



ESB Asset Development UK Limited

# Chleansaid Wind Farm

Abnormal Indivisible Load Route Assessment

663080

MARCH 2022





## RSK GENERAL NOTES

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**Project No.:** 663080-ALRA (0.0)

**Title:** Chleainsaid Wind Farm, Abnormal Indivisible Load Route Assessment

**Client:** ESB Asset Development UK Limited

**Date:** 04 March 2022

**Office:** Edinburgh

**Status:** Final

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This work has been undertaken in accordance with the quality management system of RSK Environment Ltd.

Cover Image: Causeymire Wind Farm, photo taken by Jon Hassel (jhassel@rsk.co.uk)

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# 1 INTRODUCTION

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## 1.1 Purpose of the Report

RSK has been commissioned by ESB Asset Development UK Limited (the applicant) to undertake a survey of the approved delivery route for wind turbine Abnormal Indivisible Loads (AIL) associated with the construction and development of Chleainsaid Wind Farm (the Proposed Development), located on the Dalnessie Estate, approximately 13 km to the north-east of Lairg in the Scottish Highlands, near the A836-A838 Junction.

The AIL route assessment report has been prepared to help inform the applicant on the likely issues associated with the development of the site regarding off-site transport and access for AIL traffic. The report identifies the key points and issues associated with AIL deliveries and notes where remedial works, either in form of physical works or as traffic management interventions will be required to accommodate the predicted loads.

The detailed design of any remedial works is beyond the agreed scope of works between RSK and the applicant.

Furthermore, it is the responsibility of the turbine supplier (depending on contractual arrangements) to ensure that the access route from the Port of Entry (POE) to the road transfer point is fit for purpose and that appropriate consideration for all road users has been made in accordance with the relevant health and safety legislation and ruling transport requirements.

## 1.2 Report Structure

The proceeding chapters of the report are structured as follows:

- **Section Two** provides details of the Proposed Development including candidate turbine components and anticipated transport vehicles;
- **Section Three** describes the delivery route options reviewed on the basis of the findings of a site visit along with the location of potential significant constraints including perceived / associated level of risk;
- **Section Four** provides a summary of the report and an outline of suggested further works, actions and recommendations for consideration; and
- **Appendices** details the location of the potential significant constraints and corresponding vehicle / load swept path assessment.

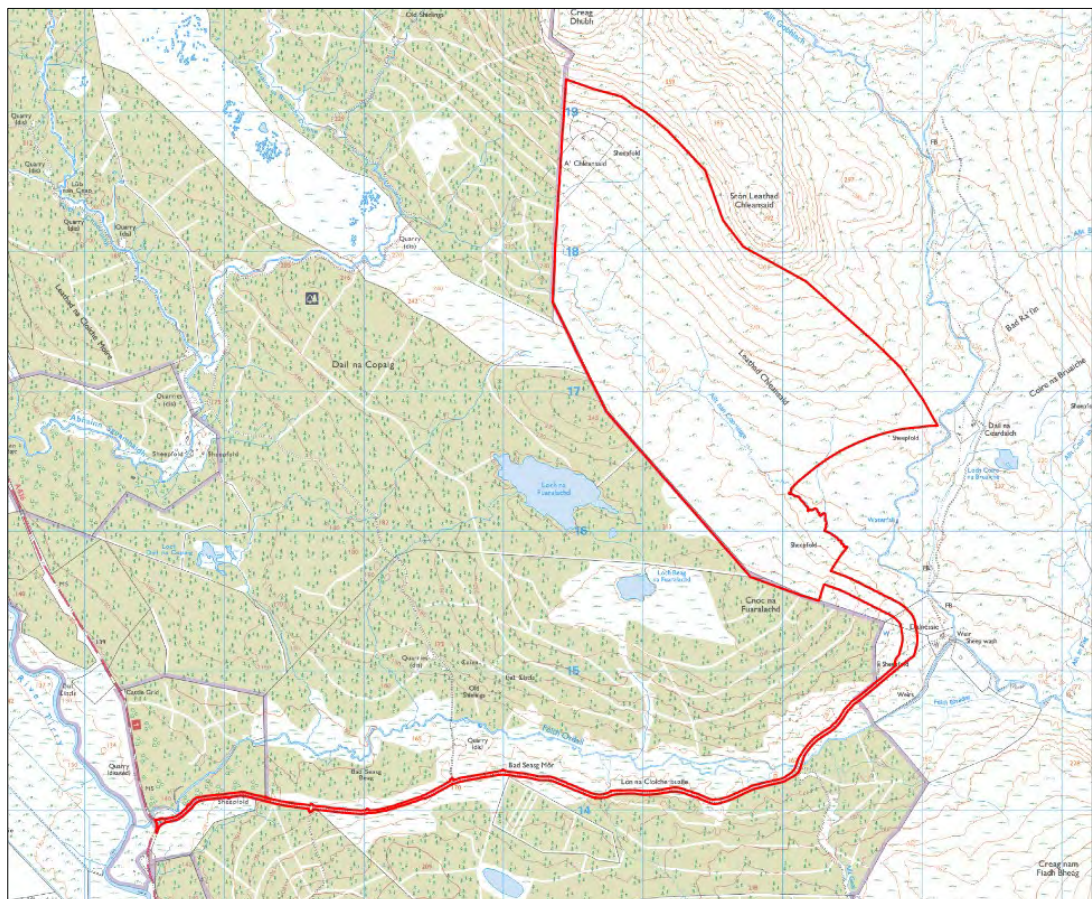
## 2 DEVELOPMENT DETAILS

### 2.1 Site Location

The Proposed Development is located on the Dalnessie Estate, approximately 13 km to the north-east of Lairg in the Scottish Highlands, near the A836 - A838 Junction. The site falls within The Highland Council area, in the North, West and Central Sutherland ward. The land is currently used as a shooting estate and for rough sheep grazing. Surrounding land uses include commercial forestry, sporting, and recreational uses.

There are two residences on site, one that is used occasionally by the landowners, with the other being a full-time residence for the Estate Manager. There are several other agricultural buildings on site near the residences. Access to the property is gained via an access track to the west. The track is owned by the landowners of the Dalnessie Estate, with the land to either side of the access track owned by Forestry and Land Scotland (FLS).

**Figure 12.1.1: Site Location Plan**



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## 2.2 Candidate Turbine

ESB have indicated they are considering the Nordex N163/5.X (NR81.5 m) turbine for the purpose of this report and as the potential component for the proposed site.

Details of the N163/5.X blade have been obtained directly from Nordex. The tower design for the turbine has not yet been finalised. As such, a typical Nordex tower for turbines of this size has been used. The details of the components are summarised in Table 2.1.

**Table 12.2.1: Candidate Turbine Component Dimensions**

Component	Length (m)	Maximum Width on Vehicle (m)
Nordex N163/5.X Blade	79.7	4.4
Nordex N163/5.X Mid Tower (Hybrid)	35	5
Hub	5.25	4.64
Nacelle	12.77	4.33

*Notes: Based on manufacturer's current specification. Correct as at 01.10.2021*

The worst-case loads for route assessment for the N163/5.X sections are:

- Blade; and
- Mid Tower.

These sections will be used for the subsequent desktop assessment of the proposed loads along the access route.

## 2.3 Proposed Delivery Equipment

To provide a robust assessment scenario based upon the known issues along the access route, it has been assumed that all blades would be carried on a Superwing trailer to reduce the need for mitigation in constrained sections of the route.

Based on the transport specifications provided by Nordex, for transporting of the blade element, two options were considered in relation to location of the transport frame support frame:

- Option 1 – 47 m; and
- Option 2 – 57.5 m.

Based on the identified constraints along the access route, Option 1 was taken forward as it allows manoeuvring round tight corners.

Towers will be carried in a 3 + 7 clamp adaptor, whereas loads such as the hub, nacelle housing and top towers would be carried on a six-axle step frame trailer.

**Figure 12.1.2: Superwing Carrier Trailer**



**Figure 12.1.3: Tower Trailer**



## 2.4 Nearby Wind Farm Developments

Nearby developments to the site include:

- Garvary Wind Farm (in planning) is being developed by Garvary Wind Farm Limited and located to the south of Lairg. This scheme proposes to use Vestas V150 turbines with blade length of circa 74m.
- Strath Tirry Wind Farm (in planning) is being developed by REG Strath Tirry Limited and located to the north of Lairg. This scheme proposes to use Vestas V117 turbine with blade length of circa 57 m.
- Creag Riabhach Wind Farm (under construction) is being developed by ERG Group and located to the north of Crask. The scheme proposes to use Vestas V112 turbine with blade length of circa 55m.

## 3 ACCESS ROUTE ASSESSMENT

### 3.1 Port of Entry

The proposed Port of Entry (PoE) is Port of Cromarty, Invergordon in Ross-shire. The port is the closest, suitable port and as such is in line with the Government's "Water Preferred" policy towards AIL movements.

The port has been used by renewables deliveries in the past for a number of wind farms, including Nover, Gordonbush and Loch Luichart.

The port has sufficient quay and storage space and is well located for the strategic trunk road network. The layout of the port is illustrated below on **Figure 3.1**.

**Figure 12.3.1: Invergordon Port Layout Plan**



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### 3.2 Proposed Access Route

An extensive site survey has been undertaken from the PoE to the point of access identified as the site entrance point. This survey was carried out by using video capture along the entire length of the delivery route. Any areas considered to require detailed assessment were marked with a Global Positioning Survey (GPS) waypoint and comments recorded detailed the nature of the concern.

Plans detailing the location of the GPS Points of Interest (POI) where further assessment has been carried out is contained within **Appendix A**.

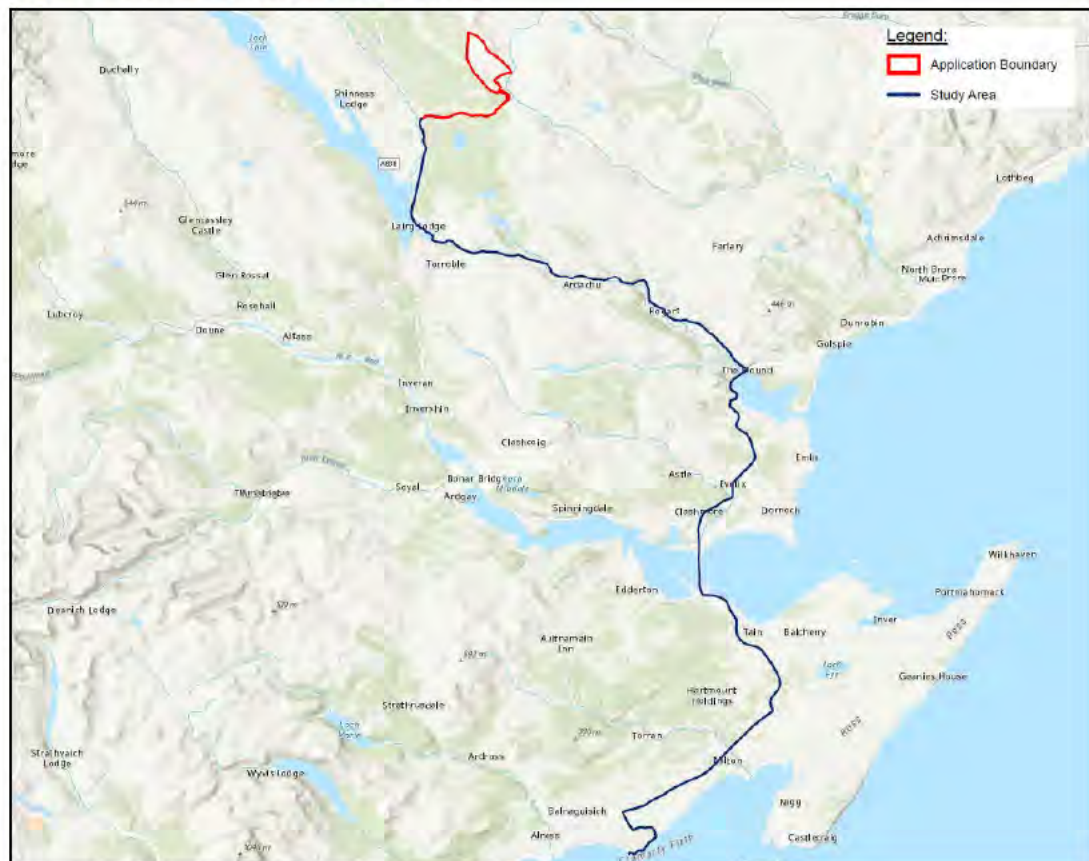


The proposed access route to site is as follows:

- Turn right onto the B817 and proceed eastbound;
- At the junction with the road (unclassified and unnamed) linking the B817 with the C1063 Academy Road and turn left;
- Continue to junction with the C1063 Academy Road and turn right onto the C1063 Academy Road;
- Proceed northbound to the A9;
- At the C1063 / A9 junction, turn right and proceed northbound on the A9;
- At The Mound, loads will turn left and will proceed westbound to Lairg;
- In Lairg, loads will turn left and proceed north on the A836 to the Dalnessie Estate access track where the proposed access point is located.

The proposed route is illustrated in **Figure 3.2** below.

**Figure 12.3.2: Proposed Access Route**





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### 3.3 Route Constraints




The constraints noted on the site visit are detailed in **Table 3.1**, covering all constraints from the port of entry gate through to the site access junction. This assessment relates only to off-site constraints and does not consider access at the quayside or through the port or on-site access tracks or the design of the site access junction.




Location of the identified constraints are illustrated by **Figures A3.1 to A3.8** in **Appendix A**.




**Table 12.3.1: Points of Interest**




POI	Key Constraint	Details
01	<p>Port Access Gate</p> 	<ul style="list-style-type: none"> <li>• Loads will exit the port and will then proceed eastbound on the B817.</li> <li>• Load will overrun and oversail into the existing port car park on the inside of the right turn where a load bearing surface should be laid.</li> <li>• Confirmation should be sought from the port that this area can be utilised. The port exit gatehouse will need to be relocated.</li> <li>• The cycle parking/bus shelter will need to be removed along with road signs and vegetation. Parking will need to be suspended for the duration of the deliveries.</li> <li>• Loads will oversail and overrun the northern edge of the B817 where load bearing surface will need to be laid.</li> <li>• Close proximity to the lighting column will have to be checked during test run.</li> <li>• Swept Path Assessment 662367-10-01 RevA is included in Appendix B of this report.</li> </ul>
02	<p>B817 Bends 1</p> 	<ul style="list-style-type: none"> <li>• Loads will proceed eastbound along the B817.</li> <li>• Load will oversail into the Port facilities along the southern edge of the B817.</li> <li>• Lighting columns, existing fence, roads signs and vegetation will need to be removed.</li> <li>• Similarly, load will oversail the northern edge of the B817 across from Port of Cormarty Firth where clearance to lighting column should be reviewed during test run.</li> <li>• Swept Path Assessment 662367-10-02 RevA is included in Appendix B of this report.</li> </ul>



03	<p>B817 Bends 2</p> 	<ul style="list-style-type: none"> <li>• Loads will continue in the eastbound direction along the B817.</li> <li>• Load will oversail footway along both southern and northern edge of the B817, clearance to lighting column and stone wall will have to be reviewed during test run.</li> <li>• Swept Path Assessment 662367-10-03 RevA is included in Appendix B of this report.</li> </ul>
04	<p>Cromarty View Left Turn</p> 	<ul style="list-style-type: none"> <li>• Loads will turn left at the junction and will proceed onto the unclassified road.</li> <li>• A swept path assessment has been undertaken and indicates that the “Saltburn” sign and street lighting column will need to be removed to accommodate the blade tip oversail.</li> <li>• Signal traffic pole, number of bollards located on the traffic islands will have to be removed.</li> <li>• Swept Path Assessment 662367-10-04 RevA is included in Appendix B of this report.</li> </ul>
05	<p>Un-named road bend</p> 	<ul style="list-style-type: none"> <li>• Loads will proceed across the bridge.</li> <li>• The bridge has a historic weight restrictions on it. Previous loads have crossed at a crawl on the right-hand side.</li> <li>• Load will oversail along the north-eastern edge of the carriageway and vegetation and lighting columns will have to be removed.</li> <li>• Swept Path Assessment 662367-10-05 RevA is included in Appendix B of this report.</li> </ul>
06	<p>C1063 Junction</p> 	<ul style="list-style-type: none"> <li>• Loads will turn right onto the C1063.</li> <li>• A swept path assessment has been undertaken at this location. Works include the removal of a lighting column and road sign on the southern verge and an area of over-run surfacing on the C1063.</li> <li>• Third party land is required on the inside of the turn to accommodate an overrun and over-sail area. Existing vegetation will need to be removed and a small area of over-run surface is required. The proximity to the utility pole on the inside of the right turn should be confirmed during test run.</li> </ul>

		<ul style="list-style-type: none"> <li>Swept Path Assessment 662367-10-06 RevA is included in Appendix B of this report.</li> </ul>
07	<p>Tomich (A9 / C1063) Junction</p> 	<ul style="list-style-type: none"> <li>Loads will turn right onto the A9.</li> <li>A swept path assessment at this junction has been prepared. Loads will over-run the north and south verge of the A9 as well as eastern verge of the C1063, where a load bearing surface should be provided. One overhead utility pole should be relocated and parking on the side street to the north suspended during deliveries.</li> <li>Two road signs on the inside of the turn will also need to be remove and loads will oversail and over-run into the third-party land. An area of over-running surfacing is required on the inside of the turn.</li> <li>Tree canopy/tree trimming/removal will be required on the west side of the C1063.</li> <li>Swept Path Assessment 662367-10-07 Rev A is included in Appendix B of this report.</li> </ul>
08	<p>A9 Nigg Roundabout</p> 	<ul style="list-style-type: none"> <li>Loads will proceed on the A9 northbound at the junction, taking the first exit.</li> <li>A swept path assessment has been undertaken and indicates that loads will oversail the southern verge of the A9 on approach to where one traffic sign should be removed. Loads will oversail the approach road island where one bollard will be oversailed and will need to be removed.</li> <li>Loads will oversail the western edge of the roundabout island.</li> <li>Swept Path Assessment 662367-10-08 Rev A is included in Appendix B of this report.</li> </ul>
09	<p>A9/A836 Roundabout</p> 	<ul style="list-style-type: none"> <li>Loads will continue on the A9 northbound taking the second exit.</li> <li>The optimum manoeuvre at this junction is a contraflow of the junction. A swept path assessment of the junction has been undertaken and illustrates the loads will oversail both the southern and northern verges of the approach road along with oversail the entry arm traffic island. One road sign and two bollards should be removed.</li> </ul>




		<ul style="list-style-type: none"> <li>• Loads will over-run and oversail the center island where a load bearing surface should be laid and one traffic sign removed.</li> <li>• Loads will oversail the exit arm island and the eastern verge where vegetation should be trimmed and proximity to the lighting column and electricity box should be confirmed during test run.</li> <li>• Swept Path Assessment 662367-10-09 Rev A is included in the Appendix B of this report.</li> </ul>
10	<p>A9 Bends 1</p> 	<ul style="list-style-type: none"> <li>• Loads will continue northbound.</li> <li>• A swept path assessment has been undertaken and shows that loads will oversail the eastern verge on the outside of the bend.</li> <li>• Swept Path Assessment 662367-10-10 Rev A is included in Appendix B of this report.</li> </ul>
11	<p>A9 Bends 2</p> 	<ul style="list-style-type: none"> <li>• Loads will continue northbound.</li> <li>• A swept path assessment has been undertaken and shows that loads will oversail the western verge on the outside of the bend where one chevron sign should be removed, and extent of the adopted highway boundary should be checked. Parking should be prevented to allow use of the layby by the loads when transiting the bend.</li> <li>• Swept Path Assessment 662367-10-11 Rev A is included in Appendix B of this report.</li> </ul>
12	<p>A9 Bends 3</p> 	<ul style="list-style-type: none"> <li>• Loads will continue northbound.</li> <li>• A swept path at this location has been prepared and shows that loads will oversail the eastern verge throughout the left bend where traffic bollards should be removed. It is recommended that a land search is completed for these areas to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-12 Rev A is included in Appendix B of this report.</li> </ul>
13	<p>A9 Bends 4</p>	<ul style="list-style-type: none"> <li>• Loads will continue northbound.</li> <li>• A swept path at this location has been prepared and shows that loads will oversail the western verge throughout</li> </ul>





		<p>the right bend where 4 no. road signs will need to be removed and vegetation trimmed/removed.</p> <ul style="list-style-type: none"> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-13 Rev A is included in Appendix B of this report.</li> </ul>
14	<p>A9 Bends 5</p> 	<ul style="list-style-type: none"> <li>• Loads will continue northbound.</li> <li>• A swept path at this location has been undertaken and illustrates that loads will oversail the verges on the inside and outside of the right bend.</li> <li>• A total of 8 no. traffic signs, chevrons and bollards to be removed. Additionally, bin storage and lighting column to be removed.</li> <li>• Proximity to the utility pole to be checked during the test run.</li> <li>• On the inside of the bend vegetation and utility pole to be removed and clearance over the stone wall to be checked during the test run.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Due to constrained nature of the bends section, it is recommended that the assessments are repeated on a topographical base to inform the land agreement and detailed design phases.</li> <li>• Swept Path Assessment 662367-10-14 Rev A is included in Appendix B of this report.</li> </ul>
15	<p>A9 Bends 6</p> 	<ul style="list-style-type: none"> <li>• Loads will continue northbound.</li> <li>• A swept path at this location has been prepared and shows that loads will oversail the eastern verge throughout the left bend where 2 no. traffic signs to be removed and vegetation to be trimmed/removed.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-15 Rev A is included in Appendix B of this report.</li> </ul>





<p>16</p>	<p>A9 Bends 7</p> 	<ul style="list-style-type: none"> <li>• Loads will continue northbound.</li> <li>• A swept path at this location has been prepared and shows that loads will oversail the eastern verge throughout the left bend where 2 no. traffic signs to be removed and vegetation to be trimmed/removed.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-16 Rev A is included in Appendix B of this report.</li> </ul>
<p>17</p>	<p>A9/A839 (The Mound) Junction</p> 	<ul style="list-style-type: none"> <li>• Loads will turn left onto the A839.</li> <li>• A swept path assessment has been prepared and indicates that vegetation on the south verge of the A9 should be trimmed to enable the blade tip to oversail and 5 no. traffic signs to be removed.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• The junction island will be over-run and oversailed and 1 no. sign and bollard to be removed.</li> <li>• Loads will oversail the inside of the left turn where one traffic bollard should be removed along with trees and vegetation.</li> <li>• Load will oversail the eastern verge of the A839 where tree and vegetation to be removed.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-17 Rev A is included in Appendix B of this report.</li> </ul>
<p>18</p>	<p>Rogart Bends 1</p> 	<ul style="list-style-type: none"> <li>• Loads will proceed westbound on the A839 through Rogart.</li> <li>• A swept path assessment has been undertaken as loads will straddle both lanes of the road. A section of guardrail will need to be removed to allow load to oversail.</li> <li>• Loads will require the removal of one lighting column and the trimming of trees near the bridge. A parking</li> </ul>



		<p>suspension will be required through Rogart.</p> <ul style="list-style-type: none"> <li>• The blade tip oversails the bridge and third-party land will be required.</li> <li>• On the exit of the bends, loads will over-run the footway and a review of underground services is recommended. The kerbs should be protected by a tar wedge and the footway surface reinforced.</li> <li>• Load will also oversail the inside of the left turn where trees and vegetation should be trimmed/removed.</li> <li>• It is recommended that the assessment is repeated on a topographical base due to the constrained nature of this section.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-18 Rev A is included in Appendix B of this report.</li> </ul>
19	<p>Rogart Bends 2</p> 	<ul style="list-style-type: none"> <li>• Loads will proceed westbound on the A839 departing the village of Rogart.</li> <li>• A swept path assessment at this location has been prepared and indicates that loads will straddle both lanes of the road and will oversail the verge where traffic bollards, 2 no. traffic signs and trees and vegetation to be removed.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-19 RevA is included in Appendix B of this report.</li> </ul>
20	<p>Rogart Bends 3</p> 	<ul style="list-style-type: none"> <li>• Loads will proceed westbound on the A839 departing the village of Rogart.</li> <li>• A swept path assessment at this location has been prepared and indicates that loads will straddle both lanes of the road and will oversail the verge where trees and vegetation to be trimmed/removed.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> </ul>






		<ul style="list-style-type: none"> <li>Swept Path Assessment 662367-10-20 RevA is included in Appendix B of this report.</li> </ul>
21	<p>Rogart Bends 4</p> 	<ul style="list-style-type: none"> <li>Loads will proceed westbound on the A839 departing the village of Rogart.</li> <li>A swept path assessment at this location has been prepared and indicates that loads will straddle both lanes of the road and will oversail the verge where 1 no. traffic sign to be removed.</li> <li>It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>Swept Path Assessment 662367-10-21 RevA is included in Appendix B of this report.</li> </ul>
22	<p>A839 near Muie</p> 	<ul style="list-style-type: none"> <li>Loads will proceed towards Lairg on the A839.</li> <li>Loads will oversail both the northern and southern verges throughout the section and vegetation should be trimmed.</li> <li>It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>Swept Path Assessment 662367-10-22 RevA is included in Appendix B of this report.</li> </ul>
23	<p>A839 near Rhaoine 1</p> 	<ul style="list-style-type: none"> <li>Loads will proceed westbound towards Lairg on the A839.</li> <li>Loads will oversail both the northern and southern verges throughout the section and vegetation should be trimmed.</li> <li>It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>Swept Path Assessment 662367-10-23 RevA is included in Appendix B of this report.</li> </ul>
24	<p>A839 near Rhaoine 2</p>	<ul style="list-style-type: none"> <li>Loads will proceed westbound towards Lairg on the A839.</li> <li>Loads will oversail the eastern verge where vegetation should be trimmed.</li> <li>It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> </ul>

		<ul style="list-style-type: none"> <li>• Swept Path Assessment 662367-10-24 RevA is included in Appendix B of this report.</li> </ul>
25	<p>A839 west of Rhaoine 1</p> 	<ul style="list-style-type: none"> <li>• Loads will proceed westbound towards Lairg on the A839.</li> <li>• Loads will oversail the northern verge where vegetation should be trimmed.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-25 RevA is included in Appendix B of this report.</li> </ul>
26	<p>A839 west of Rhaoine 2</p> 	<ul style="list-style-type: none"> <li>• Loads will proceed westbound towards Lairg on the A839.</li> <li>• The swept path assessment indicates that the loads will oversail the southern verge, but that no physical works are required.</li> <li>• Swept Path Assessment 662367-10-26 RevA is included in Appendix B of this report.</li> </ul>
27	<p>A839 west of Rhaoine 3</p> 	<ul style="list-style-type: none"> <li>• Loads will proceed westbound towards Lairg on the A839.</li> <li>• Loads will oversail both the northern and southern verges throughout the section and vegetation should be trimmed.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-27 RevA is included in Appendix B of this report.</li> </ul>
28	<p>A839 near Tomich 1</p>	<ul style="list-style-type: none"> <li>• Loads will proceed westbound towards Lairg on the A839.</li> <li>• The swept path assessment indicates that the loads will oversail the northern verge, but that no physical works are required.</li> </ul>

		<ul style="list-style-type: none"> <li>• Swept Path Assessment 662367-10-28 RevA is included in Appendix B of this report.</li> </ul>
29	<p>A839 near Tomich 2</p> 	<ul style="list-style-type: none"> <li>• Loads will proceed westbound towards Lairg on the A839.</li> <li>• Loads will oversail the southern verge where vegetation should be trimmed.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-29 RevA is included in Appendix B of this report.</li> </ul>
30	<p>A839 east of Lairg 1</p> 	<ul style="list-style-type: none"> <li>• Loads will proceed westbound towards Lairg on the A839.</li> <li>• Loads will oversail the northern verge where vegetation should be trimmed.</li> <li>• Swept Path Assessment 662367-10-30 RevA is included in Appendix B of this report.</li> </ul>
31	<p>A839 east of Lairg 2</p> 	<ul style="list-style-type: none"> <li>• Loads will proceed westbound towards Lairg on the A839.</li> <li>• The swept path assessment indicates that loads will oversail both the southern and northern verges on both left and right bends.</li> <li>• Loads will oversail into third party land on the outside of the left bend with a potential requirement on the inside of the bend, where it is recommended that land search is completed.</li> <li>• Loads will oversail into third party land on the outside of the right bend with a potential requirement on the inside of the bend, where it is recommended that land search is completed.</li> <li>• Swept Path Assessment 662367-10-31 RevA is included in Appendix B of this report.</li> </ul>

<p>32</p>	<p>A839 Lairg</p> 	<ul style="list-style-type: none"> <li>• Loads will turn right onto the A836 northbound.</li> <li>• A swept path assessment on topographical base is suggested at this location. Third party land and/or Council estate land will be required.</li> <li>• The current swept path assessment indicates that loads will oversail and overrun footways through the bend as well as a car park area located south of the A839, across from Well Lairg Pharmacy. It will also oversail and overrun the existing car park area located to the east of the A836. A land search is recommended to confirm the extent of adopted boundary at these locations.</li> <li>• A load bearing surface should be laid. The land will need to be reprofiled and a vegetation might have to be trimmed.</li> <li>• A junction box, planters, traffic signs and lighting columns should be removed.</li> <li>• Section of a stone wall should be removed and all existing utilities should be protected.</li> <li>• Swept Path Assessment 662367-10-32 RevA is included in Appendix B of this report.</li> </ul>
<p>33</p>	<p>A836 Lairg Bends 1</p> 	<ul style="list-style-type: none"> <li>• Loads will continue northbound towards the site along the A836.</li> <li>• A swept path assessment on topographical base is suggested at this location due to constraint nature of the area.</li> <li>• The current swept path assessment indicates that loads will oversail both the inside and outside of the left bend</li> <li>• On the outside bend 5 no. lighting columns and 2 no. traffic signs will need to be removed. Land needs to be reprofiled and trees and vegetation to be removed. Removal of existing fence will be required. Third party land will be required to allow for blade tip oversail.</li> <li>• On the inside bend 1 no. lighting column will need to be removed and third-party land will be required to allow blade tip oversail.</li> <li>• Swept Path Assessment 662367-10-33 RevA is included in Appendix B of this report.</li> </ul>

<p>34</p>	<p>A836 Lairg Bends 2</p> 	<ul style="list-style-type: none"> <li>• Loads will continue northbound towards the site along the A836.</li> <li>• The current swept path assessment indicates that loads will oversail both the northern and southern verge of the A836.</li> <li>• no. lighting columns will need to be removed, section of a stone wall and gate should be removed, and third-party land will be required to allow blade tip to oversail.</li> </ul> <hr/> <ul style="list-style-type: none"> <li>• A swept path assessment on topographical base is suggested at this location due to constraint nature of the area.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-34 RevA is included in Appendix B of this report.</li> </ul>
<p>35</p>	<p>A836 Lairg Bends 3</p> 	<ul style="list-style-type: none"> <li>• Loads will continue northbound towards the site along the A836.</li> <li>• The swept path assessment indicates that the loads will oversail the southern verge, but that no physical works are required.</li> <li>• Swept Path Assessment 662367-10-35 RevA is included in Appendix B of this report.</li> </ul>
<p>36</p>	<p>A836 north of Lairg Bends 1</p> 	<ul style="list-style-type: none"> <li>• Loads will continue northbound towards the site along the A836.</li> <li>• Loads will oversail both the southern and northern verge where trees and vegetation should be trimmed and 1 no. parking sign to be removed.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-36 RevA is included in Appendix B of this report.</li> </ul>
<p>37</p>	<p>A836 north of Lairg Bends 2</p>	<ul style="list-style-type: none"> <li>• Loads will continue northbound towards the site along the A836.</li> <li>• Loads will oversail both the southern and northern verge where trees and vegetation should be trimmed and 1 no. parking sign to be removed.</li> <li>• Load will oversail the crash barrier.</li> </ul>

		<ul style="list-style-type: none"> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-37 RevA is included in Appendix B of this report.</li> </ul>
38	<p>A836 south of site access</p>	<ul style="list-style-type: none"> <li>• Loads will continue northbound towards the site along the A836.</li> <li>• The current swept path assessment indicates that loads will oversail both the eastern and western verge of the A836 where 1 no. passing place sign will need to be removed.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Load will go over a bridge where a structural check will be required.</li> <li>• Swept Path Assessment 662367-10-38 RevA is included in Appendix B of this report.</li> </ul>
39	<p>A836 Bends and site access</p>	<ul style="list-style-type: none"> <li>• Loads will continue northbound towards the site along the A836 and turn right into the Dalnessie Estate track which forms site access.</li> <li>• The current swept path assessment indicates that loads will oversail both the eastern and western verge of the A836 where 2 no. traffic signs will need to be removed.</li> <li>• Land reprofiling will be required on the inside of the right turn into the Dalnessie Estate track.</li> <li>• It is recommended that a land search for this area is completed to ensure that they are part of the adopted boundary.</li> <li>• Swept Path Assessment 662367-10-39 RevA is included in Appendix B of this report.</li> </ul>

### **3.4 Swept Path Assessment Results and Summary**

Detailed swept path assessment (SPA) drawings for the locations assessed are provided in Appendix B. The drawings in Appendix B illustrate tracking undertaken for the worst-case turbine component at each location.

Each drawing shows the following detail:

- Grey – Ordnance Survey or topographical base mapping;
- Green – vehicle body outline swept path;
- Red – vehicle wheel track swept path; and
- Black – turbine component load swept path and oversail where this is outside the vehicle body swept path.

Where any accommodation / mitigation works are identified the extent of any vehicle overrun and vehicle / load oversail are illustrated on the SPA drawings. The accuracy of this assessment is limited by the quality of the OS mapping data used and how up to date the survey information is for any given POI. Every effort has been taken to verify details shown in the mapping data against observations made during the site visit.

### **3.5 Land Ownership**

The limits of road adoption can vary depending on the location of the site a specific policy of the road authority. Typically, it comprises land within a defined boundary including the road carriageway.

In rural areas the area of adoption can be open to greater interpretation as defined boundaries may not be readily visible. In these locations, the general rule is that the area of adoption is between established fence/hedges lines or a maximum 2 m from the road edge. This can vary between areas and location.

### **3.6 Access Junction Considerations**

The access junction into the site will need to be rebuilt to accommodate the proposed physical size of loads and the number of trips predicted during the construction phase.

The design and form of the junction will need to be discussed with The Highland Council.

The junction will also need to be built in accordance with the turbine supplier design criteria.

### **3.7 Summary Issues**

It is strongly recommended that following the review of the RSR, the developer should undertake the following prior to the delivery of the first abnormal loads, to ensure load and road user safety:

- That any necessary topographical surveys are undertaken and the swept path results repeated;
- A revised review of axle loading on structures along the entire access route with the various road agencies is undertaken immediately prior to the loads being transported in case of last minute changes to structures;

- A review of clear heights with utility providers and the transport agencies along the route to ensure that there is sufficient space to allow for loads plus sufficient flashover protection (to electrical installations);
- That any verge vegetation and tree canopies which may foul loads is trimmed prior to loads moving;
- That a review of potential roadworks and or closures is undertaken once the delivery schedule is established in draft form;
- That a test run is completed to confirm the route and review any vertical clearance issues; and
- That a condition survey is undertaken to ascertain the extents of road defects prior to loads commencing to protect the developer from spurious damage claims.



## 4 SUMMARY AND CONCLUSIONS

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### 4.1 Summary of Access Review

RSK has been commissioned by ESB to undertake a survey of the approved delivery route for wind turbine AILs associated with the construction and development of Chleainsaid Wind Farm, located on the Dalnessie Estate, approximately 13 km to the north-east of Lairg in the Scottish Highlands, near the A836-A838 Junction.

This report identifies the key points and issues associated with the proposed route and outlines the issues that will need to be considered for successful delivery of components.

This access review has been based upon worst-case of Nordex N163/5.X turbine sections and has been undertaken on the basis of a Superwing blade trailer and 3 + 7 axle clamp adaptor for tower sections.

The report is presented for consideration to ESB. Various road modifications and interventions are required to successfully access the site. If these are undertaken, access to the wind farm site is considered feasible.

### 4.2 Further Actions

The following actions are recommended to pursue the transport and access issues further:

- Prepare detailed mitigation design proposals to help inform the land option/consultee discussions;
- Obtain the necessary land options;
- Undertake discussions with the affected utility providers and roads agencies;
- Obtain the necessary statutory licences to enable the mitigation measures; and
- Develop a detailed operational Transport Management Plan to assist in transporting the proposed loads.

# APPENDIX 1

## POINTS OF INTEREST LOCATIONS

Figure A3.1

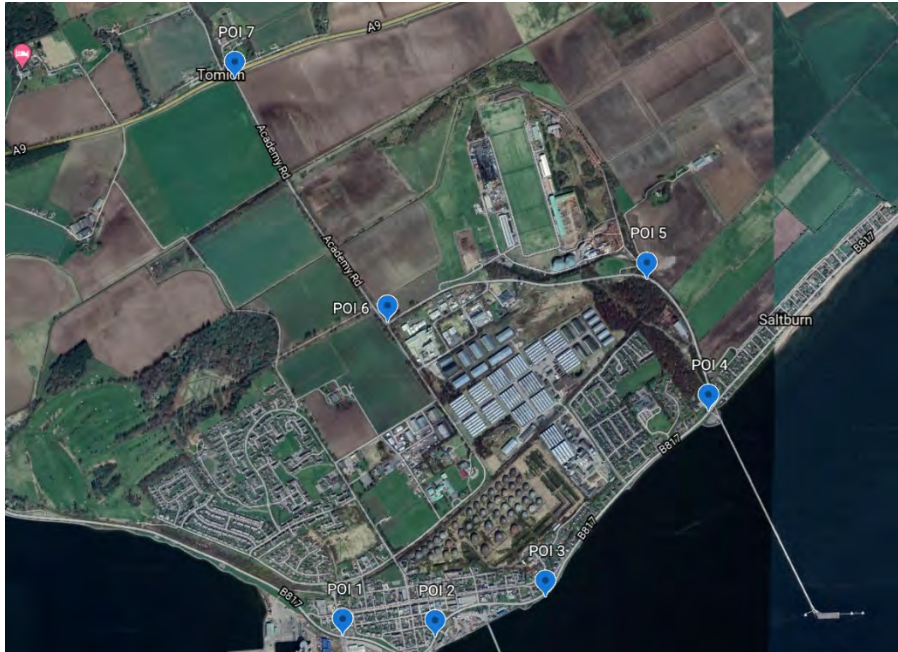


Figure A3.2



Figure A3.3

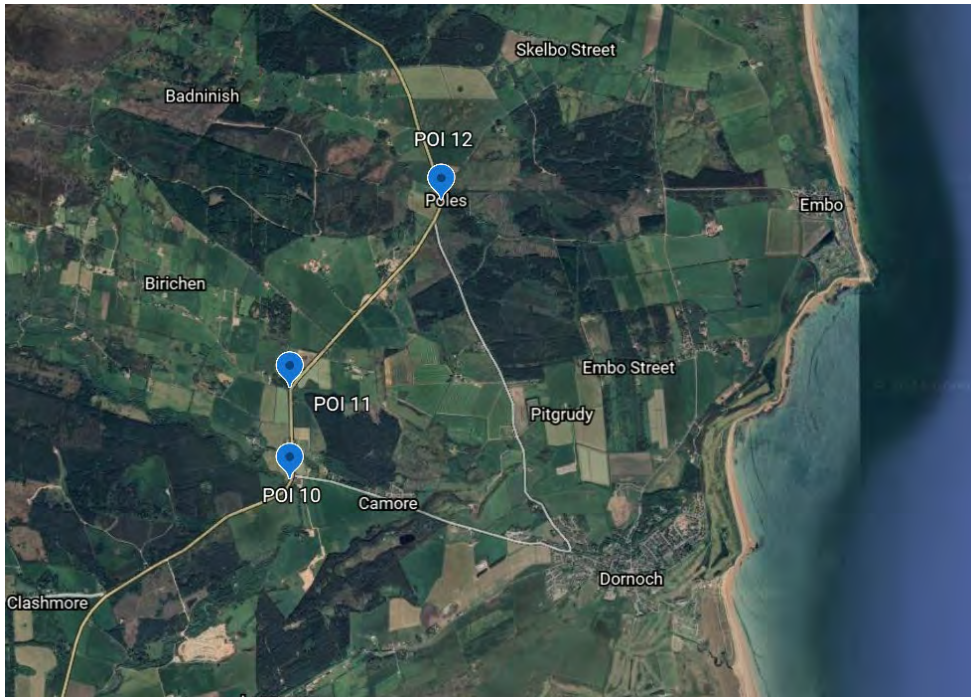


Figure A3.4

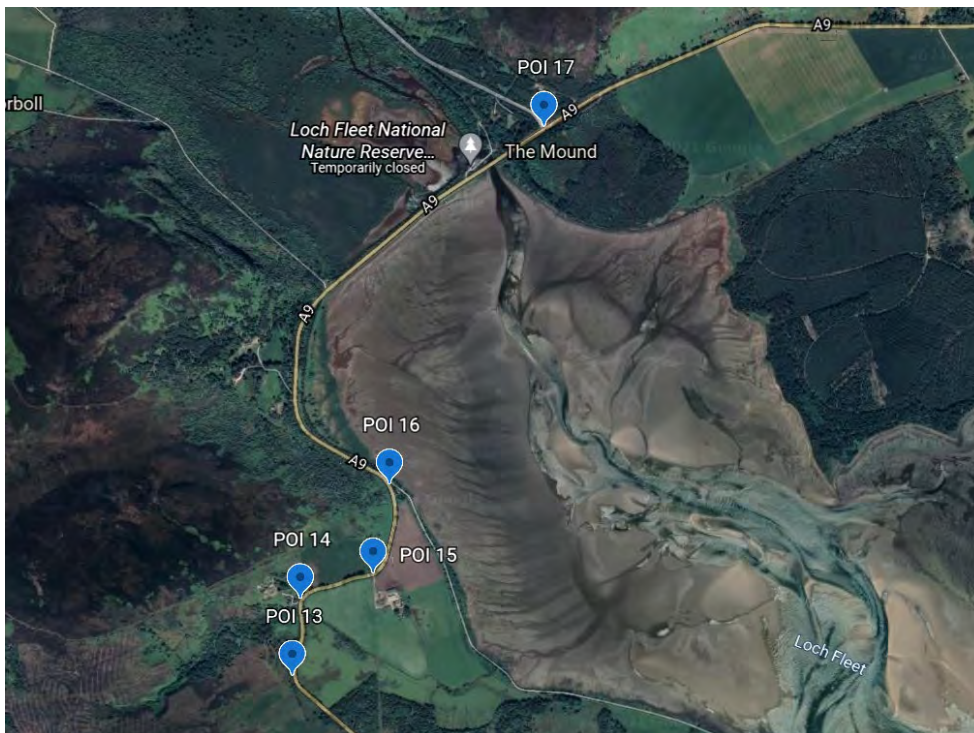


Figure A3.5

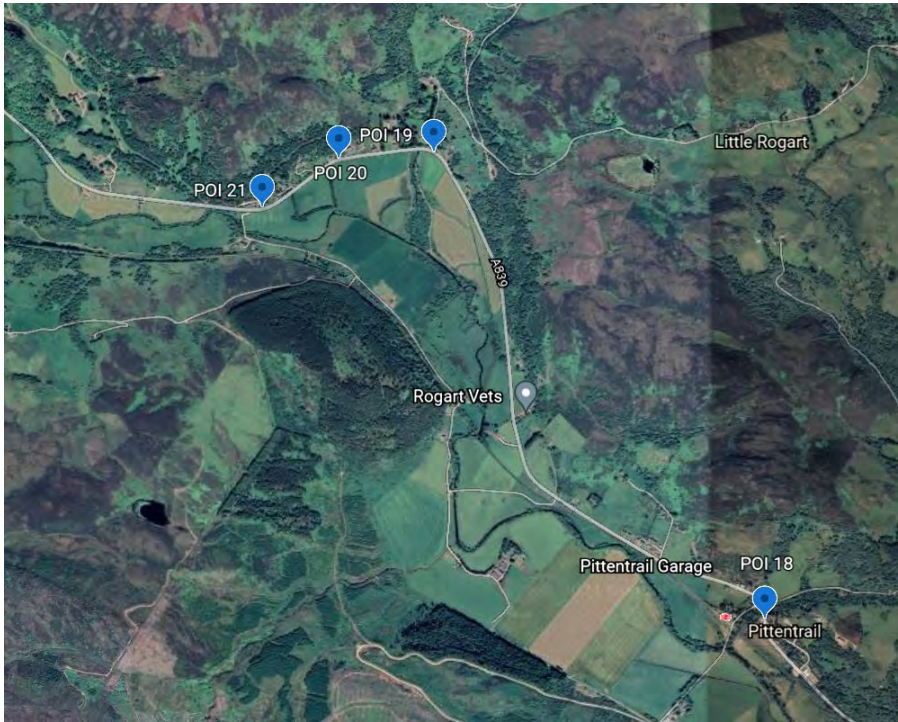


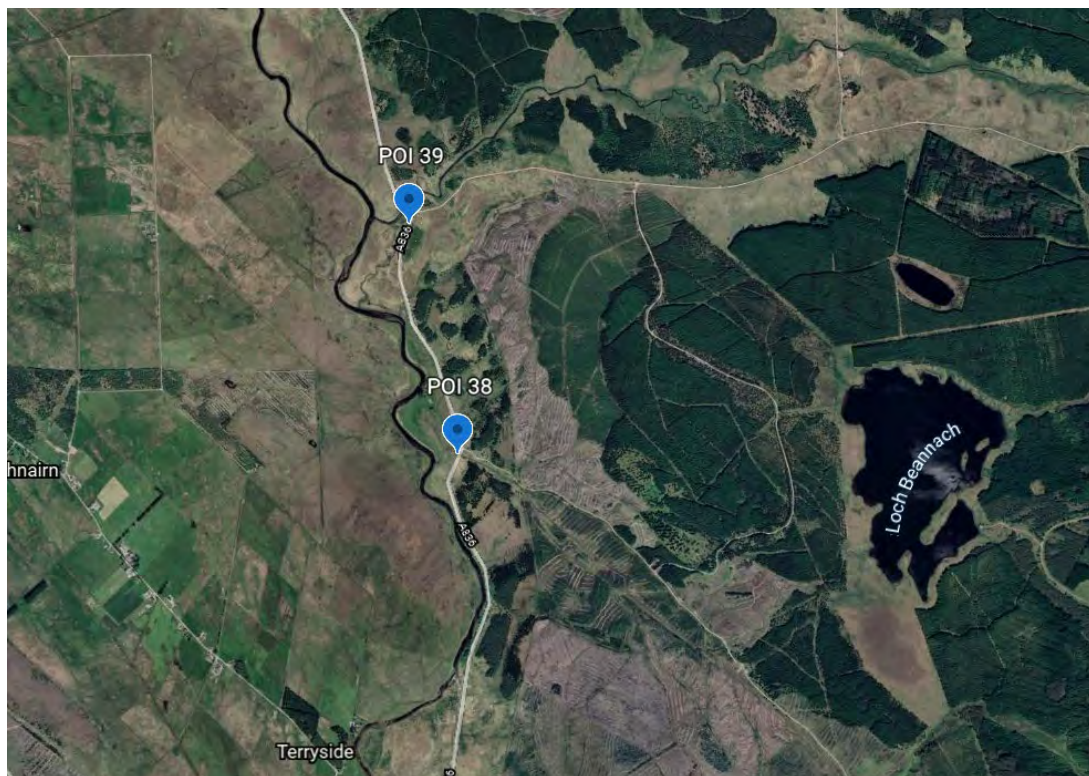
Figure A3.6



Figure A3.7



Figure A3.8



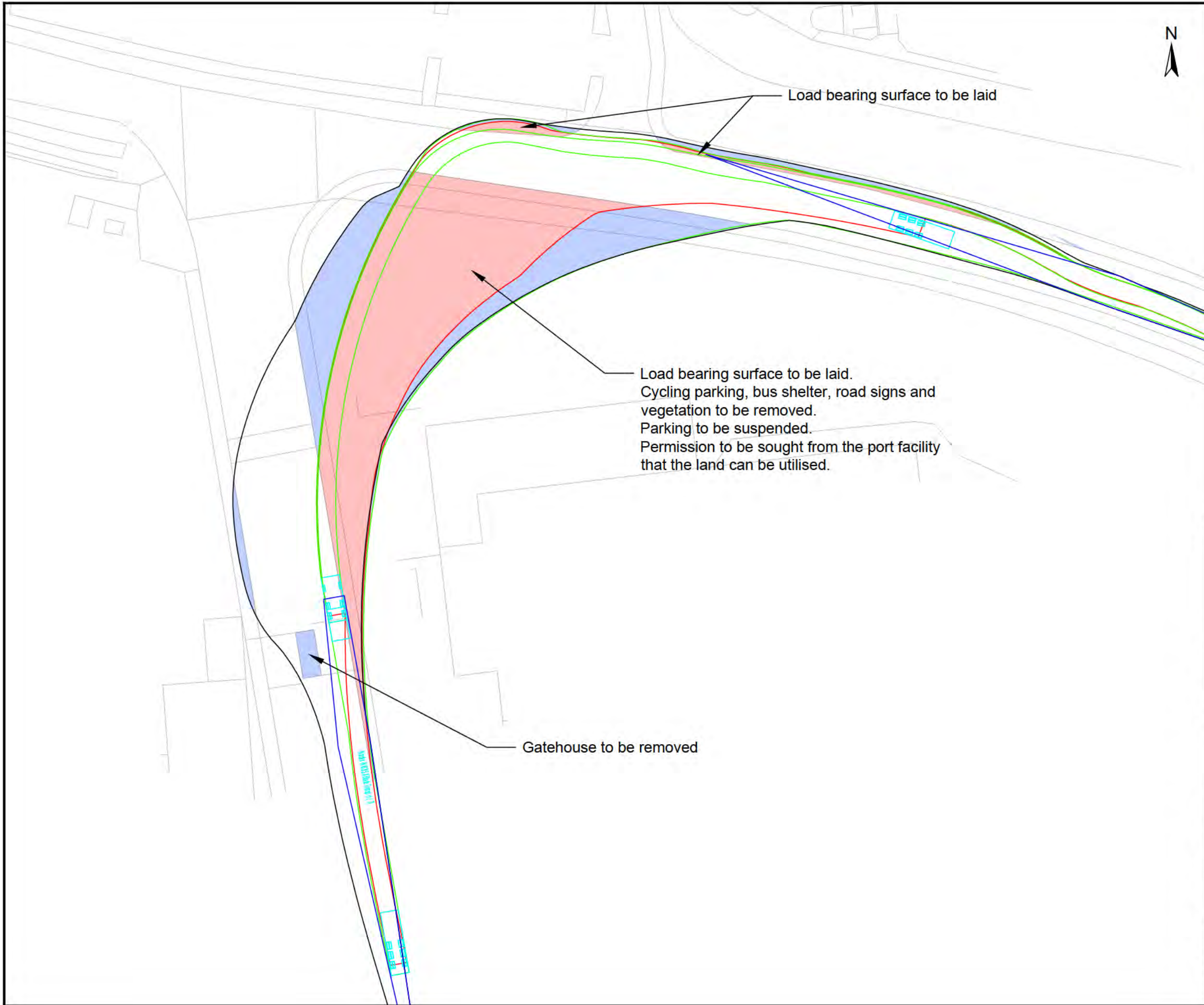
## **APPENDIX 2**

# **SWEPT PATH ASSESSMENTS**

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## Blade Swept Path Assessment



**Legend**

- Overrun Area
- Oversail Area

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Project Title  
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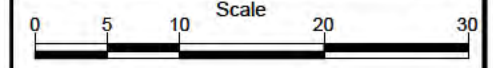
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #1 Invergordon Port Exit**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:500	A3	METRES

Project No. 662367 Drawing File

Drawing No. 662367-10-01 Rev. A







Review clearance to lighting column during test run.

3.5m

All traffic bollards to be removed

Lighting columns, existing fence, road signs and vegetation to be removed.  
Permission to be sought from the port facility that the land can be utilised.



Vegetation to be cleared.  
Potential ground re-profiling required.

Review clearance to lighting column during test run.

**Legend**

- Overrun Area
- Oversail Area

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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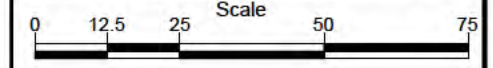
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #2 B817 Bends (Invergordon) 1**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1250	A3	METRES

Project No. 662367	Drawing File
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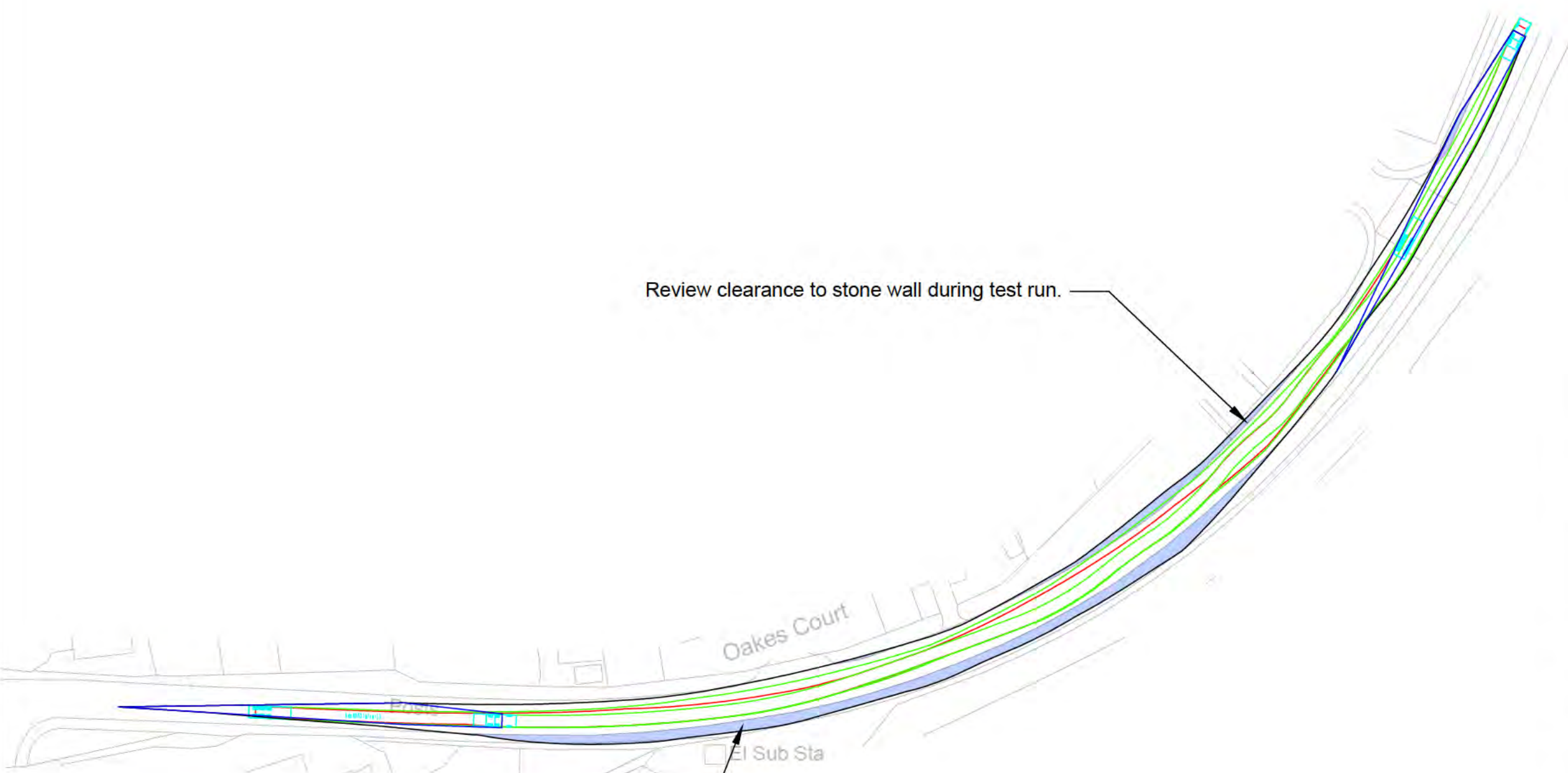
Drawing No. 662367-10-02	Rev. A
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**Legend**

- Overrun Area
- Oversail Area



Review clearance to stone wall during test run.

Review clearance to lighting column during test run.

Oakes Court

El Sub Sta

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Project Title  
**Chleansaid Wind Farm**

Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #3 B817 Bends (Invergordon ) 2**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No. 662367	Drawing File
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Drawing No. 662367-10-03	Rev. A
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**Legend**

 Overrun Area

 Oversail Area

Review clearance to fence line during test run.

Signal signs/columns, road signs to be temporarily removed/relocated

Relocate lighting column and road sign for Saltburn

Boulders

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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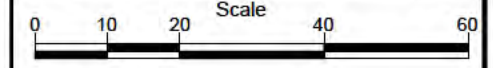
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Nordex N163 (Blade - 47m support point)  
Pol #4 Cromarty View Left Turn**

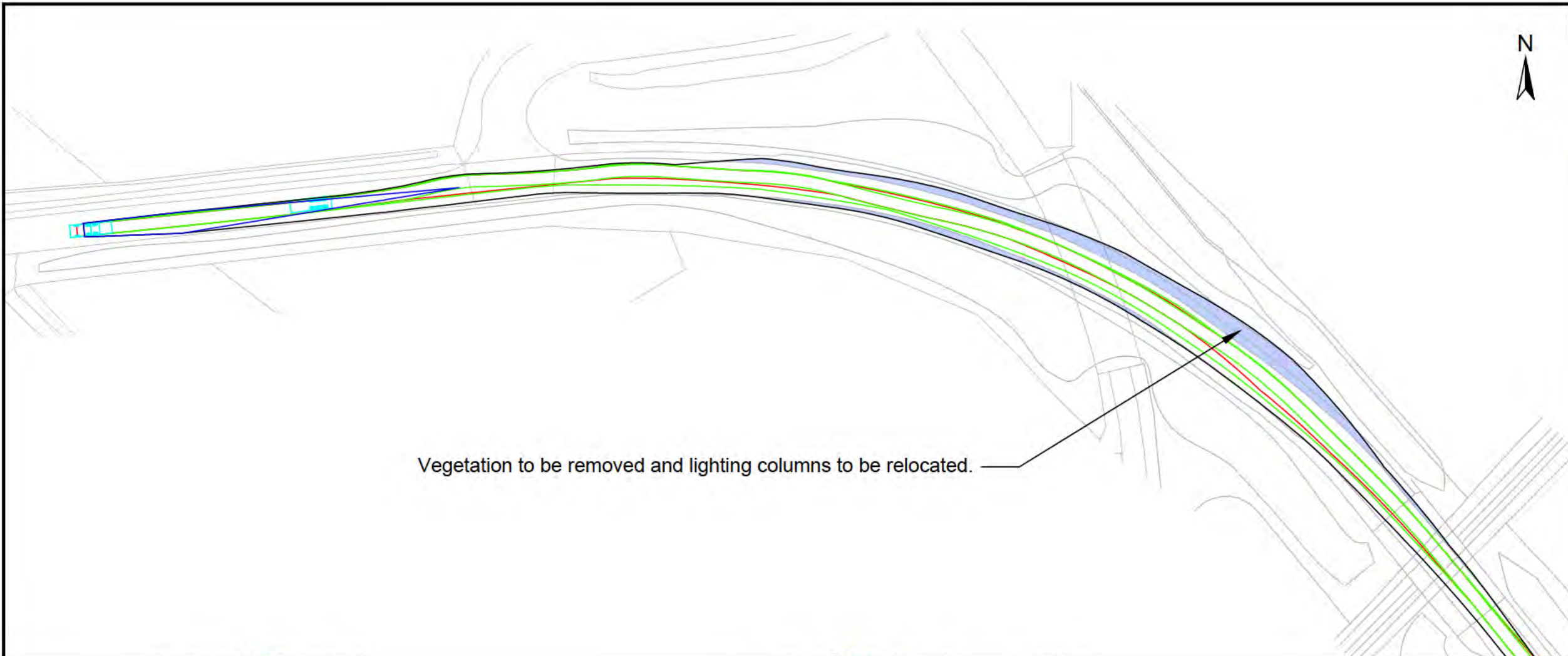
Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.	Drawing File
662367	

Drawing No.	Rev.
662367-10-04	A





Vegetation to be removed and lighting columns to be relocated.

**Legend**

- Overrun Area
- Oversail Area



Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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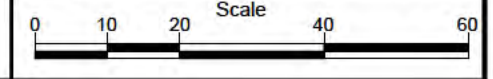
Drawing Title  
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Nordex N163 (Blade - 47m support point)  
PoI #5 Unnamed Road Bend**

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JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.	Drawing File
662367	

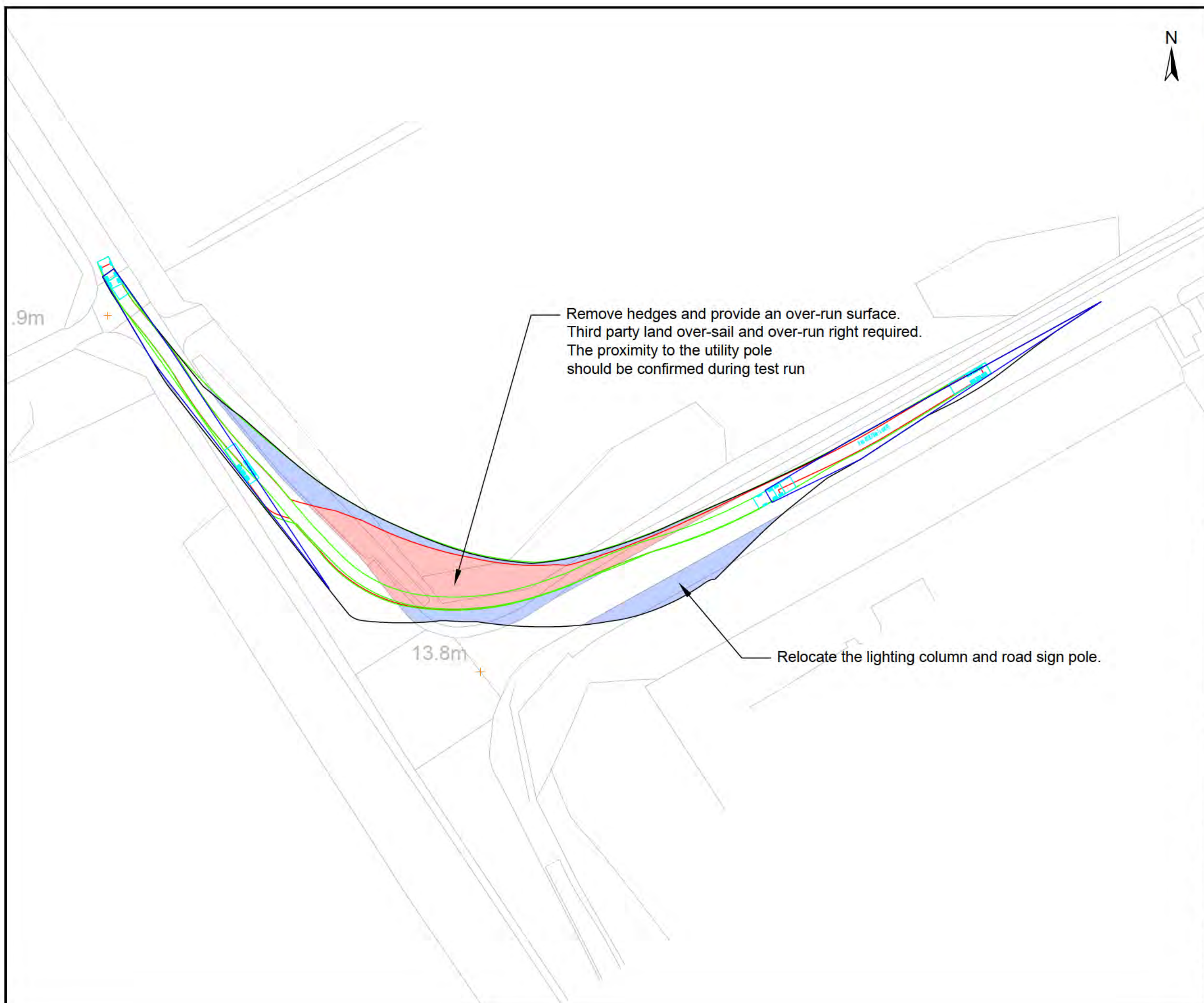
Drawing No.	Rev.
662367-10-05	A





**Legend**

- Overrun Area
- Oversail Area



Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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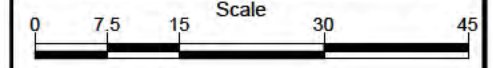
Drawing Title  
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Nordex N163 (Blade - 47m support point)  
Pol #6 C1063 Junction**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:750	A3	METRES

Project No. 662367	Drawing File
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Drawing No. 662367-10-06	Rev. A
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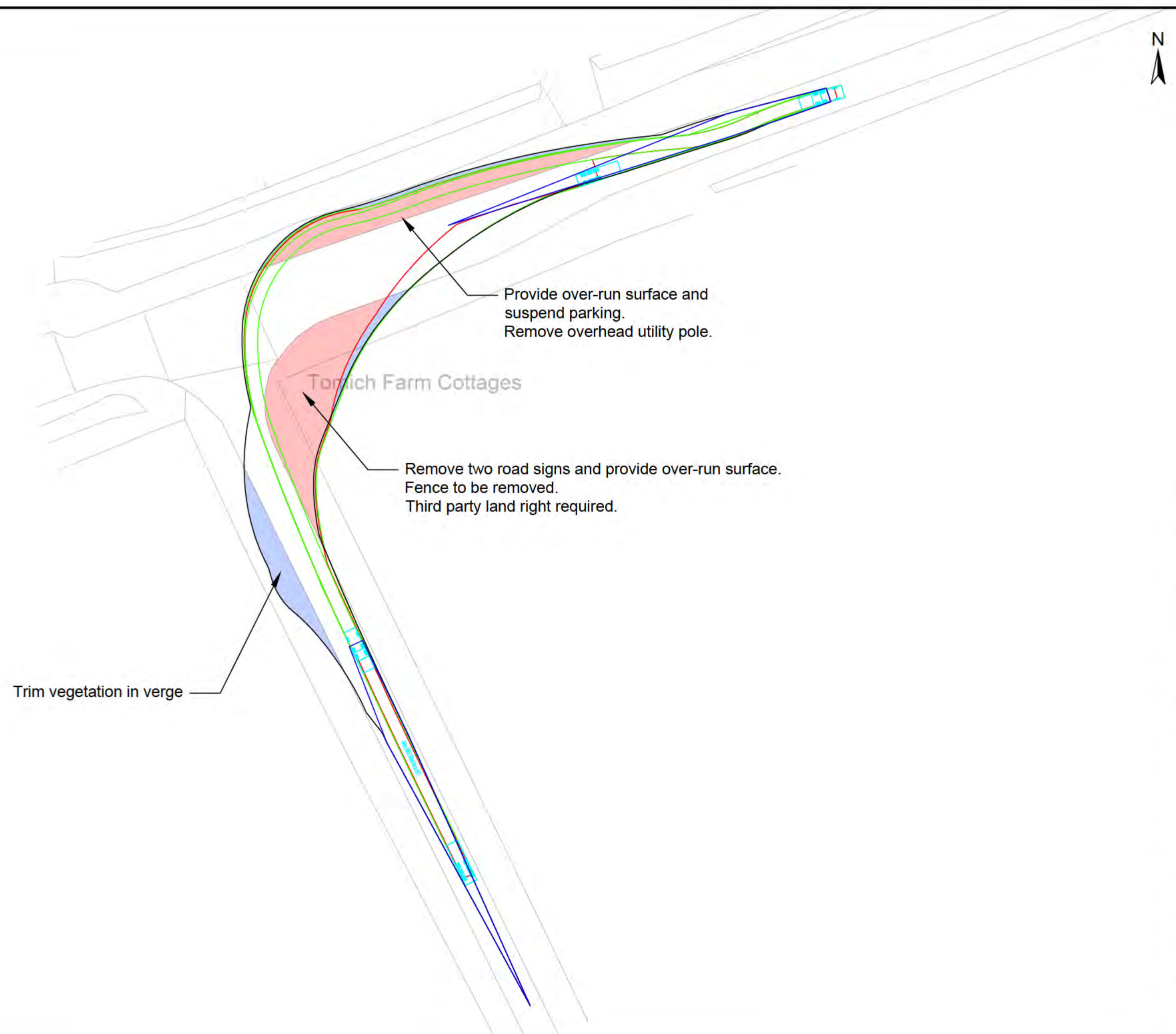




**Legend**

 Overrun Area

 Oversail Area



Provide over-run surface and suspend parking. Remove overhead utility pole.

Tomich Farm Cottages

Remove two road signs and provide over-run surface. Fence to be removed. Third party land right required.

Trim vegetation in verge

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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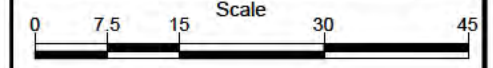
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #7 Tomich (A9 / C1063)Junction**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:750	A3	METRES

Project No. 662367 Drawing File

Drawing No. 662367-10-07 Rev. A





**Legend**

- Overrun Area
- Oversail Area

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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**Chleainsaid Wind Farm**

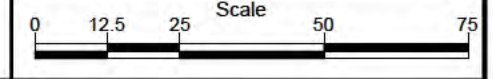
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #8 A9 Nigg Roundabout**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1250	A3	METRES

Project No.	Drawing File
662367	

Drawing No.	Rev.
662367-10-08	A





**Legend**

- Overrun Area
- Oversail Area

Check proximity to lighting column and electricity box during test run.

Load bearing surface to be laid.  
One traffic sign to be removed.

Remove road sign and two bollards.

Lighting column to be relocated.  
Third party over-sail land rights might be required.

Underpass

CG

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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**Chleansaid Wind Farm**

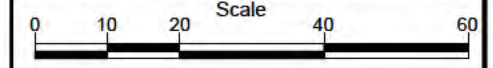
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Nordex N163 (Blade - 47m support point)  
Pol #9 A9/A836 Roundabout**

Drawn	Date	Checked	Date	Approved	Date
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Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.	Drawing File
662367	

Drawing No.	Rev.
662367-10-09	A







**Legend**

- Overrun Area
- Oversail Area

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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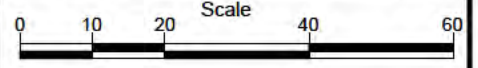
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Nordex N163 (Blade - 47m support point)  
Pol #10 A9 Bends 1**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.	Drawing File
662367	

Drawing No.	Rev.
662367-10-10	A



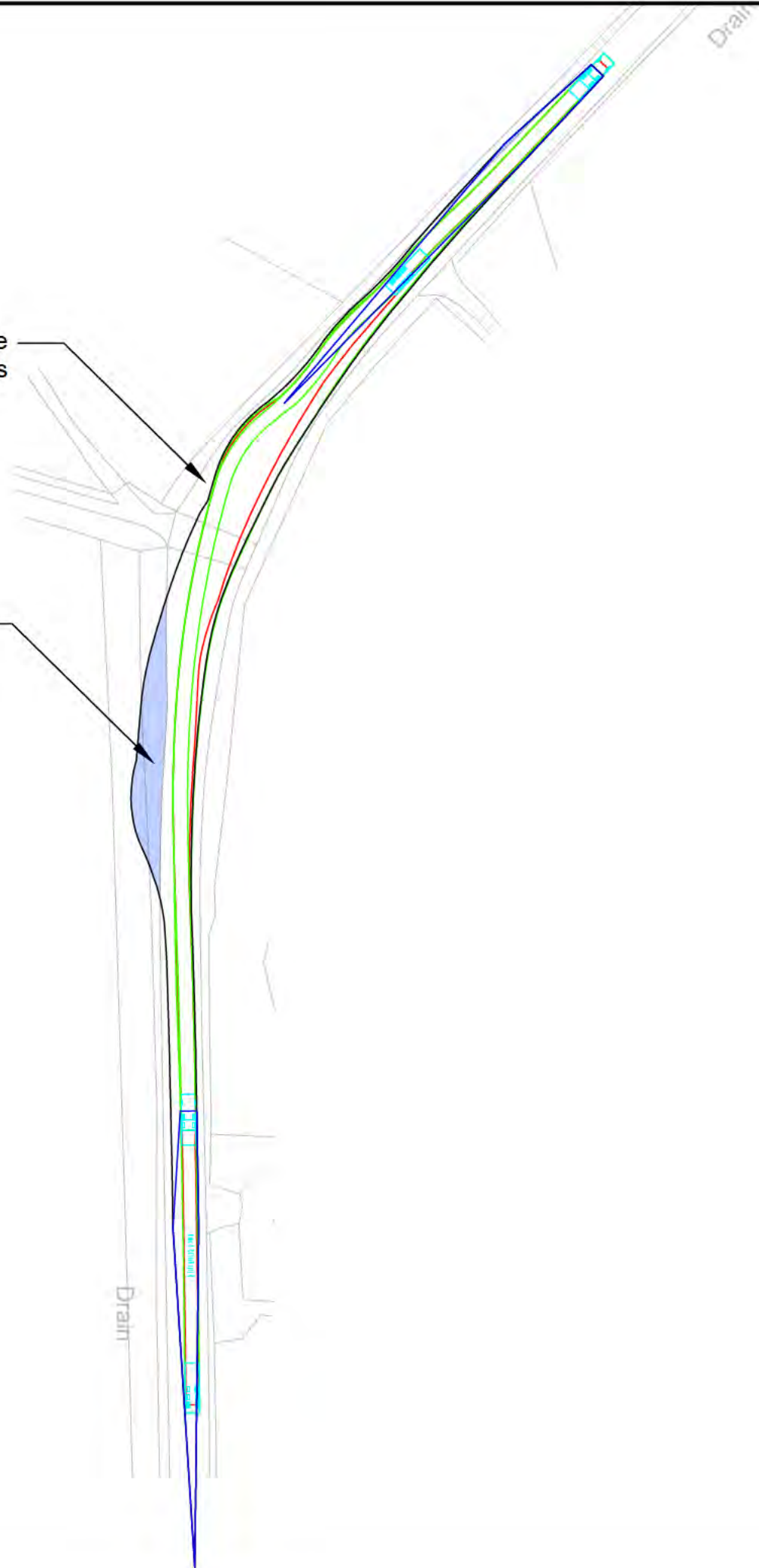


**Legend**

-  Overrun Area
-  Oversail Area

Parking in the layby to be temporarily suspended to allow use by loads

Chevron sign to be removed



Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Client  
**ESB Asset Development (UK) Ltd**

Project Title  
**Chleansaid Wind Farm**

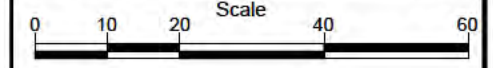
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #11 A9 Bends 2**

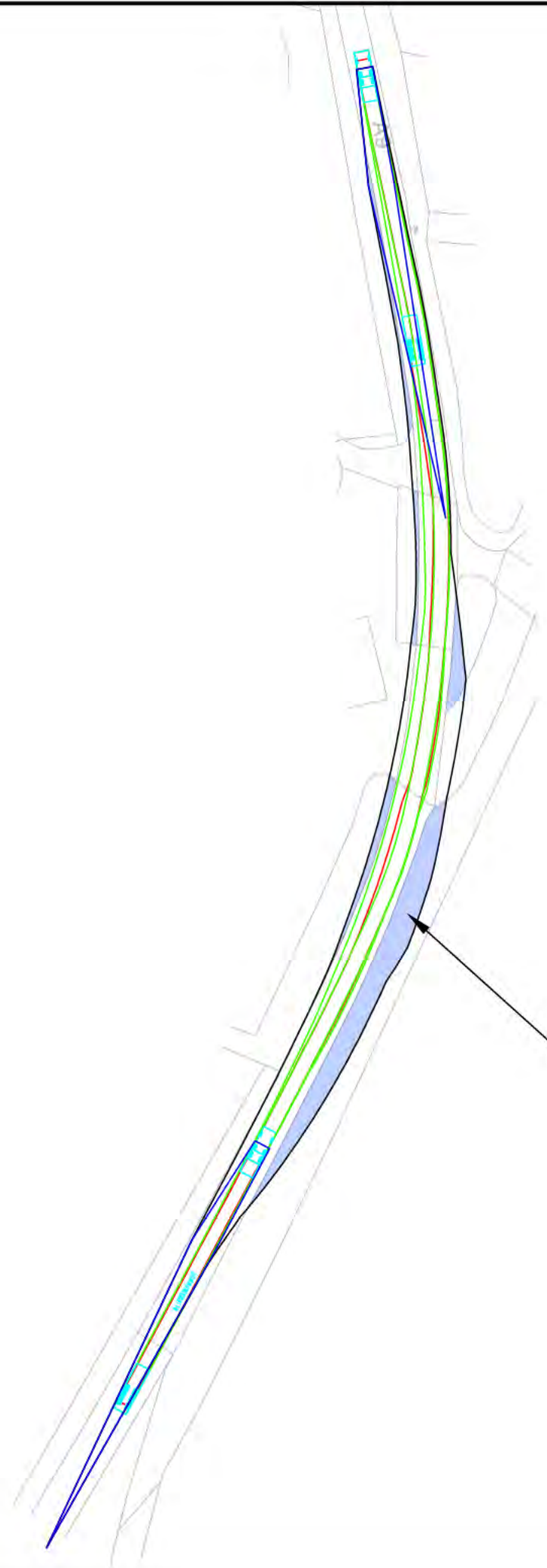
Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No. 662367 Drawing File

Drawing No. 662367-10-11 Rev. A





**Legend**

- Overrun Area
- Oversail Area

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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**Chleansaid Wind Farm**

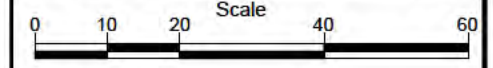
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #12 A9 Bends 3**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No. 662367	Drawing File
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Drawing No. 662367-10-12	Rev. A
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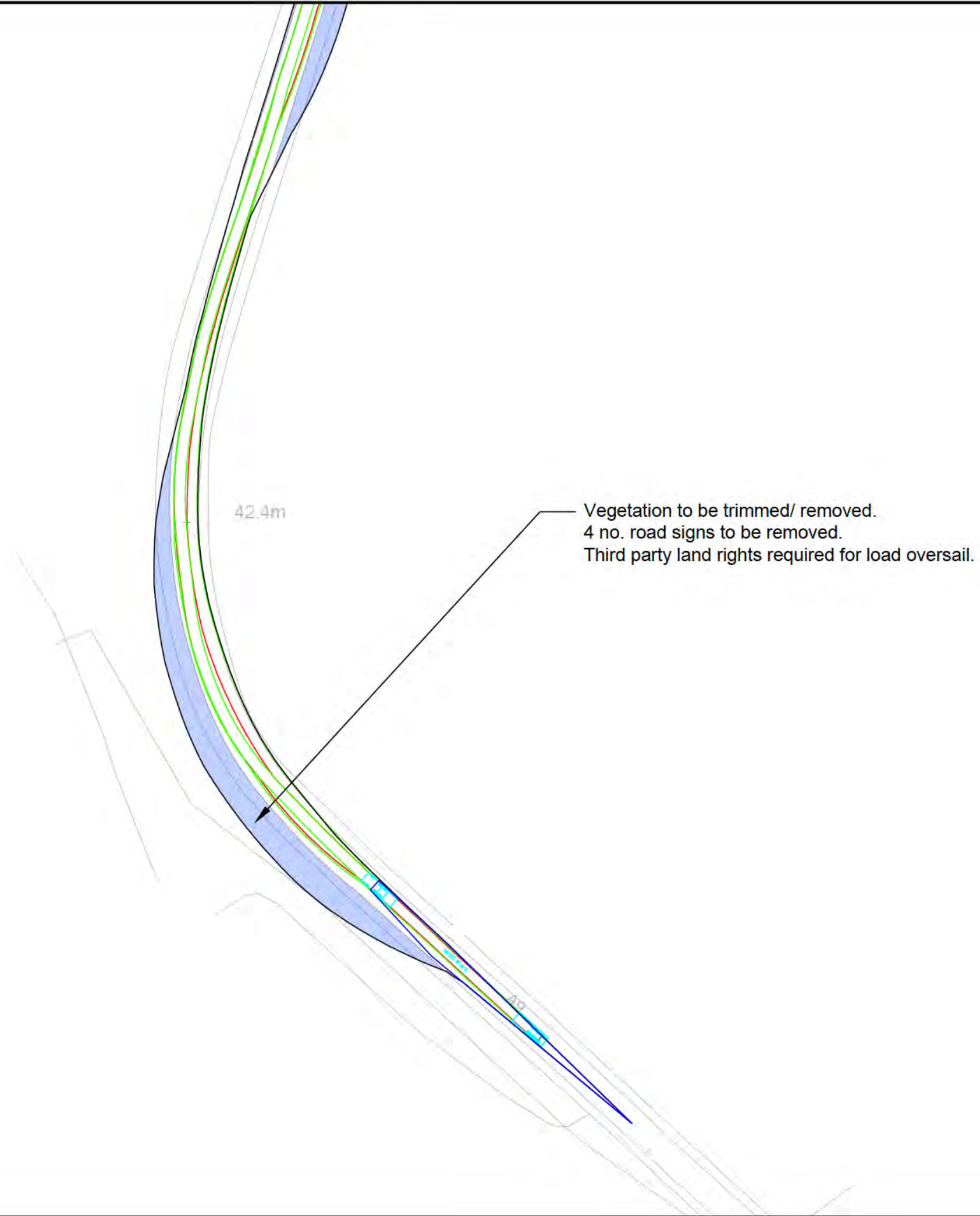


Vegetation to be removed/trimmed.  
One road sign to be removed.  
Load will oversail number of bollards.



**Legend**

-  Overrun Area
-  Oversail Area



Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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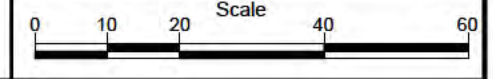
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #13 A9 Bends 4**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No. 662367 Drawing File

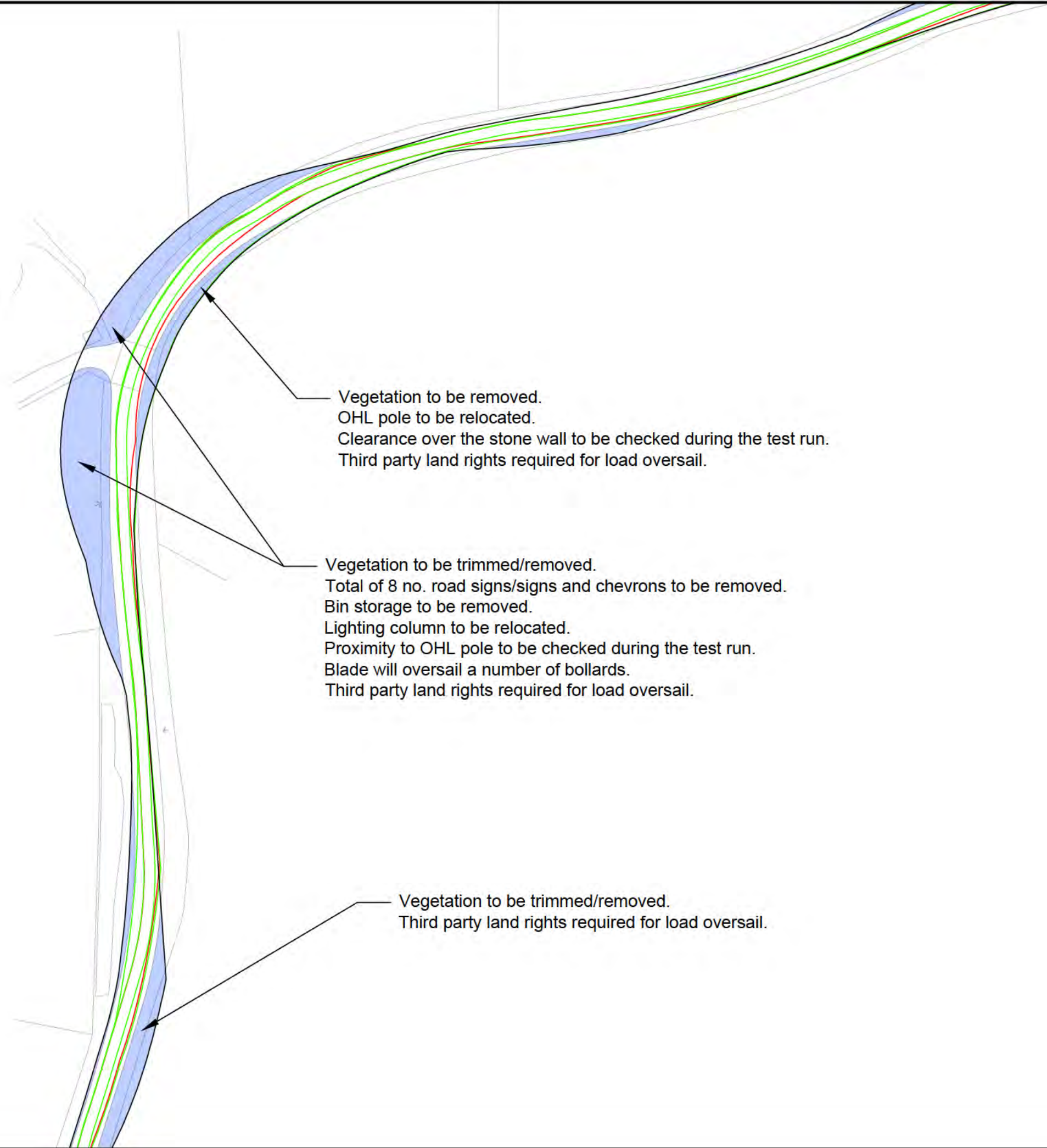
Drawing No. 662367-10-13 Rev. A





**Legend**

- Overrun Area
- Oversail Area



Vegetation to be removed.  
 OHL pole to be relocated.  
 Clearance over the stone wall to be checked during the test run.  
 Third party land rights required for load oversail.

Vegetation to be trimmed/removed.  
 Total of 8 no. road signs/signs and chevrons to be removed.  
 Bin storage to be removed.  
 Lighting column to be relocated.  
 Proximity to OHL pole to be checked during the test run.  
 Blade will oversail a number of bollards.  
 Third party land rights required for load oversail.

Vegetation to be trimmed/removed.  
 Third party land rights required for load oversail.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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**Chleansaid Wind Farm**

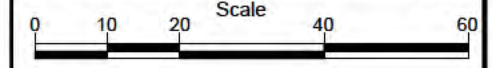
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**Swept Path Analysis  
 Nordex N163 (Blade - 47m support point)  
 Pol #14 A9 Bends 5**

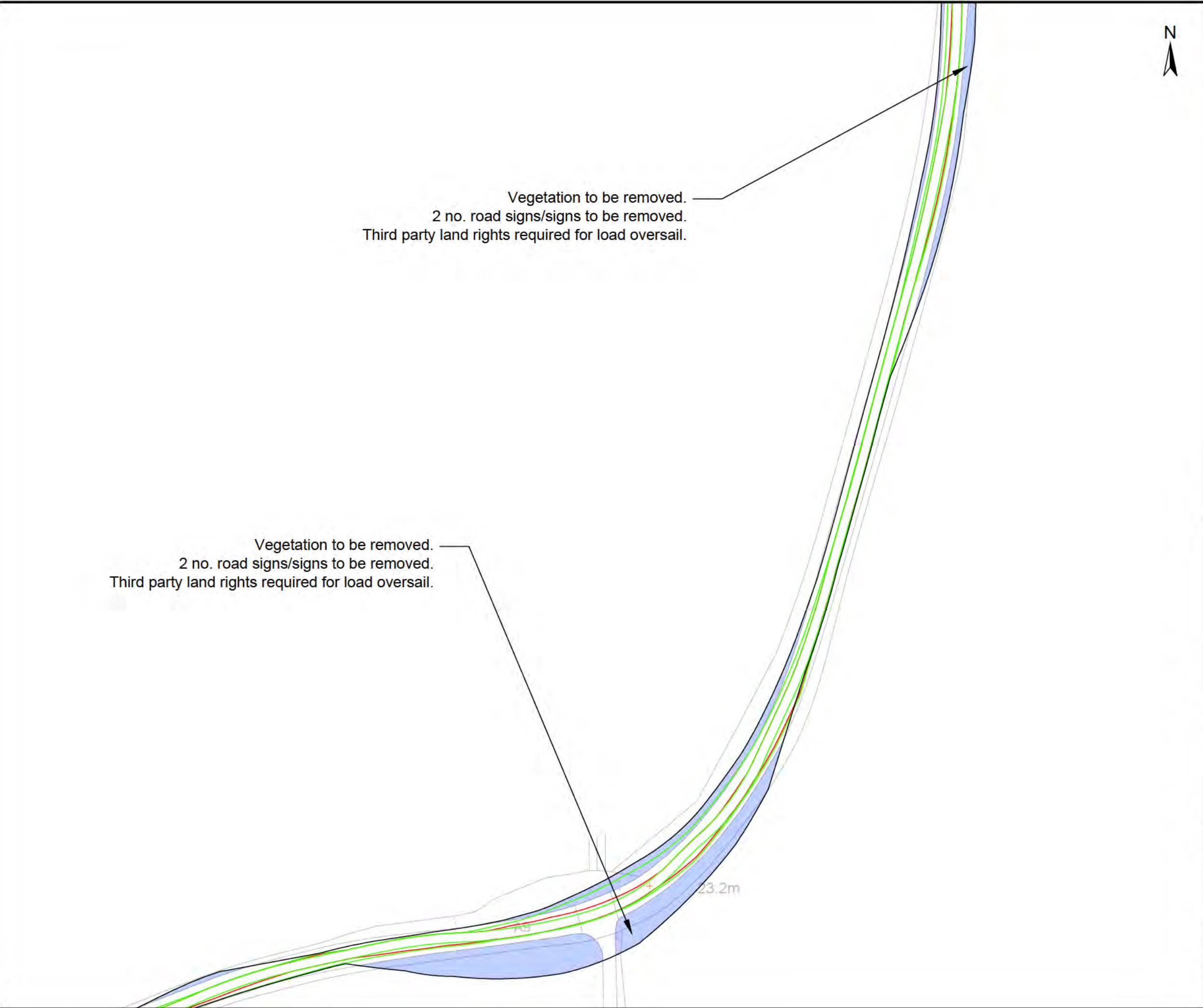
Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.	Drawing File
662367	

Drawing No.	Rev.
662367-10-14	A





Vegetation to be removed.  
 2 no. road signs/signs to be removed.  
 Third party land rights required for load oversail.

Vegetation to be removed.  
 2 no. road signs/signs to be removed.  
 Third party land rights required for load oversail.



**Legend**

- Overrun Area
- Oversail Area

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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**Chleansaid Wind Farm**

Drawing Title  
**Swept Path Analysis  
 Nordex N163 (Blade - 47m support point)  
 Pol #15 A9 Bends 6**

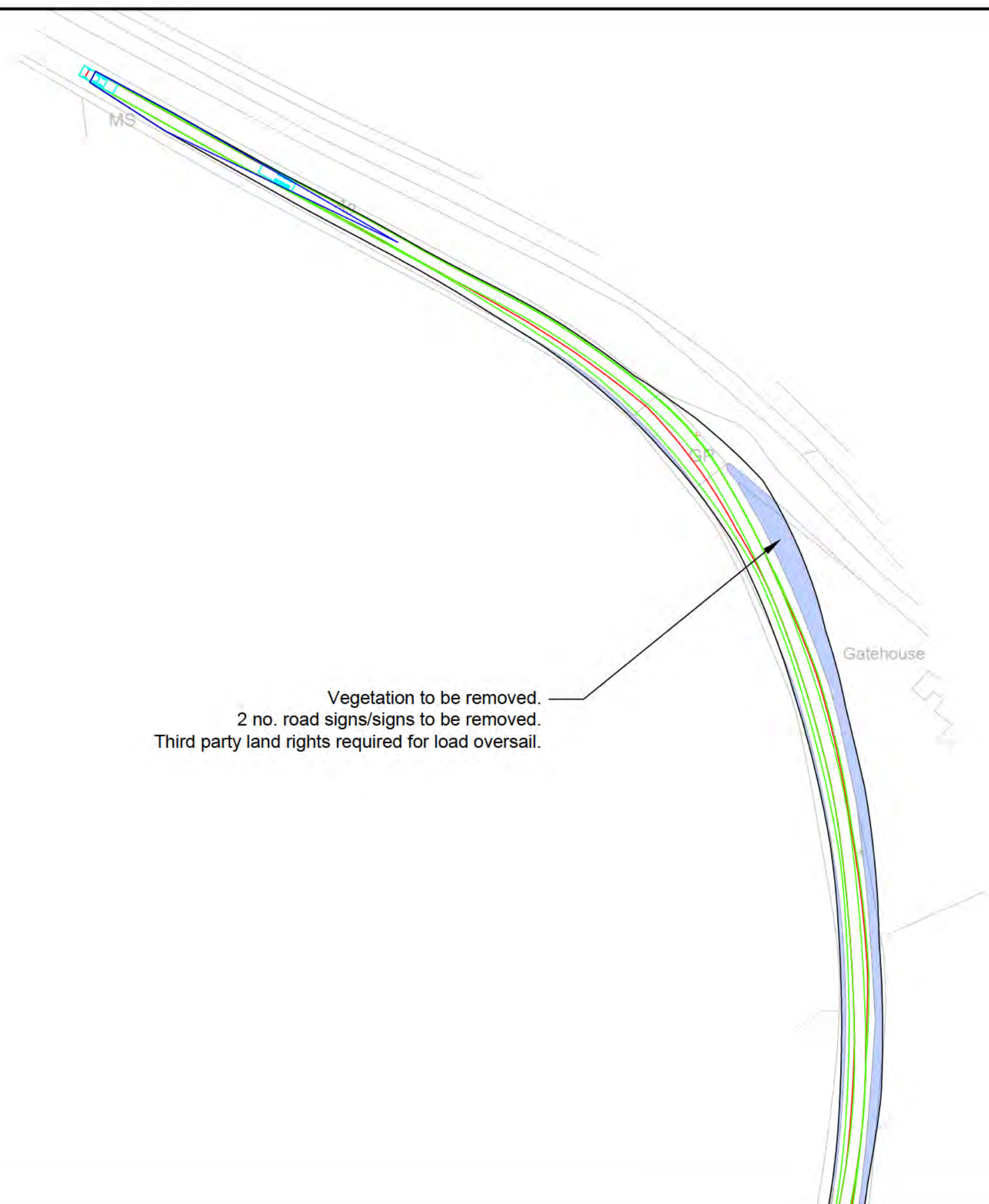
Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.	Drawing File
662367	

Drawing No.	Rev.
662367-10-15	A





Vegetation to be removed.  
 2 no. road signs/signs to be removed.  
 Third party land rights required for load oversail.



**Legend**

- Overrun Area
- Oversail Area

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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**Chleansaid Wind Farm**

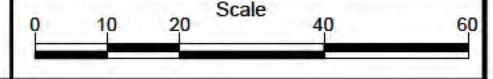
Drawing Title  
**Swept Path Analysis  
 Nordex N163 (Blade - 47m support point)  
 Pol #16 A9 Bends 7**

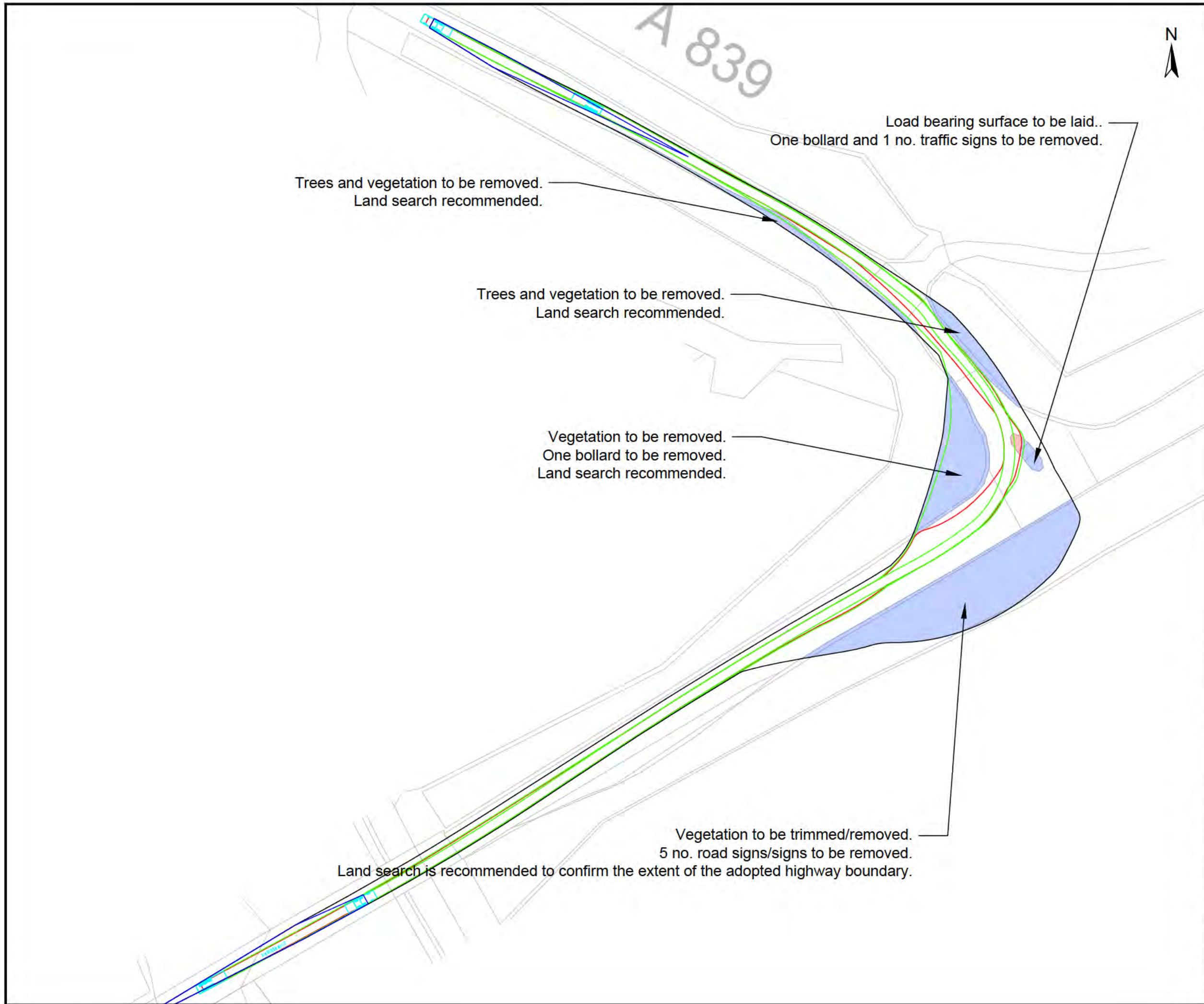
Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.	Drawing File
662367	

Drawing No.	Rev.
662367-10-16	A





**Legend**

- Overrun Area
- Oversail Area

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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**Chleansaid Wind Farm**

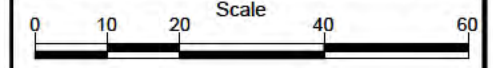
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #17 A9/A839 Junction**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.	Drawing File
662367	

Drawing No.	Rev.
662367-10-17	A







**Legend**

- Overrun Area
- Oversail Area

Load bearing surface to be laid.  
Land search required to confirm the extent of the adopted boundary.  
Third party land rights required for load oversail.  
Trees and vegetation to be trimmed.

Land search required to confirm the extent of adopted boundary.  
Topographical survey required - close proximity to the building.

Load bearing surface to be laid.  
Parking to be prevented.  
Trees and vegetation to be removed.  
Third party land rights required for load oversail.

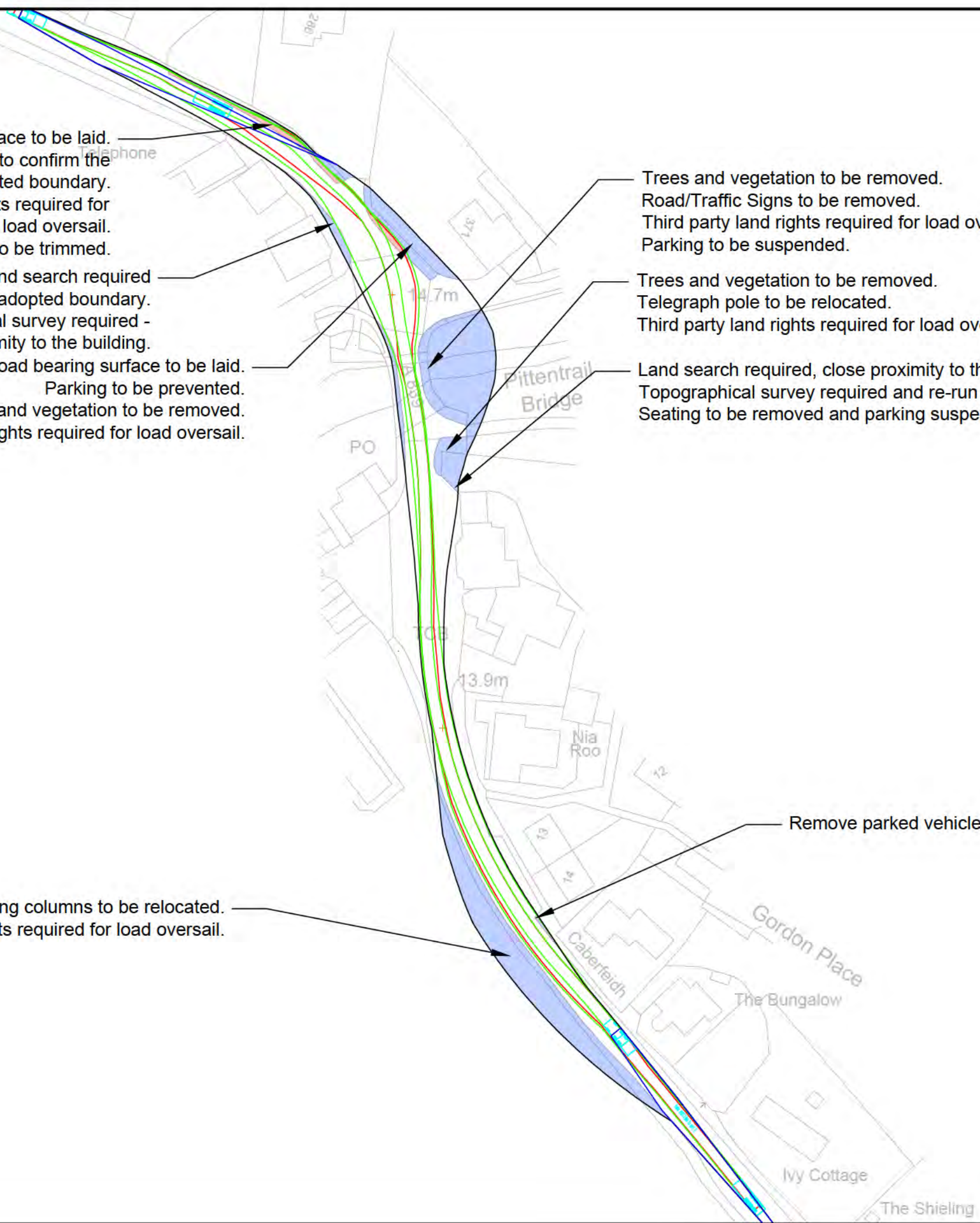
Trees and vegetation to be removed.  
Road/Traffic Signs to be removed.  
Third party land rights required for load oversail.  
Parking to be suspended.

Trees and vegetation to be removed.  
Telegraph pole to be relocated.  
Third party land rights required for load oversail.

Land search required, close proximity to the building.  
Topographical survey required and re-run of Swept Path.  
Seating to be removed and parking suspended.

Remove parked vehicles in layby.

2 no. lighting columns to be relocated.  
Third party land rights required for load oversail.



# DRAFT

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Project Title  
**Chleansaid Wind Farm**

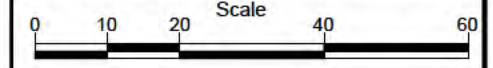
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #18 A839 Rogart Bends 1**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No. 662367	Drawing File
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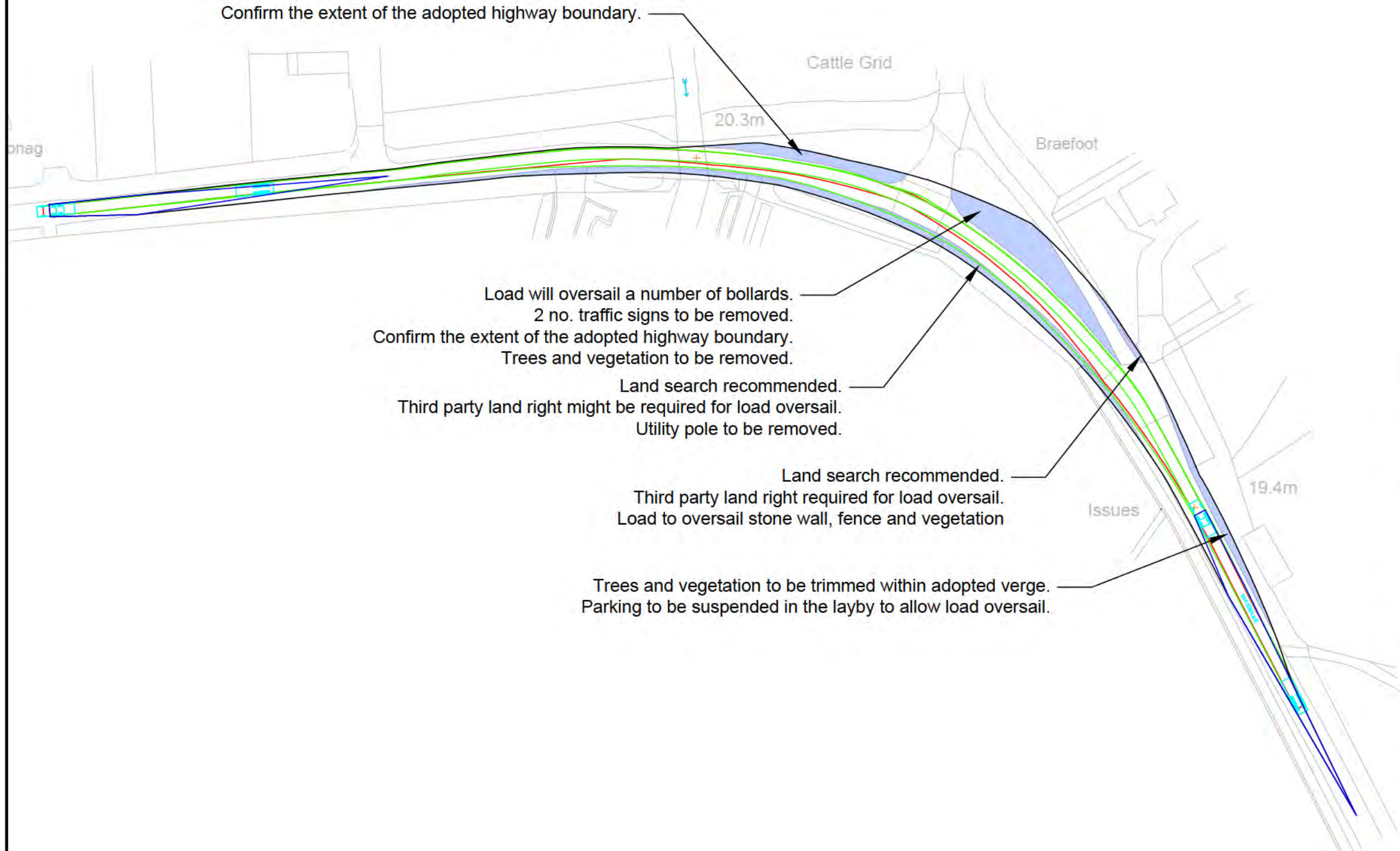
Drawing No. 662367-10-18	Rev. A
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**Legend**

- Overrun Area
- Oversail Area



Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Project Title  
**Chleansaid Wind Farm**

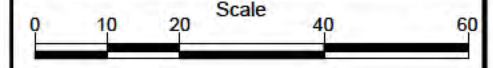
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #19 A839 Rogart Bends 2**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No. 662367 Drawing File

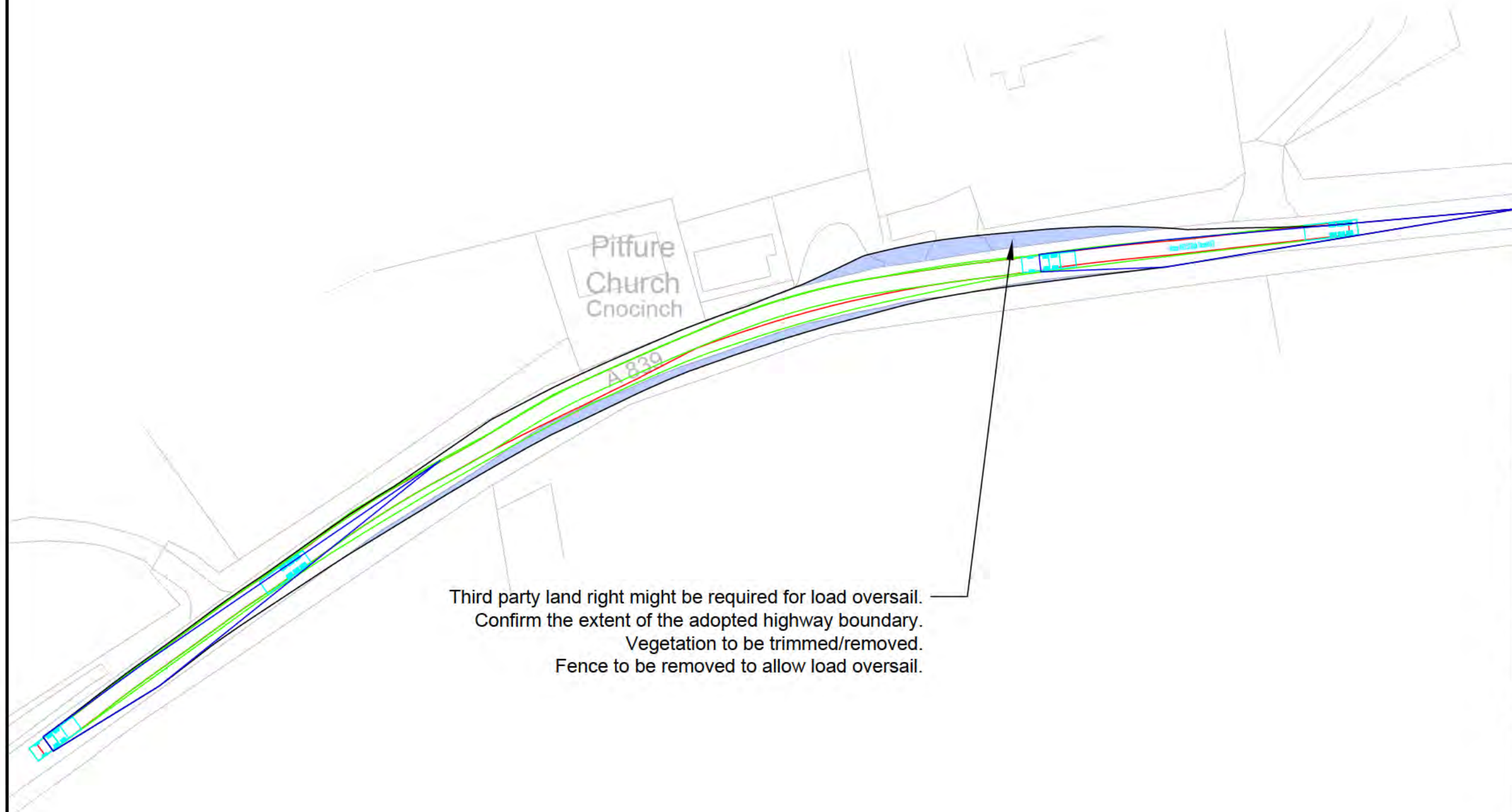
Drawing No. 662367-10-19 Rev. A





**Legend**

- Overrun Area
- Oversail Area



Third party land right might be required for load oversail.  
 Confirm the extent of the adopted highway boundary.  
 Vegetation to be trimmed/removed.  
 Fence to be removed to allow load oversail.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Project Title  
**Chleansaid Wind Farm**

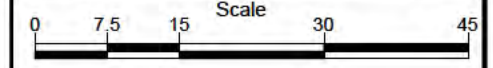
Drawing Title  
**Swept Path Analysis  
 Nordex N163 (Blade - 47m support point)  
 Pol #20 A839 Rogart Bends 3**

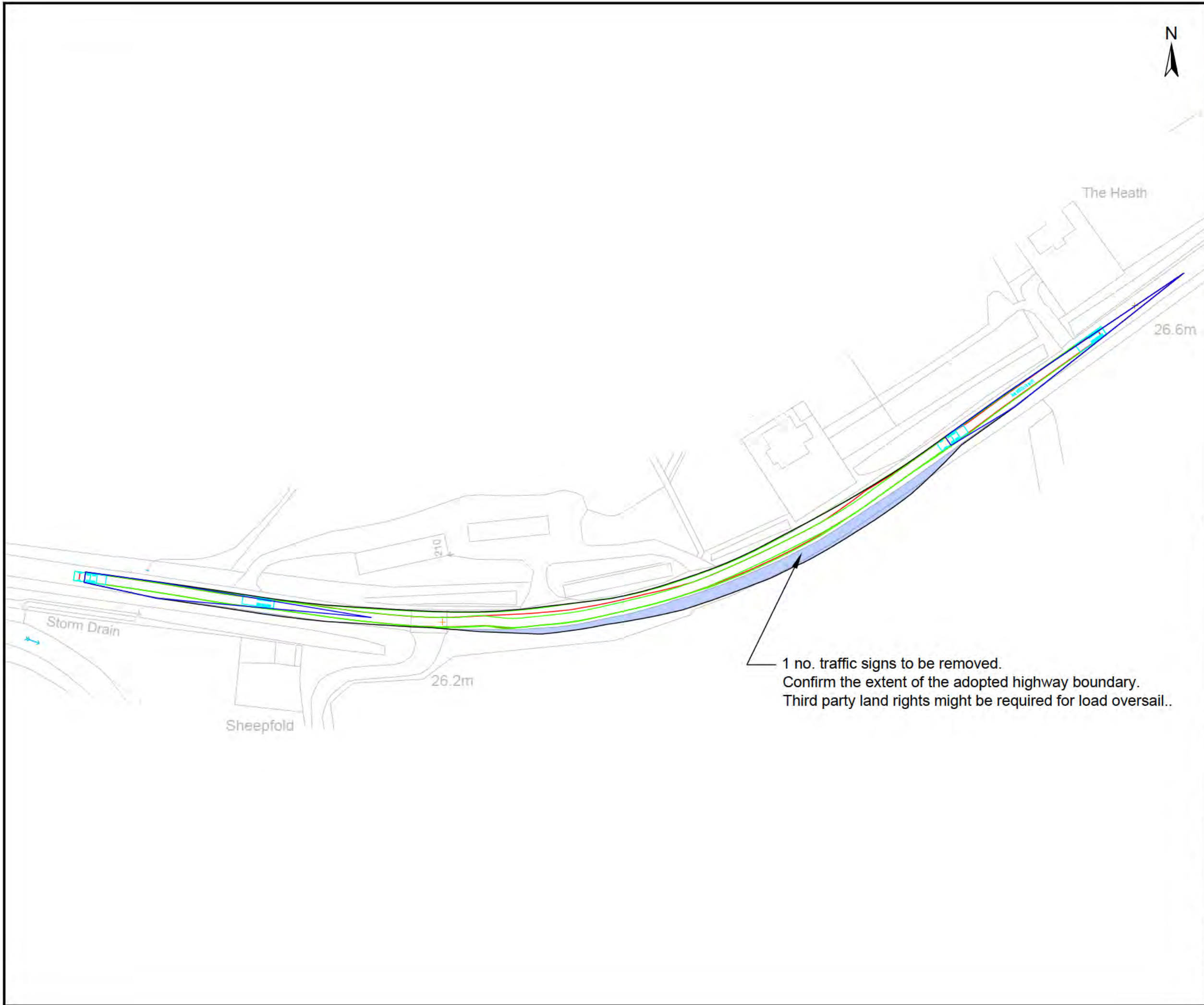
Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:750	A3	METRES

Project No.	Drawing File
662367	

Drawing No.	Rev.
662367-10-20	A





**Legend**

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<span style="display:inline-block; width:20px; height:10px; background-color:blue; border:1px solid black;"></span>	Oversail Area

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Project Title  
**Chleansaid Wind Farm**

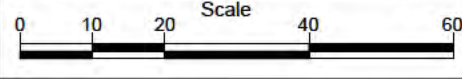
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #21 A839 Rogart Bends 4**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.	Drawing File
662367	

Drawing No.	Rev.
662367-10-21	A





**Legend**

- Overrun Area
- Oversail Area

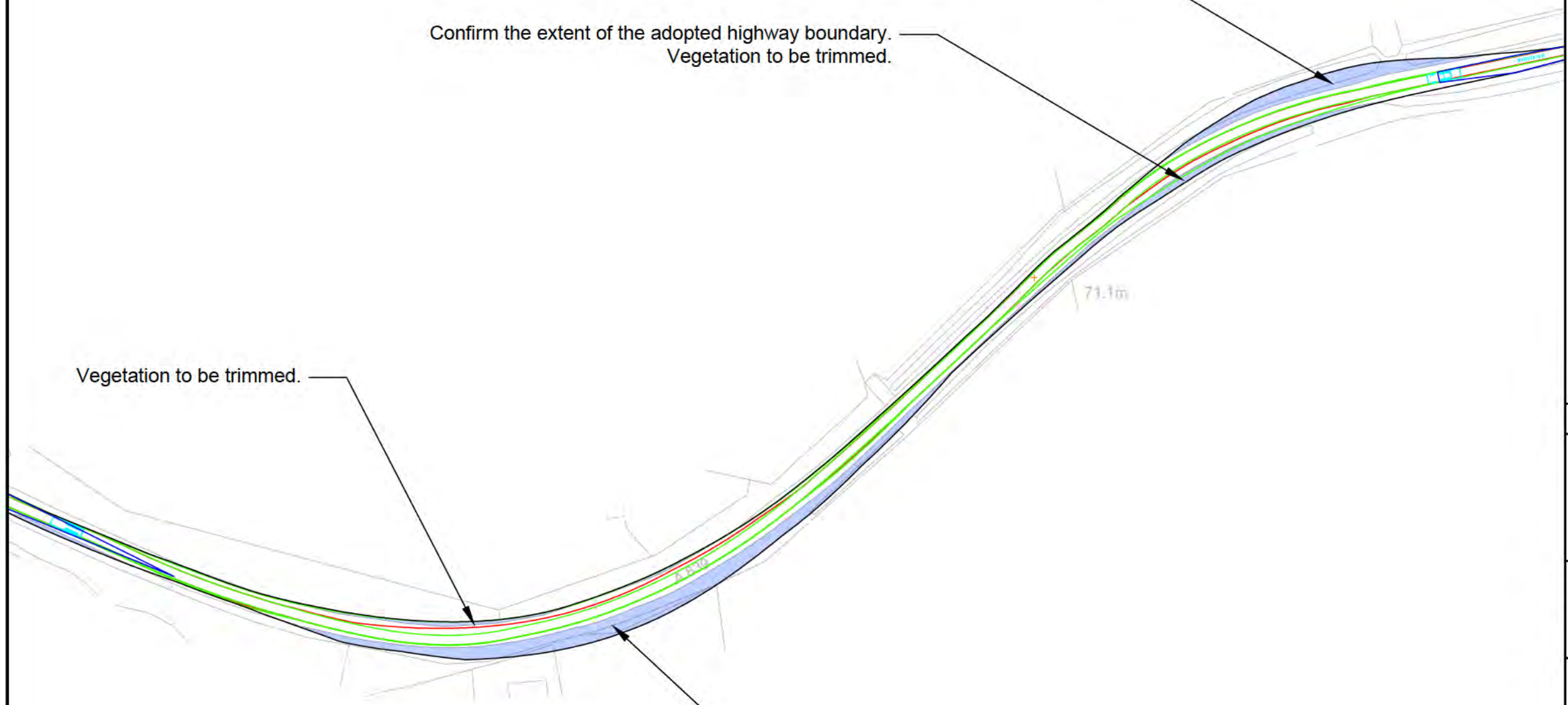
Confirm the extent of the adopted highway boundary.  
Third party land rights might be required for load oversail.

Confirm the extent of the adopted highway boundary.  
Vegetation to be trimmed.

Vegetation to be trimmed.

71.1m

Confirm the extent of the adopted highway boundary.  
Third party land rights might be required for load oversail.  
Trees and vegetation to be trimmed/removed.



Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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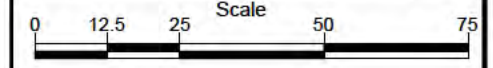
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #22 A839 near Muie**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1250	A3	METRES

Project No. 662367	Drawing File
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Drawing No. 662367-10-22	Rev. A
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**Legend**

-  Overrun Area
-  Oversail Area

Confirm the extent of the adopted highway boundary.  
Vegetation to be trimmed.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Project Title  
**Chleansaid Wind Farm**

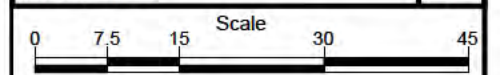
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #23 A839 near Rhaoine 1**

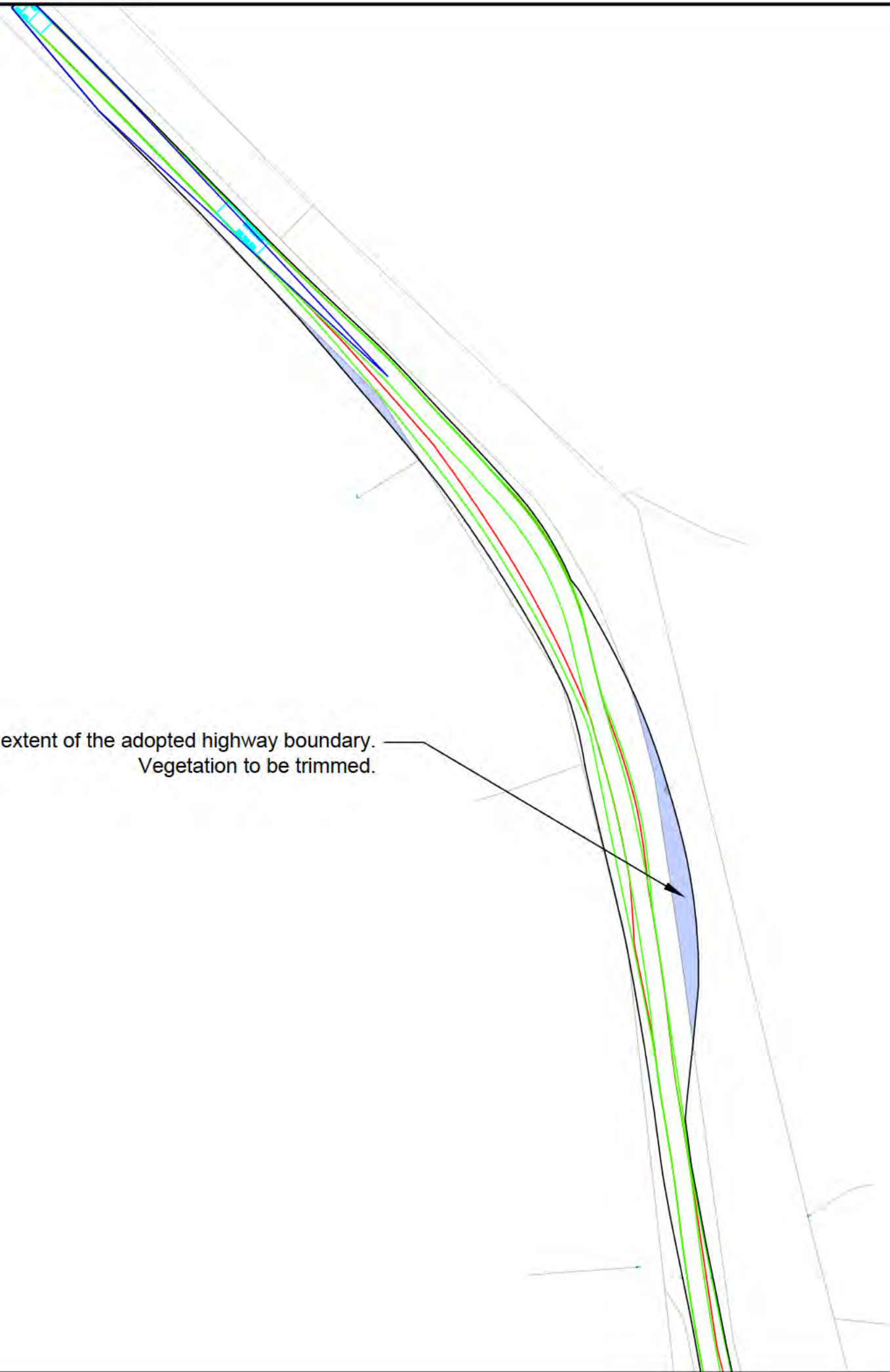
Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:750	A3	METRES

Project No.	Drawing File
662367	

Drawing No.	Rev.
662367-10-23	A





**Legend**

- Overrun Area
- Oversail Area

Confirm the extent of the adopted highway boundary.  
Vegetation to be trimmed.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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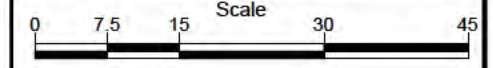
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #24 A839 near Rhaoine 2**

Drawn JW	Date 17/09/21	Checked JH	Date 17/09/21	Approved JH	Date 17/09/21
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Scale 1:750	Orig Size A3	Dimensions METRES
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Project No. 662367	Drawing File
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Drawing No. 662367-10-24	Rev. A
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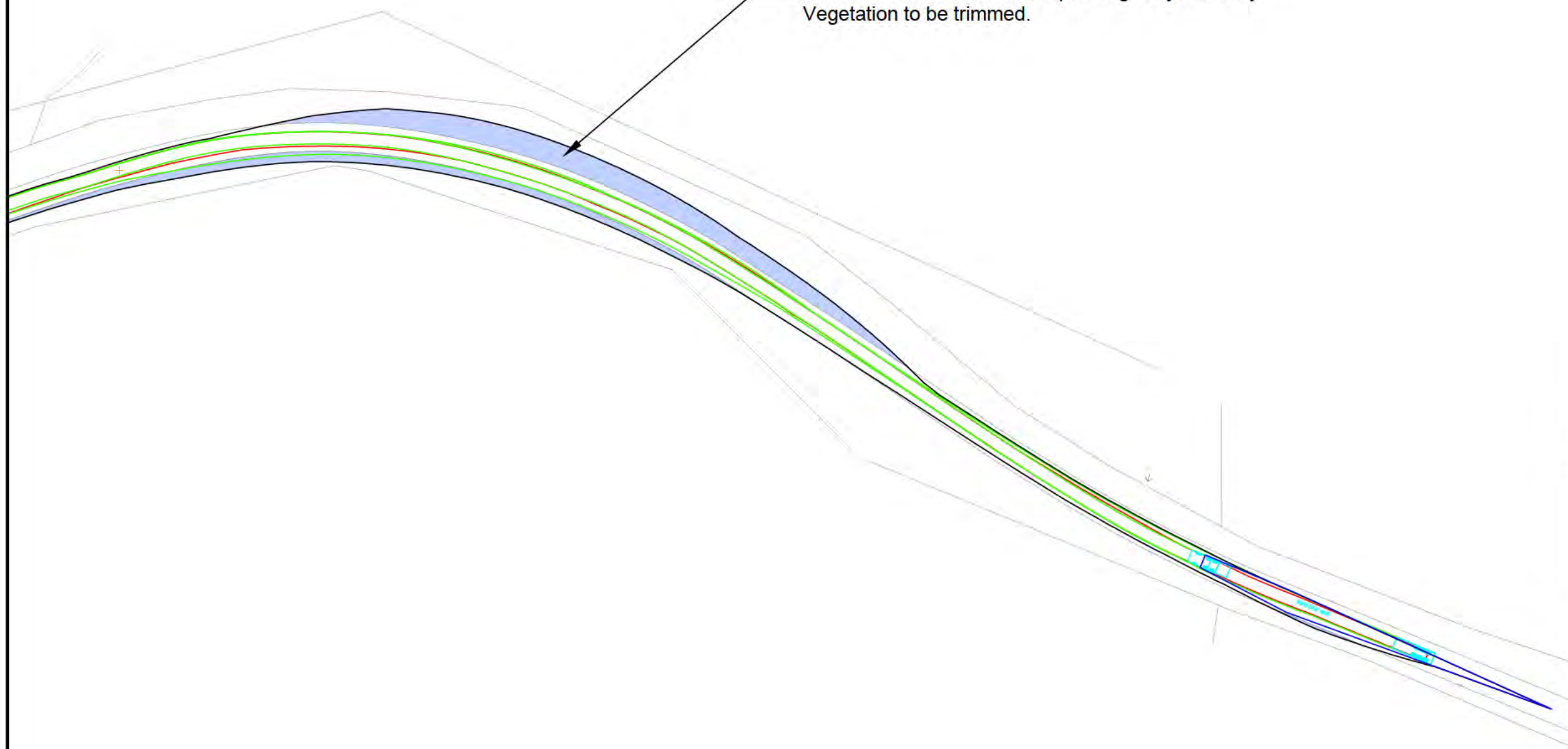




**Legend**

-  Overrun Area
-  Oversail Area

Confirm the extent of the adopted highway boundary.  
Vegetation to be trimmed.



Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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**Chleansaid Wind Farm**

Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #25 A839 West of Rhaoine 1**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

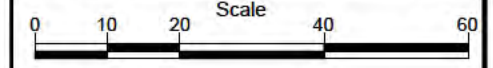
Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.  
662367

Drawing File

Drawing No.  
662367-10-25

Rev.  
A



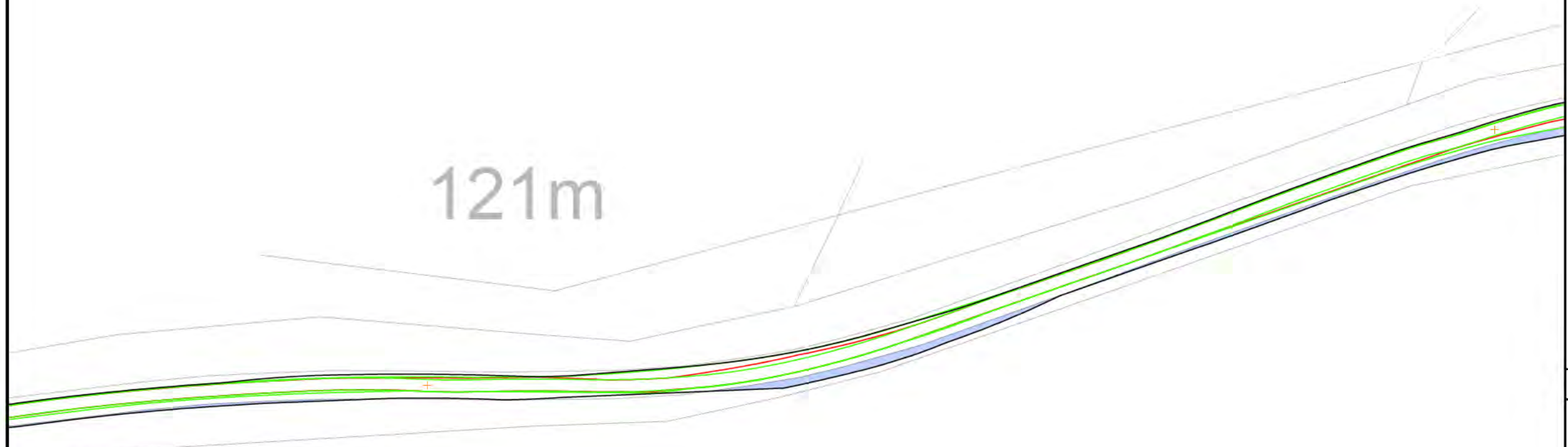




**Legend**

-  Overrun Area
-  Oversail Area

121m



Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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**ESB Asset Development (UK) Ltd**

Project Title  
**Chleansaid Wind Farm**

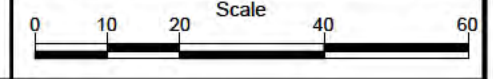
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #26 A839 West of Rhaoine 2**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.  
662367

Drawing No.  
662367-10-26





**Legend**

 Overrun Area

 Oversail Area

138m

Confirm the extent of the adopted highway boundary.  
Vegetation to be trimmed.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Client  
**ESB Asset Development (UK) Ltd**

Project Title  
**Chleansaid Wind Farm**

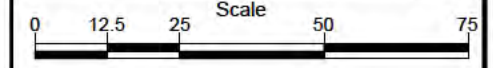
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #27 A839 West of Rhaoine 3**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1250	A3	METRES

Project No.  
662367

Drawing No.  
662367-10-27

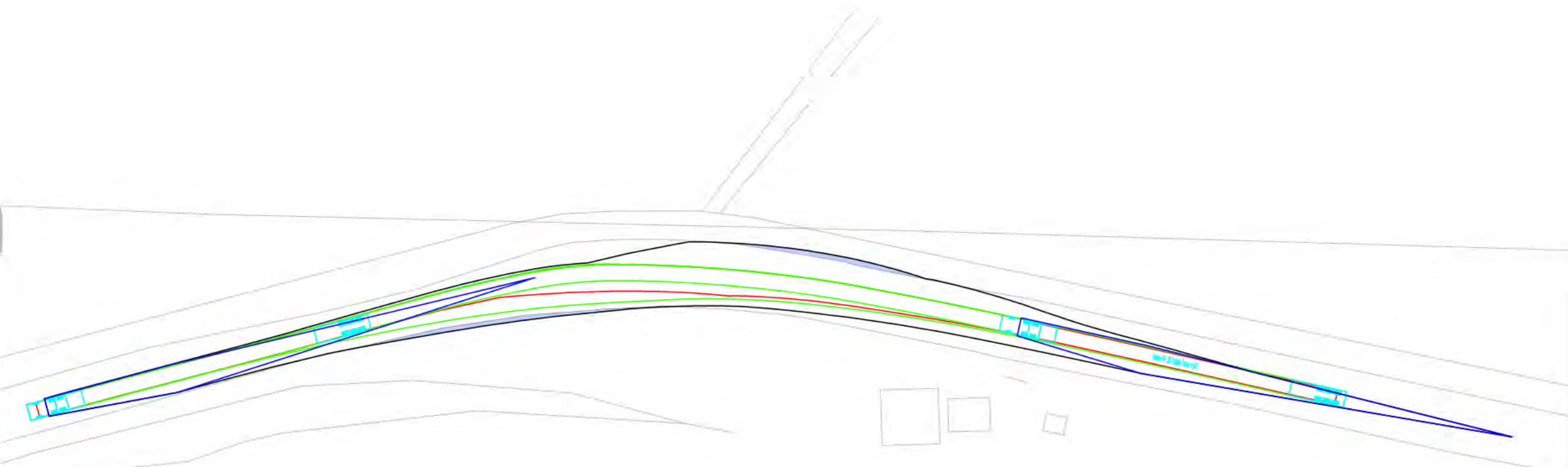




**Legend**

 Overrun Area

 Oversail Area



Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Client  
**ESB Asset Development (UK) Ltd**

Project Title  
**Chleansaid Wind Farm**

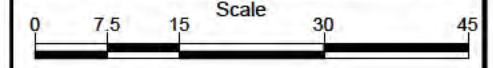
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #28 A839 Near Tomich 1**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:750	A3	METRES

Project No. 662367 Drawing File

Drawing No. 662367-10-28 Rev. A





**Legend**

- Overrun Area
- Oversail Area



Confirm the extent of the adopted highway boundary.  
Trees and vegetation to be trimmed/removed.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Client  
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Project Title  
**Chleansaid Wind Farm**

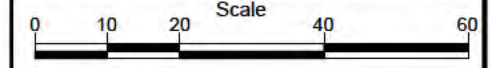
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**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #29 A839 Near Tomich 2**

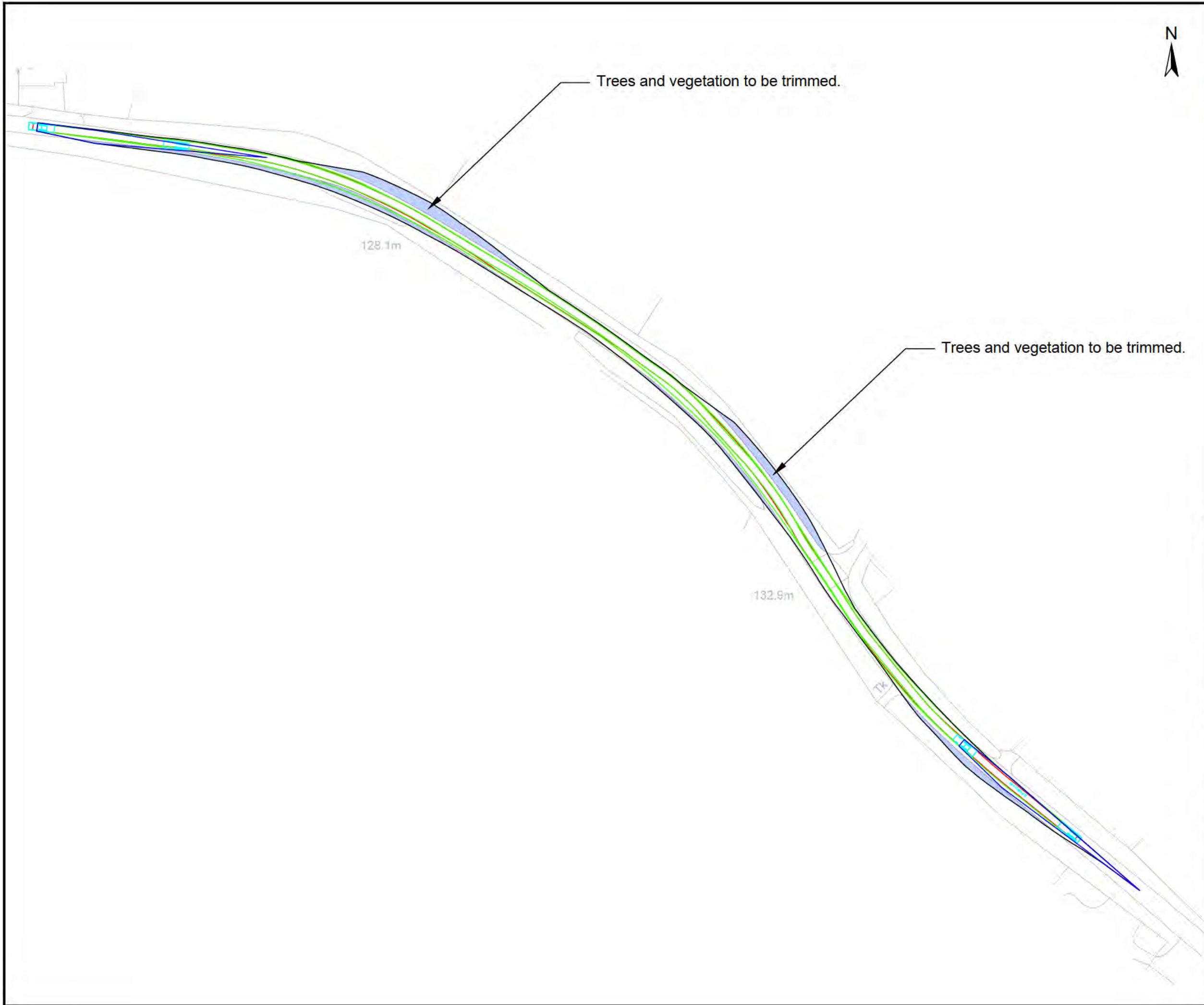
Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.	Drawing File
662367	

Drawing No.	Rev.
662367-10-29	A





**Legend**

- Overrun Area
- Oversail Area

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Project Title  
**Chleansaid Wind Farm**

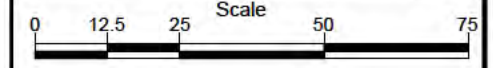
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #30 A839 East of Lairg 1**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1250	A3	METRES

Project No. 662367	Drawing File
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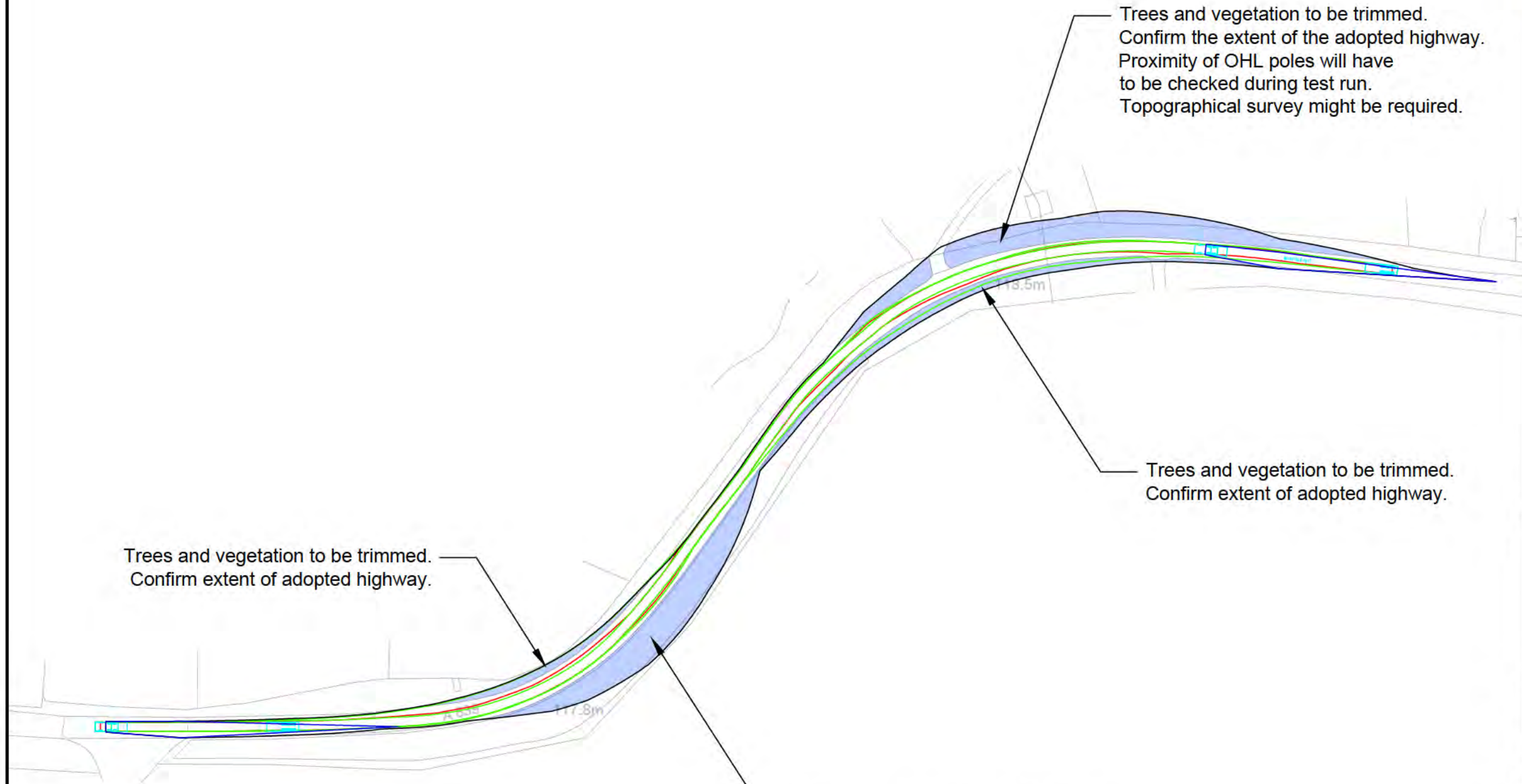
Drawing No. 662367-10-30	Rev. A
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**Legend**

- Overrun Area
- Oversail Area



Trees and vegetation to be trimmed.  
 Confirm the extent of the adopted highway.  
 Proximity of OHL poles will have to be checked during test run.  
 Topographical survey might be required.

Trees and vegetation to be trimmed.  
 Confirm extent of adopted highway.

Trees and vegetation to be trimmed.  
 Confirm extent of adopted highway.

Trees and vegetation to be trimmed.  
 Confirm extent of adopted highway.  
 1 no. sign to be removed.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Project Title  
**Chleansaid Wind Farm**

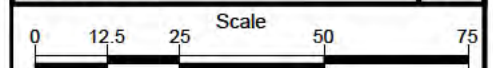
Drawing Title  
**Swept Path Analysis  
 Nordex N163 (Blade - 47m support point)  
 Pol #31 A839 East of Lairg 2**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:1250	A3	METRES

Project No. 662367 Drawing File

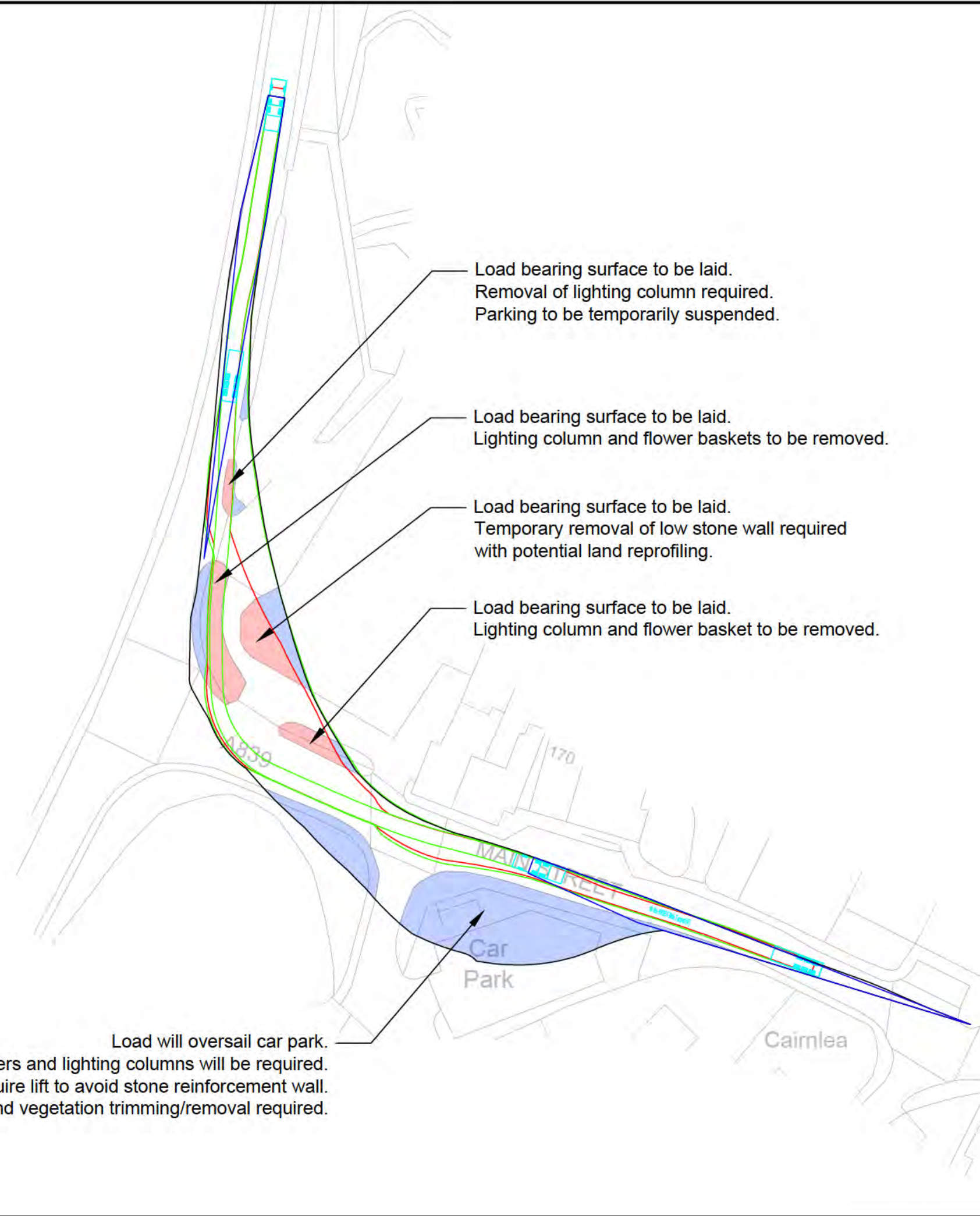
Drawing No. 662367-10-31 Rev. A





**Legend**

- Overrun Area
- Oversail Area



Load bearing surface to be laid.  
Removal of lighting column required.  
Parking to be temporarily suspended.

Load bearing surface to be laid.  
Lighting column and flower baskets to be removed.

Load bearing surface to be laid.  
Temporary removal of low stone wall required  
with potential land reprofiling.

Load bearing surface to be laid.  
Lighting column and flower basket to be removed.

Load will oversail car park.  
Removal of signs, barriers and lighting columns will be required.  
Load might require lift to avoid stone reinforcement wall.  
Trees and vegetation trimming/removal required.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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Project Title  
**Chleansaid Wind Farm**

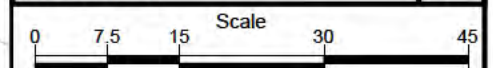
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #32 A839 Lairg**

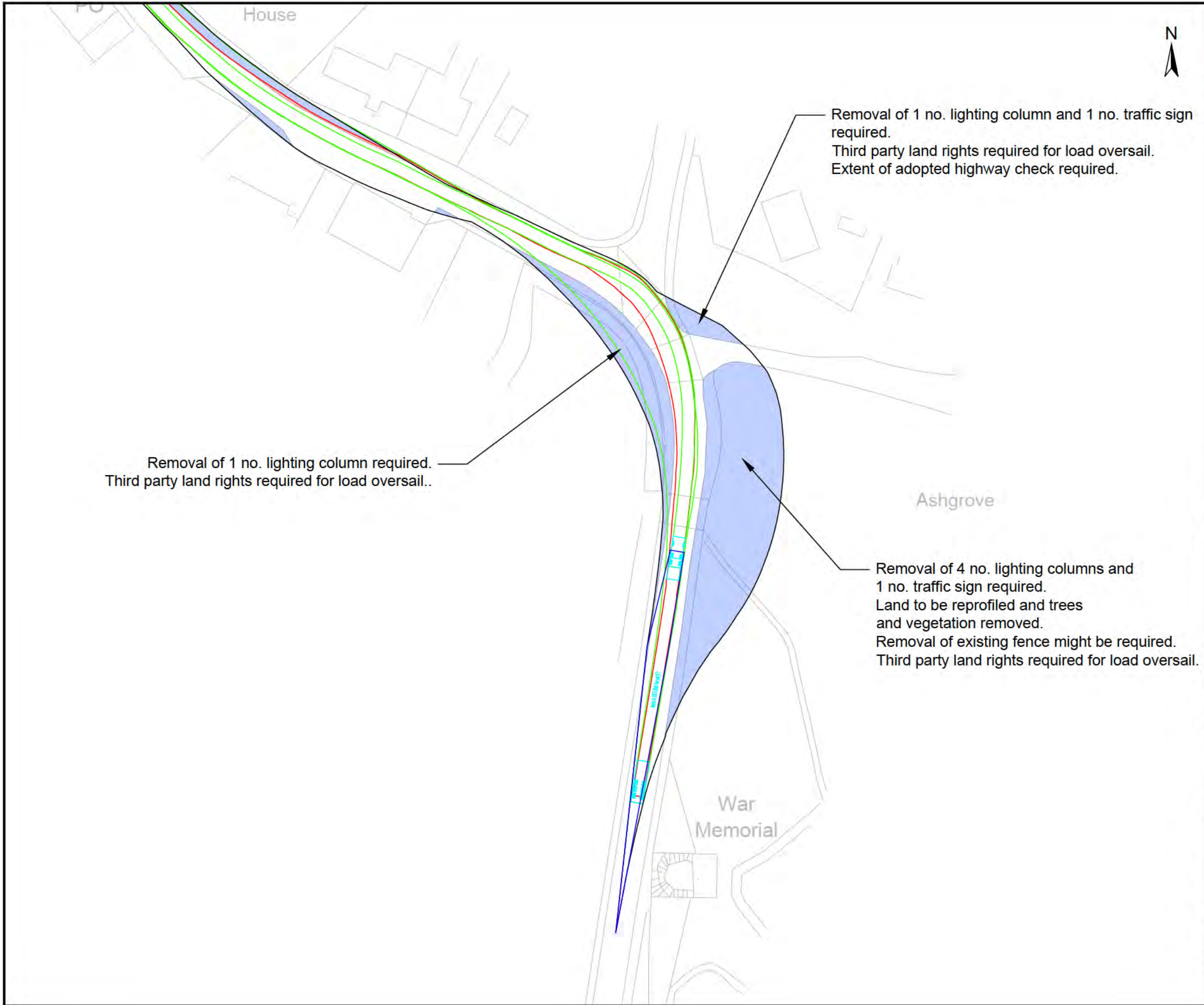
Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:750	A3	METRES

Project No. 662367	Drawing File
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Drawing No. 662367-10-32	Rev. A
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**Legend**

- Overrun Area
- Oversail Area

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
A	28/09/21	Swept path and hatching updated	JW	JH	JH



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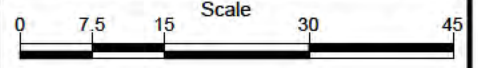
Drawing Title  
**Swept Path Analysis  
Nordex N163 (Blade - 47m support point)  
Pol #33 A836 Lairg Bends 1**

Drawn	Date	Checked	Date	Approved	Date
JW	17/09/21	JH	17/09/21	JH	17/09/21

Scale	Orig Size	Dimensions
1:750	A3	METRES

Project No. 662367      Drawing File

Drawing No. 662367-10-33      Rev. A



Removal of 1 no. lighting column required.  
Third party land rights required for load oversail..

Removal of 1 no. lighting column and 1 no. traffic sign required.  
Third party land rights required for load oversail.  
Extent of adopted highway check required.

Removal of 4 no. lighting columns and 1 no. traffic sign required.  
Land to be reprofiled and trees and vegetation removed.  
Removal of existing fence might be required.  
Third party land rights required for load oversail.