

TULLAGHMORE WIND FARM LIMITED

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TULLAGHMORE WIND FARM COUNTY GALWAY

TRAFFIC MANAGEMENT PLAN (TMP)

Rev. 2

January 2023



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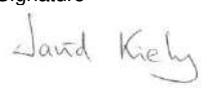


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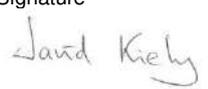
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TULLAGHMORE WIND FARM
TRAFFIC MANAGEMENT PLAN

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TULLAGHMORE WIND FARM
TRAFFIC MANAGEMENT PLAN

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1 INTRODUCTION

1.1 Brief

Jennings O'Donovan & Partners Limited has been appointed by Tullaghmore Wind Farm Limited to prepare a Traffic Management Plan ("TMP") for the proposed Tullaghmore Wind Farm, Co. Galway. The proposed Wind Farm site is located in the townland of Tullaghmore, Co. Galway. The site access point is located on the N59 National Secondary Road approximately 32km east of Galway and 38km west of Clifden. The Wind Farm development will consist of 6 No. wind turbines with a rotor diameter of 162m and a 38kV electrical substation. The wind farm will be linked to the National grid via a 38kV underground cable connection approximately 18.65km in length to the existing ESB Screebe 110kV GIS Substation. Due to environmental constraints on the wind farm site, unsuitable excavated material will be transported off site to a biodiversity enhancement area near Maam Cross.

This TMP considers the potential impact of the proposed development on traffic flows and the public road network in the area during the construction, operation and decommissioning of the wind farm

1.2 Statement of Authority

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

1.3 Site Location, Context and Proposed Development

The proposed Wind Farm site is located in the townlands of Tullaghmore, Co. Galway. The site access point is located on the N59 National Secondary Road approximately 32km east of Galway and 38km west of Clifden. The Wind Farm will consist of 6 No. wind turbines with a rotor diameter of 162m and an electrical substation. Each turbine will be erected on an insitu concrete foundation with steel reinforcement and will have a crane hardstand constructed from

granular material, the crane hardstand will be used to store turbine components and to support a crane during the erection of the turbine. Each turbine hardstand will be linked to the site entrance on the N59 by a network of access roads constructed from granular materials with associated drainage and fencing. The turbines will be linked to the onsite substation by electrical cabling laid in buried ducts alongside the access road. The substation will be linked to the National grid via a 38kV underground cable connection approximately 18.65km in length to the existing ESB Screebe 110kV GIS Substation. Due to environmental constraints on the wind farm site, unsuitable excavated material such as peat cannot be deposited on site. The unsuitable material will be transported off site to a biodiversity enhancement area near Maam Cross. The location of the wind farm site, N59 site entrance and biodiversity enhancement area at Maam Cross is shown in **Figure 1**. The location of the 38kV underground connection is shown in **Figure 2**.

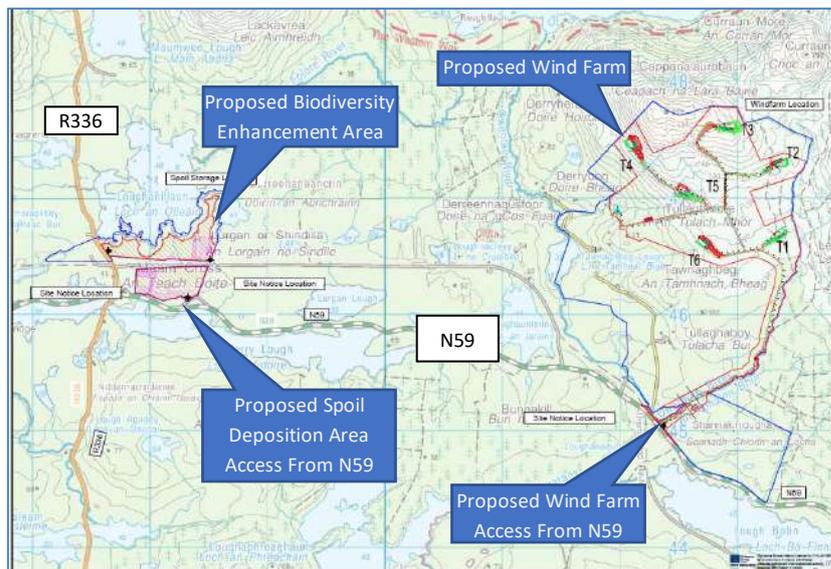


Figure 1 – Site Location & Biodiversity Enhancement Area

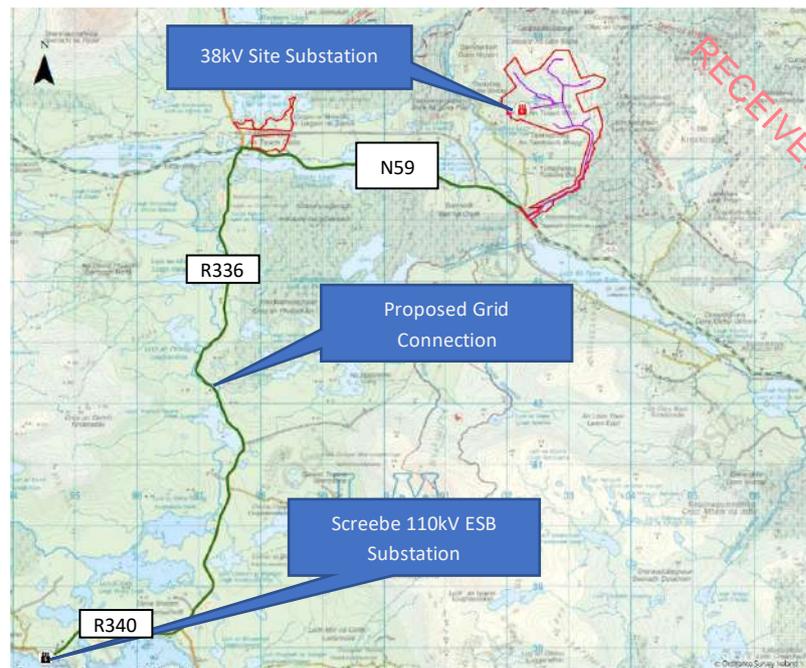


Figure 2 – 38kV Grid Connection

All major turbine components will be manufactured outside Ireland and shipped to Galway Port which is equipped with handling and storage facilities for turbine components. The turbine components will be transported from Galway Port to the wind farm site using the public road network. From Galway Port the turbine components will be transported to the Site using either the N59 national secondary road through Oughterard or using the R337, R336 and N59 passing through Spiddal and Maam Cross. The proposed Haul Routes for Turbine Components are shown in **Figure 3** via Oughterard and **Figure 4** via Spiddal. The turbine components will be transported using specialist abnormal load vehicles and will require abnormal load permits during transit. Delivery times and size of abnormal load convoys will be agreed with An Garda Síochána and Galway County Council staff to avoid peak hours on the public road vehicles. Turbine delivery convoys will be accompanied by support personnel who will carry out enabling works to allow the convoy to pass and to reinstate traffic lights etc when the convoy has passed. Turbine delivery convoys may also be accompanied by An Garda Síochána who will provide traffic management at sensitive locations along the route.

A haul route survey for the transportation of turbine components via Oughterard and Spiddal using abnormal load vehicles has been carried out by Pell Frishmann Ltd. The haul route survey is included in **Appendix 14.1** of the EIAR. The swept path analysis drawings in the haul route survey report show that enabling works will be required at isolated locations along the section of the haul route as identified in **Section 5** of this report.

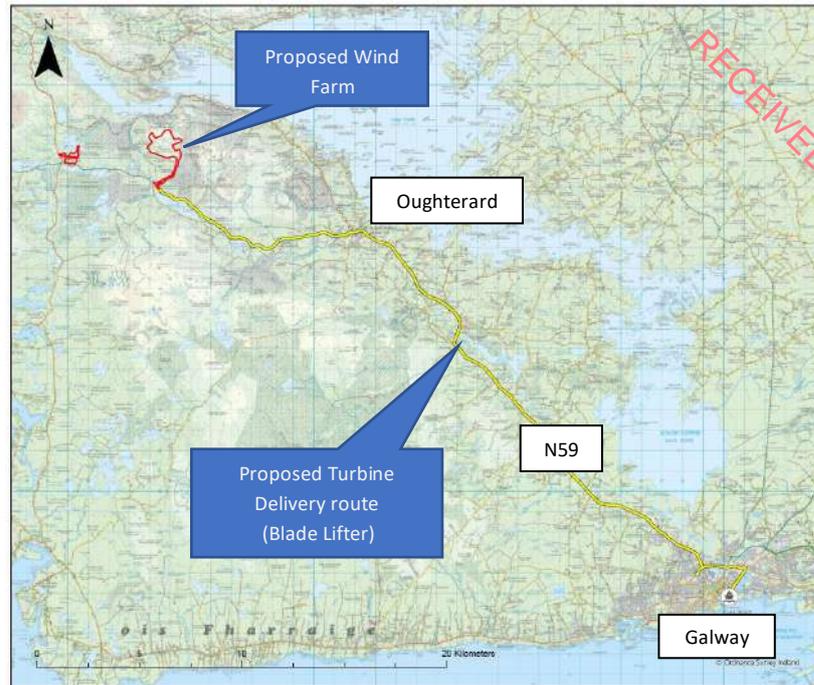


Figure 3 – Turbine Delivery Route Via Oughterard

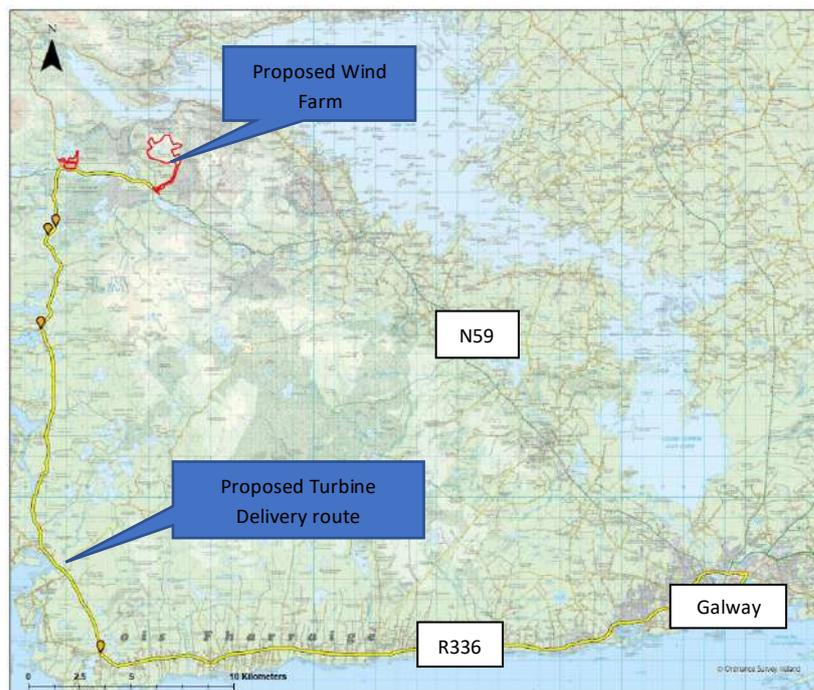


Figure 4 – Turbine Delivery Route Via Spiddal

The haul route for wind farm construction traffic will use the national and regional road network to access the site. The use of local roads for construction traffic will be prohibited unless the local road provides access to a licenced suppliers facility or forms part of the wind farm site, such as the access road to the biodiversity enhancement area. it is envisaged that

granular materials for Site Access Track and Turbine Hardstand construction will be sourced from excavations within the Site or from local suppliers. It is also envisaged that ready-mix concrete for Turbine Foundation construction and Substation foundations will be sourced from a local authorised quarry located along the N59 national secondary route and the R336 regional road corridors. The location of aggregate and concrete suppliers in the vicinity of the proposed are shown in **Figure 5**.

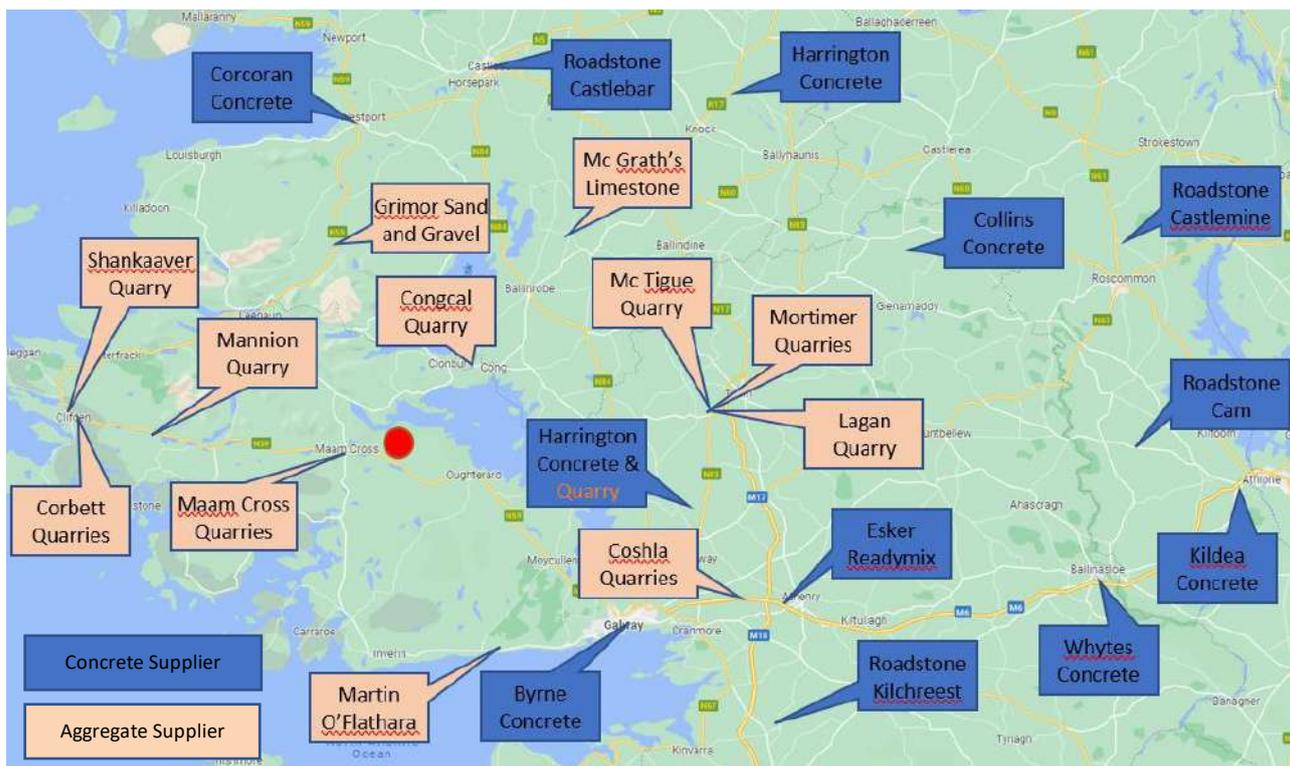


Figure 5 – Concrete and Aggregate Suppliers

Construction workers will use the Site entrance on the N59 to access the site but will need to have flexibility in the roads they use to reach the Site.

1.4 Consultation with Local Authorities

Tullaghmore Wind Farm Limited have consulted with representatives from Galway County Council and Transport Infrastructure Ireland during the planning process to discuss the proposed site entrance, 38kV grid connection and wind farm haul route for the construction of the Tullaghmore Wind Farm.

2 ACCESS TO THE PROPOSED DEVELOPMENT

2.1 The Road Network around the Proposed Development

The proposed farm site is located in the townland of Tullaghmore, Co. Galway. The site access point is located on the N59 National Secondary Road near Maam Cross approximately 32km east of Galway and 38km west of Clifden. The N59 national secondary road links Sligo to Galway, passing through Clifden, Maam Cross and Oughterard. The R336 regional road passes through Maam Cross and connects the N59 at Leenaun to the N6 and N83 in Galway City.

2.2 Road Access to the Proposed Development

All general construction traffic and turbine delivery traffic generated by the proposed wind farm development will use the N59 national secondary road and R336 regional road to access the site via the site entrance located on the N59.

2.3 Site Access

Access to the wind farm site will be from a simple priority T-Junction on the N59 as shown in **Figure 1**. The junction is located at the site of an existing forestry / farm access which will be upgraded to accommodate the swept path of abnormal load vehicles accessing the site during the delivery of turbine components. The junction will be a stop-controlled junction with priority for N59 traffic. Visibility splays of 215m will be available in both directions from a 3.0m setback in accordance with TII specifications for a design speed of 100km/h. The location of the junction will be signposted in accordance with Chapter 8 of the Traffic Signs Manual during the construction of the wind farm. The location of the wind farm site access is shown on **Plate 1**.



Plate 1 – N59 Access to Wind Farm Site

Access to the wind farm biodiversity enhancement area near Maam Cross will be from a simple priority T-Junction on the N59 as shown in **Figure 1**. The junction is located at the site of an existing access road which will be upgraded to accommodate the swept path of HGV's accessing the biodiversity enhancement area to deposit unsuitable material from the main wind farm site. The junction will be a stop-controlled junction with priority for N59 traffic. Visibility splays of 215m will be available in both directions from a 3.0m setback at the junction in accordance with TII specifications for a design speed of 100km/h. The location of the junction will be signposted in accordance with Chapter 8 of the Traffic Signs Manual during the construction of the wind farm. The location of the biodiversity enhancement area access is shown on **Plate 2**.



Plate 2 – Access to Biodiversity Enhancement Area

2.4 Haul Routes to Site for Turbine Delivery Traffic

All turbine component delivery vehicles will use the site access junctions on the N59 national secondary road. Turbine delivery traffic will travel to the wind farm site from Galway Port using the national and regional road network. The haul route to site may be via the N59 as shown in **Figure 3** using a specialised blade lifter to navigate the bridge in Oughterard or via Spiddal using standard abnormal load vehicles as shown in **Figure 4**. A haul route survey for the transportation of turbine components via Oughterard and spiddal using abnormal load vehicles has been carried out by Pell Frischmann Ltd. The haul route survey is included in **Appendix 14.1** of the EIAR. The swept path analysis drawings in the haul route survey report show that enabling works will be required at isolated locations along the section of the haul route as identified in **Section 5** of this report.

2.5 **Haul Routes to Site for General Construction Traffic**

Granular materials for wind farm access roads and turbine hardstands will be imported from local quarry's such as Maam Cross Quarries and sourced from excavation works within the site. Concrete for turbine foundations and structures will be transported to site from a local concrete supplier. General building materials and ducting for grid connection works will be supplied from local hardware providers. Permanent and temporary surfacing for grid connection works will be sourced from a local asphalt supplier, asphalt and granular materials arising from trench excavations during grid connection works will be transported to licenced recycling centre. While the sourcing of concrete and granular materials will be the responsibility of the contractor appointed to carry out the construction of the wind farm and grid connection, supplies of concrete and granular materials are likely to be chosen from the quarries shown in **Figure 5**.

3 EXISTING ROADS AND JUNCTIONS IN PROXIMITY TO THE SITE

3.1 Existing Roads in the Vicinity of the Site

The existing N59 national secondary road (Reference Plate 3) is typically a 6.0m wide two land single carriageway road in the vicinity of the site. The alignment of the N59 has been upgraded between Oughterard and the site entrance. The road is delineated with road markings and signposted with regulatory and directional signs.



Plate 3 – N59 National Secondary Road

The existing R336 (Reference Plate 4) is a 6.0m wide two land single carriageway with regulatory signs and roadmarkings.



Plate 4 – R336 Regional Road

3.2 Existing Junctions in the Vicinity of the Site

The existing junction between the N59 and the R336 at Maam Cross (Reference plate 5) is a cross roads junction with priority for N59 traffic. The junction is located in a 50km/h speed limit zone and is lit by public lighting. The junction is a stop controlled junction with regulatory roadmarkings and signage.



Plate 5 – N59 / R336 Junction at Maam Cross

3.3 Works on the Public Road Network

Temporary and Permanent Works are required at the following locations on the public road network to facilitate the construction of the Tullaghmore Wind Farm:

- N59 wind farm site entrance - upgrade existing entrance to accommodate the swept path of abnormal load vehicles.
- N59 entrance to spoil deposition area – upgrade existing entrance to accommodate HGV's.
- N59, R366 and R340 Grid connection works – construct a new 38kV underground grid connection within the public road between the wind farm site substation and the existing 100kV ESB substation at Screebe.
- Haul route enabling works for the transportation of turbine components – refer to Section 5 of this report and swept path analysis drawings in Appendix 14.1 of the EIAR.

Works on the public road network will be carried out in consultation with Galway County Council Roads Department using an approved Traffic Management Plan and Road Opening Licence. The construction of the 38kV grid connection will be carried out under a number of

phased operations which will involve traffic management. The first phase of the works will involve the excavation of a 0.6m wide cable trench, construction of 2m wide x 4m long joint bays, installation of cable ducting, backfilling of trench and temporary reinstatement of road surfacing. The second phase of the works will involve installing the 38kV cable in the ducting. During the cable installation traffic management will be required at the joint bays to allow cable pulling and jointing. The final phase of the works will involve permanent reinstatement of the road surfacing and surface dressing. The phased works will be carried out using lane closures and will require traffic management to be removed and reinstalled a number of times over the course of the project.

An outline traffic management plan for works on the public road is included in **Appendix B**.

4 PRE-CONSTRUCTION WORKS REQUIREMENTS

4.1 Location and Diversion of Existing Services

A desk-based study will be carried out to locate existing services in the area before works commences on site. Prior to the commencement of works, the location of existing services shall be confirmed by ground penetrating radar. All service diversions and works to protect existing services which are necessary for the construction of the wind farm shall be agreed with the relevant service provider prior to works commencing on site.

4.2 Permits to Work on the Public Road Network

Prior to the commencement of works, the Contractor shall obtain all necessary road opening licenses and road closure permits to work on the public road network. The Contractor shall inform the public in advance of road closures and provide alternative means of access to properties, businesses and farms.

4.3 Traffic Management Plan

All works carried out on site shall be carried out in accordance with the requirements of Chapter 8 of the Traffic Signs Manual. The appointed Contractor shall compile a detailed traffic management plan for the works which will specify the precise traffic management measures for each works section and submit to Galway County Council. The Contractor will appoint a competent traffic management coordinator who will be the main point of contact for all traffic management matters during the course of the works. The agreed traffic management

systems shall be installed and maintained by operatives with the appropriate training to carry out works on traffic management systems. The TMP shall be submitted to the OE and Employer for review 1 month before scheduled works.

4.4 Site Access Roads

All construction traffic shall access the site from the N59 and the R336. Construction traffic shall be prohibited from using local roads which are not directly affected by the works. The location of site access points shall be signposted and assigned a site access number for the duration of the works. Haul routes for construction and delivery traffic shall be signposted from the national and regional road network.

4.5 Road Condition Survey

A road condition survey will be carried on the N59 between the wind farm site entrance and the entrance to the spoil deposition area on the R336 at Maam Cross. This will consist of a Road Surface Profile (RSP) condition survey and Pavement Condition Index (PCI) report carried out by an independent contractor using a Road Surface Profiler machine testing to assess the condition of the carriageway. A post-construction condition survey shall be carried out following the completion of the works in consultation with Galway County Council.

4.6 Public Information and Access

The appointed Contractor shall inform local residents, businesses and emergency services of road closures in advance of any works taking place on site. Access shall be maintained to properties at all times during the course of the works. The Contractor will appoint a project coordinator who will be the main point of contact for matters relating to traffic which will affect the general public, local businesses and emergency services. An out of hours contact number shall also be provided

4.7 Emergency Access Routes

Emergency access routes shall be provided at all times for emergency service vehicles to access the site or to bypass the works in the event of an emergency.

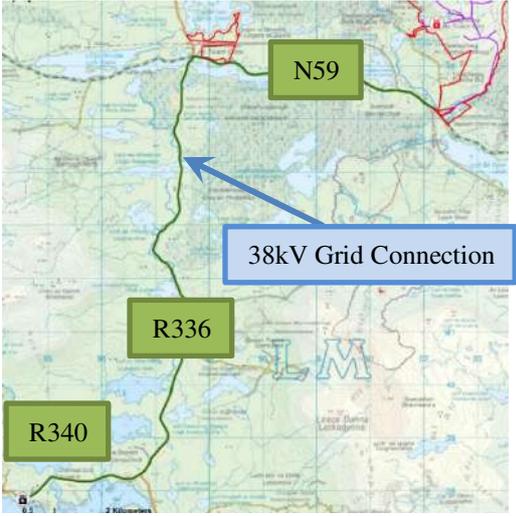
5 WORKS LOCATIONS

5.1 Permanent Works Location No.1

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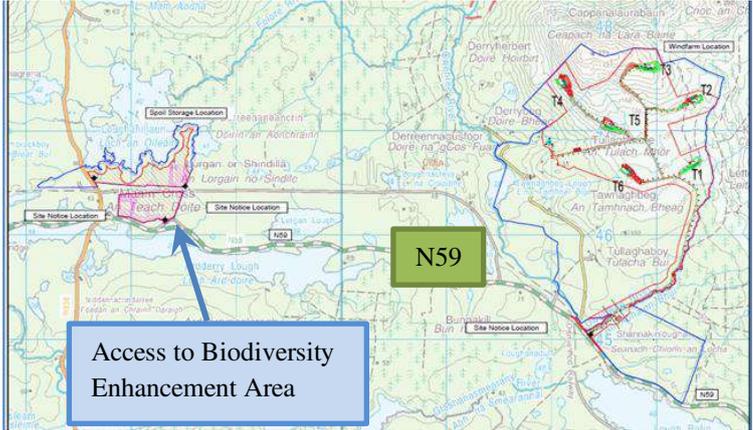
Works Location No.1	Site Entrance Construction
Road Number	N59
Description of Works to be Undertaken	Upgrading Existing Simple Junction on the N59 for Permanent Wind Farm Site Access
Drawing Reference	Figure 2.3 Appendix A
Traffic Management System	Temporary Traffic Lights / Stop & Go / Lane Closure / Flagman
	
Local Access	Maintained at all times,
Duration of Works	2 Days Construction / 2 Days Reprofiting and Landscaping Following Completion of Wind Farm Construction
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times

5.2 Permanent Works Location No.2

Works Location No.2	38kV Grid Connection
Road Number	N59/R336 / R340
Description of Works to be Undertaken	Construction of 38kV Grid Connection Between Wind Farm and 110kV ESB Substation at Screebe on the R340
Drawing Reference	Figure 2.10 Appendix A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman
	
Local Access	Maintained at all times
Duration of Works	190 Days Trench and Ducting Works 20 Days Cable Installation 10 Days Reinstatement of Permanent Surfacing
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times

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5.3 Permanent Works Location No.3

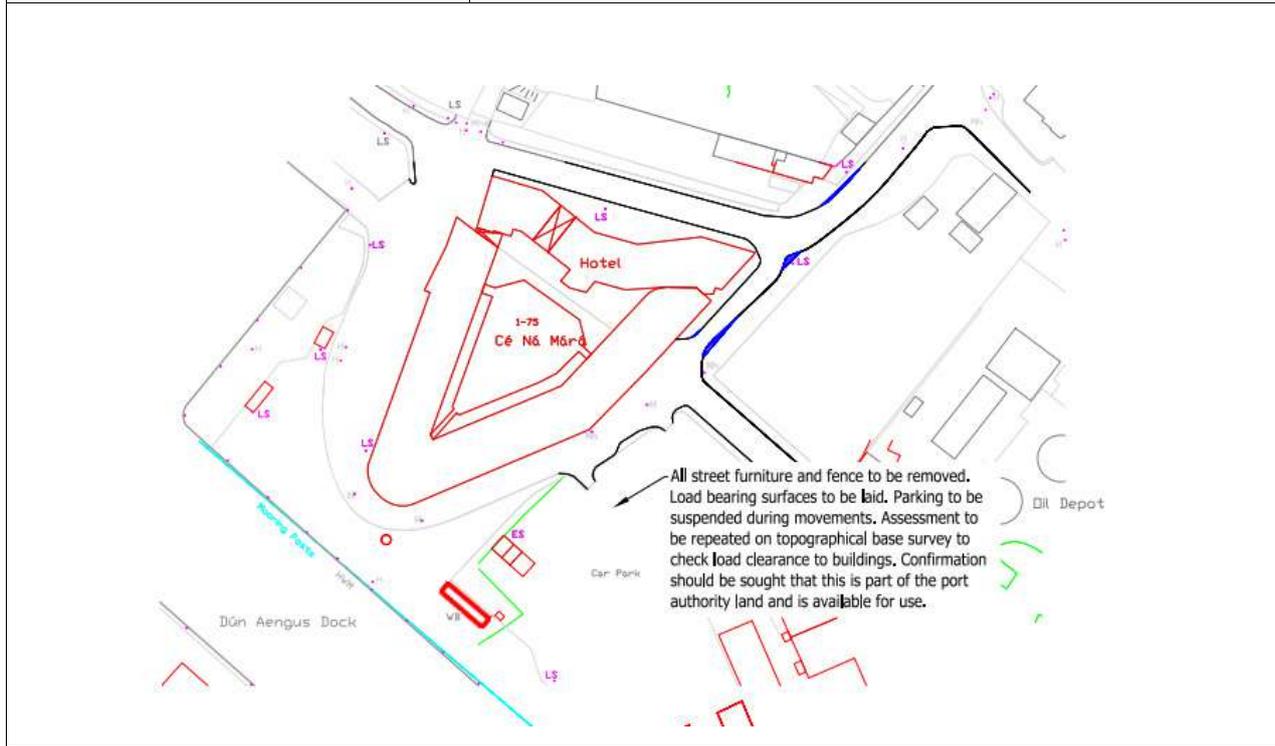
Works Location No.3	Entrance to Biodiversity Enhancement Area
Road Number	N59
Description of Works to be Undertaken	Junction Upgrade Works at Temporary Site Access to Biodiversity Enhancement Area on the N59
Drawing Reference	6276-TWF-JOD-XX-DR-C-0100 Appendix A
Traffic Management System	Temporary Traffic Lights / Flagman / Stop & Go/Lane Closure
	
Local Access	Maintained at all times
Traffic Management System	Diversion
Duration of Works	2 Days
Duration of Lane Closure/ Traffic Management	N/A
Emergency Access	Maintained at all Times

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5.4 Temporary Works Location No.4

Works Location No.4	Galway Port
Road Number	Port Entrance
Description of Works to be Undertaken	Surfacing Works Removal of Street Furniture and Fencing
Drawing Reference	Haul Route Report EIAR Appendix 14.1 – SK01A, SK01B, SK01C
Traffic Management System	Temporary Traffic Lights / Flagman

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Local Access	Maintained at all times
Duration of Works	2 days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times

5.5 Temporary Works Location No.5

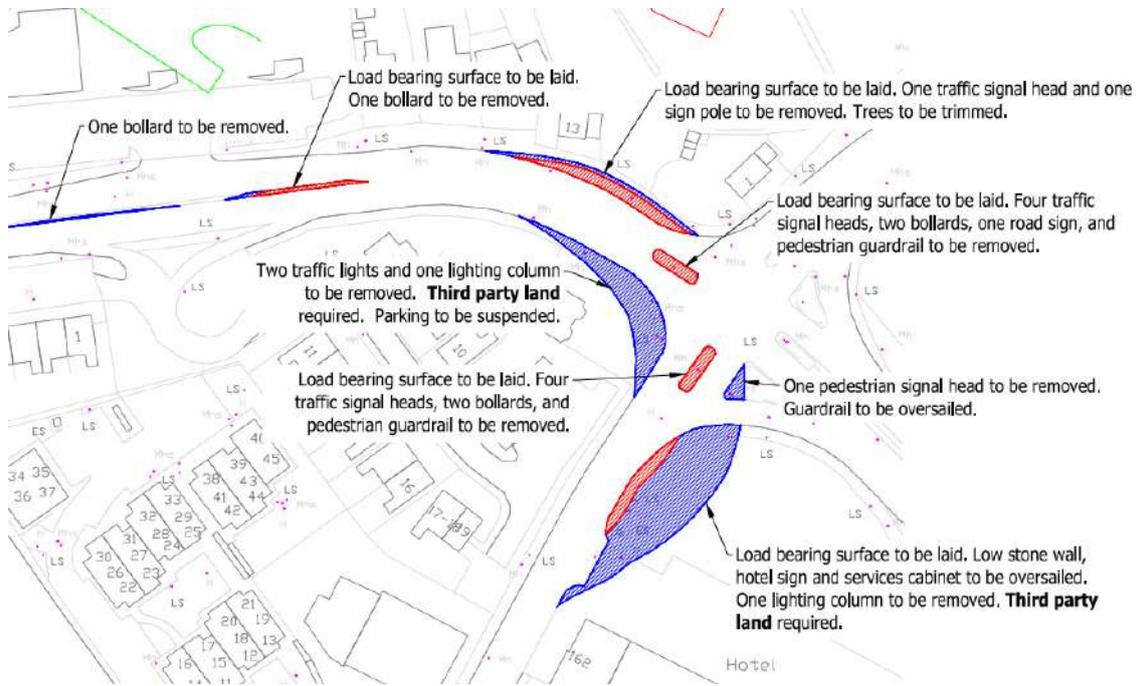
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Works Location No.5	Galway City
Road Number	Lough Atalia Rd. / R339 Junction
Description of Works to be Undertaken	Haul Route Enabling Works Removal of Street Furniture Alterations to Traffic Lights
Drawing Reference	Haul Route Report EIAR Appendix 14.1 – SK02A, SK02B
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman
Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	2 Days of construction, 2 days of reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.6 Temporary Works Location No.6

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Works Location No.6	Galway City
Road Number	R339 / R338 Junction
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Street Furniture Alterations to Traffic Lights
Drawing Reference	Haul Route Report EIR Appendix 14.1 – SK03, SK03A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman

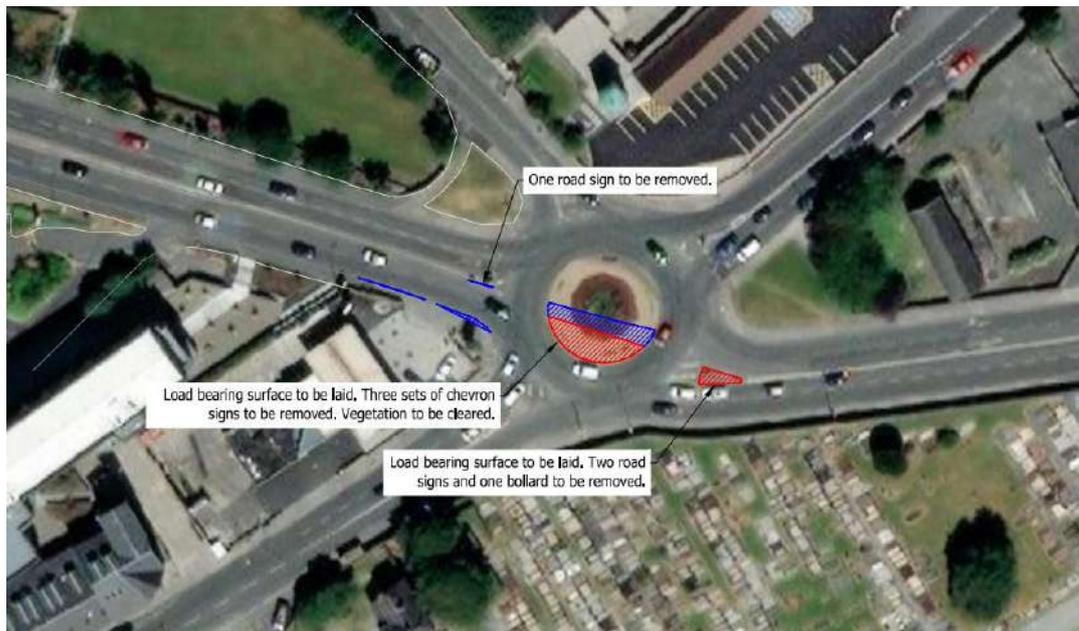


Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	3 days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.7 Temporary Works Location No.7

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Works Location No.7	Galway City
Road Number	R338 Cemetery Cross Roundabout
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Removal of Street Furniture
Drawing Reference	Haul Route Report EIA Appendix 14.1 - SK04, SK04A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman

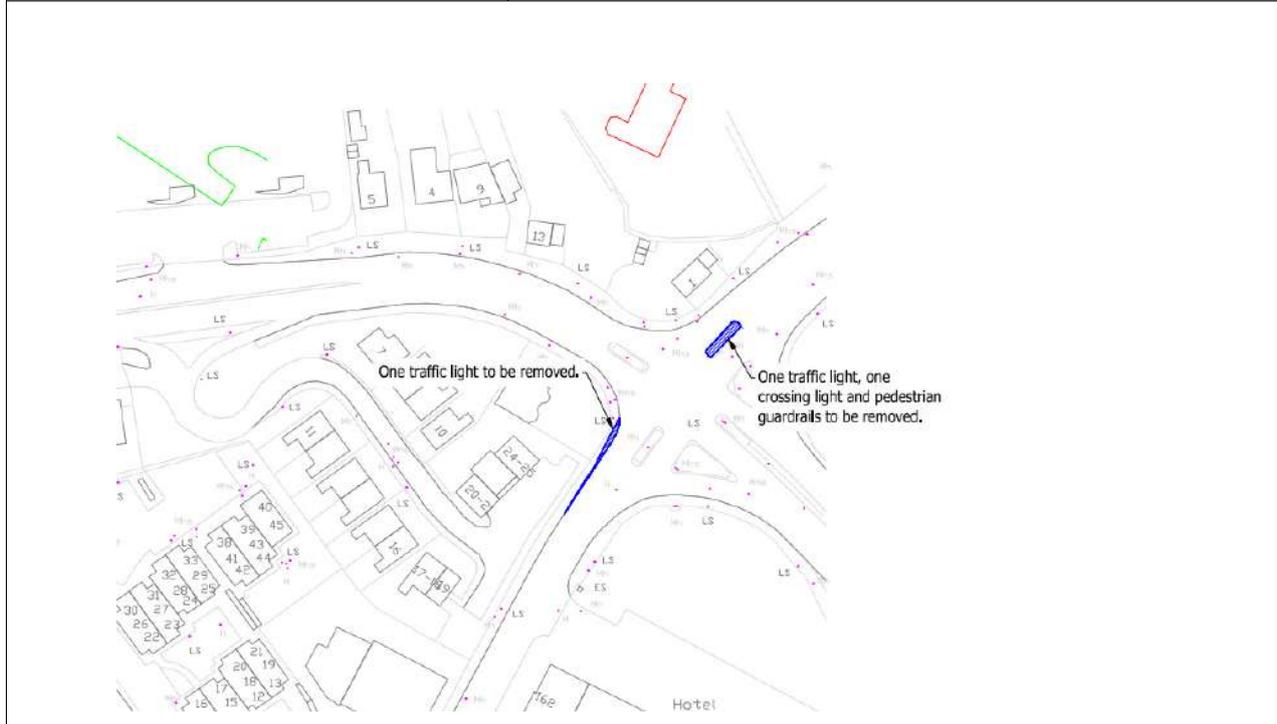


Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	4 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.8 Temporary Works Location No.8

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Works Location No.8	Galway City
Road Number	R339 / R338 Junction
Description of Works to be Undertaken	Haul Route Enabling Works Modifications to Street Furniture Alterations to Traffic Lights
Drawing Reference	Haul Route Report EIAR Appendix 14.1 - SK52, SK52A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman



Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	2 days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.9 Temporary Works Location No.9

RECEIVED: 26/01/2023

Works Location No.9	Galway City
Road Number	R339 Mervue Industrial Estate
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Street Furniture Alterations to Traffic Lights
Drawing Reference	Haul Route Report EIAR Appendix 14.1 - SK53, SK53A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman
Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	3 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.10 Temporary Works Location No.10

RECEIVED: 26/01/2023

Works Location No.10	Galway City
Road Number	R336 Mervue industrial Estate
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Alterations to Traffic Lights
Drawing Reference	Haul Route Report EIAR Appendix 14.1 - SK54, SK54A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman



Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	2 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.11 Temporary Works Location No.11

RECEIVED: 26/01/2023

Works Location No.11	Galway City
Road Number	R336 / N6 Junction
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Street Furniture Alterations to Traffic Lights
Drawing Reference	Haul Route Report EIAR Appendix 14.1 - SK55, SK55A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman
<p>Two traffic signal heads, one lighting column, one road sign, and pedestrian guardrail to be removed.</p> <p>Load bearing surface to be laid. Two traffic signal heads, two bollards, one road sign and pedestrian guardrail to be removed.</p> <p>Load bearing surface to be laid. Three traffic signal heads, two bollards, and pedestrian guardrail to be removed.</p> <p>Blade tip to oversail pedestrian guardrail. Two traffic signal heads to be removed.</p> <p>Blade tip to oversail bollards and pedestrian guardrail. Two lighting columns, signage, and two poles to be removed. One tree to be trimmed. Third party land required.</p>	
Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	4 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.12 Temporary Works Location No.12

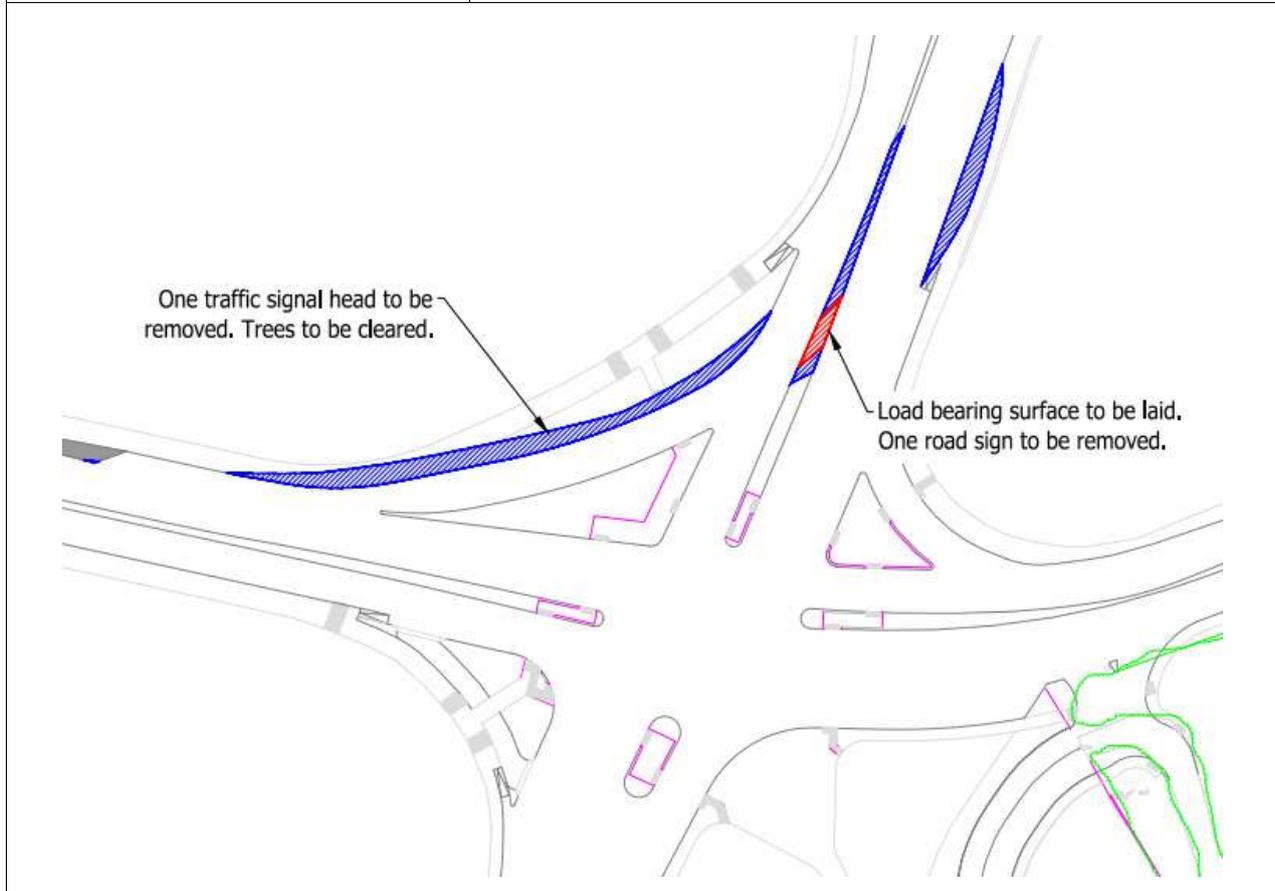
RECEIVED: 26/01/2023

Works Location No.12	Galway City
Road Number	N6 / N84 Roundabout
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Street Furniture Alterations to Traffic Lights
Drawing Reference	Haul Route Report EIAR Appendix 14.1 - SK56, SK56A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman
Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	2 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.13 Temporary Works Location No.13

RECEIVED: 26/01/2023

Works Location No.13	Galway City
Road Number	R336 / R866 Junction
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Street Furniture Alterations to Traffic Lights Tree Clearance
Drawing Reference	Haul Route Report EIAR Appendix 14.1 - SK57, SK57A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman



Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	2 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.14 Temporary Works Location No.14

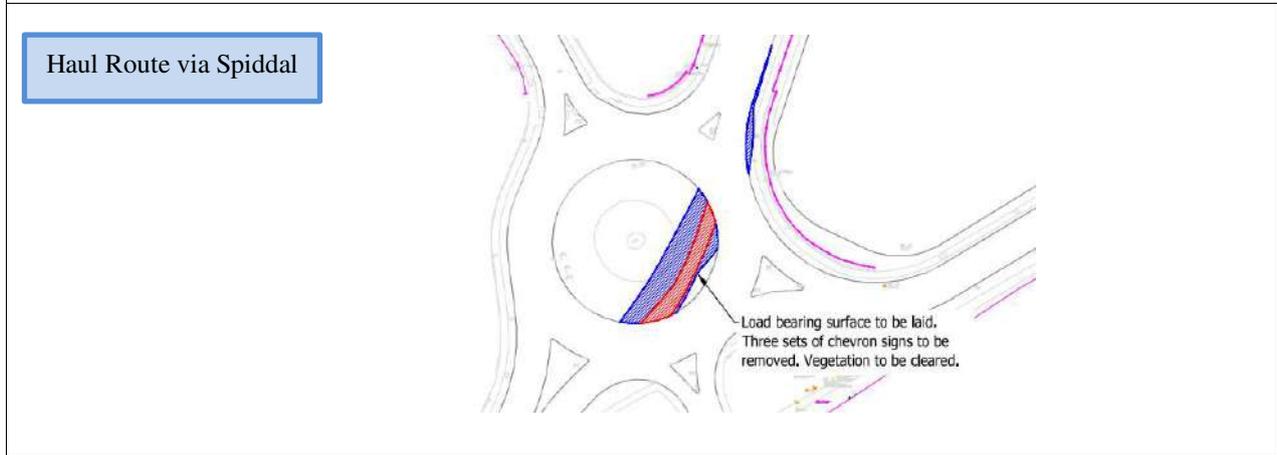
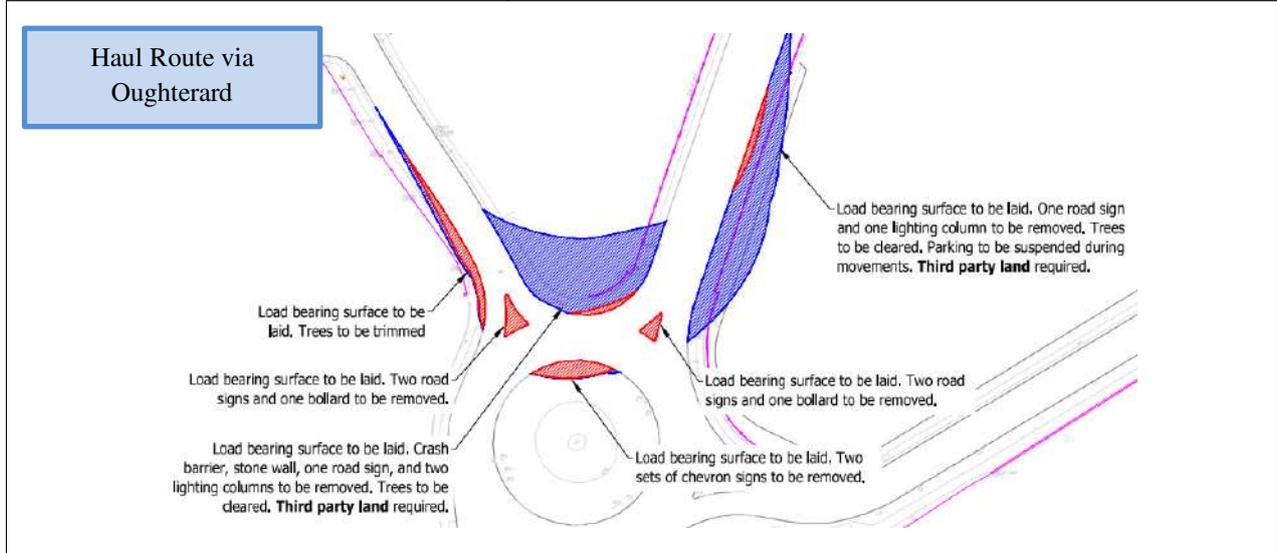
RECEIVED: 26/01/2023

Works Location No.14	Galway City
Road Number	N6 / Upper Newcastle Road Junction
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Removal of Street Furniture Alterations to Traffic Lights
Drawing Reference	Haul Route Report EIAR Appendix 14.1 – SK06, SK06A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman
Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	3 days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.15 Temporary Works Location No.15

RECEIVED: 26/01/2023

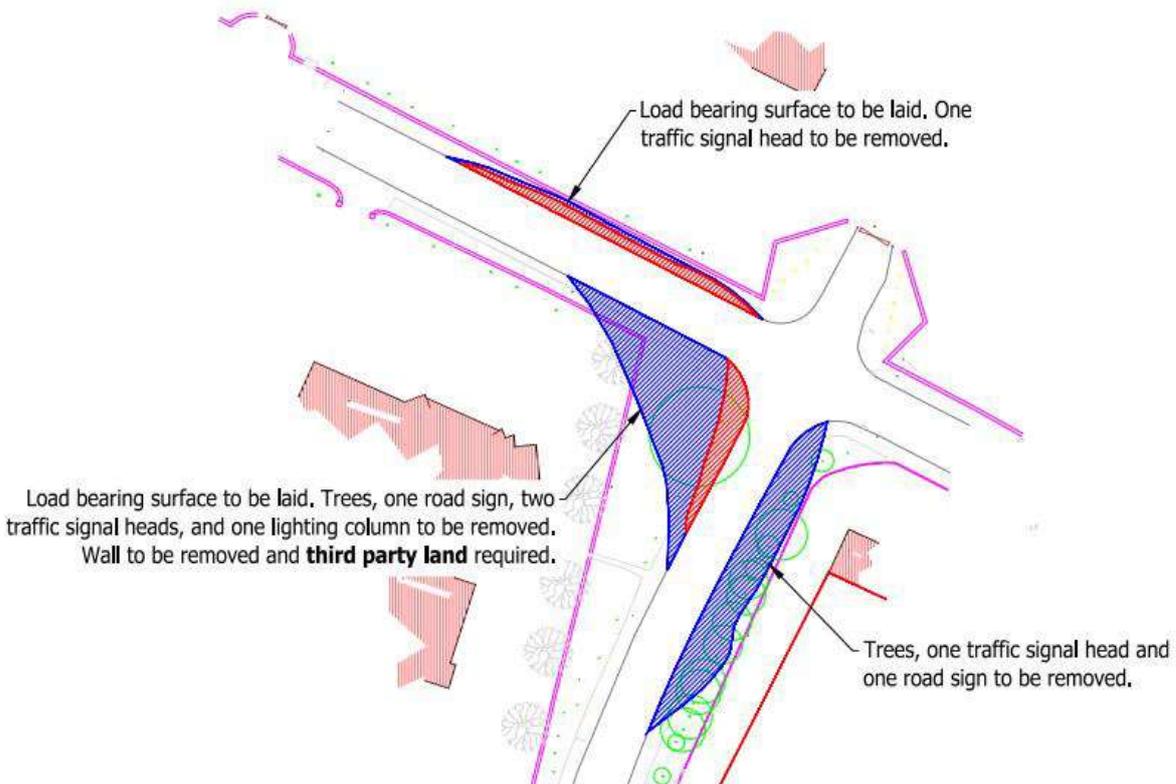
Works Location No.15	Galway City
Road Number	N6 Browne Roundabout
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Street Furniture
Drawing Reference	Haul Route Report EIAR Appendix 14.1 - SK58, SK58A, SK21, SK21A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman



Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	5 Days construction, 3 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

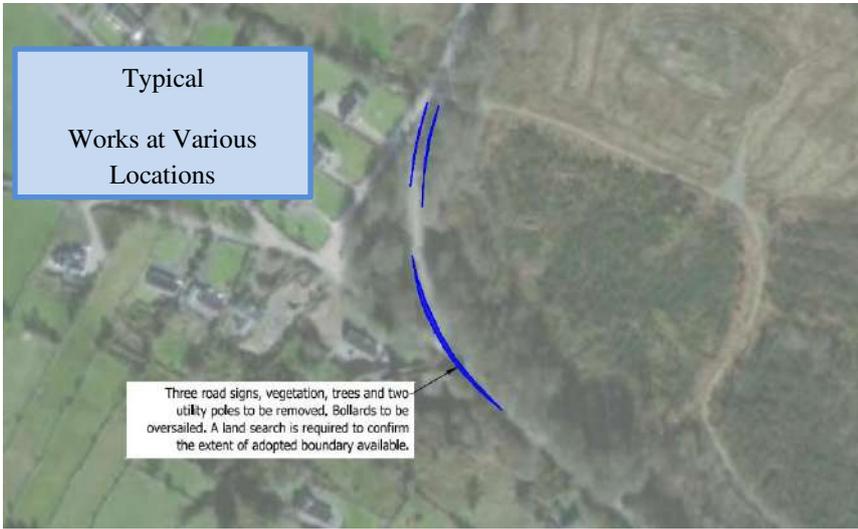
RECEIVED: 26/01/2023

5.16 Temporary Works Location No.16

Works Location No.16	Galway City
Road Number	N59 / Upper Newcastle Road Junction. (Haul Route Via N59 Oughterard)
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Street Furniture Alterations to Traffic Lights Tree Clearance
Drawing Reference	Haul Route Report EIAR Appendix 14.1 - SK59, SK59A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman
	
Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	2 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

RECEIVED: 26/01/2023

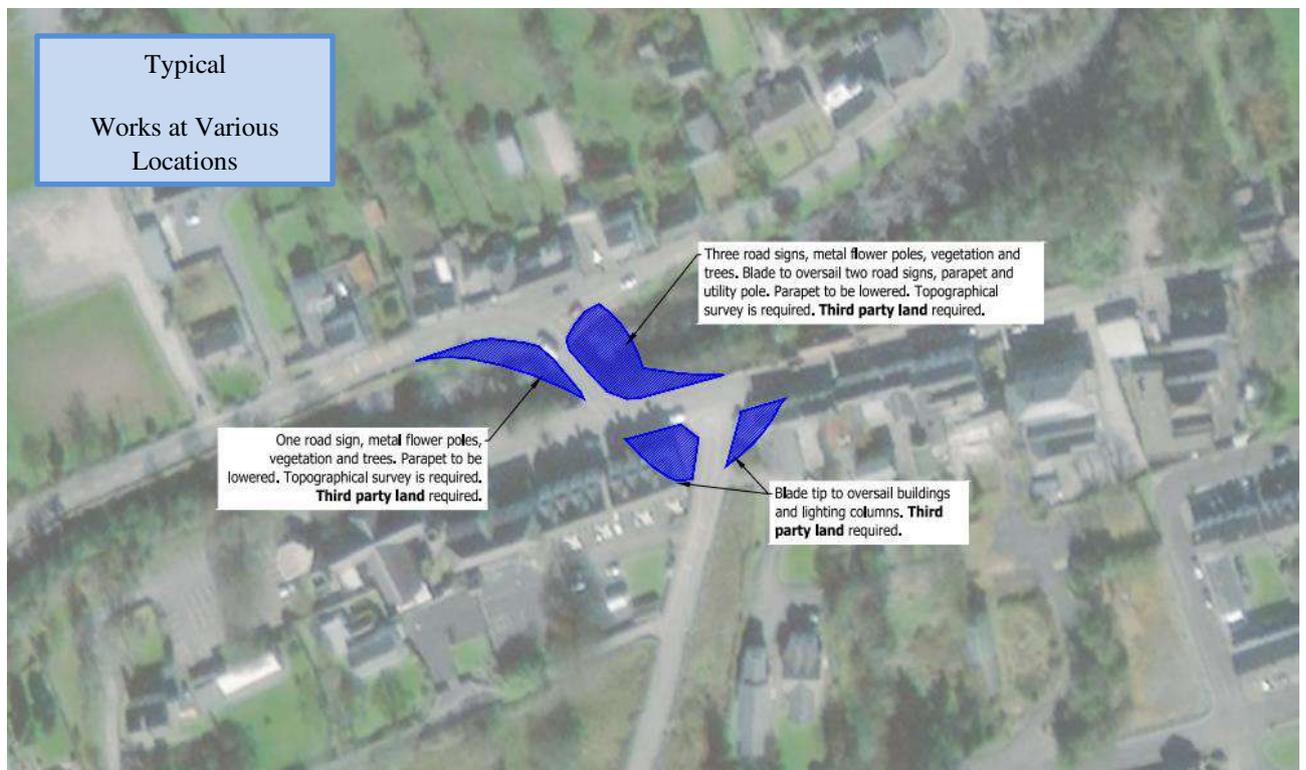
5.17 Temporary Works Location No.17

Works Location No.17	N59
Road Number	N59 Doon West to N59 Oldchapel. (Haul Route Via N59 Oughterard)
Description of Works to be Undertaken	Haul Route Enabling Works Modification of Street Furniture Tree Clearance
Drawing Reference	Haul Route Report EIAR Appendix 14.1 – SK07 to SK10A
Traffic Management System	Temporary Traffic Lights / Lane Closure /Flagman
	
Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	3 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.18 Temporary Works Location No.18

RECEIVED: 26/01/2023

Works Location No.18	N59 Oughterard to N59 Site Entrance
Road Number	N6 Upper Newcastle Road Junction
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Utilities Modifications to Street Furniture Clearance of Vegetation
Drawing Reference	Haul Route Report EIAR Appendix 14.1 – SK11 to SK20B
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman



Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	2 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.19 Temporary Works Location No.19

RECEIVED: 26/01/2023

Works Location No.19	Galway City
Road Number	R338 Deane Roundabout. (Haul Route Via Spiddal)
Description of Works to be Undertaken	Haul Route Enabling Works Modifications to Street Furniture Clearance of Vegetation
Drawing Reference	Haul Route Report EIAR Appendix 14.1 - SK22, SK22A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman

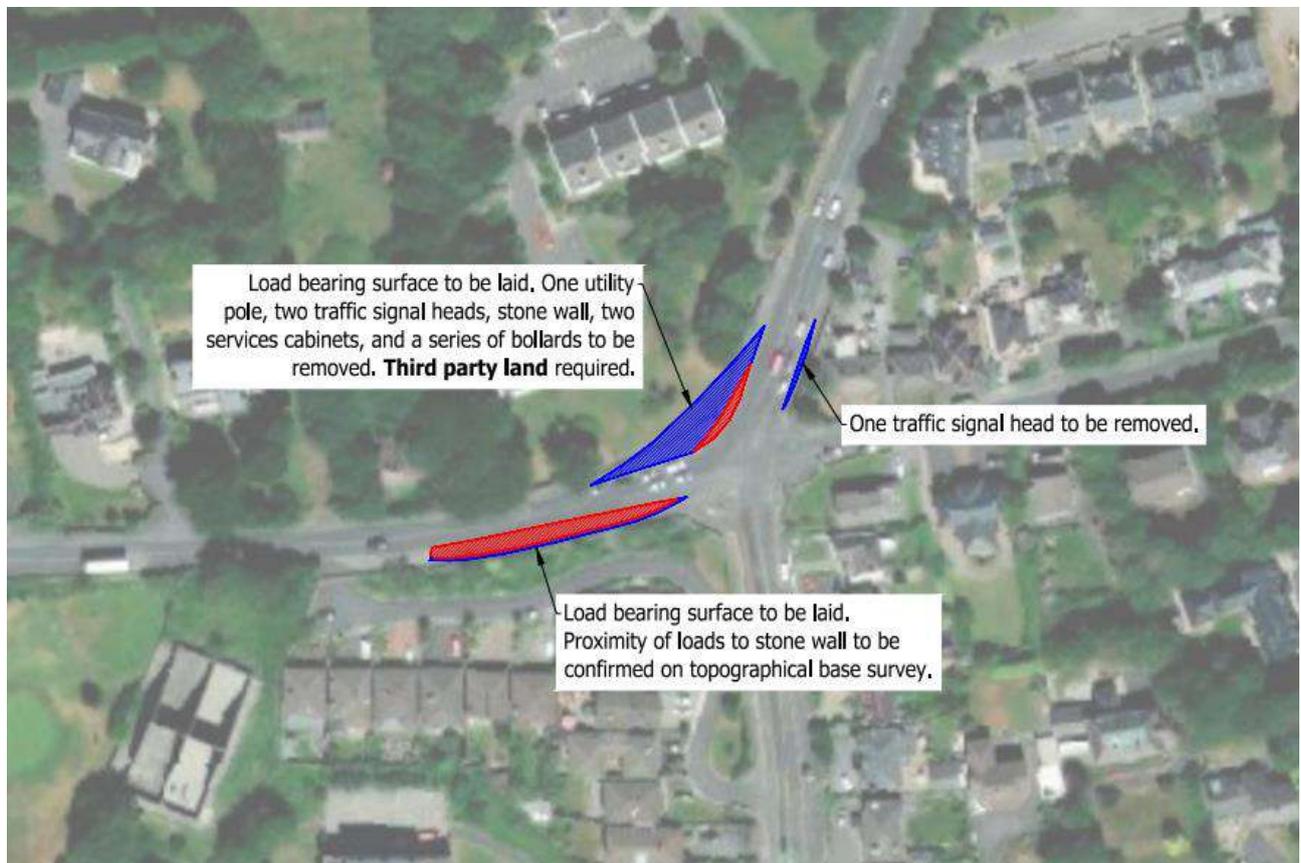


Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	2 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.20 Temporary Works Location No.20

RECEIVED: 26/01/2023

Works Location No.20	Galway City
Road Number	R338 / R337 Junction. (Haul Route Via Spiddal)
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Street Furniture Alterations to Traffic Lights Alterations to Boundary Walls
Drawing Reference	Haul Route Report EIAR Appendix 14.1 – SK23, SK23A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman

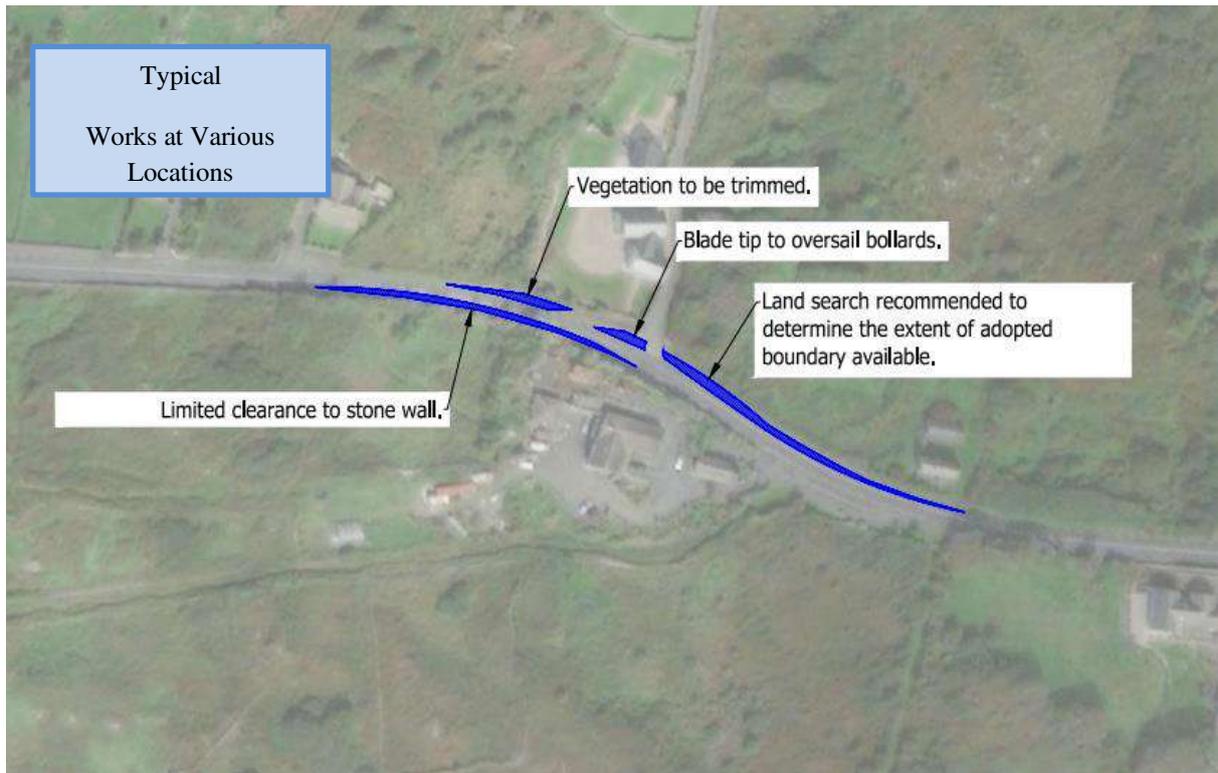


Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	5 days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.21 Temporary Works Location No.21

RECEIVED: 26/01/2023

Works Location No.21	R338 / R337 Various Locations
Road Number	R338 / R337 Junction to L1200 Junction. (Haul Route Via Spiddal)
Description of Works to be Undertaken	Haul Route Enabling Works Removal of Vegetation
Drawing Reference	Haul Route Report EIAR Appendix 14.1 – SK24 to SK27A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman



Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	2 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.22 Temporary Works Location No.22

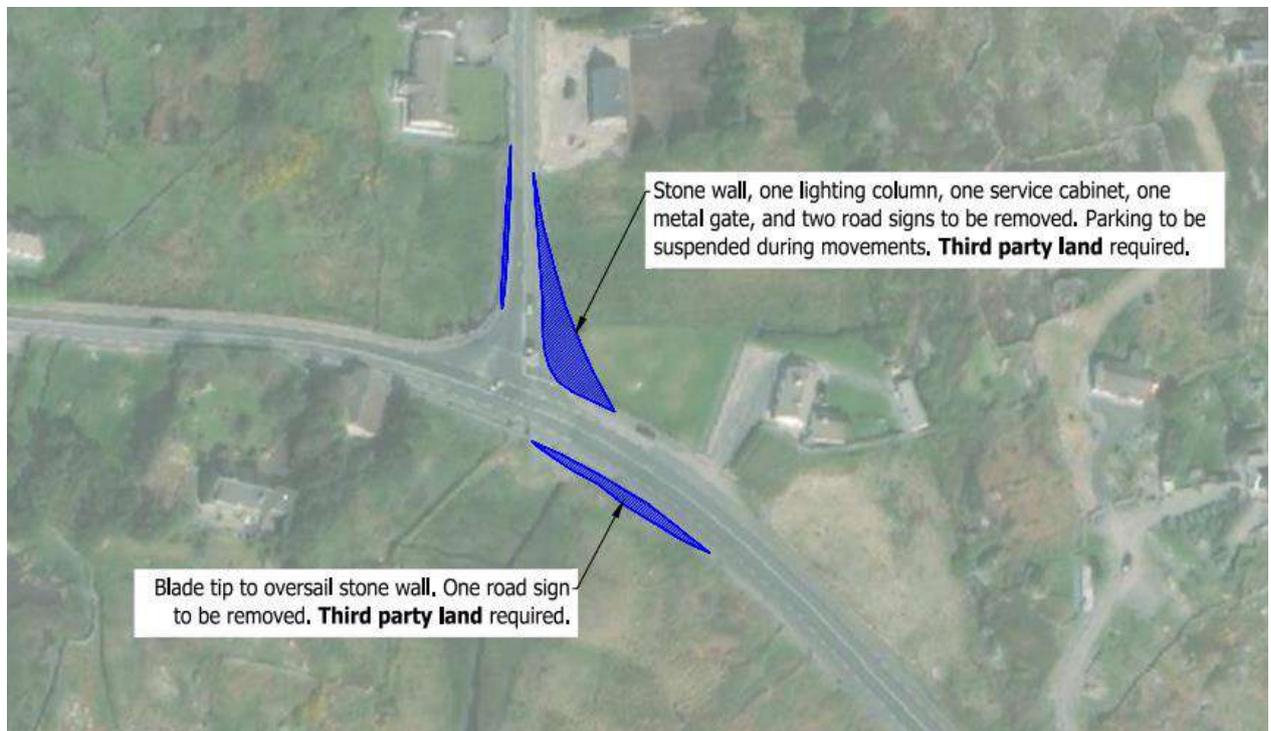
RECEIVED: 26/01/2023

Works Location No.22	R336
Road Number	R336 / L1200 Junction. (Haul Route Via Spiddal)
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Street Furniture Modifications to Utilities
Drawing Reference	6276-P-2104_Rev02 Appendix A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman
Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	2 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.23 Temporary Works Location No.23

RECEIVED: 26/01/2023

Works Location No.23	R336
Road Number	R336 / R343 Junction (Haul Route Via Spiddal)
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Street Furniture Modifications to Utilities Modifications to Boundary Walls
Drawing Reference	Haul Route Report EIAR Appendix 14.1 – SK29, SK29A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman

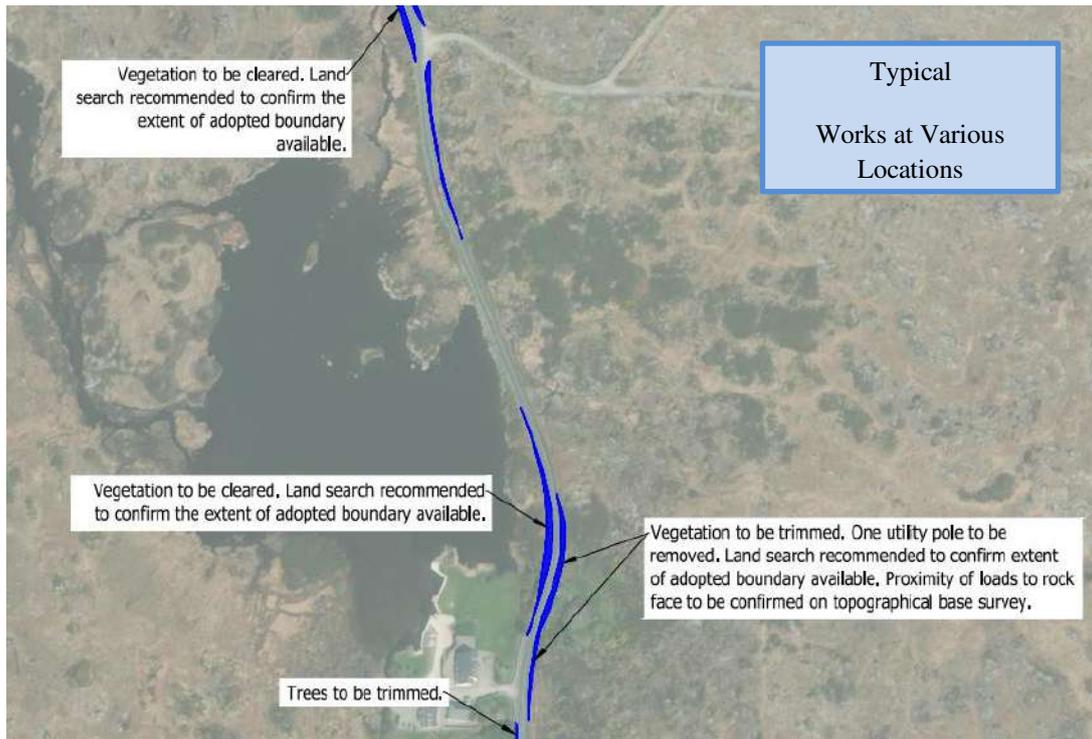


Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	4 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.24 Temporary Works Location No.24

RECEIVED: 26/01/2023

Works Location No.24	Galway City
Road Number	R336 / R343 Junction to R336 / R340 junction. (Haul Route Via Spiddal)
Description of Works to be Undertaken	Haul Route Enabling Works Removal of Vegetation
Drawing Reference	Haul Route Report EIAR Appendix 14.1 – SK30 to SK33E
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman

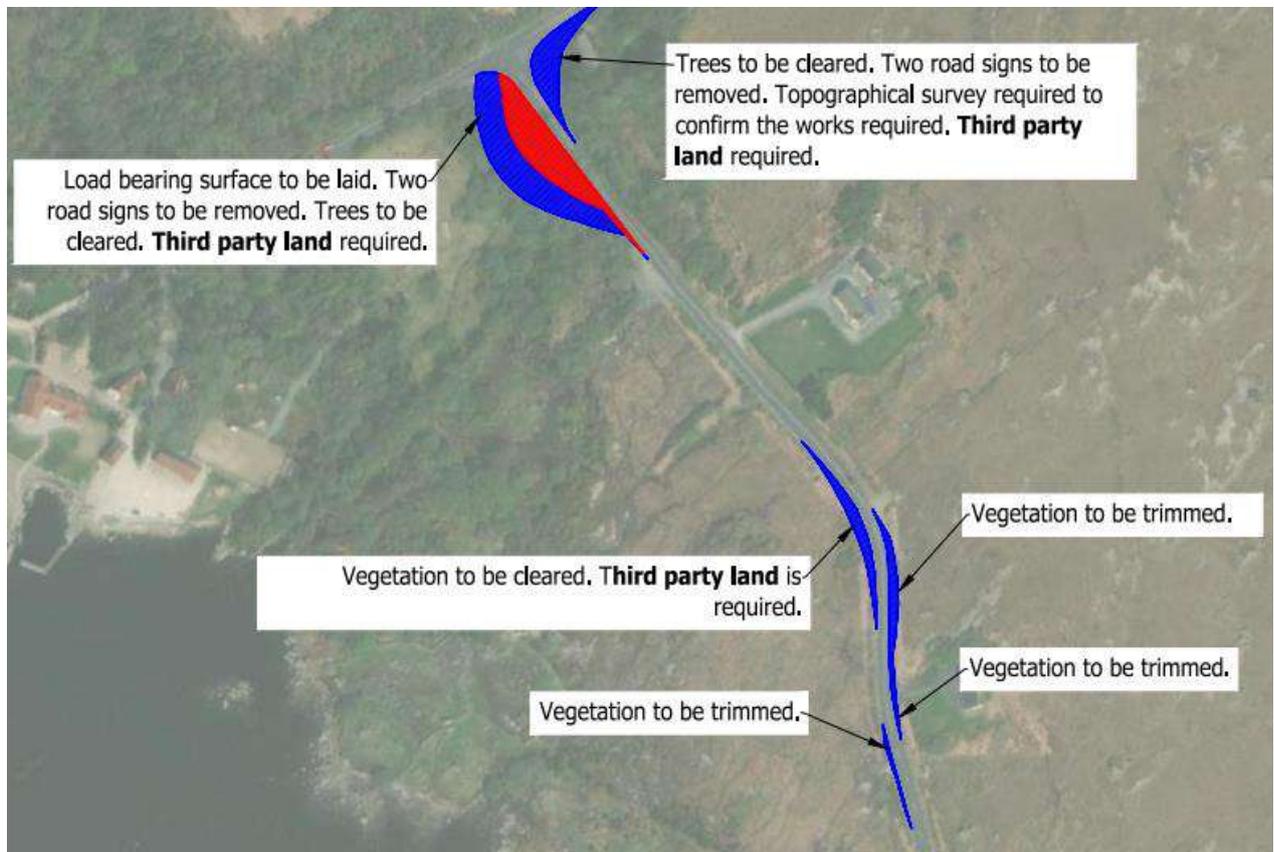


Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	2 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.25 Temporary Works Location No.25

RECEIVED: 26/01/2023

Works Location No.25	R336
Road Number	R336 / R340 Junction. (Haul Route Via Spiddal)
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Street Furniture Modifications to Utilities Clearance of Trees and Vegetation
Drawing Reference	Haul Route Report EIAR Appendix 14.1 – SK34A, SK34B
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman

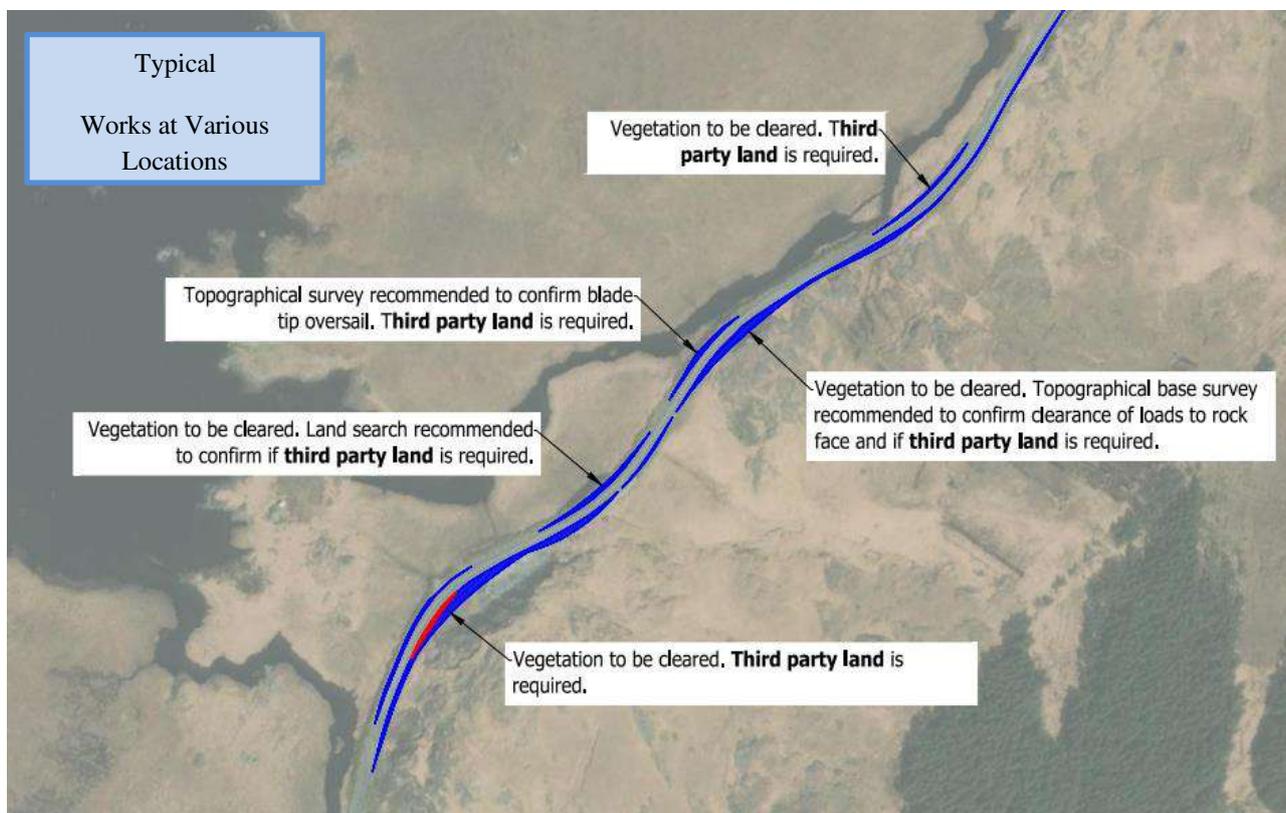


Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	4 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.26 Temporary Works Location No.26

RECEIVED: 26/01/2023

Works Location No.26	R336
Road Number	R336 / R340 Junction to R336 / N59 Junction (Haul Route Via Spiddal)
Description of Works to be Undertaken	Haul Route Enabling Works Surfacing Modifications to Street Furniture Modifications to Utilities
Drawing Reference	Haul Route Report EIAR Appendix 14.1 – SK35 to SK47A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman

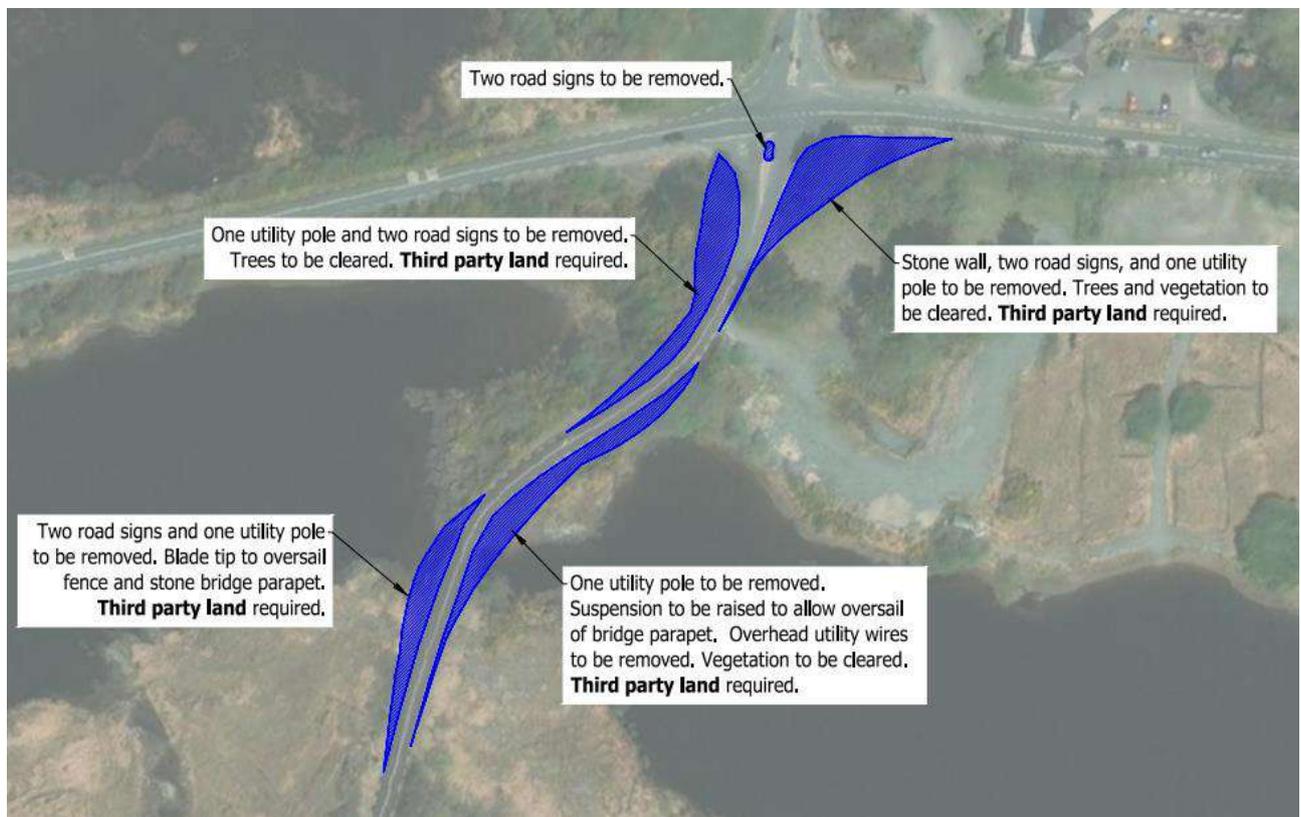


Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	4 Days construction, 3 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

5.27 Temporary Works Location No.27

RECEIVED: 26/01/2023

Works Location No.27	R336
Road Number	R336 / N59 Junction. (Haul Route Via Spiddal)
Description of Works to be Undertaken	Haul Route Enabling Works Modifications to Street Furniture Modifications to Utilities Modifications to Boundary Walls
Drawing Reference	Haul Route Report EIAR Appendix 14.1 -SK48, SK48A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman



Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	3 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

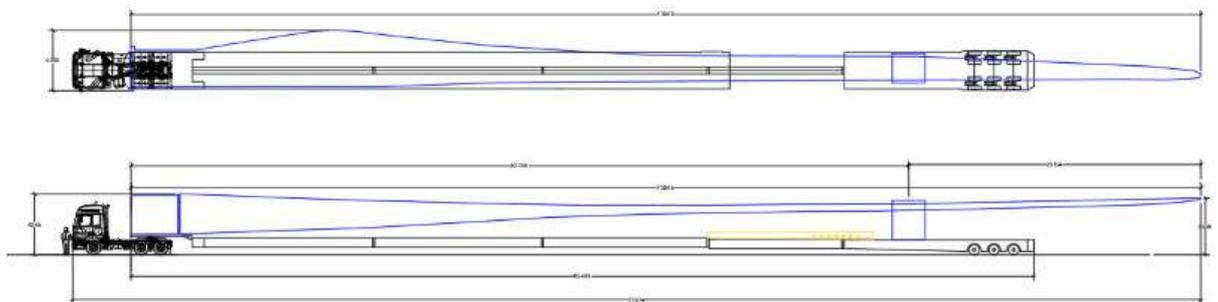
5.28 Temporary Works Location No.28

RECEIVED: 26/01/2023

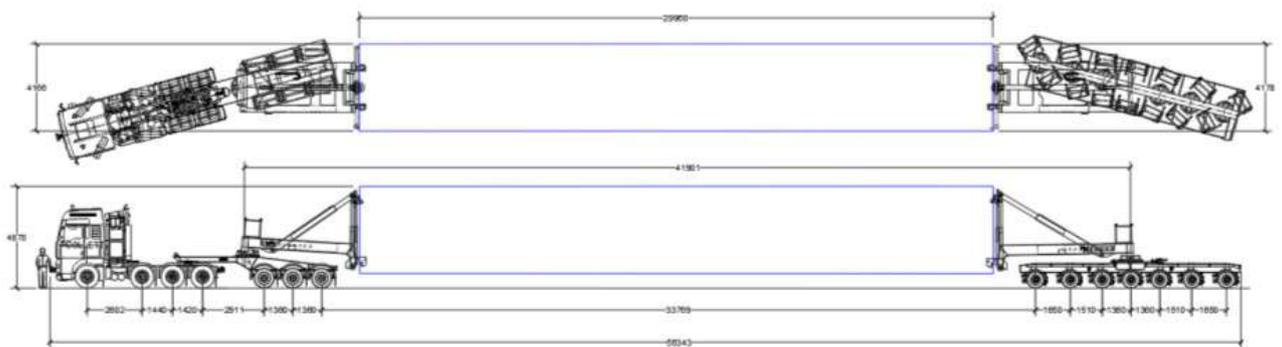
Works Location No.28	N59
Road Number	R336 / N59 Junction to N59 Site Entrance. (Haul Route Via Spiddal)
Description of Works to be Undertaken	Haul Route Enabling Works Clearance of Vegetation
Drawing Reference	Haul Route Report EIAR Appendix 14.1 – SK49 to SK51A
Traffic Management System	Temporary Traffic Lights / Lane Closure / Flagman
Local Access	Maintained at all times (Included in Traffic Light Phase) / Flagman
Duration of Works	3 Days construction, 2 days reinstatement
Duration of Road Closure	N/A
Emergency Access	Maintained at all Times Through Traffic Lights

6 DELIVERY VEHICLE SPECIFICATION

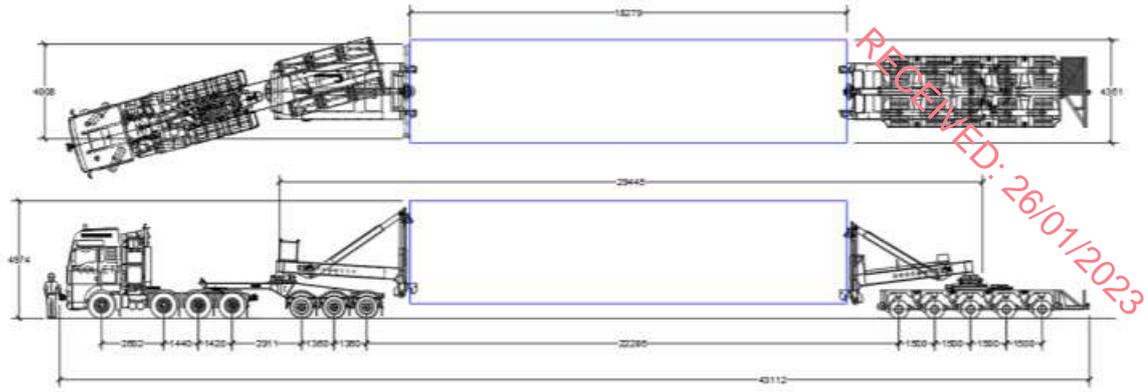
Delivery of road construction materials, concrete for turbine foundations, building materials, drainage, ducting and cables will be carried out using standard heavy goods vehicles (HGV). Delivery of turbine components will be carried out using specialist abnormal load vehicles. Turbine blades will be delivered on an extendable semi-trailer, one per trailer. Each turbine blades will be 79m long, approximately 11.50m of the blade will over hang the rear of the trailer. Following delivery to the site, the trailer will be retracted for the return trip. Each turbine tower will be delivered to site in three sections on extendable semi-trailers, the tower sections range in length from 30.0m to 23.0m with a maximum width of 4.3m. All material deliveries will have a maximum axle load of up to 12 tonnes per axle, and a maximum total truck weight 63 tonnes approx. The main crane for turbine erection will have a maximum axle loading of 12 tonnes per axle and a maximum total weight of 100 tonnes approx. Vehicles delivering counter-weights for the crane will have a maximum axle loading of up to 12 tonnes per axle. The transport vehicles used for transportation of components may differ from those shown below depending on the haulage contractor's preferences.



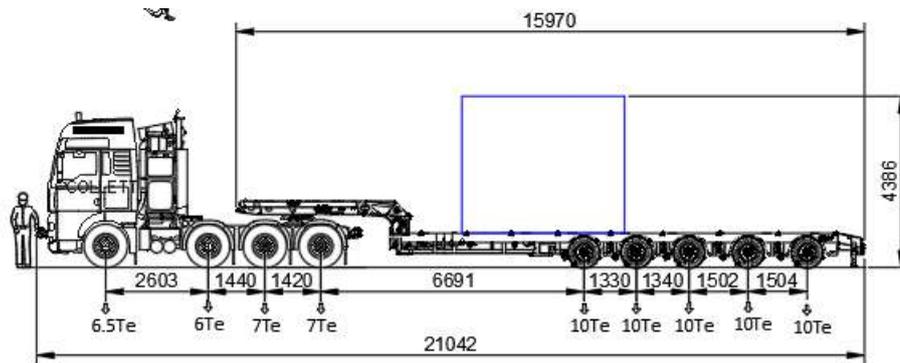
Typical Turbine Blade Transport Vehicle



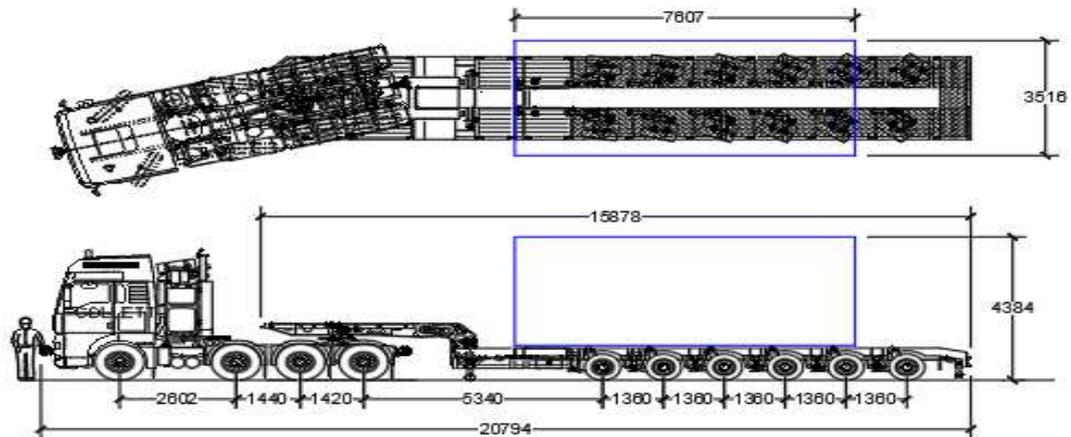
Typical Turbine Tower Transport Vehicle



Typical Nacelle Transport Vehicle



Typical Hub Transport Vehicle



Typical Generator Transport Vehicle

7 CONSTRUCTION, OPERATION & DECOMMISSIONING TRAFFIC VOLUMES

7.1 Construction Period

The construction period of the development is anticipated to take approximately 10 months with the majority of HGV deliveries to site concluding in month 7. The project timeframe is summarised in **Table 7.1** below. It is expected that construction hours will be between 08:00 and 18:00 Monday to Saturday. There may be periods out with these times whereby specialist works such as turbine installation may be required, in order to avail of more favourable weather conditions such as low wind speeds.

Table 7.1: Project Timeframe

Proposed Works	Timetable
Civil Works	
Mobilise on Site	1
Construction of Site Compound	1-2
Site Earthworks (removal of unsuitable material from site)	2-28
Rock for Site Access Tracks and Turbine Hardstands	2-28
Site Drainage and Fencing	2-28
Ready Mix Concrete for turbine Foundations	6-28
Steel Reinforcement for Turbine Foundations	6-28
Foundation Bolts	6-28
Substation Building Materials	2-20
Electrical Switchgear	18-28
Electrical Cables	6-28
Grid Connection Works	10-40
Wind Turbine Components	28-34
Crane Delivery	28
Reinstatement and Demobilisation	38-40

7.2 Construction Period – Trip Generation HGV's

The estimated HGV deliveries to the Site during the construction period are shown in **Table 7.2**. The expected HGV volumes are based on trips generated during the construction of similar sized wind farms and will be subject to amendment based on local conditions and contractors working practices.

Table 7.2: HGV and Abnormal Load Deliveries to Site During Construction

Materials	Quantity	No. Of Deliveries	Timeframe (Week)	Maximum Loads / Day	Vehicle Type
Mobilise on Site		15	1	5	OGV1
Construction of Site Compound	200m ³	20	1-2	10	OGV2
Site Earthworks (removal of unsuitable material from site)	84,760m ³	7,065	2-28	50	OGV2
Rock for Site Access Tracks and Turbine Hardstands	1,000m ³	100	2-28	5	OGV2
Site Drainage and Fencing		20	2-28	2	OGV2
Ready Mix Concrete for turbine Foundations	3,600m ³	450	6-28	75	OGV2
Steel Reinforcement for Turbine Foundations	300T	16	6-28	3	OGV2
Foundation Bolts	6 Turbines	6	6-28	1	OGV2
Substation Building Materials		15	2-20	1	OGV2
Electrical Switchgear		2	18-28	1	OGV2
Electrical Cables		10	6-28		OGV2
Grid Connection Works	18.6km	1200	10-40	6	OGV2
Wind Turbine Components	6 Turbines	60	28-34	3	OGV2
Crane		10	28	5	OGV2
Reinstatement and Demobilisation		25	38-40	5	OGV2
Total		9,014			

It is estimated that during the wind farm construction, an approximately total of 9,014 loads of material and building supplies will be delivered and removed from the Site. The majority of HGV movements to and from site will occur during the first seven months of the construction period and will be associated with the removal of unsuitable material arising

from site excavations, site road construction, turbine hardstand construction and turbine foundation construction. The trips generated by the construction of the wind farm is a worst case scenario and assumes that all granular material will be imported from quarries outside the site and does not take account of granular materials sourced from site excavations and processed on site.

A schedule of maximum predicted daily traffic movements to site over a 10-month construction period is shown in **Table 7.3**.

Table 7.3 HGV and Abnormal Load Deliveries to Site During Construction

Activity	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Mobilise on Site	5											
Construction of Site Compound	10											
Site Earthworks (removal of unsuitable material from site)	50	50	50	50	50	50	50					
Rock for Site Access Tracks and Turbine Hardstands	5	5	5	5	5	5	5					
Site Drainage and Fencing	2	2	2	2	2	2	2					
Ready Mix Concrete for turbine Foundations		75	75	75	75	75	75					
Steel Reinforcement for Turbine Foundations		3	3	3	3	3	3					
Foundation Bolts		1	1	1	1	1	1					
Substation Building Materials	1	1	1	1	1							
Electrical Switchgear					1	1	1	1				
Grid Connection		6	6	6	6	6	6	6	6	6		
Electrical Cables	1	1	1	1	1	1	1					
Wind Turbine Components							3	3	3			
Crane							5					
Reinstatement and Demobilisation										5		
Total	74	144	144	144	145	144	152	10	9	11		

Weeks 1 to 4 will involve removal of unsuitable material from site and deliveries of materials for site access works, turbine hardstand, site access tracks, site compound, site offices, site security, substation building and cable / ducting works and drainage. This period will include deliveries of fencing materials for site boundaries and compounds, temporary fencing to protect trees, hedges and ecological buffer zones where necessary, road construction materials for access tracks, site entrances, turbine hardstands and delivery of temporary site office units. It is anticipated that a maximum of 74 HGV vehicles (148 HGV movements) will visit the site on a daily basis during the period of weeks 1 to 4.

Weeks 4 to 28 will involve removal of unsuitable earthworks material and deliveries of materials for site access works, turbine hardstand, turbine foundations, site access tracks, turbine delivery substation building, grid connection and cable / ducting works. This period will include deliveries of fencing materials for site boundaries, road construction materials for access tracks, site entrances and turbine hardstands, ready mix concrete and steel reinforcement for turbine foundations. It is anticipated that a maximum of 77 HGV vehicles (154 HGV movements) will visit the site on a daily basis during the period of weeks 4 to 28 with an additional 75 HGV vehicles (100 HGV movements) delivering concrete for turbine foundations on six separate days during the 24 week period between weeks 4 to 28.

Weeks 28 to 40 will involve HGV movements for works associated with turbine delivery, turbine erection, turbine commissioning, electrical works, grid connection works, site landscaping and the removal of temporary works materials such as offices and fencing from site. It is anticipated that a maximum of 11 HGV vehicles (22 HGV movements) will visit the site on a daily basis during the period of weeks 28 to 40.

The expected HGV volumes are based on best estimates of trips generated by similar sized wind farms and will be subject to amendment based on local conditions and contractor working practices. **Table 7.3** shows that peak times for HGV deliveries will be months 2 to 7 when the unsuitable material will be removed from the site combined with the construction of site access roads, turbine hardstands and turbine foundations.

7.3 Construction Period – Light Vehicles\ Vans and Construction Personnel

The number of staff on site will vary according to the phase of the construction, peaking at approximately 50 at the height of the construction period. It is expected that the majority of

workers will arrive on site in mini-buses and crew vehicles which are used to transport teams of workers from different construction disciplines. Labour vehicle sharing will be actively encouraged to reduce vehicular movements.

It is estimated that 25-30 vehicles will visit the site on a daily basis during the peak construction period. Parking for staff will be provided within the site compound and no parking will be allowed for construction workers on the public road network in the vicinity of the site. A number of additional unscheduled visits may be required throughout the construction period for site inspections and unforeseen circumstances.

7.4 Operational Period – Traffic

The vehicle movements associated with the operational period of the proposed Development will be very low. Trips during the operational period would normally be made by vans associated with site monitoring, servicing, cleaning and maintenance operations. During the operational period, parking will be provided at the site compound and security gates will be set back from the public road to allow operatives to access the site without obstructing the public road network.

Scheduled Site Visits

Weekly maintenance, estimated two visits by two technicians – 208 trips

Six-month service, estimated of two visits by two technicians – 4 trips

Annual service, two visits by two technicians – 4 trips

Monthly visit by Developer or agents to check over the site, grass cutting etc. – 12 trips

Unscheduled Site Visits

Visits which may arise as a result of malfunction, damage or vandalism. – 5 trips

The frequency of vehicle trips associated with servicing, monitoring and upkeep of the site are expected to be in the region of 230 trips per year.

7.5 Decommissioning Period – Traffic

The vehicle movements associated with the decommissioning period of the Development are similar to the construction period. The decommissioning period will take approximately 20 weeks, during which time the entire infrastructure will be removed from site.

8 TRAFFIC IMPACT DURING CONSTRUCTION, OPERATION AND DECOMMISSIONING PERIODS

8.1 Traffic Impact During Construction Period

Increased volumes of traffic will be generated by the proposed development during the construction period. The development will generate a maximum of 152 HGV trips (304 HGV movements) and 30 LGV (60 traffic movements) at the N59 site entrance. Peak traffic generated by the development will correspond to the construction of turbine foundations and will occur during six days within the 10 month construction period. Outside these times, construction traffic will typically consist of 77 HGV trips (158 HGV movements) and 30 LGV (60 traffic movements) at the N59 site entrance. Development traffic will be distributed throughout the day with morning, afternoon and evening peaks. The distribution of development traffic is shown in **Table 8.1** during the construction of turbine foundations.

Table 8.1 Development Traffic Profile

Time	Arrivals		Departures	
	HGV	LGV	HGV	LGV
07.00 – 08.00		25		
08.00 – 09.00	20	5	20	2
09.00 – 10.00	17		17	
10.00 – 11.00	17		17	
11.00 – 12.00	17		17	
12.00 – 13.00	10		10	
13.00 – 14.00	5	5	5	5
14.00 – 15.00	20		20	
15.00 – 16.00	17		17	
16.00 – 17.00	17		17	
17.00 – 18.00	12	2	12	5
18.00 – 19.00				25
19.00 – 20.00				

Existing traffic flows on the N59 during an average workday in May 2022 are shown in **Table 8.2**, the N59 traffic flows are taken from the TII traffic counter located to the east of Maam Cross near the wind farm site entrance. The traffic data from the TII website shows that peak traffic occurs at 11.00 in the morning and at 17.00 in the evening. HGV traffic accounts for approximately 3.5% of the total traffic volume on the N59 near Maam Cross. Using the methodology from TII publication PE-PAG to calculate annual average daily traffic (AADT) from short period traffic counts, the resulting AADT on the N59 in 2022 would be approximately 3,615 vehicles. The capacity of the N59 which consists of a Type 3, 6.0m single carriageway is in the region of 5,000 AADT. The data from the TII traffic counter shows that the N59 is currently running at 73% capacity and has reserve capacity to cater for future traffic growth on the public road network and short term traffic generated by wind farm construction as shown in **Table 8.3**.

Table 8.2 - N59 Traffic Flows – Average Workday May 2022

Time	Eastbound	Westbound	Total Traffic	HGV Traffic
07.00 – 08.00	95	60	155	6
08.00 – 09.00	101	96	197	7
09.00 – 10.00	117	98	215	17
10.00 – 11.00	116	128	244	16
11.00 – 12.00	117	132	249	13
12.00 – 13.00	118	118	236	13
13.00 – 14.00	125	111	236	13
14.00 – 15.00	130	123	253	14
15.00 – 16.00	144	137	281	14
16.00 – 17.00	158	140	298	9
17.00 – 18.00	149	151	300	10
18.00 – 19.00	122	129	251	6
19.00 – 20.00	66	96	162	4

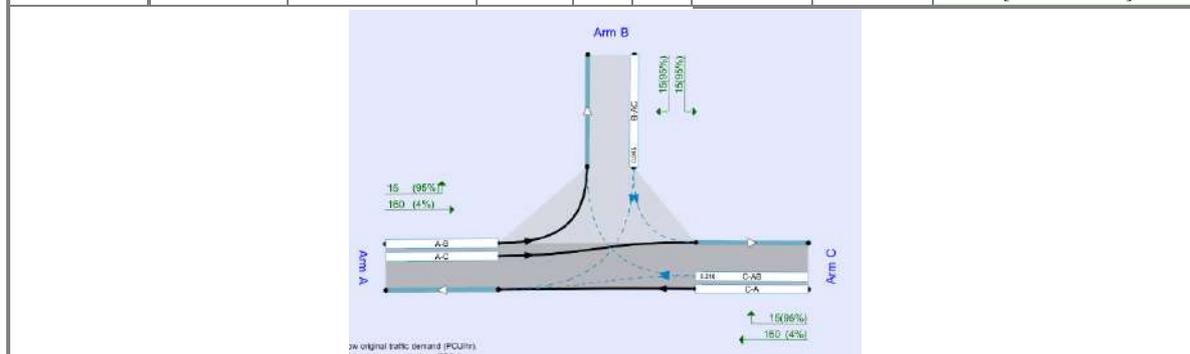
Table 8.3 - N59 Future Traffic Flows – Average Workday May 2022

Time	Without Development			With Development		
	AADT	HGV's Per Hour	%HGV	AADT During Wind Farm Construction	HGV's Per Hour	% HGV During Wind Farm Construction
2022	3,615	10	3.3%	-	-	-
2023	3,705	11	3.4%	4,277	51	14%
2024	3,797	11	3.4%	4,361	51	14%
2025	3,892	12	3.5%	4,457	52	14%

Traffic analysis carried out for the evening peak hour at the proposed N59 / wind farm site entrance junction during the construction period is shown in **Table 8.4**. The analysis shows that the junction 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 on the N59. 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.

Table 8.4 - N59 Wind Farm Site Entrance – Traffic Analysis

	PM							
	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
N59 Site Entrance PM Peak Hour - 2022								
Stream B-AC	0.1	1.0	15.56	0.07	C	1.65	A	255 %
Stream C-AB	0.1	0.8	8.47	0.03	A			[Stream B-AC]



Traffic analysis carried out for the evening peak hour at the proposed N59 / Biodiversity Enhancement Area junction near Maam Cross during the construction period is shown in **Table 8.5**. The analysis shows that the junction 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 on the N59. 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.

Table 8.5 - N59 / Biodiversity Enhancement Area Junction – Traffic Analysis

	PM							
	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
N59 Biodiversity Enhancement Area PM Peak Hour - 2022								
Stream B-AC	0.1	1.0	12.95	0.03	B	0.87	A	609 %
Stream C-AB	0.0	0.8	8.39	0.02	A			[Stream B-AC]

Works on the public road network during the construction of site entrances and during the installation of the 38kV grid connection between the wind farm site and Screebe 110kV substation will be carried out using lane closures and temporary traffic lights / flagmen. Traffic analysis carried out for temporary traffic lights on the N59 at the peak hour during the construction period is shown in **Table 8.6**. The analysis shows that the temporary signalised junction which is necessary to carry out works at lane closures on public road will operate within capacity during the construction of the wind farm site entrances and 38kV grid connection and will not exceed the 0.85 Degree of Saturation index (DOS) during the peak traffic periods on the N59. The Degree of Saturation (DOS) is calculated from Junctions 9 OSCADY software for signalised junctions. A DOS value of 1.0 indicates that the junction is operating at full capacity with a value of 0.85 considered to be the maximum DOS value after which the junction will begin to experience some capacity issues. The analysis has been carried out with signals having a green time of 45 seconds with a 15 second inter-green period

between signal phases. The analysis shows that motorists on the N59 will experience average delays of 25 seconds resulting in queue's of approximately 4 vehicles at the temporary traffic signals during the 38kV grid connection and wind farm site entrance construction works. Lane closures and temporary traffic signals will be required at the locations shown in Table 8.7.

Table 8.6 - N59 Temporary Traffic Lights – Traffic Analysis

PM								
	Queue (PCU)	95% Queue (PCU)	Delay (s)	DOS	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
N59 Temporary Traffic Lights PM Peak Hour - 2022								
Arm A	3.6	?	25.74	0.24	C	25.74	C	176 %
Arm C	3.6	?	25.74	0.24	C			[Arm A - Traffic Stream 1]

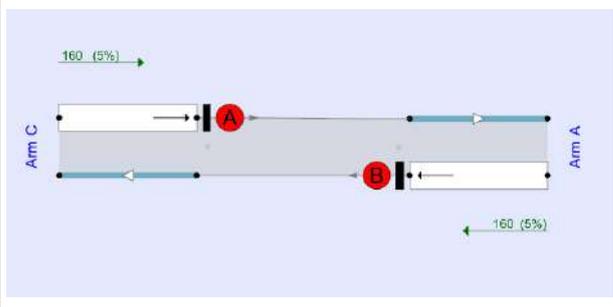
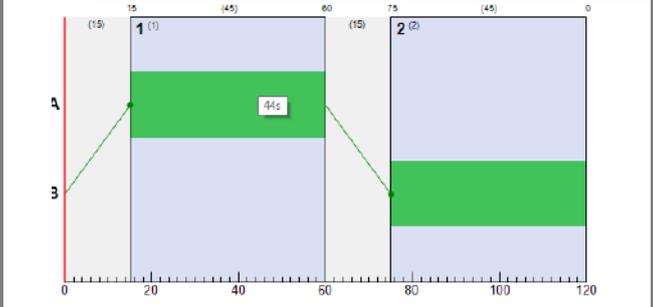



Table 8.7 – Location of Lane Closures on Public Roads

Location	Road Number	Construction Activity
Site Entrance	N59	Construction of Site Entrance
Biodiversity Area	N59	Construction of Site entrance
Grid Connection	N59	38kv Grid Connection Works
Grid Connection	R336	38kv Grid Connection Works
Grid Connection	R340	38kv Grid Connection Works
Galway City	R339	Haul Route Enabling Works Lough Ataila Road junction R338 Junction Mervue Industrial Estate
Galway City	R338	Haul Route Enabling Works R338 Cemetery Cross Roundabout Dean Roundabout (Via Spiddal) R337 Junction (Via Spiddal)
Galway City	R336	Haul Route Enabling Works Mervue Industrial Estate

Location	Road Number	Construction Activity
		N6 Junction R866 Junction
Galway City	N6	Haul Route Enabling Works N84 Roundabout Upper Newcastle Road Junction Browne Roundabout
Galway City (via Oughterard)	N59	Haul Route Enabling Works Upper Newcastle Road Junction
Galway City to Oughterard (via Oughterard)	N59	Haul Route Enabling Works Various Locations (Vegetation Trimming & Service Diversions for Blade Lifter)
Galway City to Site (via. Spiddal)	R338	Haul Route Enabling Works Various Locations (Vegetation trimming)
Galway City to Site (via. Spiddal)	R337	Haul Route Enabling Works Various Locations (Vegetation Trimming)
Galway City to Site (via. Spiddal)	R336	Haul Route Enabling Works L1200 Junction R343 Junction R340 Junction N59 Junction Various Locations (Vegetation Trimming)

Traffic analysis shows that public road network in the vicinity of the proposed Development is capable of accommodating HGVs and will cater for the increased traffic volumes during the construction period. The proposed road and junction upgrade works will accommodate construction and abnormal load vehicles during the construction of the wind farm.

8.2 Traffic Impact During Operational Period

The impact of traffic associated with the operation of the proposed Development on the existing public road network will be negligible due to the low volume of traffic generated by the proposed Development.

8.3 Traffic Impact During Decommissioning Period

During the Decommissioning phase of the proposed Development, the total volume of HGV traffic will be similar to the construction period.

9 **PROPOSED MITIGATION MEASURES**

The impact of the proposed development has been identified as being temporary in nature and associated with short construction and decommissioning stages only. It is still important that any impact is minimised as far as possible and, in light of this, the following mitigation measures have been considered:

- HGV movements will generally be limited to 08:00 - 18:00 Monday to Saturday. Deliveries will be scheduled to avoid peak times around the morning and evening peak hours. This will avoid HGV traffic arriving during the morning peak hour creating conflict with local residents on their commute/school run. Construction personnel will be encouraged to car-pool, or to travel to site in minibuses.
- Wheel wash equipment will be used on site to prevent mud and stones being transferred from the Development Site to the public highway. All drivers will be required to check that their vehicle is free from dirt and stones prior to departure from the construction site. In addition, any dust generating activities will be minimised where practical during windy conditions, and drivers will adopt driving practices to minimise dust creation. Finally, loads will be covered into and out of the site where required to ensure that the spillage or deposit of clay, rubble or other debris on the public road network is prevented.
- Construction works on the public road network will be carried out using an agreed traffic management plan in accordance with Chapter 8 of the Traffic Signs Manual.
- During the construction phase, clear construction warning signs will be placed on the N59, advising the general public as to the presence of the construction site. The site entry points will also be appropriately signed. Access to the construction site will be controlled by on site personnel and all visitors will be asked to sign in and out of the site by security / site personnel. Security gates will be sufficiently set back from the road, so that vehicles entering the site will stop well clear of the public road, thus obviating the queuing of construction traffic on the public road network. Site visitors will all receive a suitable Health and Safety site induction, and Personal Protective Equipment ("PPE") will be worn.
- Grid connection works will proceed at a rate of approximately 100m per work shift, the rate will depend on the ground conditions and the number of existing services encountered

in the excavation. The works area will be fully enclosed within the traffic management system. Traffic management using temporary traffic lights shall be kept to the minimum length necessary to accommodate the works being undertaken and to minimise delays to the public.

- Longitudinal trench excavations in the public road shall be straight and parallel to the centre of the road/footway where practicable. Transverse road or footway crossings shall be at right angles to the kerb or property line. Bituminous and concrete road surfaces and footways be cut using a road saw, concrete saw or equivalent mechanical means to the full depth of the bituminous or concrete material prior to any excavation work. The edges of the road shall be trimmed to provide an overlap for permanent road reinstatement in accordance with chapter 7 of the Managing Openings in Public Roads Specification.
- The 38kV cable trench shall be excavated using a rubber tyre excavator on all public roads. The sides of the trench shall be supported to prevent damage to the road. Material arising from trench excavations may be stored at a safe location within the works area and used to backfill trenches, surplus excavated material shall be removed from site and disposed at licenced landfills.
- All excavated trenches in the public road network are to be reinstated at the end of the work shift, A temporary reinstatement shall be carried out in the event that the works are not completed at the end of the work shift.
- Once construction of the Development is completed, all portacabins, machinery and equipment will be removed and temporary hardstanding's excavated and reinstated. The area will be re-graded with the topsoil to a natural profile and allowed to regenerate from the seed bank within the topsoil.

10 CONCLUSION

This TMP has been undertaken to detail the management of traffic movements for the Tullaghmore Wind Farm.

Increased volumes of traffic will be generated by the proposed development during the construction period. However, the overall volumes of traffic generated by the development during the construction period can be accommodated on the existing public road network.

During the operational phase of the project the site will be accessed by a light vehicle an estimated 230 times per year for routine monitoring, servicing and site maintenance.

Priority at junctions for existing public road users will remain unchanged during the construction and operational phases of the proposed Development.

All traffic accessing and leaving the site will use the designated haul route for construction traffic from the site entrance on the N59.

A number of mitigation measures have been proposed to minimise impacts on the public road network and local road users. Security gates will be provided at the site access. Gates will be set back from the N59 carriageway edge to accommodate articulated vehicles. Wheel wash facilities will be provided at the site entrance and at works locations on the public road network to prevent mud and dust spreading to the public road.

Temporary construction compounds will be provided on site and will remain for the duration of the construction period. The compound will be used to store construction materials for the proposed Development and as a parking and turning facility for construction and delivery traffic.

Components for each turbine will be delivered to site in three separate abnormal load convoys over the period of one week. The convoys will travel at times agreed with An Garda Síochána. The haulage contractor will obtain all necessary permits for the transportation of abnormal loads from the Galway County Council.

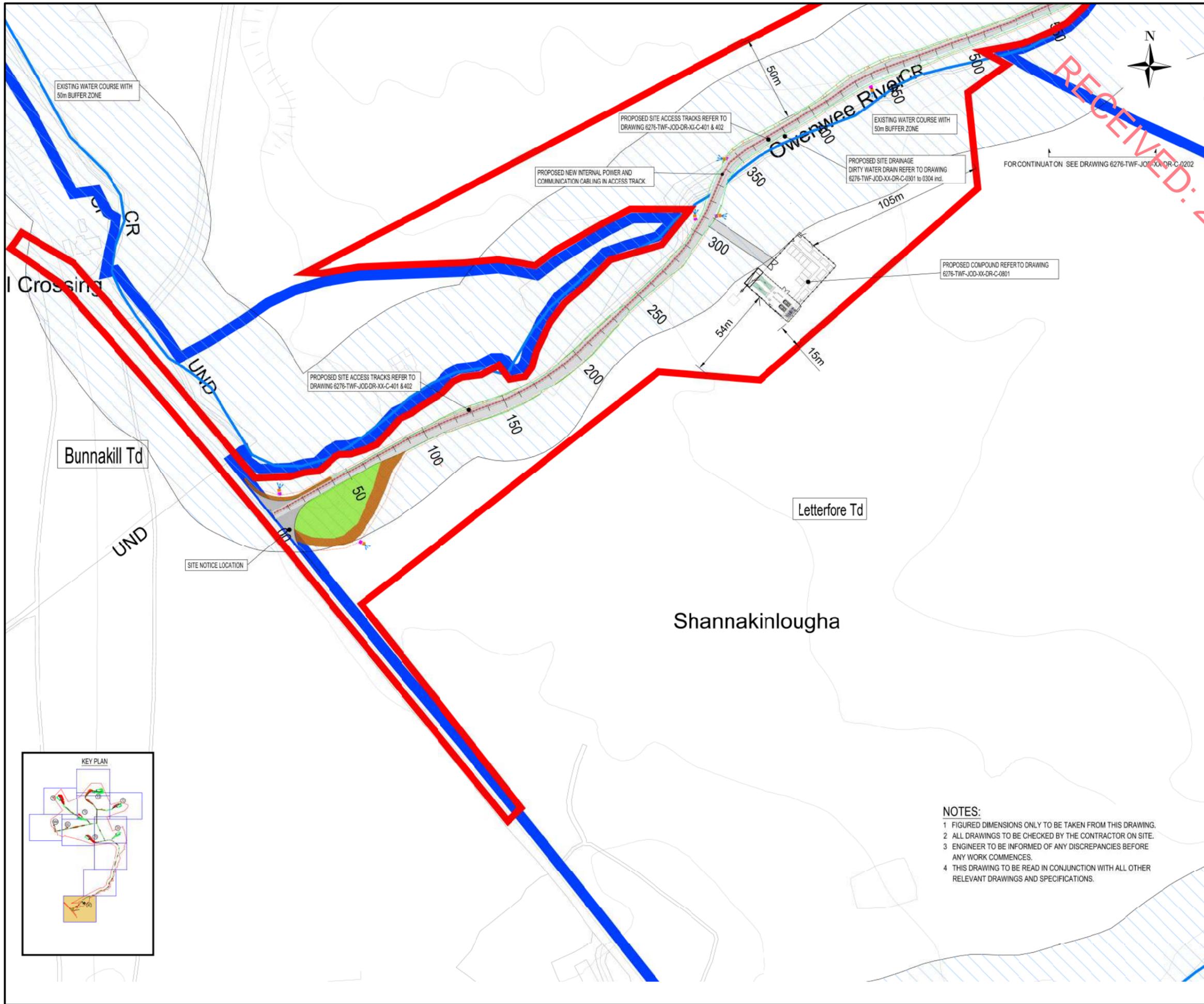
Grid connection works carried out on the public road network will be fully enclosed within the traffic management system.

Increased volumes of traffic will be generated by the proposed Development during the construction period. However, traffic analysis has shown that the additional volumes of traffic generated by the proposed development during the construction of the wind farm and during the 38kV grid connection can be accommodated by the existing public road network and will not impact adversely on existing road or junction capacity. Impacts from construction of the proposed Development have been assessed as being temporary in nature and will vary throughout the construction phase of the project. Upon completion of the turbine construction the turbine site will generate low volumes of operational traffic which will have a negligible impact on the public road network.

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APPENDIX A

DRAWINGS



LEGEND

- Land where the Applicant has ownership or beneficial interest
- Planning Application Boundary
- Proposed Wind Turbine
- Proposed Crane Hardstand
- Proposed Site Access Road
- Existing Site Road to be upgraded
- Proposed Cut Area
- Proposed Filled Area
- Dirty Water Interceptor Drain
- Clean Water Interceptor Drain
- Culvert
- Proposed New Internal Power & Communication Cabling
- Settlement Pond
- Buffered Outlet
- Watercourse Crossing
- Existing Watercourse
- Existing Watercourse with 50m buffer
- Proposed Meteorological Mast
- Contours of existing ground elevation

Rev	Date	By	Comment
-----	------	----	---------

Client
TULLAGHMORE WIND FARM LTD.

Client Representative



JENNINGS O'DONOVAN
CONSULTING ENGINEERS

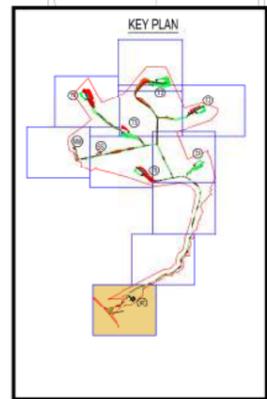
Project
TULLAGHMORE WIND FARM,
CO. GALWAY

Title
FIGURE 2.3 SITE ENTRANCE

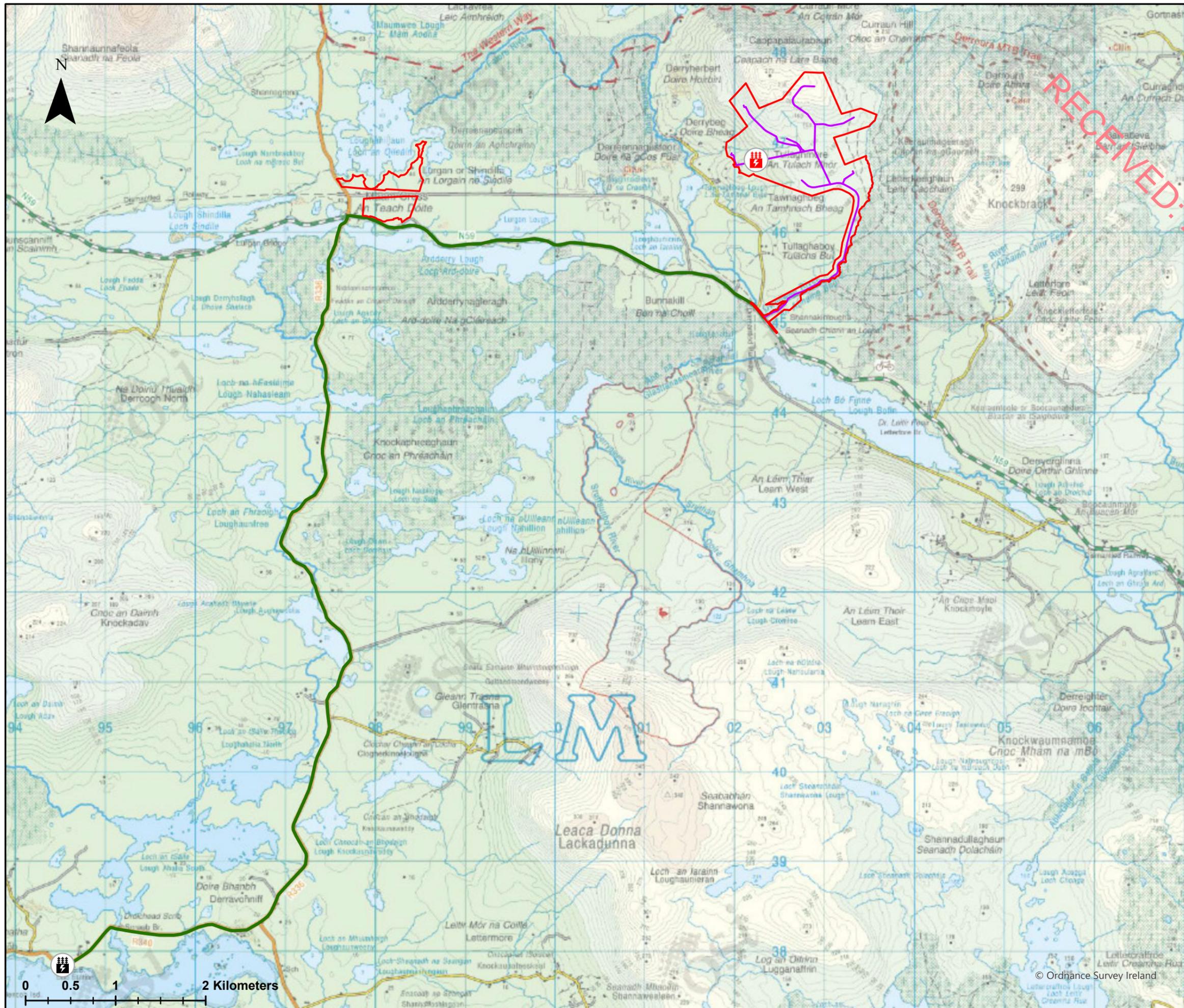
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Drg. By	DT	Job No.	6276
Checked By	KON/AOG	Rev	0
Stage	Planning	Date	AUGUST 2022
Scale	NOT TO SCALE	Figure	2.3

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 - 3 ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
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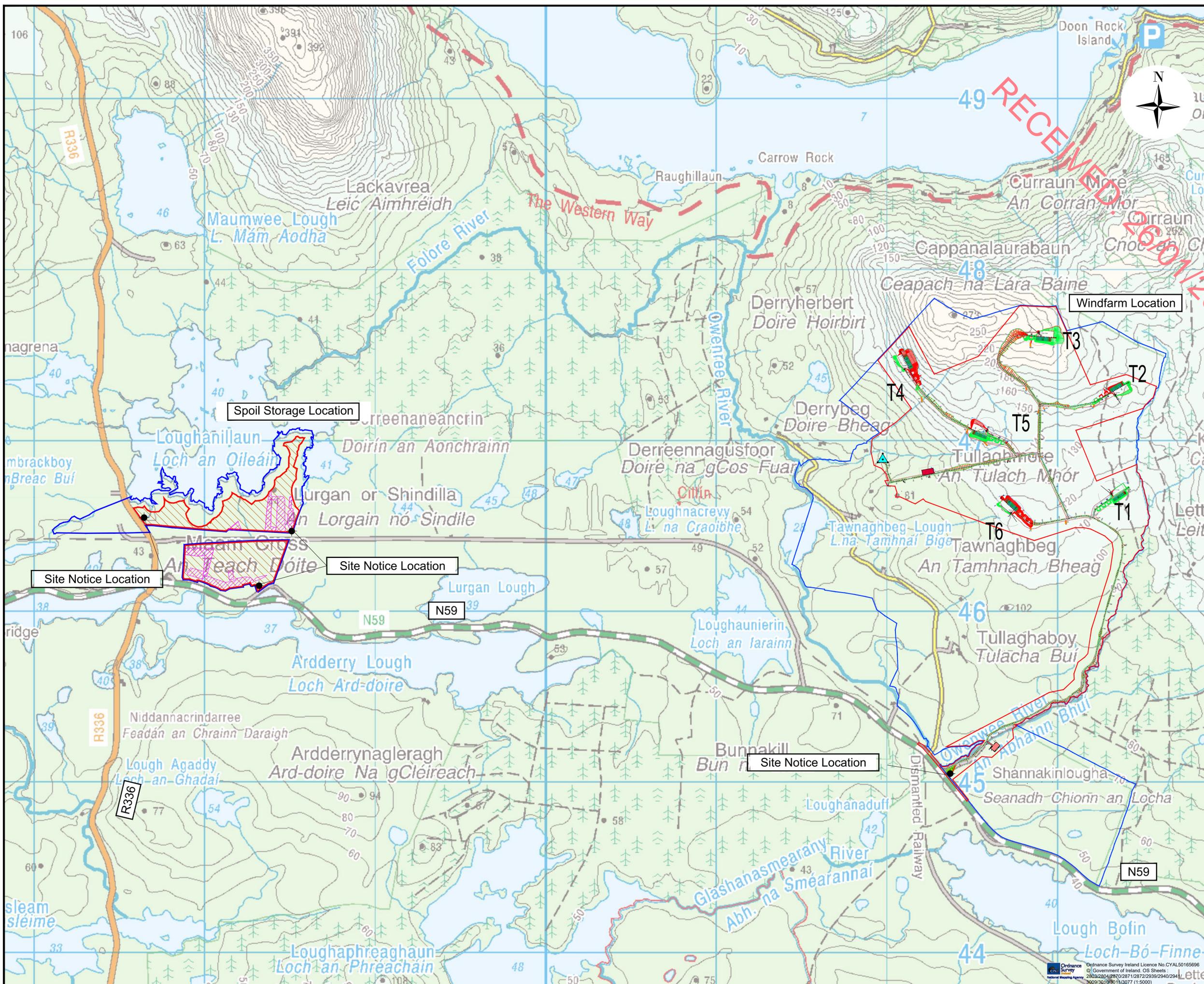
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- LEGEND**
-  INTERNAL POWER & COMMS ROUTE
 -  PROPOSED GRID ROUTE
 -  SCREEBE 110KV SUBSTATION
 -  ONSITE 38KV SUBSTATION
 -  PROJECT SITE BOUNDARY

RECEIVED: 26/01/2023

Rev	Date	By	Comment
Client TULLAGHMORE WIND FARM LTD.			
Client Representative  JENNINGS O'DONOVAN CONSULTING ENGINEERS			
Project TULLAGHMORE WIND FARM, CO. GALWAY			
Title FIGURE 2.10 PROPOSED GRID CONNECTION			
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Drg. By	DT	Job No.	6276
Checked By	KON/AOG	Rev	0
Stage	Planning	Date	July 2022
Scale	1:40,000 (A3)	Figure	2.10



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- Legend**
- Planning Application Boundary
 - Lands Under Control of Applicant
 - Proposed Wind Turbine
 - Proposed Crane Hardstand
 - Proposed Spoil Storage Locations
 - Peat Restoration (Habitat Enhancement Lands)
 - Proposed Meteorological Mast
 - Proposed Substation Location
 - Proposed Temporary Compound Location
 - Proposed Fill
 - Proposed Cut

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 3009/3010/3011/3077 (1:5000)

P01	Issued for Planning	LB	A/OG	12-2022
rev.	modifications	by	chk	date

Client
 Tullaghmore Wind Farm Limited

Project
 Proposed Tullaghmore Wind Farm, County Galway.

Stage
 Planning

Title
 Overall Site Location Map
 Discovery Series

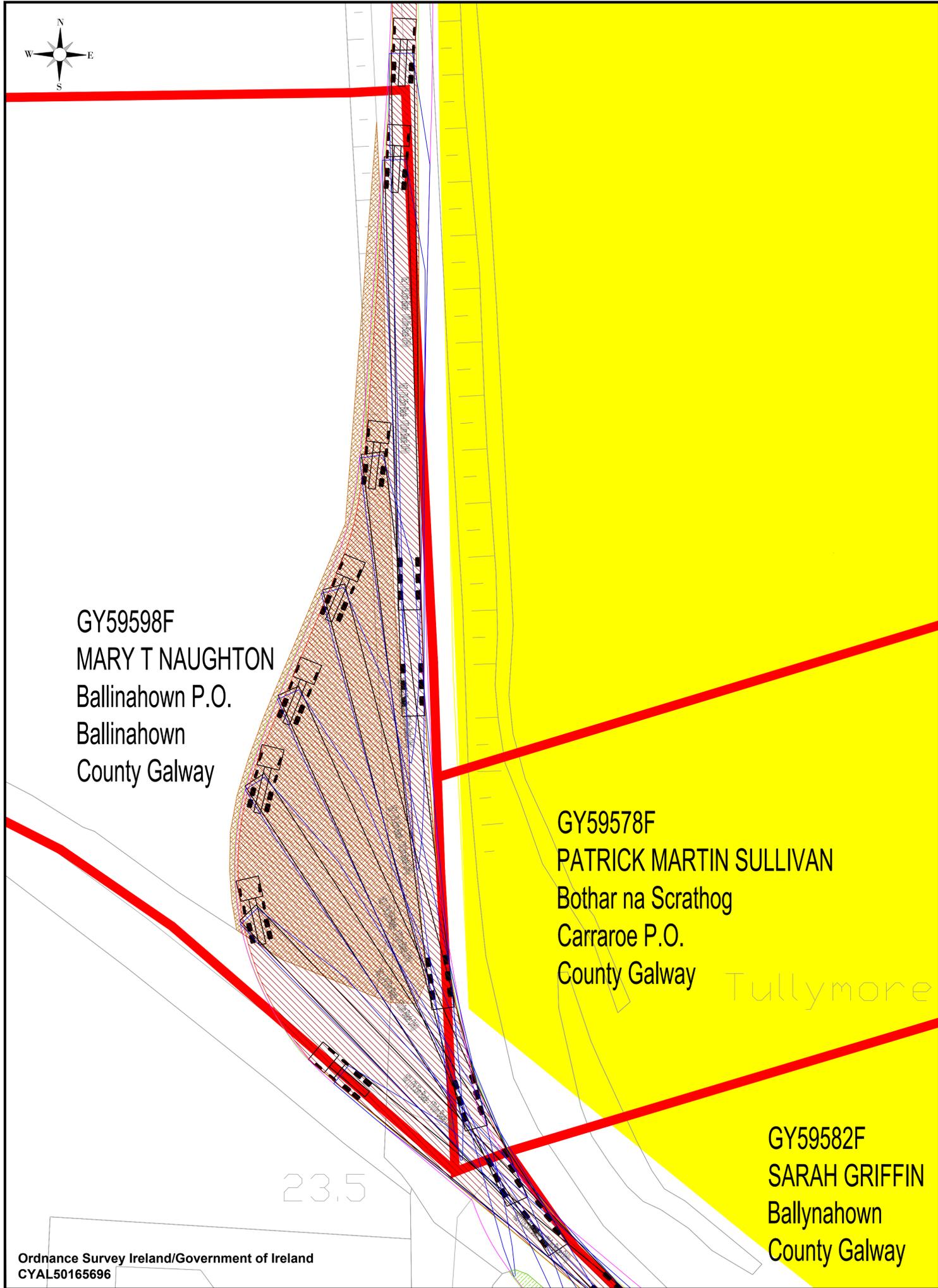
Scales
 1:10,000 (A1) & 1:20,000 (A3)

Surveyed	Prepared By	Checked	Date
	L.B.	A.OG	July 2022

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Job No.	Drawing no.	Revision
6276	6276-TFW-JOD-XX-DR-C-0100	P01

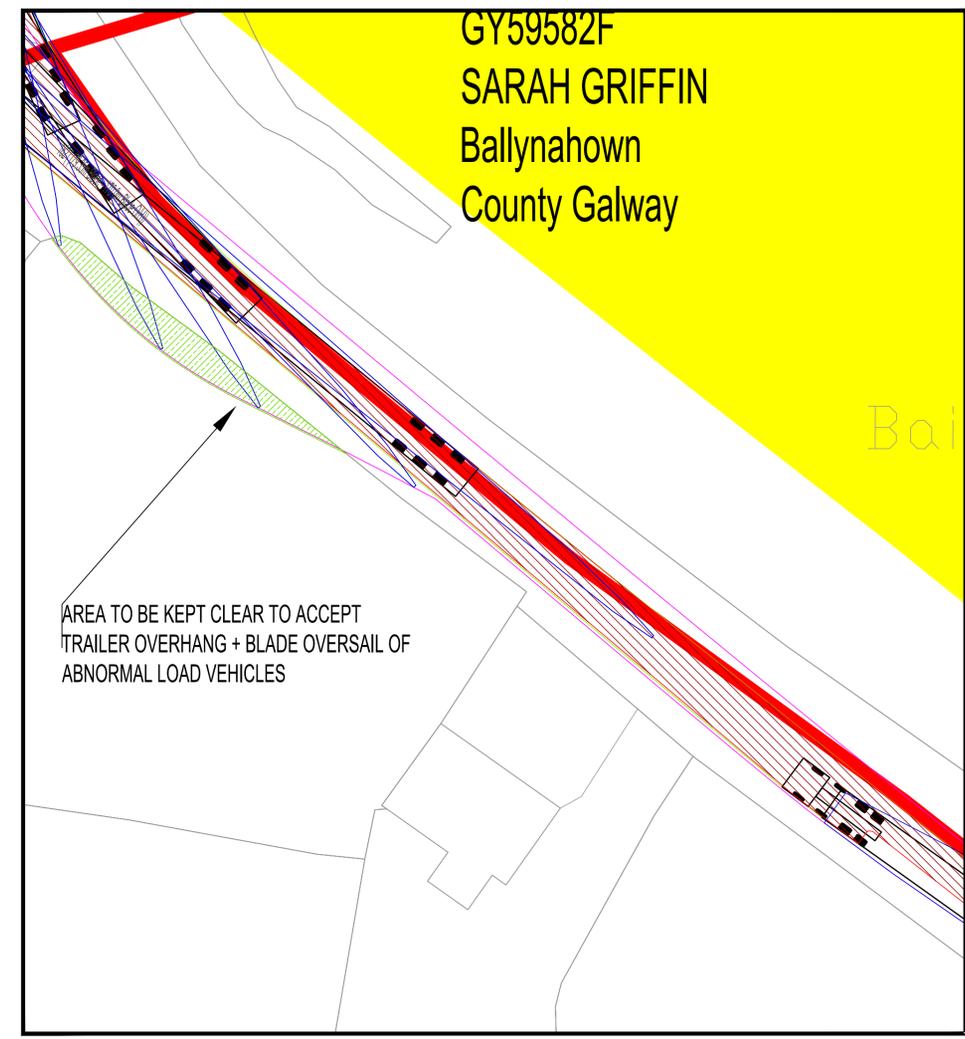
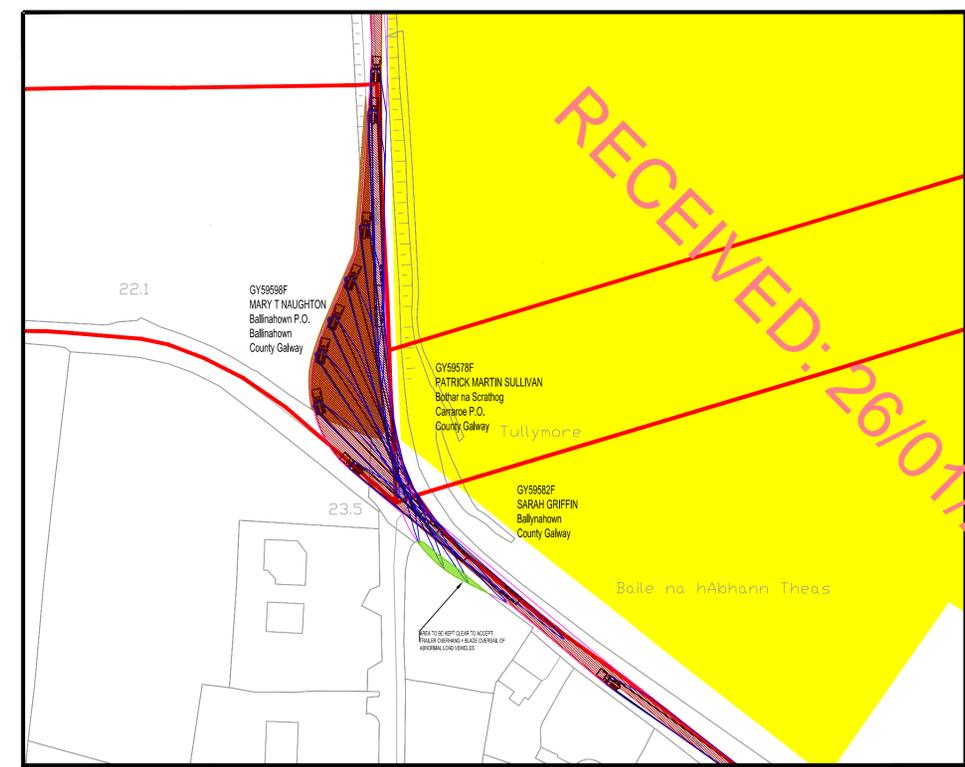


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PATRICK MARTIN SULLIVAN
Bothar na Scrathog
Carraroe P.O.
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Ballynahown
County Galway

Ordnance Survey Ireland/Government of Ireland
CYAL50165696



GY59582F
SARAH GRIFFIN
Ballynahown
County Galway

AREA TO BE KEPT CLEAR TO ACCEPT
TRAILER OVERHANG + BLADE OVERSAIL OF
ABNORMAL LOAD VEHICLES

- NOTES:
- 1 FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
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Legend

- Loadbearing Surface For Abnormal Load Vehicles
- Obstacle Free Area For Abnormal Load Vehicles

79.350

Blade Delivery Vehicle

(SAC) Special Area of Conservation

THIS DRAWING IS NOT TO BE USED AS A CONSTRUCTION DRAWING.

02.	SAC ADDED / V162	JB	AOG	17.11.21
rev.	modifications	by	chkd	date

Client
Letterkeegan Limited.

Project
Proposed Windfarm at Letterkeegan, Co. Mayo

Stage
Preliminary Design

Title
Wind Farm Haul Route R336 Bend at Baile na Habhann Theas

Scales
Plan 1:250 @ A1 (1:500 @ A3)

Surveyed	Prepared By	Checked	Date
	J.D.	A.o.G.	01/2021

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Job No.	Drawing no.	Revision
6276	P-2104	02

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APPENDIX B

OUTLINE TRAFFIC MANAGEMENT PLAN

VMS

Mobile VMS may be used as driver information signs to inform road users of the timing and reason for works and to explain delays.

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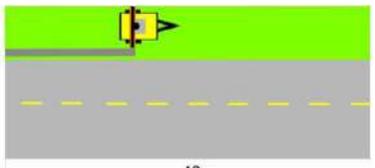
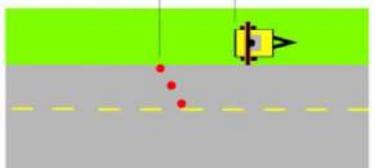
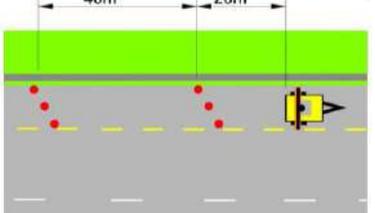
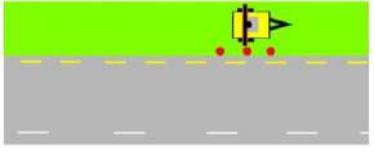
	<p>Scenario 1: VMS protected by existing barrier if access is available.</p>
	<p>Scenario 2: VMS in verge no barrier, full hard shoulder, single line of cones in hard shoulder 40m in advance of sign.</p>
	<p>Scenario 3: VMS on hard shoulder if no access to verge or barrier. 2 lines of cones 20m and 60m in advance of VMS for a 100km/h road (15m and 45m for an 80km/h road).</p>
	<p>Scenario 4: VMS on verge, no hard shoulder. Line of cones placed parallel to the VMS outside of its closest point along the edge of the carriageway.</p>

Figure C1 - Positioning VMS Signs

SCOPE

This document is intended to provide design level guidance for Temporary Traffic Management. The document should be read in conjunction with the following publications covering all aspects of TTM on Irish roads:

- Chapter 8 of the Traffic Signs Manual;
- Temporary Traffic Management Design Guidance;
- Temporary Traffic Management Operations Guidance.

REVISIT: 26/01/2023

TTM CRITERIA

The main criteria in selecting the type of TTM Design required are the road classification on which the works are to take place and the type of works involved.

The road classifications in Chapter 8 of the Traffic Signs Manual are listed in Table C1, Where roadworks take place across more than one classification the design parameters for the higher classification of road should be used.

Level		Carriageway Type	Speed / Speed Limit (km/h)
Main	Sub		
Level 1	i	Single	≤ 30
	ii	Single	40
	iii	Single	50
	iv	Single	60
		Multi-lane / Dual	≤ 60
Level 2	i	Single	80
	ii	Single	100
Level 3	i	Dual and Motorway	80
	ii	Dual and Motorway	≥ 100

Table C1 – Road Classifications

The three levels of road are listed in Table C2.

Level	Description
1	Low Speed and Urban areas using geometric standards set out in DMURS
2	Rural single roads that allow a flexible range of implementation approaches and where vehicles may be expected to stop
3	High Speed Duals and Motorways whereby traffic may be expected to merge or change lane

Table C2 – Road Level

ROADWORKS TYPES

The roadworks types identified in Chapter 8 of the Traffic Signs Manual are listed in Table C3. In selecting the works type, duration, traffic flow, visibility and road level are taken into consideration. Where works type falls between two categories the TTM Designer should design to the higher works level subject to a risk assessment.

TTM Type	Description	Traffic Flow Conditions	Visibility Conditions	Planned Duration
Static Type A	Works requiring full time Temporary Traffic Management (TTM)	All	All	Permitted for any duration but required for durations in excess of 12 hours
Static Type B	Works that normally involve the use of one or two vehicles in the operation. This type of work is typically maintenance and repair type operations, including maintenance of utilities or street furniture.	Unrestricted by either traffic volume or weather conditions	All	Permitted for a duration of up to 12 hours
Static Type C	Works at a discrete location that are of a short duration (excluding signage setup/removal).	Unrestricted by either traffic volume or weather conditions	Good	Permitted for a duration of up to 15 minutes
Semi Static Operation (SSO)	Works where the operations are mobile or making short duration stops continuously along a road where static warning signs are used. A SSO is only suitable on Level 1 to 2 roads.	Unrestricted by either traffic volume or weather conditions	Good	Permitted for stop durations of up to 15 minutes
Mobile Lane Closure (MLC)	Works where the operations are mobile or making short duration stops continuously along a road where mobile warning signs and Impact Protection Vehicles (IPV) are used. A MLC is only suitable for Level 3 roads.	Unrestricted by either traffic volume or weather conditions	Good	Permitted for stop durations of up to 15 minutes

Table C3 – Roadworks Types

LANE WIDTHS

Two-Way operation of traffic should be maintained on single carriageway roads, where practicable. When this cannot be achieved, the through passage should be further restricted using cones to a single traffic lane not less than 3.0m but not exceeding 4.3m and alternate one-way traffic (shuttle working) introduced using the most appropriate method of traffic control. When the traffic volume is low and expected to consist only of cars and other light vehicles, an absolute minimum of 2.5m may be used. Whenever this situation arises, advanced warning of the narrow lanes should be given using appropriate signs.

VISIBILITY REQUIREMENTS

Approaching traffic must have adequate visibility of TTM signage and in particular the first sign. Sign visibility requirements are dependent on the road level and speed and are defined as the uninterrupted sight distance of an approaching vehicle to the first sign (WK 001 Roadworks Ahead).

Minimum visibility requirements are shown in Table C4.

Level		Carriageway Type	Speed / Speed Limit (km/h)	Sign Visibility (m)	Visibility to Stop / Go & Traffic Signals (m)
Main	Sub				
Level 1	i	Single	≤ 30	25	25
	ii	Single	40	35	35
	iii	Single	50	50	50
	iv	Single	60	60	60
Multi-lane / Dual		≤ 60	60	60	
Level 2	i	Single	80	90	90
	ii	Single	100	120	120
Level 3	i	Dual	80	90	120 ¹
	ii	Dual	≥ 100	160	N/A ²

Table C4 – Visibility Requirements at Roadworks

DESIGN SPEED FOR TTM

TTM should be designed on the basis of the regulatory posted speed limit prevailing at the works location. The use of a Roadworks Speed Limit Order may be appropriate where works of a significant nature and duration are undertaken on a carriageway greater than 60km/h. For such works a Roadworks Speed Limit should be applied while a hazard exists that reduces the appropriate travel speed through the site below that of the permanent speed limit. Only speed limits set out in the Road Traffic Act 2004 (30, 40, 50, 60, 80 or 100km/h) can be selected.

Where it is impractical to apply a Roadworks Speed Limit (e.g., for unpredictable maintenance works, short duration works etc.) or where the desired speed limit is below any enforceable limit, consideration should be given to the application of a Cautionary Speed Plate. Cautionary Speed Plates shall be selected from the following list: 25, 35, 45, 55, 65, 75 or 85km/h.

VMS

Mobile VMS may be used as driver information signs to inform road users of the timing and reason for works and to explain delays.

	<p>Scenario 1: VMS protected by existing barrier if access is available.</p>
	<p>Scenario 2: VMS in verge no barrier, full hard shoulder, single line of cones in hard shoulder 40m in advance of sign.</p>
	<p>Scenario 3: VMS on hard shoulder if no access to verge or barrier. 2 lines of cones 20m and 60m in advance of VMS for a 100km/h road (15m and 45m for an 80km/h road).</p>
	<p>Scenario 4: VMS on verge, no hard shoulder. Line of cones placed parallel to the VMS outside of its closest point along the edge of the carriageway.</p>

Figure C1 - Positioning VMS Signs

STATIC OPERATIONS

Static operations are those where the works are confined to a fixed site location. The length of a fixed site should be kept to the minimum required to carry out the operation safely.

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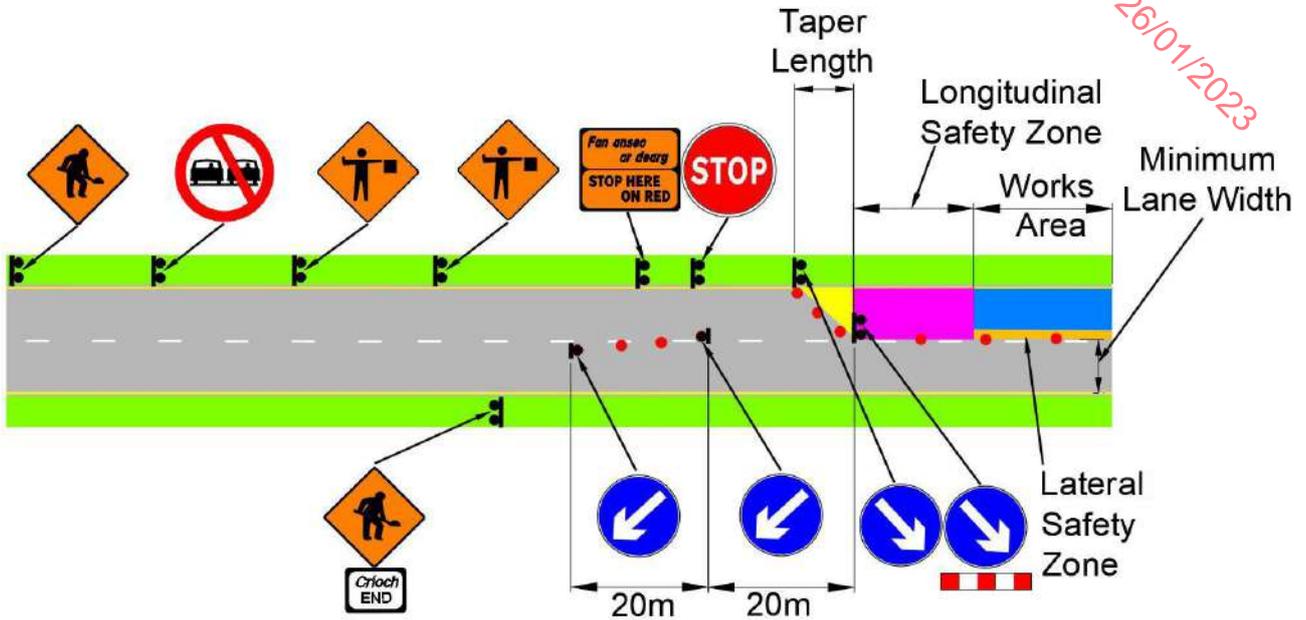


Figure C2 – Works Area Terminology

TRAFFIC CONTROL MEASURES

The following Traffic Control Methods are used for Static Type A and Type B operations:

- **Two-Way Traffic;**

Two-Way traffic should be maintained past the works where practicable.

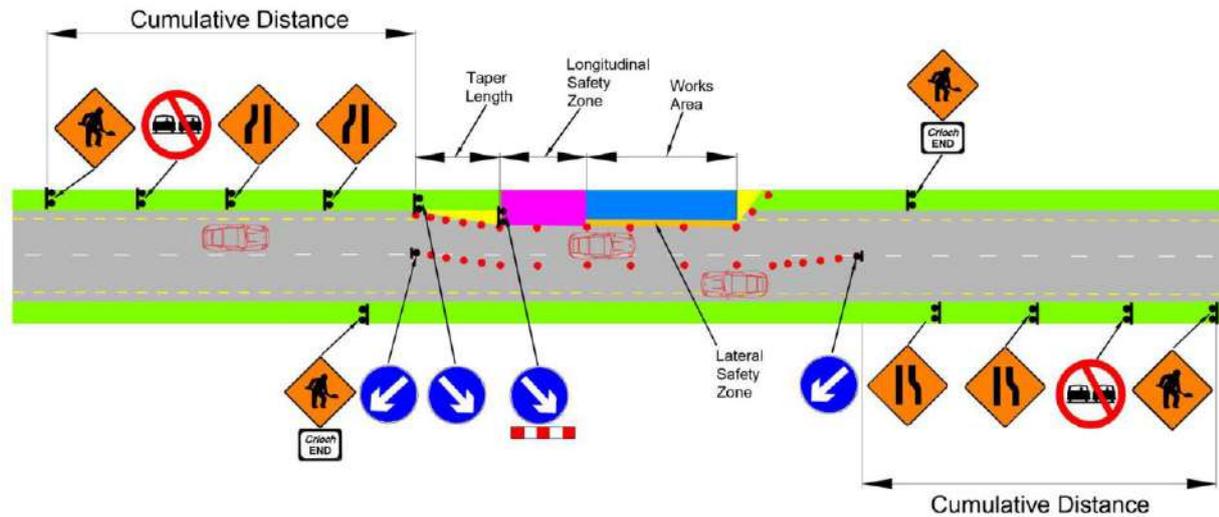


Figure C3 – Two Way traffic Operation

• **Give and Take;**

The Give and Take system may be used for shuttle working during day light hours provided that:

- there is clear visibility of and through the site for drivers approaching from either direction;
- the speed limit is 50km/h or less (this limitation does not apply where the method is used in conjunction with Semi Static operations);
- the total two-way traffic flow is less than 400 veh/hr (max 3min count 20);
- the total HGV traffic is less than 20 veh/hr (max 3min count 1); and
- the length of shuttle lane past the works does not exceed 50m between ends of tapers.

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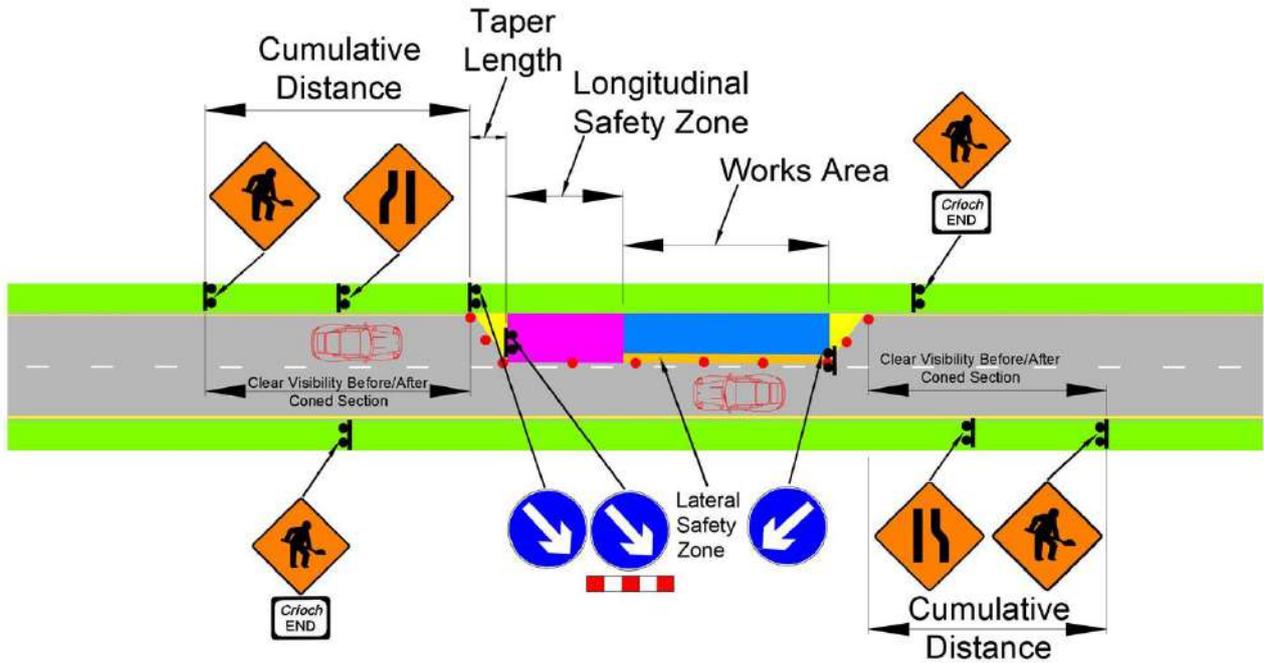


Figure C4 – Give & Take Traffic Control

• **Priority;**

Priority is established on one approach to the works site by placing a Yield sign, RUS 026, on the opposing approach. The yield sign is in addition to the required number of advance warning signs.

Priority control may be applied where all of the following conditions are met:

- the clear visibility requirements either side of the coned area specified in Table C5 are satisfied;

Maximum Speed Limit (km/h)	Clear visibility before and after the coned area (m)
≤ 50	60
60	70
80	80
100	100

Table C5 – Priority Visibility Requirements

- Two-Way traffic flow is less than 850 veh/h (max 3 min count 40)
- the site length (measured from the first cone of the entry taper to the last cone of the exit taper) is not more than 80m.

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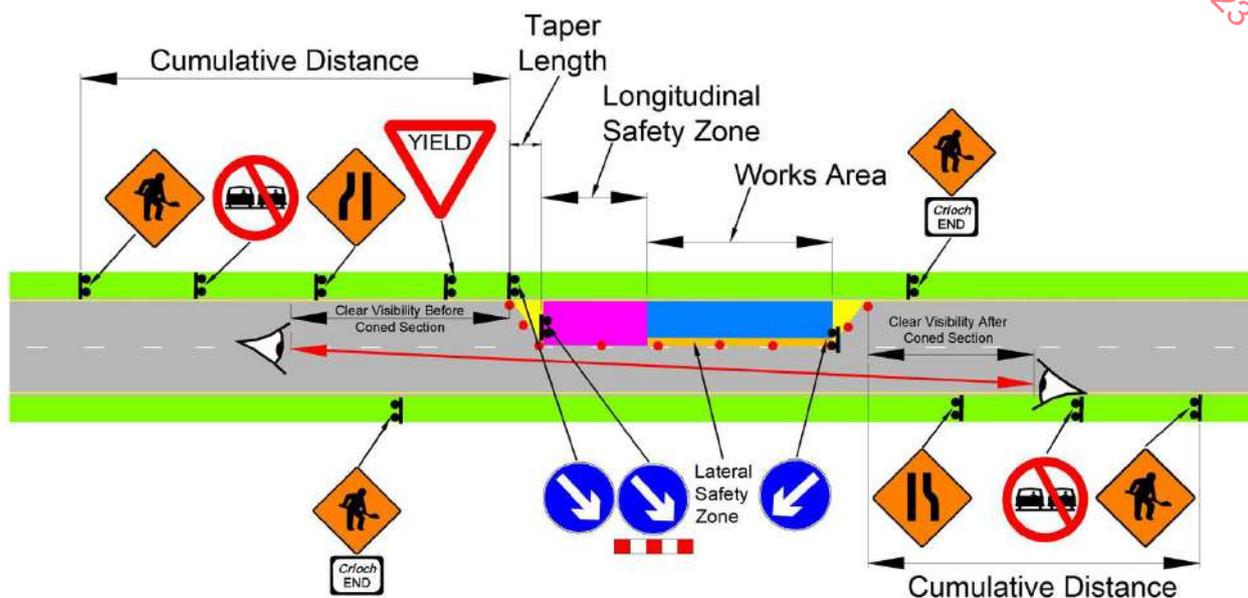


Figure C5 – Priority Traffic Control

• **Stop and Go discs;**

The Contractor must consult with the Gardaí prior to the implementation of Stop and Go discs.

Using manual or mechanically operated methods, Stop and Go discs can be used at plant crossing points, site access points or on single carriageway roads where traffic is reduced to shuttle working. This method allows traffic flows to move according to the actual demand, thereby reducing congestion, delay and driver frustration. Stop and Go discs are often specified and/or required during peak traffic flow periods on sites where remote control methods, such as temporary traffic signals, are used during the off-peak periods. For short works (20m or less) manual control at one end or in the middle may be sufficient. For short works at site crossing points or exits, a single operator may use a double-sided STOP batten to control traffic. For works longer than 20m and less than 200m remotely operated Stop and Go discs may be used provided the operator has an unobstructed view of both ends of the site and is not more than 100m from either end. For works longer than 200m, two operators will be required, one at either end of the controlled section. Additional operators may be required to regulate traffic emerging from any junctions within the controlled section. The work site should be limited to a maximum of 500m, including tapers. Preferably, operators should be inter-visible and should be in contact by a suitable and reliable means of communication (e.g., two-way radios).

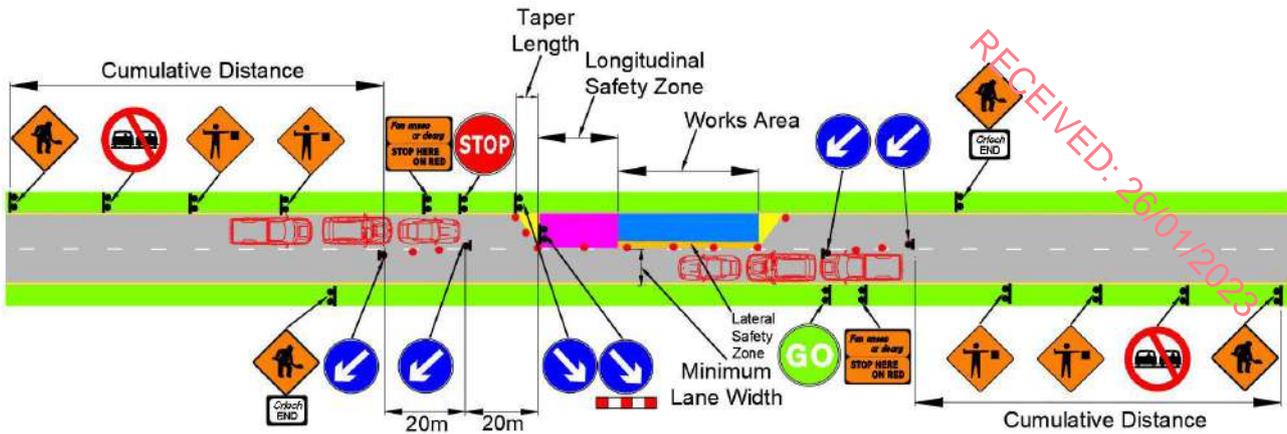


Figure C6 – Stop & Go Traffic Control

• **Temporary Traffic Signals;**

The Contractor must consult with the Gardaí prior to the implementation of Temporary Traffic Signals. Temporary Traffic Signals may be used at plant crossing points and site access points. They may also be used on single carriageway roads where traffic is reduced to shuttle working at all times on low traffic volume roads and at off-peak times only on roads with high traffic volume. Temporary traffic signals should have an adequate and reliable power supply and be capable of running a number of different phases. Vehicle actuated temporary traffic signals should be used where possible

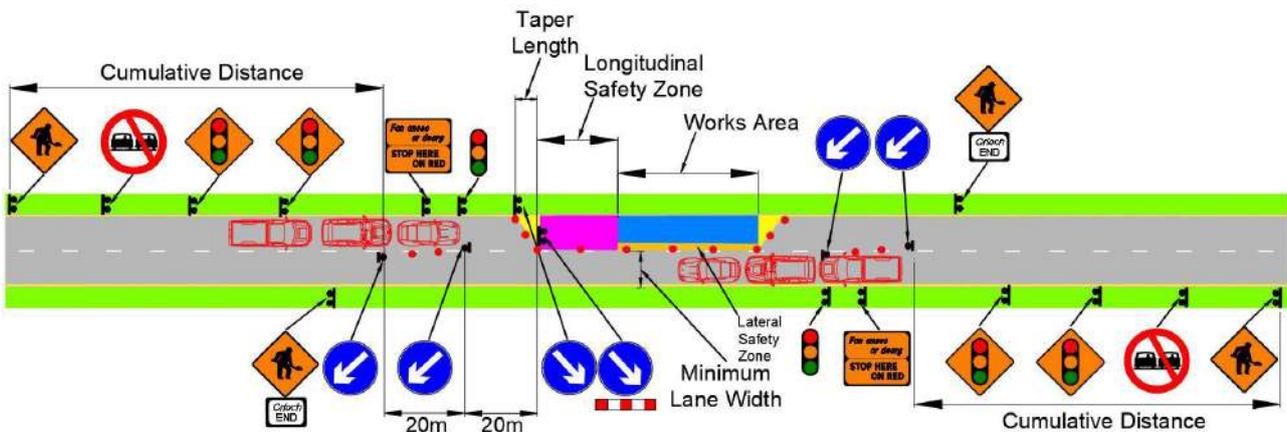


Figure C7 – Temporary Traffic Signals

• **All Stop;**

An All Stop is generally suitable for short duration works that can be quickly and easily suspended to relieve unacceptable queues and allow for emergency access through the site. The All Stop period should not exceed 10 minutes in rural areas and 3 minutes in urban areas. This method of working is generally not suitable where traffic flows exceed 300veh/hr. This method does not require a Manager’s Order. It should not be used if a suitable alternative route is available. Stop and Go discs are operated such that both discs remain on Stop whilst works are being carried out. Traffic queues are relieved periodically by opening up one or both lanes, as applicable.

• **Marshalling;**

Marshalling may be used in conjunction with another traffic control method such as Stop and Go or All Stop where minimum lane widths cannot be provided and traffic is required to encroach on the works area to pass the site. It may also be used to remove the lateral safety zone or move the longitudinal cone run to allow for larger vehicles to pass the works area. All works must be suspended while traffic is being marshalled through the site as minimum lane widths and safety zones are not in place.

• **Convoy Working;**

Where standard TTM arrangements are not feasible because of restricted roadway width and diversion is impractical, a method of Convoy traffic management may be used. In this method, traffic is brought to a halt in advance of the roadworks (usually by using Stop and Go discs) and is then led slowly, in single file, through the site and past the works by an appropriately signed works vehicle. A lateral safety zone is not required for Convoy working. Convoy lane widths should be in accordance with shuttle working lane width requirements and the maximum coned area length for Convoy working should not exceed 500m (except in relation to surface dressing. Traffic flows should be less than 900 - 1000 veh/hr two-way flow when considering the use of Convoy traffic control and the maximum queue to convoy should be 30 vehicles or less. If volumes exceed these values a 3-convoy vehicle system should be deployed.

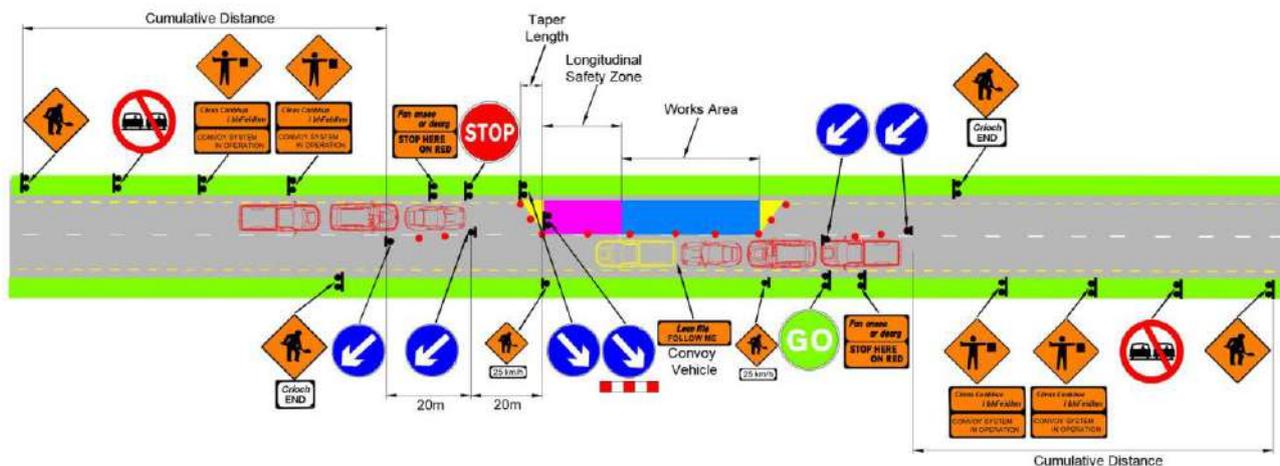


Figure C8 – Convoy Traffic Control

• **Road Closures and Detours.**

The following should be taken into account when planning a road closure with a diversion:

- Suitability of the diversionary route with respect to expected traffic type, flow, etc;
- Suitability of the diversionary route with respect to capacity, width and surface condition;
- Ensuring that the location of access for works vehicles do not adversely affect the diversion route (e.g., by introducing right turn movements);
- Establishing contractual responsibility relating to the signing of the diversion routes;
- Advanced signing detailing the nature, duration and necessity for the works and requirements for

- detailed directional signing throughout the diversion (per Chapter 8);
- Priority junctions (existing priorities may need to be altered to maintain diverted traffic flow);
 - Introducing one-way traffic flow and prohibiting turning movements;
 - Changing priority and restricting movements according to vehicle size/weight;
 - Presence of railway crossings, narrow bridges or other restrictions on the diversionary route;
 - Other works and /or winter maintenance on the diversion route;
 - Effect on the environment and safety; and
 - Requirements for vulnerable road users.

Traffic should be diverted onto roads with an adequate capacity. Where this is not possible, a oneway diversion should be considered for diverted traffic.

If the effect of the proposed road closure on road users, local residents or businesses is likely to be significant, an information campaign should be undertaken in advance of the works. This should include the following:

- Letter drop to surrounding area explaining the nature, diversions, duration and necessity for the works;
- Notification to local media outlets and AA Road Watch;
- Advance signs detailing nature, duration and necessity for the works;

JUNCTIONS

The preferred objective is to maintain two-way traffic past the obstruction when it is safe to do so. This may be achieved by providing temporary road markings and also “yield” road markings to assist in marshalling traffic. Traffic restrictions such as the prohibition of turning movements may be required, subject to agreement of the Road Authority in consultation with the Gardaí. If suitable, convenient alternative roads are available, temporary diversions should be arranged and signed. Appropriate safety zones should be maintained when working in proximity to a junction. If the full length of a longitudinal safety zone cannot be achieved between the works and the junction the safety zone should be extended past the junction and the full length incorporated prior to the junction. Where the junction is controlled by ‘Yield’ or ‘Stop’ signs and traffic or visibility problems require that the side road or access to be controlled by signals, both the junction and the shuttle lane should be controlled by a multiphase portable signal controller. As appropriate, permanent signage and road markings should be temporarily masked or removed.

Guidance and sample standard TTM layouts for works at junctions are given below. Layouts are shown for works on the junction and where works are on a side road but in close proximity to the junction. The layouts are for guidance purposes and show example scenarios, the TTM Designer should use the principles shown and design parameter tables for each road level when designing TTM for junctions. The examples given are for Type A works on Level 2 roads.

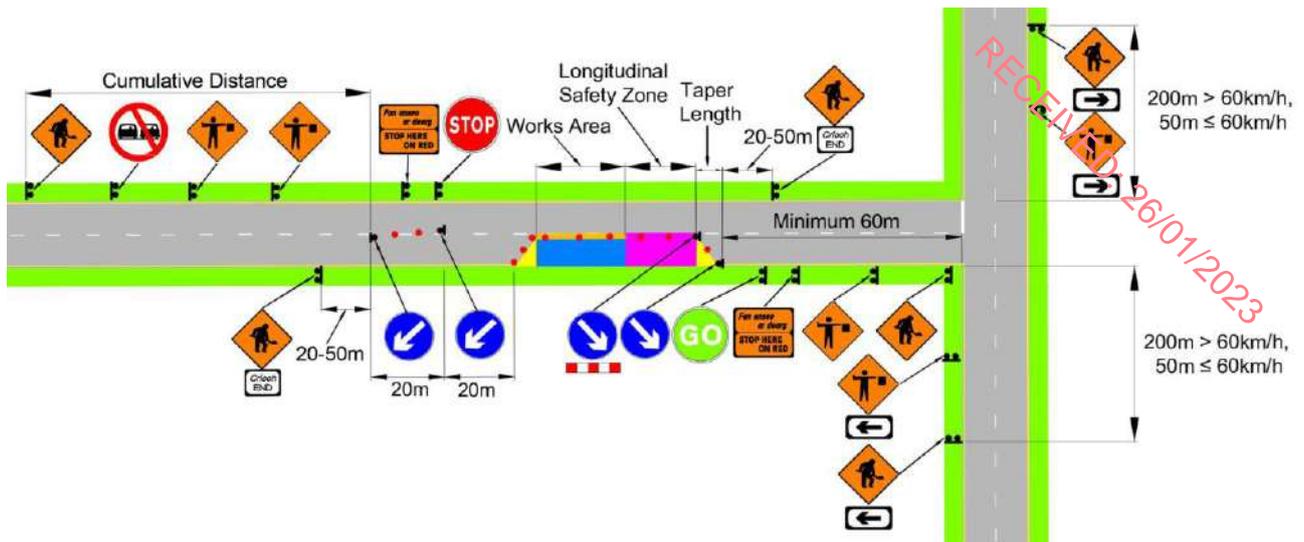


Figure C11 – Works on Side Road > 60m From Junction

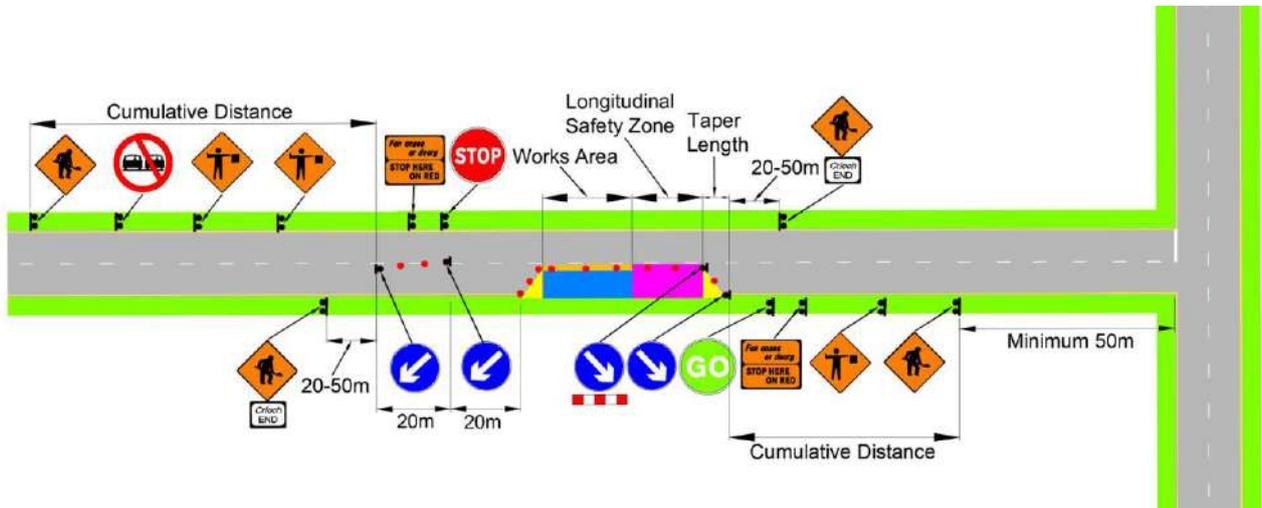


Figure C12 – Works on Side Road > 90m From Junction

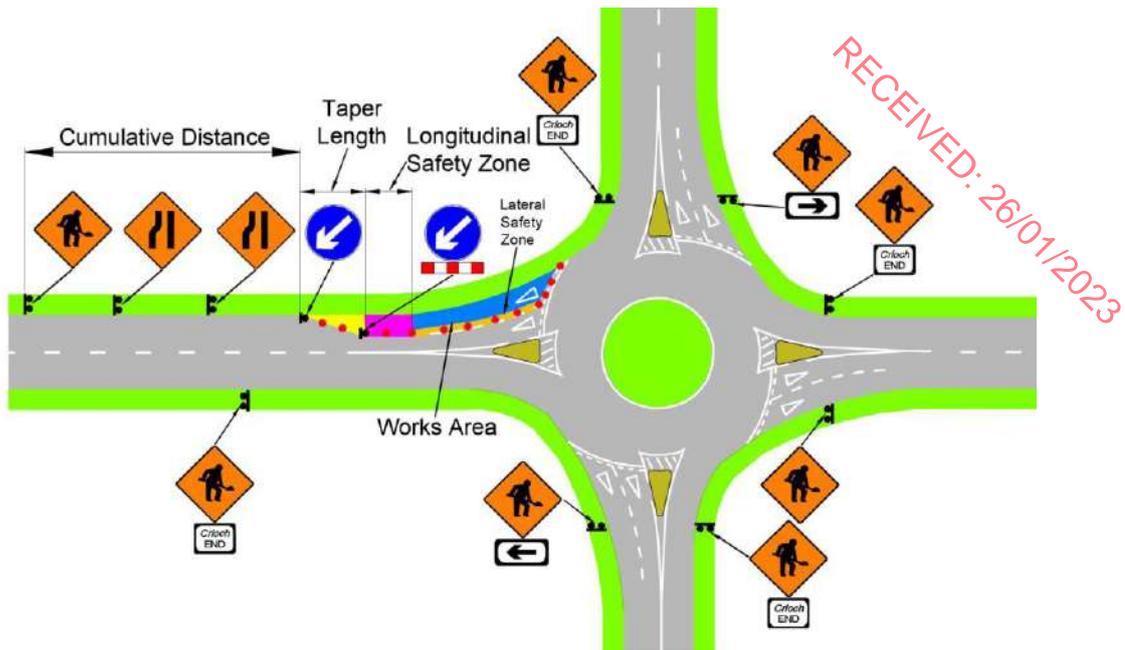


Figure C13 – Works at Entrance to Roundabout

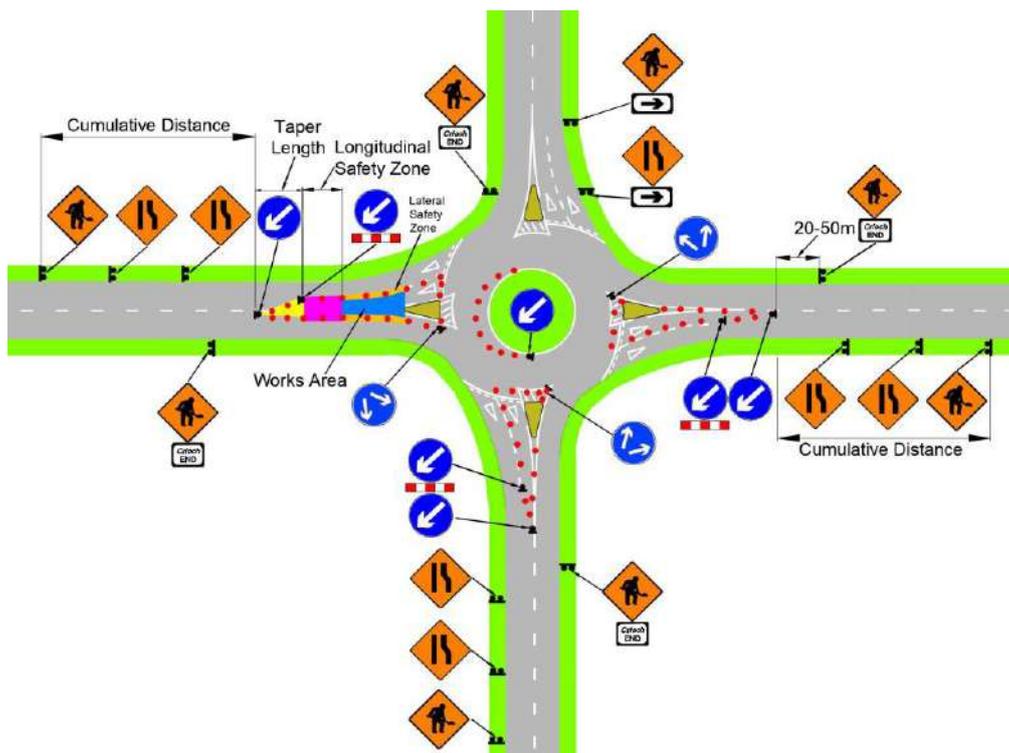


Figure C14 – Works on Central Island at Entrance to Roundabout

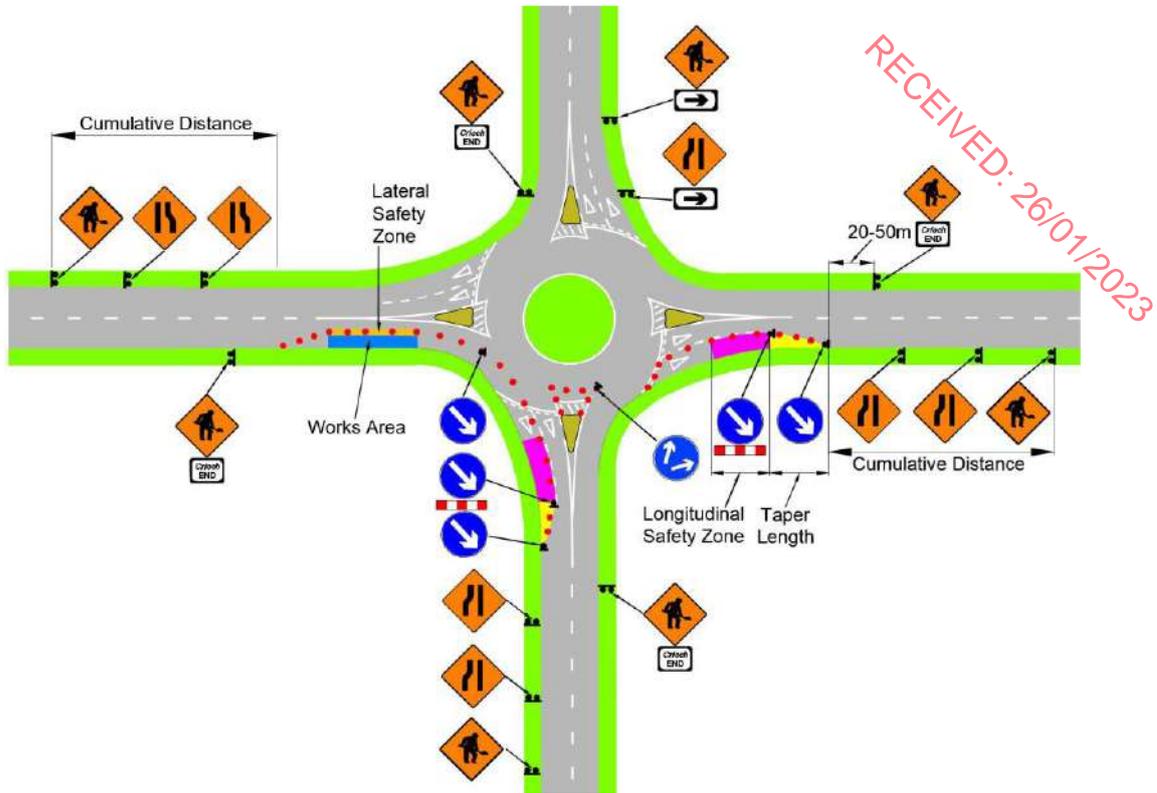


Figure C15 – Works at Exit From Roundabout

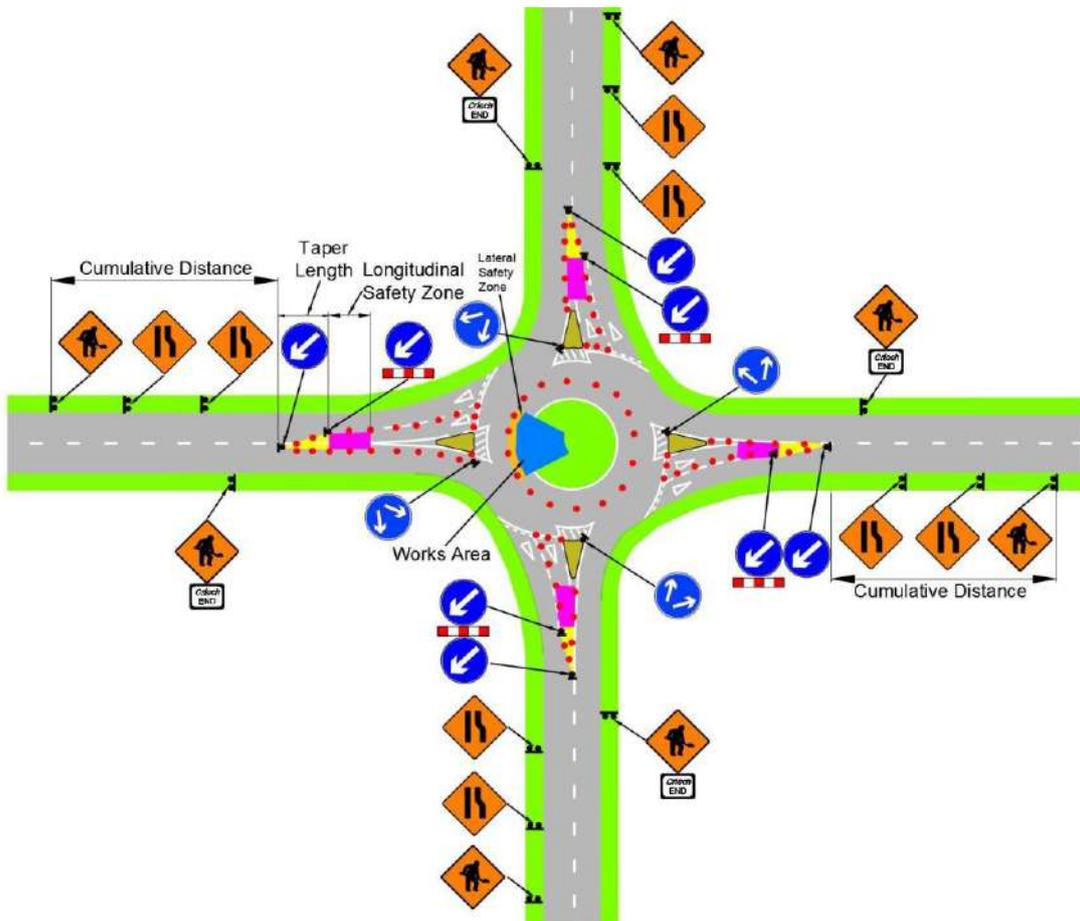


Figure C16 – Works on Roundabout Circulatory

WORKS IN URBAN AREAS

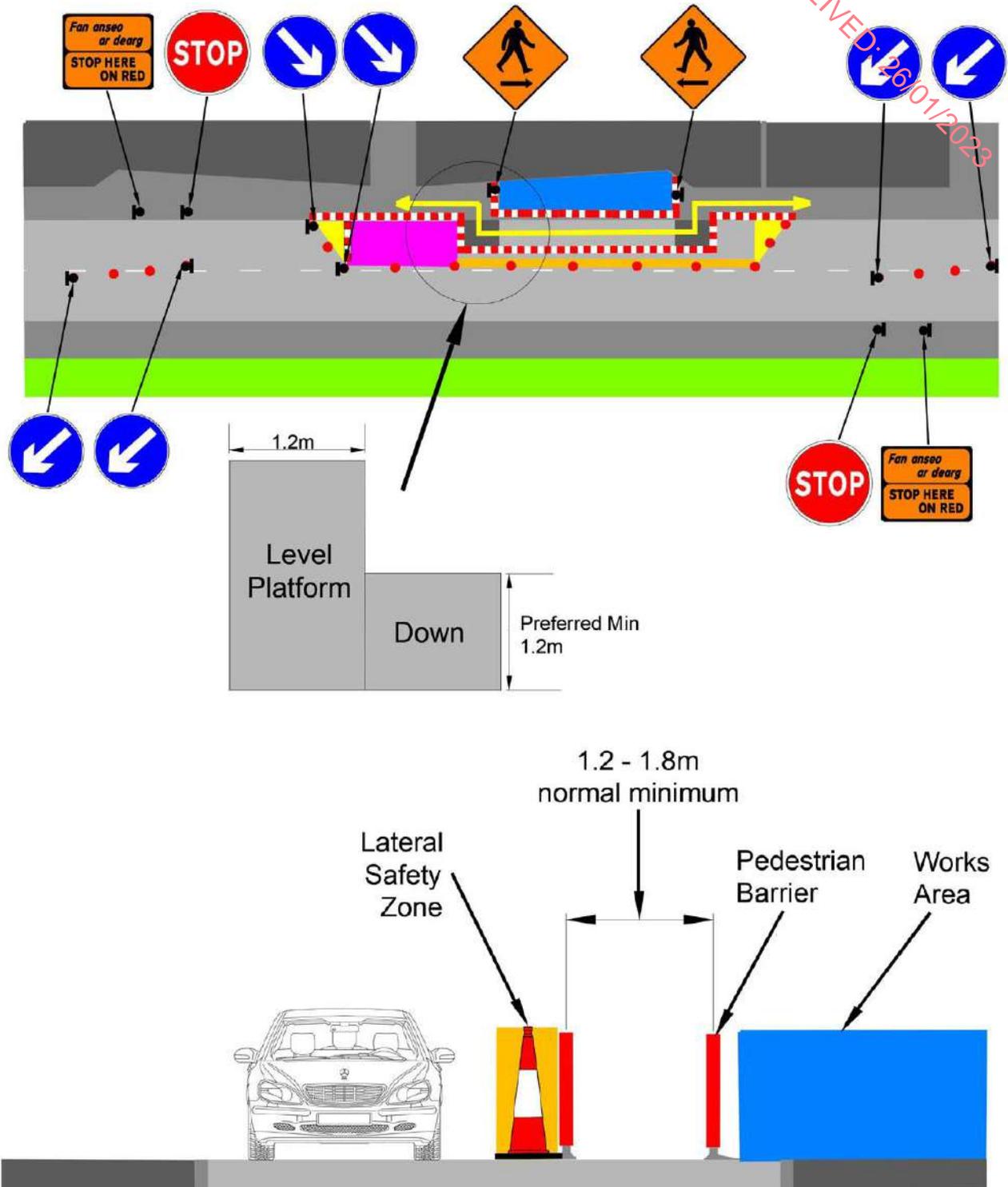


Figure C17 – Temporary Footpath on Carriageway

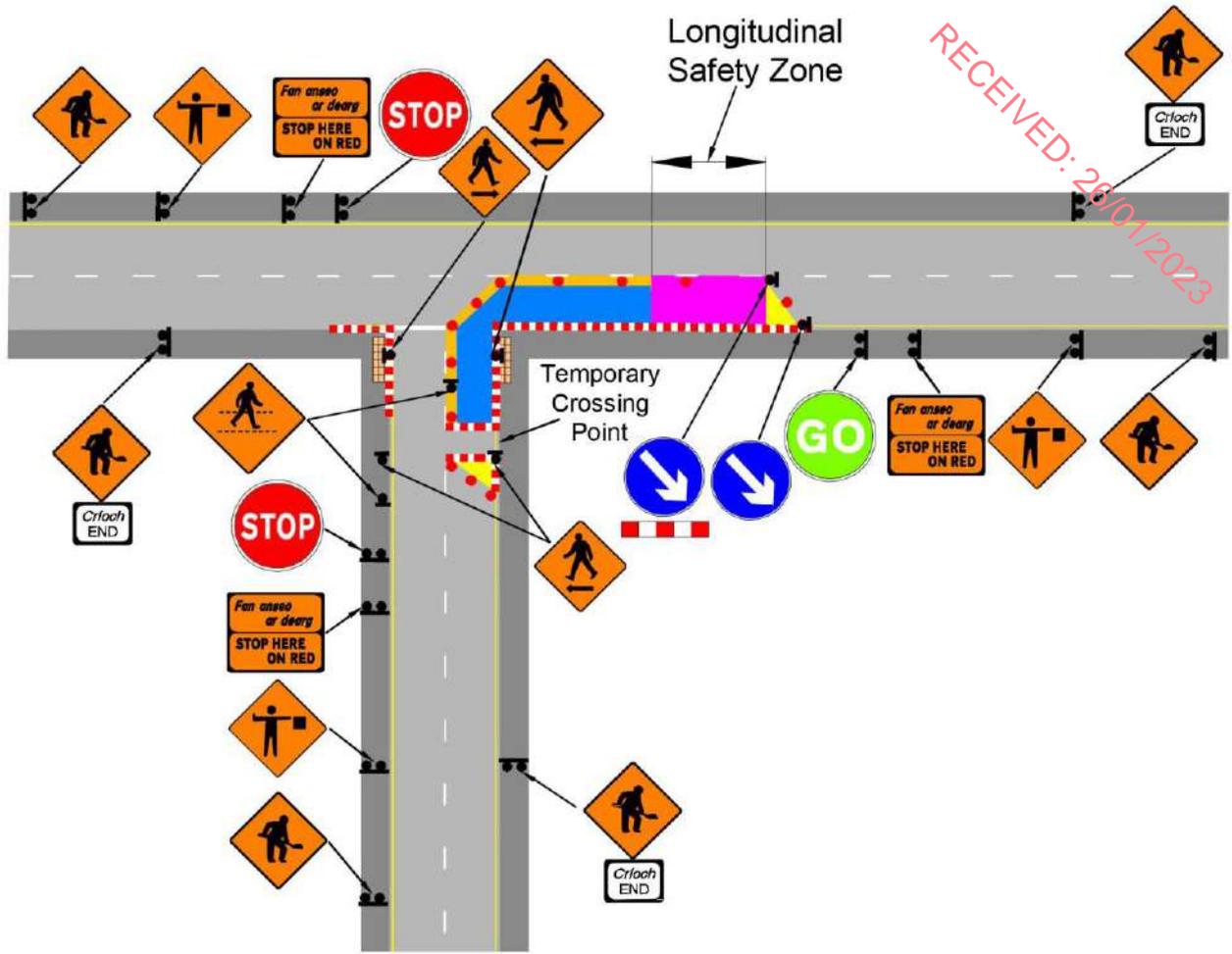


Figure C18 – Temporary Pedestrian Crossing

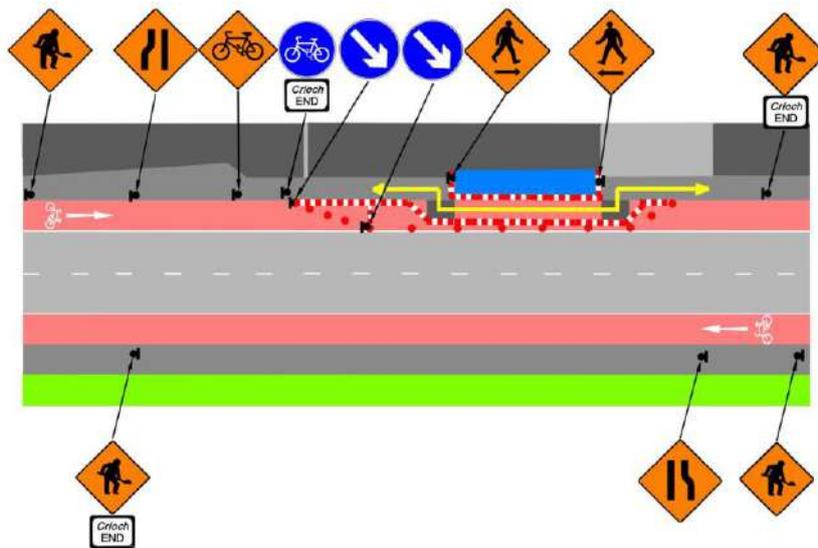


Figure C19 – Closure of Cycle Track

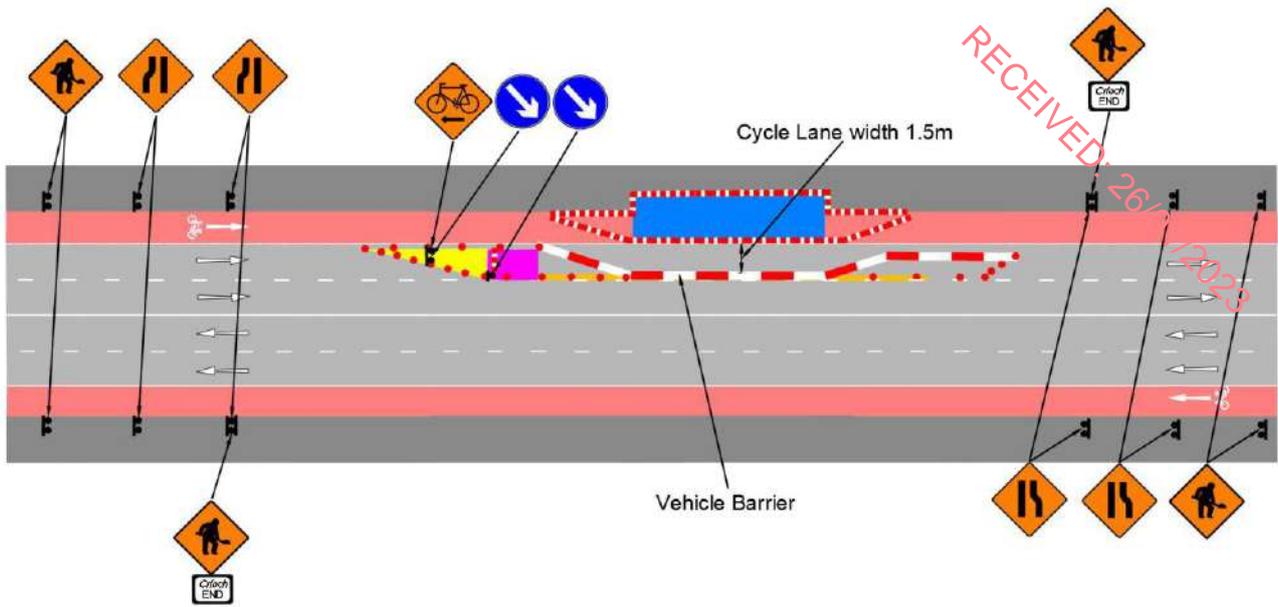


Figure C19 – Closure of Cycle Track With Dedicated Cycle Lane

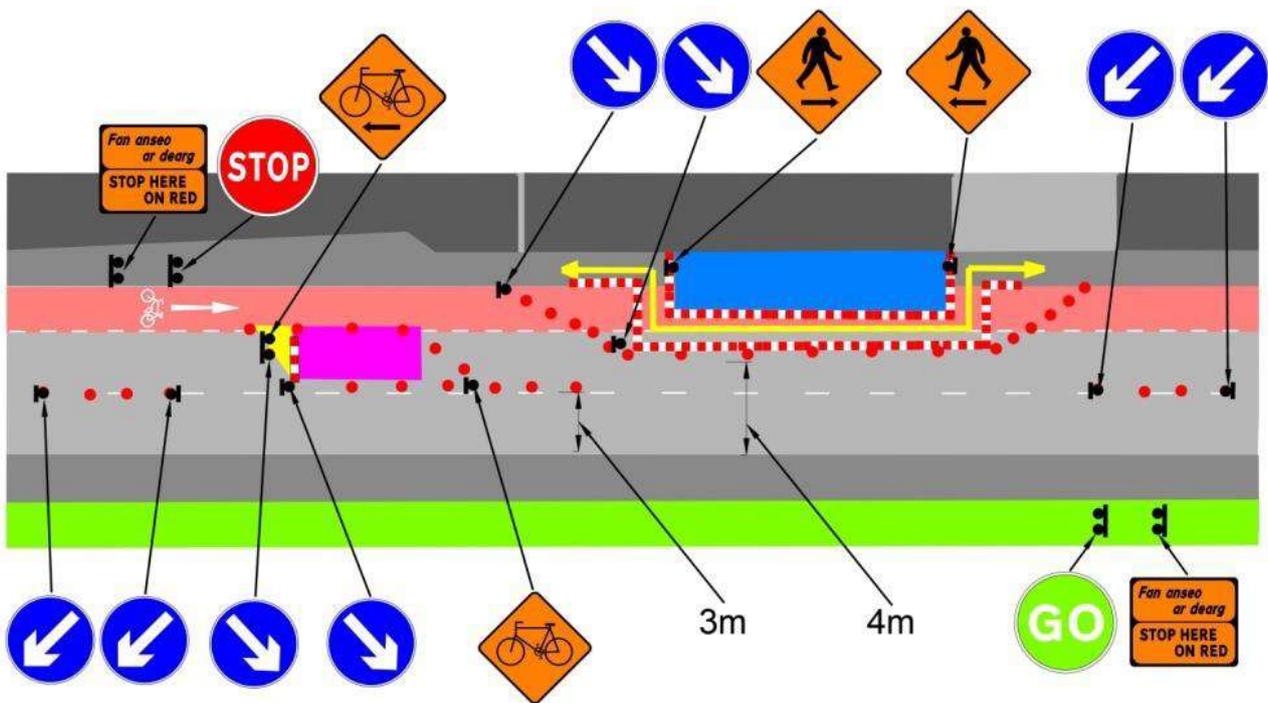


Figure C20 – Provision of Merge Lane for Cyclists