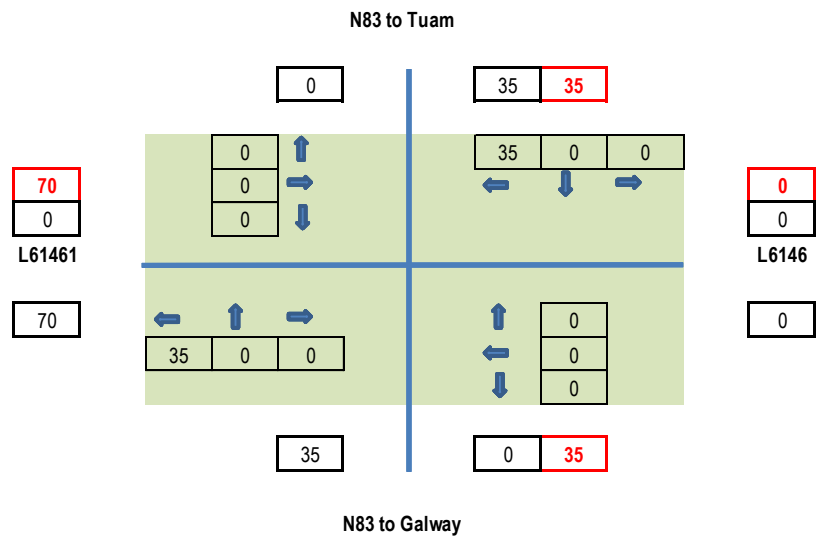
PM Peak hour - 16:00 to 17:00



All flows in pcus

Figure 15.5b Background traffic flows, N83 / L-61461 junction, AM and PM peak hours, Year 2028, pcus

AM Peak hour - 07:00 to 08:00



PM Peak hour - 16:00 to 17:00

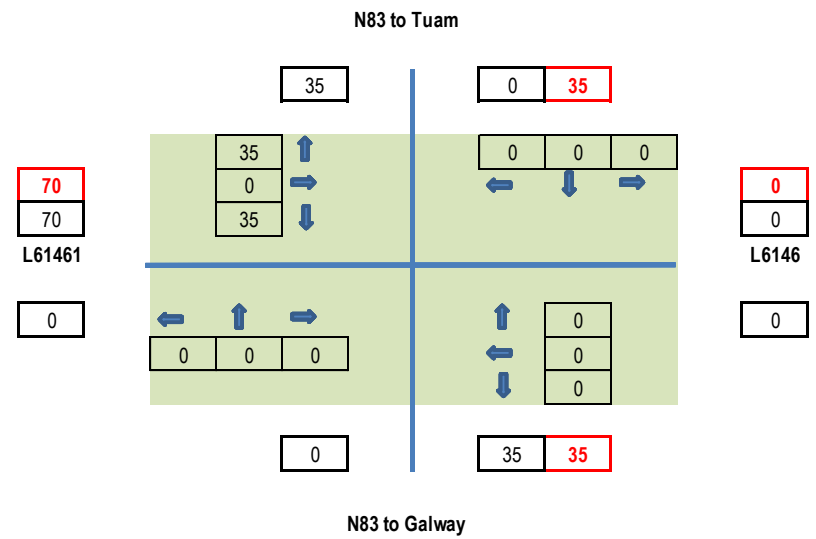
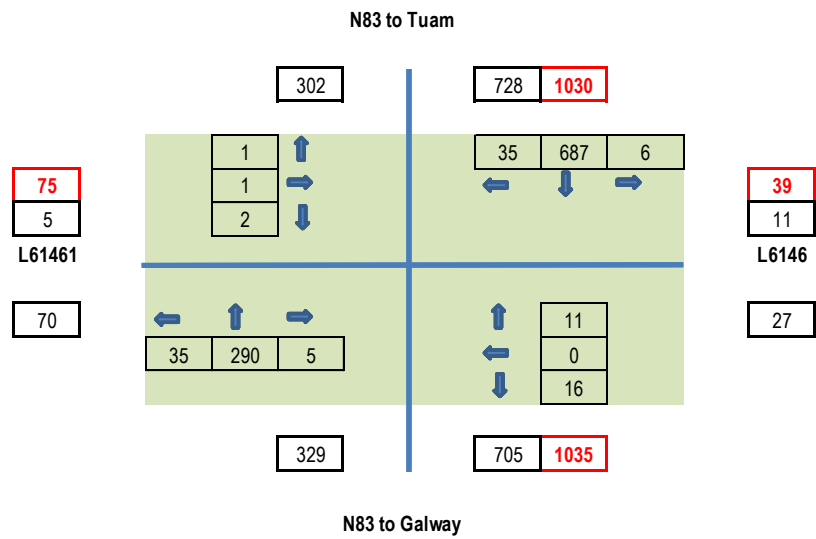


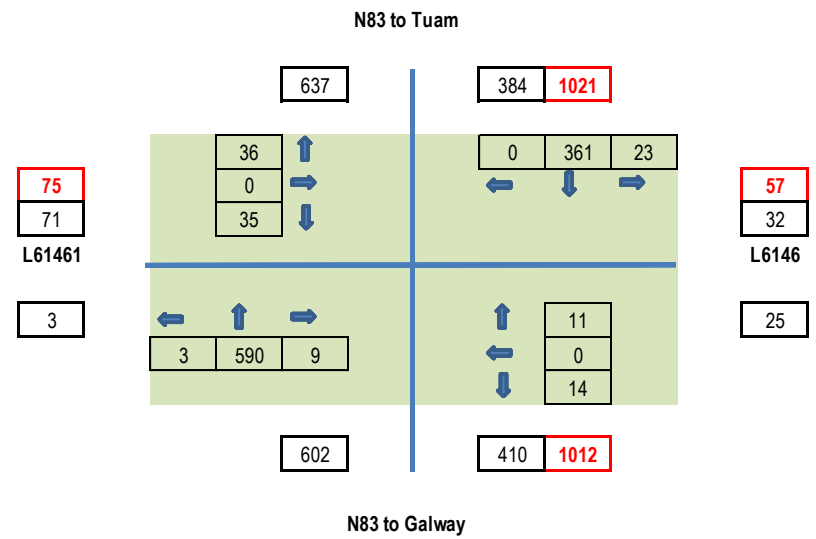
Figure 15.5c Development generated traffic flows, N83 / L-61461 junction, AM and PM peak hours

AM Peak hour - 07:00 to 08:00



All flows in pcus

PM Peak hour - 16:00 to 17:00



All flows in pcus

Figure 15.5d With construction traffic flows, N83 / L-61461 junction, AM and PM peak hours, Year 2028, pcus

Table 15-27 Proposed Grid Connection underground cabling route link summary, link length (km), construction duration (days) and diversion during construction

Underground Cabling Route Section	Traffic management	Length (kms)	Construction Duration (days)	Diversion during construction (kms)
Section 1 – Off road	Off-road	2.1	21	N/A
Section 2 – L-61461	Closure (with local access)	0.4	4	N/A
Section 3 – N83	Stop & go	7.5	50	N/A
Section 4 – L-6141	Closure	2.1	21	3.7
Section 5 – L-6141	Closure	2.0	20	6.0
Section 6 – Off road	Off-road	0.2	2	N/A
Total		14.3	118	

Section 1 – (length 2.1 kms) – The underground cabling route commences at the proposed onsite 110 kV substation located within the Proposed Wind Farm site and continues east for approximately 2.1kms to link into the L-61461. It is estimated that the construction of this section will take approximately 21 days. As this section is within the Proposed Wind Farm site no delays will be incurred by local traffic.

Section 2 – (length 0.4 kms) – The underground cabling route then continues east along the L-61461 for approximately 0.4 kms to a point where it meets the N83 to the northeast. During the 4 days required to construct this section of the underground cabling route, local access will be maintained using steel plates and local traffic management measures. The location of the construction will be transient in nature with the extent of the section of road closed kept to a minimum.

Section 3 – (length 7.5 kms) – The underground cabling route then travels north on the N83 for approximately 7.5kms to the point where it meets the L-6141 which connects into the N83 from the east. This section of the carriageway has sufficient width for the construction of the underground cabling to take place while operating a “stop-go” arrangement in order to retain 2-way traffic flow on the National Secondary Road. This section of the grid connection will take approximately 50 days to construct.

Section 4 – (length 2.1kms) – This section of the Proposed Grid Connection underground cabling route heads east from the N83 onto the L-6141, underneath the M17, before rejoining the L-6141 for approximately 2.1 kms. During the 21 days required to construct this section of the underground cabling route, traffic will require to divert onto the route shown in Figure 15.4b which will result in a diversion of 3.7kms. The location of the construction will be transient with the extent of the section of road closed kept to a minimum.

Section 5 – (length 2.0kms) – This section of the Proposed Grid Connection underground cabling route continues east on the L-6141 for approximately 2.0 kms and will take approximately 20 days to construct. During the 20 days required to construct this section of the underground cabling route, traffic will require to divert onto the route shown in Figure 15.4c which will result in a diversion of an additional 6.0kms. The location of the construction will be transient with the extent of the section of road closed kept to a minimum.

Section 6 – (length 0.2kms) – The final short section of the Proposed Grid Connection underground cabling route turns off the L-6141 into the site of the existing 110kV Cloon substation. No delays will be incurred by local traffic during the 2 days required to construct this section.

In summary, the route will take a total of approximately 118 days to construct during which a road closure will be required at one point on the network on approximately 45 of these days. The diversions incurred will be a maximum of 6kms. It is noted that the diversions will be incurred by very few trips, as both the L-61461 and the L-6141 local roads are lightly trafficked. For a further 50 days a stop & go facility will require to be operated on the N83.

With respect to the traffic volumes that will be generated during the construction of the underground cabling route, it is estimated that there will be approximately 14 daily return trips made by a truck transporting materials, and a further trip made by a minibus to transport construction staff, to and from the Site. By its nature the impacts of these additional trips on the network will be transient and will therefore be temporary and slight.

The construction methodology of providing an underground grid connection cabling route under and along local road networks is well established and accepted nationwide. There are in excess of 300 wind farms currently operational in Ireland and the majority of these are connected to the national grid via underground cable connections predominantly along the public road networks.

A detailed **Traffic Management Plan (TMP)**, incorporating all the mitigation measures is included as Appendix 15-2 of this EIAR, and will be finalised and confirmatory detailed provisions in respect of traffic management agreed with the road's authority and An Garda Síochána prior to construction works commencing on Site.

15.1.8 Traffic Management of Large Deliveries

Traffic management measures include the following:

- Identification of a delivery schedule,
- Details of the alterations required to the infrastructure identified in this report and any other minor alteration identified (hedgerows etc),
- A dry run of the route using vehicles with similar dimensions.

The transport of large components is challenging and can only be done following extensive route selection, route proofing and consultation with An Garda Síochána, the local authority and its road section and roads authorities. Turbine components are usually transported at night when traffic is lightest and this is done in consultation with the road's authorities, An Garda Síochána Traffic Corp and special permits are generally required.

In some cases, minor accommodation works are required along the turbine delivery route such as hedge or tree cutting, temporary relocation of powerlines/poles, lampposts, signage and local road widening. Any upgrades to the public road network will be carried out in advance of turbine deliveries and following consultation and agreement with the relevant authorities. It is not anticipated that any sections of the local road network will be closed during the delivery of the abnormally sized loads.

Refer also to the Construction and Environmental Management Plan (CEMP), Appendix 4-5 of this EIAR, for the Traffic Management Plan.

15.1.9 Abnormal Load Route Assessment

A route assessment was undertaken covering the proposed turbine delivery route, with the route and assessment locations shown in Figure 15-2a.

Galway Port is the proposed point of arrival for the large turbine components for the Proposed Wind Farm. The port is a well-established point of arrival for wind turbine components of similar scale into the State on a regular basis, as is the road network between the port and the national road network.

A swept path analysis was undertaken using Autotrack in order to establish the locations where the wind turbine transporter vehicles will be accommodated, and the locations where some form of remedial measure may be required.

It is noted that a dry run involving a vehicle adapted to replicate the geometry of the extended transport vehicles will be undertaken over the entire turbine delivery route prior to the construction stage of the Proposed Wind Farm.

Location 1 – R339 signalised junction at Thermo King

The swept path analysis undertaken for this junction is shown for the blade and tower transporters in Figures 15-6 and 15-7 respectively. The swept path analysis undertaken for this location shows that both vehicles will be accommodated.

Location 2 – R336 Tuam Road junction at Trappers Inn

The swept path analysis undertaken for this junction is shown for the blade and tower transporters in Figures 15-8 and 15-9 respectively. Similarly, the swept path analysis undertaken for this location shows that both vehicles will be accommodated at this existing junction.

Location 3 – N17 / N6 Bothar na dTreabh junctions

The swept path analysis undertaken for this junction is shown for the blade and tower transporters in Figures 15-10 and 15-11 respectively. At this junction the TDR passes straight through the junction with the swept path analysis demonstrating that both vehicles will be accommodated.

It is noted that vehicles of a similar size to those tested for the Proposed Project have been observed by the project team negotiating Locations 1 to 3 during the delivery phase for previously constructed wind farms.

Location 4 – N83 / L-61461, proposed temporary access for abnormally sized loads and standard HGV's during construction phase

The proposed temporary access for the abnormally sized loads is shown in Figure 15-12. The temporary access for the abnormally sized loads connects the N83 at a point approximately 80m south of the L-61461 junction, to a point on the L-61461 approximately 70m to the west of the junction with the N83. This access will be opened temporarily only on the nights that the abnormally sized vehicle convoys deliver to the Proposed Wind Farm site escorted by An Garda Síochána and staff provided by the haulage company, and during the construction period, when standard HGV's will be permitted to turn left onto the temporary road under strict traffic management conditions set out in the Traffic Management Plan included as Appendix 15-2. It is also noted that concrete mixers will exit via this temporary access on the 8 days that the concrete foundations are poured. On the completion of the construction phase this location will be fenced off and re-instated to its original state and will be opened only for the purpose of replacing large turbine component parts.

The autotrack assessment shown in Figures 15-13 and 15-14 demonstrates that the temporary access proposed between the N83 and the L-61461 will accommodate the turning requirements of the blade and tower transport vehicles. A swept path for a standard HGV using the proposed access road and exiting via the existing L-61461 junction is shown in Figure 15-15.

Location 5 – Proposed access junction off the L-61461 for all traffic during construction and operation

It is proposed to construct a new general construction traffic and operational maintenance access off the L-61461, as shown in Figure 15-16. This access is situated on the northern side of the L-61461 approximately 370m to the west of the N83.

The junction has a radius of 13m on the eastern corner to provide for standard HGVs, in accordance with TII guidelines Geometric Design of Junctions (DN-GEO-03060). Visibility splays that will be kept clear during the construction and operational stages of the Proposed Project are shown in Figure 15-17. Splays of 90m at a setback of 2.4m will be provided which is appropriate for a 60 km/h operational speed as set out in the Galway County Development Plan 2022-2028, Chapter 15 Development Management Standards, Table 15-3.

The autotrack assessment shown in Figures 15-18 and 15-19 demonstrates that the proposed junction off the L-61461 will accommodate the turning requirements of the blade and tower transport vehicles.

The proposed access off the L-61461 will be gated and closed at all times with the exception of when it is in use during the construction and operational stages of the Proposed Wind Farm.

Connections with Internal Access Roads

There are various locations where the Proposed Wind Farm internal access road crosses existing local farm access roads. During the construction phase these locations will be attended by site staff and existing farm access retained at all times. On the completion of the construction phase, the Proposed Wind Farm access road will be gated at either side of these locations, and priority retained for farm access at all times.



NOTES:

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Figure 15-6 Location 1 - R339 signalised junction at Thermo King - blade extended artic

PROJECT: Laurclavagh Renewable Energy Development

CLIENT: Laurclavagh Ltd

PROJECT NO: 9730

DATE: 10.01.24

SCALE: 1:1000

DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS



NOTES:

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Figure 15-7 Location 1 - R339 signalised junction at Thermo King - tower extended artic

PROJECT: Laurclavagh Renewable Energy Development

CLIENT: Laurclavagh Ltd

PROJECT NO: 9730

SCALE: 1:1000

DATE: 10.01.24

DRAWN BY: AL

ALAN LIPSCOMBE
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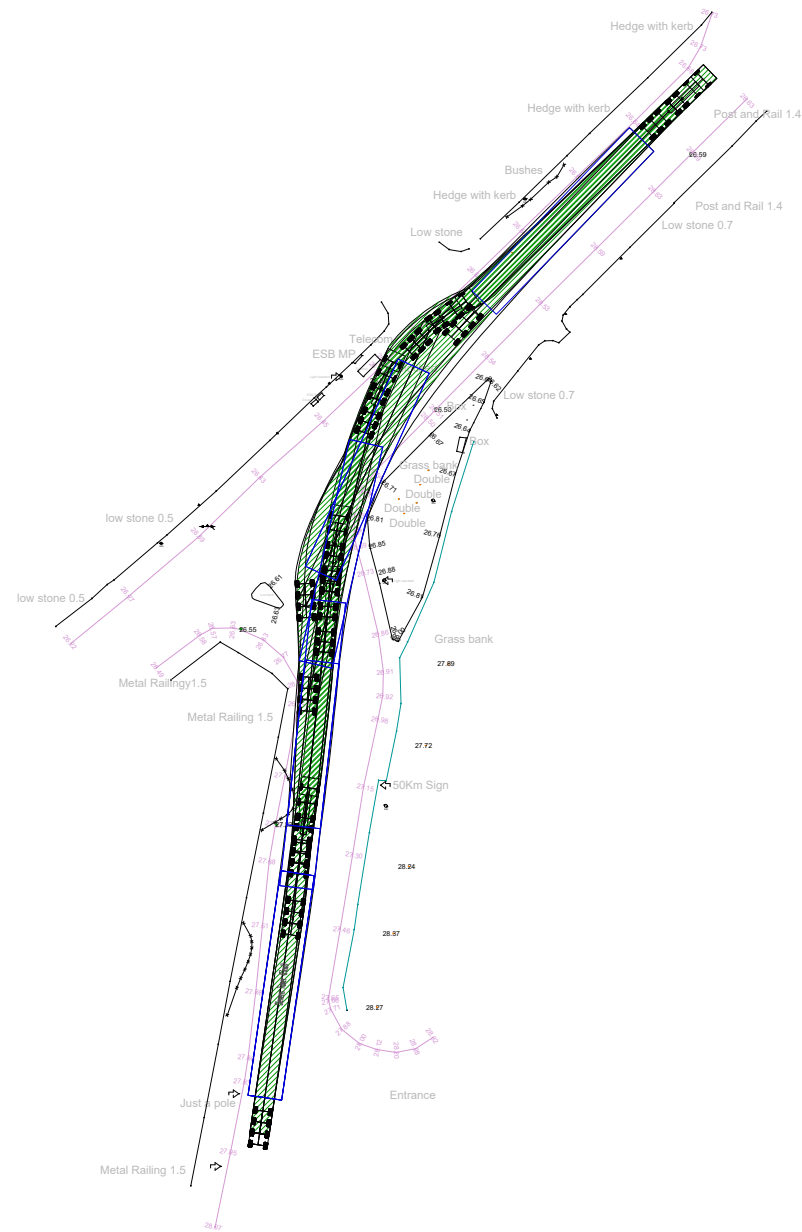


NOTES:
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Figure 15-8 Location 2 - R336 Tuam Road junction at Trappers Inn - blade extended artic

PROJECT: Laurclavagh Renewable Energy Development		
CLIENT: Laurclavagh Ltd	SCALE: 1:1000	
PROJECT NO: 9730	DATE: 10.01.24	DRAWN BY: AL

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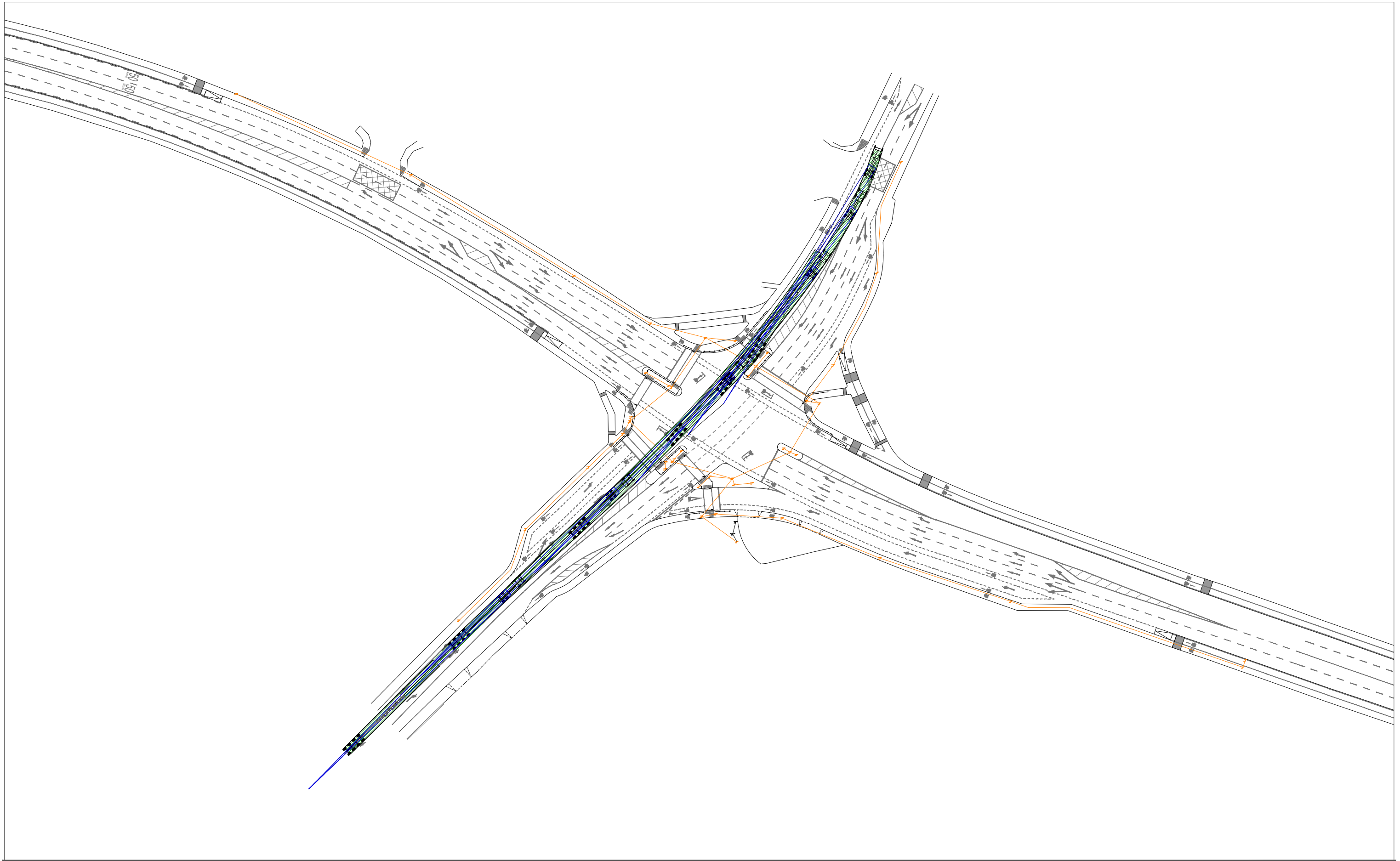


NOTES:
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Figure 15-9 Location 2 - R336 Tuam Road junction at Trappers Inn - tower extended artic

PROJECT: Laurclavagh Renewable Energy Development		
CLIENT: Laurclavagh Ltd	SCALE: 1:1000	
PROJECT NO: 9730	DATE: 10.01.24	DRAWN BY: AL

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Figure 15-10 Location 3 - N17 / N6 Bothar na dTreabh junction - blade extended artic

PROJECT: Laurclavagh Renewable Energy Development		
CLIENT: Laurclavagh Ltd	SCALE: 1:1000	
PROJECT NO: 9730	DATE: 10.01.24	DRAWN BY: AL

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NOTES:

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Figure 15-11 Location 3 - N17 / N6 Bothar na dTreabh junction - tower extended artic

PROJECT: Laurclavagh Renewable Energy Development

CLIENT: Laurclavagh Ltd

PROJECT NO: 9730

DATE: 10.01.24

SCALE: 1:1000

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Existing N83 / L-61461 junction
 All cars and lgvs will access and exit the site via the existing junction.
 All standard HGVs will exit the site via the existing junction.

Temporary road widening during construction

Temporary link road for abnormally sized loads during construction

Temporary road widening during construction

NOTES:
 PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-12 Location 4 - N83 / L-61461, proposed temporary access for abnormally sized loads and standard HGVs during construction phase

PROJECT: Laurclavagh Renewable Energy Development		
CLIENT: Laurclavagh Ltd	SCALE: 1:1000	
PROJECT NO: 9730	DATE: 05.03.24	DRAWN BY: AL

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NOTES:
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Figure 15-13 Location 4 - N83 / L-61461, proposed temporary access for abnormally sized loads and standard HGVs during construction phase - blade extended artic

PROJECT: Laurclavagh Renewable Energy Development		SCALE: 1:1000
CLIENT: Laurclavagh Ltd		DRAWN BY: AL
PROJECT NO: 9730	DATE: 05.03.24	

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NOTES:
 PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-14 Location 4 - N83 / L-61461, proposed temporary access for abnormally sized loads and standard HGVs during construction phase - tower extended artic

PROJECT: Laurclavagh Renewable Energy Development		
CLIENT: Laurclavagh Ltd	SCALE: 1:1000	
PROJECT NO: 9730	DATE: 05.03.24	DRAWN BY: AL

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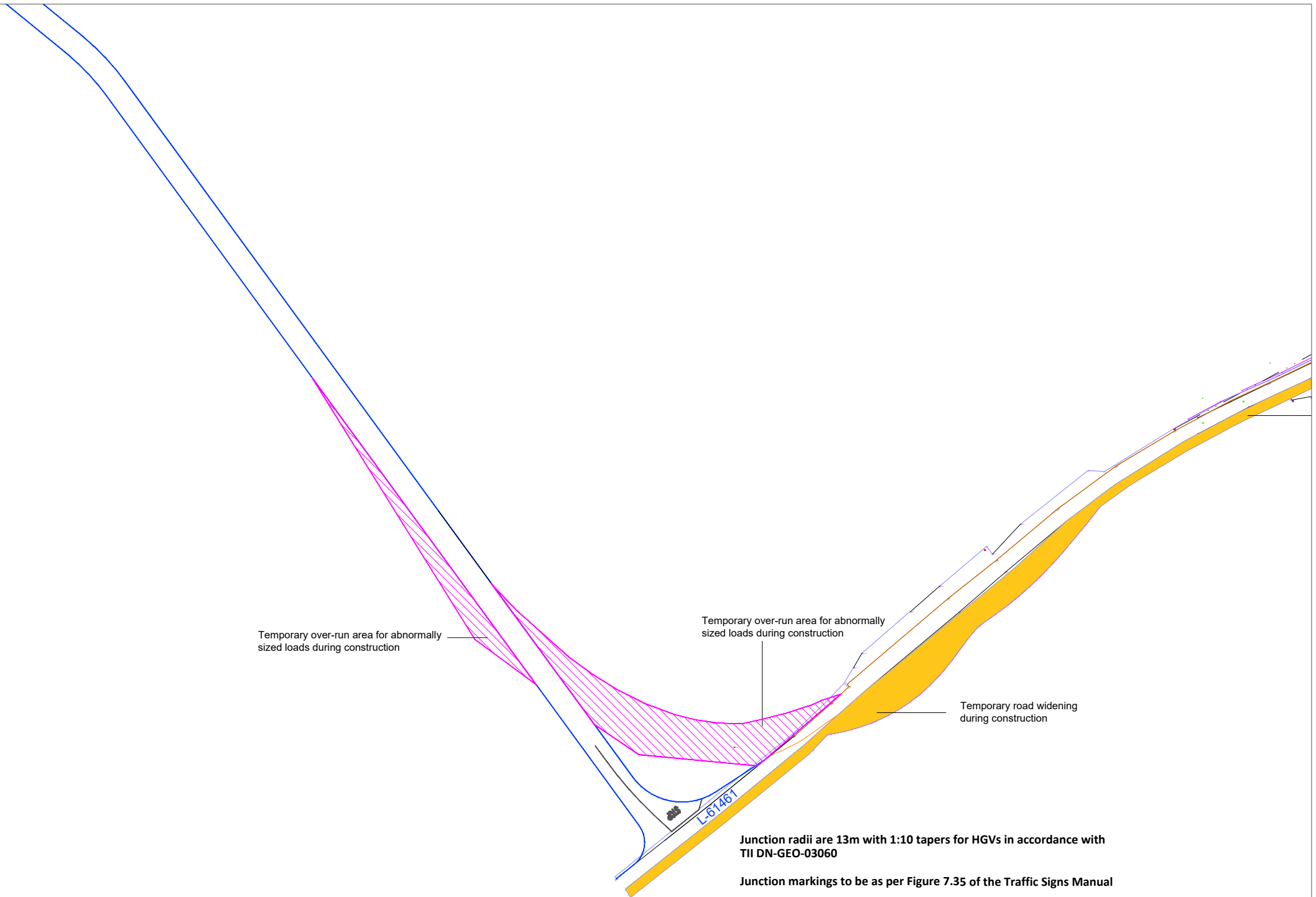


NOTES:
 PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-15 Location 4 - N83 / L-61461, proposed temporary access for abnormally sized loads and standard HGVs during construction phase - standard large articulated HGV

PROJECT: Laurclavagh Renewable Energy Development		
CLIENT: Laurclavagh Ltd	SCALE: 1:1000	
PROJECT NO: 9730	DATE: 05.03.24	DRAWN BY: AL

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Temporary over-run area for abnormally sized loads during construction

Temporary over-run area for abnormally sized loads during construction

Temporary road widening during construction

Junction radii are 13m with 1:10 tapers for HGVs in accordance with TII DN-GEO-03060

Junction markings to be as per Figure 7.35 of the Traffic Signs Manual

- Centreline RM 001
- STOP line RRM 017
- STOP lettering M114.

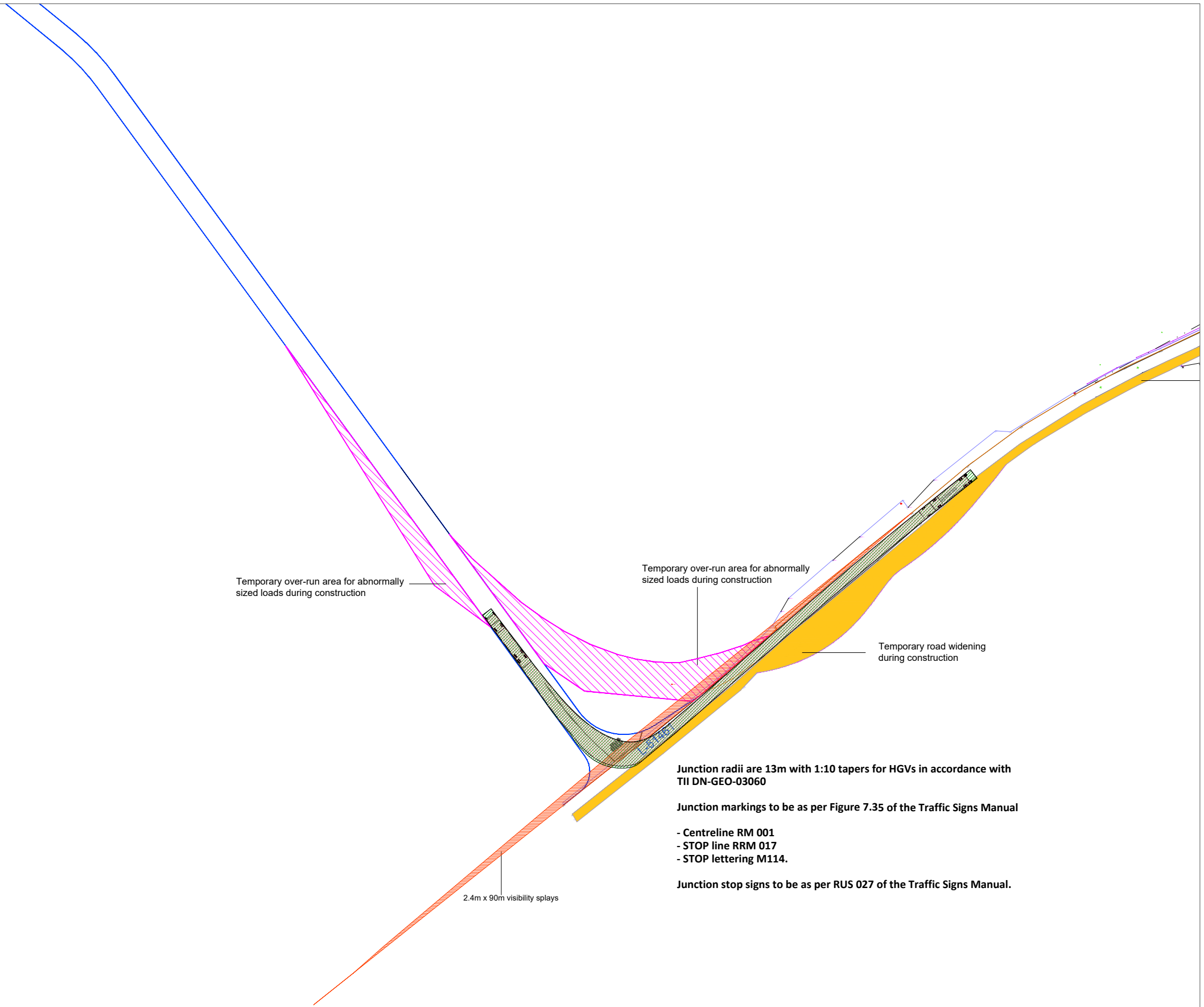
Junction stop signs to be as per RUS 027 of the Traffic Signs Manual.

NOTES:
 PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-16 Location 5 - Proposed access junction off the L-61461 for all traffic during construction and operational phases

PROJECT: Laurclavagh Renewable Energy Development	
CLIENT: Laurclavagh Ltd	SCALE: 1:1000
PROJECT NO: 9730	DATE: 05.03.24
	DRAWN BY: AL

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Temporary over-run area for abnormally sized loads during construction

Temporary over-run area for abnormally sized loads during construction

Temporary road widening during construction

Junction radii are 13m with 1:10 tapers for HGVs in accordance with TII DN-GEO-03060

Junction markings to be as per Figure 7.35 of the Traffic Signs Manual

- Centreline RM 001
- STOP line RRM 017
- STOP lettering M114.

Junction stop signs to be as per RUS 027 of the Traffic Signs Manual.

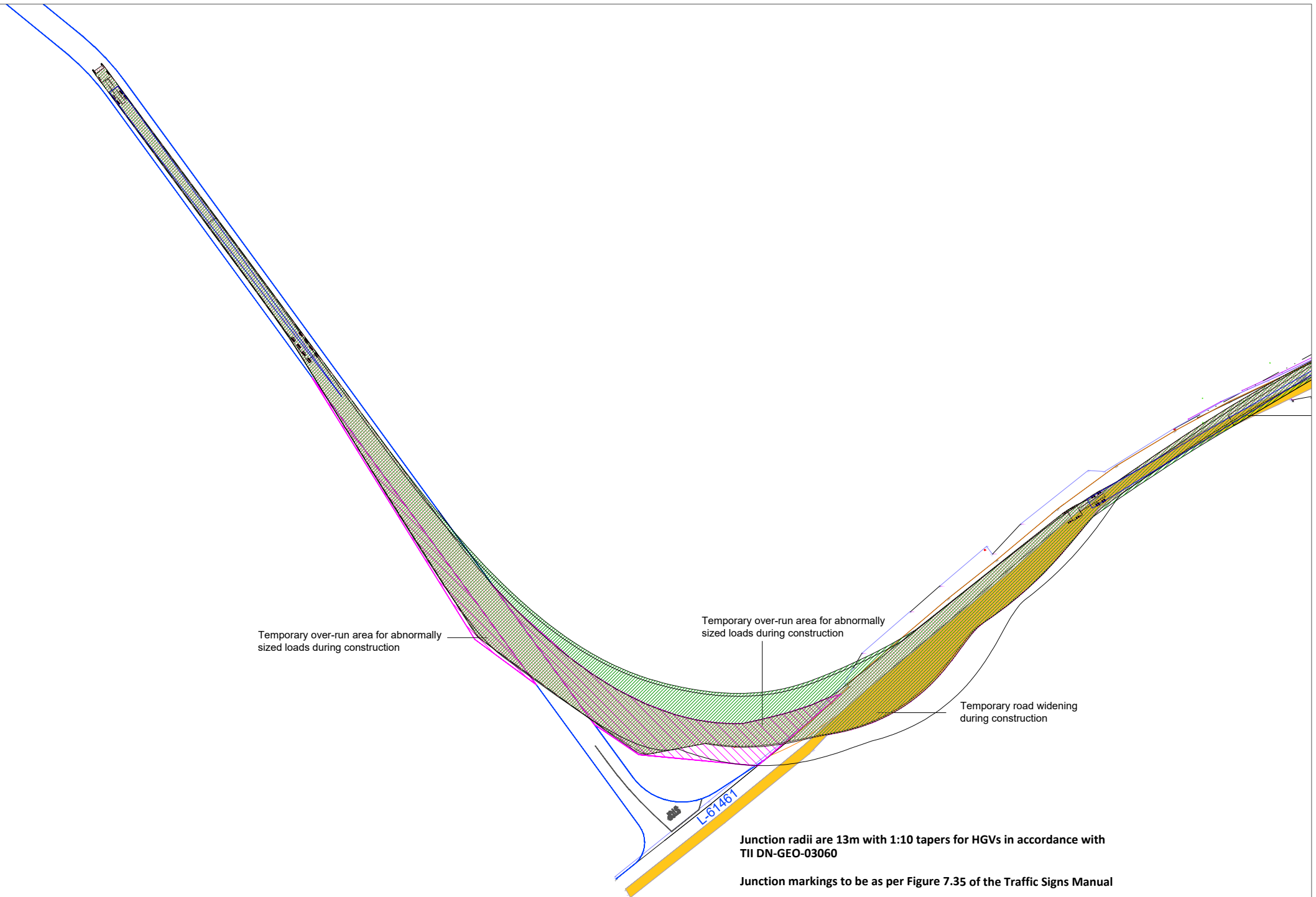
2.4m x 90m visibility splays

NOTES:
PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-17 Location 5 - Proposed access junction off the L-61461 for all traffic during construction and operational phases - visibility splays

PROJECT: Laurclavagh Renewable Energy Development	
CLIENT: Laurclavagh Ltd	SCALE: 1:1000
PROJECT NO: 9730	DATE: 05.03.24
	DRAWN BY: AL

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Temporary over-run area for abnormally sized loads during construction

Temporary over-run area for abnormally sized loads during construction

Temporary road widening during construction

Junction radii are 13m with 1:10 tapers for HGVs in accordance with TII DN-GEO-03060

Junction markings to be as per Figure 7.35 of the Traffic Signs Manual

- Centreline RM 001
- STOP line RRM 017
- STOP lettering M114.

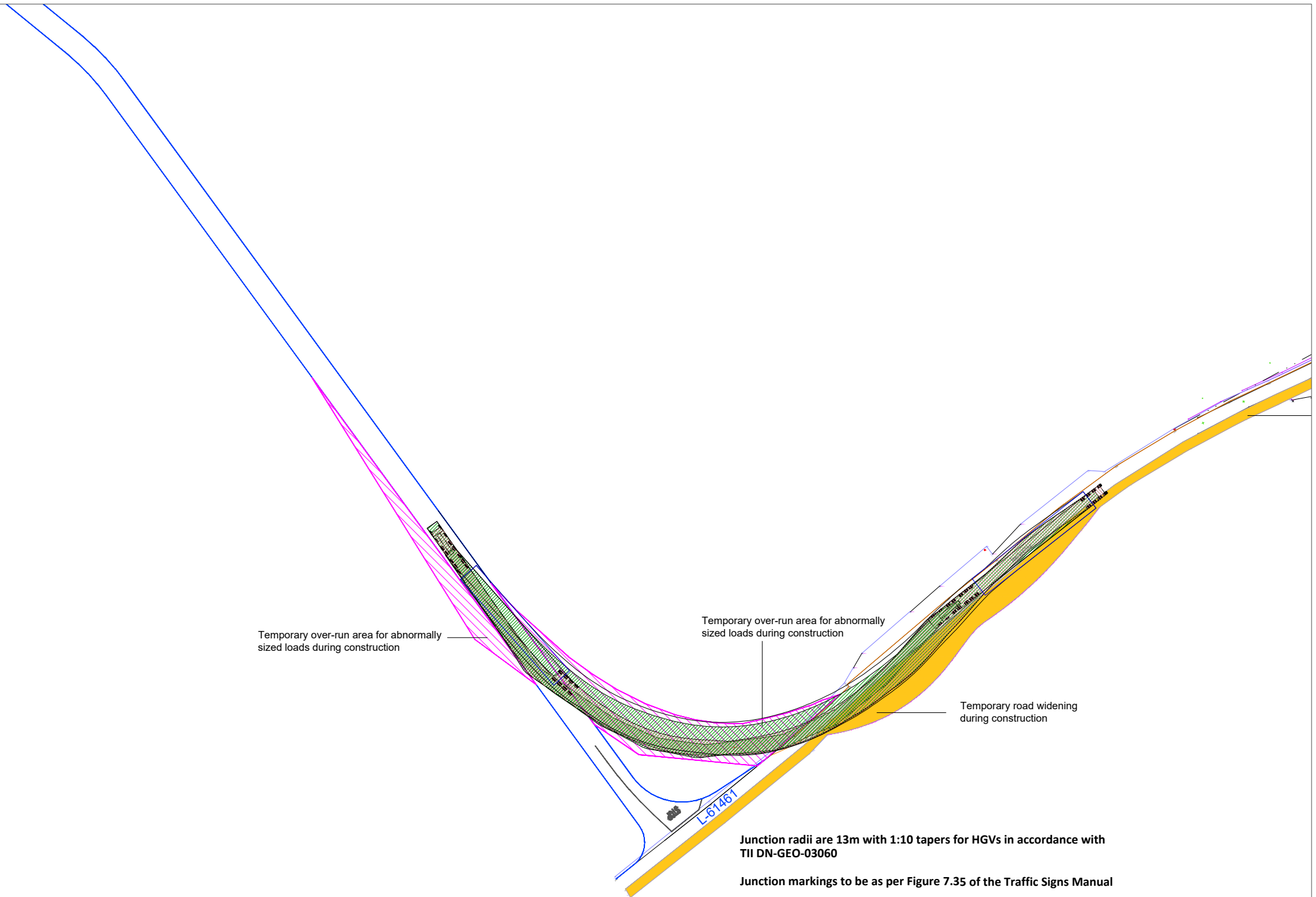
Junction stop signs to be as per RUS 027 of the Traffic Signs Manual.

NOTES:
PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-18 Location 5 - Proposed access junction off the L-61461 for all traffic during construction and operational phases - blade extended artic

PROJECT: Laurclavagh Renewable Energy Development		SCALE: 1:1000
CLIENT: Laurclavagh Ltd		DRAWN BY: AL
PROJECT NO: 9730	DATE: 05.03.24	

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Temporary over-run area for abnormally sized loads during construction

Temporary over-run area for abnormally sized loads during construction

Temporary road widening during construction

Junction radii are 13m with 1:10 tapers for HGVs in accordance with TII DN-GEO-03060

Junction markings to be as per Figure 7.35 of the Traffic Signs Manual

- Centreline RM 001
- STOP line RRM 017
- STOP lettering M114.

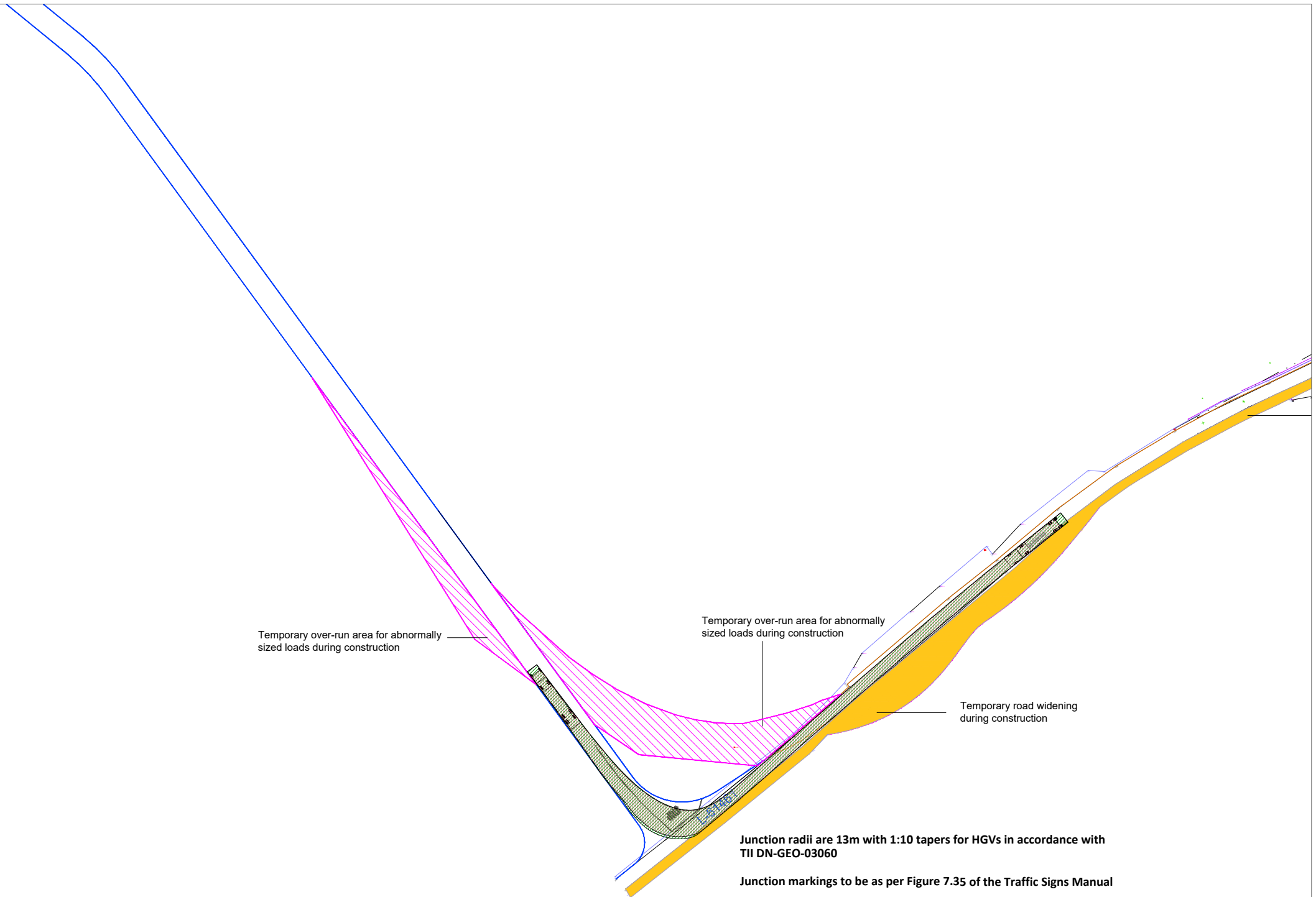
Junction stop signs to be as per RUS 027 of the Traffic Signs Manual.

NOTES:
 PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-19 Location 5 - Proposed access junction off the L-61461 for all traffic during construction and operational phases - tower extended artic

PROJECT: Laurclavagh Renewable Energy Development		SCALE: 1:1000
CLIENT: Laurclavagh Ltd		DRAWN BY: AL
PROJECT NO: 9730	DATE: 05.03.24	

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Temporary over-run area for abnormally sized loads during construction

Temporary over-run area for abnormally sized loads during construction

Temporary road widening during construction

Junction radii are 13m with 1:10 tapers for HGVs in accordance with TII DN-GEO-03060

Junction markings to be as per Figure 7.35 of the Traffic Signs Manual

- Centreline RM 001
- STOP line RRM 017
- STOP lettering M114.

Junction stop signs to be as per RUS 027 of the Traffic Signs Manual.

NOTES:
 PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-20 Location 5 - Proposed access junction off the L-61461 for all traffic during construction and operational phases - standard large articulated HGV

PROJECT: Laurclavagh Renewable Energy Development		SCALE: 1:1000
CLIENT: Laurclavagh Ltd		DRAWN BY: AL
PROJECT NO: 9730	DATE: 05.03.24	

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TRAFFIC & TRANSPORT CONSULTANTS

15.1.10 Road Safety

At the Applicants request, Traffico Road Safety Engineering Consultants Ltd were commissioned to undertake a Stage 1 Road Safety Audit for the access arrangements for the Proposed Wind Farm site, in accordance with GE-STY-01024 Road Safety Audit Guidelines, TII, December 2017. The Stage 1 Road Safety Audit Report is included as Appendix 15-3 of the EIAR.

As documented in the Audit Report, the Audit Team identified 3 potential Problems. For each Problem identified the Design Team are required to provide a response, as documented in Appendix A, Road Safety Audit Feedback Form of the Stage 1 Road Safety Audit Report. The 3 problems identified, together with the Design Teams response and whether the response was accepted by the Audit Team are set out below.

Problem 2.1 – Space for opposing HGVs to pass on section of the L-61461 to be used by construction traffic – The Audit Team state; It's likely that in some locations, space will be limited for two opposing HGVs to pass each other on the L-61461. This could lead to opposition type conflicts or lengthy (and risky) reversing manoeuvres. The Audit Team recommends that appropriate measures should be set in place as part of the Construction Traffic Management Plan to manage the risks associated with opposing HGV conflicts on the L-61461.

The Design Team Response is as follows - It is proposed that that the approx. 270m section of the L-61461 between the temporary road and the proposed access junction will have a minimum width of 5m, which will be sufficient for many of the construction vehicles to pass when moving slowly. A traffic management plan is also proposed as part of the EIAR to manage traffic volumes and minimise the potential for opposing HGVs to meet on this section of the L-61461. It is noted that site staff (Flagmen) will be on-site at all times during the construction phase to manage traffic construction traffic.

Problem 2.2 – Errant drivers entering works / over-run area at temporary link between N83 and L-61461 - The Audit Team state: The opening of the over-run area for abnormal loads and construction traffic could create driver confusion, leading to errant drivers (i.e. the general public) accessing the wind farm construction site in error. The Audit Team recommends that access to the over-run area should be managed appropriately whilst being used for construction traffic to avoid errant drivers entering the works. Access points should be closed when not required by construction traffic.

The Design Team Response is as follows - The default for the temporary over-run area connecting the N83 to the L-61461 will be that it will be closed to all traffic by means of gates / fencing. During times when this area is being used for construction traffic the access at both ends will be managed at all times by means of signing and site staff (Flagmen), and during the delivery of the abnormally sized loads, by Garda escort vehicles. On completion of the construction phase the temporary road will be permanently closed with boundary fencing.

Problem 2.3 – Sightline for drivers looking right obscured - The Audit Team state: Visibility looking to the right for drivers leaving the construction site may be partially obscured by foliage within the adjacent field boundary. This is likely to increase the risk of a side impact type collision on the Local Road L-61461. The Audit Team recommends that sightlines at the wind farm access should be maximised by cutting back and maintaining all boundary foliage falling within the envelope of visibility.

The Design Team Response is as follows - It is confirmed that the appropriate visibility splays as shown in Figure 15-17 of the EIAR will be kept clear of all obstruction during the construction, operational and decommissioning stages of the Proposed Project.

Summary of Stage 1 Road Safety Audit - The Audit Team raised 3 potential road safety problems. The Design Team agreed with each problem and each recommendation suggested by the Audit Team and provided a detailed solution describing each mitigation measure proposed. It is confirmed that each solution was to the satisfaction of the RSA Team Leader. It is noted that the final column in the

RSA Feedback form is blank in each case, as it is understood from TII that this column is for instances where alternative solutions to those recommended by the Audit Team are proposed.

15.1.11 Provision for Sustainable Modes of Travel

15.1.11.1 Walking and Cycling

The provision for these modes is not relevant during the construction stage of the Proposed Project as travel distances will likely exclude any employees walking or cycling to work.

15.1.11.2 Public Transport

Public bus routes 417 Bus Eireann (Galway / Corofin Cross / Tuam), 425 Bus Eireann (Galway / Roscommon / Longford), 427 Burkes Bus (Dunmore / Eyre Square Galway), 428 Burkes Bus (Tuam / Galway) and 429 Bus Eireann (Galway / Tuam / Castlerea) all travel on the N83 less than 400m from the Proposed Wind Farm access junction on the L-61461. It is noted that at present these services are infrequent, and while staff will be encouraged to use them, they are unlikely to be suitable for most construction staff to access the Proposed Wind Farm site. The provision of mini-buses will be considered for transporting staff to and from the site in order to minimise traffic generation and parking demand.

As the Proposed Grid Connection underground cabling route is located along the public road network there are a number of public transport services that service this aspect of the Site. However, due to the transient nature of construction works along the underground cabling route, use of these public transport services would be limited to short durations.

15.1.12 Likely and Significant Effects and Associated Mitigation Measures

15.1.12.1 'Do-Nothing' Scenario

If the Proposed Project does not proceed there will be no additional traffic generated or works carried out on the road network and therefore no effects with respect to traffic and the potential to impact on Irish Rail infrastructure would be removed.

If the Proposed Project were not to proceed, the opportunity to capture part of Galway's valuable renewable energy resource would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions.

15.1.12.2 Construction Phase: Traffic and Transport

15.1.12.2.1 Proposed Wind Farm

During the 8 days when the concrete foundations are poured, the effect on the surrounding road network will be negative. It is forecast that the increase in traffic volumes will range from +2.1% on the N83 between Claregalway and Loughgeorge (Link 1), to +3.7% on the N83 just to the south of the L-61461 (Link 2) to a 5-fold increase in traffic flows (+399.8%) on the L-61461 leading to the Proposed Wind Farm site (Link 3), which is currently lightly trafficked. This will have a temporary slight negative effect on the delivery route with the impact forecast to be moderate on the short section of the L-61461.

For 227 days when the general construction and groundworks are undertaken it is forecast that the increase in traffic volumes will range from +1.0% on the N83 between Claregalway and Loughgeorge

(Link 1), to +1.7% on the N83 just to the south of the L-61461 (Link 2) to a 184.9% increase on the L-61461 leading to the site (Link 3). This will have a temporary negative effect on the study network ranging from slight on the majority of the delivery route, to moderate on the short section of the L-61461 leading to the main access junction (Location 5, as discussed in Section 15.1.9.

For 118 days when the Proposed Grid Connection underground cabling route is being constructed it is forecast that the increase in traffic volumes will range from +0.7% on the N83 between Claregalway and Loughgeorge (Link 1), to +1.2% on the N83 just to the south of the L-61461 (Link 2) to a 126.8% increase on the L-61461 leading to the site (Link 3). This will have a temporary negative effect on the study network ranging from slight on the majority of the delivery route, to moderate on the short section of the L-61461 leading to the proposed access junction.

During the 22 days when the various component parts of the wind turbine plant are delivered to the Proposed Wind Farm site using extended articulated HGVs, the effect of the additional traffic on these days will be slight to moderate along the turbine delivery route due to the size of vehicles involved, resulting in increased traffic volumes ranging from +0.5% on the N83 between Claregalway and Loughgeorge (Link 1), to +0.8% on the N83 just to the south of the L-61461 (Link 2) to an 92.5%

increase on the L-61461 leading to the Proposed Wind Farm site (Link 3). It is forecast that there will be a negative temporary, slight effect on traffic flows as the delivery of the abnormally sized loads is undertaken at night.

During the 8 days of the turbine construction stage when general materials are delivered to the Proposed Wind Farm site, it is forecast that the increase in traffic volumes on these days will range from +0.3% on the N83 between Claregalway and Loughgeorge (Link 1), to +0.5% on the N83 just to the south of the L-61461 (Link 2), to a 56.4% increase on the L-61461 leading to the Proposed Wind Farm site (Link 3).

This will have a temporary imperceptible negative effect on the N83, and temporary slight negative effect on the L61461 leading to the Proposed Wind Farm site.

15.1.12.2.2 **Proposed Grid Connection**

With respect to the traffic volumes that will be generated during the construction of the Proposed Grid Connection underground cabling route, all traffic for this and the onsite 110kV substation will be delivered via the proposed new temporary road. It is estimated that there will be approximately 14 daily return trips made by a truck transporting materials, and 7 return trips made by a car to transport construction staff, to and from the site. Short term diversions are forecast for local traffic although the traffic volumes that will be impacted on the local road network are low. By its nature the effects of these additional trips and diversions on the network will be transient, will be temporary and will be slight.

15.1.12.3 **Operational Phase: Traffic and Transport**

The impacts on the surrounding local highway network will be negligible given that there will only be an average of approximately 1 to 2 trips made to the Proposed Wind Farm site by car or light goods vehicle per day, with less than that required for the Proposed Grid Connection. The effects of the maintenance traffic on the surrounding highway network will therefore be imperceptible.

15.1.12.4 **Decommissioning Phase: Traffic and Transport**

15.1.12.4.1 **Proposed Wind Farm**

The wind turbines proposed as part of the Proposed Project are expected to have a lifespan of approximately 30 years. Following the end of their useful life, the wind turbines may be replaced with a

new set of turbines, subject to planning permission being obtained, or the Site may be decommissioned fully.

Any impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during part of the construction phase when turbines were being erected. The impacts and associated effects will be materially less than during the construction phase as significant ground works are not required to decommission a wind farm.

Following decommissioning of the Proposed Wind Farm, turbine foundations, hardstanding areas and site tracks will be rehabilitated, i.e. left in place, covered over with local soil/subsoil and allowed to re-vegetate naturally, if required. The internal site access tracks may be left in place, as they may serve as useful access to the agricultural and forestry land. It is considered that leaving these areas in-situ will cause less environmental damage than removing and recycling them.

While the actual number of loads that will require to be removed from the Site in the event that the Proposed Wind Farm is decommissioned has not been determined at this stage, the impact in terms of traffic volumes will be significantly less than during the construction stage.

15.1.12.4.2 **Proposed Grid Connection**

The Proposed Grid Connection will remain in place as it will remain under the management and operation of EirGrid. There are no impacts associated with this.

The works required during the decommissioning phase are described in Chapter 4: Description of the Proposed Project and the accompanying Decommissioning Plan included as Appendix 4-7 of this EIAR.

15.1.12.5 **Mitigation Measures**

This section summarises the mitigation measures to minimise the effects of the Proposed Project during both the construction and operational stages (decommissioning will be same as construction where required).

15.1.12.5.1 **Mitigation by Design**

Mitigation by design measures include the following:

- Selection of the most appropriate delivery route to transport the wind turbine components, requiring the minimum remedial works to accommodate the vehicles as set out in Section 15.1.1.
- Selection of the shortest underground grid connection route, minimising the impacts on the existing road network and traffic.

15.1.12.5.2 **Mitigation Measures During the Construction Stage**

The successful completion of the Proposed Project will require significant coordination and planning and a comprehensive set of mitigation measures will be put in place before and during the construction stage of the Proposed Project, in order to minimise the effects of the additional traffic generated by the Proposed Project.

A detailed **Traffic Management Plan (TMP)**, included as Appendix 15-2 of this EIAR, will be finalised and confirmatory detailed provisions in respect of traffic management agreed with the road's authority and An Garda Síochána prior to construction works commencing.

Traffic management measures for the local road network between the existing N83 and the proposed access junction on the L-61461 will include the following. It is proposed that a temporary road will be

constructed linking the N83 to the L-61461 commencing at a location on the N83 at a point approximately 80m south of the existing N83 / L-61461 junction. The proposed temporary road connects into the L61461 at a point approximately 70m west of the N83 / L-61461 junction. The proposed temporary road will facilitate the delivery of the turbine components, which will be accompanied by a Garda escort, and the access of all standard HGV deliveries to the Proposed Wind Farm site. On the 8 days that the concrete foundations are poured the temporary road will also be used for these vehicles to exit the site. All other HGV movements will exit the Site via the existing L-61461 / N83 junction. All staff vehicles will use the existing N83 / L-61461 junction.

The default for the temporary road connecting the N83 to the L-61461 will be that it is closed to all traffic by means of temporary gates / fencing / traffic barriers. During times when this area is being used for construction traffic the access at both ends will be opened and will be managed at all times by means of signing and site staff (Flagmen), and during the delivery of the abnormally sized loads, by Garda escort vehicles. On completion of the construction phase the temporary road will be permanently closed with boundary fencing re-instated. The temporary road will only be re-established in the unlikely event of the replacement of large turbine component parts during the operational phase.

While the details of the traffic management measures will be developed in detail and submitted for agreement with Galway County Council prior to the construction of the Proposed Project, they will include the following measures,

- An application to Galway County Council for the temporary reduction of the speed limit on the N83 from 100 km/h to 80 km/h during the construction phase of the Proposed Project, as discussed in principle with Galway County Council during pre-planning discussions.
- Similar in relation to the section of the L-61461 between the N83 and the proposed site access junction approximately 280m to the west for a temporary reduction in the speed limit from 80 km/h to 60 km/h (the default speed limit for this road could already be reduced from 80kmh to 60kmh under proposed government guidelines).
- Introduction of signage on northbound and southbound approaches to the existing L-61461 and the temporary link of warning of approaching construction site (TMS Traffic Signs WK001).
- Signage on the N83 northbound indicating the temporary construction access approaching on the left (TMS traffic Sign WK052) and similar on southbound lane indicating the temporary link approaching on the right (TMS Traffic Signs WK053).
- Signage on the N83 northbound and southbound approaches to temporary access of Flagmen (TMS traffic Sign WK061).
- It is also proposed that temporary signage indicating the overtaking is not permitted during the construction phase (TMS traffic Sign RUS 014). These may be introduced with temporary bollards on the centreline of the N83.
- It is proposed that the temporary speed limit of 80 km/h is indicated on this section of the N83 using Variable Message Signs in order to maximise conspicuity.
- Similarly, temporary signage will be introduced on the L-61461, including signage on eastbound and westbound approaches to the proposed temporary link (TMS Traffic Signs WK001), signage indicating the temporary construction access approaching on the L-61461 (TMS traffic Signs WK052 and WK053), signage on the L-61461 warning of the presence of Flagmen (TMS traffic Sign WK061).
- A temporary 60 km/h speed limit signs will also be introduced on the L-61461 (if not already established as the default speed limit).

The detailed TMP will also include the following measures:

- **Traffic Management Coordinator** – a competent Traffic Management Co-ordinator will be appointed for the duration of the construction of the Proposed Project and this person will be the main point of contact for all matters relating to traffic management.

- **Delivery Programme** – a programme of deliveries will be submitted to Galway County Council and other relevant authorities in advance of deliveries of turbine components to the Proposed Wind Farm site.
- **Information to locals** – Locals in the area will be informed of any upcoming traffic related matters e.g. delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Contract Project Co-ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number will also be provided.
- **A Pre and Post Construction Condition Survey** – A pre-condition survey of roads associated with the Proposed Project will be carried out prior to construction commencement to record the condition of the road. A post construction survey will be carried out after works are completed. Where required the timing of these surveys will be agreed with the local authority.
- **Liaison with the relevant local authorities** - Liaison with the relevant local authorities including the roads sections of local authorities that the delivery routes traverse, and An Garda Síochána, during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required.
- **Implementation of temporary alterations to road network at critical junctions** – At locations where required highlighted in Section 15.1.9.
- **Identification of delivery routes** – These routes will be agreed and adhered to by all contractors.
- **Travel plan for construction workers to Site**– A travel plan for construction staff, which will include the identification of a routes to / from the Site and identification of parking areas will be implemented by the main contractor.
- **Temporary traffic signs** – As part of the traffic management measures temporary traffic signs will be put in place at all key junctions, including the temporary access linking the N83 and L-61461 and the access junction on the L-61461. All measures will be in accordance with the “*Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works*” (DoT now DoTT&S) and “*Guidance for the Control and Management of Traffic at Roadworks*” (DoTT&S). Construction staff (flagman) will be present at key junctions during peak delivery times.
- **Delivery times of large turbine components** - The management plan will include the delivery of large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage.
- **Diversion routes during the construction of the Proposed Grid Connection Underground Cabling Route** – As set out in Section 15.1.7 of this EIAR.
- **Additional measures** - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including sweeping / cleaning of local roads as required.
- **Re-instatement works** - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.

15.1.12.5.3 **Mitigation Measures During Operational Stage**

Due to the very low volumes of traffic forecast to be generated during this stage no mitigation measures are required.

15.1.12.5.4 **Mitigation Measures During Decommissioning Stage**

In the event that the Proposed Project is decommissioned after the 30 years of operation, a decommissioning plan, will be prepared for agreement with the local authority, as described in Chapter 4 and Appendix 4-7 Decommissioning Plan. This plan will include a material recycling / disposal and traffic management plan will be prepared for agreement with the local authority prior to decommissioning, in accordance with Scottish Natural Heritage report (SNH) *Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms* (SNH, 2013) .

15.1.12.6 Residual Effects

15.1.12.6.1 Construction Stage

During the 18–24-month construction stage of the Proposed Project, it is forecast that the additional traffic that will appear on the public road network serving the Proposed Wind Farm site and during the construction of the Proposed Grid Connection underground cabling route will have a slight to moderate and temporary negative effect on existing road users, which will be minimised with the implementation of the mitigation measures included in the proposed Traffic Management Plan included as Appendix 15-2.

15.1.12.6.2 Operational Stage

As the traffic impact of the Proposed Project will be imperceptible during the operational stage, there will be no residual effects during this stage.

15.1.12.6.3 Decommissioning Stage

As stated above, in the event that the Proposed Wind Farm is decommissioned, a decommissioning plan will be prepared and implemented in order to minimise the residual effects during this stage. The residual effect will be less than for the construction stage as set out above and will be slight to imperceptible.

For this scenario the Proposed Grid Connection onsite 110kV substation and underground cabling route will remain in-situ and continue to operate as part of the national electricity grid network.

15.1.12.7 Cumulative Effects

A detailed assessment of all developments at varying stages in the development process (from pre-planning to operational), is set out in Section 2.8 of Chapter 2 with all developments included listed in Appendix 2-3. The potential cumulative traffic effects with the Proposed Project are assessed based on the following criteria;

- Project status (pre-planning to operational)
- Degree of overlap with the Proposed Project delivery highway network (low to high)
- Traffic volumes (low to high).

15.1.12.7.1 Other Wind Farms

From a review of all existing and approved wind farms set out in Appendix 2-3 it has been determined that the potential for cumulative impacts will only occur with other wind farms that are permitted and have yet to be constructed, as the traffic generation for existing operational wind farms is very low. There are several other applications in the pre-application stage that have not been considered as their applications have not been submitted to the relevant authorities and no traffic related information is available. In addition, any single/domestic turbines have not been considered in the cumulative assessment as the scale of construction traffic associated with these would be considered insignificant and therefore would not have a cumulative impact when associated with the Proposed Project.

As set out in Table 15-29 there is just 1 permitted wind farm development within 25km of the Proposed Project, yet to be constructed, that has the potential to cause cumulative effects in relation to traffic and transport.

The planning application for the Knockranny Wind Farm was permitted in 2016 but is yet to be constructed. The development includes 11 turbines, located approximately 5km to the north-west of Moycullen, Co. Galway. A further application was lodged with Galway County Council in June 2023,

which included for an increase in the size of the blades on the 11 planned turbines, as well as the installation of cabling connecting it to Ardderroo Wind Farm, to accommodate connection to the national grid.

This permitted development is located approximately 21kms from the Proposed Project. The TDRs for both developments potentially share a 3.0km section of the road network through part of Galway City from Galway Harbour onto Lough Atalia, followed by the R339 and the R336 to the junction with the N6 Bothar na dTreabh, at which point the routes diverge. . As set out in Table 15-29, it is therefore considered that there is a medium risk of cumulative impacts between the 2 developments. In the event that the construction of the Proposed Project coincides with the Knockranny Wind Farm, the traffic related cumulative impacts would be negative, short-term and slight, based on the potential overlap of TDRs and associated traffic generation. It is therefore proposed that the construction phase of the Proposed Project will be scheduled, where possible, to avoid the construction phases of the permitted Knockranny Wind Farm. This will ensure that the potential for cumulative effects is minimised.

Table 15-28 Summary of other wind farms considered in cumulative assessment and potential for cumulative traffic effects with Proposed Project

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential cumulative traffic effects
<p>1 – ABP PL07.243094 – Knockranny Wind Farm – 10-year permission for a wind farm consisting of 11 turbines, mast, 110 kV substation, new entrance, roads and site works.</p> <p>Located approximately 5km to the north-west of Moycullen, Co. Galway</p>	Permitted	Medium	Medium	Medium
<p>2. Pl Ref: 23/225 (alteration to Pl Ref: 13/829) Amendments to the permitted Knockranny Wind Farm to increase in the size of the blades on the 11 planned turbines, as well as the installation of cabling connecting it to Ardderroo Wind Farm, to accommodate connection to the national grid.</p> <p>Located approximately 5km to the north-west of Moycullen, Co. Galway</p>	Permitted	Medium	Medium	Medium

Other development applications in the planning system

A planning search was undertaken by MKO of the EIA planning register for all development planning applications within 25km of the Proposed Wind Farm site, as set out in Appendix 2-3. Of the developments included in the list it was considered that the 8 developments listed in Table 15-30 should be considered, based on the location and scale of these developments. It is considered that the potential risk of cumulative impacts between the Proposed Project and these 8 developments is low with the resulting cumulative impacts being negative, short term and slight.

Table 15-29 Summary of other development applications considered in cumulative assessment and potential for cumulative traffic effects with Proposed Wind Farm

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential cumulative traffic effects
<p>1 – Carrowmanagh, GCC Planning Reference 21/1623</p> <p>For development that will consist of the construction, operation and decommissioning of a solar photo-voltaic panel array to export electricity to the national grid.</p>	Permitted	Medium	Low	Low
<p>2 – Cluidrevagh, GCC Planning Reference 21/1274</p> <p>For an EBS Substation and Switchroom.</p>	Permitted	Medium	Low	Low
<p>3 – Pollaturk or New Garden, GCC Planning Reference 21/439</p> <p>Consists of an existing telecommunications support structure (previously granted permission under PL. Ref. 09/1618) together with antennas, dishes, ladder attached, equipment cabinets, fencing, access track and all associated site development works.</p>	Permitted	Medium	Low	Low
<p>4 – Claretuam, GCC Planning Reference 21/442</p> <p>Provision of a steel frame and cladding to cover existing aggregate stock bays for environmental purposes.2.</p>	Permitted	Medium	Low	Low
<p>5 – Cluidrevagh, GCC Planning Reference 23/61345</p>	Permitted	Medium	Low	Low

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential cumulative traffic effects
For the expansion to an existing sawmills to include for Permission for new automated timber handling facilities/buildings, water storage tank and ancillary services.				
6 – Droim na Gaoithe (Lakeview), GCC Planning Reference 19/1667 for change of use of part of Unit 9 from office space to light industrial as constructed.	Permitted	Medium	Low	Low
7 – Polkeen, GCC Planning Reference 18/1544 For extension to existing industrial building, parking and all associated services on extended site at Parkmore Business Park West.	Permitted	Medium	Low	Low
8 – Lakeview, Claregalway, ABP Planning Reference 31291	Permitted	High	Low	Low

In addition, as set out in Appendix 2-3, and for the purposes of the cumulative traffic assessment, planning applications within 200m of the Proposed Grid Connection. Of the developments included in the list, it was considered that the 7 developments listed in Table 15-31 should be considered based on the location and scale of these developments. It is considered that the potential risk of cumulative impacts between the Proposed Project and these 7 developments is low, with the resulting cumulative impacts being negative, short term and slight.

Table 15-30 Summary of other development applications considered in cumulative assessment and potential for cumulative traffic effects with the Proposed Grid Connection

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential cumulative traffic effects
<p>1 – Cloonascragh, GCC Planning Reference 22/1175</p> <p>For the development consisting of a wind energy development comprising of one electricity generating wind turbine, with an overall blade tip height of up to 168m.</p>	Permitted	High	Low	Low
<p>2 – Cloonascragh, GCC Planning Reference 22/1030</p> <p>To refurbish the existing Castlebar-Cloon 110kV overhead line, which is approximately 57km long.</p>	Permitted	High	Low	Low
<p>3 – Cloontoa, GCC Planning Reference 20/1387</p> <p>For a 10 year planning permission for the construction of a solar PV farm and ancillary infrastructure at Cloontoa, Rinkippeen, Cloonascragh, Barnacurragh and Ballykeaghra, Tuam, Co Galway.</p>	Permitted	High	Low	Low
<p>4 – Cloonascragh, GCC Planning Reference 19/1315</p> <p>For a 10-year permission for</p>	Permitted	High	Low	Low

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential cumulative traffic effects
development at Cloonascragh, Tuam. The development will consist of the construction and operation of solar PV panels, and associated ancillary development including an electrical substation compound, control building.				
5 – Cloonascragh, GCC Planning Reference 22/60819 For quarrying operations including the extraction of minerals (sand and gravel).	Permitted	High	Low	Low
6 – Cloonascragh, ABP Reference 306685 Construction and operation of solar PV panels, including an electrical substation compound, control building, up to 9 inverter units, underground cable ducts.	Permitted	High	Low	Low
7 – Cloon to Ballyleague, ABP Reference 302597 Permission for the development at this site, the existing Cloon to Lanesboro 110 kV Overhead Line which is approximately 65 kilometres long.	Permitted	High	Low	Low

As determined above, the effects during the construction, operation or decommissioning phases of the Proposed Project will be not significant. Therefore, no significant cumulative effects are foreseen.

15.1.13 Summary

An assessment of the traffic effects was undertaken for the Proposed Project. The assessment considers the likely impacts resulting from the additional traffic movements that will be generated by the Proposed Project during the construction, operational and decommissioning phases on the transport delivery route to the site.

An assessment of the geometry of the delivery route was also undertaken in order to ensure that the abnormally sized vehicles required to deliver the turbine plant to the Site are accommodated.

Traffic Route & Study Area

The delivery route to the Site for the abnormally sized loads transporting the large turbine components commences at Galway Harbour. From Galway Harbour the route travels northeast through Galway City on the R339 and the R336 to the N83 at the junction with the N6 Bothar na dTreabh. From this point the route travels north on the N83 for approximately 19.4 kms through the village of Claregalway to the existing junction with the L-61461. Approximately 80m south of the L-61461 it is proposed to provide a new short, temporary access road which links back into the L-61461 at a point approximately 70m to the west of the existing N83 / L-61461 junction. The proposed access road will provide for all construction related deliveries that will approach the Site on the N83 from the south. From this point the route travels west on the L-61461 for approximately 300m to the location of a new junction on the north side of the L-61461 that will provide access to the Proposed Wind Farm site.

Vehicle types and network geometry

The types of vehicles that will be required to negotiate the local network will be up to 86.9 metres long and will carry a blade 81.5 metres in length.

An assessment of the geometric requirements of the delivery vehicles was undertaken on the turbine delivery route. Locations where it was established that the existing road geometry will not accommodate all of the vehicles associated with the Proposed Project are highlighted, with the extent of remedial works identified. In addition to the assessment presented, it is recommended that a dry run is undertaken by the transport company to check vertical and horizontal clearance on the transport route prior to construction.

Traffic impact on local network

In terms of daily traffic flows it is estimated that the impact of the development traffic on the delivery route will be as follows:

- During the 8 days when the concrete foundations are poured, the effect on the surrounding road network will be negative. It is forecast that the increase in traffic volumes will range from +2.1% on the N83 between Claregalway and Loughgeorge (Link 1), to +3.7% on the N83 just to the south of the L-61461 (Link 2) to a 5-fold increase in traffic flows (+399.8%) on the L-61461 leading to the Proposed Wind Farm site (Link 3), which is currently lightly trafficked. This will have a temporary slight negative effect on the delivery route with the impact forecast to be moderate on the short section of the L-61461.
- For 227 days when the general construction and groundworks are undertaken it is forecast that the increase in traffic volumes will range from +1.0% on the N83 between Claregalway and Loughgeorge (Link 1), to +1.7% on the N83 just to the south of the L-61461 (Link 2) to a 184.9% increase on the L-61461 leading to the Site (Link 3). This will have a temporary negative effect on the study network ranging from slight on the

majority of the delivery route, to moderate on the short section of the L-61461 leading to the main access junction (Location 5, as discussed in Section 15.1.9.

- For 118 days when the Proposed Grid Connection underground cabling route is being constructed it is forecast that the increase in traffic volumes will range from +0.7% on the N83 between Claregalway and Loughgeorge (Link 1), to +1.2% on the N83 just to the south of the L-61461 (Link 2) to a 126.8% increase on the L-61461 leading to the Site (Link 3). This will have a temporary negative effect on the study network ranging from slight on the majority of the delivery route, to moderate on the short section of the L-61461 leading to the main access junction.
- During the 22 days when the various component parts of the wind turbine plant are delivered to the Proposed Wind Farm site using extended articulated HGVs, the effect of the additional traffic on these days will be slight to moderate along the turbine delivery route due to the size of vehicles involved, resulting in increased traffic volumes ranging from +0.5% on the N83 between Claregalway and Loughgeorge (Link 1), to +0.8% on the N83 just to the south of the L-61461 (Link 2) to an 92.5% increase on the L-61461 leading to the Proposed Wind Farm site (Link 3). It is forecast that there will be a negative temporary, slight effect on traffic flows as the delivery of the abnormally sized loads is undertaken at night.
- During the 8 days of the turbine construction stage when general materials are delivered to the Proposed Wind Farm site, it is forecast that the increase in traffic volumes on these days will range from +0.3% on the N83 between Claregalway and Loughgeorge (Link 1), to +0.5% on the N83 just to the south of the L-61461 (Link 2), to a 56.4% increase on the L-61461 leading to the Proposed Wind Farm site (Link 3).
- This will have a temporary imperceptible negative effect on the N83, and temporary slight negative effect on the L61461 leading to the Proposed Wind Farm site.
- With respect to the traffic volumes that will be generated during the construction of the Proposed Grid Connection underground cabling route, all traffic for this and the onsite 110kV substation will be delivered via the proposed new temporary road. It is estimated that there will be approximately 14 daily return trips made by a truck transporting materials, and 7 return trips made by a car to transport construction staff, to and from the site. Short term diversions are forecast for local traffic although the traffic volumes that will be impacted on the local road network are low. By its nature the effects of these additional trips and diversions on the network will be transient, will be temporary and will be slight.

Once the Proposed Project is operational the traffic impact created by maintenance staff will be imperceptible. The residual effect for the decommissioning phase will be less than for the construction stage as set out above and will be slight to imperceptible.

15.2 Telecommunications and Aviation

15.2.1 Introduction

This section of the EIAR assessed the likely significant effects of the Proposed Project on other material assets such as telecommunications and aviation assets.

For the purposes of this EIAR:

- The 'Proposed Wind Farm' refers to the 8 no. turbines and supporting infrastructure which is the subject of this Section 37E application.
- The 'Proposed Grid Connection' refers to the 110kV onsite substation and supporting infrastructure which will be the subject of a separate Section 182A application.
- The 'Proposed Project' comprises the Proposed Wind Farm and the Proposed Grid Connection, all of which are located within the EIAR Site Boundary (the 'Site') and assessed together within this EIAR.

A detailed description of the Proposed Project is provided in Chapter 4 of this EIAR.

Section 15.3.2 describes the way in which wind turbines can potentially interfere with telecommunications signals or aviation activities. Section 15.2.4 presents details on how such effects will be avoided, with the likely significant effects assessed (and mitigation measures proposed) in Section 15.2.5.

15.2.1.1 Statement of Authority

This section of the EIAR has been prepared by Niamh McHugh and Órla Murphy, and reviewed by Sean Creedon, all of MKO. Niamh is an Environmental Scientist who has been working in private consultancy since 2021. Niamh holds a BSc (Hons) in Environmental Science from the National University of Ireland, Galway. Niamh has been involved in the preparation, compilation and production of a number of EIARs, primarily in the field of renewable energy. Órla is a Senior Environmental Scientist with nearly 8 years' experience in the environmental sector where she has acted as Project Manager for a number of EIAR applications for wind energy developments, compiling numerous chapters including chapters on Population and Human Health. Órla holds a BSc. in Geography and MSc. in Environmental Protection and Management. Sean is an Associate Director in the Environment Team at MKO. He oversees a team of highly skilled environmental professionals working on EIAR for large-and medium scale Renewable Energy infrastructure. Sean has directed and overseen multiple renewable energy projects across wind, solar, battery and hydrogen as well as a range of thermal and other energy related developments. He has worked on the planning and environmental impact elements within all stages of wind farm project delivery. He is a member of the MKO senior management team responsible for developing the business, mentoring team members, fostering a positive culture and promoting continuous employee professional development. Sean has over 22 years' experience in program and project development, holds an MSc from NUI Galway and a Diploma in Project Management from Institute of Project Management Ireland

15.2.2 Methodology and Guidance

This section of the assessment focuses particularly on the scoping and consultation exercise conducted with telecoms operators and aviation authorities. Scoping was carried out in line with the EPA guidelines, and the '*Best Practice Guidelines for the Irish Wind Energy Industry*' (Irish Wind Energy Association, 2012) which provides a list of telecommunications operators for consultation.

A full description of the scoping and consultation exercise is provided in Section 2.6 of Chapter 2 of this EIAR. Consultation with the telecommunications operators and aviation bodies informed the

constraints mapping process, which in turn informed the layout of the Proposed Project, as described in Chapter 3, Section 3.3.6 of the EIAR.

The assessment of likely significant effects on material assets uses the standard methodology and classification of impacts as presented in Section 1.7.2 of Chapter 1 of this EIAR.

15.2.3 Background

15.2.3.1 Broadcast Communications

Wind turbines, like all large structures, have the potential to interfere with broadcast signals, by acting as a physical barrier or causing a degree of scattering to microwave links. The most significant effect at a domestic level relates to a possible flicker effect caused by the moving rotor, effecting, for example radio signals. The most significant potential effect occurs where the renewable energy development is directly in line with the transmitter radio path.

15.2.3.2 Domestic Receivers

Depending on local topography, a domestic receiver may receive broadcast signals from more than one location. The strength of the signals varies with distance from the transmitter, and the receiver's antenna is generally always directed towards the most local, and usually strongest, broadcasting station.

There are two types of potential electromagnetic interference to domestic receivers depending on the location of the receiver in relation to a wind farm. 'Shadowed' houses are located directly behind a wind farm, relative to the location from where the signal is being received. In this case, the main signal passes through the wind farm and the rotating blades can create a degree of signal scattering. In the case of viewers located beside the wind farm (relative to the broadcast signal direction), the effects are likely to be due to periodic reflections from the blade, giving rise to a delayed signal.

In both cases, i.e., shadowed houses located behind the wind farm and those located to the side of it, the effects of electromagnetic interference may depend to some degree on the wind direction, since the plane of rotation of the rotor will affect both the line-of-sight blockage to viewers located behind the wind farm and the degree of reflection to receivers located to the side.

15.2.3.3 Other Signal Types

Wind turbines have the potential to affect other signal types used for communication and navigational systems, for example tower-to-tower microwave communication links, and airborne and ground radar systems. Interference with radar systems occurs when wind turbines are located close to an airport or directly in line with the instrument landing approach. The published Corine Land Cover Maps (www.epa.ie) identify that the closest airport to the Proposed Project is the Galway Airport, located at Carnmore, Co. Galway. This airport is located approximately 15km south of the Proposed Wind Farm site. The closest large international airport to the Proposed Project is Knock Airport, which is located approximately 50km north of the Proposed Project. Both airports listed above are outside the range at which such issues would be expected, and as detailed in Table 15-31 below, the Irish Aviation Authority noted no issues with the Proposed Project however they issued observations as discussed in Section 15.2.5.3.2.

15.2.4 Preventing Electromagnetic Interference

15.2.4.1 National Guidelines

Both the adopted 'Wind Energy Development Guidelines for Planning Authorities' produced by the Department of the Environment, Heritage and Local Government (DoEHLG, 2006) (referred to as the

Guidelines) and the Draft Wind Energy Development Guidelines for Planning Authorities (DoEHLG, 2019) (referred to as the draft Guidelines) state that interference with broadcast communications can be overcome by the installation of deflectors or repeaters where required.

Developers are advised to contact individual local and national broadcasters and mobile phone operators to inform them of proposals to develop wind farms. This consultation has been carried out by MKO as part of the assessment of the Proposed Project as summarised below in Table 15-31; full details are provided in Section 2.6 in Chapter 2 of this EIAR.

15.2.4.2 Scoping and Consultation

As part of the EIAR scoping and consultation, MKO contacted the relevant national and regional broadcasters, fixed and mobile operators, aviation authorities and other relevant consultees. Consultation was also carried out with ComReg in order to identify any other additional licenced operators in the vicinity of the Proposed Wind Farm site to be contacted, who may not have been on the list of main operators.

The responses received from the telecommunications and aviation consultees are summarised below in Table 15-31.

Table 15-31 Telecommunications and Aviation Scoping Responses

Consultee	Response	Potential for Interference Following Consultation Exercise
2RN	24 th February 2022	No impact anticipated
BAI	25 th February 2022	No impact anticipated
BT	24 th February 2022	No impact anticipated
Eir	28 th February 2022	2 no. links were identified in proximity to the Proposed Project Site. A designated setback distance of 100m was requested by the link operator from the link to the end of the nearest turbine blade. This setback distance was achieved. Therefore, no impact is anticipated.
Enet	25 th February 2022	Links were identified in the vicinity of the Proposed Wind Farm site. Once these links and their relevant buffers were mapped, it was found that there was potential for these links to be interfered with due to turbine locations. Upon further engagement with the relevant operator, a decision was made to decommission these links and reroute them to fibre in

Consultee	Response	Potential for Interference Following Consultation Exercise
		2023. Therefore, no impact is anticipated.
ESB	9 th June 2022	3 no. links were identified in proximity to the Proposed Project Site. Designated setback distances from the link to the end of the nearest turbine blade were calculated by the operator. These setback distances were achieved. Therefore, no impact is anticipated.
Lightnet	15 th March 2022	4 no. links were identified in proximity to the Proposed Project Site. A setback distance of 20m was requested by the operator to the end of the turbine blade. This setback distance was achieved. Therefore, no impact is anticipated.
Imagine	28 th February 2022	No impact anticipated
Tetra Communications	25 th February 2022	No impact anticipated
Three	1 st September 2022	4 no. microwave links were identified in the vicinity of the Proposed Project Site. A 30m setback distance was requested by the link operator from the links to the turbine edge of the turbine blade. This setback was achieved. Therefore, no impact is anticipated.
Virgin Media	1 st March 2022	No impact anticipated
Vodafone	28 th March 2022	2 no. links were identified in close proximity to proposed turbine locations. A setback distance of 30m plus 1 st Fresnel zone was requested by the Operator. The links and their requested setback distances were mapped on a 3D plane, where it was proven that no impact would be anticipated on the mapped link. Therefore, no impact is anticipated.

The scoping responses from the telecommunications and aviation consultees are described below. Relevant copies of scoping responses are provided in Appendix 2-2.

15.2.4.2.1 **Broadcasters**

There are two broadcasters operating in Ireland, RTÉ Transmission Network (operating as 2RN) and Virgin Media.

2RN were contacted as part of the overall telecoms scoping exercise in February 2023. 2rn responded shortly thereafter to confirm they did not operate any links in the area indicated, and therefore anticipated no impact to their transmission links. It was requested by the operator that the Applicant and 2RN sign a Protocol agreement in order to insure accountability against any potential future disruptions to 2RN networks if the Proposed Project were to be constructed. This was signed on 10th November and is appended as Appendix 15-4 to this EIAR.

Virgin Media were also contacted in February 2022 regarding any links they may have in the area. A response was received on the 1st March to state that Virgin Media didn't not have any links in the area, and therefore no impact to the network is anticipated.

15.2.4.2.2 **Other Consultees**

Of the scoping responses receive from telephone, broadband and other telecommunications operators, those who highlighted an initial potential interference risk are addressed below. The final proposed turbine layout does not overlap with any of the telecoms links or clearance zones requested by these operators. The remaining consultees who responded to scoping, operate links either outside the Wind Farm Site, and therefore are not subject to any interference risk, or do not operate any links in the area.

Enet

Enet identified 2 no. links in close proximity to the Proposed Project Site. Once the path of these links and their designated setback buffers were mapped, it was seen that 1 no. turbine not maintaining this buffer. Further communication was had with the operator in order to come to a resolution that was suitable. The operator in this case confirmed that the links were to be decommissioned in 2023 and rerouted to fibre instead. Therefore, no impact to this telecoms link is anticipated.

Lightnet

Lightnet identified 4 no. links in the vicinity of the Proposed Project Site, and requested that the developer maintain a 20m setback distance from these links to the edge of the nearest turbine blade. Once these link paths and setback distances were mapped, it was seen that the setback distances were being maintained and therefore, no effects are anticipated.

Vodafone

Vodafone identified 12 no. active links within the vicinity of the Proposed Project Site, and requested that a setback distance of 30m plus 1st Fresnel zone. At this stage, it was identified that 2 no. of the links passed in close proximity to the proposed turbine locations. Further assessment was carried out on these links, in which their paths and requested setback distances were mapped on a 3D viewer. It was established at this stage that the proposed turbine locations were achieving the requested setback distance. Therefore, no negative effect on the Vodafone transmission network is anticipated.

15.2.4.2.3 **Aviation**

As noted in Table 15-31 above, scoping responses were received from the following aviation consultees:

- Irish Aviation Authority (IAA)
- Department of Defence

Pertinent information has been summarised below, however the scoping response should be referenced to for further detail.

Irish Aviation Authority (IAA)

A representative for the Irish Aviation Authority responded to the Scoping Document to say that the Authority had no specific requirements in relation to the completion of this EIAR. It was also stated that, should a formal planning application be submitted for the Proposed Project that IAA were likely to make some observations, such as the following:

- Developer would need to agree to an aeronautical obstacle warning light scheme for all proposed wind turbines
- Developer would need to provide as-built coordinates together with a ground to tip height elevations at each proposed turbine location, and
- Developer will need to notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection.

Department of Defence

A representative from the Department of Defence responded to the Scoping Document to state that the Department of Defence does not provide observations or advice in the scoping process, except where the relevant parties have been directed to seek the Department's views. They followed up with a number of observations which were based solely on the information contained in the Scoping Document as issued by MKO. The following comments were put forward having consulted with members of the Irish Air Corps on the matter:

- All turbines should be illuminated by Type C, Medium intensity, Fixed Red obstacle with a minimum u=output of 2,000 candela to be visible in all directions and operational 24/7;
- Obstacle lighting should be incandescent. If LED or other lighting types are used, should be a type visible to Night Vision equipment. Obstacle lighting should also be Infra-Red, and
- Light intensity to be of a similar value to that emitted in the visible spectrum of light.

15.2.5 Likely Significant Effects and Associated Mitigation Measures

15.2.5.1 'Do-Nothing' Scenario

If the Proposed Project were not to proceed, the existing uses of small-scale agriculture would continue. The opportunity to harness the wind energy resource of County Galway would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions. The opportunity to generate local employment and investment would also be lost.

15.2.5.2 Construction Phase

The potential for electromagnetic interference from wind turbines occurs only during the operational phase of the Proposed Project. There are no electromagnetic interference impacts associated with the

construction phase of the Proposed Project, and therefore no mitigation required. Potential impacts during turbine erection and commissioning are assessed in the operational phase impact assessment.

15.2.5.3 Operational Phase

15.2.5.3.1 Telecommunications

Pre-Mitigation Effect

Consultation regarding the potential for electromagnetic interference from the Proposed Project was carried out with the relevant national and regional broadcasters, fixed line and mobile telephone operators and other operators, which confirmed that no turbines are proposed within the areas requested to be left clear of turbines.

Mitigation Measures

In the event of interference occurring to telecommunications, the Guidelines acknowledge that '*electromagnetic interference can be overcome*' by the use of divertor relay links out of line with the wind farm.

Residual Effect

The Proposed Project will have no residual impact on the telecommunications signals of any other operator, due to distance from or absence of any links in the area.

Significance of Effects

There will be no significant effect on telecommunications from the Proposed Project.

15.2.5.3.2 Aviation

Pre-Mitigation Effect

The scoping responses received from both the Irish Aviation Authority and the Department of Defence requested standard lighting requirements to be used at the Proposed Project.

Mitigation Measures

The scoping responses received from both IAA and the Department of Defence set out lighting requirements and obstacle avoidance strategies as set out above. These requirements will be complied with for the Proposed Project and any further details will be agreed in advance of construction with the IAA, i.e. crane erection. The coordinates and elevations for the as-built turbines will be supplied to the IAA, as is standard practice for wind farm developments.

Residual Effects

The Proposed Project will have no residual impact on aviation as all lighting requirements will be met by the applicant.

Significance of Effects

There will be no significant effects on aviation operations due to the Proposed Project.

15.2.5.4 Decommissioning Phase

As stated in Section 15.2.5.2 above, the potential for electromagnetic interference from wind turbines occurs only during the operational phase of the Proposed Project. There are no electromagnetic interference impacts associated with the construction or decommissioning phases of the Proposed Project, and therefore no mitigation required.

15.2.5.5 Cumulative Impact

Chapter 2, Section 2.7 of this EIAR describes the methodology used in compiling the list of permitted or proposed projects and plans in the area, (wind energy or otherwise) considered in the assessment of cumulative effects, and provides a description of each project, including current status, and is set out in Section 2.7 in Chapter 2 of this EIAR. The closest existing wind farm to the Proposed Project site is a two-turbine development (Cloonlusk Wind Farm) located approximately 9km east of the Proposed Wind Farm site. The closest permitted wind energy development to the Proposed Wind Farm is a single turbine at Cloonascragh, approximately 6.3km to the northeast. As the Proposed Wind Farm is not predicted to have any potential effect on existing telecommunications or aviation services, there is no potential for in-combination effects with other wind farms located nearby. Therefore, there will be no cumulative effects relating to the Proposed Project and surrounding projects in relation to telecommunications or aviation.

15.3 Other Material Assets

This section of the Material Assets chapter considers other utilities or built services in the area such as electricity supply and transmission, water, gas and underground telecommunications. This section also considers waste management during the construction, operational and decommissioning phases of the Proposed Project.

In order to assess the potential for significant effects on built services and waste management in the vicinity of the Proposed Project, scoping requests were made to EirGrid, Irish Water and numerous sections of Galway County Council, including the Roads Department and Environment Department. Please refer to section 2.6 of Chapter 2 of this EIAR for details in relation to the EIA scoping exercise.

A scoping response was received from Irish Rail to say that no impact was anticipated on any of their infrastructure or services due to the Proposed Project. No scoping response was received from Irish Water, the Roads or Water departments of the local authority.

15.3.1 Existing Built Services and Utilities

A detailed survey of the entire Proposed Grid Connection underground cabling route was prepared, picking up all identified existing services and utilities along the route and the proposed underground cabling route has been designed to avoid these existing services and utilities.

There is an overhead electricity cable which traverses the Proposed Wind Farm site in the eastern-most portion of the site, adjacent to the N83 National Road. This overhead line is located 1.2km east of the nearest turbine. There are also 3 no. areas where overhead electricity lines cross over the Proposed Grid Connection. However, no impacts on overhead electricity lines are likely to occur due to the nature of the underground cabling installation works.

There are no known existing underground electricity cables present on the Proposed Wind Farm site. There are existing underground electricity cables present along the Proposed Grid Connection underground cabling route, and in the vicinity of the Proposed Project site. Damage of underground electricity cables during construction operations could potentially result in serious injury or death of site staff. The Proposed Project has been designed to avoid existing underground electricity cables.

The Gas Networks Ireland underground gas pipeline travels from north to south through the Proposed Wind Farm site. It was confirmed in a scoping response from Bord Gais Networks that a minimum setback distance relating to deep intrusive groundworks of 2 no. turbine hub heights should be achieved. A designated 207m setback distance relating to deep intrusive groundworks has been applied to this underground pipeline. The Applicant has been able to achieve a 284m setback from the closest turbines (T5) which exceeds the requirements requested by the operator. There are no turbines located within this designated setback distance. In addition, telecom lines were laid alongside the gas line to avoid the need for additional trenching works. The Applicant achieved setback distance also allows for avoidance during construction. Based on survey information, and information provided by Gas Networks Ireland, no impacts are likely to occur as the groundworks needed in order to construct the Proposed Wind Farm infrastructure will not interfere with the existing gas pipeline.

There is a water main located within the Proposed Wind Farm site that travels east to west beneath the proposed new access road. The Applicant has been able to design the new access road in a way where no impacts are likely to occur as the groundworks needed in order to construct the Proposed Wind Farm infrastructure will not interfere with the existing water main.

There are no other known existing services (i.e. water supply, sewage, telecommunications) present on the Proposed Wind Farm site. There are existing services (i.e. water supply, sewage, telecommunications) present along the Proposed Grid Connection underground cabling route, and in the vicinity of the Proposed Project site. Damage of underground services during construction operations could potentially result in disruption to those local services, and a risk to health and safety of site staff.

As noted above the Proposed Wind Farm and Proposed Grid Connection infrastructure have been designed to avoid identified services and utilities. Prior to commencement of construction of the Proposed Project the surveys will be repeated and updated, to ensure any new services and utilities will not be impacted by the Proposed Project.

15.3.2 Waste Management

A Waste Management Plan (WMP) has been prepared and forms part of the Construction and Environmental Management Plan (CEMP) in Appendix 4-5 of the EIAR.

The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Project. Disposal of waste will be a last resort.

All waste generated on Site will be contained in waste skip at a waste storage area on Site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein. The expected waste volumes generated on Site are unlikely to be large enough to warrant source segregation at the Site. Therefore, all waste streams generated onsite will be deposited into a single waste skip. The waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licenced waste contractor where the waste will be sorted into individual waste stream for recycling, recovery or disposal.

Site personnel will be instructed at induction that under no circumstances can waste be brought on to Site for disposal in the on-site waste skip. It will also be made clear that the burning of waste material on Site is forbidden.

Further details on waste management are presented in the CEMP which is included as Appendix 4-5.

15.3.3 Likely Significant Effects and Associated Mitigation Measures

15.3.3.1 'Do-Nothing' Scenario

If the Proposed Project were not to proceed, the existing uses of small-scale agriculture would continue. The opportunity to harness the wind energy resource of County Galway would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions. The opportunity to generate local employment and investment would also be lost.

15.3.3.2 Construction Phase

The construction of the Proposed Project will be unlikely to have an impact on above ground or underground built services or waste management. The Proposed Project infrastructure has been designed to avoid existing underground electricity cables and other services and can be described as mitigation by design, therefore there is no potential to give rise to effects on electrical and other services.

Proposed Mitigation Measures

Notwithstanding the above, specific measures are incorporated into the CEMP, included as Appendix 4-5 of this EIAR, to ensure that the construction of the Proposed Project will not have effect on underground electrical cables and built services at the Site. The mitigation measures include the following:

- Any area where excavations are planned will be surveyed and all existing services will be identified prior to commencement of any works.
- Liaison will be had with the relevant sections of the Local Authority including all the relevant area engineers to ensure all services are identified.
- Excavation permits will be completed, and all plant operators and general operatives will be inducted and informed as to the location of any services.
- The contractor must comply with and standard construction codes of practice in relation to working around electricity, gas, water, sewage and telecommunications networks.

Residual Impacts

Following the implementation of the above mitigation measures, there will be a short-term imperceptible negative residual impact during the construction phase of the Proposed Project.

Significance of Effects

Based on the assessment above there will be no significant effects.

15.3.3.3 Operational Phase

There will be no operational phase impacts or associated effects on built services and waste management associated with the Proposed Project.

15.3.4 Cumulative Impact Assessment

The potential cumulative impact of the Proposed Project and other relevant development has been carried out with the purpose of identifying what influence the Proposed Project will have on the surrounding environment when considered cumulatively and in combination with relevant existing, permitted or proposed projects and plans in the area, in the vicinity of the Site, as set out in Section 2.7 in Chapter 2 of this EIAR.

1 no. permitted renewable energy project, a single turbine at Cloonascragh was identified in close proximity to the Proposed Grid Connection and will also be connecting into the existing 110kV Cloon Substation once constructed. It is not thought that this will cause a cumulative effect as the grid connection for the single turbine at Cloonascragh renewable energy project will not be placed in the road in the same location as the Proposed Grid Connection. There were no other potential cumulative effects identified as part of this assessment.

On the basis of the assessment above, the Proposed Project will have no impact on built services and waste management. It is on this basis that it can be concluded that there would be a short-term imperceptible cumulative impact on built services and waste management from the Proposed Project during the Construction phase and permitted or proposed projects and plans in the area as set out in Section 2.7 in Chapter 2 of this EIAR. There are no cumulative effects associated with the operational and decommissioning phases of the Proposed Project.