Pell Frischmann

Giant's Burn Wind Farm

Abnormal Indivisible Load Route Survey

May 2025

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1 Introduction

1.1 Purpose of the Report

Pell Frischmann (PF) have been commissioned by Statkraft (the Applicant) to undertake a survey of the Abnormal Indivisible Load (AIL) delivery route for wind turbine loads associated with the construction and development of Giant's Burn Wind Farm, located on the Cowal Peninsula, Argyll and Bute.

The Route Survey Report (RSR) has been prepared to help inform Statkraft 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 Statkraft at this point in time.

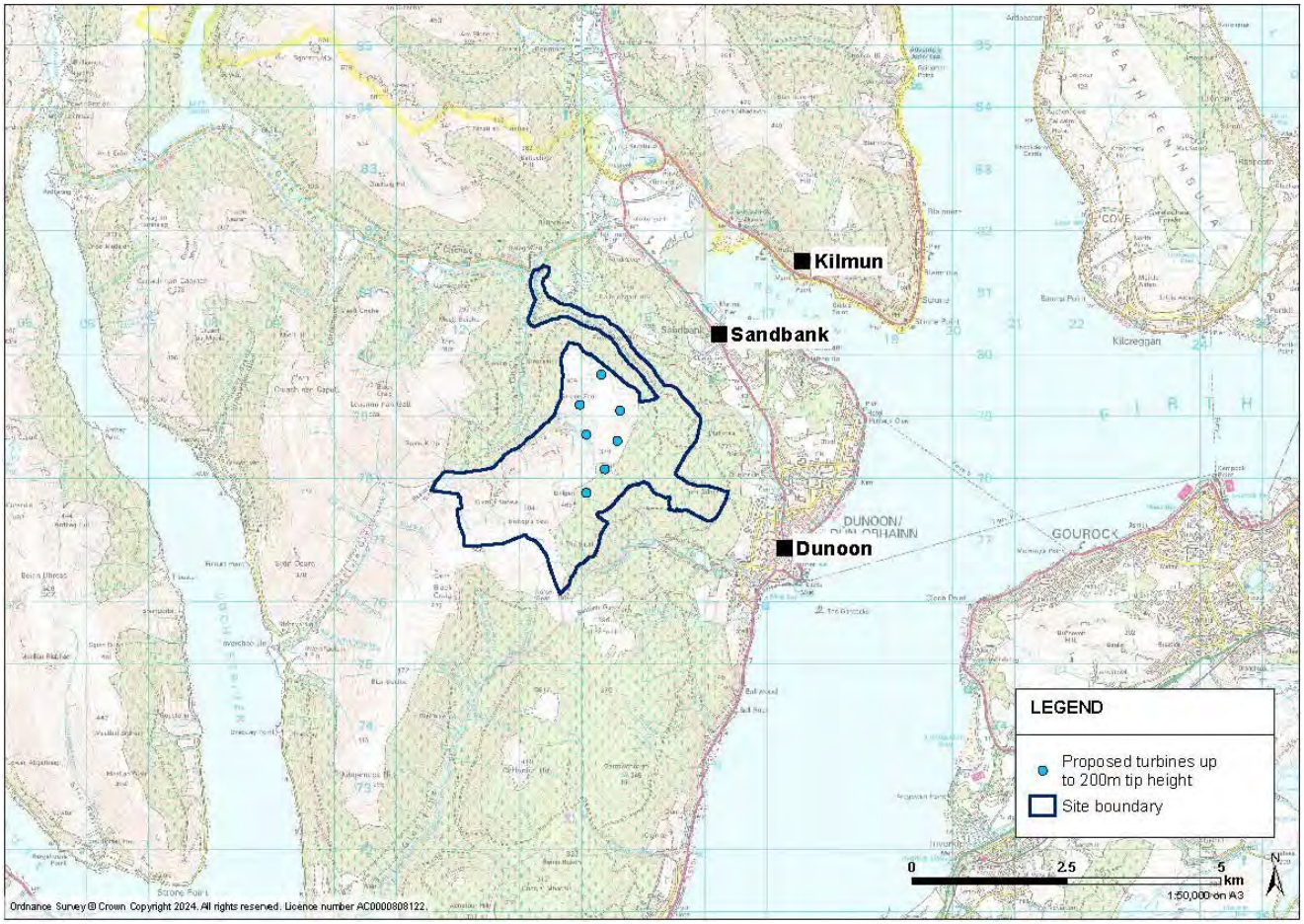
It is the responsibility of the wind turbine supplier to ensure that the entirety of the proposed access route is suitable and meets with their satisfaction. The turbine supplier will be responsible for ensuring that the finalised proposals meet with the appropriate levels of health and safety consideration 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 on the Cowal Peninsula, Argyll and Bute. Figure 2-1 illustrates the general site location.

Figure 2-1: Site Location Plan



2.2 Candidate Turbine

Statkraft have indicated that they wish to consider the worst case components from the Vestas V162 with a tip height of 200m. The details of the components are detailed in Table 2-1.

Table 2-1: Turbine Size Summary

Component	Length (m)	Width (m)	Height / Min Diameter (m)	Weight (t)
V162 Blade	81.100	4.320	3.294	21.700
Base Tower	9.590	4.500	4.150	81.000
Mid Tower 1	12.040	4.150	4.150	82.000
Mid Tower 2	15.680	4.150	4.150	78.000
Mid Tower 3	20.720	4.150	4.150	77.000
Mid Tower 4	28.280	4.150	4.000	76.000
Top Tower	30.000	4.000	4.000	62.000

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 Super Wing carrier trailer to reduce the need for mitigation in constrained sections of the route. The towers would be carried on a 4+7 clamp trailer. The hub and nacelle housing would be carried on a six-axle step frame trailer.

Figure 2-2: Superwing Carrier Trailer

Figure 2-3: Tower Trailer

Where constraints are significant, loads would need to be transferred to a blade lifting trailer. The blade lifting trailer can elevate loads up to 60 degrees to shorten the load in plan view. Where the blade lifting trailer is used, all overhead utilities and obstructions would need to be removed.

To transfer to a blade lifting trailer, an area of third party land would be required to construct a transfer station. The transfer station should be large enough to accommodate up to two sets of blades, welfare facilities, two cranes and a storage area for frames. Figure 2-3 below illustrates an example of a blade lifter.

Figure 2-4: Indicative Blade Lifting Trailer

3 Access Route Review

3.1 Port of Entry

The proposed Port of Entry (PoE) for blade loads is KGV Docks in Glasgow. The port is the closest suitable port to site and as such is in line with the Government's "Water Preferred" policy towards AIL movements.

There is a weight restriction for loads over 100 tonnes crossing the Erskine Bridge. As such it is assumed that only blade loads will cross the Erskine Bridge and all other loads will arrive at Clydebank Dock. Detailed discussions need to be held with the owners of Clydebank Dock, Peel Port to ensure they allow for the proposed loads to be landed and that adequate facilities are available for its use.

3.2 Proposed Access Routes

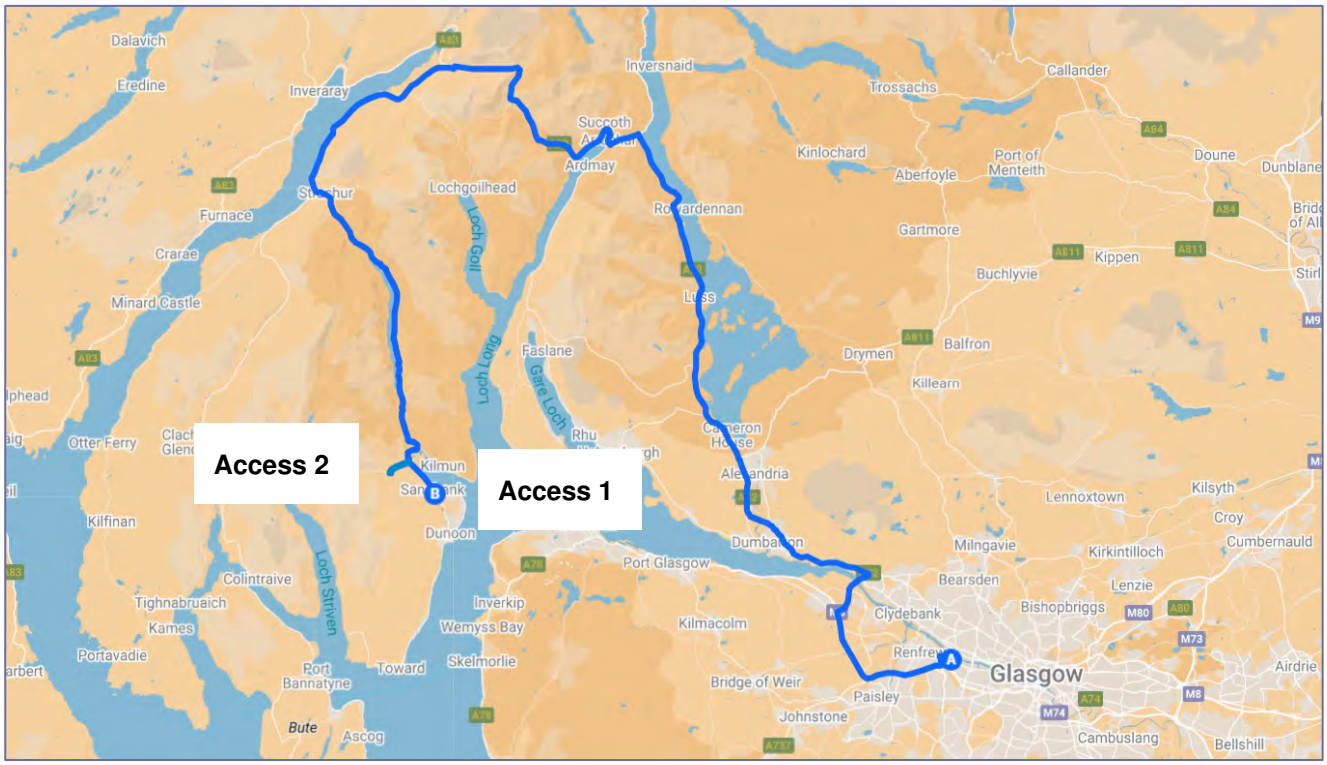
Two routes have been assessed as blade loads will depart from KVG docks and all other components will depart from Clydebank docks. Additionally, two viable site access locations have been identified.

The blade access route to site is as follows:

- Loads will exit the dock and continue west on Kings Inch Drive before turning left onto Kings Inch Road;
- Loads will join the westbound M8 at Junction 26;
- At M8 Junction 30 loads will join the northbound M898 and cross the Erskine Bridge;
- Loads will join the westbound A82 to Tarbet;
- Loads will join the A83 using a new bypass at Tarbert;
- Loads will turn left onto the A815 and head south;
- Loads will continue southbound on the A815 towards Dunoon;
- The first viable site access location (Option 1) is located within Sandbank, northwest of Dunoon. Loads would head southeast on the A815 into Sandbank then join the A885, driving southeast through the village. They would turn right into the access track for Dunoon Substation, westbound;
- The second viable site access location (Option 2) would be taken to the north of Sandbank. Loads would turn right onto the B836 and would then proceed westbound. After approximately 2km, loads would turn into a site access junction.

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

Figure 3-1: Proposed Blade Route

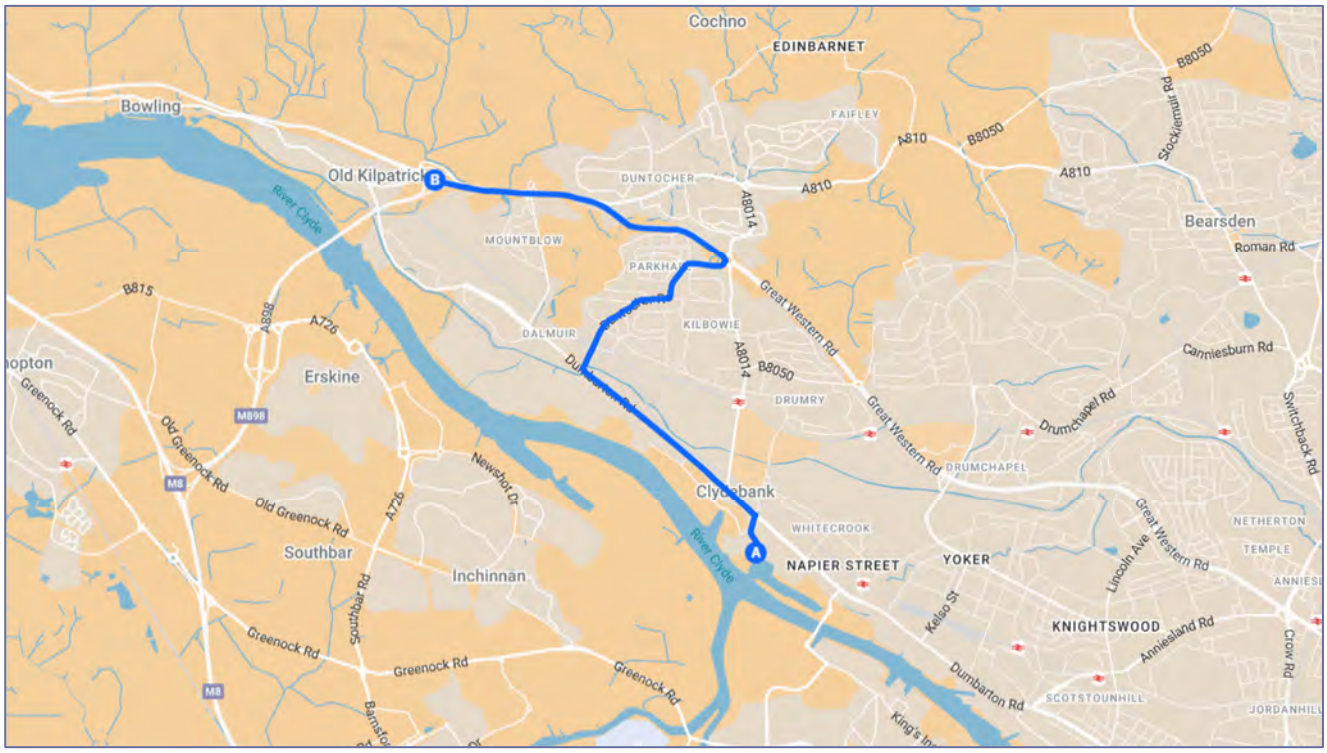


The non-blade load route to site is as follows:

- Loads will exit the dock and continue north on Cart St;
- Loads will turn left onto Glasgow Road heading northwest;
- Loads will turn right onto Duntocher Road (B814);
- At Kilbowie Roundabout, loads will take the first exit to join the A82 heading west; and
- Loads will continue on the A82 to join the blade route to the site access junction.

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

Figure 3-2: Proposed Non-Blade Load Access Route



3.3 Route Constraints

The constraints noted on the route are detailed in Tables 3-1 to 3-4. These cover all constraints from the port access gate through to the proposed site access junctions. 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.

3.3.1 Blade Only Route from KGV Dock

Table 3-1: Constraint Summary – Blade Only Route

POI	Key Constraint	Details
1	**KGV Docks Exit** 	Blades will exit the junction, which has recently been upgraded. A swept path assessment has been undertaken and indicates that blades will overrun and oversail the central island of the roundabout where the existing overrun area should be utilised. Blades will also oversail the central reservation of the north-western arm of the roundabout where two lit road signs should be removed. Swept path drawing SK01 is included in Appendix B.
2	**IKEA Roundabout** 	Blades will proceed ahead at the junction, taking the second exit. A swept path assessment has been undertaken and indicates that blades will oversail the southern verge of the entry arm where one lighting column should be removed. Blades will also oversail the northern verge of the entry arm as well as the southern verge of the roundabout central island and the southern verge of the exit arm though no further mitigation will be required. Swept path drawing SK02 is included in Appendix B.
3	**Braehead Shopping Centre Roundabout** 	Blades will proceed ahead at the junction, taking the second exit. A swept path assessment has been undertaken and indicates that the blades can pass through the section without mitigation. Swept path drawing SK03 is included in Appendix B.

POI	Key Constraint	Details
4	**Kings Inch Road Junction** 	Blades will turn left at the junction onto Kings Inch Road. A swept path assessment has been undertaken and indicates that the blades oversail both verges of the carriageway on approach to the junction. Two sets of traffic signal heads should be removed and the guardrail oversailed on the northern central reserve. One traffic signal head should be removed from the southern verge. Blades will oversail the splitter island of the junction where three sets of traffic signal heads, one crossing signal and pedestrian guardrail should be removed. Blades will overrun and oversail the central reservation of the southern arm where a load bearing surface should be laid. One lit road sign should be removed. Oncoming traffic should be held in advance of the junction to allow loads to complete the manoeuvre. Blades will oversail the eastern verge of the carriageway past the junction though no further physical mitigation will be required. Swept path drawing SK04 is included in Appendix B.
5	**A8 Roundabout** 	Blades will proceed ahead at the junction, taking the second exit. A swept path assessment has been undertaken and indicates that the blades will oversail the central reservation on approach to the roundabout where one lit road sign should be removed. One traffic signal should be removed from the eastern verge on entry. Blades will oversail the central island of the roundabout, where three sets of traffic signal heads and two lit road signs should be removed. Blades will also oversail the eastern verge of the exit arm, where one lighting column should be removed. Two poles should be removed from the exit arm splitter island. Swept path drawing SK05 is included in Appendix B.

POI	Key Constraint	Details
6	**M8 Junction 26 Interchange** 	Blades will right onto the M8 westbound at the junction, taking the third exit. A swept path assessment has been undertaken and indicates that lades will oversail the north-eastern verge of the roundabout island where the safety barrier will be oversailed. Blades will overrun and oversail the southern verge of the central island where a load bearing surface should be laid. One set of chevron signs and three traffic signal heads should be removed. The vehicles will overrun both the separator island for the M8 off slip and the southeastern verge where load bearing surfaces should be laid and **third party land** will be required. On approach to this area loads will overrun the southeastern edge of the roundabout where a load bearing surface should be laid. Blades will oversail the opposite footway where one lighting column and one traffic signal should be removed. The blade loads will overrun and oversail the central reservation of the southern arm where a load bearing surface should be laid. Electrical junction boxes, one road sign, one lighting column, two traffic signal heads and pedestrian guardrail should be removed. Upon exiting the roundabout to join the M8, blades will oversail both verges where three road signs and one electric road sign should be removed. A land search is recommended on the southern verge to confirm the extent of adopted boundary. Swept path drawing SK06 is included in Appendix B.
7	**M8 / M898 Junction** 	Blades will depart the M8 at Junction 30 and will join the M898 northbound. A swept path assessment has been undertaken of the bend following the diverge and this indicates that blades will oversail both verges of the carriageway. Trees and vegetation should be trimmed on the eastern verge. Two sets of chevron signs and one road sign should be removed from the western verge. Swept path drawing SK07 is included in Appendix B.
8	**A898 Erskine Bridge** 	Blades will cross the Erskine Bridge. Weather should be checked in advance of load movements to ensure high winds are not forecast. The bridge is only suitable for loads up to 100t in weight.

POI	Key Constraint	Details
9	**A898 / A82 Merge** 	Blades will diverge form the A898 onto the A82 westbound. A swept path assessment has been undertaken and indicates that blades will oversail both verges of the carriageway where trees and vegetation should be trimmed. One road sign and two chevron signs should be removed from the eastern verge. One lit road sign and one road sign should be removed from the western verge. Blades will oversail the barrier on both sides of the carriageway and oversail the guardrail on the eastern verge. Swept path drawing SK08 is included in Appendix B.

3.3.2 Non-Blade Route from Clydebank Dock

Table 3-2: Constraint Summary – Non-Blade Route

POI	Key Constraint	Details
10	**Clydebank Dock**  	Non-blade loads will exit the dock and join Cart Street heading north. A swept path assessment has been undertaken and indicates that loads will oversail the footway on the inside of the right bend where three traffic signals should be removed. Swept path drawing SK09 is included in Appendix B.

POI	Key Constraint	Details
11	**Cart St / Glasgow Rd Junction**  	Non-blade loads will turn left at the junction and join Glasgow Road. The swept path assessment should be repeated on a topographical survey base due to the limited clearances to street furniture. A swept path assessment has been undertaken and indicates that loads will overrun and oversail the footway on the inside of the left turn where a load bearing surface should be laid and existing utilities should be protected. There is limited clearance to the junction boxes located at this location. The vehicles will cross the central reserve into the opposing lanes before returning to the correct carriageway. A load bearing surface should be laid and existing utilities should be protected. Loads will then continue west through a cobbled section of road with speed cushions where caution should be taken. Swept path drawing SK10 is included in Appendix B.
12	**A814 Underpass** 	Loads will pass under a railway bridge which is signed as having a height restriction of 16 feet or 4.8m. A topographical survey of the bridge has been completed and a vertical assessment shows that the minimum clearance to the bridge soffit is 0.21m.
13	**A814 / B814 Junction**  	High loads will turn right and join the B814. A load bearing surface should be laid on the western footway of the A814 to allow loads to overrun and oversail. Trees in the western verge should be trimmed. Loads will oversail the eastern footway through the junction where one lighting column, two road signs, one traffic signal, fence and the pedestrian guardrail should be removed. **Third party land** is required. Loads will immediately climb up and over the railway. 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 prevent grounding. Swept path drawing SK11 is included in Appendix B.

POI	Key Constraint	Details
14, 15, 16	**B814 Splitter Islands**   	Loads will pass three splitter islands through the bends. Loads will contraflow the first splitter island to avoid mitigation. One lit road sign should be removed from both the second and third islands. Bollards will be oversailed.
17	**Kilbowie Roundabout** 	Non-blade loads will take the first exit to join the A82 heading west. A swept path assessment has been undertaken and indicates that loads will oversail the western footway where two lit road signs, two traffic signals, pedestrian guardrail, one road sign, trees and one lighting column should be removed. Swept path drawing SK12 is included in Appendix B.

3.3.3 Combined Route from Old Kilpatrick to Site (Access Option 1)

Table 3-3: Constraint Summary (Shared Route) – Access Option 1

POI	Key Constraint	Details
18	**A82 / Dumbarton Road Roundabout** 	Loads will proceed ahead at the junction, taking the second exit. A swept path assessment has been undertaken and indicates that loads will oversail both verges on approach to the roundabout as well as the central island of the roundabout. Loads will oversail the safety barrier on the entry central reserve. Traffic should be held at this location during movement of loads. One lit road sign and two lighting columns should be removed from the southern verge of the carriageway. Two sets of chevron signs should be removed from the southern verge of the roundabout's central island. Swept path drawing SK13 is included in Appendix B.
19	**A82 Dumbarton Road Bend** 	Loads will continue ahead through the bend. A swept path assessment has been undertaken and indicates that the loads will oversail the southern footway but no works are required. Swept path drawing SK14 is included in Appendix B.
20	**A82 / A814 Junction** 	Loads will proceed ahead at the junction. Loads will require access to both lanes of the junction at this location. A swept path assessment has been undertaken and indicates that loads will oversail the central reservation of the carriageway. One traffic signal and one bollard should be removed from the eastern side of the junction. One traffic signal should be removed from the western side of the junction. Swept path drawing SK15 is included in Appendix B.
21	**A82 Stirling Road Bend** 	Loads will continue ahead through the bend. A swept path assessment has been undertaken and indicates that loads will oversail the western verge of the carriageway and the central reservation, where hazard markers should be removed. One lighting column should also be removed from the western verge of the carriageway. Swept path drawing SK16 is included in Appendix B.

POI	Key Constraint	Details
22	**A82 Stirling Road Bend 2** 	Loads will continue ahead through the bend. A swept path assessment has been undertaken and indicates that loads will oversail the central reservation of the carriageway where two lit road signs should be removed. Swept path drawing SK17 is included in Appendix B.
23	**Barloan Toll Roundabout** 	Loads will proceed ahead at the junction, taking the second exit. A swept path assessment has been undertaken and indicates that loads will oversail the central reserve on approach to the roundabout. Loads will overrun and oversail through the central island, where a load bearing surface should be laid. One set of lit chevron signs and two traffic signals should be removed. On exit from the roundabout, loads will oversail the western verge of the exit arm, though no further physical mitigation will be required. Swept path drawing SK18 is included in Appendix B.
24	**Lomondgate Roundabout** 	Loads will take the second exit at the roundabout and continue northbound. A swept path assessment has been undertaken and indicates that loads will overrun and oversail the central island, where a load bearing surface should be laid. One set of traffic signals and one set of chevron signs should be removed. Swept path drawing SK19 is included in Appendix B.
25	**A82/A811 Roundabout** 	Loads will take the second exit at the roundabout and continue northbound on the A82. A swept path assessment has been undertaken and indicates that loads will oversail the western verge on approach to the roundabout, though no works are required. Loads will overrun and oversail the central island, where a load bearing surface should be laid. Two sets of chevron signs should be removed. When exiting the roundabout loads will oversail the splitter island and western verge where two road signs and one lighting column should be removed. Swept path drawing SK20 is included in Appendix B.

POI	Key Constraint	Details
26	**A82/A818 Roundabout** 	Loads will take the second exit at the roundabout and continue northbound on the A82. A swept path assessment has been undertaken and indicates that loads will oversail the western verge on approach to the roundabout where one road sign should be removed. Loads will overrun and oversail the western edge of the central island, where a load bearing surface should be laid. Two sets of lit chevron signs should be removed. On exiting loads will oversail the splitter island where one road sign should be removed. Swept path drawing SK21 is included in Appendix B.
TP1	**Potential Blade Transfer Point** 	A potential blade transfer point could be located in this vicinity to allow blade to be transferred from the superwing carrier onto the blade lifting trailer. Third party land will be required to allow for the construction of a transfer point. It is expected that the transfer point will require an approximately 60m x 200m land parcel. It is assumed that the blade will be carried in the raised position for all constraints to the proposed transfer point to the west of POI 45. All overhead utilities and obstructions should be removed.
27	**A83 Tarbet** 	Loads will continue through the left bend at Tarbet. It is recommended that the swept path assessment is repeated on a topographical base plan to confirm the required mitigation. A swept path assessment has been undertaken and indicates that loads will oversail land on the inside of the left bend where vegetation / trees should be removed. Tower loads should be raised to allow oversail of the wall if required. Potential **third party land** is required. Loads will overrun and oversail the footway on the outside of the bend where a load bearing surface should be laid and three bollards and vegetation should be removed. Loads will oversail the verge on the inside of the following right bend. Swept path drawing SK22 is included in Appendix B.

POI	Key Constraint	Details
28	**A83 West of Tarbet** 	Loads will pass under a railway bridge to the west of Tarbet which is signed as having a height restriction of 16 feet or 4.8m. Blades will need to be stopped in advance of the structure and lowered completely to allow for movement beneath the bridge. Once clear of the structure, the blade should be raised for onward movement to the transfer point. A topographical survey of the bridge has been completed and a vertical assessment shows that the minimum clearance to the bridge soffit is 0.28m. All overhead utilities and obstructions should be removed.
29	**A83 Arrochar Bend** 	Loads will continue west through the Arrochar Bend. A swept path assessment has been undertaken and indicates that loads oversail the footway on the inside of the bend. Swept path drawing SK23 is included in Appendix B.
30	**A83 Arrochar Bend 2** 	Loads will continue north through Arrochar. A swept path assessment has been undertaken and indicates that loads will oversail the eastern verge of the carriageway. Swept path drawing SK24 is included in Appendix B.
31	**A83 Arrochar Bend 3** 	Loads will continue north through Arrochar. A swept path assessment has been undertaken and indicates that loads will oversail both verges of the carriageway through this location. Loads will overrun the inside of the second left bend where a load bearing surface should be laid and one road sign should be removed. This is an extremely constrained location. Swept path drawing SK25 is included in Appendix B.

POI	Key Constraint	Details
32	**A83 Loin Water Bridge and Bends** 	Loads will continue through the left bend exiting Arrochar. A swept path assessment has been undertaken and indicates that loads will overrun and oversail the western footway of the carriageway, where a load bearing surface should be laid and the kerb should be protected. One road sign should be removed. Swept path drawing SK26 is included in Appendix B.
33	**A83 Ardgartan Bend** 	Loads will continue through the right bend. ***The available OS mapping does not accurately identify the road edge. An indicative road edge has been provided for illustration only. The mitigation should be confirmed during the test run.*** A swept path assessment has been undertaken and indicates that loads will oversail a section of the outside of the bend. Swept path drawing SK27 is included in Appendix B.
34	**A83 Croe Water Bridge** 	Loads will continue through the right bend of the bridge. ***The available OS mapping does not accurately identify the road edge. An indicative road edge has been provided for illustration only. The mitigation should be confirmed during the test run.*** A swept path assessment has been undertaken and indicates that loads will be able to negotiate the bend within the road edges. Swept path drawing SK28 is included in Appendix B.
35	**A83 Croe Water Bend** 	Loads will continue west on the A83. ***The available OS mapping does not accurately identify the road edge. An indicative road edge has been provided for illustration only. The mitigation should be confirmed during the test run.*** A swept path assessment has been undertaken and indicates that loads will oversail both the northern and southern verges of the carriageway. Swept path drawing SK29 is included in Appendix B.
36	**A83/Old Military Road Junction** 	Loads will continue north through the right bend. ***The available OS mapping does not accurately identify the road edge. An indicative road edge has been provided for illustration only. The mitigation should be confirmed during the test run.*** A swept path assessment has been undertaken and indicates that loads will oversail verge on the inside of the bend. Swept path drawing SK30 is included in Appendix B.

POI	Key Constraint	Details
37	**North of A83/Old Military Road Junction** 	Loads will continue north towards the Rest and Be Thankful. ***The available OS mapping does not accurately identify the road edge. An indicative road edge has been provided for illustration only. The mitigation should be confirmed during the test run.*** A swept path assessment has been undertaken and indicates that loads will oversail the western verge. Swept path drawing SK31 is included in Appendix B.
38	**A83 East of Glen Mhor** 	Road works as part of the rock fall protection works were noted. The road has been reduced to one way operation and a large protection fence will make it difficult for wide loads to pass. Discussions should be held with Transport Scotland to ascertain the timescales for these works to be removed and develop a management plan for movements, if required.
39	**A83 Rest and Be Thankful** 	Loads will continue through the Rest and Be Thankful. A swept path assessment has been completed and indicates that loads will be able to negotiate the section within the road edges. Swept path drawing SK32 is included in Appendix B.
40	**A83/B828 Junction** 	Loads will continue north through the right bend. A swept path assessment has been completed and indicates that loads will be able to negotiate the section within the road edges. Swept path drawing SK33 is included in Appendix B.
41	**A83 North of Loch Restil** 	Loads will continue north through the right bend. A swept path assessment has been completed and indicates that loads will be able to negotiate the section within the road edges. Swept path drawing SK34 is included in Appendix B.

POI	Key Constraint	Details
42	**A83 Kinglas Water Bridge** 	Loads will continue west across the bridge ***The available OS mapping does not accurately identify the road edge. An indicative road edge has been provided for illustration only. The mitigation should be confirmed during the test run.*** A swept path assessment has been undertaken and indicates that loads will oversail the verge on the inside of the bend. Swept path drawing SK35 is included in Appendix B.
43	**A83 Kinglas Water Bridge** 	Roadworks were noted at this location. Their timescale for completion should be ascertained from Transport Scotland, should these prove to be long term in nature.
44	**A83/A815 Junction** 	Loads will turn left at the junction onto the A815. A swept path assessment has been undertaken and indicates that loads will oversail the northern verge of the carriageway on approach to the junction. Loads will overrun the splitter island where a load bearing surface should be laid and one road sign should be removed. Loads will oversail the inside of the left turn where trees and vegetation should be trimmed. The safety barrier will be oversailed and it is recommended that a land search is completed to confirm the extent of adopted boundary available. Swept path drawing SK36 is included in Appendix B.
45	**A815 Bend** 	Throughout the route, the tree canopy needs to be trimmed to provide a clear 5m head height. Trimming of the tree canopy can be subject to ecological constraints and it is suggested that early consultation with Argyll and Bute Council is undertaken to agree cutting times and permits.
TP2	**Potential Transfer Point** 	A potential blade transfer point could be located in this vicinity to allow blade to be transferred from the blade lifting trailer onto the superwing carrier. Third party land will be required to allow for the construction of a transfer point. It is expected that the transfer point will require an approximately 75m x 220m land parcel. Loads will be carried on the Superwing carrier for the remainder of the route.

POI	Key Constraint	Details
46	**A815 Creggans Bend** 	Loads will continue south on the A815. A swept path assessment has been undertaken and indicates that loads will oversail both verges of the carriageway, where the safety barrier on the western verge will be oversailed. Swept path drawing SK37 is included in Appendix B.
47, 48	**A815 / A886 Junction**  	Loads will head east on the A815 keeping left at the junction then driving through a right bend. They will oversail both verges throughout. Trees in the northern verges should be trimmed. Two road signs should be removed from the southern verge through the right bend where trees and vegetation should be trimmed. Swept path drawing SK38 is included in Appendix B.
49	**A815 Strachur** 	Loads will head south on the A815 through a right bend. They will oversail the western verges where two road signs should be removed and vegetation should be trimmed. Swept path drawing SK39 is included in Appendix B.
50	**A815 North of Glenbranter** 	Loads will continue south through a right bend. ***The available OS mapping does not identify the road edge accurately due to the tree coverage through this section. An indicative road edge has been provided for illustration only. All mitigation should be confirmed through the test run or on a topographical survey base.*** They will oversail both verges where trees and vegetation should be trimmed. Swept path drawing SK40 is included in Appendix B.

POI	Key Constraint	Details
51, 52, 53	**A815 Northwest of Loch Eck**   	Loads will head southeast on the A815 towards Loch Eck. The vertical profile of the road at these locations is pronounced and should be reviewed during the test run stage or on a topographical survey base to ascertain if tar wedges are required to prevent grounding.

POI	Key Constraint	Details
54, 55	**A815 Southeast of Glenshellish**  	Loads will head southeast through two bends. ***The available OS mapping does not identify the road edge accurately due to the tree coverage through this section. An indicative road edge has been provided for illustration only. All mitigation should be confirmed through the test run or on a topographical survey base.*** At this location and throughout the entire route, the tree canopy needs to be trimmed to provide a clear 5m head height. Trimming of the tree canopy can be subject to ecological constraints and it is suggested that early consultation with the relevant road authority is undertaken to agree cutting times and permits. Loads will oversail both verges throughout the section. Through the first bend, trees and two utility poles should be removed from the southern verge. Bollards in the southern verge will be oversailed. **Third party land** is required to the south. Trees in both verges between the two bends should be trimmed. Through the second bend, one set of chevron signs should be removed from the northern verge where the land should be reprofiled to accommodate oversail. Bollards in the northern verge will be oversailed. Two utility poles and two bollards should be removed from the southern verge. Trees in the northern verge and vegetation in both verges should be cleared. **Third party land** is required on both sides of the road. Swept path drawing SK41 is included in Appendix B.
56	**A815 West of Cuilmuich** 	Loads will continue southeast through a right bend and over a bridge. They will oversail both verges into **third party land** throughout the bend. Land reprofiling is required to the north to accommodate oversail. Detailed design on a topographical survey required to confirm the works. Two sets of chevron signs should be removed from the northern verge. The northern bridge parapet and a series of bollards will be oversailed. One utility pole and two bollards should be removed from the southern verge where the bridge parapet should be lowered. Trees and vegetation should be cleared from both verges. Trees in the eastern verge after the bend should be trimmed. Swept path drawing SK42 is included in Appendix B.

POI	Key Constraint	Details
57, 58	**A815 West of Carrick Castle**  	Loads will continue southeast, oversailing both verges throughout this location. One utility pole should be removed from the eastern verge. Several bollards and a safety barrier in the western verge will be oversailed. **Third party land** is required to the west. Trees on both sides of the road and vegetation in the eastern verge should be trimmed. Swept path drawing SK43 is included in Appendix B.
59, 60	**A815 West of Carrick Castle**  	Loads will head south through a series of bends. Through the first bend they will oversail both verges into **third party land**. Bollards in the eastern verge will be oversailed. Two utility poles should be removed from the western verge. Vegetation in the eastern verge and trees in both verges should be cleared. Loads will overrun and oversail the western verges through the subsequent two bends where a load bearing surface should be laid. The layby should be temporarily closed during deliveries. Six utility poles, fourteen bollards and one road sign should be removed. They will oversail the eastern verges where several bollards will be oversailed. Trees and vegetation should be cleared from both verges throughout the bends. **Third party land** is required on both sides of the road. Swept path drawing SK44 is included in Appendix B.
61	**A815 Whistlefield** 	Loads will continue south through a right bend. It is strongly recommended that a full overhead utility search is carried out at this location and along the entire route prior to deliveries to ensure that height clearances are suitable for normal temperature ranges. Loads will oversail both verges. Several bollards in the eastern verge will be oversailed. Vegetation in the western verge should be trimmed. Swept path drawing SK45 is included in Appendix B.

POI	Key Constraint	Details
62, 63	**A815 East of Bernice**  	Loads will continue south. The vertical profile of the road at these locations is pronounced and should be reviewed during the test run stage or on a topographical survey base to ascertain if tar wedges are required to prevent grounding.
64, 65	**A815 East of Beinn Mhòr**  	Loads will continue south through two bends. They will oversail both verges through both bends. Through the first bend a series of bollards in the western verge will be oversailed. Trees and vegetation should be cleared from the western verge. **Third party land** is required to the west. Trees in the eastern verge should be trimmed. Through the second bend the land to the east should be reprofiled to accommodate oversail. Bollards in the eastern verge will be oversailed. Trees in both verges and vegetation in the eastern verge should be cleared. **Third party land** is required on both sides of the road. Swept path drawing SK46 is included in Appendix B.
66	**A815 Southeast of Beinn Mhòr** 	Loads will continue south through a left bend. They will oversail both verges through the bend. The western wall and several bollards in the western verge will be oversailed. Trees in the western verge should be cleared. **Third party land** is required to the west. Vegetation in the eastern verge should be cleared. Minimal clearance was noted to the eastern rock face. The clearance should be confirmed sufficient on a topographical survey base. Potential requirement to reprofile the rockface which would require **third party land**. Following the bend loads will oversail a wall and several bollards to the west into **third party land** where vegetation should be cleared and trees should be trimmed. Swept path drawing SK47 is included in Appendix B.

POI	Key Constraint	Details
67, 68	**A815 West of Barnacabber**  	Loads will continue south through a series of bends. Through the first bend they will oversail both verges into **third party land**. The western safety barrier should be removed. Two utility poles should be removed from the eastern verge. Bollards in the eastern verge will be oversailed. The eastern rock face should be regraded to accommodate oversail. Trees and vegetation should be cleared from both verges. Through the second bend one road sign should be removed from the eastern verge where loads will oversail. Trees and vegetation should be trimmed. The proximity to the eastern rock face should be confirmed sufficient on a topographical survey base. Potential requirement to regrade the rockface which would require **third party land**. Through the third bend the western safety barrier will be oversailed where vegetation should be cleared. One road sign should be removed from the eastern verge. The eastern rock face should be regraded to allow oversail. Trees and vegetation should be cleared from the eastern verge **Third party land** is required on both sides of the road. Swept path drawing SK48 is included in Appendix B.
69	**A815 Loch Eck Caravan Park** 	Loads will continue south through a right bend. Prior to the bend they will oversail the eastern verge where trees should be trimmed. Through the bend they will oversail both verges into **third party land**. Bollards and wooden railings should be removed from the western verge. Two utility poles and one road sign should be removed from the eastern verge. A fence, several bollards and hedge in the eastern verge will be oversailed. A topographical survey is essential to confirm the clearances to the permanent structures located within the Loch Eck Caravan Park. Trees in the eastern verge should be cleared. There is a potential requirement to move boat moorings subject to confirmation on the topographical survey. Swept path drawing SK49 is included in Appendix B.
70	**A815 Coylet** 	Loads will continue south on the A815. They will oversail both verges. One road sign should be removed from the western verge. Trees in the eastern verge should be trimmed. A land search should be completed to confirm the extent of the available adopted boundary to the east. Swept path drawing SK50 is included in Appendix B.

POI	Key Constraint	Details
71	**A815 South of Coylet** 	Loads will continue south through a left bend. They will oversail both verges. One road sign should be removed from the western verge where several bollards will be oversailed. Trees and vegetation should be cleared. **Third party land** is required to the west. Trees and vegetation in the eastern verge should be trimmed. Swept path drawing SK51 is included in Appendix B.
72	**A815 South of Coylet** 	Loads will continue south through a right bend. Trees and vegetation in the western verge should be trimmed. The eastern rock face should be regraded to accommodate oversail. Trees and vegetation should be cleared from the eastern verge. **Third party land** is required to the east. It is strongly recommended that a full overhead utility search is carried out along the route prior to deliveries to ensure that height clearances are suitable for normal temperature ranges. Swept path drawing SK52 is included in Appendix B.
73	**A815 West of Ardentinny** 	Loads will continue south, oversailing the eastern verge where trees and vegetation should be trimmed. The OS and satellite mapping at this location do not accurately portray the road edge. It is recommended that a topographical survey is undertaken and the swept path assessment completed to confirm the required mitigation. There is a potential requirement for rockface reprofiling and **third party land** subject to the results of the swept path assessment.
74, 75	**A815 Rashfield**  	Loads will head southeast through two bends. They will oversail the northern verge through the first bend where trees and vegetation should be trimmed. One road sign should be removed from the southern verge through the second bend. Trees in the northern verge and vegetation in both verges through the second bend should be trimmed. Swept path drawing SK53 is included in Appendix B.

POI	Key Constraint	Details
76	**A815 Northwest of Ardbeg** 	Loads will head south into Ardbeg. A load bearing surface should be laid in the northern verge to allow loads to overrun and oversail. Two road signs and fifteen bollards should be removed. A series of bollards will be oversailed. Trees and vegetation in both verges should be trimmed. Swept path drawing SK54 is included in Appendix B.
77	**A815 Ardbeg** 	Loads will head south through Ardbeg. They will oversail both footways/verges throughout this section; however, no further mitigation is required. Swept path drawing SK55 is included in Appendix B.
78	**A815 Sandbank** 	Loads will drive southeast through Sandbank. A traffic management plan will be required to facilitate safe passage through the village. Parking should be suspended during deliveries. Loads will oversail both footways at this location however, no further mitigation is required. Swept path drawing SK56 is included in Appendix B.
79	**Proposed Site Entrance Option One** 	The exact location of the proposed site access junction has not been provided to allow for a swept path assessment to be completed. The junction should be constructed to meet manufacturer and local authority standards.

3.3.4 Shared Route from Dalinlongart to Site (Access Option 2)

Table 3-4: Constraint Summary – Access Option 2

POI	Key Constraint	Details
80, 81, 82	**A815 / B836 Junction**   	Loads will turn right at the junction and head southwest on the B836 through a series of bends. They will oversail the eastern footway and verge of the A815 on approach. A load bearing surface should be laid in the north western verge at the junction to allow loads to overrun and oversail. One road sign, one wooden sign, eleven bollards and several fence sections should be removed. Vegetation should be cleared. **Third party land** is required. The drainage ditch should be culverted. After the junction loads will drive through a double bend, oversailing both verges. Three bollards should be removed from the southern verge where vegetation should be cleared and trees should be trimmed. Vegetation in the northern verge should be cleared to allow loads to oversail into **third party land**. Loads will oversail both verges through the following bend. Vegetation in the southern verge should be trimmed. Swept path drawing SK57 is included in Appendix B.
83	**B836 West of Dalinlongart** 	Loads will continue southwest on the B836. The northern safety barrier will be oversailed. Trees in the northern verge and vegetation in both verges should be trimmed. Swept path drawing SK58 is included in Appendix B.
84	**B836 Southwest of Dalinlongart** 	Loads will continue southwest on the B836 through a left bend, oversailing the southern verge where vegetation should be trimmed. The vertical profile of the road at this location is pronounced and should be reviewed during the test run stage or on a topographical survey base to ascertain if tar wedges are required to prevent grounding.

POI	Key Constraint	Details
85, 86, 87	**B836 East of Clachaig**   	Loads will head northwest through a series of bends and over a bridge. The swept path assessment should be repeated on a topographical survey to confirm the proposed mitigation. The vertical profile of the road at this location is pronounced and should be reviewed during the test run stage or on a topographical survey base to ascertain if tar wedges are required to prevent grounding. Adverse camber was noted. It is strongly recommended that a full overhead utility search is carried out at this location and along the entire route prior to deliveries to ensure that height clearances are suitable for normal temperature ranges. Through the first bend they will oversail both verges into **third party land**. One utility pole and one road sign should be removed from the eastern verge. Trees and vegetation should be cleared from both verges. Over the bridge and through the second bend loads will oversail both sides of the road into **third party land**. The northern safety barrier should be removed. The northern bridge parapet should be lowered. The southern bridge parapet and safety barrier and several bollards in the southern verge will be oversailed. Trees and vegetation should be cleared from both verges. Trees in the southern verge after the second bend should be trimmed. A load bearing surface should be laid in the northern verge through the third bend to allow loads to overrun and oversail. One utility pole, one road sign, one grit bin and four bollards should be removed. One bollard will be oversailed. Trees and vegetation should be cleared. **Third party land** is required. One bollard should be removed from the southern verge where vegetation should be trimmed. Swept path drawing SK59 is included in Appendix B.
88	**Proposed Site Entrance 2** 	The exact location of the proposed site access junction has not been provided to allow for a swept path assessment to be completed. The junction should be constructed to meet manufacturer and local authority standards. The vertical profile of the road at this location is pronounced and should be reviewed during the test run stage or on a topographical survey base to ascertain if tar wedges are required to prevent grounding.

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
- Magenta – 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, aerial mapping or available CAD based aerial mapping, there can be errors in the 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.

Where mitigation works are required, the extents of over-run and oversail areas are illustrated on the swept path drawings. Additional land areas to those indicated in the swept path assessment drawings may be required to facilitate the construction of the proposed physical mitigation measures depending on the site conditions and topography. The extent of any additional areas required to construct mitigation works highlighted within this study and the detailed design of said mitigation works is outwith the scope of this study and should be confirmed on detailed topographical survey data.

3.5 Access Junction Considerations

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

The design and form of the junctions will need to be discussed with the local road authority. The design of the junction should take into account the requirement for provision of visibility splays which should be confirmed with the road authority.

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

3.6 Third Party Land

A review of third party land should be undertaken by the client to ensure that no additional land rights are required to enable deliveries or mitigation works. Pell Frischmann accepts no responsibility for the accuracy of land ownership assumptions, all of which should be confirmed across the entire access route by a qualified land agent.

3.7 Weight Review

A review of the structures on the proposed access routes has been undertaken via the ESDAL (Electronic Service Delivery for Abnormal Loads) database. No constraints were identified at this time, using the Highways Agency website www.esdal.com. This, however, does not confirm the suitability or otherwise of the structures and a full review of these structures will be required with the relevant agencies via the contacts in the database when the candidate turbine has been confirmed. For information, the relevant ESDAL contacts in relation to the proposed development are noted in Table 3-2 below.

Table 3-5: ESDAL Contacts

Organisation	Email Address
Glasgow City Council	abnormalloads@glasgow.gov.uk
Renfrewshire Council*	ei@renfrewshire.gov.uk
Argyll and Bute Council	abnormalloads@argyll-bute.gov.uk
West Dunbartonshire Council	cameron.muir@west-dunbarton.gov.uk
M8 DBFO	m8dbfo.abloads@amey.co.uk
Amey	SWAbloads@amey.co.uk
Police Scotland	osdwindfarmabnormalloads@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

The responses from the ESDAL search are contained in Appendix C, where no response has been received, it is assumed that no constraints are in place at this time.

3.8 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.

3.9 Summary Issues

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

- Confirm that the mitigation measures for the larger blade are achievable with respect to land ownership boundaries and ecological constraints;
- 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

PF has been commissioned by Statkraft 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 Statkraft. 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.

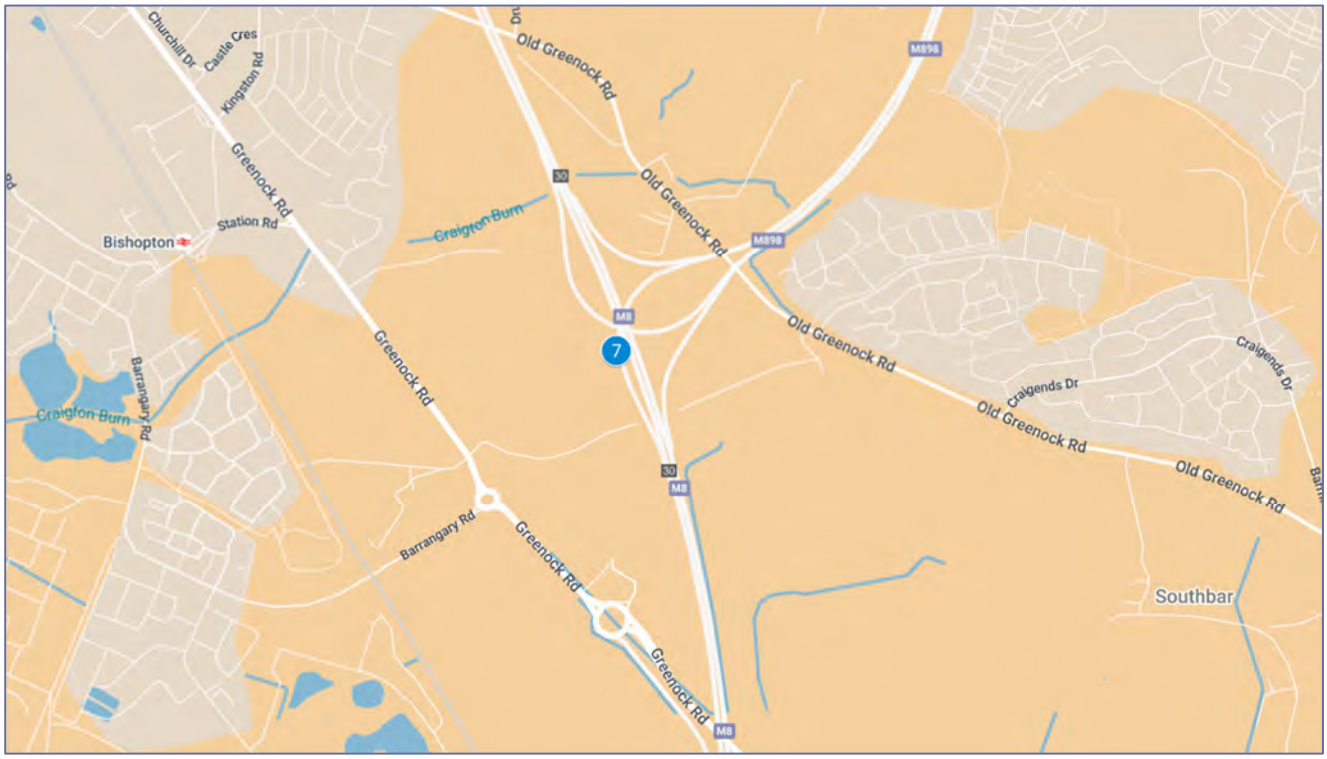
4.2 Further Actions

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=1wKPcxrbe4-VzRbYqdznVjODAAVK8YL0&usp=sharing

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Dumbarton Rd
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MOUNTBLOW
Mountblow Rd
Melbourne Ave
Great Western Rd


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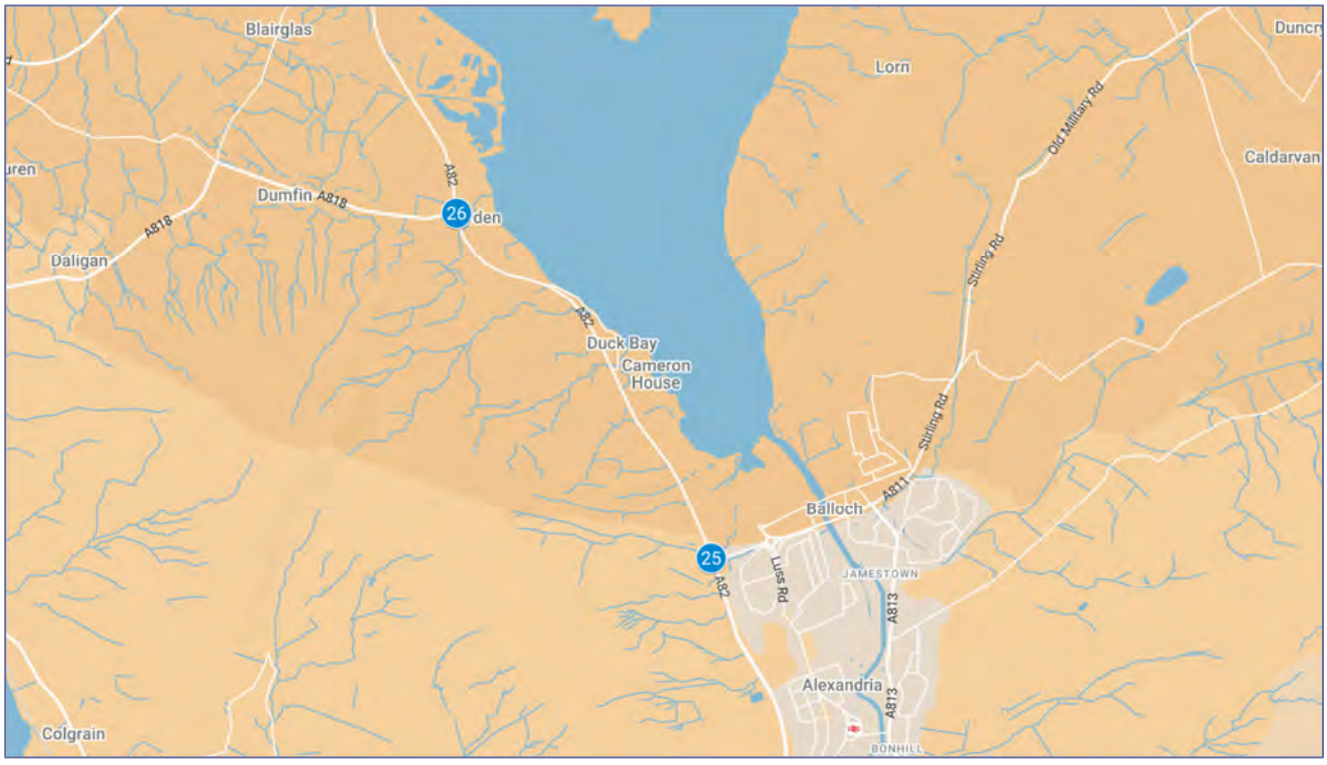
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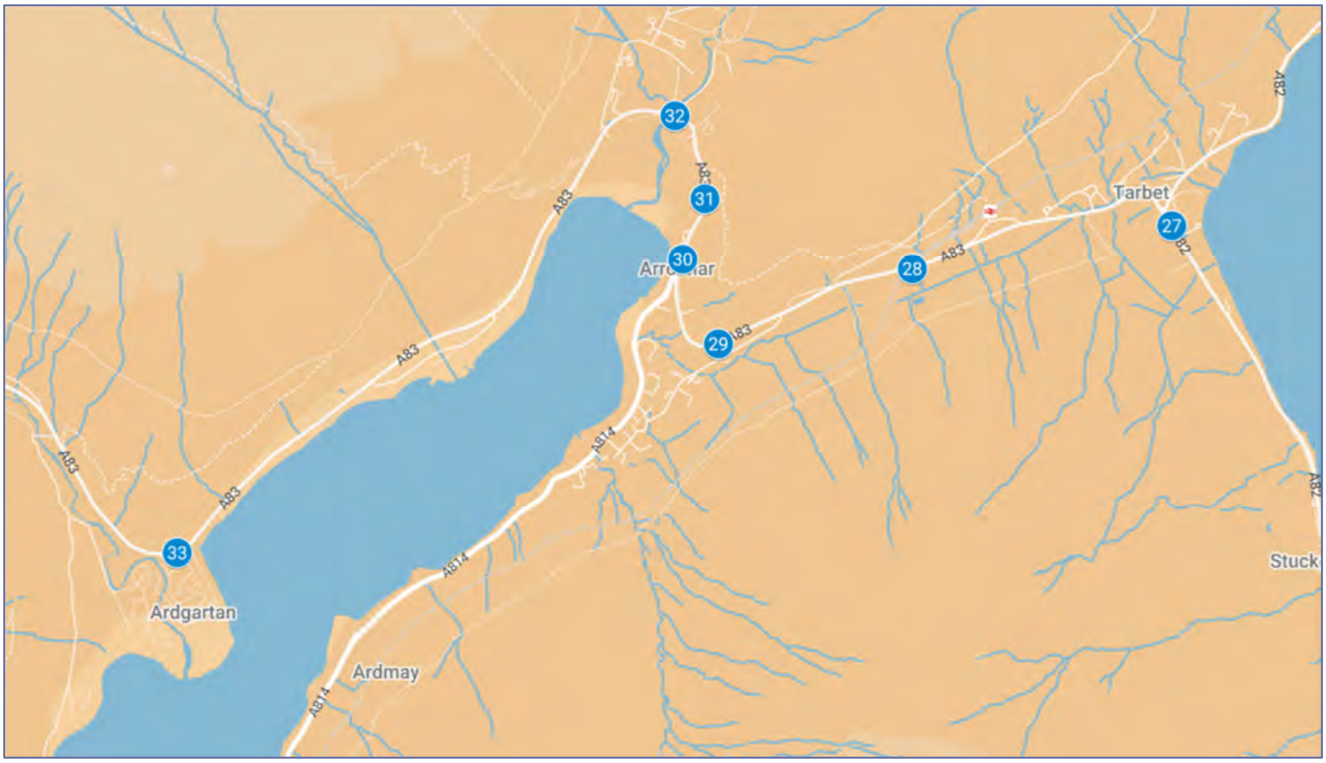
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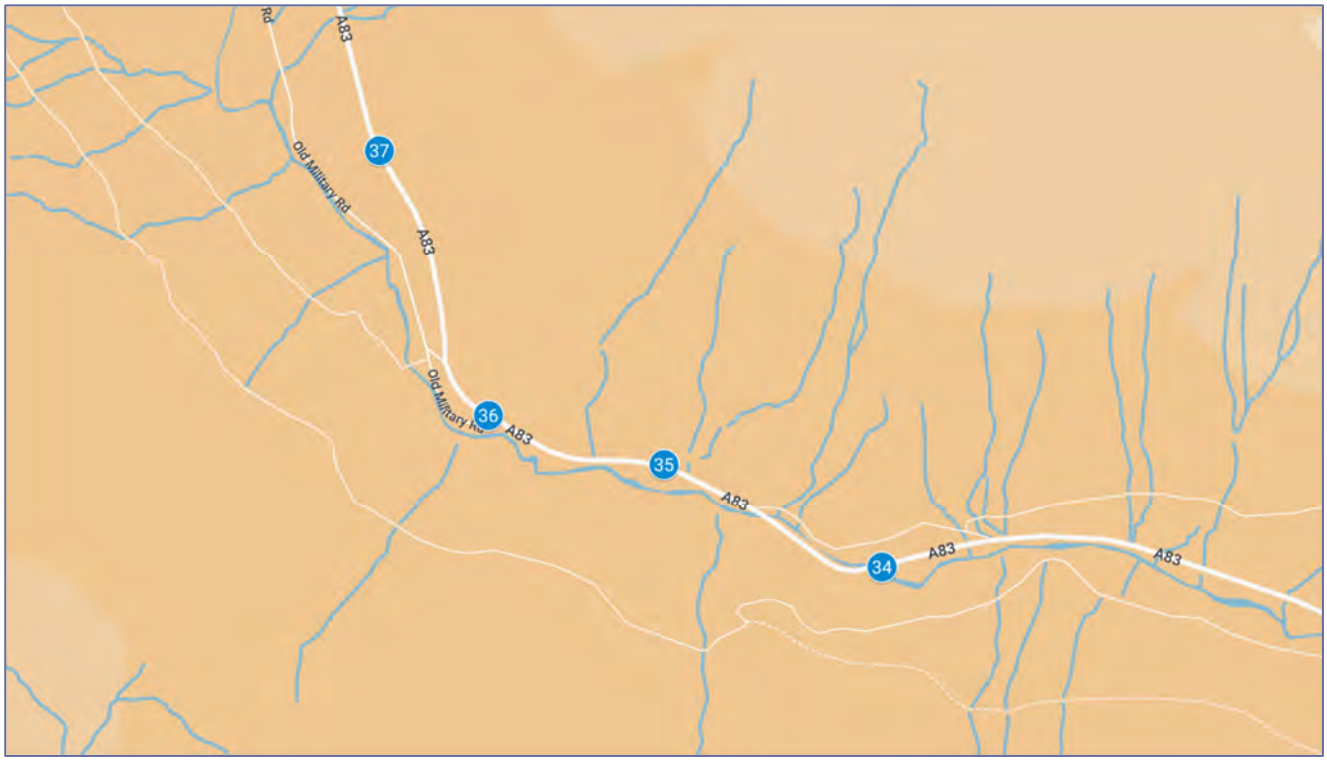
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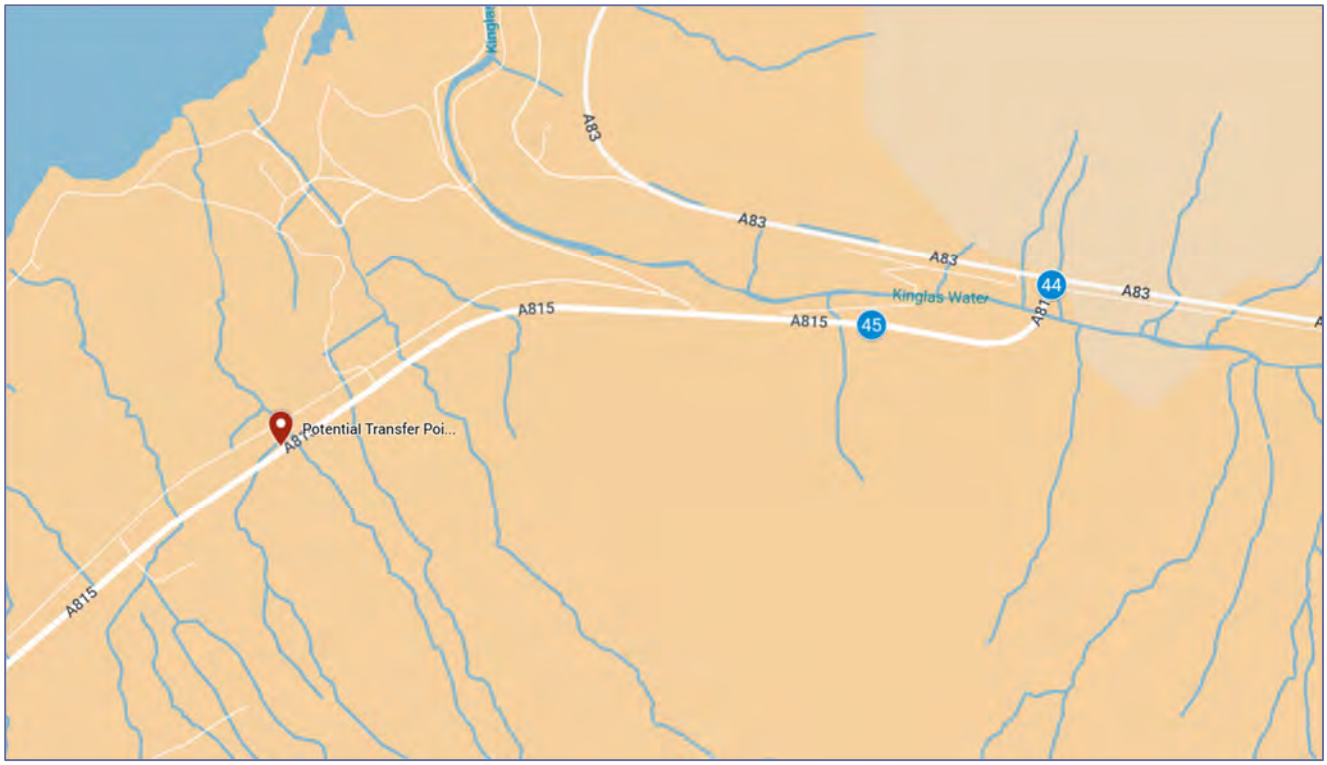
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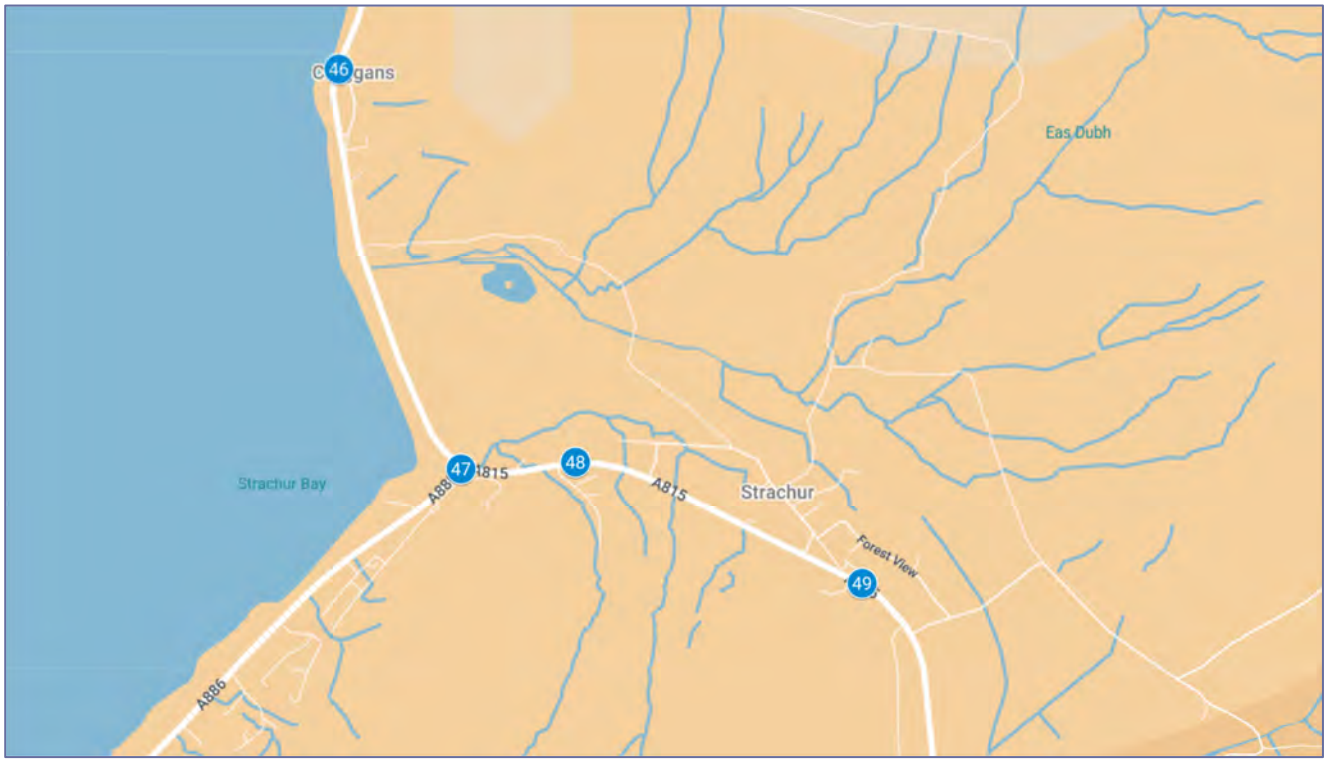
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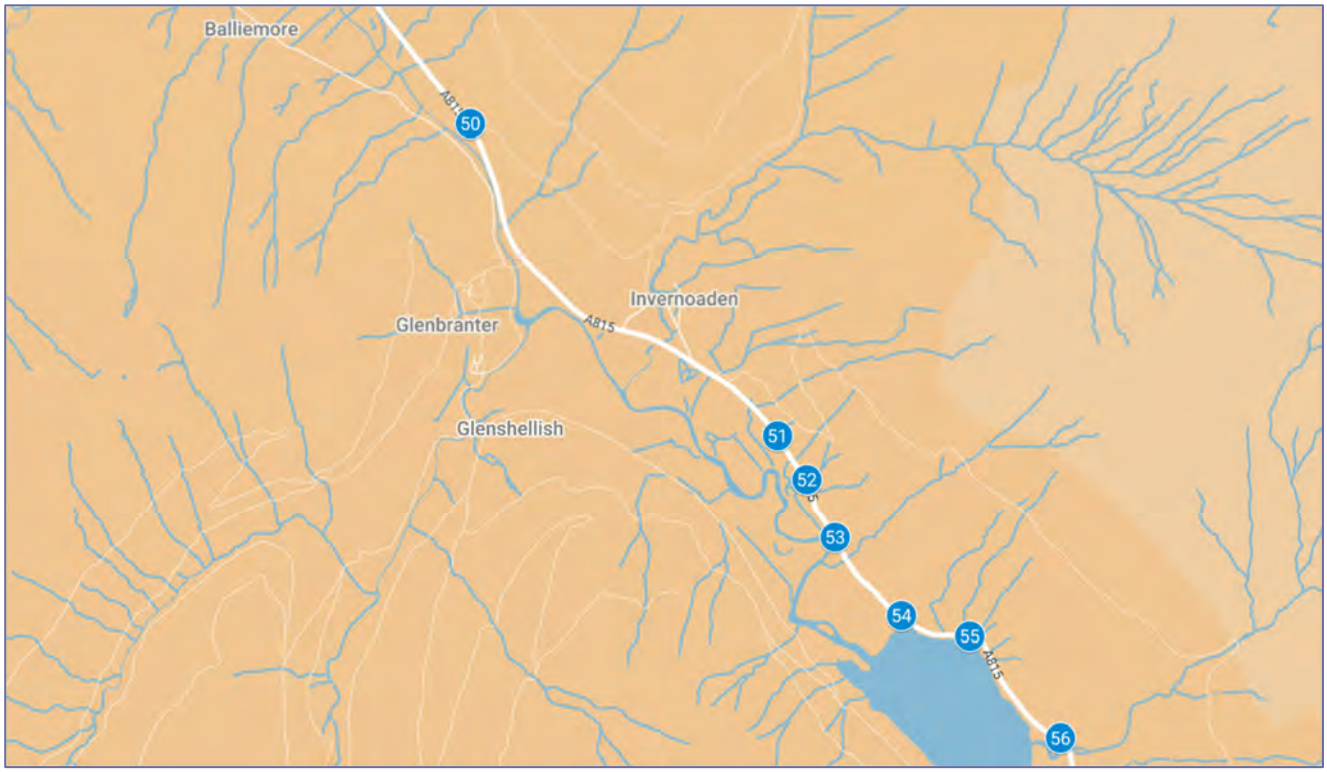
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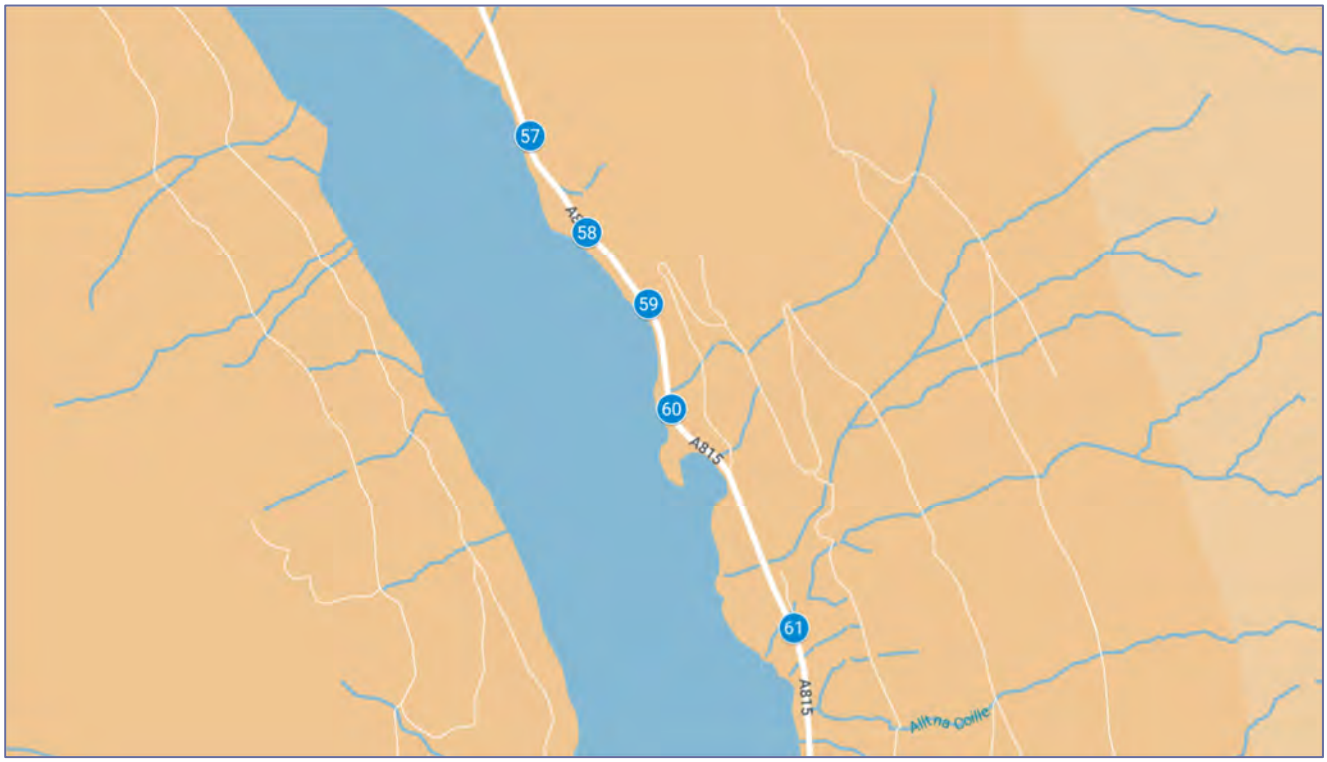
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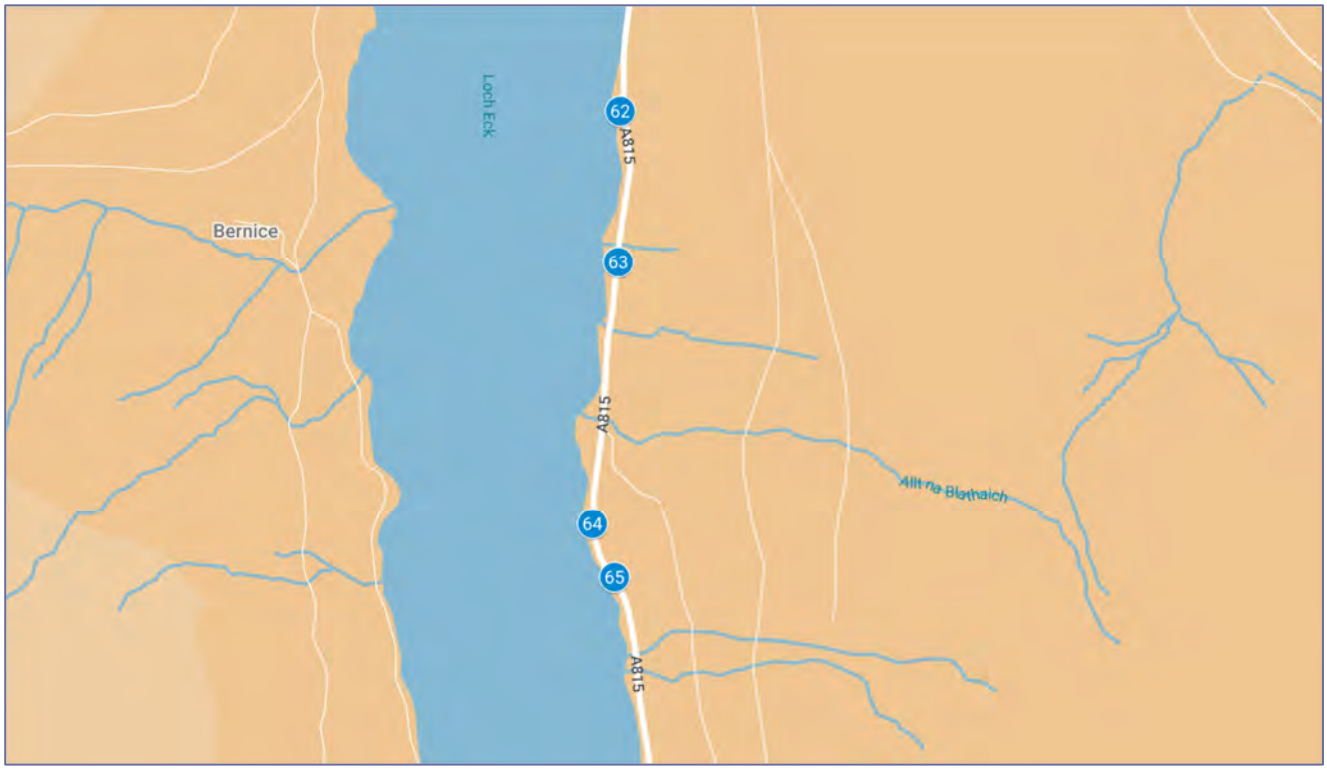
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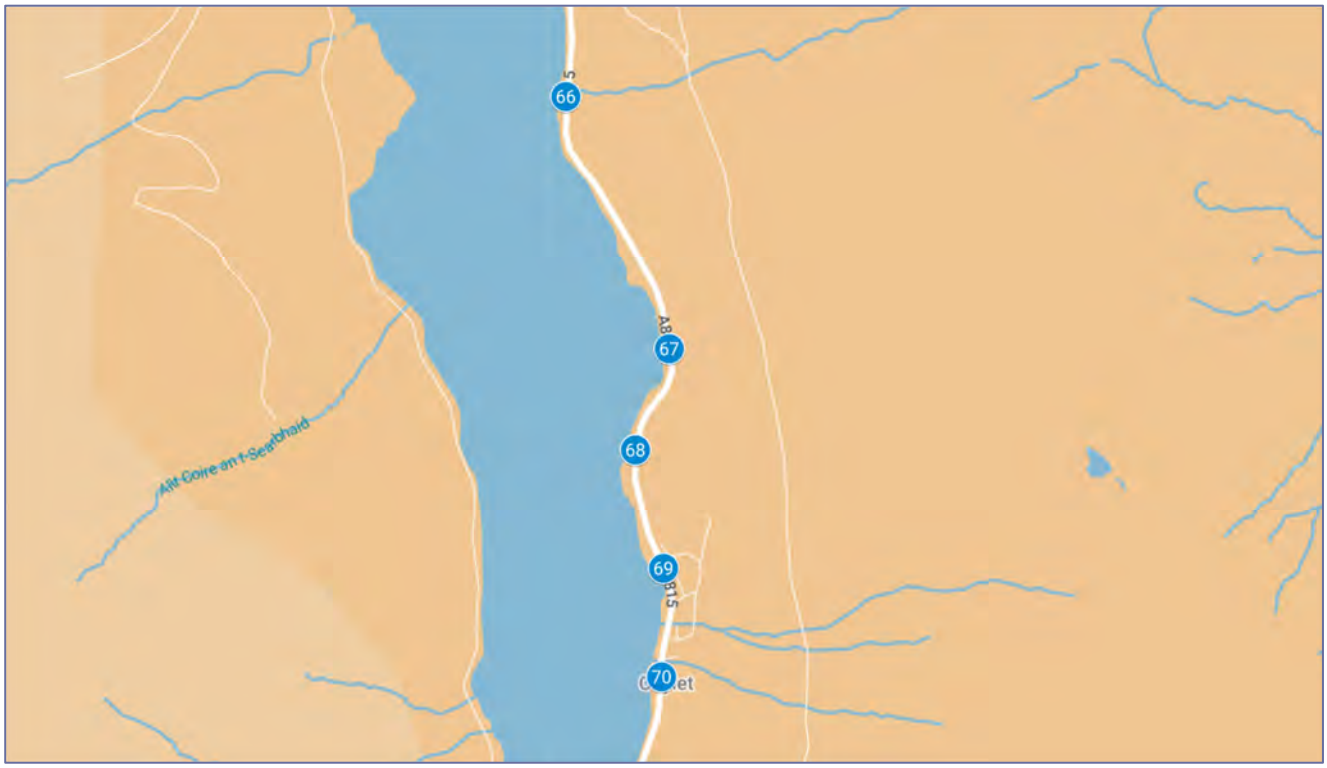
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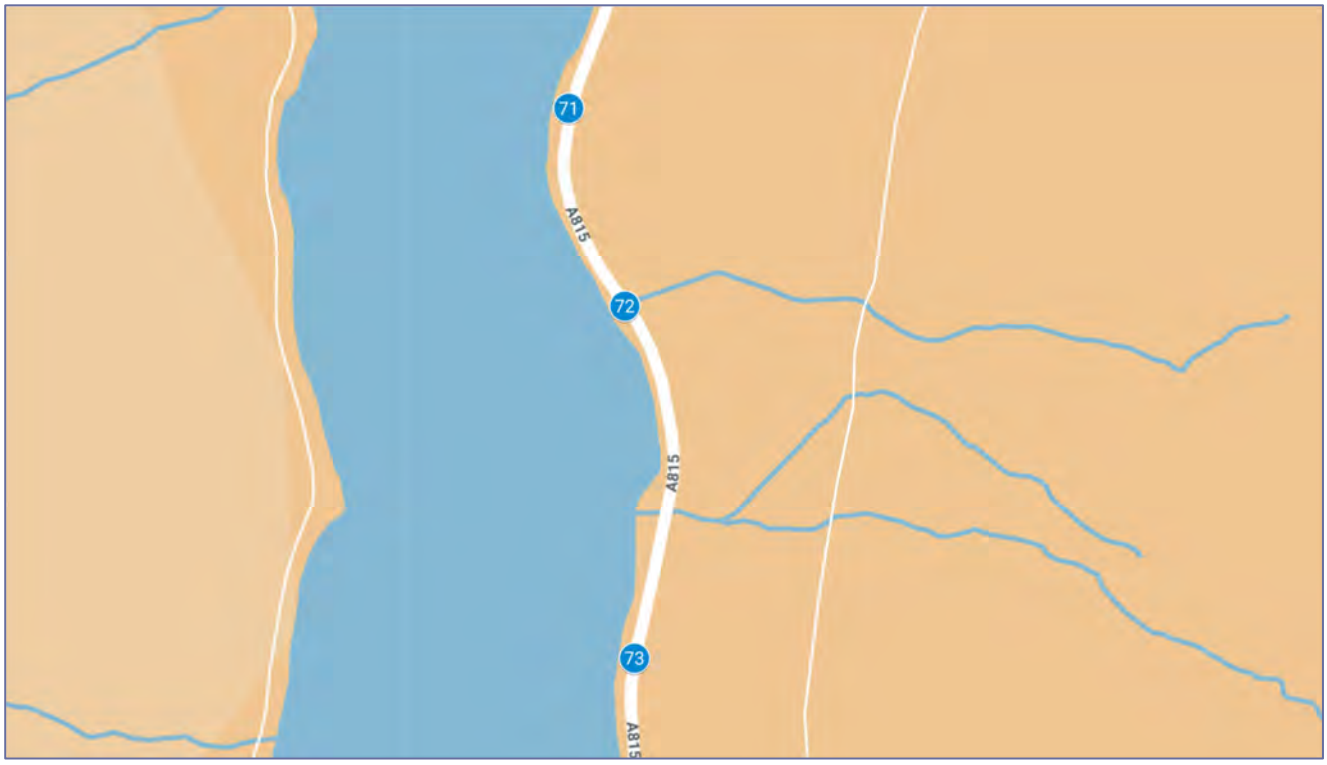
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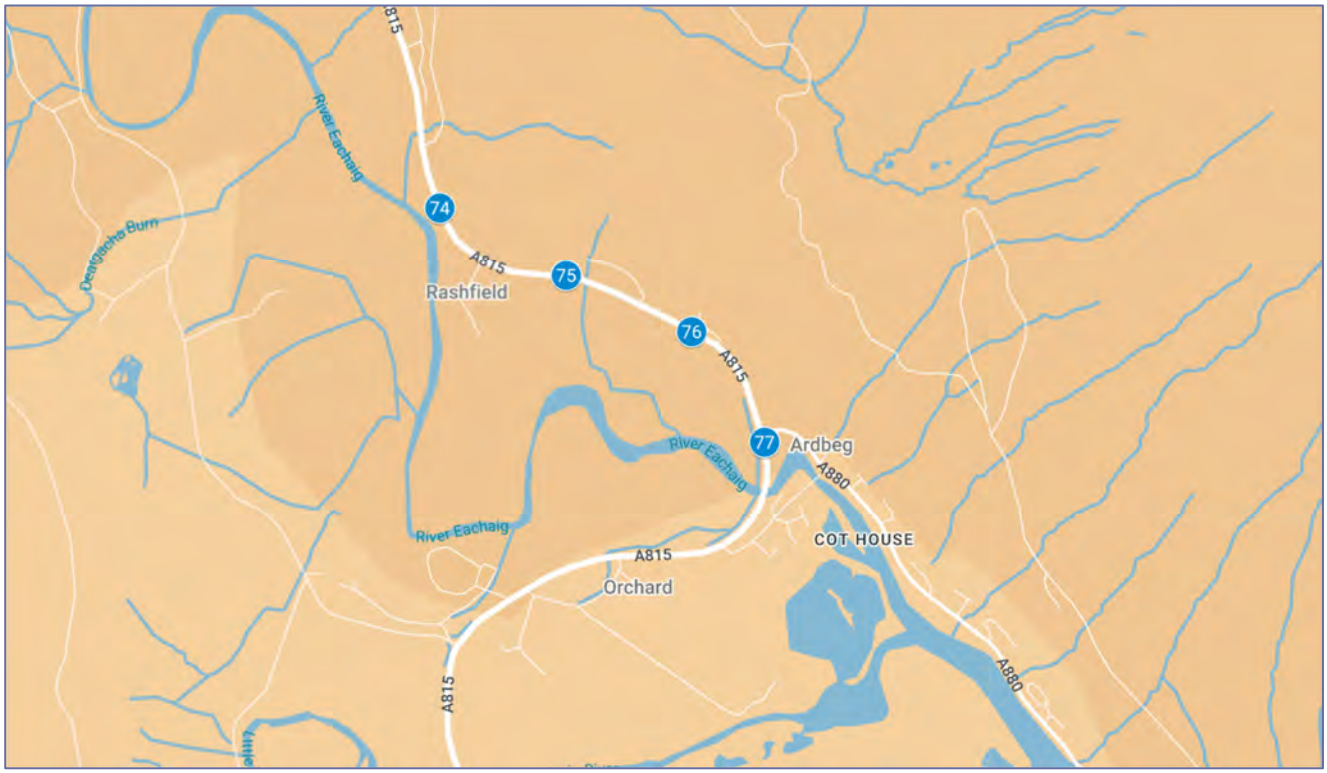
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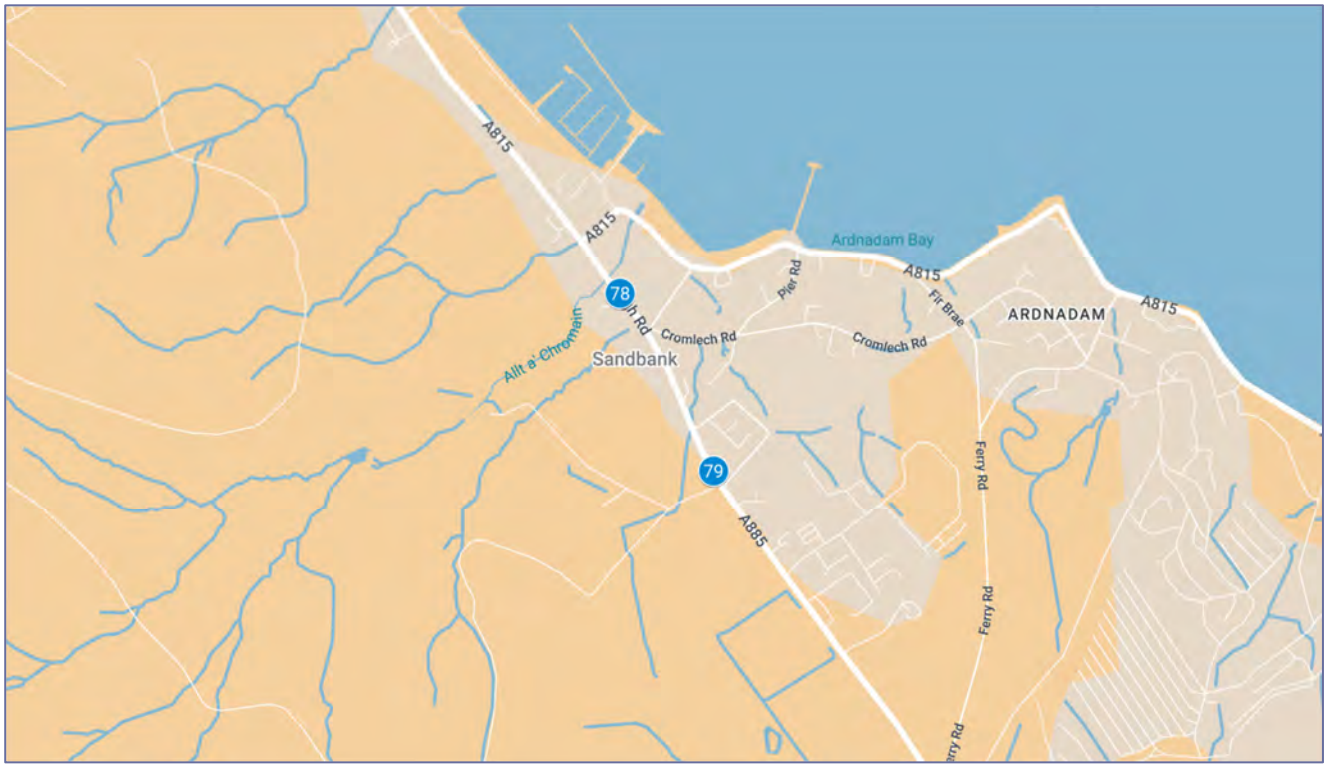
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Ferry Rd
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