voltalia

CRUACH CLENAMACRIE WIND FARM

APPENDIX 12.1 TRANSPORT ASSESSMENT - PART 2

Pell Frischmann

Cruach Clenamacrie Wind Farm

Abnormal Indivisible Load Route Survey

December 2023

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Prepared for

Voltalia

Unit 1, Headley Park 8,
Headley Road East,
Woodley,
Reading,
RG5 4SA.

Prepared by

Pell Frischmann

93 George Street
Edinburgh
EH2 3ES

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1 Introduction

1.1 Purpose of the Report

Pell Frischmann (PF) has been commissioned by Voltalia to undertake a survey of the Abnormal Indivisible Load (AIL) delivery route for wind turbine loads associated with the construction and development of Cruach Clenamacrie Wind Farm, located to the south of Fearnoch, Argyll and Bute.

The Route Survey Report (RSR) has been prepared to help inform Voltalia 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 site visit 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 Voltalia 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.

2 Site Background

2.1 Site Location

The development site is located to the south of Fearnoch, Argyll and Bute. Figure 2-1 illustrates the general site location.

Figure 2-1: Site Location Plan

2.2 Candidate Turbine

Voltalia have indicated that they wish to consider the worst-case components from a Vestas V162 turbine at hub height of 200m for use at the site.

The details of the components are detailed in Table 1.

Table 1: Turbine Size Summary

Component	Length (m)	Width (m)	Height / Min Diameter (m)	Weight (t)
Vestas V162 Blade	79.967	4.460	3.800	34.961
Base Tower	12.070	4.760	4.740	81.000
Mid Tower 1	18.760	4.740	4.687	86.000
Mid Tower 2	25.480	4.687	4.676	82.000
Mid Tower 3	29.960	4.676	4.421	76.000
Top Tower	30.000	4.421	3.978	60.000

The subsequent assessment has been based on the blade and worst-case tower.

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.

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. The worst case loads for these sections will be considered in a further study.

Figure 2-2: Superwing Carrier Trailer

Figure 2-3: Tower Trailer

Where constraints are significant, blades would be transferred onto a ten-axle blade lifting trailer to reduce the amount of third-party land required and to reduce the extents of associated physical improvements. This trailer can lift blades up to a maximum angle of 60 degrees to clear potential constraints and an example is illustrated in Figure 2-4.

The report notes where on the route this would need to be deployed. Where the blade lifting trailer is used, a transfer location will need to be constructed off the public road to allow the lifting operation to occur in safety.

Figure 2-4: Blade Lifting Trailer

3 Access Route Review

3.1 Port of Entry

The nearest feasible and economical Port of Entry (PoE) for the site is Corpach Harbour. The port has been previously used by turbines imports in the past including tower and nacelle deliveries for Stronelairg Wind Farm.

Access from the closer port of Campbeltown has been considered and discounted due to the constraints at Inverary Parish Church and the arch at the Inverary Inn.

3.2 Proposed Access Routes

A site visit to review the constraints was undertaken using an HD video review of the route. Points of Interest (POI) were recorded using a GPS tracker along the route. The proposed access route to the site access junction from Corpach is as follows:

- Loads would exit Corpach Harbour and proceed east on the A830;
- Loads would exit the A830 to join the A82 southbound;
- At Tyndrum, loads would exit the A82 to join the A85 westbound; and
- Loads would then proceed along the A85, where they would turn left into the proposed access junction.

The proposed access route is illustrated in Figure 3-1.

Figure 3-1: Proposed Access Route

3.3 Route Constraints

The constraints noted on the route are detailed in Table 2. 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.

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

Table 2: Constraint Summary

POI	Key Constraint	Details
1	**Corpach Harbour** 	Loads will exit Corpach Harbour in reverse and turn right onto the A830 eastbound. A swept path assessment has been undertaken and indicates that loads will overrun and oversail the northern verge of the A830 where load bearing surfaces should be laid, and the existing kerb protected. The area should be cleared of obstructions and parking should be suspended during deliveries. The fence, trees and one lighting column should be removed. **Third party land** is required. Communication with Network Rail is required. Swept path assessment SK01 is included in Appendix B.
2	**Banavie Swing Bridge** 	Loads will proceed on the A830. Loads will cross the bridge at caution and will advise the swing bridge control room that loads will be passing prior to them leaving Corpach.
3	**Blar Mhor Roundabout** 	Loads will take the second exit at the roundabout to continue on the A830 via a **contraflow** manoeuvre. A swept path assessment has been undertaken and indicates that loads will oversail the right-hand verge on entry to the roundabout where one road sign and two lighting columns should be removed. Loads will oversail the central island where one set of lit chevron signs and two private signs should be removed. Loads will also oversail the western verge upon exiting the roundabout, where the verge should be levelled and one lighting column and one private road sign should be removed. Swept path assessment SK02 is included in Appendix B.

POI	Key Constraint	Details
4	**A830 / A82 Roundabout** 	Loads will take the second exit at the roundabout to join the A82 southbound via a **contraflow** manoeuvre. A swept path assessment has been undertaken and indicates that loads will oversail the northern verge on approach to the roundabout, where two lighting columns and one road sign should be removed. The bridge parapet will be oversailed and **third party land** is required. Loads will oversail the entry splitter island where the bollards and one road sign should be removed. Loads will then oversail the central island where two chevron signs and one private sign should be removed. Loads will then oversail the inside of the junction where three lighting columns, two road signs, trees, vegetation, one traffic signal, one call post and the guardrail should be removed. Loads will oversail the safety barrier and junction box. A land ownership review should be undertaken at this location. Swept path assessment SK03 is included in Appendix B.
5	**A82 / North Road Roundabout** 	Loads will take the second exit at the roundabout to continue on the A82. A swept path assessment has been undertaken and indicates that loads will overrun through the centre of the roundabout island where a load bearing surface should be laid and two sets of lit chevron signs should be removed. Loads will also oversail the exit arm splitter island where one road sign and one bollard should be removed. Swept path assessment SK04 is included in Appendix B.

POI	Key Constraint	Details
6	**Belford Road Roundabout** 	Loads will take the third exit at the roundabout to continue on the A82 via a **contraflow** manoeuvre. A swept path assessment has been undertaken and indicates that loads will oversail the eastern bridge parapet into **third party land.** Trees, vegetation, two road signs, one lit road sign and two lighting columns should be removed. The temporary splitter island on the approach should be removed along with the bollard. Loads should be raised using suspension settings to allow oversail of the bridge parapet on the inside of the right bend where trees should be trimmed and two road signs, one lit road sign and one lighting column should be removed. **Third party land** is required. Loads will overrun and oversail the exit arm splitter island and southern footway where load bearing surfaces should be laid and one road sign, one lighting column and two bollards should be removed. Loads will also overrun and oversail the verges of the following left bend, where a load bearing surface should be laid on the northern verge and one lighting column should be removed. Kerbs should be protected. Swept path assessment SK05 is included in Appendix B.
7	**Belford Road / A82 Roundabout** 	It is proposed that loads will approach the roundabout on the opposite side of the carriageway. A swept path assessment has been undertaken and indicates that loads will cross the central reserve in advance of the roundabout where a load bearing surface should be laid. One lighting column, one bollard and one road sign should be removed. The blade tip will over-sail the north-eastern footway where two lighting columns and two road signs should be removed. Loads will oversail the verge on the inside of the roundabout where three lighting columns, one lit road sign, a section of fencing and trees and vegetation to be removed. The blade tip will over-sail southern edge of the roundabout, where one lit road sign and one private road sign are to be removed. Loads will also oversail the southern verge of the exit arm, where one road sign, one lit road sign, one lighting column and one bollard should be removed. Swept path assessment SK06 is included in Appendix B.

POI	Key Constraint	Details
8	**West End Roundabout** 	Loads will take the third exit at the roundabout to continue on the A82 via a **contraflow** manoeuvre. A swept path assessment has been undertaken and indicates that loads will cross the central reservation on the entry arm where a load bearing surface should be laid and existing utilities protected. One road sign and one lighting column should be removed. Loads will oversail the western verge of the entry arm splitter island, where one road sign should be removed and one bollard oversailed. A load bearing surface should be laid on the central roundabout island where two sets of lit chevron signs should be removed. Loads will oversail north-western verge and splitter island of the exit arm where one bollard should be oversailed. Swept path assessment SK07 is included in Appendix B.
9	**A82 Druimarbin** 	Loads will continue on the A82. The road surface was noted to be in a poor state of repair at this location. It is recommended that discussions are held with Transport Scotland to ensure repairs are completed prior to deliveries.
10	**A82 Southwest of Drimarben** 	Loads will continue south on the A82. *The available OS mapping does not accurately identify the road edge. An indicative road edge has been provided for illustration only and should be confirmed during the test run.* A swept path assessment has been undertaken and indicates that loads will oversail both verges through the bends where a number of bollards and chevron signs should be over-sailed and vegetation trimmed. Swept path assessment SK08 is included in Appendix B.

POI	Key Constraint	Details
11	**A82 South of River Kiachnish** 	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that loads will oversail both verges through the bend. The blade will oversail a series of bollards on the outside of the bend where one set of chevron signs should be removed. Loads will oversail the safety barrier on the inside of the first bend where **third party land** is required. Vegetation and trees should be trimmed on both sides of the carriageway. Swept path assessment SK09 is included in Appendix B.
12	**A82 North of Corrychurrachan** 	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that vegetation and trees should be trimmed on both verges through the bends. Bollards will be oversailed on both verges of the carriageway and one metal pole to be removed on the western verge. Swept path assessment SK10 is included in Appendix B.
13	**A82 Corrychurrachan** 	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that loads will oversail both verges of the first left bend where vegetation and trees should be trimmed. Bollards will be oversailed on the north western verge and two sets of chevron signs should be removed. Loads will oversail both verges through the right bend where bollards will be oversailed on the east and one set of chevron signs should be removed and trees / vegetation should be trimmed. One road sign should be removed on the western verge and loads should be raised to oversail the bridge parapet. Loads will finally oversail both verges through the third bend where trees and vegetation should be trimmed. Bollards and safety barrier should be oversail on the north western verge where one set of chevron signs should be removed. Trees and vegetation should be trimmed on both verges through the following bends. Swept path assessment SK11 is included in Appendix B.

POI	Key Constraint	Details
14	**A82 Northeast of Corran** 	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that loads will oversail both verges through the first bend. The blade will over-sail a series of bollards on the outside of the bend. Loads will oversail the safety barrier and the stone wall on the inside of the bend. Vegetation should be trimmed and one road sign removed. **Third party land** is required. Loads will oversail the inside verge through the second bend where vegetation and trees should be trimmed. Loads should be raised to their highest suspension setting to oversail the safety barrier. Swept path assessment SK12 is included in Appendix B.
15	**A82 Bends, Corran** 	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that loads will oversail both verges through this location. Vegetation and trees should be trimmed through the first two bends. On the second set of bends bollards should be over-sailed on the western verge through the double bend. Vegetation should be trimmed on the eastern verge through the first bend and the clearance to the rock face should be confirmed on a topographical survey. Swept path assessment SK13 is included in Appendix B.
16	**A82 Bends, Corran** 	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that loads will oversail both verges through the bends, where bollards will be over-sailed on the outside verges of both bends. At the first bend, two roads signs should be removed and vegetation trimmed on the inside verge. Vegetation should be trimmed on the inside verge of the send bend. Swept path assessment SK14 is included in Appendix B.

POI	Key Constraint	Details
17	**A82 Double Bend, Keppanach** 	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that loads will oversail both verges of the carriageway where trees and vegetation should be trimmed on both verges. One bollard should be oversailed on the western verge on approach to the bend. Two road signs, two private signs and one set of chevron signs should be removed from the north-eastern verge. **Third party land** is required. One metal pole should be removed on the inside verge on the bend. Swept path assessment SK15 is included in Appendix B.
18	**A82 Right Bend, Keppanach** 	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that loads will oversail both verges of the bend. Vegetation and trees should be trimmed on the inside verge. Swept path assessment SK16 is included in Appendix B.
19 & 20	**A82 Left Bends, Onich**  	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that loads will oversail both verges of the carriageway where and vegetation should be trimmed on the western verge through both bends. Bollards should be oversailed on the western verge through the second bend where one road sign should be removed on the eastern verge. Swept path assessment SK17 is included in Appendix B.

POI	Key Constraint	Details
21	**A82 Bends, Onich** 	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that loads will over-sail both verges through the first left hand bend, though no works are required. Loads will over-sail the inside verge of the right-hand bend where a section of fencing should be removed along with one tree. **Third party land** is required. Loads will over-sail the inside verge of the second left-hand bend though no mitigation is required. Swept path assessment SK18 is included in Appendix B.
22	**A82 Double Bend, Onich** 	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that loads will oversail both verges of the carriageway through the bends, where vegetation should be trimmed on the south western verge through the final bend. Swept path assessment SK19 is included in Appendix B.
23 & 24	**A82 North of Ballachulish**  	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that loads will over-sail the southern verge through the first right bend where vegetation should be trimmed and loads raised to clear the stone wall. Parking should be suspended during movements on the north eastern verge of the last bend. Loads will oversail the inside of the last bend, where two utility posts should be relocated and loads raised to clear the stone wall. **Third party land** will be required. Swept path assessment SK20 is included in Appendix B.

POI	Key Constraint	Details
25	**Ballachulish Roundabout** 	Loads will take the second exit at the roundabout to continue on the A82 via a **contraflow** manoeuvre. A swept path assessment has been undertaken and indicates that loads will oversail the southern verge of the entry arm where one lit road sign should be removed. A load bearing surface should be laid on the entry splitter island where two road signs and two bollards should be removed. Loads will overrun and oversail the southern verge of the central island where a load bearing surface should be laid. Loads will then oversail the southern verge on the exit of the roundabout where two lighting columns and one road sign should be removed. Loads will over-sail the splitter island, though no further physical mitigation will be required. Swept path assessment SK21 is included in Appendix B.
Blade loads will be transferred from the Superwing Carrier trailer into a blade lifting trailer at a blade transfer station near Ballachulish. The exact location of the transfer station will be detailed at a later date once the necessary land option is secured. The blade lifter will be used for all blade loads through constraints in Glencoe. Loads will be transferred back to the Superwing Carrier at a point to the east of Glencoe. Where the blade tip is elevated, all overhead obstructions (tree canopy, overhead utilities, etc) will need to be removed. The blade tip does not need to be fully elevated for the entire transit of Glencoe.		
26	**North East of Loch Achtriochtan** 	Loads will continue on the A82. The road surface was noted to be in a poor state of repair at this location. It is recommended that discussions are held with Transport Scotland to ensure repairs are completed prior to deliveries.

POI	Key Constraint	Details
27	**A82 North of Three Sisters of Glencoe** 	Loads will continue on the A82. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* The blade lifting trailer should be raised through this section. All overhead utility obstructions should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail the northern verge through the right bend where bollards, one road sign and one chevron sign should be oversailed. Loads will oversail the southern verge through the right bend where one road sign should be removed and the safety barrier over-sailed. Loads will then oversail the southwestern verge though the left bend where chevron signs, bollards and the safety barrier will be oversailed. **Third party land** is required The rock face should be regraded on the inside of the left bend subject to confirmation on a topographical survey. Loads will also oversail the safety barrier on both sides of the carriageway following this bend. **Third party land** is required throughout this section on both sides of the road. Swept path assessment SK22 is included in Appendix B.
28	**A82 East of Three Sisters of Glencoe Car Park** 	Loads will continue on the A82. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run or on a topographical survey base plan.* The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will over-sail both verges of the right bend where the rock faces should be regraded subject to confirmation on a topographical survey. Loads will over-sail both verges of the following left-hand bend where the rock face should be regraded subject to confirmation on a topographical survey on the inside verge and the safety barrier should be over-sailed on the outside verge. Swept path assessment SK23 is included in Appendix B.

POI	Key Constraint	Details
29	**A82 East of Aonach Eagach Car Park** 	Loads will continue on the A82. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads should be set to highest suspension to oversail safety barrier on the inside of the bend. **Third party land** will be required though this section. Swept path assessment SK24 is included in Appendix B.
30	**A82 West of Ralston Cairn** 	Loads will continue on the A82. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will over-sail the northern verge through the right bend where the wall and all street furniture will be oversailed. Loads should be set to highest suspension to oversail safety barrier on the inside of the right bend. The rock face on the inside of the left bend should be regraded subject to confirmation on a topographical survey. Swept path assessment SK25 is included in Appendix B.
31	**A82 Glencoe Waterfall** 	Loads will continue on the A82. The blade lifting trailer should be raised through this extremely constrained section. A swept path assessment has been undertaken and indicates that the rock face on the outside of the left bend should be regraded subject to detailed design reviews. Swept path assessment SK26 is included in Appendix B.

POI	Key Constraint	Details
32	**A82 Northwest of Glencoe Waterfall** 	Loads will continue on the A82. The blade lifting trailer should be raised through this section. A swept path assessment has been undertaken and indicates that loads will over-sail both verges, though no physical mitigation is required. Following this section, the blade tip can be lowered. Swept path assessment SK27 is included in Appendix B.
33	**A82 West of Glencoe Valley Viewpoint** 	Loads will continue on the A82. The road surface was noted to be in a poor state of repair at this location. It is recommended that discussions are held with Transport Scotland to ensure repairs are completed prior to deliveries.
Blade loads will be transferred to a Superwing Carrier trailer to the east of Glencoe. The exact location of the transfer station will be detailed once the required land option has been secured by the developer.		
34	**A82 Loch Tulla Viewpoint** 	Loads will continue on the A82. A swept path assessment has been undertaken and indicates that loads will oversail the inside of the left bend where three snow poles should be removed. Loads will oversail the western verge on approach to the left bend where two snow poles, one road sign and one set of chevron signs should be removed. Bollards will be over-sailed. Parking should be suspended in the oversail area in the layby during deliveries. Loads will oversail the inside verge through the right where one snow pole should be removed. Swept path assessment SK28 is included in Appendix B.
35	**A82 Left Bend, Northwest of Achallader** 	Loads will continue on the A82. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* Loads will oversail both verges of the carriageway where two poles should be removed from the northern verge. Swept path assessment SK29 is included in Appendix B.

POI	Key Constraint	Details
36	**A82 Northwest of Achallader** 	Loads will continue on the A82. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* A swept path assessment has been undertaken and indicates that loads will oversail both verges through the bend. Three sets of chevron signs and three snow poles should be removed from the outside of the bend. The blade will oversail all bollards. **Third party land** is required. Loads will oversail the inside of the bend where four snow poles should be removed. Swept path assessment SK30 is included in Appendix B.
37	**A82 South of Auch** 	Loads will continue on the A82. Ongoing road works were noted at this location during the site visit. Confirmation that all works have finished should be sought before movements commence.

POI	Key Constraint	Details
38 & 39 & 40	**A82 / A85 Junction**    	Loads will turn right at the junction to exit the A82 and join the A85 westbound. A swept path assessment has been undertaken and indicates that loads will oversail both verges of the bend on the A82 prior to the junction. On the outside verge two sets of chevron signs, one sign, one pole and one lighting column should be removed. The blade will oversail the safety barrier and trees should be trimmed. On the inside of the bend loads will oversail the safety barrier. One road sign and one snow gate should be removed. Trees and vegetation should be trimmed. On joining the A85, loads will oversail the eastern verge of the A82 where three road signs and trees should be removed. The blade will oversail the safety barrier. **Third party land** is required. Loads will then overrun and oversail the inside of the turn where four road signs, trees, vegetation, fencing and all bollards should be removed. A load bearing surface should be laid. **Third party land** required. A load bearing surface should be laid on the southern verge of the A85 as they enter the junction. Two road signs, trees and vegetation should be removed. **Third party land** required. Several snow poles should be removed through the following A85 bends. Loads will oversail both verges through the first bend on the A85 where two road signs, one private road sign, and three sets of chevron signs should be removed. Bollards will be oversailed. Three chevron signs and one road sign should be removed from the southern verge of the third bend on the A85. Bollards will be oversailed and **third party land** is required. Bollards will be oversailed on the northeastern verge through the last bend where two sets of chevron signs should be removed. Swept path assessment SK31 is included in Appendix B.

POI	Key Constraint	Details
41	**A85 Arrivain**    	Loads will continue on the A85. Parking in the layby on the northern side of the road to be suspended during deliveries. The vertical profile of the road at this location is pronounced and should be reviewed during the test run stage to ascertain if tar wedges will be required to extend the vertical curvature of the road and prevent grounding.
42	**A85 Glenlochy Crossing** 	Loads will continue on the A85. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* A swept path assessment has been undertaken and indicates that loads will over-sail both verges through the series of bends where three metal poles should be removed. The blade tip will over-sail multiple bollards on the outside verge of the left-hand bend where one road sign and one chevron sign should be removed. Swept path assessment SK32 is included in Appendix B.

POI	Key Constraint	Details
43	**A85 Southwest of Arrivain** 	Loads will continue on the A85. The vertical profile of the road at this location is pronounced and should be reviewed during the test run stage to ascertain if tar wedges will be required to extend the vertical curvature of the road and prevent grounding.
44	**A85 Bends Southwest of Arrivain**  	Loads will continue on the A85. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* A swept path assessment has been undertaken and indicates that loads will oversail both verges of the carriageway through this location where the safety barrier will be oversailed on the eastern verge and five snow poles should be removed on the western verge. Trees and vegetation should be removed on the inside verge of the final bend where three further snow poles should be removed. Swept path assessment SK33 is included in Appendix B.
45	**A85 Bends Southwest of Arrivain** 	Loads will continue on the A85. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* A swept path assessment has been undertaken and indicates that loads will oversail the inside of the bend where one snow pole should be removed. Loads will oversail the safety barrier where **third party land** is required. Vegetation and trees should be trimmed. Loads will oversail the north-western verge where one chevron sign should be removed and bollards oversailed. Swept path assessment SK34 is included in Appendix B.

POI	Key Constraint	Details
46	**A85 Bends Southwest of Arrivain** 	Loads will continue on the A85. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* A swept path assessment has been undertaken and indicates that loads will oversail both verges of the bend. On the outside of the right bend two sets of chevron signs and two snow poles should be removed. The blade will oversail the safety barrier and bollards. Two snow poles should be removed from the inside of the right bend where **third party land** will be required. Loads will over-sail the safety barrier on the inside of the left bend. Swept path assessment SK35 is included in Appendix B.
47	**A85 Northeast of Glen Lochy Car Park** 	Loads will continue on the A85. The vertical profile of the road at this location is pronounced and should be reviewed during the test run stage to ascertain if tar wedges will be required to extend the vertical curvature of the road and prevent grounding. Loads should be set on a higher suspension setting to reduce the need for physical works at this location.
48	**A85 Southwest of Glen Lochy Car Park** 	Loads will continue on the A85. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* A swept path assessment has been undertaken and indicates that loads will over-sail on both verges through the bends where two snow poles should be removed. The vertical profile of the road at this location is pronounced and should be reviewed during the test run stage to ascertain if tar wedges will be required to extend the vertical curvature of the road and prevent grounding. Swept path assessment SK36 is included in Appendix B.

POI	Key Constraint	Details
49	**A85 Northeast of Succoth Lodge**  	Loads will on continue on the A85. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* A swept path assessment has been undertaken and indicates that loads will over-sail on both verges through the double bends where multiple snow poles should be removed on the northern verge. Trees and vegetation should be trimmed. Swept path assessment SK37 is included in Appendix B.
50, 51	**A85 East of Strone Hill Car Park**   	Loads will continue on the A85. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* A swept path assessment has been undertaken and indicates that loads will over-sail on both verges through the bends where multiple snow poles should be removed and bollards over-sailed. Trees and vegetation should be trimmed on the northern verge through the final right-hand bend. Swept path assessment SK38 is included in Appendix B.

POI	Key Constraint	Details
52	**A85 Strone Hill Car Park**  	Loads will continue on the A85. A swept path assessment has been undertaken and indicates that loads will oversail the inside of the first two left-hand bends where four snow poles should be removed and trees should be trimmed. Bollards should be oversailed on the northern verge through the second bend. Loads will over-sail both verges of the following right-hand bend where three chevron signs should be removed on the outside verge and one snow pole should be removed on the inside verge. The blade tip will over-sail the outside verge of the final left-hand bend where three chevron signs should be removed. The clearances to overhead power lines at this location should be reviewed with the utility provider prior to loads moving to ensure that there is sufficient head height and flashover protection for all temperature ranges. Swept path assessment SK39 is included in Appendix B.
53	**A85 West of Inverlochy** 	Loads will continue on the A85. The clearances to overhead power lines at this location should be reviewed with the utility provider prior to loads moving to ensure that there is sufficient head height and flashover protection for all temperature ranges.
54	**A85 Right Bend, Dalmally**  	Loads will continue on the A85. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run or topographical survey.* A swept path assessment has been undertaken and indicates that loads will over-sail both verges of the bends where one road sign should be removed on the southern verge of the second bend and bollards to be over-sailed and one road sign removed on the northern verge where trees should be trimmed. **Third party land** will be required through this section. Swept path assessment SK40 is included in Appendix B.

POI	Key Constraint	Details
55	**A85 Upper Kinchrackine** 	Loads will continue on the A85. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* A swept path assessment has been undertaken and indicates that loads will over-sail both verges of the bend where two chevron signs should be removed on the southern verge and vegetation to be trimmed on both verges. Swept path assessment SK41 is included in Appendix B.
56	**A85 Dalmally Golf Club** 	Loads will continue on the A85. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* A swept path assessment has been undertaken and indicates that loads will over-sail both verges of the bends where bollards should be over-sailed and one chevron sign and one private road sign should be removed on the northern verge and vegetation trimmed on the southern verge. Swept path assessment SK42 is included in Appendix B.
57	**A85 Blade Change Park East of Drishaig** 	Loads will turn off the A85 left into a car park to change onto a blade lift adaptor and will re-join the A85 heading westbound. This is due to extreme constraints located at POI 59. The parking area would then be used as a blade transition area. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* A swept path assessment has been undertaken and indicates loads will over-sail and over-run on the southern edge of the car park where trees and vegetation should be removed and load bearing surface provided. **Third party land** will be required. Loads will over-run and over-sail the northern edge of the car park where a load bearing surface will be required to be laid and one bollard and a section of fencing is to be removed. **Third party land** will be required. Swept path assessment SK43 is included in Appendix B.

POI	Key Constraint	Details
58	**A85 Drishaig** 	Loads will continue on the A85. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail both verges of the carriageway where the blade tip will over-sail all street furniture. Swept path assessment SK44 is included in Appendix B.
59	**A85 Creag a' Gheoidh**  	Loads will continue on the A85. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail and over-run the outside verge through the right bend where a load bearing surface should be laid and **third party land** is required. The blade will over-sail the safety barrier and all street furniture, vegetation and trees should be trimmed. Vegetation should be trimmed on the inside of the right bend and the clearance to the stone wall should be confirmed on a topographical survey. Loads will over-sail both verges of the following left-hand bend, though no physical mitigation is required. Swept path assessment SK45 is included in Appendix B.

POI	Key Constraint	Details
60	**A85 East of Coille Driseig**   	Loads will continue on the A85. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail both verges through this location where trees and vegetation should be trimmed on the inside verges of the first two bends. Loads will over-sail both verges on the final left-hand bend where the blade will over-sail all street furniture on the outside verge and loads will over-sail a fence on the inside verge where **third party land** will be required. Swept path assessment SK46 is included in Appendix B.
61	**A85 St Conan's Tower**  	Loads will continue on the A85. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail both verges of the carriageway where one utility pole, vegetation and trees should be removed on the south-eastern verge through the right-hand bend and on both verges through the left-hand bend. Loads will oversail the safety barrier and wall into **third party land**. Swept path assessment SK47 is included in Appendix B.

POI	Key Constraint	Details
62	**A85 St Conan's Kirk**  	Loads will continue on the A85. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail both verges of the carriageway, however no physical works are required. The vertical profile of the road at this location is pronounced and should be reviewed during the test run stage to ascertain if tar wedges will be required to extend the vertical curvature of the road and prevent grounding. Swept path assessment SK48 is included in Appendix B.
63	**A85 Railway Bridge at Innis Chonain** 	Loads will continue on the A85 over the railway bridge. *OS base mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only. Mitigation should be confirmed through a test run.* The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail the northern verge on approach to the bridge where bollards should be over-sailed, and one utility pole should be removed. Loads will oversail sides of the bridge where loads should be set to their highest suspension setting to oversail the bridge parapet and safety barrier. **Third party land** is required. One utility pole, one traffic signal, trees and vegetation should be removed on the south eastern verge over the bridge. A further traffic signal, chevron signs, trees and vegetation should be removed on the northwestern verge over the bridge. A revised assessment on a topographical survey base plan is recommended. Early engagement with Network Rail is required at this location. Swept path assessment SK49 is included in Appendix B.

POI	Key Constraint	Details
64	**A85 Innis Chonain** 	Loads will continue on the A85. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail the southern verge through the left bend though no physical mitigation is required. Loads should be set to their highest suspension setting to oversail the retaining wall / embankment on the inside of the right bend. Swept path assessment SK50 is included in Appendix B.
65	**A85 Southwest of Creag a' Bhodaich** 	Loads will continue on the A85. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. *Ariel mapping and OS mapping does not identify the road edge at this location. An indicative road edge has been provided for illustration only.* A swept path assessment has been undertaken and indicates that loads will oversail the north eastern verge where the clearance to the retaining wall should be confirmed on a topographical survey. Bollards will be oversailed. Trees should be removed on the south western verge where **third party land** is required and the safety barrier oversailed. Swept path assessment SK51 is included in Appendix B.
66	**A85 Loch Awe Holiday Park** 	Loads will continue on the A85. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail both verges through the bends where the blade tip will over-sail all street furniture. Swept path assessment SK52 is included in Appendix B.

POI	Key Constraint	Details
67	**A85 Northwest of Bridge of Awe**  	Loads will continue on the A85. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail both verges through the first double bend where bollards will be oversailed and the vegetation / trees should be trimmed. One road sign should be removed in the northeastern verge. Both verges are to be over-sailed through the final right-hand bend where three sets of chevron signs should be removed from the outside verge, multiple bollards will be oversailed and the vegetation / trees should be trimmed. Vegetation should be trimmed on the inside verge of the final bend. Swept path assessment SK53 is included in Appendix B.
68	**A85 North of Ichrachan** 	Loads will continue on the A85. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail the southern verge though no physical mitigation is required. Swept path assessment SK54 is included in Appendix B.
69	**A85 Kirkton** 	Loads will continue on the A85. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail both verges of the carriageway through the right bend. Bollards, safety barrier and all street furniture will be over-sailed. Swept path assessment SK55 is included in Appendix B.
70	**A85 West of Taynilt** 	The vertical profile of the road at this location is pronounced and should be reviewed during the test run stage to ascertain if tar wedges will be required to extend the vertical curvature of the road and prevent grounding.

POI	Key Constraint	Details
71	**A85 Railway / Allt Nathais Bridge**  	Loads will continue on the A85. The blade should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail both verges through the left bend though no physical mitigation is required. The blade tip should over-sail all street furniture. Loads will oversail both verges of the carriageway through the right bend where the embankment should be reprofiled and one road sign removed on the inside verge where **third party land** is required. Vegetation and trees should be trimmed. A revised assessment on a topographical survey base plan is recommended. Early engagement with Network Rail is also required at this location to agree the over-sail. Swept path assessment SK56 is included in Appendix B.
72	**A85 Eltham Cottages** 	Loads will continue on the A85. The blade lifting trailer should be raised through this section. Any overhead utilities should be relocated. A swept path assessment has been undertaken and indicates that loads will oversail the inside verge through the left bend though no physical mitigation is required. Swept path assessment SK57 is included in Appendix B.
73	**A85 Northeast of Dailnamac** 	The clearances to overhead power lines at this location should be reviewed with the utility provider prior to loads moving to ensure that there is sufficient head height and flashover protection for all temperature ranges.
74	**A85 Site Access** 	Loads will turn left into the proposed site access junction at this location. Abnormal loads will use the ahead slip, which will be constructed out of different surfacing to the conventional bellmouth, which would be used by all other construction traffic. The abnormal lane would be coned off when not in use, during the construction phase to prevent use by other traffic. The new junction and access track should be constructed to manufacturer guidelines. The design of the junction is illustrated in the Transport Assessment.

3.4 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 oversail tracked path of the load where it encroaches outwith the trailer (load swept path).

Where mitigation works are required, the extents of overrun and oversail areas are illustrated on the swept path drawings.

Please note that where assessments have been undertaken using Ordnance Survey (OS) 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 or client supplied data.

3.5 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. The has previously stated that their general rule is that the area of adoption is between established fence / hedges lines or a maximum 2m from the road edge (3m in The Highland Council area). This can vary between areas and location.

3.6 Weight Review

A weight review will need to be undertaken via the ESDAL (Electronic Service Delivery for Abnormal Loads) contacts database using the Highways Agency website www.esdal.com once the exact model of turbine has been procured and the haulier selected.

The following ESDAL contacts will need to be contacted to ascertain if there are any relevant constraints that should be noted.

Table 3: ESDAL Contacts

Organisation	Email Address
Police Scotland	OSDAbnormalLoadsScotland@scotland.pnn.police.uk
Network Rail	AbLoadsESDAL@networkrail.co.uk
Historic Rail Estate	rsgbrb@jacobs.com
Scottish Canals	SCAbnormal.Loads@scottishcanals.co.uk
Transport Scotland	AbnormalLoads@transport.gov.scot
Scotland Transerv (South West)	abnormalloadrouting@scotlandtranserv.co.uk
Bear North West	NWAbnormalLoad@bearscotland.co.uk
Argyll and Bute Council	abnormalloads@argyll-bute.gov.uk
The Highland Council	abnormal.loads@highland.gov.uk

A review of the ESDAL constraints map has not identified any relevant constraints.

3.7 Summary Issues

It is strongly suggested that following a 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 completed;
- A review of axle loading on structures along the entire access route with the various road agencies is undertaken prior to the loads being transported;
- 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; 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

PF has been commissioned by Voltalia to prepare a Route Survey Report to examine the issues associated with the transport of AIL turbine components to the development site.

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.

The report is presented for consideration to Voltalia. 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.

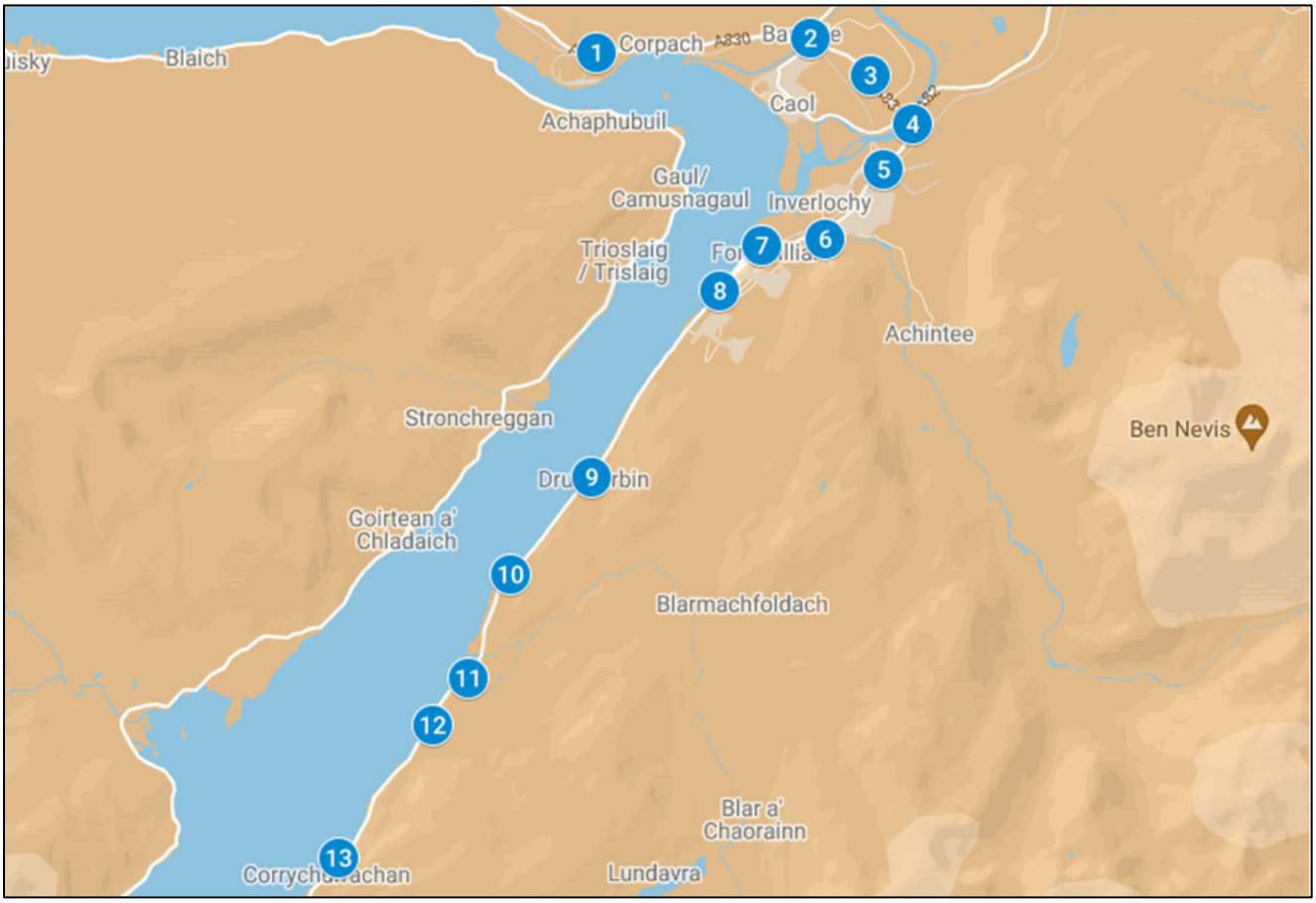
4.2 Further Actions

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

- 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.

Appendix A Points of Interest

An electronic version of these plans can be found here:
https://www.google.com/maps/d/edit?mid=1Val5ieg-nX_4Uo6f8RdNKCurAmZX-Ag&usp=sharing

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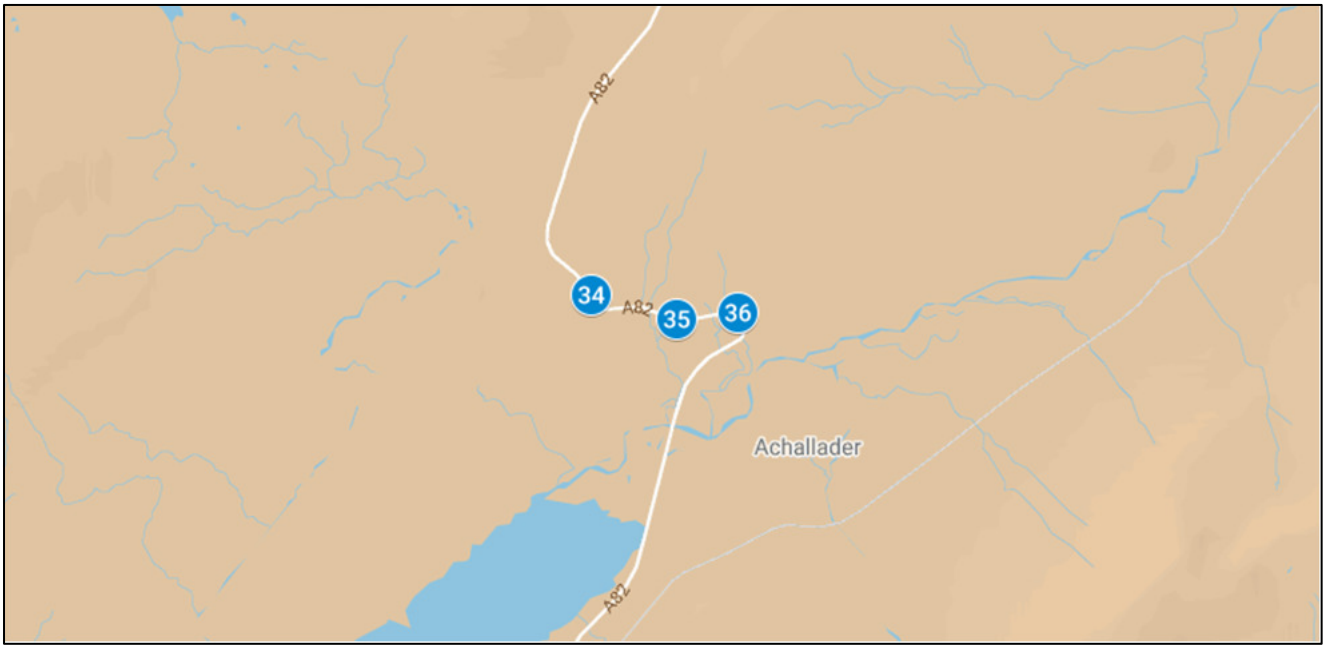
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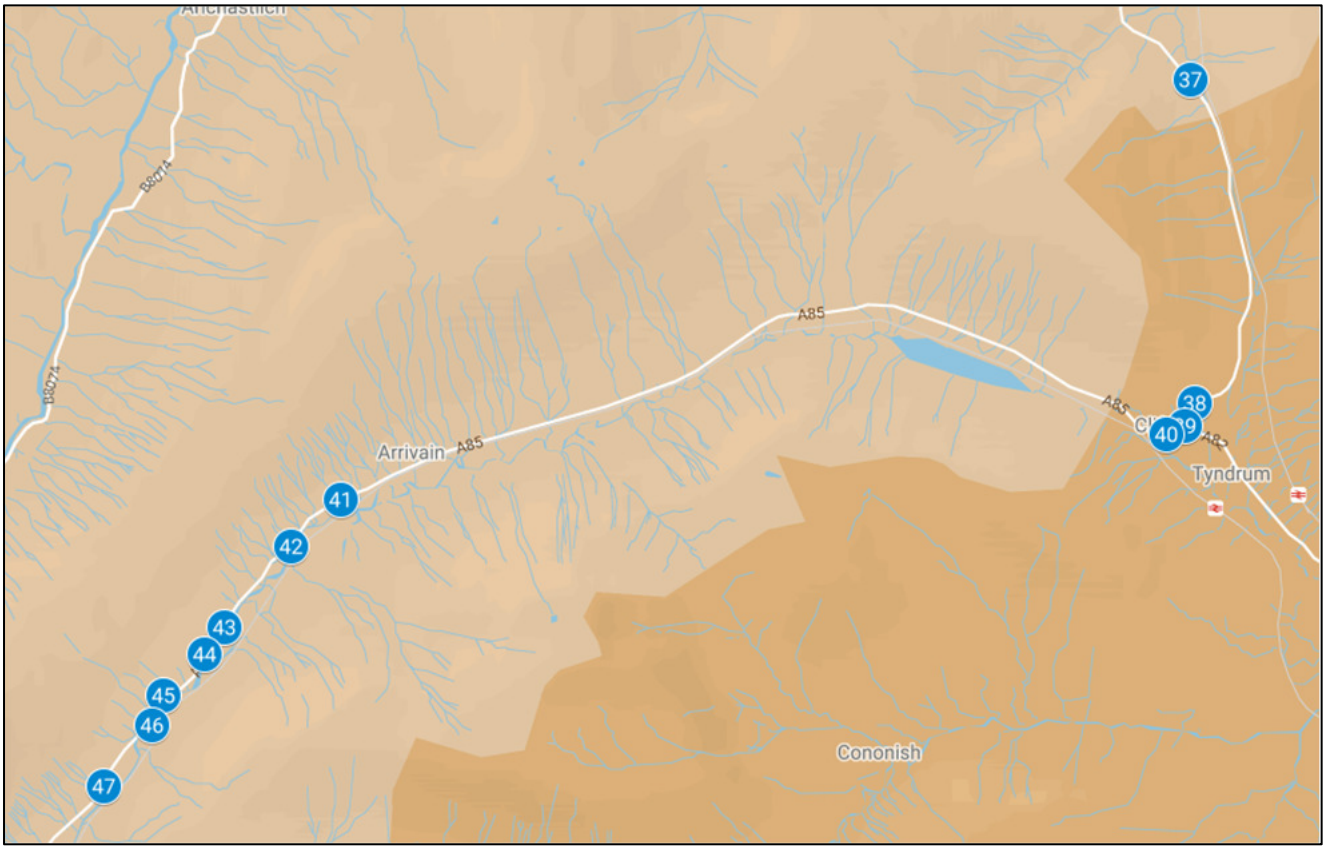
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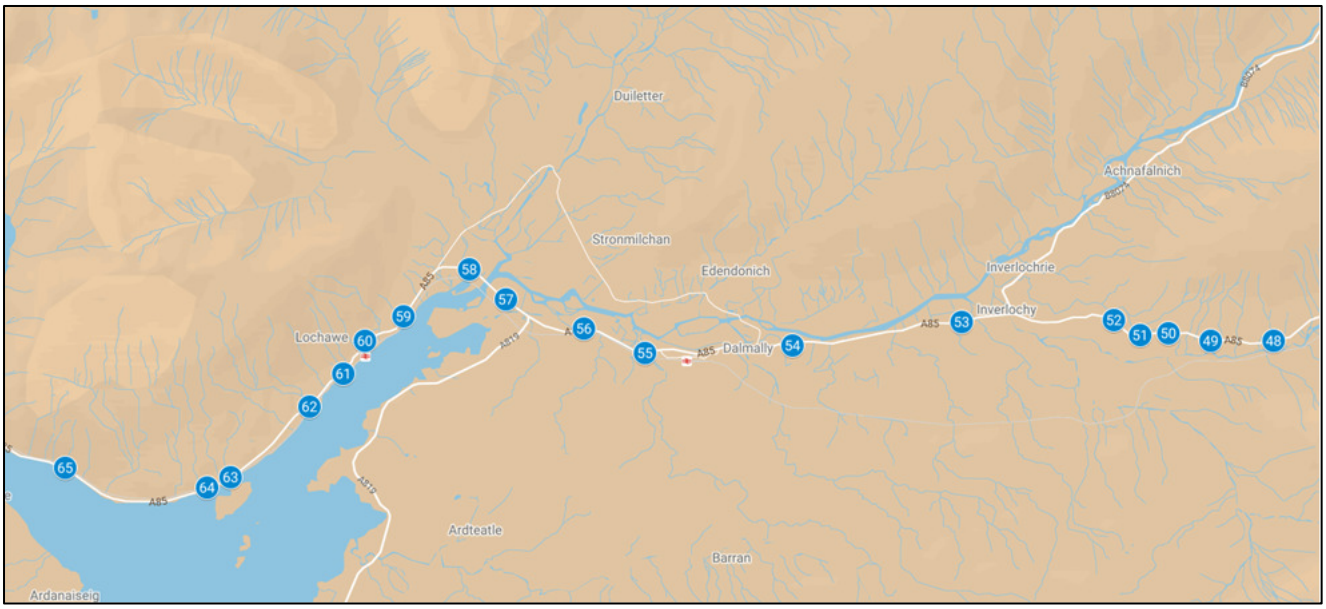
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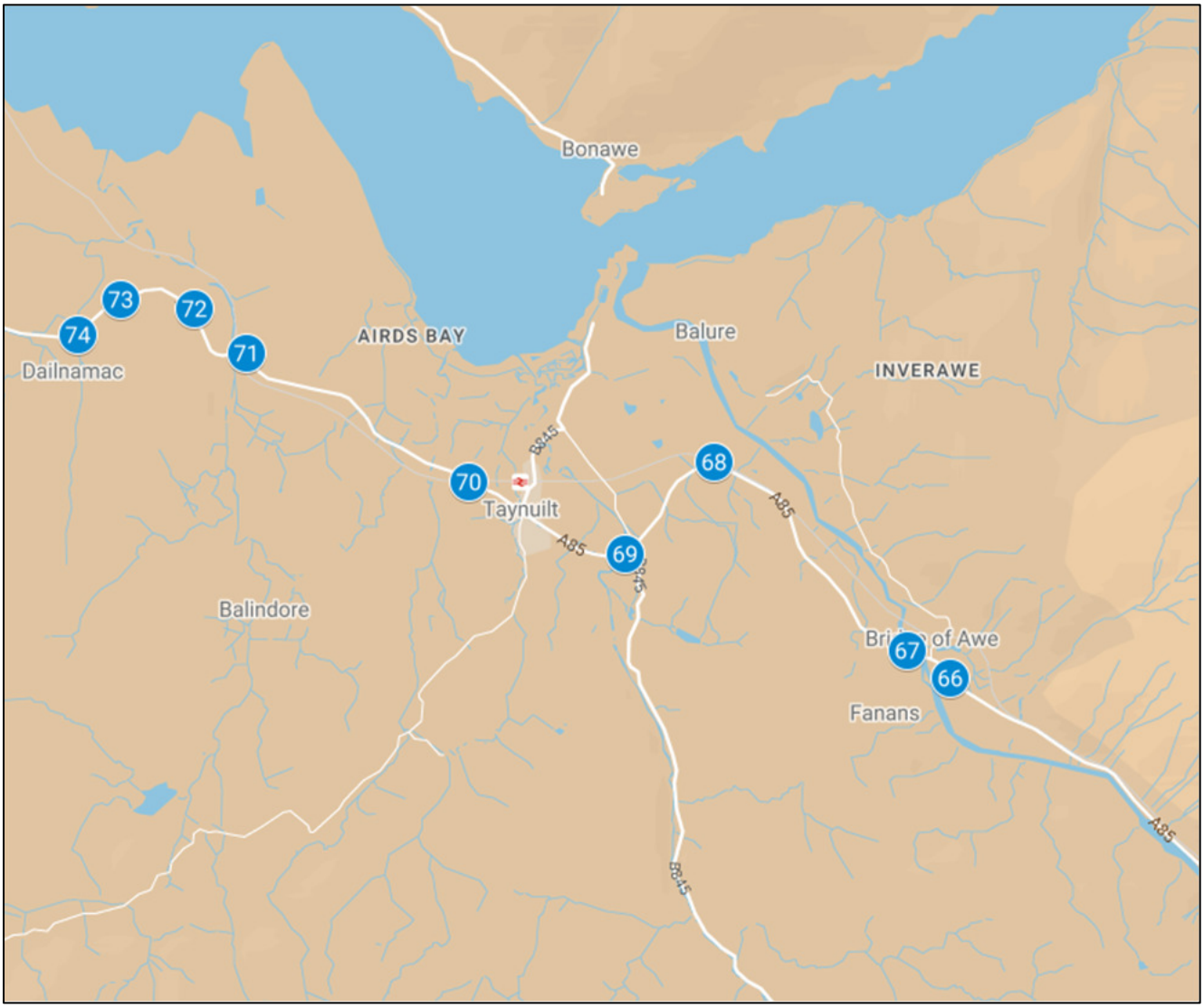
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Appendix B Swept Path Assessments