Rampion 2 WIND FARM

Rampion 2 Wind Farm

Category 6: Environmental Statement

Volume 4, Appendix 23.1: Abnormal Indivisible Loads assessment (tracked)

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1. Introduction

1.1 Background

1.1.1 This Abnormal Indivisible Load (AIL) Assessment has been prepared to support the **Chapter 23: Transport, Volume 2** of the Environmental Statement (ES) (Document Reference 6.2.23). This Appendix should also be read in conjunction with:

- **Chapter 4: The Proposed Development, Volume 2** of the ES (Document Reference: 6.2.4); and
- **Outline Construction Traffic Management Plan** (Document Reference: 7.6).

1.1.2 An AIL is any load which cannot without undue expense or risk of damage be divided into smaller parts for the purposes of being transport by road. This AIL Assessment only considers delivery of AILs which relate to the onshore elements of the Proposed Development (i.e. by land) and specifically the delivery of transformers to the onshore substation as the largest type of equipment to be transported via road.

1.1.3 The onshore elements of the Proposed Development comprise a landfall site within the vicinity of Climping, west of Arun, an underground cable (approximately 38.8km in length) and a new onshore substation at Oakendene in the vicinity of ~~Bolney~~Cowfold, ~~Mid Sussex~~Horsham. The onshore substation will connect into the electricity grid at the existing National Grid Bolney substation. Construction of a new onshore substation at Oakendene, will require the delivery of transformers and shunt reactors which form part of the onshore substation infrastructure. Due to the size and weight of the onshore substation transformer and shunt reactor components, their delivery to the onshore substation will be required as an AIL.

1.1.4 The AIL Assessment considers the requirement to deliver ~~three~~ four transformers and six shunt reactors~~, and as such there will be nine AIL deliveries all~~ to the onshore substation site at Oakendene.

1.1.5 This AIL assessment considers the possible delivery route from marine delivery berths at the port of Shoreham to the proposed Oakendene substation. The proposed AIL delivery route will be finalised following consultation with National Highways (NH), West Sussex County Council (WSCC) and Network Rail (NR). Formal movement applications (the application process for movement of AILs on road networks) will be necessary upon appointment of a specialist haulage contractor by the transformer manufacturer with associated detailed movement programme. These will be completed through the National Highways Electronic Service Delivery for Abnormal Loads (EDSAL) system.

1.1.6 It should be noted that Newhaven Port was the base port for Rampion 1 operation and maintenance, and is proposed as the base port for the operation and maintenance phase of Rampion 2. However, no AILs are envisaged to require transportation during the operation and maintenance phase, unless in exceptional circumstances where a replacement part may be required.

1.1.7 Cable drums associated with the onshore cable route will also be classified as AILs owing to their weight being in excess of 44,000kg and the inability to divide them into smaller parts for transport by road. The cable drums will be transported by low loader HGVs rather than specialist transport vehicles and therefore have been excluded from assessment within the document. These vehicle movements will be subject to controls detailed within the **Outline Construction Traffic Management Plan [REP5-068]** (updated at Deadline 6).

~~1.1.7~~1.1.8 Traffic management arrangements will be necessary prior to movements (under police escort) as it is likely that there will be locations where the full extent of the carriageway will be required for AILs to transit, especially on single carriageway sections of the road network or in urban locations where street furniture may need to be removed. The exact requirements will be determined when AIL delivery requirements are confirmed and an appointed haulage contractor confirms street furniture removal requirements, escorts, movement timings and other logistical details prior to delivery.

1.2 Study approach

1.2.1 This AIL assessment has been informed by a desktop study. The desktop study has been undertaken to review the proposed AIL route from port to the new onshore substation has been based on Ordnance Survey (OS, 2023), Google Maps Street View (Google, 2023a) (Google, 2023b) and the High and Heavy Load Grid Map for Abnormal Loads (National Highways, 2010).

1.2.2 As a result of the desktop study, the proposed AIL delivery route has been assessed for its suitability to accommodate AILs required for the onshore elements of the Proposed Development. This has involved undertaking preliminary swept path analysis (SPA) (**Section 4**) at the identified constraint locations in order to identify any third-party land requirements and any potential accommodation work for AIL vehicles and reinstatement work following the completion of AIL deliveries.

1.2.3 The purpose of this Appendix is to set out the proposals for the conveyance of AILs to the Proposed Development.

1.3 Structure of this Appendix

1.3.1 The AIL assessment is structured as follows:

- **Section 2: The Proposed Development** which provides a summary of the onshore elements of the Proposed Development and its location;
- **Section 3: Assessment methodology** which describes the methodology for undertaking the AIL Assessment;
- **Section 4: Swept path analysis** which outlines the findings of the swept path analysis;
- **Section 5: Conclusions and next steps** which outlines the conclusions of the AIL Assessment and sets out the next steps;
- **Section 6: Reference list**;
- **Section 7: Glossary of terms and abbreviations**; and

- **Annex A: Figures**.

2. The Proposed Development

2.1 Description of the onshore elements of the Proposed Development

2.1.1 The onshore elements of the Proposed Development (outlined in **Chapter 4: The Proposed Development, Volume 2** of the ES (Document Reference: 6.2.4)) will include the construction of an onshore cable corridor from landfall at Climping to a new substation at Oakendene, and then on to the existing National Grid substation at Bolney, including an extension there. The onshore cable will be buried along its entire length. For construction purposes, a nominal working width of approximately 40m will be required for a majority of the onshore cable corridor, with some larger working areas required at key areas while constraints may restrict the working width in other areas.

2.1.2 The onshore cable corridor will cover an approximate distance of 38.8km. The general route description is that it will make landfall at a site in Climping and cross under the A259 and River Arun before crossing under the A27 near Crossbush. From here, the onshore cable route heads north east across the South Downs to Washington, West Sussex and under the A24 and A283 via a trenchless crossing. The onshore cable corridor continues northeast through a rural area and to the onshore substation at Oakendene that will connect to the existing National Grid Bolney Substation, Mid Sussex, via buried onshore cables. Additional infrastructure is also required at the existing National Grid Bolney substation to connect Rampion 2 to the National Grid electrical network.

2.1.3 The operational lifetime of the Proposed Development is expected to be around 30 years. A decommissioning plan will be prepared prior to commencement but at present the requirement for the onshore decommissioning is not proposed to be prepared until later (although this may change during examination if earlier identification of principles is required by stakeholders).

2.1.4 The purpose of the new onshore substation at Oakendene is to increase the onshore cable route voltage to 400kV which is required to connect to the existing National Grid Bolney substation. **Figure 23.4c, Volume 3** of the ES (Document Reference: 6.3.4) shows the location of the new onshore substation. The proposed Oakendene onshore substation is located in close proximity to the existing AIL access route which will be from a port of entry to the junction of the ~~A24~~A23/A272. The onshore substation at Oakendene has good links to the Strategic Road Network (SRN).

2.1.5 The onshore substation is the only part of the onshore elements of the Proposed Development that requires delivery of AILs using specialist transport equipment such as the girder frame trailer detailed in **Table 2-1**. Cable drums are also categorised as AILs but these will be transported on vehicles such as low loaders.

Onshore substation access

2.1.6 There are no current formal arrangements to access the onshore substation at Oakendene and the only access into this area is currently through field gates. Access to the onshore substation will be designed to accommodate AILs during the construction phase via temporary construction access arrangements. Permanent access arrangements will be provided for maintenance vehicles when the onshore substation is operational.

Transformer

2.1.7 The largest component requiring delivery to the onshore substation will be transformers. It is expected that there will be ~~three~~ four transformers required at the onshore substation. The weight of plant considered in the AIL Assessment is based on the currently assumed maximum weight of a transformer of 272 tonnes with an envelope of 12m long x 4.4m wide x 5m high.

2.1.8 This weight is considered indicative of the size of abnormal loads likely to require delivery to the onshore substation and would be above the legal limit of 44 tonnes for conveyance of loads on roads in England. Beyond 44 tonnes special provisions are required for the delivery of loads.

2.1.9 The weight and dimensions are subject to change following the award of final manufacturing contract but this is assumed to be robust for the AIL Assessment.

Shunt reactor

2.1.10 The shunt reactor is another large component needed at the onshore substation and is a smaller load than the transformer. It is expected that there will be six shunt reactors required at the onshore substation.

2.2 Transport requirements

2.2.1 Delivery of equipment such as transformers ~~and other AIL loads~~ require the use of specialised delivery vehicles which have the capability to transport loads which are abnormal in weight and/or size. A typical AIL delivery vehicle configuration for transportation of a transformer would consist of two tractor units with one pulling and one pushing an axle frame trailer which accommodates the abnormal load. There are numerous haulage contractors currently operating girder frame trailers of sufficient capacity to carry a transformer of the proposed weight and with the previous experience to be able to position the unit correctly on the plinth.

2.2.2 The dimensions of the AIL transporter assumed to be used in the delivery of transformers is summarised in **Table 2-1**.

Table 2-1 AIL transporter dimensions

AIL transporter with girder frame trailer	
Overall length	67.643m
Overall width	5.030m
Overall body height	5.389m
Minimum body ground clearance	0.426m
Track width	3.650m
Lock-to-lock time	6 seconds
Wall-to-wall turning radius	10.45m

2.2.3 The shunt reactor being a lighter and smaller element than the transformers will be transported by a vehicle that consists of one tractor unit pulling an axle frame trailer which accommodates the abnormal load.

Shoreham

2.2.4 It is anticipated that Shoreham Port will also be utilised for Rampion 2 for deliveries being transported to the onshore substation. The Rampion 1 onshore substation is located in close vicinity to the proposed onshore substation for Rampion 2, so there is an established route commencing from the canal section of the non-tidal port to an existing onshore substation, which can also be used in future to transfer materials from Shoreham Port to the Rampion 2 onshore substation. Vessels using the canal section of the port are restricted in size by the lock gates, with the larger of the locks being 114m long and 17m wide. Shoreham Port generally restricts vessel to the following maximum ship berth dimensions in the canal section:

- maximum length 103m;
- beam 16.4; and
- draft 5.5m

2.2.5 In practice, this means vessels can access this part of the port capable of carrying the transformers and shunt reactors required as part of Rampion 2.

2.2.6 The transformers may require storage prior to onward transportation to the onshore substation. If the storage area is not part of the formal port estate, then security arrangements may need to be considered.

2.2.7 Shoreham Port can be accessed via Wharf Road (as part of HR99) or Basin Road from the A259. Wharf Road junctions with the A259 Kingsway at the eastern

periphery of Shoreham Port and Basin Road North junctions with the A259 and the B2194 at the northern periphery of the port.

2.2.8 The location of Shoreham Port will require the AIL vehicle to route along HR99 through urban areas within the City of Brighton to reach the A27 and continue north on the A23, then west on the A272 to the onshore substation.

Physical restrictions affecting road movement

2.2.9 A minimum clearance headroom over every part of the highways network is 5.03m (16'6"). Where clearance over any part of the highways network is less than this standard warning signs are provided in advance of at on the relevant structure. The UK electricity supply industry and plant manufacturers generally work to a travelling height of 4.95m (16'3") to allow for a safety margin.

2.2.10 Where restrictions are caused by overhead services such as telephone lines and local power distribution lines, it is feasible to raise or underground these along relatively short routes. The services could also be temporally disconnected, although this is not popular with the end user. Arrangements are made with the responsible undertakers. This is, however, not usually feasible over longer routes or where there are many lines involved. It is usually impossible to do anything to raise low bridges, but steel gantries with bolted connections can sometimes be temporarily lifted.

2.2.11 Although there is no legal limit on the travelling height of a load, the Department for Transport does advise hauliers to inform the Regional Electricity Company's (REC), British Telecom and any other company with overhead service lines, of the route of proposed movements with a travelling height in excess of 5m. This enables arrangements to be made for temporary or permanent rearrangement of facilities.

2.2.12 It is recommended that overhead line authorities are approached to confirm recorded and safe height clearances for all wires above the often-referred to high load cut of point of 16'6" (5.03m). Just because a line is of a given height it does not mean that high loads will automatically be permitted to pass underneath due to flashover and safe height clearance requirements of the line owner.

2.2.13 The shunt reactors considered in this AIL Assessment should be able to be carried at below 5.03m and therefore no specific difficulties with overhead wires are envisaged. The transformers are anticipated to be at a height of 5.389m which may present some issues to conveyance under overhead wires. These loads can be lowered at points to make difficult movements or the load can be arranged to sit as low as possible, potentially lower than the dimensions set out in **Table 2-1** which has been provided as a robust for this stage.

3. Proposed AIL route

3.1 Details of the proposed AIL route

3.1.1 Route HR99, an existing heavy load route which runs from Shoreham-By-Sea to the existing National Grid Bolney Substation, was used as a starting point to establish the AIL delivery route to Oakendene for Rampion 2. This is a preferred route as it was also used for the construction of Rampion 1 substation located nearby in Twineham. An assessment has been undertaken to understand the potential constraints along this proposed route which require further investigation.

3.1.2 The proposed AIL access route from Shoreham Port to the onshore substation at Oakendene will be for the AIL vehicle to route out of the port onto HR99. Leaving the port, the AIL vehicle will travel along the A259, B2193, A270, A293 and A270 to the A23 northbound before joining the A272. It will continue westbound on the A272 before turning into the new Oakendene substation access road.

3.2 AIL route opportunities

3.2.1 The proposed AIL routes predominantly make use of the SRN which is the road network managed by National Highways (NH).

3.2.2 NH Heavy Load Routes (HR) are routes identified by NH as being suitable for various weights of load along their entire length, thus avoiding the need for assessment of weight limitations of individual assets along the routes' lengths. The Heavy Load Route which the AIL route would make use of is:

- HR99 which routes between Shoreham-By-Sea (Docks) and Bolney (Substation).

3.2.3 The HR99 is a classification D route, meaning it is capable of supporting trailer weights of 264.16T (12 Axles) and 299.72T (14 Axles). As such, this AIL delivery route is capable of accommodating an AIL delivering a transformer if other appropriate mitigation and accommodation measures are also implemented.

Route HR99

3.2.4 Route HR99 details an existing heavy load route which runs between Shoreham-By-Sea (Docks) to Bolney (Substation), which is also suitable to form the basis for a route to the proposed Oakendene onshore substation. HR99 is easily accessible from Shoreham via use of the A27. The HR99 movements are set out in **Table 3-1**.

Table 3-1 HR99 from Shoreham Port to the existing National Grid Bolney substation as identified by National Highways

Route ID	Turn Direction	Road Name
99/1		Exit Dock area
99/2		Wharf Rd
99/3	TL	A259 Kingsway, Wellington Road
99/4	TR	A293 Church Road, Trafalgar Road
99/5	TR	A270 Old Soreham [sic] Road
99/6	TL	A293 Hangelton [sic] Link Road
99/7	TR	A270 Brighton Bypass
99/8	TL	A23 London Road
99/9	TL	A272 Cowford [Sic] Rd
99/10	TL	Wineham La
99/11	TL	into Substation

3.2.5 It is noted that **Table 3-1** lists the full extent of route HR99 movements from start to finish, and not just the section of route proposed for use by vehicles serving Oakendene substation; this is because at route ID 99/9 (A272), vehicles would not turn left into Wineham Lane but proceed a short distance further along the A272 before turning left into Oakendene substation.

3.3 AIL access route constraints

Bridges

3.3.1 A desktop study identified locations where the AIL would need to pass under a bridge on the proposed AIL delivery route which may pose height constraints **Table 3-2** identifies the locations of these bridges on route HR99.

Table 3-2 Bridge locations and height constraints – HR99

Number	Bridge location	Height constraint
1	Trafalgar Road	There is a bridge on Trafalgar Road that does not have a posted high restriction. As such, this is a bridge that requires further consultation with NR.
2	A293 below A27	There is a bridge on the A293 that does not have a posted high restriction. As such, this is a bridge that requires further consultation with National Highways.
3	A27 below Devil's Dyke Road	There is a bridge on A27 that does not have a posted high restriction. As such, this is a bridge that requires further consultation with National Highways.
4	A23 below footbridge, north of London Road/Mill Road Roundabout	There is a footbridge on the A23 that does not have a posted height restriction, as such, this is a bridge that requires further consultation with WSCC.
5	A23 below footbridge, east of South Downs Way	There is a footbridge on the A23 that does not have a posted height restriction, as such, this is a bridge that requires further consultation with WSCC.
6	A23 below footbridge, below South Downs Way	There is a footbridge on the A23 that does not have a posted height restriction, as such, this is a bridge that requires further consultation with WSCC.
7	A23 below footbridge, south of Pyecombe Street	There is a footbridge on the A23 that does not have a posted height restriction, as such, this is a bridge that requires further consultation with WSCC.
8	A23 below B2117	There is a bridge on the A23 that does not have a posted height restriction, As such, this is a bridge that requires further consultation with National Highways.
9	A23 below footbridge, east of B2118	There is a footbridge on the A23 that does not have a posted height restriction, as such, this is a bridge that requires further consultation with WSCC.
10	A23 below B2116	There is a bridge on the A23 that does not have a posted height restriction, As such, this is a bridge that requires further consultation with National Highways.
11	A23 below footbridge, north of B2116	There is a footbridge on the A23 that does not have a posted height restriction, as such, this is a bridge that requires further consultation with WSCC.

Number	Bridge location	Height constraint
12	A23 below Mill Lane	There is a bridge on the A23 that does not have a posted height restriction, As such, this is a bridge that requires further consultation with National Highways.
13	A23 below footbridge, south of A2300	There is a bridge on the A23 that does not have a posted height restriction, As such, this is a bridge that requires further consultation with National Highways.
14	A23 below A2300	There is a bridge on the A23 that does not have a posted height restriction, As such, this is a bridge that requires further consultation with National Highways.

3.3.2 In a number of locations, the SRN is overbridged by rail lines or by other roads. Further consultation with NR and the highway authorities will be required to confirm that the height clearances of the bridges is acceptable to accommodate the height of the AIL delivering a transformer.

3.3.3 It is important to note that this does not mean any height constraints have been identified: rather, the locations identified **Table 3-2** are ones where the overbridges do not have a stated height restriction. The standard minimum clearance over a public road is 5.03m unless warning signs advise of a lower limit in place. This would usually be sufficient clearance for most vehicles on the highway but, for AILs, it is important to check that there is no additional constraint. The engagement with NR and the highway authorities would therefore have the purpose of confirming what the height limit at the structures in **Table 3-2** are.

Junction constraints

3.3.4 A desktop study was undertaken to identify junctions where the horizontal alignment may present a constraint to AIL delivery vehicles.

3.3.5 Following selection of Oakendene as the onshore substation location, it was determined through SPA that no existing junctions on the highway network represent a constraint.

3.3.6 The turning movement from the A272 to Oakendene represented a potential additional constraint with respect to the AIL route previously tested at PEIR, therefore SPA was undertaken for this manoeuvre.

3.3.7 As shown in Figure 23.1.3, this manoeuvre can be undertaken by an AIL turning from the A272 into the proposed Oakendene substation access.

3.3.8 Further SPA will be undertaken during detailed design of the proposed access at Oakendene, as well as at any other accesses requiring access by AILs.

3.3.9 It is also necessary to establish that the overall width and length of the transporter arrangement can negotiate the delivery route. Selection of transporter is often

influenced by the load carrying capability of the AIL delivery route. If a large number of axles are needed in order to obtain the required load distribution on the road and bridge decks, this may result in a configuration that is unable to negotiate a particular AIL delivery route.

3.3.10 Where negotiability is restricted by the width or the curvature of the AIL delivery route, it can be increased by the temporary removal of street furniture such as lamp posts, traffic signs etc. Any temporary removal of street furniture will have to be undertaken with the agreement of the relevant local and highway authorities. Engagement with the local authorities and highway authorities along the routes used by AILs will take place post-Development Consent Order (DCO) Application submission to determine the details of such arrangements if necessary.

3.4 Highways network review

3.4.1 The following section sets out a review of the roads required for access as part of the proposed AIL delivery route.

A23 London Road

3.4.2 The A23 routes from the M23 south of Crawley to the A27 on the northern periphery of Brighton. For much of its length, the A23 is a dual carriageway subject to the national speed limit (70mph). The A23 has junctions with two major roads, the A272 and the A27 as follows:

- the junction with the A272 is located east of Bolney and comprises grade separated roundabout junctions located either side of the A23 alignment which connect to the A23 with on / off slip roads; and
- the junction with the A27 is located on the northern periphery of Brighton and comprises a grade separated bell junction with on / off slip roads which connects to a separate roundabout junction with the A23 (London Road).

A27

3.4.3 The section of the A27 that is managed by NH routes between Pevensey in East Sussex to Cosham, Portsmouth where the A27 becomes the M27. The A27 connects numerous coastal towns along the south coast as well as connecting the cities of Portsmouth and Brighton. Road design standards vary along the A27, however, for most of its length the A27 is a dual carriageway subject to the national speed limit. The junction with the A23 is located north of Worthing and is a five arm at grade roundabout.

A272

3.4.4 The A272 routes east / west between the A24 and the A23. The A272 intersects with the A24 via a staggered crossroad and junctions with the A23 are via two grade separated roundabouts which connect to the A23 by on / off slip roads. The A272 is a predominantly a single carriageway rural road. The speed limit varies between national speed limit and 50mph depending on local constraints.

Preliminary Swept Path Analysis (SPA)

3.4.5 Having identified locations where possible horizontal alignment constraints for the delivery of AILs exist, the horizontal swept path of the AIL vehicles at each constraint location was determined using AutoCAD Vehicle Tracking computer software that models the swept paths of all types of steered vehicles.

3.4.6 The resultant swept path of the proposed design vehicle was then assessed to identify where temporary engineering or traffic management works would be required at each pinch point in order to facilitate delivery of the AILs (transformers).

Proposed AIL delivery route – General considerations

Structural capability

3.4.7 The load carrying capability of roads depends to a great extent on axle loading rather than total weight of the load being transported. The load carrying capability of the AIL delivery route has to be assessed in relation to the loadings that would be imposed by the total gross weight of the load plus transporter for each item to be transported. The factors to be considered are:

- the axle and wheel pair loadings;
- the road crust;
- the effect of such loadings on bridges;
- underground services; and
- speed.

3.4.8 The tractor unit is normally considered as a separate unit in terms of imposed axle and wheel loadings. Indemnities are given to highway and bridge authorities for any damage caused, usually by the appointed haulage contractor.

Road crust

3.4.9 Road crust (the upper layers of the road) strength is important, but with the spread of load obtained with modern multi-wheeled transporters, it is not normally problematic, providing the road is maintained to a reasonable standard.

3.4.10 Damage of the road crust especially at the fringes of un-kerbed roads can become prevalent during the construction phase of projects within remote areas. This can have a damaging effect on the available track width for abnormal loads due to the risk of wheels becoming sunken into damaged road edges or soft verges. The **Outline Construction Traffic Management Plan** (Document Reference: 7.6) sets out anticipated details for highways condition surveys.

Underground services

3.4.11 The weight that can be safely borne by underground services (such as buried cables, pipelines and other structures usually for water, phone, gas or electricity networks) varies depending on their age and condition; the depth to which they are

buried; and the strength of the road crust covering. All these factors have to be considered when assessing the suitability of a road for the passage of abnormal loads and assessment is usually carried out by the relevant authority or undertaker concerned.

3.4.12 When assessing the effect of weight on underground services, such as gas / water pipes, sewers and service ducts, the loading imposed by individual wheels is normally considered. There are international standards (API 1104) which can be used to assess the integrity of buried pipes.

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4. Swept Path Analysis

4.1 Conclusions

4.1.1 Swept Path Analysis (SPA) has been undertaken along the SRN and has not identified turning movements likely to pose a constraint for the delivery vehicle.

4.1.2 **Figure 23.1.3** shows the results of the SPA undertaken for an AIL turning into the Oakendene access. This shows that the vehicle can undertake the manoeuvre without conflict.

4.1.3 Further SPA will be undertaken during the detailed design, to enable the manoeuvre of the Oakendene access to be modelled in greater detail.

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5. Conclusions and next steps

5.1 Conclusions

5.1.1 The movement of AILs requiring specialist transport equipment are low in number (approximately ~~nine~~ten), will be spread over a number of days, and is expected to result in no more than one movement in any one day, potentially during the night. The port of entry will be Shoreham Port for the transformers and shunt reactors and the delivery routes of the AILs will use established routes but there will be consultation with National Highways, local highway authorities and local planning authorities.

5.1.2 There is already a well-defined existing AIL delivery route (HR99) covering the majority of the route between Shoreham and the onshore substation at Oakendene. It is proposed that this route will be used as the proposed AIL delivery route for Rampion 2.

5.1.3 The assessment of the proposed AIL delivery route for ~~Rampion 2~~transformers / shunt reactors associated with the Proposed Development has reviewed vertical and horizontal restrictions that might be an issue on the route and that has identified locations where there may be specific issues that will need further liaison with NH, WSCC and NR to confirm the height restrictions of bridges along the route.

5.1.4 The conveyance of the transformer load may also result in a need for more detailed analysis of all the overhead line infrastructure. As a worst-case load height could be 5.389m, which is a height which may require some overhead lines to be raised for a temporary period.

5.1.5 At this stage, it is considered that there will not be significant impacts with regard to AIL delivery vehicle routing to the onshore substation at Oakendene.

5.2 Next steps

5.2.1 The following steps will be undertaken to inform an updated AIL assessment to:

- further consultation with NH, WSCC and NR to discuss the proposed AIL delivery route, management and mitigation measures;
- consultation with the police services to understand the conveyance limitations on timings;
- update the SPA at detailed design stage based on the final AIL delivery route agreed, vehicle specification and nature of the difference in loads between the transformer and shunt reactor;
- update the SPA at detailed design stage once designs for the onshore substation at Oakendene vehicular access are finalised;
- understand any limitations with secure storage for the AIL load between port delivery and conveyance to the onshore substation at Oakendene;

- detailed assessment of all overhead lines on the AIL delivery route, the heights of these overhead lines and mitigation that could be implemented if the load height cannot be reduced;
- detailed assessment of bridges on the AIL delivery route, the heights of these bridges and mitigation if required; and
- consultation with heavy haulage companies regarding how specific AILs can be managed and how the AIL lengths and heights can potentially be reduced.

6. Glossary of terms and abbreviations

Table 6-1 Glossary of terms and abbreviations

Term (Acronym)	Definition
AIL	Abnormal Indivisible Loads
ALE	Abnormal Load Engineering
DCO	Development Consent Order
NH	National Highways
NR	Network Rail
OS	Ordnance Survey
REC	Regional Electricity Company
SPA	Swept Path Analysis
WSCC	West Sussex County Council

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Annex A
Figures

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527000 527050 527100 527150

104700 104650

N

309 303 3 301 295 293 281 1a

Shelter

Posts

Sea Ways

Kingsway

6.2m

5.7m

Play Area

Service Layer Credits: Contains OS data © Crown Copyright and database right 2020

Key

- Load outline
- Wheelbase outline
- Towing vehicle outline
- Vehicle

Kilometres

0 0.00275 0.0055 0.011 0.0165 0.022

1:500

British National Grid Transverse Mercator

Rampion Extension Development

Rampion 2 WIND FARM

Rampion 2 Offshore Wind Farm

Figure 23.1.1 Wharf Road / Kingsway swept path

Abnormal Indivisible Loads Assessment

Environmental Statement

System Identifier:	Version:
42285-WSPE-ES-ON-FG-OT-6434	1.0

Company:	Drawn By:	Chk/Aprvd:	Drawn Date:	Status:
WSP	SHEPS	BUXTG	08/08/2023	FINAL

525850
525900
525950
105000
104950
N
6.2m
108
79
LB
Shelter
1 to 11
Garage
7.7m
Shelter
WELLINGTON ROAD
6.4m
19
El Sub
Shelter
8.5m
Ppg Sta
Conveyor

Key

- Load outline
- Wheelbase outline
- Towing vehicle outline
- Vehicle

Kilometres
0 0.00275 0.0055 0.011 0.0165 0.022
1:500
British National Grid Transverse Mercator

Rampion Extension Development

Rampion 2 WIND FARM

Rampion 2 Offshore Wind Farm

Figure 23.1.2 A259 / A253 swept path

Abnormal Indivisible Loads Assessment

Environmental Statement

System Identifier:	Version:
42285-WSPE-ES-ON-FG-OT-9360	1.0

Company:	Drawn By:	Chk/Aprvd:	Drawn Date:	Status:
WSP	SHEPS	BUXTG	08/08/2023	FINAL

522900 522950 523000 523050 523100 523150 523200

122800 122750 122700 122650 122600

N

A272

19.8m

GP

LB

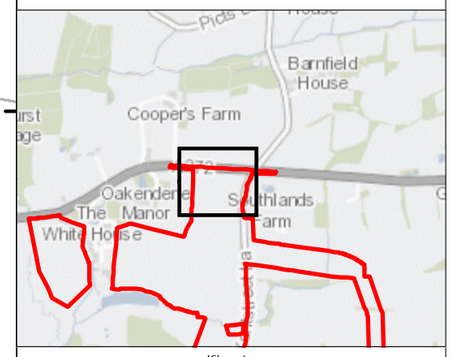
Southlands

Track

16.8m

Key

- Load outline
- Wheelbase outline
- Towing vehicle outline
- Vehicle



Kilometres
0 0.005 0.01 0.02 0.03 0.04

1:1,000

British National Grid Transverse Mercator

Rampion Extension Development

Rampion 2 WIND FARM

Rampion 2 Offshore Wind Farm

Figure 23.1.3 Oakendene access swept path

Abnormal Indivisible Loads Assessment

Environmental Statement

System Identifier:	Version:
42285-WSPE-ES-ON-FG-OT-9997	1.0

Company:	Drawn By:	Chk/Aprvd:	Drawn Date:	Status:
WSP	SHEPS	BUXTG	08/08/2023	FINAL

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Rampion 2
WIND FARM