



Appendix 13A

Swept Path Analysis



COLLETT

EXPERTS IN MOTION



Swept Path Analysis Report
323500

Stornoway Wind Farm

Lewis Wind Power
May 2019

COLLETT
EXPERTS IN MOTION

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Document Revisions

No	Date	Details
323500 – SPA Report Rev1	14/05/2019	Updated to client comments

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Company Profile

Collett & Sons Ltd established in Halifax over 45 years ago specialise in the multimodal logistics throughout the UK, Europe and Worldwide.

Our Company owns a modern fleet of over 60 vehicles and over 100 trailers, operating from 3 depots located in Halifax, Goole and Grangemouth.

The depots situated in Goole and Grangemouth offer strategically located sites suitable to provide central hubs for the distribution of wind turbine components throughout the UK. Each facility is complete with up to 110 tonnes lifting capacity in order to be able to handle all current turbine types. As logistical partners to the Wind Energy Industry, the company is able to offer the complete transport solution from point of manufacture through to job site.

Collett & Sons Limited operate an in-house consultancy that deals with transport feasibility, route and site access surveys, Swept Path Analysis, Traffic Management Plans, Test Drives and Environment Statements.

In addition to consulting services, Collett & Sons Limited delivers the following services;

- Marine
- Port Operation
- Heavy Lift Storage
- Heavy Transport
- Project Management
- Freight Forwarding
- Heavy Lift
- General Haulage
- Warehousing
- Test Station (DVSA-authorized)
- SHEQ Training



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1. Executive Summary

- 1.1. This report comprises of a study of the road routes as detailed here in for the road transport of Vestas V150 blade component to entrance of Stornoway Wind farm.
- 1.2. One route has been assessed from Arnish Point to the proposed site entrances.
- 1.3. All swept path analysis has been carried out on Ordnance survey data has not been adjusted due to no site visit being carried out.

Third party land

- 1.4. No third party land has been identified by the assessment.

Road widening

- 1.5. Road widening is required at a number of locations:
 - 323500-10A1.2 – Right hand bend exiting Arnish Point
 - 323500-20A1.2 – Right hand bend on unnamed road
 - 323500-30A1.2 – Left hand bend on unnamed road
 - 323500-40A1.2 – Right hand bend on unnamed road
 - 323500-50A1.2 – S- bend on unnamed road
 - 323500-60A1.2 – Left hand bend on unnamed road
 - 323500-70A1.2 – Left hand bend on unnamed road over culvert
 - 323500-80A1.2 – S-bend on unnamed road
 - 323500-85A1.2 – Left hand bend on unnamed road at junction
 - 323500-90A1.2 – Unnamed road / A859 junction
 - 323500-95A1.1 – Site entrance 1
 - 323500-97A1.1 – Site entrance 2

Modifications to street furniture

- 1.6. Street furniture removal will be required at the junction of unnamed road and A859.

Manual Steering

- 1.7. Manual steering will be required at the following locations:
 - 323500-10A1.2 – Right hand bend exiting Arnish Point
 - 323500-20A1.2 – Right hand bend on unnamed road
 - 323500-30A1.2 – Left hand bend on unnamed road
 - 323500-40A1.2 – Right hand bend on unnamed road
 - 323500-50A1.2 – S- bend on unnamed road
 - 323500-60A1.2 – Left hand bend on unnamed road
 - 323500-70A1.2 – Left hand bend on unnamed road over culvert
 - 323500-80A1.2 – S-bend on unnamed road
 - 323500-85A1.2 – Left hand bend on unnamed road at junction
 - 323500-90A1.2 – Unnamed road / A859 junction
 - 323500-95A1.1 – Site entrance 1
 - 323500-97A1.1 – Site entrance 2

Vertical Alignment

- 1.8. No vertical alignment issues have been identified by the assessment due to no site visit being carried out.

2. Introduction

- 2.1 Collett & Sons Ltd. were commissioned by Lewis Wind Power to undertake an abnormal loads route access study to assess the transportation of a Vestas V150 blade to the proposed Stornoway Wind Farm site, Isle of Lewis.
- 2.2 The road routes as detailed herein are for the road transport of a Vestas V150 blade.
- 2.3 The site is located to the near Stornoway. The purpose of this report is to detail access to the entrance of the Stornoway Wind Farm from Arnish Point.

3. Abnormal Indivisible Load Profiles

- 3.1. The turbine component is assessed based on weight, length, width and height and loaded to the most appropriate vehicle the weights and dimensions of these are detailed below. The loading diagram is detailed in Appendix 1.

3.2.	323500 - A
V150 Blade	
	Loaded vehicle dimensions
Overall vehicle Length	78.10m
Blade Length	73.94m
Rigid Length	73.94m
Width	4.20m
Height	3.91m
Gross Vehicle Weight	44.00Te
Maximum axle weight	8.00Te

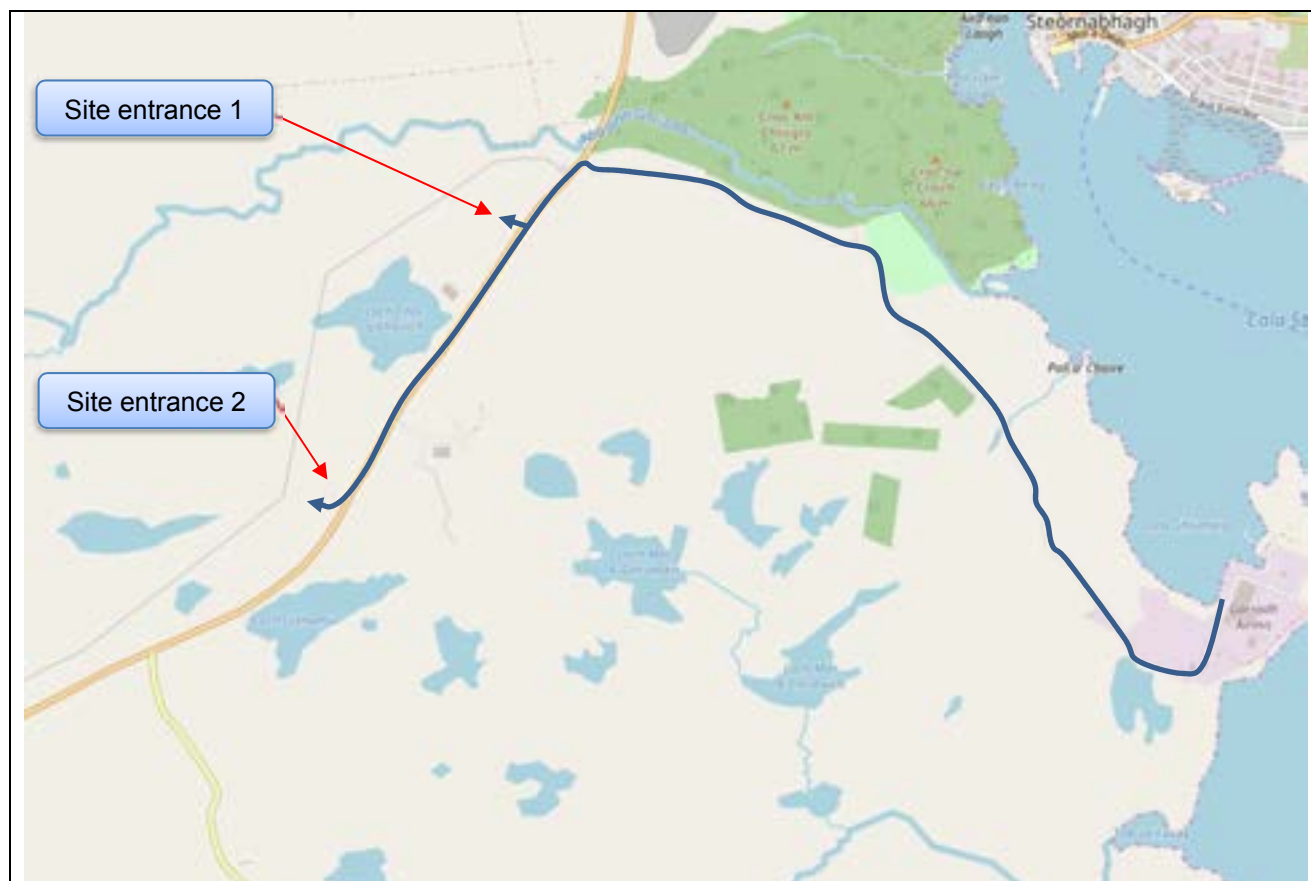
4. Route Assessment Overview

4.0. This section of the report illustrates the routes assessed for the delivery of a Vestas wind turbine blade from the Arnish Point to the start of the proposed access routes to Stornoway Wind Farm. For the purpose of this report, 1 route to the site was surveyed.

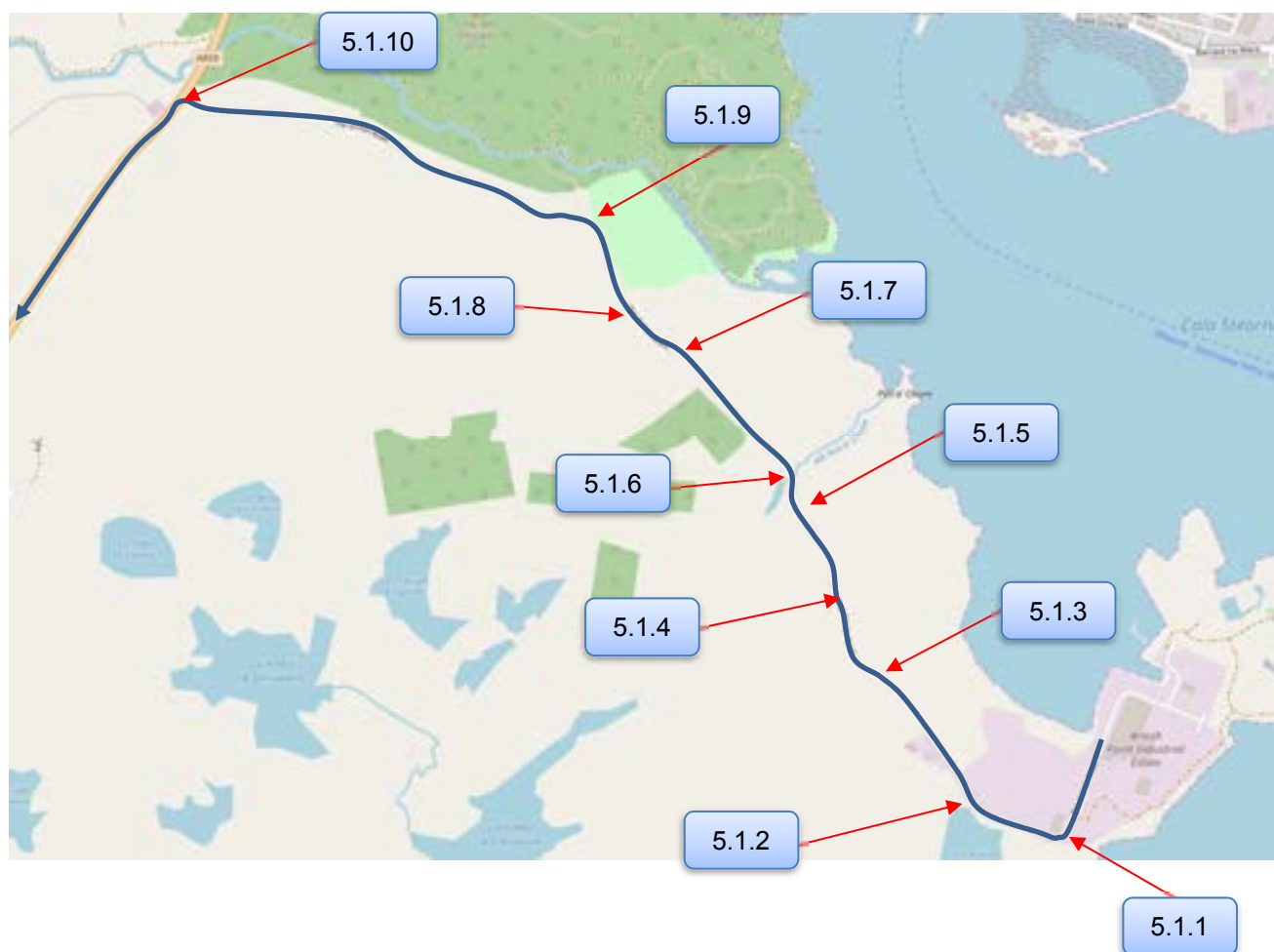
5. Route Assessment

Start Location	Arnish Point	Distance of Route	Km	Miles
Via:	Unnamed / A859		4.8	3.0
<ul style="list-style-type: none">Continue on unnamed road from Arnish Point to junction with A859.At junction turn left onto A859 and continue to first site entrance at Approx. OSi Grid Ref: NB 40599 33100 and second entrance at Approx. OSi Grid Ref: NB 39405 31244.				

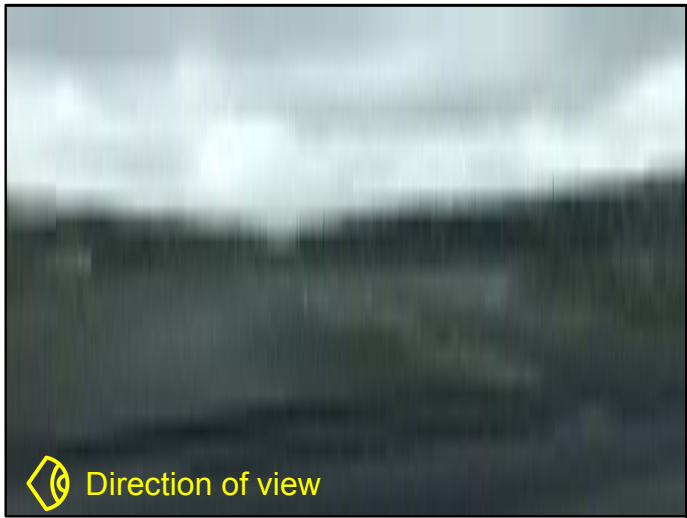
5.0. Map Overview



5.1. Map extract of survey location



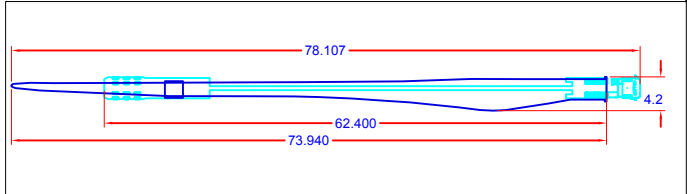
ITEM NUMBER	5.1.1	LOCATION	EXIT ARNISH POINT ONTO UNNAMED ROAD	
DIRECTION	Continue straight at this location			
GRID REFERENCE	NB 42556 30260			
MODIFICATION AND DESCRIPTION		PHOTOGRAPH OF LOCATION		
<p>Visual inspection indicates that a contraflow manoeuvre will be required at this location.</p> <p>Verge on offside of unnamed road required to be lowered to allow the trailer to oversail this area.</p>				
				
FURTHER INVESTIGATION RECOMMENDED		NO	TYPE	N/A



Direction of view

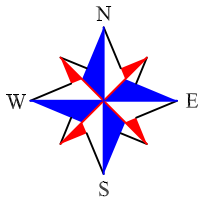


Overview



Swept Path indicates trailer utilising MANUAL steering

Vestas
V150 73.94m Blade
62.4m super wing carrier



Exit Arnish Point onto unnamed road to right hand bend.

****Caution****

- Trailer will require to be raised to avoid colliding with verge on offside.



UK Grid Reference: NB 42568 30265

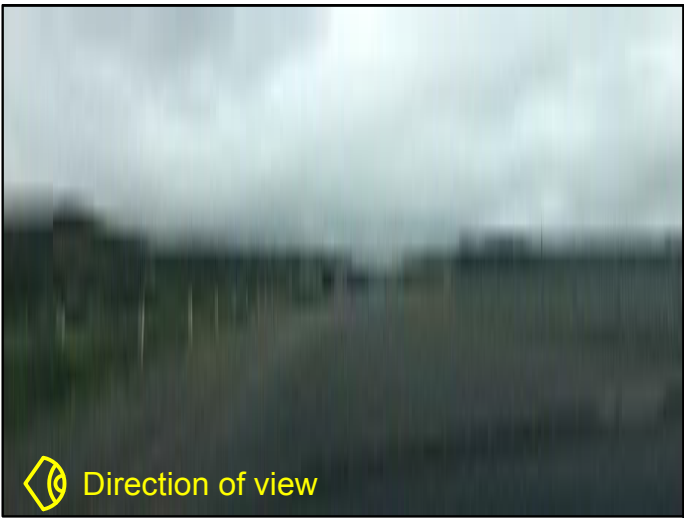
- The swept path analysis provided is produced from a purely transport orientated view, and does not consider any political issues in terms of land ownership, or any other precincts raised, that may otherwise be restrictive.
- The drawing has been produced from Ordnance Survey Data. A site visit has **not** been conducted to verify road widths or the presence of street furniture.
- All swept path diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying Turbine components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.
- This SPA is a means of providing evidence of minimum requirements of any one vehicle as a footprint and there is no safety factor or margin included.
- Turbine delivery vehicles can be both left and right hand drive vehicles, therefore due to drivers perception it must be assumed that every vehicle will not follow the exact same line and so a margin of additional space should be allowed for.
- Land take is usually referred to when land is required from Private Land Owners; road widening is usually referred to when land is required within highways boundaries. The boundaries between private land and highways property are assumed by using obvious demarcation such as fence lines/hedges etc. It should be noted that actual boundaries between highways and private land are not substantiated in this report and can only be authenticated by carrying out land searches.
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- All dimensions in meters
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Trailer to rasied

Car Park

- Area within red outline will be swept by tractor and trailer axles
- Hatched area within red outline to be levelled and prepared to accept axle loadings
- Area within magenta outline will be oversailed by load and projections
- Area within green outline will be oversailed by trailer body

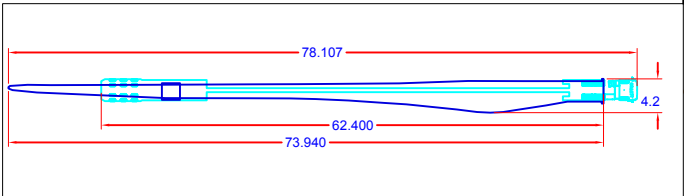
ITEM NUMBER	5.1.2	LOCATION	FIRST RIGHT HAND BEND ON UNNAMED ROAD
DIRECTION	Continue straight at this location		
GRID REFERENCE	NB 42350 30343		
MODIFICATION AND DESCRIPTION		PHOTOGRAPH OF LOCATION	
Visual inspection indicates that road widening will be required at this location.			
			
FURTHER INVESTIGATION RECOMMENDED		NO	TYPE N/A



Direction of view

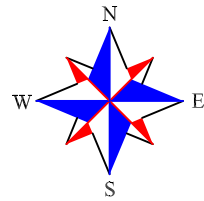


Overview



Swept Path indicates trailer utilising MANUAL steering

Vestas
V150 73.94m Blade
62.4m super wing carrier



Continue on unnamed road to right hand bend past building on nearside.


****Caution****

- Widening required to provide a useable road surface as indicated by the red hatching.
- Ground to be prepared to accept suitable axle loadings.

UK Grid Reference: NB 42350 30343

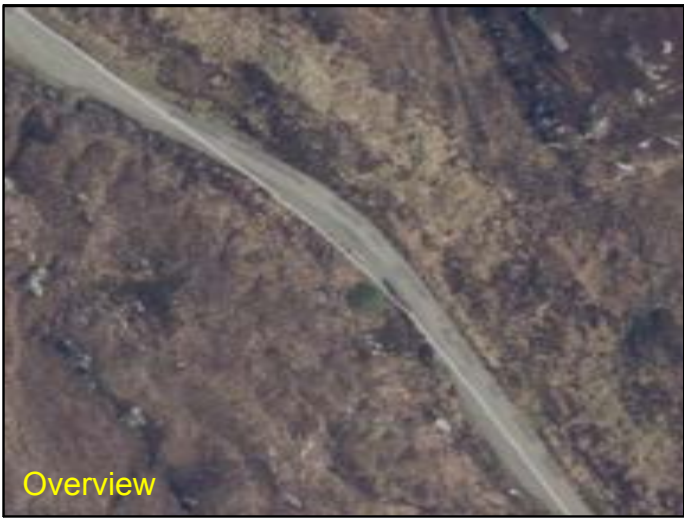
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- Area within red outline will be swept by tractor and trailer axles
- Hatched area within red outline to be levelled and prepared to accept axle loadings
- Area within magenta outline will be oversailed by load and projections
- Area within green outline will be oversailed by trailer body

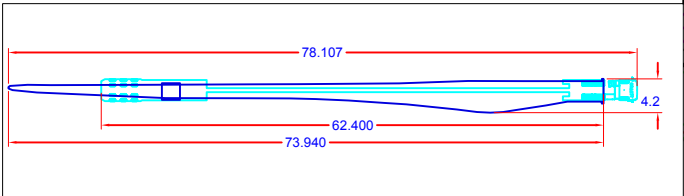
ITEM NUMBER	5.1.3	LOCATION	LEFT HAND BEND ON UNNAMED ROAD
DIRECTION	Continue straight at this location		
GRID REFERENCE	NB 42350 30343		
MODIFICATION AND DESCRIPTION	PHOTOGRAPH OF LOCATION		
Visual inspection indicates that road widening will be required at this location.			
			
FURTHER INVESTIGATION RECOMMENDED	NO	TYPE	N/A



Direction of view

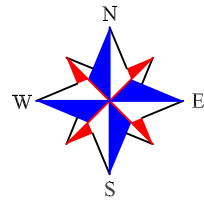


Overview



Swept Path indicates trailer utilising MANUAL steering

Vestas
V150 73.94m Blade
62.4m super wing carrier



Continue on unnamed road to left hand bend.

****Caution****

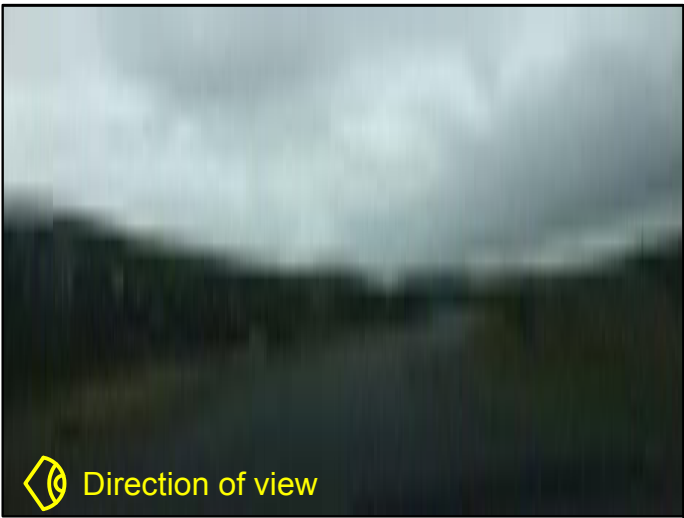
- Widening required to provide a useable road surface as indicated by the red hatching.
- Area within magenta hatched area required to be lowered to ground level to allow the trailer to oversail.
- Ground to be prepared to accept suitable axle loadings.

UK Grid Reference: NB 42350 30343

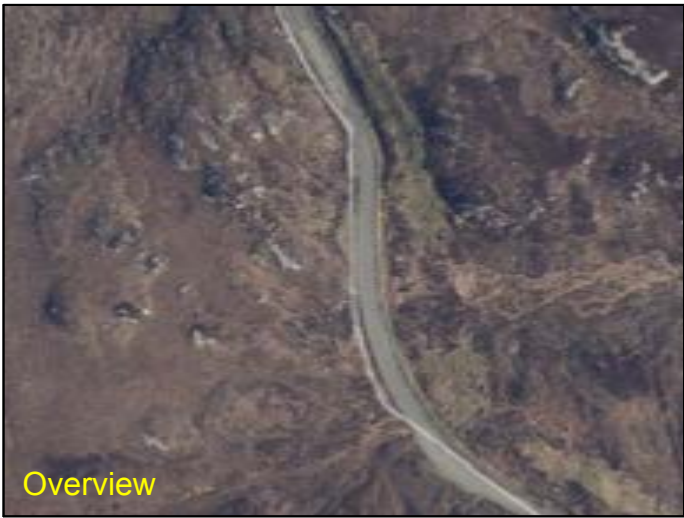
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- Area within red outline will be swept by tractor and trailer axles
- Hatched area within red outline to be levelled and prepared to accept axle loadings
- Area within magenta outline will be oversailed by load and projections
- Area within green outline will be oversailed by trailer body

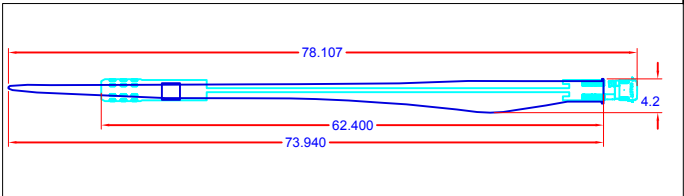
ITEM NUMBER	5.1.4	LOCATION	RIGHT HAND BEND ON UNNAMED ROAD
DIRECTION	Continue straight at this location		
GRID REFERENCE	NB 42036 30787		
MODIFICATION AND DESCRIPTION	PHOTOGRAPH OF LOCATION		
Visual inspection indicates that road widening will be required at this location.			
	 <div data-bbox="1114 949 1474 1010" data-label="Text">Road widening required</div>		
FURTHER INVESTIGATION RECOMMENDED	NO	TYPE	N/A



Direction of view

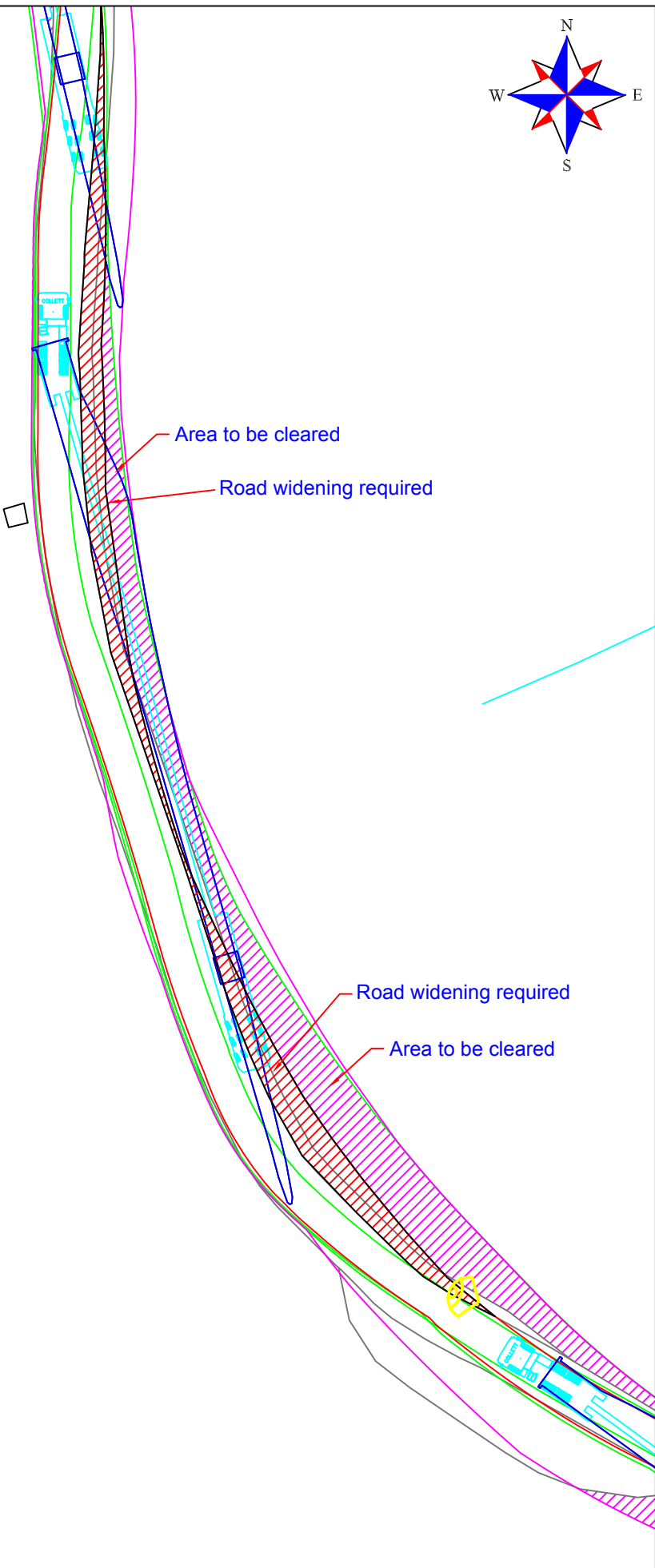


Overview



Swept Path indicates trailer utilising MANUAL steering

Vestas
V150 73.94m Blade
62.4m super wing carrier



Continue on unnamed road to right hand bend.

****Caution****

- Widening required to provide a useable road surface as indicated by the red hatching.
- Area within magenta hatched area required to be lowered to ground level to allow the trailer to oversail.
- Ground to be prepared to accept suitable axle loadings.

UK Grid Reference: NB 42036 30787

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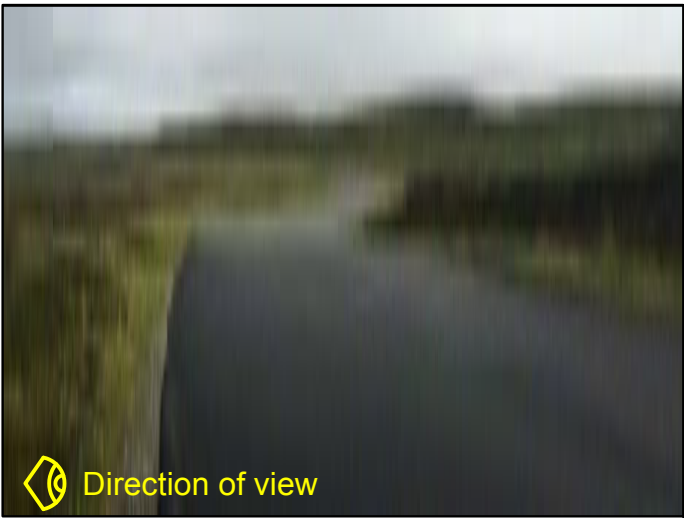
- Area within red outline will be swept by tractor and trailer axles
- Hatched area within red outline to be levelled and prepared to accept axle loadings
- Area within magenta outline will be oversailed by load and projections
- Area within green outline will be oversailed by trailer body



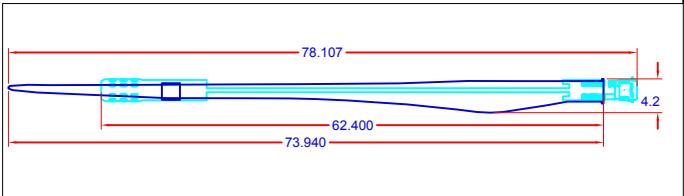
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Albert Road FAX: +44(0)8456 255244
Halifax, HX2 0DF WEB: www.collett.co.uk

DRAWN J.HALSTEAD		TITLE RIGHT HAND BEND ON UNNAMED ROAD			
DATE 13/05/2019		MAPPING ORDNANCE SURVEY <small>Not Adjusted</small>		CUSTOMER EDF ENERGY RENEWABLES	
SCALE 1:500	SIZE A3	PINCH POINT IDENTIFIED BY CLIENT		SITE STORNOWAY WIND FARM	DWG 323500-40A1.2

ITEM NUMBER	5.1.5	LOCATION	LEFT HAND BEND ON UNNAMED ROAD
DIRECTION	Continue straight at this location		
GRID REFERENCE	NB 42000 30980		
MODIFICATION AND DESCRIPTION		PHOTOGRAPH OF LOCATION	
Visual inspection indicates that road widening will be required at this location.			
			
FURTHER INVESTIGATION RECOMMENDED	NO	TYPE	N/A

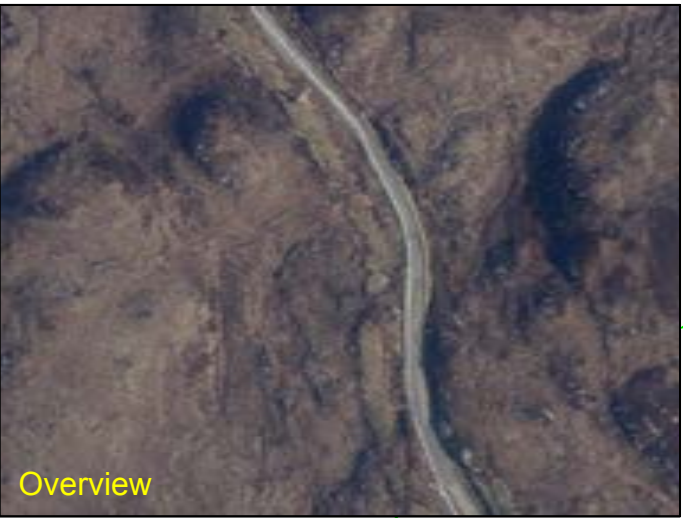


Direction of view

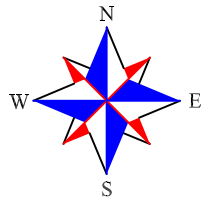


Swept Path indicates trailer utilising MANUAL steering

Vestas
V150 73.94m Blade
62.4m super wing carrier



Overview



Continue on unnamed road through S-bend.

****Caution****

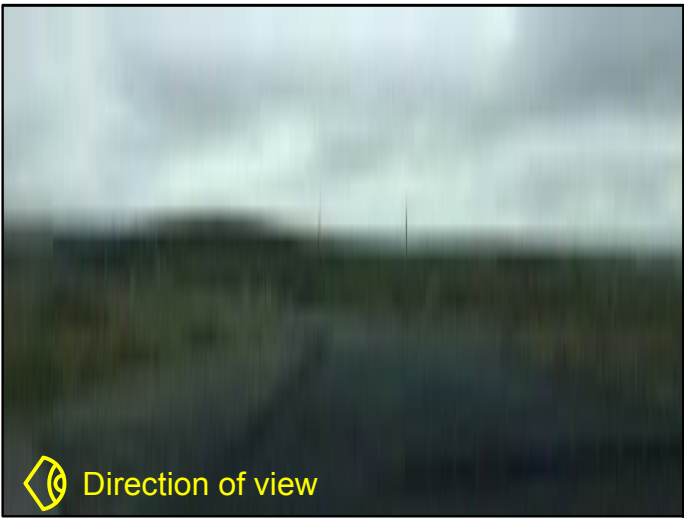
- Widening required to provide a useable road surface as indicated by the red hatching.
- Area within magenta hatched area required to be lowered to ground level to allow the trailer to oversail.
- Ground to be prepared to accept suitable axle loadings.

UK Grid Reference: NB 42000 30980

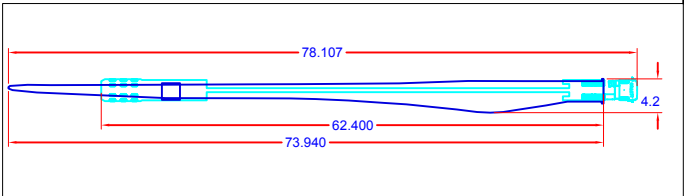
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- Area within red outline will be swept by tractor and trailer axles
- Hatched area within red outline to be levelled and prepared to accept axle loadings
- Area within magenta outline will be oversailed by load and projections
- Area within green outline will be oversailed by trailer body

ITEM NUMBER	5.1.6	LOCATION	LEFT HAND BEND ON UNNAMED ROAD	
DIRECTION	Continue straight at this location			
GRID REFERENCE	NB 42028 30873			
MODIFICATION AND DESCRIPTION		PHOTOGRAPH OF LOCATION		
Visual inspection indicates that road widening will be required at this location.				
				
FURTHER INVESTIGATION RECOMMENDED		NO	TYPE	N/A

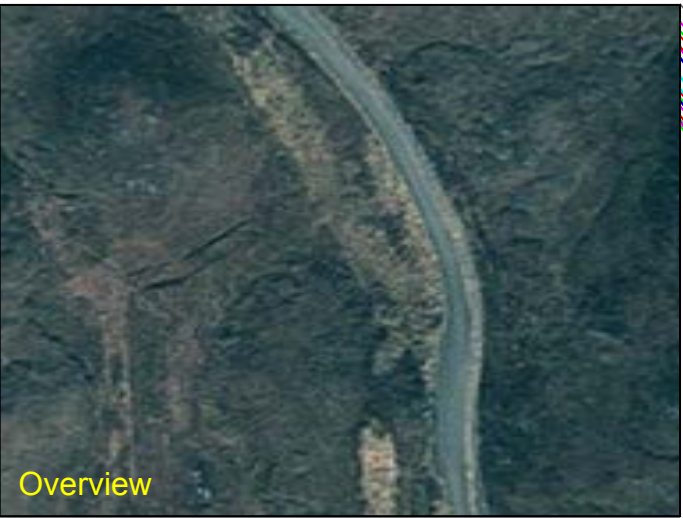


Direction of view

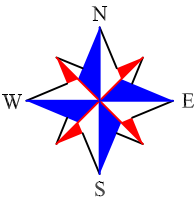
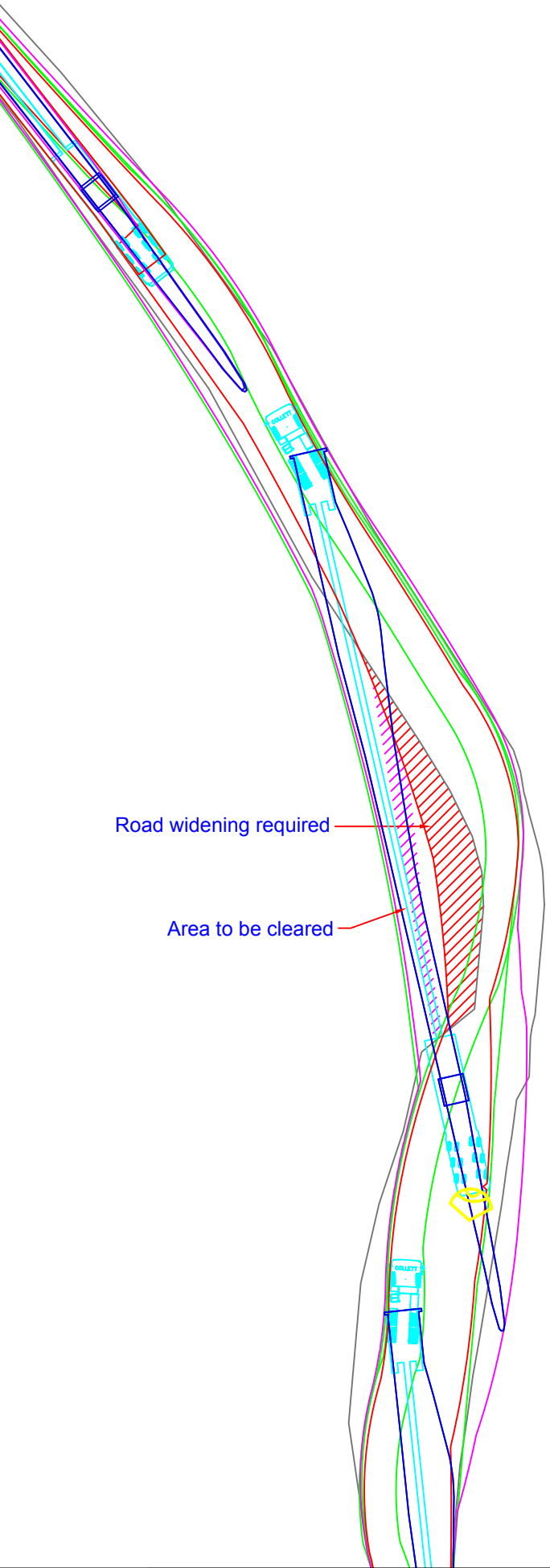


Swept Path indicates trailer utilising MANUAL steering

Vestas
V150 73.94m Blade
62.4m super wing carrier



Overview



Continue on unnamed road to left hand bend.

****Caution****

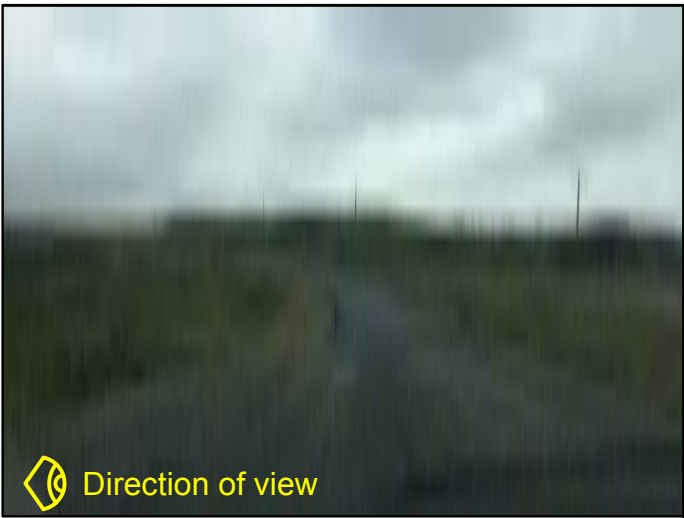
- Widening required to provide a useable road surface as indicated by the red hatching.
- Area within magenta hatched area required to be lowered to ground level to allow the trailer to oversail.
- Ground to be prepared to accept suitable axle loadings.

UK Grid Reference: NB 42028 30873

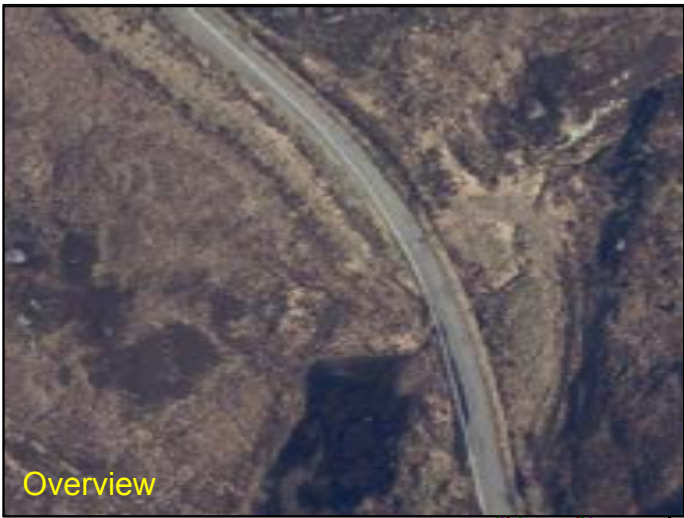
- The swept path analysis provided is produced from a purely transport orientated view, and does not consider any political issues in terms of land ownership, or any other precincts raised, that may otherwise be restrictive.
- The drawing has been produced from Ordnance Survey Data. A site visit has **not** been conducted to verify road widths or the presence of street furniture.
- All swept path diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying Turbine components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.
- This SPA is a means of providing evidence of minimum requirements of any one vehicle as a footprint and there is no safety factor or margin included.
- Turbine delivery vehicles can be both left and right hand drive vehicles, therefore due to drivers perception it must be assumed that every vehicle will not follow the exact same line and so a margin of additional space should be allowed for.
- Land take is usually referred to when land is required from Private Land Owners; road widening is usually referred to when land is required within highways boundaries. The boundaries between private land and highways property are assumed by using obvious demarcation such as fence lines/hedges etc. It should be noted that actual boundaries between highways and private land are not substantiated in this report and can only be authenticated by carrying out land searches.
- Police escorts and permits will be required for the movement of all of the components. Form 'BE16' permits will also be required to undertake the movement of the vehicle shown in the swept path analysis. These permits are at the discretion of the Highway Agency (HA). Therefore, approval of these 'permits for movements' by the HA are a major consideration before the physical capability to deliver these components are undertaken.
- In critical areas, where modifications are required, the road construction must be formed to the minimum specification contained in the Turbine Manufactures Transport Guidance Notes.
- The Turbine Manufactures Transport Guidance Notes will state the minimum road width required for the transport of components. Any roads below this stated width will require widening to reflect this regardless of any swept path analysis not indicating modifications.
- The information is privileged and confidential and is for the exclusive use of the nominated client.
- All dimensions in meters
- © Crown copyright and database rights 2014. Ordnance Survey 0100031673 (EMAP)

- Area within red outline will be swept by tractor and trailer axles
- Hatched area within red outline to be levelled and prepared to accept axle loadings
- Area within magenta outline will be oversailed by load and projections
- Area within green outline will be oversailed by trailer body

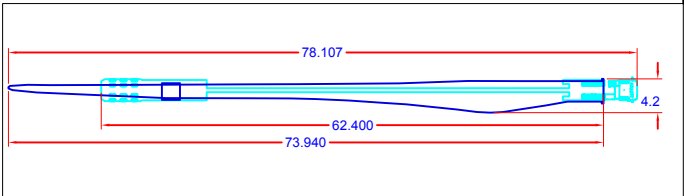
ITEM NUMBER	5.1.7	LOCATION	LEFT HAND BEND ON UNNAMED ROAD OVER CULVERT
DIRECTION	Continue straight at this location		
GRID REFERENCE	NB 42028 30873		
MODIFICATION AND DESCRIPTION		PHOTOGRAPH OF LOCATION	
Visual inspection indicates that road widening will be required at this location.			
			
FURTHER INVESTIGATION RECOMMENDED		NO	TYPE N/A



Direction of view



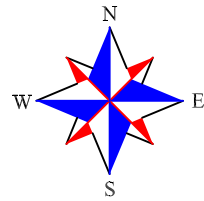
Overview



Swept Path indicates trailer utilising MANUAL steering

Vestas
V150 73.94m Blade
62.4m super wing carrier

Road widening required



Continue on unnamed road to left hand bend over culvert.

****Caution****



- Widening required to provide a useable road surface as indicated by the red hatching.
- Ground to be prepared to accept suitable axle loadings.

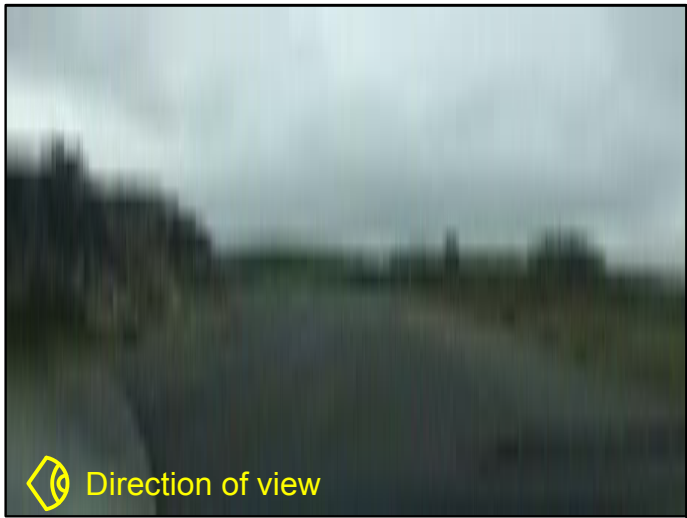
UK Grid Reference: NB 42028 30873

- The swept path analysis provided is produced from a purely transport orientated view, and does not consider any political issues in terms of land ownership, or any other precincts raised, that may otherwise be restrictive.
- The drawing has been produced from Ordnance Survey Data. A site visit has **not** been conducted to verify road widths or the presence of street furniture.
- All swept path diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying Turbine components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.
- This SPA is a means of providing evidence of minimum requirements of any one vehicle as a footprint and there is no safety factor or margin included.
- Turbine delivery vehicles can be both left and right hand drive vehicles, therefore due to drivers perception it must be assumed that every vehicle will not follow the exact same line and so a margin of additional space should be allowed for.
- Land take is usually referred to when land is required from Private Land Owners; road widening is usually referred to when land is required within highways boundaries. The boundaries between private land and highways property are assumed by using obvious demarcation such as fence lines/hedges etc. It should be noted that actual boundaries between highways and private land are not substantiated in this report and can only be authenticated by carrying out land searches.
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- In critical areas, where modifications are required, the road construction must be formed to the minimum specification contained in the Turbine Manufactures Transport Guidance Notes.
- The Turbine Manufactures Transport Guidance Notes will state the minimum road width required for the transport of components. Any roads below this stated width will require widening to reflect this regardless of any swept path analysis not indicating modifications.
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- All dimensions in meters
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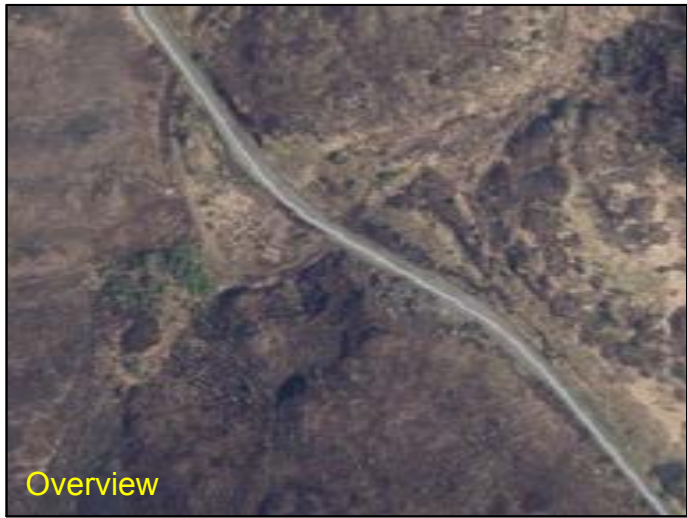
CULVERT

- Area within red outline will be swept by tractor and trailer axles
- Hatched area within red outline to be levelled and prepared to accept axle loadings
- Area within magenta outline will be oversailed by load and projections
- Area within green outline will be oversailed by trailer body

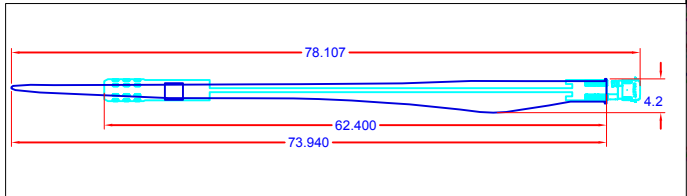
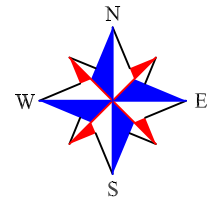
ITEM NUMBER	5.1.8	LOCATION	S-BEND ON UNNAMED ROAD
DIRECTION	Continue straight at this location		
GRID REFERENCE	NB 41605 31633		
MODIFICATION AND DESCRIPTION	PHOTOGRAPH OF LOCATION		
Visual inspection indicates that road widening will be required at this location.			
			
FURTHER INVESTIGATION RECOMMENDED	NO	TYPE	N/A



Direction of view



Overview



Swept Path indicates trailer utilising MANUAL steering

Vestas
V150 73.94m Blade
62.4m super wing carrier

Area to be cleared

Road widening required

52

Road widening required


Continue on unnamed road to through S-bend.



****Caution****

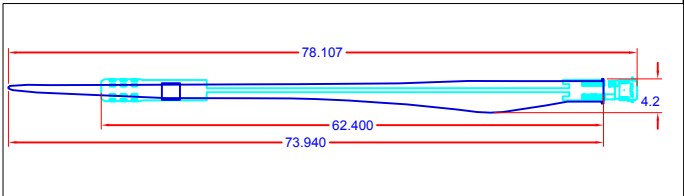
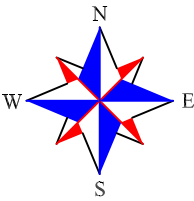
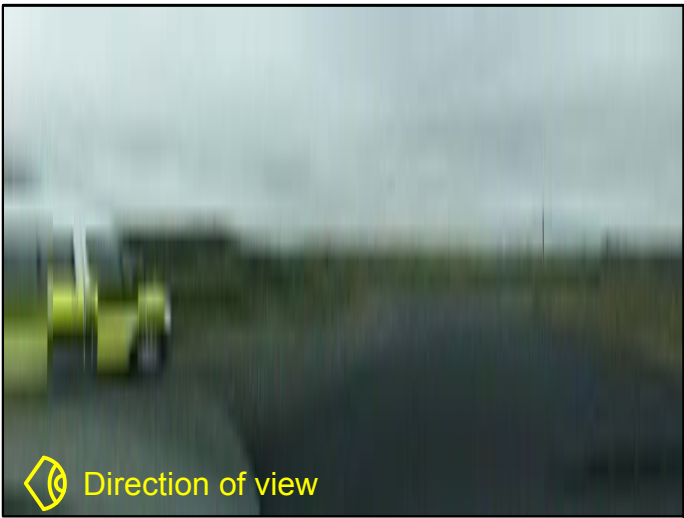
- Widening required to provide a useable road surface as indicated by the red hatching.
- Area within magenta hatched area required to be lowered to ground level to allow the trailer to oversail.
- Ground to be prepared to accept suitable axle loadings.

UK Grid Reference: NB 41605 31633

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- All swept path diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying Turbine components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.
- This SPA is a means of providing evidence of minimum requirements of any one vehicle as a footprint and there is no safety factor or margin included.
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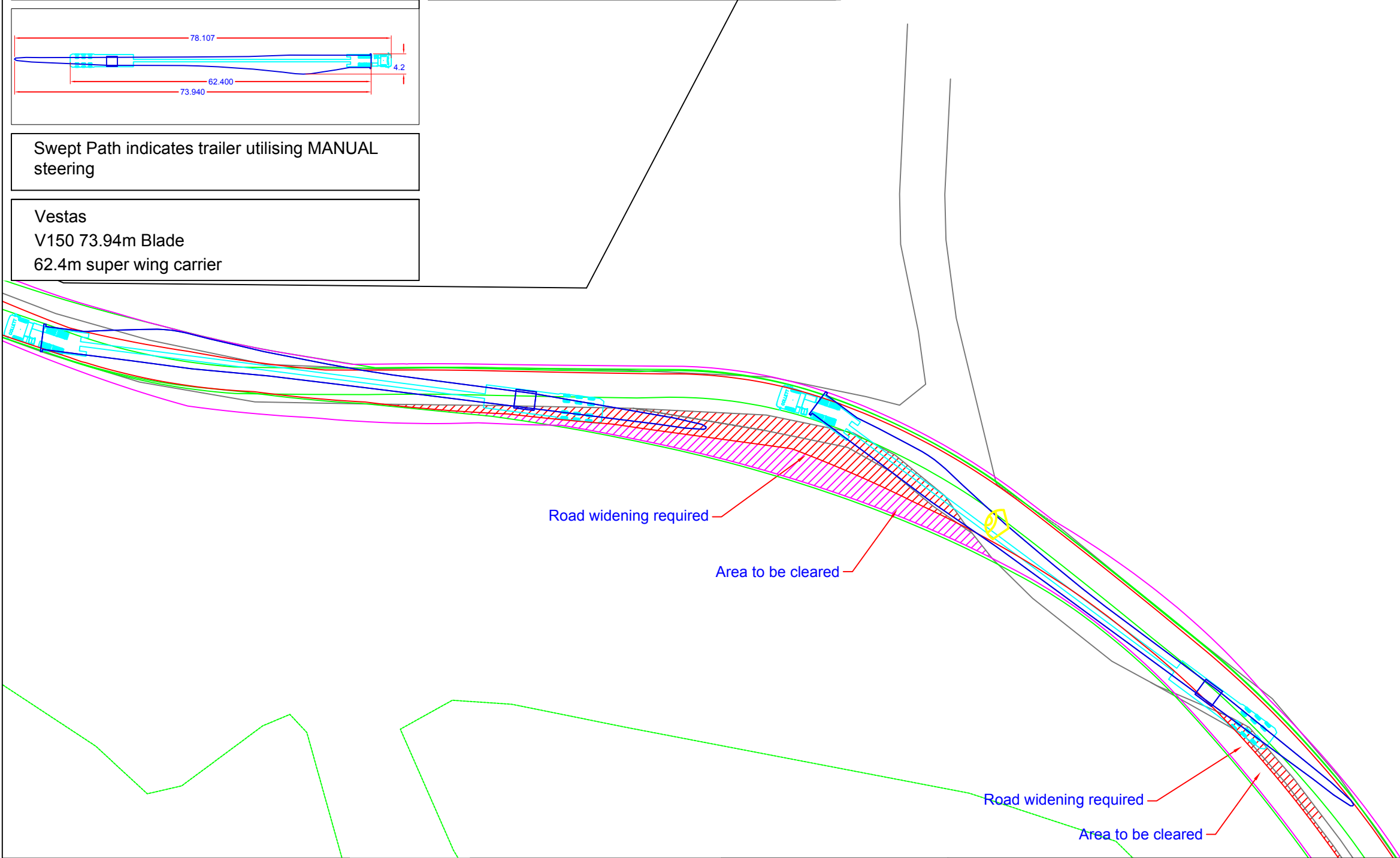
- Area within red outline will be swept by tractor and trailer axles
-  Hatched area within red outline to be levelled and prepared to accept axle loadings
- Area within magenta outline will be oversailed by load and projections
- Area within green outline will be oversailed by trailer body

ITEM NUMBER	5.1.9	LOCATION	LEFT HAND BEND ON UNNAMED ROAD AT JUNCTION	
DIRECTION	Continue straight at this location			
GRID REFERENCE	NB 41374 32003			
MODIFICATION AND DESCRIPTION		PHOTOGRAPH OF LOCATION		
Visual inspection indicates that road widening will be required at this location.				
				
FURTHER INVESTIGATION RECOMMENDED		NO	TYPE	N/A



Swept Path indicates trailer utilising MANUAL steering

Vestas
V150 73.94m Blade
62.4m super wing carrier



Continue on unnamed road to left hand bend at junction.

****Caution****

- Widening required to provide a useable road surface as indicated by the red hatching.
- Area within magenta hatched area required to be lowered to ground level to allow the trailer to oversail.
- Ground to be prepared to accept suitable axle loadings.

UK Grid Reference: NB 41374 32003

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- All swept path diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying Turbine components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.
- This SPA is a means of providing evidence of minimum requirements of any one vehicle as a footprint and there is no safety factor or margin included.
- Turbine delivery vehicles can be both left and right hand drive vehicles, therefore due to drivers perception it must be assumed that every vehicle will not follow the exact same line and so a margin of additional space should be allowed for.
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- Police escorts and permits will be required for the movement of all of the components. Form 'BE16' permits will also be required to undertake the movement of the vehicle shown in the swept path analysis. These permits are at the discretion of the Highway Agency (HA). Therefore, approval of these 'permits for movements' by the HA are a major consideration before the physical capability to deliver these components are undertaken.
- In critical areas, where modifications are required, the road construction must be formed to the minimum specification contained in the Turbine Manufactures Transport Guidance Notes.
- The Turbine Manufactures Transport Guidance Notes will state the minimum road width required for the transport of components. Any roads below this stated width will require widening to reflect this regardless of any swept path analysis not indicating modifications.
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- All dimensions in meters
- © Crown copyright and database rights 2014. Ordnance Survey 0100031673 (EMAP)

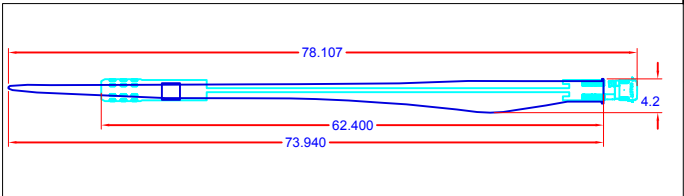
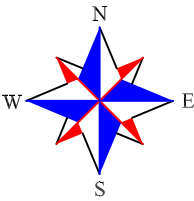
- Area within red outline will be swept by tractor and trailer axles
- Hatched area within red outline to be levelled and prepared to accept axle loadings
- Area within magenta outline will be oversailed by load and projections
- Area within green outline will be oversailed by trailer body



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DRAWN	J.HALSTEAD	TITLE LEFT HAND BEND ON UNNAMED ROAD AT JUNCTION			
DATE	13/05/2019	MAPPING	ORDNANCE SURVEY Not Adjusted	CUSTOMER	EDF ENERGY RENEWABLES
SCALE	1:500	SIZE	A3	PINCH POINT IDENTIFIED BY	CLIENT
				SITE	STORNOWAY WIND FARM
				DWG	323500-85A1.2

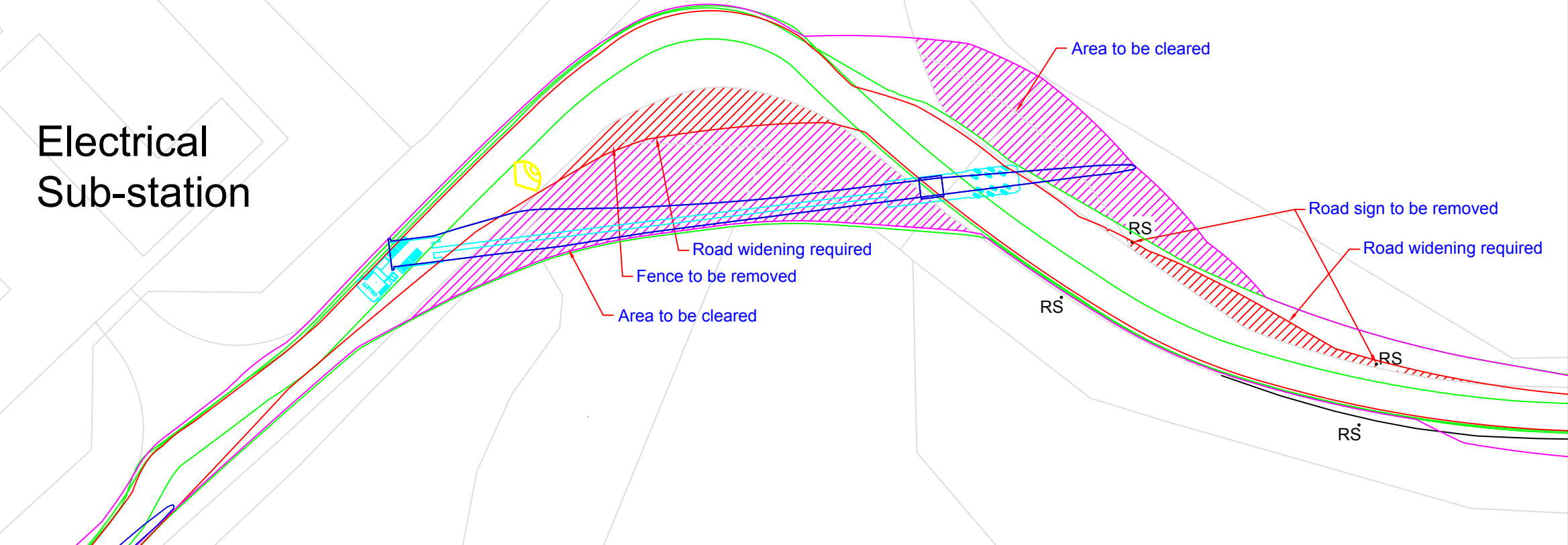
ITEM NUMBER	5.1.10	LOCATION	UNNAMED ROAD / A859 JUNCTION
DIRECTION	Continue straight at this location		
GRID REFERENCE	NB 41374 32003		
MODIFICATION AND DESCRIPTION	PHOTOGRAPH OF LOCATION		
Visual inspection indicates that road widening will be required at this location. Road signs on nearside of unnamed road required to be removed to allow the rear projection to oversail.			
			
FURTHER INVESTIGATION RECOMMENDED	NO	TYPE	N/A



Swept Path indicates trailer utilising MANUAL steering

Vestas
V150 73.94m Blade
62.4m super wing carrier

Electrical
Sub-station



Continue on unnamed road to junction with A859.
At junction turn left onto A859.

****Caution****

- Widening required to provide a useable road surface as indicated by the red hatching.
- Area within magenta hatched area required to be lowered to ground level to allow the trailer to oversail.
- Road signs on offside of unnamed road require to be removed to allow the rear projection of the blade to oversail.
- Fence on nearside required to be removed.
- Ground to be prepared to accept suitable axle loadings.

UK Grid Reference: NB 40335 32381

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- The drawing has been produced from Ordnance Survey Data. A site visit has **not** been conducted to verify road widths or the presence of street furniture.
- All swept path diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying Turbine components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.
- This SPA is a means of providing evidence of minimum requirements of any one vehicle as a footprint and there is no safety factor or margin included.
- Turbine delivery vehicles can be both left and right hand drive vehicles, therefore due to drivers perception it must be assumed that every vehicle will not follow the exact same line and so a margin of additional space should be allowed for.
- Land take is usually referred to when land is required from Private Land Owners; road widening is usually referred to when land is required within highways boundaries. The boundaries between private land and highways property are assumed by using obvious demarcation such as fence lines/hedges etc. It should be noted that actual boundaries between highways and private land are not substantiated in this report and can only be authenticated by carrying out land searches.
- Police escorts and permits will be required for the movement of all of the components. Form 'BE16' permits will also be required to undertake the movement of the vehicle shown in the swept path analysis. These permits are at the discretion of the Highway Agency (HA). Therefore, approval of these 'permits for movements' by the HA are a major consideration before the physical capability to deliver these components are undertaken.
- In critical areas, where modifications are required, the road construction must be formed to the minimum specification contained in the Turbine Manufactures Transport Guidance Notes.
- The Turbine Manufactures Transport Guidance Notes will state the minimum road width required for the transport of components. Any roads below this stated width will require widening to reflect this regardless of any swept path analysis not indicating modifications.
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- All dimensions in meters
- © Crown copyright and database rights 2014. Ordnance Survey 0100031673 (EMAP)

- Area within red outline will be swept by tractor and trailer axles
- ▨ Hatched area within red outline to be levelled and prepared to accept axle loadings
- Area within magenta outline will be oversailed by load and projections
- Area within green outline will be oversailed by trailer body





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DRAWN J.HALSTEAD		TITLE UNNAMED ROAD / A859 JUNCTION			
DATE 13/05/2019		MAPPING ORDNANCE SURVEY Not Adjusted		CUSTOMER EDF ENERGY RENEWABLES	
SCALE 1:500	SIZE A3	PINCH POINT IDENTIFIED BY CLIENT	SITE STORNOWAY WIND FARM	DWG 323500-90A1.2	

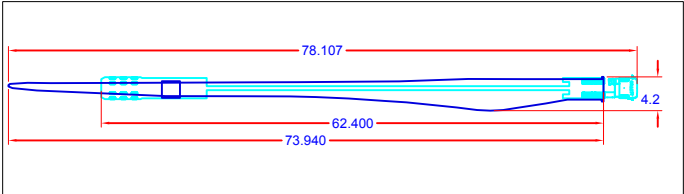
5.2. Map extract of survey location



ITEM NUMBER	5.2.1	LOCATION	SITE ENTRANCE 1	
DIRECTION	Turn right at this junction			
GRID REFERENCE	NB 40599 33100			
MODIFICATION AND DESCRIPTION		PHOTOGRAPH OF LOCATION		
Visual inspection indicates that road widening will be required to provide a suitable site entrance.				
				
FURTHER INVESTIGATION RECOMMENDED		NO	TYPE	N/A

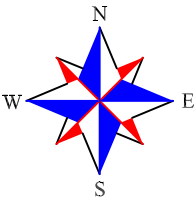


Overview



Swept Path indicates trailer utilising MANUAL steering

Vestas
V150 73.94m Blade
62.4m super wing carrier



Continue on A859 to first site entrance.

****Caution****

- Widening required to provide a useable road surface as indicated by the red hatching.
- Area within magenta hatched area required to be lowered to ground level to allow the trailer and rear projection to oversail.
- Ground to be prepared to accept suitable axle loadings.

UK Grid Reference: NB 40599 33100

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- All dimensions in meters
- © Crown copyright and database rights 2014. Ordnance Survey 0100031673 (EMAP)

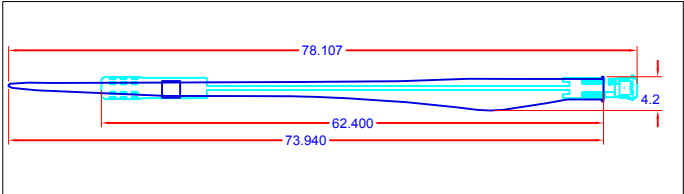
- Area within red outline will be swept by tractor and trailer axles
- Hatched area within red outline to be levelled and prepared to accept axle loadings
- Area within magenta outline will be oversailed by load and projections
- Area within green outline will be oversailed by trailer body



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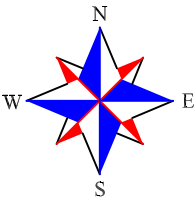
DRAWN J.HALSTEAD		TITLE FIRST SITE ENTRANCE	
DATE 13/05/2019		MAPPING ORDNANCE SURVEY <small>Not Adjusted</small>	CUSTOMER EDF ENERGY RENEWABLES
SCALE 1:500	SIZE A3	PINCH POINT IDENTIFIED BY CLIENT	SITE STORNOWAY WIND FARM
		DWG 323500-95A1.1	

ITEM NUMBER	5.2.2	LOCATION	SITE ENTRANCE 2
DIRECTION	Turn right at this junction		
GRID REFERENCE	NB 39405 31244		
MODIFICATION AND DESCRIPTION		PHOTOGRAPH OF LOCATION	
Visual inspection indicates that road widening will be required to provide a suitable site entrance.			
			
FURTHER INVESTIGATION RECOMMENDED		NO	N/A



Swept Path indicates trailer utilising MANUAL steering

Vestas
V150 73.94m Blade
62.4m super wing carrier




Continue on A859 to second site entrance.

****Caution****

- Widening required to provide a useable road surface as indicated by the red hatching.
- Area within magenta hatched area required to be lowered to ground level to allow the trailer and rear projection to oversail.
- Ground to be prepared to accept suitable axle loadings.

UK Grid Reference: NB 39405 31244

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- The information is privileged and confidential and is for the exclusive use of the nominated client.
- All dimensions in meters
- © Crown copyright and database rights 2014. Ordnance Survey 0100031673 (EMAP)

- Area within red outline will be swept by tractor and trailer axles
-  Hatched area within red outline to be levelled and prepared to accept axle loadings
- Area within magenta outline will be oversailed by load and projections
- Area within green outline will be oversailed by trailer body



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DRAWN J.HALSTEAD		TITLE SECOND SITE ENTRANCE			
DATE 13/05/2019		MAPPING ORDNANCE SURVEY <small>Not Adjusted</small>		CUSTOMER EDF ENERGY RENEWABLES	
SCALE 1:500	SIZE A3	PINCH POINT IDENTIFIED BY CLIENT		SITE STORNOWAY WIND FARM	DWG 323500-97A1.1

5. Recommendations

- 5.1. A 'Test Drive' with a Blade Trailer from the commencement point of the selected route to the site entrance is recommended. This is in order to verify the facts contained in this report and proof test the requirements for road alterations horizontally and vertically. The test run should be completed with an empty trailer, so that in an emergency or at the points where land take has been recommended, but not progressed, or in the case of vertical issues there is insufficient ground clearance, the trailer can be 'closed' until it is past the hazard. The test run should be attended by Turbine manufacturers, project managers, Police, Highways & County council representatives and other interested parties with responsibility for road alterations.
- 5.2. These recommendations are made from a purely transport orientated view, and does not consider any political issues in terms of land ownership, or any other precincts raised, that may otherwise be restrictive. It is recommended to have adequate warning signs implemented to warn other road users at critical points along the route.
- 5.3. All hedges, shrubs, bushes, trees and overhanging branches along the nominated routes must be trimmed to allow a minimum envelope on the road of 5.0m wide by 5.0m high.
- 5.4. All street furniture, signage etc. along the nominated route must be removed to allow a minimum envelope on the road of 5.0m by 5.0m. Other specific street furniture has been nominated in this report to facilitate 'over-sailed' and 'swept' areas.

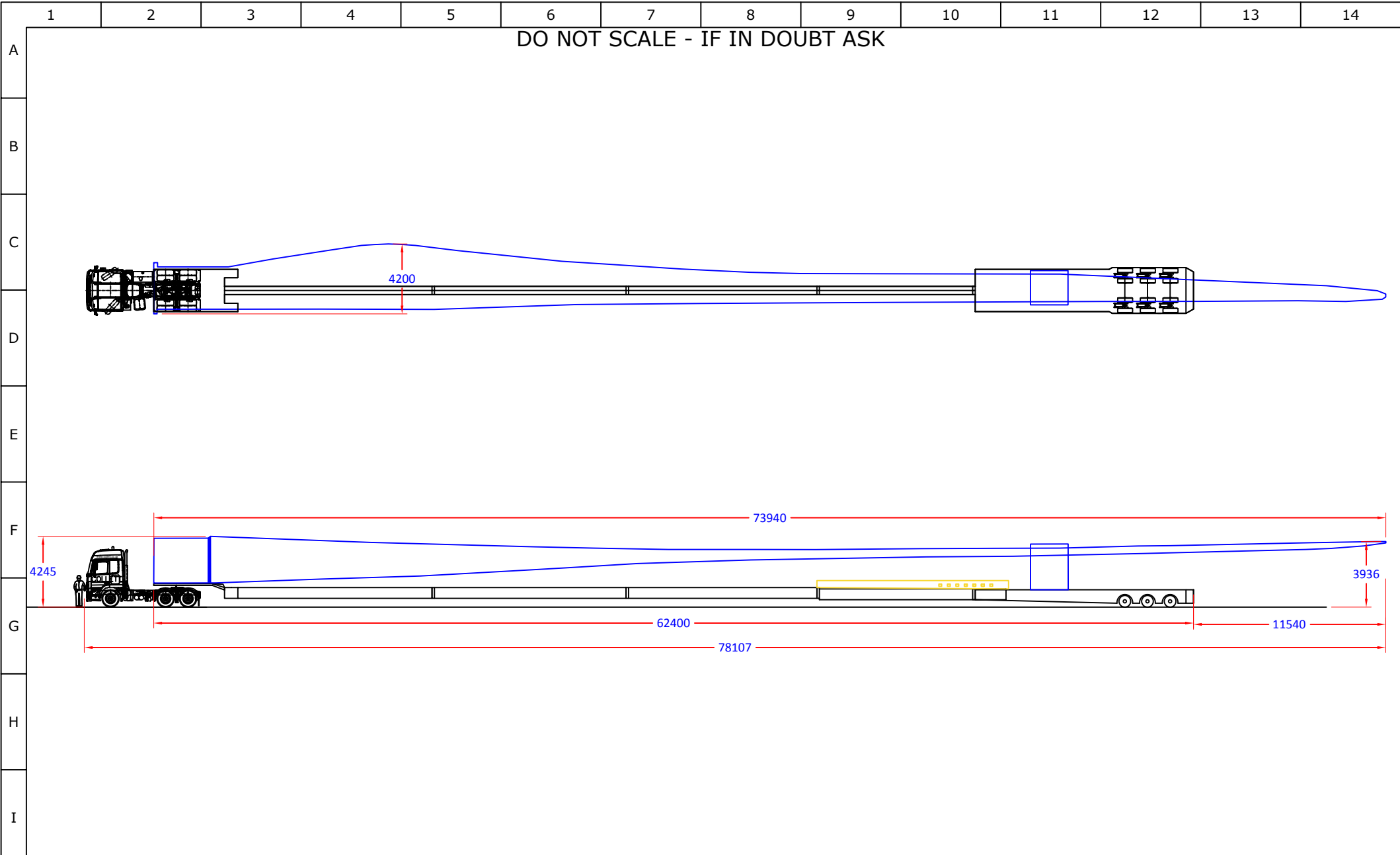
6. Important Notes

- 6.1. The recommendations in this report are made from a purely transport orientated view, and do not consider any political issues in terms of land ownership, or any other precincts raised that may otherwise be restrictive.
- 6.2. The information contained in this report is privileged and confidential and is for the exclusive use of the client nominated herein.
- 6.3. A Police escort or pilot car will be required for nacelle, towers and blade component trailers in order to assist with traffic control for the entire route surveyed.
- 6.4. Permits will be required for the movement of all of the components. These permits are at the discretion of the Highways Agency (H.A). Therefore, approval of these permits by the H.A are a major consideration before any movements can be undertaken.
- 6.5. It is recommended to have adequate warning signs implemented to warn other road users at critical points.
- 6.6. All hedges, shrubs, bushes, trees and overhanging branches along the nominated routes must be trimmed to allow a minimum envelope on the road as specified in manufacturer's specification.
- 6.7. All street furniture, signage etc. along the nominated route must be removed to allow a minimum envelope on the road as specified in manufacturer's specification. Other specific street furniture has been nominated in this report to facilitate over-sailed and swept areas.
- 6.8. The turbine manufactures transport guidance notes will state the minimum road width required for the transport of components. Any roads below this stated width will require widening to reflect this.
- 6.9. In areas where land take or road widening is required, the road construction must be formed to the minimum specification suitable for the transfer of axle loadings up to 16Te, the road construction must be formed to the minimum specification contained in the selected manufacturers transport and erection guidance notes.
- 6.10. The maximum gross vehicle weight anticipated for a 50m diameter rotor turbine could be the tower section at over 65Te. Therefore, a full Route Access Survey (RAS) is recommended, in order to determine the

acceptability of gross vehicle weights and axle loading issues, for bridges, culverts and structures for the entire route, the results of which have not been applied for in terms of the depth and level of reporting required for this report.

- 6.11.** It should be noted that all assessments and inspections have been done so with the intention of producing information to highlight anticipated problems. This includes highlighting of potential land take requirements, possible street furniture implications, and highway alignment issues.
- 6.12.** Land take is usually referred to when land is required from private land owners; road widening is usually referred to when land is required within highways boundaries. However the details of the nominated land take and road widening contained in this report are highlighting the expected areas of concern, and can only be confirmed by swept path analysis. The boundaries between private land and highways property are assumed by using obvious demarcation such as fence lines/hedges etc. It should be noted that actual boundaries between highways and private land are not substantiated in this report and can only be authenticated by carrying out land searches.
- 6.13.** All inspections and assessments are made for the road movement of loaded trailer equipment carrying Turbine components. These dimensions are based on the turning circles and specification of Collett & Sons trailer equipment.
- 6.14.** All route inspections and assessments, and subsequent conclusions and recommendations are deemed accurate by Collett & Sons Limited at the date that this report is created. We cannot be held responsible for the development of future road schemes or alterations to the routes surveyed that may leave this report inaccurate.
- 6.15.** This report is based solely on a preliminary visual inspection. Nothing in this report shall be construed in any way as committing Collett & Sons Limited to being able to deliver turbines to site using this route before a test drive has been undertaken, and any accommodation/remedial works undertaken which are to Collett & Sons satisfaction.

APPENDIX 1 – LOADED COMPONENT DRAWINGS



COLLETT
EXPERTS IN MOTION

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DRAWN		J.HALSTEAD		TITLE		VESTAS V150 - BLADE	
DATE		15/05/2019		SITE		STORNOWAY WIND FARM	
SCALE		1:300		SIZE		A4	
CUSTOMER		EDF ENERGY RENEWABLES		DRG No.		323500 - A	