MWP

Appendix 3A - Turbine Delivery Route Assessment

Ballynisky Wind Farm

Ballynisky Green Energy Ltd.

December 2025

Contents

Figures

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1 Introduction

The purpose of this report is to assess the feasibility of delivering wind turbine components to the proposed Ballynisky Wind Farm development in County Limerick.

This report has assessed components being delivered to the proposed development along one potential route from the port at Foynes to the entrance to the proposed wind farm site.

A detailed topographical survey has been carried out which focused on a number of key junctions influencing the Turbine Delivery Route. Analysis has also been carried out using Bing and Google aerial photography which is ortho-rectified to ITM coordinates. Autodesk Vehicle Tracking (or Autotrack) swept path analysis software was used to determine the wheel track and component over sail extents for each critical location along the potential delivery route.

The proposed wind farm is expected to consist of 6 wind turbine generators. The turbine type is proposed to be similar to the Vestas V136 4.5MW specification.

It should be noted that this report is not a construction stage transport assessment. This report does not identify items such as telecom lines, domestic electricity lines and any hedge cutting required to achieve the clearance envelope specified by component delivery contractors. A detailed Traffic Management Plan outlining these will be required prior to construction stage. All oversized turbine component deliveries will require Statutory licences and liaison with the Local Authority, TII and An Garda Síochána. Oversized and overweight deliveries are likely to be accompanied by pilot vehicles and/or Garda escort.

2 Delivery Vehicle Types

The longest components are the turbine blades which are usually the most onerous for delivery. The widest and heaviest components are usually the base tower sections or the nacelle (housing containing generator, gearbox etc). The analysis of the route has been carried out for the delivery of a 68m long turbine blade. However, for large turbines, the tower sections, or the nacelle can be excessively wide or high. The bottom tower section will have maximum bottom flange diameter of up to 4.5m. Allowing for ground and overhead clearance, a load height of 5m has been applied for the tower sections.

It is proposed to employ specialised blade lifting trailers to transport wind turbine blades from the port at Foynes to the proposed wind farm site. These blade lifter trailers have the capacity to transport the blades horizontally or tilted at up to 60° to the horizontal. A blade lifter trailer with a blade tilted to 60 degrees is shown in Figure 2-1 below. The ability to transport the blades in an inclined configuration allows for increased capacity to negotiate tight bends and junctions without modification to the road network which would otherwise be required when using traditional blade transport trailers. An important consideration of transporting lifted blades are overhead clearances including high voltage overhead lines and underpasses. Where these overhead obstructions are encountered, it is proposed to lower the blade to a horizontal position until the delivery vehicles have passed the obstruction. An example of 3 blade lifter trailers travelling in convoy transitioning from tilted to almost horizontal configuration to safely pass under an overhead line is shown in Figure 2-2.

There are several manufacturers including:

- Scheurele G4 Blade Lifter https://www.tii-group.com/tii-scheuerle/our-solutions/spmt/scheuerle-bladelifter; and

- Goldhofer Blade Lifter Trailer https://www.goldhofer.com/en/special-applications/ftv-850.

Figure 2-1: Blade Lifter Trailer with Blade Tilted to 60° from Horizontal

Figure 2-2: Blade Lifter Trailers in Convoy Transitioning from Tilted to Lowered to Avoid Overhead Line

An important consideration for the route assessment is the 6m wide standard delivery clearance area recommended by Vestas. When road alignments are straight the blade delivery truck is not the most onerous in terms of width and height. For the V136 wind turbine the base tower sections have a maximum width and height of 4.5m.

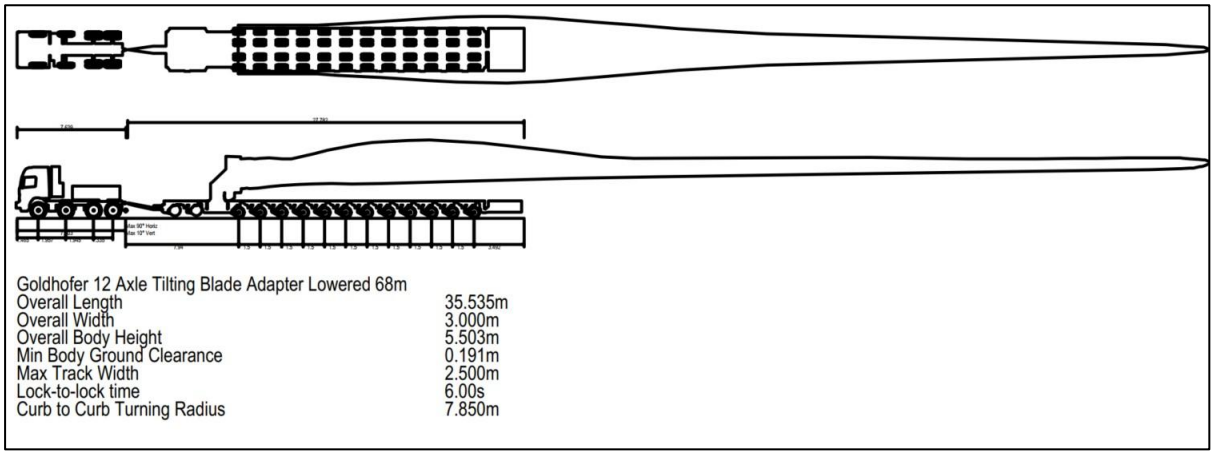
There are generally two methods of transporting tower sections:

- The clamp method using self-tracking bogies such as manufactured by Goldhofer shown in Figure 2-3; and
- The stepped Semi Low-loader manufactured by Nooteboom and Broshuis among others and shown in Figure 2-4.

Figure 2-3: Bogie Type Tower Transporter

Figure 2-4: Semi Low-loader

The wind turbine component delivery vehicles assessed for the route from Foynes port to the Ballynisky Wind Farm site are presented in Figure 2-5, Figure 2-6 and Figure 2-7.



Goldhofer 12 Axle Tilting Blade Adapter Lowered 68m	
Overall Length	35.535m
Overall Width	3.000m
Overall Body Height	5.503m
Min Body Ground Clearance	0.191m
Max Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	7.850m

Figure 2-5: Blade Lifter Trailer with 68m Long Blade in Horizontal Configuration

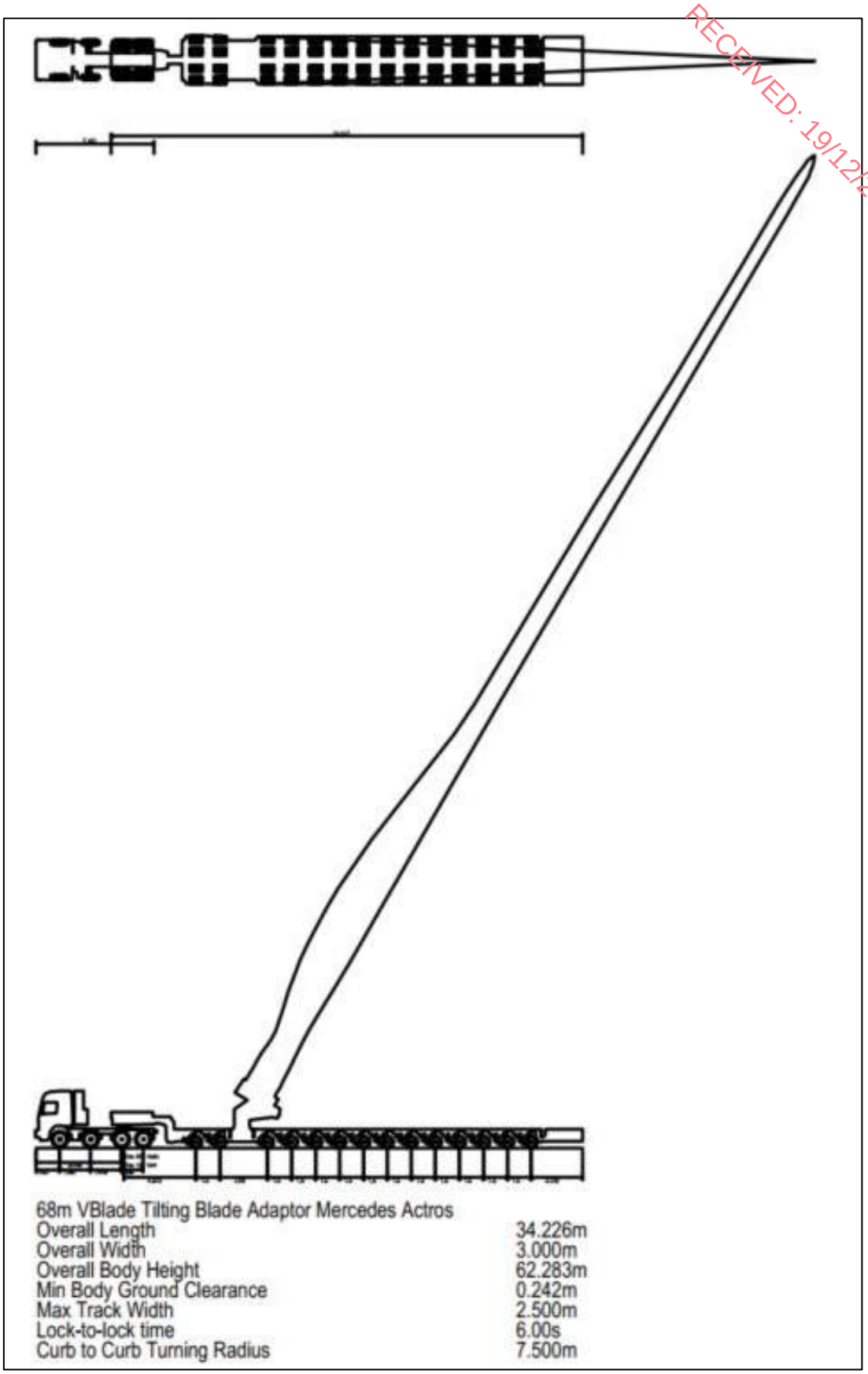


Figure 2-6: Blade Lifter Trailer with 68m Long Blade Lifted to 60°

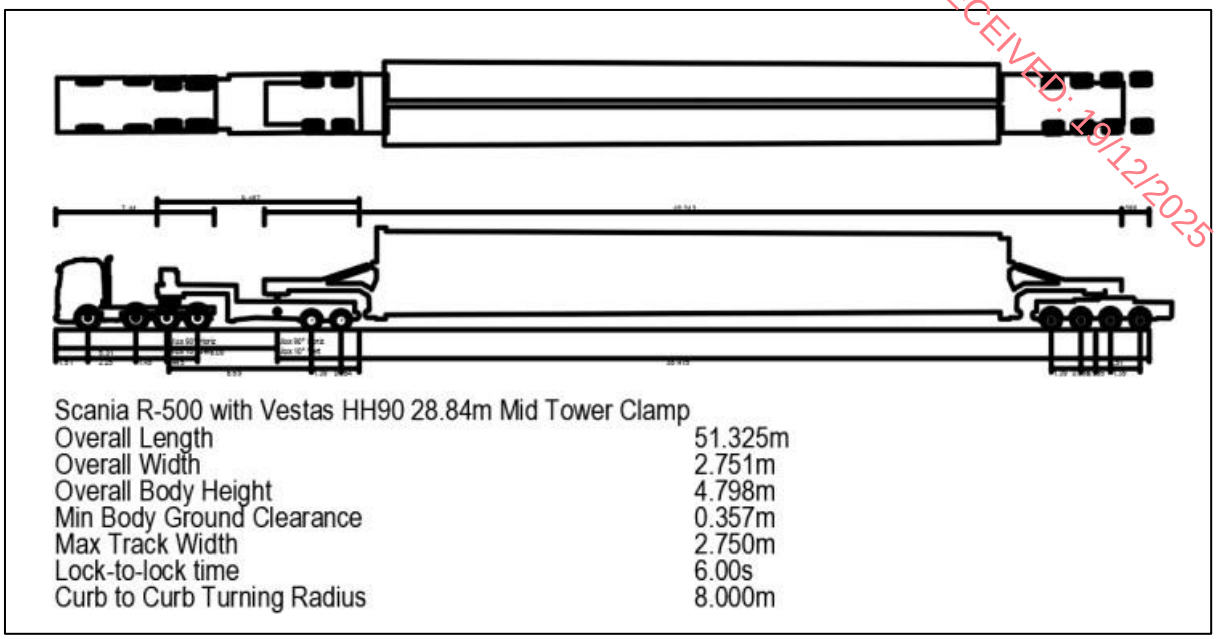


Figure 2-7: Blade Lifter Trailer with 68m long blade in Horizontal Configuration

3 Description of Proposed Route

The proposed delivery route is shown on Drawing 22569-MWP-00-00-DR-C-5008 and Appendix 1. A brief summary of the proposed route to the wind farm site is given below.

The proposed route is outlined as follows:

- Exit Foynes Port storage area and travel south for 1.3km;
- Turn left onto N69 and head southeast for 1.8km on N69;
- Turn Right and take the L-1222 southeast for 5.1km to Creeves Cross;
- At Creeves Cross take a right turn (second exit) onto the L-1220; and
- Travel southwest for 2.5km to the construction stage site entrance for the proposed Wind Farm.

4 Assessment of Pinch Points along Proposed Routes

The results of a swept path analysis of each identified pinch point are given in this section of the report. A description of what each of the swept path lines represents is provided in Figure 4-1.

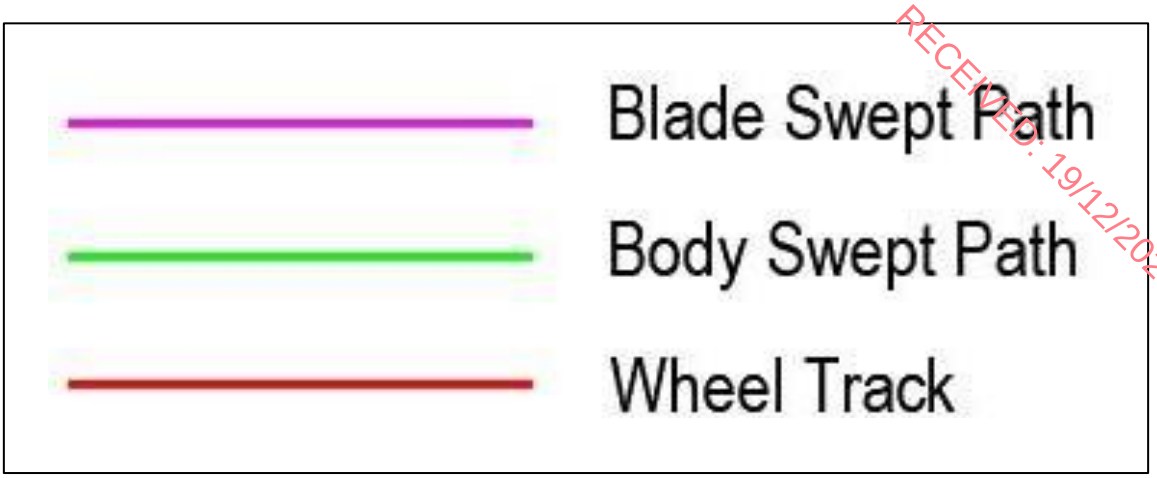


Figure 4-1: Swept Path Analysis Legend

4.1 Delivery Vehicle Swept Path Assessment

4.1.1 Pinch Point 1

- Blade lifter trailer to be in the tilted position.
- Signage on traffic islands will need to be temporarily removed.
- Limerick City and County Council permission to be agreed for the temporary works.
- Light post on inside of bend to be relocated away from the kerbline to avoid overheight clashing with tilted blade.
- Existing ESB overhead line to the south of the junction to be undergrounded or temporarily relocated.

Figure 4-2: Photograph of Pinch Point 1

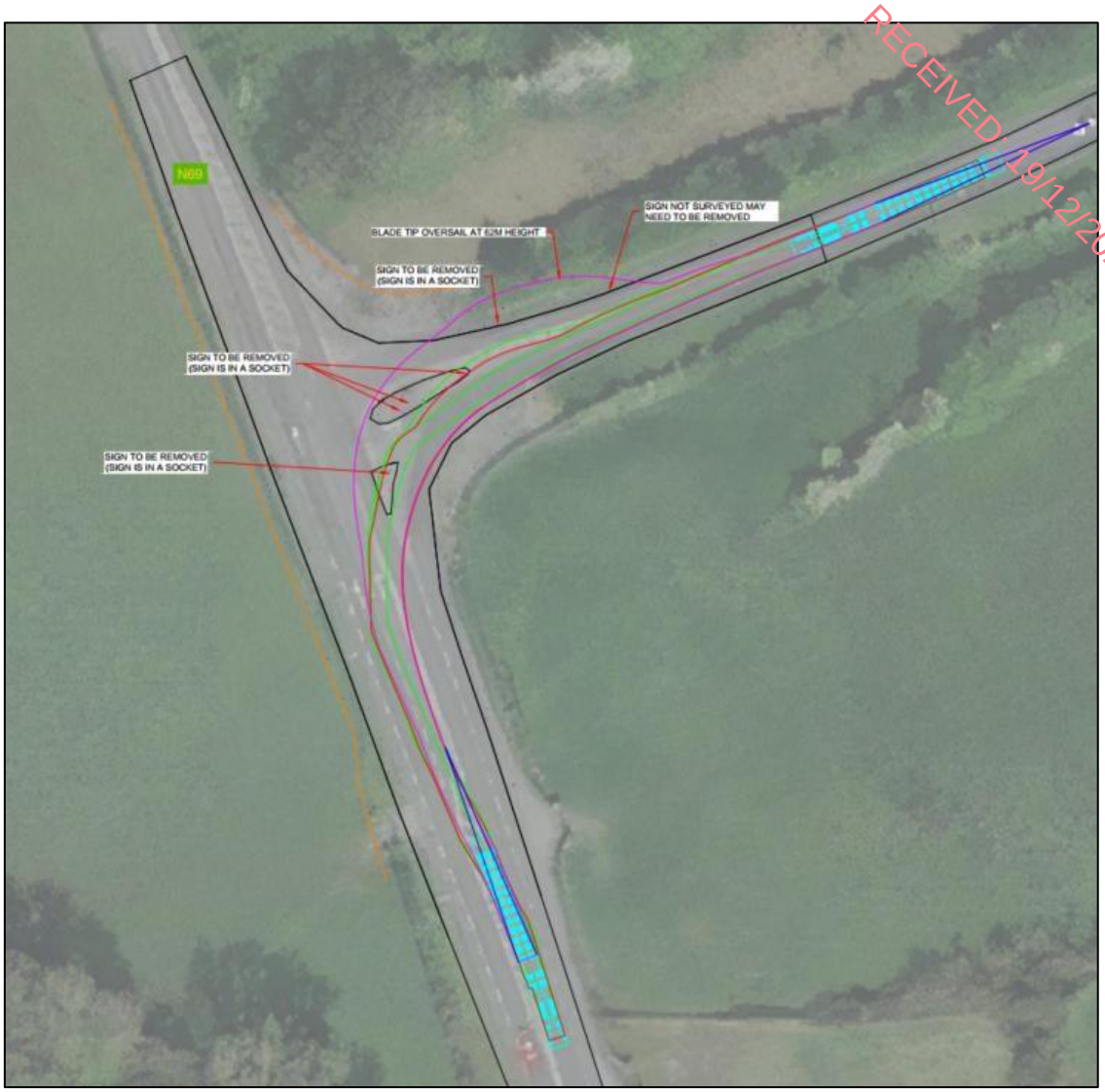


Figure 4-3: Swept Path Analysis of Pinch Point 1

4.1.2 Pinch Point 2

- Blade lifter trailer to be transitioned to horizontal configuration 90m before crossing under two existing high voltage overhead lines.
- Tree/hedge clearance may be required prior to and after bends for blade oversail.

Figure 4-4: Photograph 1 of Pinch Point 2

Figure 4-5: Photograph 2 of Pinch Point 2

Figure 4-6: Swept Path Analysis of Pinch Point 2

4.1.3 Pinch Point 3

- Blade lifter trailer to be in the tilted position.

Figure 4-7: Photograph of Pinch Point 3

Figure 4-8: Swept Path Analysis of Pinch Point 3

4.1.4 Pinch Point 4

- Blade lifter trailer to be in the tilted position.
- Limerick City and County Council Permission to be agreed for the temporary works.
- Temporary works required to harden areas of soft verge to the west of the junction with granular fill to allow for tower section deliveries to overrun the verge.
- Existing ESB overhead lines to the West of the junction to be undergrounded or temporarily relocated.

Figure 4-9: Photograph of Pinch Point 4

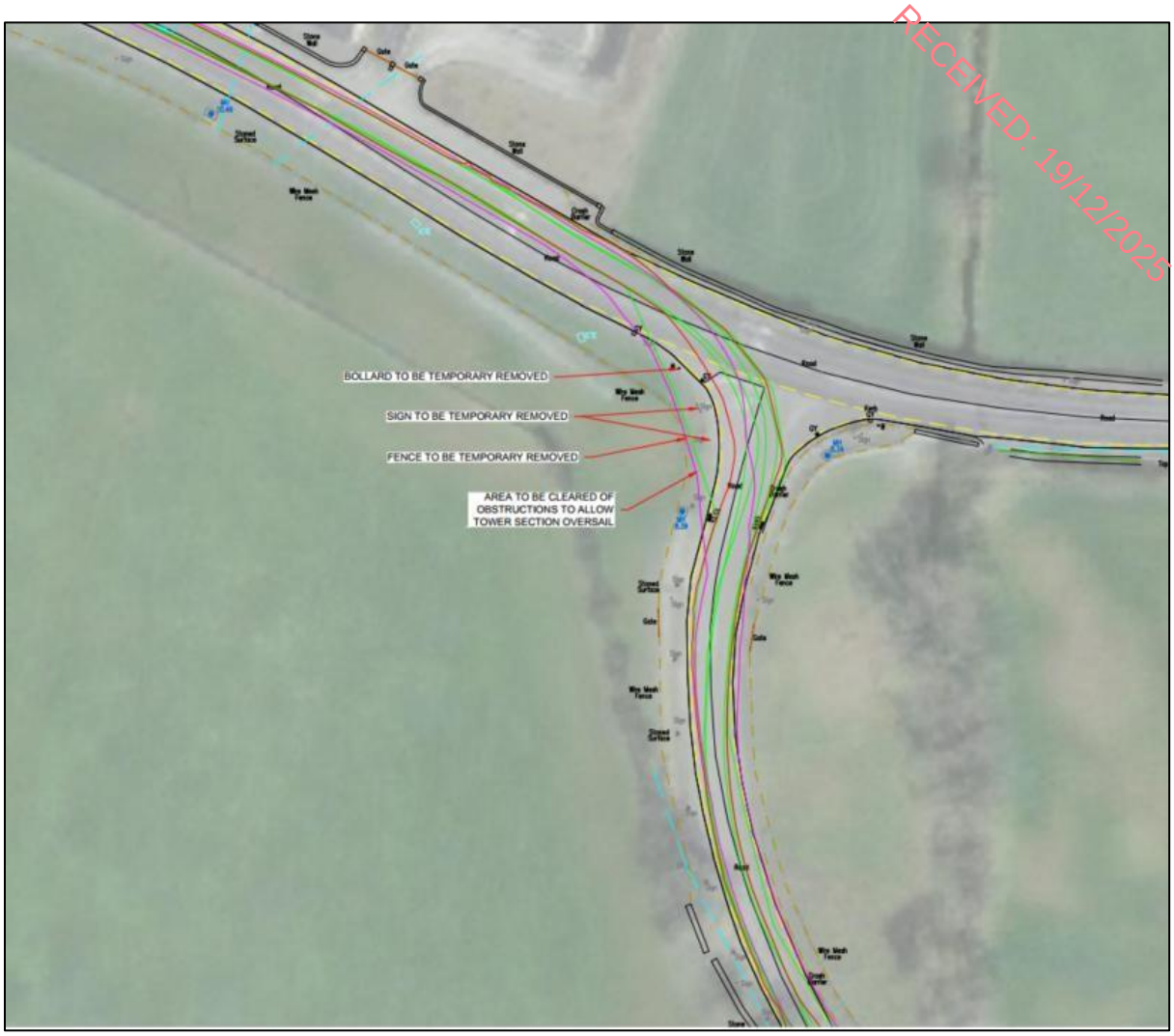


Figure 4-10: Swept Path Analysis of Pinch Point 4

4.1.5 Pinch Point 5

- Blade lifter trailer to be transitioned to horizontal configuration 90m before crossing under two existing high voltage overhead lines.
- Tree/hedge clearance potentially required.

Figure 4-11: Photograph of Pinch Point 5

Figure 4-12: Swept Path Analysis of Pinch Point 5

4.1.6 Pinch Point 6

- Blade lifter trailer to be in the tilted position.
- Tree/hedge clearance potentially required.

Figure 4-13: Photograph of Pinch Point 6

Figure 4-14: Swept Path Analysis of Pinch Point 6

4.1.7 Pinch Point 7

- Blade lifter trailer to be in the tilted position.
- Provision for tower section delivery vehicle, including possible temporary removal of a section of stone wall, where required.
- Temporary works required to harden areas of soft verge to the southwest of the junction with granular fill to allow for tower section delivery vehicles to overrun the verge.
- Possible requirement for wall removal to be confirmed via unladen test delivery prior to component deliveries.
- Tree/hedge clearance potentially required.
- Overhead lines to be undergrounded or temporarily relocated to allow for blade delivery in the tilted position.

Figure 4-15: Photograph of Pinch Point 7

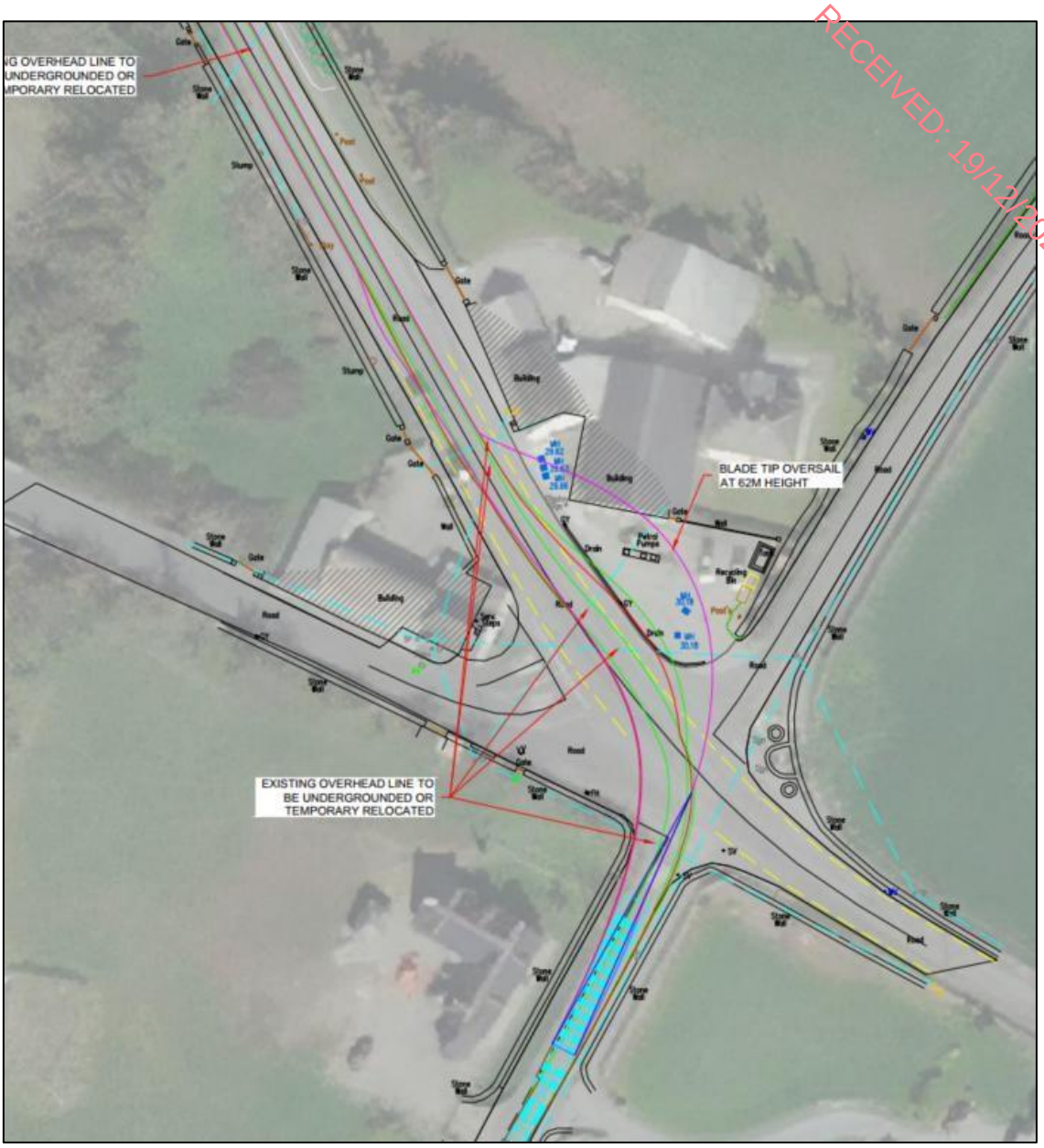


Figure 4-16: Swept Path Analysis of Pinch Point 7 (Overhead Lines)

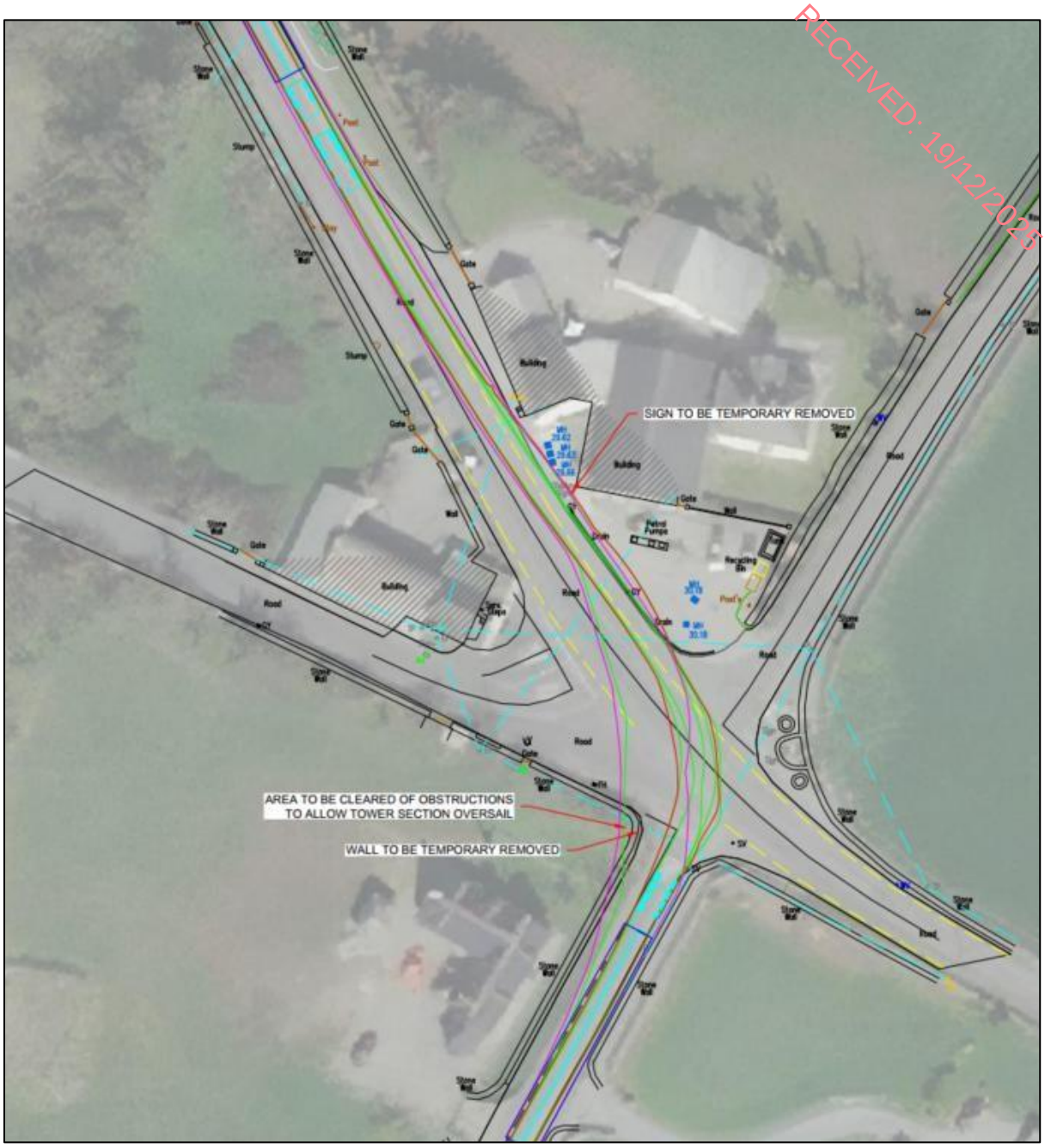


Figure 4-17: Swept Path Analysis of Pinch Point 7 (Obstructions)

4.1.8 Pinch Point 8

- Blade lifter trailer to be transitioned to horizontal configuration 90m before crossing under the existing high voltage overhead lines.
- Tree/hedge clearance potentially required.

Figure 4-18: Photograph of Pinch Point 8

Figure 4-19: Swept Path Analysis of Pinch Point 8

4.1.9 Pinch Point 9

- Overhead lines to be undergrounded or temporarily relocated.
- Signpost to be temporarily removed.
- Tree/hedge clearance required.

Figure 4-20: Photograph of Pinch Point 9

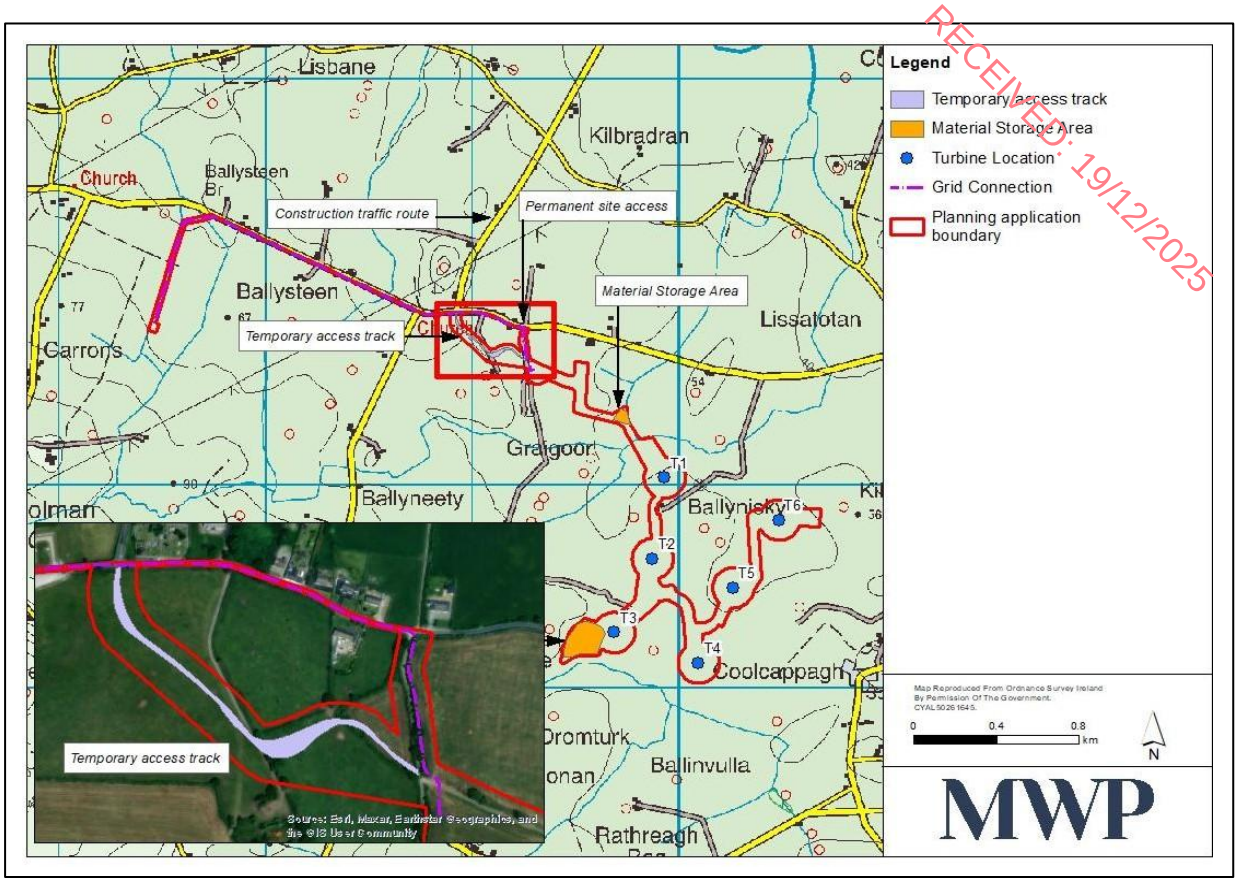


Figure 4-21 Temporary Access Track

5 Conclusions

A conservative swept path analysis has been carried out on all the identified potential pinch points on the route from Foynes Port to the site of the proposed Ballynisky Wind Farm.

The delivery of a 68m blade and 30m tower section to the site is feasible with potentially some modifications to existing boundaries and temporary widening. Temporary widening by placing hardcore or other suitable material over existing grass verges and road traffic islands is required at a number of locations along the proposed route as illustrated in the drawings throughout the report. Where required consent will also be required from the relevant stakeholders, TII and Limerick City and County Council to carry out the required works.

Appendix 1

Proposed Turbine Component Delivery Route

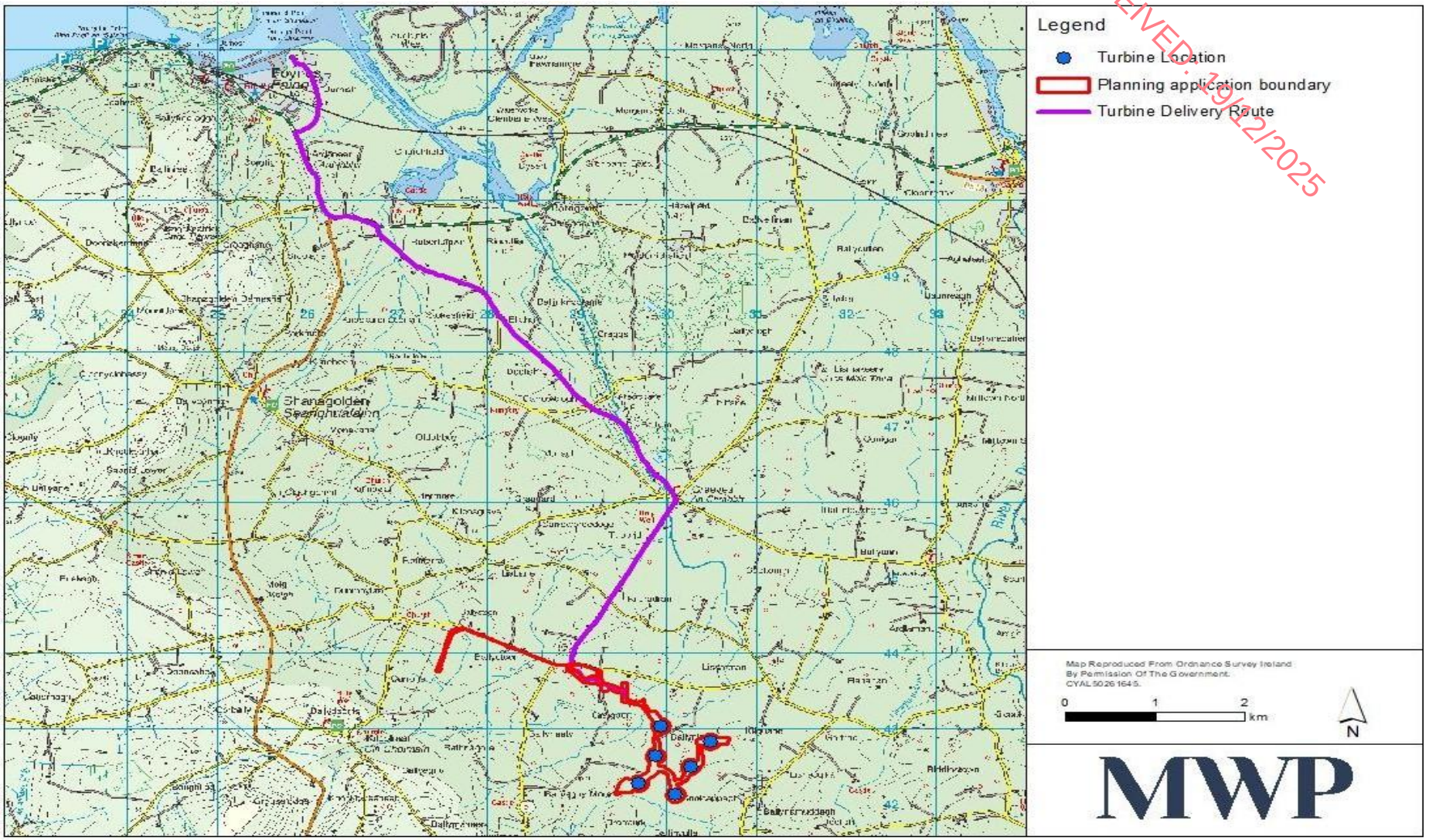


Figure 1A: Proposed Turbine Component Delivery Route