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Pell Frischmann

Tullaghmore Wind Farm

Abnormal Indivisible Load Route Survey

September 2021

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1 Introduction

1.1 Purpose of the Report

Pell Frischmann (PF) has been commissioned by EMPower (EMP) to undertake a study of the delivery route for wind turbine Abnormal Indivisible Loads (AIL) associated with the construction and development of Tullaghmore Wind Farm, located to the northeast of Maam Cross, Connemara.

The Route Survey Report (RSR) has been prepared to help inform EMP on the likely issues associated with the development of the site with regards to off-site transport and access for AIL traffic. This report is based upon a desktop review and identifies the key issues associated with AIL deliveries and notes that remedial works, either in the form of physical works or as traffic management interventions will be required to accommodate the predicted loads.

The detailed assessment and subsequent designs of any remedial works are beyond the agreed scope of works between PF and EMP at this point in time.

It is the responsibility of the wind turbine supplier to ensure that the entirety of the proposed access route is suitable and meets with their satisfaction. The turbine supplier will be responsible for ensuring that the finalised proposals meet with the appropriate levels of health and safety consideration for all road users and in accordance with the relevant legislation at the time of delivery.

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2 Site Background

2.1 Site Location

The development site is located to the northeast of Maam Cross, situated in Connemara in County Galway. Figure 2-1 illustrates the general site location.

Figure 2-1: Site Location Plan



2.2 Candidate Turbine

EMP have indicated that they wish to consider the use of V162 turbines with a tip height of 185m, requiring a 105m tower.

The details of the components are provided in Table 2-1 below.

Table 2-1: Turbine Components Summary

Component	Length (m)	Width (m)	Height / Min Diameter (m)	Weight (t)
Blade	81.100	4.500	4.000	27.100
Base Tower	17.430	(4.450) 4.150	4.189	80.100
Mid Tower 1	24.920	4.189	4.178	76.900
Mid Tower 2	29.960	4.178	4.166	66.500
Top Tower	30.000	4.166	4.008	56.800

The swept path assessments have been based on the blade and mid tower to represent the worst case kinematic envelope.

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 Carrier trailer to reduce the need for mitigation in constrained sections of the route.

South of Oughterard (for the northern access route option), blade loads would be transferred onto a Goldhofer blade lifting trailer. This trailer can lift blades up to a maximum angle of 60 degrees, lifting blades over potential constraints and shortening the length of the plan view. This trailer is not efficient for use on the whole route and as such, it is proposed to swap trailers to carry the blade flat once west of Oughterard for the remainder of the route.

The base and mid towers would be carried on a 4+7 clamp trailer. The hub, nacelle housing, and top towers would be carried on a six-axle step frame trailer.

Figure 2-2: Superwing Carrier Trailer



Figure 2-3: Blade Lifter



Figure 2-4: Clamp Tower Trailer



3 Access Route Review

3.1 Proposed Access Routes

The nearest Port of Entry for the site is Galway Harbour. The port has been used for a number of wind farm projects such as Oweninny Wind Farm and Galway Wind Park. The proposed Vestas V162 would be the largest blades to transit through the port to date.

Due to travel restrictions associated with the current Covid 19 pandemic, it has not been possible to undertake a site visit. Therefore, this study has been undertaken using Google Streetview images and other desk top resources.

Two potential routes have been considered to exit the port and join the N6 (Figure 3-1 shows the routes).

3.1.1 Port Exit Option 1 (Blue Route)

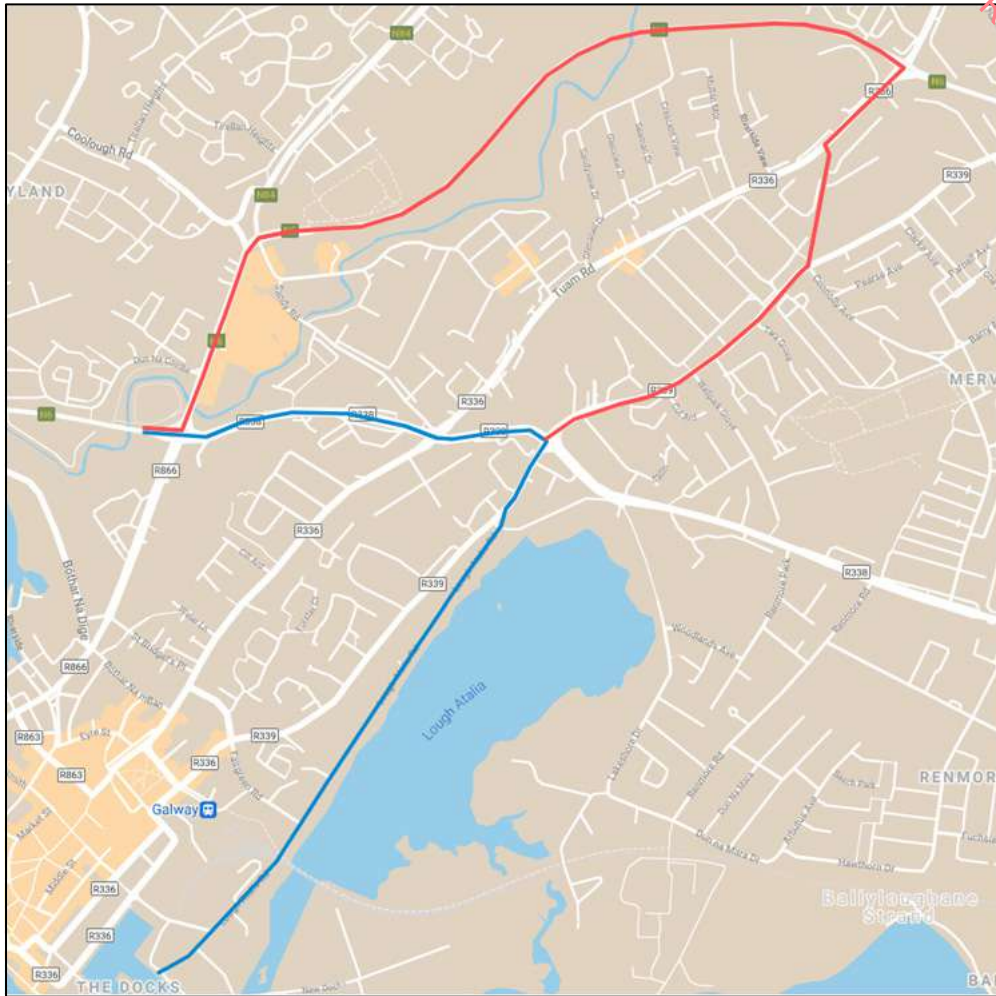
- Exit the port north onto Lough Atalia; and
- Continue onto College Road before turning left onto the R338 and continuing to the N6.

3.1.2 Port Exit Option 2 (Red Route)

- Exit the port north onto Lough Atalia;
- Continue onto College Road and onto the R339 north east;
- Loads would turn left onto Wellpark.
- Loads would turn right onto the R336 travelling north east; and
- Loads would turn left and join the N6 travelling west.

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Figure 3-1: Port Exit Options



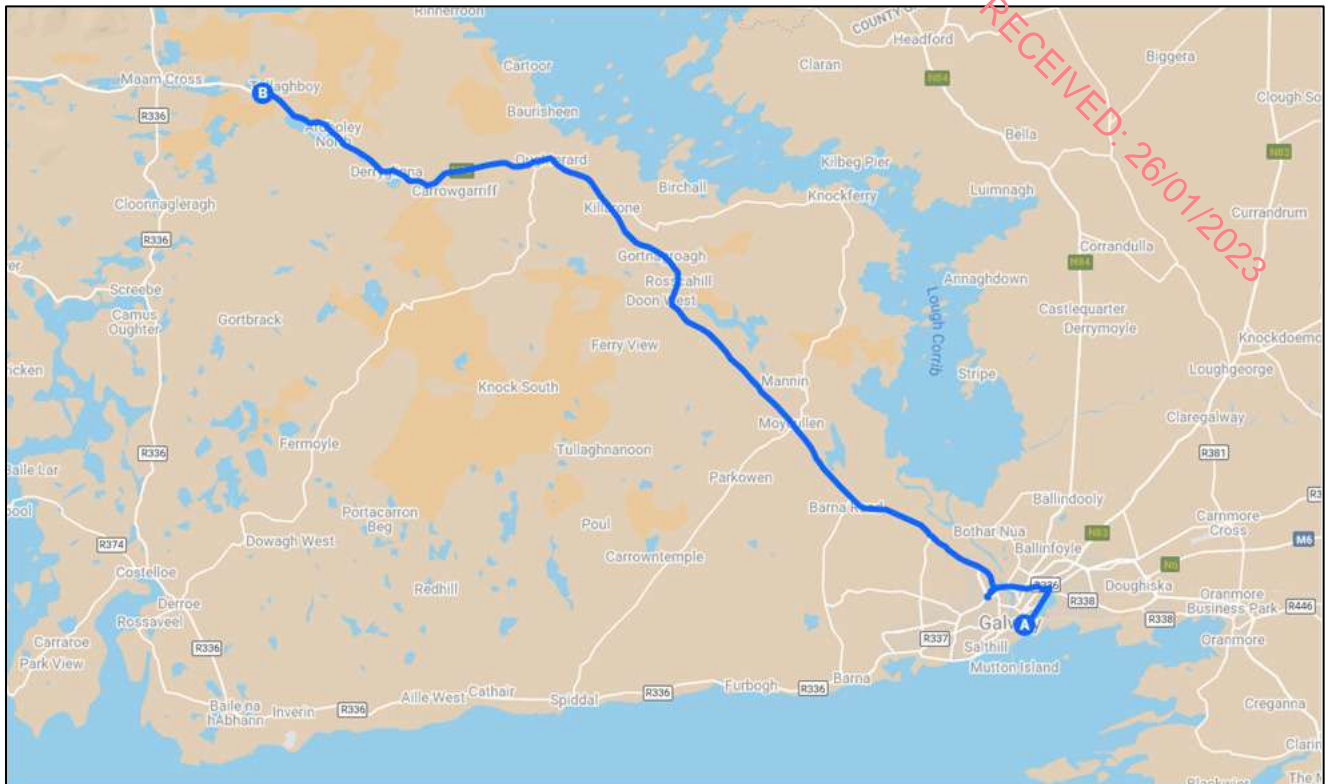
3.1.3 Northern Access Route

The proposed access route to site is as follows:

- Loads would exit the harbour and join Lough Atalia Rd northbound before merging with the R339 northbound;
- Loads would then turn left onto the R338 westbound and merge with the N6;
- Loads would turn right onto Upper Newcastle Road northbound before merging with the N59 northbound; and
- Loads would continue on the N59 northbound to the site access junction east of Maam Cross.

The proposed access route is illustrated in Figure 3-2.

Figure 3-2: Proposed Northern Access Route



3.1.4 Southern Access Route

The proposed access route to site is as follows:

- Loads would exit the harbour and join Lough Atalia Rd northbound before merging with the R339 northbound;
- Loads would then turn left onto the R338 westbound and merge with the N6;
- Loads would continue on the R338 southbound before turning right to join the R337 westbound;
- Loads would merge with the R336 westbound and continue west and north to Maam Cross; and
- Loads would turn right onto the N59 eastbound to the site access junction.

The proposed access route is illustrated in Figure 3-3.

3.2 Route Constraints

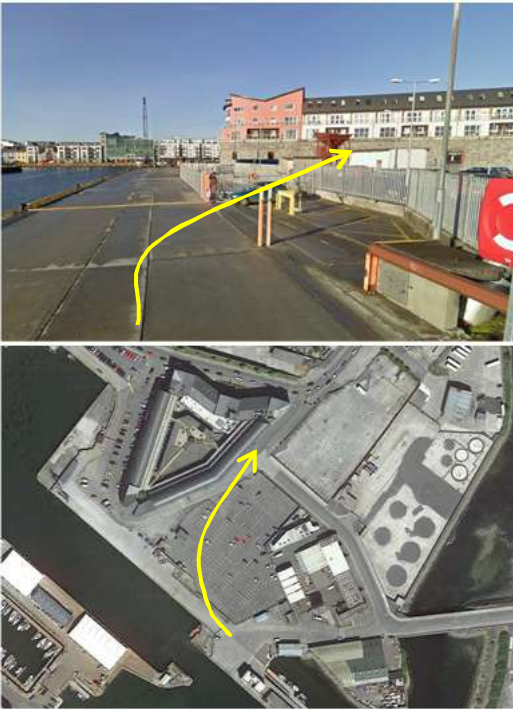

The constraints noted on the routes are provided in the tables below. These cover all constraints from the port access gate through to the proposed site access junction. No consideration of the transport issues within the development site have been undertaken.


Two route options for the exit from Galway Port to the N6 have been presented in Table 3-1 and 3-2. The northern route option to site is provided in Table 3-3. The southern route option to site is detailed in Table 3-4.


Plans illustrating the location of the constraints are provided in Appendix A.

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Table 3-1: Constraint Points and Details – Galway Option 1




POI	Key Constraints	Details
<p>1, 2</p>	<p>Exit from Galway Harbour</p> 	<p>Loads will exit Galway Harbour and proceed onto Lough Atalia Rd.</p> <p>Two options to exit the harbour have been presented. Due to the length of the proposed blade loads, it will be necessary for them to utilise the car park to exit the quay. Option 1 would see the loads drive east and utilise a storage area to turn and then return west before transiting right through the car park and onto Atalia Road. Option 2 would see loads reverse south east along the quay before transiting through the same car park.</p> <p>Swept path assessments have been undertaken and indicates that loads will need to travel through the car park where parking should be suspended and the fences removed. Confirmation should be made that the surface is suitable for the proposed load weights.</p> <p>In order to confirm the required street furniture removal, it is recommended that a topographical survey is used to repeat the swept path assessment.</p> <p>Loads will oversail both footways when joining onto Lough Atalia Road.</p> <p>Swept path assessment SK01 is included in Appendix B.</p>
<p>3</p>	<p>Lough Atalia Rd Bridge</p> 	<p>Loads will continue on Lough Atalia Rd.</p> <p>Loads will pass under the railway which has a signed height restriction of 5.46m. Galway Port Authority have undertaken their own assessments which indicate that the V162 blade is able to pass beneath the structure.</p>

POI	Key Constraints	Details
4	<p>Lough Atalia Rd / R339 Junction</p> 	<p>Loads will merge onto the R339 northbound by Contraflowing through the junction.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both footways where one traffic signal head, one road sign and two bollards should be removed.</p> <p>Swept path assessment SK02 is included in Appendix B.</p>
5	<p>R339 / R338 Junction</p> 	<p>Loads will turn left onto the R338 westbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will overrun and oversail land to the south east of the approach road. Load bearing surfaces should be laid and the low stone wall, the services cabinet and the hotel signage will be oversailed. One lighting column should be removed. Third party land will be required.</p> <p>Three splitter islands will be overrun and oversailed where load bearing surfaces should be laid and nine traffic signal heads should be removed along with four bollards, one road sign and pedestrian guardrails.</p> <p>Loads will oversail the footway on the inside of the left bend where two sets of traffic lights plus one lighting column should be removed. Third party land is required and parking should be suspended.</p> <p>Loads will overrun and oversail the northern footway of the exit road where a load bearing surface should be laid and one traffic signal head and one sign pole should be removed. Trees should be trimmed. Loads will overrun and oversail the exit road central reserve where a load bearing surface should be laid and two bollards should be removed.</p> <p>Swept path assessment SK03 is included in Appendix B.</p>
6	<p>R338 Cemetery Cross Roundabout</p> 	<p>Loads will take the second exit at the roundabout to continue on the R338 westbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will overrun the approach road splitter island where a load bearing surface should be laid and two road signs and one bollard should be removed. Loads will overrun and oversail the southern edge of the roundabout island where a load bearing surface should be laid and three sets of chevron signs should be removed and the vegetation cleared.</p> <p>Loads will oversail both sides of the road on exit from the roundabout where one road sign should be removed.</p> <p>Swept path assessment SK04 is included in Appendix B.</p>

POI	Key Constraints	Details
7	R338 / R866 Junction 	<p>Loads will continue straight at the junction to join the N6 westbound.</p> <p>A swept path assessment has been undertaken and indicates that loads are able to negotiate the junction without the requirement for any physical mitigation.</p> <p>Swept path assessment SK05 is included in Appendix B.</p>

An alternative route out of Galway Port was assessed and is detailed in Table 3-2 below.

Table 3-2: Constraint Points and Details – Galway Option 2

POI	Key Constraints	Details
5	R339 / R338 Junction 	<p>Loads will continue on the R339 northbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will continue north through the junction where they will oversail the footpath and exit road splitter island where two traffic lights, one crossing control and the pedestrian guardrail should be removed.</p> <p>Swept path assessment SK52 is included in Appendix B.</p>
8	R339 Mervue Industrial Estate 	<p>Loads will turn left to exit the R339 and proceed towards the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will overrun and oversail the eastern and western footways of the exit road where load bearing surfaces should be laid and two traffic signals and one lighting column should be removed.</p> <p>Swept path assessment SK53 is included in Appendix B.</p>
9	R336 Mervue Industrial Estate 	<p>Loads will turn right to join the R336 northbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will overrun and oversail the verge on the inside of the right turn where a load bearing surface should be laid and one lighting column removed.</p> <p>Loads will oversail the footway in advance of the junction however no physical mitigation is required.</p> <p>Swept path assessment SK54 is included in Appendix B.</p>


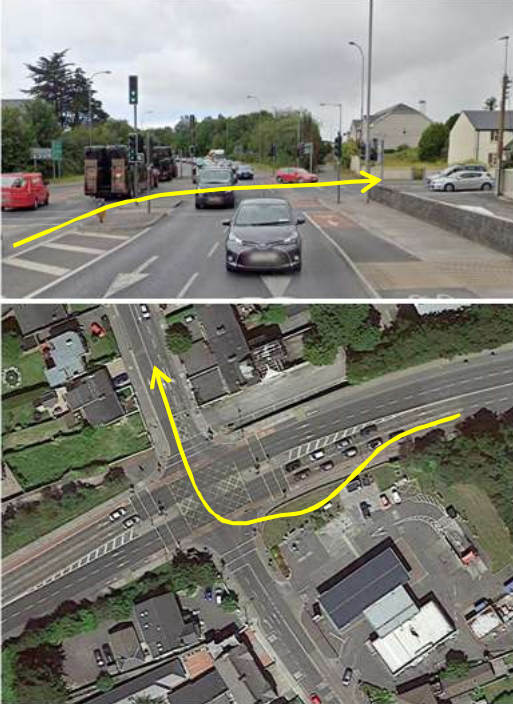






POI	Key Constraints	Details
10	<p>R336 / N6 Junction</p> 	<p>Loads will turn left to join the N6 westbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail into the south eastern verge on approach to the junction where the blade tip will oversail bollards and the pedestrian guardrail. Two lighting columns, signage and two poles should be removed. One tree should be trimmed and third party land will be required.</p> <p>Loads will overrun and oversail three splitter islands where load bearing surfaces should be laid and five sets of traffic lights, four bollards, one road sign and all pedestrian guardrails should be removed.</p> <p>Loads will oversail the verge on the inside of the left bend where two traffic signals, one lighting columns, one road sign and the pedestrian guardrail should be removed.</p> <p>Swept path assessment SK55 is included in Appendix B.</p>
11	<p>N6 / N84 Roundabout</p> 	<p>Loads will take the second exit at the roundabout to remain on the N6 southbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail the approach road central reserve where four traffic signals and four road signs should be removed. The blade tip will oversail the pedestrian guardrail.</p> <p>Loads will oversail the pedestrian guardrail on the inside of the left movement.</p> <p>Loads will overrun and oversail the south eastern edge of the roundabout where a load bearing surface should be laid and two signs should be removed.</p> <p>Swept path assessment SK56 is included in Appendix B.</p>
7	<p>R338 / R866 Junction</p> 	<p>Loads will turn right at the junction to join the N6 westbound using a contra flow manoeuvre.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail the eastern footway on approach to the junction.</p> <p>Loads will overrun and oversail the approach road central reserve to contraflow through the junction. A load bearing surface should be laid and one road sign should be removed.</p> <p>Loads will oversail the footway on the inside of the right bend where one traffic light should be removed and the trees cleared.</p> <p>Swept path assessment SK57 is included in Appendix B.</p>

Table 3-3: Constraint Points and Details – Northern Route




POI	Key Constraints	Details
<p>12</p>	<p>N6 / Upper Newcastle Rd Junction (Option a)</p> 	<p>Loads will turn right onto Upper Newcastle Rd northbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will overrun and oversail the footway and the private filling station where a load bearing surface should be laid. Two lighting columns, two traffic lights and all lighting columns within the filling station will need to be removed. Discussions should be held with the petrol station owners. Third party land required.</p> <p>Loads will oversail the approach road splitter island where two sets of traffic lights and one bollard should be removed.</p> <p>Loads will oversail the inside of the right turn where one utility pole, two traffic lights, one lighting column, two road signs, one tree and the stone wall should be removed. Third party land is required.</p> <p>Loads will overrun and oversail the western footway of the exit road where a load bearing surface should be laid.</p> <p>Swept path assessment SK06 is included in Appendix B.</p>
<p>13</p>	<p>N6 Browne Roundabout (Option b)</p> 	<p>Should land not be available at POI 12, an alternative route has been investigated. Loads will take the fourth exit at the roundabout to join the N59 northbound, undertaking a contraflow manoeuvre.</p> <p>A swept path assessment has been undertaken and indicates that loads will overrun and oversail the eastern verge of the approach road where a load bearing surface should be laid and one road sign, one lighting column and the trees should be removed. Parking should be suspended and third party land is required.</p> <p>Loads will overrun and oversail the approach and exit road splitter islands where load bearing surfaces should be laid and four road signs and two bollards should be removed.</p> <p>Loads will overrun and oversail the northern edge of the roundabout island where a load bearing surface should be laid and two sets of chevron signs should be removed.</p> <p>Loads will overrun and oversail the western footway of the exit road where a load bearing surface should be laid and the trees should be trimmed.</p> <p>Loads will overrun and oversail the footway and verge on the inside of the right turn where a load bearing surface should be laid and the crash barrier, stone wall, one road sign, two lighting columns and trees should be removed. Third party land is required.</p> <p>Swept path assessment SK58 is included in Appendix B.</p>

POI	Key Constraints	Details
<p>14</p>	<p>N59 / Upper Newcastle Rd Junction (option b)</p> 	<p>Loads will turn left at the junction to remain on the N59 northbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail the south eastern verge on approach to the junction where trees, one traffic light and one road sign should be removed.</p> <p>Loads will overrun and oversail the inside of the left turn where a load bearing surface should be laid. Trees, one road sign, two traffic lights and one lighting column should be removed along with a section of wall. Third party land is required.</p> <p>Loads will overrun and oversail the northern footway of the exit road where a load bearing surface should be laid and one traffic signal removed.</p> <p>Swept path assessment SK59 is included in Appendix B.</p>
<p>15</p>	<p>N59 Doon West</p> 	<p>Loads will continue on the N59.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both sides of the road through the right bend where three road signs, vegetation / trees and two utility poles should be removed. The traffic bollards will be oversailed. A land search should be completed to confirm the extent of adopted boundary available.</p> <p>Swept path assessment SK07 is included in Appendix B.</p>
<p>16</p>	<p>N59 Laghtgannon</p> 	<p>Loads will continue on the N59.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the bend.</p> <p>Swept path assessment SK08 is included in Appendix B.</p>
<p>17</p>	<p>N59 Oldchapel</p> 	<p>Loads will continue west on the N59.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the section where three road signs should be removed. Hedges should be trimmed and there is minimal clearance to the walls on either side of road.</p> <p>Swept path assessment SK09 is included in Appendix B.</p>




POI	Key Constraints	Details
<p>TP 1</p>	<p>Potential Blade Transfer Point 1</p> 	<p>A suitable location for a blade transfer point is required to the east of Riverside to allow the blades to be transferred from the Superwing carrier trailers to blade lifting trailers.</p> <p>The area of land required will need to be circa 160m x 40m and will need to include an access junction and two crane pads. Storage for up to three blades should also be available, with all infrastructure designed in accordance with turbine manufacturer standards.</p> <p>The location of the transfer point is dependent upon EMPOWER agreeing a land option. A potential area is illustrated opposite and is considered suitable, subject to the design of the required infrastructure.</p> <p>Once loaded onto the tilting trailers, the loads will proceed through Riverside and west on the N59. V162 blades will continue to the beginning of POI 24.</p> <p>All overhead utilities and obstructions such as trees would need to be removed to accommodate the raised blade between the transfer zones. It is assumed that the blade will be carried in the raised position for all POI locations between the transfer zones.</p>
<p>18 & 19</p>	<p>N59 Ardvarna & Oughterard</p> 	<p>Loads will continue on the N59.</p> <p>A swept path assessment has been undertaken with the blade in the raised position and indicates that loads will oversail the footway on the outside of the left bend. Parking should be suspended to allow loads to utilise the parking bays through the bend.</p> <p>It is recommended that a traffic management plan is developed to control the movement of loads through the town.</p> <p>Swept path assessment SK10 is included in Appendix B.</p>



POI	Key Constraints	Details
20	<p>N59 Riverside</p> 	<p>Loads will continue on the N59.</p> <p>A swept path assessment has been undertaken with the blade in the raised position and indicates that loads will oversail into third party land to the south of the road. The blade will oversail the buildings and lighting columns.</p> <p>Loads will oversail both sides of the bridge into third party land. Extensive street furniture removal will be required however a topographical survey of the section is required to confirm the works.</p> <p>All overhead utilities and obstructions should be removed.</p> <p>Swept path assessment SK11 is included in Appendix B.</p>

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POI	Key Constraints	Details
21 - 23	<p>N59 Oughterard Shrubbery to Riverside House</p> 	<p>Loads will continue west on the N59.</p> <p>A swept path assessment has been undertaken with the blade in the raised position and indicates that loads will oversail both verges throughout the section. All overhead utilities and obstructions should be removed. Vegetation and trees should be trimmed.</p> <p>Swept path assessment SK12 is included in Appendix B.</p>
24	<p>N59 Claremount</p> 	<p>Loads will continue west on the N59.</p> <p>A swept path assessment has been undertaken with the blade in the raised position and indicates that loads will oversail both verges throughout the section. Two road signs should be removed and the vegetation trimmed. The crash barrier will be oversailed.</p> <p>Swept path assessment SK13 is included in Appendix B.</p>
TP 2	<p>Potential Blade Transfer Point 2</p> 	<p>A suitable location for a blade transfer point is required to the west of POI 24 to allow the V162 blades to be transferred from the blade lifting trailer to the Superwing carrier trailers.</p> <p>The area of land required will need to be circa 160m x 40m and will need to include an access junction and two crane pads. Storage for up to three blades should also be available, with all infrastructure designed in accordance with turbine manufacturer standards.</p> <p>The location of the transfer point is dependent upon EPower agreeing a land option. A potential area is illustrated opposite and is considered suitable, subject to the design of the required infrastructure.</p>

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POI	Key Constraints	Details
25	<p>N59 Carrowgarriff</p> 	<p>Loads will continue on the N59.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the section. One road sign should be removed and vegetation should be trimmed.</p> <p>Swept path assessment SK14 is included in Appendix B.</p>
26 & 27	<p>N59 west of Carrowgarriff & Glengowla West</p> 	<p>Loads will continue on the N59.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both sides of the road throughout the right / left bend section where one road sign and one utility pole should be removed. Vegetation should be trimmed throughout and the blade will oversail the safety barrier. A section of fence should be removed from the outside of the final right bend where third party land is required for blade tip oversail.</p> <p>Swept path assessment SK15 is included in Appendix B.</p>
28	<p>N59 east of Lough Agraffard</p> 	<p>Loads will continue on the N59.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the right / left bends. Third party land will be required for oversail on the inside of the right bend and outside of the left bend where vegetation / trees and sections of fence should be removed.</p> <p>Two utility poles should be removed.</p> <p>Swept path assessment SK16 is included in Appendix B.</p>

POI	Key Constraints	Details
29 & 30	<p>N59 Lough Agraiffard</p> 	<p>Loads will continue on the N59.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges throughout the left / right bends where vegetation should be trimmed. One road sign, two utility poles, a section of fence and vegetation / trees should be removed. Third party land is required to the south of the road through the final right bend.</p> <p>Swept path assessment SK17 is included in Appendix B.</p>
31	<p>N59 southeast of Ardboley North</p> 	<p>Loads will continue on the N59.</p> <p>A swept path assessment has been undertaken and indicates that loads will overrun and oversail both verges throughout the section. Load bearing surfaces should be laid and two utility poles, vegetation / trees and a section of fence should be removed.</p> <p>Swept path assessment SK18 is included in Appendix B.</p>




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POI	Key Constraints	Details
<p>32 & 33</p>	<p>N59 Lough Bofin</p> 	<p>Loads will continue west through the bend section on the N59.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges throughout the section where vegetation should be trimmed and one utility pole should be removed.</p> <p>Swept path assessment SK19 is included in Appendix B.</p>
<p>34</p>	<p>Proposed Site Access</p> 	<p>Loads will turn right into the site access junction.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail and overrun into third party land on the inside of the right bend.</p> <p>The junction should be designed to meet manufacturer and road authority standards. Utility poles and vegetation will need to be removed and the existing track will need to be upgraded and widened to a minimum of 4.5m.</p> <p>Swept path assessment SK20 is included in Appendix B.</p>

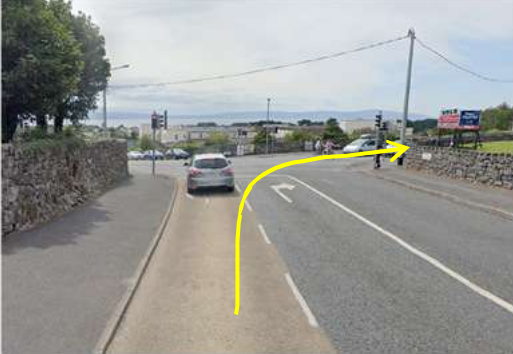



3.2.1 Southern Route Option





Loads will exit Galway Port and continue to the N6 at POI 13 where the remainder of the route is detailed in Table 3-4 below.

Table 3-4: Constraint Points and Details – Southern Route



POI	Key Constraints	Details
13	<p>N6 Browne Roundabout</p> 	<p>Loads will take the third exit at the roundabout to join the R338 southbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will overrun and oversail the south eastern edge of the roundabout island where a load bearing surface should be laid and three sets of chevron signs should be removed and the vegetation cleared.</p> <p>Swept path assessment SK21 is included in Appendix B.</p>
35	<p>R338 Rahoon</p> 	<p>Loads will continue on the R338.</p> <p>Loads will occupy all lanes through the bend however there is no requirement for physical mitigation.</p>
36	<p>R338 Deane Roundabout</p> 	<p>Loads will take the second exit at the roundabout to continue on the R338 southbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail the eastern verge on entry and exit from the roundabout along with the eastern edge of the roundabout island itself. One bollard should be removed from the approach road splitter island and vegetation should be trimmed.</p> <p>Swept path assessment SK22 is included in Appendix B.</p>

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POI	Key Constraints	Details
37	<p>R338 / R337 Junction</p> 	<p>Loads will turn right onto the R337 westbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail and overrun into third party land on the inside of the right turn where a load bearing surface should be laid. One utility pole, two sets of traffic lights, two services cabinets, a series of bollards and a section of wall should be removed. Third party land is required.</p> <p>Loads will oversail the eastern footway on approach to the bend where one traffic signal head should be removed. Loads will overrun and oversail the southern footway on exit from the bend where a load bearing surface should be laid. It is recommended that the swept path assessment is repeated on a topographical base plan.</p> <p>Swept path assessment SK23 is included in Appendix B.</p>
38	<p>R337 southwest of Kingston</p> 	<p>Loads will continue straight ahead on the R337.</p> <p>Loads to pass the traffic lights at a slow speed due to the reduced road width.</p>
39	<p>R336 Ballard</p> 	<p>Loads will continue on the R336 westbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail the northern footway on entry to the roundabout. The trees should be trimmed.</p> <p>Swept path assessment SK24 is included in Appendix B.</p>
40	<p>R336 Carraig Na Greine</p> 	<p>Loads will continue west on the R336 near Carraig Na Greine.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the bends where vegetation should be trimmed. There is limited clearance to the stone wall to the south of the road and it is recommended that a land search is completed to confirm the extent of adopted boundary available to the north.</p> <p>Swept path assessment SK25 is included in Appendix B.</p>



POI	Key Constraints	Details
41	<p>R336 Furbo Hill</p> 	<p>Loads will continue west on the R336.</p> <p>Loads will occupy the entire road through the section however no physical mitigation is required. Escorts should provide advanced warning to oncoming vehicles.</p>
42	<p>R336 Baile An Tsleibhe</p> 	<p>Loads will continue west on the R336 passing Baile An Tsleibhe.</p> <p>Loads will occupy the entire road through the section however no physical mitigation is required. Escorts should provide advanced warning to oncoming vehicles.</p>
43	<p>R336 east of Spiddal Middle</p> 	<p>Loads will continue west on the R336.</p> <p>Loads will occupy the entire road through the section however no physical mitigation is required. Escorts should provide advanced warning to oncoming vehicles.</p>
44	<p>R336 Spiddal Middle</p> 	<p>Loads will continue west on the R336 past Spiddal Middle.</p> <p>Loads will oversail the verge on the inside of the bend however no physical mitigation is required.</p>

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POI	Key Constraints	Details
45	<p>R336 Cor Na Ron Middle</p> 	<p>Loads will continue on the R336.</p> <p>Loads will oversail the verge on the inside of the bend however no physical mitigation is required.</p>
46	<p>R336 west of Cor Na Ron Middle</p> 	<p>Loads will continue on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the left bend.</p> <p>Swept path assessment SK26 is included in Appendix B.</p>
47	<p>R336 Cartron</p> 	<p>Loads will continue west on the R336 through Cartron.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail the verge on the inside of the bend however no mitigation is required.</p> <p>Swept path assessment SK27 is included in Appendix B.</p>
48	<p>R336 / L1200 Junction</p> 	<p>Loads will turn right to continue on the R336 northbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will overrun and oversail into third party land on the inside of the right bend where a load bearing surface should be laid and one utility pole should be removed.</p> <p>Swept path assessment SK28 is included in Appendix B.</p>




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POI	Key Constraints	Details
49	<p>R336 / R343 Junction</p> 	<p>Loads will turn right to continue on the R336 northbound.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail the southern verge on approach to the junction where the blade tip will oversail a stone wall into third party land and one road sign should be removed.</p> <p>Loads will oversail into third party land on the inside of the right turn where the stone wall, one lighting column, one service cabinet, one metal gate and two road signs should be removed. Parking should be suspended during load movements. Loads will oversail the western verge of the exit road.</p> <p>Swept path assessment SK29 is included in Appendix B.</p>
50	<p>R336 south of Lough Nawnaghaneekyne</p> 	<p>Loads will continue north on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges throughout the bend section. Land searches should be completed throughout to determine the extent of adopted boundary available.</p> <p>It is recommended that the swept path assessment is repeated on a topographical base plan to confirm the proximity to the rocks east of the road through the initial left bend. Vegetation / trees should be trimmed throughout and one utility pole should be removed.</p> <p>Swept path assessment SK30 is included in Appendix B.</p>
51	<p>R336 Lough Nawnaghaneekyne</p> 	<p>Loads will continue north on the R336 passing Lough Nawnaghaneekyne.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the right bend. Potential third party land is required on the inside of the bend and a land search should be completed to confirm the extent of adopted boundary on the outside of the bend.</p> <p>Swept path assessment SK31 is included in Appendix B.</p>





POI	Key Constraints	Details
52 & 53	<p>R336 Lough Carrafinla</p> 	<p>Loads will continue north on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will require to oversail into third party land on both sides of the road throughout the route. Vegetation / trees, four utility poles and a stone wall will need to be removed.</p> <p>Swept path assessment SK32 is included in Appendix B.</p>
54	<p>R336 northwest of Loch na mBuaichini</p> 	<p>Loads will continue north on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the initial right / left bends where vegetation should be cleared. A land search is recommended on the outside of the initial right bend to confirm the extent of adopted boundary available.</p> <p>Through the final right bend, loads will oversail into third party land on both sides of the road where two utility poles should be removed and vegetation trimmed.</p> <p>Swept path assessment SK33 is included in Appendix B.</p>




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POI	Key Constraints	Details
55 & 56	<p>R336 Loughaunweeny & R336 / R340 Junction</p> 	<p>Loads will turn right to continue on the R336 northbound at Loughaunweeny.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both sides of the left bend on approach to the junction where third party land will be required to the west. Vegetation should be trimmed throughout.</p> <p>Loads will overrun and oversail into third party land on the outside of the junction where a load bearing surface should be laid and two road signs and trees should be removed. Loads will oversail the inside of the turn into third party land and it is recommended that the swept path assessment is repeated on a topographical survey base. Two road signs should be removed.</p> <p>Swept path assessment SK34 is included in Appendix B.</p>
57	<p>R336 Doire Bhanbh</p> 	<p>Loads will continue on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the right bend where third party land will be required on the inside. Trees / vegetation should be cleared.</p> <p>Swept path assessment SK35 is included in Appendix B.</p>
58	<p>R336 Lough Ahalia</p> 	<p>Loads will continue north on the R336 past Lough Ahalia.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the bends. Vegetation should be cleared and one utility pole should be removed.</p> <p>Swept path assessment SK36 is included in Appendix B.</p>
59	<p>R336 Loch Dhoire Bhanbh</p> 	<p>Loads will continue on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the right bend where vegetation should be cleared.</p> <p>Swept path assessment SK37 is included in Appendix B.</p>

POI	Key Constraints	Details
60	<p>R336 Knockadav</p> 	<p>Loads will continue north on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the right / left bends where vegetation should be trimmed. It is recommended that a land search is completed to confirm the requirement for third party land on the outside of the initial right bend.</p> <p>Swept path assessment SK38 is included in Appendix B.</p>
61	<p>R336 Lough Aughawoolia</p> 	<p>Loads will continue north on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail into third party land on both sides of the road through the initial right / left bends where vegetation should be cleared and one utility pole should be removed.</p> <p>Loads will continue to oversail both verges through the following section where third party land will be required to the west of the road where the blade tip will oversail the safety barrier and fence. Two utility poles should be removed and vegetation cleared.</p> <p>Swept path assessment SK39 is included in Appendix B.</p>
62	<p>R336 Screebe Waterfall</p> 	<p>Loads will continue on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges into third party land through the first and second bridge crossing. Loads should be set to their maximum suspension settings to allow oversail of the bridge parapets. Vegetation should be cleared.</p> <p>One utility pole should be removed from the south western verge in advance of the second bridge. Care should be taken to ensure that overhead utilities are not impacted when the load suspension is raised.</p> <p>Swept path assessment SK40 is included in Appendix B.</p>

POI	Key Constraints	Details
63	<p>R336 south of Loughaunfree</p> 	<p>Loads will continue on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the right bend. The clearance to the rock face on the inside of the bend should be confirmed on a topographical survey. Third party land will be required on both sides of the road. Two utility poles should be removed from the western verge and vegetation should be cleared.</p> <p>Swept path assessment SK41 is included in Appendix B.</p>
64	<p>R336 Loughaunfree</p> 	<p>Loads will continue north on the R336.</p> <p>It is recommended that a topographical survey is completed and the swept path assessment repeated to confirm the proposed mitigation.</p> <p>A swept path assessment has been undertaken and indicates that loads will overrun and oversail the verge on the inside of the initial right bend where a load bearing surface should be laid.</p> <p>Loads will oversail into third party land on both sides of the road through the section. Vegetation should be cleared and the proximity to the utility poles should be confirmed on the topographical survey.</p> <p>The clearance to the rock face on the inside of the second right bend should be confirmed on the topographical survey.</p> <p>Swept path assessment SK42 is included in Appendix B.</p>
65	<p>R336 Lough Nasilloge</p> 	<p>Loads will continue on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will overrun and oversail the verge on the outside of the bend where a load bearing surface should be laid and third party land will be required. Vegetation should be cleared.</p> <p>Loads will oversail the verge on the inside of the left bend.</p> <p>Swept path assessment SK43 is included in Appendix B.</p>

POI	Key Constraints	Details
66	<p>R336 Lough Aphreaghaun</p> 	<p>Loads will continue on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail the western verge on approach to the bridge over Lough Aphreaghaun.</p> <p>Loads will oversail both verges through the following section with third party land required into land to the east of the road. Load suspension should be raised to oversail the bridge parapet where third party land will be required.</p> <p>Swept path assessment SK44 is included in Appendix B.</p>
67	<p>R336 east of Lough Nahasleam</p> 	<p>Loads will continue north on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the right bend where third party land will be required on both sides of the road. Utility poles should be removed from the outside of the bend and the blade tip will oversail the stone wall. Vegetation should be trimmed and it is recommended that a loads are raised on the suspension settings to oversail the rock on the inside of the bend.</p> <p>Loads will continue to oversail both verges through the following left bend where vegetation should be cleared and it is recommended that a land search is completed to confirm if third party land is required.</p> <p>Swept path assessment SK45 is included in Appendix B.</p>
68	<p>R336 northeast of Lough Nahasleam</p> 	<p>Loads will continue north on the R336.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail into third party land on both sides of the road where vegetation should be cleared and utility poles should be removed.</p> <p>Swept path assessment SK46 is included in Appendix B.</p>
69	<p>R336 south of Ardderry Lough</p> 	<p>Loads will continue on the R336 south of Ardderry Lough.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail into third party land on both sides of the road where vegetation should be cleared and utility poles should be removed.</p> <p>Swept path assessment SK47 is included in Appendix B.</p>

POI	Key Constraints	Details
70 & 71	<p>R336 Ardderry Lough & R336 / N59 Junction</p> 	<p>Loads will turn right to join the N59 eastbound at the junction.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail into third party land on both sides of the road throughout the section. Four utility poles, eight road signs, stone wall and trees to be removed.</p> <p>Trailer suspension settings should be raised to allow oversail of the bridge parapet. Overhead utilities should be cleared where the trailer is raised.</p> <p>Swept path assessment SK48 is included in Appendix B.</p>
72	<p>N59 east of Maam Cross</p> 	<p>Loads will continue east on the N59 at Maam Cross.</p> <p>A swept path assessment has been undertaken and indicates that loads will oversail both verges through the bend where vegetation should be cleared.</p> <p>Swept path assessment SK49 is included in Appendix B.</p>
73	<p>N59 Lurgan Lough</p> 	<p>Loads will continue on the N59 near Lurgan Lough.</p> <p>A swept path assessment has been undertaken and indicates that the trailer suspension should be raised to allow oversail of the safety barrier. Trees and vegetation should be cleared and the blade tip will oversail the safety barrier through the final left bend where potential third party land will be required.</p> <p>Swept path assessment SK50 is included in Appendix B.</p>

POI	Key Constraints	Details
34	<p data-bbox="220 241 475 271">Proposed Site Access</p> 	<p data-bbox="751 253 1254 282">Loads will turn left into the site access junction.</p> <p data-bbox="751 338 1425 450">A swept path assessment has been undertaken and indicates that loads will overrun and oversail into third party land on the inside of the left turn. The access should be designed to meet manufacturer and road authority standards.</p> <p data-bbox="751 506 1358 535">Swept path assessment SK51 is included in Appendix B.</p>

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3.3 Swept Path Assessment Results and Summary

The detailed swept path drawings for the locations assessed are provided in Appendix B for review. The drawings in Appendix B illustrate tracking undertaken for the worst case loads at each location.

The colours illustrated on the swept paths are:

- Grey / Black – OS / Topographical Base Mapping;
- Green – Vehicle body outline (body swept path);
- Red – Tracked pathway of the wheels (wheel swept path); and
- Purple – The over-sail tracked path of the load where it encroaches outwith the trailer (load swept path).

Where mitigation works are required, the extents of over-run and over-sail areas are illustrated on the swept path drawings.

Please note that where assessments have been undertaken using Ordnance Survey (OSI) base mapping, there can be errors in this data source.

Where provided by the client, topographical data has been utilised. Please note that PF cannot accept liability for errors on the data source, be that OS base mapping, available aerial mapping or client supplied data.

3.4 Land Ownership

The limits of road adoption can vary depending upon the location of the site and the history of the road agencies involved. The adopted area is generally defined as land contained within a defined boundary where the road agency holds the maintenance rights for the land. In urban areas, this usually defined as the area from the edge of the footway across the road to the opposing footway back edge.

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 2m from the road edge. This can vary between areas and location and should be confirmed by the developer.

3.5 Summary Issues

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

- Undertake a detailed site visit to confirm the desk top survey details;
- That any necessary topographical surveys are undertaken, and the swept path results repeated;
- A 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

4.1 Summary of Access Review

Pell Frischmann has been commissioned by EMP to prepare a desktop Route Survey Report to examine the issues associated with the transport of AIL turbine components to Tullaghmore Wind Farm from Galway Port.

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

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

4.2 Further Actions

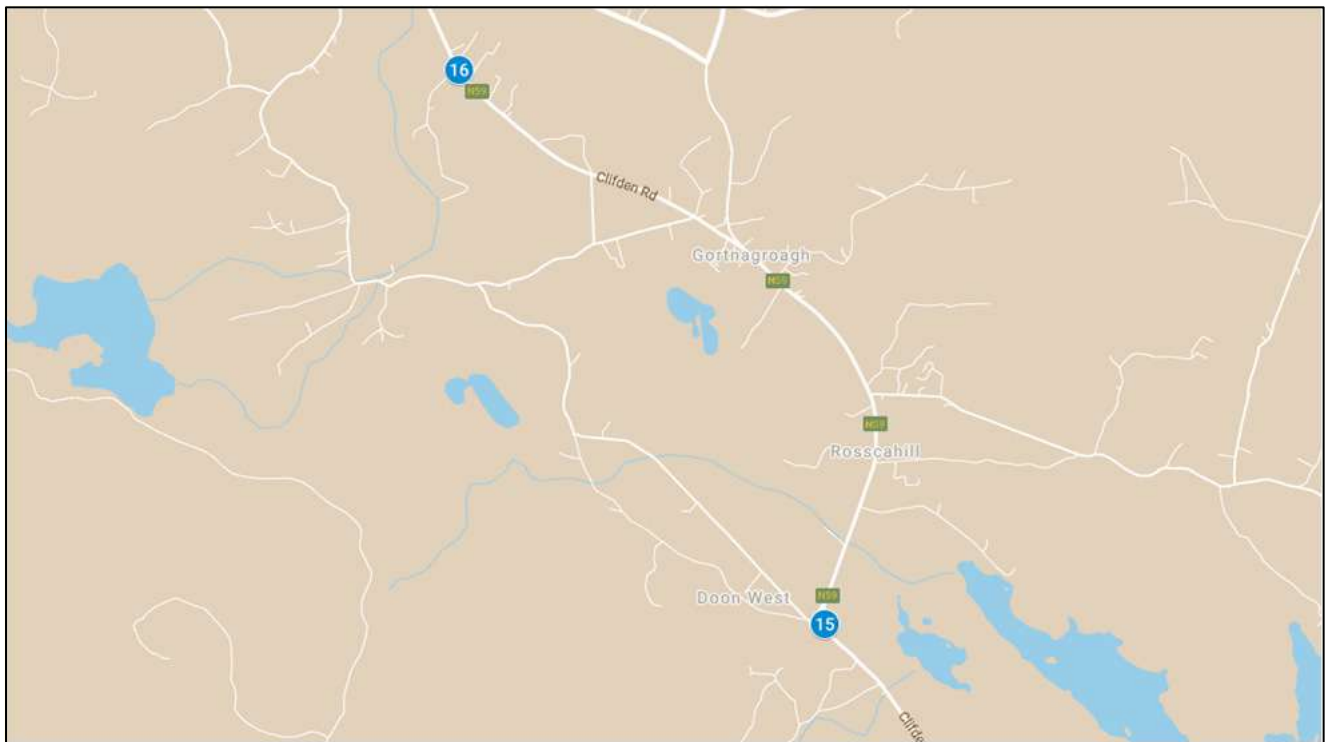
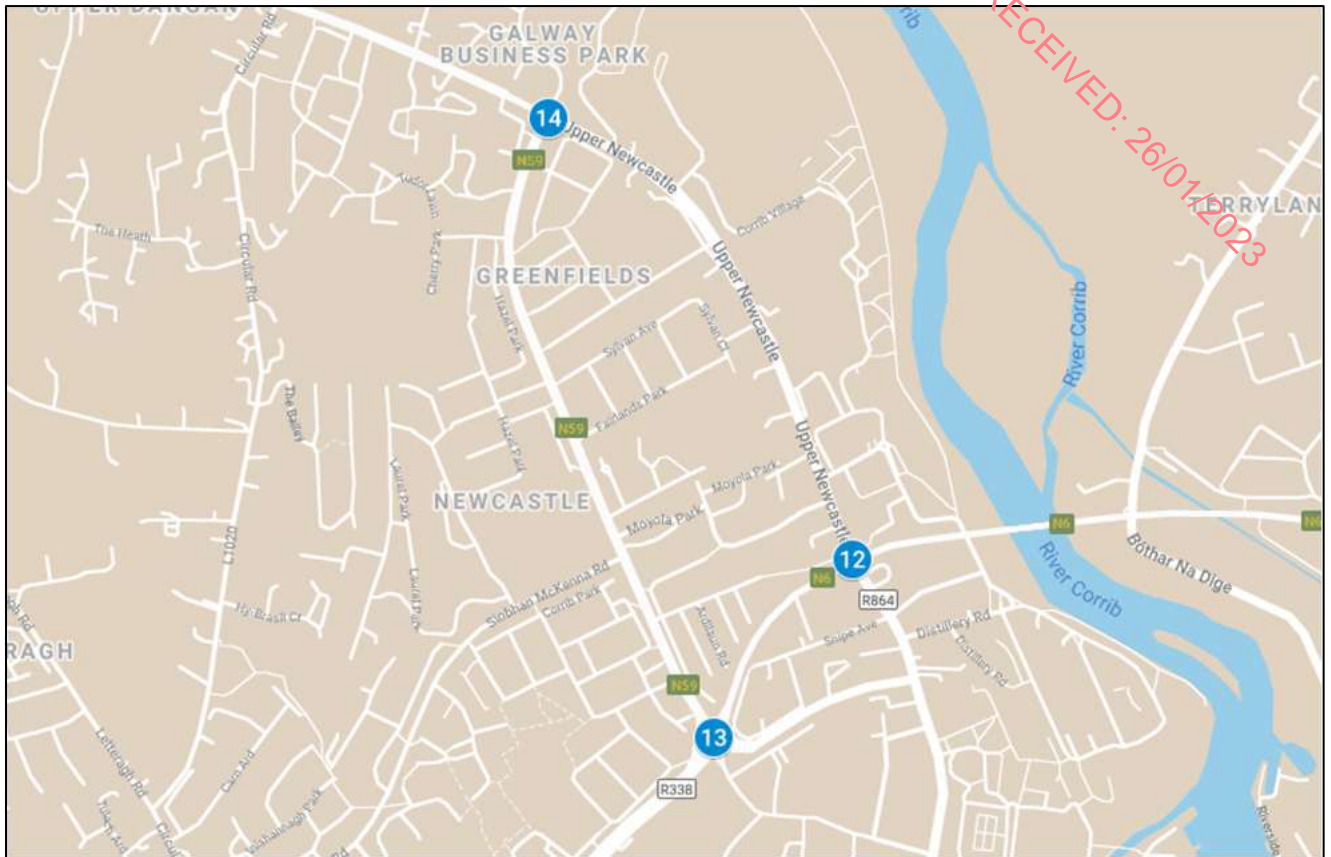
The following actions are recommended to pursue the transport and access issues further:

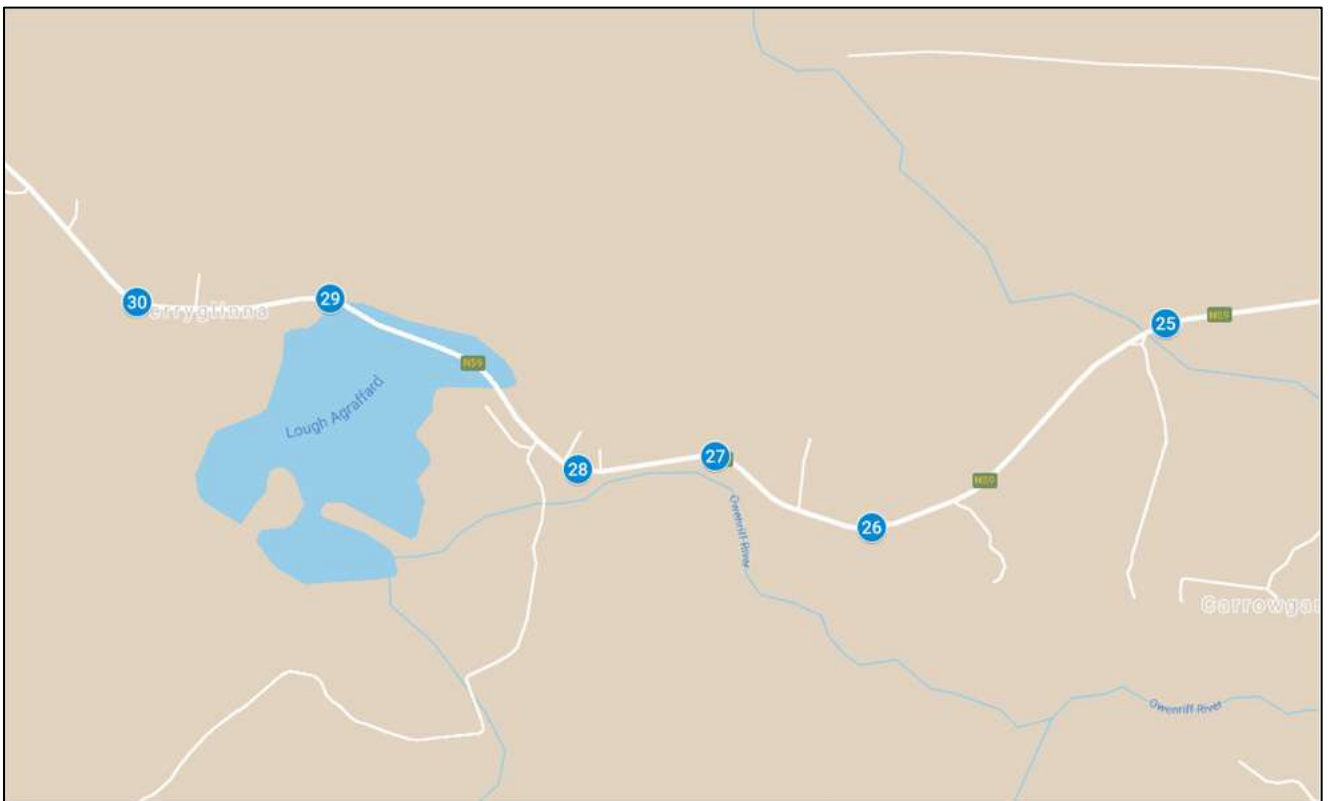
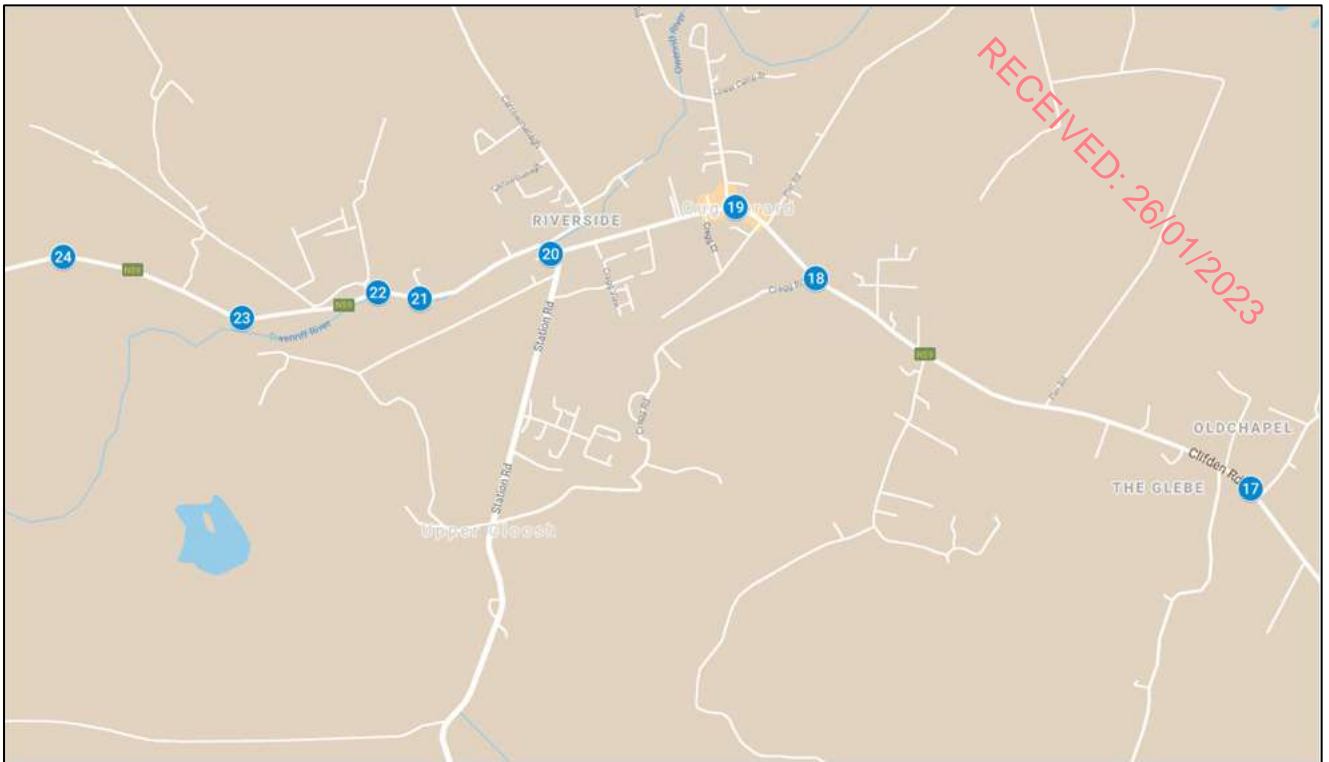
- Confirm the access route via a site visit;
- Revise the swept path assessments on topographical surveys where required;
- Prepare detailed mitigation design proposals to help inform the land option / consultee discussions;
- Obtain the necessary land options;
- Undertake discussion with the affected 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.

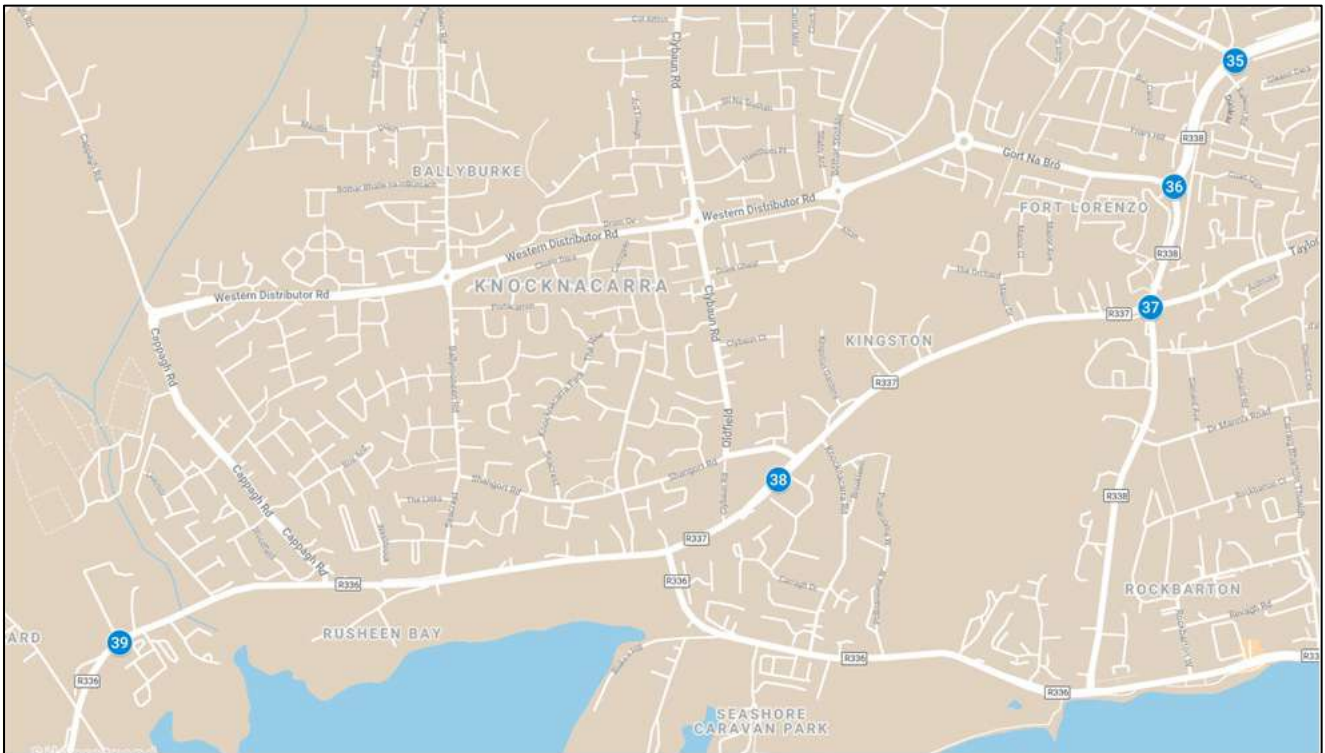
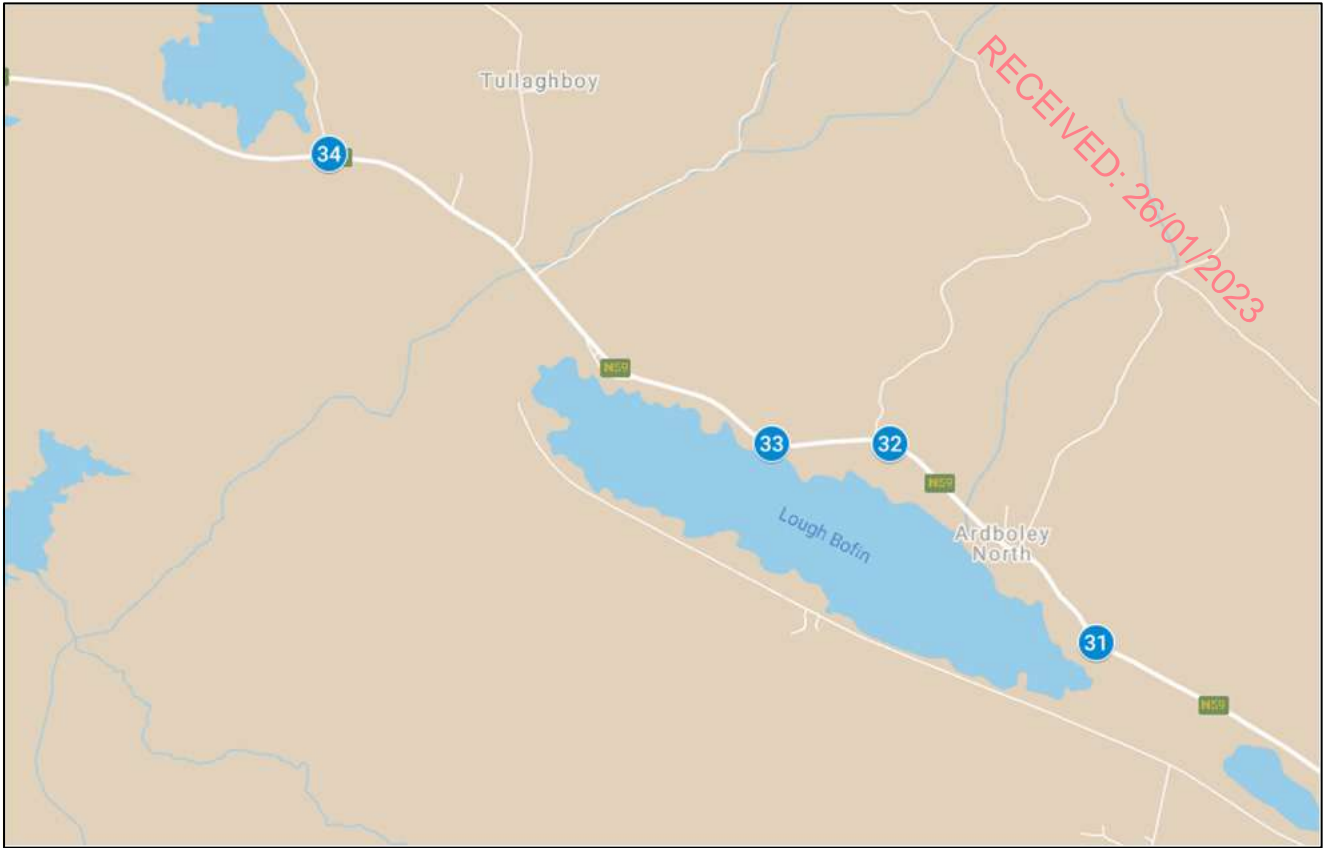
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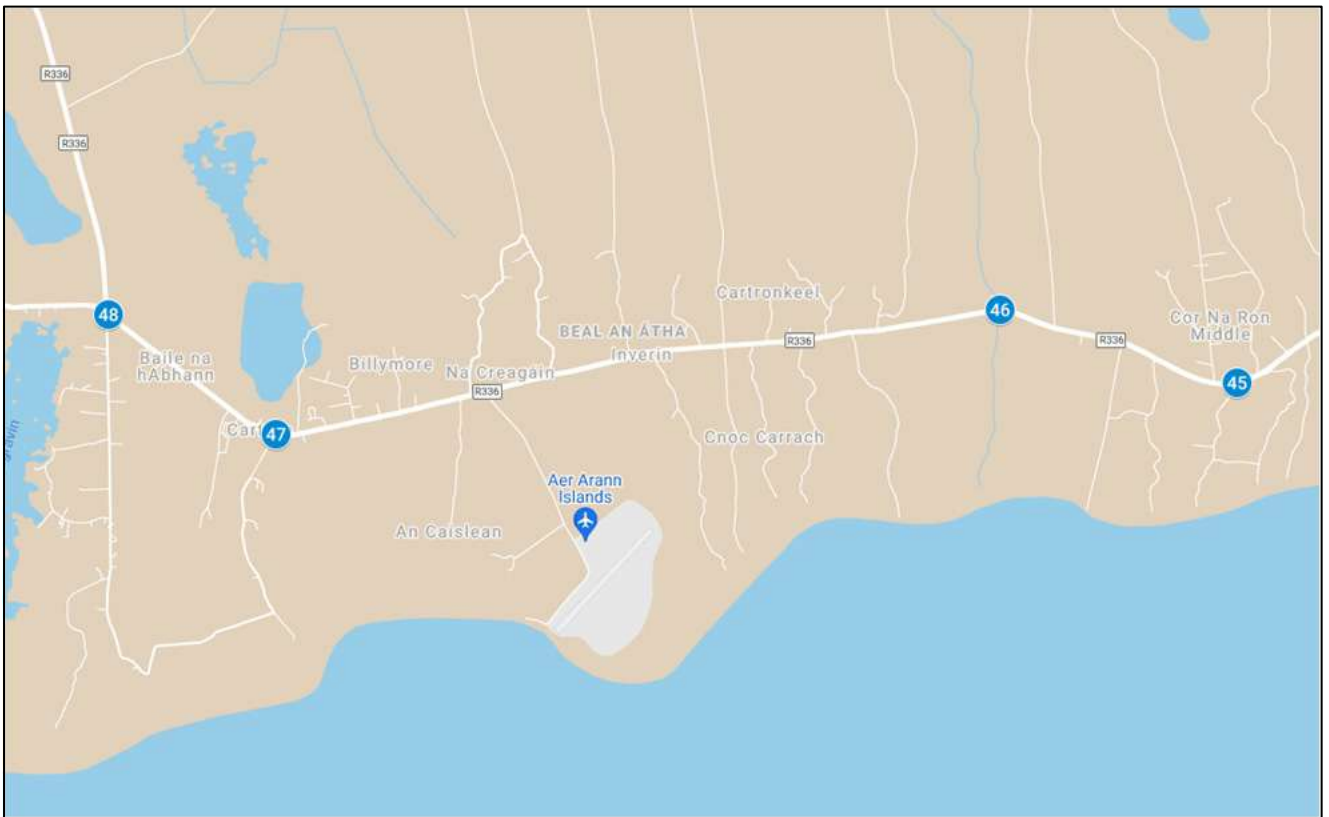
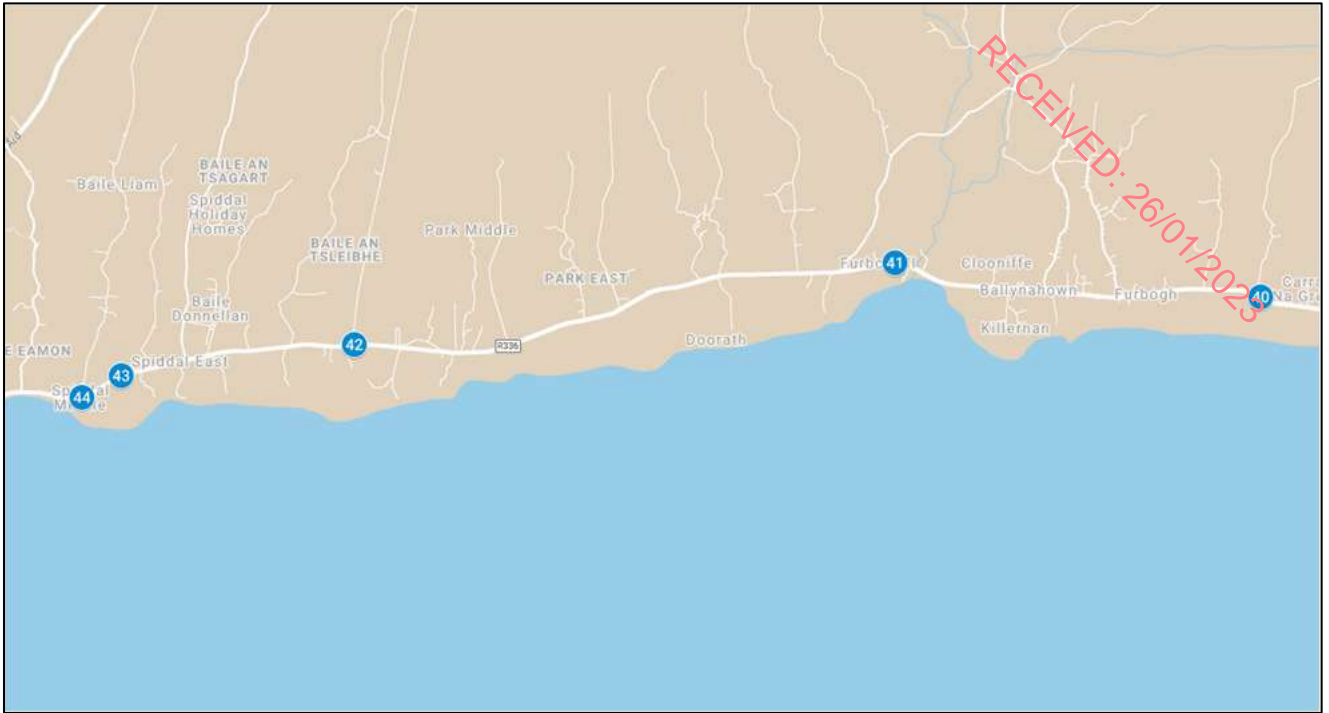
Appendix A Points of Interest

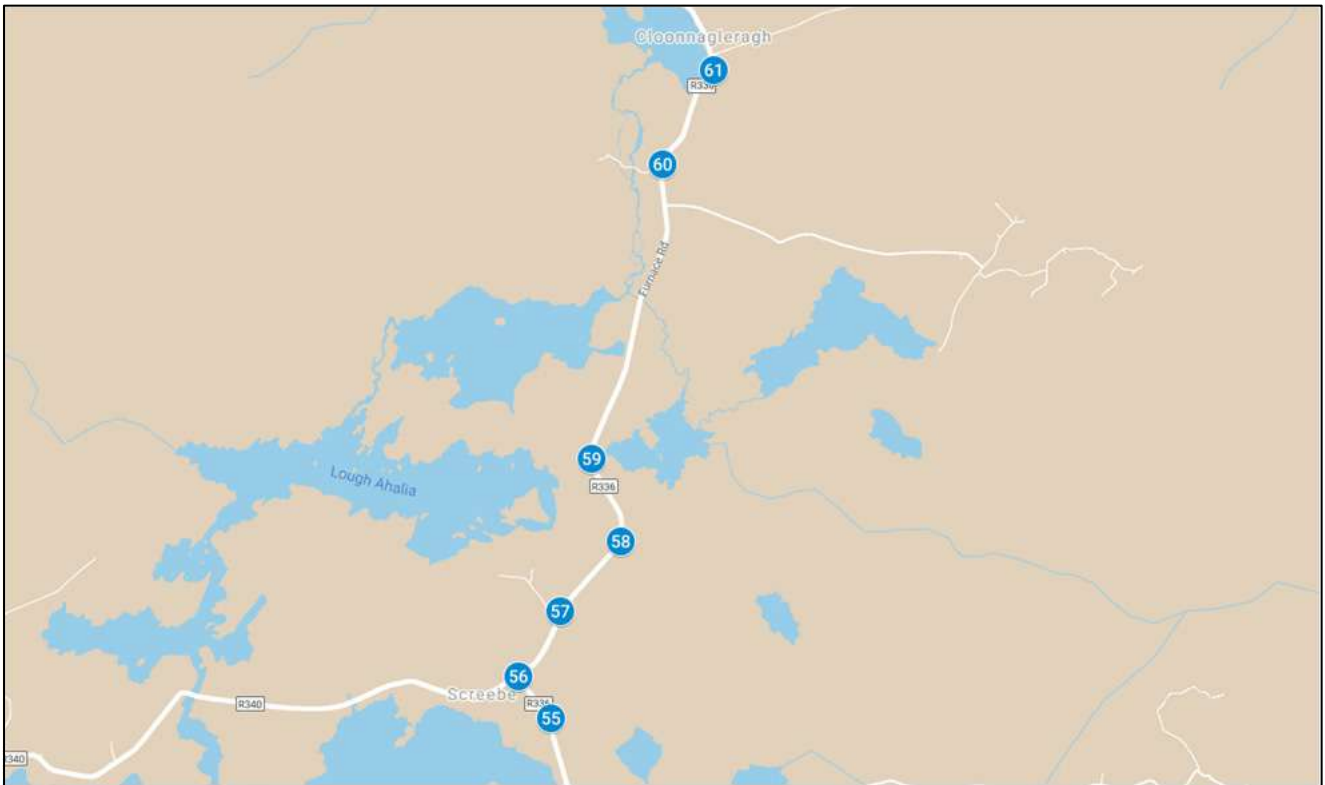
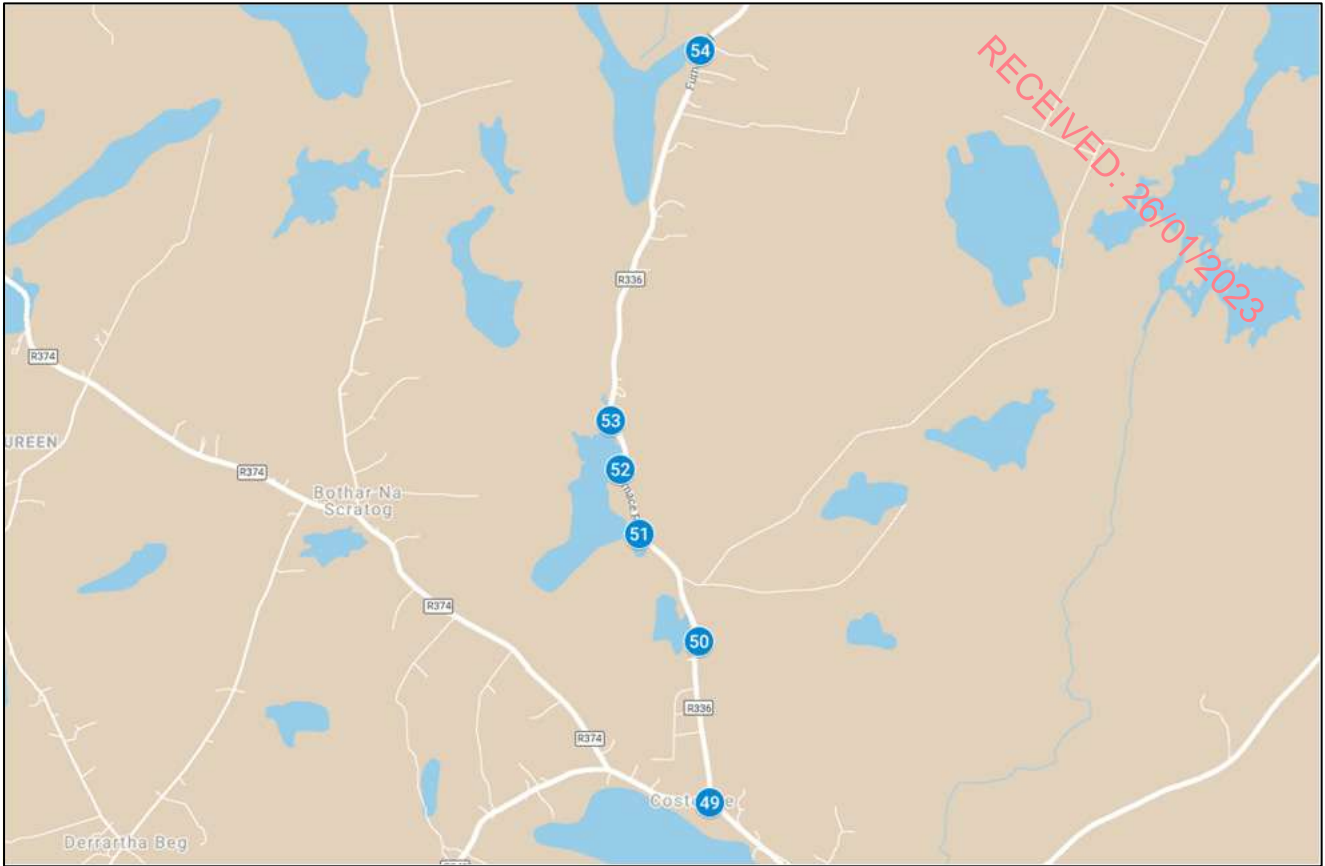
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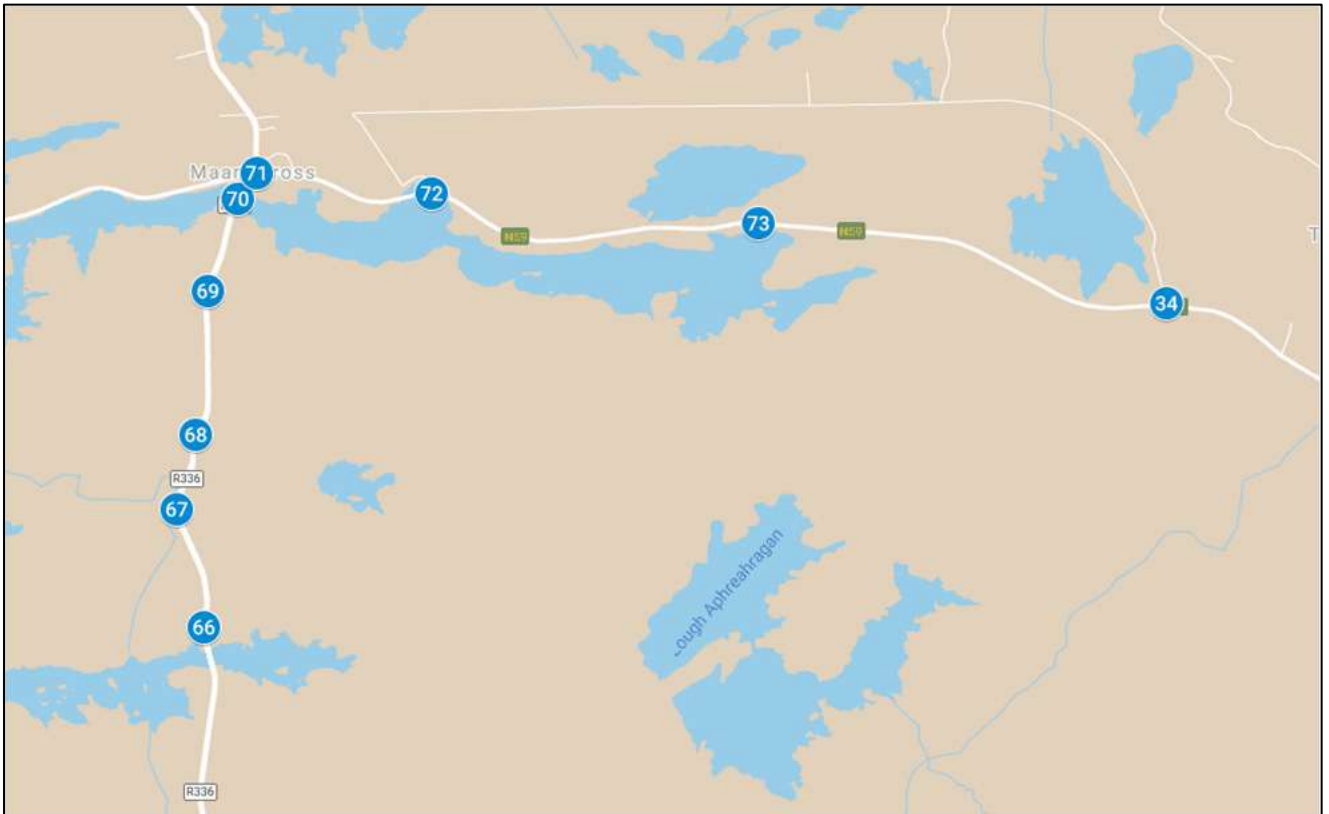
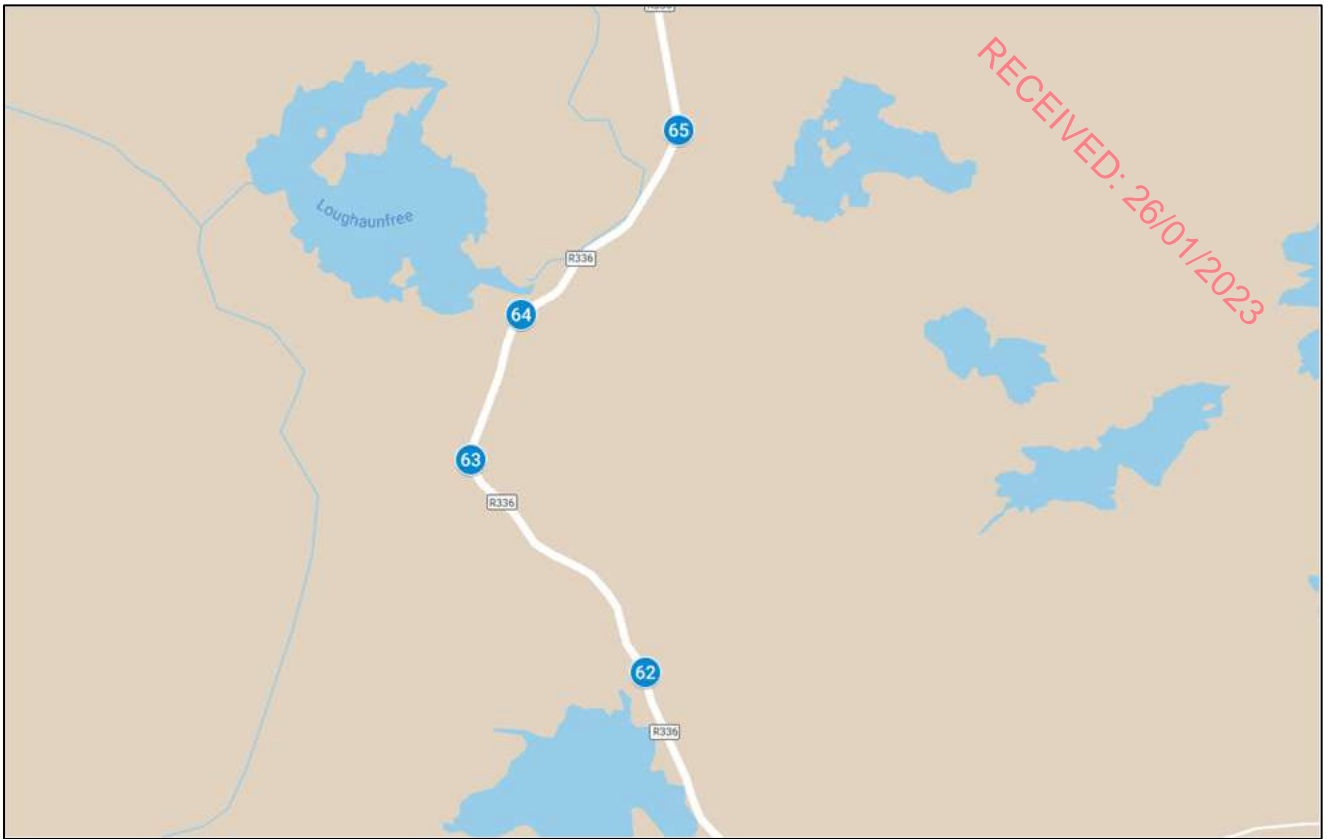






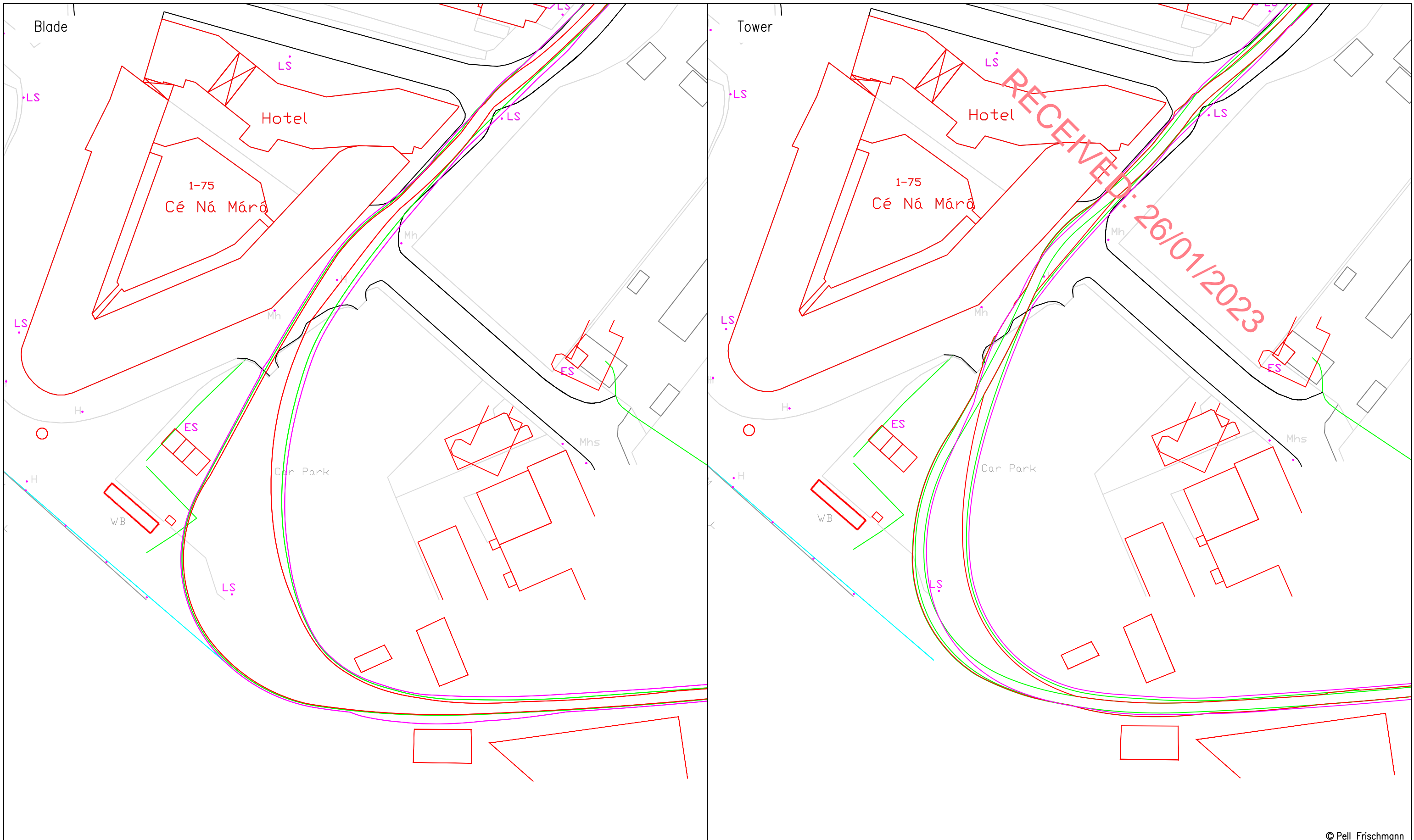






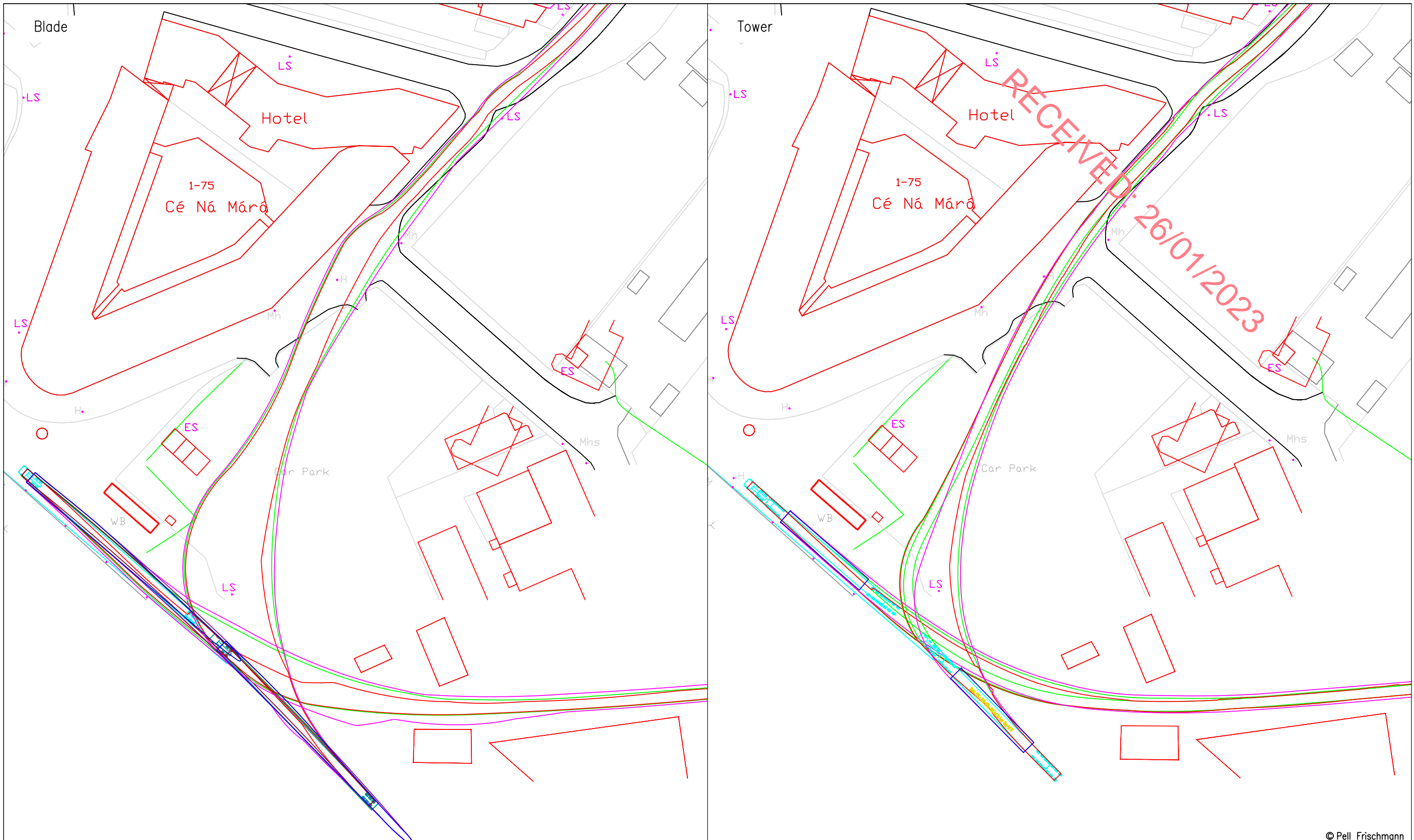
Appendix B Swept Path Assessments

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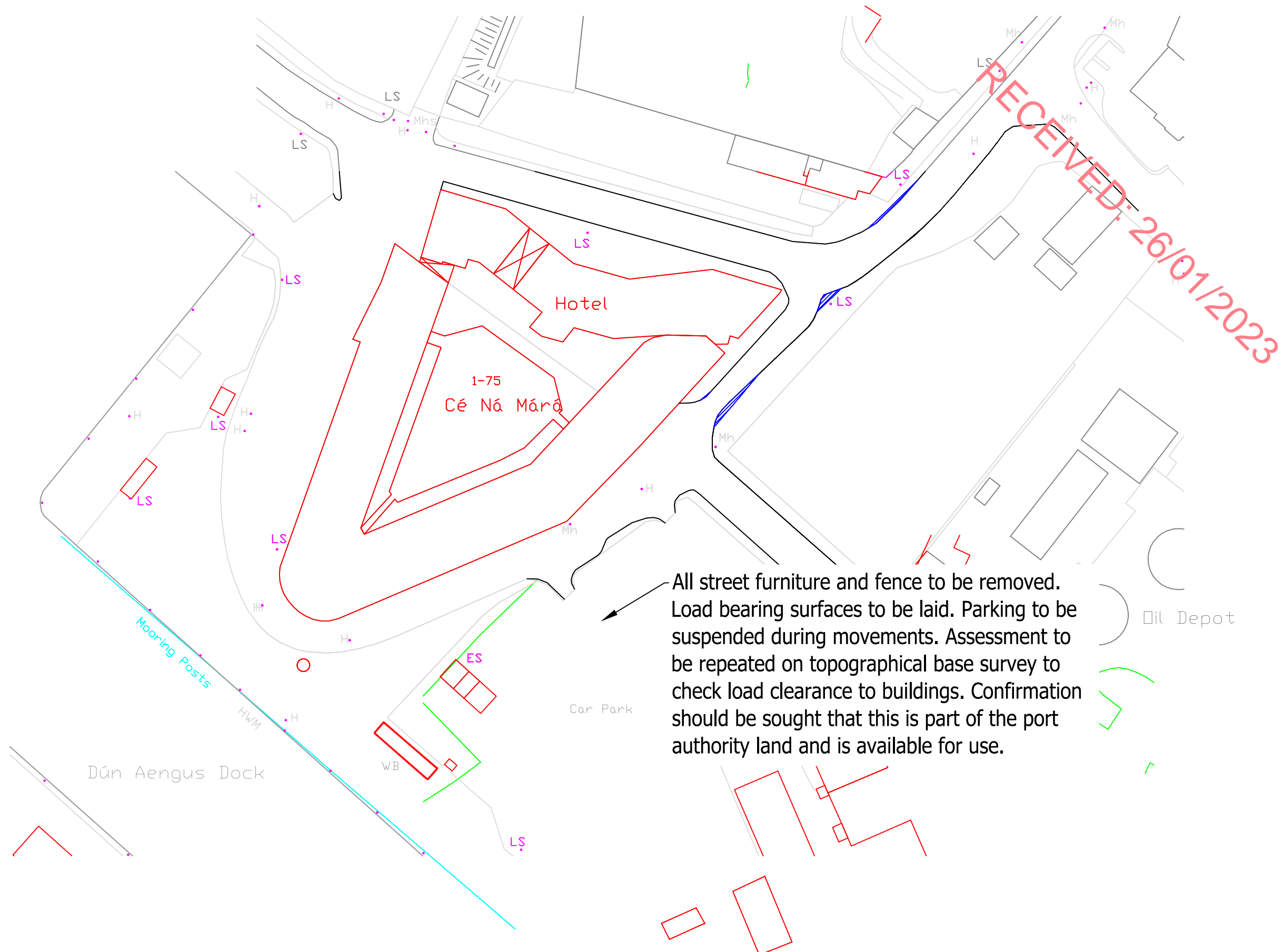
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EMPower <table border="1"> <tr> <td>Wheel SPA</td> <td>Body SPA</td> <td>Load SPA</td> <td>Indicative</td> <td>Over-run</td> <td>Over-sail</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Wheel SPA	Body SPA	Load SPA	Indicative	Over-run	Over-sail							SPA Location	Exit from Galway Harbour	<table border="1"> <tr> <td>Checked</td> <td>Date</td> <td>Drawing Status</td> </tr> <tr> <td>GB</td> <td>16/09/2021</td> <td>Draft</td> </tr> </table>	Checked	Date	Drawing Status	GB	16/09/2021	Draft
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Client	Drawing Title	Vestas V162 Blade & Tower	<table border="1"> <tr> <td>Designed</td> <td>Date</td> <td>File No.</td> </tr> <tr> <td>GLJ</td> <td>15/09/2021</td> <td>210913 Tullaghmore Tracking.dwg</td> </tr> </table>	Designed	Date	File No.	GLJ	15/09/2021	210913 Tullaghmore Tracking.dwg																	
Designed	Date	File No.																								
GLJ	15/09/2021	210913 Tullaghmore Tracking.dwg																								
EMPower	SPA Location	Exit from Galway Harbour	<table border="1"> <tr> <td>Checked</td> <td>Date</td> <td>Drawing Status</td> </tr> <tr> <td>GB</td> <td>16/09/2021</td> <td>Draft</td> </tr> </table>	Checked	Date	Drawing Status	GB	16/09/2021	Draft																	
	Checked	Date	Drawing Status																							
GB	16/09/2021	Draft																								
<table border="1"> <tr> <td>Key</td> <td>Wheel SPA</td> <td>Body SPA</td> <td>Load SPA</td> <td>Indicative</td> <td>Over-run</td> <td>Over-sail</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Key	Wheel SPA	Body SPA	Load SPA	Indicative	Over-run	Over-sail										<table border="1"> <tr> <td>Point of Interest</td> <td>1,2</td> <td>Drawing No.</td> <td rowspan="2"> Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only. </td> <td>Revision</td> </tr> <tr> <td></td> <td></td> <td>SK01A</td> <td>1</td> </tr> </table>	Point of Interest	1,2	Drawing No.	Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	Revision			SK01A	1
Key	Wheel SPA	Body SPA	Load SPA	Indicative	Over-run	Over-sail																				
Point of Interest	1,2	Drawing No.	Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	Revision																						
		SK01A		1																						



All street furniture and fence to be removed. Load bearing surfaces to be laid. Parking to be suspended during movements. Assessment to be repeated on topographical base survey to check load clearance to buildings. Confirmation should be sought that this is part of the port authority land and is available for use.

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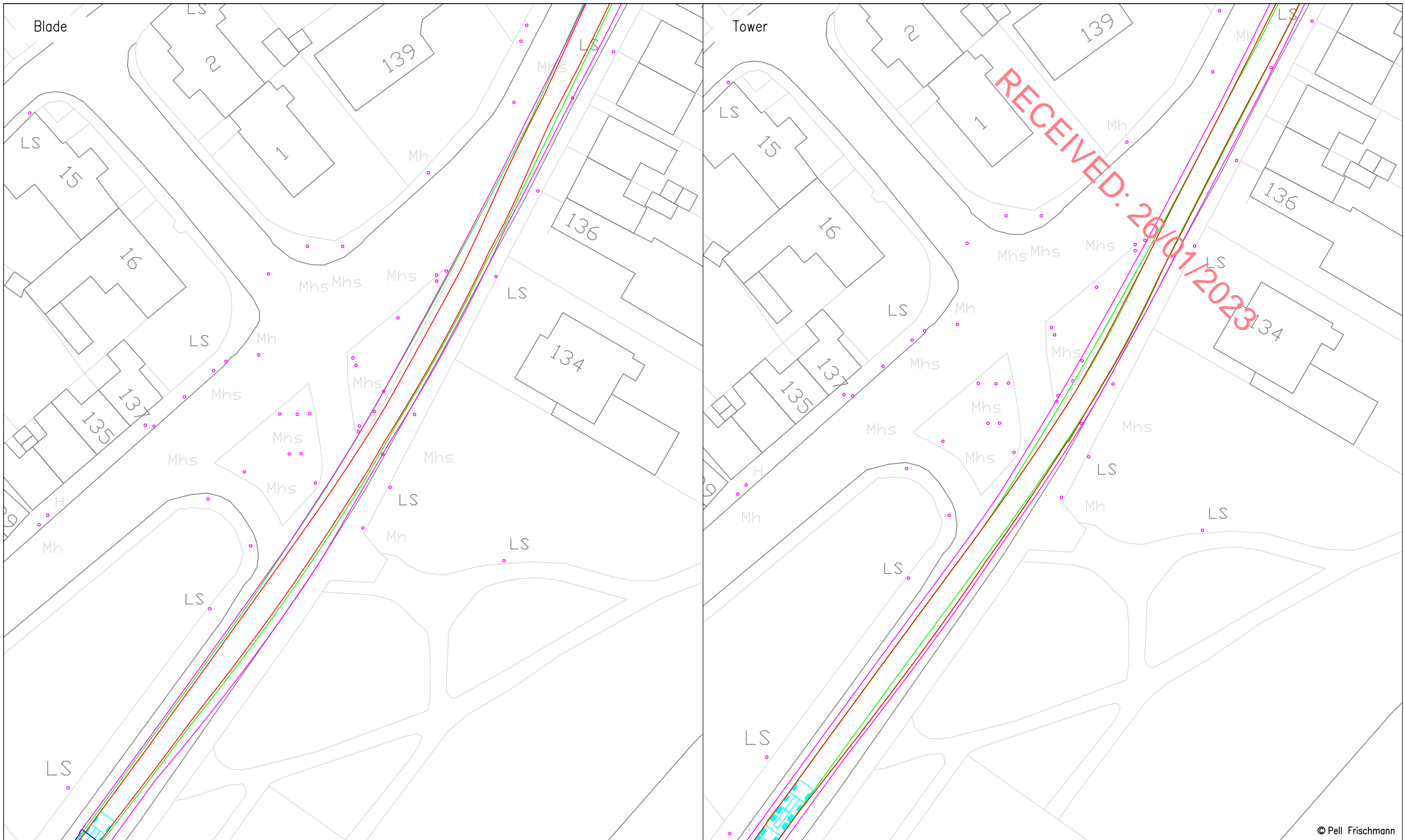
Pell Frischmann 93 GEORGE STREET, EDINBURGH, EH2 3ES Tel: +44 (0)131 240 1270 Email: pfeinburgh@pellfrischmann.com www.pellfrischmann.com	Project	Tullaghmore Wind Farm	Drawn	GLJ	15/09/2021	Scale	1:1000 @ A3
	Client	EMPower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	Drawing Title	Vestas V162 Blade & Tower	Checked	GB	16/09/2021	Drawing Status	Draft
	SPA Location	Exit from Galway Harbour	Point of Interest	1,2		Drawing No.	SK01B
			Notes:	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		Revision	1



All street furniture and fence to be removed. Load bearing surfaces to be laid. Parking to be suspended during movements. Assessment to be repeated on topographical base survey to check load clearance to buildings. Confirmation should be sought that this is part of the port authority land and is available for use.

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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key — Wheel SPA — Body SPA — Load SPA — Indicative Over-run Over-sail	SPA Location	Exit from Galway Harbour	Checked	GB	16/09/2021	Drawing Status	Draft		
			Point of Interest	1,2		Drawing No.	SK01C	Revision	1
				Notes:		1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.			

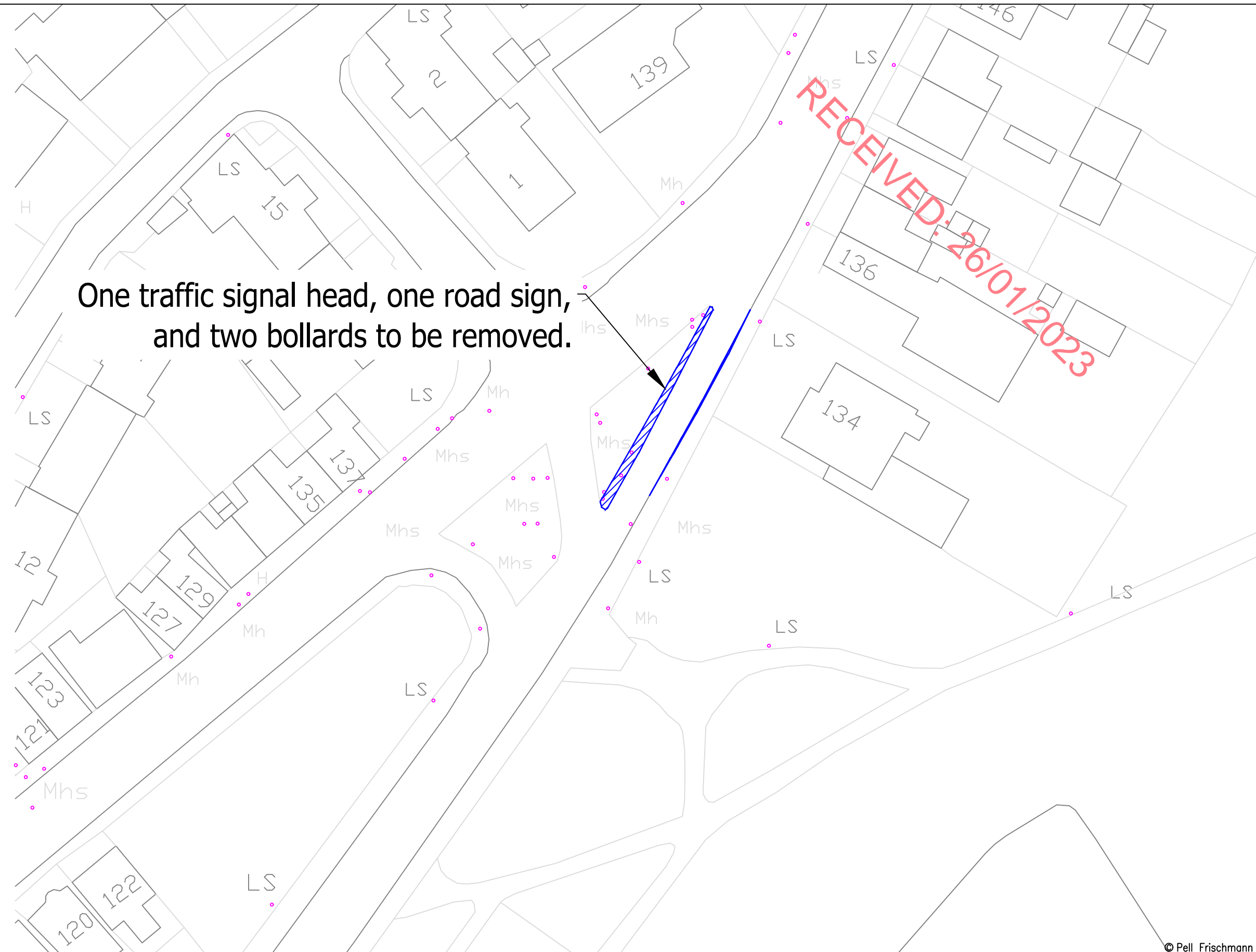


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	Client	EMPower			Drawn	GLJ	15/09/2021	
Key — Wheel SPA — Body SPA — Load SPA — Indicative Over-run Over-sail	Drawing Title	Vestas V162 Blade & Tower			Designed	GLJ	15/09/2021	
	SPA Location	Lough Atalia Rd / R339 Junction			Checked	GB	16/09/2021	
		Point of Interest	4		Drawing No.	SK02		
				Notes:	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		Revision	1

One traffic signal head, one road sign,
and two bollards to be removed.

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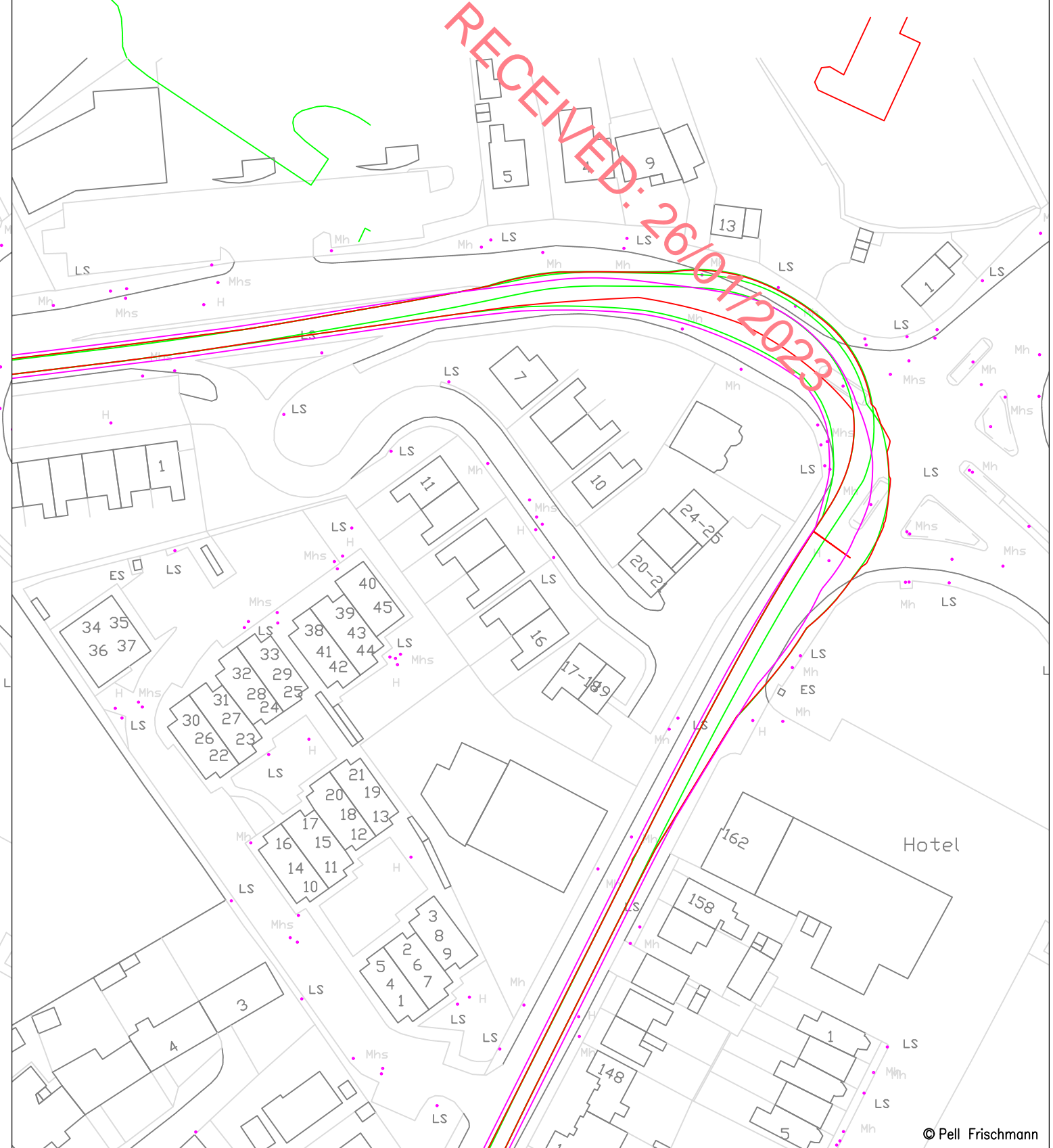
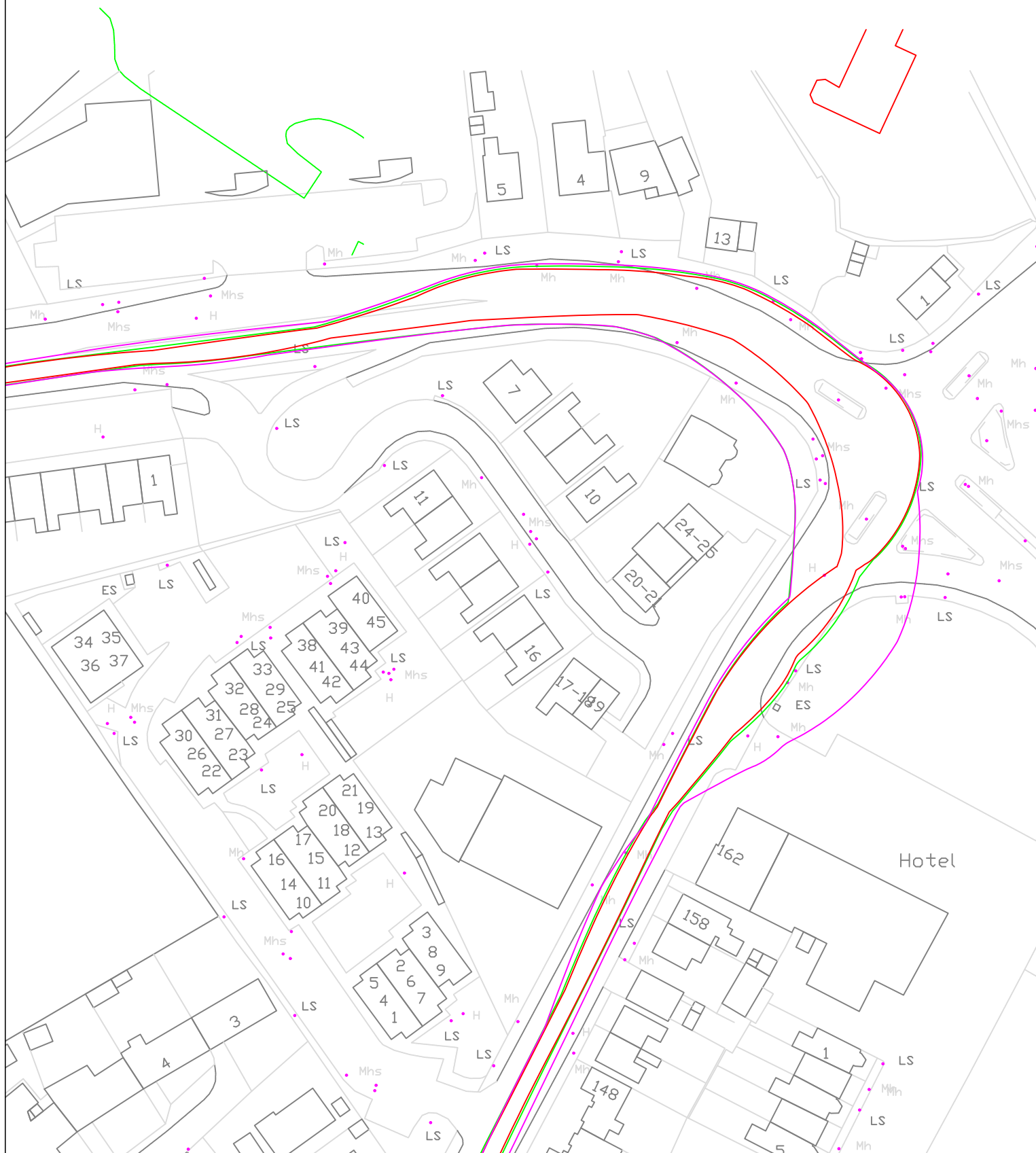


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	Client	EMPower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	Drawing Title	Vestas V162 Blade & Tower	Checked	GB	16/09/2021	Drawing Status	Draft
	SPA Location	Lough Atalia Rd / R339 Junction	Point of Interest	4		Drawing No.	SK02A
			Notes:	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		Revision	1

Blade

Tower



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Client **EMPower**

Key						
	Wheel SPA	Body SPA	Load SPA	Indicative	Over-run	Over-sail

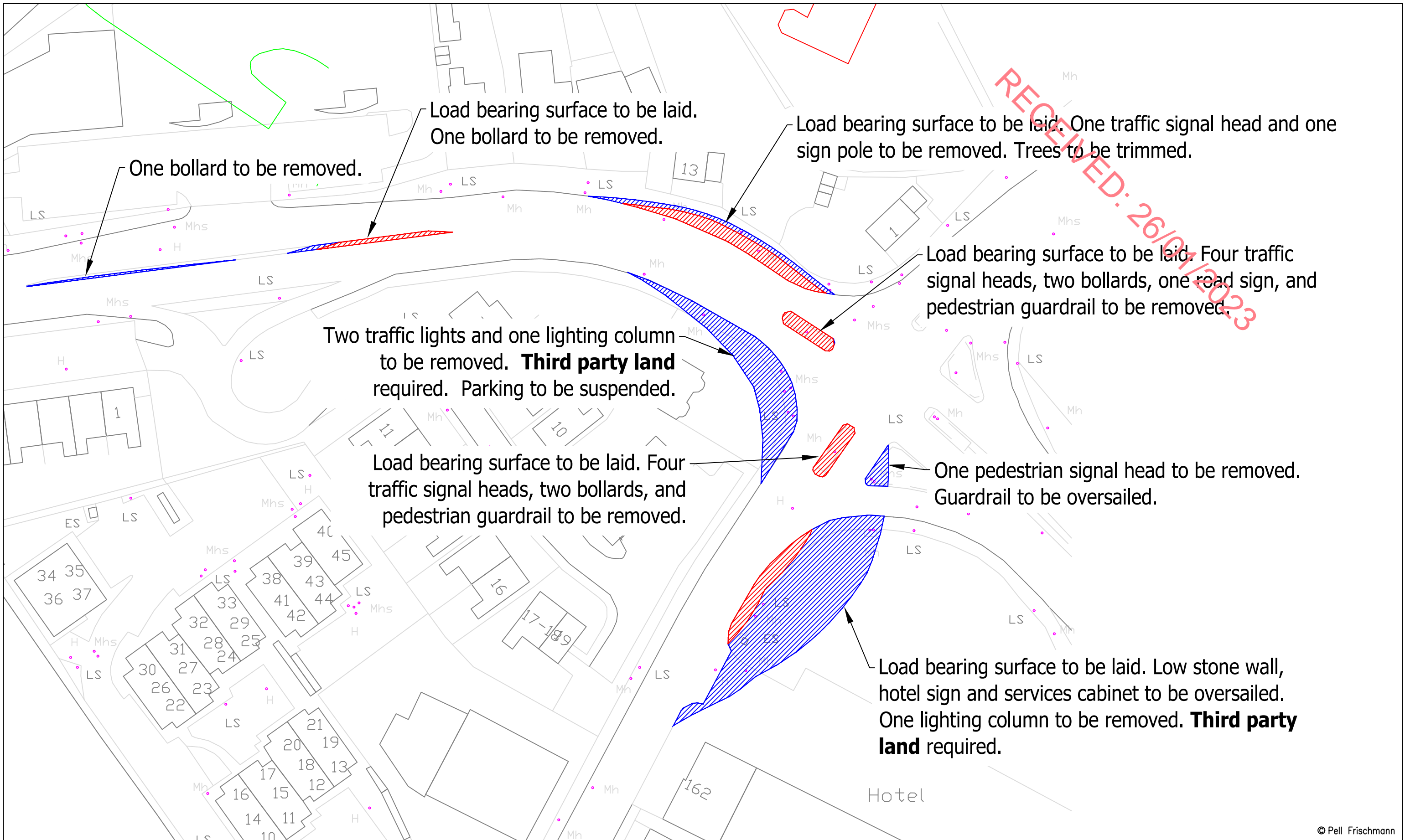
Project
Tullaghmore Wind Farm

Drawing Title
Vestas V162 Blade & Tower

SPA Location
R339 / R338 Junction

Drawn	GLJ	15/09/2021	Scale	1:1000 @ A3
Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Checked	GB	16/09/2021	Drawing Status	Draft
Point of Interest	5		Revision	1
Drawing No.	SK03		Notes:	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.

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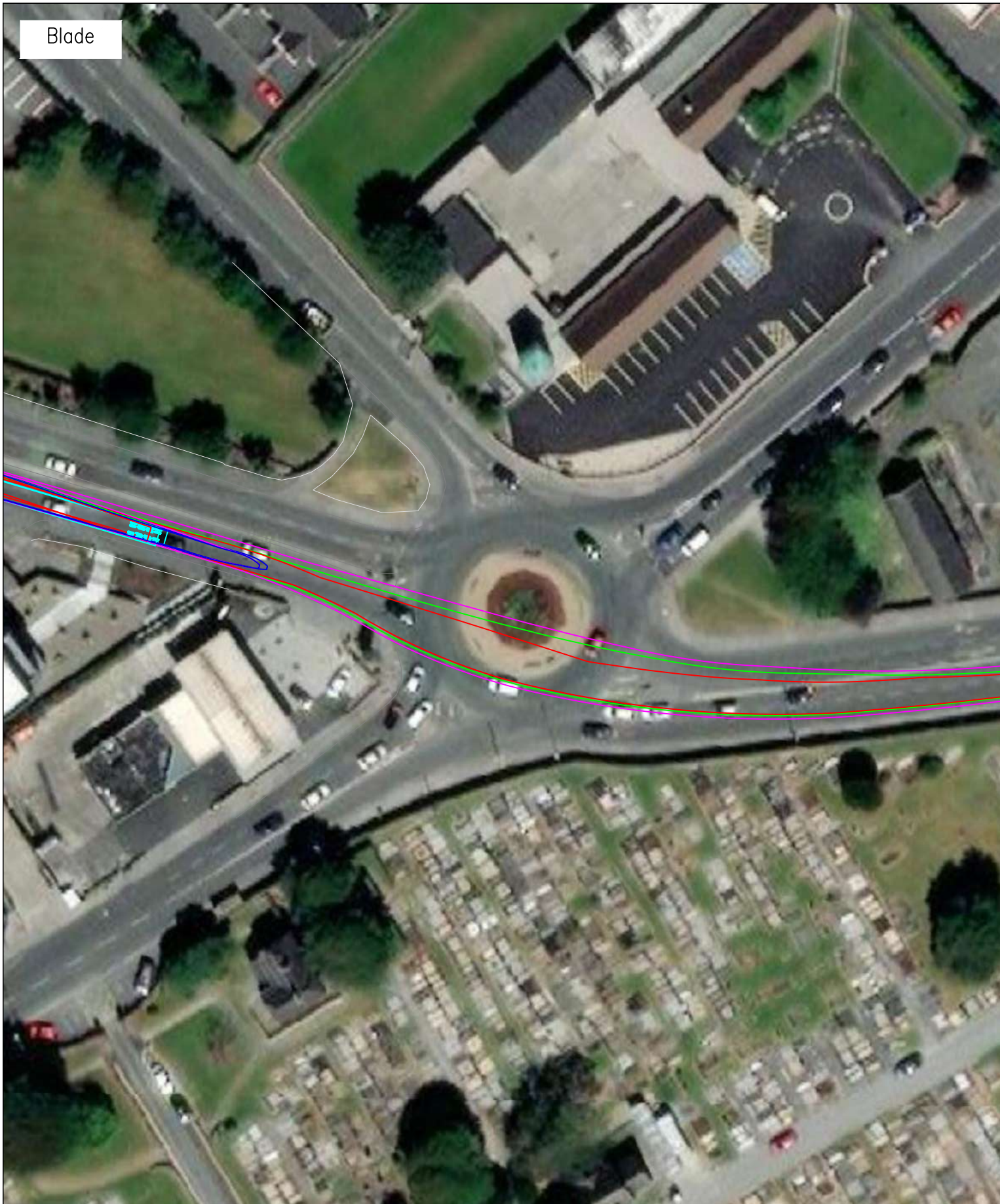
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Client: **EMPower**

Key
 Wheel SPA (Red line)
 Body SPA (Green line)
 Load SPA (Purple line)
 Indicative (Cyan line)
 Over-run (Red hatched area)
 Over-sail (Blue hatched area)

Project	Tullaghmore Wind Farm
Drawing Title	Vestas V162 Blade & Tower
SPA Location	R339 / R338 Junction

Drawn	GLJ	15/09/2021	Scale	Custom @ A3
Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Checked	GB	16/09/2021	Drawing Status	Draft
Point of Interest	5		Drawing No.	SK03A
Notes:				Revision
1. All mitigation is subject to confirmation through a test run.				1
2. This is not a construction drawing and is intended for illustration purposes only.				



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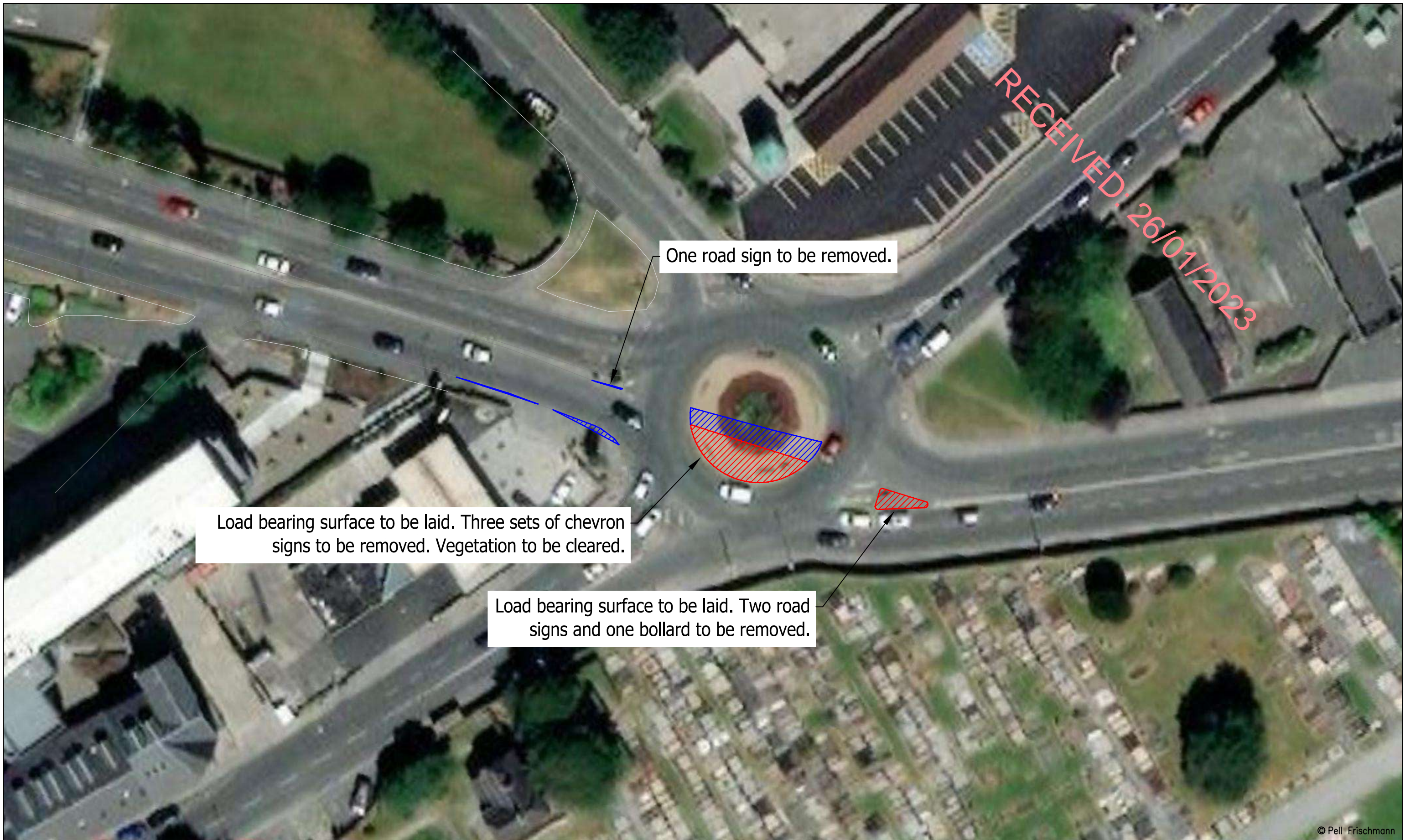
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Client **EMPower**

Key
 Wheel SPA (Red line)
 Body SPA (Green line)
 Load SPA (Magenta line)
 Indicative (Cyan line)
 Over-run (Red hatched box)
 Over-sail (Blue hatched box)

Project	Tullaghmore Wind Farm
Drawing Title	Vestas V162 Blade & Tower
SPA Location	R338 Cemetery Cross Roundabout

Name	Date	Scale	1:750 @ A3
Drawn	GLJ	15/09/2021	File No. 210913 Tullaghmore Tracking.dwg
Designed	GLJ	15/09/2021	
Checked	GB	16/09/2021	
Point of Interest	6	Drawing Status	Draft
Drawing No.	SK04	Notes:	Revision
		1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	1



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One road sign to be removed.

Load bearing surface to be laid. Three sets of chevron signs to be removed. Vegetation to be cleared.

Load bearing surface to be laid. Two road signs and one bollard to be removed.

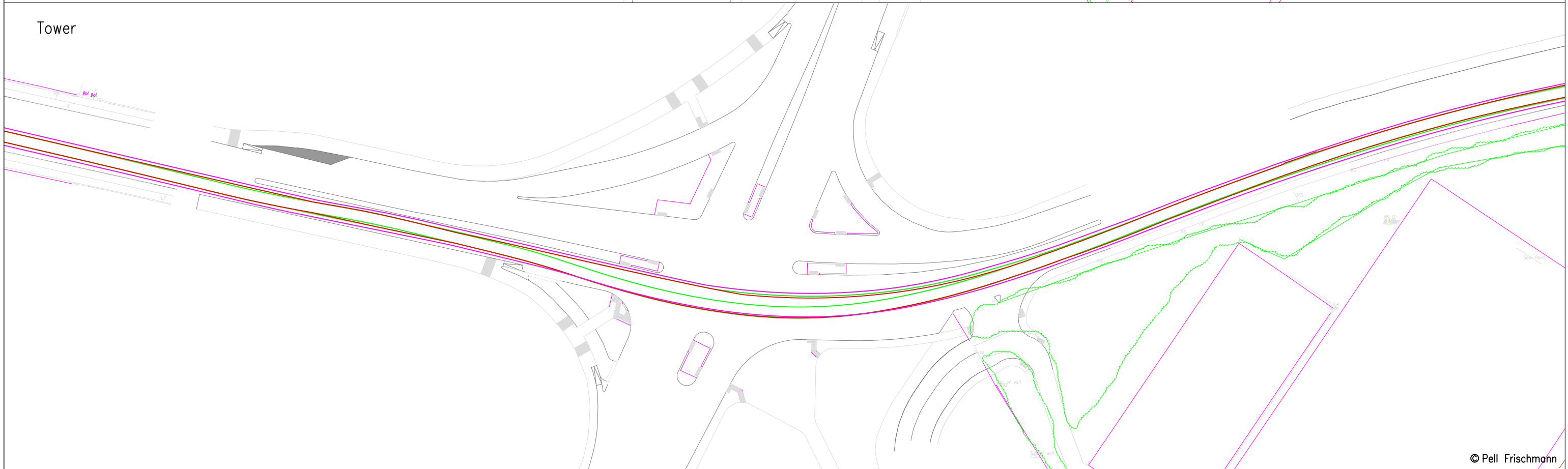
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	Client	EMPower		Drawn	GLJ	Designed	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg	
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	Drawing Title	Vestas V162 Blade & Tower		Checked	GB	Date	16/09/2021	Drawing Status	Draft	
	SPA Location	R338 Cemetery Cross Roundabout		Point of Interest	6		Drawing No.	SK04A	Notes:	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.
								Revision	1	

Blade



Tower



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	Client	EMPower		Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg	
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	Drawing Title	Vestas V162 Blade & Tower		Checked	GB	16/09/2021	Drawing Status	Draft	
	SPA Location	R338 / R866 Junction		Point of Interest	7		Drawing No.	SK05	Revision
				NO MITIGATION REQUIRED			Notes:		
							1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		

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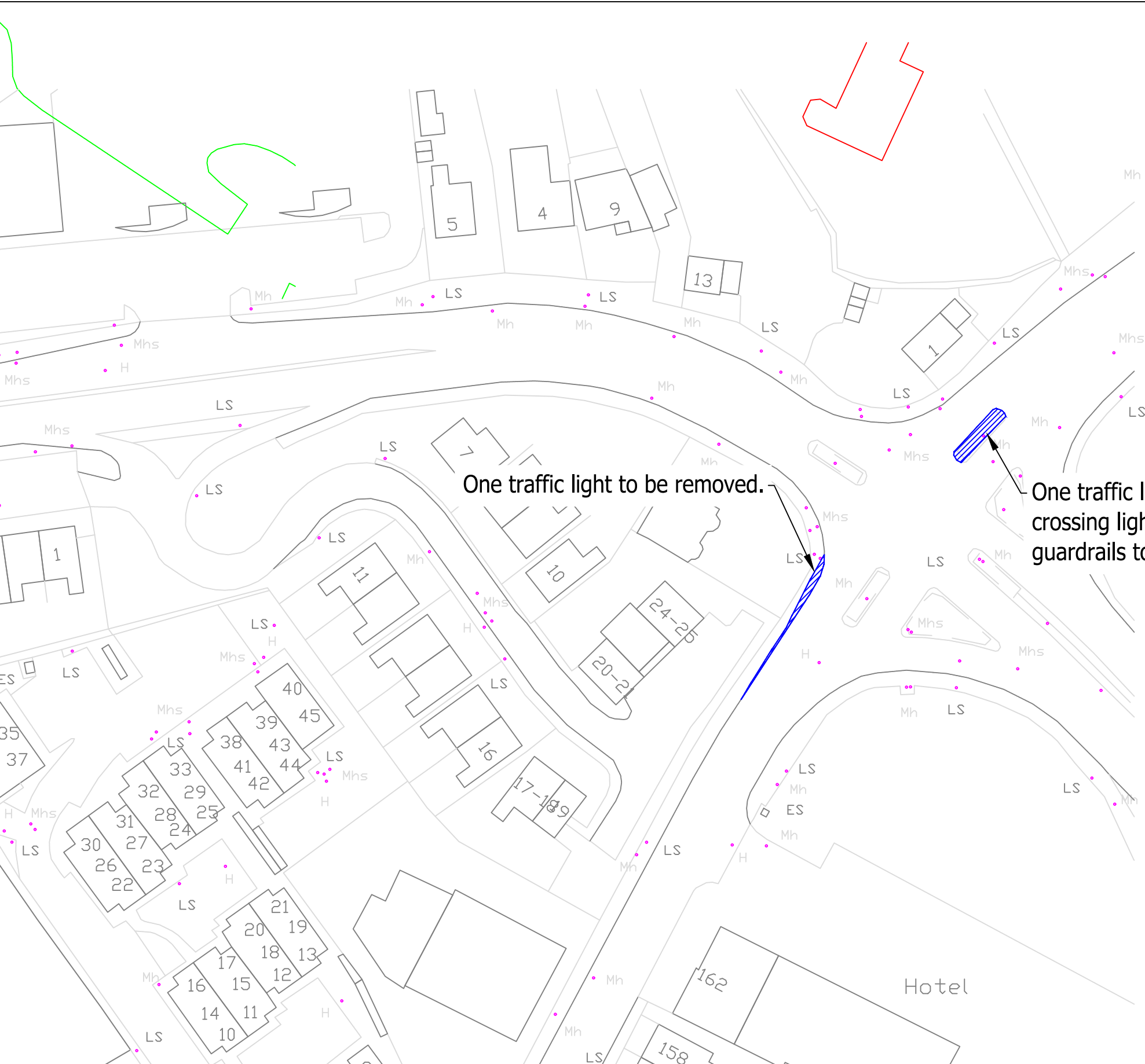
Client: **EMPower**

Key
— Wheel SPA
— Body SPA
— Load SPA
— Indicative
 Over-run
 Over-sail

Project	Tullaghmore Wind Farm
Drawing Title	Vestas V162 Blade & Tower
SPA Location	R339 / R338 Junction

Drawn	GLJ	15/09/2021	Scale	1:1000 @ A3
Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Checked	GB	16/09/2021	Drawing Status	Draft
Point of Interest	5		Revision	1
Drawing No.	SK52		Notes:	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.

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One traffic light to be removed.

One traffic light, one crossing light and pedestrian guardrails to be removed.

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Client: **EMPower**

Key
 Wheel SPA (Red line)
 Body SPA (Green line)
 Load SPA (Purple line)
 Indicative (Cyan line)
 Over-run (Red hatched box)
 Over-sail (Blue hatched box)

Project	Tullaghmore Wind Farm
Drawing Title	Vestas V162 Blade & Tower
SPA Location	R339 / R338 Junction

Drawn	GLJ	15/09/2021	Scale	1:750 @ A3
Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Checked	GB	16/09/2021	Drawing Status	Draft
Point of Interest	5		Drawing No.	SK52A
Notes:			Revision	
1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.			1	



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Client: **EMPower**

Key

—	—	—	—		
Wheel SPA	Body SPA	Load SPA	Indicative	Over-run	Over-sail

Project	Tullaghmore Wind Farm
Drawing Title	Vestas V162 Blade & Tower
SPA Location	R339 Mervue Industrial Estate

Drawn	GLJ	15/09/2021	Scale	1:750 @ A3
Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Checked	GB	16/09/2021	Drawing Status	Draft
Point of Interest	8		Revision	1
Drawing No.	SK53		Notes:	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.



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	Client	EMPower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	Drawing Title	Vestas V162 Blade & Tower	Checked	GB	16/09/2021	Drawing Status	Draft
	SPA Location	R339 Mervue Industrial Estate	Point of Interest	8		Drawing No.	SK53A
	Notes:						Revision

1. All mitigation is subject to confirmation through a test run.
 2. This is not a construction drawing and is intended for illustration purposes only.

Blade

Tower

TRAPPERS PUB

TRAPPERS PUB

Entrance

Entrance

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Project







Tullaghmore Wind Farm

Drawn	GLJ	15/09/2021	Scale	1:750 @ A3
Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Checked	GB	16/09/2021	Drawing Status	Draft
Point of Interest	9		Revision	1

Client **EMPower**

Drawing Title

Vestas V162 Blade & Tower

Key						
	Wheel SPA	Body SPA	Load SPA	Indicative	Over-run	Over-sail

SPA Location

R336 Mervue Industrial Estate

Drawing No.	SK54	Notes:
		1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.







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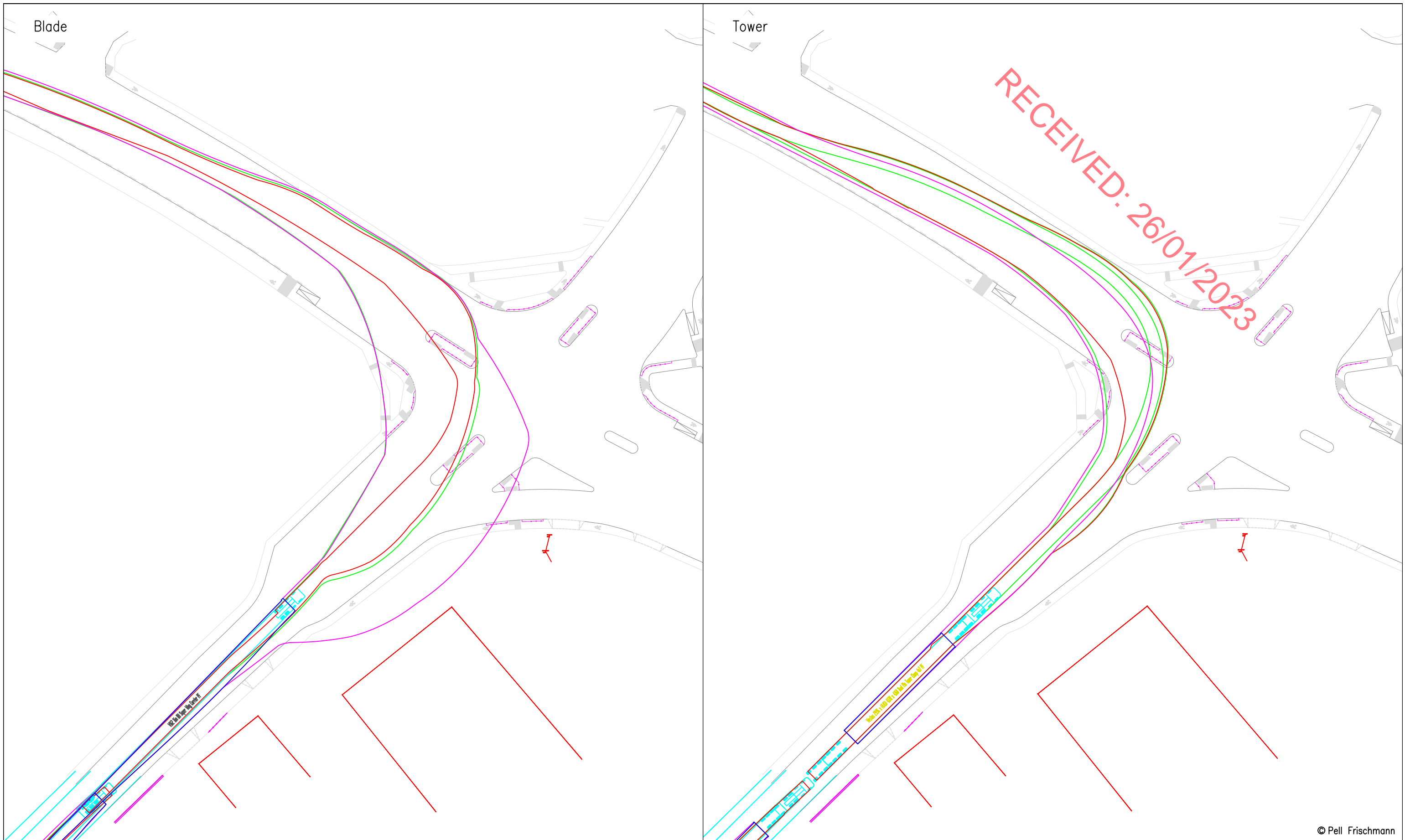
TRAPPERS PUB

Entrance

Load bearing surface to be laid. One lighting column to be removed.

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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key  Wheel SPA  Body SPA  Load SPA  Indicative  Over-run  Over-sail	SPA Location	R336 Mervue Industrial Estate	Checked	GB	16/09/2021	Drawing Status	Draft	Revision	1
			Drawing No.	SK54A	Notes:		1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		



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	Client	EMPower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	Drawing Title	Vestas V162 Blade & Tower	Checked	GB	16/09/2021	Drawing Status	Draft
	SPA Location	R336 / N6 Junction	Point of Interest	10		Drawing No.	SK55
				Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		Revision	1

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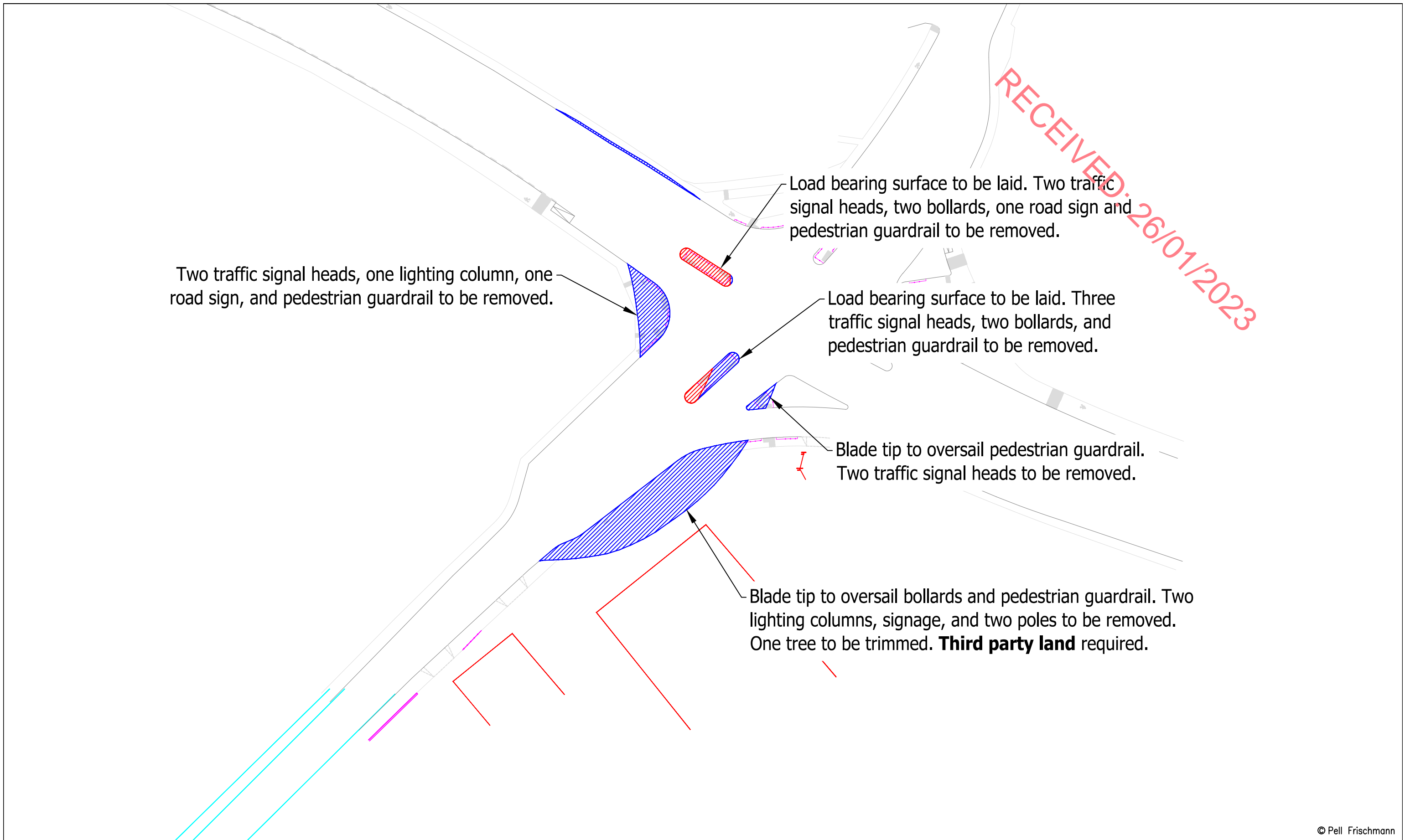
Two traffic signal heads, one lighting column, one road sign, and pedestrian guardrail to be removed.

Load bearing surface to be laid. Two traffic signal heads, two bollards, one road sign and pedestrian guardrail to be removed.

Load bearing surface to be laid. Three traffic signal heads, two bollards, and pedestrian guardrail to be removed.

Blade tip to oversail pedestrian guardrail. Two traffic signal heads to be removed.

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.



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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.
Key — Wheel SPA — Body SPA — Load SPA — Indicative Over-run Over-sail	SPA Location	R336 / N6 Junction	Checked	GB	16/09/2021	Drawing Status	Draft	
			Point of Interest	10	Drawing No.	SK55A	Notes:	Revision

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Blade

Tower

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Client **EMPower**

Key						
	Wheel SPA	Body SPA	Load SPA	Indicative	Over-run	Over-sail

Project
Tullaghmore Wind Farm

Drawing Title
Vestas V162 Blade & Tower

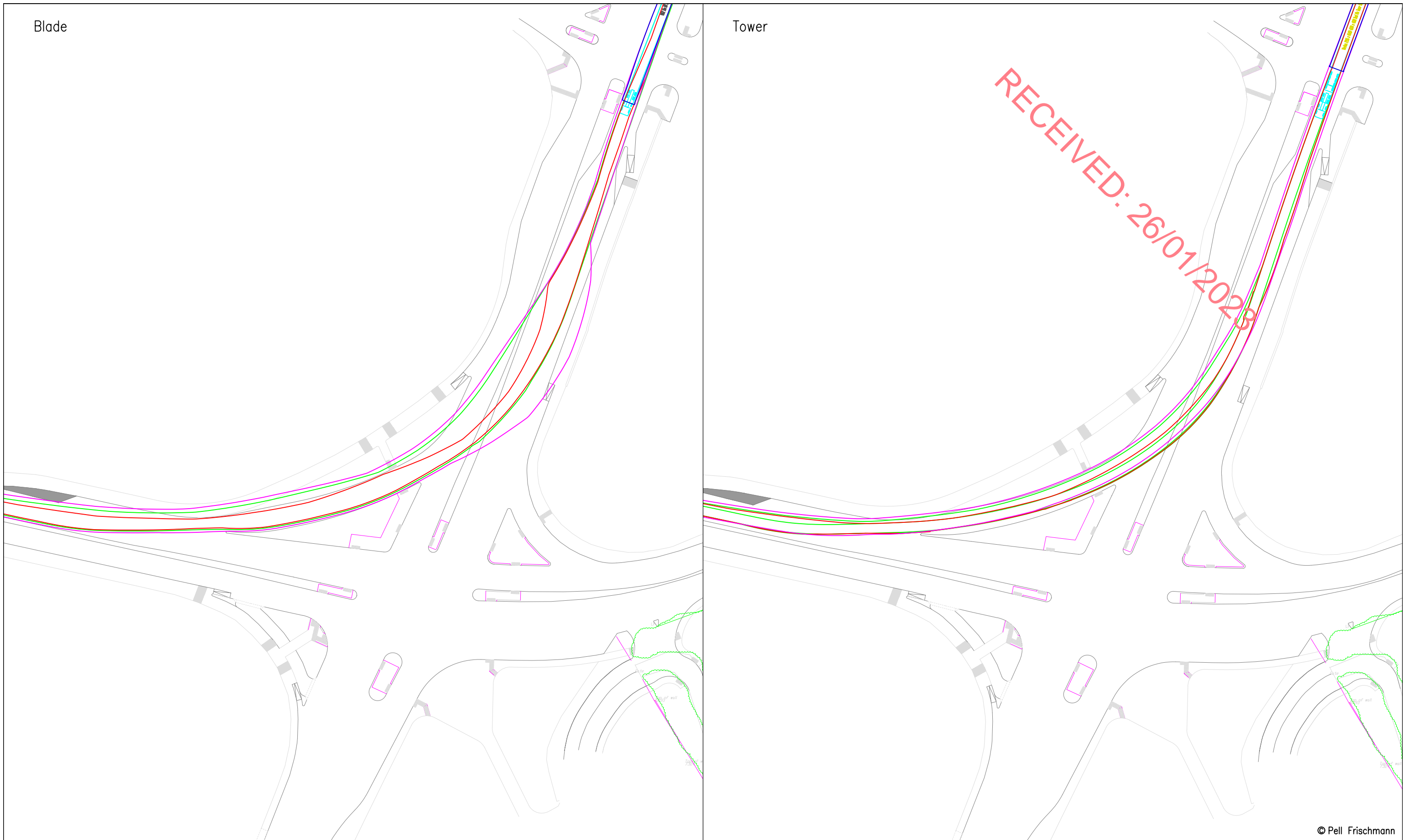
SPA Location
N6 / N84 Roundabout

	Name	Date	Scale
Drawn	GLJ	15/09/2021	1:750 @ A3
Designed	GLJ	15/09/2021	File No. 210913 Tullaghmore Tracking.dwg
Checked	GB	16/09/2021	Drawing Status
Point of Interest		11	Draft
Drawing No.	Notes:		Revision
SK56	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		1

Blade

Tower

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	Client	EMPower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	Drawing Title	Vestas V162 Blade & Tower	Checked	GB	16/09/2021	Drawing Status	Draft
	SPA Location	R338 / R866 Junction	Point of Interest	7		Drawing No.	SK57
						Notes:	Revision
						1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	1

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One traffic signal head to be removed. Trees to be cleared.

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



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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.
Key — Wheel SPA — Body SPA — Load SPA — Indicative ▨ Over-run ▨ Over-sail	SPA Location	R338 / R866 Junction	Checked	GB	16/09/2021	Drawing Status	Draft	
			Point of Interest	7		Drawing No.	SK57A	
				Notes:	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		Revision	1

Blade

Tower

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Project

Tullaghmore Wind Farm

	Name	Date	Scale
Drawn	GLJ	15/09/2021	1:1000 @ A3
Designed	GLJ	15/09/2021	File No. 210913 Tullaghmore Tracking.dwg
Checked	GB	16/09/2021	
Point of Interest			Drawing Status
12			Draft
Drawing No.	Notes:		Revision
SK06	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		1

Client **EMPower**

Drawing Title

Vestas V162 Blade & Tower

Key						
	Wheel SPA	Body SPA	Load SPA	Indicative	Over-run	Over-sail

SPA Location

N6 / Upper Newcastle Rd Junction

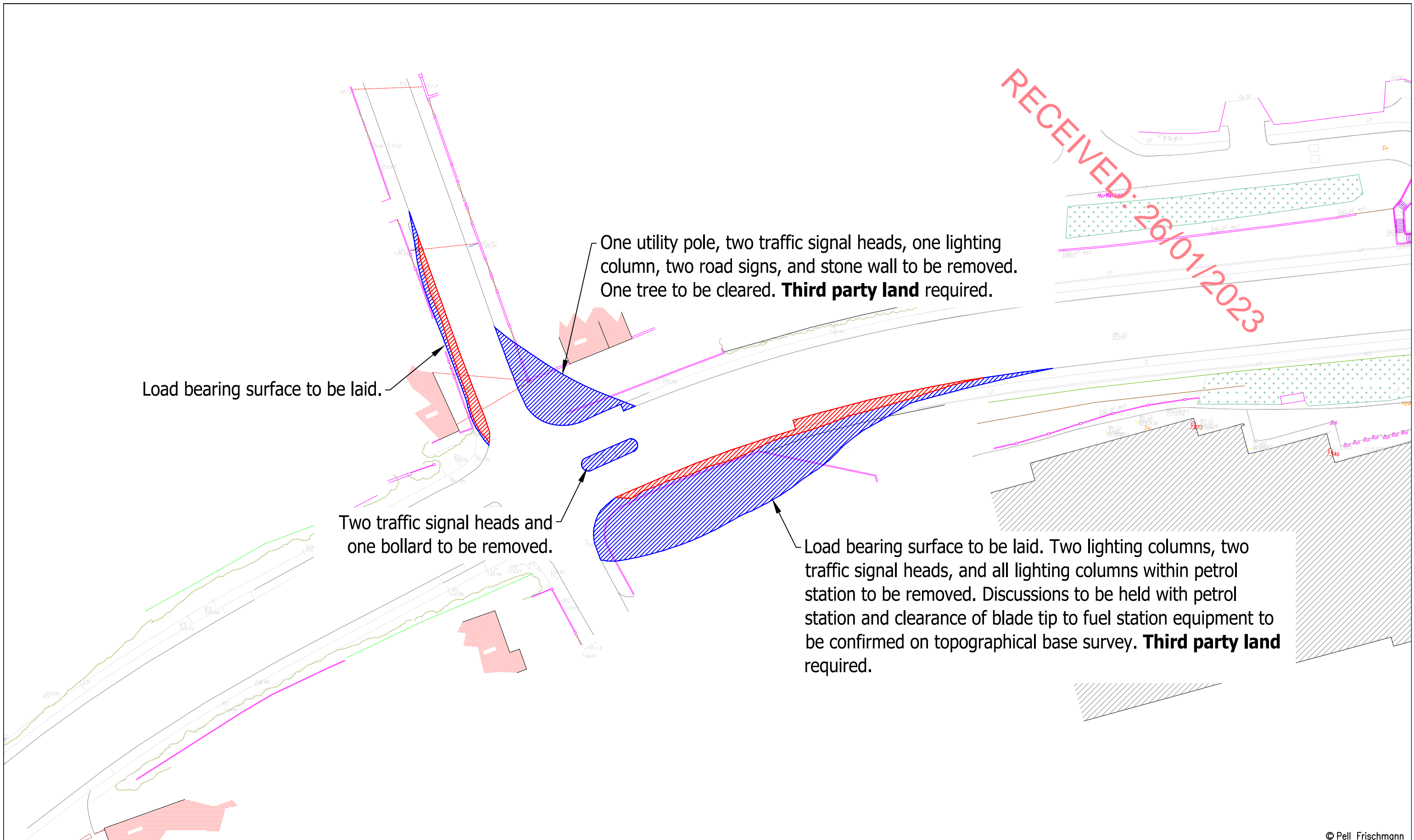
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Load bearing surface to be laid.

One utility pole, two traffic signal heads, one lighting column, two road signs, and stone wall to be removed. One tree to be cleared. **Third party land** required.

Two traffic signal heads and one bollard to be removed.

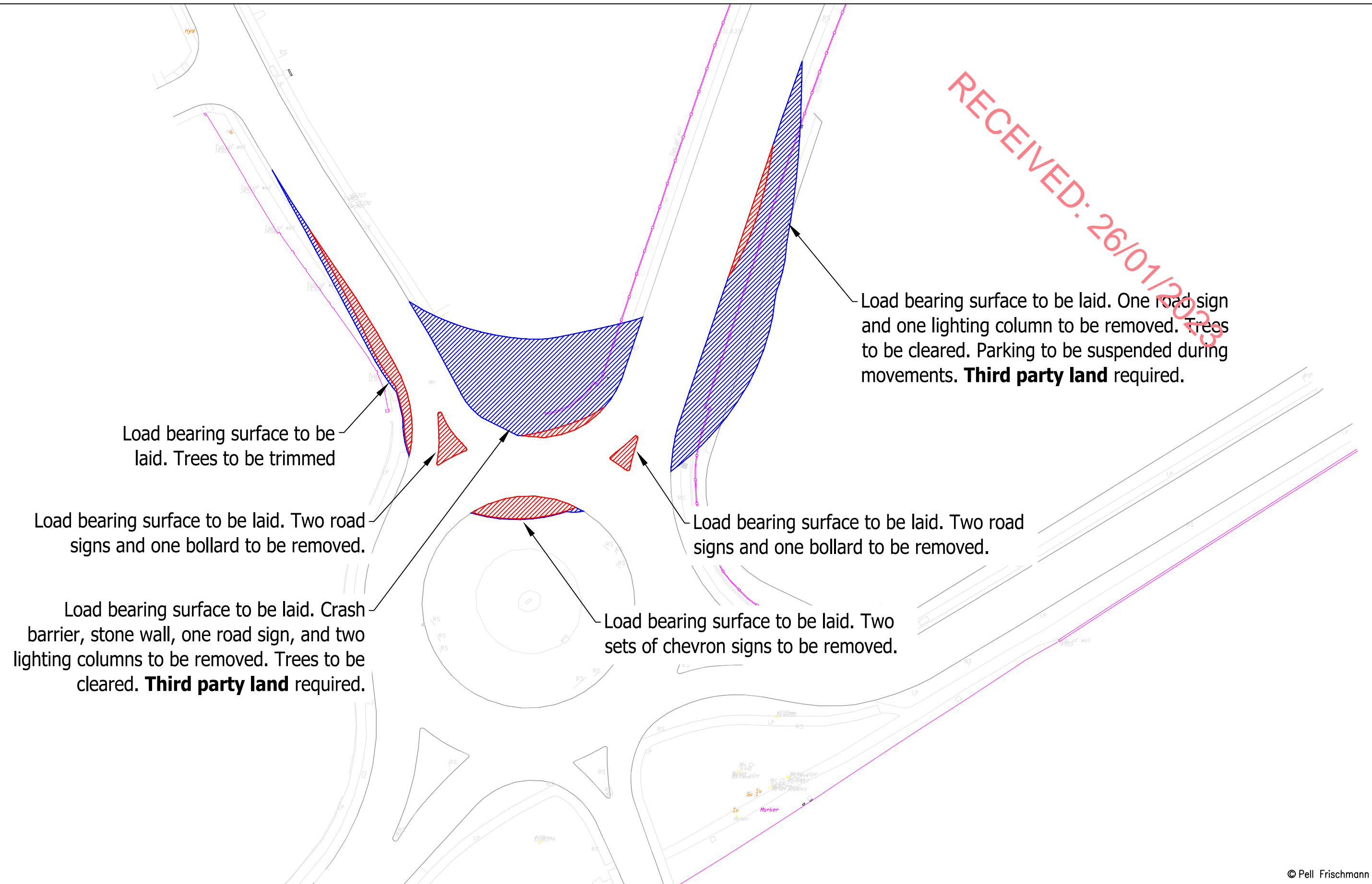
Load bearing surface to be laid. Two lighting columns, two traffic signal heads, and all lighting columns within petrol station to be removed. Discussions to be held with petrol station and clearance of blade tip to fuel station equipment to be confirmed on topographical base survey. **Third party land** required.



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	Client	EMPower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	Drawing Title	Vestas V162 Blade & Tower	Checked	GB	16/09/2021	Drawing Status	Draft
	SPA Location	N6 / Upper Newcastle Rd Junction	Point of Interest	12		Drawing No.	SK06A
						Notes:	Revision
						1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	1

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Load bearing surface to be laid. Trees to be trimmed

Load bearing surface to be laid. Two road signs and one bollard to be removed.

Load bearing surface to be laid. Crash barrier, stone wall, one road sign, and two lighting columns to be removed. Trees to be cleared. **Third party land** required.

Load bearing surface to be laid. Two sets of chevron signs to be removed.

Load bearing surface to be laid. Two road signs and one bollard to be removed.

Load bearing surface to be laid. One road sign and one lighting column to be removed. Trees to be cleared. Parking to be suspended during movements. **Third party land** required.

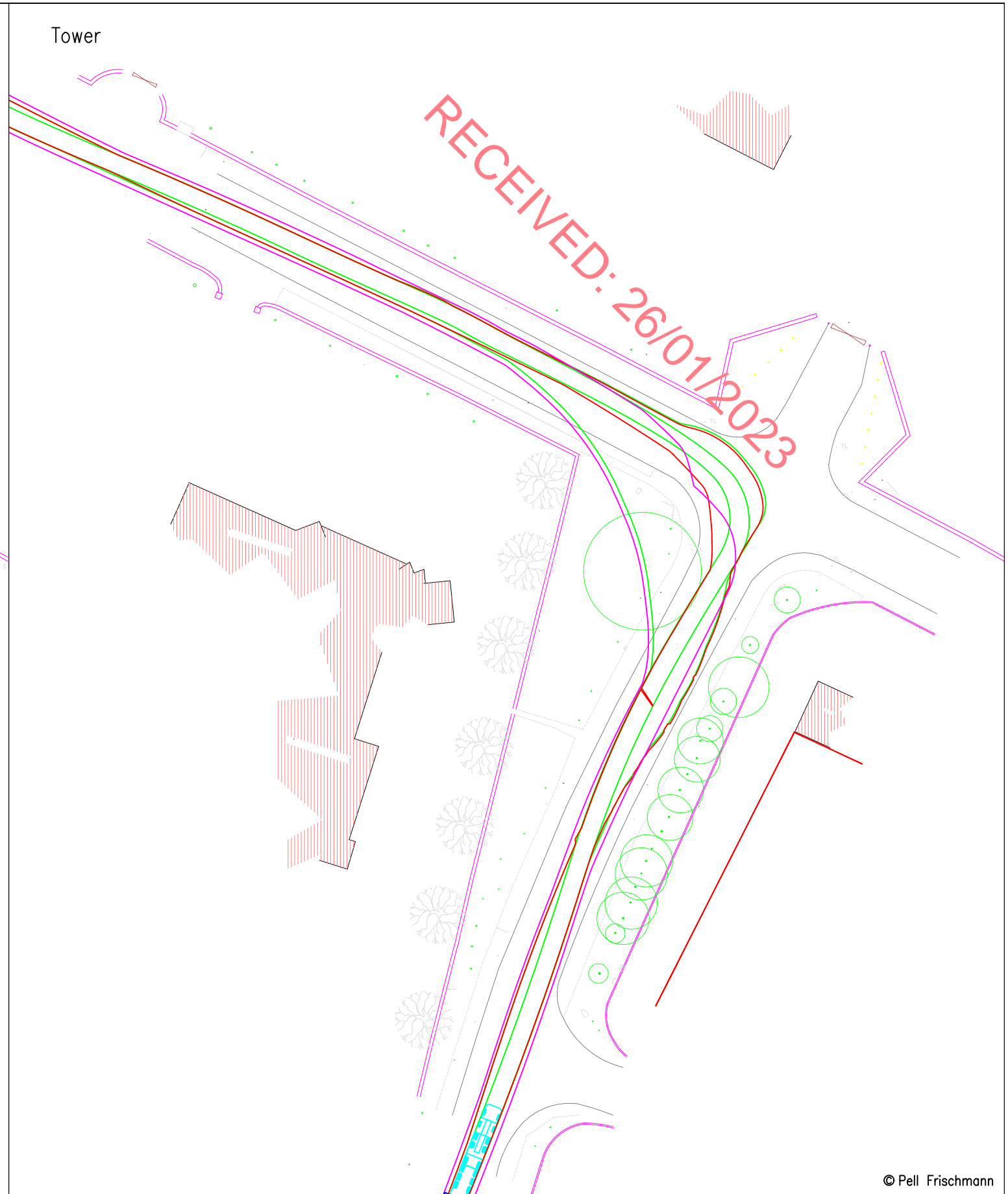
Pell Frischmann 93 GEORGE STREET, EDINBURGH, EH2 3ES Tel: +44 (0)131 240 1270 Email: pfe@pellfrischmann.com www.pellfrischmann.com	Project	Tullaghmore Wind Farm	Drawn	GLJ	15/09/2021	Scale	1:750 @ A3
	Client	EMPower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	Drawing Title	Vestas V162 Blade & Tower	Checked	GB	16/09/2021	Drawing Status	Draft
	SPA Location	N6 Browne Roundabout	Point of Interest	13		Drawing No.	SK58A
						Notes:	Revision
						1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	1

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Client

EMPower

Project

Tullaghmore Wind Farm

Drawing Title

Vestas V162 Blade & Tower

SPA Location

N59 / Upper Newcastle Rd Junction

Drawn	GLJ	15/09/2021	Scale	1:750 @ A3
Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Checked	GB	16/09/2021	Drawing Status	Draft
Point of Interest	14		Revision	1
Drawing No.	SK59		Notes:	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.

Key						
	Wheel SPA	Body SPA	Load SPA	Indicative	Over-run	Over-sail

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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	N59 / Upper Newcastle Rd Junction	Checked	GB	16/09/2021	Drawing Status	Draft	
			Point of Interest	14		Drawing No.	SK59A	Notes:
							1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	1

Blade

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Project

Tullaghmore Wind Farm

Name

Date

Scale

1:1500 @ A3

Drawn

GLJ

15/09/2021

File No.

210913 Tullaghmore Tracking.dwg

Designed

GLJ

15/09/2021

Checked

GB

16/09/2021

Drawing Status

Draft

Point of Interest

15

Drawing No.

SK07

Notes:

1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision

1

Client

EMPower

Drawing Title

Vestas V162 Blade & Tower

Key

					
Wheel SPA	Body SPA	Load SPA	Indicative	Over-run	Over-sail

SPA Location

N59 Doon West

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Three road signs, vegetation, trees and two utility poles to be removed. Bollards to be oversailed. A land search is required to confirm the extent of adopted boundary available.

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	Client	Drawing Title	Drawn	GLJ	15/09/2021	File No. 210913 Tullaghmore Tracking.dwg		
			Designed	GLJ	15/09/2021	Drawing Status Draft		
EMPower	Vestas V162 Blade & Tower	Checked	GB	16/09/2021	Point of Interest	15	Revision	
Key	SPA Location	N59 Doon West	Drawing No.	SK07A	Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.			1
Wheel SPA (Red line) Body SPA (Green line) Load SPA (Purple line) Indicative (Cyan line) Over-run (Red hatched) Over-sail (Blue hatched)								



Blade



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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	N59 Laghtgannon	Checked	GB	16/09/2021	Drawing Status	Draft	
			Point of Interest	16		Drawing No.	SK08	Notes:
							1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	1



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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	N59 Laghtgannon	Checked	GB	16/09/2021	Drawing Status	Draft	Revision	1
			Point of Interest	16	Drawing No.	SK08A	Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		

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Project

Tullaghmore Wind Farm

Name

Date

Scale

1:1250 @ A3

Drawn

GLJ

15/09/2021

File No.

210913 Tullaghmore Tracking.dwg

Designed

GLJ

15/09/2021

Checked

GB

16/09/2021

Drawing Status

Draft

Point of Interest

17

Drawing No.

SK09

Notes:

1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision

1

Client

EMPower

Drawing Title

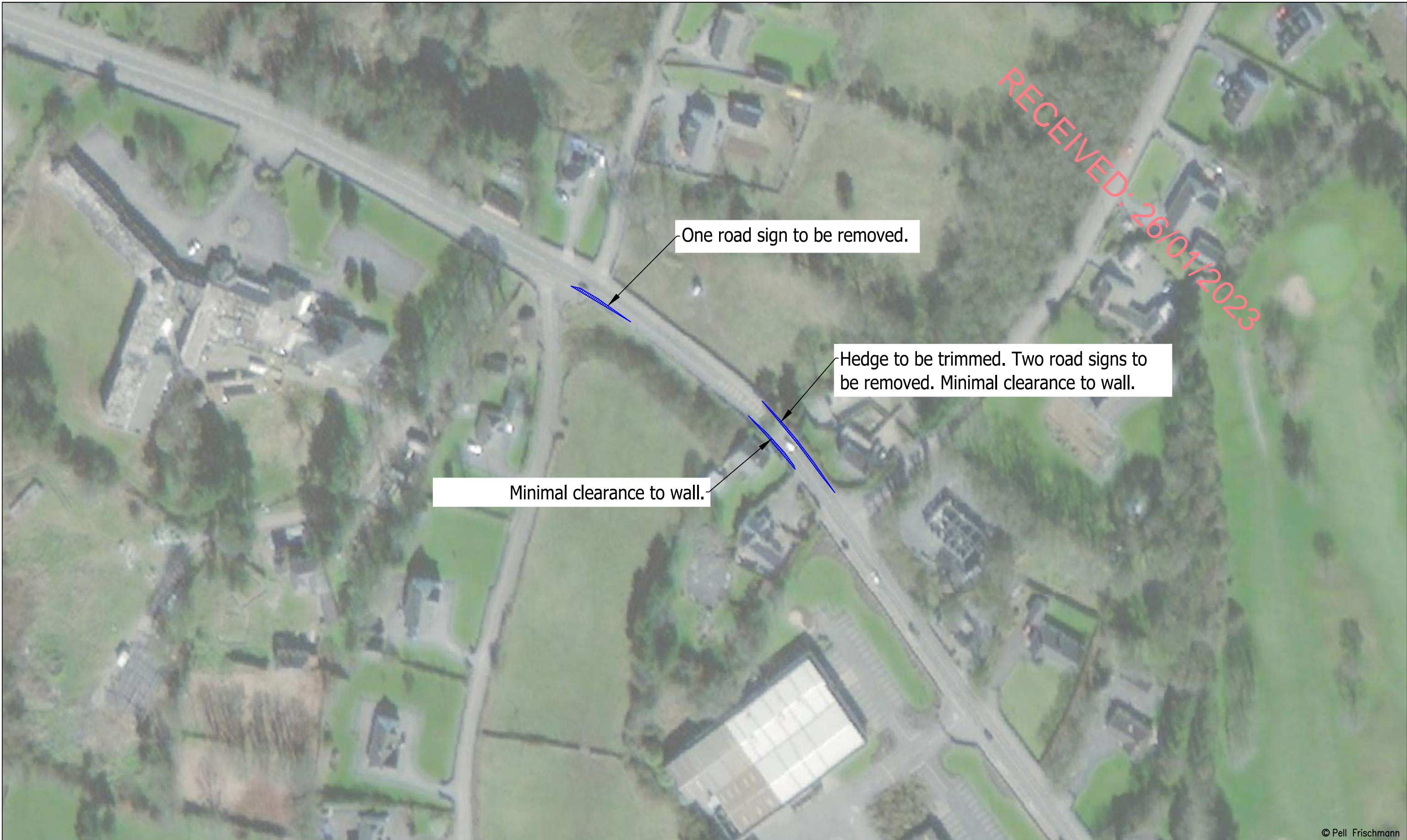
Vestas V162 Blade & Tower

Key

- Wheel SPA
- Body SPA
- Load SPA
- Indicative
- Over-run
- Over-sail

SPA Location

N59 Oldchapel

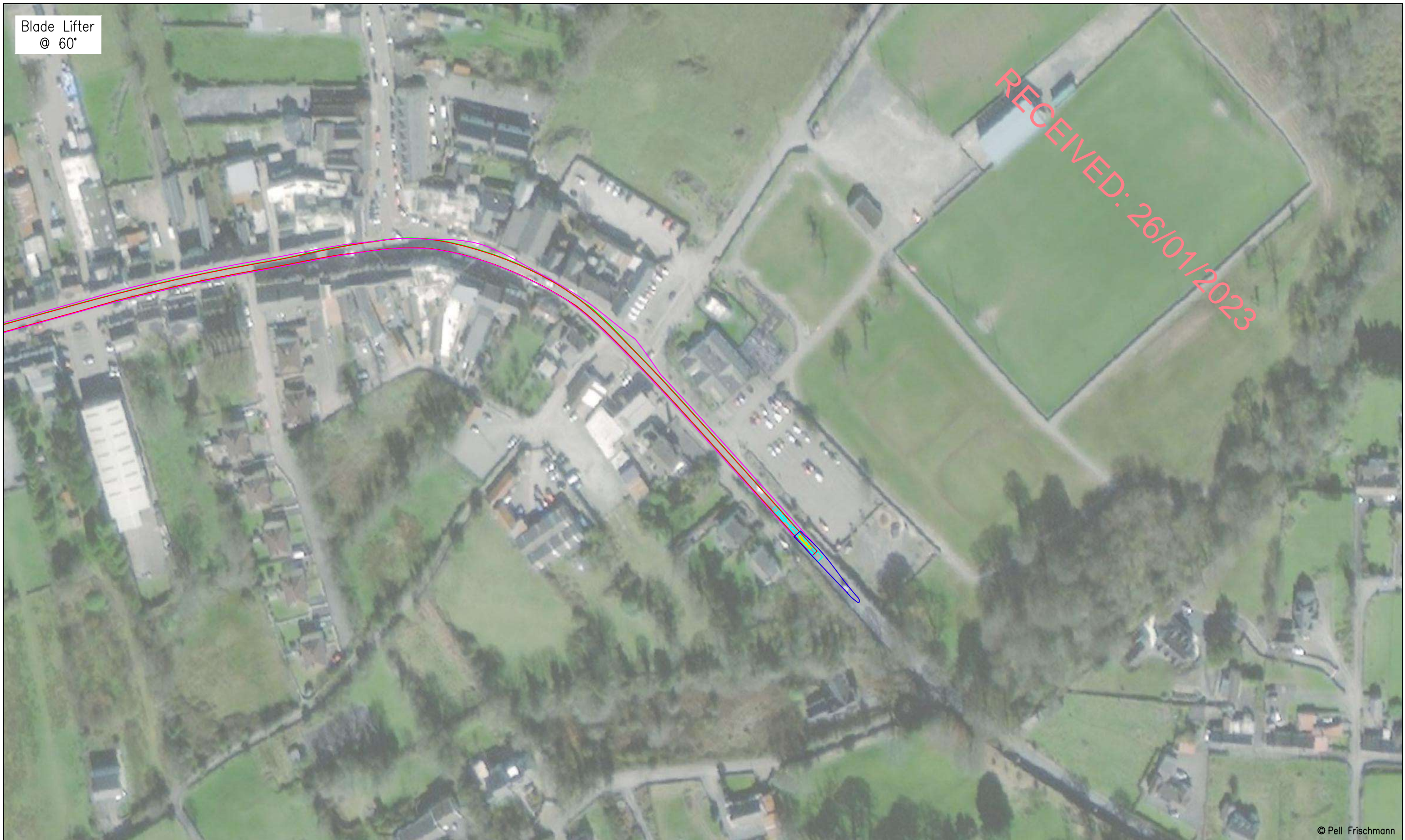


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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	N59 Oldchapel	Checked	GB	16/09/2021	Drawing Status	Draft	Revision	1
			Point of Interest	17	Drawing No.	SK09A	Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		

Blade Lifter
@ 60°

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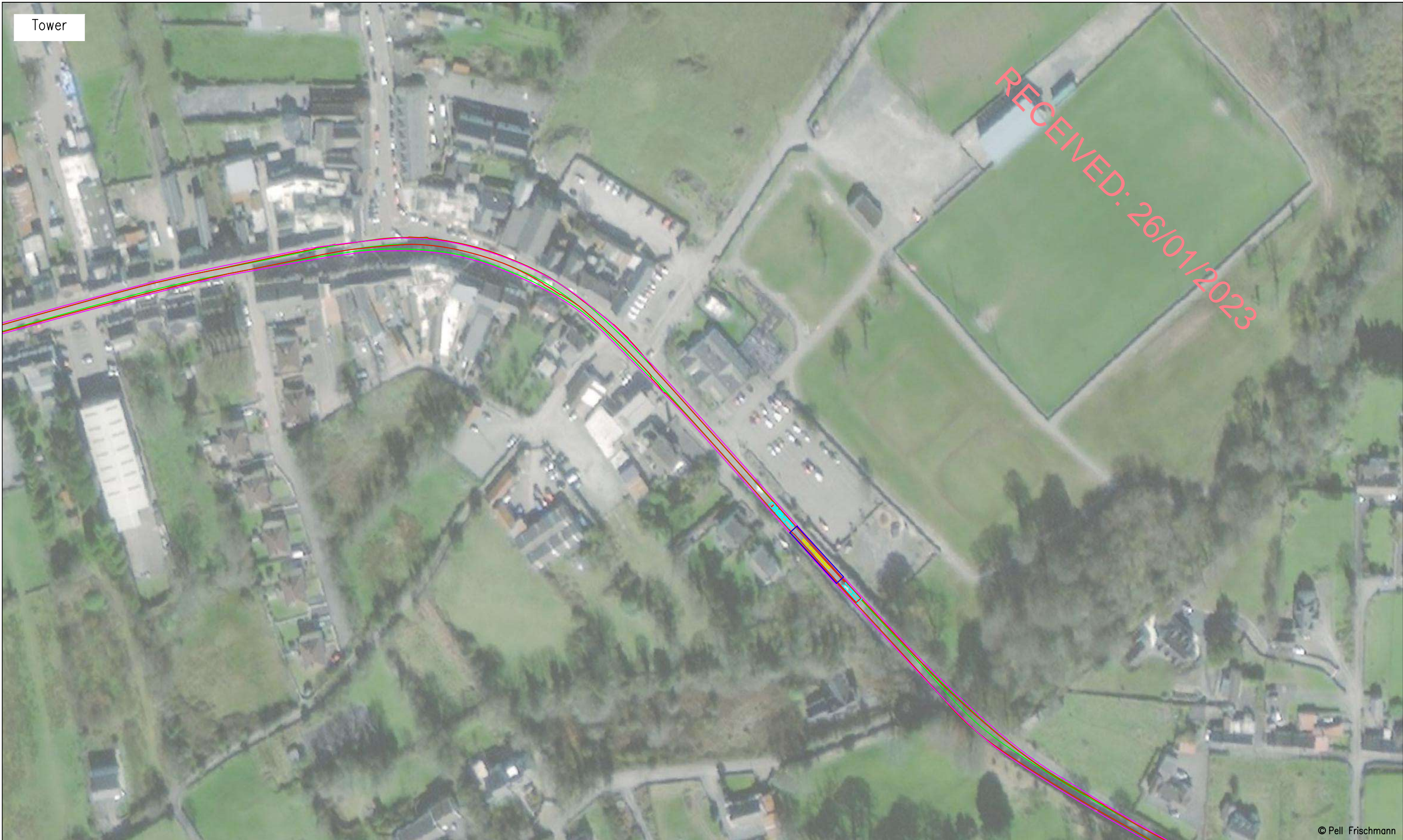


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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	N59 Ardvarna & Oughterard	Checked	GB	16/09/2021	Drawing Status	Draft		
			Point of Interest	18 & 19		Drawing No.	SK10	Notes:	Revision
								1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	1

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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	N59 Ardvarna & Oughterard	Checked	GB	16/09/2021	Drawing Status	Draft	Revision	1
			Point of Interest	18 & 19	Drawing No.	SK10A	Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		



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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	N59 Ardvarna & Oughterard	Checked	GB	16/09/2021	Drawing Status	Draft	Revision	1
			Point of Interest	18 & 19	Drawing No.	SK10B	Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		

Blade Lifter
@ 60°

Tower

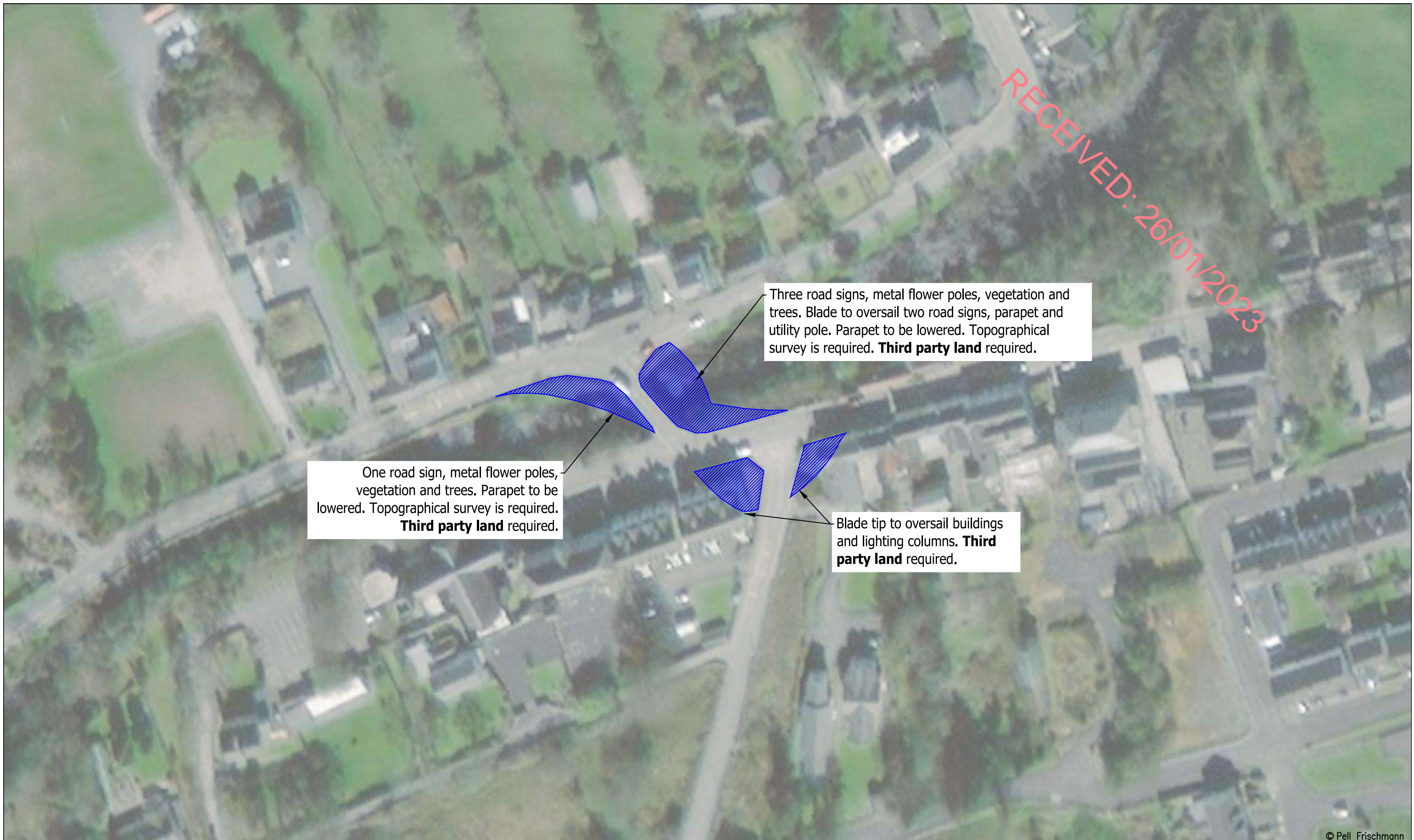
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	Client	EMPower	Designed	GLJ	Date	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg	
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	Drawing Title	Vestas V162 Blade & Tower	Checked	GB	Date	16/09/2021	Drawing Status	Draft	
	SPA Location	N59 Riverside	Point of Interest	20		Drawing No.	SK11	Notes:	Revision
								1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	1

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One road sign, metal flower poles, vegetation and trees. Parapet to be lowered. Topographical survey is required. **Third party land** required.

Three road signs, metal flower poles, vegetation and trees. Blade to oversail two road signs, parapet and utility pole. Parapet to be lowered. Topographical survey is required. **Third party land** required.

Blade tip to oversail buildings and lighting columns. **Third party land** required.

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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	N59 Riverside	Checked	GB	16/09/2021	Drawing Status	Draft	Revision	1
			Point of Interest	20		Drawing No.	SK11A	Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	

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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	N59 Oughterard Shrubbery to Riverside House	Checked	GB	16/09/2021	Drawing Status	Draft		
				Point of Interest	21 - 23		Drawing No.	SK12	Revision
			Notes:		1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.				



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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.	210913 Tullaghmore Tracking.dwg
Key Wheel SPA (Red line) Body SPA (Green line) Load SPA (Purple line) Indicative (Cyan line) Over-run (Red hatched box) Over-sail (Blue hatched box)	SPA Location	N59 Oughterard Shrubbery to Riverside House	Checked	GB	16/09/2021	Drawing Status	Draft		
			Point of Interest	21 - 23		Drawing No.	SK12A	Notes:	Revision
							1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		1

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	Client	EMPower	Drawing Title	Vestas V162 Blade & Tower	Designed	GLJ	15/09/2021	File No.
Key — Wheel SPA — Body SPA — Load SPA — Indicative Over-run Over-sail	SPA Location	N59 Claremount	Checked	GB	16/09/2021	Drawing Status	Draft	
			Point of Interest	24		Drawing No.	SK13	Notes:
							1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	1

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One road sign to be removed. Vegetation to be trimmed. Blade to oversail crash barrier.

One road sign to be removed. Vegetation to be trimmed.

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	Client	Drawing Title	Designed	GLJ	15/09/2021	File No. 210913 Tullaghmore Tracking.dwg		
			Checked	GB	16/09/2021	Drawing Status Draft		
Client	EMPower	Drawing Title	Point of Interest		24	Revision		
Key	Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	Drawing No.		SK13A	Notes:		1
		N59 Claremount	<small>1. All mitigation is subject to confirmation through a test run.</small> <small>2. This is not a construction drawing and is intended for illustration purposes only.</small>					