Pell Frischmann

Glentarken Wind Farm

Annex C – Abnormal Indivisible Load Route Survey Report

November 2024

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1 Introduction

1.1 Purpose of the Report

Pell Frischmann (PF) has been commissioned by SSE Renewables Services Ltd ('the agent') on behalf of SSE Generation Ltd (the 'Applicant') to undertake a route access review of the potential delivery route for wind turbine Abnormal Indivisible Loads (AIL) associated with the construction and development of the proposed Glentarken Wind Farm (hereafter referred to as the Proposed Development), which is located within the Drummond Estate in the Perth and Kinross Council (PKC) and Stirling Council (SC) administrative areas.

The Route Survey Report (RSR) has been prepared to help inform the Applicant on the likely issues associated with the development of the site with regards to off-site transport and access for AIL traffic. The report 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 the Applicant 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 has been made in accordance with the relevant legislation at the time of delivery.

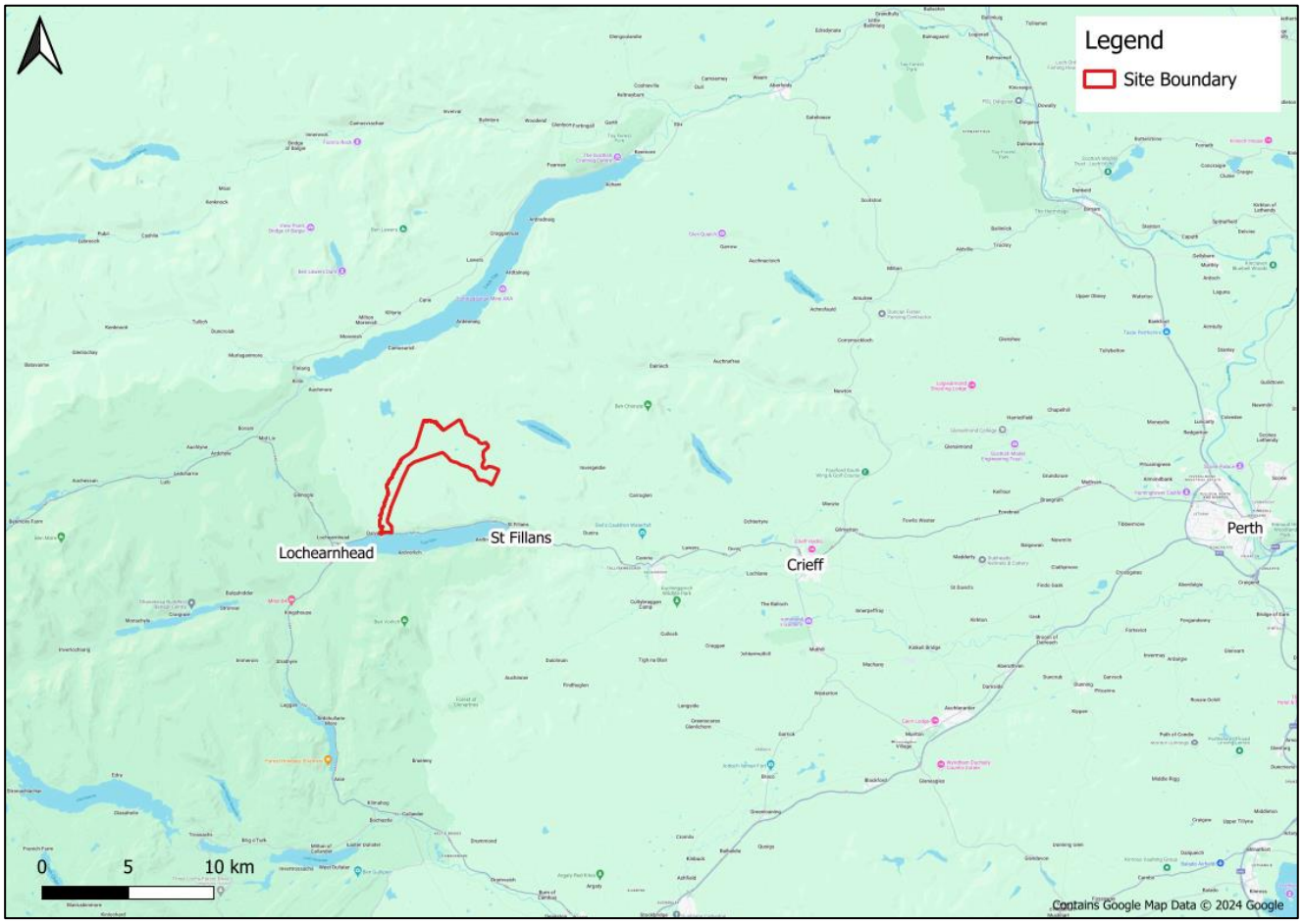
2 Site Background

2.1 Site Location

The application boundary (the Site) is approximately 1,103 hectares and located within the Drummond Estate. The Site is approximately 2.8 kilometres (km) east of Lochearnhead, 15.5 km west of Crieff, 35 km north of Stirling, and 45 km west of Perth. The Site includes land within the PKC authority area and the SC local authority area. The turbine array will be within Perth and Kinross, while the Site entrance and a portion of the access track is located within the Stirling area.

The general location of the Site is shown in **Figure 1**.

Figure 1 Site Location



2.2 Candidate Turbines

For the purposes of preparing the AIL RSR, the Applicant has indicated that they wish to consider the worst-case components from a Nordex N163 turbine on TS118 tower. The details of the components have been provided by the Applicant and are detailed in **Table 1**. Note these are indicative component dimensions at this time and are subject to change.

Table 1 Turbine Component Summary

Component	Length (m)	Width (m)	Height/Min Diameter (m)	Weight (t)
Blade	81.500	4.395	4.110	28.871
Base Tower	11.561	4.300	4.292	83.318
Mid Tower 1	16.430	4.292	4.286	82.391

Component	Length (m)	Width (m)	Height/Min Diameter (m)	Weight (t)
Mid Tower 2	21.125	4.286	4.279	81.401
Mid Tower 3	29.972	4.279	4.268	82.563
Top Tower	35.000	4.268	3.258	60.569
Nacelle	12.770	4.290	4.000	73.230
Drive Train	6.710	3.400	3.280	83.800
Hub	4.880	4.450	4.000	56.330

The swept path assessments have been based upon the blade and 29.972 metres (m) mid-section of the tower section in its loaded configuration. Whilst the top tower sections are longer, they can be carried in a step frame trailer which would reduce the overall length of the proposed load.

2.3 Proposed Delivery Equipment

With regards to the equipment used to transport the turbine components, to provide a robust assessment scenario based upon the known issues along the access routes and constraints in moving larger loads a combination of trailer types will be required, particularly for the blade loads. 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.

Where constraints are extreme, loads would be transferred onto a blade lifting trailer. This trailer has the ability to lift blades up to a maximum angle of 60 degrees, lifting blades over potential constraints and shortening the length plan view.

Towers would be carried in a 4+7 clamp adaptor style trailer, whereas loads such as the hub, nacelle housing and top towers would be carried on a six-axle step frame trailer.

Examples of the vehicles and trailers that are likely to transport loads are shown in **Figure 2** to **4**.

Figure 2 Superwing Carrier Trailer

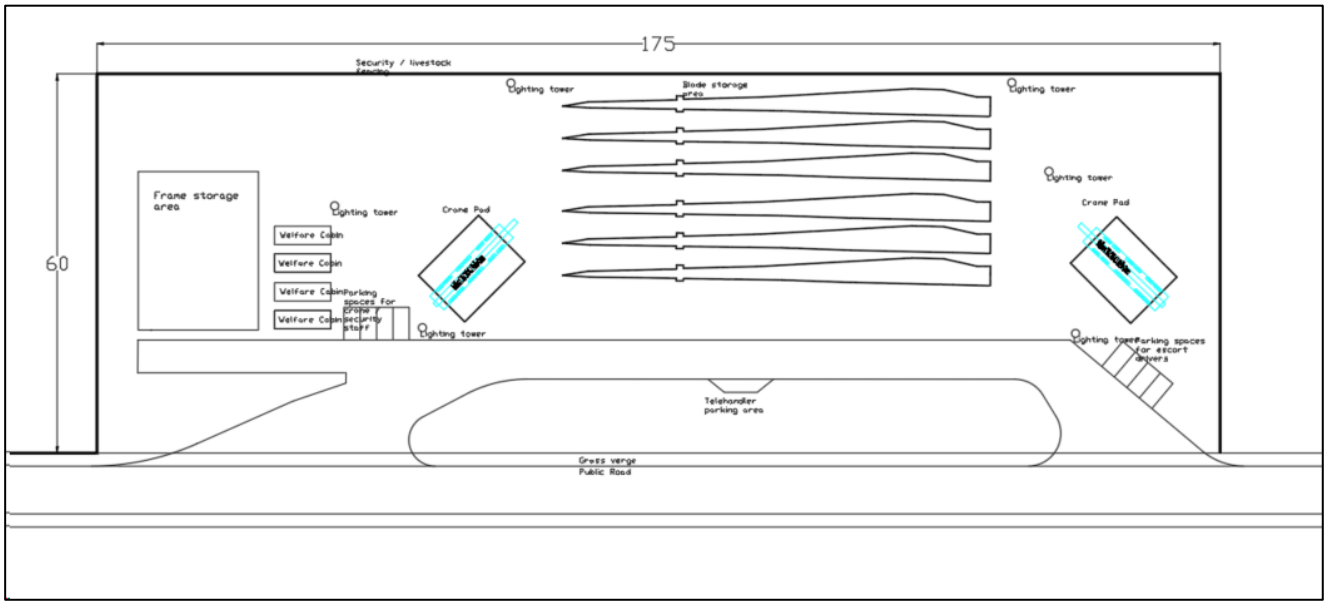
Figure 3 Blade Lifter Trailer

Figure 4 Clamp Tower Trailer

To undertake the transfer between trailers for the blade loads, a blade transfer area will need to be constructed. The area of land required will need to be circa 175 m x 60 m and will need to include an access junction and two crane pads. Storage for up to six blades should also be available, with all infrastructure designed in accordance with turbine supplier standards.

The location of the transfer point is dependent upon the Applicant agreeing a suitable land option. Details of the indicative Nordex transfer station are provided below in **Figure 5**.

Figure 5 Indicative Blade Transfer Station



3 Access Route Review

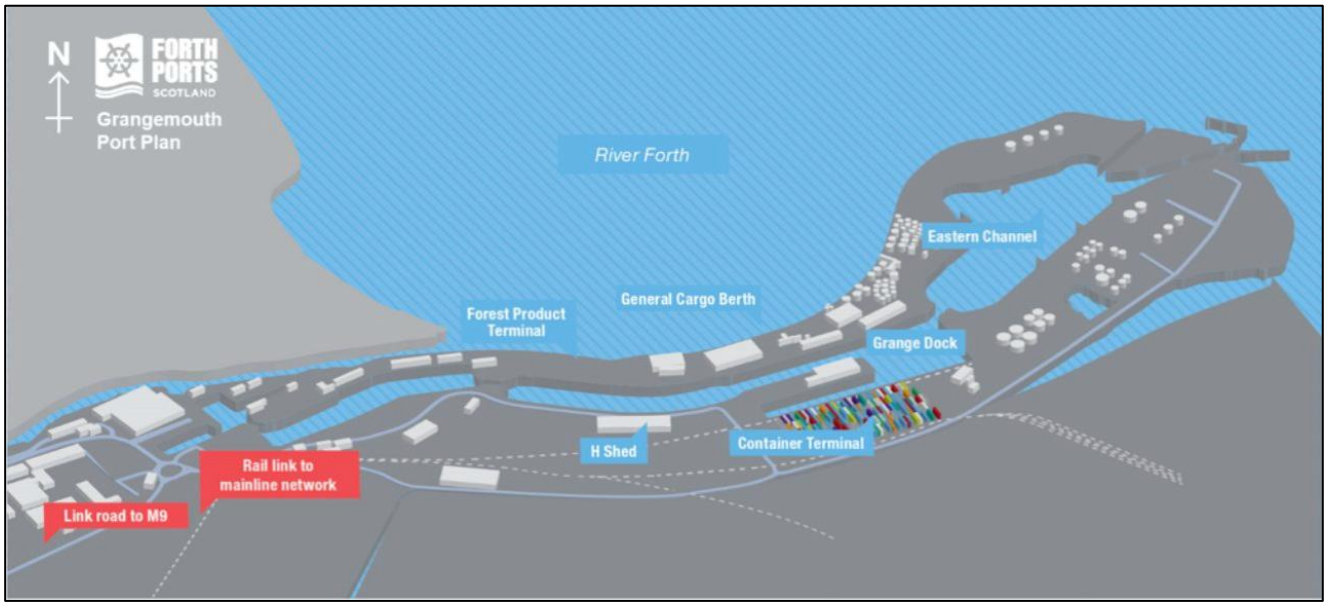
3.1 Port of Entry

The closest Port of Entry to the site is Grangemouth. Grangemouth is Scotland's largest port handling 9 million tonnes of cargo each year and is located in close proximity to the M9 corridor, providing good access to central and eastern Scotland.

The port has been used in the past for a number of wind farms and has adequate facilities for the import of the proposed loads. The port has 2,270m of quayside within a 365 acre estate.

The layout of the port is illustrated in **Figure 6**.

Figure 6 Port of Grangemouth Layout



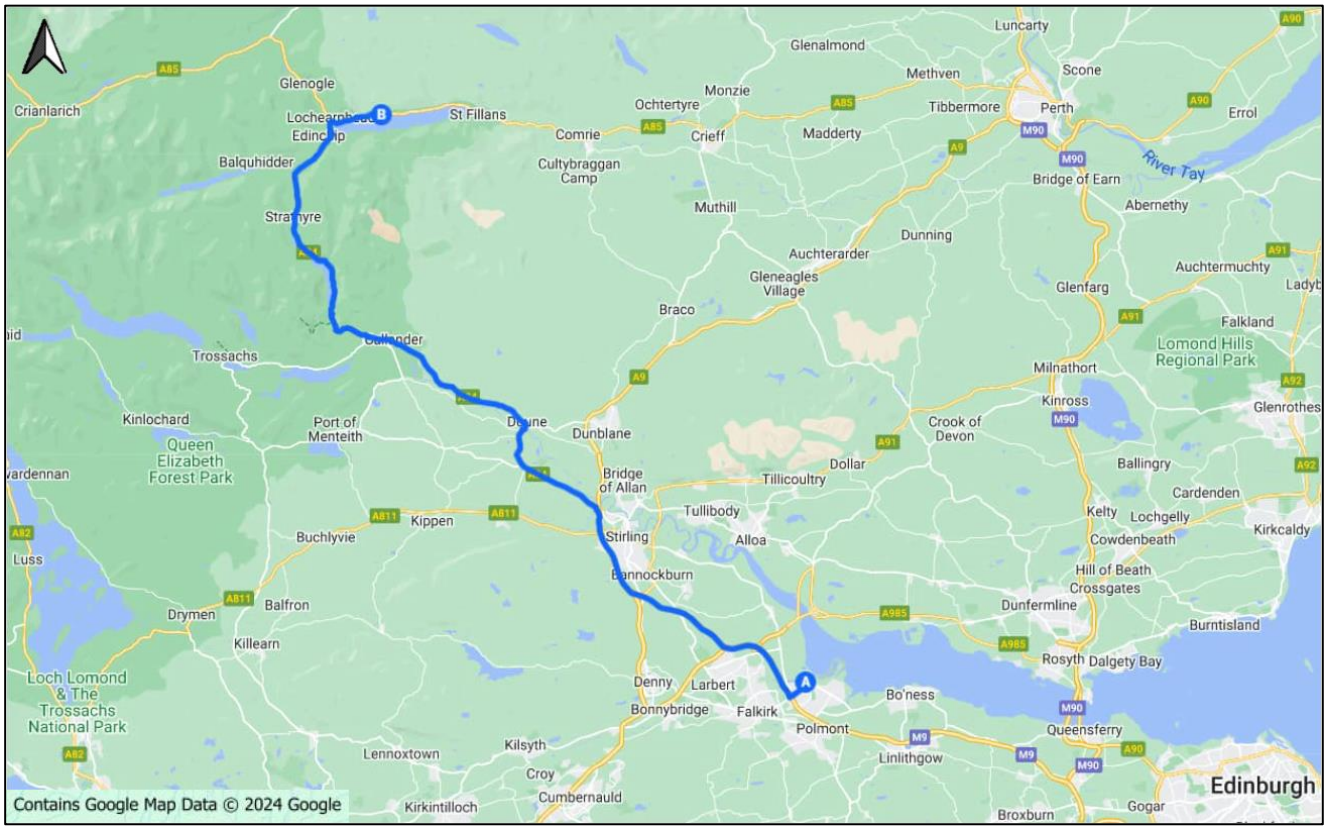
3.2 Proposed Access Route

The proposed access route to site is detailed below:

- Loads would exit the Port of Grangemouth onto North Shore Road;
- Loads will proceed to the M9 via the A904, joining the motorway at Junction 6;
- Loads will continue on the M9 until Junction 10, where they would depart the motorway and join the A84 westbound;
- Loads would continue on the A84, passing through Doune, Callander and Balquidder;
- At the junction with the A85 in Lochearnhead, loads will turn right onto the A85 eastbound;
- Loads will pass through Lochearnhead before turning left into a purpose built Site access junction.

The proposed route is shown in **Figure 7**.

Figure 7 AIL Access Route



3.3 Route Constraints

The constraints noted during the access route review are provided in the **Table 2** below. These cover all constraints from both port access gates through to the proposed site entrance. No consideration of the transport issues within the port or Proposed Development Site have been undertaken within this assessment and this includes the design of the Site access junction.

Plans illustrating the location of the constraints are provided in **Annex A**.

Table 2 Constraint Points and Details

POI	Key Constraint	Details
1, 2	**Port Access Gates & A904 Timber Basin Roundabout**  	Loads will depart from the port using the port access road (right) or the AIL access gate (left). They will join North Shore Road and will proceed southwest towards Timber Basin Roundabout. At the roundabout, loads will take the third exit onto the A904 southbound. A swept path assessment of the junction has been undertaken and is provided in Annex B. The assessment indicates that when joining North Shore Road, loads will overrun and oversail the left-hand side of the road where a load bearing surface should be laid. Three lighting columns, three road signs and one ornamental statue should be removed. Trees and vegetation should be cleared. **Third party land** is required. Loads will overrun and oversail the roundabout island where a load bearing surface should be laid. One lit road sign and one chevron sign should be removed. Trees and vegetation should be cleared. Loads will oversail both verges of the third exit arm. Swept path drawing SK01 is included in Annex B.
3	**A904 Cross Islands** 	Bollards on the central island should be laid flat to enable wide loads to pass in safety. Five islands on the road are affected.

POI	Key Constraint	Details
4	**A904 Earls Gate Roundabout** 	Loads will turn right at the junction and will join the M9 at Junction 6. A swept path assessment of the junction has been undertaken and is provided in Annex B. The assessment indicates that loads will oversail the left-hand verge of the entry arm where one traffic signal should be removed. Loads will oversail the southeastern verge of the roundabout island where one set of chevron signs, one lit road sign and two traffic signals should be removed. Loads will oversail the left-hand verge of the second exit arm where two lighting columns should be removed. The blade tip will oversail two junction boxes. One lighting column, one road sign and two traffic signals should be removed from the second arm splitter island where the blade tip will oversail. Loads will oversail the southwestern verge of the roundabout island when driving into the fourth exit arm. Two traffic signals, two sets of chevron signs and two lit road signs should be removed. Trees should be trimmed. The blade tip will oversail the northwestern verge of the second exit arm. Loads will join the M9. The escorts should ensure that the convoy does not get split up at the junction and that it is clear to join the M9 in Lane 1. Swept path drawing SK02 is included in Annex B.
5	**M9 Junction 10** 	Loads will depart the M9 at Junction 10. A swept path assessment of the diverge and subsequent bend have been undertaken and is provided in Annex B. The assessment indicates that loads will oversail both verges throughout this section. Along the western side of the road one road sign should be removed. The safety barrier will be oversailed and trees should be trimmed. Along the eastern side, one road sign and four chevron signs should be removed. A series of bollards will be oversailed. The escorts should ensure that no following traffic tries to enter the convoys during the diverge. Swept path drawing SK03 is included in Annex B.

POI	Key Constraint	Details
6	**Slip Road / A84 Roundabout** 	Loads will take the second exit at the junction and will join the A84. A swept path assessment of the diverge and subsequent bend have been undertaken and is provided in Annex B. The assessment indicates that loads will oversail both verges of the entry arm. Loads will overrun and oversail the southwestern verge of the roundabout island where a load bearing surface should be laid. Two sets of chevron signs and two lit road signs should be removed. Vegetation should be removed. Loads will oversail the left-hand verge of the exit arm. Tree canopy trimming to the west of the junction will be required. A 5m clear head height is necessary and early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussions with the ecology team may be required. Swept path drawing SK04 is included in Annex B.
7	**Stirling Auctions Roundabout** 	Loads will take the second exit at the junction and will join the A84. A swept path assessment of the diverge and subsequent bend have been undertaken and is provided in Annex B. The assessment indicates that loads will oversail the southern verge of the entry arm. Loads will overrun and oversail the southern verge of the roundabout island where a load bearing surface should be laid. One lit road sign, three chevron signs and vegetation should be removed. Loads will oversail the exit arm splitter island where one road sign should be removed. One bollard will be oversailed. Swept path drawing SK05 is included in Annex B.
8	**A84 Bend North of Blair Drummond** 	Loads will proceed ahead on the A84 through the bend. Loads will straddle the centreline through the section. Oncoming vehicles should be held in advance.
9	**A84 Bend North of Blair Drummond 2** 	Loads will proceed ahead on the A84 through the bend. A swept path assessment has been completed and indicates that loads will oversail both verges through the bend. Loads should be raised on their suspension settings to allow oversail of the western verge. Trees and vegetation should be cleared. A land search is required to confirm the extent of the adopted road boundary. In the eastern verge, one utility pole and one set of chevron signs should be removed. Five bollards will be oversailed. Vegetation should be trimmed. Swept path drawing SK06 is included in Annex B.

POI	Key Constraint	Details
10	**A84 Bend North of Blair Drummond 3** 	Loads will proceed ahead on the A84 through the bend. Loads will oversail the verge on the inside of the left bend where vegetation should be trimmed.
11	**A84 Bend near A826 Junction** 	Loads will proceed ahead on the A84 through the bend. A swept path assessment has been completed and indicates that loads will oversail both verges through the bend. One road sign should be removed from the eastern verge. On the western verge, two bollards and two pillars will be oversailed and vegetation should be trimmed. A review of the limits of road adoption at this location is recommended. Swept path drawing SK07 is included in Annex B.
12	**A84 Bend near Deanston Filling Station** 	Loads will proceed ahead on the A84 through the bend. Loads will straddle the centreline through the section. Oncoming vehicles should be held in advance.
13	**A84 Bend near B8032 Junction** 	Loads will proceed ahead on the A84 through the bend. A swept path assessment has been undertaken and indicates that loads will oversail the southeastern verge into **third party land**. Two lighting columns and two road signs should be removed. A series of bollards will be oversailed. Trees should be cleared. Loads will oversail the western verge through the bend. A land search is required to confirm the extents of the adopted road boundary. Loads should be raised on their suspension settings to allow oversail. One lighting column and one road sign should be removed. Trees should be cleared. Loads will overrun and oversail the eastern verge of the bend where a load bearing surface should be laid. One utility pole should be removed. Trees should be trimmed. Swept path drawing SK08 is included in Annex B.

POI	Key Constraint	Details
14	**A84 River Teith Bridge and Bend** 	Loads will cross the River Teith at Doune and will continue ahead on the A84. Due to the constrained nature of the manoeuvre over the bridge, it is recommended that the swept path assessment is repeated on a topographical base plan. A swept path assessment of the diverge and subsequent bend have been undertaken and is provided in Annex B. The assessment indicates that the eastern bridge parapet may need to be lowered to allow load oversail into **third party land.** Trees and vegetation should be cleared. Loads will overrun the kerb on the western verge where a load bearing surface should be laid. Two lighting columns, two road signs and one set of chevron signs on the western verge should be removed. Trees and vegetation should be cleared. The blade tip will oversail into **third party land**. Loads will overrun and oversail the northern verge of the road after the bridge into **third party land**. A load bearing surface should be laid. Two lighting columns and one road sign should be removed. Vegetation should be cleared. Swept path drawing SK09 is included in Annex B.
15	**A84 Bend to North of the River Teith Bridge** 	Loads will proceed ahead on the A84 through the bend. Due to the constrained nature of the manoeuvre, it is recommended that the swept path assessment is repeated on a topographical base plan. A swept path assessment has been undertaken and indicates that loads will overrun and oversail the northern verge through the bend where a load bearing surface should be laid. All obstacles should be removed. Trees and vegetation should be cleared. A land search is recommended to confirm the extent of the available adopted road boundary. Loads will overrun and oversail the eastern verge through the bend where a load bearing surface should be laid. Three utility poles, three lighting columns, two road signs and ten bollards should be removed. Trees should be trimmed. Swept path drawing SK10 is included in Annex B.
16	**A84 / George Street Junction, Doune** 	Loads will proceed ahead on the A84 through the bend. Due to the constrained nature of the manoeuvre and the proximity to the war memorial, it is recommended that the swept path assessment is repeated on a topographical base plan. A swept path assessment has been undertaken and indicates that loads will oversail the western verge through the bend into **third party land**. Loads should be raised to allow the vehicles to oversail a wall. Trees and vegetation should be cleared. Loads will oversail the southeastern verge through the bend where they should be raised to allow the blade tip to oversail a wall and two junction boxes. Two lighting columns should be removed. Trees and vegetation should be cleared. **Third party land** is required. Loads will oversail two splitter islands on the entry to George Street to the east. Two bollards will be oversailed. Loads will overrun and oversail the northeastern verge through the bend where a load bearing surface should be laid. Three road signs and two lighting columns should be removed. Five utility markers will be oversailed. Vegetation should be removed. After the bend loads will oversail the western verge where one road sign should be removed. Swept path drawing SK11 is included in Annex B.

POI	Key Constraint	Details
17	**A84 / Balkerach Street Junction, Doune** 	Loads will proceed ahead on the A84 through two bends. A swept path assessment has been undertaken and indicates that loads will oversail the verge on the inside of the first bend where one lighting column and one road sign should be removed. The clearance to a nearby wall should be confirmed during the test run or on a topographical survey base. Vegetation should be trimmed. Loads will overrun and oversail the northern verge through the first bend where a load bearing surfaces should be laid. Three lighting columns and two road signs should be removed. Two bollards will be oversailed. Loads should be raised to allow the blade tip to oversail a wall. Trees and vegetation should be cleared. **Third party land** is required. Loads will oversail both verges through the second bend. On the northern verge, one road sign should be removed. Swept path drawing SK12 is included in Annex B.
18	**A84 Tree Canopy** 	Tree canopy trimming to the west of Doune will be required. A 5m clear head height is necessary and early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required.
19	**A84 Bends at Buchany** 	Loads will proceed ahead on the A84 through a series of bends near Buchany. A swept path assessment of this sinuous section of road has been undertaken. The assessment indicates that loads will overrun and oversail the northern verge through the first bend into **third party land**. Load bearing surfaces should be laid. Two road signs, six chevron signs, five bollards and a wall section should be removed. One bollard will be oversailed. Trees and vegetation should be cleared. Loads will oversail one bollard on the southern verge through the first bend. Loads will oversail both verges through the second bend. On the southern verge, a series of bollards will be oversailed. Trees should be trimmed on both sides of the road through this bend. Loads will oversail the southern verge through the third bend where vegetation should be trimmed. Swept path drawing SK13 is included in Annex B.

POI	Key Constraint	Details
20	**A84 Bend West of Buchany** 	Loads will proceed ahead on the A84 through the bends to the west of Buchany. A swept path assessment has been undertaken and indicates that loads will oversail the southern verge through the first bend. Loads will oversail both verges through the second bend. On the northern verge, vegetation should be trimmed. Loads will oversail both verges through the third bend. On the northern verge, one set of chevron signs should be removed. The blade tip will oversail a series of bollards and a safety barrier. Trees and vegetation should be cleared. **Third party land** is required. Loads will oversail the southern verge through the third bend where vegetation should be trimmed. Swept path drawing SK14 is included in Annex B.
21	**A84 Bends Near Lanrick Bridge** 	Loads will proceed ahead on the A84 through two bends. A swept path assessment has been undertaken and indicates that loads will oversail the southern verge through the first bend where trees should be trimmed. Loads will overrun and oversail the southern verge and oversail the northern verge through the second bend. On the southern verge, a load bearing surface should be laid. One set of chevron signs, a series of bollards, trees and vegetation should be removed. On the northern verge, trees and vegetation should be trimmed. Swept path drawing SK15 is included in Annex B.
22	**A84 Bends Near Lanrick Bridge 2** 	Loads will proceed ahead on the A84 through two bends. A swept path assessment has been undertaken and indicates that along the southern side of the road loads will oversail the verge through the first bend and overrun and oversail the verge through the second bend. Load bearing surfaces should be laid. The wall and one pillar should be lowered. The fence will be oversailed. Three bollards should be removed. A series of bollards will be oversailed. Trees and vegetation should be cleared. **Third party land** is required. Loads will oversail the right-hand side through both bends. Through the first bend, three utility poles, one set of chevron signs and a fence should be removed. A wall and one bollard will be oversailed. Trees and vegetation should be cleared. **Third party land** is required. Through the second bend, one utility pole should be removed. Vegetation should be trimmed. The clearance to a nearby wall should be confirmed during the test run or on a topographical survey base. Swept path drawing SK16 is included in Annex B.

POI	Key Constraint	Details
23	**A84 Bends near Lanrick Bridge 3** 	Loads will proceed ahead on the A84 through a left bend. A swept path assessment has been undertaken and indicates that loads will oversail a series of bollards on the northeastern verge on approach to the bend where vegetation should be trimmed. Loads will overrun and oversail the southern verge through the bend. A load bearing surface should be laid. Minimal clearance was noted to a nearby wall. It is highly recommended that the clearance is checked on a topographical survey base. Loads will overrun and oversail the northern verge through the bend where a load bearing surface should be laid. Two utility poles, one set of chevron signs, a series of bollards, a wall and boulders should be removed. Trees and vegetation should be cleared. **Third party land** is required. Swept path drawing SK17 is included in Annex B.
24	**A84 Near Drumvaich** 	Loads will proceed ahead on the A84 through the bend. Loads will straddle the centreline through the section. Oncoming vehicles should be held in advance. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required.
25	**A84 Near Drumvaich** 	The vertical profile of the road is pronounced at this location. Loads should be set on higher suspension settings, noting tree canopy restrictions, to avoid the need for intrusive works at this location.
A blade lifting station should be provided on third party land located to the east of Callander. This is to ensure that a suitable site can be identified prior to the constraints located to the west of the town. **All overhead utilities from the location of the blade transfer station to site will need to be re-routed or placed underground. All overhead tree canopies will need to be trimmed.** The exact location of the transfer station will be dependent upon a land deal that SSER will need to obtain. As such, no layout has yet been illustrated.		
26	**A84 Callander** 	A Traffic Management Plan is required to safely navigate loads through the town of Callander.

POI	Key Constraint	Details
27	**A84 on Departure from Callander** 	Loads will proceed ahead on the A84 through the bends when departing Callander. Loads will straddle the centreline through the section. Oncoming vehicles should be held in advance.

POI	Key Constraint	Details
28, 29, 30, 31	**A84 Bends Near the Trossachs Woollen Mill**     	Loads will proceed ahead on the A84 through a series of bends. Overhead utilities at this location will need to be diverted or placed underground to accommodate the raised blade. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussions with the ecology team may be required. A swept path assessment has been undertaken and indicates that loads will oversail both verges through the second bend (POI 29). Loads will oversail both verges through the third bend (POI 30). On the northern verge, one tree should be trimmed. On the southern verge, one road sign, one bollard, a guardrail, wall and fence section should be removed. A separate wall and fence section will be oversailed. Vegetation should be cleared. **Third party land** is required. Through the following bend (POI 31), loads will oversail the southern verge where trees should be trimmed. A series of bollards, one chevron sign, one road sign and a safety barrier will be oversailed. Loads will overrun and oversail the northern verge where a load bearing surface should be laid. Trees and vegetation should be trimmed. Through the final bend (POI 31), loads will oversail both verges. On the northern verge, one road sign will be oversailed and trees and vegetation should be trimmed. On the southern verge, a safety barrier, trees and vegetation should be removed. Swept path drawing SK18 is included in Annex B.

POI	Key Constraint	Details
32	**A84 Vertical Alignment** 	Loads will proceed ahead on the A84 through the bend. The overhead utilities at this location will need to be diverted or placed underground to accommodate the raised blade. The vertical profile of the road is pronounced at this location. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussions with the ecology team may be required.

POI	Key Constraint	Details
33, 34, 35, 36, 37	**A84 Bend to west of Leny Woods and Falls of Leny**     	Loads will proceed ahead on the A84 through the bend. The overhead utilities through this section will need to be diverted or placed underground to accommodate the raised blade. Loads will occupy the entire road width through this entire section and oversail the verges where vegetation should be cleared. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required. The vertical profile of the road is pronounced through this section. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location.

POI	Key Constraint	Details
38	**A84 at the Forest Holidays Junction** 	Loads will proceed ahead on the A84 through the bend. The vertical profile of the road is pronounced at the exit from the bend. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location.
39	**A84 at Anie**   	Loads will proceed ahead on the A84 through two bends. The overhead utilities at this location will need to be diverted or placed underground to accommodate the raised blade. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required. A swept path assessment of this section of road has been undertaken and is provided in Annex B. The assessment indicates that loads will oversail both verges through the first bend into **third party land**. On the western verge, one utility pole, two sets of chevron signs, a series of bollards and a wall will be oversailed. Trees should be trimmed. On the eastern verge, land reprofiling is required to allow the vehicles to oversail. Trees and vegetation should be cleared. Loads will oversail the western verge through the second bend. Swept path drawing SK19 is included in Annex B.

POI	Key Constraint	Details
40, 41	**A84 North of Anie**  	Loads will proceed ahead on the A84 through two right bends. Loads will occupy the entire carriageway through the section. Oncoming vehicles should be held in advance of the bends. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required.
42	**A84 Vertical Alignment** 	Loads will proceed ahead on the A84 through the bend. The vertical profile of the road is pronounced at this location. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location.
43	**A84 Vertical Alignment and Bend near The Cabin**  	Loads will proceed ahead on the A84 through the bend. The vertical profile of the road is pronounced at this location. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location. Loads will occupy the entire carriageway through the section. The vehicles will oversail the western verge through the bend. Oncoming vehicles should be held in advance of the bend.

POI	Key Constraint	Details
44	**A84 at Benview** 	Loads will proceed ahead on the A84 through the bend. The vertical profile of the road is pronounced at this location. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location.
45, 46, 47, 48	**A84 Ardchullarie More**    	Loads will proceed ahead on the A84 through the bend. Loads will occupy the entire carriageway through the section. Oncoming vehicles should be held in advance of the bend. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required. The vertical profile of the road at POI 47 and 48 is pronounced at this location. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location.

POI	Key Constraint	Details
49	**A84 Bend**   	Loads will proceed ahead on the A84 through two bends. The overhead utilities at this location will need to be diverted or placed underground to accommodate the raised blade. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required. The vertical profile of the road is pronounced at this location. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location. A swept path assessment of this section of road has been undertaken and is provided in Annex B. The assessment indicates that loads will oversail a safety barrier on the southern verge through the first bend. Through the second bend loads will oversail the northern verge where trees and vegetation should be trimmed. Swept path drawing SK20 is included in Annex B.
50	**A84 Doctor's Corner** 	Loads will proceed ahead on the A84 through the bend. Due to the constrained nature of the section, it is recommended that the swept path assessment is repeated on a topographical base plan. The overhead utilities at this location will need to be diverted or placed underground to accommodate the raised blade. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussions with the ecology team may be required. A swept path assessment of this section of road has been undertaken and is provided in Annex B. The assessment indicates that loads will oversail both verges of the road on approach to the bend. On the northern verge, five bollards will be oversailed. Trees and vegetation should be trimmed. On the southern verge, a safety barrier will be oversailed. Through the bend, loads will oversail both verges into **third party land**. On the northern verge, land reprofiling is required. Trees and vegetation should be cleared. On the southern verge, two utility poles and three sets of chevron signs will be oversailed. Trees should be trimmed. Swept path drawing SK21 is included in Annex B.

POI	Key Constraint	Details
51, 52, 53	**A84 North of Doctor's Corner & South of Strathyre**   	Loads will proceed ahead on the A84 through the sinuous section of road. Loads will occupy the entire carriageway through the section. Oncoming vehicles should be held in advance of the bend. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required. The overhead utilities at this location will need to be diverted or placed underground to accommodate the raised blade.
54	**A84 Strathyre** 	Loads will proceed ahead on the A84 through bend. Loads will straddle the centre line through the section. Oncoming vehicles should be held in advance. The overhead utilities throughout Strathyre will need to be diverted or placed underground to accommodate the raised blade. The vertical profile of the road is pronounced at this location. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location. The tree canopy within the village will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required.
55	**A84 north of Strathyre** 	Bollards on the central island should be laid flat to enable wide loads to pass in safety. The overhead utilities crossing the road north of Strathyre will need to be diverted or placed underground to accommodate the raised blade.

POI	Key Constraint	Details
56	**A84 south of Balquidder** 	Loads will proceed ahead on the A84 through bend. Loads will straddle the centre line through the section. Oncoming vehicles should be held in advance. The overhead utilities will need to be diverted or placed underground to accommodate the raised blade. The vertical profile of the road is pronounced at this location. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location.
57	**A84 south of Balquidder** 	Loads will proceed ahead on the A84. The vertical profile of the road is pronounced at this location. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location.
58	**A84 west of Balquidder** 	Loads will proceed ahead on the A84 through bend. Loads will straddle the centre line through the section. Oncoming vehicles should be held in advance. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required.
59	**A84 Balquidder**  	Loads will proceed ahead on the A84 through bend. The vertical profile of the road is pronounced at this location. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location. The overhead utilities within Balquidder will need to be diverted or placed underground to accommodate the raised blade. Loads will straddle the centre line through the section. Oncoming vehicles should be held in advance. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required.

POI	Key Constraint	Details
60	**A84 north of Balquidder** 	Loads will proceed ahead on the A84 through bend. Loads will straddle the centre line through the section. Oncoming vehicles should be held in advance. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required.
61	**A84 / A85 Junction, Lochearnhead** 	Loads will enter Lochearnhead. To the south and within the village, all overhead utilities will need to be diverted or placed underground to accommodate the raised blade. At the junction with the A85, loads will turn right onto the A85 eastbound, towards Crieff. A swept path assessment of this section of road has been undertaken and is provided in Annex B. The assessment indicates that loads will oversail the eastern verge into **third party land**. One lit road sign and fence should be removed. One junction box will be oversailed. Trees and vegetation should be cleared. Loads will overrun the splitter island of the A85 entry where a load bearing surface should be laid. One lighting column, one lit road sign and two bollards should be removed. Loads will overrun and oversail the northern verge of the A85 where a load bearing surface should be laid. Trees and vegetation should be trimmed. The blade tip will oversail the western verge of the A84 as loads complete the manoeuvre. One road sign and fence will be oversailed. **Third party land** is required. Swept path drawing SK22 is included in Annex B.
62	**A85 Bend, Lochearnhead** 	Loads will proceed ahead on the A85 through a right bend. The vertical profile of the road is pronounced at this location. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location. Within the village, all overhead utilities will need to be diverted or placed underground to accommodate the raised blade. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required. A swept path assessment of this section of road has been undertaken and is provided in Annex B. The assessment indicates that loads will oversail the southern verge through the bend. One road sign, a fence and gate should be removed. Vegetation should be cleared. **Third party land** is required. Loads will overrun and oversail the northeastern verge where a load bearing surface should be laid. The blade tip will oversail the northwestern verge. Two road signs, one lighting column, one utility pole, a wall, fence, bridge, and five bollards will be oversailed. Trees should be trimmed. Swept path drawing SK23 is included in Annex B.

POI	Key Constraint	Details
63	**Past A85/Auchraw Terrace Junction** 	Loads will proceed ahead on the A85 through a left bend. Within the village, all overhead utilities will need to be diverted or placed underground to accommodate the raised blade. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required. A swept path assessment of this section of road has been undertaken and is provided in Annex B. The assessment indicates that loads will overrun and oversail the southern verge through the bend where a load bearing surface should be laid. Trees should be trimmed. Swept path drawing SK24 is included in Annex B.
64	**A85 East of Lochearnhead** 	Loads will proceed ahead on the A85. The vertical profile of the road is pronounced at this location. Loads should be set on higher suspension settings to avoid the need for intrusive works at this location. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required.
65	**A85 East of Lochearnhead**  	Loads will proceed ahead on the A85. Loads will straddle the centre line through the section. Oncoming vehicles should be held in advance. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required.

POI	Key Constraint	Details
67, 68	**A85 Dalveich**  	Loads will proceed ahead on the A85 through two bends. A swept path assessment of this section of road has been undertaken and is provided in Annex B. The assessment indicates that loads will oversail both verges. Trees should be trimmed from both verges. Loads will oversail both verges of the section of road in between the two bends. Through the second bend, loads will overrun and oversail both verges where load bearing surfaces should be laid and vegetation should be removed. In the southern verge, two sets of chevron signs and two bollards should be removed. The tree canopy will need to be trimmed throughout the section. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required. Swept path drawing SK25 is included in Annex B.
69	**A85 east of Drummond Estate Boat Hire** 	Loads will proceed ahead on the A85 through a right bend. The overhead utilities at this section will need to be diverted or placed underground to accommodate the raised blade. The tree canopy will need to be trimmed. Early engagement with the roads authority is recommended. Tree canopy trimming is subject to seasonal licences and discussion with the ecology team may be required. A swept path assessment of this section of road has been undertaken and is provided in Annex B. The assessment indicates that loads will overrun and oversail the northern verge through the bend. A load bearing surface should be laid. One set of chevron signs, two bollards and vegetation should be removed. Two sets of chevron signs and four bollards will be oversailed. Loads will oversail the southern verge through the bend where one utility pole should be removed. Trees and vegetation should be trimmed. Swept path drawing SK26 is included in Annex B.
70	**Site Access Junction** 	Loads will turn left into a newly formed site access that will conform to turbine supplier standards. Detailed design and **third party land** is required. Loads will oversail the northern side of the track where a fence and vegetation should be removed. A section of wall will be oversailed. Full detailed design of the proposed access junction should be completed. Swept path drawing SK27 is included in Annex B.

3.4 Swept Path Assessment Results and Summary

The detailed swept path assessment drawings for the locations assessed are provided in **Annex B** for review. The drawings illustrate tracking undertaken for the worse case-loads at each location. The colours illustrated on the swept paths are:

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

Where mitigation works are required, the extents of over-run and oversail areas are illustrated on the swept path drawings as hatched red or blue. 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.

Please note that where assessments have been undertaken using Ordnance Survey (OS) base mapping, CAD based aerial mapping and historic topographical data, there can be errors in these data sources.

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, aerial mapping, historic topographical surveys or client supplied data.

Please note that turbine supplier guidance suggests that the minimum road width for the safe transport of AIL components is 4.5 m. All public roads and onsite access tracks should comply with this standard unless a relaxation has been agreed with suppliers.

The need to widen public roads will require engagement with the relevant road authority and may constitute permanent or temporary surfacing.

3.5 Land Ownership

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. PF 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.

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 / hedge lines or a maximum 2 m from the road edge. This can vary between areas and location.

3.6 Weight Review

A weight review has been undertaken via the ESDAL (Electronic Service Delivery for Abnormal Loads) contacts database using the National Highways website www.esdal.com. All of the relevant ESDAL contacts are noted in **Table 3**, and all have been contacted to ascertain if there are any relevant constraints that should be noted.

Table 3 ESDAL Contacts

Organisation	Email Address
Police Scotland	OSDAbnormalLoadsScotland@scotland.police.uk
Historic Rail Estate	rsgbrb@jacobs.com
Transport Scotland	AbnormalLoads@transport.gov.scot
Network Rail	AbnormalLoadsEnquiries@networkrail.co.uk
Stirling Council	roadsandlandservices@stirling.gov.uk
Perth & Kinross Council	abnormalloads@pkc.gov.uk
Falkirk Council	abnormalloads@falkirk.gov.uk
Bear (South East)	seabnormalload@bearscotland.co.uk
Bear (North West)	NWAbnormalLoad@bearscotland.co.uk

Where responses from the ESDAL have been received, these are contained in **Annex C**. Where no response has been received, it is assumed that no constraints are in place at this time.

3.6.1 Identified Route Constraints

The ESDAL review has highlighted two issues on the proposed AIL access route at this time. The first of these, Drip Bridge (ESRN S-NS770956-1) which is located on the A84, immediately to the west of Junction 10 on the M9 has been highlighted by BEAR (North West) as being a 'substandard structure' and unsuitable for the proposed loads.

Discussions with BEAR have confirmed that a CAT 3 bridge inspection has been undertaken on the structure and are in the process of finalising the results, however they do not expect that the results of this will alter their current position whereby the bridge is unsuitable for the proposed loads at present.

Until such time as BEAR have confirmed the results of the CAT 3 bridge inspection or alternatively provided information in relation to works to address the current failings of the structure, alternative routing options are under consideration which will allow the proposed AILs to access the Proposed Development Site. This includes all loads routing via an alternative route from the M9 or options of routing heavier loads, for example the towers, nacelles, drive trains and hub loads via an alternative route while lighter loads would still utilise Drip Bridge. It would be proposed to assess these in detail once information on Drip Bridge has been made available by BEAR.

With regards to the second identified issue on the proposed access route, BEAR have advised that Pass House (ECRN C1-10005114-P1) which is a retaining wall, is also substandard, with a gross weight restriction of 38,000 kg on the structure. They have however advised that loads can make use of the southbound lane to avoid the weight restriction at this location, which would be subject to suitable traffic management procedures.

3.7 Summary Issues

It is strongly suggested that following a review of the RSR, the Applicant 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;
- Liaise with Transport Scotland / BEAR (North West) on proposed improvement works and timescales of these works to Drip Bridge on the A84;
- 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 SSE Renewables Wind Farms UK Ltd to prepare a Route Survey Report to examine the issues associated with the transport of AIL turbine components to the Proposed 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.

This report has been based upon a worst case of Nordex N163 turbine sections and has been undertaken on the basis of a Superwing Carrier blade trailer, transferring to a blade lifting trailer from Callander to Site.

The report is presented for consideration to SSE Renewables Wind Farms UK Ltd. Various road modifications, structural reviews, and interventions are required to successfully access the Site. A number of areas have been identified where topographical surveys are required to confirm the feasibility of the routes.

4.2 Further Actions

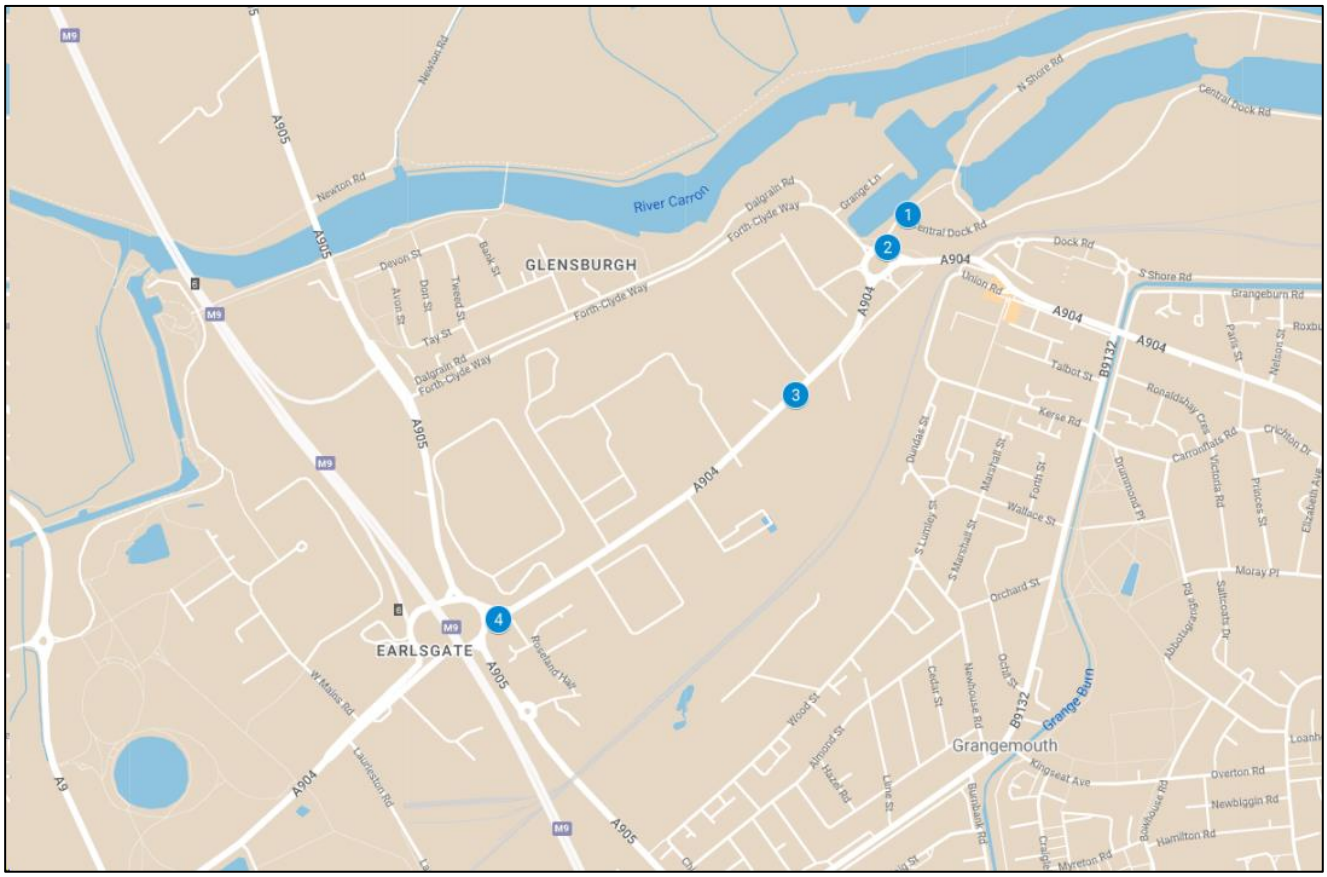
The following actions are recommended to pursue the transport and access issues further:

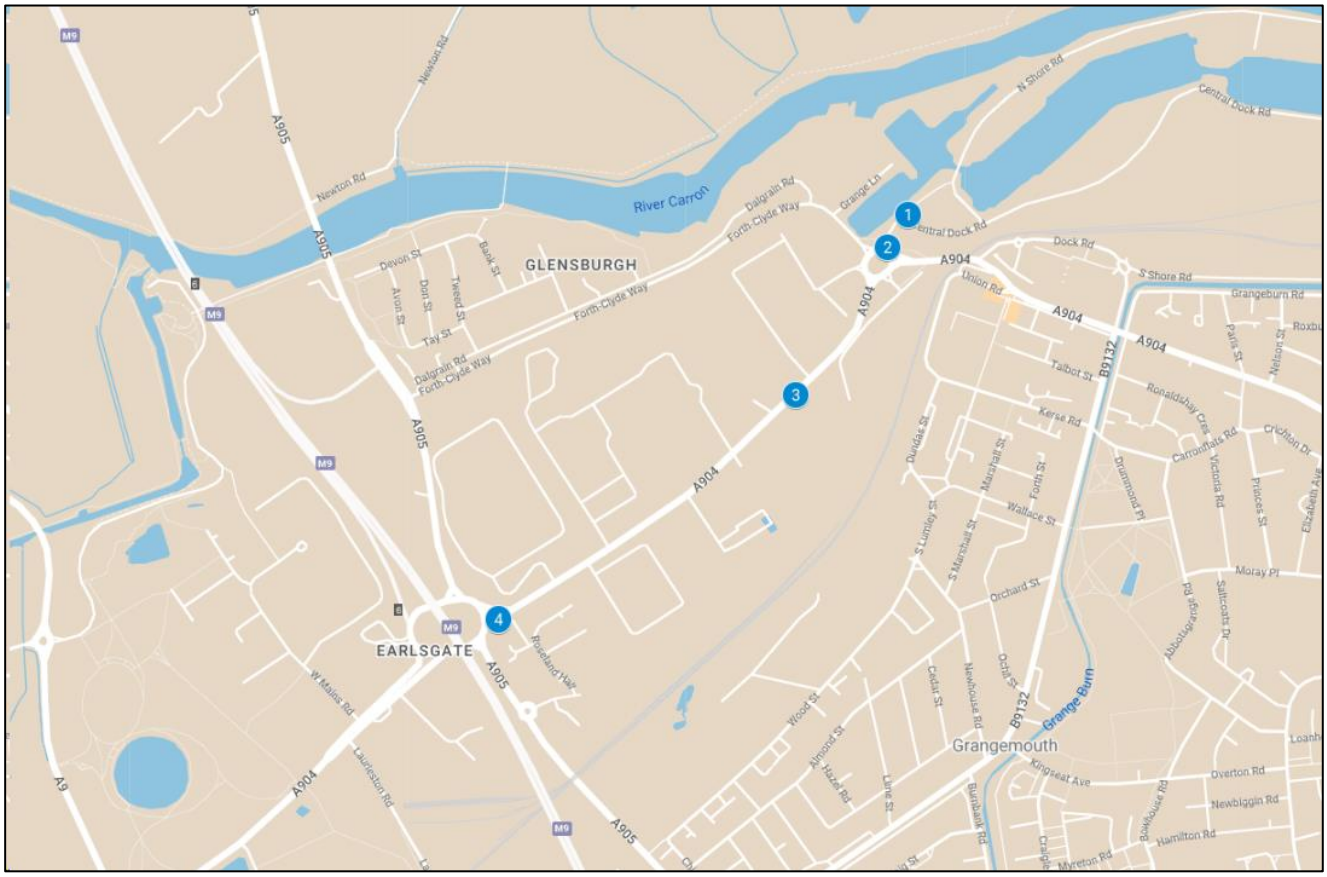
- Prepare detailed mitigation design proposals to help inform the land option / consultee discussions;
- Obtain the necessary land options and permissions;
- Liaise with Transport Scotland / BEAR (North West) on proposed improvement works and timescales of these works to Drip Bridge on the A84;
- Undertake discussion with the affected utility providers and roads agencies;
- Obtain the necessary statutory licences to enable the mitigation measures; and
- Develop a detailed operational Abnormal Load Transport Management Plan to assist in transporting the proposed loads. Further details in this regard are included in **Chapter 11: Traffic and Transport** of EIA Report Volume 1 and **Technical Annex 11.1 Transport Assessment**.

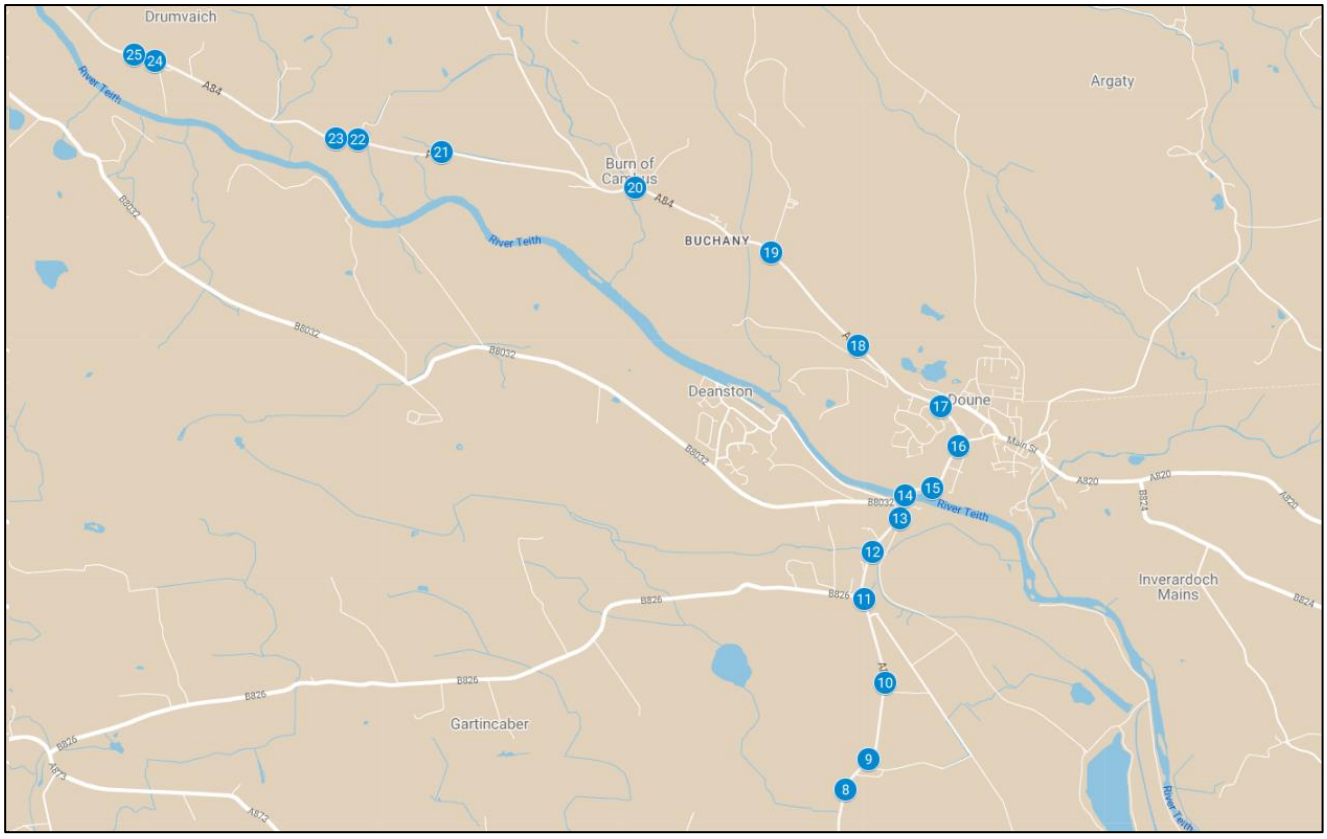
Annex A: Points of Interest

An electronic version of the POI plans can be found here:

https://www.google.com/maps/d/edit?mid=1d73YaV1MuSAeLjIXLa7S06E88X0YnBA&usp=sharing



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Argaty
Burn of
BUCHANY
Deanston
Doune
Inverardoch
Mains
Gartincaber
River Teith
A84
B8032
B826
Main St
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Anie
Kilmahog
Bochastle
Callander
A84
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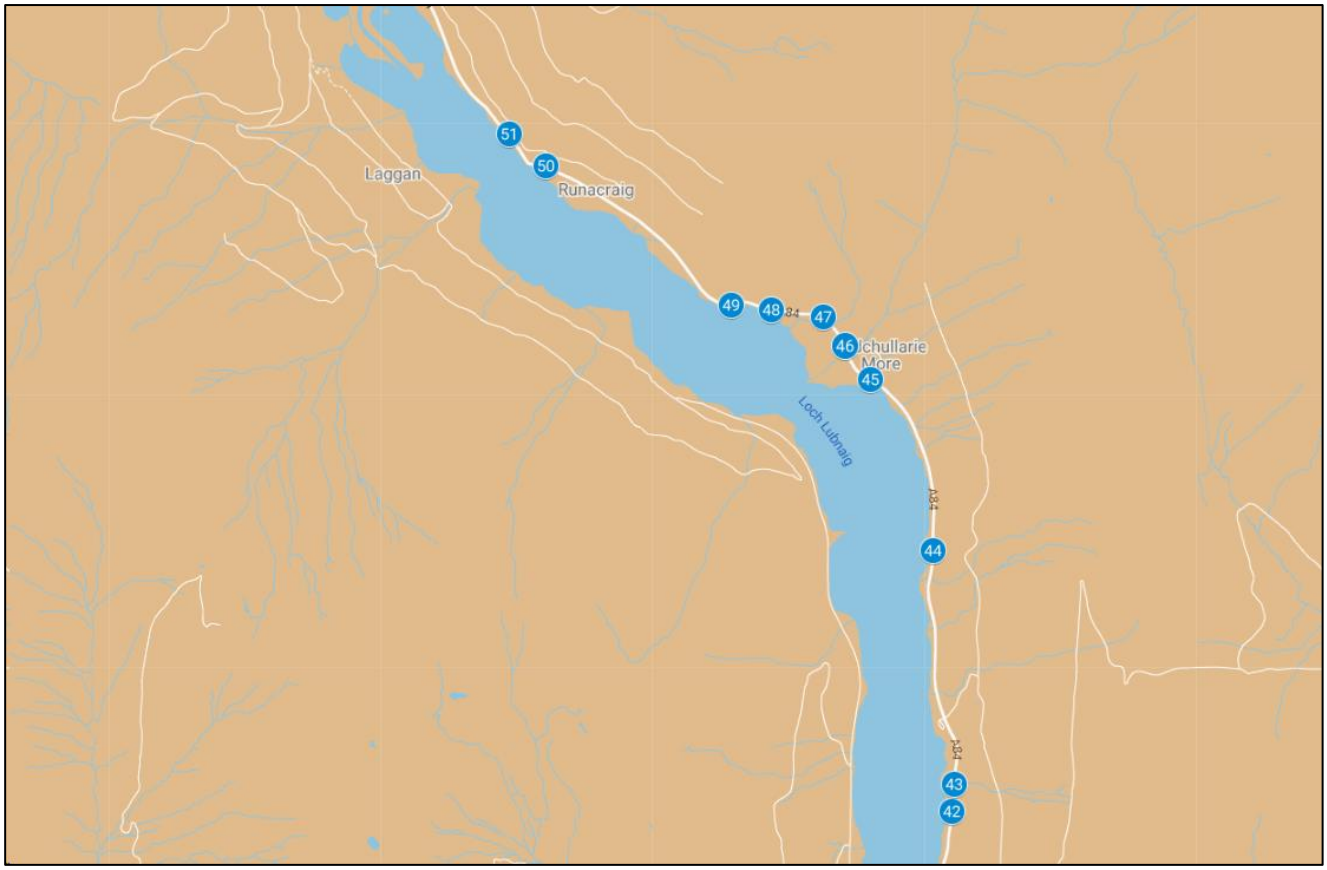
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Laggan
Runacraig
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Loch Lubnaig
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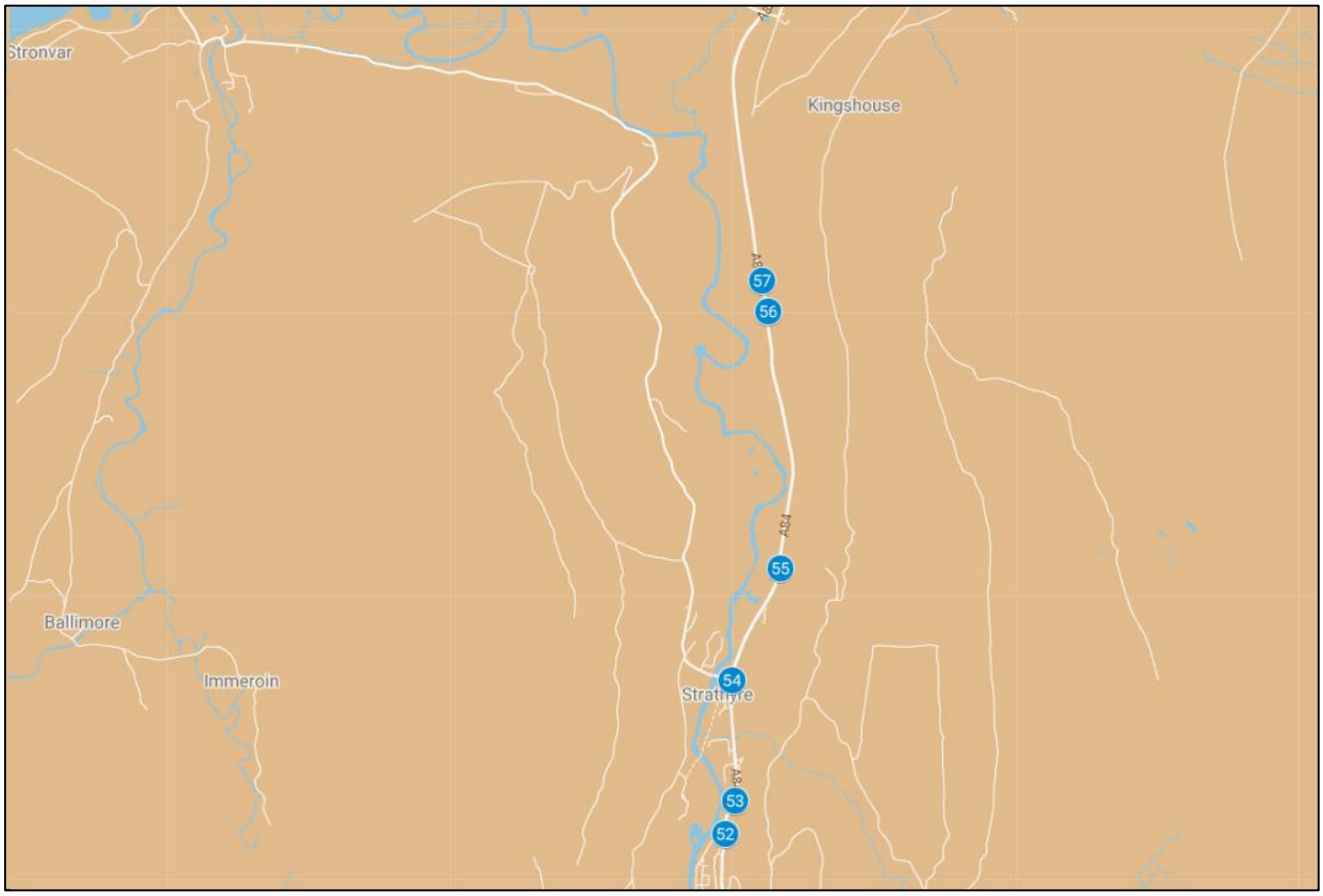
Stronvar
Kingshouse
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Ballimore
Immeroin
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Ardveich
Lochearnhead
Edinchip
Ardvorlich
Auchtubh
A85
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Annex B: Swept Path Assessment Drawings

Annex C: ESDAL Correspondence

From: abnormalloads
Sent: Tuesday, February 13, 2024 3:44 PM
To: Gordon Buchan
Subject: RE: Glentarken AIL review

Good Afternoon Gordon,
The below route you have provided I have no issues/restrictions with regards to weight.
For me to fully confirm that this route is acceptable can you let me know the height that this load is going to be?

Kind Regards

Molly

Falkirk Council

From: abnormalloads
Sent: Friday, February 16, 2024 10:10 AM
To: Gordon Buchan
Subject: RE: Glentarken AIL review

Hi Gordon,

Thanks for confirming the height.

I can know confirm that there are no objections from Falkirk Council.

Kind Regards
Molly

From: Communities Structure ALR
Sent: Tuesday, February 13, 2024 4:09 PM
To: Gordon Buchan
Subject: RE: Glentarken AIL review

Hi Gordon

Going by your route then no PKC structures would be affected, so no issues from us.

Regards

Euan Lamont

Engineer (Structures)
Communities
Perth & Kinross Council
Pullar House
35 Kinnoull Street
Perth
PH1 5GD

Report a Perth & Kinross Council bridge, culvert or road retaining wall fault online here.

Information regarding Abnormal Load Enquiries can be found here.

From: rsgbrb

Sent: Wednesday, February 14, 2024 9:02 AM

To: Gordon Buchan

Subject: RE: Glentarken AIL review

Hi Gordon,

I trust you are well.

Thank you for your e-mail. I've looked at the route, and can confirm that no HRE structures would be affected.

Therefore, I don't have any objections or concerns.

Best regards

Tania

Tania Howell
Abnormal Loads Officer (on behalf of National Highways Historical Railways Estate)
Jacobs

If your mail concerns abnormal load movements, please reply to RSGBRB@jacobs.com

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From: SE Abnormal Loads
Sent: Friday, February 16, 2024 10:21 AM
To: Gordon Buchan
Cc: SE Abnormal Loads
Subject: RE: Glentarken AIL review

Good morning Gordon,

Having reviewed the proposed movement and the route highlighted below there are no weight or height restrictions on the South East Trunk Road Network, this will however be subject to the same check once actually submitted.

It should however be stated to the hauliers that it is their responsibility to check swept paths and to check the overall route for the width and length restrictions.

Please note that neither the Operating Company nor the Scottish Ministers or Director assume responsibility of any kind in connection with the movement of the relevant abnormal indivisible load or abnormal vehicle, and in following any advice provided, the owner and the operator of the vehicle shall not be relieved of any of their obligations or liabilities under the relevant Legislation. Hauliers are responsible for ensuring safe passage of the loads in terms of height and width.

Police Scotland manages the movement of abnormal loads throughout Scotland.
Anyone who wants to move an abnormal load throughout Scotland has a legal obligation to notify the Chief Officer of Police Scotland.

Kind regards,

Lewis Kane
Engineer | BEAR Scotland | NMC - South East Unit

Dear Gordon

We have no objections to this particular movement. Please note this only applies to this route enquiry.

We check the load carrying capacity of Network Rail owned road over rail bridges affected. We do not check anything else, including:

* Load carrying capacity of level crossings

* Clearance to bridge parapets

* Clearance under a rail bridge

* Clearance to overhead wires at level crossings

We regularly inspect and assess our bridges and occasionally we have to revise the permitted load carrying capacity, as such I suggest that you contact us again closer to the movement to ensure that our bridges are still adequate. Once the movement dates are set, you will still need to submit an abnormal load notification for the move

Many Thanks

Sunil Maniraj

Abnormal Loads Clerk

Abnormal Loads Help Desk: 07395 391628

Abnormal Loads Team – Part of the National Records Group

Good morning,

Apologies as we seem to have missed responding to your email.

On the A84 there are two substandard structures, Drip and Pass House LB, that make the route unsuitable for the vehicle. Although the vehicle could use the southbound lane to avoid loading the wall at Pass House the bridge at Drip cannot be avoided.

Drip bridge is located at the Striling end of the A84 where the road crosses the River Forth. OSGR 695654, 277007.

Pass House wall is located west of Kilmahog at OSGR 708580 , 260330

Regards

Stephen Oakley

Bridge Engineer | BEAR Scotland | North West Unit

Telephone: [redacted] **| Visit us @ www.bearscot.com**