GARRANE GREEN ENERGY

GARRANE GREEN ENERGY PROJECT

COUNTY LIMERICK

APPENDIX 17.6

N20 / Site Entrance 1 (Temporary) - Junction Design Report

August 2025

Jennings O'Donovan & Partners Limited,
Consulting Engineers,
Finisklin Business Park,
Sligo.
Tel.: 071 9161416
Fax: 071 9161080
email: info@jodireland.com

JENNINGS O'DONOVAN & PARTNERS LIMITED
Project, Civil and Structural Consulting Engineers,
FINISKLIN BUSINESS PARK,
SLIGO,
IRELAND.

Telephone (071) 9161416
Fax (071) 9161080

Email info@jodireland.com
Web Site www.jodireland.com

DOCUMENT APPROVAL

PROJECT	Garrane Green Energy Project	
CLIENT / JOB NO	Garrane Green Energy	6839
DOCUMENT TITLE	N20 / Site Entrance 1 (temporary) - Junction Design Report	

	Prepared by	**Reviewed/Approved by**
Document Final	Name John Doogan	Name David Kiely
Date August 2025	Signature	Signature

6839/703/JD

GARRANE GREEN ENERGY PROJECT

N20 / SITE ENTRANCE 1 (TEMPORARY) - JUNCTION DESIGN REPORT

CONTENTS

1 INTRODUCTION

1.1 Brief

Jennings O'Donovan & Partners Limited have been appointed by Garrane Green Energy to prepare a Preliminary Design Report for the proposed Garrane Green Energy Project (Project), Co. Limerick. The Project Site is located 22.9km south of Limerick City, 46.9km north of Cork City and 2.5km (closest turbine) north of Charleville, Co. Cork. The Project will consist of the following main components:

- Erection of 9 No. wind turbines with a tip height of 170m. The wind turbines will have a rotor diameter of 150m and a hub height of 95m.
- Upgrade of existing Access Tracks and construction of new permanent Access Tracks, permanent turbine hardstand areas and turbine foundations.
- Construction of two new bridge crossings on-site, one over the River Maigue and one over the Charleville Stream.
- Upgrade of existing site drainage network and installation of new site drainage.
- Wind Farm Internal Cabling connecting the wind turbines to the electrical substation.
- Construction of a permanent on-site AIS 110kV Substation, with a 'loop in' Grid Connection to the existing 110kV overhead line between Charleville and Killonan, including two single-storey control buildings with welfare facilities, all associated electrical plant and equipment, security fencing, gates, signage, all associated underground cabling, private well for water supply, wastewater holding tank, and all ancillary structures and works.
- Construction of a permanent double circuit 110kV underground cable and two steel cable interface masts to connect to the existing overhead line OHL.
- Erection of a permanent 60m Meteorological Mast for monitoring wind speeds.
- Construction of a Temporary Construction Compound for use during construction.
- Upgrade of the existing entrance on the N20 (Site Entrance 1) (to be used for abnormal loads and turbine component delivery) and upgrade of an existing site entrance on the L1537 (Site Entrance 2) (to be used for all construction traffic except for abnormal loads and turbine component delivery).
- 6 No. temporary spoil storage areas and 1 No. permanent spoil storage area.
- Biodiversity enhancement and improvements associated with the Project.
- Landscaping, fencing and all associated ancillary works.

The Location and layout of the Proposed Development is shown on **Figure 1**.

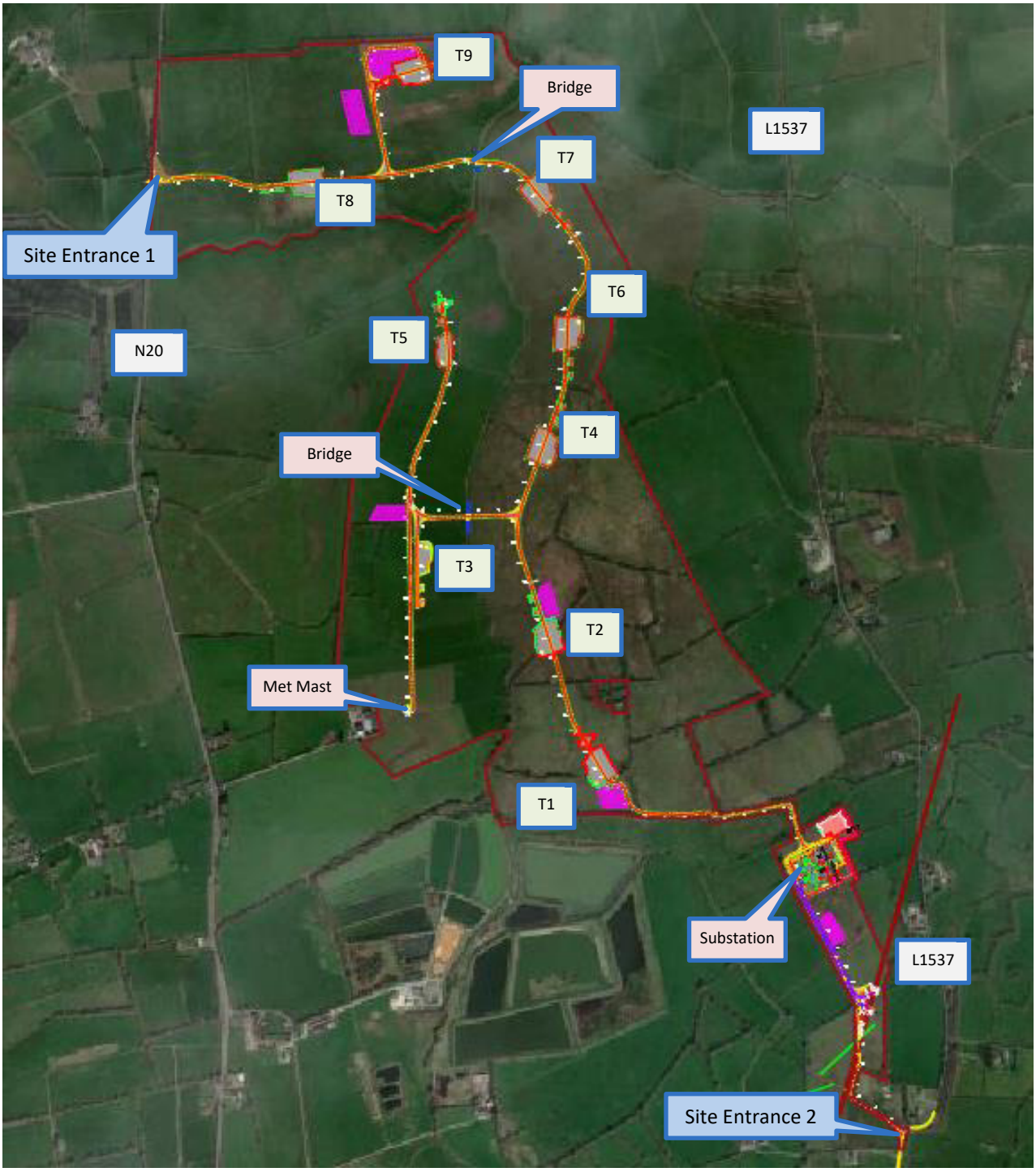


Figure 1 – Site Layout

1.2 Objectives

This design report is intended to provide information to TII regarding the proposed temporary entrance for abnormal load deliveries on the N20 (Site Entrance 1) to the proposed Garrane Green Energy project. Site Entrance 1 will be used during the delivery of turbine components, cranes and transformers using abnormal load vehicles. Site Entrance 1 will not be used for general construction traffic and will only be used for abnormal load vehicles which cannot access the site via the main site entrance (site entrance 2) on the L1537 due to geometric restrictions. A temporary overrun area will be constructed at the junction

to accommodate the swept path and wheel loading from abnormal load vehicles delivering turbine components during the turbine delivery phase of the project. When the junction is not being used by abnormal load vehicles, access to the overrun areas will be restricted using temporary fencing along the N20 boundary. The temporary fencing will be located to restrict access and prevent parking in the vicinity of the N20. The overrun area at the junction will be reinstated with topsoil and seeded with grass following the delivery of turbine components and removal of cranes from site. The layout of Site Entrance 1 during the construction phase of the Project is shown in **Figure 2** and on drawing 6839-JOD-GGE-XX-DR-C-0201 in **Appendix A.** During the operations phase of the project, Site Entrance 1 will be closed and all operations traffic will access the development via Site Access 2 on the L1537. The layout of Site Entrance 1 during the Operations phase of the Project is shown in **Figure 3** and on drawing 6839-JOD-GGE-XX-DR-C-0212 in **Appendix A.** Site Entrance 1 will have a dwell area with a gradient of -2.5% at its intersection with the N20 with drainage falling towards the Proposed Development and away from the N20 carriageway. Visibility at Site Entrance 1 will be in accordance with TII standards and will have visibility splays of 215m measured from a 3.0m setback. The design and layout of site entrance 1 has been subject to an independent Stage 1 Road Safety Audit carried out by CST consulting Engineers who are accredited by TII to carry out audits on the national road network. The road safety audit is included in **Appendix B**. Site entrance 1 is located at an existing field entrance, the existing field entrance will be gated and will be isolated from the abnormal load entrance. The existing field entrance will remain operational for agricultural use and will not be available for construction, operation or decommissioning traffic. The field access will be upgraded as part of the Project, upgrades will include 215m visibility splays, 4m access track, bound surfacing at N20 intersection and field gate set back from the carriageway edge.

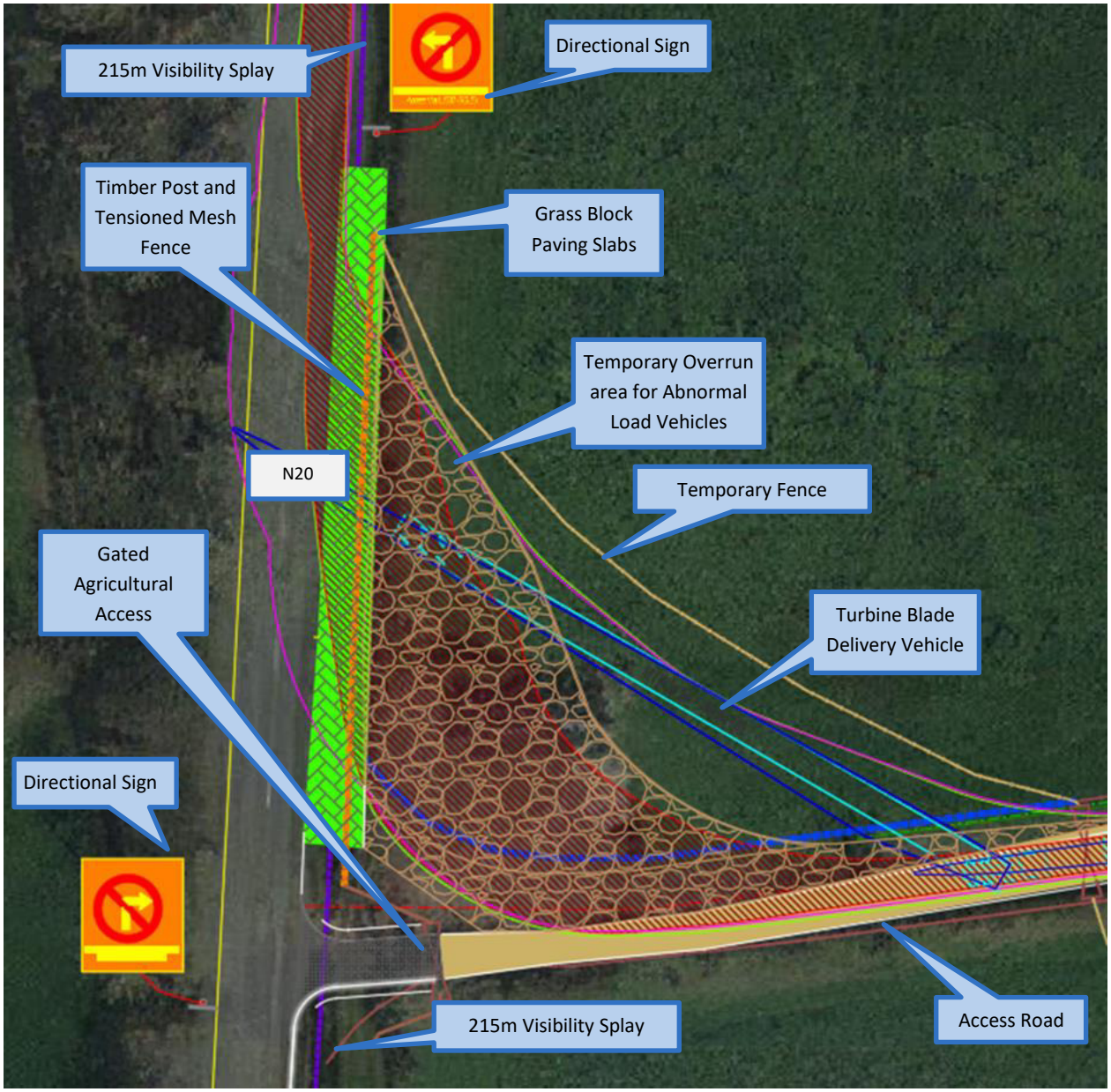


Figure 2 – Site Entrance 1 on the N20 – Construction Phase

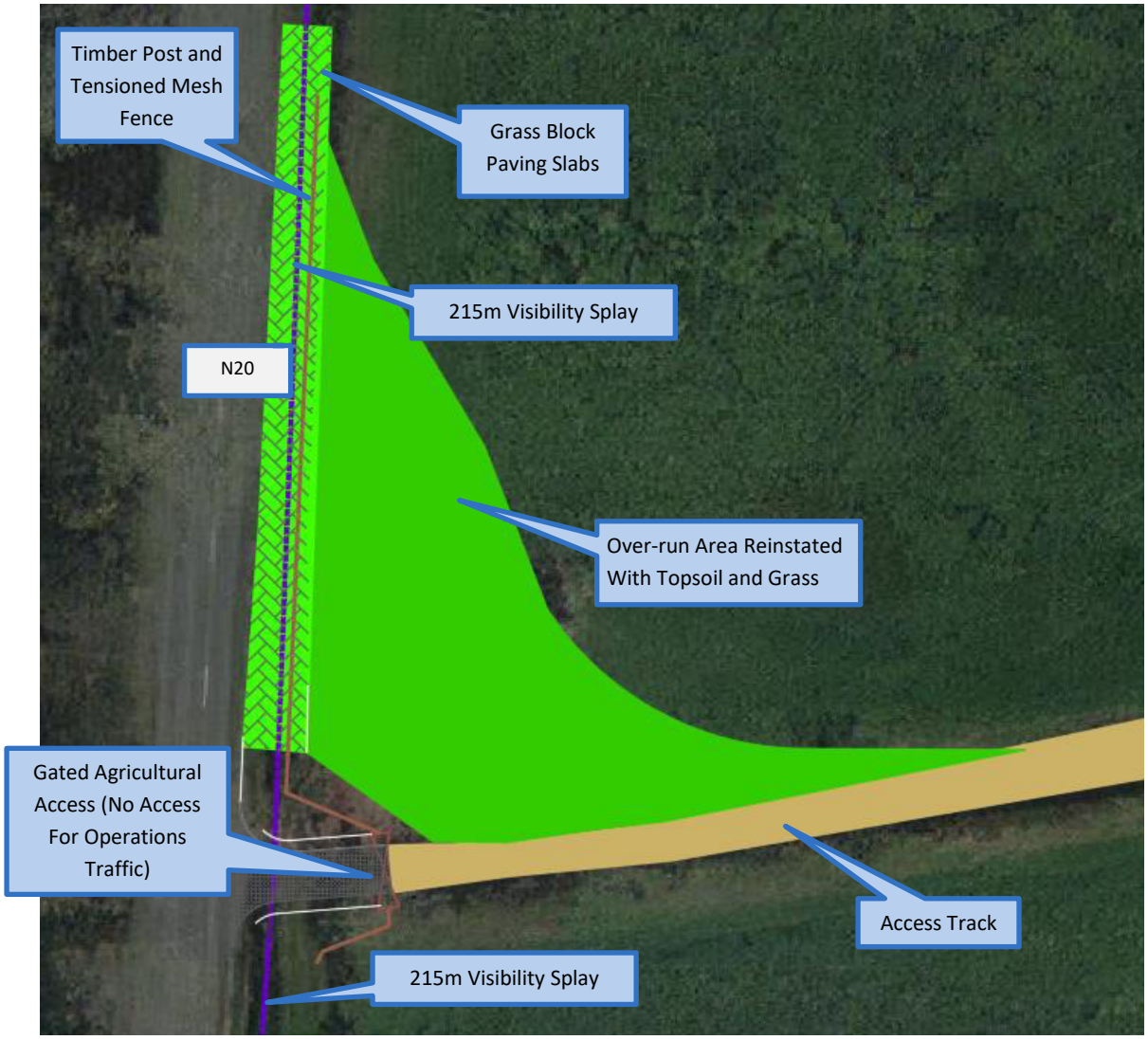


Figure 3 – Site Entrance 1 on the N20 – Operations Phase

1.3 Statement of Authority

This report has been prepared by John Doogan of Jennings O'Donovan & Partners Limited, Finisklin, Sligo. Established in Sligo in 1950, Jennings O'Donovan & Partners Limited is a Clean Tech Company providing consulting engineering services in the areas of road design, renewable energy, civil and structural engineering, water supply, wastewater collection and treatment, environmental resource management and impact assessment and in the area of industrial and commercial development.

1.4 Design References / Standards

The Design Report for the N20 Site Entrance to the Proposed Development is based on the following technical documents:

- TII Publications, DN-GEO-03060, DN-GEO-03030, DN-REQ-03034, PE-PAG-02039
- Limerick County Development Plan 2022 -2028

2 PROPOSED N20 - SITE ENTRANCE 1 (TEMPORARY)

2.1 Site Location

The location of the proposed N20 Site Entrance 1 is shown in **Figure 1**. The site entrance is located at ITM coordinates E553385.90, N627551.37. The existing field entrance which will be upgraded as part of the Proposed Development is shown on **Plate 1**. The field entrance will be a gated entrance for third party agricultural use and will not be used for construction traffic.

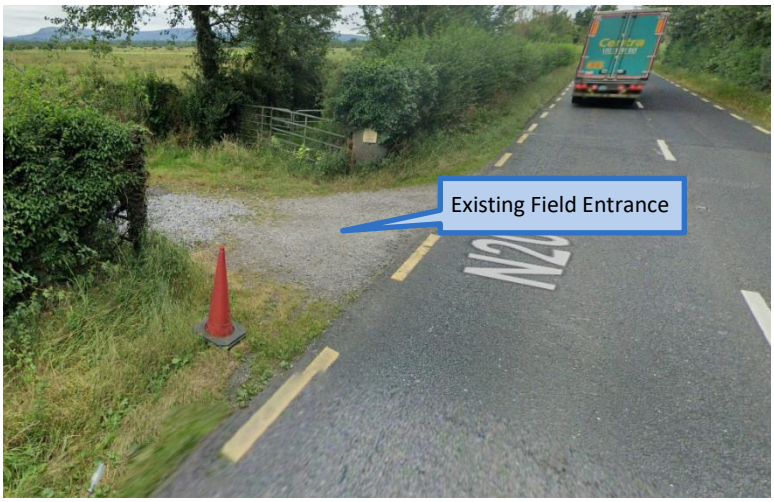


Plate 1 – Existing Field Access to be Upgraded

3 COLLISION HISTORY

3.1 Collision History in the Vicinity of the Proposed N20 Site Entrance

Specific safety data for this location is not currently available on the RSA Website. Data from the National Road Risk Rating published by TII show that the location has a collision rate threshold of 3 corresponding to a "Below Expected Rate" collision threshold.

4 SAFETY OBJECTIVES

4.1 Safety Objectives for the Proposed Junction

The safety objectives of the proposed N20 Site Entrance 1 are as follows:

- Implement the recommendations of the Stage 1 Road Safety Audit carried out for the proposed N20 Site Entrance 1 leading to the Garrane Green Energy Project.
- Provide visibility at Site Entrance 1 by providing 215m visibility splays in both directions for vehicles using the junction.

- Design N20 Site Entrance 1 to accommodate the turning movements of abnormal load vehicles during the delivery of turbine components.
- Provide directional signs, regulatory signs and roadmarkings at N20 Site Entrance 1.
- Restrict vehicle access to all vehicles other than abnormal load deliveries
- Upgrade the adjacent field entrance to a gated entrance with 215m visibility splays for third party agricultural use and prohibit all construction, operations and decommissioning traffic from using the entrance.
- Fully reinstate Site Entrance 1 on completion of the Garrane Green Energy Project.

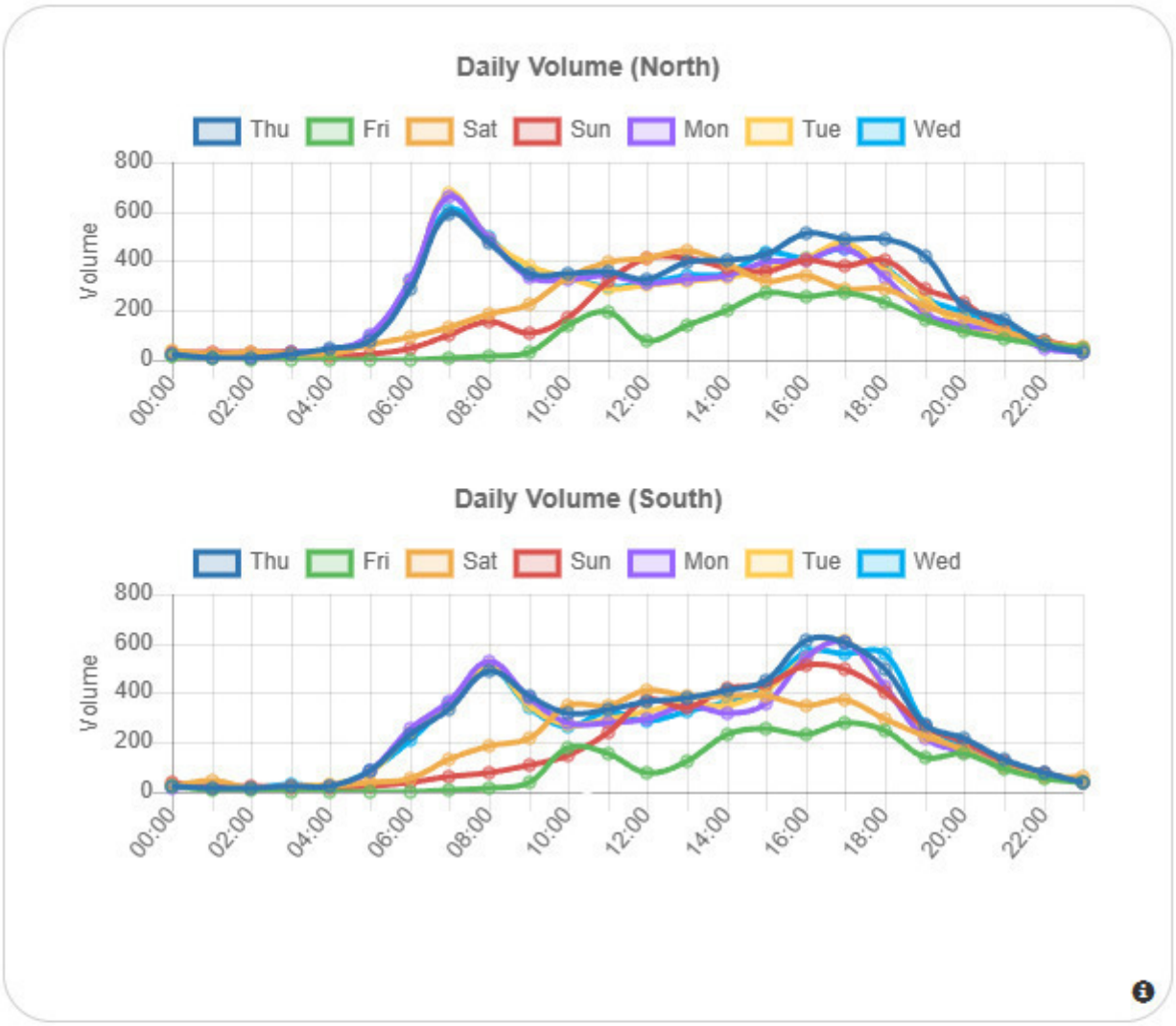
5 EXISTING CONDITIONS AT THE PROPOSED SITE ENTRANCE 1

5.1 Vehicle Speed

The posted speed limit for this section of the N20 is 100km/h.

5.2 Traffic Volumes

Existing traffic volumes on the N20 near proposed Site Entrance 1 were obtained from the TII automatic counter at Rockhill. The traffic counter is located 2.5km to the north of the proposed Site Entrance 1. The results from the traffic counter show that the N20 had an annual average daily traffic (AADT) of 11,535 vehicles in 2024 with 8.4% HGV. The traffic counter data is shown in **Figure 4.**



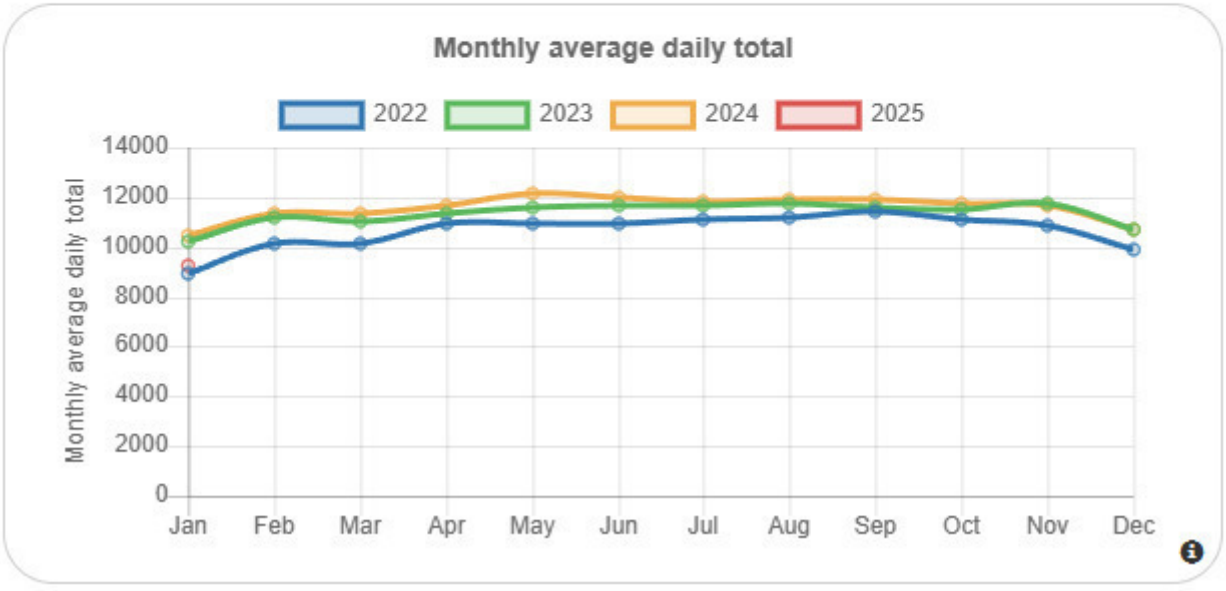


Figure 4 – N20 Traffic Data - N20 Between Charleville and R518, Rockhill Co Limerick

5.3 Junction Capacity Analysis

The existing entrance consists of a field entrance to agricultural land and does not generate significant volumes of traffic. Analysis of the proposed Site Entrance 1 during the construction of the Proposed Development is shown in **Section 6.17** of this report.

5.4 Horizontal Alignment

The horizontal alignment of the N20 at the proposed Site Entrance 1 consists of a 1.0km straight section of Type 3 carriageway. The existing field entrance intersects the N20 at an angle of 90 degrees. The horizontal alignment of the N20 at the proposed Site Entrance 1 is shown in **Plate 2.**

Plate 2 – N20 Alignment

5.5 Vertical Alignment

The vertical alignment of the N20 at the existing field entrance which will be upgraded for Site Entrance 1 consists of a 0.5% linear gradient. The alignment of the N20 is shown in **Plate 2.**

5.6 Cross Section

The cross section of the N20 at the location of Site Entrance 1 is a Type 3 single carriageway with two 3.0m wide lanes, 0.5m hard strip and grass verges in the vicinity of the proposed site entrance 1. Crossfall The N20 has a balanced crossfall of 0.5% at the location of Site Entrance 1.

5.7 Superelevation

The N20 is not superelevated at the location of Site Entrance 1.

5.8 Existing Junctions and Accesses

The existing N20 / L1539 / L8607 Rockhill staggered cross roads junction is located 2.5km to the north of the proposed Site Entrance 1 and the N20 / L8580 T-junction is located 1.5km to the south. There are a number of field and dwelling access points on this section of the N20.

5.9 Facilities for Vulnerable Road Users

There are currently no dedicated facilities for pedestrians or cyclists on the N20 at the location of proposed Site Entrance 1.

5.10 Visibility and Sightlines

Visibility splays at the existing field entrance are restricted by the existing boundary wall and by boundary vegetation. The upgraded Site Entrance 1 and the adjacent field entrance will have full visibility splays in accordance with TII specifications. Details of visibility splays at the proposed Site Entrance 1 are shown on drawing 6839-JOD-GGE-XX-DR-C-0210 in **Appendix A**

6 PROPOSED N20 SITE ENTRANCE 1

6.1 Proposed N20 Site Entrance 1 Junction Design

Site Entrance 1 will be constructed as a temporary entrance for abnormal loads to access the Project from the N20 national primary road. Site Entrance 1 will consist of a simple T-Junction located at an existing field entrance. The existing field entrance will be gated and will be isolated from the abnormal load entrance. The existing field entrance will remain operational for agricultural use and will not be available for construction, operation or decommissioning traffic. The field access will be upgraded as part of the Project, upgrades will include 215m visibility splays, 4m access track, bound surfacing at N20 intersection and field gate set back from the carriageway edge. Site Entrance 1 will only be used during delivery of abnormal loads such as turbine components, cranes and transformers and will not be used for general construction traffic. A temporary overrun area will be constructed at the junction to accommodate the swept path and wheel loading from abnormal load vehicles delivering turbine components during the turbine delivery phase of the project. When Site Entrance 1 is not in use for abnormal load deliveries, access to the junction will be restricted using temporary fencing erected along the existing N20 boundary. The temporary fencing will be used to restrict access and to prevent parking at the junction in the vicinity of the N20. The overrun area at the junction will be reinstated with topsoil and seeded with grass following the delivery of turbine components and the removal of cranes from the site. The layout of Site Entrance 1 during the construction phase of the Project is shown in **Figure 2** and on Drawing 6839-JOD-GGE-XX-DR-C-0201 **in Appendix A.** During the operations phase of the project, Site entrance 1 will be closed and reinstated, operations traffic will access the development via Site Access 2 on the L1537. The layout of

Site Entrance 1 during the operations phase of the Project following reinstatement is shown in **Figure 2** and on drawing 6839-JOD-GGE-XX-DR-C-0212 in **Appendix A.** Site Entrance 1 will have a dwell area with a gradient of -2.5% at its intersection with the N20 with drainage falling towards the Project and away from the N20 carriageway. Visibility at Site Entrance 1 will be in accordance with TII standards and will have visibility splays of 215m measured from the carriageway edge at a 3.0m setback distance. The design and layout of the proposed site entrance has been subject to an independent Stage 1 Road Safety Audit carried out by CST consulting Engineers who are accredited by TII to carry out audits on the national road network. The road safety audit is included in **Appendix B.**

6.2 Land Acquisition

Site Entrance 1 is located on lands which are in the control of the Garrane Green Energy and the works will be within the planning red line boundary of the Garrane Green Energy Project planning application.

6.3 Horizontal Alignment

The horizontal alignment of the N20 at proposed Site Entrance 1 consists of a 1.0km straight section of Type 3 carriageway. Proposed Site Entrance 1 will intersect the N20 at an angle of 90 degrees. The horizontal alignment of the N20 at the proposed Site Entrance 1 is shown in **Plate 2.** The horizontal alignment of the N20 will remain unchanged following the construction of Site Entrance 1.

6.4 Vertical Alignment

The vertical alignment of the N20 at proposed Site Entrance 1 consists of a 0.5% linear gradient. The vertical alignment of the N20 will remain unchanged following the construction of Site Entrance 1.

6.5 Visibility and Sightlines

Visibility at Site Entrance 1 will be in accordance with TII standards and the site entrance will have visibility splays of 215m measured from a 3.0m setback from the N20 carriageway edge. Visibility details are shown in F**igure 5** and on Drawing 6839-JOD-GGE-XX-DR-C-0210 in **Appendix A.**

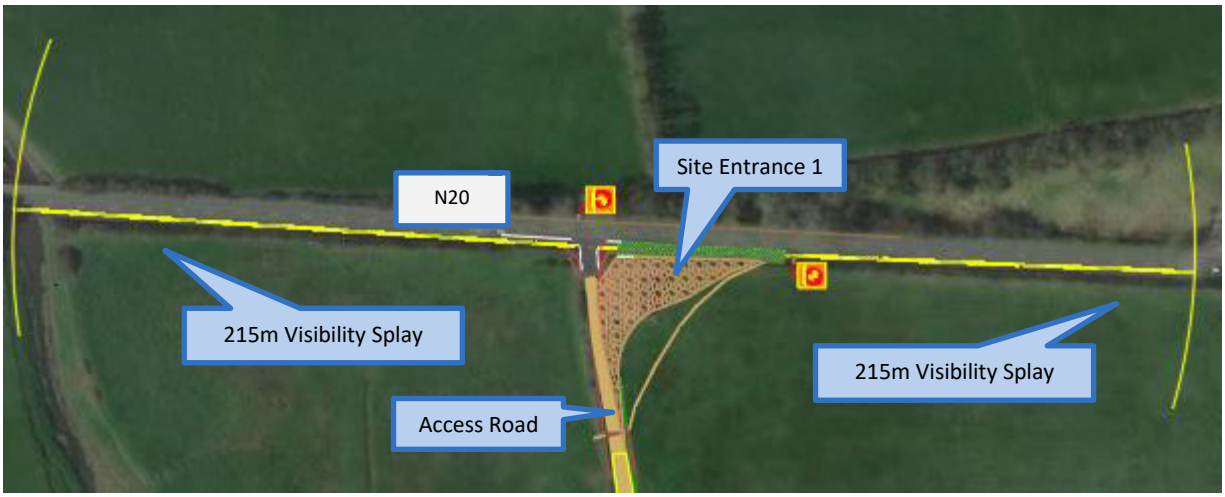


Figure 5 – Visibility Splays

6.6 Cross Section

The cross section of the N20 at the location of Site Entrance 1 is a Type 3 single carriageway with two 3.0m wide lanes, 0.5m hard strip and grass verges carriageway with grass verges in the vicinity of Site Entrance 1. The cross section of the N20 will remain unchanged following the construction of Site Entrance 1.

6.7 Crossfall

The N20 has a balanced crossfall of 0.5% at the location of Site Entrance 1. The crossfall of the N20 will remain unchanged following the construction of Site Entrance 1.

6.8 Superelevation

The N20 superelevation will remain unchanged following the construction of Site Entrance 1.

6.9 Existing Junctions and Accesses

All public road junctions, third party field accesses and dwelling accesses onto the N20 will remain unchanged following the construction of Site Entrance 1. Upgrades to the existing field access adjacent to site entrance 1 are detailed in **Section 6.1.**

6.10 Facilities for Vulnerable Road Users

There are no dedicated facilities for vulnerable road users at the proposed N20 Site Entrance 1. The site entrance is located in a rural setting with low pedestrian flows.

6.11 Drainage

All surface water at the proposed N20 Site Entrance 1 will be drained away from the N20 and will not be allowed to flow onto the N20 carriageway. The site drainage will be carried out during the detailed design

phase of the project and will consist of clean and dirty water drains with attenuation, settlement ponds and dispersed outfalls to existing watercourses.

6.12 Pavement

Surfacing to be provided at the tie-in to the N20 will be in accordance with TII standards and specifications using approved materials and skid resistance at the approach to the junction.

6.13 Safety Barrier Risk Assessment and Provision

The Safety Barrier Risk Assessment is included in **Appendix C.** all hazards at the proposed site entrance can be mitigated and it is not proposed to install safety barriers at the proposed site entrance.

6.14 Traffic Signs and Roadmarkings

It is proposed to provide directional signs, regulatory signs and roadmarkings in accordance with the Traffic Signs Manual. Details of the signs are shown on Drawing 6839-JOD-GGE-XX-DR-C-0201 in **Appendix A.** Following construction, site entrance 1 will be closed and all signage will be removed. The existing field access will not be used by operations traffic and will not be signed.

6.15 Accommodation Works

The lands required to carry out the upgrade works to the existing field entrance are within the control of the developer and will be included within the planning red line boundary.

6.16 Lighting

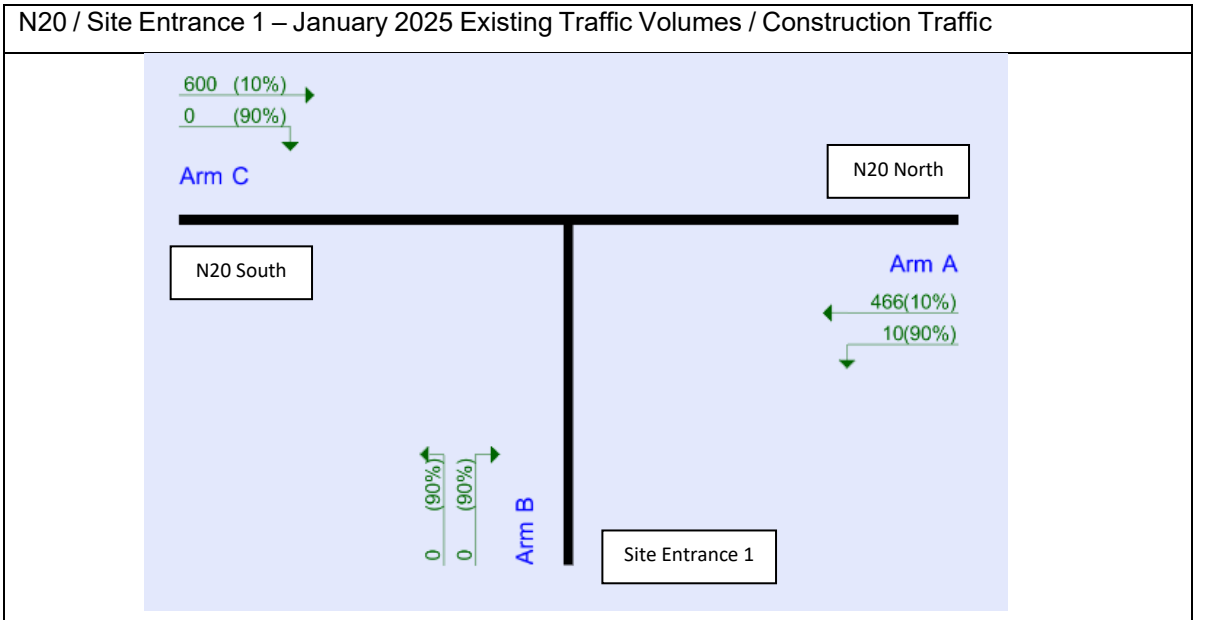
The proposed N20 Site entrance 1 will not be lit by public lighting.

6.17 Construction Traffic

The Proposed Development will generate traffic at Site Entrance 1 during the delivery of abnormal loads such as turbine components, cranes and transformers. The delivery of turbine components will take place outside peak traffic periods on the N20. During the delivery of turbine components and cranes the development will generate approximately 6 HGV trips and 4 LGV at site Entrance 1. Delivery vehicles will exit the Proposed Development via site entrance 2 on the L1537 local road.

Traffic analysis carried out at Site Entrance 1 during the N20 morning peak hour traffic period is shown in **Table 1**. The analysis is carried out using data from the TII traffic counter at Rockhill for a worst case scenario with the abnormal load vehicles arriving during the morning peak hour on the N20. The analysis shows that. Site Entrance 1 will operate within capacity during the construction of the wind farm and will not exceed the 0.85 Ratio to Flow Capacity (RFC) during the peak traffic periods. The ratio of flow to

capacity (RFC) is calculated from Junctions 9 PICADY software. An RFC value of 1.0 indicates that the junction is operating at full capacity with a value of 0.85 considered to be the maximum RFC value after which the junction will begin to experience some capacity issues.



	AM							
	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2025							
Stream B-AC	0.0	~1	0.00	0.00	A	0.00	A	900 %
Stream C-AB	0.0	~1	0.00	0.00	A			[]

Table 1 – Junction Capacity Analysis, Construction Period

6.18 Departures from Standard

There are no departures from standards associated with the design of proposed Site Entrance 1.

7 ROAD SAFETY AUDIT

An independent Stage 1 Road Safety Audit was carried out for the proposed N20 site entrance in July 2025 by CST Consulting Engineers who are accredited by TII to carry out audits on the national road network. A copy of the audit is included in **Appendix B.** The recommendations of the audit have been accepted by the design team and incorporated into the N20 site entrance design. The audit raised the following items relating to N20 site entrance 1.

3.2.1 Junction Visibility

Problem: Although the junction is intended for entry only, there is concern some users may attempt to exit on the N20. This length of N20 National Road is straight with only slight vertical undulations. Traffic speeds were observed to be high and consisted of a large percentage of heavy good vehicles. The roadside boundaries generally consist of hedging with breaks for field accesses. Although the drawing indicates junction visibility envelopes will be provided, there is concern the hedging will regrow to obscure intervisibility between drivers exiting the site and mainline traffic.

Hazard: Drivers may exit the junction into the path of oncoming vehicles, or mainline traffic may have late visibility of users approaching the mainline and errantly take avoidance action by entering into the opposing traffic lane.

Recommendation: The design team should provide a physical means to ensure vehicles cannot exit via this junction.

Design Tean Response: visibility at the proposed Site Entrance 1 is shown on Drawing 6839-JOD-GGE-XX-DR-C-0210 in **Appendix A**. It is proposed to erect a temporary post and tensioned wire fence at site entrance 1 during the construction phase of the project. The temporary fence will be removed periodically to allow access to abnormal load vehicles and re-erected following delivery. A permanent post and tensioned wire fence will be erected at site entrance 1 following completion of construction and site entrance 1 will be closed and reinstated with topsoil and grass seeding. The adjacent field access will be gated and will not be available for construction, operations or development traffic.

3.2.2 Construction Stage N20 Signage

Problem: This section of N20 was observed to have a high volume of high-speed vehicles and a high percentage of HGV traffic. The large and heavy vehicles accessing the site are likely to be slow moving when making their turns. There is concern that N20 users will not expect to encounter slow moving vehicles on this straight section of road with historically minimal traffic turning movements.

Hazard: Rear end shunt collisions may result.

Recommendation: The Design Team should provide temporary signage on the National Road network well in advance of the junction for the duration of the construction phase. **Note:** All temporary signage should comply with Chapter 8 of the Traffic Signs Manual and be approved by the Roads Authority.

Design Tean Response: Proposed signage at the N20 site entrance 1 during the construction period is shown on **Figure 6.** Site entrance 1 will be used for the delivery of abnormal loads only. Abnormal load deliveries will take place outside peak traffic hours on the N20 and will be escorted by support teams /

An Garda Siochana who will provide traffic management to allow abnormal load vehicles to access the site.

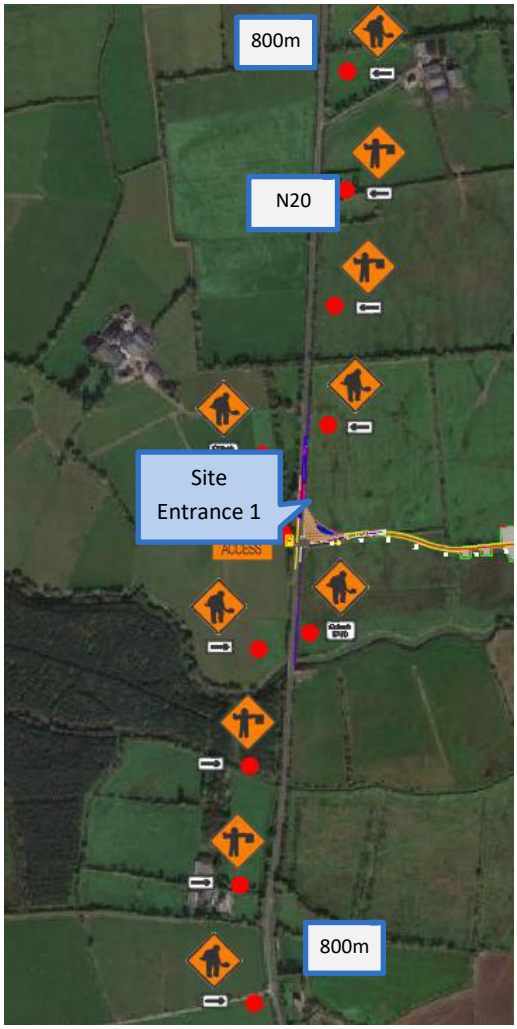


Figure 6 – Site Entrance Signage

3.3.1 Development Junction – Operational Phase – N20

Problem: The operational phase of the development shows what appears to be a bound macadam access road that may be mistaken by public road users as a road junction. There is a gate located at circa 20m from the N20 on the development road. There is concern that public road users may enter the development road and finding the gate closed, reverse back onto the N20.

Hazard: The user may reverse into the path of high speed N20 traffic.

Recommendation: The design team should provide an area between the N20 and the gate where vehicles can turn. Upon completion of the wind farm construction, this entrance should be removed and passively safe field boundary fencing provided adjacent to the N20.

Design Tean Response: The field access will not be available for operations traffic and will be for agricultural purposes only. The extent of the bound asphalt surfacing has been reduced to a 4 m strip at the intersection of the field access track and the N20 carriageway to prevent the spread of debris onto the N20 carriageway. The layout of the field entrance is shown on Drawing 6839-JOD-GGE-XX-DR-C-0212 in **Appendix A**.

8 ENVIRONMENTAL, ARCHAEOLOGICAL AND OTHER CONSTRAINTS

An Environmental Impact Assessment Report (EIAR) has been carried out for the Garrane Green Energy Project including the N20 site entrance to accompany the wind farm planning application.

9 TOTAL SCHEME BUDGET

Not Applicable. The site entrance works will be carried out as part of a developer led scheme and will be constructed as part of the proposed Garrane Green Energy Project.

10 PROJECT APPRESAL BALANCE SHEET

Not Applicable.

APPENDIX A

DRAWINGS

N

W E

S

N20

T08

293.754m

370.692m

189.360m

82.400m

PROPOSED SPOIL STORAGE LOCATION(TEMPORARY)

SILT FENCING UNTIL REVEGETATION OCCURS

CONSTRUCTION SIGNAGE

TIE INTO EXISTING FENCING

SITE ENTRANCE 01 JUNCTION VISIBILITY AND REINSTATEMENT DETAILS REFER TO DRAWING 6839-JOD-GGE-XX-DR-C-0210 & 6839-JOD-GGE-XX-DR-C-0212

SITE NOTICE 1

SITE ENTRANCE 1

EXISTING FARM ENTRANCE TO BE UPGRADED IN ACCORDANCE WITH TII FIELD ENTRANCE DRAWING CC-SCD-02754. UPGRADE WORKS TO INCLUDE 215M VISIBILITY SPLAYS, 4.0m WIDE ACCESS TRACK WITH BOUND SURFACING AT N20 INTERSECTION. ENTRANCE FOR LANDOWNER USE ONLY, NO ACCESS FOR CONSTRUCTION TRAFFIC.

GRASS BLOCK PAVING SLABS

TIMBER POST & TENSION MESH FENCE IN ACCORDANCE WITH TII DRAWING CC-SCD-00320. FENCING TO BE REMOVED FOR ABNORMAL LOAD DELIVERIES AND REPLACED WITH CONES / TEMPORARY BARRIERS TO PREVENT PARKING AT THE SITE ENTRANCE DURING TURBINE DELIVERY PERIODS, FENCING TO BE REINSTATED FOLLOWING COMPLETION OF TURBINE DELIVERIES.

TEMPORARY STOCKPROOF FENCING (CONSTRUCTION PERIOD)

TEMPORARY ROAD WIDENING FOR ABNORMAL LOADED VEHICLES

ACCESS GATE (CONSTRUCTION PERIOD)

SECURITY CABIN, 3mx3m

PROPOSED SETTLEMENT PONDS TYPES AND SIZES REFER TO DRAWING 6839-JOD-GGE-XX-DR-C-0303

SP32 (Type D)

PROPOSED SITE ACCESS TRACKS REFER TO DRAWING 6839-JOD-GGE-XX-DR-C-0401

PROPOSED SITE DRAINAGE DIRTY WATER DRAIN REFER TO DRAWING 6839-JOD-GGE-XX-DR-C-0301 to 0304 incl.

PROPOSED CULVERT REFER TO DRAWING 6839-JOD-GGE-XX-DR-C-0304

PROPOSED NEW HEDGEROW

10m Drain Buffer

EXISTING WATER COURSE WITH 50m BUFFER ZONE

PROPOSED CRANE HARDSTAND
REFER TO DRAWING 6389-JOD-GGE-XX-DR-C-0501
PROPOSED TURBINE FOUNDATION DETAILS
REFER TO DRAWING 6389-JOD-GGE-XX-DR-C-0503
PROPOSED TURBINE ELEVATIONS
REFER TO DRAWING 6389-JOD-GGE-XX-DR-C-0504

Hardstand Finished Level(Z):57.60m

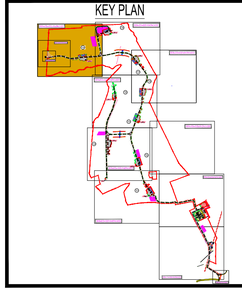
SP31A (Type A)

E:553803.9m
N:627520.3m

SP25 (Type B)

PROPOSED SITE DRAINAGE
CLEAN WATER DRAIN REFER TO DRAWING 6839-JOD-GGE-XX-DR-C-0301 to 0304 incl.

KEY PLAN



NOTES:

1 FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2 ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3 ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
4 THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.
5 ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED

Legend

- Planning Application Boundary
- Proposed Wind Turbine
- Proposed Crane Hardstand
- Proposed Spoil Storage Locations (Temporary)
- Proposed Temporary Compound Location
- Existing Farm Tracks To be Modified(Permanent)
- Proposed New Access Track(Permanent)
- Contours of existing ground elevation
- Proposed Fill
- Proposed Cut
- Existing Watercourse
- Existing Watercourse with 50m buffer
- Proposed New Hedgerow
- 10m Drain Buffer
- Temporary Road Widening
- Dirty Water Interceptor Drain
- Clean Water Interceptor Drain
- Culvert Crossing
- Settlement Pond (Refer to Drawing 6839-JOD-GGE-XX-DR-C-0303 For Settlement Ponds Types and Sizes)
- Buffered Outlet
- Temporary Stockproof Fencing
- Timber Post & Tension Mesh Fence
- XX.XX Finished Access Track Level
- Grass Block Paving Slabs
- Bound Asphalt Surface at Site Entrance
- Access Gate
- Silt Fencing

rev	date	modifications	D	C	A

Client
Garrane Green Energy Ltd.

Project
Garrane Green Energy Project, Garrane, Co.Limerick.

Stage
Planning

Title
Proposed Windfarm Layout Plan
Sheet 1 of 12

Scales
1:1,000 (A1)

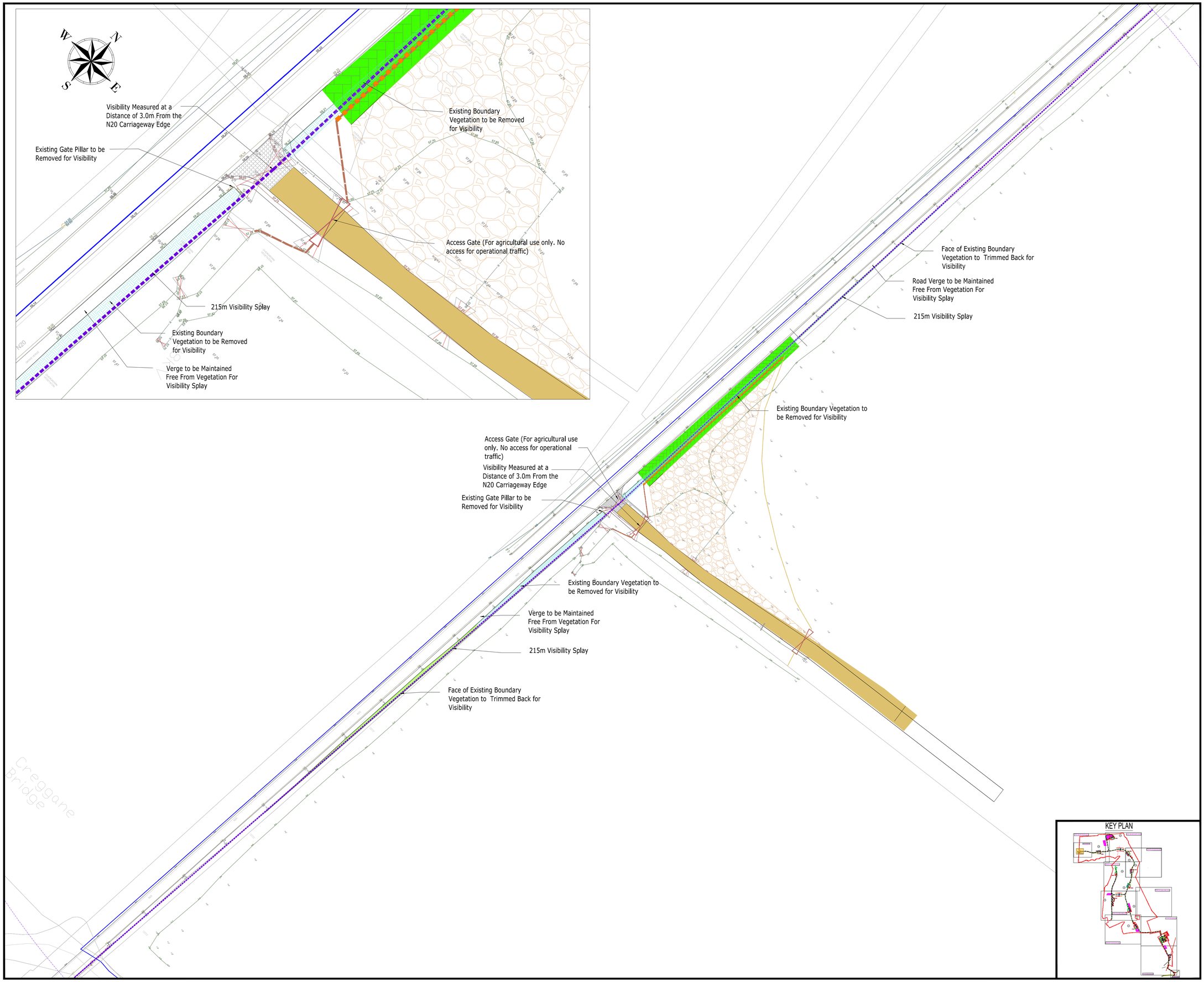
Surveyed	Drawn	Checked	Approved	Date
	A.G	J.D	A.O.G	Aug 2025

JENNINGS O'DONOVAN
an RSK company

FINISKLIN
SLIGO
IRELAND
Tel (+353) 719 161 416
Email. info@jodireland.com
www.jodireland.com

@JOD_Sligo | Jennings O'Donovan & Partners | Jennings O'Donovan

Job Ref.	Drawing No.	Revision
6839	6839-JOD-GGE-XX-DR-C-0201	-



NOTES:

1 FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2 ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3 ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
4 THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.

Legend

- Proposed Access Road in Cut Area
- Proposed Access Road in Filled Area
- Access Gate
- Site Fencing
- Over-run Area For Abnormal Load Vehicles
- Area to be Topsoiled on Completion of Construction
- Visibility Splay
- Temporary Road Barrier
- Bound Asphalt Surface at Site Entrance
- Lands Under Control of Applicant
- Boundary to be Removed for Visibility
- Boundary to be Trimmed for Visibility

Tailte Éireann

rev	date	modifications
D		
C		
A		

Client
Garrane Green Energy Ltd.

Project
Garrane Green Energy project, Garrane,Co.Limerick.

Stage
Planning

Title
N20 Site Entrance 01 Junction Visibility (Sheet 10 of 12)

Scales
1:500 & 1:200 @ A1

Surveyed	Drawn	Checked	Approved	Date
	A.G	J.D	A.O.G	Aug 2025

JENNINGS O'DONOVAN an RSK company

KEY PLAN

FINISKLIN
SLIGO
IRELAND
Tel (+353) 719 161 416
Email. info@jodireland.com
www.jodireland.com
@JOD_Sligo Jennings O'Donovan & Partners Jennings O'Donovan

Job Ref.	Drawing No.	Revision
6839	6839-JOD-GGE-XX-DR-C-0210	-

N

W E

S

215m Visibility Splay

Tie into Existing Fenceline

Timber Post & Tension Mesh Fence in Accordance With CC-SCD-00320

Grass Block Paving Slabs

Over-run Areas For Abnormal Load Vehicles to be Covered with Topsoil and Seeded With Grass

215m Visibility Splay from Entrance

Bound Surface at N20 Intersection

215m Visibility Splay from Entrance

Access Gate - 12m Setback from Carriageway Edge (For agricultural use only. no access for operational traffic).

4m Granular Access Road (For agricultural use only. no access for operational traffic)

Timber Post & Tension Mesh Fence in Accordance With CC-SCD-00320

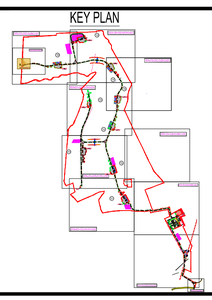
Tie into Existing Fenceline

215m Visibility Splay

N20

N20

KEY PLAN



NOTES:

1 FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2 ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3 ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
4 THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.

Legend

- Proposed Access Road in Cut Area
- Proposed Access Road in Filled Area
- Access Gate
- Temporary Site Fencing
- Timber Post & Tension Mesh Fence
- Grass Block Paving Slabs
- Over-run Area For Abnormal Load Vehicles
- Area to be Topsoiled on Completion of Construction
- Visibility Splay
- Temporary Road Barrier
- Bound Asphalt Surface at Site Entrance
- Existing Access Track (Upgraded)
- Lands Under Control of Applicant

rev	date	modifications	D	C	A

Client
Garrane Green Energy Ltd.

Project
Garrane Green Energy project, Garrane,Co.Limerick.

Stage
Planning

Title
N20 Site Entrance 01 Reinstatement Details (Sheet 12 of 12)

Scales
1:200 @ A1

Surveyed	Drawn	Checked	Approved	Date
	A.G	J.D	A.O.G	Aug 2025

JENNINGS O'DONOVAN
an RSK company

FINISKLIN SLIGO IRELAND
Tel (+353) 719 161 416
Email. info@jodireland.com
www.jodireland.com
@JOD_Sligo Jennings O'Donovan & Partners Jennings O'Donovan

Job Ref.	Drawing No.	Revision
6839	6839-JOD-GGE-XX-DR-C-0212	-

APPENDIX B

ROAD SAFETY AUDIT

Stage 1 Road Safety Audit

Garrane Wind Farm, Garrane, Co Limerick

On behalf of **Garrane Green Energy Ltd**

Prepared By:
CST GROUP
Chartered Consulting Engineers
1, O'Connell Street, Sligo, F91 W7YV
+353 (0)71 919 4500 info@cstgroup.ie www.cstgroup.ie

August 2025

Civil
Structural
Traffic

Table of Contents

DOCUMENT CONTROL

Revision	R0	R1	R1								
Purpose of Issue: P=Preliminary C=Comment F=Final	C	C	F								
Date:	01 11 24	28 07 25	11 08 25								
Originator:	SS	SS	SS								
Checked By:	PJG	PJG	PJG								
Approved By:	SS	SS	SS								

1. INTRODUCTION

1.1. This report describes a Stage 1 Road Safety Audit carried out on behalf of Garrane Green Energy Ltd on a proposed wind farm entrance junction off the N20 north of Charleville, Co Limerick. This entrance will be used for abnormal loads while constructing the wind farm only. All vehicles exiting the development and future service vehicle movements will be via the nearby local road network, and these are not subject to this road safety audit.

1.2. The audit was carried out between 29th October 2024 – 28th July 2025

1.3. The audit team were as follows:

Team Leader: Stuart Summerfield, HNC (Civil) FCIHT FSoRSA
Certificate of Competency in Road Safety Audits (SoRSA, 2015)
TII Auditor Ref. SS73290

Team Member: PJ Gallagher, BEng M.Inst.A.E.A. MITAI
TII Auditor Ref. PG3425716

1.4. The audit comprised an examination of the drawings relating to the scheme supplied by the design office. A site visit was carried out by both Audit Team members together on 29th October 2024 between the hours of 12:30 – 13:30. Weather conditions during the inspection were fine and the road surface dry. Traffic conditions were considered busy with cars, light goods and HGVs. No cyclists or pedestrians were observed. Photographs were taken during the inspection.

1.5. This Stage 1 audit has been carried out in accordance with the relevant sections of the Transport Infrastructure Ireland (TII) Publication (Standard) GE-STY-01024 (Dec 2017) 'Road Safety Audit'. The audit team has examined only those issues within the design relating to the road safety implications of the scheme and has therefore not examined or verified the compliance of the design to any other criteria.

1.6. **Appendix A** describes the documents examined by the Audit Team.

Appendix B contains a copy of the TII's approval of the Audit Team.

Appendix C contains the Audit Feed Back Form. The Designer shall consider the Audit Report and prepare a Designer Response to each of the recommendations, using the Feedback Form. The response shall state clearly whether each recommendation is accepted, rejected, or whether an alternative recommendation is proposed. Copies of the Designer Response shall be sent to the Employer and the Audit Team. The Audit Team shall then consider the Designer Response and indicate on the Feedback Form whether the Designer's response to each recommendation is accepted. The completed Report contains the completed Feedback Form with signatures of all three parties involved - Designer, Audit Team Leader and Employer.

1.7. All of the problems described in this report are considered by the Audit Team to require action in order to improve the safety of the scheme and minimise collision occurrence.

2. ITEMS RESULTING FROM PREVIOUS STAGE 1 AUDIT

A previous Stage 1 road safety audit was undertaken on the scheme in October 2024. Reference to this audit has been made by the current team. Where problems remain and there is a viable and proportionate remedial measure available, the problem has been repeated in Section 3 of this report.

3. ITEMS RESULTING FROM THIS STAGE 1 AUDIT

3.1 Collision Data

Collision data has not been supplied with this scheme.

Road Collision Data is not currently available on the Road Safety Authority Database, therefore no collision trends in the immediate vicinity of the proposed site can be analysed.

3.2 General Problems / Problems at Multiple Locations

3.2.1 Junction Visibility

Problem: Although the junction is intended for entry only, there is concern some users may attempt to exit on the N20. This length of N20 National Road is straight with only slight vertical undulations. Traffic speeds were observed to be high and consisted of a large percentage of heavy good vehicles. The roadside boundaries generally consist of hedging with breaks for field accesses. Although the drawing indicates junction visibility envelopes will be provided, there is concern the hedging will regrow to obscure intervisibility between drivers exiting the site and mainline traffic.

Hazard: Drivers may exit the junction into the path of oncoming vehicles, or mainline traffic may have late visibility of users approaching the mainline and errantly take avoidance action by entering into the opposing traffic lane.

Recommendation: The design team should provide a physical means to ensure vehicles cannot exit via this junction.

3.2.2 Construction Stage – N20 Signage

Problem: This section of N20 was observed to have a high volume of high-speed vehicles and a high percentage of HGV traffic. The large and heavy vehicles accessing the site are likely to be slow moving when making their turns. There is concern that N20 users will not expect to encounter slow moving vehicles on this straight section of road with historically minimal traffic turning movements.

Hazard: Rear end shunt collisions may result.

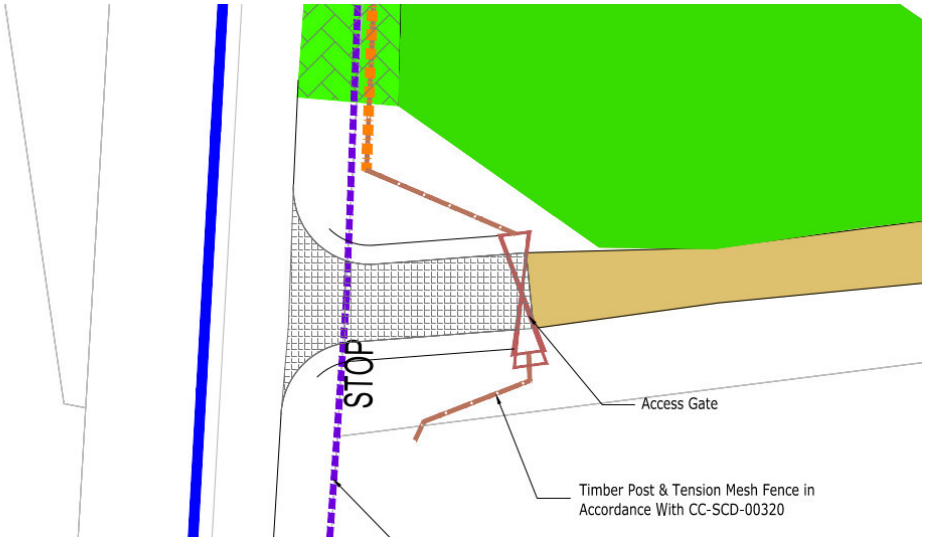
Recommendation: The Design Team should provide temporary signage on the National Road network well in advance of the junction for the duration of the construction phase.

Note: All temporary signage should comply with Chapter 8 of the Traffic Signs Manual and be approved by the Roads Authority.

3.3 Problems at Specific Locations

3.3.1 Development Junction – Operational Phase – N20

Problem: The operational phase of the development shows what appears to be a bound macadam access road that may be mistaken by public road users as a road junction. There is a gate located at circa 20m from the N20 on the development road. There is concern that public road users may enter the development road and finding the gate closed, reverse back onto the N20.



Hazard: The user may reverse into the path of high speed N20 traffic.

Recommendation: The design team should provide an area between the N20 and the gate where vehicles can turn. Upon completion of the wind farm construction, this entrance should be removed and passively safe field boundary fencing provided adjacent to the N20.

AUDIT TEAM STATEMENT

We certify that we have examined the drawings and other information listed in Appendix A. This examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified to improve the safety of the scheme. The problems that we have identified have been noted in the report, together with suggestions for improvement which we recommend should be studied for implementation. No one in the Audit Team has been involved with the scheme design as shown in Appendix A.

Signed .....

Stuart Summerfield
Audit Team Leader

Date 28th July 2025

Signed .....

PJ Gallagher
Audit Team Member

Date 28th July 2025

Appendix A List of Documents Examined

DOCUMENT REF / NAME:	RECEIVED FROM:	DATE:
6839-JOD-XX-DR-C-0210 P02 N20 Site Entrance 01 Junction Visibility (Sheet 10 of 12	Jennings O'Donovan	24/07/2025
6839-JOD-XX-DR-C-0212 P01 N20 Site Entrance 01 Reinstatement Details (Sheet 12 of 12)	Jennings O'Donovan	24/07/2025

Appendix B TII Approval of RSA Team

TII Email Agent - N20 Garrane Green Energy, Charleville Co. Cork - Wind Farm Stage 1 - Audit team & briefs approved

Reply | Reply All | Forward

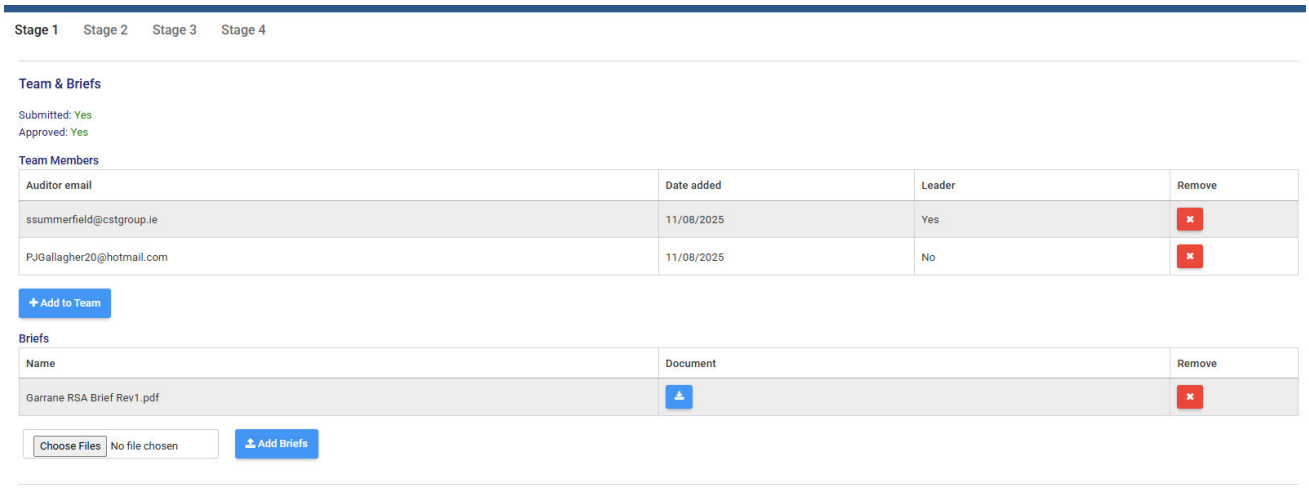
TS

TII Systems Notification <noreply@tii.systems>
To aogrady@jodireland.com
Cc lucy.curtis@tii.ie; pat.phelan@tii.ie

Mon 11/08/2025 15:24

This message was sent with High importance.

Audit team & briefs for N20 Garrane Green Energy, Charleville Co. Cork - Wind Farm Stage 1 have been approved.
For further information please click here.



Stage 1 Stage 2 Stage 3 Stage 4

Team & Briefs

Submitted: Yes
Approved: Yes

Team Members

Auditor email	Date added	Leader	Remove
ssummerfield@cstgroup.ie	11/08/2025	Yes	
PJGallagher20@hotmail.com	11/08/2025	No	

+ Add to Team

Briefs

Name	Document	Remove
Garrane RSA Brief Rev1.pdf		

Choose Files No file chosen Add Briefs

Appendix C RSA Feedback Form

ROAD SAFETY AUDIT FEEDBACK FORM

CST Group Chartered Consulting Engineers
1, O'Connell Street, Sligo, F91 W7YV, Ireland

Scheme: Garrane Wind Farm, Garrane, Co Limerick

Audit Stage: 1 **Date Audit Completed:** 28/07/2025 **Route No.** N20 **Our Ref :**123248|R0

TO BE COMPLETED BY DESIGNER				TO BE COMPLETED BY AUDIT TEAM LEADER
Paragraph No. in Safety Audit Report	**Problem accepted (Yes/No)**	**Recommended measure accepted (Yes/No)**	**Describe alternative measure(s). Give reasons for not accepting recommended measure. Only complete if recommended measure is not accepted.**	**Alternative measures or reasons accepted by Auditors (Yes/No)**
3.2.1	Yes	Yes		
3.2.2	Yes	Yes		
3.3.1	Yes	No	Bound asphalt surfacing removed at field gate and replaced with granular surfacing with 3.0m asphalt strip at N20 intersection to prevent spread of debris onto N20 carriageway. Field access to be in accordance with CC-SCD-02754 with gate set back 12m from the N20 carriageway edge. Field access to remain for agricultural purposed only, there will be no access for development traffic	Yes

Signed: Design Team Date: 11/08/25

John Doogan
Jennings O'Donovan

Signed: Audit Team Leader Date: 11/08/25

Stuart Summerfield
CST Group Chartered Consulting Engineers

Signed: Employer Date: 11/08/25

Larry O'Halloran
For Garrane Green Energy Ltd

APPENDIX C

SAFETY BARRIER RISK ASSESSMENT

Risk Assessment Sheet for Vehicle Restraint Systems	**Date:**	**Completed By: J Doogan**
	Location ID/Description:	**N20 Between Charliville and O'Rourkes Cross**
	Site Survey Conducted	**Yes**

	Hazard Type, Start and End Coordinates	**Is Hazard within the Clear Zone? (Y/N)**	**Can the Hazard be Mitigated? (Y/N)**	**(1) Hazard Ranking**	**Sinuosity Index (SI)**	**(2) Sinuosity Ranking**	**(3a) Collision Rate Threshold**	**(3b) Collision Rate Ranking**	**(4) Risk of a Vehicle Leaving the Road**	**(5) Overall Risk Rating**	**Distance of Hazard (m)**	**VRS to be Installed (Y/N) Start and End Coordinates**	**Reasons for Installing/Not Installing the VRS**
1	Masonry Gate Pillars E 553385.65, N 627545.48	Y	Y	H	1	L	4	L	L	L	10m	No	Pillars to be removed
2	Existing Boundary E 553392.77, N 627623.25 to E 553384.85, N 627536.18	Y	Y	H	1	L	4	L	L	L	80m	No	Boundary to be replaced with passively safe boundary and fencing
3													
4													
5													
6													
7													

L = Low, M = Medium, H = High

(1) Hazard Ranking as per Appendix C
High/Very High (H) as per Appendix C
Medium (M) as per Appendix C
Low (L) as per Appendix C

(2) Sinuosity Ranking
High (H) > 1.02
Medium (M) = 1.004 ≤ SI ≤1.02
Low (L) < 1.004

(3a) Collision Rate Threshold
(1) Twice above Expected Rate
(2) Above Expected Rate
(3) Below Expected Rate
(4) Twice Below Expected Rate

(3b) Collision Rate Ranking
High (H) = Twice above Expected Rate
Medium (M) = Above Expected Rate
Low (L) = Below Expected Rate and Twice Below Expected Rate

(4) Risk of a Vehicle Leaving the Road		**Collision Rate Ranking**		
		H	**M**	**L**
Sinuosity Ranking	**H**	H	H	M
	M	H	M	L
	L	M	L	L

(5) Overall Risk Rating		**Hazard Ranking**		
		H	**M**	**L**
Risk of a Vehicle Leaving the Road	**H**	H	H	M
	M	H	M	L
	L	M	L	L