

Pell Frischmann

Pen March Wind Farm

Transport Assessment

August 2022

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1 Introduction

1.1 Purpose of the Report

RWE Renewables UK Swindon Ltd. (hereafter ‘the applicant’) is proposing to construct and operate Pen March Wind Farm (hereafter ‘the proposed scheme’) which would be located north of the A465 Heads of the Valleys road, north-west of the small town of Rhymney and north-east of Merthyr Tydfil.

Pell Frischmann (PF) has been commissioned by the ‘Applicant’ to undertake a Transport Assessment (TA) for the Proposed Scheme. The TA has been prepared in support of a planning application to Planning Environment Decisions Wales (PEDW) for the Proposed Scheme (the ‘Application’).

This report identifies the key transport and access issues associated with the Proposed Scheme, including the route for abnormal loads. The TA identifies where the Proposed Scheme may require mitigation works to accommodate the predicted traffic; however, the detailed design of these remedial works is beyond the agreed scope of this report.

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1.2 Report Structure

Following this introduction, the TA report is structured as follows:

- Chapter Two describes the Proposed Scheme;
- Chapter Three reviews the relevant transport and planning policies;
- Chapter Four sets out the methodology used in this assessment;
- Chapter Five describes the trip generation and distribution of traffic in the study area;
- Chapter Seven summarises the traffic impact assessment;
- Chapter Eight considers mitigation proposals for development related traffic within the study network; and
- Chapter Nine summarises the findings of the TA and outlines the key conclusions.

2 Site Background

2.1 Site Location

The location of the Site for the Proposed Scheme is shown in Figure 1 (by a red circle). The Site is located to the north-east of Merthyr Tydfil and comprises a total area of approximately 604.5 hectares (ha).

Access to the Site is via Common Road, which runs along the southern boundary of the Site. Common Road can be accessed from the strategic road network via the A740 (T) and A465 (T).

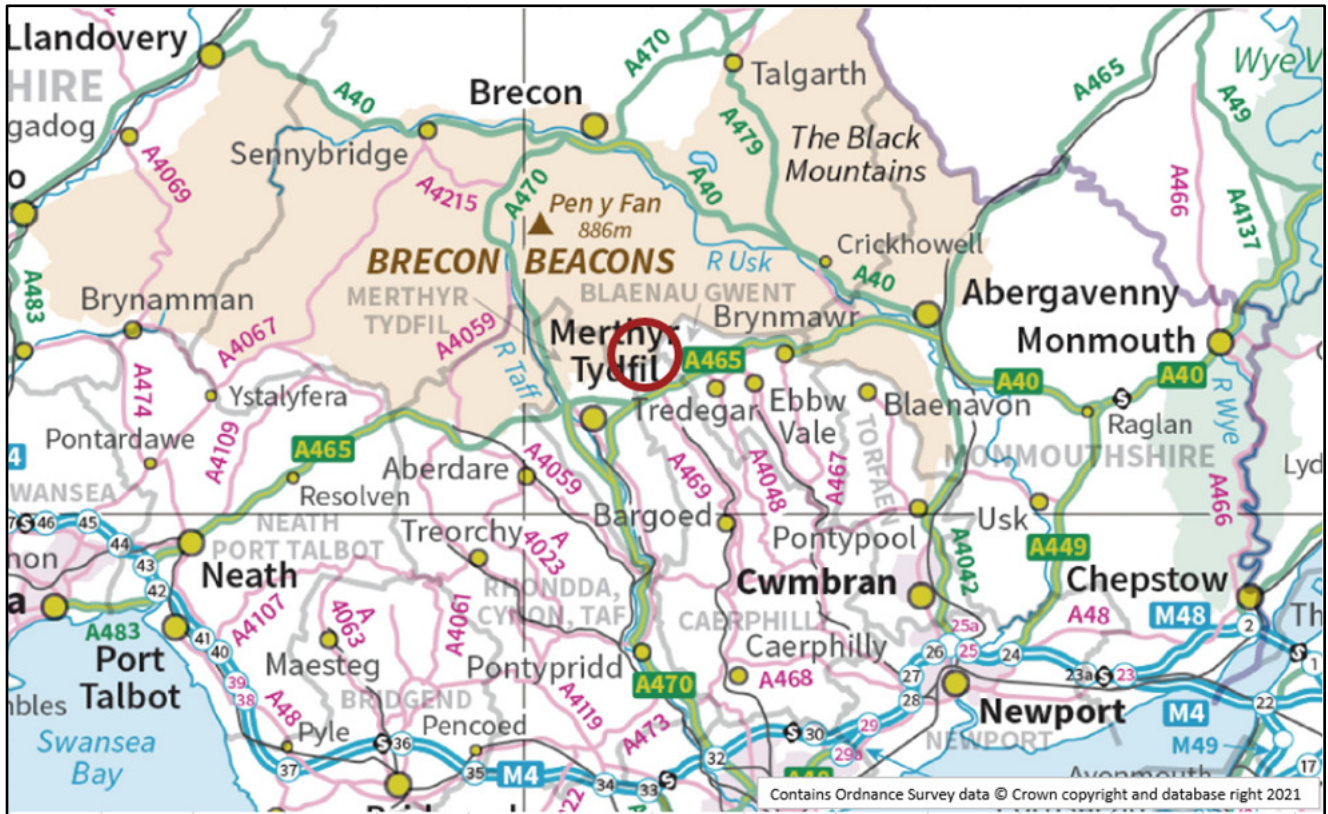


Figure 1 Site Location Plan

In summary, the Proposed Scheme will comprise the following:

- Up to six wind turbines, each with turbine foundations, crane hardstandings and laydown/storage areas;
- An electrical control building, along with potential battery storage facilities;
- Underground power cables linking the turbines and the on-site control building, laid in trenches alongside access tracks;
- New site access and on-site access tracks, with pipeline and watercourse crossings (if/where required);
- A temporary construction and storage compound; and
- Off-site works to facilitate the movement of abnormal loads (construction of over-run areas and temporary modifications to street furniture etc).

Planning permission for the Proposed Scheme is being sought for an operational life of 35 years.

2.2 Candidate Turbines

The Applicant has advised that a Vestas V150 turbine, at a tip height of 180m, should be used as the candidate turbine for this assessment. The tower design is likely to be site specific and therefore Vestas has advised that a 30m x 4.3m x 4.3m tower will provide a worst-case kinematic envelope.

The details of the components are summarised in Table 1.

Table 1 V150 Turbine Size Summary

Component	Length (m)	Width (m)	Height (m)	Weight (t)
Blade	73.70	4.06	3.12	17.24
Tower	30.00	4.30	4.30	60.00

A Route Survey Report detailing the turbine components and the proposed access route to Site is attached in Appendix A, contained in the Transport Management Plan.

The selection of the final turbine model and specification will be subject to a commercial procurement process following consent of the Application. The actual dimensions may therefore vary slightly from those assumed as part of this assessment.

To provide a robust assessment scenario based upon the known issues along the proposed access route, it has been assumed that all blades would be carried on a Super Wing Carrier to reduce the need for mitigation in constrained sections of the route.

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

Examples of the vehicles and trailers are shown in Figures 2 and 3.



Figure 2 Super Wing Carrier Trailer



Figure 3 Tower Trailer

3 Policy Context

3.1 Introduction

An overview of relevant transport planning policies has been undertaken and is summarised below for national and local government policies.

3.2 National Policy & Guidance

3.2.1 Future Wales – The National Plan 2040 (February, 2021)

Future Wales is Welsh Government's National Development Framework. It applies the key principles of Planning Policy Wales (PPW) (see 3.2.2) and establishes where in Wales development should take place and how these places should grow and change. Future Wales is the highest tier of development plan.

The Welsh government strongly supports the principles of developing renewable and low carbon energy to meet future demands. Decision makers must give significant weight to the need to meet Wales international commitments to generate 70% of consumed electricity by renewable means by 2030. There is a presumption in favour of large-scale wind energy developments in areas that have been pre-assessed for wind energy by Welsh Government.

Applications for Developments of National Significance (DNS) must be determined in accordance with Future Wales.

3.2.2 Planning Policy Wales (PPW) (Edition 11, February 2021)

PPW establishes the key principles for the planning system. It establishes what development plans and decisions taken by the planning system must achieve and how developments should be shaped to deliver the best possible outcomes.

PPW informs the preparation of development plans and development management decisions.

3.2.3 Technical Advice Note (TAN) 18 Transport (2007)

TAN 18 reinforces the principle aims of PPW. It describes how to integrate land use and transport planning and explains how transport impacts should be assessed and mitigated.

Key requirements of TAN 18 that are applicable to the Proposed Scheme include:

- Ensuring that transport infrastructure or service improvements necessary to serve new development allow existing transport networks to continue to perform their identified functions (para 2.3, page 3);
- Submission of Transport Assessments to accompany planning applications for developments that are likely to result in significant trip generation (para 9.2, page 36);
- Access to be provided that reflects the nature and type of road and the volume and character of traffic likely to use the access and the road (para 9.16, para 39);
- Any works to the trunk road resulting from the development to be constructed to the standards applied to its own schemes (para 9.17, page 39); and
- Where transport improvements are required in the vicinity of the scheme and beyond to accommodate trips associated with the development, conditions may be imposed to make its commencement / occupation subject to the completion of those works or a developer may be invited to conclude an agreement under section 278 of the Highways Act 1980 for the provision of highway works (para 9.18, page 40).

3.2.4 Welsh Transport Appraisal Guidance (WelTAG) (2017)

WelTAG was published in 2017 and aims to provide a framework for thinking about proposed changes to the transport system and it contains best practice for the development, appraisal and evaluation of proposed transport interventions in Wales.

The document notes that a TA will be required where planning applications for development, including changes of use, fall into the categories identified in TAN 18.

3.3 Local Policy and Guidance

3.3.1 Caerphilly County Borough Local Development Plan (2010 - 2021)

Caerphilly County Borough Local Development Plan (LDP) was adopted in November 2010. In relation to Transport Infrastructure Improvement outlined in Section A: The Development Strategy, policy number SP19 of the LDP notes:

The Council will seek to implement improvements to the existing transport infrastructure that:

- A. Address social exclusion by increasing accessibility to employment, services and facilities throughout the County Borough; and/or*
- B. Assist in regenerating the Head of the Valleys Regeneration Area through creating and improving transport links to the settlements in the Northern and Southern Connections Corridors; and/or*
- C. Reinforce the role and function of settlements; and/or*
- D. Reduce the level of traffic movements and/or congestion, within any identified air quality management area; and/or*
- E. Promote the most efficient use of the transport network.*

The LDP is currently under review and Caerphilly County Borough is seeking to update the LDP until 2035.

3.3.2 The Adopted Merthyr Tydfil Replacement Local Development Plan (2016 – 2031)

Merthyr Tydfil County Borough Council Replacement LDP (2016 – 2031) was adopted in January 2020. In relation to improving the transport network, Policy SW12 states that:

Development that encourages a modal shift towards sustainable transport will be supported, including the enhancement of pedestrian, cycle, rail and bus facilities, in addition to any necessary road improvements. Development proposals will be expected to demonstrate how they reduce the need to travel and encourage the use of sustainable transport.

With regard to renewable energy, Policy EcW8 notes that:

We will support the use of renewable energy as a tangible means of reducing our local carbon footprint, where appropriate to do so. Development proposals for renewable energy will be permitted where:

- They do not have an unacceptable landscape and visual impact, including on the setting of the Brecon Beacons National Park.*
- There would be no unacceptable cumulative impacts in combination with existing or consented development.*
- Satisfactory mitigation can be put in place to minimise the impacts of the renewable energy proposal and its associated infrastructure.*
- Proposals make provision for the appropriate restoration and after-care of the land for its beneficial future re-use.*

3.4 Policy Summary

The Proposed Scheme aligns with the stated policy objectives and the design of the Site and proposed mitigation measures will ensure compliance with national and local objectives.

4 Study Methodology

4.1 Introduction

There are three phases of the life of the Proposed Scheme. All three phases have been considered in this assessment and are as follows:

- The Construction Phase;
- The Operational Phase; and
- The Decommissioning Phase.

4.2 Project Phases – Transport Overview

Of all of the three phases, the construction phase is considered to have the greatest impact in terms of transport. Construction plant, bulk materials and turbine sections will be transported to site, which could potentially have a significant increase in traffic on the study network.

The decommissioning phase involves fewer trips on the network than the construction phase, as access tracks are likely to be left in place, adding to local infrastructure that can potentially be used for further agricultural or leisure uses in the future.

The operational phase is restricted to occasional maintenance operations which generate significantly lower volumes of traffic that are not considered to be in excess of daily traffic variation levels on the road network.

It should be noted however the construction effects are short lived and transitory in nature, whilst the operational phase assessment has been assumed to be based typical operating conditions with occasional operational and maintenance traffic.

4.3 Scoping Discussions

The Applicant submitted a Scoping Report to Welsh Ministers in respect of the Environmental Statement (ES) which included a section considering traffic and transport. The following stakeholders provided scoping advice in relation to access, traffic and transport:

- The Inspectorate;
- Merthyr Tydfil County Borough Council; and
- Caerphilly County Borough Council.

The Transport Assessment has been prepared in accordance with the stakeholders' advice. Their input is gratefully acknowledged.

5 Baseline Conditions

5.1 Access Arrangement

Access to the Proposed Scheme will be via a new access junction from Common Road, which runs along the southern boundary of the Site.

The access junction would be designed to accommodate all predicted loads and traffic for all phases of the Proposed Scheme. An indicative junction layout is provided in Appendix B.

5.2 Study Area Determination

Strategic access to Common Road is available from the A465 (T) and A470 (T) which are part of the trunk road network.

Access for construction traffic would be from routes which are to include A4060 (T), A470 (T), A465 (T) and Common Road.

Abnormal loads associated with the wind turbines will travel from the Port of Entry (PoE) at Swansea to the site via the A483, M4, A465 (T) and Common Road.

The study area for this assessment is as follows:

- The Common Road, near the site access;
- A465 (T) Heads of the Valleys Road, section between A465 (T) / A470 (T) and A465 (T) / Llwyn Helyg / A4048 roundabout junctions;
- A4060 (T); and
- A470 (T), section between Abercanaid and Abercynon Roundabouts.

The study area is illustrated in Figure 4.

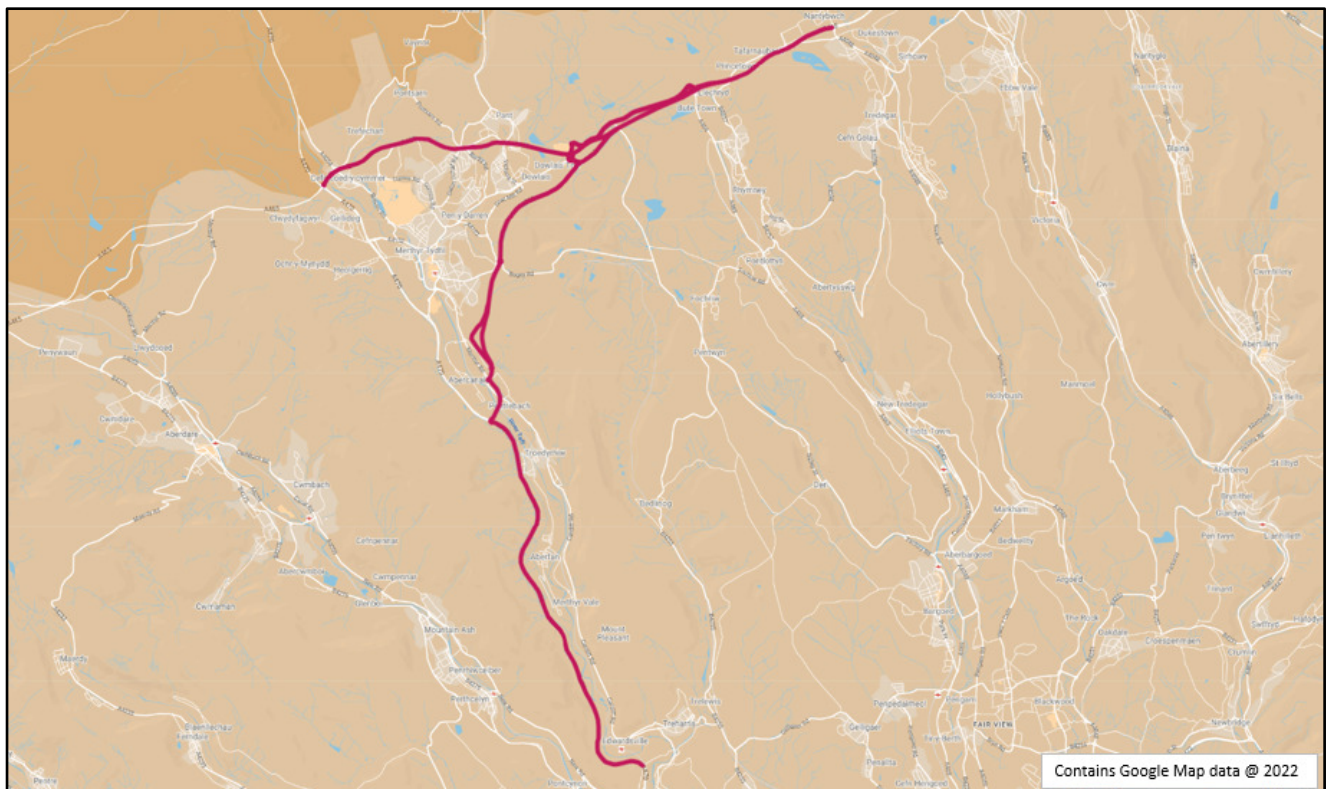


Figure 4 Assessment Study Area

5.3 Common Land

The majority of the Site is registered as Common Land (Urban) and makes up part of Common Land Unit 38 (Gelligaer and Merthyr Common), which also extends to the south of the A465. Members of the public have rights to access the Common for air and exercise under Section 193 of the Law of Property Act 1925.

There are a number of informal paths used by the graziers of the common and members of the public which run across the Site. The informal paths are largely grouped towards the north-east of the Site, following the trajectory of the Nant Pitwellt, and south-west of the Site, close to Jepson's Pond.

5.4 Pedestrian and Cyclist Networks

There are a number of Public Rights of Way (PRoW) paths in the vicinity of the site which are demonstrated on Caerphilly County Borough Council's PRoW webpage (<https://caerphillycbc.maps.arcgis.com/apps/View/>). To the east of the site lies two PRoW footpaths which include RHYM/FP101/1 and RHYM/FP101/2.

There is a Bridleway (RHYM/BR103/1) located adjacent to the southern edge of the Site boundary. The Bridleway is approximately 400m in length and connects into Common Road at its most northerly point.

National Cycle Network route number (NCR) 46 is located along a section of the Common Road, to the south of the site. NCR 46 comprises a combination of on-road and traffic-free sections which connects Bromsgrove to Neath. Along the Common Road an on-road section of the route is present and this connects to a traffic-free route to the west, providing a link to Pant.

To the east, NCR 46 connects to a predominantly traffic-free route via the A465 (T) underpass which subsequently links to NCR468 providing a connection to Rhymney. NCR 468 is made up of a combination of on-road and traffic-free sections which provides a connection between Pengam and Rhymney.

5.5 Road Access

Access to the site would be taken directly from a newly constructed junction access on Common Road, which can be accessed from the strategic road network via the A465 (T) and A4060 (T). Access tracks within the Site will accommodate all traffic requirements.

Common Road is a single two-way carriageway which is subject to the national speed limit. There are no footways located along the Common Road, however, there are a number of cattlegrids located along its length.

Common Road is linked to A465 (T) (Heads of the Valleys Road) both to its west and east via roundabout junctions. The A465 (T) forms part of the strategic road network that connects the Site to Neath, to the west, and Hereford to the north-east. The A465 (T) is subject to the national speed limit in the vicinity of the Site and is operated by South Wales Trunk Road Agency (SWTRA) within Wales. Works are currently underway on the A465 (T) section 5 and 6 Dowlais Top to Hirwaun which involves converting the A465 (T) to two lanes in each direction. It is anticipated that the works will be complete in 2025¹. The A465 (T) currently remains open to traffic and is managed through traffic management operations.

The A4060 (T) can be accessed via the A465 (T) to the west of the Site and provides a connection to the A470 (T). The A4060 (T) is a two-lane dual-carriageway which is subject to the national speed limit.

The A470 (T) is a two-lane dual-carriageway which runs north-south and providing a further connection to Brecon to the north and Cardiff to the south. The A470 (T) is maintained by the North and Mid Wales Trunk Road Agency (NMWTRA) and SWTRA.

5.6 Existing Traffic Conditions

In order to assess the impact of construction traffic on the study area, one Automatic Traffic Count (ATC) site was established in November 2021 along Common Road, near the proposed site access.

The following count site was used:

¹ Welsh Government (2022), Available at: <https://gov.wales/a465-section-5-and-6-dowlais-top-hirwaun>

1. The Common Road, west of the proposed Site access.

In addition to the ATC data, further traffic flow information was obtained from the UK Department for Transport (DfT) traffic database.

The count sites used were as follows:

2. A465 (T), Heads of the Valleys Road, (north of Gurnos Ring Road) (DfT count site 10537);
3. A4060 (T), to the east of Goat Mill Road (DfT count site 30574);
4. A4060 (T), south of A4060 (T) / Merthyr Road / A4054 roundabout (DfT count site 99585);
5. A470 (T), south of Merthyr Vale (DfT count site 99588);
6. A465 (T), Heads of the Valleys Road (south of Common Road) (DfT count site 99664); and
7. A465 (T), Heads of the Valleys Road (Tafarnaubach) (DfT count site 99665).

The count site locations are shown in Figure 3.

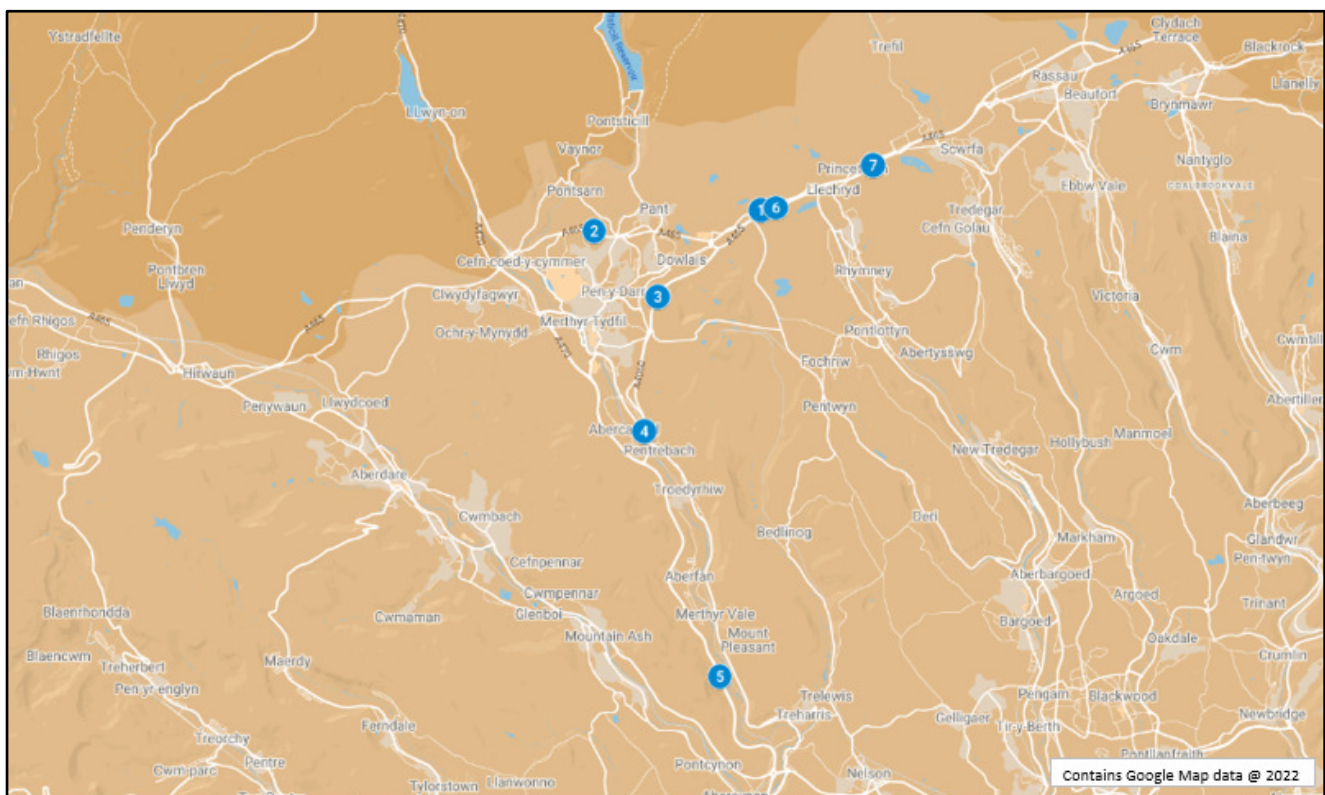


Figure 5 Count Site Locations

These sites were identified as being areas where sensitive receptors on the access route would be located.

The traffic counters allowed the traffic flows to be split into vehicle classes and the data has been summarised into cars/ light goods vehicles (LGVs) and heavy goods vehicles (HGVs) (buses and all goods vehicles >3.5 tonnes gross maximum weight).

A National Road Traffic Forecast (NRTF) low growth factor was applied to the 2019 flows obtained from the DfT database in order to estimate future year flows. It should be noted that 2019 flows were retrieved from the DfT as these flows were not subject to COVID-19 travel restrictions.

The NRTF low growth from 2019 to 2022 is 1.022. This factor was applied to the 2019 traffic flows retrieved from the DfT database in order to estimate 2022 flows.

In order to achieve a common base year with the DfT traffic count sites, a NRTF low growth was applied to the ATC survey flows to factor the 2021 observed flows to estimate 2022 flows. The NRTF low growth from 2021 to 2022 is 1.005.

The 24-hour average daily traffic flows are presented in Table 2.

Table 2 24-hour Average Traffic Data (2022)

Ref. No.	Survey Location	Source	Cars & LGV	HGV	Total
1	The Common Road, near site access	ATC	2,475	347	2,822
2	A465 (T), Heads of the Valleys Road (north of Gurnos Ring Road)	DfT	16,246	1,069	17,315
3	A4060 (T), to the east of Goat Mill Road	DfT	13,694	670	14,364
4	A4060 (T), south of A4060 (T) / Merthyr Road / A4054 roundabout	DfT	15,553	919	16,472
5	A470 (T), south of Merthyr Vale	DfT	24,785	890	25,675
6	A465 (T), Heads of the Valleys Road (south of Common Road)	DfT	27,918	1,655	29,573
7	A465 (T), Heads of the Valleys Road (Tafarnaubach)	DfT	26,008	1,363	27,371

Please note minor variances due to rounding may occur.

The ATC survey undertaken along Common Road, in November 2021 was also used to collect traffic speeds. Speed data was not available for the DfT count points.

The two-way five-day average and 85th percentile speeds observed at the ATC location are summarised in Table 3.

Table 3 Speed Summary (2021 / 2022)

Ref. No.	Survey Location	Source	Mean Speed (mph)	85 th percentile (mph)	Max. Speed Limit (mph)
1	The Common Road, near site access	ATC	41.0	47.5	60.0
2	A465 (T), Heads of the Valleys Road (north of Gurnos Ring Road)	DfT	No Available Data		60.0
3	A4060 (T), to the east of Goat Mill Road	DfT			60.0
4	A4060 (T), south of A4060 (T) / Merthyr Road / A4054 roundabout	DfT			40.0
5	A470 (T), south of Merthyr Vale	DfT			60.0
6	A465 (T), Heads of the Valleys Road (south of Common Road)	DfT			60.0
7	A465 (T), Heads of the Valleys Road (Tafarnaubach)	DfT			60.0

The results of the ATC survey indicates that there is compliance with the posted speed limit along Common Road.

5.7 Accident Review

Road traffic accident data for the three-year period commencing 1 January 2018 through to the 31 December 2020 was obtained from the online resource crashmap.co.uk (CrashMap) which uses data collected by the police about road traffic crashes occurring on British roads. While information on the CrashMap webpage notes that provisional data is available to June 2021, a review of accidents along the study area does not present any accident information for 2021, however, the traffic information analysed between 2018 and 2020 is considered sufficient to identify any accident trends within the study area.

The statistics are categorised into three categories, namely “Slight” for damage only incidents, “Serious” for injury accidents and “Fatal” for accidents that result in a death.

A summary analysis of the incidents indicates that:

- A total of 70 accidents were recorded within the study area roads within the study period;
- Of those 70 accidents, 62 were classed as slight, seven as serious and one fatality were recorded;
- Two accidents were recorded along the Common Road of which one was recorded as serious and one as slight. The serious accident involved a multi-vehicle accident involving car and bus;
- Eighteen accidents were recorded along the A465 (T) (to the west of Dowlais Top) within the study area, of which 16 were classed as slight and two were classed as serious. Two of these accidents involved motorcycles and seven separate accidents involved HGVs;
- Eight accidents have been recorded on the section of the A465 (T) (to the east of Dowlais Top) within the study area, of which six were recorded as slight, one as serious and one fatality was recorded. The fatal accident occurred at the Merthyr Road / A465 (T) Heads of the Valleys Road overpass and was recorded as a single vehicle collision involving a car. While the exact location of the accident on CrashMap is ambiguous, for the purpose of this assessment, it is assumed that the accident occurred on the A465 (T);
- Thirteen accidents were recorded along the A4060 (T) within the study area, of which 12 were recorded as slight and one was recorded as slight. Three of these incidents involved motorcycles and three separate accidents involved HGVs. The three motorcycle accidents were recorded within approximately 80m of each other along a section of the A4060 (T) bend, located to the east of Pentrebach Road / Merthyr Road roundabout;
- A total of 29 accidents were recorded along the A470 (T) within the study area, of which 27 were recorded as slight and two was recorded as serious. Four accidents occurred approximately 330m to the north of Abercynon Roundabout, all of which were recorded as slight.

The analysis indicates that the majority of recorded accidents are categorised as being slight. A review of the accident information suggests that there are no specific accident patterns or trends within the study area.

5.8 Baseline Traffic Conditions

It is anticipated that construction of the Proposed Scheme will commence in 2025. Construction of the Proposed Scheme will take approximately 12 months.

To assess the likely effects during the construction and operational phases, base year traffic flows were determined by applying a NRTF low growth factor to the surveyed traffic flows.

The NRTF low growth factor for 2022 to 2025 is 1.016. These factors were applied to the 2022 traffic data in Table 2 to estimate the 2025 Baseline traffic flows shown in Table 4.

Table 4 Baseline 2025 AADT Traffic Data

Ref. No.	Survey Location	Source	Cars & LGV	HGV	Total
1	The Common Road, near site access	ATC	2,515	353	2,867
2	A465 (T), Heads of the Valleys Road (north of Gurnos Ring Road)	DfT	16,506	1,086	17,592
3	A4060 (T), to the east of Goat Mill Road	DfT	13,913	681	14,594
4	A4060 (T), south of A4060 (T) / Merthyr Road / A4054 roundabout	DfT	15,802	933	16,735
5	A470 (T), south of Merthyr Vale	DfT	25,181	904	26,085
6	A465 (T), Heads of the Valleys Road (south of Common Road)	DfT	28,365	1,681	30,046
7	A465 (T), Heads of the Valleys Road (Tafarnaubach)	DfT	26,424	1,385	27,809

Please note minor variances due to rounding may occur.

5.9 Committed Developments

5.9.1 Introduction

The TA considers committed developments as consented schemes whose development traffic trips will be permanent on the road network and cumulative developments as consented schemes whose development trips will be transitory on the network i.e. wind farm developments construction traffic trips.

The inclusion of transitory development trips as committed development will dilute the impact of the Proposed Development's construction traffic trips. It is considered that the approach taken is a robust assessment.

5.9.2 Committed Development Trips

A review of the Caerphilly County Borough Council and Merthyr Tydfil County Borough Council planning portal was undertaken to determine any significant development which has been granted planning permission and should be considered as committed development. Planning permission was granted for the provision of 36 camping pods and five chalets, as well as on-site facilities at the existing Bike Park Wales, Abercanaid site (Merthyr Tydfil County Borough Council Planning reference P/19/0073). Trip information was obtained from the Bike Park's Transport Assessment to estimate daily trips associated with the development to be included as committed development trips.

The 2025 Future Baseline Flows, which include the committed development trips, are presented in Table 5. This will be used in the Construction Peak Traffic Impact Assessment.

Table 5 2025 Future Baseline Flows (including Committed Development Trips)

Ref. No.	Survey Location	Cars & LGV	HGV	Total
1	The Common Road, near site access	2,515	353	2,867
2	A465 (T), Heads of the Valleys Road (north of Gurnos Ring Road)	16,506	1,086	17,592
3	A4060 (T), to the east of Goat Mill Road	13,960	681	14,641
4	A4060 (T), south of A4060 (T) / Merthyr Road / A4054 roundabout	15,888	933	16,822
5	A470 (T), south of Merthyr Vale	25,228	904	26,133
6	A465 (T), Heads of the Valleys Road (south of Common Road)	28,412	1,681	30,093
7	A465 (T), Heads of the Valleys Road (Tafarnaubach)	26,471	1,385	27,856

It should be noted that the use of low NRTF growth factors for background traffic is considered robust for addressing smaller, non-significant traffic generation caused by smaller developments within the study area. As such, a robust assessment case has been provided in this report.

5.9.3 Cumulative Development Trips

A review of surrounding wind farm developments has been undertaken. Planning consent has been granted for one wind turbine with a maximum blade tip height of 77m, to the north of Asda Superstore (Merthyr Tydfil County Borough Council Planning ref P/15/0241). A review of the online planning application documents presents a Transport Management Plan (TMP) which shows the delivery schedule, which is two-weeks in total. Deliveries are shown to be a maximum of two deliveries per day with the exception of Day 8 where concrete deliveries will account for 35 deliveries. The TMP notes that "Ahead of the selected day for pouring of concrete the contractor will give timely notice of the activity to all stakeholders."

One wind turbine with a maximum blade tip height of 20.2m has been granted on land adjacent to the Valley Heights Filling Station, along the Heads of the Valleys Road (Merthyr Tydfil County Borough Council Planning reference P/16/0384). A review of the online planning documents notes that construction works will take place over a total of nine days, with a maximum of 14 movements occurring in week one, which is an average of three movements per day.

Abergorki Wind Farm (Rhondda Cynon Taf Planning reference 13/0663/10) is located approximately 16km to the south west of the site and has been granted planning permission for a total of three wind turbines. It is not expected that construction traffic associated with Abergorki Wind Farm will impact on the Proposed Scheme's study area.

Any significant crossover of traffic associated of the above wind farms with the Proposed Scheme flows (such as the wind turbines to the north of ASDA Superstore and adjacent to Valley Heights Filling Station) would be addressed via an overarching Construction Traffic Management Plan, if required by the road authorities. The inclusion of further traffic flows in the base line (i.e. including non-consented traffic) will dilute the potential impact that the Proposed Scheme will have. As such, the approach taken is considered to be a robust assessment.

6 Trip Generation and Distribution

During the construction period, the following traffic will require access to the Site:

- Staff transport, in either cars or minibuses;
- Construction equipment and materials, deliveries of machinery and supplies such as concrete and crushed rock; and
- Abnormal loads comprising wind turbine sections and also heavy lift crane(s).

Average monthly traffic flow data were used to establish the construction trips associated with the Proposed Scheme based on the assumptions detailed in the following sections.

It should be noted that there may be variations in the following calculations due to rounding, which are not considered significant.

6.1.1 Construction Staff

Staff would arrive in non-HGV vehicles and where possible will be encouraged to car share. The workforce onsite will depend on the activities undertaken, but, based on previous wind farm construction site experience for a project of this scale which suggests three staff per turbine during the short peak period of construction is likely, the maximum number of staff expected onsite could be around 18 per day.

For the purposes of estimating traffic movements, it was assumed that 40% of staff would be transported by minibus and 60% would arrive by car (single car occupancy was assumed as the worst case at this stage with potentially fewer movements through car sharing).

Based on these assumptions, staff transport cars and light vehicles would account for a maximum of 24 vehicle trips (12 inbound trips and 12 outbound trips) per day during the peak period of construction.

6.1.2 Abnormal Indivisible Load Deliveries

The wind turbines are broken down into components for transport to the Site. The nacelle, blade and tower sections are classified as Abnormal Indivisible Loads (AIL) due to their weight, length, width and height when loaded. For the purposes of the report, the 'worst case' numbers of components requiring transport are illustrated in Table 6.

In addition to the turbine deliveries, one high capacity erection crane would be needed to offload a number of components and erect the turbines. The crane is likely to be mobile cranes with a capacity up to 1,000 tonnes that are escorted by boom and ballast trucks to allow full mobilisation onsite. Smaller erector cranes would also be present to allow the assembly of the main cranes and to ease the overall erection of the turbines.

Escort vehicles would accompany the AIL convoys to support the traffic management measures. Up to three vehicles would be deployed and it is assumed that three turbine components would be delivered per convoy.

Table 6 Turbine Components

Component	Number of Components per Turbine
Rotor Blades	3
Tower Sections	4
Nacelle	1
Hub	1
Drive Train	1
Nose Cone	1
Transformer	1
Ancillary	1
Site Parts	0.2 (parts shared between 5 turbines on one delivery)

6.1.3 General Deliveries

Throughout the construction phase, general deliveries will be made to the site by means of HGV. These would include fuel, site office and staff welfare. At the height of construction, it is assumed that up to 40 journeys to site are made (20 inbound trips and 20 outbound trips) per month.

6.1.4 Material Deliveries

Various materials will need to be delivered to site to form the site-based infrastructure. At the outset, HGV deliveries will deliver plant and initial material deliveries to the Site to enable the formation of the site compound and to delivery construction machinery.

Ready-mix concrete will be delivered to the Site for the foundations of the turbines and substation. For the purpose of this assessment, it is assumed that ready-mix concrete will be delivered from concrete plants located to the east of the Site via the A465 (T) Heads of the Valleys Road. It is expected that the total required volume of concrete will be approximately 10,120m³, which will result in 4,284 total journeys (2,142 inbound trips and 2,142 outbound trips).

Reinforcement required in the foundations across the Site are detailed in Table 7 below.

Table 7 Steel Reinforcement Deliveries

Element	Weight / Installation (t)	Total Weight (t)	Lorry Capacity (t)	Inbound Trips	Total Journeys
Turbine Foundation	150	900	30	30	60
Substation Foundation	20	20	30	1	2

The proposed access tracks would generally be 5.5m in width and would be designed to accommodate 13 tonne axle loads. In addition to the roads, crane pads will be constructed to enable the turbine erection process. It is estimated that 100% of the aggregate material requirements will be imported to the Site from quarries to the south of the site, via the A470 (T).

The tracks, crane pads and compounds will require geotextile in the foundations. Geotextile will be delivered to site in rolls. A total of 70 large rolls may be required at site and would be delivered by HGV, which will result in approximately seven journeys (four inbound trips and four outbound trips).

Cables will connect each turbine to the control building. Trip estimates for the cable materials are provided below in Tables 8 and 9.

Three cables are to be provided within each cable trench and would be assumed to be backfilled with cable sand to provide a robust assessment.

The cable materials would be likely sourced from sites along the A470 (T) corridor, to the south of Merthyr Tydfil and would be transported on the A4060 (T) and Common Road to the Site.

Table 8 Cable Trip Estimate

Element	Total Cable Length (m)	Length per Drum (m)	Number of Drums	Inbound Trips	Total Journeys
Cables	19,170	500	38	5	10

Table 9 Cable Sand Trip Estimate

Element	Volume / Installation (m3)	Lorry Capacity (t)	Inbound Trips	Total Journeys
Cable Sand	2,157	20	173	346

It is estimated that ten journeys (five inbound trips and five outbound trips) will be required to deliver cable ducting to the Site.

A control building will be constructed on the Site. This will require deliveries of building materials and structural elements and would result in 75 journeys.

The resulting traffic generation estimates have been plotted onto the indicative construction programme to illustrate the peak journeys on the network. Table 10 illustrates the trip generation throughout the construction programme.

Table 10 Construction Traffic Profile

Activity	Class	Month											
		1	2	3	4	5	6	7	8	9	10	11	12
Site Establishment	HGV	50	50										
General Site Deliveries	HGV	40	40	40	40	40	40	40	40	40	40	40	40
Access Tracks & Hardstand Stone	HGV	801	801	1,601	1,601	1,601	1,601	1,601					
Access Track Geotextiles	HGV		4			4							
Concrete Deliveries	HGV						1,428	1,428	1,428				
Reinforcement Deliveries	HGV						21	21	21				
Cabling Sand	HGV							115	115	115			
Cabling and Ducting Materials	HGV							7	7	7			
Cranage	HGV									6	6		
Turbine Delivery	HGV									79	79		
Substation & Ancillary Works	HGV							19	19	19	39	20	
Turbine Escorts	Cars & LGV									62	62		
Site Reinstatement & Commissioning	Cars & LGV											50	50
Staff	Cars & LGV	286	506	519	519	519	519	519	519	519	519	260	260
Total HGV	HGV	891	894	1,641	1,641	1,645	3,090	3,230	1,629	266	164	60	40
Total Cars & LGV	Cars & LGV	286	506	519	519	519	519	519	519	581	601	330	310
Total Movements	Total	1,177	1,400	2,160	2,160	2,164	3,609	3,750	2,149	847	745	370	350
Total HGV per Day*	HGV	40	41	75	75	75	140	147	74	12	8	3	2
Total Cars & LGV per Day*	Cars & LGV	13	23	24	24	24	24	24	24	26	26	14	14
Total per Day*	Total	53	64	98	98	98	164	170	98	39	34	17	16

*Calculations assume that there are 22 working days per month

The peak of construction occurs in Month 7 with 170 journeys (24 Car & LGV and 147 HGV journeys).

6.1.5 Distribution of Construction Trips

The distribution of construction traffic on the network would vary depending on the types of loads being transported. The assumptions for the distribution of construction traffic during the peak months would be as follows and is based upon a desk based review of likely sources:

- All construction traffic enters the Site via the newly provided access junction leading from Common Road;
- Deliveries associated with ready-mix concrete deliveries will arrive via from a concrete plant located to the east of the Site, via the A465 (T);

- It is assumed that 100% of aggregate material requirements will be imported to the Site and will be delivered from the quarries to the south of the Site, via the A470 (T). The Balance of Plant (BoP) contractor will confirm final quarry and material sourcing in the Construction Traffic Management Plan (CTMP);
- HGV deliveries associated with the High Voltage (HV) electrical installation, control buildings, batteries, etc will arrive via the A470 (T), and subsequently by the A4060 (T) and Common Road to the Site;
- Staff working at the site are likely to be based locally. It is assumed that 40% will be based to the west of the Site, 40% to the east and 20% to the south; and
- General site deliveries are assumed to arrive from Pant and will arrive via the A465 (T) to the Site. These are generally smaller rigid HGV vehicles.

Loads relating to the turbine components would be delivered from the Port of Swansea. The access route is shown in Figure 6 would be as follows:

- Loads will depart the port and access the A483 Fabian Way (Eastbound) using a contraflow manoeuvre;
- Loads would proceed eastbound and would join the M4 at Junction 42;
- Loads would then continue to Junction 43, where they would depart the motorway and would subsequently join the A465 (T) through to Merthyr Tydfil; and
- Loads would leave the A465 (T) using a new off slip track for AIL traffic only based upon the old road alignment located to the east of the Pengarnddu Business Park access roundabout. This would be reopened for AIL only traffic. The proposed layout of the slip track is presented in Appendix C.
- They would then proceed directly onto Common Road where the loads will then continue to the Site access junction. This removes the need for complex turning manoeuvres at the Asda roundabout and bends located to the west end of Common Road.

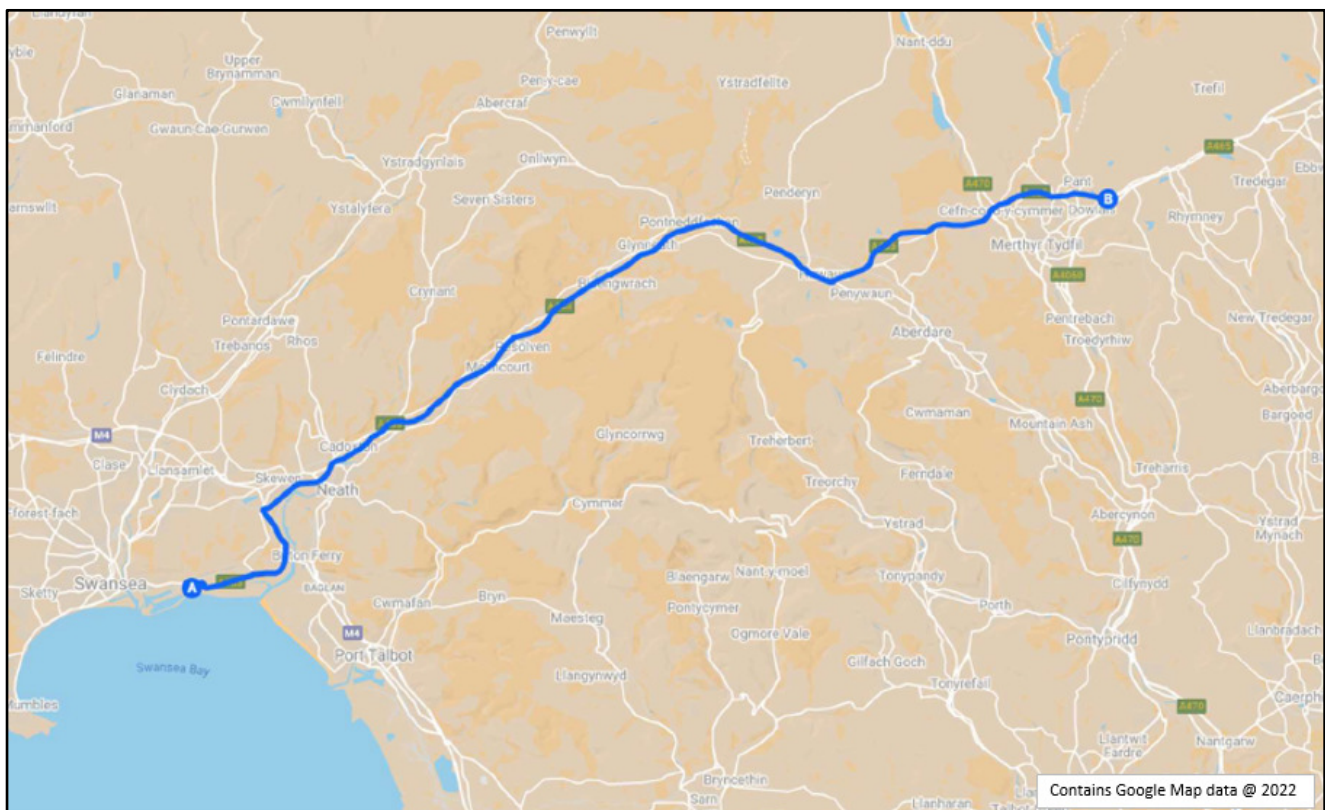


Figure 6 AIL Component Delivery Route

Following the distribution and assignment of traffic flows to the study area network, the resultant daily traffic during the peak of construction are summarised in Table 11.

Table 11 Peak Construction Traffic

Ref. No.	Survey Location	Cars & LGV	HGV	Total
1	The Common Road, near site access	12	82	93
2	A465 (T), Heads of the Valleys Road (north of Gurnos Ring Road)	6	0	6
3	A4060 (T), to the east of Goat Mill Road	6	78	84
4	A4060 (T), south of A4060 (T) / Merthyr Road / A4054 roundabout	6	78	84
5	A470 (T), south of Merthyr Vale	0	78	78
6	A465 (T), Heads of the Valleys Road (south of Common Road)	0	0	0
7	A465 (T), Heads of the Valleys Road (Tafarnaubach)	12	65	77

Please note minor variances due to rounding may occur.

From Table 11, it is estimated that 93 journeys (12 Cars & LGV and 82 HGVs) will arrive to the Site access from the south and west, via Common Road, and 77 journeys (12 Cars & LGV and 65 HGVs) will arrive to the Site access from the east via Common Road.

6.2 Decommissioning Phase

Prior to decommissioning of the site, a traffic assessment would be undertaken, and appropriate traffic management procedures followed.

The decommissioning phase would result in fewer trips on the road network than the construction or operational phases as it is considered likely that elements of infrastructure such as access tracks would be left in place and structures may be broken up onsite to allow transport by a reduced number of HGV.

7 Traffic Impact Assessment

7.1 Construction Impact

The peak month traffic data was combined with the future year (2025) traffic data to allow a comparison between the baseline results to be made. The increase in traffic volumes is illustrated in percentage increases for each class of vehicle. This is illustrated in Table 12.

Table 12 2025 Peak Monthly Daily Traffic Data

Ref. No.	Survey Location	Cars & LGV	HGV	Total Traffic	Cars & LGV % Increase	HGV % Increase	Total Traffic % Increase
1	The Common Road, near site access	2,526	434	2,961	0.47%	23.13%	3.26%
2	A465 (T), Heads of the Valleys Road (north of Gurnos Ring Road)	16,512	1,086	17,598	0.04%	0.00%	0.03%
3	A4060 (T), to the east of Goat Mill Road	13,966	759	14,725	0.04%	11.45%	0.57%
4	A4060 (T), south of A4060 (T) / Merthyr Road / A4054 roundabout	15,894	1,011	16,906	0.04%	8.36%	0.50%
5	A470 (T), south of Merthyr Vale	25,228	982	26,211	0.00%	8.63%	0.30%
6	A465 (T), Heads of the Valleys Road (south of Common Road)	28,412	1,681	30,093	0.00%	0.00%	0.00%
7	A465 (T), Heads of the Valleys Road (Tafarnaubach)	26,483	1,450	27,933	0.04%	4.71%	0.28%

Please note minor variances due to rounding may occur.

The total traffic movements are not predicted to increase by more than 10% on all of the study area.

Table 12 shows that HGV traffic movements will increase by more than 10% Common Road, to the west of the Site access (23.13%) and along the A4060 (T), to the east of Goat Mill Road (11.45%). Whilst these increases are statistically significant, it is generally caused by relatively low HGV flows on these two links which will see an increase of 82 and 79 daily HGV movements, respectively. This represents approximately seven HGV movements per hour on each of the respective links during construction activities, which is not considered significant in terms of overall traffic flows.

A review of the existing road capacity has been undertaken using the Design Manual for Roads and Bridges, Volume 15, Part 5 "The NESMA Manual". The theoretical road capacity has been estimated for each of the road links for a 12-hour period that makes up the study area. The results are summarised in Table 12.

Table 13 2025 Peak Traffic Flow Capacity Review

Ref. No.	Survey Location	2025 Baseline Flow	2025 Base + Development Flows	Theoretical Road Capacity (12hr)	Spare Road Capacity %
1	Common Road, near site access	2,867	2,961	19,200	84.58%
2	A465 (T), Heads of the Valleys Road (north of Gurnos Ring Road)	17,592	17,598	36,000	51.12%
3	A4060 (T), to the east of Goat Mill Road	14,641	14,725	81,600	81.95%
4	A4060 (T), south of A4060 (T) / Merthyr Road / A4054 roundabout	16,822	16,906	28,800	41.30%
5	A470 (T), south of Merthyr Vale	26,133	26,211	81,600	67.88%
6	A465 (T), Heads of the Valleys Road (south of Common Road)	30,093	30,093	81,600	63.12%
7	A465 (T), Heads of the Valleys Road (Tafarnaubach)	27,856	27,933	81,600	65.77%

Please note minor variances due to rounding may occur.

The results indicate there are no road capacity issues as a result of the construction of the Proposed Scheme and ample spare capacity exists within the trunk and local road network to accommodate construction phase traffic.

8 Proposed Traffic Mitigation Measures

8.1 Construction Phase

The following measures would be implemented through a Construction Traffic Management Plan (CTMP) during the construction phase. The CTMP would be agreed with the relevant road authorities prior to construction works commencing:

- Where possible the detailed design process would minimise the volume of material to be imported to site to help reduce HGV numbers;
- Where possible deliveries will be co-ordinated so that vehicles will not be idle on-site. In instances where vehicles are required to wait to carry out the deliveries, the engines of stationary vehicles will be turned off in order to reduce emissions;
- A site worker transport and travel arrangement plan, including transport modes to and from the worksite (including pick up and drop off times);
- All materials delivery lorries (dry materials) should be sheeted to reduce dust and stop spillage on public roads;
- Specific training and disciplinary measures should be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- Wheel cleaning facilities may be established at the site entrance, depending the views of the local road authorities;
- Normal site working hours would be limited to between 0700 and 1900 (Monday to Friday) and 0700 and 1300 (Saturday) though component delivery and turbine erection may take place outside these hours;
- Appropriate traffic management measures would be put in place on the Common Road in the vicinity of the junction providing access to the site to avoid conflict with general traffic, subject to the agreement of the roads authority. Typical measures would include HGV turning and crossing signs and/ or banksmen at the site access and warning signs;
- Provide construction updates on the project website and or a newsletter to be distributed to residents within an agreed distance of the site.
- Adoption of a voluntary speed limit of 20 mph for all construction vehicles along Common Road;
- All drivers would be required to attend an induction to include:
 - A tool box talk safety briefing;
 - The need for appropriate care and speed control;
 - A briefing on driver speed reduction agreements (to slow site traffic at sensitive locations through the villages); and
 - Identification of the required access routes and the controls to ensure no departure from these routes.

The local road authorities may require an agreement to cover the cost of abnormal wear and tear on Common Road within 200 m of the site access junction.

Video footage of the pre-construction phase condition of the abnormal loads access route and the construction vehicles route would be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline would inform any change in the road condition during the construction stage of the Proposed Scheme. Any necessary repairs would be coordinated with the Roads Authority. Any damage caused by traffic associated with the Proposed Scheme, during the construction period that would be hazardous to public traffic, would be repaired immediately.

Any damage to road infrastructure caused directly by construction traffic would be made good, and street furniture that is removed on a temporary basis would be fully reinstated.

There would be a regular road edge review and any debris and mud would be removed from the public carriageway to keep the road clean and safe during the initial months of construction activity, until the construction junction and immediate access track works are complete.

8.2 Abnormal Load Transport Management Measures

There are a number of traffic management measures that could help reduce the effect of abnormal load convoys. Full details of the proposals are set out in the Transport Management Plan with summary measures proposed below.

All abnormal load deliveries would be undertaken at appropriate times (to be discussed and agreed with the relevant roads authorities and police) with the aim to minimise the effect on the local road network. It is likely that the abnormal load convoys would travel in the early morning periods, before peak times while general construction traffic would generally avoid the morning and evening peak periods.

The majority of potential conflicts between construction traffic and other road users will occur with abnormal load traffic. General construction traffic is not likely to come into conflict with other road users as the vehicles are smaller and road users are generally more accustomed to them.

Advance warning signs would be installed on the approaches to the affected road network. Information signage could be installed to help assist drivers and an example is illustrated in Figure 7. Flip up panels (shown in grey) would be used to mask over days where convoys would not be operating. When no convoys are moving, the sign would be bagged over by the Traffic Management contractor.

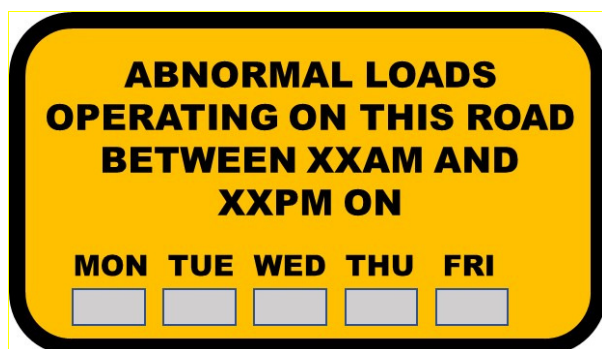


Figure 7 General Site Location

This signage will assist in helping improve driver information and allow other road users to consider alternative routes or times for their journey (where such options exist).

The location and numbers of signs would be agreed post consent and would form part of the wider Traffic Management Proposal for the project.

The Abnormal Load Transport Management Plan would also include:

- Procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles are not impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates and agreeing communication protocols and lay over areas to allow overtaking;
- A diary of proposed delivery movements to liaise with the communities to avoid key dates;
- A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic; and

8.3 Public Information

Information on the turbine convoys would be provided to help assist the public.

Information would relate to expected vehicle movements from the port of entry through to the site access junction. This will assist residents becoming aware of the convoy movements and may help reduce any potential conflicts.

The applicant would also ensure information was distributed through its communication team via the project website, local newsletters and social media.

8.4 Convoy System

A police escort would be required to facilitate the delivery of the predicted loads. The police escort would be further supplemented by a civilian pilot car to assist with the escort duty. It is proposed that an advance escort would warn oncoming vehicles ahead of the convoy, with one escort staying with the convoy at all times. The escorts and convoy would remain in radio contact at all times where possible.

The abnormal loads convoys would be no more than three AILs long, or as advised by the police, to permit safe transit along the delivery route and to allow limited overtaking opportunities for following traffic where it is safe to do so.

The times in which the convoys would travel will need to be agreed with South Wales Police who have sole discretion on when loads can be moved.

8.5 Operational Phase Mitigation

Site entrance roads will be well maintained and monitored during the operational life of the development. Regular maintenance will be undertaken to keep the site access track drainage systems fully operation and to ensure there are no run-off issues onto the public road network.

9 Summary and Conclusions

Pell Frischmann was commissioned to undertake a Transport Assessment (TA) for the proposed Pen March Wind Farm on behalf of the Applicant.

Existing traffic data established a base point for determining the impact during the construction phase and was factored to future levels to help determine the effect of construction traffic on the local road network.

The construction traffic would result in a temporary increase in traffic flows on the road network surrounding the Proposed Scheme. The maximum traffic effect associated with construction of the Proposed Scheme is predicted to occur in Month 7 of the construction programme. During this month, an average of 147 HGV movements is predicted per day and it is estimated that there would be a further 24 car and light van movements per day to transport construction workers to and from the Site.

A series of mitigation measures and management plans have been proposed to help mitigate and offset the impacts of both the construction and operational phase traffic flows.

No link capacity issues are expected on any of the roads assessed due to the additional movements associated with the Proposed Scheme. The effects of construction traffic are temporary in nature and are transitory.

Appendix A Transport Management Plan & Route Survey Report

Pell Frischmann

Pen March Wind Farm

Transport Management Plan

November 2022

104561

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Annex A Route Survey Report

1 Introduction

1.1 Report Purpose

Pell Frischmann has been commissioned by RWE to undertake a Transport Management Plan (TMP) for the delivery of abnormal loads associated with the construction of Pen March Wind Farm located approximately 1km to the north-east of Dowlais Top and 2km north-west of Rhymney town centre.

This report has been prepared in accordance with instructions from RWE on the above project details. No liability is accepted for the use of all or part of this report by third parties. Any other persons who use any information contained herein do so at their own risk.

This document is indicative at this point in time and it is expected that a revised document will be required via planning conditions, should the site be consented and following confirmation of the exact candidate turbine. The report identifies the key points, issues and management proposals associated with the route that may require remedial works to accommodate the predicted loads. The designs of these remedial works, however, are beyond the agreed scope of works. It is the responsibility of the turbine supplier to ensure that the access route from the Port of Entry (POE) to the site is fit for purpose and that appropriate consideration for all road users has been made in accordance with the relevant health and safety legislation and ruling transport requirements.

Where references are made to work by third parties, Pell Frischmann do not accept any liabilities for these items or issues based upon them.

Whilst this report primarily features the requirements of those loads classed as abnormal under current legislation, it also contains elements relevant for the transport of other non-abnormal turbine components and materials.

2 Proposed Development

2.1 Site Location

The location of the Proposed Development is presented in Figure 1.

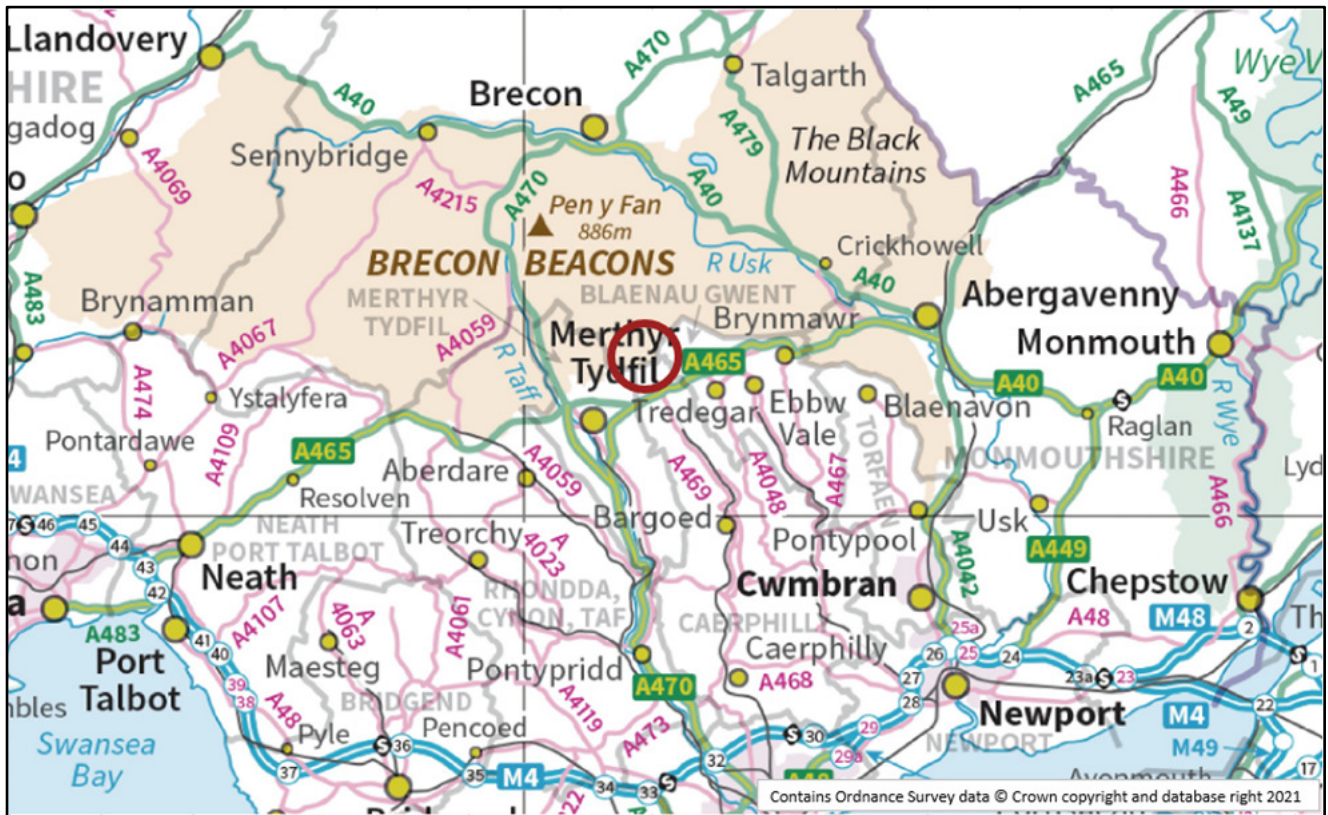


Figure 1 Site Location Plan

In summary, the Proposed Scheme will comprise the following:

- Up to six wind turbines, each with turbine foundations, crane hardstandings and laydown/storage areas;
- An electrical substation and control building, along with potential battery storage facilities;
- Underground power cables linking the turbines and the on-site substation, laid in trenches alongside access tracks;
- New site access and on-site access tracks, with pipeline and watercourse crossings (if/where required);
- A temporary construction and storage compound; and
- Off-site works to facilitate the movement of abnormal loads (construction of over-run areas and temporary modifications to street furniture etc).

Planning permission for the Proposed Scheme is being sought for an operational life of 35 years.

2.2 Candidate Turbines

RWE have indicated that they wish to consider a Vestas V150 turbine at a tip height of 180m. The tower design is likely to be site specific and therefore for the purpose of the access assessment Vestas has advised that a 30m x 4.3m x 4.3m tower will provide a worst-case kinematic envelope. The details of the components are summarised in Table 1.

Table 1 Turbine Size Summary

Component	Length (m)	Width (m)	Height / Min Diameter (m)	Weight (t)
Blade	73.70	4.06	3.12	17.24
Tower	30.00	4.30	4.30	60.00

Full details of the selected candidate turbine will be provided once the commercial turbine selection process has been undertaken and the Route Survey and TMP will be revised.

It is likely that the turbines used on the site will be delivered as up to 12 abnormal loads and would be escorted by the police in convoys of between two and three convoys depending upon the view of the Police. Sections that do not classify as abnormal, would not need a police escort and can be escorted by civilian escorts.

Indicative component details are noted in Table 2.

Table 2 Indicative Turbine Components

Component	Number of Components per Turbine
Rotor Blades	3
Tower Sections	4
Nacelle	1
Hub	1
Drive Train	1
Nose Cone	1
Transformer	1
Ancillary	1
Site Parts	0.2 (parts shared between 5 turbines on one delivery)

All the trailers used in the transport process are specifically designed for the transport of components or feature custom modifications to suit loads. All feature rear wheel steering and the nacelle and tower load adaptor trailers feature hydraulic lift capabilities to adjust ground clearances.

When not transporting components, the trailers are collapsed so that they do not exceed normal HGV dimensions.

The trailers are built to a high standard and the tractor units are designed for heavy haulage. Regular checks are undertaken on the vehicles on a daily basis as outlined in later sections of the report. As such, the mechanical state of vehicles is kept at a very high level and breakdowns or malfunctions are very rare.

2.3 Proposed Abnormal Load Delivery Equipment

To provide a robust assessment scenario based upon the known issues along the access route, it has been assumed that all blades will be carried on Super Wing Carrier to reduce the need for mitigation in constrained sections of the route.

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

Figure 2 Super Wing Carrier Trailer



Figure 3 Tower Trailer



2.4 Legislative Background

The UK Government describes an Abnormal Indivisible Load (AIL) as “any load that cannot be broken down into smaller loads without undue expense or risk of damage”. AIL movements remain a reserved matter for the UK parliament.

There are four main pieces of legislation that cover AIL movements are:

- The Road Vehicles (Construction & Use) Regulation 1986;
This covers all aspects of the vehicles setup from the weights and dimensions through to the braking system and environmental standards.
- The Road Vehicles (Authorised Weight) Regulations 1998;
This regulation sets the limited maximum weight of the vehicle and axle loading of different vehicle categories.

- The Road Vehicles (Authorisation of Special Types) (General) Order 2003;
The STGO is for vehicles not covered by either of the above Regulations and covers wind turbine component delivery vehicles which are categorised as N3 for the tractor units and O4 for the specifically designed trailers. It states that the Police, the relevant highway and bridge authorities or the Secretary of State may need to be notified of vehicle movement, dependent on the size of the load. Notifications can be made online through the 'Highway Agency's Electronic Service Delivery for Abnormal Loads (ESDAL) System' or in paper form using the BE16 form for Special Orders.
- The Road Vehicles Lighting Regulation 1989 (Authorisation of Special Types) (General) Order 2003;
This regulation defines whether front, side and rear lamps and reflectors are mandatory and which ones are permitted and which are not permitted.

Applications for a 'Vehicle Special Order' (VSO) should be made to the Vehicle Certification Agency (VCA) and it is recommended that applications are applied for at least 8 weeks prior to planned vehicle movements.

To support the movement of abnormal loads the Police may be required to stop other traffic. In order to bolster existing powers, a Temporary Traffic Regulation Order (TTRO) will be required to cover the delivery period to allow the Police to stop and redirect where necessary.

Wherever possible in this study, Pell Frischmann has referred to the above and any specific WG guidance on the transport of abnormal wind farm loads.

2.5 General Construction Traffic

An estimate of the traffic associated with the construction phase of the development has been included in the Transport Assessment report.

Estimates have been made of the likely number and type of heavy vehicle movements including abnormal loads requiring access to the site to deliver plant, equipment and materials for the various activities and stages of construction (two-wheel vehicle access is not included).

Heavy goods vehicles (HGVs) are required during the construction process for:

- Mobilisation – the initial delivery of plant and equipment to the site;
- Daily service and deliveries – for example the delivery of concrete; and
- Demobilisation (the reverse of mobilisation).

An assessment of the likely significance of effects of the traffic associated with the proposed wind farm during construction and operation has been undertaken. Based on existing traffic data, the estimated volume of construction traffic, the implementation of mitigation measures such as an appropriate traffic management plan and suitable liaison with the relevant authorities, an assessment of the residual effect has been made. The residual traffic and transport effects are temporary and have been assessed as having no significant or lasting impact.

3 Access Strategy

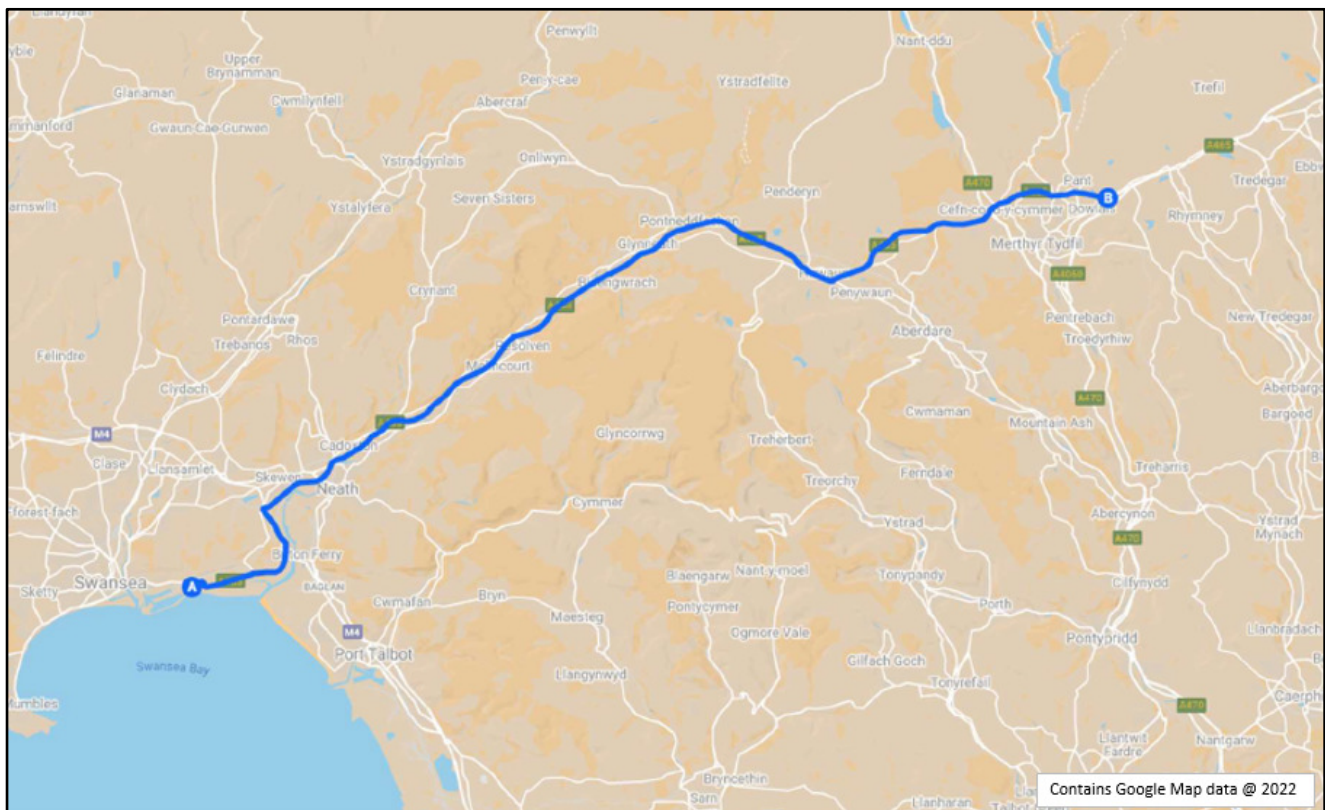
The Proposed Development will be directly accessed from a new access junction located off the Common Road. The junction will be built to accommodate all predicted loads and traffic for both the construction and operational phases of the proposed development.

The proposed Port of Entry (PoE) is Swansea. The port is the closest suitable port to site and as such is in line with the Government's "Water Preferred" policy towards AIL movements.

The proposed access route is illustrated in Figure 4 and is as follows:

- Loads will depart the port and access the A483 Fabian Way (Eastbound) using a contraflow manoeuvre;
- Loads would proceed eastbound and would join the M4 at Junction 42;
- Loads would then continue to Junction 43, where they would depart the motorway and would subsequently join the A465 (T) through to Merthyr Tydfil; and
- Loads would leave the A465 (T) using the old road alignment located to the east of the Pengarnddu Business Park access roundabout. This would be reopened for AIL only traffic. They would then proceed directly onto the Common Road where the loads will then continue to the Site access junction. This removes the need for complex turning manoeuvres at the Asda roundabout and bends located to the west end of the Common Road.

Figure 4 AIL Component Delivery Route



It should be noted that works are currently underway on the A465 (T) section 5 and 6 Dowlais Top to Hirwaun which involves converting the A465 (T) to two lanes in each direction. It is anticipated that the works will be complete in 2025¹. The A465 (T) currently remains open to traffic and is managed through traffic management operations. It is expected that the works will be complete by mid 2025.

¹ Welsh Government (2022), Available at: <https://gov.wales/a465-section-5-and-6-dowlais-top-hirwaun>

4 Access Constraints

4.1 Route Survey

A detailed Route Survey from the port access gates through to the site access junction has been undertaken and is provided in Annex A of this report. This includes swept path assessments of the proposed route for the worst case turbine sections.

4.2 Contingency / Hold Points

As most of the route is dual carriageway, there is no need to provide temporary or new laybys along the route as demonstrated in other wind farm projects where such facilities have not been required. Trailing traffic can pass the convoy on dual carriageways where the Police decide it is appropriate.

To allow for contingency stop over points, it is suggested that existing laybys on the A465 are used and these are coned off for AIL use when required, with the coning operated by the convoy traffic management contractors. This was successfully used for the Hendy Wind Farm deliveries with Welsh Government approval.

The locations of the proposed laybys will be selected once the A465 improvement works are complete and once the locations and form of all of the laybys on the road have been completed. The locations would be agreed with the Police and Welsh Government in the finalised TMP document.

4.3 Initial Structures Review

An Electronic Service Delivery for Abnormal Loads (ESDAL) consultation has been undertaken using the indicative vehicle load information and details of the consultation are provided in Annex A. These will be reconfirmed once the exact turbine model to be used on the site has been selected following the commercial tendering process, post consent.

4.4 BE16 Permits and Movement Orders

The BE16 permits and movement orders for the movement of the convoys will be applied for by the haulier, once selected by the successful turbine supply firm. The application will detail the movement dates and will confirm any potential road works conflicts and will include a more detailed weight review and assessment with all of the ESDAL contacts noted in Annex A.

Movement orders will be applied for by the haulier following the granting of the BE16 permits and will be agreed with the Police. This will agree the convoy composition and dates / times of transit.

4.5 Use of Banksman

All steering of loads using manual steering will be undertaken by civilian escort drivers. A suitably qualified and approved contractor will support the manoeuvring of loads in constrained sections. The lead traffic management operative will be in contact with the lead escort driver to arrange communications.

The traffic management contractor will also be required to erect warning road signs (at locations advised by the road agencies, to remove cones from temporary use areas and to remove items such as bollards from the roundabout islands.

4.6 AIL Movement Co-ordinator

The turbine supplier will appoint their haulier in advance of the movements occurring. The haulier will make the various applications for the AIL movements and shall appoint its senior driver or other responsible person as their Movement Co-ordinator.

The Movement Co-ordinator will act as the main point of contact for the Councils, trunk road officers, planning authorities and the Police. The Co-ordinator will be in place two months prior to loads moving and will be responsible for the implementation of the TMP and for any changes and or updates.

4.7 Temporary Traffic Regulation Order

A Temporary Traffic Regulation Order (TTRO) will be applied for in advance of the convoy movement to provide further powers to the Police to allow them to escort the abnormal load convoys.

On the trunk road sections of the route, it is likely that existing rolling trunk road orders would be used and this will be confirmed with the Welsh Government prior to the mobilisation phase.

A separate TTRO order will be made for the non-trunk road sections of the route with the four affected local authorities and will be made at least 6 months in advance of the first convoy to allow for test runs, as well as the full deliveries.

4.8 Land Requirements

A legal land review has been undertaken for all areas where third party works are noted. All land required to deliver the infrastructure associated with the wind farm is either within land controlled by RWE or is located within the extents of the adopted highway.

No third-party land rights are required to enable the development of this TMP.

4.9 Road Condition Review

A before and after condition review of the road infrastructure changed or altered following use by abnormal loads will be undertaken before and after deliveries. Any damage caused will be repaired at the developer's cost following the post-delivery inspection.

5 Convoy Movement Strategy

5.1 Convoy Management Strategy

The abnormal loads would be transported in a convoy with Police escorts. The convoy would be made up of the following vehicles:

- 3-4 Police outrider motorcyclists, providing close and advance escort protection;
- 1 police command vehicle, providing a control point for the outriders, located at either the front or rear of the convoy, depending upon movement instructions;
- 1 traffic management vehicle (operating in specific sections such as those in urban areas to provide additional traffic management support to the Police) providing traffic management support to the convoy. Please note that this vehicle would be manned by specifically trained personnel to assist with close convoy traffic management. Other traffic management teams could be stationed along the route to assist at specific points where socket signage, etc are required;
- 2 -3 abnormal loads; and
- 1 civilian escort. This vehicle is located behind the last abnormal load and provides steersman support to the AIL drivers.

The convoy is controlled by the Police when on the public highway. All movements are under their instruction.

The Police have indicated that they wish to keep the convoy moving as much as possible and will operate a “rolling roadblock”, by continuing ahead of the convoy and halting oncoming traffic where and when required. To be clear, it is only in constrained sections of the route that oncoming traffic will have to be managed in this way.

Unconstrained sections, where oncoming traffic will be able to pass safely whilst the convoy is moving are referred to as “free running”. Sections where at specified points oncoming traffic will be held by Police to enable the convoy to navigate a constrained length of carriageway are referred to as “held running”.

Oncoming traffic at junctions will be held back by Police escorts to allow the safe passage where loads are manoeuvring. The motorway and dual carriageway sections of the route will not present significant issues for other road users. The loads will remain in Lane 1 or crawler lanes where available. Other road users will be able to safely pass the loads.

Where loads project outwith dual carriageway lanes, the Police have advised that they would not wish passing traffic to pass. To overcome this, the Police have indicated that over-sail of hard shoulders / verges is permitted, or that the convoy would stop to allow overtaking where the officer in charge deems it prudent.

5.2 Traffic Management

Hold points are required at locations where there is a potential for the wider loads to come into potential conflict with oncoming HGV traffic. The Freight Transit Association (FTA) advises that an average HGV is 2.55m wide in the body. The driver side wing mirror would account for a further 0.1m, requiring a minimum clear passage of 2.65m, assuming the offside mirror can over-sail the verge.

The operation of the hold point would be as follows:

- The advance police outrider would move ahead of the convoy to the hold point location;
- At the hold point, the outrider would stop oncoming traffic under existing Police powers and the TTRO powers;
- The convoy would progress to the hold point where it would either pass or stop, depending upon the need to release following traffic;
- The held oncoming traffic would then be released under Police control;
- If required, oncoming traffic would be held to allow the release of trailing traffic; and

- The convoy would continue.

Traffic conditions on the day may not require the use of all hold points. The number of hold points provided represents a worst case example and officers on the day would be free to reduce the points using their judgement of traffic flows.

5.3 Delivery Timings

The delivery timings have been based upon the experience of other deliveries in Wales. Loads will depart Swansea Docks and will proceed to site on the proposed route. Table 3 indicates the proposed timings with an initial start time of 10:00.

Table 3 Indicative Convoy Timing

Time	Location
10:00	Depart Swansea Docks
10:10	Join M4
10:13	Depart M4 and Join A465
10:42	Pass Hirwaun
11:08	Pass A470 Junction
11:13	Arrive at A465 Exit Location
11:18	Arrive at Site Access Junction

The timings would be controlled by the Police and the details provided are an estimate. They do however demonstrate that loads can be transported outside peak hours and would not interfere with school pick up / drop off times (not that the route passes along the frontage of any schools).

Should convoys of three components per day be permitted, deliveries could be complete within twenty days (thirty days if convoy lengths are restricted to two components).

A review of civilian daylight hours will be undertaken once delivery dates have been established to ensure that the proposed journey times will be conducted in daylight hours and will have a sufficient safety margin.

A review of sensitive locations and journey times will be agreed with the haulier in the finalised TMP. Whilst there are no schools in the proposed delivery route, convoys will avoid peak hour times on the road network.

5.4 Queue Delays

5.34 Delays created by wind farm deliveries on routes such as that proposed are generally not unreasonable and no worse than those incurred by the movement of agricultural vehicles or static caravans, both of which regularly use sections of the proposed route, and neither of which are subject to the restrictions that wind turbine loads are placed under.

The temporary inconvenience that could be caused by delivery vehicles must be viewed in the context that the delivery period is restricted to no greater than 6 weeks and is a 1 in 25 year event.

During actual deliveries, careful monitoring of trailing traffic will be made by the Police escort who will judge when the convoy is to pull over to allow following traffic to pass. The police will also review the likely conflicts between the convoy and oncoming traffic where constraints exist. It is suggested that the convoys operate outwith the peak times, preferably in the morning to reduce potential conflicts with other road users. Given that the police will have the final say on convoy movements, it is difficult to further estimate with any degree of certainty the level of delay to other road users at this stage, save to say that any such delay will clearly be limited and well within guidance.²

² Welsh Government Procedure & Advice Guidance (PAG) Welsh Government Motorway and Trunk Road Network 'Pulling Together' Best Practice for Transporting Abnormal Loads in Wales

5.5 Advance Warning Signs

Advance warning signs would be installed on the approaches to the affected roads network. Temporary signage advising drivers that abnormal loads will be operating could be erected on the non-dual carriageway sections of the route and the roads leading from the harbour. Signs such as the examples shown in Figure 5 could be installed to help assist drivers and pedestrians.

Figure 5 Indicative Information Signs (Left Vehicular / Right Pedestrian)



The purpose of this type of the vehicular signage is to help improve driver information and allow drivers of oncoming traffic to consider proceeding to the nearest convenient passing bay (when directed to by the Police or escorts), or breaking their journey until the convoy has moved on.

The temporary pedestrian warning signs would be erected within urban areas on the Common Road to alert pedestrians of the proposed loads. The time and date section of the sign could be written in marker pen so to allow re-use of the sign during the life of the project. The signs would be fixed by means of cable ties (or similar) to existing street furniture or fence posts.

5.6 Public Information

Information on the movement of abnormal load convoys should be provided to local media outlets to help assist the public. Information could be provided to local newspapers and radio stations and via other local stakeholders, which may include:

- BBC Radio Wales;
- BBC Radio Cymru;
- Merthyr Express Newspaper; and
- Wales Online.

It is hoped that this level of information will make residents aware of convoy movements and help reduce any potential conflicts.

Pell Frischmann also suggest that the developer may wish to consider producing a local newsletter for distribution to properties along the most affected sections of the proposed access routes, advising of convoy movements and the measures put in place to ensure the safe and efficient operation of the road network.

It may be possible, Police permitting, to provide convoy movement updates on the Police Twitter feed. Consultation with the Police will be held on other forms of communication that could also be utilised.

6 Traffic Management Plan

The Transport Management Plan by its definition is a live document and should be updated on a regular basis to reflect changes in road, load and operational conditions that may develop over the delivery period.

In addition to the finalised TMP, a condensed version known as a Driver Information Pack (DIP) will be provided to AIL drivers that sets out all the operational requirements such as:

- Welfare arrangements;
- Incident plans;
- Requirements for Tool Box Talks;
- Weather and road condition checks;
- Safety equipment requirements; and
- Other pertinent safety briefing material.

6.1 Daily Initial Checks

Before the convoys depart the POE, the lead convoy driver will check weather and traffic conditions and advise colleagues through a “Tool Box Talk”. The following websites provide relevant weather and traffic updates:

Traffic updates	Weather conditions
www.traffic-wales.com	www.metoffice.gov.uk
www.theaa.com/traffic-news/index	www.bbc.co.uk/weather
www.bbc.co.uk/travelnews	www.uk.weather.com
www.transportdirect.com	www.weatheronline.co.uk
www.rac.co.uk	

6.2 Potential Urban / Built Up Area Conflict Points

The urban areas along the route pose different challenges for the abnormal loads. Whilst the vehicle speeds will be less than those in the rural or motorway sections of the route, there are more potential conflicts with other road users to be aware of. These include:

- Pedestrians and cyclists;
- Local vehicular traffic;
- Parked vehicles;
- Side junctions; and
- Street furniture.

Within the urban / built up areas, the convoy escorts and other loads will need to be aware of all road and footway users at turn sections within the route.

6.3 Daily Management Updates

Daily updates to the general convoy management will be provided at the daily Tool Box Talks, where drivers and escorts will be fully briefed on the specific requirements of the convoys on that day. During these sessions, the following checks will be made:

- That staff are aware of the TMP and have a copy of the latest version of the Driver Information Pack (DIP) in the cab;
- That all staff have the appropriate licences, safety equipment and clothing;

- That all radios and mobile telephones are fully charged and that the correct channels are known;
- That the convoy is aware of its legal responsibilities for the country of operation;
- That drivers are briefed on welfare issues, including provisions for sleep and rest during the day;
- That the convoy is aware of client, haulier and turbine supplier health and safety requirements and method statements; and
- That all staff have been inducted on site rules before entering the site boundary and that induction is undertaken immediately upon arrival. Details of induction process are to be provided by the main contractor to the haulier before loads commence.

6.4 Communications Strategy

In order to ensure effective communications during transit, all vehicles within the convoy will be fitted with Citizens Band (CB) radio equipment. The CB units on the transporters will be hard-wired to reduce the risk of power failure during transit. All escort vehicles will be fitted with hand held battery powered CB radio sets. Spare sets should be carried to allow communications with the Police during transit, if the Police request it only. In addition to the CB sets, all vehicles will be fitted with hands free mobile phones, to allow contact with third parties without CB devices and that would also act as an alternative form of communication in an emergency. Mobile phones will only be used when stationary.

A communication protocol, between the escorting Police officers and the emergency services so that in the case of a blue light emergency, the convoys would be diverted to the nearest lay-by / hold point area.

In the case of emergency vehicles that need to pass the convoy en route to a third party emergency, the escorting police will be informed by radio of the incident and the requirement for vehicles to pass unhindered. At that time, a police escort vehicle, which is likely to comprise a motorbike, will travel ahead of the convoy to the next convenient holding point(s) at which the convoy could be manoeuvred such that clear passage can be afforded to the emergency vehicle. In the unlikely event that such an area is a considerable distance away, the emergency services will be informed of this and a decision taken concerning the necessity to reroute the emergency vehicle(s). Alternatively, once the wide area has been reached, the police escort will marshal the AIL convoy such that safe and speedy passage is afforded to the emergency vehicle.

This entire process will be controlled by the escorting police officers, in contact with the emergency services control centre.

6.5 Contingency and Incident Plans

Contingency details for incidents such as tyre punctures, breakdowns and accidents are described below and should be observed. In all situations the safety of personnel and the public is paramount and reasonable steps to ensure safety at a site should be undertaken. In the event of an incident, it should be reported to the appropriate person immediately.

These items are relevant for both abnormal and non-abnormal loads. Where the police are escorting, their instructions will take precedence and the lead Police officer must be informed should an issue on transit occur.

In the event of vehicle breakdown or incident the following details from The Highway Code must be observed:

- Try to remove the vehicles off the road if possible. On the motorway / dual carriageway, if possible, depart at the nearest exit or service area. If it is not possible to depart the motorway, pull onto the hard shoulder as far left as possible;
- If on a dual carriageway, try to stop near to an emergency telephone;
- When stopped, close the convoy up to reduce the length where possible;
- Warn other traffic by using hazard warning lights if the vehicles are causing an obstruction;
- Drivers should depart using the left-hand side door. Unless staff are threatened by their situation, all staff should depart the vehicles;
- Use PPE at all times when outside the vehicle;

- Place a warning triangle on the road at least 100 metres behind the last convoy vehicle on the same side of the road. Use the warning cones and flares carried in the escorts to protect the end of the convoy by creating a diagonal around the back of the last vehicle. Always take great care when placing or retrieving them. The Highway Code indicates that warning triangle should not be used on motorways;
- Consult with the Police escorts to identify what additional warning devices should be deployed;
- Keep sidelights and beacons on;
- No staff should stand between the convoy vehicles and oncoming traffic. Staff should not stand between vehicles in the convoy. Staff should be located at locations where all road users can see them;
- Staff should wait on the verge and where barriers are provided, stay behind them;
- In the event of injuries, do not move injured people unless they are in immediate danger from fire or explosion. Staff must not remove a motorcyclist's helmet unless it is essential to do so and should be prepared to give first aid if appropriately trained;
- In the case of injuries, all staff must stay at the scene until the emergency services arrive;
- In the event if a collision which causes damage or injury to any other person, vehicle, animal or property, the convoy must stop, provide contact details and addresses, provide vehicle registration details to third parties. The police escort should be informed and the incident reported within 24 hours to the local police station;
- In the event of a collision, all staff should obey directions from the escort Police Officers or attending officers;
- In the event of a breakdown, the nature of the breakdown should be reported to the indicated assistance provider. Obtain advice from the haulier Project Manager; and
- In the event of a burst tyre the appropriate repair provider should be contacted to come and replace the damaged item. Staff should not attempt to replace any HGV tyres themselves although if possible, the HGV should continue to the next lay-by if safe to do so in order to reduce delays. A spare wheel can be carried in the escort vehicles to be fitted by a specialist technician to help speed up the process.

These items are relevant for both abnormal and non-abnormal loads. Where the police are escorting, their instructions will take precedence and the lead Police officer must be informed should an issue on transit occur. To ensure the minimum delay and inconvenience, the turbine supplier has recovery agreements set up with suitable contractors along the route.

For minor vehicle faults, repairs could be made at the roadside or existing laybys as per any other road user, with the police escort helping divert traffic around the temporary restriction. The traffic management team supporting the convoy This provision is far in excess of what other road users would be able to deploy in an emergency.

In the event of the police being required for an emergency, the convoy would be stopped at the nearest safe location and the civilian and traffic management contractor deployed to allow traffic to pass in safety using stop / go boards until the Police returned. Such occurrences where all Police officers depart a convoy are exceptionally rare, if not unheard of. It is more likely that the Police escort numbers would reduce and the convoy continue with a smaller escort.

6.6 Third Party Accident/Breakdown on the Route

In the eventuality of a third-party accident or breakdown on the delivery route, ahead of the AIL convoy, it may be necessary for the convoy to be slowed or temporarily halted until safe passage can be assured. The police escort would take control of the convoy and monitor manoeuvring of the convoy into a safe location, which would generally comprise of the nearest contingency lay over point. The convoy would be held at this location until the highway ahead was judged by the police to be sufficiently clear to enable safe passage of the convoy.

Should it be required for Loads to be temporarily halted, traffic in the vicinity of the convoy will be marshalled by a combination of the police and civilian escorts.

If it becomes necessary to halt an AIL convoy overnight, the convoy will be moved to occupy a nearby layby, or number of lay-bys. Security staff will be present to ensure security of Loads overnight and temporary signage

will be erected, where necessary, to warn advancing motorists of the presence of the AIL or convoy. Where necessary on safety grounds, traffic will be controlled by means of police escort staff.

6.7 Equipment Requirements

Each of the convoy vehicles must be suitably equipped with hazard warning devices to warn all other road users. All the tractor, trailer and escort vehicles operating on the project must have the following:

- Tractor units to have beacon bars on the roof and 3M reflective markings on both sides;
- Trailer units to have amber beacons on the rear with 3M reflective markings on both sides;
- All escort vehicles will have beacon bars on the roof, with 360 degree motion for all round visibility, and 3M reflective markings; and
- Certified cargo lashing straps are to be used at all times. Certification must be carried and made available for inspection, kept within the cab.

All hazard warning equipment must be checked and cleaned at the start of each day. Additional cleaning of the warning equipment may be required throughout the day and must be undertaken when required.

All escort vehicles will carry the following equipment:

- 8 x Reflective Road Cones;
- 1 x Flash Light;
- 1 x Spare High-Vis Waistcoat;
- 8 x Flare Alert Beacons;
- 1 x Auxiliary Rechargeable CB Radio;
- 1 x Spare Hard Hat;
- 2 x Warning Triangles;
- 1 x Fire Extinguisher (dry powder);
- 1 x pack of disposable dust masks;
- 1 x Spill Kit;
- 1 x Van/Truck First Aid Kit;
- 1 x safety spectacles;
- 1 x Emergency Hammer ; and
- 1 x Roll of Barrier Tape.

All relevant personnel must have the appropriate Personal Protective Equipment (PPE). All PPE clothing must be 'CE' marked to show it meets the European standards and should be appropriate for use in Motorway situations (i.e. must be full coats with reflective bands on the arms). Drivers must be issued with:

- Hard hat (within certification date);
- High-Vis (jacket / coat and trousers);
- Lace up steel toe capped safety boots; and
- Gloves.

6.8 Co-ordinator Role

To provide a contact between the haulier, developer and stakeholders, a Travel Co-ordinator will be appointed by the turbine supplier firm to act as a conduit for information between all interested parties and to make the lines of communication clear and efficient.

The Co-ordinator would liaise with the local authorities to ensure wherever possible, that AIL traffic did not coincide with special events where traffic flows may be sensitive along the route.

6.9 Dates of Movement

The dates for actual movements cannot be practically included in the TMP prior to planning consent being made. In addition there are many other variables that are associated with AIL movements, including, but not limited to:

- Availability of the Police (not generally known until at least three weeks to loads moving);
- Availability of the site to accept loads (weather and progress dependent);
- Availability of the haulier and their resourcing plan (generally set in discussion with the Police circa three weeks to the start of movements); and
- Weather conditions on the day (loads would not be moving in adverse conditions).

For these reasons, it is not possible to provide a definitive list of dates when loads will be operating at present or a schedule of load movements.

Deliveries are expected to operate on the network Monday – Saturday, with no movements occurring on Sundays during the delivery period as per previous discussions with the Police on other projects.

When date details are more confirmed, the developer will provide a schedule to all relevant stakeholders detailing the movements. Similar details will be provided by the haulier via the BE16 and Movement Order process.

7 Summary

Pell Frischmann were commissioned by RWE to produce a Transport Management Plan for the delivery of abnormal loads associated with the proposed Pen March Wind Farm.

This report identifies the key points and issues associated with the route. It is the responsibility of the wind farm turbine supplier to ensure that the access route from the port of entry to the sites are fit for purpose and that appropriate consideration for all road users has been made in accordance with the relevant health and safety legislation and ruling transport requirements.

The access review has been undertaken from Swansea Docks through to the site access junction. The route is suitable for the movement of the anticipated loads, although careful manoeuvring will be required through a small number of sections along the route and into the site access.

A series of operational measures have also been detailed to further aid the delivery of equipment and to minimise the impact of convoys on the network. These include the provision of warning signs and incident contingency plans.

The temporary inconvenience that could be caused by delivery vehicles must be viewed in the context that the delivery period is restricted to 1 in 25 year event. Police escorts, assisted by civilian escorts will also ensure road user safety.

Pell Frischmann

Pen March Wind Farm

Route Survey Report

August 2022

104561

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Ref. reference. Rev revision. Suit suitability.

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1 Introduction

1.1 Report Purpose

Pell Frischmann has been commissioned by RWE to undertake a review of potential delivery routes for wind turbine Abnormal Indivisible Loads (AIL) associated with the construction and development of Pen March Wind Farm, located to the east of Merthyr Tydfil.

This report was first produced in June 2020 and has been updated to reflect the changes on the A465 that are currently being constructed.

The Route Survey Report (RSR) has been prepared to help inform RWE on the likely issues associated with the development of the site with regards to off-site transport and access for AIL traffic. The report identifies the key issues associated with AIL deliveries and notes that remedial works, either in form of physical works or as traffic management interventions will be required to accommodate the predicted loads.

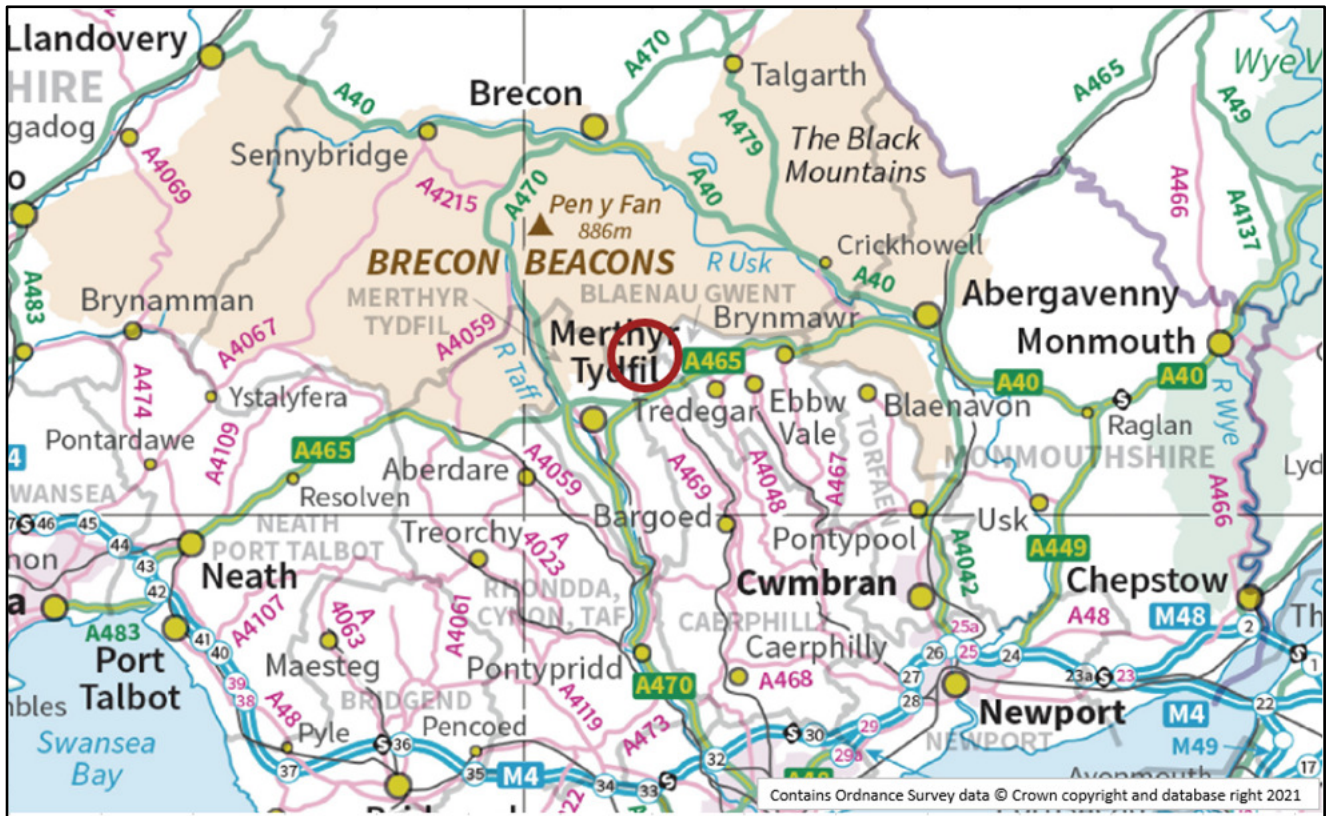
It is the responsibility of the wind turbine supplier to ensure that the entirety of the proposed access route is suitable and meets with their satisfaction. The turbine supplier will be responsible for ensuring that the finalised proposals meet with the appropriate levels of health and safety consideration for all road users has been made in accordance, in line with the relevant legislation at the time of delivery.

2 Proposed Development

2.1 Site Location

The location of the Proposed Development is presented in Figure 1.

Figure 1 Site Location Plan



In summary, the Proposed Scheme will comprise the following:

- Up to six wind turbines, each with turbine foundations, crane hardstandings and laydown/storage areas;
- An electrical substation and control building, along with potential battery storage facilities;
- Underground power cables linking the turbines and the on-site substation, laid in trenches alongside access tracks;
- New site access and on-site access tracks, with pipeline and watercourse crossings (if/where required);
- A temporary construction and storage compound; and
- Off-site works to facilitate the movement of abnormal loads (construction of over-run areas and temporary modifications to street furniture etc).

Planning permission for the Proposed Scheme is being sought for an operational life of 35 years.

2.2 Candidate Turbines

RWE have indicated that they wish to consider a Vestas V150 turbine at a tip height of 180m. The tower design is likely to be site specific and therefore for the purpose of the access assessment Vestas has advised that a 30m x 4.3m x 4.3m tower will provide a worst-case kinematic envelope. The details of the components are summarised in Table 1.

Table 1 Turbine Size Summary

Component	Length (m)	Width (m)	Height / Min Diameter (m)	Weight (t)
Blade	73.70	4.06	3.12	17.24
Tower	30.00	4.30	4.30	60.00

Full details of the selected candidate turbine will be provided once the commercial turbine selection process has been undertaken and the Route Survey and TMP will be revised.

It is likely that the turbines used on the site will be delivered as up to 12 abnormal loads and would be escorted by the police in convoys of between two and three convoys depending upon the view of the Police. Sections that do not classify as abnormal, would not need a police escort and can be escorted by civilian escorts.

Indicative component details are noted in Table 2.

Table 2 Indicative Turbine Components

Component	Number of Components per Turbine
Rotor Blades	3
Tower Sections	4
Nacelle	1
Hub	1
Drive Train	1
Nose Cone	1
Transformer	1
Ancillary	1
Site Parts	0.2 (parts shared between 5 turbines on one delivery)

All the trailers used in the transport process are specifically designed for the transport of components or feature custom modifications to suit loads. All feature rear wheel steering and the nacelle and tower load adaptor trailers feature hydraulic lift capabilities to adjust ground clearances.

When not transporting components, the trailers are collapsed so that they do not exceed normal HGV dimensions.

The trailers are built to a high standard and the tractor units are designed for heavy haulage. Regular checks are undertaken on the vehicles on a daily basis as outlined in later sections of the report. As such, the mechanical state of vehicles is kept at a very high level and breakdowns or malfunctions are very rare.

2.3 Proposed Abnormal Load Delivery Equipment

To provide a robust assessment scenario based upon the known issues along the access route, it has been assumed that all blades will be carried on Super Wing Carrier to reduce the need for mitigation in constrained sections of the route.

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

Figure 2 Super Wing Carrier Trailer



Figure 3 Tower Trailer



3 Road Access Review

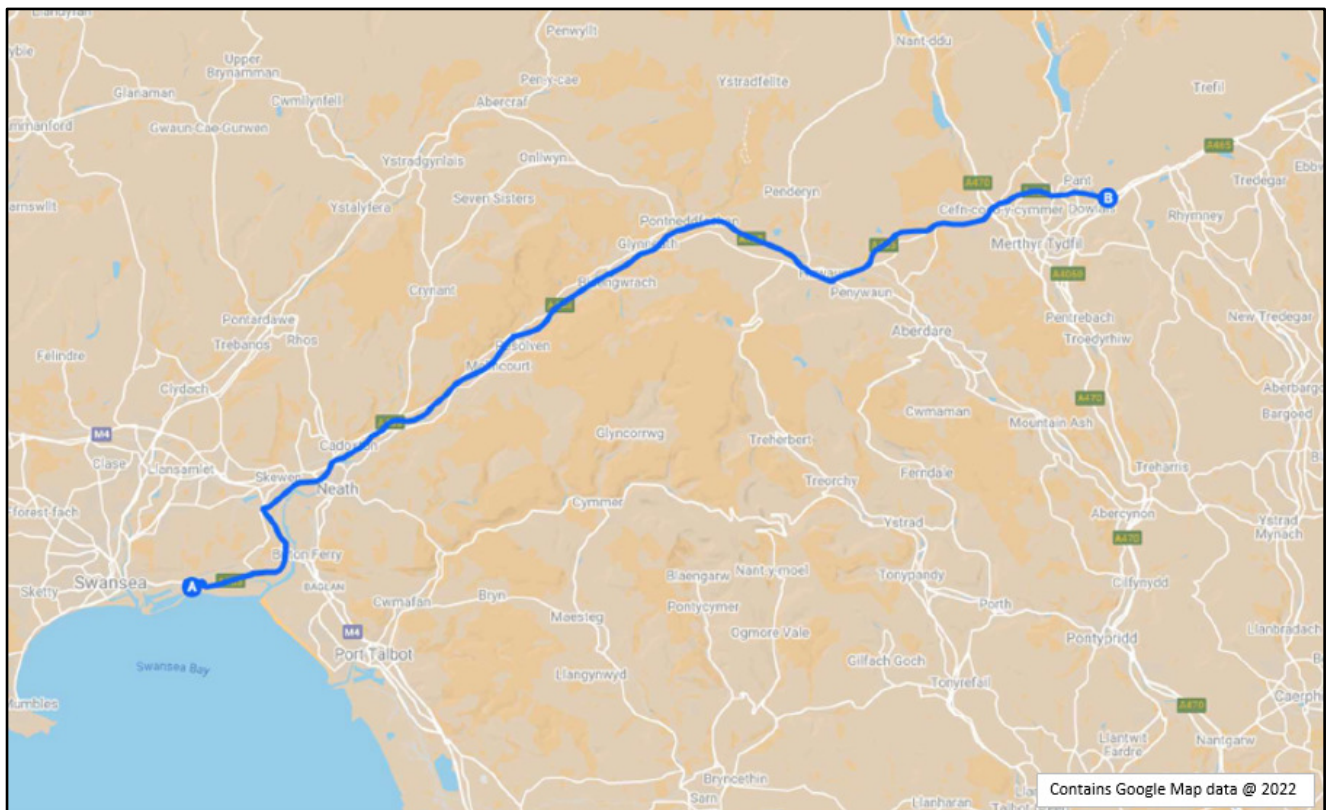
The Proposed Development will be directly accessed from a new access junction located off the Common Road. The junction will be built to accommodate all predicted loads and traffic for both the construction and operational phases of the proposed development.

The proposed Port of Entry (PoE) is Swansea. The port is the closest suitable port to site and as such is in line with the Government's "Water Preferred" policy towards AIL movements.

The proposed access route is illustrated in Figure 4 and is as follows:

- Loads will depart the port and access the A483 Fabian Way (Eastbound) using a contraflow manoeuvre;
- Loads would proceed eastbound and would join the M4 at Junction 42;
- Loads would then continue to Junction 43, where they would depart the motorway and would subsequently join the A465 (T) through to Merthyr Tydfil; and
- Loads would leave the A465 (T) using the old road alignment located to the east of the Pengarnddu Business Park access roundabout. This would be reopened for AIL only traffic. They would then proceed directly onto the Common Road where the loads will then continue to the Site access junction. This removes the need for complex turning manoeuvres at the Asda roundabout and bends located to the west end of the Common Road.

Figure 4 AIL Component Delivery Route



3.1 Route Constraints

A detailed Route Survey from the port access gates through to the site access junction has been undertaken and is provided in Annex A of this report. This includes swept path assessments of the proposed route for the worst case turbine sections.

Table 3 Route Constraint Points

POI	Key Constraint	Details
1	Port Access Gate 	Loads will exit the gate and proceed towards Baldwins Crescent.
2	Baldwins Crescent Junction 	Loads will proceed ahead onto Baldwins Crescent. A swept path assessment has been undertaken and indicates that the blade tip will over-sail the boulders on the left-hand side on joining Baldwins Crescent. Vegetation should be cleared on the right verge of Baldwins Crescent to avoid scratching the components.

POI	Key Constraint	Details
3	Fabian Way Access Junction 	Loads will turn right onto Fabian Way. This will need to be undertaken under full Police escort as all traffic on the dual carriageway will need to be held as loads pass through the gap in the central reserve through a contraflow movement. A swept path assessment has been undertaken and indicates that, on approach to the junction, the blade tip will over-sail the western verge, where one lit road sign should be removed. The blade tip will then over-sail two bollards on the splitter island, where two road signs and one lighting column should be removed and one tree trimmed. A further lighting column should be removed from the central reservation on the outside of the turn to allow for blade tip over-sail. On the inside of the turn, the vertical clearance to the crash barrier on both the southern verge and central reservation should be confirmed during the test run. One lighting column should be removed from the central reservation.
4	A483 Ffordd Amazon Roundabout 	Loads will proceed ahead onto the A483. A swept path assessment has been undertaken and indicates that on the outside of the roundabout the blade tip will over-sail the pedestrian guardrails and bollards. Three traffic signal poles, three road signs, one bollard, and one lighting column should be removed. On navigating the roundabout, loads will over-sail the northern verge of the central reservation, where two traffic signal poles and one lit chevron sign should be removed.

POI	Key Constraint	Details
5	A483 / M4 Slip Junction 	Loads would proceed onto the slip road for the M4. A swept path assessment has been undertaken and indicates that on the left-hand verge of the approach the blade tip will over-sail several bollards. One road sign and two lighting columns should also be removed in this area. On the inside of the bend, several bollards should be removed to allow load over-sail. The proximity of loads to the lighting column should be confirmed during the test run or on a topographical base survey. On joining the M4, loads will over-sail the splitter island, where load proximity to a bollard and traffic signal pole should be confirmed during the test run or on a topographical base survey. Vegetation should be trimmed on the western verge.

POI	Key Constraint	Details
6	M4 / A465 Roundabout 	Loads will diverge from the M4, proceed onto the slip road, and will then turn right onto the A465. A swept path assessment has been undertaken and indicates that on the right-hand side of the approach to the roundabout the blade tip will over-sail the crash barrier where vegetation should be trimmed. On entering the roundabout, the vertical clearance to the crash barrier on the south eastern verge should be confirmed during the test run and two traffic signal poles removed. The blade tip will over-sail the splitter island on the western side of the roundabout, where one road sign, two lighting columns and one traffic signal pole should be removed. At this location, loads will over-sail the western verge of the central island. The vertical clearance to the crash barrier should be confirmed during the test run, one traffic signal pole removed, and vegetation trimmed. The blade tip will then over-sail the northern verge on the outside of the roundabout where two lighting columns should be removed. At this location on the central island, load proximity to one traffic signal pole should be confirmed during the test run or on a topographical base survey. On exiting the roundabout, loads will over-sail the northern verge, where one lit road sign should be removed.

POI	Key Constraint	Details
7	A465 / B4434 Roundabout 	Loads will proceed ahead at the junction. A swept path assessment has been undertaken and indicates that on approach to the roundabout one lit road sign should be removed from the central reservation. On entering the roundabout, loads will over-sail the left-hand verge where the vertical clearance to the crash barrier should be confirmed during the test run and two lighting columns and one lit road sign should be removed. The blade tip will then over-sail one bollard on the first splitter island where one road sign should be removed. Loads will over-sail the northern section of the central island where one lit chevron sign should be removed and vegetation trimmed. On exiting the roundabout, vertical clearance to the crash barrier on the northern verge should be confirmed during the test run.
8	A465 / B4242 Roundabout 	Loads will proceed ahead at the junction. A swept path assessment has been undertaken and indicates that on entering the roundabout, loads will over-sail the left-hand verge where the vertical clearance to the crash barrier should be confirmed during the test run. Loads will then over-sail the northern section of the central island, where one lit chevron sign should be removed. Loads will then continue eastbound on the A465 and it is assumed that they use the new alignment of the road from this junction through to the proposed Dowlaid Top interchange on the A465 to the east of Merthyr Tydfil. No further constraints are expected on the new road alignment until POI 9.

POI	Key Constraint	Details
9	A465 Dowlais Top Junction 	Loads depart the A465 at the slip road and will proceed ahead over the roundabout onto the eastbound slip road. The junction is currently being remodelled as part of the A465 upgrade works. A swept path assessment will be undertaken to confirm the mitigation works once the construction works have been completed.
10	A465 AIL Access 	A new AIL only slipway from the A465 to the Common Road could be provided to bypass the Asda Road and other potential constraints on the route. This would use the former road alignment that is currently stopped up. A swept path assessment of this option has been undertaken and indicates that a new slipway will require construction to allow loads to exit the A465 and join the Common Road. Load bearing surfaces and land reprofiling will be required. A section of fence and vegetation should be removed.
11	Common Road Bend 	Loads will pass through the bend. A swept path assessment has been undertaken and indicates that vegetation should be cleared from the northern verge on approach to the bend. On the inside of the bend a section of fence should be removed, and vegetation cleared to allow load over-sail. On the outside of the bend, the blade tip will over-sail the fence.
12	Common Road Cattle Grid 	A structural review of the cattle grid is recommended to ensure that it can accommodate the proposed axle loads once the candidate turbine has been selected.

POI	Key Constraint	Details
13	Site Access Junction 	A site access will be constructed. The junction should be designed in accordance with the successful manufacturer's design standards and should feature DMRB compliant visibility splays of a maximum of 4.5m x 215m in both directions.

3.2 Swept Path Assessment Results and Summary

The detailed swept path drawings for the locations assessed are provided in Annex B for review. The drawings in Annex B illustrate tracking undertaken for the worst case loads at each location.

The colours illustrated on the swept paths are:

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

Where mitigation works are required, the extents of over-run and over-sail areas are illustrated on the swept path drawings. Please note that where assessments have been undertaken using Ordnance Survey (OS) base mapping, there can be errors in this data source. Where provided by the client, topographical data has been utilised. Please note that PF cannot accept liability for errors on the data source, be that OS base mapping or client supplied data.

3.3 Land Ownership

The limits of road adoption can vary depending upon the location of the site and the history of the road agencies involved. The adopted area is generally defined as land contained within a defined boundary where the road agency holds the maintenance rights for the land. In urban areas, this usually defined as the area from the edge of the footway across the road to the opposing footway back edge.

In rural areas the area of adoption can be open to greater interpretation as defined boundaries may not be readily visible. The has previously stated that their general rule is that the area of adoption is between established fence / hedges lines or a maximum 2m from the road edge. This can vary between areas and location.

3.4 Weight Review

A weight review has been undertaken via the ESDAL (Electronic Service Delivery for Abnormal Loads) contacts database using the Highways Agency website www.esdal.com.

All of the relevant ESDAL contacts are noted in Table 4 and all have been contacted to ascertain if there are any relevant constraints that should be noted.

Table 4 ESDAL Contacts

Organisation	Email Address
Swansea Council	Abnormal.Loads@swansea.gov.uk
Neath Port Talbot County Borough Council	abloads@npt.gov.uk
South Wales Police	swp@abloadspolice.com
South Wales Trunk Road Agent	abnormalloads@southwales-tra.gov.uk
Network Rail	AbLoadsESDAL@networkrail.co.uk
Historic Rail Estate	rsgbrb@jacobs.com
Merthyr Tydfil County Borough Council	Carwyn.Morris@merthyr.gov.uk
Caerphilly County Borough Council (shared resource with Monmouth Council)	AbnormalLoads@monmouthshire.gov.uk

The responses from the ESDAL search are contained in Annex C where these have been received.

3.5 Summary Issues

It is strongly suggested that following a review of the RSR, RWE should undertake the following prior to the delivery of the first abnormal loads, to ensure load and road user safety:

- That any necessary topographical surveys are undertaken and the swept path results completed;
- A review of axle loading on structures along the entire access route with the various road agencies is undertaken immediately prior to the loads being transported in case of last minute changes to structures;
- A review of clear heights with utility providers and the transport agencies along the route to ensure that there is sufficient space to allow for loads plus sufficient flashover protection (to electrical installations);
- That any verge vegetation and tree canopies which may foul loads is trimmed prior to loads moving;
- That a review of potential roadworks and or closures is undertaken once the delivery schedule is established in draft form;
- That a condition survey is undertaken to ascertain the extents of road defects prior to loads commencing to protect the developer from spurious damage claims.

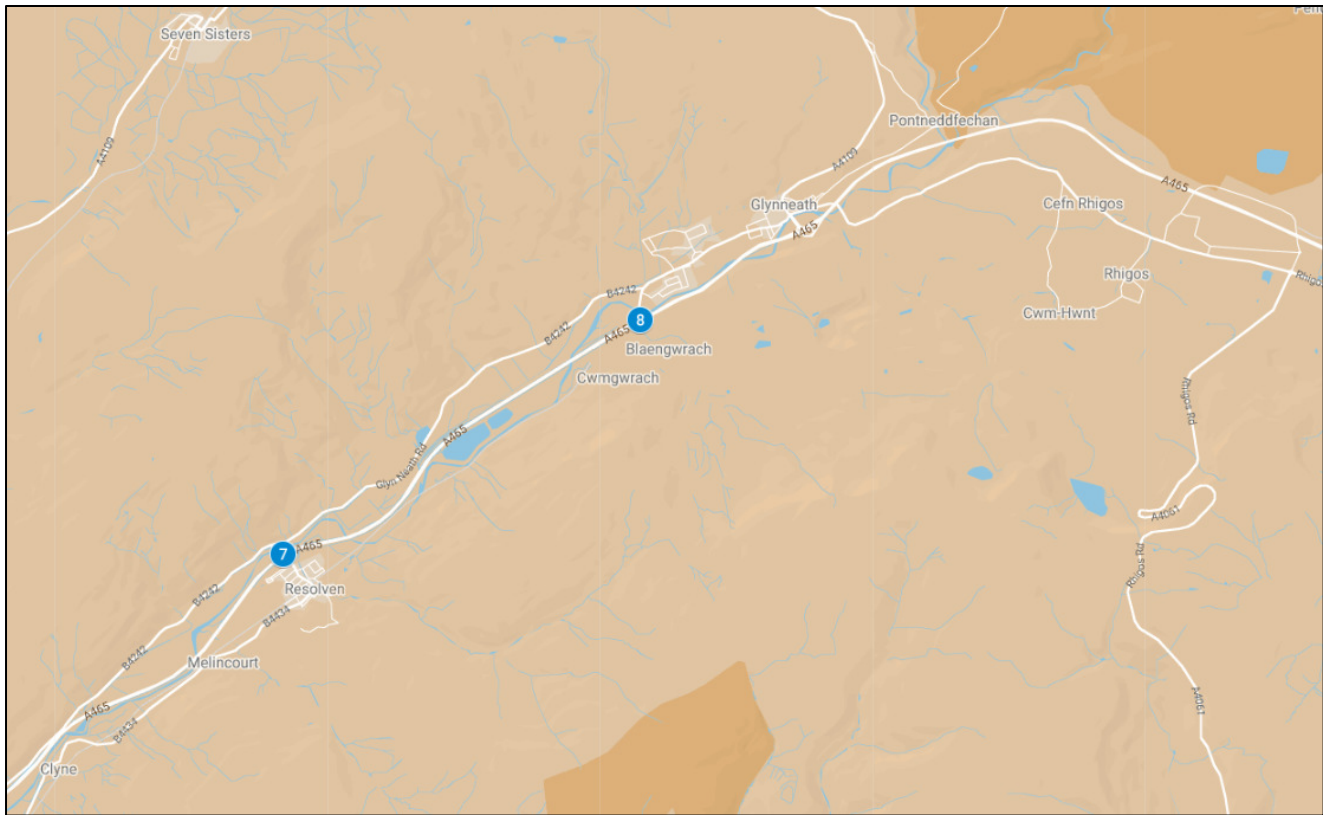
4 Summary

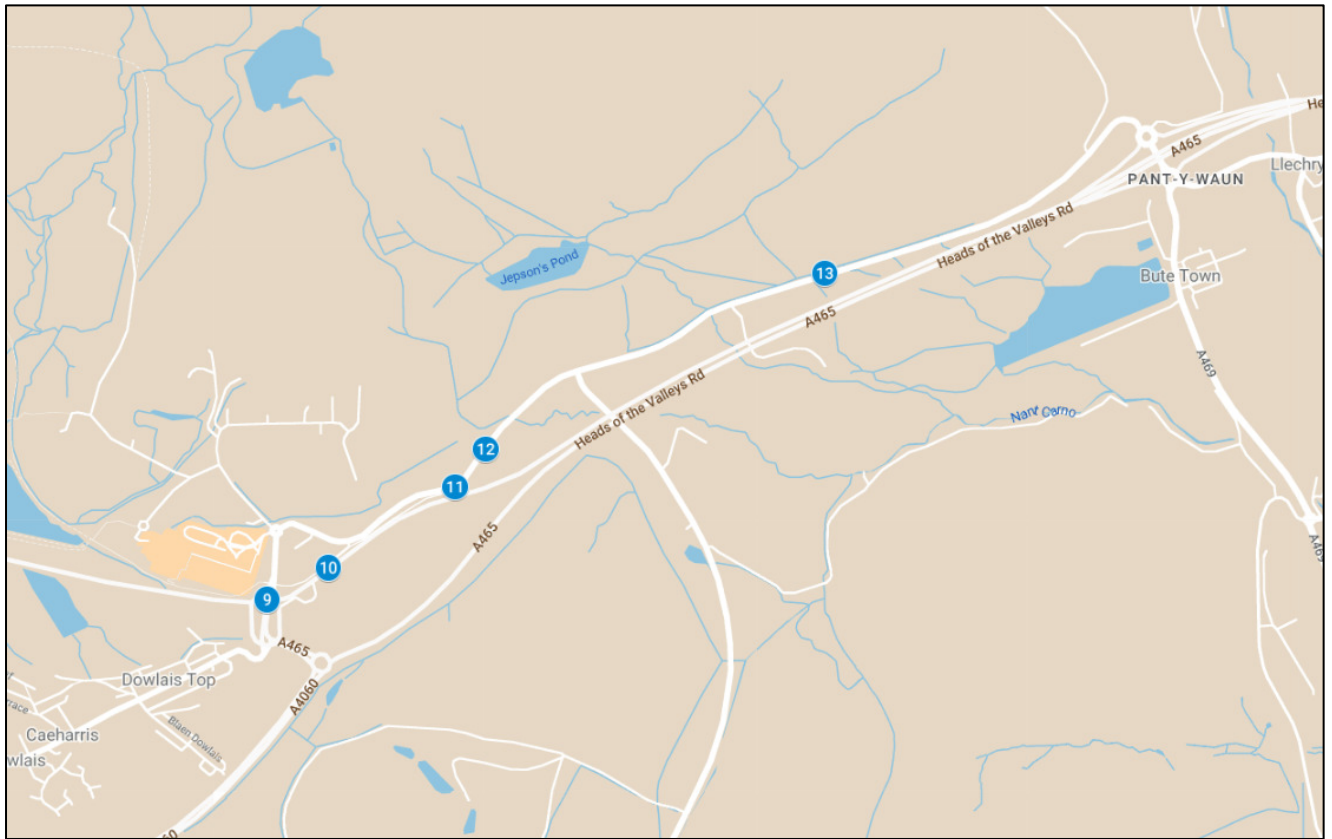
Pell Frischmann were commissioned by RWE to produce a Route Survey Report for the delivery of abnormal loads associated with the proposed Pen March Wind Farm.

This report identifies the key points and issues associated with the route. It is the responsibility of the wind farm turbine supplier to ensure that the access route from the port of entry to the sites are fit for purpose and that appropriate consideration for all road users has been made in accordance with the relevant health and safety legislation and ruling transport requirements.

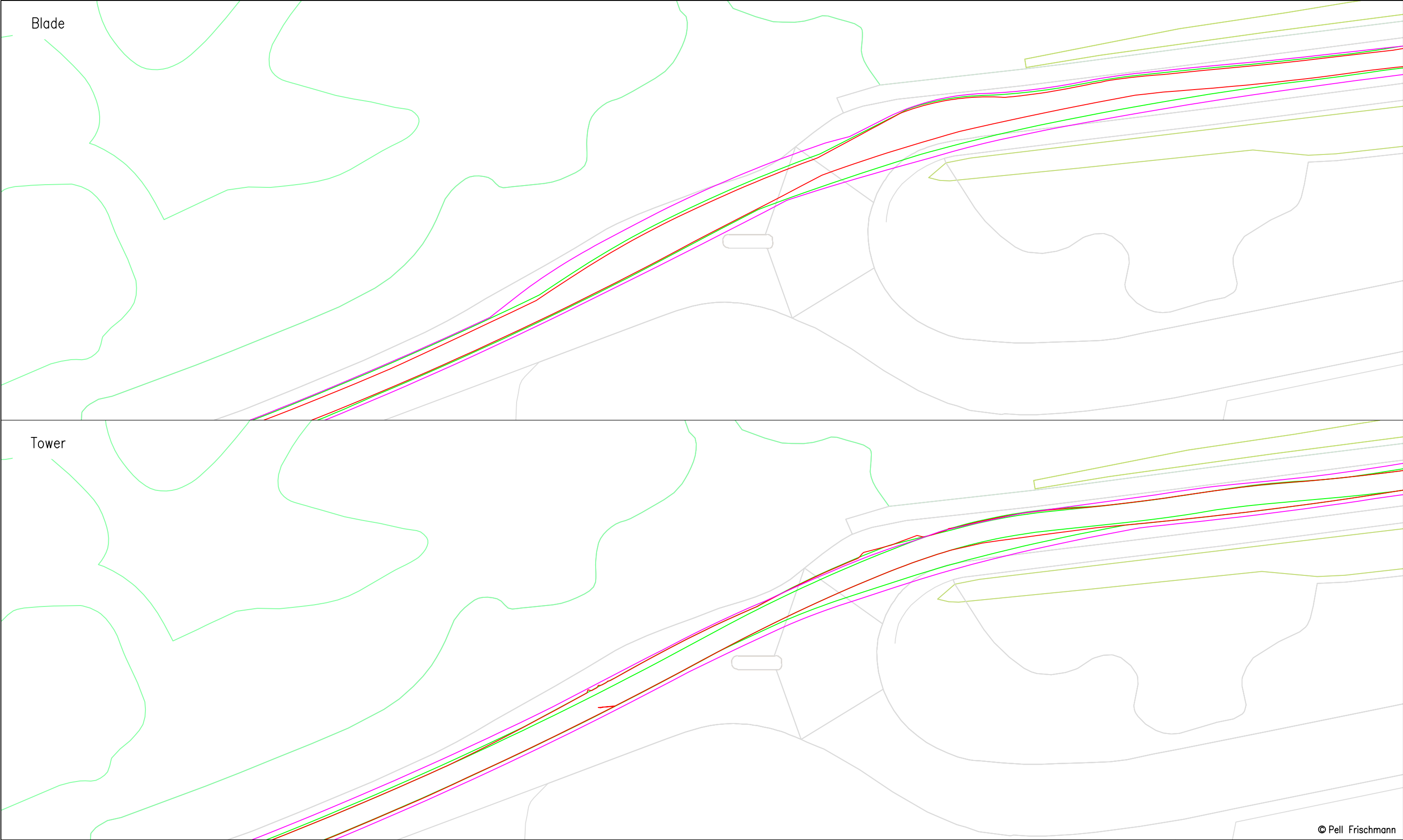
The access review has been undertaken from Swansea Docks through to the site access junction. The route is suitable for the movement of the anticipated loads, although careful manoeuvring will be required through a small number of sections along the route and into the site access.

Annex A: Points of Interest



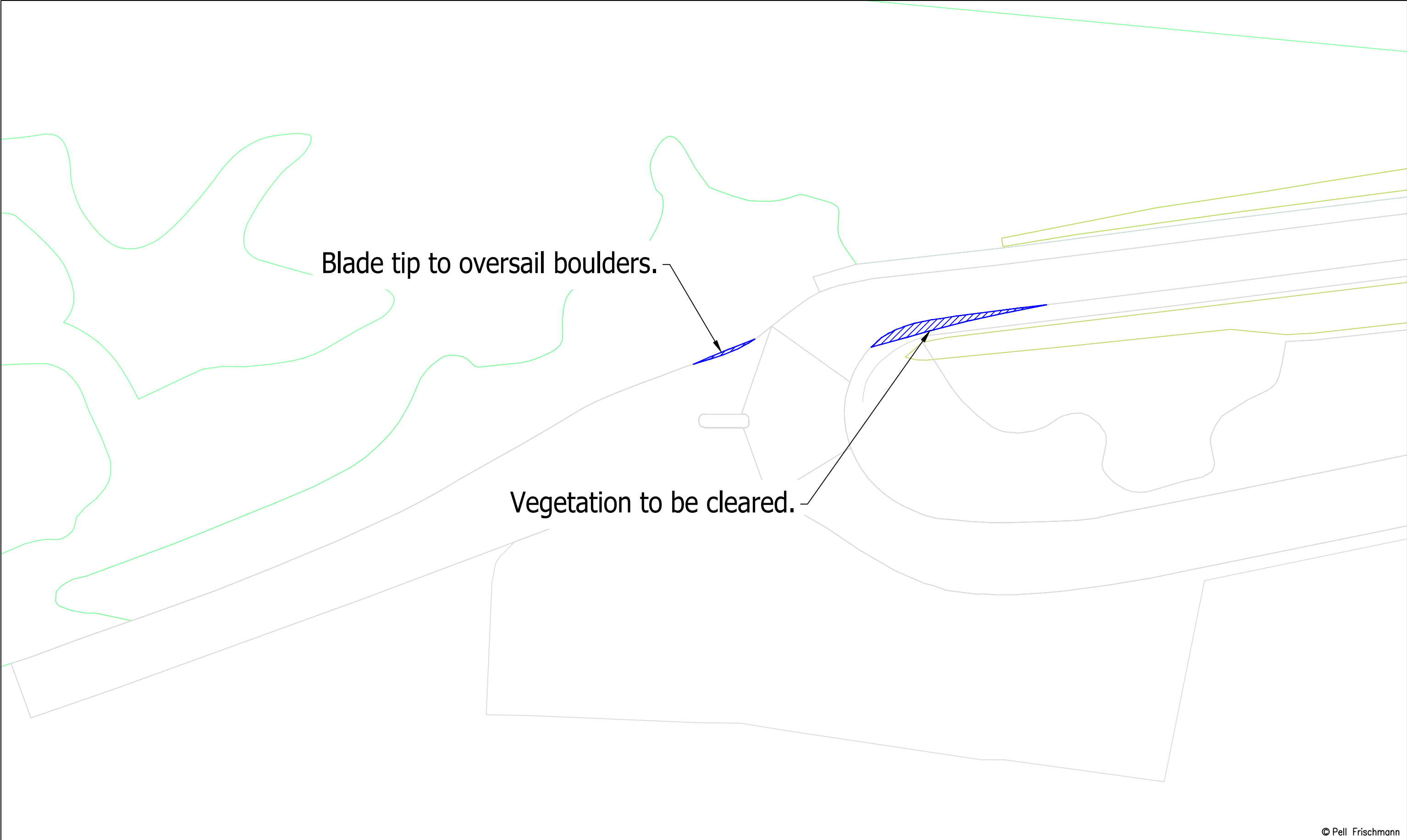


Annex B: Swept Path Assessment Drawings



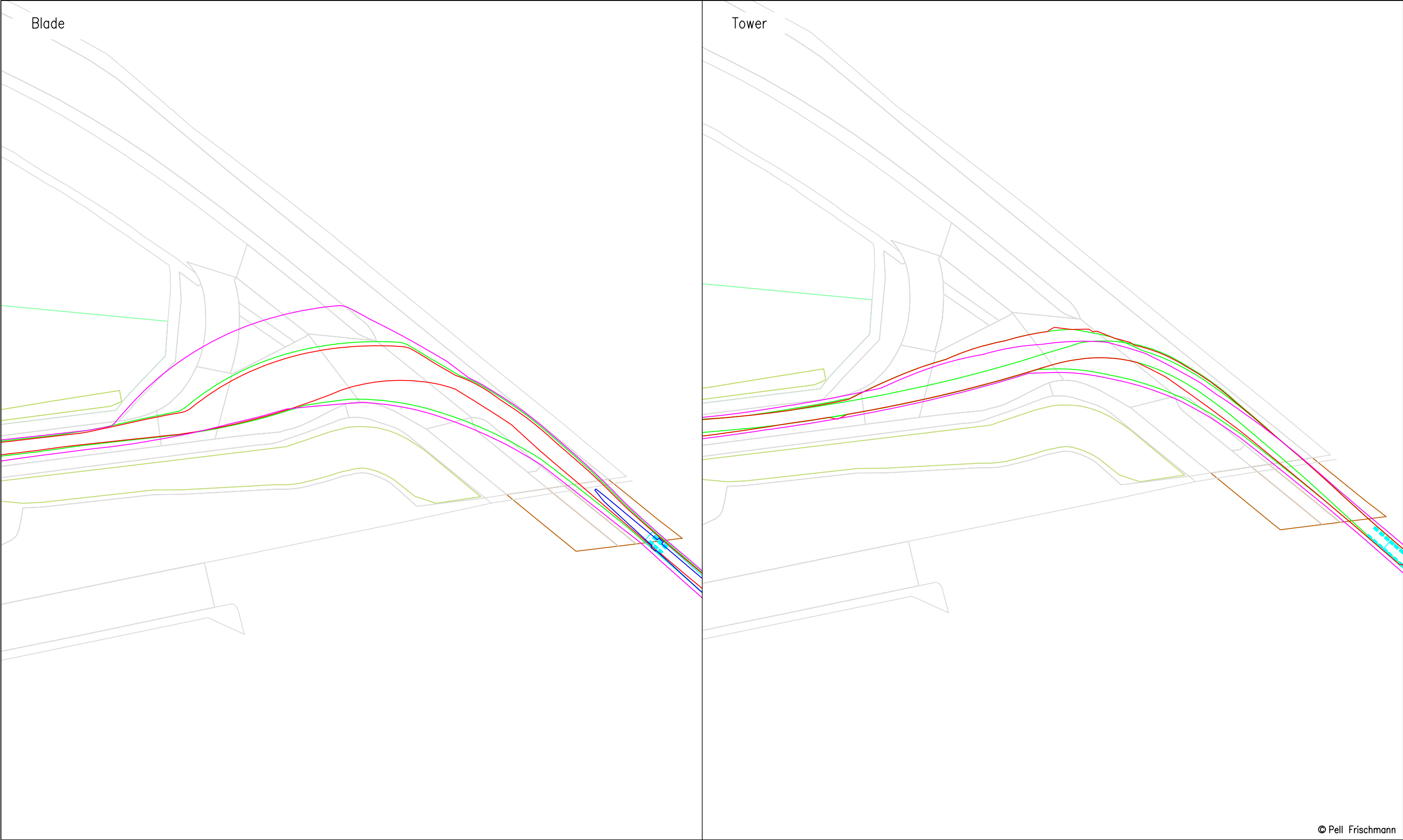
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								1	



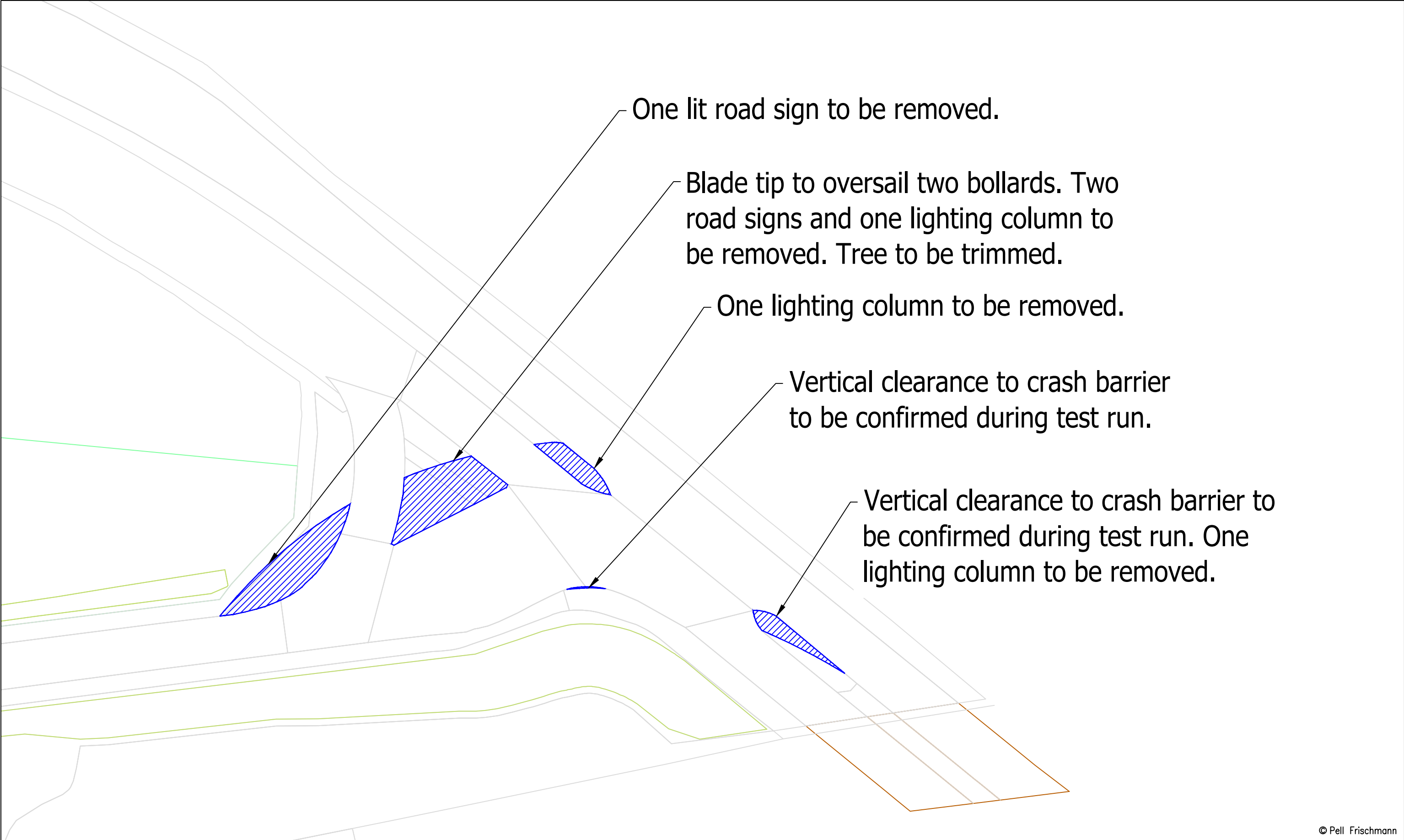
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		Baldwins Crescent Junction							



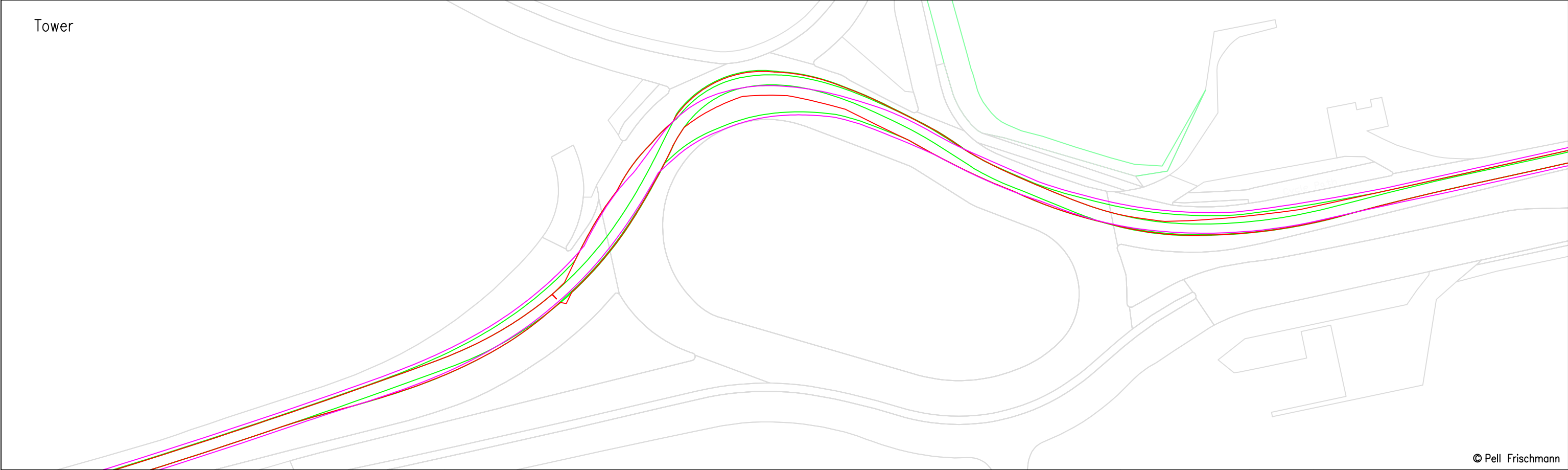
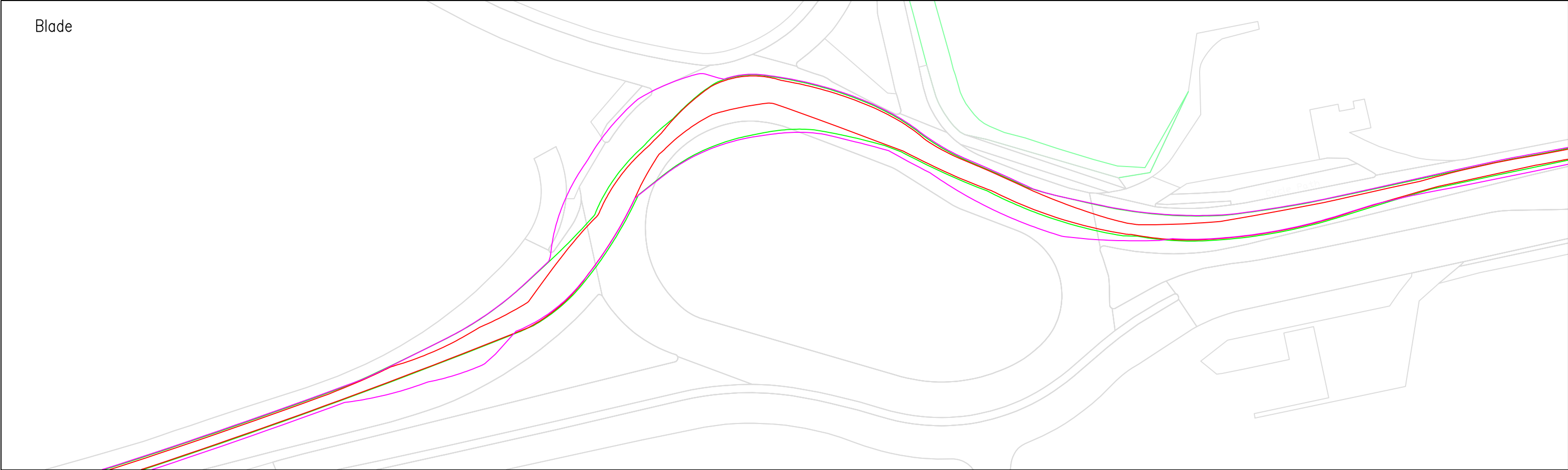
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				Drawing No.	Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.			Revision	
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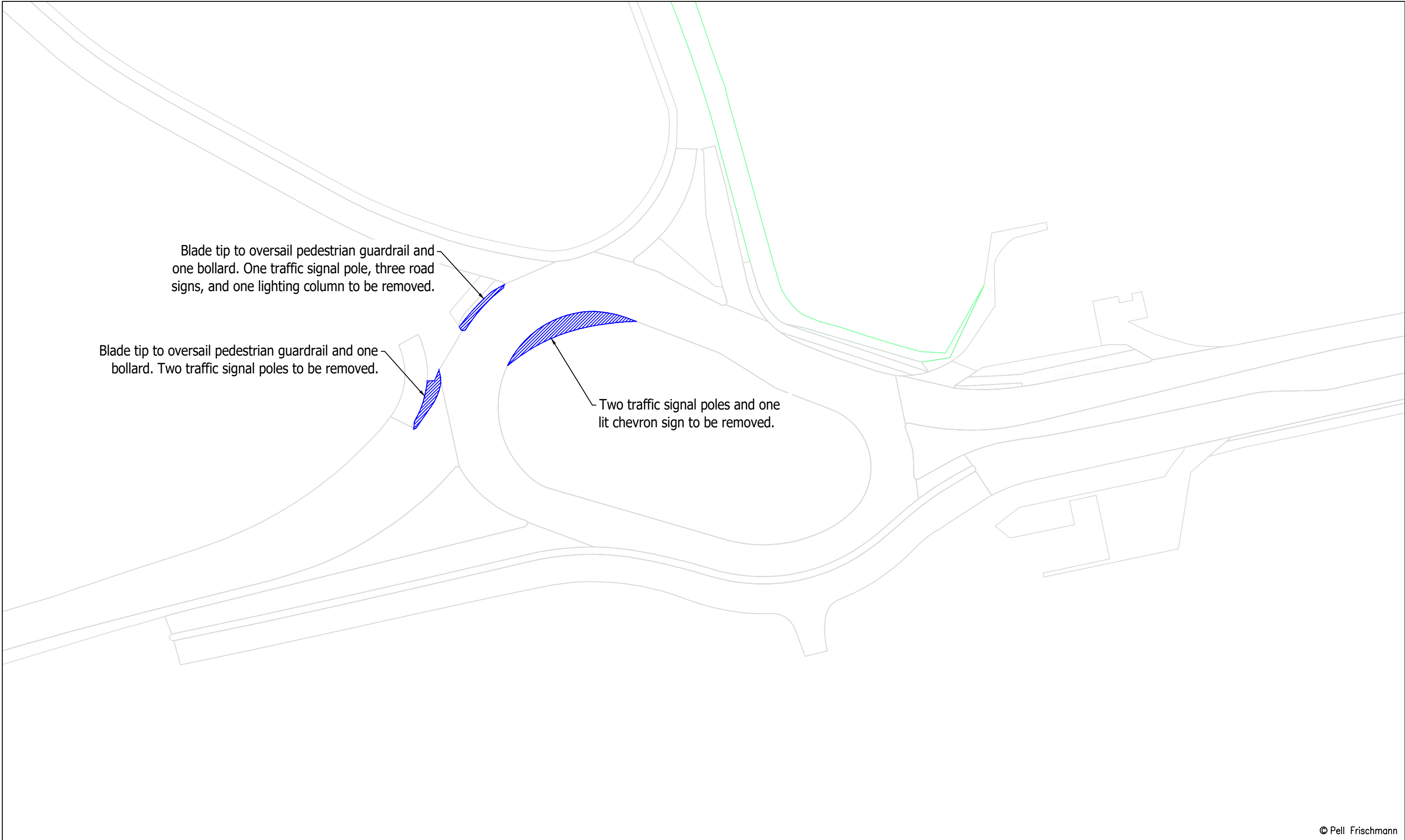
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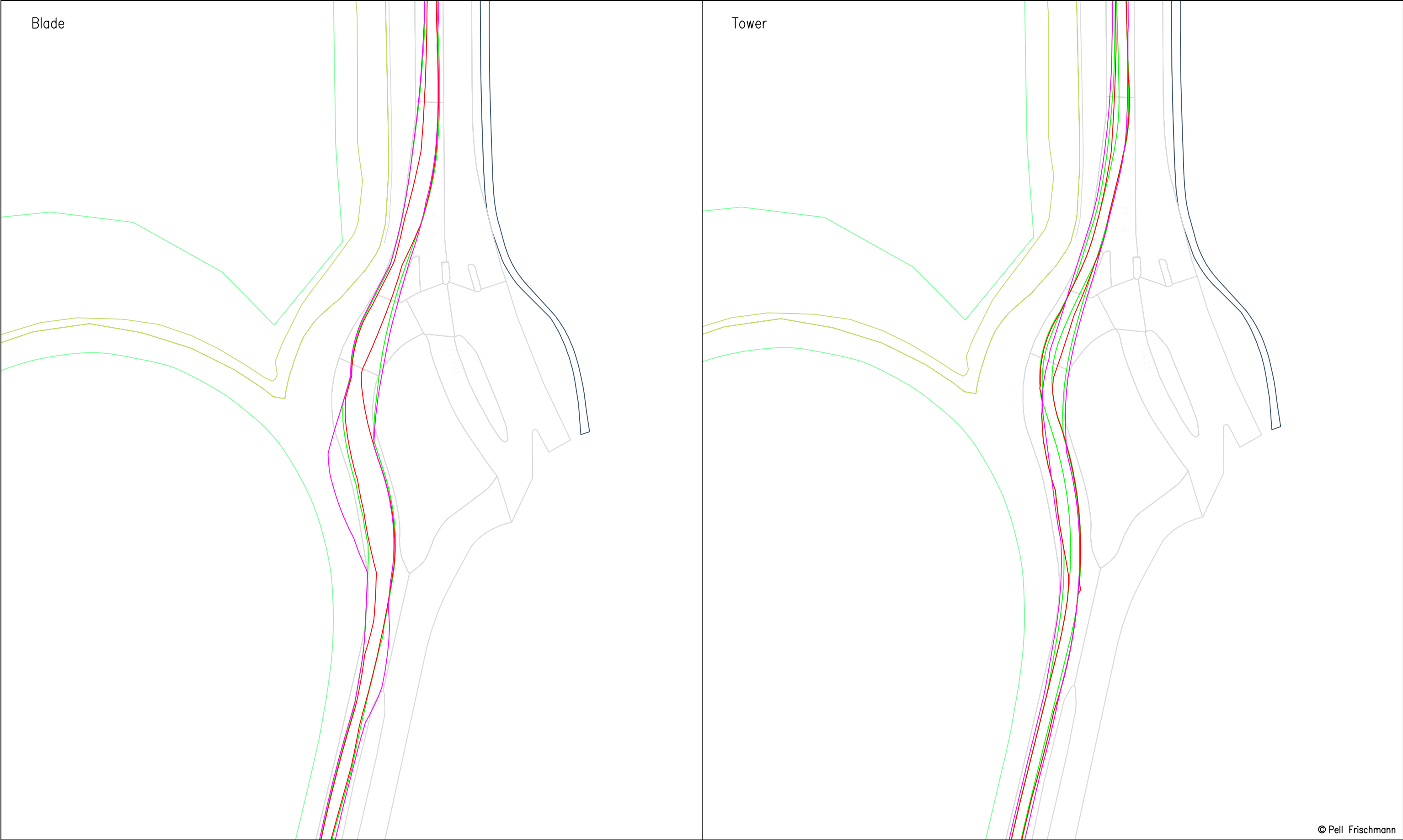
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Wheel SPA										
Body SPA										
Load SPA										
Indicative										
Over-run										
Over-sail										



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Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location A483 Ffordd Amazon Roundabout							



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Key

Wheel SPA

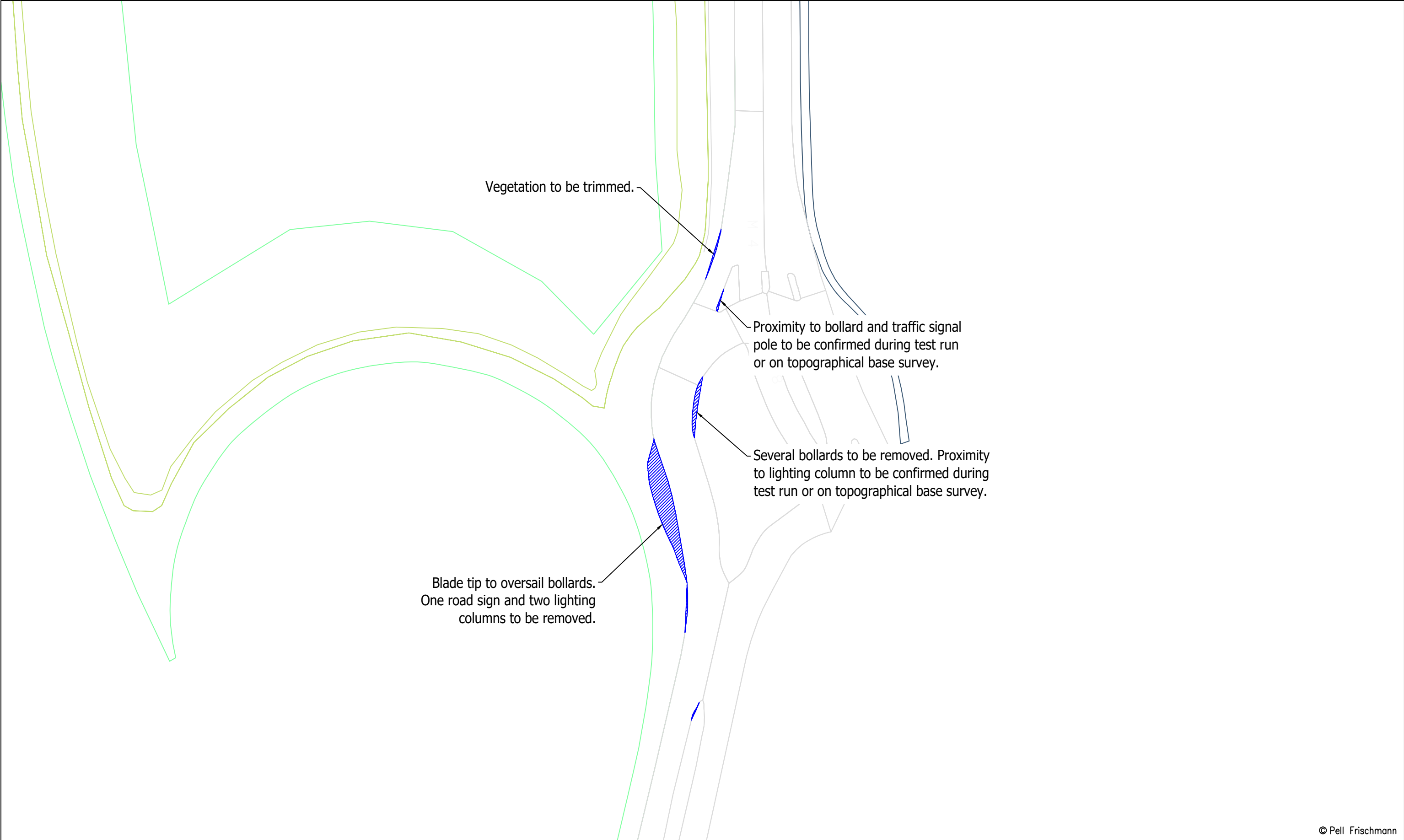
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Load SPA

Indicative

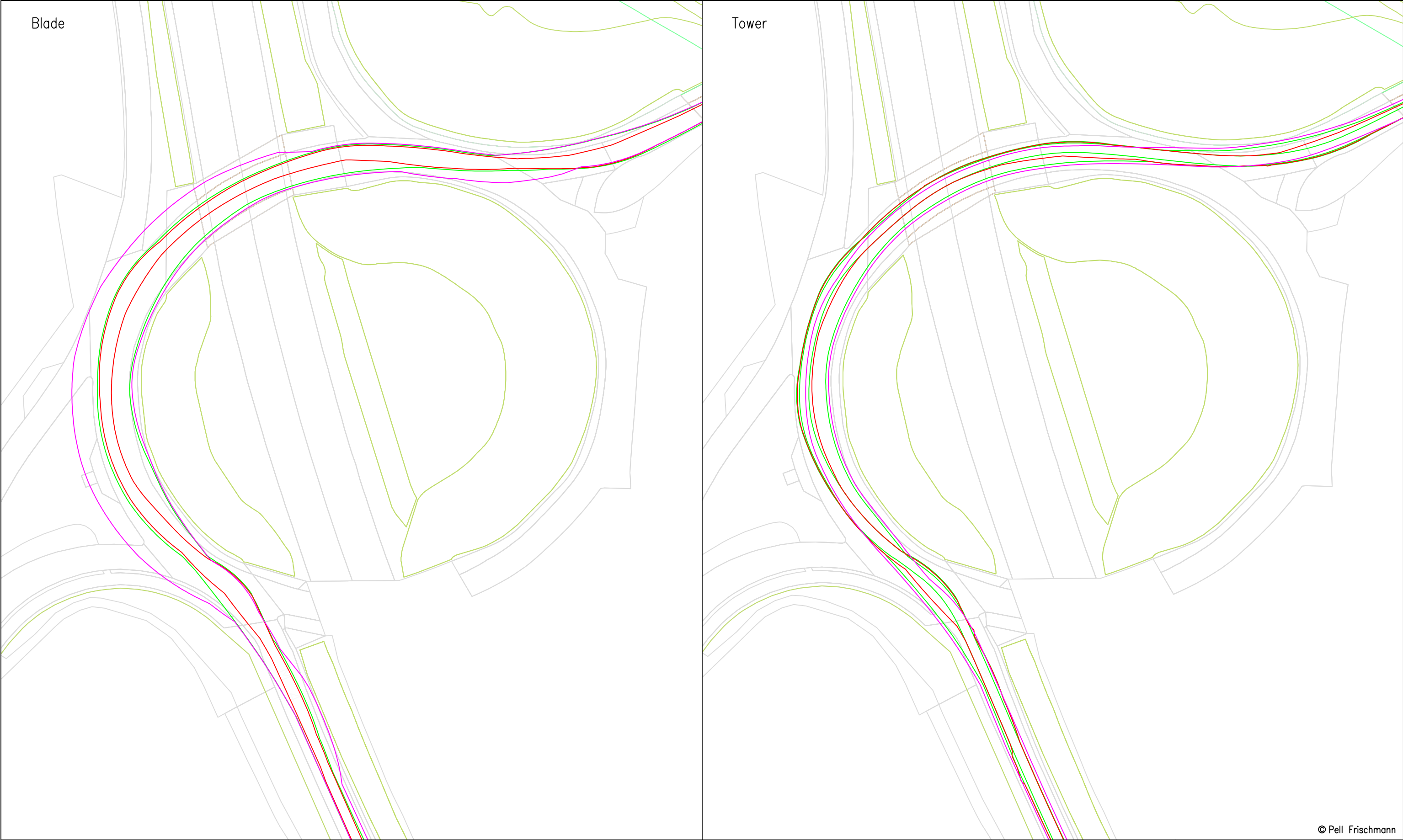
Over-run

Over-sail



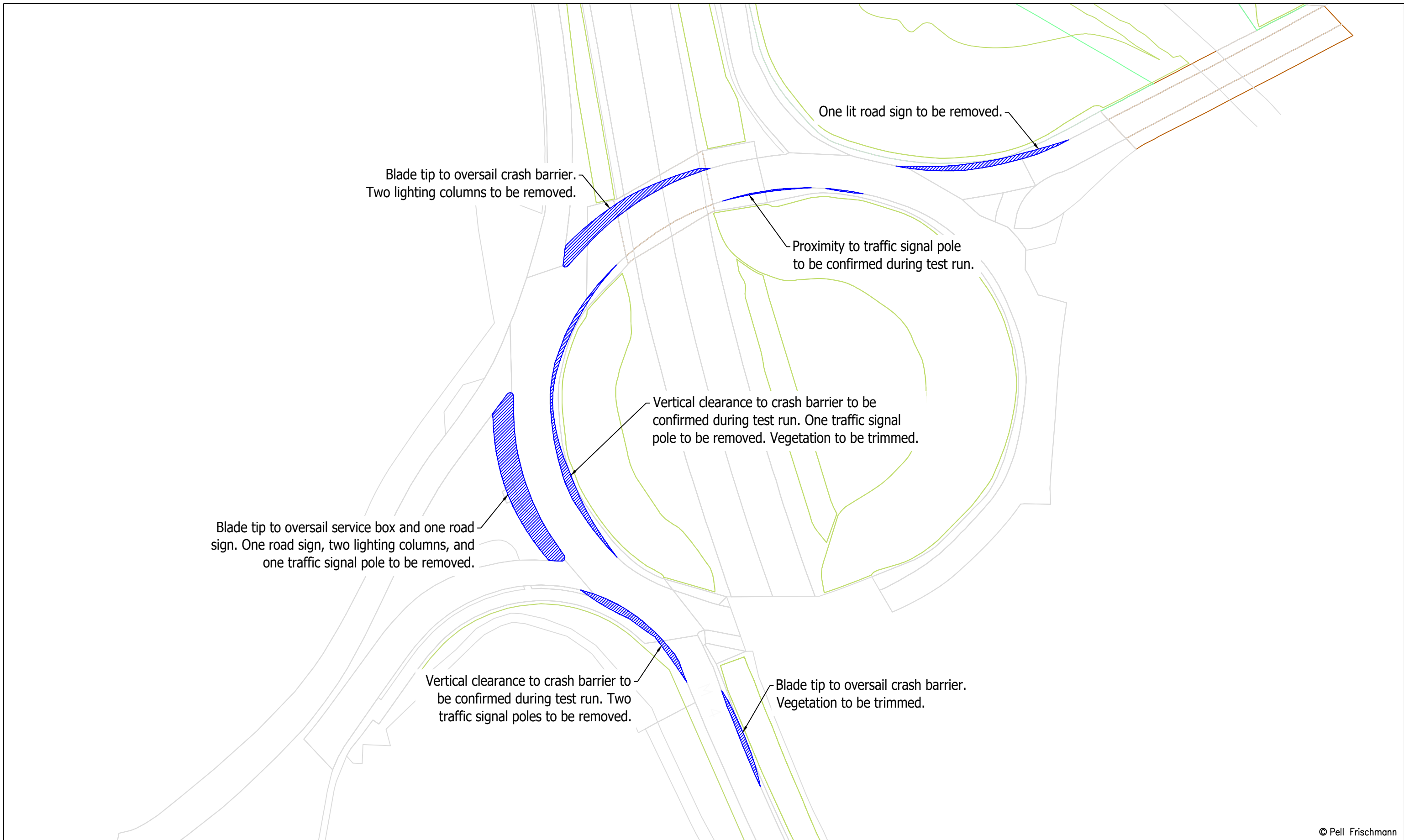
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Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail								



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			Checked	SCM	30/08/2022	Point of Interest 6		
Client RWE	Drawing Title V150 Blade and Tower		Drawing No. SK05		Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.			Revision 1
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location M4 / A465 Roundabout							

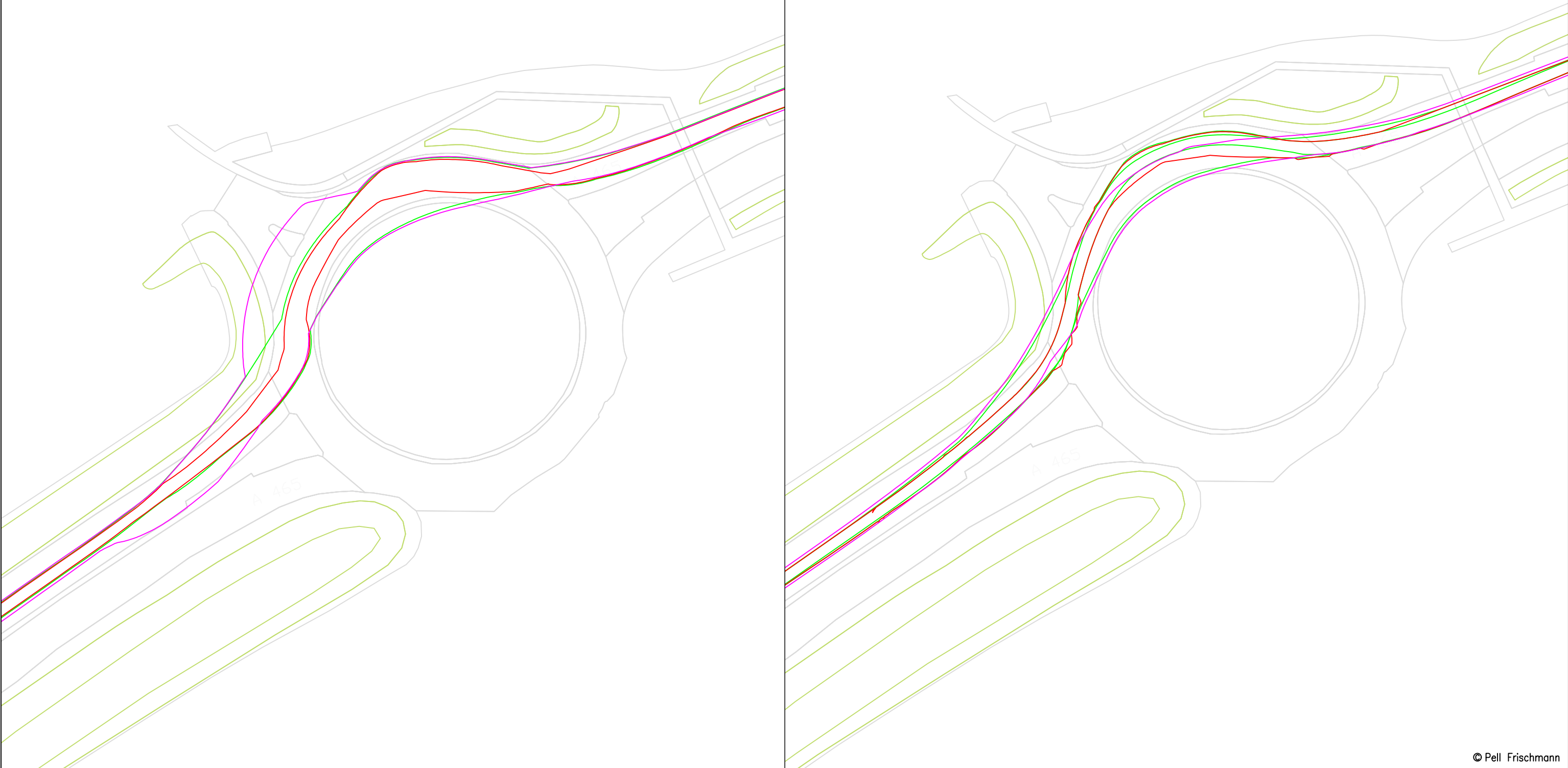


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Pell Frischmann 93 GEORGE STREET, EDINBURGH. EH2 3ES Tel: +44 (0)131 240 1270 Email: p.fedinburgh@pellfrischmann.com www.pellfrischmann.com	Project		Pen March Wind Farm			Name	Date	Scale		
					Drawn	GLJ	30/08/2022	1:1000 @ A3		
					Designed	GLJ	30/08/2022	File No. 220830 tracking.dwg		
					Checked	SCM	30/08/2022	Drawing Status		
Client	RWE		Drawing Title		Point of Interest		6		Draft	
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail		Drawing No.			Notes:		Revision			
		SPA Location		SK05A		1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		1		
		M4 / A465 Roundabout								

Blade

Tower

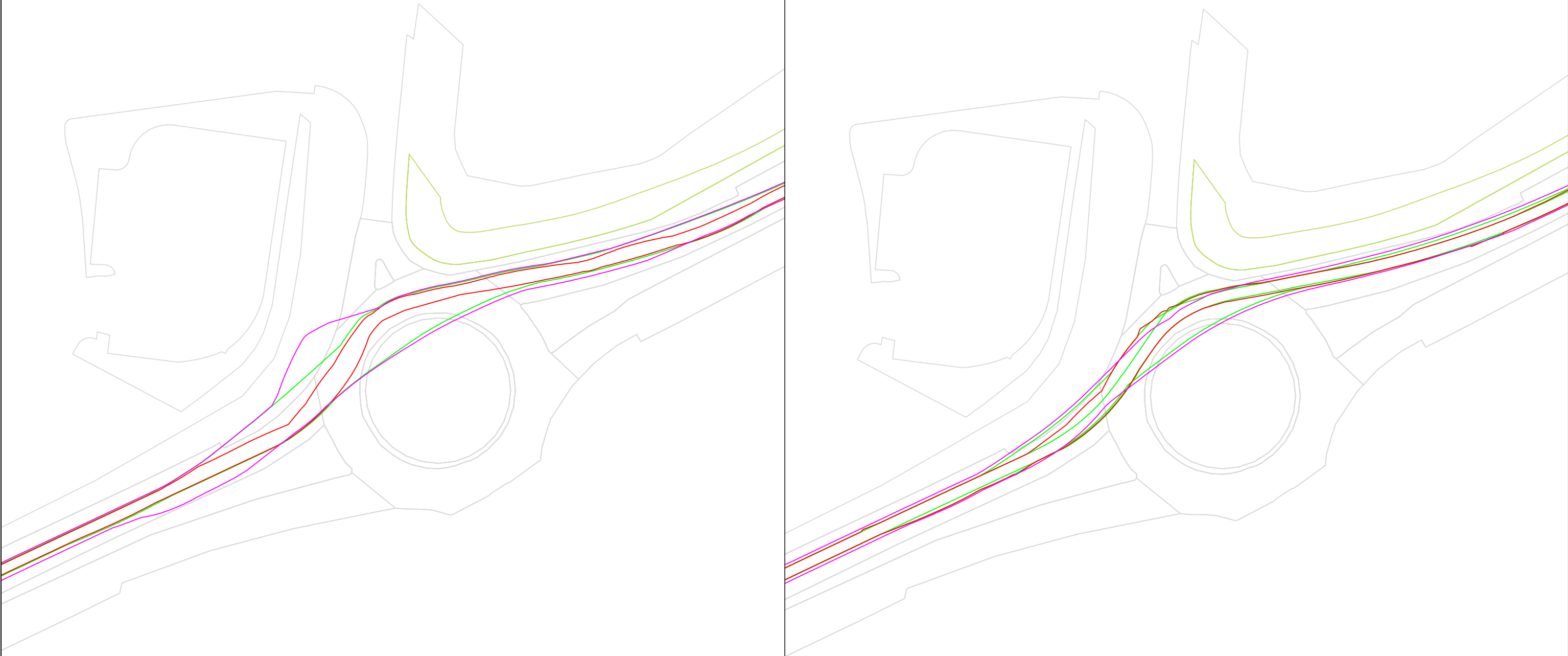


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		Pen March Wind Farm		GLJ		30/08/2022	1:1000 @ A3	
		Drawing Title		GLJ		30/08/2022	File No.	
		SPA Location		SCM		30/08/2022	220830 tracking.dwg	
Client		RWE		Point of Interest		7	Drawing Status	
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail		V150 Blade and Tower		Drawing No.		Notes:		Revision
		A465 / B4434 Roundabout		SK06		1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		1

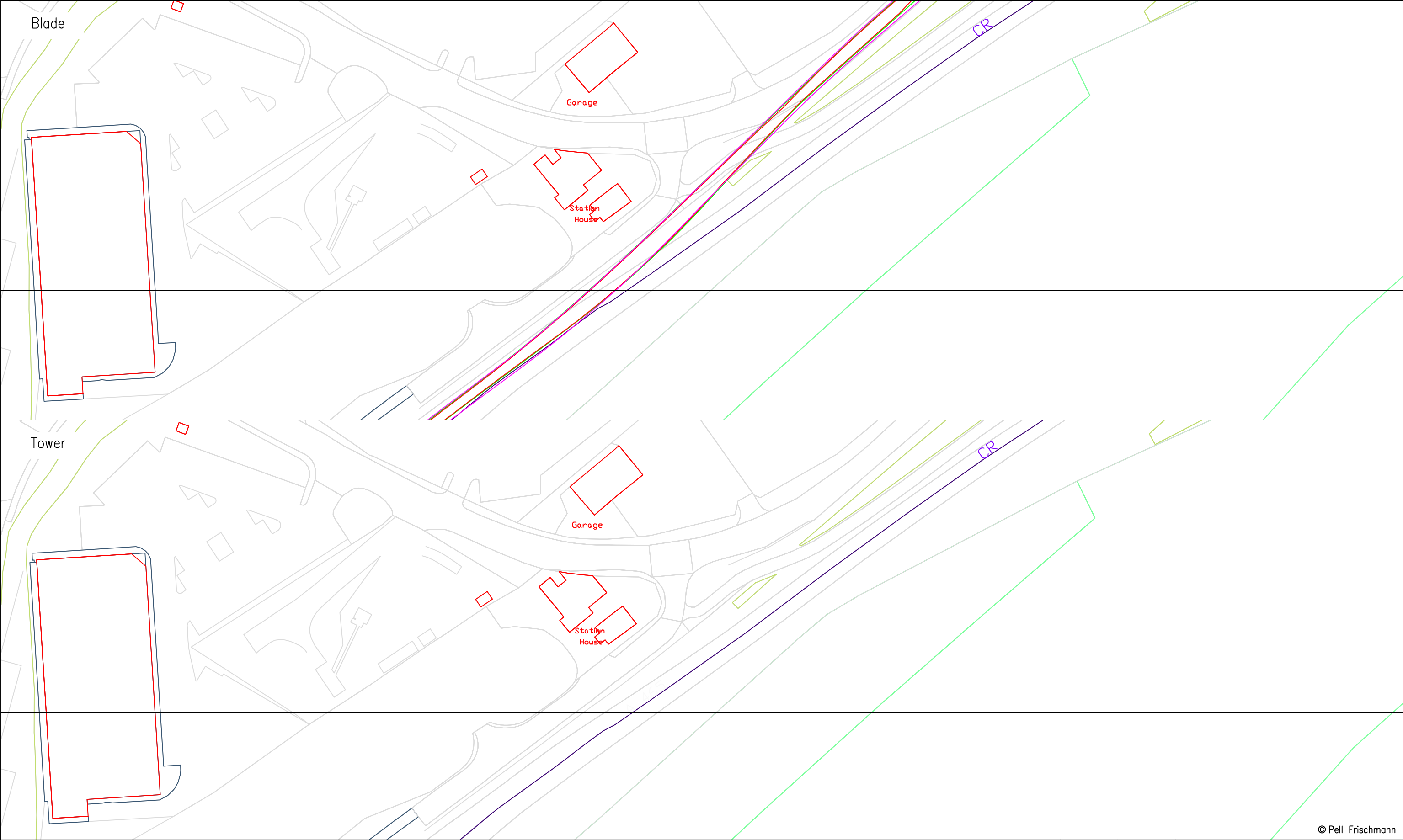
Blade

Tower



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				Drawn	GLJ	30/08/2022	1:1000 @ A3	
				Designed	GLJ	30/08/2022	File No.	
				Checked	SCM	30/08/2022	220830 tracking.dwg	
Client	RWE	Drawing Title	V150 Blade and Tower	Point of Interest		8	Drawing Status	
				Draft				
Key	Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	A465 / B4242 Roundabout	Drawing No.	Notes:			Revision
				SK07	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.			1



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				Drawn	GLJ	30/08/2022	1:1000 @ A3		
				Designed	GLJ	30/08/2022	File No.		
				Checked	SCM	30/08/2022	220830 tracking.dwg		
Client	RWE	Drawing Title	V150 Blade and Tower		Point of Interest		10	Drawing Status	
					Draft				
Key	Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	Potential Access from A465 to Common Road		Drawing No.	Notes:			Revision
					SK08	1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.			1

Wheel SPA

Body SPA

Load SPA

Indicative

Over-run

Over-sail



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	Drawing Title		V150 Blade and Tower		Drawn	GLJ	30/08/2022	File No.				220830 tracking.dwg	
					Designed	GLJ	30/08/2022	Drawing Status				Draft	
					Checked	SCM	30/08/2022	Point of Interest				10	
Client	RWE		SPA Location		Drawing No.		Notes:		Revision				
Key	Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail				SK08A		1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.		1				
				Potential Access from A465 to Common Road									

This topographic map shows a mountain ridge with contour lines. A proposed road route is highlighted in red, starting from a red-outlined rectangular area in the lower-left and curving upwards along the ridge. Other colored lines (purple, green, blue) represent different proposed routes or boundaries. A vertical purple line crosses the ridge. A small orange '+' symbol and the elevation '387.7m' are marked on the ridge. A small arrow points to a spot on the ridge. The word 'Blade' is written in the top-left corner.

[illegible]

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		Drawn	GLJ	30/08/2022	Scale	1:1000 @ A3		
		Designed	GLJ	30/08/2022	File No.	220830 tracking.dwg		
		Checked	SCM	30/08/2022	Drawing Status	Draft		
Client	RWE	Drawing Title	V150 Blade and Tower		Point of Interest	11		
Key	Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location	Common Road Bend		Drawing No.	SK09	Notes:	Revision
						1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.	1	



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			Drawn	GLJ	30/08/2022	File No. 220830 tracking.dwg		
			Designed	GLJ	30/08/2022	Drawing Status Draft		
			Checked	SCM	30/08/2022			
Client RWE	Drawing Title V150 Blade and Tower		Point of Interest		11			
Key Wheel SPA Body SPA Load SPA Indicative Over-run Over-sail	SPA Location Common Road Bend		Drawing No. SK09A		Notes: 1. All mitigation is subject to confirmation through a test run. 2. This is not a construction drawing and is intended for illustration purposes only.			Revision 1

Annex C: ESDAL Consultation Responses

Thank you for your submission. I can confirm that we only maintain one structure on the route you have proposed – Baldwins Bridge.

I have attached a plan indicating the contraflow manoeuvre for abnormal loads leaving Swansea Docks.

I trust the above is acceptable.

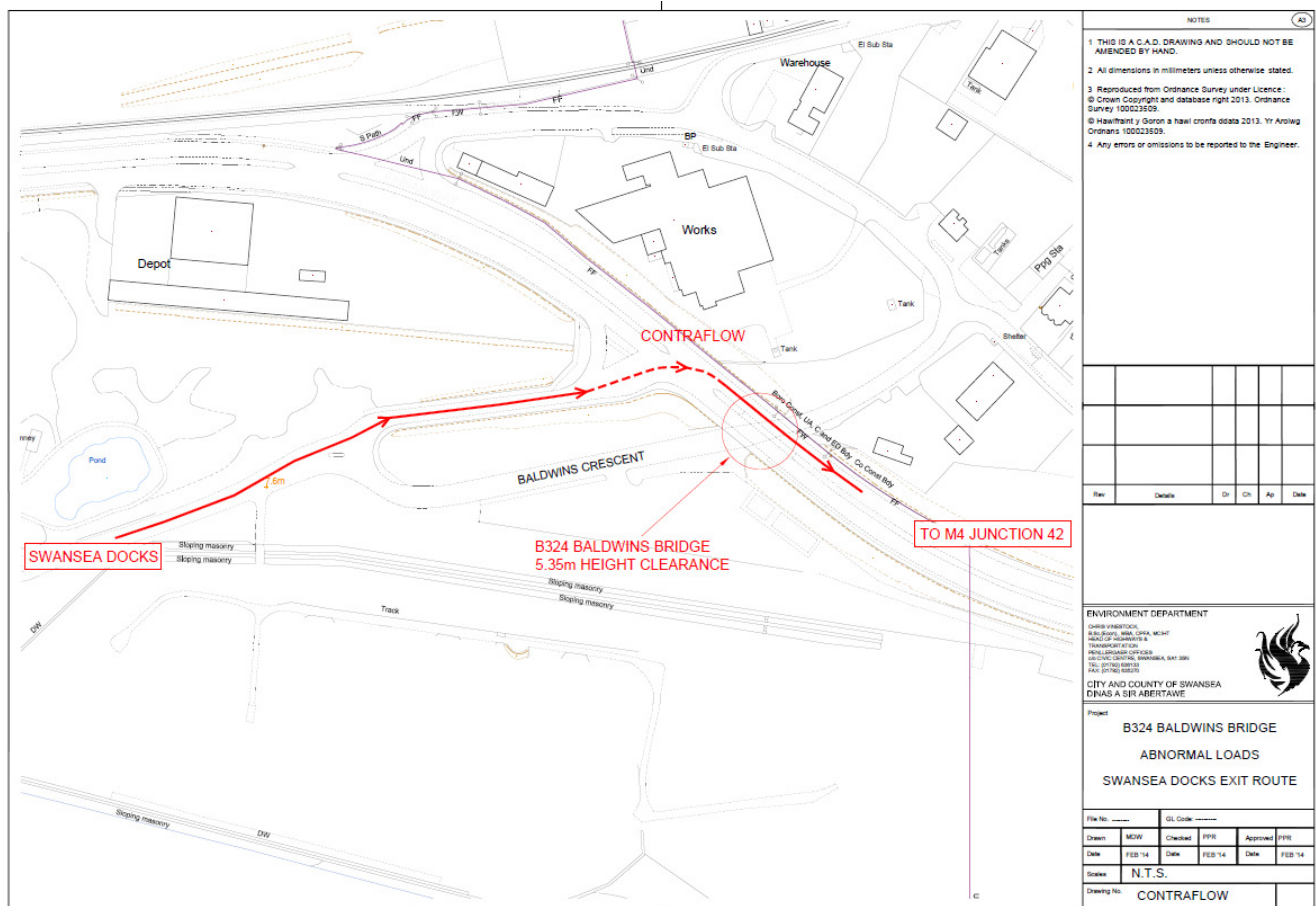
Cofion/Regards

Martyn

Martyn Wheel

Pontydd a Strwythurau

Bridges & Structures



Good Morning,

I have looked at the route you have proposed and can confirm that we have no structures located along this route. However I would like to remind you that it is the responsibility of the haulier to ensure the vehicle can successfully negotiate the route.

Please do not hesitate to contact me if you have any further queries.

Kind Regards



Matthew Bevan

Senior Technician

Bridges/ Pontydd
Neath Port Talbot County Borough Council/ Cyngor Bwrdeistref Sirol Castell-nedd Port Talbot

Good Day,

Thank you for your enquiry.

I have assessed the proposed route, and can confirm that no Historical Railway Estate structures will be affected.

I therefore have no objections, or any further comment, to make.

Regards

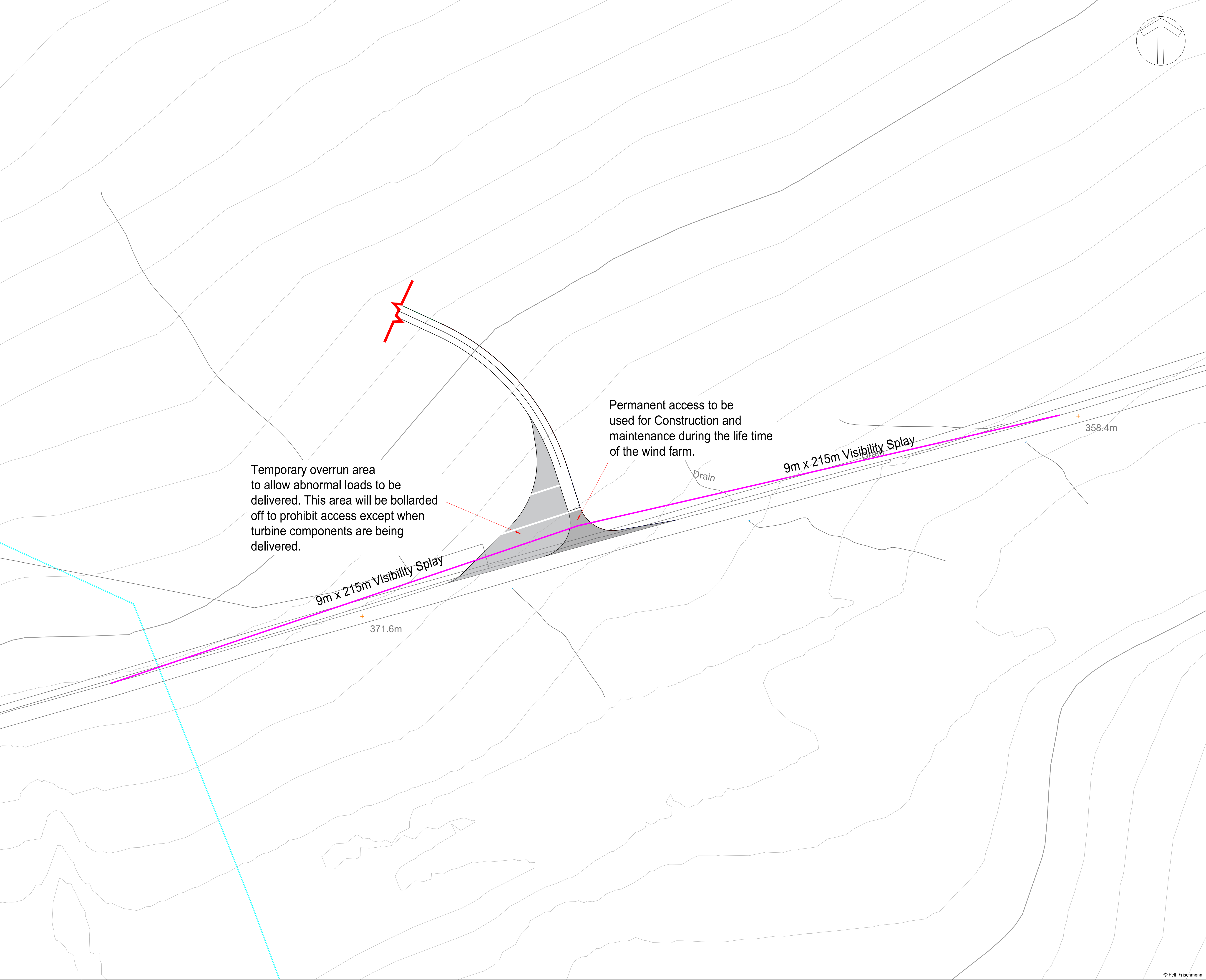
Clive Tegg | Jacobs | Principal Technician/Bridges

Jacobs Challenging today.
Reinventing tomorrow.



Please consider the environment before printing this e-mail

Appendix B Indicative Access Junction



- NOTE:
1. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION FOR HIGHWAY WORKS AND THE TURBINE MANUFACTURERS STANDARDS AND ALL RELEVANT DRAWINGS WITHIN THE PROJECT DESIGN PACKAGE.
 2. ALL WORKS TO BE EXECUTED IN ACCORDANCE WITH THE DMRB, THE MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS, DESIGN MANUAL FOR ROADS AND BRIDGES, AND TRAFFIC SIGNS MANUAL.
 3. ALL DIMENSIONS ARE IN METERS UNLESS STATED OTHERWISE. ALL LEVELS ARE IN METERS AND RELATE TO ORDNANCE DATUM.
 4. DO NOT SCALE FROM ANY DRAWING. WORK TO FIGURED DIMENSIONS ONLY. ANY DISCREPANCIES IN DIMENSIONS ARE TO BE REFERRED TO THE DESIGNER BEFORE WORK IS PUT TO HAND.
 5. ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO PREPARING ANY WORKING DRAWINGS OR COMMENCING ON SITE.
 6. ALL WORKS BY THE CONTRACTOR MUST BE CARRIED OUT IN SUCH A WAY THAT ALL REQUIREMENTS UNDER THE HEALTH AND SAFETY AT WORK ACT ARE SATISFIED.
 7. ALL WORKS ARE TO BE CARRIED OUT IN COMPLIANCE WITH THE REQUIREMENT OF THE STATUTORY AUTHORITIES AND CONSTRUCTION DESIGN MANAGEMENT REGULATIONS.

- KEY:
- Proposed Junction
 - Proposed Widening
 - 9m x 215m Visibility Splay

Temporary overrun area to allow abnormal loads to be delivered. This area will be bollarded off to prohibit access except when turbine components are being delivered.

Permanent access to be used for Construction and maintenance during the life time of the wind farm.

9m x 215m Visibility Splay

9m x 215m Visibility Splay

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Client

RWE

Project

Pen March Wind Farm

Drawing Title

Access Junction

	Name	Date	Scale	1:500 @ A1
Designed	JS	24.10.2022	File	Pen March Plan Access Junction Figure
Checked	SCM	24.10.2022	Drawing Status	DRAFT
Drawing No.	SK01			Revision 1

Appendix C Indicative A465 Slip Track



- NOTE:
1. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION FOR HIGHWAY WORKS AND THE TURBINE MANUFACTURERS STANDARDS AND ALL RELEVANT DRAWINGS WITHIN THE PROJECT DESIGN PACKAGE.
 2. ALL WORKS TO BE EXECUTED IN ACCORDANCE WITH THE DMRB, THE MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS, DESIGN MANUAL FOR ROADS AND BRIDGES, AND TRAFFIC SIGNS MANUAL.
 3. ALL DIMENSIONS ARE IN METERS UNLESS STATED OTHERWISE. ALL LEVELS ARE IN METERS AND RELATE TO ORDNANCE DATUM.
 4. DO NOT SCALE FROM ANY DRAWING. WORK TO FIGURED DIMENSIONS ONLY. ANY DISCREPANCIES IN DIMENSIONS ARE TO BE REFERRED TO THE DESIGNER BEFORE WORK IS PUT TO HAND.
 5. ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO PREPARING ANY WORKING DRAWINGS OR COMMENCING ON SITE.
 6. ALL WORKS BY THE CONTRACTOR MUST BE CARRIED OUT IN SUCH A WAY THAT ALL REQUIREMENTS UNDER THE HEALTH AND SAFETY AT WORK ACT ARE SATISFIED.
 7. ALL WORKS ARE TO BE CARRIED OUT IN COMPLIANCE WITH THE REQUIREMENT OF THE STATUTORY AUTHORITIES AND CONSTRUCTION DESIGN MANAGEMENT REGULATIONS.
 8. TO BE READ IN CONJUNCTION WITH STREET LIGHTING DESIGN PACK.

KEY:

- Proposed Track
- Proposed Earthworks

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Client

RWE

Project

Pen March

Drawing Title

A465 Access

	Name	Date	Scale
Designed	JS	24.10.2022	1:250 @ A1
Checked	GB	24.10.2022	File Pen March A465 Access Figure
			Drawing Status DRAFT

Drawing No.	SK01	Revision
		1