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Appendix 12.1

Abnormal Indivisible Load Access Assessment

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Glossary

Term	Definition
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together by the developer, in a systematic way, a description of the development and information relating to the likely significant environmental effects arising from a Proposed Development
Environmental Impact Assessment Report	A document reporting the findings of the EIA and produced in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 Regulation 5
The Proposed Development	The proposed Scawd Law Wind Farm development
The Proposed Development Area	The development area within the red line site boundary (application area) as shown in Volume 3 a Figure 1.2: Site Layout.

List of Abbreviations

List and describe your abbreviations here.

Abbreviation	Description
AIL	Abnormal Indivisible Load
SPA	Swept Path Analysis
TA	Technical Appendix

A12.1.1 INTRODUCTION

A12.1.1.1 Natural Power has been commissioned by the Applicant to assess the abnormal load access to the Proposed Development.

A12.1.1.2 This assessment based on the anticipated delivery of a turbine with blade length of up to 73.7 metres and the turbine specifications provided in Chapter 4 of the EIAR.

A12.1.1.3 A site inspection of the route was carried out on the 16th December 2020 to assess the route to site taking into account the constraints identified during the desk based assessment. This report summarises the findings of the assessments undertaken, identifies the constraints for abnormal indivisible load deliveries and makes recommendations to resolve these issues.

A12.1.1.4 The proposed abnormal delivery route for the Proposed Development runs from the port of Grangemouth to the point where the delivery vehicles leave the public highway off the B709 and access the Site. Figure 12.2 illustrates the route along with the 26no. pinch points identified. A Swept Path Analysis (SPA) have been undertaken on each of these pinch points and is included in Figures 12.3a-z.

A12.1.1.5 This Technical Appendix (TA) :

- Identifies and confirms that the proposed AIL route allows access for the delivery turbine components as described in Chapter 4; and
- Undertakes SPA based on OS Mastermap data at relevant pinch points along the route to identify any required upgrade works to facilitate AIL deliveries.

A12.1.2 PROJECT DETAILS

Site Location

A12.1.2.1 See Chapter 4: Project Description for detail on the Proposed Development.

Proposed Turbine

A12.1.2.2 The turbine proposed for the development has not yet been confirmed however, the maximum key dimensions considered for this assessment, and referred to as “the candidate turbine” in this technical appendices, are as follows:

- Hub height = up to 103 metres.
- Turbine blade length = up to 73.7 metres.

Proposed AIL Route

A12.1.2.3 With reference to Figure 12.2, the proposed route is as follows:

- Exit Grangemouth Docks onto Powdrake Road,
- Follow Powdrake Road to Powdrake Roundabout and join the A904 (Boness Road),
- Follow A904 to Inchyra Roundabout and join the B9143 (Inchyra Road),
- Follow B9143 to Wholeflats Roundabout and join the A905 (still named as Inchyra Road),
- Follow A905 and join the M9 at Cadgers Brae Roundabout (Junction 5),
- Continue on M9 towards Edinburgh and join the M8 at Junction 2 after Newbridge,
- Continue on M8 towards Edinburgh and Hermiston Gate,
- At Hermiston Gate join the A720 Edinburgh City Bypass heading east,
- Continue east along the A720 Edinburgh City Bypass to Old Craighall,

- Go around Old Craighall and join the west bound A720 Edinburgh City Bypass,
- Continue on the A720 west bound and join the A68 heading south at Millerhill Junction,
- Follow the A68 south and join the B6458 heading west,
- Continue on the B6458 which merges onto the B6367 and continue on the B6367 and join the A7,
- Continue on the A7 heading north and join the B7007 heading south-west,
- Continue on the B7007 and join the B709,
- Continue on the B709 heading south to the site entrance.

A12.1.3 ROUTE ASSESSMENT

Identification of Preferred Route

A12.1.3.1 Natural Power undertook a series of detailed investigations and assessments into potential routes to the site, including:

- From the M74 Motorway, utilising the A702, A701 and A72 to approach the site from the west via Peebles, Innerleithen and Walkerburn.
- From the A720 (Edinburgh City Bypass), utilising the A701, A703 and A72 to approach the site from the west via Peebles, Innerleithen and Walkerburn.
- From the A720 (Edinburgh City Bypass), utilising the A68, A6091 and A72 to approach the site from the east via Galashiels.
- From the A720 (Edinburgh City Bypass), utilising the A7, B710 and A72 to approach the site from the east via Clovenfords.
- Various other minor roads bypassing sections and/or linking between the above routes.

A12.1.3.2 The proposed AIL route as presented in A12.1.2.3 was chosen as the preferred route as it was considered the most viable route, offering the least constraints by volume and technicality.

Port of Entry

A12.1.3.3 As part of the access assessment several ports suitable for delivery of wind turbine components were considered. Grangemouth Docks was identified as a likely candidate port as it has sufficient capacity, facilities and has been used extensively in the past for wind turbine component delivery.

Swept Path Analysis

A12.1.3.4 From desktop assessments and site inspections of the proposed AIL route, pinch points were identified and assessed by SPA. OS Mastermap data indicating the ground features (i.e. road edge, road corridor, building outlines, fences lines, watercourses, etc) of each pinch point location was obtained and SPA undertaken utilising Autodesk Vehicle Tracking.

A12.1.3.5 The assessment is based on the use of delivery vehicles specialised for the purposes of transportation of wind farm turbine components. The vehicle set-ups adopted for this assessment are based on details of these specialised delivery vehicles and candidate turbine component details.

A12.1.3.6 The transportation of the blade is typically considered the most onerous in terms of horizontal alignment. The candidate turbine blade of 73.7 metres length has been used in the SPA drawings. Other turbine components such as towers and nacelles are included in the SPA to ensure there are no further horizontal alignment issues over those identified for the blade. Where other components have been found to be more onerous these are identified within the pinch point description.

A12.1.3.7 Initially 27 no. pinch points were identified and assessed. Subsequently, the SPA indicated that one of the pinch points (Pinch Point 8) did not require any modification works to facilitate abnormal load deliveries. Therefore, Pinch Point 8 is identified as 'Not Required' in the numbering sequence.

A12.1.3.8 The SPA is based on developed vehicle set-ups, OS mastermap data and site inspections of the route and individual pinch points. The vehicle set-ups at the time of delivery may differ depending on the final selected turbine and the appointed hauliers' approach to delivery. The OS mastermap data can only be considered as indicative of the actual ground features and may not be wholly accurate. Therefore, the assessment should be reviewed during detailed design stages adopting actual vehicle set-ups, topographic survey of the pinch points and a trial run.

A12.1.3.9 Street furniture (i.e. road signs, lighting columns, traffic lights, telegraph poles, etc) have been identified from aerial imagery and site inspections and included on the SPA drawings. The presence and location of these should be considered as indicative at this stage and should be confirmed via topographic survey. Where they are within the swept path areas, arrangements should be made for their relocation or temporary removal during AIL deliveries.

A12.1.3.10 During this assessment, no services searches were carried out along the proposed route and should form part of further investigations during the detailed design stage.

A12.1.3.11 3rd party land ownership searches have been undertaken at pinch points along the route to identify ownership of areas of land required for the abnormal load deliveries including areas of oversail. Based on discussions with the local roads' authority, it has been assumed that the extent of the highway boundary is to the nearest obvious demarcation (e.g. fence/wall) or two metres where there is no obvious demarcation.

A12.1.3.12 The results of the SPA are detailed in Figures 12.3a-z.

A12.1.3.13 All upgrade areas identified within this report are subject to pre commencement detailed survey.

Height Restrictions

A12.1.3.14 The inspections of the route did not identify any structures that would provide height restrictions. The route passes beneath a number of bridges and overpasses along the trunk road network (i.e. M9, M8, A720 and A68). None of these bridges are signed to identify the maximum height and therefore should have a minimum standard clearance of 5.03 m.

A12.1.3.15 There are no bridges or underpasses on the minor local authority operated roads associated with the route (B6458, B7007 and B709) that would offer a height restriction.

A12.1.3.16 There are a number of locations where power and telephone cables cross the roads associated with the route. While the minimum height of any cable should be above 5.2 m, and no cables were identified during the site inspections that would offer a height restriction, these will require to be re-checked and confirmed during a trial run of the route.

Weight Restrictions

A12.1.3.17 A review of the weight restrictions on the AIL route was undertaken, including site inspections, Electronic Service Delivery for Abnormal Loads (ESDAL) gateway and consultation with the local Roads Authorities and Network Rail. This review did not identify any weight restrictions along the route. Prior to the delivery of abnormal loads and as part the AIL permitting process to obtain approvals for transporting AILs an updated assessment of the structures, with specific vehicle set-ups and axle loadings, will be undertaken in consultation with the relevant road/bridge authorities.

Road Structure and Width

A12.1.3.18 The proposed route utilises several minor rural roads including the B6458 and B6367 linking the A68 to the A7 and the B7007 and B709 from the A7 to the site entrance.

A12.1.3.19 The B7007/B709 to the proposed site access near Colquhar is around 20 km from the A7 and consist of a single two-lane carriageway to the south of Dewar. From Dewar to Colquhar (around 6km), the B709 it is single lane carriageway of varying width at around 4 metres. The site inspection of the single lane section of the B709 identified that it is presenting more signs of deterioration (i.e. pot holes, loss of wearing course, edge of bound surface crumbling, etc).

A12.1.3.20 The local roads authorities have not identified any specific sections of the route that may have poor structural capacity. It is anticipated condition surveys of the roads would be required to monitor the condition prior to, during and following the abnormal load delivery period. Sections of the B709, particularly along the single lane section, may need strengthening/repair works, such as a tarmacadam overlay, prior to abnormal load deliveries. The extents and detail of this should be confirmed during detailed design stage through condition inspections and discussions with the road authority.

A12.1.3.21 Turbine suppliers will typically require a road width of 4.5 to 5 metres on straight sections and wider on bends but may accept a reduction due to it being a bound surface. The OS mastermap data for sections of the B709, and in particular the single lane section, is not detailed enough to identify the highway boundary and carriageway edge, appearing to delineate the highway boundary only. Therefore, it is anticipated widening works will be required on the single lane section of the B709. The full extents and details of this should be confirmed through discussions with turbine suppliers, the roads authority and edge of road topographic survey during the detailed design stage.

A12.1.3.22 The environmental impacts on ecological receptors of the SSSI have been assessed in Chapter 7: Ecology of this EIAR.

A12.1.4 PINCH POINT ASSESSMENT AND SWEPT PATH ANALYSIS

Pinch Point 1 – Central Dock Rd to South Shore Rd

Pinch Point Photo 1 – Central Dock Rd to South Shore Road

Photo from Google Earth, copyright 2021 Google

A12.1.4.1 **Pinch Point 1** is located within Grangemouth Docks on the exit from Central Dock Road onto South Shore Road. Central Dock Road crosses over the internal Grangemouth Railway line via a level crossing at the junction onto South Shore Road. An area of oversail on the inside and outside of the junction bend will be required to accommodate the proposed turbine components.

A12.1.4.2 SPA for Pinch Point 1, based on a 73.7m blade, is shown on Figure 12.3a (drawing *11427_200_101*).

Pinch Point 2 – Exit from Docks from South Shore Road to Powdrake Road

Pinch Point Photo 2A – Access track across Grange Burn from South Shore Road to Powdrake Road

Photo from Google Earth, copyright 2021 Google

Pinch Point Photo 2B – Corner on Powdrake Road

Photo from Google Earth, copyright 2021 Google.

A12.1.4.3 **Pinch Point 2** is located on an informal exit from the docks from South Shore Road onto Powdrake Road. An access track crossing the Grange Burn has been formed and blocked off with Armco barriers. It is proposed to utilise this track due to the favourable geometry versus the formal road exit. It is understood this track/crossing was formed to facilitate previous abnormal load deliveries. Powdrake Road crosses a railway siding and it is understood this no longer in use, being heavily overgrown with vegetation and terminating on Powdrake Road.

A12.1.4.4 Two areas of overrun would need to be formed on flat ground on the outside of Powdrake Road. Based on the site inspection it is considered the initial smaller area of overrun will be on concrete infill to the railway siding. Areas of oversail will be required on the entrance to the track from South Shore Road to Powdrake Road and on the outside of Powdrake Road to facilitate abnormal load deliveries. There is a chainlink fence along the area of oversail from South Shore Road to the track which would need to be temporarily removed or relocated during abnormal load deliveries. Oversail on the outside of Powdrake Road is over a flat grassed area that is effectively a triangular shaped roundabout on Powdrake Road. A number of items of street furniture, which should be confirmed via topographical survey, will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.5 SPA for Pinch Point 2, based on a 73.7m blade, is shown on Figure 12.3b (drawing *11427_200_102*).

Pinch Point 3 – Right Hand Bend on Powdrake Road

Pinch Point Photo 3 – Corner on Powdrake Road

Photo from Google Earth, copyright 2021 Google

A12.1.4.6 **Pinch Point 3** is located on a right-hand bend on Powdrake Road before the approach to Powdrake Roundabout. An area of overrun will be required on the grass verge between the carriageway and a chainlink boundary fence. Oversail of the footpath and grass verge will be required to facilitate abnormal load deliveries. Three lighting columns and a road sign have been identified, which should be confirmed via topographical survey, and will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.7 SPA for Pinch Point 3, based on a 73.7m blade, is shown on Figure 12.3c (drawing *11427_200_103*).

Pinch Point 4 – Powdrake Roundabout

Pinch Point Photo 4 – Powdrake Roundabout
Photo from Google Earth, copyright 2021 Google

A12.1.4.8 **Pinch Point 4** is located on Powdrake Roundabout where Powdrake Road joins Bo'ness Road. A small area of overrun may be required on the approach island to the roundabout. This island is paved with lowered kerbs and it is anticipated could easily accommodate the overrun. A larger area of overrun will be required on the exit island to the roundabout. This is currently a flat grassed area with raised kerbs. It is proposed to contra-flow from the roundabout along Bo'ness Road to Pinch Point 5 at Inchyra Roundabout. A contra-flow manoeuvre would avoid more significant works at both Pinch Point 4 and Pinch Point 5. Oversail on existing carriageway verges will also be required to accommodate the proposed turbine components. Two road signs, one bollard and one lighting column have been identified, which should be confirmed via topographical survey, and will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.9 SPA for Pinch Point 4, based on a 73.7m blade, is shown on Figure 12.3d (drawing *11427_200_104*).

Pinch Point 5 – Inchyra Roundabout

Pinch Point Photo 5 – Inchyra Roundabout
Photo from Google Earth, copyright 2021 Google

A12.1.4.10 **Pinch Point 5** is located on Inchyra Roundabout as Bo'ness Road joins Inchyra Road. A contra flow manoeuvre is proposed at this pinch points to limit any major works. Areas of oversail into road verges would be required to accommodate the proposed turbine components. Three road signs, two lighting columns and three bollards have been identified, which should be confirmed via topographical survey, and will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.11 SPA for Pinch Point 5, based on a 73.7m blade, is shown on Figure 12.3e (drawing *11427_200_105*).

Pinch Point 6 – Wholeflats Roundabout

Pinch Point Photo 6 – Wholeflats Roundabout
Photo from Google Earth, copyright 2021 Google

A12.1.4.12 **Pinch Point 6** is located on Wholeflats Roundabout on Inchyra Road (B9143). A contra-flow manoeuvre is proposed due to the carriageway geometry. An area of overrun on the entrance and exit islands of the roundabout would be required to accommodate the proposed turbine components. The areas of overrun are on an existing bound footpath and it is not anticipated any upgrade works would be required except for temporary ramps to enable the abnormal load vehicles to mount the footpath. The structural capacity to support the abnormal loads should be checked during the detailed design stage and any strengthening/upgrade works implemented. Minor oversail within the carriageway bounds would also be required. One road sign has been identified, which should be confirmed via topographical survey, and will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.13 SPA for Pinch Point 6, based on a 73.7m blade, is shown on Figure 12.3f (drawing *11427_200_106*).

Pinch Point 7 – Slip Road onto M9 at Junction 5

Pinch Point Photo 7 – Slip Road onto M(at Junction 5
Photo from Google Earth, copyright 2021 Google

A12.1.4.14 **Pinch Point 7** is located on the Cadgers Brae Roundabout where the Inchyra Road (B9143) joins onto the M9 motorway. Oversail within the carriageway verges would be required to accommodate the proposed turbine components. Four road signs and four lighting columns have been identified, which should be confirmed via topographical survey, and will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.15 SPA for Pinch Point 7, based on a 73.7m blade, is shown on Figure 12.3g (drawing *11427_200_107*).

Pinch Point 8 – Not Used

A12.1.4.16 As noted earlier, Pinch Point 8 at Hermiston Gate Roundabout as the M8 motorway ends and joins the A720 Edinburgh City Bypass was originally identified as a Pinch Point. However, further assessment of this indicated that abnormal loads could negotiate this roundabout with no oversail or overrun beyond the carriageway extents required. Therefore, this Pinch Point is no longer used.

Pinch Point 9 – Old Craighall Roundabout

Pinch Point Photo 9 – Old Craighall Roundabout
Photo from Google Earth, copyright 2021 Google

A12.1.4.17 **Pinch Point 9** is located at Old Craighall Roundabout on the A720 Edinburgh Bypass where the roundabout would be used to turn abnormal loads around to run along the west bound carriageway of the A720. Minor oversail within the carriageway verges would be required to accommodate the proposed turbine components. A number of items of street furniture, which should be confirmed via topographical survey, will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.18 SPA for Pinch Point 9, based on a 73.7m blade, is shown on Figure 12.3h (drawing *11427_200_109*).

Pinch Point 10 – Millerhill Junction

Pinch Point Photo 10 – Millerhill Junction
Photo from Google Earth, copyright 2021 Google

A12.1.4.19 **Pinch Point 10** is located at Millerhill Junction on the A720 Edinburgh City Bypass onto the A68. A small area of overrun would be required on the roundabout to accommodate the proposed turbine components. The area of overrun is an existing monoblock paving edge to the roundabout and it is not anticipated any upgrade works would be required except for temporary ramps to enable the abnormal load vehicles to mount the paving. The structural capacity to support the abnormal loads should be checked during the detailed design stage and any strengthening/upgrade works implemented. Minor oversail in the carriageway verges would also be required. Four road signs, two lighting columns, one bollard and an electrical box have been identified, which should be confirmed via topographical survey, will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.20 It should be noted that it may be possible to avoid the above noted overrun by increasing the oversail on the inside of the turn. Currently there is an existing earth bund at this location whose exact position and dimensions are unknown and hence we have adopted a conservative approach to the swept path. Topographic survey or a trial run could be used to confirm the location of this bund and if any overrun is required.

A12.1.4.21 SPA for Pinch Point 10, based on a 73.7m blade, is shown on Figure 12.3i (drawing *11427_200_110*).

Pinch Point 11 – A68 Through Pathhead

Pinch Point Photo 11 – A68 Through Pathhead
Photo from Google Earth, copyright 2021 Google

A12.1.4.22**Pinch Point 11** is located on the A68 as it runs through the village of Pathhead. Overrun and oversail of a central island on the A68 will be required to accommodate the proposed turbine components. The island is kerbed with concrete internally and hence it is it is not anticipated any upgrade works would be required except for temporary ramps to enable the abnormal load vehicles to mount the kerbing. The structural capacity to support the abnormal loads should be checked during the detailed design stage and any strengthening/upgrade works implemented. There are two bollards and a lighting column on the island that would need to be temporarily removed or relocated for the turbine deliveries.

A12.1.4.23A further two areas of overrun and minor oversail will be required on the bend to avoid planted flower beds and trees located in the immediate verge of the road. The overrun and oversail would be onto the paved footway and hence it is it is not anticipated any upgrade works would be required except for temporary ramps to enable the abnormal load vehicles to mount the kerbing. No further street furniture has been identified as requiring temporary removal or relocation and this should be verified with topographic survey and a trial run.

A12.1.4.24SPA for Pinch Point 11 based on a 73.7m blade, is shown on Figure 12.3j (drawing 11427*_200_111*).

Pinch Point 12 – Junction of A68 onto B6458

Pinch Point Photo 12 – Junction A68 onto B6458
Photo from Google Earth, copyright 2021 Google

A12.1.4.25**Pinch Point 12** is located at the junction of the A68 onto the B6458 near Fala. A large area of overrun would be required on the inside of the junction and on the outside of the B6458 part of the junction to accommodate the proposed turbine components. There is a stand of trees, including some mature trees on the inside of the junction which would be avoided by the proposed overrun. The overrun would be on reasonably flat grassed verge and 3rd party field. An overhead transmission line pylon on the outside of the B6458 part of the junction would be avoided. Two road signs, two bollards and a post box have been identified, which should be confirmed via topographical survey, will require being temporarily removed or relocated for the turbine deliveries. There are two telegraph poles carrying overhead telephone cables that the assessment indicates will be avoided but this should be confirmed via topographic survey or a trial run.

A12.1.4.26SPA for Pinch Point 12 based on a 73.7m blade, is shown on Figure 12.3k (drawing 11427*_200_112*).

Pinch Point 13 – B6367 Border Rail Crossing

Pinch Point Photo 13 – B6376 Borders Rail Crossing
Photo from Google Earth, copyright 2021 Google

A12.1.4.27 **Pinch Point 13** is located on the B6367 on the west side of the Borders Railway bridge crossing. Due to the alignment of the B6367 on the exit of the bridge over the Borders Railway it is proposed to continue straight on into 3rd party fields avoiding any works or oversail to the Border Railway and bridge. A new track would be formed within the 3rd party relatively flat grassed fields. The analysis indicates that telegraph poles carrying overhead telephone lines run along the west side of the B6367 will be avoided but this should be confirmed with topographic survey or a trial run.

A12.1.4.28 SPA for Pinch Point 13, based on a 73.7m blade, is shown on Figure 12.3l (drawing 11427_*200_113*).

Pinch Point 14 – Return of Off-route Track from Pinch Point 13

Pinch Point Photo 14 – Return of Track from Pinch Point 13
Photo from Google Earth, copyright 2021 Google

A12.1.4.29 **Pinch Point 14** is where the off-route track from Pinch Point 13 returns onto the B6367. It is proposed to return the off-route track at a bend on the B6367 enabling the abnormal loads to run straight avoiding the B6367 bend. The analysis indicates that telegraph poles carrying overhead telephone lines run along the west side of the B6367 will be avoided but this should be confirmed with topographic survey or a trial run.

A12.1.4.30 SPA for Pinch Point 14, based on a 73.7m blade, is shown on Figure 12.3m (drawing 11427_*200_114*).

Pinch Point 15 – Right Hand Bend on B6367

Pinch Point Photo 15 – Corner on B6367
Photo from Google Earth, copyright 2021 Google

A12.1.4.31 **Pinch Point 15** is located on a right-hand bend on the B6367. An area of overrun, with some minor oversail, into 3rd party land would need to be formed on the inside of the bend to accommodate the proposed turbine components. Two telegraph poles have been identified, which should be confirmed via topographical survey, will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.32 SPA for Pinch Point 15, based on a 73.7m blade, is shown on Figure 12.3n (drawing 11427_*200_115*).

Pinch Point 16 – Junction of B6367 onto the A7

Pinch Point Photo 16 – Junction B6367 onto A7
Photo from Google Earth, copyright 2021 Google

A12.1.4.33 **Pinch Point 16** is located at the junction of the B6367 onto the A7. An area of overrun, with some minor oversail, into 3rd party land would need to be formed on the inside of the junction to accommodate the proposed turbine components. Two telegraph poles have been identified, which should be confirmed via topographical survey, and will require temporary removal or relocated for the turbine deliveries. A pole containing what appears to be telecommunications or road monitoring equipment and associated electrical kiosk has also been identified and will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.34 SPA for Pinch Point 16, based on a 73.7m blade, is shown on Figure 12.3o (drawing 11427_*200_116*).

Pinch Point 17 – Junction of A7 onto B7007

Pinch Point Photo 17 – Junction A7 onto B7007
Photo from Google Earth, copyright 2021 Google

A12.1.4.35**Pinch Point 17** is located on the junction of the A7 and the B7007. An area of overrun in the carriageway verge would need to be formed at this junction. A large area of oversail would also need to be facilitated on the inside of the junction along with a more minor area on the verge and footpath on the north side of the A7 to accommodate the proposed turbine components. The oversail on the inside of the junction would be within 3rd party land. The terrain slopes up from the carriageway to the verge and 3rd party land and therefore some minor earthworks may be required to facilitate the oversail. There are a number of trees and bushes in the verge between the road and the 3rd party land that would need to be removed. Two bollards and an overhead electrical pole have been identified, which should be confirmed via topographical survey, and will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.36SPA for Pinch Point 17, based on a 73.7m blade, is shown on Figure 12.3p (drawing 11427_*200_117*).

Pinch Point 18 – Right Hand Bend on B7007

Pinch Point Photo 18 – Corner on B7007
Photo from Google Earth, copyright 2021 Google

A12.1.4.37**Pinch Point 18** is located on a right-hand bend on the B7007. An area of oversail will be required on both sides of the road. The oversail on the outside of the corner would be within the road verge with the larger area of oversail on the inside of the corner within an areas of 3rd party land. One telegraph pole has been identified, which should be confirmed via topographical survey, and will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.38SPA for Pinch Point 18, based on a 73.7m blade, is shown on Figure 12.3q (drawing 11427_*200_118*).

Pinch Point 19 – Left Hand Bend on B7007

Pinch Point Photo 19 – Corner on B7007
Photo from Google Earth, copyright 2021 Google

A12.1.4.39 **Pinch Point 19** is located on a sharp left-hand bend on the B7007. It is understood this corner has been modified in the past to accommodate wind turbine components. An area of oversail on both sides of the road would be required, within 3rd party land to accommodate the proposed turbine components. One bollard has been identified, which should be confirmed via topographical survey, and will require being temporarily removed or relocated for the turbine deliveries.

A12.1.4.40 SPA for Pinch Point 19, based on a 73.7m blade, is shown on Figure 12.3r (drawing 11427*_200_119*).

Pinch Point 20 – Right Hand Bend on B7007

Pinch Point Photo 20 – Corner on B7007
Photo from Google Earth, copyright 2021 Google

A12.1.4.41 **Pinch Point 20** is located on a right-hand bend on the B7007. Minor oversail within the carriageway verges would be required to accommodate the proposed turbine components. No street furniture has been identified as requiring removal. There is a line of trees on the outside of the bend and although the SPA indicates these will not need removed, there may be a need for some pruning.

A12.1.4.42 SPA for Pinch Point 20, based on a 73.7m blade, is shown on Figure 12.3s (drawing 11427*_200_120*).

Pinch Point 21 – Left Hand Bend at The Mound on the B7007

Pinch Point Photo 21 – Corner on B7007
Photo from Google Earth, copyright 2021 Google

A12.1.4.43 **Pinch Point 21** is located on a left-hand bend on the B7007 at an area known as The Mound. An area of overrun will be required to accommodate the proposed turbine components. To form the overrun an existing embankment would need to be excavated and the slope retained. Minor oversail within the carriageway verges would also be required. No street furniture has been identified as requiring removal or relocation in the assessment.

A12.1.4.44 SPA for Pinch Point 21, based on a 73.7m blade, is shown on Figure 12.3t (drawing 11427*_200_121*).

Pinch Point 22 – Left Hand Bend on B7007

Pinch Point Photo 22 – Corner on B7007
Photo from Google Earth, copyright 2021 Google

A12.1.4.45 **Pinch Point 22** is located on a left-hand bend on the B7007. An area of oversail will be required on both sides of the road to accommodate the proposed turbine components. The oversail on the outside of the corner will be within the carriageway verge. The oversail on the inside of the bend will include some 3rd party land. No street furniture has been identified as requiring removal or relocation in the assessment.

A12.1.4.46 SPA for Pinch Point22, based on a 73.7m blade, is shown on Figure 12.3u (drawing 11427*_200_122*).

Pinch Point 23 – S Bends on B7007

Pinch Point Photo 23 – S Bends on B7007
Photo from Google Earth, copyright 2021 Google

A12.1.4.47 **Pinch Point 23** is located on a slight S bend on the B7007. An area of overrun will be required on the west side of the road, predominantly within the carriageway verge, to accommodate the proposed turbine components. Some minor oversail will also be required. No street furniture has been identified as requiring removal or relocation in the assessment.

A12.1.4.48 SPA for Pinch Point 23, based on a 73.7m blade, is shown on Figure 12.3v (drawing 11427_*200_123*).

Pinch Point 24 – Right Hand Bend on B7007

Pinch Point Photo 24 – Corner on B7007
Photo from Google Earth, copyright 2021 Google

A12.1.4.49 **Pinch Point 24** is located at a right-hand bend on the B7007. A small area of overrun will be required within the carriageway verge on the inside of the bend. Oversail on the inside of the bend will also be required and may extend into 3rd party land. No street furniture has been identified as requiring removal or relocation in the assessment.

A12.1.4.50 SPA for Pinch Point 24, based on a 73.7m blade, is shown on Figure 12.3w (drawing 11427_*200_124*).

Pinch Point 25 – Right Hand Bend on B709 After Junction with B7007

Pinch Point Photo 25 – Corner on B709
Photo from Google Earth, copyright 2021 Google

A12.1.4.51 **Pinch Point 25** is located on a right-hand turn on the B709 just past the junction with the B7007. The bend runs through a cutting with a small knoll on the inside of the bend fronting onto the road. A small area of overrun and some oversail will be required on the inside of the bend to accommodate the proposed turbine components. The oversail will extend into 3rd party land. Additionally, due to the knoll fronting the road, excavation and landscaping of the knoll will be required to facilitate the oversail. One bollard has been identified, and there are a number of bollards that are broken down near ground level, that may require being removed or relocated for turbine deliveries if they cannot be oversailed.

A12.1.4.52 SPA for Pinch Point 25, based on a 73.7m blade, is shown on Figure 12.3x (drawing 11427_*200_125*).

Pinch Point 26 – B709 on Approach to Blackhopebyres Steading

Pinch Point Photo 26 – Corner on B709
Photo from Google Earth, copyright 2021 Google

A12.1.4.53 **Pinch Point 26** is located on the B709 just before Blackhopebyres Steading. A minor area of oversail will be required on the inside of a slight right-hand bend. It is anticipated this oversail will extend into 3rd party land. No street furniture has been identified as requiring removal or relocation in the assessment. The landowner boundary fence may need to be temporarily relocated if it cannot be oversailed.

A12.1.4.54 SPA for Pinch Point 26, based on a 73.7m blade, is shown on Figure 12.3y (drawing 11427_*200_126*).

Pinch Point 27 – Southern Section of B709 to Site Entrance

Pinch Point Photo 27 – Typical Alignment on B709
Photo from Google Earth, copyright 2021 Google

A12.1.4.55 **Pinch Point 27** encapsulates the southern section of the B709 to the site entrance. Over this area the OS Mastermap data appeared to capture the road boundary extents rather than the pavement extents. From site inspections of the route the pavement varies in width at around four metres. A swept path of the entire section was undertaken and indicated the abnormal loads, including oversail, would stay within the road boundary extents. However, it is anticipated there will be overrun required at various points along this section which could not be determined due to the lack of information in the OS Mastermap data.

A12.1.4.56 It is recommended, post consent, that a pavement edge survey is undertaken, and the swept path re-assessed to identify the sections of the road where overrun will be required. Based on the swept path undertaken it is anticipated any overrun will be limited to discreet sections within the road boundary.

A12.1.4.57 Over significant lengths of this road, telegraph poles are located in the road verge and it is anticipated some of these may need relocated where any widening cannot be undertaken on the opposite side of the road. The location of the telegraph poles should be identified as part of the pavement edge survey.

A12.1.4.58 SPA for Pinch Point 27, based on a 73.7m blade, is shown on Figure 12.3z (drawing 11427_*200_127*).

A12.1.5 SUMMARY

A12.1.5.1 Natural Power were commissioned by Fred. Olsen Renewables to carry out a desk-based access assessment, visual route inspection and SPA of the potential delivery route for the wind turbines to the proposed Scawd Law Wind Farm, around 10 miles east of Peebles, and 14 miles west of Galashiels, Scottish Borders.

A12.1.5.2 The proposed access route runs from the port of entry and Grangemouth, onto the M9 and M8 to the A720 Edinburgh City Bypass. From the A720 the route follows the A68, B6458/B6367, A7 and onto the B7007 and then B709 to the proposed site entrance.

A12.1.5.3 The route was assessed, and 26 no. pinch points identified. OS Mastermap data was utilised for each of the pinch point areas and SPA was undertaken using Autodesk Vehicle Tracking. A 73.70 metre turbine blade and delivery vehicle has been considered and shown on the drawings appended to this report. Checks for the other wind turbine components have also been undertaken to ensure there are no further horizontal alignment issues over those identified for the blade.

A12.1.5.4 With reference to the SPA, the assessment of the access route indicates that modification works are required which generally include the following;

- Road widening,
- Removal of street lamp posts,
- Removal of road traffic signs,
- Removal of bollards,
- Removal of other street furniture,
- Pruning of hedges,
- Pruning of trees / Removal of trees,
- Contra-flow manoeuvres.

A12.1.5.5 The assessment has indicated that with various upgrade works it is possible to traverse all of the pinch points along the proposed route with a 73.7 metre blade based on the OS Mastermap data and modelled delivery vehicle, as well as the other turbine components assessed. Once a turbine model has been selected further assessments will be undertaken using the exact turbine dimensions supplied by the manufacturer together with intended delivery vehicles and topographic survey to enable navigation of all turbine components through the constraints identified at each of the pinch points.

A12.1.5.6 Based on this assessment, notwithstanding the above comments, Natural Power would consider that the route is viable for abnormal load deliveries associated with the assessed wind turbine components, if the identified modifications are undertaken and subject to height and weight checks being carried out.

A12.1.6 RECOMMENDATIONS

A12.1.6.1 Detailed survey and inspection of this route is required to be carried out prior to carrying out upgrade works or delivery of abnormal loads, in order to determine the extent of the constraints and upgrades identified. Further assessments should include the following:

- Obtain specific turbine component and intended delivery vehicle dimensions for further SPA, engineering design and implementation of the necessary upgrade works;
- Undertake topographic survey at each pinch point for engineering design and to identify street furniture within the swept path areas. Arrangements will need to be made in consultation with the road authorities for the relocation or temporary removal during AIL deliveries of any street furniture;
- Obtain utility information to ensure any upgrade works designs take account of overhead and buried services;
- Conduct a turbine component 'dry-run' by a competent haulage contractor to confirm findings of the SPA and further assess constraints, including verifying there are no vertical alignment issues on the route;
- Liaise with road authorities to determine the extent of the highway boundary and to determine any weight restrictions along the route;
- Conduct condition inspections/surveys of the route, particularly the single lane section of the B709, to determine any strengthening works required. This should be undertaken in consultation with the road authorities;

- Prior to the delivery of abnormal loads and as part the AIL permitting process to obtain approvals for transporting AILs undertake an updated assessment of the structures, with specific vehicle set-ups and axle loadings, in consultation with the relevant road/bridge authorities;
- Conduct a road edge survey of the single lane section of the B709 and early engagement with turbine suppliers to identify locations where widening works into the verge are required by the turbine supplier and agree any reductions in their standard specification;
- Consider options to enable the selection of turbine components and an appropriate mode of transport that enables delivery within very limited modification to the parameters of the highway.