



Pennant Walters Limited

Mynydd Y Glyn Wind Farm

Draft Environmental Statement

Appendix 12A: Abnormal Indivisible Load (AIL) Access Study



This report was prepared by WSP Environment & Infrastructure Solutions UK Limited (formerly known as Wood Environment & Infrastructure Solutions UK Limited), company registration number 02190074, which is carrying out these services as a subcontractor and/or agent to Wood Group UK Limited

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Report for

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1. Introduction

1.1 Preface

- 1.1.1 WSP Environment and Infrastructure Solutions UK Ltd (WSP E&IS)¹ has been commissioned by Pennant Walters Limited ('the Applicant') to undertake an Abnormal Indivisible Load (AIL) access study for the delivery of AILs associated with Mynydd y Glyn Wind Farm, also referred to as 'the Proposed Development'.
- 1.1.2 The Proposed Development comprises up to 7 wind turbines and all on-site infrastructure required to transmit the power generated by the turbines to the national grid network.

1.2 Purpose of Report

- 1.2.1 The purpose of the report is to provide an assessment of the feasibility of the delivery of AILs to the Proposed Development from the port of origin. The assessment is based on detailed vehicle swept path analysis (SPA) using computer software AutoTrack, SPA has been undertaken of the delivery of AILs between the M4 and the Proposed Development's new construction vehicle access off the A4233 Trebanog Road.
- 1.2.2 Several AIL components (nacelle, hub, tower and blade) will need to be delivered to the Site. For the purpose of this study, the blade is assumed as the worst-case AIL. A transporter (rear steer) with a 70m turbine blade (V150 Vestas model²) has been considered to assess the feasibility of the preferred route. SPA of the pinch points along the preferred route have been included within this report.
- 1.2.3 In summary this report provides information on the following items:
- transfer vehicle and AIL specifications;
 - transfer routes considered within this assessment; and
 - next steps.
- 1.2.4 This is a dynamic document and will continue to be updated as the project develops.

1.3 Study Approach

- 1.3.1 A desktop review has been undertaken to identify potential routes from Swansea port to the Proposed Development. On these routes, both horizontal and vertical clearance for the AIL and delivery vehicle was considered. Aspects such as bridge headroom, road width, load, and weight restrictions which are known and considered to be a constraint to AIL deliveries have been marked as pinch points. No site visit has been undertaken as part of this review.
- 1.3.2 On identified pinch points, SPA has been performed to assess the impact of AIL deliveries on the existing road infrastructure and third-party land. Based on the SPAs, potential mitigation works have been identified.

¹ Previously Wood Environment and Infrastructure

1.4 Report Structure

1.4.1 The scope of this study is structured as follows:

- **Chapter 2 Site Context and AIL Transfer Vehicles Specifications:** provides the site location and context, identifies the proposed transport vehicle for the blade, along with details on axle spacing/loading;
- **Chapter 3 Legislative and Procedural Guidelines:** provides an overview of the relevant guidance and procedural documentation used to determine the category of AIL vehicle and respective requirements concerning notification procedures, speed limits and escorts;
- **Chapter 4 Route Options:** provides an outline of the port of entry and identified routes along the strategic, regional, and local road network to the Proposed Development;
- **Chapter 5 Route Options Appraisal:** provides an assessment of the route options, identifying pinch points, constraints, and potential mitigation requirements;
- **Chapter 6 Management Strategy:** details the general arrangement measures that will be adhered to during the transfer of AILs; and
- **Chapter 7 Summary:** provides a summary of the route options identified.

1.4.2 All information presented within this assessment, including the AIL and vehicle specifications, is based on the best available information at this time and may be subject to change following the appointment of a haulage contractor. This assessment does however represent a 'worst case' scenario, meaning any change to the AIL/vehicle specification should not cause any issues at a later stage.

1.4.3 Any intended changes will be forwarded to the relevant highway authorities for consideration.

2. Site Context and AIL Transfer Vehicles Specifications

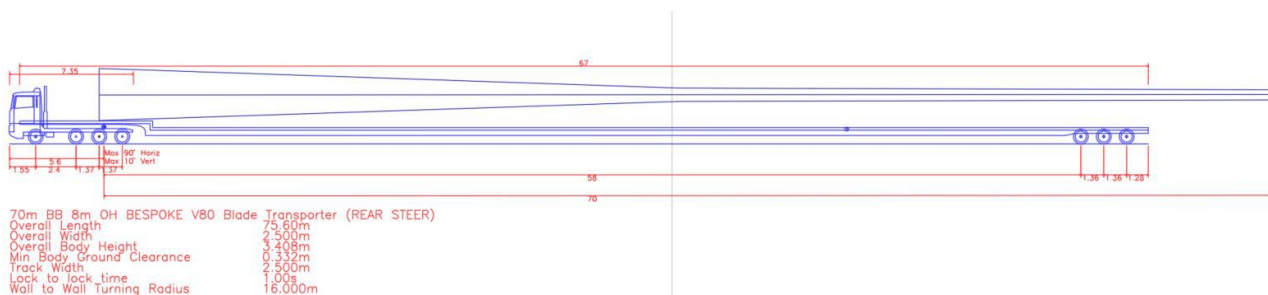
2.1 Site Context

- 2.1.1 The Proposed Development Site for the wind farm and Grid Connection corridor lie within the Rhondda Cynon Taf County Borough Council (RCTCBC) administrative area and is located approximately 600m from the southern edge of the town of Porth.
- 2.1.2 The Site is situated within the Rhondda Valley and consists of upland habitat, the majority of which has been improved for agricultural grazing and is controlled by two landowners. Parts of the site are within a Site of Importance for Nature Conservation (SINC), designated in the Rhondda Cynon Taf Local Development Plan.
- 2.1.3 The Site lies within Mynydd y Glyn and Nant Muchudd Basin Special Landscape Area (SLA), partially within Rhondda Historic Landscape Area, and approximately 15km from the Brecon Beacons National Park. The Site is located on an upland plateau with steep sloping sides, 3km west of Pontypridd. It is approximately 182 hectares, predominantly grassland used for grazing. The nearest settlements are Porth, Trebanog, Tonyrefail and Trehafod.

2.2 AIL Transfer Vehicles Specifications

- 2.2.1 The type of transfer vehicle being considered in this assessment is a 70m blade transporter with rear steer. The vehicle configuration used to transfer the blade will ultimately be decided by the appointed haulier, however, the configurations selected are a robust representation for the purposes of this assessment.
- 2.2.2 Confirmation/guidance would be sought from the appointed haulier during a trial run later once known. Figure 2.1 illustrates the dimensions of vehicle with load and Table 2.1 summarises the vehicle specification.

Figure 2.1 Blade Transporter Vehicle Specification



Source: Autodesk Vehicle Tracking, 2019

Table 2.1 Blade Transporter Details

Parameter	Measurement (vehicle and AIL)
Overall Length	75.60m
Overall Width	2.50m
Overall Body Height	3.408m
Min Body Ground Clearance	0.332m
Track Width	2.50m
Lock to lock time	1.00s
Wall to Wall Turning Radius	16.00m
Tractor	
Type:	Tractor (with driver-controlled steering)
Body style:	Articulated Vehicle Tractor (Medium)
Classification	Autodesk
Datum:	Front Primary Axle
Front Axle(s):	1 Ackerman (axles fixed, wheels turn)
Primary Front Axle Offset:	0.000m
Effective Front Axle Offset:	0.000m (Auto Calculated)
Maximum Wheel Angle:	45.000deg (Any Front Wheel)
Status:	Active Non Self-Steered
Track Width:	2.500m
Total Wheels:	2 (positioned at the ends of the axle)
Tyre Width:	0.250m (Auto Calculated - proportion of Track Width)
Tyre Diameter:	0.875m (Auto Calculated - proportion of Track Width)
Rear Axle(s):	3 Fixed (All axles identical)
Primary Rear Axle Offset:	2.400m (Innermost Axle behind Front Primary Axle)
Effective Rear Axle Offset:	3.770m (Auto Calculated)
Maximum Wheel Angle:	Unlimited

Parameter	Measurement (vehicle and AIL)
Rear Axle Spacing:	1.370m
Status:	Active Non Self-Steered
Track Width:	2.500m
Total Wheels:	4 (positioned at the ends of the axle)
Tyre Width:	0.250m (Auto Calculated - proportion of Track Width)
Tyre Diameter:	0.875m (Auto Calculated - proportion of Track Width)
Steering: Front Axle(s):	
Minimum Wall / Wall Turning Radius:	16.000m (based upon body only)
Calculated Maximum Wheel Angle:	16.500deg
Lock to Lock Time (Fwd/Rev):	1.0sec / 1.0sec Driver / Pilot
Driver Offset Longitudinally:	-0.050m (in front of Front Primary Axle)
Driver / Pilot Offset Laterally:	-0.600m (Right of Centreline)
Driver Height:	2.600m (Above ground level)
Front coupling:	None
Rear coupling:	Generic
Coupling Offset:	4.050m (behind Front Primary Axle)
Coupling Height:	1.000m
Capability:	Can tow or be towed Max.
Horizontal Articulation Angle:	90.000deg
Max. Vertical Articulation Angle:	10.000deg
Blade Transporter (REAR STEER) Trailer	
Type:	Trailer (no driver-controlled steering)
Body style:	Low Loader Trailer
Classification	(Unspecified)
Datum:	Front coupling
Maximum Articulation Angle:	90deg (to previous unit)
Front Axle(s):	None
Rear Axle(s):	3 Tandem bogies (multiple pivots) (All axles identical)

Parameter	Measurement (vehicle and AIL)
Primary Rear Axle Offset:	62.000m (Innermost Axle behind Front coupling)
Effective Rear Axle Offset:	64.720m (Auto Calculated)
Maximum Wheel Angle:	30.000deg (Any Rear Wheel)
Rear Axle Spacing:	1.360m
Linkage:	Rear axles linked to front axles Basis
Angle of rear wheels	
Rule 1:	Forwards and reverse from 0.00deg, 100.00 based upon Straights
Status:	Active Non-Self-Steered
Track Width:	2.500m
Total Wheels:	4 (positioned at the ends of the axle)
Tyre Width:	0.250m (Auto Calculated - proportion of Track Width)
Tyre Diameter:	0.875m (Auto Calculated - proportion of Track Width)
Front coupling:	Generic
Coupling Offset:	0.000m (in front of Front coupling)
Coupling Height:	0.438m (Auto Calculated - proportion of Tyre Diameter)
Capability:	Can tow or be towed Max. Horizontal
Articulation Angle:	90.000deg
Max. Vertical Articulation Angle:	10.000deg
Rear coupling	Generic
Coupling Offset:	48.100m (behind Front coupling)
Coupling Height:	0.875m (Auto Calculated - proportion of Tyre Diameter)
Capability:	Can tow or be towed Max. Horizontal Articulation
Angle:	90.000deg
Max. Vertical Articulation Angle:	10.000deg

3. Legislative and Procedural Guidelines

3.1 Introduction

- 3.1.1 An AIL is a type of load that cannot be divided into two or more loads for transportation by road. The vehicle and its load is classed as an abnormal load when it has:
- a weight of more than 44,000kg;
 - an axle load of more than 10,000kg for a single non-driving axle and 11,500kg for a single driving axle;
 - a width of more than 2.9 metres; and
 - a rigid length of more than 18.65 metres.
- 3.1.2 The Road Vehicles (Construction & Use) Regulations 1986 (C&U) describes the different types and classification of permitted vehicles for use on the road, for example motor cars, motorbikes, buses, lorries, mobile cranes, and tracked vehicles. It also states the maximum dimensions for each type of vehicle, its gross weight, number of axles, braking system, type of tyres, maximum speed, exhaust system and mirrors.
- 3.1.3 The Road Vehicles (Authorised Weight) Regulations 1998 (AW) details the imposed maximum weight (gross and per axle) of different types of vehicles relating to the number of axles within each category of vehicle.
- 3.1.4 Vehicles not conforming to the Regulations specified above are subject to those outlined within Road Vehicles (Authorisation of Special Types) (General) Order 2003 (STGO). It specifies when the Police, Roads Authority or Secretary of State is to be notified of an intended vehicle movement, and the number of days' notice required before the movement takes place.
- 3.1.5 Section 3.3 and the accompanying tables shows how the legislative and procedural guidelines applies to the Proposed Development and deliveries of AILs.

3.2 Special Types General Order (STGO) – Abnormal Indivisible Load Regulations

- 3.2.1 An AIL transport vehicle which does not comply with the Road Vehicles (Authorisation of Special Types) (General) Order 2003 (STGO) would require a special order issued by:
- South Wales Trunk Road Agent (SWTRA) or National Highways on abnormal loads not covered by C&U and STGO; or
 - the Vehicle Certification Agency (VCA) on special vehicles and divisible loads outside the scope of C&U and STGO.
- 3.2.2 In addition to the above, hauliers are generally advised to inform statutory authorities if total vehicle heights are likely to exceed 5.0m (although it should be noted that there is no legal height restriction).
- 3.2.3 STGO vehicles are further categorised into three weight categories, as follows:

- Category 1 - Maximum Gross Weight: 50,000 kg, C&U Regulation axle limit (46,000 kg if the combination has less than 6 axles and does not comply in all other respects with the Authorised Weight Regulations);
- Category 2 - Maximum Gross Weight: 80,000 kg, 12,500 kg axle limit; and
- Category 3 - Maximum Gross Weight: 150,000 kg, 16,000 kg axle limit.

3.2.4 For all categories, the following advice is provided with regards to width:

- a vehicle, locomotive or trailer may be up to 3.0m wide and subject to certain qualifications, this limit may be exceeded if it is necessary for the safe carriage of the load.
- loads wider than 5m can only be conveyed if authorised by special order (the VR1 procedure under STGO). The VR1 must be carried on the vehicle and at least 10 days notification is required prior to the movement date; and
- the load cannot exceed 6.1m width under STGO Regulations.

3.2.5 For all categories, the following advice is provided with regards to length:

- the overall length of the vehicle(s) and load may be up to 30m, or greater if authorised by special order from the Secretary of State (SOS). In any combination of vehicles on which a load rests, including any articulated vehicle, the 30m does not include the length of the drawing vehicle; and
- an articulated vehicle or trailer, which is abnormal only in respect of length for carrying indivisible loads of exceptional length, can operate under normal C&U Regulations.

3.2.6 With regards to speeds, those that apply to each of the weight categories are set out in **Table 3.1**.

Table 3.1 Speed Restrictions

	Motorways	Dual Carriageways	Other
Category 1	60mph	50mph	40mph
Category 2	40mph	35mph	35mph
Category 3	40mph	35mph	30mph

Source: Drivers and Vehicle Standards Agency, 2018³

3.2.7 It should be noted that although the speeds referenced above are the legal limits, the actual achievable speed of the vehicle configuration may be lower.

3.3 Welsh Government Procedure and Advice Guidance (PAG)

3.3.1 The Welsh Government Procedure and Advice Guidance (PAG) – ‘Pulling Together’ Best Practice for Transporting Abnormal Loads in Wales, defines the statutory process for planning and organising safe and effective abnormal load movements in agreement with all

³ Drivers and Vehicles Standards Agency, 2018. Special types enforcement guide (Online) Available at: <https://www.gov.uk/government/publications/special-types-enforcement-guide/special-types-enforcement-guide> (Accessed April 2022).

relevant authorities and organisations. **Table 3.2** and **Table 3.3** provide the abnormal load legal categorisation and the actions required depending on the vehicle and load width, length and weight. The highlighted row and column in the following tables represents the category of the proposed AIL delivery.

Table 3.2 Abnormal load legal category by size/weight combination

Gross weight	Axle weight	Load Dimensions				
		W <=2.9m L <=18.65m	W >2.9m L >18.65m	W >4.3m L >27.4m	W >5m L >27.4m	W >6.1m L >30m
<=44,000kg	<=11,500kg	C&U	C&U	STGO Category 1	STGO Category 1	Special Order
>44,000kg	<=11,500kg	STGO Category 1	STGO Category 1	STGO Category 1	STGO Category 1	Special Order
>50,000kg	>11,500	STGO Category 2	STGO Category 2	STGO Category 2	STGO Category 2	Special Order
>80,000kg	>12,500	STGO Category 3	STGO Category 3	STGO Category 3	STGO Category 3	Special Order
>150,000kg	>16,500kg	Special Order	Special Order	Special Order	Special Order	Special Order

Key: = Abnormal load legislation

Table 2.3 Pre-journey notification requirements by abnormal load category

Gross weight	Axle weight	Load Dimensions				
		W <=2.9m L <=18.65m	W >2.9m L >18.65m	W >4.3m L >27.4m	W >5m L >27.4m	W >6.1m L >30m
<=44,000kg	<=11,500kg	N/A	Police – 2d			
>44,000kg	<=11,500kg	HA&BO – 2d	Police – 2d HA&BO – 2d		Police – 2d HA&BO – 2d NH – 2w	
>50,000kg	>11,500		Police – 2d HA&BO – 2d			
>80,000kg	>12,500		Police – 2d HA&BO – 5d		Police – 2d HA&BO – 5d NH – 2w	
>150,000kg	>16,500kg					Police – 5d HA&BO – 5d NH – 10w

Key: = Abnormal Load legislation = VR1 form notice = C&U
 = STGO C1 = STGO C2 = STGO C3 = Special Order
 HA&BO = Highway Authority and other Bridge Owners NH = National Highways

3.3.2 **Table 3.2** and **Table 3.3** shows that the proposed AIL delivery will require Special Order and will need to comply with pre-journey notification requirements.

Special Orders

3.3.3 To apply for a VSO, the following information will need to be supplied to the Department for Transport (DfT):

- name and address of person/organisation making the application;
- details of persons/organisations who will be using the vehicles, if different from the previous;
- the number of vehicles involved;
- type of vehicles involved, their make, model, registration, and/or chassis (serial) numbers of motor vehicles or trailers. These will be listed on any order issued;
- details of the vehicles e.g., number of axles, individual axle weights, and gross vehicle weights (both in kg), plus dimensions (in m);
- in the case of vehicle combinations, overall weights (in kg) and dimensions (in m); and
- details of the C&U Regulations with which the vehicles do not comply and the reasons why they cannot comply: The Regulations are specified on the VSO, and it should be made clear that failure to comply with non-specified Regulations or supplying incorrect data would invalidate the VSO.

3.3.4 On receipt of the application, the Vehicle Certification Agency (VCA) will evaluate the application and contact the applicant should further information be required. Various organisations including the Police, Local Authorities, and other interested parties, both within and outside of the DfT may be consulted; especially in respect of the conditions to be imposed. Following receipt of all information, and assuming that there are no technical reasons or objections from any of the parties consulted, the VSO will be prepared and dispatched by email within 10 working days.

3.3.5 VSOs are issued for varying periods of time at the discretion of the DfT. Typically, they are issued for a period of up to five years. The following sets out the speed limits of VSO loads:

- articulated vehicles weighing between 150 and 250 tonnes: 25 mph;
- draw-bar Trailer vehicles weighing between 150 and 250 tonnes: 20 mph;
- girder frame trailers: 12 mph; and
- girder frame trailers: 12 mph.

Notification Requirements

3.3.6 The pre-journey notification requirement will be five days prior notice to the Police, Highway Authorities and Bridge Owners such as Network Rail, whereas it is ten weeks to National Highways.

- 3.3.7 The SWTRA preferred method of receiving notifications is on the Electronic Service Delivery for Abnormal Loads (ESDAL) website⁴.
- 3.3.8 Gwent Police, South Wales Police and Dyfed Powys Police are the police forces to be notified before the journey is made.

3.4 Guidance on the movement of Abnormal Indivisible Loads (APCO 2010)

- 3.4.1 Guidance on the movement of Abnormal Indivisible Loads (ACPO 2010) has been issued by the Association of Chief Police Officer (ACPO) of England, Wales & Northern Ireland and sets the general rules for escorting abnormal loads on roads in England, Wales and Northern Ireland.
- 3.4.2 The purpose of this document is to assist individual Constabularies concerning the movement of abnormal loads.
- 3.4.3 Section 2.14 of the ACPO (2010) states that:
- “An escort or escort vehicle is not defined in legislation and there is no legal requirement for any abnormal loads to be escorted. There is however a requirement for loads of certain dimensions to have an attendant. SOS (2003) permits the attendant to be in an accompanying vehicle, which may for practical purposes be considered an ‘Escort Vehicle’”.*
- 3.4.4 Section 2.16 of the ACPO (2010) lists the dimensions of vehicles that are currently self or privately escorted as follows:
- Motorways:
 - ▶ width over 4.6m wide;
 - ▶ weight over 130tonnes; and
 - ▶ length no overall policy (load, route and dimensions considered).
 - All other roads:
 - ▶ width over 4.1m wide;
 - ▶ weight over 100tonnes; and
 - ▶ length over 27.4m rigid length.
- 3.4.5 These dimensions are a general guide and police officers retain the right to vary them as considered necessary.
- 3.4.6 Where there is a requirement to stop or control traffic for the purposes of undertaking a specific manoeuvre, Sections 2.21 and 2.22 of the ACPO (2010) state:
- “An escort driver or any other person or attendant to the abnormal load does not have any legislative powers to stop and control other road users. A Police authority will not accredit an escort driver or any other person with powers to stop and control traffic to facilitate the movement of an abnormal load.*

⁴ Traffic Wales (2022). SWTRA street works and abnormal loads | Traffic Wales. (Online) Available at: <https://traffic.wales/swtra-street-works-and-abnormal-loads?msclkid=04e89b78add511ecac1b83cef40903fa> (Accessed 15 March 2022).

The appointed haulier will, therefore, confirm the above with all relevant Police Constabularies prior to transfer.”

- 3.4.7 In accordance with the above, where the stopping of traffic or other road is required, a Police escort will be utilised. In all other instances, self/private escort will be utilised.

4. Route Option(s)

4.1 Introduction

- 4.1.1 This section describes the approach undertaken to identify potential routes to transport wind turbine blades from Swansea Docks (the port of entry) to the Proposed Development. Routes have been assessed against the type of road, horizontal alignment, settlement patterns, and available height and weight restrictions in order to identify pinch points.
- 4.1.2 A 'pinch point' is defined as a location where constraints relating to each of the design characteristics referenced below are likely to prevent or significantly impede abnormal load access.
- horizontal road alignment.
 - vertical road alignment; and
 - weight/height restrictions.

4.2 Assessment Approach

- 4.2.1 Potential AIL delivery route to the Proposed Development were identified through discussion with the Applicant and desktop analysis of the highway network between Swansea Docks and the Proposed Development.
- 4.2.2 A desktop assessment has been undertaken using Ordnance Survey (OS) maps, Google Earth Pro, Google Street View and Google Maps and has considered road type, horizontal and vertical alignment, settlement patterns and available height and weight restrictions.
- 4.2.3 The preferred route has been selected based on the consideration of the above, in addition to the likelihood of upgrade works and third-party land being required.

4.3 Ports of Entry

- 4.3.1 Best practice guidelines set by SWTRA and National Highways state that, where possible, the nearest port to the proposed development should be used when investigating the transportation of AILs.
- 4.3.2 The Port of Swansea will be used for the delivery of the AILs. The Port of Swansea is one of South Wales's major ports, located in Swansea, the port is well connected to the M4, offering great connectivity to the strategic road network (SRN). It is less than 5 kilometres to junction 42 of the M4.

4.4 Proposed AIL Route

- 4.4.1 **Figure 4.1** illustrates the route option to the Proposed Development that has been considered as part of this assessment. The preferred option that has been identified for the transportation of the wind turbine blades is as follows:
- Routing from the Port of Swansea, accessing the Proposed Development via the M4, A4119 and A4223 (using a newly proposed construction vehicle site access).

Figure 4.1 Selected AIL delivery route for the proposed development



4.5 Strategic Road Network

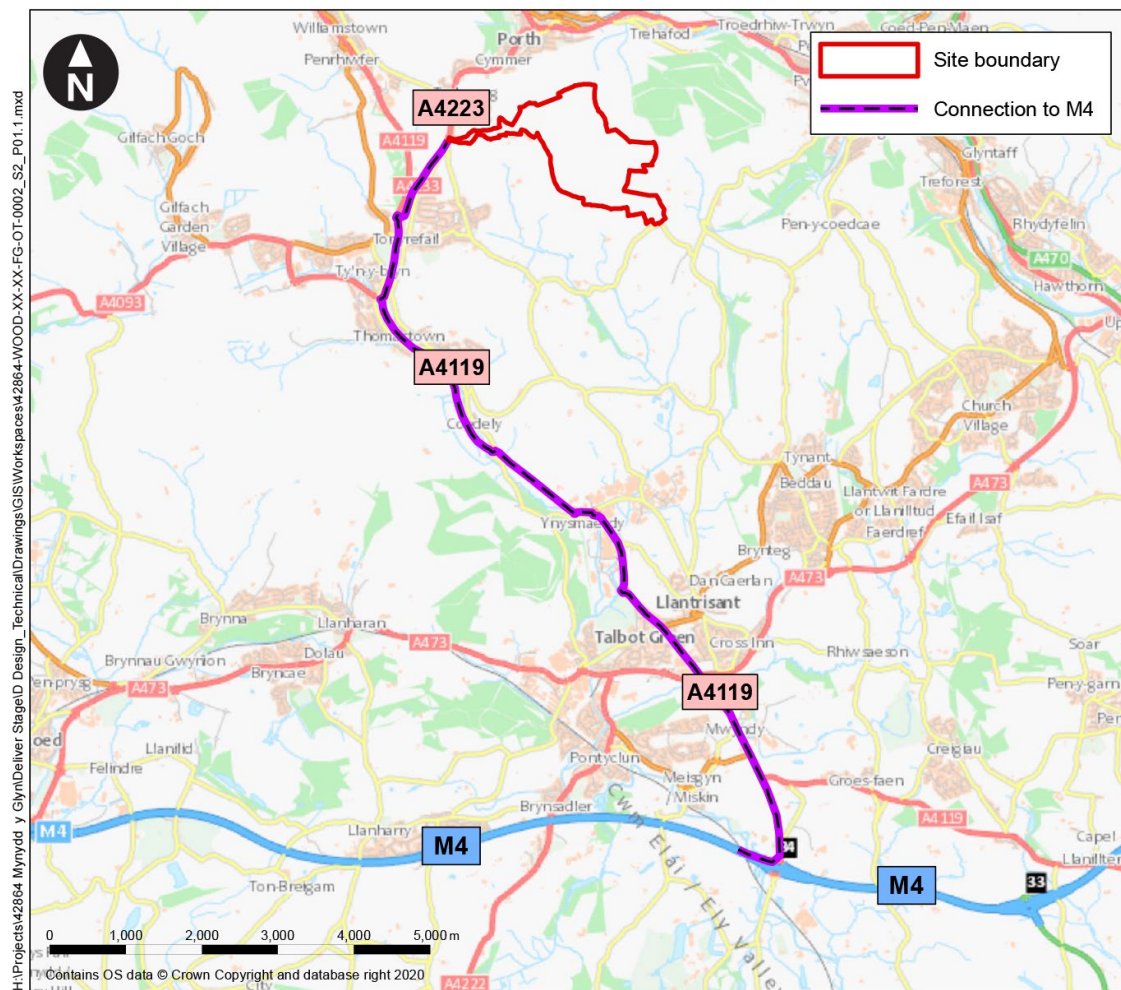
- 4.5.1 The SRN comprises the routes of national strategic importance (motorways and trunk roads), which are operated and maintained by SWTRA.
- 4.5.2 The M4 is the strategic road that will provide the AIL transport route between Swansea Port and the LRN (the M4 / A4119, Junction 34). The M4 is a long-distance route between Swansea and London.

4.6 Local Road Network (LRN)

Description of route

Figure 4.2 illustrates the route to Site from the M4.

Figure 4.2 Selected AIL delivery route from M4 to the Proposed Site Access



A4119

- 4.6.1 The A4119 is a two-lane single carriageway road and provides transition from the A4233 to the M4 to the south. The A4119 routes from the A4233 in the vicinity of Tonyrefail, 1.2km from the Site access after which point it leads southbound for approximately 10.6 km until it reaches the M4 Junction 34 near Miskin. For most of the route the speed limit is the National Speed Limit (NSL (60mph). For sections of the A4119 including Ely Valley Road, parts of this section of the route alternate between the NSL and 40mph.
- 4.6.2 From Trebanog Road/ A4233 there is no footway or pedestrian provision. This continues until Ely Valley Road roundabout where there are footways, dropped kerbs are present at the roundabout however no formal crossings are provided. Along Ely Valley Road there is a narrow footway along one side of the carriageway. Reaching Edwards Business Park roundabout there is pedestrian provision on both sides of the carriageways and refuge islands to assist crossing. To the roundabout north of Talbot Green there is no pedestrian provision. From here heading into Talbot Green Crossroads there are narrow footways either side of the carriageway. The crossing itself is signalised with pedestrian crossing facilities and guardrails. Through Talbot there is minimal provision until the M4 Junction 34 with occasional narrow footways.

A4233

- 4.6.3 The A4233 is a two-lane single carriageway road and provides access to the Site. The A4233 intersects with the A4119 via a roundabout. The A4233 operates at the national speed limit (60mph) but this changes to 30mph approximately 75 metres north of the proposed temporary construction vehicle Site access location. Footways and streetlighting are not present in the vicinity of the Site access.

5. Route Appraisal

5.1 Route Appraisal

- 5.1.1 The following section provides further detail on the preferred route option. This includes identification of the location, obstacle and potential mitigation measures required for the AIL transfer vehicle to safely manoeuvre between the port of origin to the primary access to the proposed development for AILs (A4233/Site Access). Supporting photographic evidence is included within **Annex A**.
- 5.1.2 For the purpose of this assessment, it has been assumed that the AIL would straddle both running lanes on dual carriageway sections.
- 5.1.3 Due to the size and nature of the M4, it is assumed that there are no constraints to impede AILs on the section of the haulage route between Swansea port and the M4 (Newport). Therefore, the route assessment commences from M4 Junction 34.
- 5.1.4 Route: Swansea Docks – Baldwins Crescent – A483 - A483/Ffordd Amazon/Ashleigh Terrace Roundabout - A483- A483/M4 - M4/Miskin Interchange/A4119-A473-A4119 Ely Valley Road- Heol-Y-Sam- A4093- A4233- Site access.

Table 5.1 Route Op Pinchpoint Appraisal

Pinch Point No.	Direction of Travel	Location	Photo Set (Ref No)	Responsible Authority	Issue	Comment
1	Left turn	M4 junction 34/Miskin Interchange /A4119	Photograph 1,2,3	Rhondda Cynon Taf County Borough Council	Central island, splitter island and street furniture constraint	SPA recommended
2	Straight	A4119 / A473 Roundabout	Photograph 4,5,6,7	Rhondda Cynon Taf County Borough Council	Central island, splitter island and street furniture constraint	SPA recommended
3	Right turn	A4119 Ely Valley Road/ unclassified road roundabouts	Photograph 8,9,10,11	Rhondda Cynon Taf County Borough Council	Central island, splitter island and street furniture constraint	SPA recommended
4	Left turn	A4119 Ely Valley Road/Heol-Y-Sam roundabout	Photograph 12,13,14	Rhondda Cynon Taf County	Central island, splitter	SPA recommended

Pinch Point No.	Direction of Travel	Location	Photo Set (Ref No)	Responsible Authority	Issue	Comment
				Borough Council	island and street furniture constraint	
5	Straight ahead	A4119 Ely Valley Road	Photograph 15,16,17,18	Rhondda Cynon Taf County Borough Council	Central island, splitter island and street furniture constraint	SPA recommended
6	Straight ahead	A4119 Ely Valley Road	Photograph 19,20,21	Rhondda Cynon Taf County Borough Council	Central island, splitter island and street furniture constraint	SPA recommended
7	Straight ahead	A4119/A4093/Mill Street roundabout	Photograph 22,23,24	Rhondda Cynon Taf County Borough Council	Central island, splitter island and street furniture constraint	SPA recommended
8	Right turn	A4119/A4233 roundabout	Photograph 25,26,27	Rhondda Cynon Taf County Borough Council	Central island, splitter island and street furniture constraint	SPA recommended
9	Right turn	A4233/ Site access	Photograph 28	Rhondda Cynon Taf County Borough Council	Existing access gate	SPA recommended

5.2 Further Assessment of Route

Swept Path Analysis

5.2.1 The detailed SPA results, in the form of the SPA drawings for the 70m wind turbine blade transporter, are presented in **Annex B. Table 5.2** summarises the expected mitigation works.

Table 5.2 Route SPA Summary

Pinch Point No.	Location	Drawing Number/Name	Indicative Works
Pinch Point 1	M4/A4119 Miskin Interchange	42864-WOOD-XX-XX-DR-OT-0005_S0_P01 / Pinch Point 1	Temporary dismantling of signposts and lighting columns is required.
Pinch Point 2	A4119 / A473 Roundabout	42864-WOOD-XX-XX-DR-OT-0006_S0_P01 / Pinch Point 2	Temporary dismantling of traffic signal and signposts, lighting column at the central island is required.
Pinch Point 3	A4119 Ely Valley Road/ unclassified roundabouts	42864-WOOD-XX-XX-DR-OT-0007_S0_P01 / Pinch Point 3	Vegetation trimming at the central island and structure protection at the central island is required. Temporary dismantling of signposts and lighting columns is required.
Pinch Point 4	A4119 Ely Valley Road/Heol-Y-Sam roundabout	42864-WOOD-XX-XX-DR-OT-0008_S0_P01 / Pinch Point 4	Temporary dismantling of signposts and lighting columns is required. Temporary hardstanding area on the central island is required.
Pinch Point 5	A4119 Ely Valley Road	42864-WOOD-XX-XX-DR-OT-0009_S0_P01 / Pinch Point 5	Temporary dismantling of signposts and lighting column is required. Temporary hardstanding area on the central island is required.
Pinch Point 6	A4119 Ely Valley Road	42864-WOOD-XX-XX-DR-OT-0010_S0_P01 / Pinch Point 6	Vegetation trimming at the central island is required. Temporary dismantling of signposts and lighting columns is required.
Pinch Point 7	A4119/A4093/Mill roundabout	42864-WOOD-XX-XX-DR-OT-0011_S0_P01 / Pinch Point 7	Vegetation trimming at the central island is required. Temporary dismantling of sign posts and lighting columns is required. Temporary hardstanding area on the central island is required.
Pinch Point 8	A4119/A4233 roundabout	42864-WOOD-XX-XX-DR-OT-0012_S0_P01 / Pinch Point 8	Vegetation trimming at the central island is required. Temporary dismantling of sign post and lighting column is required. Contra-flow movement around the roundabout is required.
Pinch Point 9	A4233/ Site access	42864-WOOD-XX-XX-DR-OT-	Vegetation clearance is required. Relocation of lighting column is required.

Pinch Point No.	Location	Drawing Number/Name	Indicative Works
		0013_S0_P01 / Pinch Point 12	

5.2.2 During the delivery of AILs rolling roadblocks would be implemented where required.

6. Consultation

- 6.1.1 In terms of AIL delivery route, SWTRA and other relevant highway authorities (Rhondda Cynon Taf County Borough Council) will be consulted before trial run. The wind turbine component supplier and transporter are yet to be identified. The AIL assessment identified temporary mitigation measures were required at a number of junctions. All relevant permits for abnormal load transportation will be arranged prior to commencement of deliveries.
- 6.1.2 A Section 278 Agreement of the Highways Act 1980 will be secured between the relevant local highways authorities and the developer to cover the associated highway works, needed to facilitate the delivery of the abnormal loads. The appropriate officer at each highways authority will be contacted in due course.

7. Management Strategy

7.1 Management Strategy Introduction

- 7.1.1 It is essential that the movements are thoughtfully planned and undertaken to ensure they progress safely on the highway.
- 7.1.2 Those responsible for transporting abnormal loads by road are required by law to plan and execute each movement in agreement with relevant authorities to ensure the incident-free passage of every load from origin to destination.
- 7.1.3 The Welsh Government Procedure and Advice Guidance (PAG) document which aims to summarise the legal process which must be followed in the planning and execution of all abnormal load movements on trunk roads within Wales and to clarify the roles and responsibilities of the various parties involved.
- 7.1.4 There is no legal height limit for vehicles but, wherever possible, the overall height of a vehicle and load should not exceed 4.95m so that the maximum use can be made of the motorway and trunk road network. This will ensure that loads are less than 5.03m in height, which is the minimum maintained headroom requirement on highways in the UK. In addition to the mitigation measures on the route, the following will be undertaken prior to transporting the abnormal load:
- notify South Wales Trunk Road Agent (SWTRA);
 - advance warning to the police (Gwent Police, South Wales Police, Dyfed Powys Police); and
 - advance warning to bridge owner Network Rail at Hardwick Gyratory.
- 7.1.5 A Draft Construction Traffic Management Plan (CTMP) has been prepared separately covering the construction of the proposed development. The Draft CTMP is a working document which sets out the principles by which traffic travelling to the Site should be managed, but it will require final confirmation of its suitability following the appointment of the Principal Contractor and relevant suppliers. The Draft CTMP will be reviewed and updated when necessary to incorporate any comments and additional mitigation measures which may be required to address comments received from key stakeholders in the future.
- 7.1.6 The following sets out the general traffic management strategy that would be employed by the contractor.

7.2 Route Enforcement

- 7.2.1 The AIL route identified in this document will be strictly enforced unless further notification is given. All main and sub-contracting companies involved in the project will be monitored to ensure they follow the correct routes and do not use other 'shortcuts'. The routes will be clearly defined in all sub-contracts and clearly signposted for all drivers to see. Any contractor not adhering to the relevant route guidance will be disciplined. Onsite monitoring and spot checks will assist in this.

7.3 Timing of Movements

7.3.1 Deliveries shall only take place during the hours agreed with the Police and the relevant Highways Authority. Deliveries would be timed to avoid the morning or afternoon school run periods or other predictable peak traffic periods. Deliveries are expected to take place during weekdays, however, if deliveries are required at weekends approval in principle should be sought from the relevant Roads Authority and the Police.

7.4 Escorts

7.4.1 Where applicable, abnormal loads shall all be escorted in accordance with the relevant highway authorities. The escorting will be undertaken by the haulage contractor. Where it has been identified that traffic will need to be temporarily stopped, then a Police escort will be required. Convoys would typically comprise no more than two abnormal vehicles and shall be escorted by Police and/or haulier escort vehicles, as appropriate.

7.5 Temporary Closures and Traffic Regulation Order

7.5.1 At the discretion of the haulage contractor, temporary road closures may be required in order to deliver some of the larger abnormal loads. The haulage contractor will liaise with the local community, businesses and key services to ensure they are fully informed in advance should a road closure scheme be required.

7.5.2 Any required Temporary Traffic Regulation Orders (TTRO) will be obtained prior the transport of the abnormal loads.

7.6 Notification

7.6.1 All key stakeholders, which include the Local and Strategic Highways Authorities, would be notified prior to the movement of any abnormal loads. The appointed haulage contractor will be responsible for notifying the relevant stakeholders.

7.6.2 After the confirmation of haulier appointment and other related information, pre-notifications and consultations where possible will be undertaken.

7.6.3 Notifications will be made using the Electronic Service Delivery for Abnormal Loads (ESDAL)⁵.

7.6.4 VR1 and Special-order movements will take place when an explicit written approval is received as required by legislation.

7.7 Lighting, Signing and Marking

7.7.1 Lighting, signing, and marking will be in accordance with:

- Code of Practice Lighting and Marking for Special Order, VR1, STGO and C&U loads⁶; and

⁵ Department for Transport. (2022). ESDAL abnormal load notification. (Online) Available at: <https://www.gov.uk/esdal-abnormal-load-notification?msclkid=a4d2e08fb40c11ecb535f203205fd1e5> (Accessed 7 October 2022).

⁶ Highways England. (2016). Lighting and marking for abnormal loads vehicles code of practice. (Online) Available at: <https://www.gov.uk/government/publications/lighting-and-marking-for-abnormal-loads-vehicles-code-of-practice> (Accessed 7 October 2022).

- Using abnormally large or heavy vehicles on the road⁷ .

7.8 Public Communication Strategy

- 7.8.1 The delivery of abnormal loads is likely to cause some delay to local road users and, in some cases, restrict access along certain routes. To ensure residents, local business and key services are made aware of such restrictions, the principal contractor will implement a comprehensive communications strategy, which could include, but is not limited to; letter drops, radio spots, notices within local papers, temporary road signage, website updates on a project website and other social media outlets.

⁷ National Highways. (2018). Special types enforcement guide. (Online) Available at: <https://www.gov.uk/government/publications/special-types-enforcement-guide/special-types-enforcement-guide> (Accessed 7 October 2022).

8. Summary

- 8.1.1 The AIL access study indicates that a 70m long turbine blade can be successfully transferred from Swansea port to the Site with the provision of accommodation works to those identified within this study. The report identifies key pinch points along the route, presents the SPA of the pinch points identified and identifies potential mitigation measures. It is also concluded that other AIL components related to the Proposed Development can be transported by providing the suggested mitigation measures, as the blade SPA show a worst-case scenario.
- 8.1.2 The results of the 70m long blade transporter SPA will need to be confirmed by trial run.

Annex A

Photographs to Accompany Table 5.1 and 5.2

Illustrative Figures Of Pinch Point 1
Location : M4 /Miskin Interchange /A4119
Source: Google Earth, Google Street view, 2022



Photograph 1

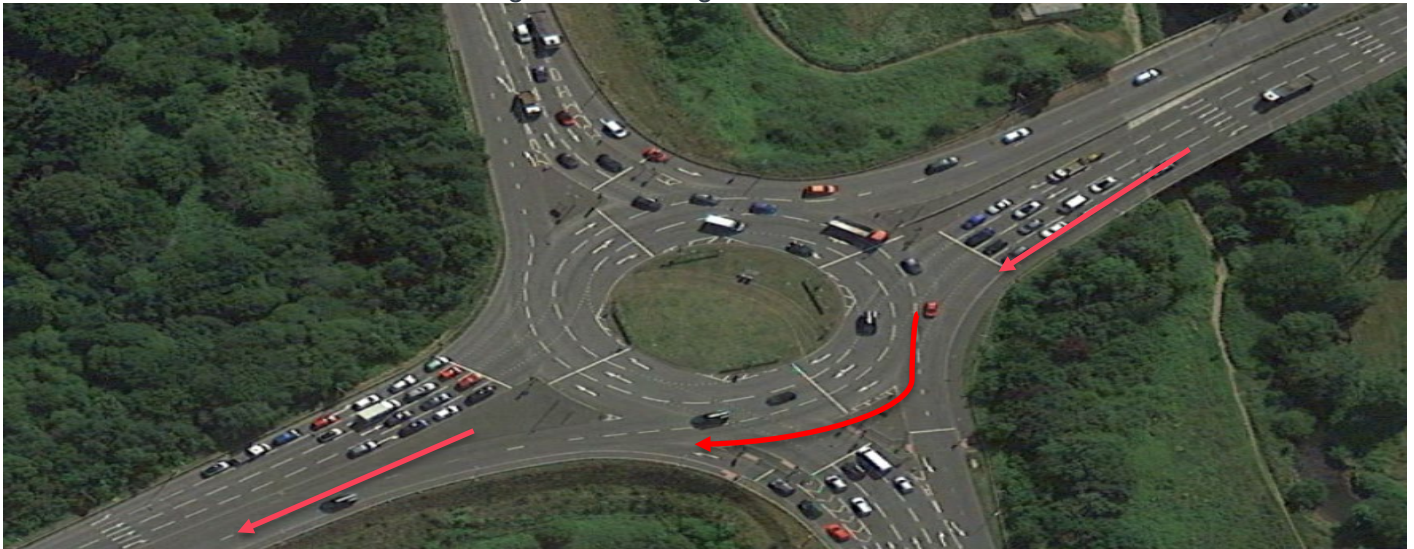


Photograph 2



Photograph 3

Illustrative Figures Of Pinch Point 2
Location : A4119 / A473 Roundabout
Source: Google Earth, Google Street view, 2022



Photograph 4



Photograph 5

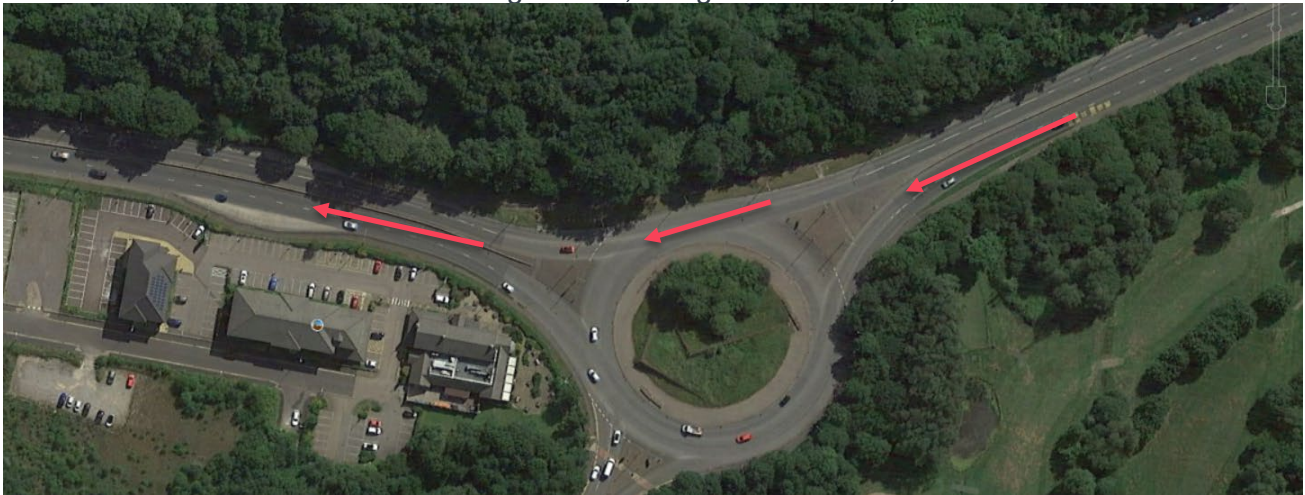


Photograph 6



Photograph 7

Illustrative Figures Of Pinch Point 3
Location : A4119 Ely Valley Road/ unclassified road roundabouts
Source: Google Earth, Google Street view, 2022



Photograph 8



Photograph 9



Photograph 10



Photograph 11

Illustrative Figures Of Pinch Point 4
Location : A4119 Ely Valley Road/Heol-Y-Sam roundabout
Source: Google Earth, Google Street view, 2022



Photograph 12

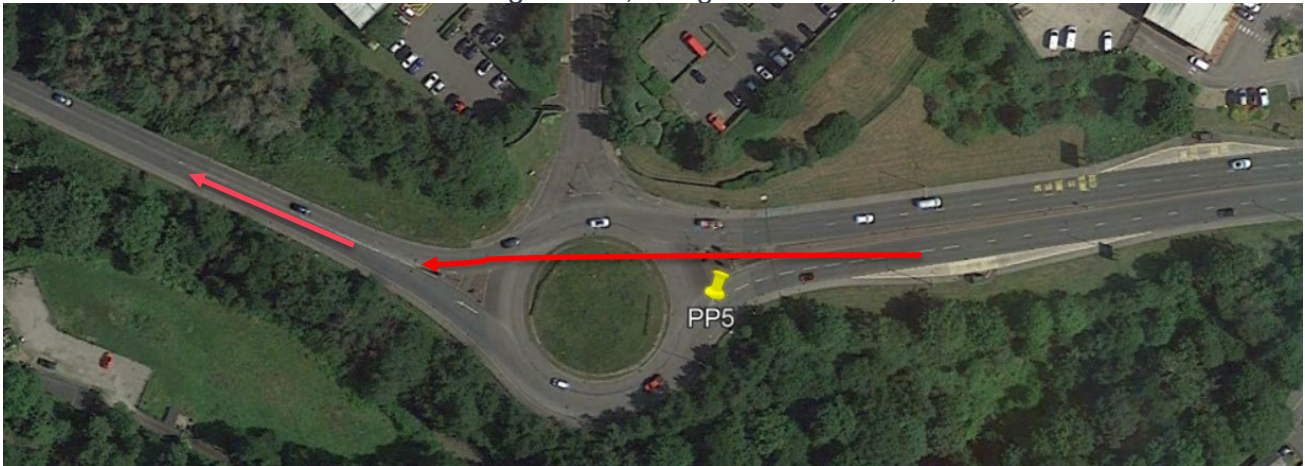


Photograph 13



Photograph 14

Illustrative Figures Of Pinch Point 5
Location : A4119 Ely Valley Road
Source: Google Earth, Google Street view, 2022



Photograph 15



Photograph 16

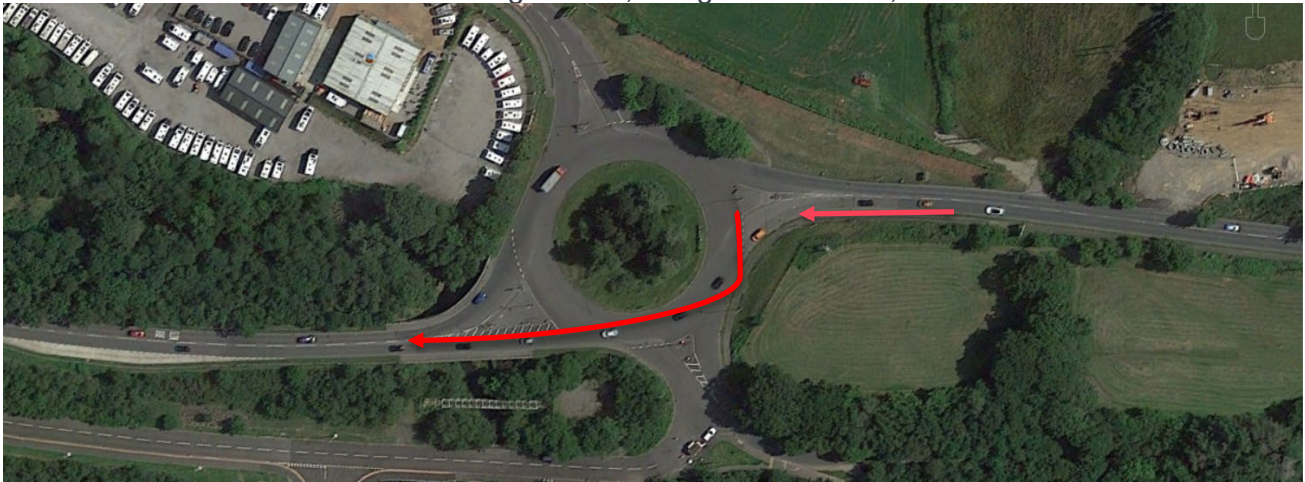


Photograph 17



Photograph 18

Illustrative Figures Of Pinch Point 6
Location : A4119 Ely Valley Road
Source: Google Earth, Google Street view, 2022



Photograph 19

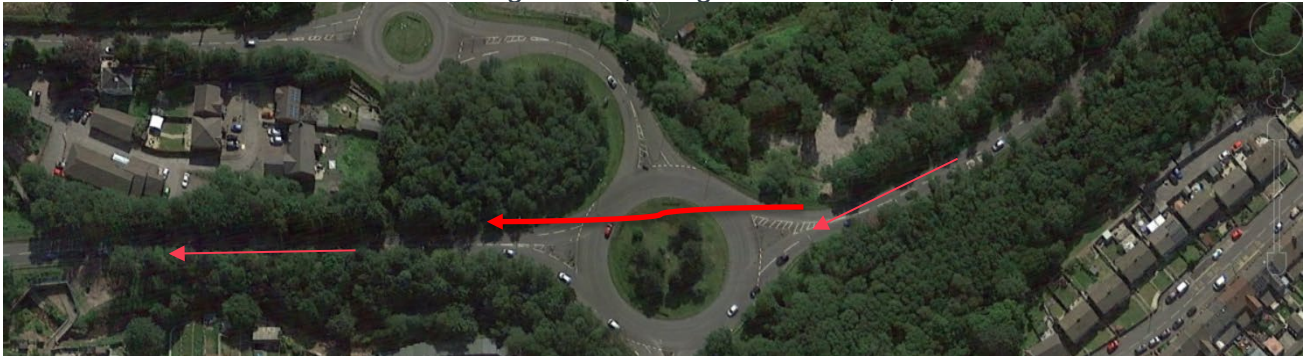


Photograph 20



Photograph 21

Illustrative Figures Of Pinch Point 7
Location : A4119/A4093/Mill Street roundabout
Source: Google Earth, Google Street view, 2022



Photograph 22

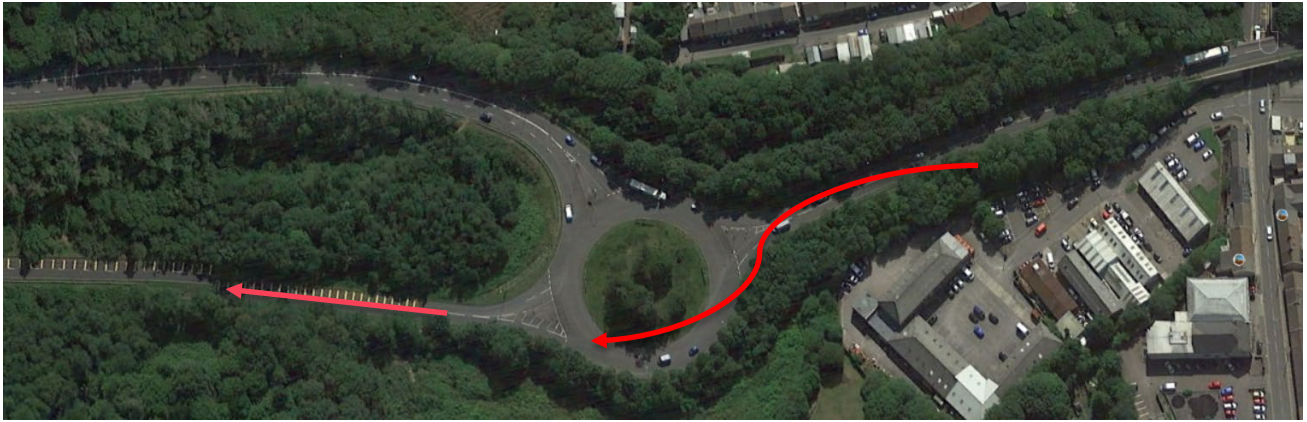


Photograph 23



Photograph 24

Illustrative Figures Of Pinch Point 8
Location : A4119/A4233 roundabout
Source: Google Earth, Google Street view, 2022



Photograph 25



Photograph 26



Photograph 27

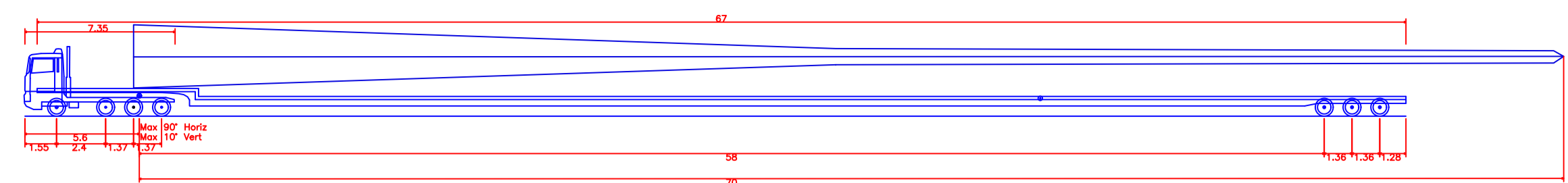
Illustrative Figures Of Site Access
Location : A4233/ Site access
Source: Google Earth, Google Street view, 2022



Photograph 28

Annex B

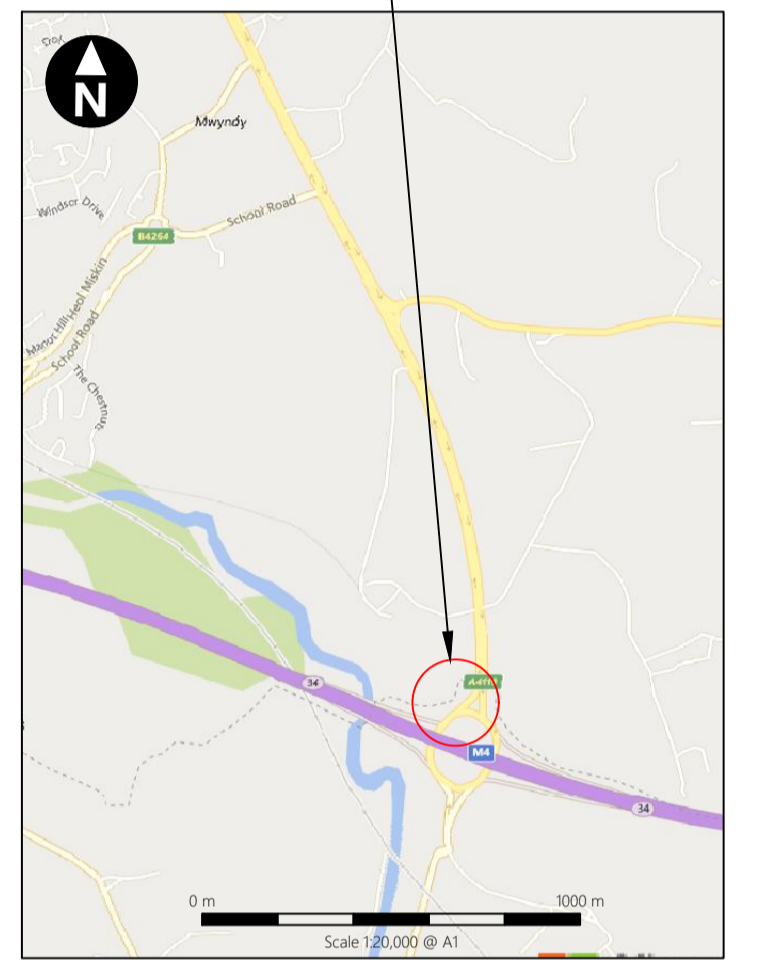
Swept Path Analysis Plans



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- Key
- Indicative location of existing lighting column or traffic sign post
 - Indicative location of existing traffic sign
 - Vehicle body
 - Vehicle wheel track
 - Wind turbine blade outline
 - Temporary hardstanding area

42864-WOOD-XX-XX-DR-OT-0005_S0_P01



P01	19/10/22	First Issue	VS	AG	SE
REV	DATE	REVISION/ISSUE DESCRIPTION	DRN	CHK	APP
DRAWING STATUS					SUITABILITY
Initial Status					S0

SCALE: 1:500 @ A1

PROJECT TITLE
 Mynydd Y Glyn
 Abnormal Indivisible Load (AIL) Access Study

DRAWING TITLE
 Swept Path Analysis
 Pinch Point 1

CLIENT
 Pennant Walters Limited

PROJECT REF. No. 42864



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Body and blade overhang into verge and treeline. Trimming back of vegetation/trees required.

Minor blade overhang over verge. No impact expected.

Temporary dismantling of sign posts is required.

Potential temporary dismantling of sign post.

FF UA Bdy
 Co Const, P Const & C Bdy

Drain

A4119

A4119

M 4

8

7

6

5

4

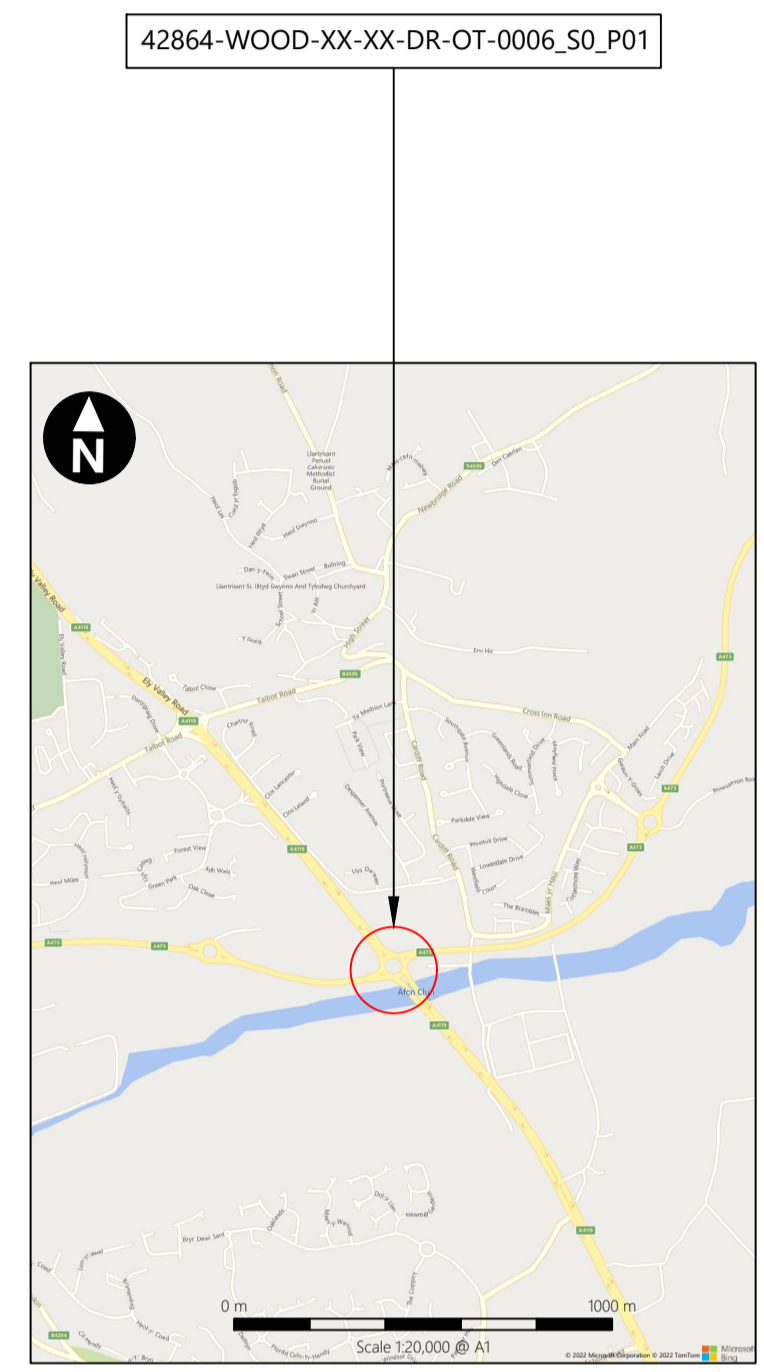
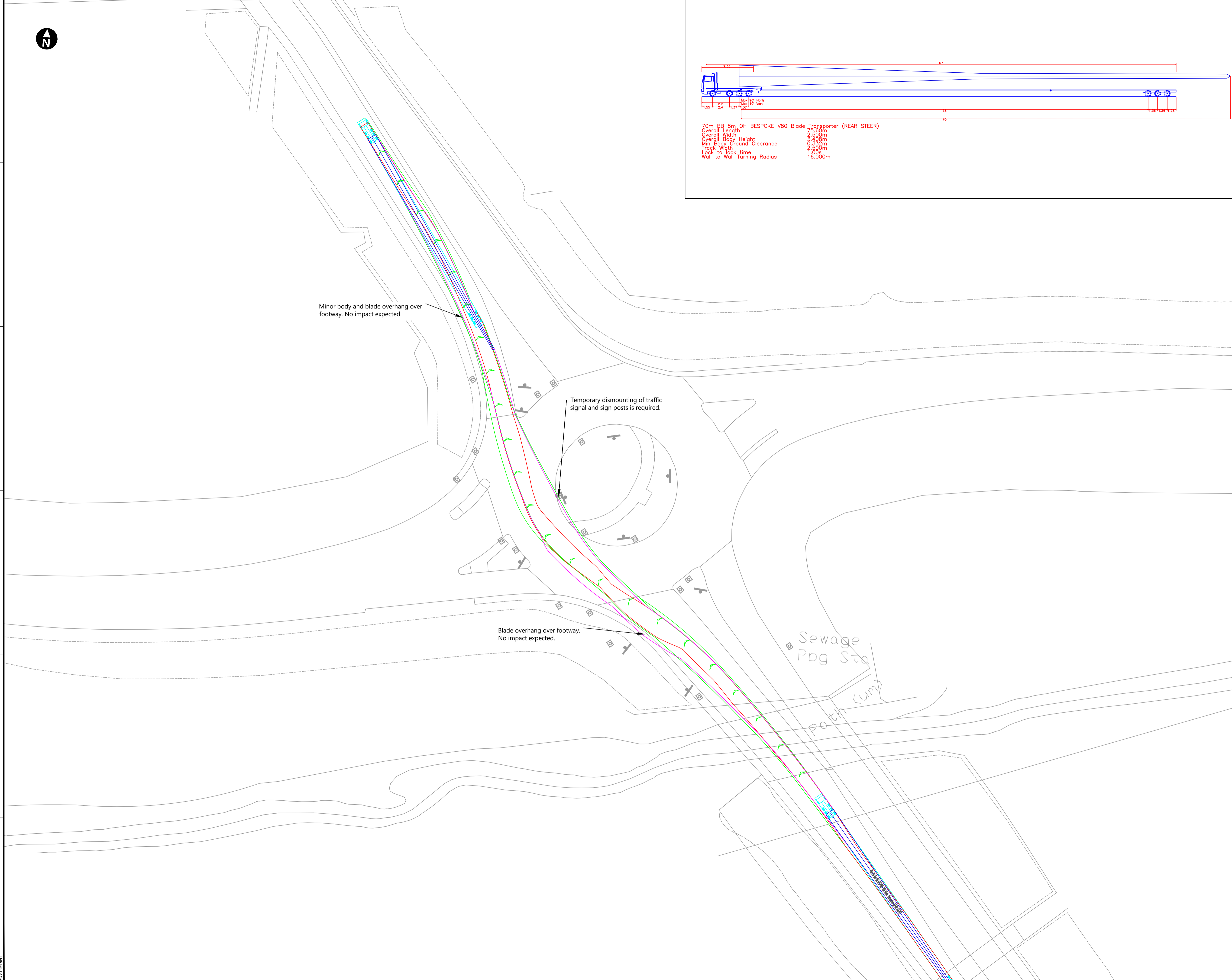
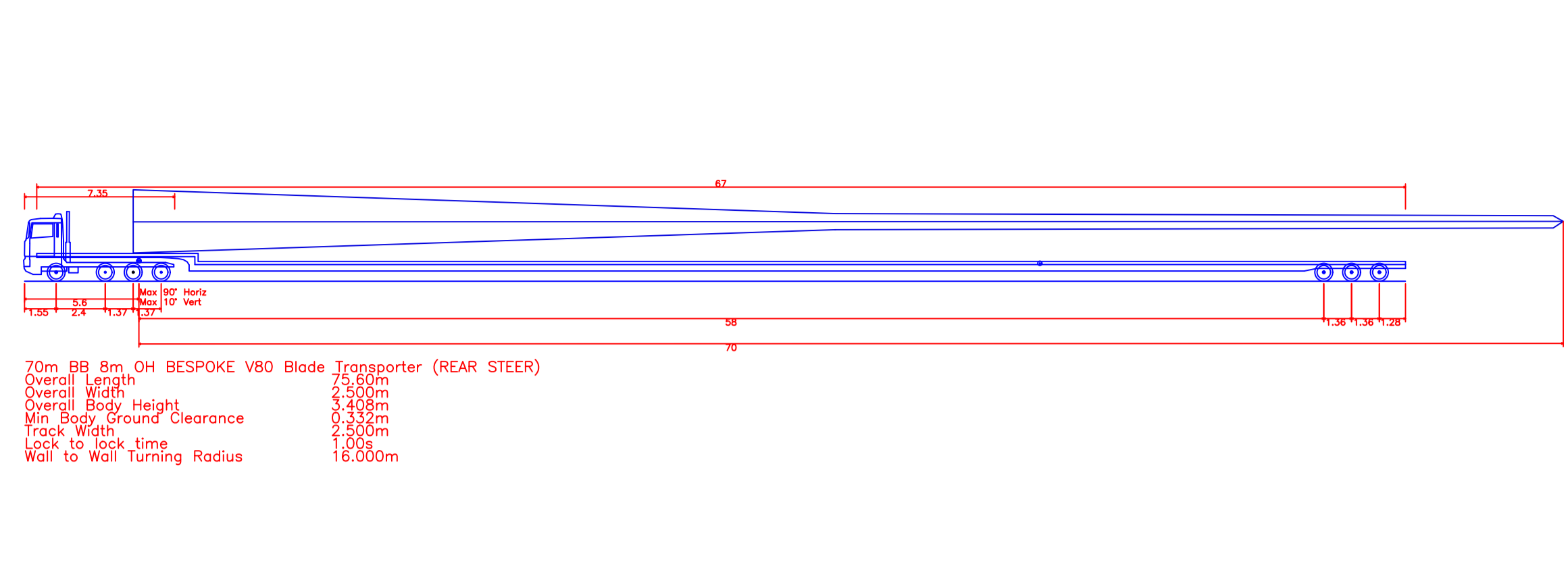
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 - Temporary hardstanding area



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Swept Path Analysis
Pinch Point 2

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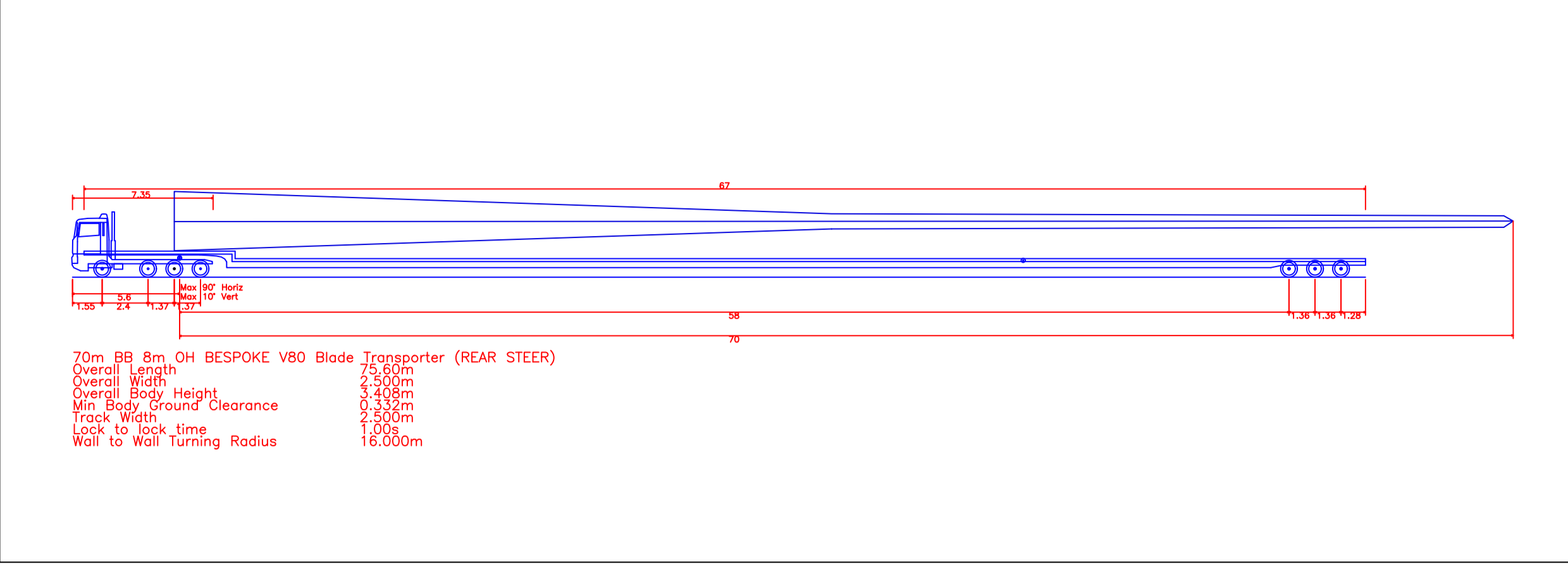
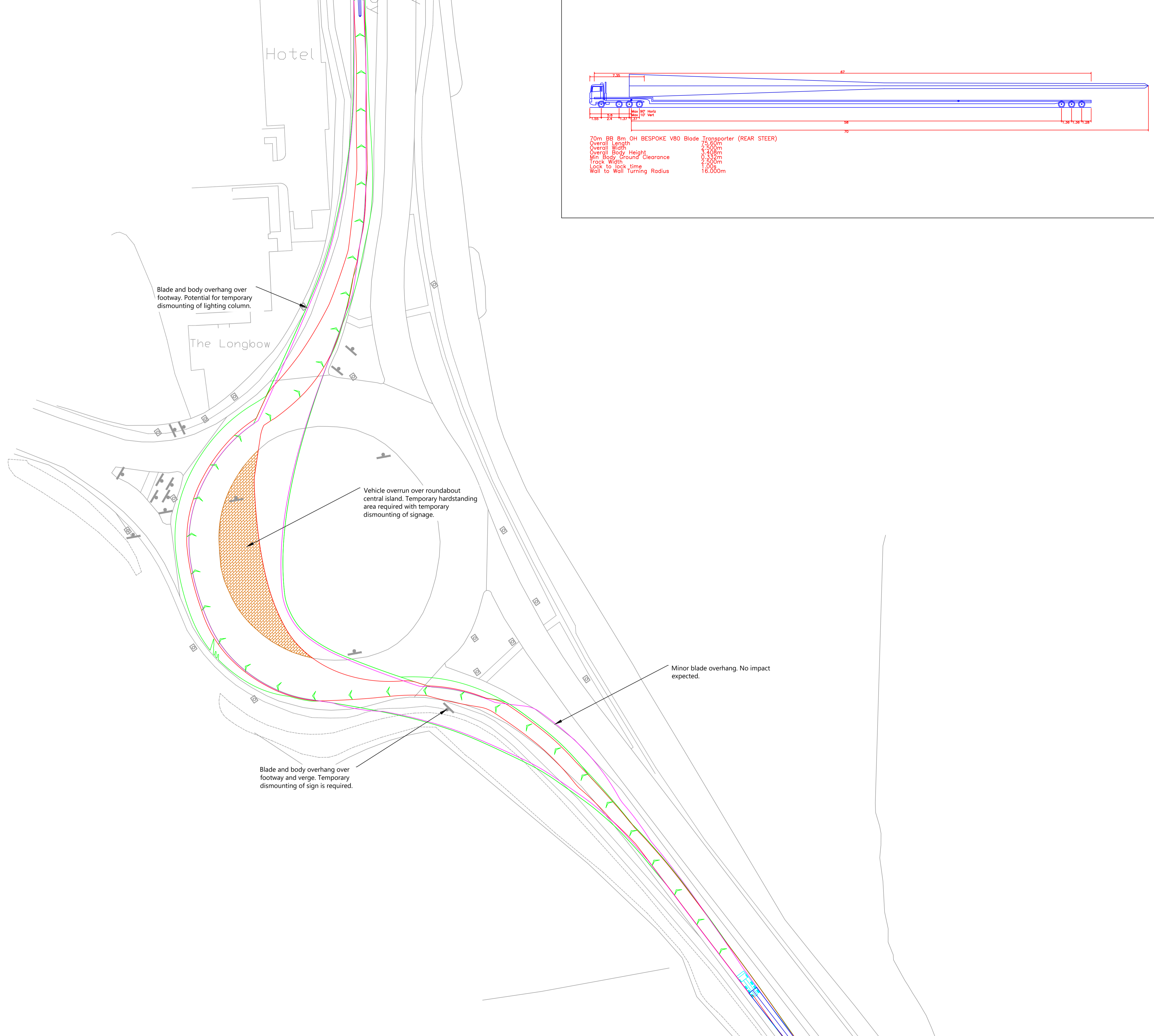
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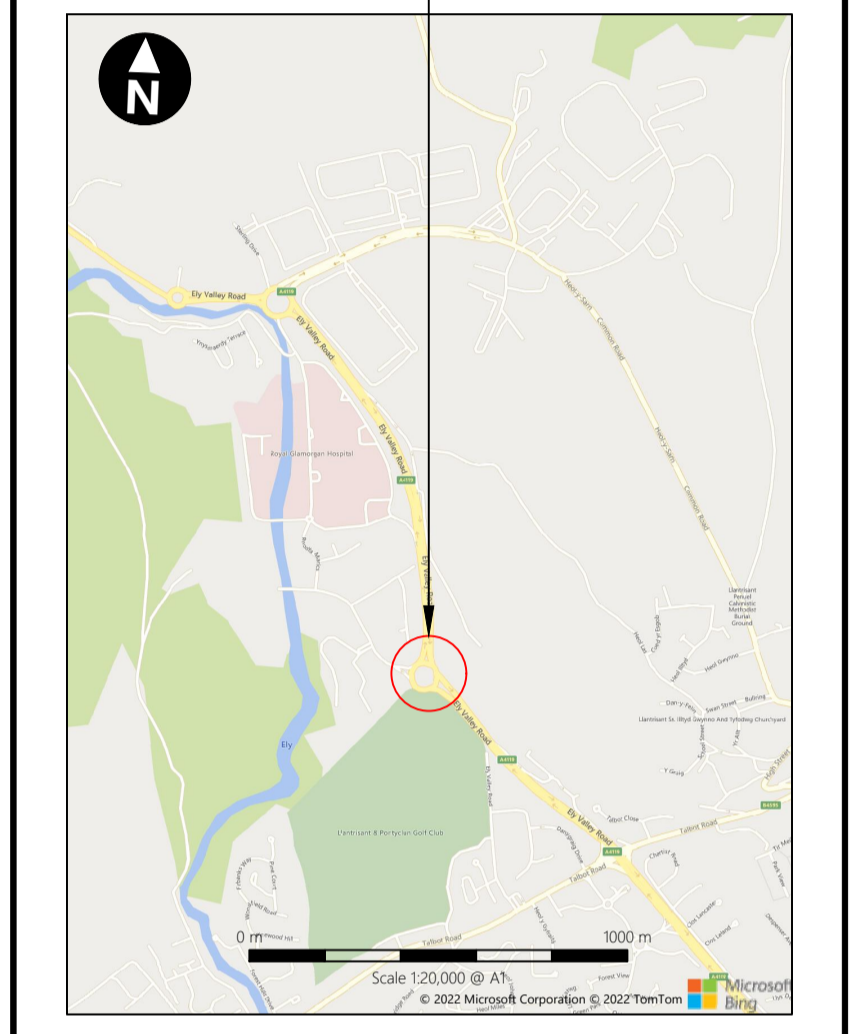
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 - Indicative location of existing traffic sign
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42864-WOOD-XX-XX-DR-OT-0007_S0_P01



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Swept Path Analysis Pinch Point 3					
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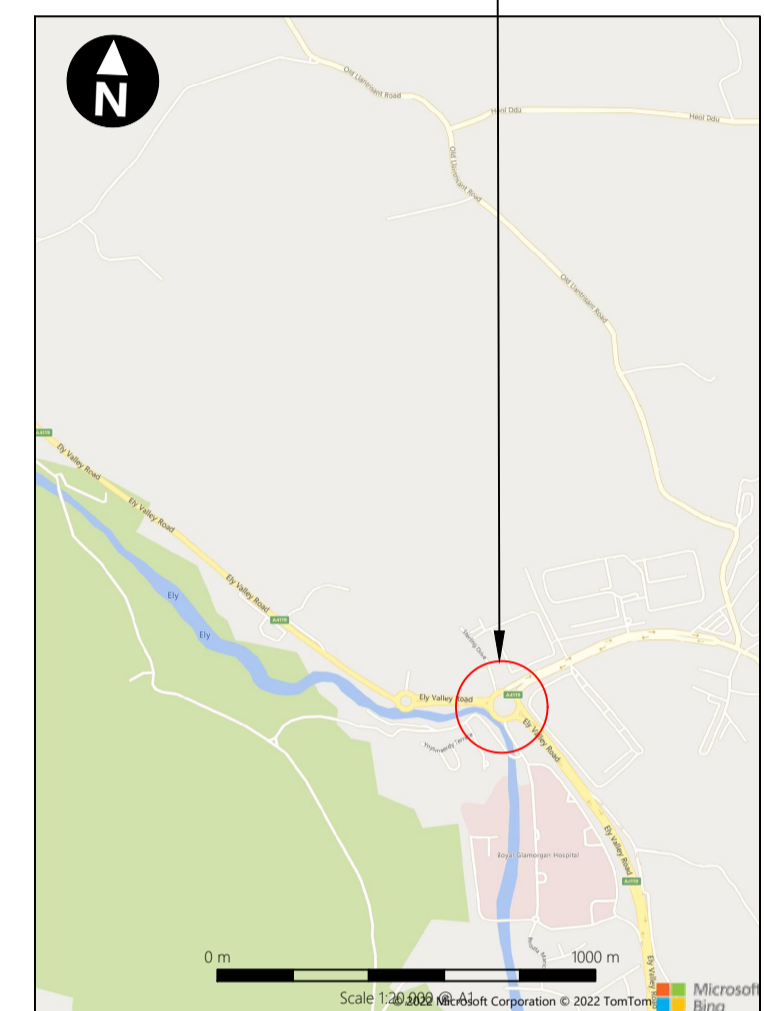
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- Indicative location of existing traffic sign
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- Temporary hardstanding area

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Abnormal Indivisible Load (AIL) Access Study

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Swept Path Analysis
Pinch Point 4

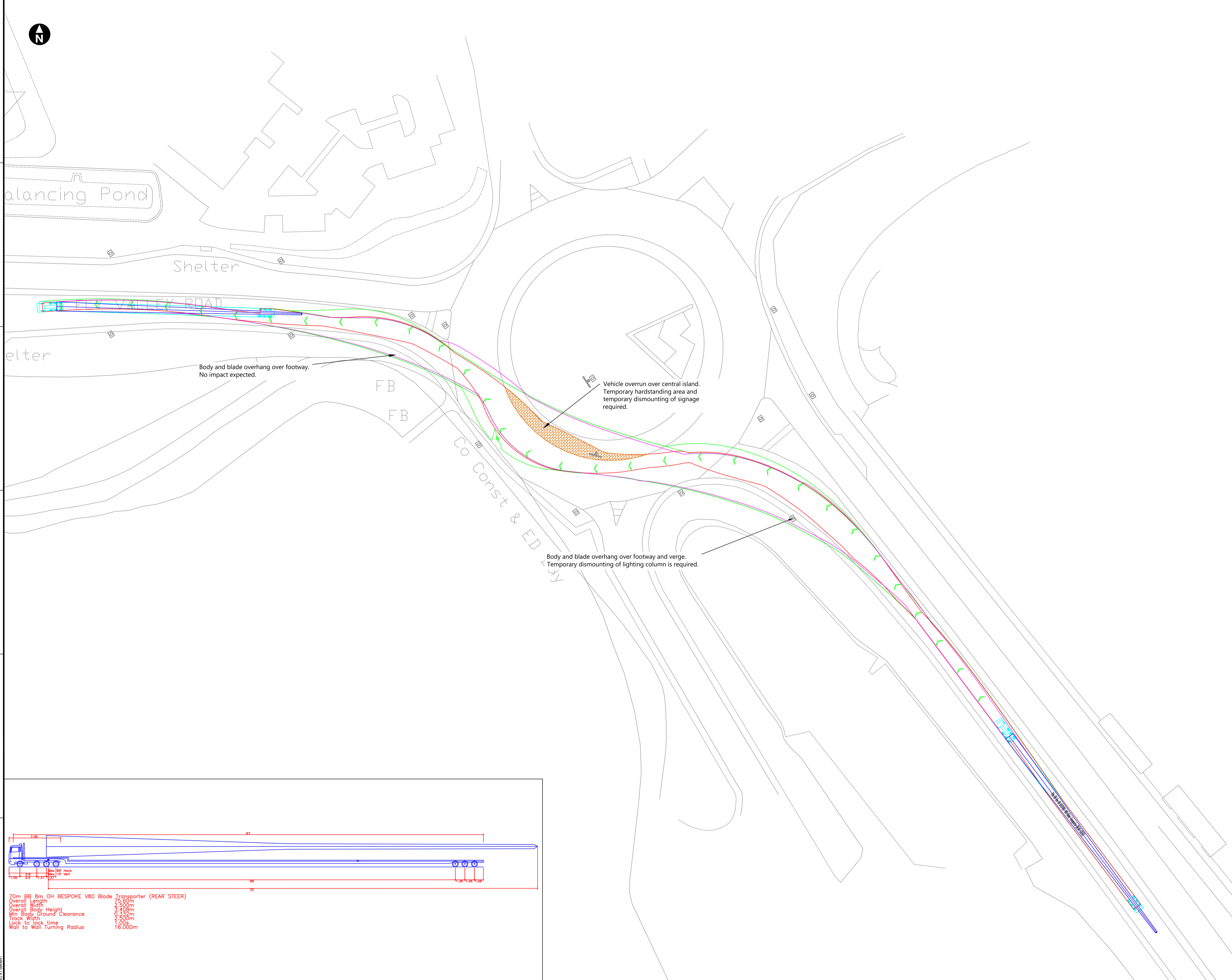
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42864-WOOD-XX-XX-DR-OT-0008_S0	P01



70m BB 8m OH BESPOKE V80 Blade Transporter (REAR STEER)

- Overall Length: 75.60m
- Overall Width: 4.500m
- Overall Body Height: 4.300m
- Min Body Ground Clearance: 0.332m
- Track Width: 2.500m
- Lock to lock time: 1.00s
- Wall to Wall Turning Radius: 16.000m



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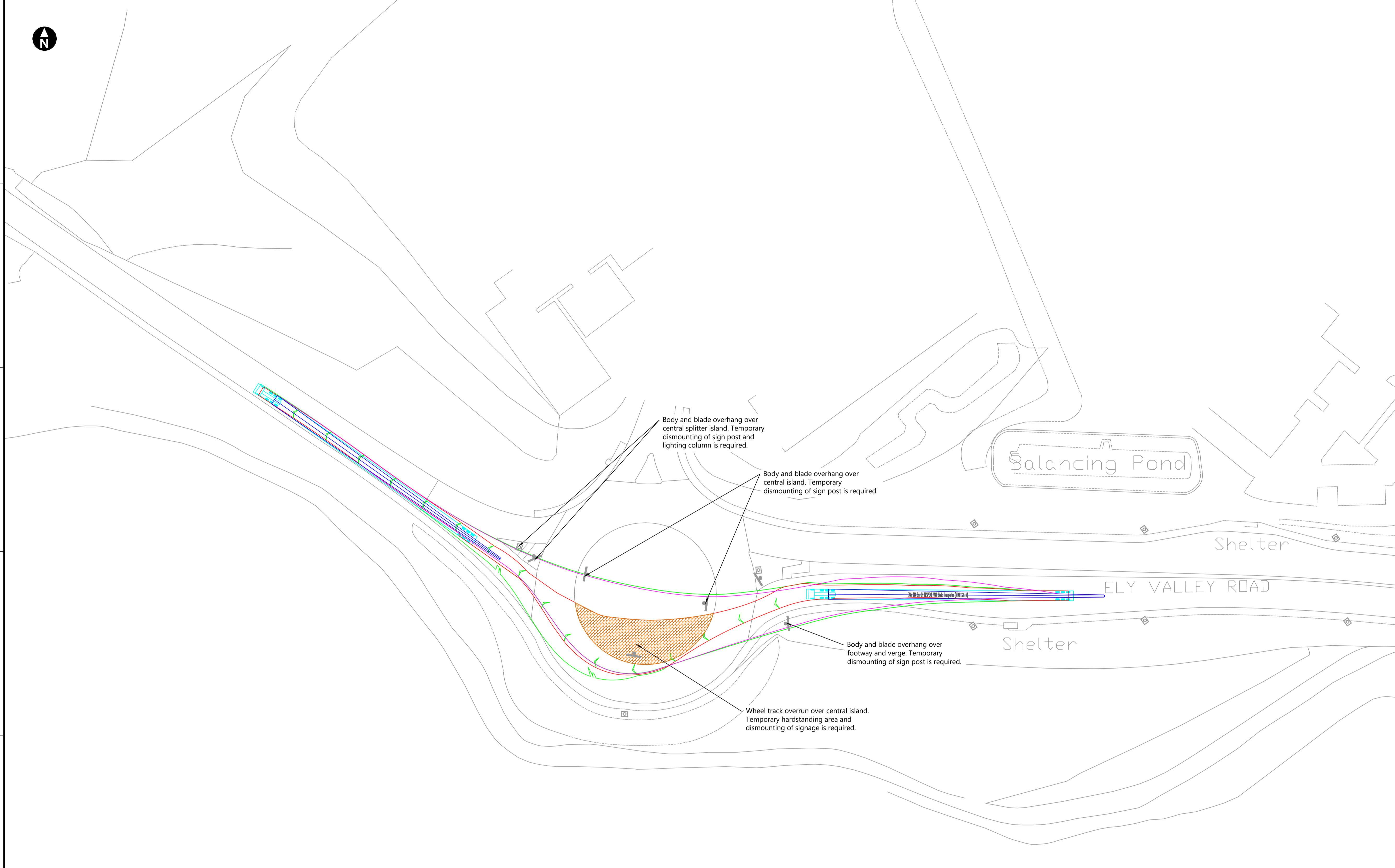
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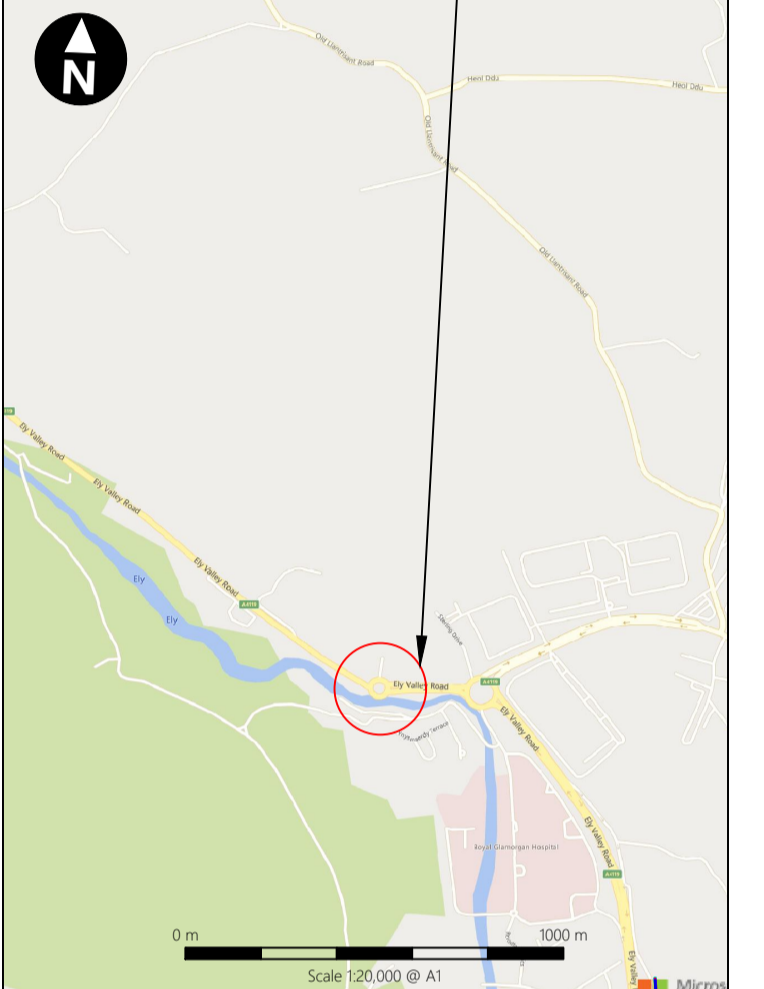
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Key

- Indicative location of existing lighting column
- Indicative location of existing traffic sign
- Vehicle body
- Vehicle wheel track
- Wind turbine blade outline
- Temporary hardstanding area



P01	19/10/22	First Issue	VS	AG	SE
REV	DATE	REVISION/ISSUE DESCRIPTION	DRN	CHK	APP
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Initial Status					S0

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PROJECT TITLE
Mynydd Y Glyn
Abnormal Indivisible Load (AIL) Access Study

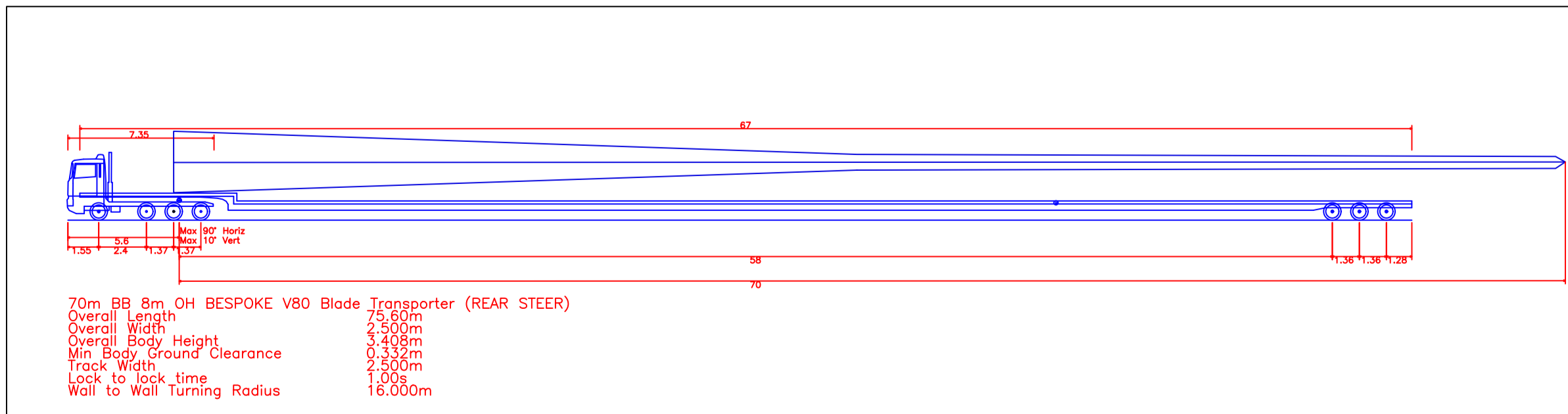
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Swept Path Analysis
Pinch Point 5

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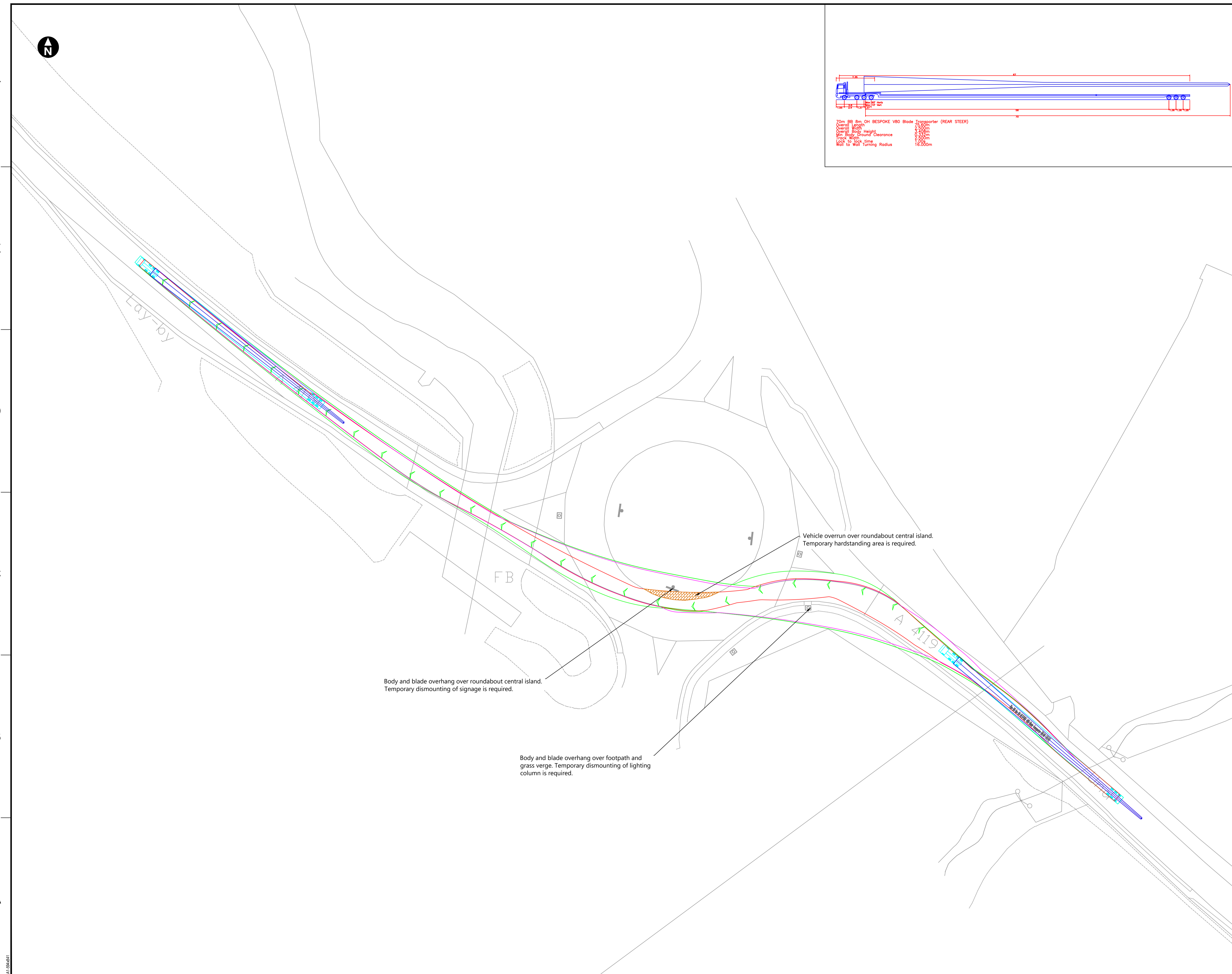
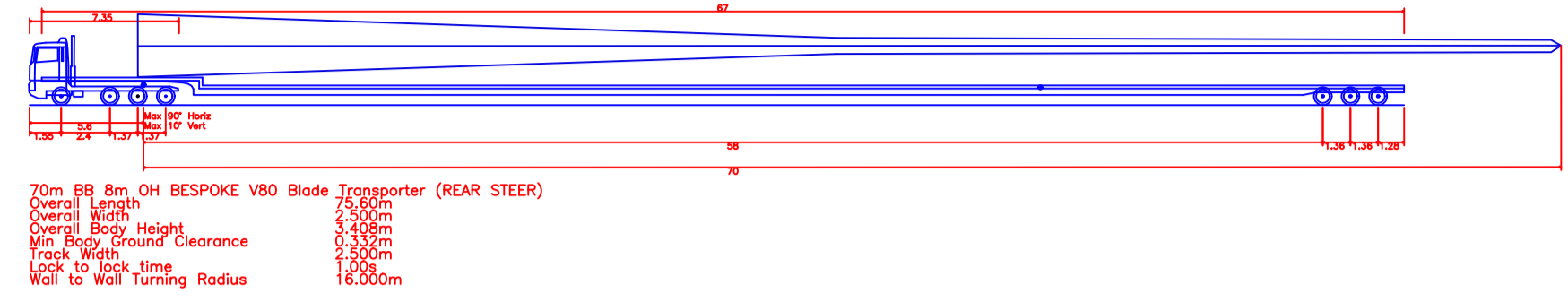
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PARTNERSHIP HOUSE, REGENT FARM ROAD, GOSFORTH,
NEWCASTLE UPON TYNE, NE3 3AF
TEL: (0191) 2726100

DRAWING No.	REV
42864-WOOD-XX-XX-DR-OT-0009_S0	P01



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- Key
- Indicative location of existing lighting column
 - Indicative location of existing traffic sign
 - Vehicle body
 - Vehicle wheel track
 - Wind turbine blade outline
 - Temporary hardstanding area



P01	19/10/22	First Issue	VS	AG	SE
REV	DATE	REVISION/ISSUE DESCRIPTION	DRN	CHK	APP
DRAWING STATUS					SUITABILITY
Initial Status					S0

SCALE: 1:500 @ A1

PROJECT TITLE
Mynydd Y Glyn
Abnormal Indivisible Load (AIL) Access Study

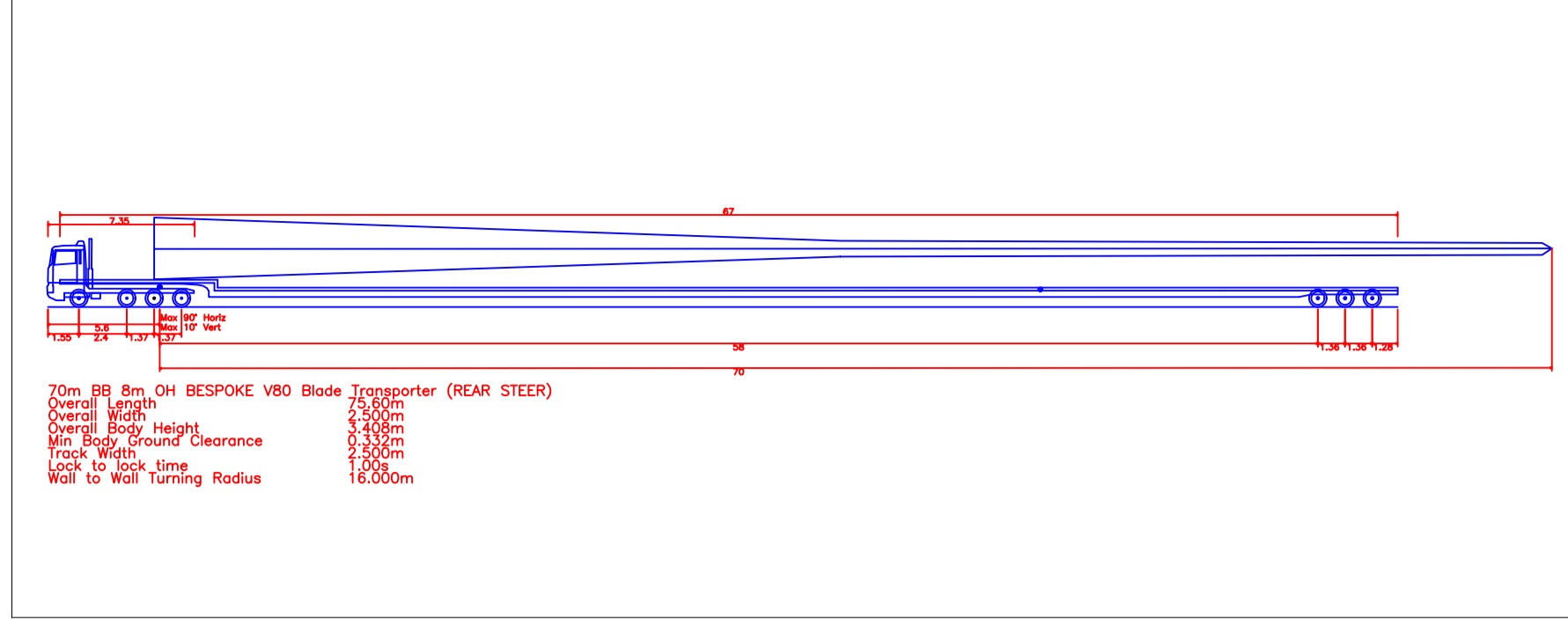
DRAWING TITLE
Swept Path Analysis
Pinch Point 6

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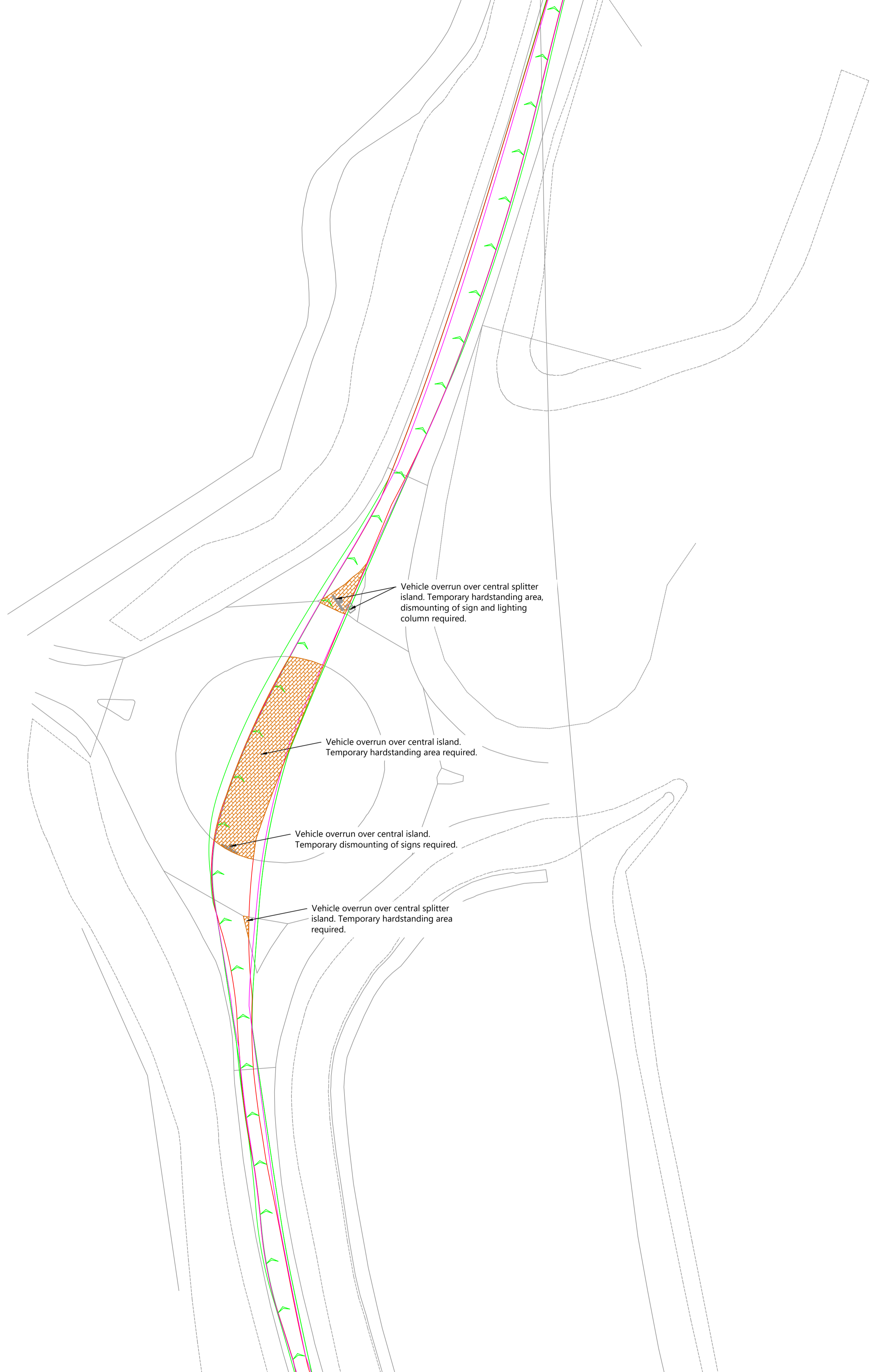
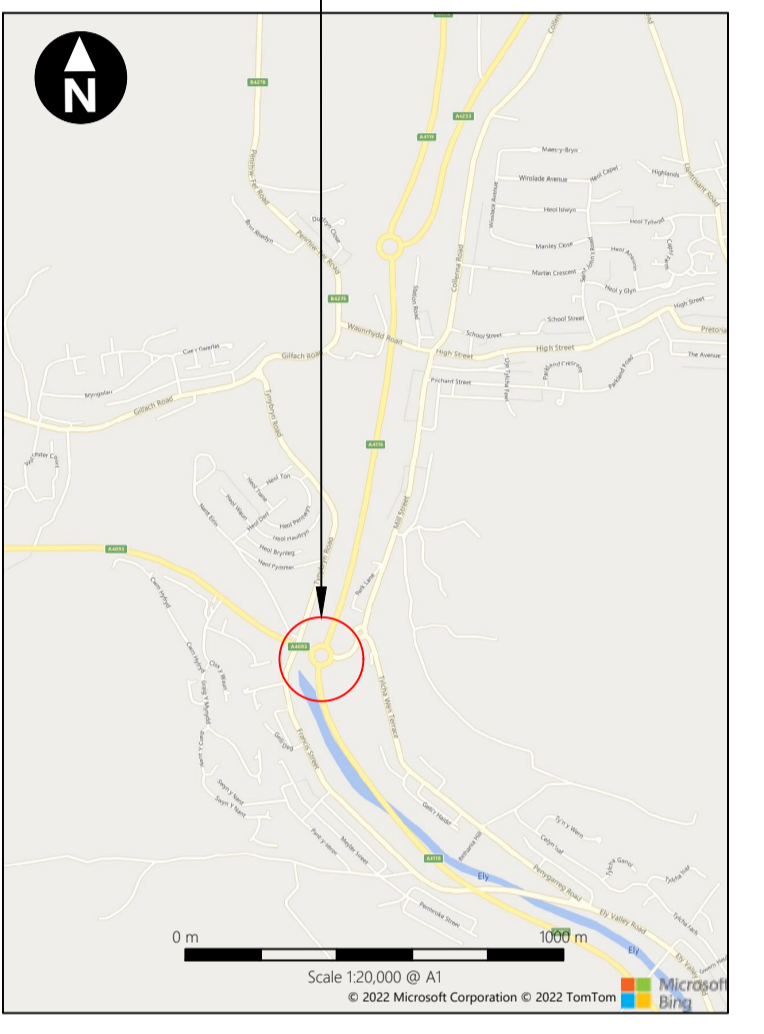
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- Key
- Indicative location of existing lighting column
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42864-WOOD-XX-XX-DR-OT-0011_S0_P01



P01	19/10/22	First Issue	VS	AG	SE
REV	DATE	REVISION/ISSUE DESCRIPTION	DRN	CHK	APP
DRAWING STATUS					SUITABILITY
Initial Status					S0

SCALE: 1:500 @ A1

PROJECT TITLE
Mynydd Y Glyn
Abnormal Indivisible Load (AIL) Access Study

DRAWING TITLE
Swept Path Analysis
Pinch Point 7

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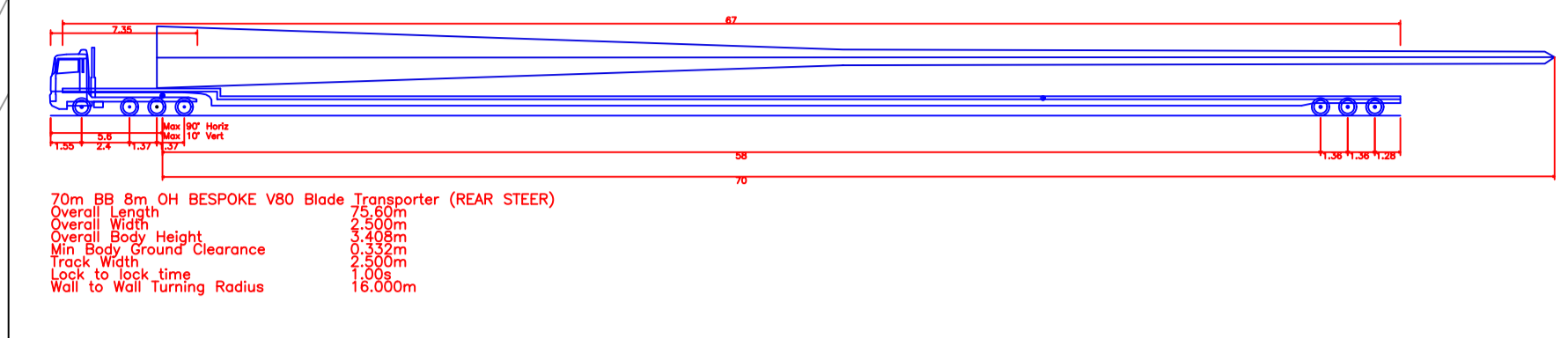
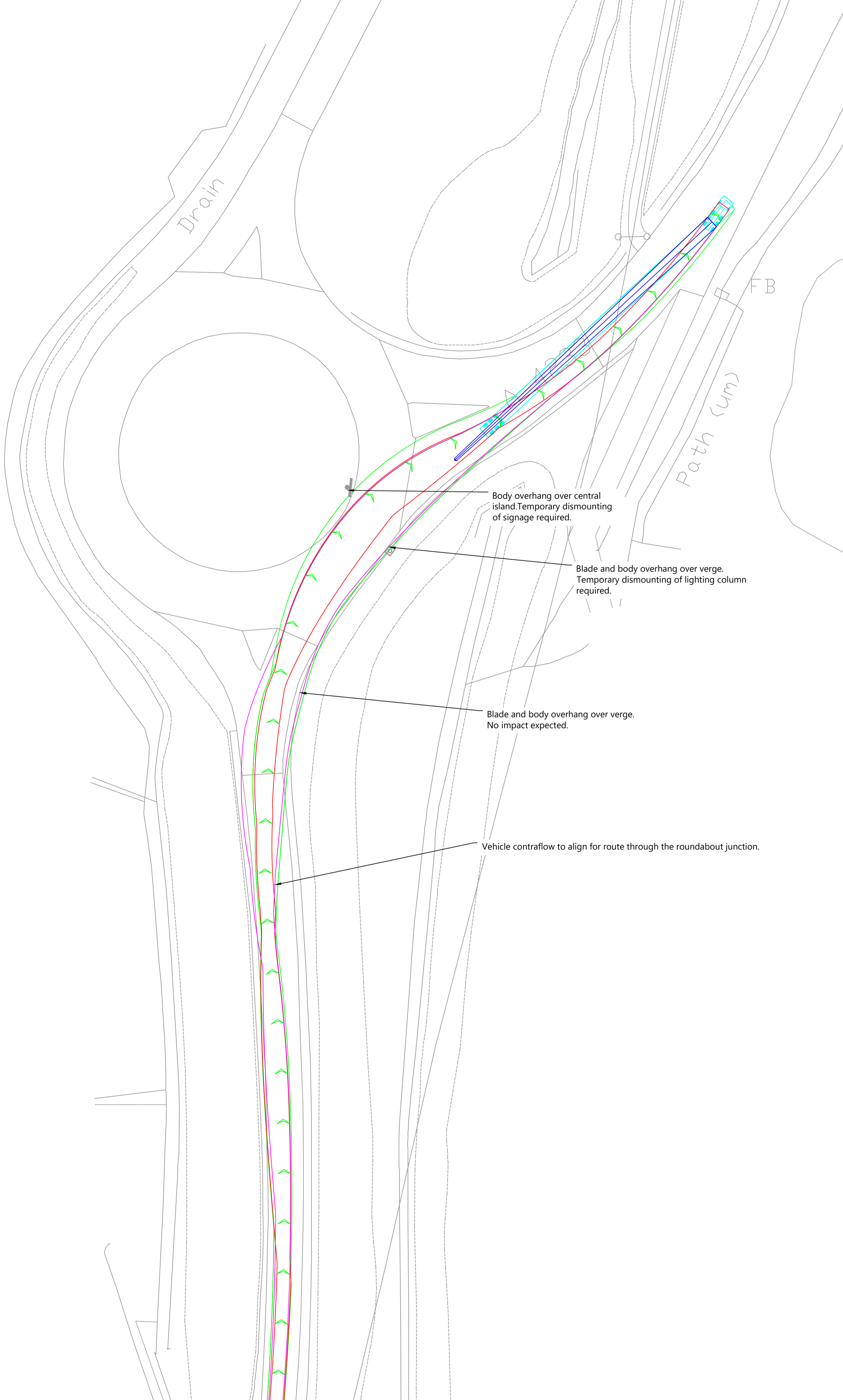
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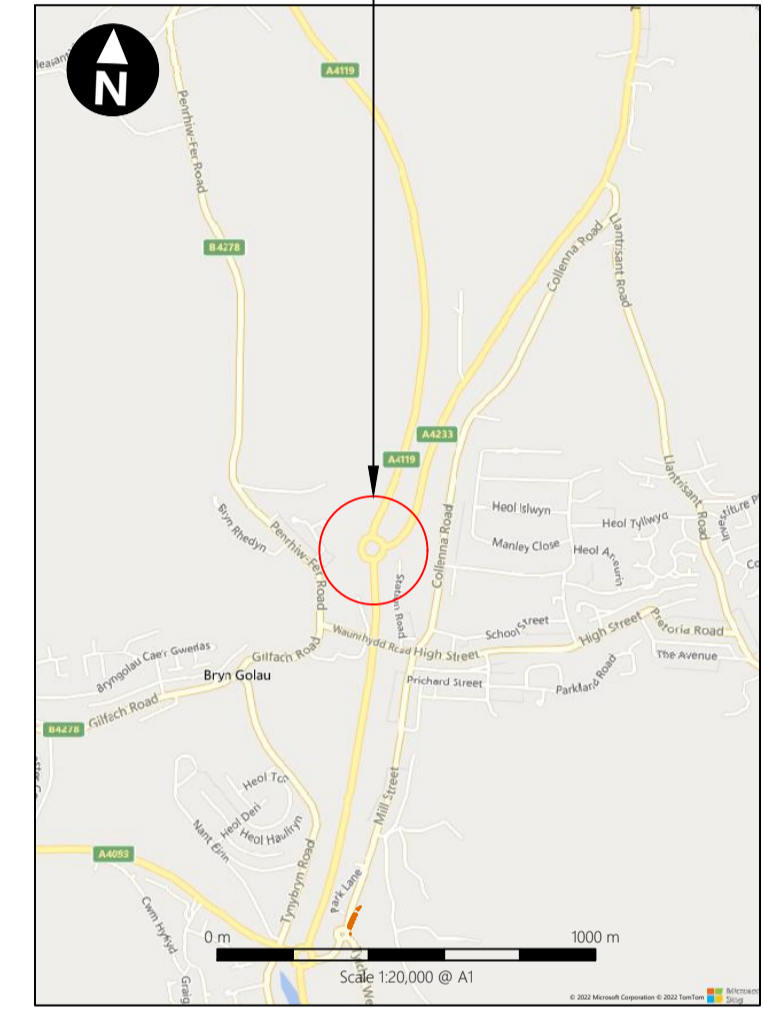
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- Key
- Indicative location of existing lighting column
 - Indicative location of existing traffic sign
 - Vehicle body
 - Vehicle wheel track
 - Wind turbine blade outline
 - Temporary hardstanding area

42864-WOOD-XX-XX-DR-OT-0012_S0_P01



P01	19/10/22	First Issue	VS	AG	SE
REV	DATE	REVISION/ISSUE DESCRIPTION	DRN	CHK	APP
DRAWING STATUS					SUITABILITY
Initial Status					S0

SCALE: 1:500 @ A1

PROJECT TITLE
**Mynydd Y Glyn
 Abnormal Indivisible Load (AIL) Access Study**

DRAWING TITLE
**Swept Path Analysis
 Pinch Point 8**

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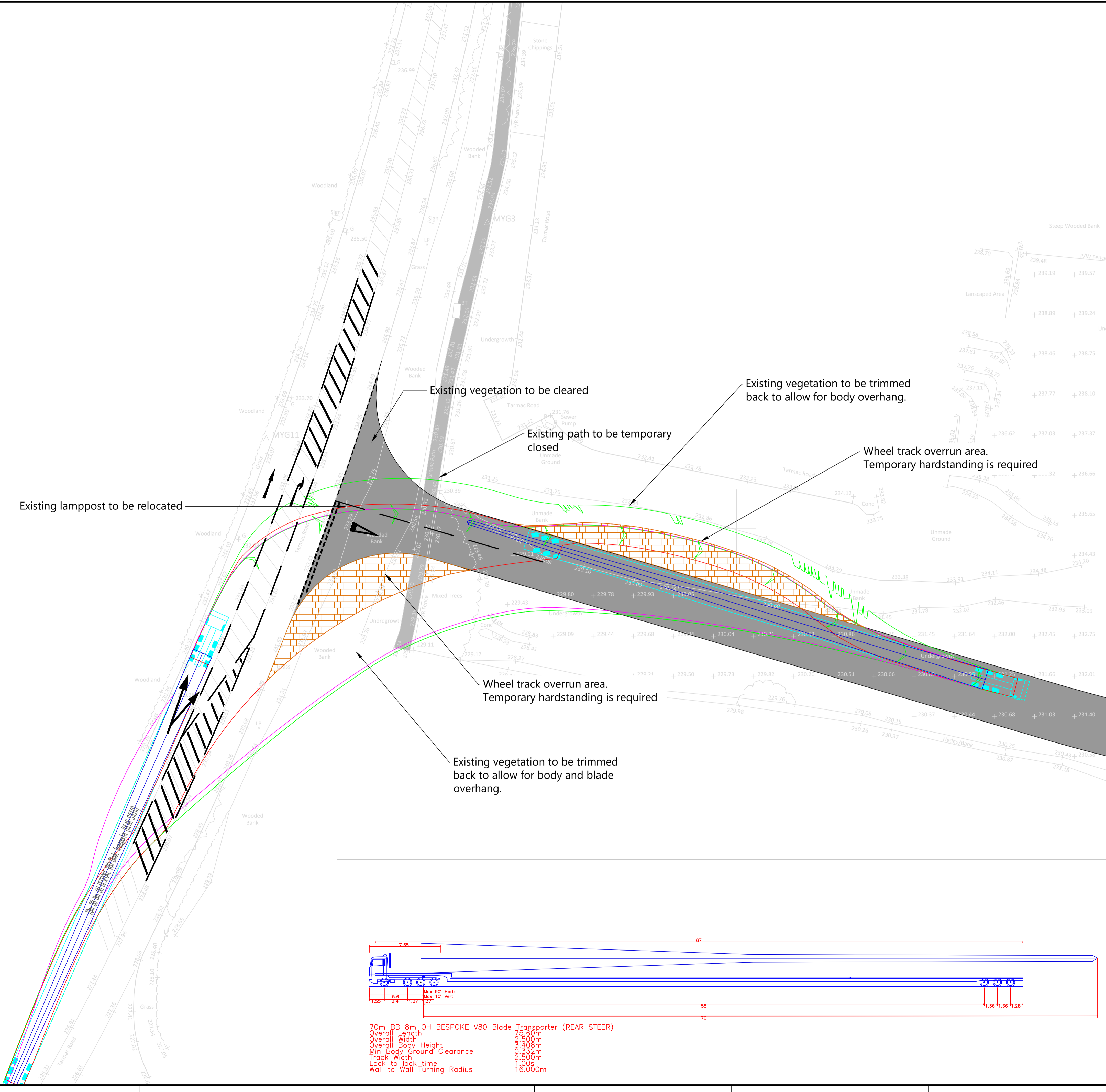
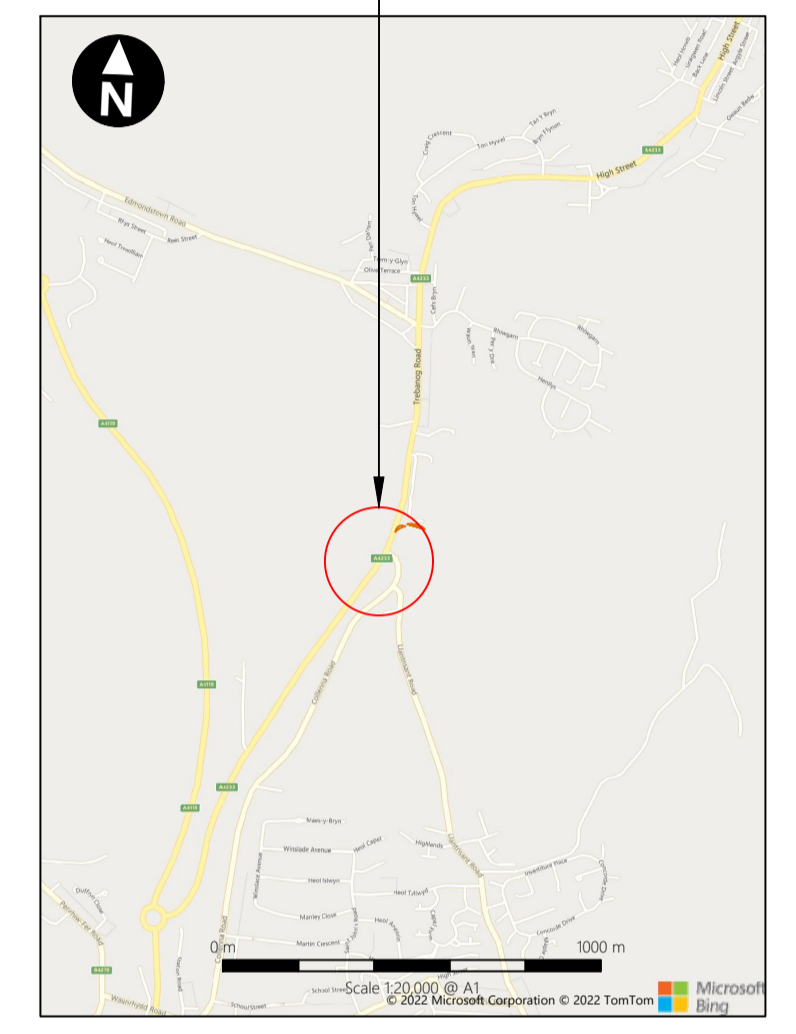
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Key

- Existing Infrastructure
- Proposed Infrastructure
- Proposed carriageway
- Vehicle body
- Vehicle wheel track
- Wind turbine blade outline
- Temporary hardstanding area

42864-WOOD-XX-XX-DR-OT-0013_S0_P01



Existing lamppost to be relocated

Existing vegetation to be cleared

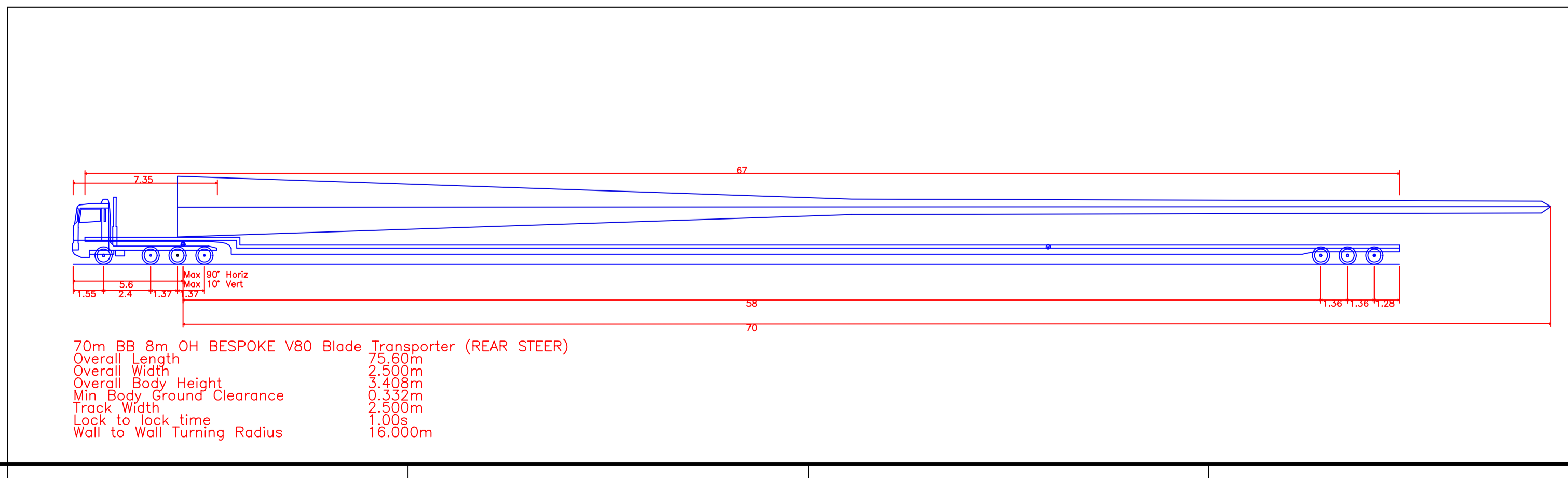
Existing vegetation to be trimmed back to allow for body overhang.

Existing path to be temporary closed

Wheel track overrun area. Temporary hardstanding is required

Wheel track overrun area. Temporary hardstanding is required

Existing vegetation to be trimmed back to allow for body and blade overhang.



P01.1	20/10/22	First Issue	CM	AG	SE
REV	DATE	REVISION/ISSUE DESCRIPTION	DRN	CHK	APP
DRAWING STATUS					SUITABILITY
Initial Status					S0

SCALE: 1:250 @ A1

PROJECT TITLE
Mynydd Y Glyn
Abnormal Indivisible Load (AIL) Access Study

DRAWING TITLE
Swept Path Analysis
Finch Point 9

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