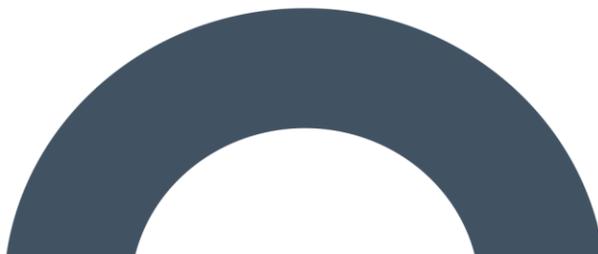


Environmental Impact Assessment Report

Proposed Clonberne Wind
Farm Development, Co.
Galway

Chapter 15 – Material Assets





DOCUMENT DETAILS

Client: **Clonberne Windfarm Limited**

Project Title: **Proposed Clonberne Wind Farm Development, Co. Galway**

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Prepared By: **MKO
Tuam Road
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Ireland
H91 VW84**



Rev	Status	Date	Author(s)	Approved By
01	Final	20/06/2024	AL, JF	OC

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, and 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 4.3.4.7 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 15.3 below.

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, 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 on 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 management plan is also provided in Section 15.1.13.5 aimed at minimising the traffic impact on the local highway network. Refer also to Appendix 15-1 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; Ardderoo, 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 1.7.1 of this EIAR.

15.1.1.4 Scoping and Consultation

Transport Infrastructure Ireland

Transport Infrastructure Ireland (TII) responded to scoping by emails on the 29th September 2020 and 21st of December 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.

Specific issues raised by TII include the following;

- Consultations should be had with relevant Local Authority / National Roads Design Offices with regards to locations of existing and future national roads schemes.
 - It is confirmed that consultation has been undertaken with Galway County Council as set out below.
- 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.
 - The impacts of the Proposed Project on the delivery routes in terms of link flows are set out in Sections 15.1.6.1.1 and 15.1.6.2 of the EIAR, while an assessment of the capacity of the R328 / site development access junction is

set out in Section 15.1.6.4. An assessment of the impacts during the construction of the grid connection is set out in Section 15.1.7 while a swept path analysis undertaken for the abnormally large loads on the Turbine Delivery Route is set out in Section 15.1.9 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.

- 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.
- 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 15.1.13.7.
- 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.
- 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.
- 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 Noise and Vibration in National Road Schemes" (1st Rev, NRA 2004).
 - It is confirmed that the impacts of the Proposed Project with regards Noise set out in Chapter 12 of this EIAR.
- 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.
 - 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).
- The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required.
 - A Road Safety Audit has been undertaken in accordance with TII Guidelines and is discussed in Section 15.1.11 of the EIAR, with the full Stage 1 Road Safety Audit Report included as Appendix 15-2.
- 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.

- All construction will be undertaken in accordance with current guidelines including 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).
- In relation to any proposed haul route where abnormal ‘weight’ loads are proposed, separate structure approvals/permits and other licences 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.
 - 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 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 15.1.13.5.2.
- 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 15.1.9.
- 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.
- 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.
- 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 15.1.13.5.2 of this EIAR.
- TII note that that grid connection proposals were not included in the scoping consultation and set out various items for consideration in the event that the proposed grid connection impacts on the national road network.
 - As set out in Section 15.1.7 it is confirmed that the proposed grid connection route does not impact on the national road network.

Department of Transport

A response to scoping was received from The Department of Transport on the 15th February 2024. The response stated that the Department have no further observations to make on the project and requested to be informed of any updates on relation to the Clonberne Wind Farm Development.

Galway County Council

As outlined in Section 2.7 of this EIAR, pre-planning consultations were held with Galway County Council (GCC) in 2020 and again in 2023. At the first meeting in 2020, a member of the Roads Department of GCC requested that a full assessment of the turbine delivery route be provided with the

benefit of swept path analysis and autotracks analysis. It was also outlined that road realignment works were proposed by GCC and that any autotracks should adopt this where required. There was also a request to liaise with the local engineer for the Tuam area to ensure any works proposed on the network in the area would be taken into consideration where any remedial works are proposed/required to accommodate turbine delivery.

Whilst some temporary works are proposed off the N83 for turbine delivery, these are minor in nature and not commensurate to any realignment works identified by GCC.

The meeting in 2023 was not attended by the Roads Department and was essentially a project update for the local authority in terms of the Strategic Infrastructure status and the approach to both wind farm and grid connection applications as outlined throughout this EIAR. GCC were also updated on the approach to turbine delivery and the minor works involved, and the refined grid connection route which had been reduced in length from the previous meeting.

15.1.1.5 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 period of 2028 to 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 Proposed Access Junctions undertaken for the Proposed Project (Section 15.1.10 – Road Safety),
- A review of the Road Safety Audit undertaken for the Proposed Project (Section 15.1.11 – 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 15.1.12 – Provision for Sustainable Modes of Travel),
- A description of potential significant effects on Roads and Traffic (Section 15.1.13 – Likely and Significant Effect and Associated Mitigation Measures).

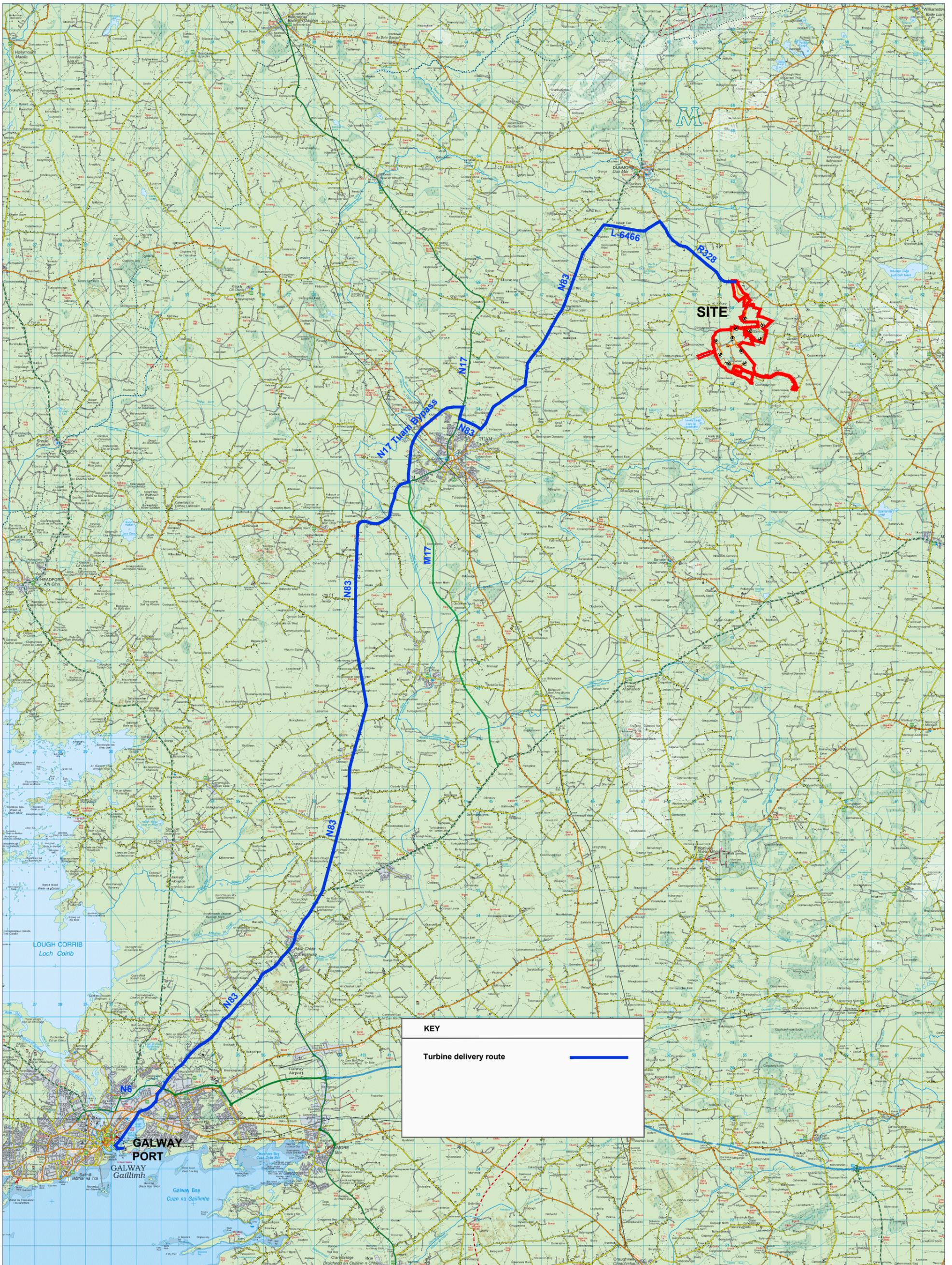
15.1.2 Receiving Environment

15.1.2.1 Site Location

The Proposed Project, known as Clonberne Wind Farm, 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 northeast County Galway, approximately 14km northeast of Tuam and 6.5km southeast of Dunmore. The R328 Dunmore to Clonberne Road runs in a northwest to southeast direction bordering the site to the north. It is proposed that a temporary access road and junction off the R328 will provide access for all traffic during the construction stage of the Proposed Project. The site is currently accessed and traversed by various local tertiary roads, all of which are considered in the site layout described in Section 15.1.10 of the EIAR.

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 15-1a.



KEY

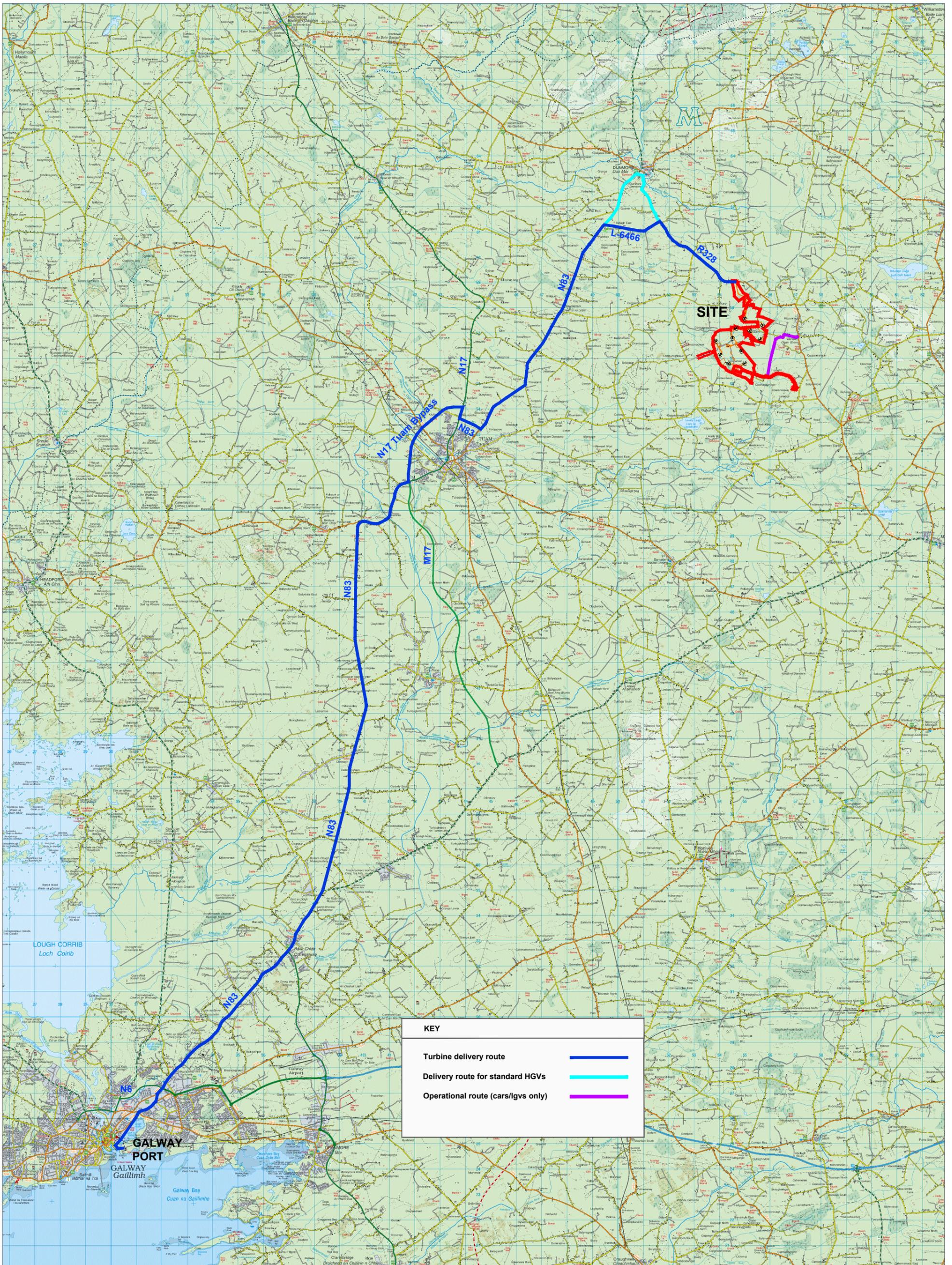
Turbine delivery route

NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-1a Site location and turbine delivery route

PROJECT: Clonberne Wind Farm		ALAN LIPSCOMBE TRAFFIC & TRANSPORT CONSULTANTS
CLIENT: Clonberne Wind Farm Ltd	SCALE: NTS	
PROJECT NO: 7310	DATE: 08.05.24	
		DRAWN BY: AL



KEY

- Turbine delivery route —
- Delivery route for standard HGVs —
- Operational route (cars/igvs only) —

NOTES:
 PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-1b Delivery routes for standard HGVs and for operational maintenance trips

PROJECT: Clonberne Wind Farm	
CLIENT: Clonberne Wind Farm Ltd	SCALE: NTS
PROJECT NO: 7310	DATE: 08.05.24
	DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS

The proposed TDR is as follows;

- From Galway Harbour the route travels northeast on Lough Atalia Road and the R339 for approximately 2.4km to the signalised junction adjacent to Thermo King.
- The route continues left at this junction to travel north for approximately 0.3 km to the junction with the R336 Tuam Road.
- At this point the route turns right onto the R336 to travel approximately 0.3 km 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 28 km through the village of Claregalway to the roundabout with the M17 and N17 Tuam bypass to the southwest of Tuam.
- The route then travels north on the N17 Tuam Bypass for approximately 4.2 km to meet the roundabout with the N83 directly north of Tuam.
- From this point the route travels south for approximately 0.4km on the N83 to the roundabout with Milltown road before travelling east on the N83 for approximately 1 km to the priority junction formed with the Dunmore Road.
- From this point located on the northeast of Tuam the route heads northeast on the N83 for approximately 9.6 km to the local L-6466.
- At this point the Turbine Delivery Route turns right onto the L-6466 heading east for approximately 2.5 km to the junction with the R328 located approximately 2.0km south of Dunmore.
- The route then turns right onto the R328 and heads in a southeastern direction for approximately 3.9 km to the location of a new junction on the south side of the R328 that will provide access for all construction traffic to the 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 15.1.9.

15.1.2.3 Proposed Construction Traffic Haul Route

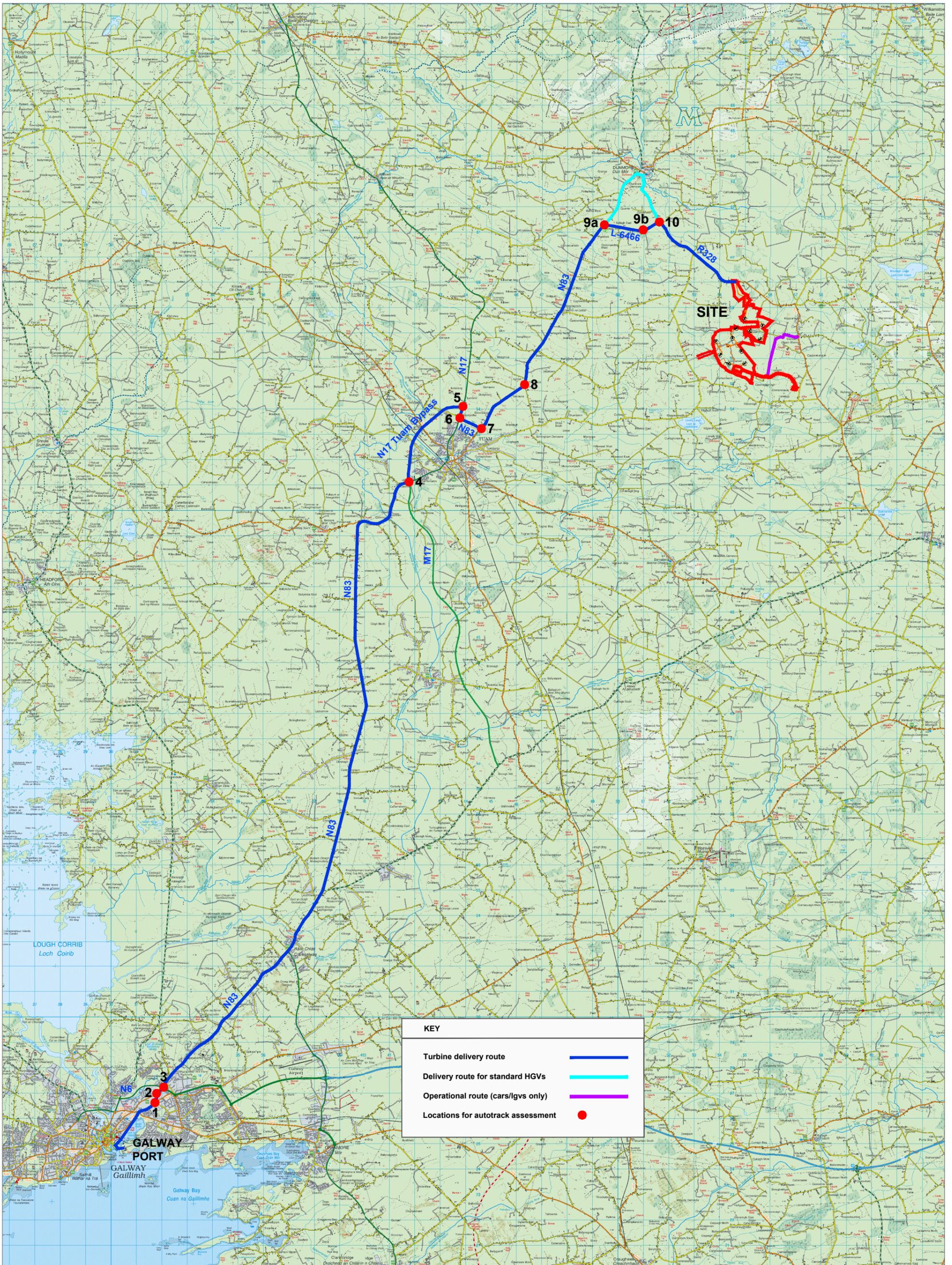
The smaller turbine components that will be delivered to the site by standard HGVs will also arrive at the port in Galway City and will also use the main part of the TDR discussed above. The one section of the delivery route for standard HGVs that differs from the TDR is the section between Tuam, Dunmore and the approach to the site, where standard HGV deliveries will continue north on the N83 to Dunmore, where they will then turn right onto The Green, and then turn right again onto the R328 before travelling southeast on the R328 towards the site. The northern part of the delivery route for standard HGVs is compared to the TDR in Figure 15-1b.

Stone, sand and cement required for the construction of the Proposed Project infrastructure will be sourced from the neighbouring borrow pit and appropriately authorised quarries. All quarries are located to the southwest of the site and all materials provided by these quarries will approach the site via the direction of Tuam and will use the northern section of the TDR.

As discussed above it is proposed that the temporary access junction on the R328 will be closed on the completion of the construction of the Proposed Project. It is proposed that the modest volumes of maintenance traffic that will be generated once the Wind Farm Site is operational will access the site using the existing local road network, as also indicated in Figure 15-1b.

15.1.2.4 Proposed Grid Connection Route

The Proposed Grid Connection includes for the proposed onsite 220kV substation and an associated underground 220kV cabling connecting to the existing 220kV overhead line located in the townland of Laughil. The underground cabling route measuring approximately 2.8km of which approx. 1.4km is



KEY

- Turbine delivery route —
- Delivery route for standard HGVs —
- Operational route (cars/igvs only) —
- Locations for autotrack assessment ●

NOTES:
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Figure 15-2a Autotrack assesment location plan

PROJECT: Clonberne Wind Farm	
CLIENT: Clonberne Wind Farm Ltd	SCALE: NTS
PROJECT NO: 7310	DATE: 08.05.24
	DRAWN BY: AL

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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 6 locations included in the link flow assessment and for which base year 2022 / 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 between Claregalway and Tuam,
- Link 3 – N17 Tuam Bypass,
- Link 4 – N83 between Tuam and Dunmore,
- Link 5 – R328 south of Dunmore, and,
- Link 6 – R328 at site access.

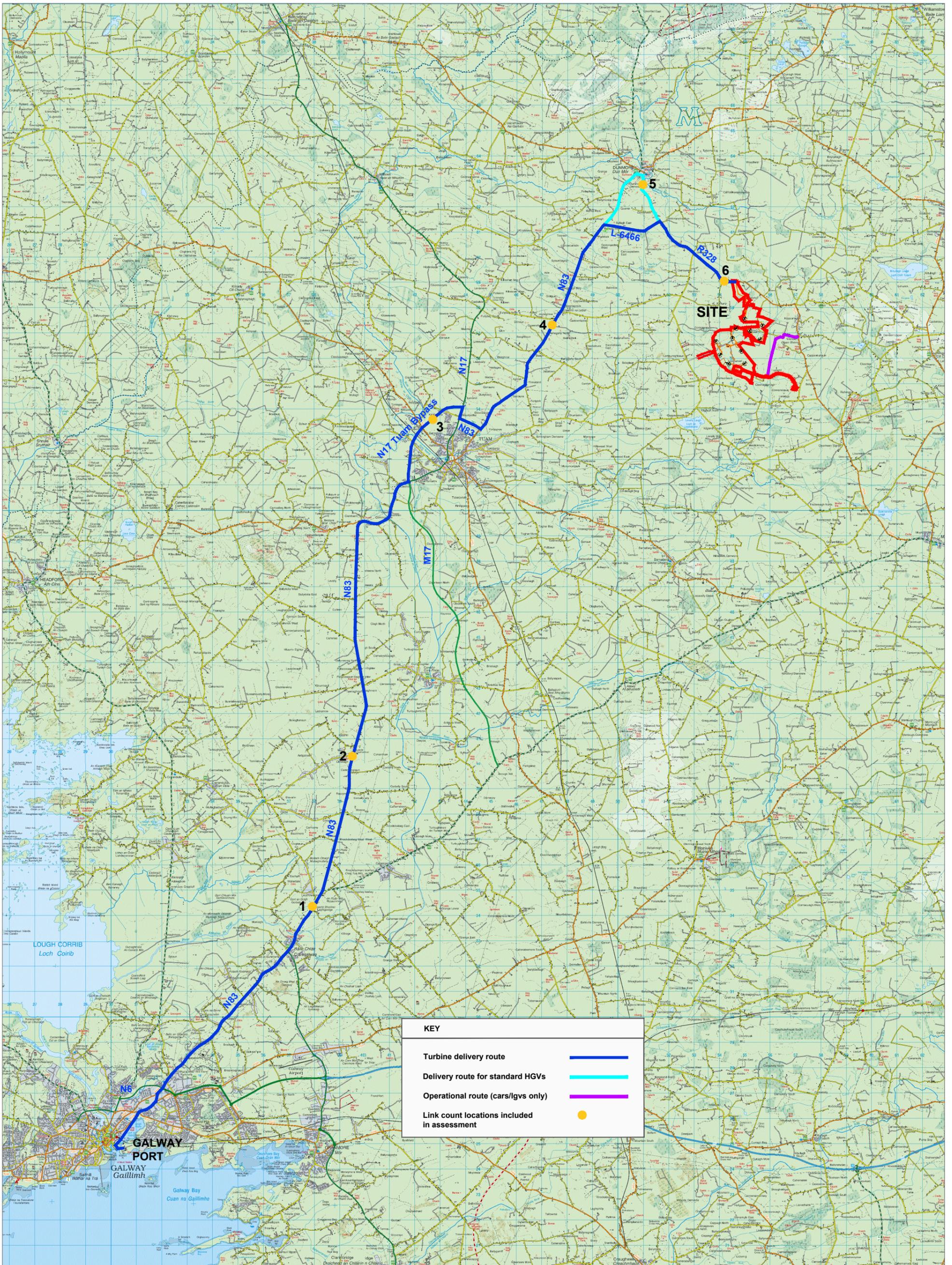
Two sources of data were used to provide all day traffic flows for the links included in the assessment, as set out in Table 15-1. For Links 1 to 4 data obtained from automatic traffic counters maintained by Transport Infrastructure Ireland (TII) was used. For the remaining 2 links, all day traffic counts were undertaken at the on the R328 just to the south of Dunmore (15th February 2022) and just to the west of the proposed access junction (3rd October, 2023) to provide 2-way links flows and junction turning count data. The traffic counts were undertaken by Traffinomics Ltd. All base year traffic count data is included as Appendix 15-3.

The all-day traffic flows observed for the base years 2022 / 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 route, ranging from 18,637 vehicles per day on the N83 between Claregalway and Loughgeorge, to 10,247 vehicles per day on the N83 between Claregalway and Tuam, to 10,638 vehicles on the Tuam Bypass. On the approach to Dunmore traffic volumes on the N83 reduce to 4,486 vehicles per day, with flows reducing further on the R328 to 1,691 vehicles heading southeast out of Dunmore, to 905 vehicles on the R328 approaching the Site access junction.

While link capacities are discussed for the construction year 2030 in further detail in Section 15.1.6.2, 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 = 10,247 vehicles, link capacity = 11,600, and therefore currently operates at 88% of capacity.

As they leave the urban area, the link capacity for each road 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 between Claregalway and Tuam) operating at 88% of capacity. While the traffic flows observed on these links are high it is important to consider the relative increase compared to background traffic



NOTES:

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Figure 15-2b Autotrack assessment location plan

PROJECT: Clonberne Wind Farm

CLIENT: Clonberne Wind Farm Ltd

PROJECT NO: 7310

DATE: 08.05.24

SCALE: NTS

DRAWN BY: AL

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levels when considering the impacts of the Proposed Project. This issue is discussed further in Section 15.1.6.2.

Table 15-1 Count locations and data source.

Link	Data source
1 - N83 between Claregalway and Loughgeorge	TII ATC site
2 - N83 between Claregalway and Tuam	TII ATC site
3 - N17 Tuam Bypass	TII ATC site
4 - N83 between Tuam and Dunmore	TII ATC site
5 - R328 south of Dunmore	Classified count
6 - R328 at site access	Classified count

Note: ATC = Automatic Traffic Count

Table 15-2 All day traffic flows by location, years 2022 and 2023 (2-way vehicles)

Link	2022	2023
1 - N83 between Claregalway and Loughgeorge	NA	18,637
2 - N83 between Claregalway and Tuam	NA	10,247
3 - N17 Tuam Bypass	NA	10,638
4 - N83 between Tuam and Dunmore	NA	4,486
5 - R328 south of Dunmore	1,691	NA
6 - R328 at site access	NA	905

15.1.3.2 Background Traffic Volumes for the Assumed Construction Year 2030

This section describes the process adopted to produce background traffic forecasts for an assumed construction period of 2028 to 2030, with an assessment year of 2030.

Revised guidelines for forecasting annual growth in traffic volumes were produced by TII in October 2021, as set out by county 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 +22.7% during the period from 2022 to 2030, and by +19.6% between the years 2023 to

2030, when the construction of the Proposed Project is forecast to take place. Year 2022 / 2023 and 2030 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 2030 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 2030 (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 15.1.4. For example, in the event that the construction year is 2032 rather than 2030, background traffic volumes will increase from the base year of 2022 by 25.4% rather than 22.7%, 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 counts 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 2.3% observed on Link 2 on the N83 between Claregalway and Tuam, to a maximum of 9.8% observed on the R328 leading to the Site access junction.

Table 15-3 TII traffic growth forecasts, growth per annum and cumulative, County Galway

Year	Cars and lgvs – Annual Factor			Cars and lgvs – Cumulative Factor		
	Low	Medium	High	Low	Medium	High
2022	1.0243	1.0259	1.0294	1.000	1.000	1.000
2023	1.0243	1.0259	1.0294	1.024	1.026	1.029
2024	1.0243	1.0259	1.0294	1.049	1.052	1.060
2025	1.0243	1.0259	1.0294	1.075	1.080	1.091
2026	1.0243	1.0259	1.0294	1.101	1.108	1.123
2027	1.0243	1.0259	1.0294	1.128	1.136	1.156
2028	1.0243	1.0259	1.0294	1.155	1.166	1.190
2029	1.0243	1.0259	1.0294	1.183	1.196	1.225
2030	1.0243	1.0259	1.0294	1.212	1.227	1.261
2031	1.0087	1.0109	1.0148	1.222	1.240	1.280
2032	1.0087	1.0109	1.0148	1.233	1.254	1.298

Table 15-4 TII traffic growth rates by growth scenario

Period	New Factors		
	Low	Medium	High
2022 – 2030	1.212	1.227	1.261
2023 – 2030	1.183	1.196	1.225

Table 15-5 All day traffic flows by location and year (2-way vehicles)

Link	2022	2023	2030
1 - N83 between Claregalway and Loughgeorge	NA	18,637	22,290
2 - N83 between Claregalway and Tuam	NA	10,247	12,255
3 - N17 Tuam Bypass	NA	10,638	12,723
4 - N83 between Tuam and Dunmore	NA	4,486	5,365
5 - R328 south of Dunmore	1,691	NA	2,075
6 - R328 at site access	NA	905	1,082

Table 15-6 All day flows, percentage HGVs and flows by vehicle type, year 2030

Link	All day flow (vehs)	% HGV's	Vehicles		PCUs		
			HGVs	Cars / lgvs	HGVs	Cars / lgvs	Total
1 - N83 between Claregalway and Loughgeorge	22,290	2.7%	602	21,688	1,444	21,688	23,132
2 - N83 between Claregalway and Tuam	12,255	2.3%	282	11,974	676	11,974	12,650
3 - N17 Tuam Bypass	12,723	5.4%	687	12,036	1,649	12,036	13,685
4 - N83 between Tuam and Dunmore	5,365	2.7%	145	5,220	348	5,220	5,568
5 - R328 south of Dunmore	2,075	5.6%	116	1,959	279	1,959	2,238
6 - R328 at site access	1,082	9.8%	106	976	255	976	1,231

Note: % HGVs obtained from traffic counts

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 Project is discussed in Sections 15.1.9, a summary of the proposed access junctions, which are indicated on Figure 15-2c, is provided below.

Proposed construction access off the R328

It is proposed that a new access junction is constructed off the R328 (as shows as Location A on Figure 15-2c) that will provide access to the Site for all traffic generated during the construction phase of the Proposed Project, including the delivery of abnormally sized loads, standard HGVS of various types (cement mixers, trucks and large articulated HGV's) and construction staff car trips. This location is discussed further in Section 15.1.9.

Internal access junctions

The Site access road is traversed by various local access roads with junctions proposed at locations B to G in Figure 15-2c. These locations are discussed further in Section 15.1.10

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 considered in the following stages.

- Stage 1 – Proposed Project construction: groundworks, construction of temporary construction compounds, turbine foundations, on-site 220kV 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 11 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 4-4 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 over an 18-month construction period.

A summary of the number of days that the various construction stages will take place during the overall 18 month construction period (383 working days) is as follows;

- Stage 1 – Concrete foundation pours = 11 days
- Stage 1 – Remaining site preparation and general construction = 332 days
- **All stage 1 = 343 days**
- Stage 2 – Delivery of abnormal loads = 29 days
- Stage 2 – Delivery of other turbine components on standard HGV = 11 days
- **All stage 2 = 40 days**
- **Total construction period = 383 days.**

The above durations are included in the assessment presented 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, , onsite 220kV substation, internal electrical cabling and construction of the Proposed Grid Connection underground cable route, is assumed to last between 16 months (343 days). The total number of deliveries made to the Site during that period are shown in Table 15-7. It is estimated that a total of 4,463 deliveries by truck or standard articulated HGVs will be made to the Site during this period.

During this construction phase there will be two distinct types of days with respect to trip generation. A total of 11 days will be used to pour the 11 concrete wind turbine foundations. Foundations will likely be poured one per day, with circa 107 concrete loads required for each turbine delivered to the Site over a 12-hour period, resulting in 9 HGV trips to and from the site per hour.

On the remaining 332 working days for this stage other general materials will be delivered to the 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 11 days that concrete will be delivered to the Site, an additional 512 two-way PCUs will be added to the network (comprising 107 two-way HGV trips with 2.4 PCUs per movement), as shown in Table 15-8. Similarly, on the 332 days when other materials will be delivered to the Site, traffic volumes on the local network will increase by an average of 48 PCUs, as set out in Table 15-9.

Table 15-7 Trip generation - Stage 1 - Site preparation and groundworks – total loads

Material	Total no. Truck Loads	Truck type
Concrete	1,173	Trucks
Delivery of plant	43	Large artic
Fencing & gates	4	Large artic
Compound setup	44	Large artic
Steel	31	Large artic
Sand / binding / stone / pile foundation	241	Truck
Ducting and cabling (internal)	323	Large artic

Material	Total no. Truck Loads	Truck type
Tree felling	103	Truck
Crane (to lift steel)	1	Large artic
Stone for Proposed Wind Farm	666	Truck
Borrow pit spoil management	842	Truck
Trip generation for Grid connection	378	Truck
Substation	100	Large artic
Cranes for turbines	12	Large artic
Refuelling for plant	227	Large artic
Site maintenance	165	Large artic
Miscellaneous	110	Large artic
Total	4,463	

Table 15-8 Trip generation - Stage 1 – Concrete foundation pouring – total movements and volumes per delivery day

Material	Total Truck Loads	Truck type	PCU Value	Total PCUs	PCU Movements /day*	2-way PCUs/day
Concrete	1,173	Trucks	2.4	2,815	255.9	511.9
* Estimation based on 11 concrete pouring days						

Table 15-9 Trip generation - Stage 1 – Site preparation and groundworks – total movements and volumes per delivery day

Material	Total Truck Loads	Truck type	PCU Value	Total PCUs	PCU Movements /day*	2-way PCUs/day
Delivery of plant	43	Large artic	2.4	103.2	0.31	0.62
Fencing & gates	4	Large artic	2.4	9.6	0.03	0.06
Compound setup	44	Large artic	2.4	105.6	0.32	0.64

Material	Total Truck Loads	Truck type	PCU Value	Total PCUs	PCU Movements /day*	2-way PCUs/day
Steel	31	Large artic	2.4	74.4	0.22	0.45
Sand / binding / stone / pile foundation	241	Truck	2.4	578.4	1.74	3.48
Ducting and cabling (internal)	323	Large artic	2.4	775.2	2.33	4.67
Tree felling	103	Truck	2.4	247.2	0.74	1.49
Crane (to lift steel)	1	Large artic	2.4	2.4	0.01	0.01
Stone for Proposed Wind Farm	666	Truck	2.4	1,598.4	4.81	9.63
Borrow pit spoil management	842	Truck	2.4	2,020.8	6.09	12.17
Trip generation for Grid connection	378	Truck	2.4	907.2	2.73	5.47
Substation	100	Large artic	2.4	240.0	0.72	1.45
Cranes for turbines	12	Large artic	2.4	28.8	0.09	0.17
Refuelling for plant	227	Large artic	2.4	544.8	1.64	3.28
Site maintenance	165	Large artic	2.4	396.0	1.19	2.39
Miscellaneous	110	Large artic	2.4	264.0	0.80	1.59
Total	3,290			7,896.0	23.78	47.57
* Estimation based on groundwork period of 332 working days						

15.1.4.2.2

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 15-10, which summarises that a total of 88 trips will be made to and from the site by extended artics, with a further 44 trips made by standard large articulated HGVs.

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

Material	Units	Quantity per Unit	Total Quantity	Quantity per Truck	Total Truck Loads	Truck type
Nacelle	11	1	11	1	11	Extended Artic
Blades	11	3	33	1	33	Extended Artic
Towers	11	4	44	1	44	Extended Artic
Sub total					88	
Transformer	11	1	11	1	11	Large Artic
Drive train and blade hub	11	1	11	1	11	Large Artic
Base and other deliveries	11	2	22	1	22	Large Artic
Sub total					44	
Total					132	

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 site 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 29 days spread over a 6 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 6 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 15-11 and 15-12. In Table 15-11 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 29 days, while an additional 19.2 PCUs are forecast to be on the network on 11 other days, as shown in Table 15-12, during the turbine construction phase.

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

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

Material	Units	Truck Type	PCU Value	Total PCUs	2-way PCUs/ day
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 88 loads will take 29 nights spread over 6 weeks)					

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

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 over 11 days spread over 2 days for 6 weeks			

Construction Employee Traffic

During the construction of the Proposed Project, it is estimated that 80-100 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 per day during the turbine construction stage (Stage 2).

15.1.4.3 Development Trip Generation – During Operation

It is estimated that the Proposed Project will be unmanned once operational and will be remotely monitored. The only traffic associated with the operational phase of the Proposed Project will be from maintenance personnel. While there will be no schedule maintenance trips required for the Proposed Grid Connection Underground Cabling, ad hoc repairs will 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 Project once it is operational will be minimal, with an estimated 1-2 staff employed on the Proposed Project site at any time. The impact on the network of these trips during the operational stage is discussed in Section 15.1.6.

15.1.4.4 Development Trip Generation – During Decommissioning

Traffic generation to the Proposed Wind Farm 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.

The onsite substation and grid connection cabling will remain in place as it will be under the ownership of the ESB and will form a permanent part of the national electricity grid therefore, 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 Project site will have an overall tip height of 180 metres; blade rotor diameter of 162 metres and hub height of 99 metres. The turbine blades are the longest turbine component and a blade length of 81 metres has been assessed for the turbine delivery assessment for the Proposed Project.

It is noted that various location on the delivery route will be required to raise the rear tip of the blade using a “blade lifter” in order to avoid trees and property boundaries, this is discuss further in Section 15.1.6. The critical vehicles in terms of size and turning geometry requirements and used in the detailed route assessment discussed in Section 15.1.6 are the blade transporter and the tower transporter vehicles, with the geometry of each shown in Figures 15-3a and 15-3b respectively.

The key dimensions are as follows:

Transport of Blades – Articulated HGV with blade

Total length	86.3 m
Length of blade	81.0 m, lifted to 11 at blade, 80.25m in plan
Inner radius	28.0 m

Transport of Tower – Using low-bed or drop deck trailers

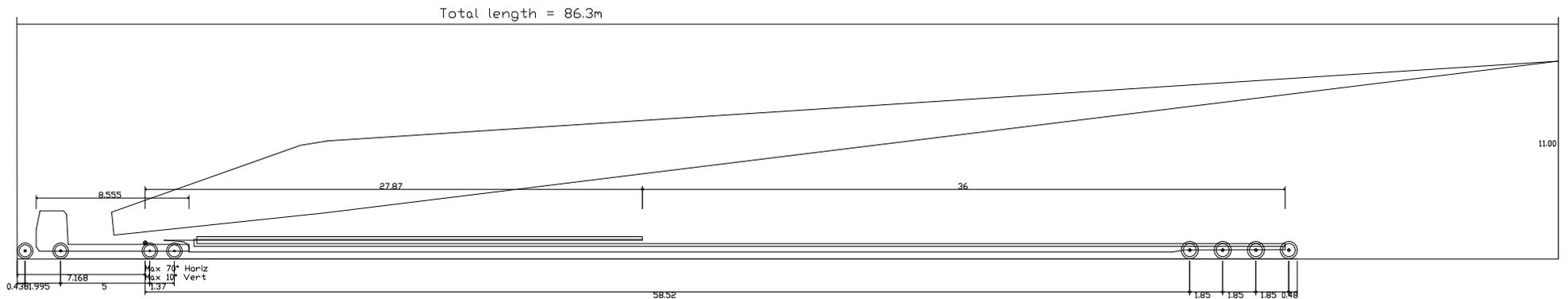
Total length (with load)	46.7 m
Length of load	29 m
Inner radius	25.0 m

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 site entrance off the R328.

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

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.



81.0m blade with lifter and 15m overhang
 Overall Length 71.717m
 Overall Width 2.550m
 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: Clonberne Wind Farm

CLIENT: Clonberne Wind Farm Ltd

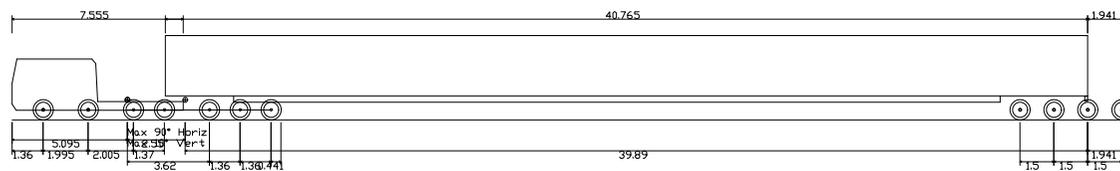
PROJECT NO: 7310

DATE: 06.06.24

SCALE: NTS

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: Clonberne Wind Farm

CLIENT: Clonberne Wind Farm Ltd

PROJECT NO: 7310

DATE: 06.06.24

SCALE: NTS

DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS

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 15.1.6 and shown in Tables 15-13 to 15-16, 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 15-17 to 15-20. 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 11 days when the concrete foundations are poured an additional 582 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 +2.5% on the N83 between Claregalway and Loughgeorge (Link 1), to +10.5% on the N83 south of Dunmore (Link 4). Traveling southeast from Dunmore it is forecast that traffic volumes on the R328 will increase by +26.0% (Link 5), and by +47.3% on the R328 on the approach to the proposed site access junction (Link 6).

During Stage 1 – Site Preparation and Groundworks

For 332 days when the general construction and groundworks are undertaken an additional 118 PCUs will travel to/from the Proposed Wind Farm site.

During the main construction phase it is forecast that the increase in traffic volumes will range from +0.5% on the N83 between Claregalway and Loughgeorge (Link 1), to +2.1% on the N83 south of Dunmore (Link 4). Traveling southeast from Dunmore it is forecast that traffic volumes on the R328 will increase by +5.3% (Link 5), and by +9.6% on the approach to the proposed site access junction (Link 6).

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

On the 29 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 / nights it is forecast that the increase in traffic volumes will range from +0.5% on the N83 between Claregalway and Loughgeorge (Link 1), to +1.9% on the N83 south of Dunmore (Link 4). Traveling southeast from Dunmore it is forecast that traffic volumes on the R328 will increase by +4.7% (Link 5), and by +8.5% on the approach to the proposed site access junction (Link 6).

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

For 11 days an additional 64 PCUs will travel to/from the Proposed Wind Farm site. On these days / nights it is forecast that the increase in traffic volumes will range from +0.3% on the N83 between

Claregalway and Loughgeorge (Link 1), to +1.1% on the N83 south of Dunmore (Link 4). Traveling southeast from Dunmore it is forecast that traffic volumes on the R328 will increase by +2.9% (Link 5), and by +5.2% on the approach to the proposed site access junction (Link 6).

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	21,688	1,444	23,132	70	512	582	21,758	1,956	23,714
2 - N83 between Claregalway and Tuam	11,974	676	12,650	70	512	582	12,044	1,188	13,232
3 - N17 Tuam Bypass	12,036	1,649	13,685	70	512	582	12,106	2,161	14,267
4 - N83 between Tuam and Dunmore	5,220	348	5,568	70	512	582	5,290	860	6,150
5 - R328 south of Dunmore	1,959	279	2,238	70	512	582	2,029	791	2,820
6 - R328 at site access	976	255	1,231	70	512	582	1,046	767	1,813

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 Project)		
	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
1 - N83 between Claregalway and Loughgeorge	21,688	1,444	23,132	70	48	118	21,758	1,492	23,250
2 - N83 between Claregalway and Tuam	11,974	676	12,650	70	48	118	12,044	724	12,768
3 - N17 Tuam Bypass	12,036	1,649	13,685	70	48	118	12,106	1,697	13,803
4 - N83 between Tuam and Dunmore	5,220	348	5,568	70	48	118	5,290	396	5,686

5 - R328 south of Dunmore	1,959	279	2,238	70	48	118	2,029	327	2,356
6 - R328 at site access	976	255	1,231	70	48	118	1,046	303	1,349

Table 15-15 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 Project)		
	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
1 - N83 between Claregalway and Loughgeorge	21,688	1,444	23,132	45	60	105	21,733	1,504	23,237
2 - N83 between Claregalway and Tuam	11,974	676	12,650	45	60	105	12,019	736	12,755
3 - N17 Tuam Bypass	12,036	1,649	13,685	45	60	105	12,081	1,709	13,790
4 - N83 between Tuam and Dunmore	5,220	348	5,568	45	60	105	5,265	408	5,673
5 - R328 south of Dunmore	1,959	279	2,238	45	60	105	2,004	339	2,343
6 - R328 at site access	976	255	1,231	45	60	105	1,021	315	1,336

Table 15-16 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 Project)		
	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
1 - N83 between Claregalway and Loughgeorge	21,688	1,444	23,132	45	19	64	21,733	1,463	23,196
2 - N83 between Claregalway and Tuam	11,974	676	12,650	45	19	64	12,019	695	12,714
3 - N17 Tuam Bypass	12,036	1,649	13,685	45	19	64	12,081	1,668	13,749

Link	Background PCUs			Proposed Project PCUs			Total PCUs (Background + Proposed Project)		
4 - N83 between Tuam and Dunmore	5,220	348	5,568	45	19	64	5,265	367	5,632
5 - R328 south of Dunmore	1,959	279	2,238	45	19	64	2,004	298	2,302
6 - R328 at site access	976	255	1,231	45	19	64	1,021	274	1,295

Table 15-17 Summary daily effects of Proposed Project traffic - concrete pouring - % increase and number of days

Link	Background	Proposed Project	Total	% increase	Estimated No. of days
1 - N83 between Claregalway and Loughgeorge	23,132	582	23,714	2.5%	11
2 - N83 between Claregalway and Tuam	12,650	582	13,232	4.6%	11
3 - N17 Tuam Bypass	13,685	582	14,267	4.3%	11
4 - N83 between Tuam and Dunmore	5,568	582	6,150	10.5%	11
5 - R328 south of Dunmore	2,238	582	2,820	26.0%	11
6 - R328 at site access	1,231	582	1,813	47.3%	11

Table 15-18 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	23,132	118	23,250	0.5%	332
2 - N83 between Claregalway and Tuam	12,650	118	12,768	0.9%	332
3 - N17 Tuam Bypass	13,685	118	13,803	0.9%	332

4 - N83 between Tuam and Dunmore	5,568	118	5,686	2.1%	332
5 - R328 south of Dunmore	2,238	118	2,356	5.3%	332
6 - R328 at site access	1,231	118	1,349	9.6%	332

Table 15-19 Summary daily effect of Proposed Wind Farm traffic - turbine construction, extended artics - % increase and number of days

Link	Background	Proposed Project	Total	% increase	Estimated No. of days
1 - N83 between Claregalway and Loughgeorge	23,132	105	23,237	0.5%	29
2 - N83 between Claregalway and Tuam	12,650	105	12,755	0.8%	29
3 - N17 Tuam Bypass	13,685	105	13,790	0.8%	29
4 - N83 between Tuam and Dunmore	5,568	105	5,673	1.9%	29
5 - R328 south of Dunmore	2,238	105	2,343	4.7%	29
6 - R328 at site access	1,231	105	1,336	8.5%	29

Table 15-20 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	23,132	64	23,196	0.3%	11
2 - N83 between Claregalway and Tuam	12,650	64	12,714	0.5%	11
3 - N17 Tuam Bypass	13,685	64	13,749	0.5%	11

Link	Background	Proposed Project	Total	% increase	Estimated No. of days
4 - N83 between Tuam and Dunmore	5,568	64	5,632	1.1%	11
5 - R328 south of Dunmore	2,238	64	2,302	2.9%	11
6 - R328 at site access	1,231	64	1,295	5.2%	11

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 15-21 to 15-23 with the capacity of the links on the route options, as shown in Table 15-21, varying from 20,000 vehicles per day on the N17 Tuam Bypass, down to 5,000 vehicles per day for on the N83 approaching Dunmore and the R328 leading to the site access. 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.

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 flows, are compared to flows forecast for the various construction delivery stages, in Table 15-22, with the percentage capacity reached for each stage shown in Table 15-23.

Based on this assessment, it is forecast that the N17 Tuam Bypass (68%), and the R328 heading south from Dunmore (45%) and approaching the site (25%) are forecast to operate well within link capacity by the construction year 2030 without the additional traffic forecast to be generated by the Proposed Project. For these links it is forecast that all will remain well within link capacity, increasing to a maximum during the 11 days when the concrete foundations will be poured to 71% on the N17 Tuam Bypass, 56% on the R328 heading south from Dunmore, and 36% on the R328 approaching the site.

With respect to the N83, it is forecast that all sections will operate over capacity by the construction year 2030 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 2030 will range from +109% on the N83 between Claregalway and Tuam, to +111% on the N83 between Tuam and Dunmore, to +269% 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. It is forecast that the N83 between Claregalway and Tuam is forecast to operate at 109% of capacity by the year 2030 with background traffic only, increasing to a maximum of 114% for the 11 days during which the concrete foundations are poured. For all other construction days, the link is forecast to operate at a maximum of 110% capacity, or 1% point above background levels. Similar levels of increases are forecast for the N83 Tuam and Dunmore (background 111%, increasing to 123% during the 11 day concrete pours, reducing to maximum of 114%, or 3% points above background levels during remainder of construction period), and for the N83 between Claregalway and Loughgeorge (background 269%, increasing to 276% during the 11 day concrete pours, reducing to maximum of 270%, or 1% points above background levels during remainder of construction period).

Table 15-21 Delivery route carriageway widths, 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 between Claregalway and Tuam	Type 1 single	11,600
3 - N17 Tuam Bypass	Type 2 dual	20,000
4 - N83 between Tuam and Dunmore	Type 1 single	5,000
5 - R328 south of Dunmore	Type 1 single	5,000
6 - R328 at site access	Type 1 single	5,000

Table 15-22 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	Other site works	Turbine plant	Turbine equipment
1 - N83 between Claregalway and Loughgeorge	8,600	23,132	23,714	23,250	22,237	23,196
2 - N83 between Claregalway and Tuam	11,600	12,650	13,232	12,768	12,755	12,714
3 - N17 Tuam Bypass	20,000	13,685	14,267	13,803	13,790	13,749
4 - N83 between Tuam and Dunmore	5,000	5,568	6,150	5,686	5,673	5,632
5 - R328 south of Dunmore	5,000	2,238	2,820	2,356	2,343	2,302

Link	Link capacity (Level of Service D)	Construction delivery stage				
6 - R328 at site access	5,000	1,231	1,813	1,349	1,336	1,295

Table 15-23 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	Other site works	Turbine plant	Turbine equipment
1 - N83 between Claregalway and Loughgeorge	8,600	269%	276%	270%	270%	270%
2 - N83 between Claregalway and Tuam	11,600	109%	114%	110%	110%	110%
3 - N17 Tuam Bypass	20,000	68%	71%	69%	69%	69%
4 - N83 between Tuam and Dunmore	5,000	111%	123%	114%	113%	113%
5 - R328 south of Dunmore	5,000	45%	56%	47%	47%	46%
6 - R328 at site access	5,000	25%	36%	27%	27%	26%

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 Proposed Wind Farm access junction and the R328. As set out above, the R328 is forecast to increase by 8.6% during the main

construction phase lasting 332 working days (see Table 15-18), which is approaching the TII threshold of +10% that requires a detailed junction capacity test.

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 R328 / Wind Farm Access Junction Capacity Test Results

The AM and PM peak hour traffic flows for the base year 2030 and the proposed construction year of 2030 are shown in Figures 15-4a and 15-4b respectively. The additional traffic movements that are forecast to be generated by construction workers are shown in Figure 15-4c, with proposed construction year 2030 traffic flows including the additional construction traffic shown in Figure 15-4d. The results of the junction capacity tests are set out in Table 15-24 and show that the construction traffic accessing the Proposed Wind Farm access junction will be accommodated with a maximum ratio of flow to capacity (RFC) forecast to be 4.9%. Similarly for construction traffic exiting the Proposed Wind Farm site during the PM peak hour, it is also forecast that these trips will be accommodated, with a maximum RFC of 7.4%.

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 15-24 Junction capacity test results, R328 / Wind Farm Access junction, AM and PM peak hours, with construction traffic, by time period, year 2030

Arm	AM peak hour			PM peak hour		
	RFC	Queue (vehicles)	Delay (minutes)	RFC	Queue (vehicles)	Delay (minutes)
From Wind Farm access	0.0%	0.00	0.00	7.4%	0.08	0.12
Right turn into Wind Farm	4.9%	0.06	0.06	0.0%	0.00	0.00

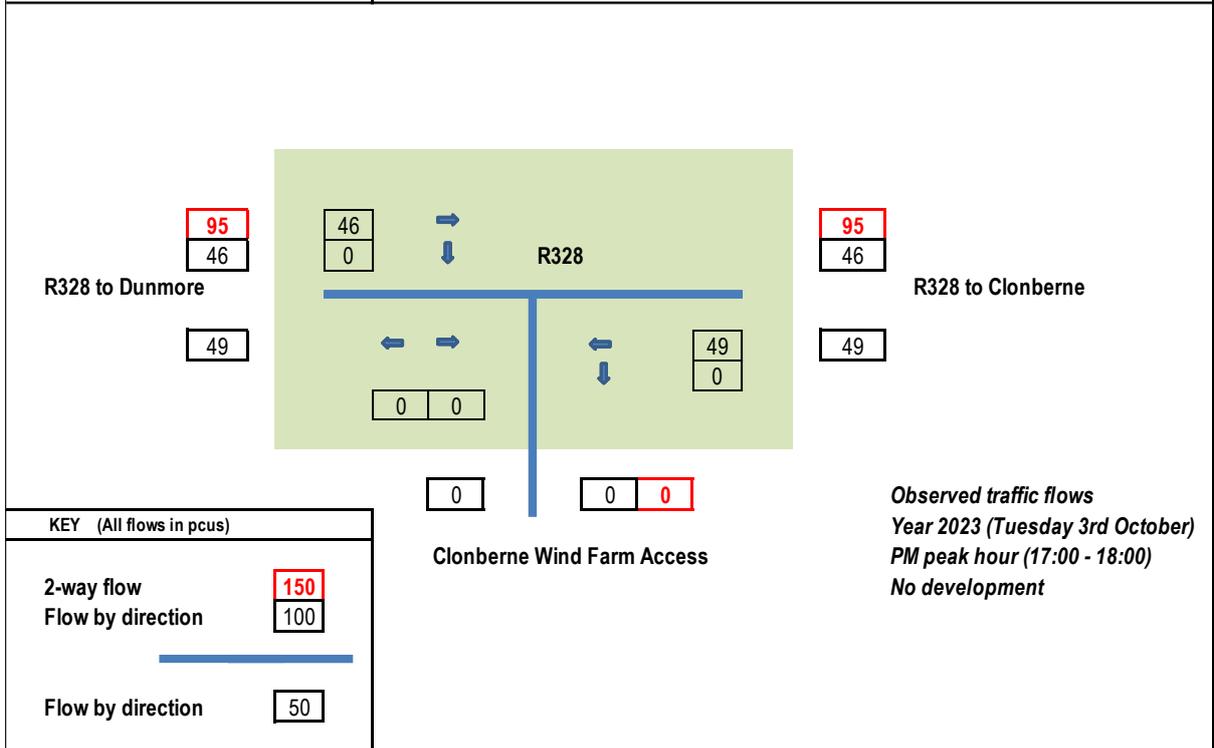
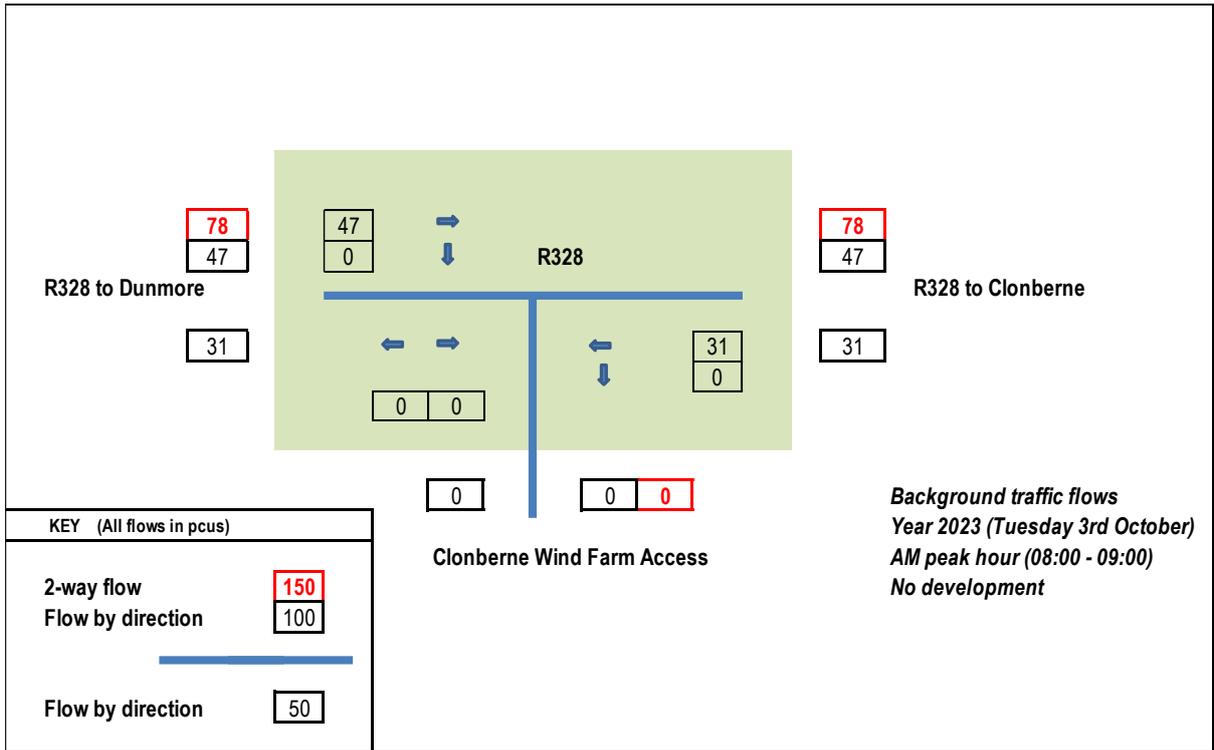


Figure 15-4a Observed traffic flows, R328 / site access junction
 AM and PM peak hours, year 2023, pcus

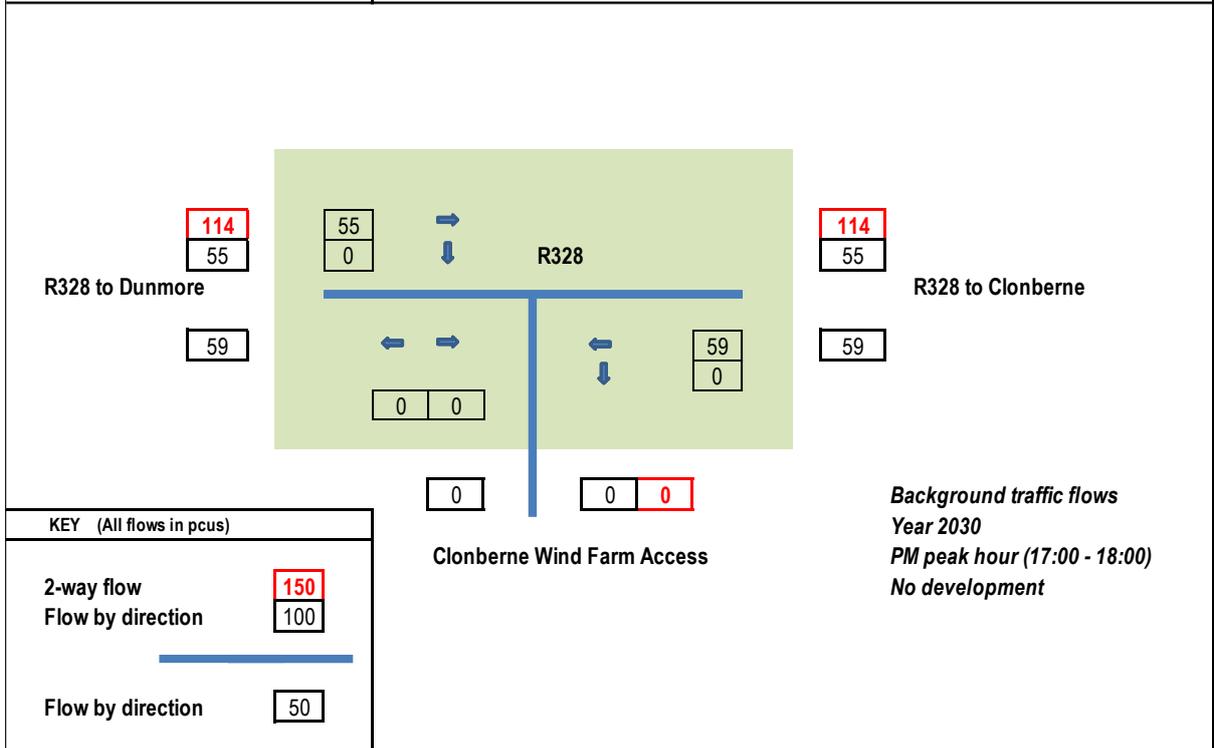
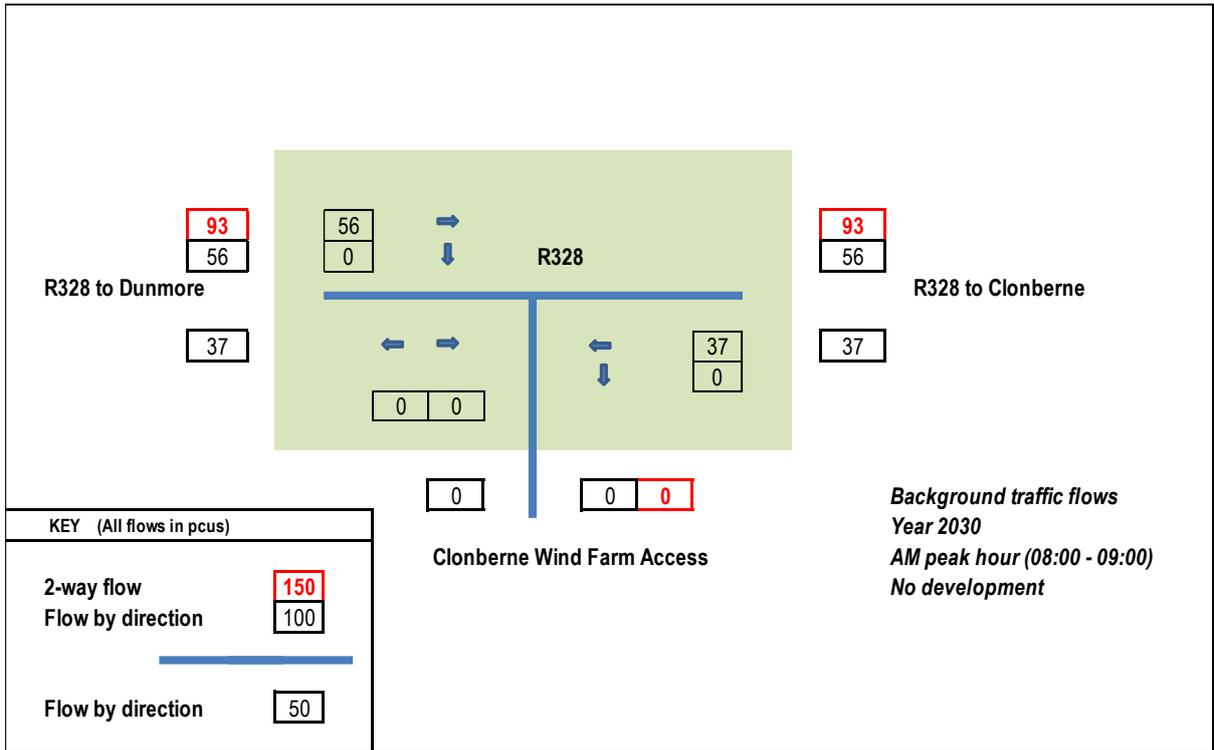


Figure 15-4b Background traffic flows, R328 / site access junction
 AM and PM peak hours, year 2030, pcus

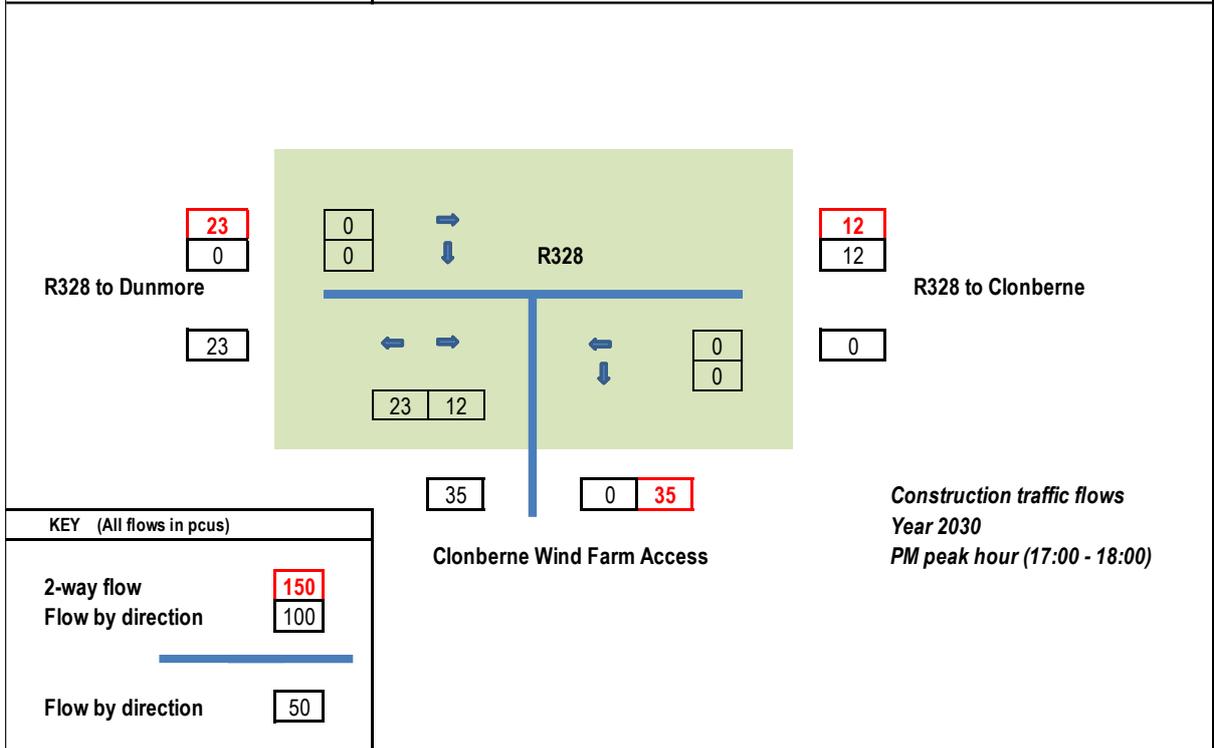
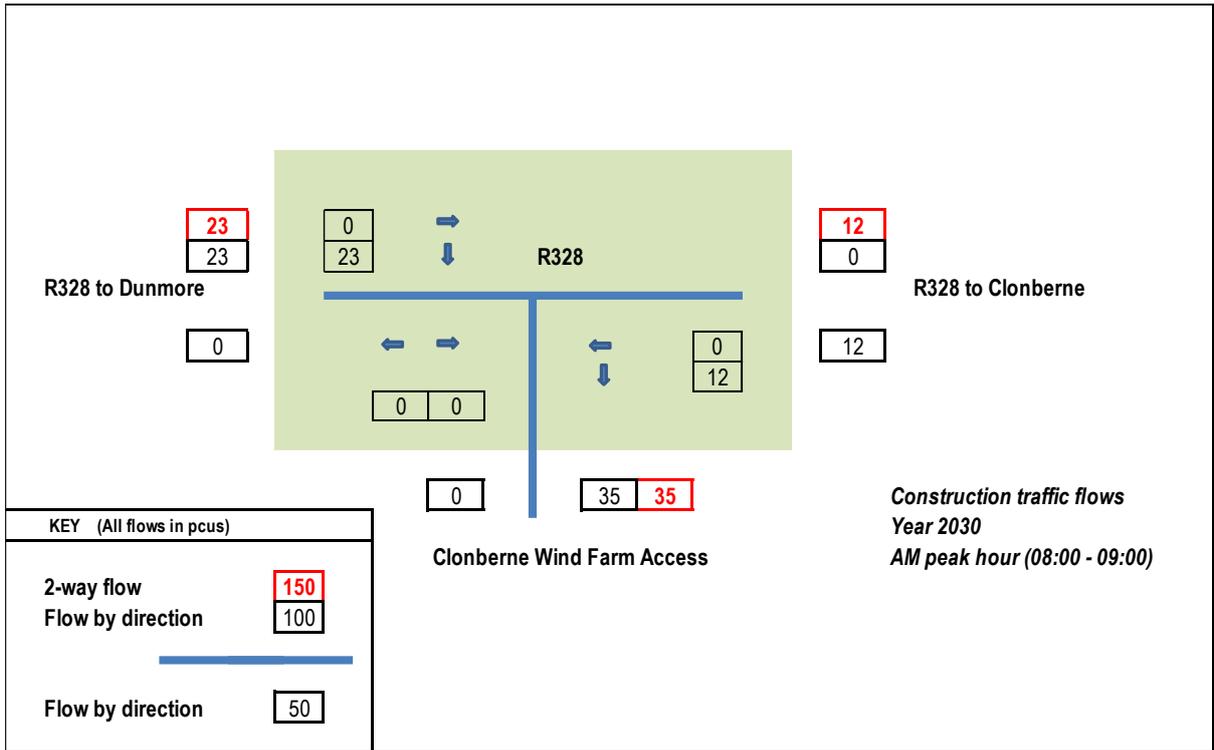
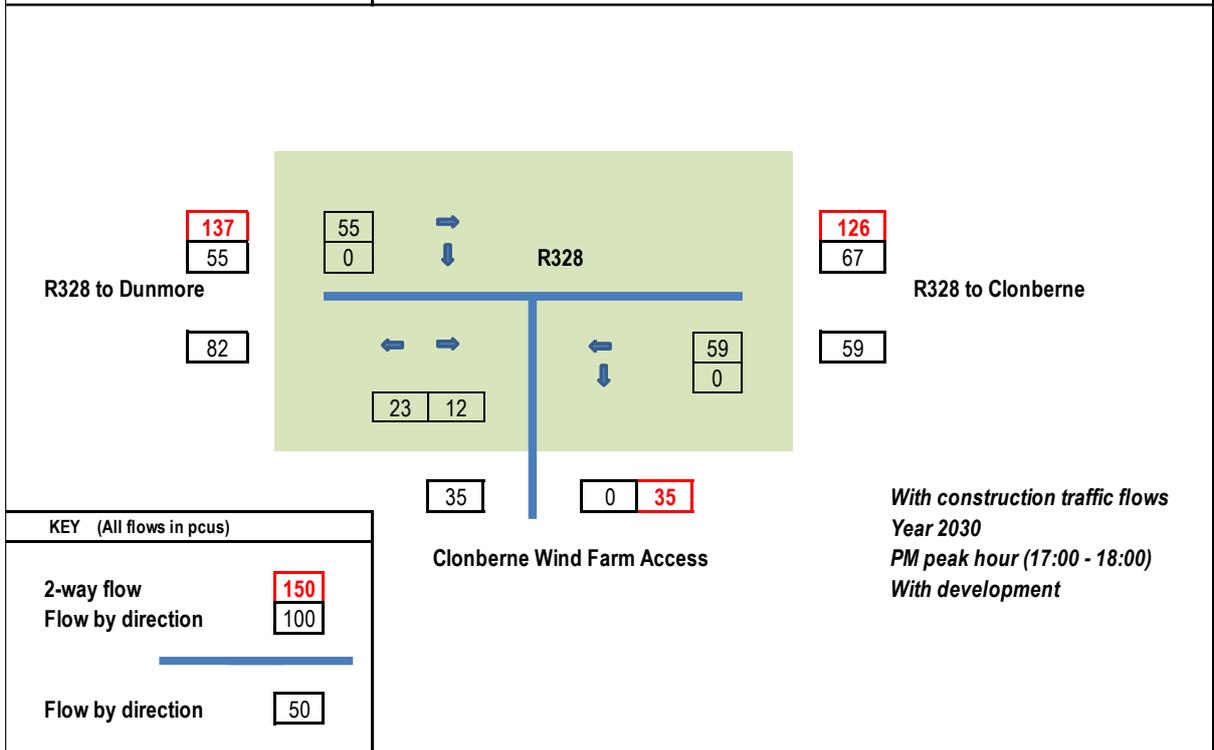
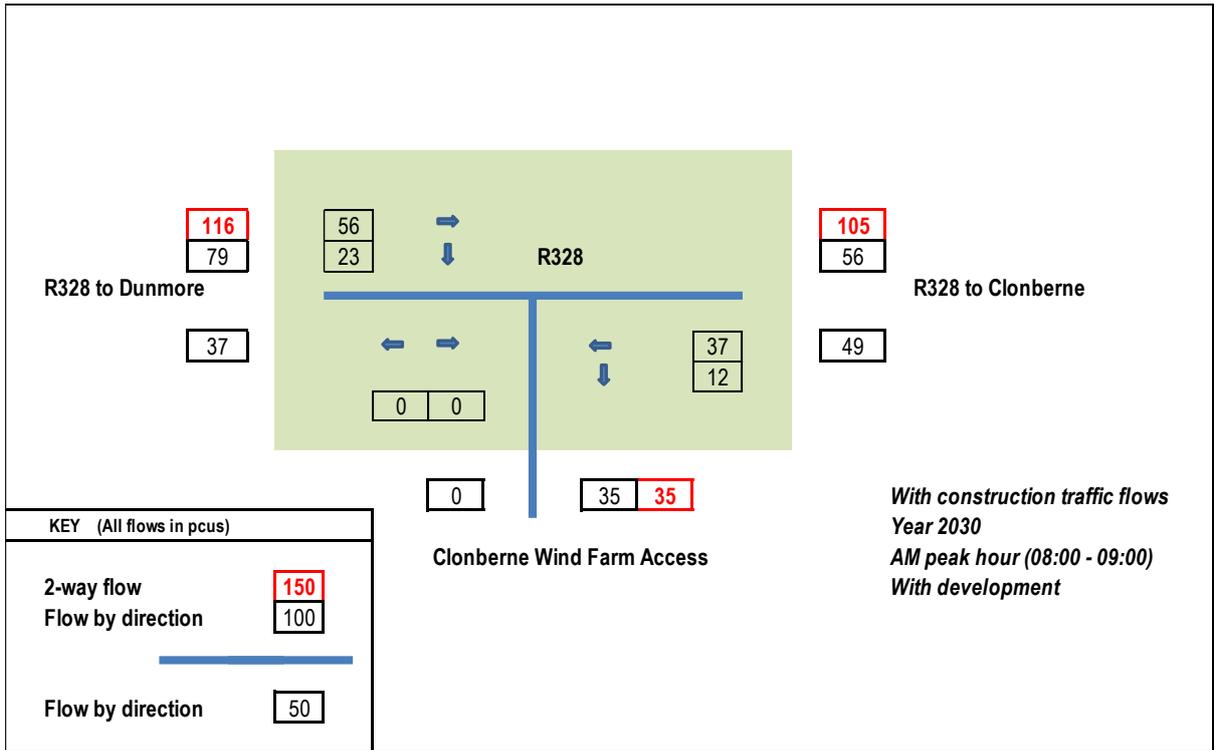


Figure 15-4c Development generated traffic flows, R328 / site access junction AM and PM peak hours, pcus



15.1.6.4.3 *Effect on Junctions – During Operation*

As discussed in Section 15.1.4.3 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**

A detailed description of the Proposed Grid Connection is provided in Chapter 4 of this EIAR. It is proposed that the 220kV onsite electrical substation is connected by means of an underground 220kV electricity cable to the existing 220kV overhead line located in the townland of Laughil. The proposed grid connection is shown in Figure 15-5a and is approximately 2.8 km in length, of which 1.4 km is located along the public road corridor.

The 220kV 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 underground grid connection cable route is also considered in Section 15.1.6. All traffic for the proposed Grid Connection and the substation will be delivered via the R348, the proposed access junction, and delivered along the site access road to the site of the substation at the western end of the grid connection route.

It is estimated that construction of the 2.8 km grid connection will commence at the western end at the connection with the proposed 220kV substation and will progress eastwards at a rate of approximately 100m / day, to the connection into the existing overhead line, with the construction for this element forecast to last approximately 28 days.

It is proposed that a 1.4 km section of the proposed grid connection will be installed on the public road, as shown in Figure 15-5b. As the public road will require to be closed during the 14 days construction of this section, the proposed diversion route for local traffic is also shown in Figure 15-5b. The proposed diversion route is a maximum of 5.1km which will result in a 3.7 km diversion on these days. It is noted that the local road is very lightly trafficked and the diversion will therefore be incurred by very few trips.

With respect to the traffic volumes that will be generated during the construction of the underground electrical 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 15-1 of this EIAR, will be finalised and confirmatory detailed provisions in respect of traffic management agreed with the roads 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.

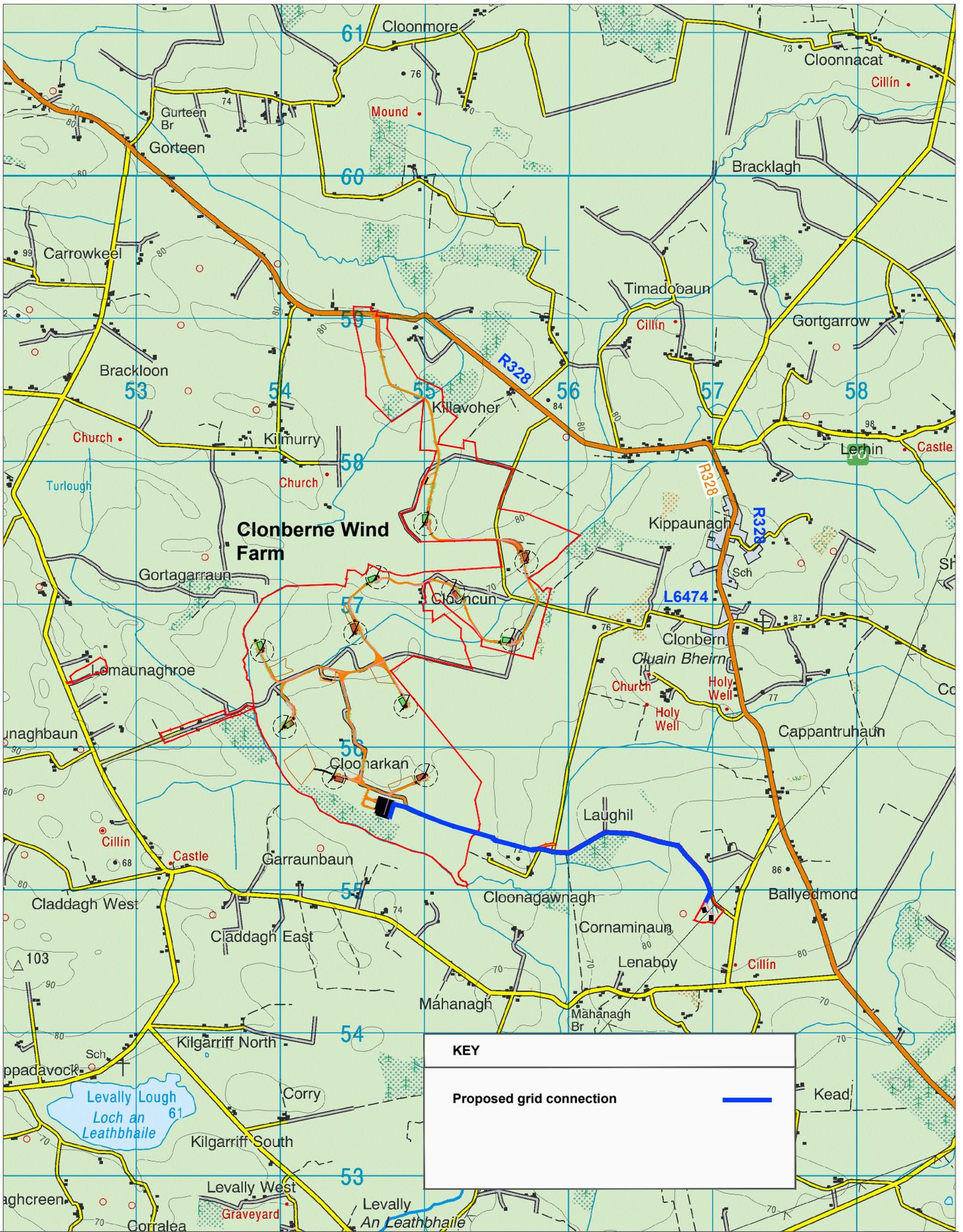


Figure 15-5a Proposed grid connection

PROJECT: Clonberne Wind Farm		SCALE: NTS
CLIENT: Clonberne Wind Farm Ltd		
PROJECT NO: 7310	DATE: 15.02.24	DRAWN BY: AL

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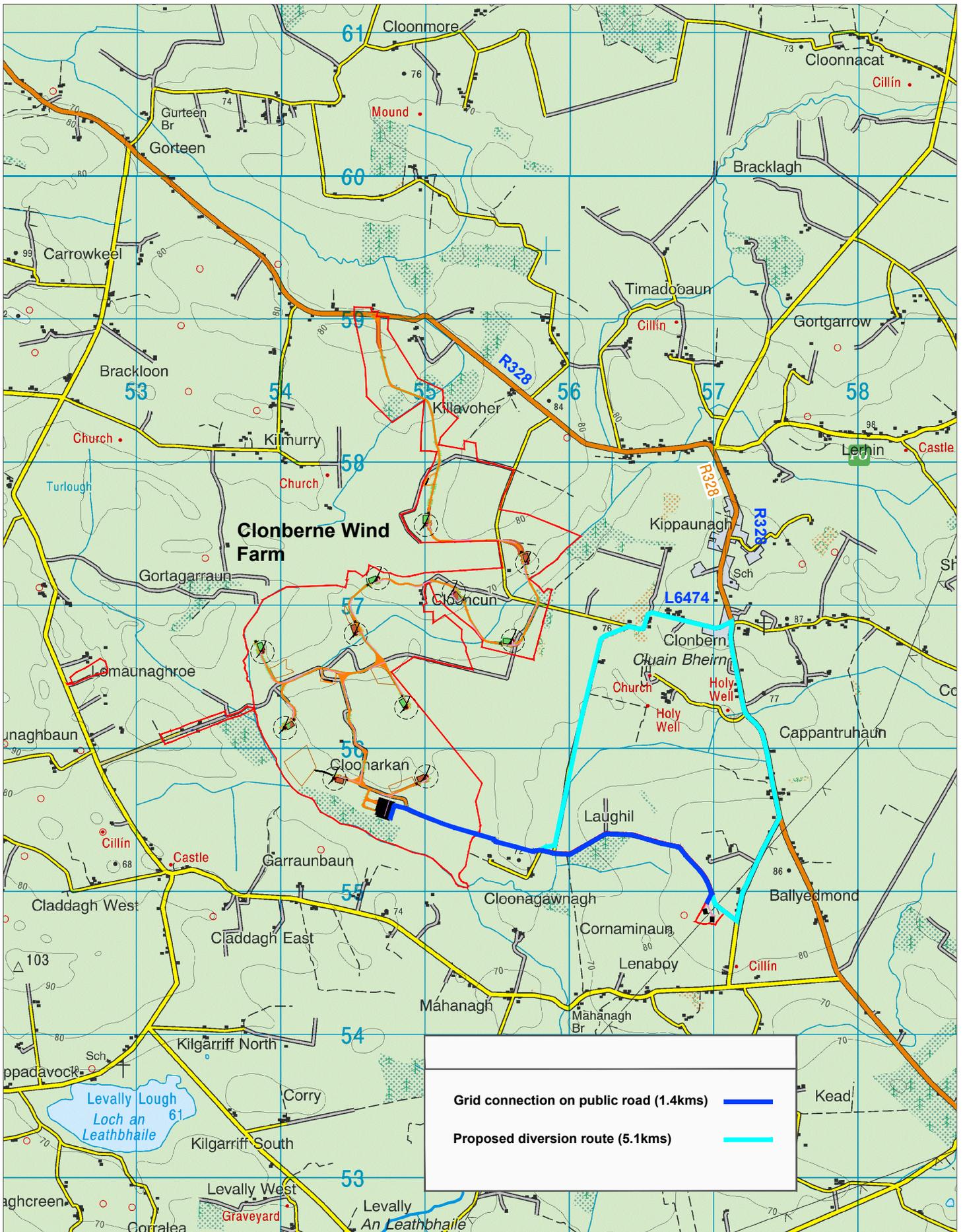


Figure 15-5b Proposed grid connection - section on public road and proposed diversion route

PROJECT: Clonberne Wind Farm

CLIENT: Clonberne Wind Farm Ltd

PROJECT NO: 7310

DATE: 15.02.24

SCALE: NTS

DRAWN BY: AL

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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 roads 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 4-4 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 street furniture, signs, posts and traffic signals (Galway City Centre only) will require to be temporarily removed at various locations on the TDR on the evenings that the abnormally sized loads are delivered to the site. 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 (Appendix 15-4) 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 (Appendix 15-4) 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 (Appendix 15-4) 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 / N17 Tuam Bypass / M17 roundabout

The swept path analysis undertaken for this junction is shown for the blade and tower transporters in Figures 15-12 and 15-13 (Appendix 15-4) respectively. The swept path analysis demonstrates that temporary over-run of the splitter island on the N83 approach to the roundabout will be required for the turbine transport vehicles to be accommodated at this location.

Location 5 – N17 Tuam Bypass / N83 roundabout

The swept path analysis undertaken for this roundabout are shown for the blade and tower transporters in Figures 15-14 and 15-15 (Appendix 15-4) respectively. At this junction the TDR turns right at the roundabout and the swept path assessment shows a small section of the centre island will be required for the delivery of the blade vehicles and that over-sail of the blade tip will be required outside the carriageway edge at the northwest corner of the roundabout. It is noted that a section of the centre line cabling and bollards on the N17 Tuam Bypass approach to the roundabout will require to be removed on the evenings that the abnormally sized deliveries are made to the site.

Location 6 – N83 / N83 / Milltown Road roundabout

The swept path analysis undertaken for this roundabout is shown for the blade and tower transporters in Figures 15-16 and 15-17 (Appendix 15-4) respectively. At this junction the TDR heads east from the roundabout. The assessment shows that minor over-run of the roundabout centre island will be required and that over-sail of the blade tip will be required at properties on the western side of the approach to the roundabout. A temporary over-run of the centre island and removal of a section of the centre line cabling and bollards will be required on the N83 southbound approach to the roundabout, and a temporary over-run of the splitter island on the eastern arm of the N83 approach to the roundabout will also be required.

Location 7 – N83 / N83 / Dunmore Road junction

As the turbine delivery vehicles negotiate this junction a run over area will be required on the southwest corner of the junction, and oversail of the northern corner of the junction will also be required, as shown in Figures 15-18 and 15-19 (Appendix 15-4).

Location 8 – Bend on N83

The swept path analysis for the turbine delivery vehicles negotiating this location are shown in Figures 15-20 and 15-21. The assessment shows that the blade will be required to overhang the boundary on the north west corner of the bend and the rear of the blade will require to oversail the boundary on the southern side of the N83.

Location 9a – N83 / L-6466, Location 9b – Bend on L-6466 and Location 10 – R328 / L-6466 junction

At the existing N83 / L-6466 junction, the bend on the L-6466 and the R328 / L6466 junction, the areas of land that will be required temporarily to accommodate the abnormally sized turbine vehicles are shown in Figures 15-22a, 15-22b and 15-25, while the swept path analysis for the blade and tower vehicles are set out in Figure 15-23a, Figure 15-24a, Figure 15-23b, Figure 15-24b, Figure 15-26 and

Figure 15-27 (Appendix 15-4). The figures show that these vehicles will be accommodated in the land indicated.

15.1.10 Proposed Project Access Junctions

The location of the site access junctions A to H are shown in Figure 15-2c and are described below.

Junction A – Construction access junction on R328 – Proposed temporary access for abnormally sized loads and general construction traffic

The proposed temporary access junction on the R328 for the abnormally sized loads, which will be accompanied by a Garda escort, standard HGVs and construction staff, is shown in Figure 15-28. The access is situated on the southern side of the R328 where an 80 km/h speed limit applies. The proposed junction radii are 13m with 1:10 tapers provided for standard HGV access in accordance with TII DN-GEO-03060. STOP road markings and signs are as per Figure 7.35 of the Traffic Signs Manual.

The proposed junction includes a run-over area at the southwestern corner in order to facilitate the delivery of the abnormally sized turbine loads. On completion of the delivery of the abnormally sized loads the temporary run-over areas will be closed off to traffic with the layout resorting to the standard layout described above.

The available visibility splays at Junction A are shown in Figure 15-29. Looking west from the access junction a visibility splay of 160m taken from a setback of 3.0m is available, which is appropriate for the 80 km/h speed limit as set out in the Galway County Development Plan 2023-2029, Chapter 15 Development Management Standards, Table 15.3. To the east the visibility splays is constrained to a distance of 67m due to a neighbouring site boundary. It is proposed to mitigate against this shortfall using a series of traffic management measures, which are included in the Traffic Management Plan set out in Section 15.1.13.5.2 and the Traffic Management Plan included as Appendix 15-1, including the following;

- An application to Galway County Council for a temporary reduction of the speed limit on this section of the R328 to 50 km/h during the 18 month construction phase of the Proposed Project,
- The introduction of Traffic signs 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). The proposed traffic management measures will be submitted to Galway Councils Roads section for agreement prior to the construction phase.
- The provision of a flagman at all times that the proposed access junction is in use during the construction phase.
- The closure of the site access by means of temporary fencing and gates during periods when the access is not in use, including evenings during the construction phase.
- The permanent closure of the site access junction on completion of the construction phase. This junction will only be opened for the purpose of the replacement of large component parts.

The autotrack assessment shown in Figures 15-30 and 15-31 demonstrates that the temporary access proposed on the R328 will accommodate the turning requirements of the blade and tower transport vehicles, with over-sail of the blade required on the northside of the R328. Similarly, the autotrack assessment set out in Figure 15-32 demonstrates that the junction layout proposed to accommodate the standard HGVs will accommodate a large articulated HGV.

Junctions B and C – L-6474 local road / site access road junctions

Junctions B and C are shown in Figures 15-33 and 15-34 respectively. Visibility splays of 70m which are appropriate for the safe design speed, considered to be 50km/h based on the nature of the L-6474 local road, are shown along the local roads at both location. It is noted that in general visibility splays on the

Access Junction A

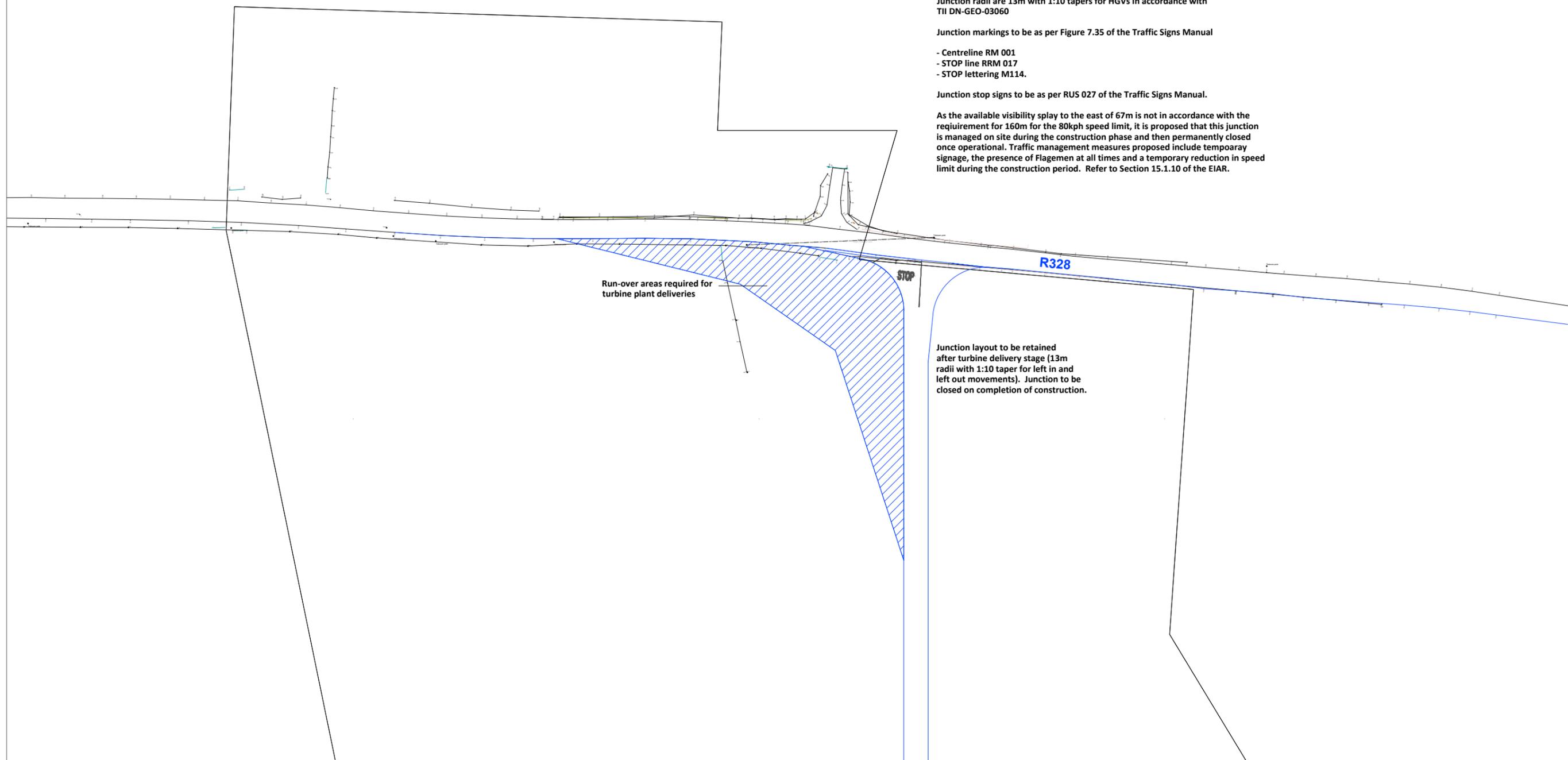
Junction radii are 13m with 1:10 tapers for HGVs in accordance with TII DN-GEO-03060

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.

As the available visibility splay to the east of 67m is not in accordance with the requirement for 160m for the 80kph speed limit, it is proposed that this junction is managed on site during the construction phase and then permanently closed once operational. Traffic management measures proposed include temporary signage, the presence of Flagmen at all times and a temporary reduction in speed limit during the construction period. Refer to Section 15.1.10 of the EIAR.



Run-over areas required for turbine plant deliveries

STOP

R328

Junction layout to be retained after turbine delivery stage (13m radii with 1:10 taper for left in and left out movements). Junction to be closed on completion of construction.

NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-28 Junction A - Construction access on R328 - Proposed temporary access for abnormally sized loads and general construction traffic

PROJECT:	Clonberne Wind Farm	
CLIENT:	Clonberne Wind Farm Ltd	SCALE: 1:1000
PROJECT NO: 7310	DATE: 04.06.24	DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS

Access Junction A

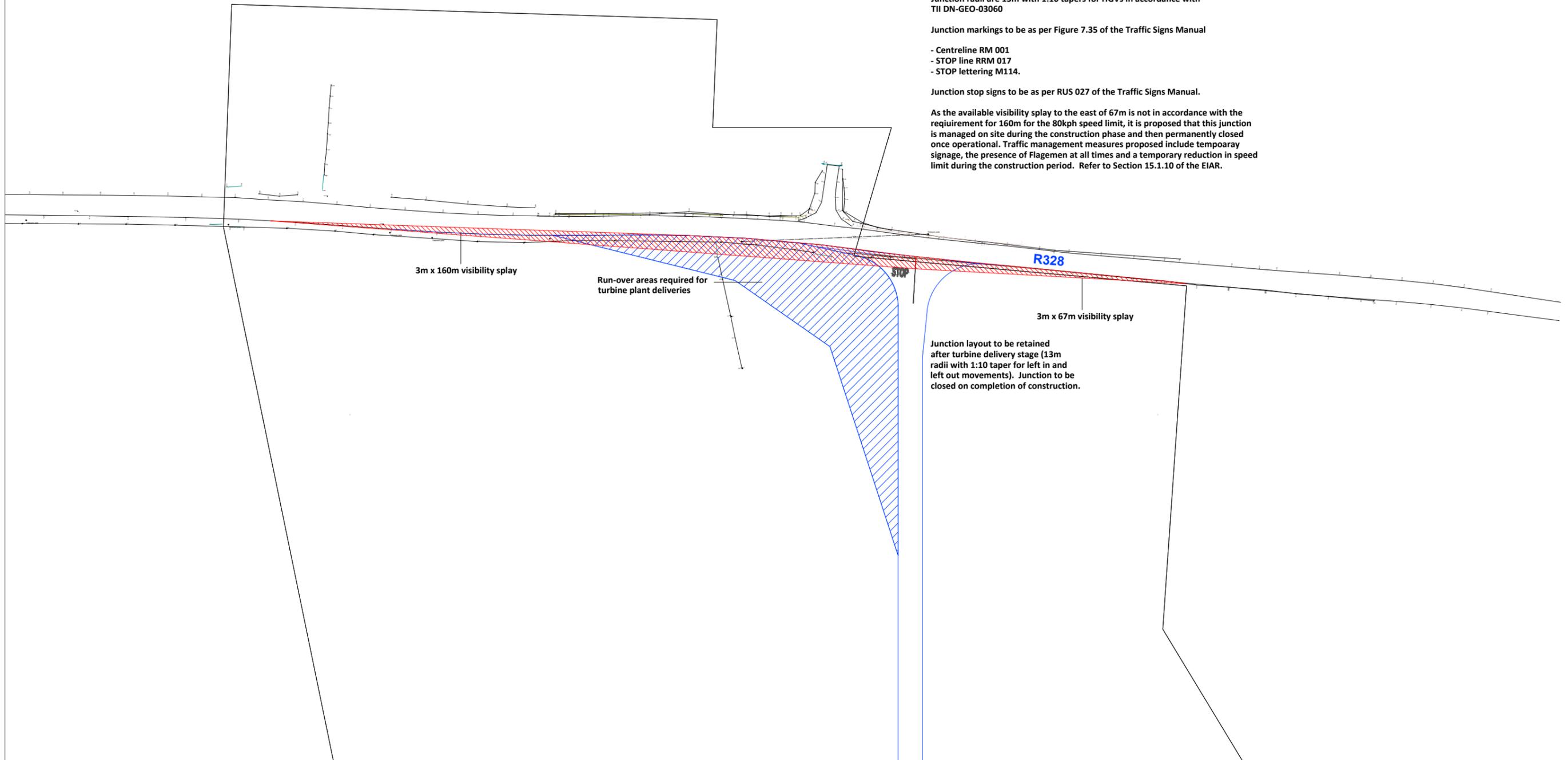
Junction radii are 13m with 1:10 tapers for HGVs in accordance with TII DN-GEO-03060

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.

As the available visibility splay to the east of 67m is not in accordance with the requirement for 160m for the 80kph speed limit, it is proposed that this junction is managed on site during the construction phase and then permanently closed once operational. Traffic management measures proposed include temporary signage, the presence of Flagmen at all times and a temporary reduction in speed limit during the construction period. Refer to Section 15.1.10 of the EIA.



Junction layout to be retained after turbine delivery stage (13m radii with 1:10 taper for left in and left out movements). Junction to be closed on completion of construction.

NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-29 Junction A - Construction access on R328 - Proposed temporary access for abnormally sized loads and general construction traffic - available visibility splays

PROJECT:	Clonberne Wind Farm	
CLIENT:	Clonberne Wind Farm Ltd	SCALE: 1:1000
PROJECT NO: 7310	DATE: 04.06.24	DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS

Access Junction A

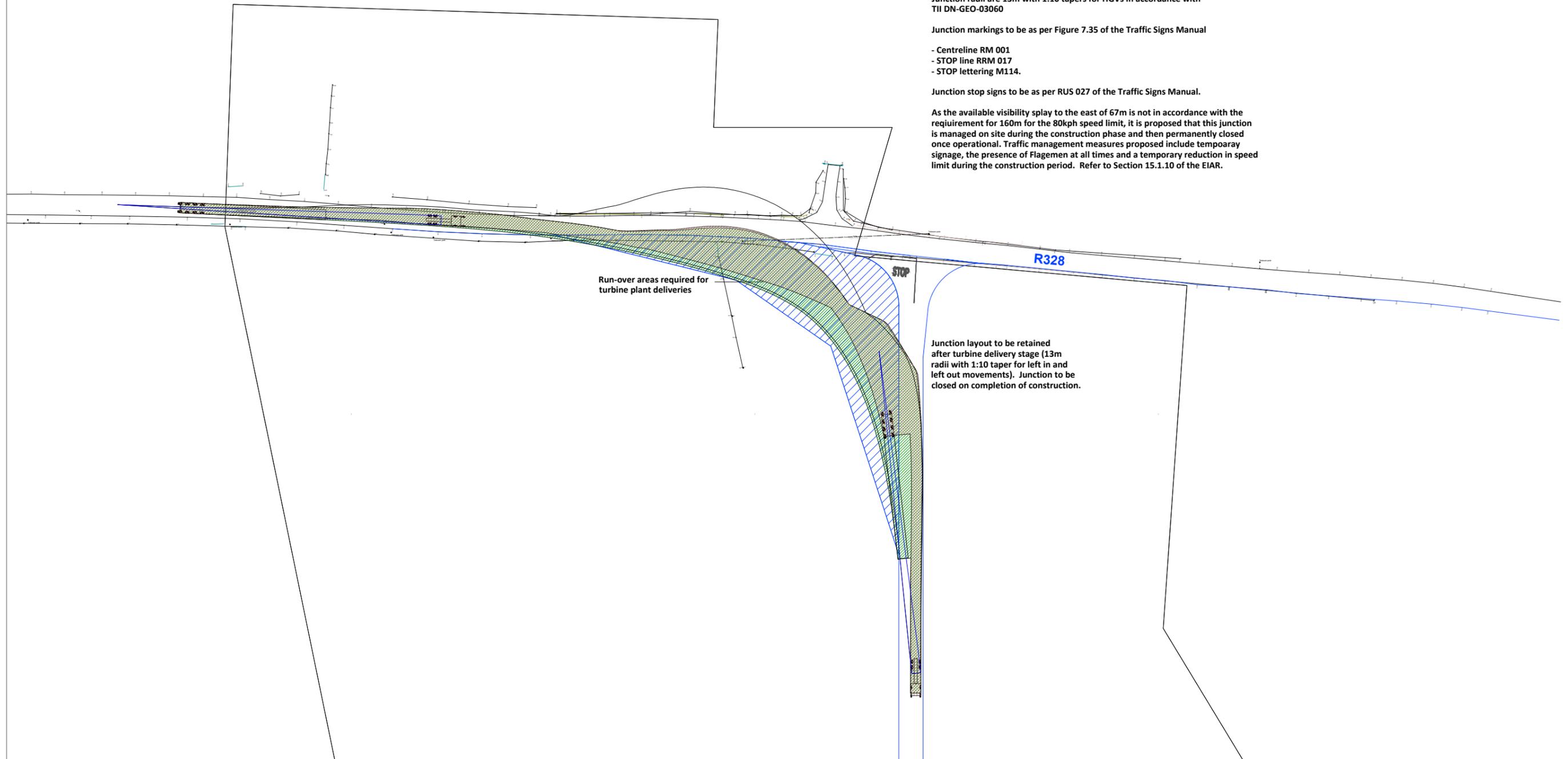
Junction radii are 13m with 1:10 tapers for HGVs in accordance with TII DN-GEO-03060

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.

As the available visibility splay to the east of 67m is not in accordance with the requirement for 160m for the 80kph speed limit, it is proposed that this junction is managed on site during the construction phase and then permanently closed once operational. Traffic management measures proposed include temporary signage, the presence of Flagmen at all times and a temporary reduction in speed limit during the construction period. Refer to Section 15.1.10 of the EIAR.



NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-30 Junction A - Construction access on R328 - Proposed temporary access for abnormally sized loads and general construction traffic - blade extended artic

PROJECT:	Clonberne Wind Farm	SCALE:	1:1000
CLIENT:	Clonberne Wind Farm Ltd	DATE:	04.06.24
PROJECT NO:	7310	DRAWN BY:	AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS

Access Junction A

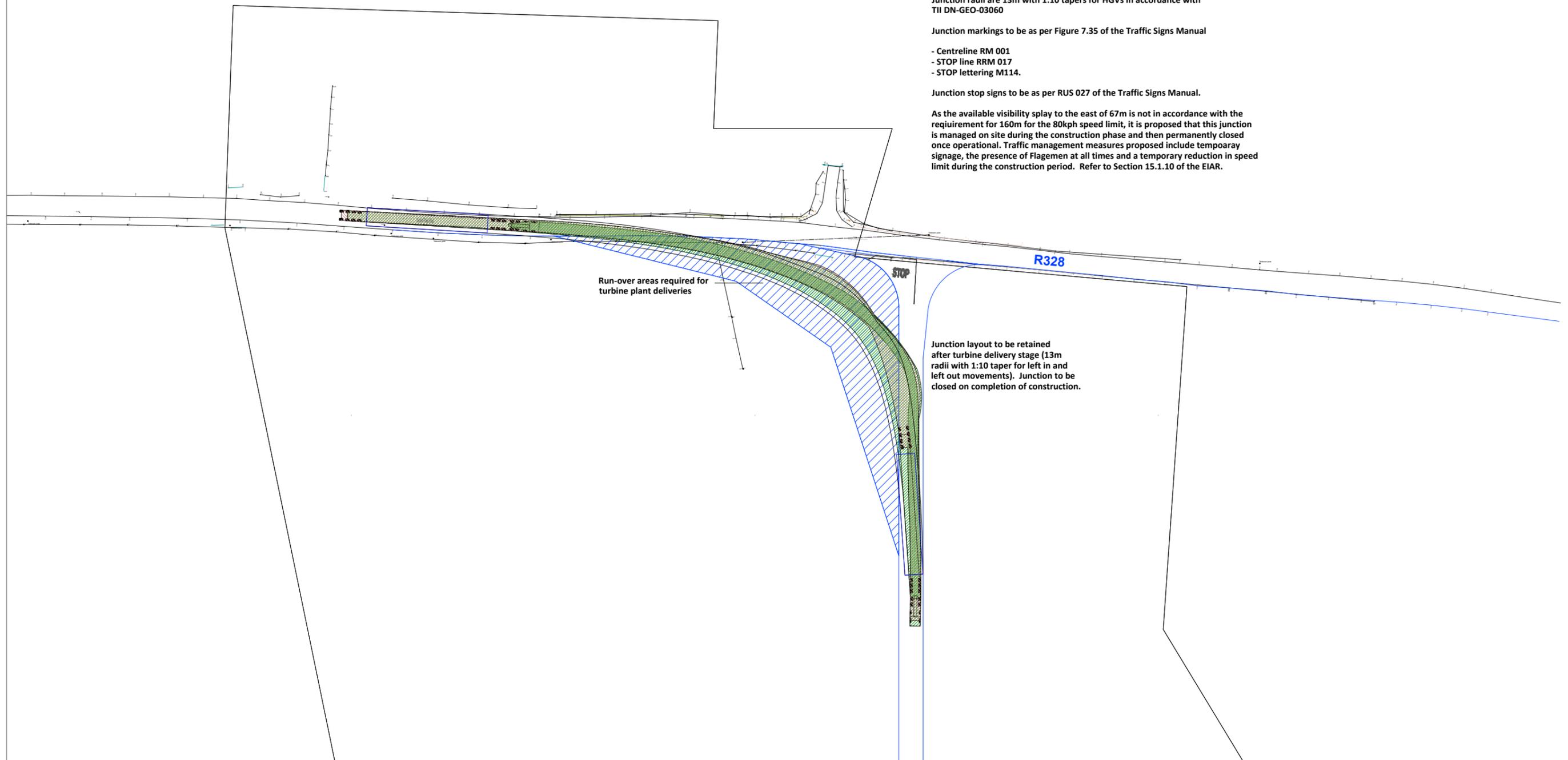
Junction radii are 13m with 1:10 tapers for HGVs in accordance with TII DN-GEO-03060

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.

As the available visibility splay to the east of 67m is not in accordance with the requirement for 160m for the 80kph speed limit, it is proposed that this junction is managed on site during the construction phase and then permanently closed once operational. Traffic management measures proposed include temporary signage, the presence of Flagmen at all times and a temporary reduction in speed limit during the construction period. Refer to Section 15.1.10 of the EIAR.



NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-31 Junction A - Construction access on R328 - Proposed temporary access for abnormally sized loads and general construction traffic - tower extended artic

PROJECT:	Clonberne Wind Farm	SCALE:	1:1000
CLIENT:	Clonberne Wind Farm Ltd	DRAWN BY:	AL
PROJECT NO:	7310	DATE:	04.06.24

ALAN LIPSCOMBE
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Access Junction A

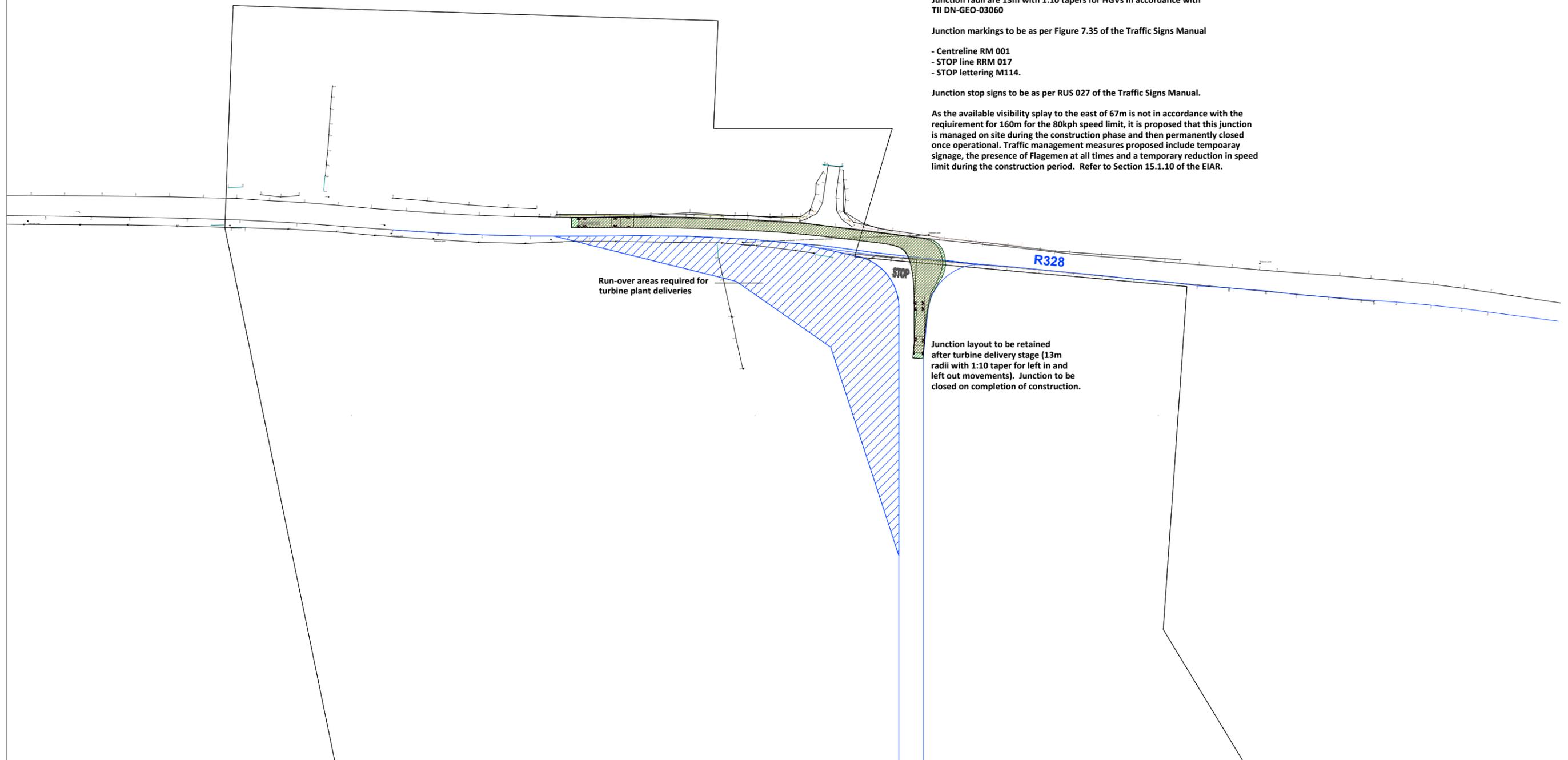
Junction radii are 13m with 1:10 tapers for HGVs in accordance with TII DN-GEO-03060

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.

As the available visibility splay to the east of 67m is not in accordance with the requirement for 160m for the 80kph speed limit, it is proposed that this junction is managed on site during the construction phase and then permanently closed once operational. Traffic management measures proposed include temporary signage, the presence of Flagmen at all times and a temporary reduction in speed limit during the construction period. Refer to Section 15.1.10 of the EIAR.



NOTES:

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Figure 15-32 Junction A - Construction access on R328 - Proposed temporary access for abnormally sized loads and general construction traffic - standard large articulated HGV

PROJECT: Clonberne Wind Farm

CLIENT: Clonberne Wind Farm Ltd

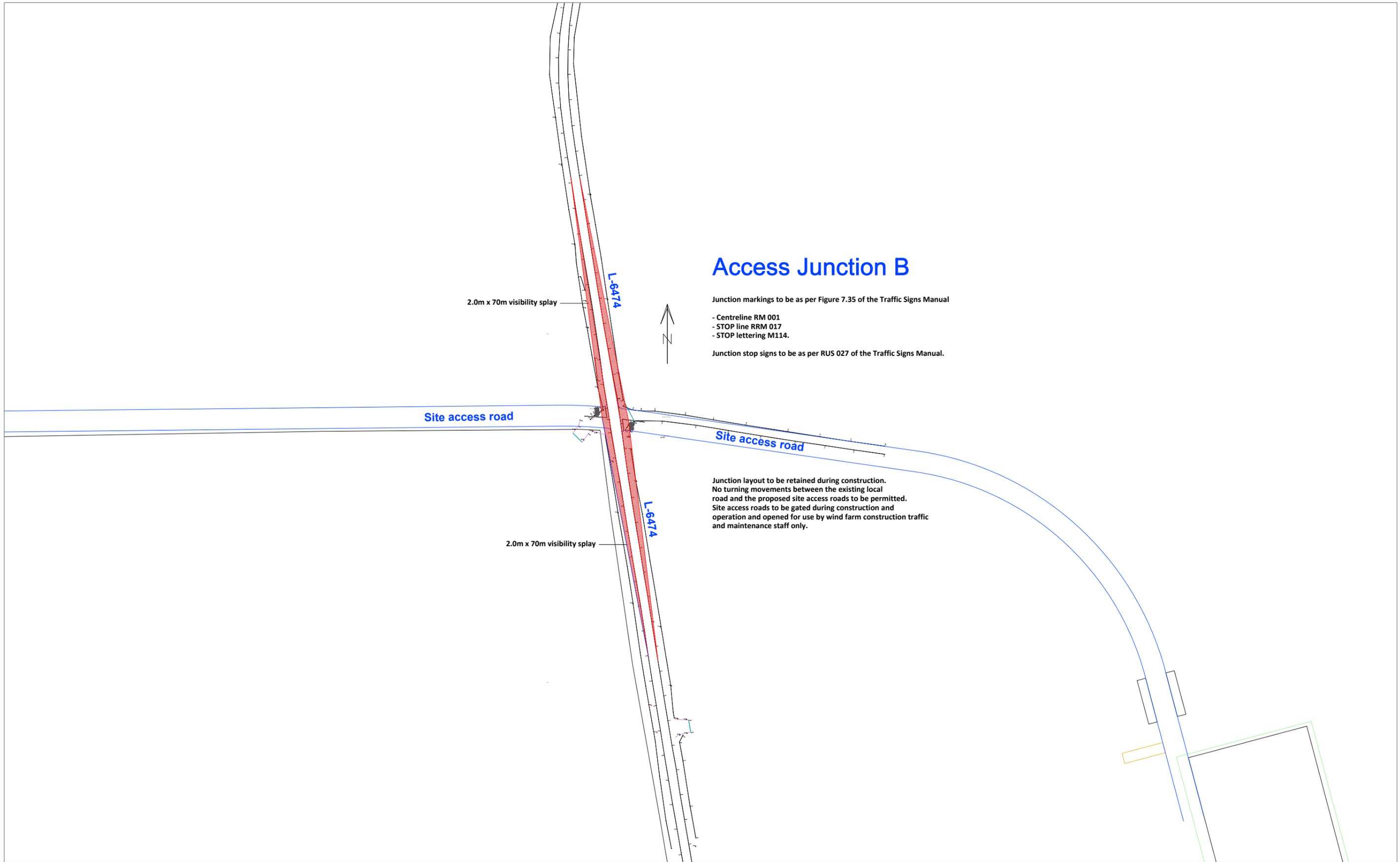
PROJECT NO: 7310

DATE: 04.06.24

SCALE: 1:1000

DRAWN BY: AL

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NOTES:
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Figure 15-33 Junction B - L-6474 / site access road junction - junction layout and visibility splays

PROJECT: Clonberne Wind Farm		
CLIENT: Clonberne Wind Farm Ltd	SCALE: 1:1000	
PROJECT NO: 7310	DATE: 04.06.24	DRAWN BY: AL

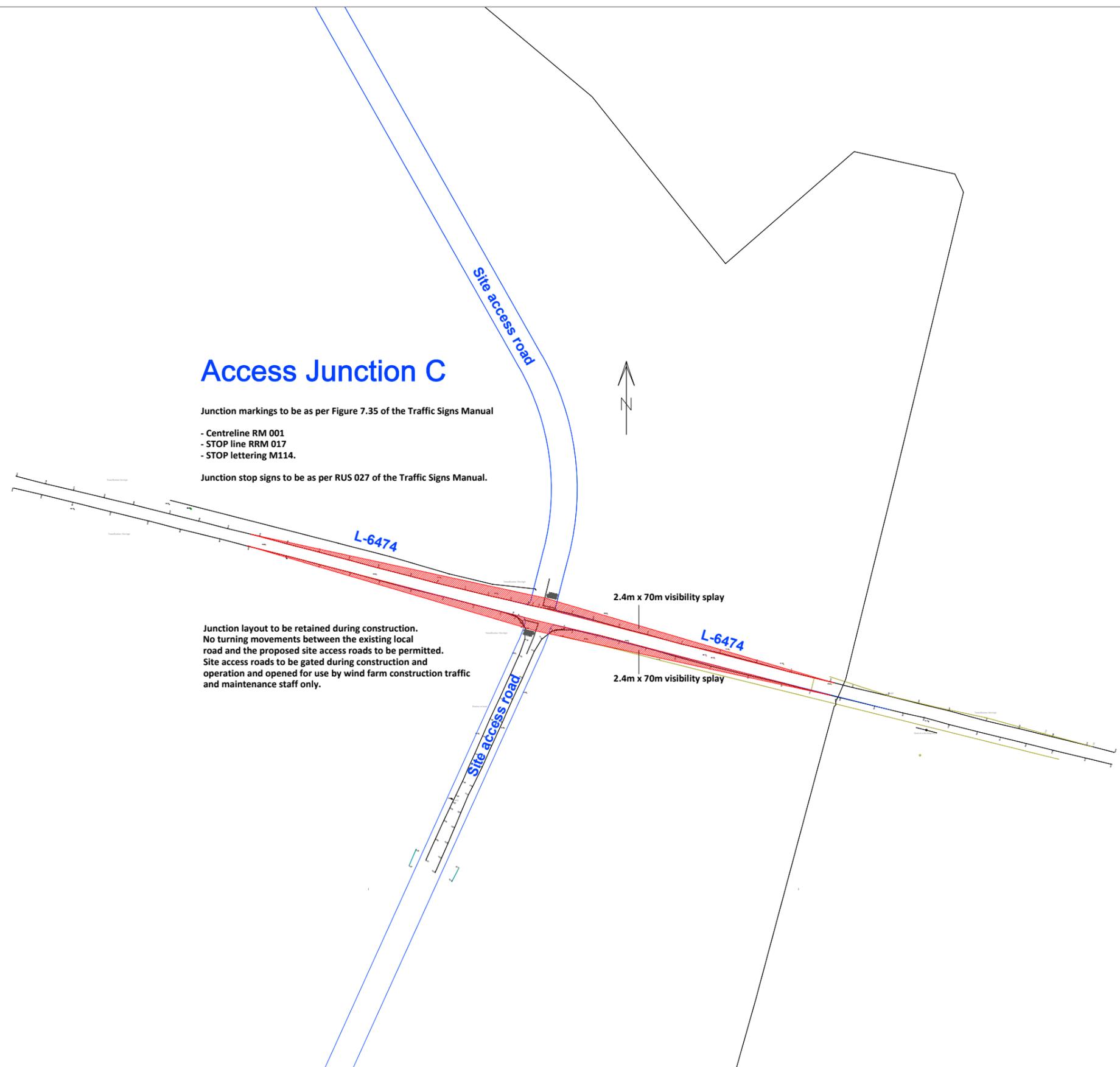
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Access Junction C

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.



Junction layout to be retained during construction.
 No turning movements between the existing local road and the proposed site access roads to be permitted.
 Site access roads to be gated during construction and operation and opened for use by wind farm construction traffic and maintenance staff only.

NOTES:
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Figure 15-34 Junction C - L-6474 / site access road junction - junction layout and visibility splays

PROJECT:	Clonberne Wind Farm		
CLIENT:	Clonberne Wind Farm Ltd	SCALE:	1:1000
PROJECT NO:	7310	DATE:	08.02.24
		DRAWN BY:	AL

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local road network are provided taken from a 2.4m setback from the carriageway edge, while the visibility splay on the west side of the L-6474 is shown in Figure 15-33 taken from a setback of 2.0m. This is the available visibility at this location taking account of the site boundary and is in accordance with the minimum setback that may be considered in accordance with TII guidelines. It is proposed that construction traffic will cross these locations during the construction phase of the proposed project, as will maintenance trips, which will be low in frequency, once the Proposed Wind Farm is operational. There will be no turning movements between the local roads and the access junctions at these junctions and the site accesses will be gated when not in use. All abnormally sized loads will be accompanied by a Garda escort and a Flagman will be present at these junctions on busy days during the construction period.

Junction D – L-64741 local road / site access road junctions

The proposed layout of Junction D is shown in Figure 15-35. The layout includes a temporary route for abnormally sized loads, which will be accompanied by a Garda escort, and for standard HGVs, which will be managed by a Flagman during the construction stage. On completion of the construction the additional area required for the larger vehicles will be removed and the junction with the reduced geometry, as shown in Figure 15-35, will be left in place. To the left a visibility splay of 70m is available, which is appropriate for a 50 km/h design speed, and to the east 50m is available, which is appropriate for a 42 km/h design speed. Based on the sharp bend located 50m to the east of the proposed access, and the single track nature of the existing L-64741 local road, it is considered that the available visibility splays will provide a safe environment for existing local traffic and development generated traffic. It is noted that the site accesses will be closed by means of gates at all times when they are not in use during construction and once the Proposed Project is operational.

Junction E – L-6501 local road / site access road junctions

The purpose of the short access road and Access junction E, shown in Figure 15-36, is to provide a safe route through the site for maintenance traffic during the operational phase of the Proposed Project. It is proposed that the existing access located on the 90° bend will be replaced by the proposed improvements. Visibility splays of 70m are available in both directions which are also shown in Figure 15-36.

Junctions F – L-2232 / L-22321 junction and Junction G – L-2232 / borrow pit access junction

The purpose of these junctions, which are shown in Figures 15-37 and 15-38 respectively, is to provide an access route into the proposed Wind Farm Site, via Junction F, for materials that will be won from the proposed borrow pit which will be accessed via proposed access junction G. It is proposed that both of these junctions will be managed by a flagman on the days that materials are delivered from the borrow pit.

Junctions H – L-6501 / OHC access junction

A junction that will provide access for occasional maintenance trip to the overhead cable connection is proposed off the southern side of the L-6501, as shown in Figures 15-39. It is proposed that access to this junction will be managed by temporary traffic management measures implemented by the maintenance staff.

Access Junction D

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.



L-64741

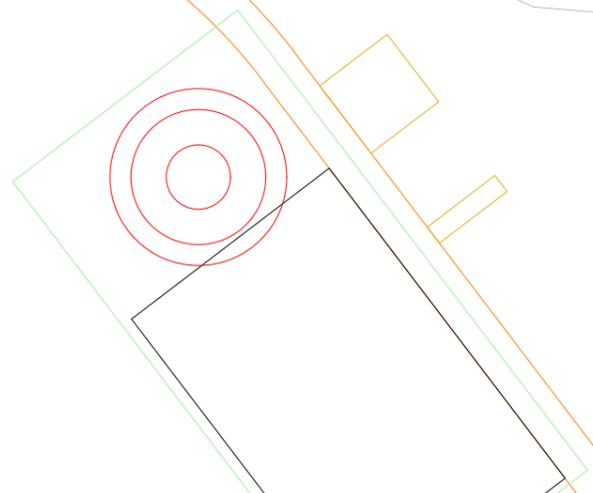
2.4m x 50m visibility splay

L-64741

Access for general construction traffic

Site access road

Access for abnormally sized loads



NOTES:
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Figure 15-35 Junction D - L-64741 / site access road junction - junction layout and visibility splays

PROJECT:	Clonberne Wind Farm		
CLIENT:	Clonberne Wind Farm Ltd	SCALE:	1:1000
PROJECT NO:	7310	DATE:	04.06.24
		DRAWN BY:	AL

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Figure 15-36 Junction E - L-6501 / site access road junction - junction layout and visibility splays

PROJECT:	Clonberne Wind Farm		
CLIENT:	Clonberne Wind Farm Ltd	SCALE:	1:1000
PROJECT NO:	7310	DATE:	04.06.24
		DRAWN BY:	AL

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Access Junction F

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.

This existing junction will be managed by means of temporary signing and Flagmen when in use during the construction stage for the Proposed Development. This existing junction will not be used during the operational stage of the Proposed Development.

NOTES:

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Figure 15-37 Junction F - L-2232 / L-22321 junction - junction layout

PROJECT:	Clonberne Wind Farm		
CLIENT:	Clonberne Wind Farm Ltd	SCALE:	1:1000
PROJECT NO:	7310	DATE:	04.06.24
		DRAWN BY:	AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS



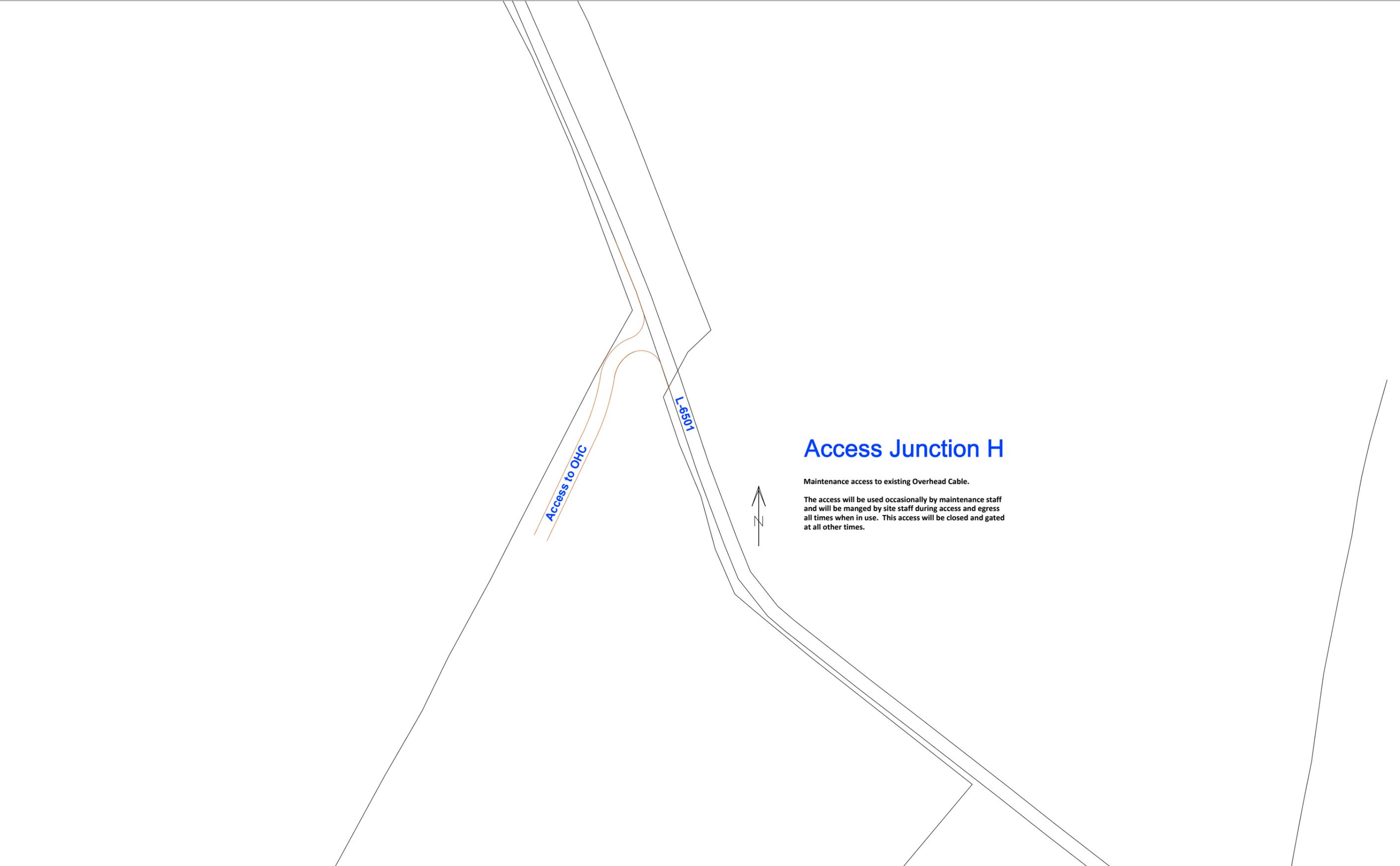
NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-38 Junction G - L-2232 / borrow pit access junction - junction layout

PROJECT:	Clonberne Wind Farm		
CLIENT:	Clonberne Wind Farm Ltd	SCALE:	1:1000
PROJECT NO:	7310	DATE:	04.06.24
		DRAWN BY:	AL

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NOTES:

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Figure 15-39 Junction H - L-6501 / OHC access junction - junction layout

PROJECT: Clonberne Wind Farm		SCALE: 1:1000
CLIENT: Clonberne Wind Farm Ltd		DRAWN BY: AL
PROJECT NO: 7310	DATE: 04.06.24	

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15.1.11 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 15-2 of this 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 – Sight line partially obscured, Access junction A on R328, emerging drivers line of sight looking to the right – A driver’s line of sight to approaching westbound traffic travelling on the R328 appears to be partially obscured by an existing field boundary. This is likely to increase the risk of conflict on the R328 in proximity to the temporary wind farm access during the construction period.

The Audit Team recommends that Appropriate sight lines should be provided at the temporary access. This should be supported with practical temporary traffic management interventions to mitigate any residual risks.

The Design Team Response is as follows - The available visibility splays at the main Access junction A are shown in Figure 15-29 of the EIAR. The figure shows that the area shown hatched in blue in Figure 2.1 of the RSA will be cleared as part of the proposed junction and visibility splays of 3 x 160m will be available to the west, in accordance with the 80 km/h speed limit. To the east the visibility splays are constrained to 3m x 67 metres due to site boundaries. For this reason it is proposed that this junction will be managed by means of signage and Flagmen and the introduction of a temporary reduced speed limit during the construction phase, and then permanently closed once the site Proposed Project is operational. The proposed traffic management measures are discussed in Section 15.1.10 of the EIAR.

The Design Team response was accepted in in the Road Safety Audit Feedback Form included as Appendix A of the Audit Report.

Problem 2.2 – Failing to stop type collisions, Access junctions B and C, road crossings - The Audit Team state: A number of the site access road approaches are long and straight. This could lead to higher approach speeds and ‘failing to stop’ type conflicts on the Local Roads.

The Audit Team recommends that appropriate (self-regulating) temporary traffic management measures should be set in place to throttle construction traffic speed and to reduce the risk of collisions on the Local Road crossings.

The Design Team Response is as follows - It is proposed that signs will be put in place on the access road approaches to the local roads at Junctions B and C and that appropriate traffic management measures, including a Flagman, will be on site at all times during the construction phase. The site accesses will be closed by means of gates during all times that the accesses are not in use during construction. During the operational stage the default will be that the accesses will be closed using gates at all times and opened only during site visits made by maintenance staff. It is noted that visibility splays appropriate for the local speeds on the local road network are available at both junctions, as shown in Figures 15-33 and 15-34 of the EIAR.

The Design Team response was accepted in in the Road Safety Audit Feedback Form included as Appendix A of the Audit Report.

Problem 2.3 – Higher vehicle speeds on down hill approach – Access Junction F, southbound approach on local road L-2232 - The Audit Team state: The downhill approach to Access Junction F is likely to result in higher vehicle speeds. This could increase the likelihood and the severity of a collision at the junction.

The Audit Team recommends appropriate signage and road markings should be set in place to inform drivers (including drivers of construction related traffic) of the approaching junction and warn them to throttle their approach speeds.

The Design Team Response is as follows - It is noted that this is an existing junction and during the days that it is used to transport materials from the borrow pit to the site the junction will be controlled by traffic management measures, including temporary signing and a Flagman, which will calm local traffic speeds. Once the construction phase is complete there will be no development generated traffic passing through this junction.

The Design Team response was accepted in in the Road Safety Audit Feedback Form included as Appendix A of the Audit Report.

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.

15.1.12 Provision for Sustainable Modes of Travel

15.1.12.1 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.

15.1.12.2 Public Transport

Public bus route 427 Bus Eireann (Galway / Tuam / Dunmore) is the bus route that passes closest to the Proposed Project site, although the nearest bus stop is located in Dunmore, approximately 6.5km from the proposed site access on the R328. Based on this, public transport is not considered a viable option for construction staff to travel to the 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.

15.1.13 Likely and Significant Effects and Associated Mitigation Measures

15.1.13.1 ‘Do-Nothing’ Scenario

If the Proposed Project does not proceed there will be no additional traffic generated or works carried out adjacent to the road network and therefore no effects with respect to traffic.

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.

15.1.13.2 Construction Phase: Traffic and Transport

15.1.13.2.1 Proposed Wind Farm

During the 11 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 +2.5% on the N83 between Claregalway and Loughgeorge (Link 1), to +10.5% on the N83 south of Dunmore (Link 4). Traveling southeast from Dunmore it is forecast that traffic volumes on the R328 will increase by +26.0% (Link 5), and by +47.3% on the R328 on the approach to the proposed site access junction (Link 6). It is forecast that this will have a temporary, slight, negative effect on the delivery route.

For 332 days when the general construction and groundworks are undertaken it is forecast that the increase in traffic volumes will range from +0.5% on the N83 between Claregalway and Loughgeorge (Link 1), to +2.1% on the N83 south of Dunmore (Link 4). Traveling southeast from Dunmore it is forecast that traffic volumes on the R328 will increase by +5.3% (Link 5), and by +9.6% on the approach to the proposed site access junction (Link 6). This will have a temporary, slight negative effect on the delivery routes.

During the 29 days/nights 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 +1.9% on the N83 south of Dunmore (Link 4). Traveling southeast from Dunmore it is forecast that traffic volumes on the R328 will increase by +4.7% (Link 5), and by +8.5% on the approach to the proposed site access junction (Link 6). 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 11 days of the turbine construction stage when other turbine components are transported to the Proposed Wind Farm site using standard HGVs, it is forecast that the increase in traffic volumes will range from +0.3% on the N83 between Claregalway and Loughgeorge (Link 1), to +1.1% on the N83 south of Dunmore (Link 4). Traveling southeast from Dunmore it is forecast that traffic volumes on the R328 will increase by +2.9% (Link 5), and by +5.2% on the approach to the proposed site access junction (Link 6). This will have a temporary slight negative effect on the delivery route to the Proposed Project site.

15.1.13.2.2 Proposed Grid Connection

With respect to the traffic volumes that will be generated during the construction of the Proposed Grid Connection, all traffic for this and the substation will be delivered via Junction A located on the R328 at the northern end of the site. Materials will then be delivered through the internal road network to the site of the proposed on-site 220 kV substation at the western end of the proposed grid connection. From here materials will be delivered to the point of construction on the grid connection.

It is estimated that there will be approximately 14 daily return trips made by a truck transporting materials, and 4 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 negative, will be transient in nature, will be temporary and will be slight.

15.1.13.3 Operational Phase: Traffic and Transport

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

15.1.13.4 Decommissioning Phase: Traffic and Transport

15.1.13.4.1 Proposed Wind Farm

The wind turbines proposed as part of the Proposed Project are expected to have a lifespan of approximately 35 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.

15.1.13.4.2 Proposed Grid Connection

The underground electrical cabling connecting the turbines to the on-site substation will be removed from the cable ducts. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance. The 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 4-6 of this EIAR.

15.1.13.5 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).

15.1.13.5.1 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 15.1.8.

15.1.13.5.2 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 15-1 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. The detailed TMP will include the following:

- **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 Project 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**– While the assessment above has assumed a robust case that construction workers will drive to the Site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of a routes to / from the site and identification of an area for parking.
- **Traffic management measure for temporary construction access junction off the R328** – The traffic management measures that will be implemented at proposed temporary access junction off the R238 will include the following;
 - Traffic signs 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). The proposed traffic management measures will be submitted to Galway Councils Roads section for agreement prior to the construction phase.
 - An application for a temporary reduction of the speed limit on the R328 for a short section either side of the proposed access junction for the duration of the construction phase.
 - The presence of a permanent “Flagman” during the entire construction phase.
- **Temporary traffic signs** – As part of the traffic management measures temporary traffic signs will be put in place at all key junctions. 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). A member of 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.

- **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.

15.1.13.5.3 **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.

15.1.13.5.4 **Mitigation Measures During Decommissioning Stage**

In the event that the Proposed Project is decommissioned after the 35 years of operation, a decommissioning plan, will be prepared for agreement with the local authority, as described in Chapter 4 and Appendix 4-6 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.

15.1.13.6 **Residual Effects**

15.1.13.6.1 **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 Site 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 15-1.

15.1.13.6.2 **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.

15.1.13.6.3 **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 on-site substation and Grid Connection will remain in-situ and continue to operate as part of the national electricity grid network.

15.1.13.7 **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).

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 have yet to be constructed, as the traffic generation for existing operational wind farms is very low. Single turbine developments were excluded as the trip generation associated with them is low.

As set out in Table 15-25 there are 3 Wind Farm development in the planning system within 20km of the Proposed Project, yet to be constructed, that have the potential to cause cumulative effects in relation to traffic and transport. The developments are located within relatively close proximity of the Proposed Project and with the TDRs for all developments potentially sharing common sections from the Port in Galway, through Galway City Centre and onto the N83 and N17. It is therefore estimated that there is a medium risk of cumulative impacts between the Proposed Project and the 3 other Wind Farm developments. In the event that the construction of the Proposed Project coincides with the any of the 3 of these Wind Farm developments, the traffic related cumulative impacts would be negative, short-term and moderate, 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 these other Wind Farms. This will ensure that the potential for cumulative effects is minimised.

Table 15-25 Summary of other Wind Farm Developments 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
1 – Laurclavagh Wind Farm (8 turbines) – Galway County ABP PI ref 319307	Proposed	Medium	Medium	Medium
2 – Cooloo Wind Farm (9 turbines) – Galway County ABP PI ref 316466	Pre-planning	Medium	Medium	Medium
3 – Shancloon Wind Farm (11 turbines) – Galway County ABP PI ref 317307	Pre-planning	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 10km of the Proposed Project, as set out in Appendix 2-3. Of the developments included in the list it was considered that the 12 developments listed in Table 15-26 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 12 developments is low with the resulting cumulative impacts being negative, short term and slight.

Table 15-26 Summary of other developments 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
1 – For development consisting of the construction of an astroturf pitch with perimeter fencing and flood lighting, children's playground and all associated car parking, drainage, boundary treatments and site works, Knock. – Galway County Council Planning Ref 19/1639	Conditional	Low	Low	Low
2 – For the alteration works at the Central Park Nursing Home, Clonberne into patient bedrooms. The development will consist of: alteration works to the existing nursing home consisting of the conversion of the existing pool, treatment & changing rooms to 4, Cappantruhaun. – Galway County Council Planning Ref 19/1830	Conditional	Low	Low	Low
3 – To construct 6 No single storey semi-detached dwellings (sheltered housing) in 3 blocks of 2 and all associated access and site works to rear of existing housing. Gross floor space of proposed works: 210 sqm, Dunmore. - Galway County Council Planning Ref 19/194	Conditional	Medium	Low	Low
4 – For the extension of existing residential development consisting of 22 no additional units made up of 4 no. 2 bed detached units, 2 no 4 bed detached units, 2 no 2 bed mid terraced units, 4 no 3 bed end of terrace units, 8 no 3 bed semi detached units, Lakeview, Glenamaddy – Galway County Council Planning Ref 20/493	Conditional	Low	Low	Low
5 – For the extension of an existing quarry to facilitate the extraction of sand and gravel and all associated site works. the proposed quarry extension is located on lands to the west of the existing, Knockaunnagat – Galway County Council Planning Ref 22/686	Conditional	Medium	Low	Low
6 – for the development of a quarry for the extraction of sand in a phased basis	In planning process	High	Low	Low

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential cumulative traffic effects
over an area of c. 6.2 ha by an average depth of 3m from existing ground levels. The development will consist of: i. Installation of a processing plant and associated components, Lomaunaghbaun – Galway County Council Planning Ref 24/60013				
7 - Permission for the development at this site, the existing Cloon to Lanesboro 110 kV Overhead Line which is approximately 65 kilometres long – Roscommon County Council Planning Ref 18/1832	Granted	High	Low	Low
8 - Extension of existing residential development consisting of 22 additional units – Galway County Council Planning Ref – 20/493, ABP PI Ref 308527	Granted	Medium	Low	Low
9 - Use field as an airstrip – Galway County Council Planning Ref 23/60592, ABP PI Ref 319221	Granted	Low	Low	Low
10 - Provision of 220KV substation and the provision of a 22KV underground cable c.2.8km in length connecting the proposed wind farm to the national grid by breaking into the Cashla – Carrick overhead line to the south-east of the wind farm site. (Previously Proposed 110kV electrical infrastructure and connection to the national grid). Clonberne and Ballinphuill, Co. Galway, Clonberne Grid Connection Proposed 110kV electrical infrastructure and connection to the national grid – ABP PI Ref VCO7.314729	Pre-planning	High	Low	Low
11 - For the construction of a new forest road bellmouth entrance, for trucks to access forestry plantations and associated site works, Clonberne – Galway County Council Planning Ref 19/1827	Granted	High	Low	Low
12 - For the development consisting of a new 38kV overhead line (OHL) from existing Glenamaddy 38kV station to existing cable ducts approximately 720 metres East of the existing Cloon	Further information	High	Low	Low

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential cumulative traffic effects
110kV station at Cloonascragh. The proposed development involves the construction of 179no. poles (up to 18m in height), 2no. end masts (up to 16.2m in height) and stringing with overhead lines, over a distance of approximately 26.8km, and all associated works including any temporary works required. The project was previously granted under pl. ref. no. 10779 and an extension of this permission was granted under PL. ref. no. 15861- Galway County Council Planning Ref 24/60230, Glenamaddy.				

15.1.14 Summary

An assessment of the traffic effects resulting from the additional traffic movements that will be generated by the Proposed Project during the construction, operational and decommissioning phases was undertaken.

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 large turbine components are accommodated.

Traffic Route & Study Area

The delivery route to the Site for the abnormally sized loads commences at the port in Galway Harbour. From Galway Harbour the route travels northeast on Lough Atalia Road, the R339 and the R336 Tuam Road through Galway City. From this point the route continues onto the N83 to join the N17 bypass in the southwest of Tuam. The route continues north on the N17 Tuam Bypass to the roundabout with the N83 directly north of Tuam. The route then travels south and east on the N83 before heading north towards Dunmore. For the turbine delivery route the route then travels east on the local L-6466 to the R328 to the south of Dunmore. From this point the route heads in a southeastern direction to the location of a new junction on the south side of the R328 that will provide access for all construction traffic to the Site.

The route for general construction traffic is the same as for the turbine delivery route with the exception that standard delivery vehicle will pass through Dunmore rather than use the L-6466.

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 11 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 +2.5% on the N83 between Claregalway and Loughgeorge, to +10.5% on the N83 south of Dunmore. Traveling southeast from Dunmore it is forecast that traffic volumes on the R328 will increase by +26.0%, and by +47.3% on the R328 on the approach to the proposed site access junction. It is forecast that this will have a temporary, slight, negative effect on the delivery route.
- For 332 days when the general construction and groundworks are undertaken it is forecast that the increase in traffic volumes will range from +0.5% on the N83 between Claregalway and Loughgeorge, to +2.1% on the N83 south of Dunmore. Traveling southeast from Dunmore it is forecast that traffic volumes on the R328 will increase by +5.3%, and by +9.6% on the approach to the proposed site access junction. This will have a temporary, slight negative effect on the delivery routes.
- During the 29 days/nights 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, to +1.9% on the N83 south of Dunmore. Traveling southeast from Dunmore it is forecast that traffic volumes on the R328 will increase by +4.7%, and by +8.5% on the approach to the proposed site access junction. 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 11 days of the turbine construction stage when other turbine components are transported to the Proposed Wind Farm site using standard HGVs, it is forecast that the increase in traffic volumes will range from +0.3% on the N83 between Claregalway and Loughgeorge, to +1.1% on the N83 south of Dunmore. Traveling southeast from Dunmore it is forecast that traffic volumes on the R328 will increase by +2.9%, and by +5.2% on the approach to the proposed site access junction. This will have a temporary slight negative effect on the delivery route to the Proposed Project site.

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.

The full description of the Proposed Project, including the proposed turbine locations and elevations, is provided in Chapter 4 of this EIAR. As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Project', 'the Proposed Wind Farm Site', 'the Proposed Grid Connection' and 'the Site'.

Section 15.2.3 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 Jack Smith and Jonny Fearon and reviewed by Owen Cahill, all of MKO. The Statement of Authority for Jack, Jonny and Owen are detailed in Section 1.8.2.1 in Chapter 1 of this EIAR

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 2.7 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 3.2.6.1 of the EIAR.

The assessment of likely significant effects on material assets uses the standard methodology and classification of impacts as presented in Section 1.7.1 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. These effects can be avoided through design or dealt with by detailed micro-siting of turbines to avoid alignment with signal paths or by the use of repeater relay links out of line with the wind farm. The closest airport to the Proposed Project is the Galway Airport, located at Carnmore, Co. Galway. This airport is located approximately 32km southwest of the Proposed Wind Farm Site. The closest large international airport to the Proposed Project is Ireland West Airport Knock, which is located approximately 38km 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 15-1 below, no response was received from the Aviation Navigation Ireland.

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 15-1; 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 summaries below in Table 15-1.

Table 15-23 Telecommunications and Aviation Scoping Responses

Consultee	Response	Potential for Interference Following Consultation Exercise
2RN	20 th December 2023	No impact anticipated. 2rn asked that a protocol be signed between the developer and 2rn should the site go ahead. See Section 15.2.4.2.1 below for details
Aviation Navigation Ireland	No response received	N/A
Cellnex	No response received	N/A
Coimisiún na Meán	21 st December 2023	N/A
Dense Air	No response received	N/A
Department of Defence	15 th December 2023	N/A
Eir	No response received	N/A
Enet	20 th December 2023	Potential for interference. Mitigation measures proposed to avoid any impact to the Enet links. See Section 15.2.4.2.2 below for details.
EOBO	No response received	N/A
ESB	No response received	N/A
FastCom Broadband Ltd	No response received	N/A
Hibernian	No response received	N/A
Galway Airport	No response received	N/A
Imagine	No response received	No impacts anticipated
Invertec	31 st January 2024	No impacts anticipated
Ireland West Airport, Knock	No response received	N/A
JFK Communications Ltd	No response received	N/A
JS Whizzy Internet Ltd	No response received	N/A
Magnet Plus	No response received	N/A
Tetra Communications	No response received	No impacts anticipated

TG4	20 th December 2023 (2rn responded on behalf of TG4)	No impact anticipated. 2rn asked that a protocol be signed between the developer and 2rn should the site go ahead. See Section 15.2.4.2.1 below for details
Towercom	15 th December 2023	No impacts anticipated
Three	20 th February 2024	Potential for interference. Mitigation measures proposed to avoid any impact to the Three links. See Section 15.2.4.2.2 below.
Viatel	N/A	N/A
Virgin Media	No response received	N/A
Vodafone	10 th January 2024	No impacts anticipated
Western Broadband Network	No response received	N/A

The scoping responses from the telecommunications and aviation consultees are described below. Relevant copies of scoping responses are provided in Appendix 2-1.

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 December 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 Developer 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.

A standard Protocol Document will be prepared by 2rn for the Proposed Project.

Virgin Media were also contacted in December 2023 regarding any links they may have in the area. No response was received.

15.2.4.2.2 **Other Consultees**

Of the scoping responses received 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 telecommunication links or clearance zones requested by these operators. The remaining consultees who responded to scoping, operate links either outside the Proposed Project, 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 did not maintain 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 may be decommissioned in 2027 and rerouted to fibre instead. Therefore, no impact to this telecoms link is anticipated. In the event that both the Enet link and the Proposed Project were to co-exist, a commitment to the necessary mitigation measures will be implemented by the Developer. This proposal was acknowledged to Enet.

Three

Three identified a link which traversed the Proposed Project. AI Bridges, a telecommunications solutions expert, was engaged to consult with Three and assess the potential impact of the proposed turbines on the identified link. An Impact Assessment Report has been produced which details the mitigation measures that have been agreed with Three to avoid any impact to their telecommunication link. The Telecommunications Impact Assessment Report is included in Appendix 15-4.

15.2.4.2.3 Aviation

As noted in Table 15-1 above, scoping responses were received from the following aviation consultees:

- > Aviation Navigation Ireland
- > Department of Defence
- > Ireland West Airport, Knock
- > Galway Airport

Pertinent information has been summarised below; however, the scoping response should be referenced to for further detail. No scoping response was received from Ireland West Airport Knock or Galway Airport.

Aviation Navigation Ireland

No response was received from Aviation Navigation Ireland.

Department of Defence

A representative from the Department of Defence responded to the Scoping Document and acknowledged the receipt of the correspondence containing the Scoping Document. The Department of Defence did not revert, post acknowledgment, with any further observations.

Ireland West Airport Knock

No response was received from Ireland West Airport Knock.

Galway Airport

No response was received from Galway Airport.

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, there would be no change to existing telecommunications and aviation operations in the area.

If the Proposed Project were not to proceed, the opportunity to capture an even greater part of County Galway's valuable renewable energy resource would be lost, as would the opportunity to further 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 and to diversify the local economy would also be lost. This would result in a slight negative effect over time.

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. The first round of consultation occurred in 2020 and identified that no links were identified to be impacted from the Proposed Project. A second round of consultation was undertaken in December 2023 given the time that had elapsed since the first round. The second round of consultation identified links owned by Three and Enet which would be impacted by the Proposed Project.

Without mitigation measures, there could be the potential for interference of the wind turbine blades on the identified Three and Enet links which traverse the Proposed Wind Farm Site.

Mitigation Measures

As outlined in the Three Ireland Impact Assessment Report in Appendix 15-5 of this EIAR, Three have outlined they will have no objection to the Proposed Project should the mitigation measures outlined in the Three Ireland Impact Assessment Report in Appendix 15-5 are implemented as a condition of the planning in the event that a successful grant of permission occurs. The Developer of the Proposed Project has agreed to re-route the impacted radio link should the Proposed Project receive a grant of permission. Any re-routing solution will take place in advance of the construction and operation of the Proposed Project.

In the event of interference occurring to telecommunications owned by Enet, the Guidelines acknowledge that '*electromagnetic interference can be overcome*' by the use of divertor to relay links out of line with the wind farm. As outlined in their scoping replies, Enet acknowledged the commitment

by the Developer for the implementation of the necessary mitigation measures in order to protect the link should both the Proposed Project and the link co-exist.

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.

15.2.5.4 Decommissioning Phase

There will be decommissioning phase impacts on telecommunications and therefore no mitigation required.

15.2.5.5 Cumulative Impact

Chapter 2, Section 2.5 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 Appendix 2-2 'Projects considered in the EIA Cumulative Assessment' of this EIAR. The closest existing wind farm to the Site is a two-turbine development located approximately 11.6km southwest of the Site. The nearest proposed wind farm is the proposed Cooloo wind farm located 5.3km south of the Proposed Project.

During the development of any large project that may affect telecoms or aviation, the Developer is responsible for engaging with all relevant Telecoms Operators and Aviation Authorities to ensure that the proposals will not interfere with television or radio signals by acting as a physical barrier. In the event of any potential impact, the Developer for each individual project is responsible for ensuring that the necessary mitigation measures are in place. All modern wind farms have lighting requirements agreed with IAA and the turbine locations entered into aircraft navigation databases and therefore can be avoided during flight. It is on this basis that it can be concluded that there would 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 2.7 of Chapter 2 of this EIAR for details in relation to the EIA scoping exercise.

No scoping responses were received from Eirgrid or the local authority departments.

A scoping request was sent to Uisce Éireann on the 15th December 2023. A response was received the 18th December 2023 stating that they do not have the capacity to comment on individual projects, but general aspects of Water Services should be considered in the EIA where relevant. Some of the items to

consider are listed below. Please Appendix 2-3 for a full list of Irish Water comments. It should be noted that the Proposed Project does not intend to connect into Irish Water assets.

1. *Where the development proposal has the potential to impact an Uisce Éireann Drinking Water Source(s), the applicant shall provide details of measures to be taken to ensure that there will be no negative impact to Uisce Éireann's Drinking Water Source(s) during the construction and operational phases of the development. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified as part of the report.*
2. *Mitigations should be proposed for any potential negative impacts on any water source(s) which may be in proximity and included in the environmental management plan and incident response.*
3. *Any and all potential impacts on the nearby reservoir as public water supply water source(s) are assessed, including any impact on hydrogeology and any groundwater/surface water interactions.*
4. *Impacts of the development on the capacity of water services (i.e. do existing water services have the capacity to cater for the new development). This is confirmed by Uisce Éireann in the form of a Confirmation of Feasibility (COF). If a development requires a connection to either a public water supply or sewage collection system, the developer is advised to submit a Pre-Connection Enquiry (PCE) enquiry to Uisce Éireann to determine the feasibility of connection to the Uisce Éireann network.*
5. *The applicant shall identify any upgrading of water services infrastructure that would be required to accommodate the proposed development.*
6. *In relation to a development that would discharge trade effluent – any upstream treatment or attenuation of discharges required prior to discharging to an Uisce Éireann collection network.*
7. *Any physical impact on Uisce Éireann assets – reservoir, drinking water source, treatment works, pipes, pumping stations, discharges outfalls etc. including any relocation of assets.*
8. *Any potential impact on the contributing catchment of water sources either in terms of water abstraction for the development (and resultant potential impact on the capacity of the source) or the potential of the development to influence / present a risk to the quality of the water abstracted by Uisce Éireann for public supply should be identified within the report.*
9. *Where a development proposes to connect to an Uisce Éireann network and that network either abstracts water from or discharges wastewater to a “protected”/sensitive area, consideration as to whether the integrity of the site/conservation objectives of the site would be compromised should be identified within the report.*
10. *Mitigation measures in relation to any of the above ensuring a zero risk to any Uisce Éireann drinking water sources (Surface and Ground water).*

15.3.1 Existing Built Services and Utilities

There are overhead and underground electricity transmission and supply cables within the vicinity of the ELAR Site Boundary. An existing 220kV overhead line traverses a portion of the Site. There is also an existing 110kV overhead line located approximately 2.1km south of the Site. Additionally, there are two existing 38kV lines approximately 10km to the west and 7km to the east of the Site at its closest points.

The proposed 220kV electrical substation and 220kV underground grid connection cabling (measuring approximately 2.8km in length) will connect to the existing 220kV overhead line in the townland of Laughil. The grid connection works will include the provision of 2 no. new interface towers replacing two existing angle masts to facilitate the connection to the existing overhead line in the townland of Laughil.

There is a proposed 38kV Overhead Line (PL Ref: 24/60230) currently proposed by ESB Networks to traverse the Site in a north-south direction. As part of the Proposed Project, it is proposed to construct 2 no. 38kV Line to Cable Interface End Masts to facilitate the undergrounding of the proposed 38kV cabling within the proposed internal access roads for approximately 5.5km. The End Masts will be located adjacent to where Pole no. 101 and Pole no. 118 are currently being proposed in the ESB Networks planning application.

There are no known existing underground electricity cables present on the Proposed Project site.

There are no gas mains located within the EIAR Site Boundary. There are no known existing water services within the site boundary, however it has been assumed that there is the potential to encounter local water services within the subject 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.

Prior to the commencement of construction, a survey of the Site will be undertaken to identify and ensure any 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 4-4 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 Proposed Project Site. Therefore, all waste streams generated on site 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 4-4.

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, there would be no change to the utilities or built services in the area such as electricity supply and transmission, water, gas and underground telecommunications.

If the Proposed Project were not to proceed, the opportunity to capture an even greater part of County Galway's valuable renewable energy resource would be lost, as would the opportunity to further 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 and to diversify the local economy would also be lost. This would result in a slight negative effect over time.

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 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 4-4 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 Proposed Project 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, utilities and waste management associated with the Proposed Project.

15.3.3.4 Decommissioning Phase

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

15.3.4 Cumulative Impact Assessment

The potential for impact between the Proposed Project, and other relevant developments has been carried out with the purpose of identifying what influence the Proposed Project (Proposed Wind Farm and Proposed Grid Connection combined) will have on the surrounding environment when considered cumulatively and in combination with relevant existing permitted or proposed projects and plans in the

vicinity of the Site, as set out in Chapter 2 of this EIAR. Please see Section 2.5 of Chapter 2 for cumulative assessment methodology.

Included within proposed projects and plans, the potential for cumulative impacts with other wind farms is considered. There are 6 no. existing, permitted or proposed wind farms (Cloonascragh, Cloncoon, Clonlusk, Cooloo, Laurclavagh and Shancloon) within 20 kilometres of the Site. There will be a significant positive cumulative effect on electrical supply with the commissioning of the Proposed Project along with the cumulative wind farms within the area. The Proposed Project is proposed to connect to the national grid via the existing 220kV Cashla - Flagford overhead line in the townland of Laughil and none of the existing or proposed wind farms currently utilise this method or are proposing this grid connection method.

At the time of writing, a planning application (PI Ref: 2460230) by ESB Networks submitted to Galway County Council for the development of a new 38kV Overhead Line is currently at the Further Information stage. As outlined in Section 4.3.1.4 in Chapter 4, ESB Networks is seeking permission for a 26.8km 38kV Overhead Line between the existing 38kV Glenamaddy substation to existing cable ducts approximately 720 metres to the east of the existing Cloon 110kV substation. The proposed 38kV Overhead Line crosses the Proposed Project site in a north-south direction. Given the minor earthworks associated with overhead line developments, there will be a short term, negative, slight effect during its construction phase.

As determined above, the effects on utilities, built services and waste management services during the construction, operation or decommissioning phases of the Proposed Project will be not significant. Therefore, no significant cumulative effects are foreseen.

There will be a long term slight positive residual cumulative effect on electrical supply with the commission of the Proposed Project in combination with the operational wind farms listed above.