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Appendix 11.1

Transport Assessment

Pell Frischmann

Daer Wind Farm

Transport Assessment

September 2020
103291

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Prepared for:

RWE Renewables UK Ltd
Greenwood
Westwood Business Park
Coventry
CV4 8TT

Prepared by:

Pell Friscdhmann
93 George Street
Edinburgh
EH2 3ES

RWE

PellFrischmann

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1 Introduction

1.1 Purpose of the Report

Pell Frischmann (PF) has been commissioned by RWE Renewable Energy Developments Ltd (the Applicant) to undertake a Transport Assessment (TA) of the transport issues associated with the proposed development of Daer Wind Farm (the Proposed Development).

This report has been prepared in accordance with instructions from the Applicant on the above project details.

The report identifies the key transport and access issues associated with the Proposed Development, including the route for abnormal loads. The TA identifies where the Proposed Development may require mitigation works to accommodate the predicted loads; however, the detailed design of these remedial works is beyond the agreed scope of this report. It is the responsibility of the wind turbine supplier (depending upon the final contract) to ensure that the access routes to the development site 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 at the time the project commences onsite.

1.2 Report Structure

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

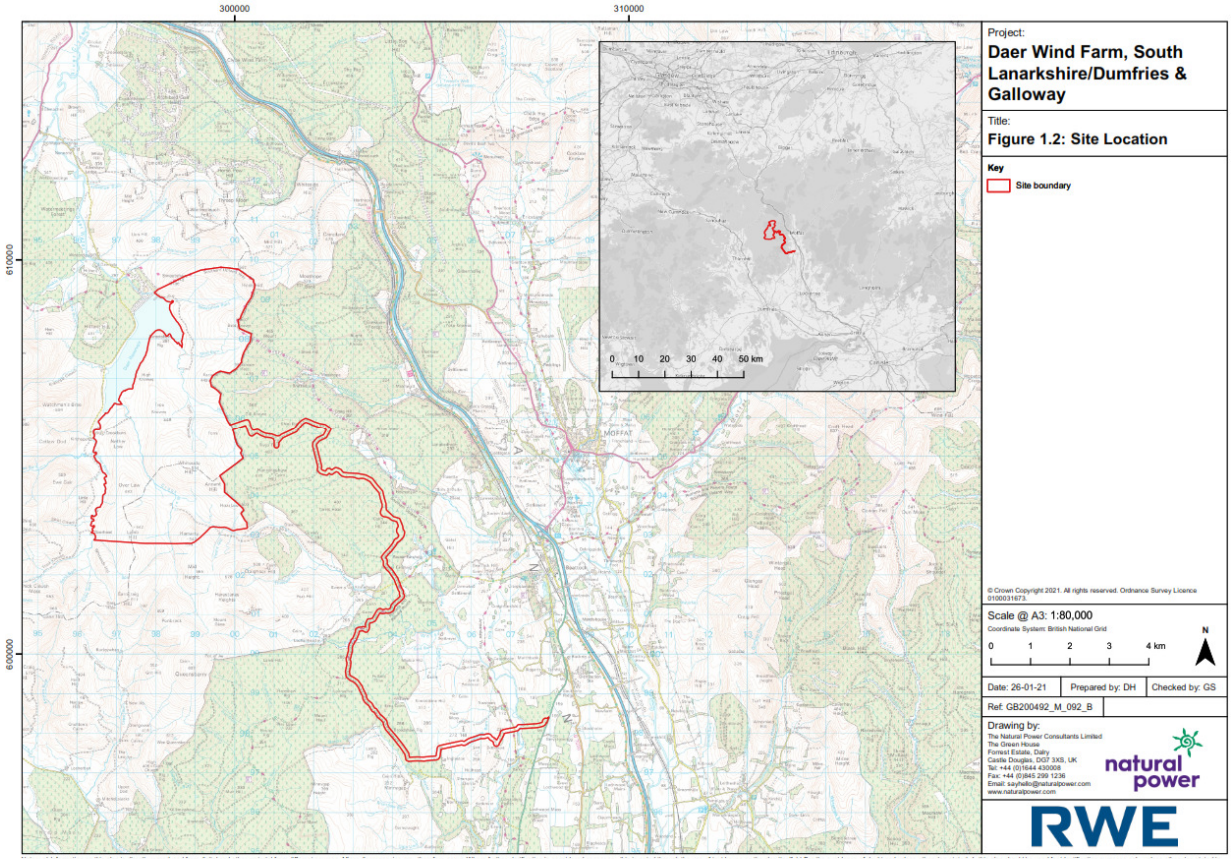
- Chapter Two describes the Proposed Development and the candidate turbine;
- Chapter Three reviews the relevant transport and planning policies;
- Chapter Four sets out the methodology used within this assessment;
- Chapter Five describes the baseline transport conditions;
- The trip generation and distribution of construction traffic in the study area is described in Chapter Six;
- Chapter Seven summarises the traffic impact assessment;
- Chapter Eight considers mitigation proposals for general construction traffic within the study area;
- Chapter Nine outlines access to the development for abnormal loads;
- Chapter Ten presents a framework Traffic Management Plan; and
- Chapter Eleven summarises the findings of the TA and outlines the key conclusions.

2 Site Background

2.1 Site Location

The Proposed Development is to create a new wind farm development south of Daer Reservoir to the west of Moffat in Dumfries and Galloway. Figure 1 illustrates the general site location.

Figure 1: Site Location Plan



The Proposed Development will comprise:

- Up to 17 wind turbines;
- Substation, control building and compound;
- Battery/energy storage infrastructure;
- Upgrading and new access tracks;
- Underground electricity cables connecting infrastructure within the Proposed Development Area;
- 2 Anemometry masts;
- 4 Temporary borrow pits;
- Temporary construction and storage compounds, laydown areas and ancillary infrastructure; and
- Drainage and drainage attenuation measures (as required).

2.2 Candidate Turbines

RWE have indicated that they wish to consider the use of Siemens Gamesa 155 turbines at a tip height of 180m. A full Route Survey Report has been undertaken on behalf of RWE and a copy is contained in Appendix A.

Details of the proposed components are summarised in table below. The worst-case assessment loads are the blade and Mid Tower Section 2.

Table 1: Turbine Size Summary

Component	Length (m)	Width (m)	Height / Min Diameter (m)	Weight (t)
Blade	76.571	4.424	3.000	25.600
Nacelle	14.620	4.200	3.500	84.000
Drive Train	7.000	3.600	3.400	83.000
Hub	4.800	4.500	4.200	50.000
Base Tower	16.464	4.700	4.433	79.355
Mid Tower 1	22.680	4.433	4.427	76.299
Mid Tower 2	27.160	4.427	3.557	68.693
Top Tower	33.610	3.557	3.574	66.933

These sections were used for the subsequent swept path assessment of the proposed loads along the access route.

The selection of the final turbine model and specification will subject to a commercial procurement process following consent of the application. The assumed 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 access route, it has been assumed that all blades would be carried on a Super Wing Carrier trailer to reduce the need for mitigation in constrained sections of the route.

Given the sizes of the proposed top tower sections, these along with other loads such as the hub and nacelle housing would be carried on a six-axle step frame trailer. The base and mid towers would be carried in a 4+7 clamp trailer.

Figure 2: Super Wing Trailer

Figure 3: Base Tower Trailer

3 Policy Context

3.1 Introduction

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

3.2 National Policy

3.2.1 National Planning Framework 3 (2014)

Scotland's National Planning Framework (NPF3) sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole. It sets out the Government's development priorities over the next 20-30 years and identifies national developments which support the development strategy. Scotland's third NPF was laid in the Scottish Parliament on June 23, 2014.

3.2.2 Planning Advice Note (PAN) 75

Planning Advice Note (PAN) 75: Planning for Transport provides advice on the requirements for Transport Assessments. The document notes that:

"… transport assessment to be produced for significant travel generating developments. Transport Assessment is a tool that enables delivery of policy aiming to integrate transport and land use planning."

"All planning applications that involve the generation of person trips should provide information which covers the transport implications of the development. The level of detail will be proportionate to the complexity and scale of the impact of the proposal...For smaller developments the information on transport implications will enable local authorities to monitor potential cumulative impact and for larger developments it will form part of a scoping exercise for a full transport assessment. Development applications will therefore be assessed by relevant parties at levels of detail corresponding to their potential impact."

3.2.3 Onshore Wind Turbines; Online Renewables Planning Advice (May 2014)

The most recent Scottish Government advice note regarding onshore wind turbines was published in 2014. The advice note identifies the typical planning considerations in determining applications for onshore wind turbines including landscape impact, impacts on wildlife and ecology, shadow flicker, noise, ice throw, aviation, road traffic impacts, cumulative impacts and decommissioning.

In terms of road traffic impacts, the guidance notes that in siting wind turbines close to major roads, pre-application discussions are advisable. This is important for the movement of abnormal indivisible loads during the construction period, ongoing planned maintenance and for the decommissioning phase.

3.2.4 Transport Assessment Guidance (2012)

Transport Scotland's (TS) Transport Assessment Guidance was published in 2012. It aims to assist in the preparation of Transport Assessments (TA) for development proposals in Scotland such that the likely transport impacts can be identified and dealt with as early as possible in the planning process. The document sets out requirements according to the scale of development being proposed.

The document notes that a TA will be required where a development is likely to have significant transport impacts but that the specific scope and contents of a TA will vary for developments, depending on location, scale and type of development.

3.3 Local Policy

3.3.1 Dumfries & Galloway Local Development Plan

The Local Development Plan (LDP) was adopted by the Council on 29th September 2014 and is the established planning policy for Dumfries and Galloway. It sets out a settlement strategy and spatial framework for how the Council foresees development occurring in the forthcoming twenty-year period.

The LDP does not contain any specific policy guidance for windfarm developments, however it does reference a Supplementary Guidance 'Part 1 Wind Energy Development: Development Management Considerations'. The relevant transport elements from this policy are:

- *"Where wind energy developments will involve abnormal load impact on public roads, developers and their contractors will be required, in consultation with the Council as roads authority, to produce an appropriate Traffic Management Plan. Developers will also be required to enter into a Section 75 or other legal agreement requiring any damage to the public roads to be made good at the developer's expense (the said agreement will require a 'before' and 'after' photographic survey of all public roads to be used by the developer and their contractors). Developers should also demonstrate how they have taken into consideration the impact on amenity for residents in close proximity to the transport routes used during the construction phase";*

- *"Developers should also carry out early consultation with the local roads and/or trunk roads officials and the Police in respect of abnormal load deliveries to the application site. Due to the size of the components being transported there can be issues in relation to the capacity of rural roads to cope with these loads";* and

- *"The route of new access roads/tracks should be carefully selected and be as sensitive to the existing contours as is practical in relation to the use it will receive".*

3.4 Policy Summary

The Proposed Development can accord 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 stages of the life of the Proposed Development. All have been considered in this assessment and are as follows:

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

4.2 Project Phases – Transport Overview

Of the two phases, the greatest traffic volumes are associated with the Proposed Development construction phase. 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.

The 'worst case' transport scenario is the construction phase and this assessment concentrates on this phase of the Proposed Development.

It should be noted however that the construction effects are short lived and transitory in nature.

4.3 Scoping Discussions

The Applicant submitted a scoping report to Dumfries and Galloway Council in respect of the Environmental Impact Assessment which included a section considering traffic and transport. A full review of that scoping opinion is provided in the Traffic and Transport Chapter of the EIA Report (Chapter 11).

The decommissioning phase has been scoped out of the assessment as elements of the wind farm would be retained following decommissioning (access tracks, cable trenches, etc). As such, the construction phase is the more intensive phase.

5 Baseline Conditions

5.1 Access Arrangement

The Proposed Development would be accessed directly from the existing strategic timber haul road junction on the A701 to the south of Beattock. This junction has been previously used for the transport of loads associated with the Harestanes and Minnygap Wind Farm developments.

The existing access junction would be widened to accommodate the proposed larger turbines.

5.2 Study Area Determination

A review of likely points of origin for materials has been undertaken along with a review of construction methodology to assist in developing a suitable study area.

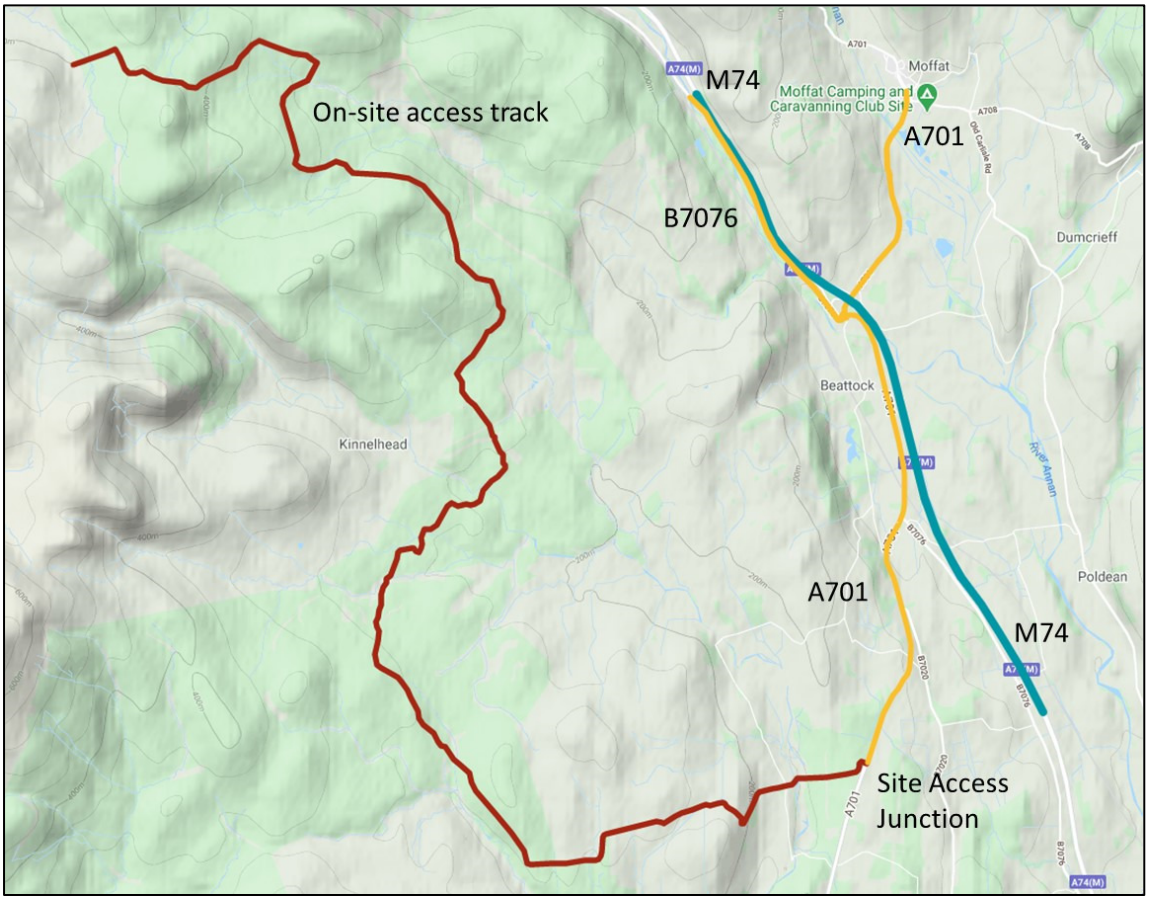
Access to the site for all construction traffic will be taken from the A701. Likely quarry locations are located on the A701 to the south of the development site, whilst access for other construction materials can be taken from the M74 via the A701 at Junction 15.

Access for turbine components will arrive via the B7076, whilst staff access will be taken from the M74 and A701 at Moffat. The study area for this assessment is as follows:

- The M74 to the north and south of Junction 15;
- The A701 between Moffat and Dumfries; and
- The B7076 between Junctions 14 and 15 of the M74.

The network is illustrated in Figure 4:

Figure 4: Assessment Study Area



Contains Google Map data © 2020 Google

5.3 Pedestrian and Cyclist Networks

There are two Core Paths recorded by Dumfries and Galloway Council that cross potential access routes to the Proposed Development site. These are:

- The Annandale Way; and
- The Southern Upland Way.

Both routes cross the construction access route on the off-road section of the route. They cross the public road network on the A701 near Beattock, however the crossing is grade separated and no physical interaction at this location between users is possible.

On the private off-road access track network, specific traffic management measures will be provided to improve the safety of the crossing locations for non-motorised users of both Core Paths.

Pedestrian facilities throughout the study area are limited and reflect the rural nature of the road network within the study area.

A review of the Sustrans cycle network plan of the United Kingdom has been undertaken and indicates that National Cycle Route (NCR) 74 Gretna – Glasgow runs along the A701 between the junction of the A701 / B7076 to the south of Beattock, through to the B7076 to the north of Junction 15 of the M74. The route is segregated from the A701 to the south of Beattock, however it continues as a painted cycle lane on the B7076 to the north of the Junction 15 roundabout.

The Dumfries and Galloway Council cycle map indicates that the A701 between Beattock and Moffat is a recognised cycle and pedestrian link. A separate shared footway / cycleway is provided between the two settlements.

5.4 Road Access

Access to the site is currently taken from the A701 via a priority junction that provides access to the wider forestry estate and to the existing Harestanes and Minnygap windfarms.

The A701 is part of the trunk road network and forms an important regional distributor function between Dumfries and towns to the west and the M74. The road is maintained by Amey on behalf of Scottish Ministers.

The junction in its current form would need minor widening works for it to be accessible for the proposed larger abnormal loads.

5.5 Existing Traffic Conditions

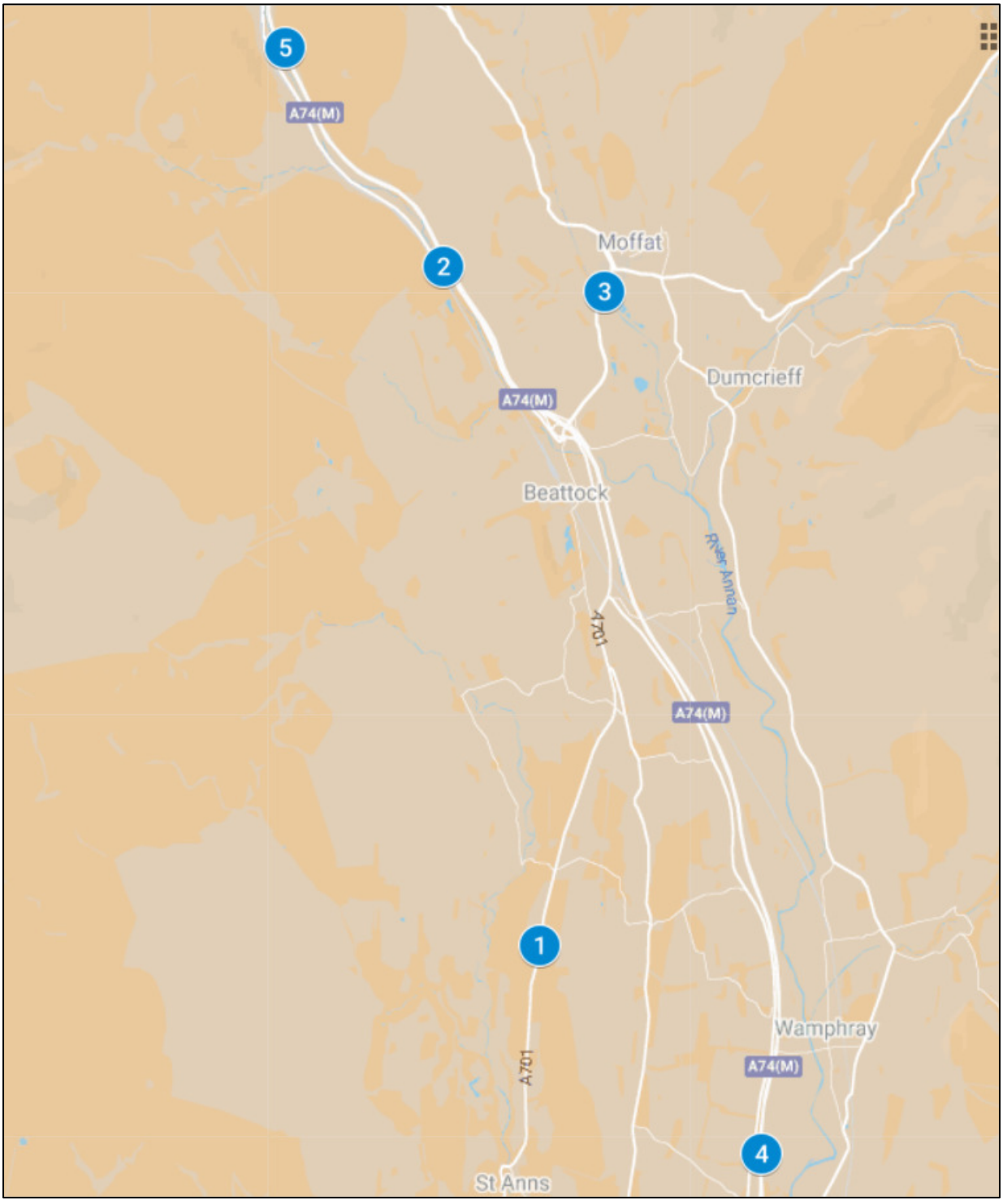
Due to travel restrictions associated with the COVID 19 lockdown, it has not been possible to collect accurate traffic data specifically for this assessment. In order to assess the impact of construction traffic on the study area, traffic count data was obtained from the UK Department for Transport (DfT) traffic count database.

The counts sites used were as follows:

- The A701 near the site access junction;
- The B7076 between Junctions 14 and 15 of the M74;
- The A701 to the south of Moffat;
- The M74 to the south of Junction 15; and
- The M74 to the north of Junction 15.

The locations of the ATC sites are illustrated in Figure 5.

Figure 5: Count Site Locations



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These sites were identified as being areas where sensitive receptors on the access route would be located. A full receptor sensitivity and effect review is prepared in the Traffic and Transport Chapter of the EIA Report (Chapter 11).

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

Table 2 summarises the 24 hour average weekday traffic data collected at the count sites for 2019.

Table 2: 24hour Average Weekday Traffic Data

Survey Location	Cars & LGV	HGV	Total
A701 Site Access	3257	609	3866
B7076 Between Junctions 14 and 15	263	84	347
A701 South of Moffat	4744	228	4972
M74 South of Junction 15	27561	7165	34726
M74 North of Junction 15	23136	7893	31029

5.6 Accident Review

Road traffic accident data for the three year period commencing 01 January 2017 through to the 31st December 2019 was obtained from the online resource crashmap.co.uk which uses data collected by the police about road traffic crashes occurring on British roads where someone is injured. Accidents are categorised as:

- "Slight" where there is damage only to vehicles or property;
- "Serious" where the accident results in a physical injury; and
- "Fatal" where a death is recorded.

Accident data for the B7076, A701 and M74 Junction 15 was reviewed. The summary statistics indicate that:

- There was one "slight" accident recorded on the B7076 (between Junctions 14 and 15) and one "slight" accident noted on the A701 between Jnction15 and Moffat;
- There were five accidents noted on the A701 between the site access junction and the roundabout at Junction 15. Of these, three were categorised as "Serious" and two as "slight". No fatal accidents were recorded on either the B7076 or A701;
- None of the accidents on the A701 between the site and Junction 15 involved a casualty who was a pedestrian, child, cyclist or motorcyclist;
- Of the five A701 accidents between Junction 15 and the site access junction, all involved cars, with only one "slight" accident involving a collision between a car and an HGV;
- A young driver was involved in a "serious" accident at the junction of the A701 and B7076. Other incidents on the A701 appear to occur at existing road junctions;
- The "slight" accident noted on the A701 to the south of Moffat involved a pedestrian and car collision;
- The "slight" accident recorded on the B7076 between Junctions 14 and 15 involved a car and an HGV on a straight section of road and occurred in 2019;
- Other than the accident noted on the B7076, no accidents were recorded in 2019;

- Two accidents were recorded on the M74 at Junction 15, one being a “fatal” accident at the diverge lane of the northbound carriageway and one a “slight” accident on the merge lane of the southbound on-slip. Neither involved HGV traffic.

The statistics indicate that the majority of accidents are “Slight” in nature and that only one involved an HGV.

5.7 Baseline Traffic Conditions

Construction of the project could commence during 2026 if consent is granted and is anticipated to take up to 18 months depending on weather conditions and ecological considerations.

To assess the likely effects during the construction phase, base year traffic flows were determined by applying a National Road Traffic Forecast (NRTF) low growth factor to the surveyed traffic flows.

The NRTF low growth factor for 2019 to 2026 is 1.043. These factors were applied to the 2019 survey data to estimate the 2026 Base traffic flows shown in Table 3.

Table 3: Baseline 2026 24hour Average Weekday Traffic Data

Survey Location	Cars & LGV	HGV	Total
A701 Site Access	3397	635	4032
B7076 Between Junctions 14 and 15	274	88	362
A701 South of Moffat	4948	238	5186
M74 South of Junction 15	28746	7473	36219
M74 North of Junction 15	24131	8232	32363

6 Trip Generation and Distribution

6.1 Construction Phase

6.1.1 General Methodology

During the 18 month construction period, the following traffic will require access to the Proposed Development:

- Staff transport, either cars or staff minibuses;
- Construction equipment and materials, deliveries of machinery and supplies such as cement; and
- Abnormal loads consisting of the wind turbine sections and also a heavy lift crane.

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

6.1.2 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, however 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 51 per day.

For the purposes of estimating traffic movements, it was assumed that 60% of staff would be transported by minibus carrying up to 8 people and 40% 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 48 vehicle trips (24 trips inbound and 24 trips outbound) per day during the peak period of construction.

6.1.3 Abnormal Indivisible Load Deliveries

The 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 4.

Table 4: Turbine Components

Component	Loads per turbine
Blades	3
Tower Sections	4
Nacelle Housing	1
Hub	1
Drive Train	1
Container	1

Component	Loads per turbine
Nose Cone	1
Transformer	1
Ancillary Parts	1
Site parts (shared Containers)	0.2
Total Movements	13.2 per turbine
Number of Turbines	17 turbines
Total Vehicle Trips	224
Total Vehicle Movements	449

In addition to the turbine deliveries, two high capacity erection cranes would be needed to offload several components and erect the turbines. The cranes are 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 four vehicles would be deployed and it is assumed that three turbine components would be delivered per convoy. This would result in 60 convoys on the network, with a total of 480 escort journeys (240 trips in and 240 trips out).

The escort vehicles have been assumed to be police cars and light goods vehicles. Motorcycles may be deployed, depending upon Police resources.

6.1.4 General Deliveries

Throughout the construction phase, general deliveries will be made to site via HGV. These would include fuel, site office supplies and staff welfare.

At the height of construction, it is assumed that up to 40 journeys to site are made (20 in and 20 out) per month.

Separate to general welfare deliveries, a site compound will be established on site and will be removed following the commissioning stage of the construction process. This will be constructed of modular buildings and a provision of 50 journeys has been established for this element.

6.1.5 Forestry Extraction

An amount of forestry will need to be cleared to form the new access track from the existing forestry access track to the development site. As the site is a managed forest resource, these trips could occur at any time on the network and as such have been excluded from the assessment.

6.1.6 Material Deliveries

Various materials will need to be delivered to site to form the site based infrastructure. At the outset, up to 100 HGV deliveries will deliver plant and initial material deliveries to the site to enable the formation of the site compound and borrow pits.

On-site borrow pits will be used to provide most of the stone for use on the site. The exception will be works to form the access tracks leading from the initial forestry access tracks into the site and up to the first of the on-site borrow pit. Material for this section of track as well as improvements to the wider forestry access track network will be imported onto site from local quarry sources (excluding the existing Forest & Land Scotland borrow pits within the neighbouring forest area).

The associated trip generation for these movements is detailed in Table 5.

Table 5: Imported Road / Hardstand Material Trip Estimation

Volume Required (m^3)	Density (te/m^3)	Total (te)	Tipper Capacity (tonnes)	No. Tippers	No. Lorry Journeys
10,013	2.20	22028	20	1102	2204

Concrete required to form the turbine bases and substation control building will be batched on site, with raw materials (cement, aggregate and water) delivered to site by HGV Steel will also be imported for use as reinforcement in the foundations and will come from the southeast of the site.

Concrete calculations for the turbine bases and the substation are detailed in Tables 6 and 7 below.

Table 6: Concrete Trip Estimation

Total Concrete Requirement (m3)	Cement Deliveries	Water Bowser Deliveries	Sand & Aggregate Deliveries	Total Lorry Journeys
12,750	28	162	404	1188

Table 7: Reinforcement Trip Estimation

Section	Tonne per base	No of bases	Total Weight (t)	Vehicle Capacity (t)	No of Trips	No of Journeys
Turbine Base	100	17	1700	30	57	114
Control Building	20	1	20	30	1	2

Cables will connect each turbine to the existing substation and control building. Trip estimates for the cable materials are provided in Tables 7, 9 and, 10.

Three cables are to be provided within each cable trench and would be backfilled with cable sand. Geotextiles would be used to reinforce the trench and ducting would be used to protect the cable when it runs under roadways.

Table 8: Cabling Trip Estimation

Length of Cable run	Total cable length	Length of cable / drum (m)	No of Drums	Drums / Vehicle	No of Trips	No of Journeys
17,725	53,175	500	319	9	36	72

Table 9: Ducting Trip Estimation

Section	Length of run	Length / roll or section (m)	No of rolls / sections	Drums / Section per Vehicle	No of Trips	No of Journeys
Ducting	500	5	100	20	5	10

Table 10: Cable Sand Estimation

Volume Required (m^3)	Density (te/m^3)	Tipper Capacity (tonnes)	No. Tippers	No. Lorry Journeys
5,982	1.60	20	479	958

In addition, it is estimated that up to 73 journeys will be required for the delivery of geotextile associated with the cabling and infrastructure works.

6.1.7 Substation and Battery Deliveries

A substation/control room building will be constructed and this is expected to also accommodate a battery/energy storage facility. A total of 82 journeys have been estimated with these works.

6.1.8 Distribution of Trips

The distribution of development trips on the study area will vary depending on the types of loads being transported. All traffic will enter and exit the site by way of the site access junction off the A701.

Staff trips are assumed to originate from local places of residence, with 50% of staff estimated to be resident in and around Moffat. The remaining 50% have been assumed to access the site from the M74 to the north and south in equal numbers.

General site deliveries are assumed to access the site from the Central Belt of Scotland and will access from the north via the M74.

Material imported to site for the initial access tracks works is predicted to originate from the south of the site and will be delivered via the A701 or M74. For the purposes of the assessment, a 50 / 50 split has been assumed.

Deliveries of materials to supply the on-site batching plant will access the site from further afield where supply chains are likely to offer more competitive commercial terms. It has been assumed that a 50/50 split between the M74 north and south is adopted for the assessment.

The final decision on material sources will be made by the Balance of Plant (BoP) contractor.

It is proposed that the port used for the deliveries of wind turbines components would be King George V Dock in Glasgow. This port has adequate facilities for accommodating the proposed loads and complies with the UK Government's "Water Preferred" access strategy as being the closest, most suitable port for this site.

Access from King George V docks would be via the M8, M74, A702, B7076 and A701. Sections of this route have already been used by the nearby Clyde Wind Farm.

6.1.9 Peak Construction Period

A construction programme has been developed for the project. This has been used to determine timescales for the various deliveries and trips.

A trip programme has been developed and is illustrated in Appendix B. Please note that there may be minor rounding errors present and where possible, headline summary figures have been subject to rounding up.

The results conclude that Month 4 is likely to be the peak period for the construction phase. This corresponds with the delivery of stone for the construction of initial access tracks, concrete raw materials for turbine foundations and reinforcement deliveries. The activities are anticipated to generate an average of 92 movements per day (46 trips in and 46 trips out), of which 48 would be made by light vehicles (site staff) and 44 by HGV.

The traffic impact assessment focuses on the peak period traffic flows to illustrate the potential worst case traffic effects on the study area.

6.2 Operational Phase

It is predicted that during the operation of the Proposed Development there would be up to 2 vehicle movements per week for maintenance purposes. Also, there may be occasional abnormal load movements to deliver replacement components in the unlikely event of a major failure.

7 Construction Traffic Impact Assessment

The peak construction month occurs in Month 8. Using the distribution of traffic described in the previous section, the proposed traffic flows on the study area network at the peak of construction are illustrated in Table 11.

Table 11: Peak Construction Month Daily Traffic Data

Survey Location	Cars & LGV	HGV	Total
A701 Site Access	48	44	92
B7076 Between Junctions 14 and 15	0	0	0
A701 South of Moffat	24	0	24
M74 South of Junction 15	12	20	32
M74 North of Junction 15	12	8	20

The peak month traffic data was combined with the future year (2026) 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: 2026 Peak Month Daily Traffic Data

Survey Location	Cars & LGV	HGV	Total Traffic	Cars & LGV % Increase	HGV % Increase	Total Traffic % Increase
A701 Site Access	3445	679	4124	1.41%	6.93%	2.28%
B7076 Between Junctions 14 and 15	274	88	362	0.00%	0.00%	0.00%
A701 South of Moffat	4972	238	5210	0.49%	0.00%	0.46%
M74 South of Junction 15	28758	7493	36251	0.04%	0.27%	0.09%
M74 North of Junction 15	24143	8240	32383	0.05%	0.10%	0.06%

It is anticipated that should any weekend working take place, it would involve limited numbers of staff and associated vehicle movements and no deliveries by HGV (with the possible exception of abnormal load deliveries). As such no detailed analysis has been undertaken.

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

The total HGV traffic movements will increase to just under 7% on the A701. This represents 6 inbound HGV journeys every hour during construction activities, which is not considered significant in operational terms.

A review of existing road capacity has been undertaken using the Design Manual for Roads and Bridges, Volume 15, Part 5 “The NESA Manual”. The theoretical road capacity has been estimated for each of the road links that makes up the study area. The results are summarised in Table 13.

Table 13: 2026 Daily Traffic Data (24hr)

Location	2026 Baseline Flow	2026 Base + Development Flows	Theoretical Road Capacity (12 hour)	Spare Road Capacity %
A701 Site Access	4032	4124	21600	80.91%
B7076 Between Junctions 14 and 15	4032	4048	21600	81.26%
A701 South of Moffat	362	362	28800	98.74%
M74 South of Junction 15	5186	5210	21600	75.88%
M74 North of Junction 15	36219	36251	122400	70.38%

The results indicate that there are no road capacity issues with the Proposed Development and that ample spare capacity exists within the trunk and local road network.

8 Abnormal Indivisible Load Summary

A Route Survey Review has been undertaken and is attached in Appendix A. The assessment is based on a rotor diameter of 155m at a maximum tip height of 180m. The assessment details the proposed route and the required physical mitigation works that are required along the proposed access route form the ports to the site access junction.

The route assessment was based upon the use of Siemens Gamesa SGRE155 turbine. The worst case loads were used in the assessment, with a 76.571m long by 4.424m wide turbine blade and a 27.160m long by 4.427m wide turbine tower section being assessed.

The assessment reviews access to the Proposed Development from King George V Docks in Glasgow via the M8, M74, B7076 and A701. The works to accommodate these loads comprises of adjustments to street furniture and the provision of over-run surfacing at various junctions between Junction 14 and 15 on the B7076.

A number of the necessary works identified are similar to those used for previous windfarm developments such as Clyde Wind Farm.

The existing access junction for the Proposed Development will be widened to accommodate the proposed larger loads. From this point onwards, loads will proceed to the proposed turbine locations using existing and new access tracks.

8.1 Site Access Junction

The existing junction would be widened to accommodate the proposed abnormal loads and the visibility splays would be cleared to ensure safe access for all users at the junction.

8.2 Convoy Management

It is not yet possible to fully detail the convoy management measures required as the turbine supplier has yet to be identified and there is no haulier appointed to the project. Should the Proposed Development be approved, the Applicant will undertake a turbine supply tender exercise and will select a suitable turbine for use on the site. The turbine supplier will then appoint a haulier. At this stage a detailed convoy plan can be prepared one the exact nature of the turbine is known.

To address the concerns expressed by the local community, it is proposed that a detailed convoy Management Plan is developed with Transport Scotland and Dumfries & Galloway Council. This will include measures to provide hold points for convoys to ensure that inconvenience to other road users can be minimised.

8.3 General Comments

A review of the following would be required prior to the delivery of the abnormal loads, to ensure load and user safety:

- A review of clear heights with utility providers and the transport agencies along the route;
- Ensure any vegetation which may foul the loads is trimmed back to allow passage (this is of concern to the hauliers once the load is on the local road network and should be assessed for summer conditions);
- Confirm there are no roadworks or closures that could affect the passage of the loads;

- Check no new or diverted underground services on the proposed route are at risk from the abnormal loads;
- Confirm Police Scotland is satisfied with the proposed movement strategy; and
- The developer contacts the appropriate agencies to ensure that the above points are reviewed before the transport of the components commences.

9 Proposed Traffic Mitigation Measures

9.1 Construction Phase

A Construction Traffic Management Plan (CTMP) would be prepared and agreed with the Council and Transport Scotland prior to construction works commencing. The following measures could be included within CTMP during the construction phase.

- Where possible the detailed design process would minimise the volume of material to be imported to site to help reduce HGV numbers;
- 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) would be sheeted to reduce dust and stop spillage on public roads;
- Specific training, audit and disciplinary measures would be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- Appropriate traffic management measures would also be put in place at the Site access junction to advise drivers to slow down and be aware of turning traffic;
- Directional signage could be provided to enforce delivery routes;
- Wheel cleaning facilities may be established at the site entrance;
- Appropriate traffic management measures would be put in place near to the new site access junction on the A701 to avoid conflict with general traffic, subject to the agreement of Transport Scotland. 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.
- All drivers would be required to attend an induction to include:
    - A toolbox 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.

A wear and tear agreement may be required in the vicinity of the site access junction.

Video footage of the pre-construction phase condition of the A701 in the vicinity of the access junction 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 Development. Any necessary repairs would be coordinated with Transport Scotland. Any damage caused by traffic associated with the Proposed

Development, 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.

A similar agreement will be made with Dumfries & Galloway and South Lanarkshire Councils for areas where mitigation works to accommodate the AIL traffic has been made.

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.

9.2 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.

10 Framework Traffic Management Plan

10.1 Proposed Management Measures

This chapter introduces several traffic management measures that could help reduce the effect of deliveries to site. These measures are currently presented as indicative to be confirmed with the relevant local and trunk road authorities and police closer to the time.

All 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 convoys would travel in the early morning periods, before peak times while general construction traffic would generally avoid the morning and evening peak periods.

10.2 Component & Transport Details

Traffic to the site during construction will fall into two categories, namely:

- General construction traffic; and
- AILs – vehicles for the transport of the largest turbine components.

10.3 Potential Route Conflict Areas

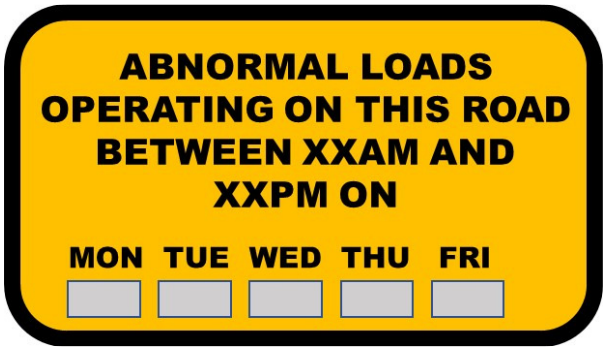
The majority of potential conflicts between construction traffic and other road users will occur with AIL traffic. General construction traffic is not likely to come into conflict with other road users as the vehicles are smaller and road users are generally more accustomed to them.

Potential conflicts between the AIL turbine loads and other road users can occur at a variety of locations and circumstances. The main potential conflicts are likely to occur:

- On the A702, B7076 and A701 where the loads may straddle the centre line, where fast moving oncoming traffic may be encountered, etc.;
- Where traffic turns at a road junction, requiring other traffic to be restrained on other approach arms; and
- In locations where high speeds of general traffic are predicted.

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 6. 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 6: Example Information Sign



This signage would 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 such as local events in Moffat and Beattock;
- A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic; and
- Proposals to establish a construction liaison committee to ensure the smooth management of the project / public interface with the applicant, the construction contractors, the local community, and if appropriate, the police forming the committee. This committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.

10.4 Public Information

Information on the turbine convoys would be provided to local media outlets such as local papers to help assist the public.

Information could 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.

10.5 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 Police Scotland who have sole discretion on when loads can be moved.

10.6 Other Measures

The Framework Traffic Management Plan could 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; and

- Potential linkages to the Transport Scotland Variable Message Signage (VMS) network to provide addition al information to users of the M74.

11 Summary & Conclusions

11.1 Summary

This report was commissioned by the Applicant to provide an assessment of the transport issues associated with the Proposed Development located to the west of Moffat.

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 Development. During the construction of the Proposed Development, the associated traffic effects are predicted to be greatest on the A701 at the site access junction.

The maximum traffic effect associated with construction of the Proposed Development is predicted to occur in Month 4 of the programme. During this month, an average of 44 HGV movements is predicted per day and it is estimated that there would be a further 48 car and light van movements per day to transport construction workers to and from the Site.

A review of the local road network was undertaken to assess the feasibility of transporting turbines to the development Site. No capacity issues are expected on any of the roads assessed due to the additional construction traffic movements associated with the Proposed Development as background traffic flows are very low and the road links within the study area are of reasonable standard.

11.2 Conclusions

The assessment has identified the following:

- That the construction phase of the project will generate the highest level of traffic and that a robust assessment assuming site supply by ready mix concrete, rather than on-site batching has been used;
- The construction traffic during the most intensive phase of the construction programme will be short lived;
- That total traffic movements are not predicted to increase by more than 7% on all of the study area;
- The disruption caused by construction activity is short lived and of a transitory nature. As such, there are no long-lasting effects associated with the Proposed Development;
- That the surrounding road network has sufficient capacity to accommodate the temporary construction traffic;
- That the route from the proposed ports of entry is suitable for turbine delivery; and
- That a traffic management plan is required to control construction traffic in the interests of road safety and efficiency.

Appendix A
Route Survey Report

Pell Frischmann

Daer Wind Farm

Abnormal Indivisible Load Route Review

September 2020

103291

Revision Record					
Rev	**Description**	**Date**	**Originator**	**Checker**	**Approver**
A	Draft	25/09/2020	T Lockett	G Buchan	G Buchan

Prepared for:

RWE Renewables UK Developments Ltd
Greenwood
Westwood Business Park
Coventry
CV4 8TT

Prepared by:

Pell Friscdhmann
93 George Street
Edinburgh
EH2 3ES

RWE

PellFrischmann

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1 Introduction

1.1 Purpose of the Report

Pell Frischmann (PF) has been commissioned by RWE to undertake a survey to establish a route for the delivery of wind turbine components associated with the construction and development of Daer Wind Farm, located to the west of Moffat, Dumfries & Galloway.

The report identifies the key issues associated with component deliveries and notes where remedial works, either in form of physical works or as traffic management interventions will be required to accommodate the predicted loads.

The detailed designs of any remedial works are beyond the agreed scope of works between PF and RWE at this point in time.

The developer will be responsible for ensuring that the finalised proposals meet with the appropriate levels of health and safety provision for all road users has been made in accordance with the relevant legislation, at the time of delivery.

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.

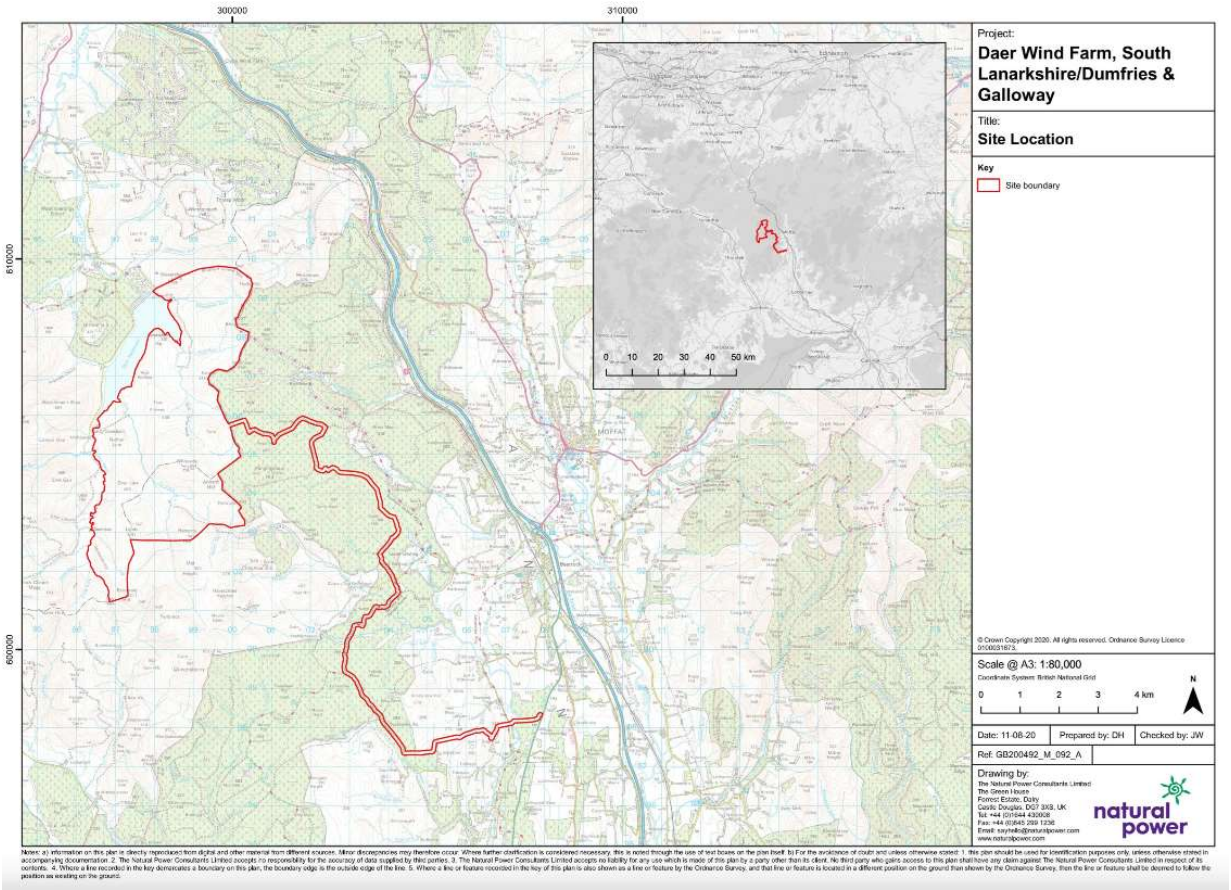
PF has been commissioned to prepare this abnormal load route assessment report as a source of guidance. The report identifies the key points and issues associated with the route that may require remedial works to accommodate the predicted loads.

2 Site Background

2.1 Site Location

The development site is located west of Moffat, Dumfries & Galloway. Figure 1 illustrates the general site location.

Figure 1: Site Location Plan



2.2 Candidate Turbines

RWE have indicated that they wish to consider the use of Siemens Gamesa SGRE155 turbines at a tip height of 180m. The details of the components are summarised in Table 1.

Table 1: Turbine Dimensions

Component	Length (m)	Width (m)	Height / Min Diameter (m)	Weight (t)
Blade	76.571	4.424	3.000	25.600
Nacelle	14.620	4.200	3.500	84.000
Drive Train	7.000	3.600	3.400	83.000
Hub	4.800	4.500	4.200	50.000
Base Tower	16.464	4.700	4.433	79.355
Mid Tower 1	22.680	4.433	4.427	76.299
Mid Tower 2	27.160	4.427	3.557	68.693
Top Tower	33.610	3.557	3.574	66.933

The assessment has been based on the blade and mid tower 2.

2.3 Proposed Delivery Equipment

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

The base and mid towers would be carried on a 4+7 clamp trailer. The assessment has included the Mid Tower. The hub, nacelle housing, and top towers would be carried on a six-axle step frame trailer.

Figure 2: Superwing Carrier Trailer

Figure 3: Clamp Trailer

3 Access Route Review

3.1 Port of entry

The proposed Port of Entry (POE) is KGV Dock, Glasgow. The port is the closest and only suitable port to site and as such is in line with the Government's "Water Preferred" policy towards AIL movements.

The port has been used by renewables deliveries in the past for a large number of wind farms, has sufficient quay and is well located for the trunk road network.

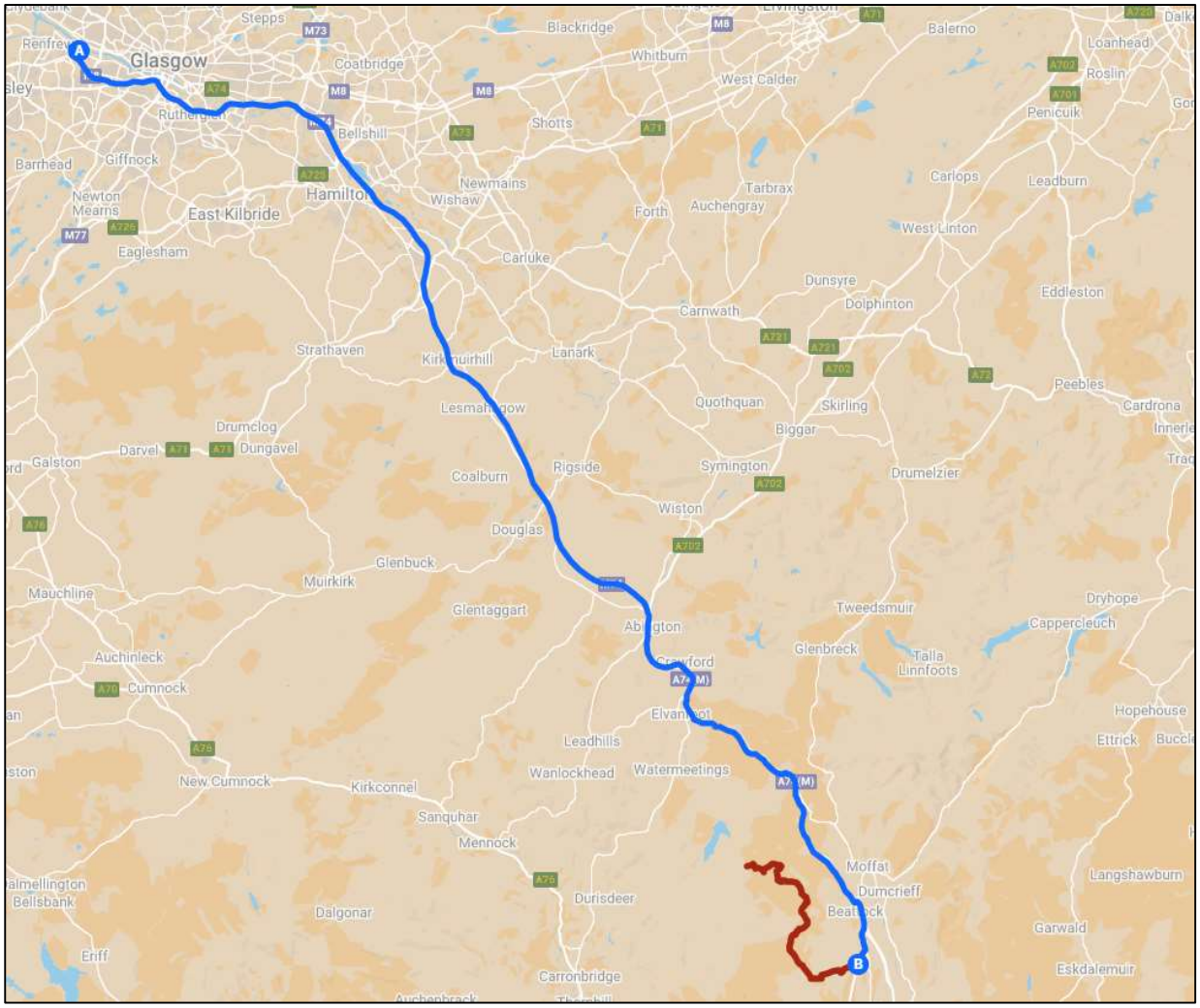
3.2 Access Routes

The proposed access route to site is as follows:

- Loads will exit the port onto Kings Inch Drive;
- Loads will turn left onto Mayo Avenue and continue onto the eastbound carriageway of the M8 at Junction 25;
- Loads would continue on the M8 and M74 until Junction 14;
- Loads would depart the M74 at Junction 14 and would join the A702 southbound;
- Loads would continue southbound on the B7076;
- At the roundabout for M74 slip roads at Junction 15, loads would continue southbound on the A701; and
- Loads would turn right at the strategic forest haul road and would proceed to site using existing and new private access tracks.

The proposed access route is illustrated in Figure 4, with the public road sections in blue and the private track sections in red.

Figure 4: Proposed Access Route



3.3 Route Constraints

The constraints noted for the main route are detailed in Table 2. These cover all constraints from the port access gate through to the site access junction. No consideration of the transport issues within the port or within the development site have been undertaken and this includes the design of the site access junction.

Plans illustrating the location of the constraints and a detailed list of POI are provided in Appendix A.

Table 2: Constraint Summary

POI	Constraint	Details
1	**Kings Inch Drive Roundabout 1** 	Loads will exit the port via the AIL access gate onto Kings Inch Drive. Loads will cross the central island of the junction and utilise the existing overrun area. Two road signs on the exit splitter island would need to be removed to enable over-sail. Loads will oversail the southwestern footway. Swept path assessment SK01 is included in Appendix B.
2	**Kings Inch Drive Roundabout 2** 	Loads will proceed ahead taking the second exit onto Kings Inch Drive. Loads will oversail the both verges on approach to the roundabout and the southern edge of the roundabout island. One lighting column should be removed. Swept path assessment SK02 is included in Appendix B.
3	**Kings Inch Drive Roundabout 3** 	Loads will proceed ahead at the junction, taking the second exit. Loads can negotiate the roundabout without the requirement for mitigation measures. Swept path assessment SK03 is included in Appendix B.

POI	Constraint	Details
4	**Kings Inch Drive / Mayo Avenue Junction** 	Loads will turn left at the junction and will enter the M8 spur road. Loads will oversail the central reserve on approach to the bend where escorts should hold oncoming vehicles to allow the blade tip to oversail into oncoming lanes. Loads will oversail the left turn splitter island where three signal heads should be laid down. These signal poles are hinged already for this purpose. Loads will oversail the verge on the inside of the left turn where the pedestrian call bell should be set down. One VMS road sign, one road sign, one lighting column and vegetation should be removed. **Third party land** required. Swept path assessment SK04 is included in Appendix B.
5	**M8 Junction 25a Slip Road** 	Loads would continue on the slip road and join the M8 heading south east. Loads will oversail the verge on the inside of the left bend where the ground clearance for loads over the safety barrier should be confirmed during the test run. Swept path assessment SK05 is included in Appendix B.
6	**Junction 14 Slip Road Roundabout** 	Loads would diverge from the M74 at Junction 14 and would take the third exit, joining the A702 southbound. A swept path assessment has been undertaken and indicates that loads will oversail the northern verge of the offslip on approach to the roundabout where two lighting columns should be removed. Loads will overrun and oversail the southern verge on entry to the roundabout where a load bearing surface should be laid and the proximity to the safety barrier should be confirmed during the test run. Loads will oversail the southern edge of the roundabout island and the southern verge of the exit road, however no mitigation is required. Swept path assessment SK06 is included in Appendix B.

POI	Constraint	Details
7	**Junction 14 On-Slip Roundabout** 	Loads will proceed ahead at the junction, taking the first exit onto the B7076. Loads will then continue southbound on the B7076. A swept path assessment has been undertaken and indicates that loads will oversail the eastern verge on entry to the roundabout however no physical mitigation works are required. Swept path assessment SK07 is included in Appendix B.
8	**Junction 15 Roundabout**  	Loads will proceed ahead through the bend before taking the third exit onto the A701 southbound at the roundabout. A contraflow transit of the junction is the optimum solution at this junction, requiring careful traffic management at the junction by the police. A swept path assessment has been undertaken and indicates that loads will oversail the south western verge of the approach road. Loads will overrun and oversail the northern verge on approach to the roundabout where a load bearing surface should be laid. Loads will oversail the approach road splitter island and south verge where two bollards and one traffic sign should be removed. Loads will overrun and oversail the eastern side of the roundabout island where a load bearing surface should be laid and two chevron signs removed. Loads will overrun and oversail the exit road splitter island where a load bearing surface should be laid and two bollards and one road sign should be removed. Loads will oversail the southern verge of the exit road where two road signs should be removed. Swept path assessment SK08 is included in Appendix B.

POI	Constraint	Details
9	**A701 / B7076 Junction Bend** 	Loads will straddle the centre line of the road at this location. The lead escorts should clear the ghost island for the turn into the B7076 prior to loads passing this section and hold oncoming traffic back at least 50m from the start of the bend.
10	**A701 Tree Canopy** 	The tree canopy over the A701 at this location should be trimmed to ensure a clear 5m head height. Canopy trimming can be subject to ecological constraints and early engagement with the road authorities is recommended.
11	**A701 Road Camber** 	There is a minor adverse camber to the road at this location. Loads should proceed through this section slowly.
12	**A701 Bend** 	Loads will straddle the centre line at this location and the lead escorts should hold oncoming traffic back prior to the site access junction (POI 13). A low overhead utility crossing was noted. A review of the overhead clearance to overhead utilities should be undertaken prior to loads moving to ensure that there is a 5m clear head height from the road and sufficient flashover protection for all temperature ranges.

POI	Constraint	Details
13	**Site Access Junction**  	Loads will turn right onto the strategic timber hail road at this location. Loads will proceed to the turbine locations from this junction. The junction will need to be widened to accommodate the proposed loads and a swept path assessment has been undertaken. The assessment indicates that loads will overrun and oversail the western verge on the inside of the turn into the junction. The load bearing area of the junction should be widened and all obstructions removed. The timber haul road will remain private and will be upgraded where required to comply with turbine supplier standards. Swept path assessment SK09 is included in Appendix B.

3.4 Swept Path Assessment Results and Summary

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

The colours illustrated on the swept paths are:

- Grey / Black – OS 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 PF cannot accept liability for errors on the data source, be that OS base mapping or client supplied data.

3.1 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 3 and all have been contacted to ascertain if there are any relevant constraints that should be noted.

When responses are gathered, they will be included in Appendix C.

Table 3: ESDAL Contacts

Organisation	Email Address
Glasgow City Council	abnormalloads@glasgow.gov.uk
Renfrewshire Council*	ei@renfrewshire.gov.uk
South Lanarkshire Council	abnormalloads@southlanarkshire.gov.uk
Dumfries & Galloway Council	esdal@dumgal.gov.uk
M8 DBFO	m8dbfo.abloads@amey.co.uk
Amey	SWAbloads@amey.co.uk
Police Scotland	osdwindfarmabnormalloads@scotland.pnn.police.uk
Network Rail	AbLoadsESDAL@networkrail.co.uk
Historic Rail Estate	rsgbrb@jacobs.com
Scottish Canals	SCAbnormal.Loads@scottishcanals.co.uk
Transport Scotland	AbnormalLoads@transport.gov.scot
Autolink	abnormal.loads@m6dbfo.co.uk

* Renfrewshire Council have previously advised that they will not enter into discussions with consultants and will only engage with hauliers immediately prior to loads moving. As such they have not been consulted.

3.2 Land Ownership

The limits of road adoption can vary depending upon the location of the site and the history of the Roads Agency. The adopted area is generally defined as land contained within a defined boundary where the road agency holds the maintenance rights for the. In urban areas, this is 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. In these locations, the 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.

3.3 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:

- Undertake a review of axle loading on structures along the entire access route with the various road;
- 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 test run is completed to confirm the route and review any vertical clearance issues; and
- That a condition survey is undertaken to ascertain the extents of road defects prior to loads commencing to protect RWE from spurious damage claims.

4 Summary

4.1 Summary of Access Review

PF has been commissioned by RWE to prepare a Route Survey Report to examine the issues associated with the transport of AIL turbine components from KGV Docks through to the development site known as Daer.

This report identifies the key points and issues associated with the proposed routes and outlines the issues that will need to be considered for successful delivery of components.

The access review has been based upon a worst case of SGRE 155 turbines at a tip height of 180m.

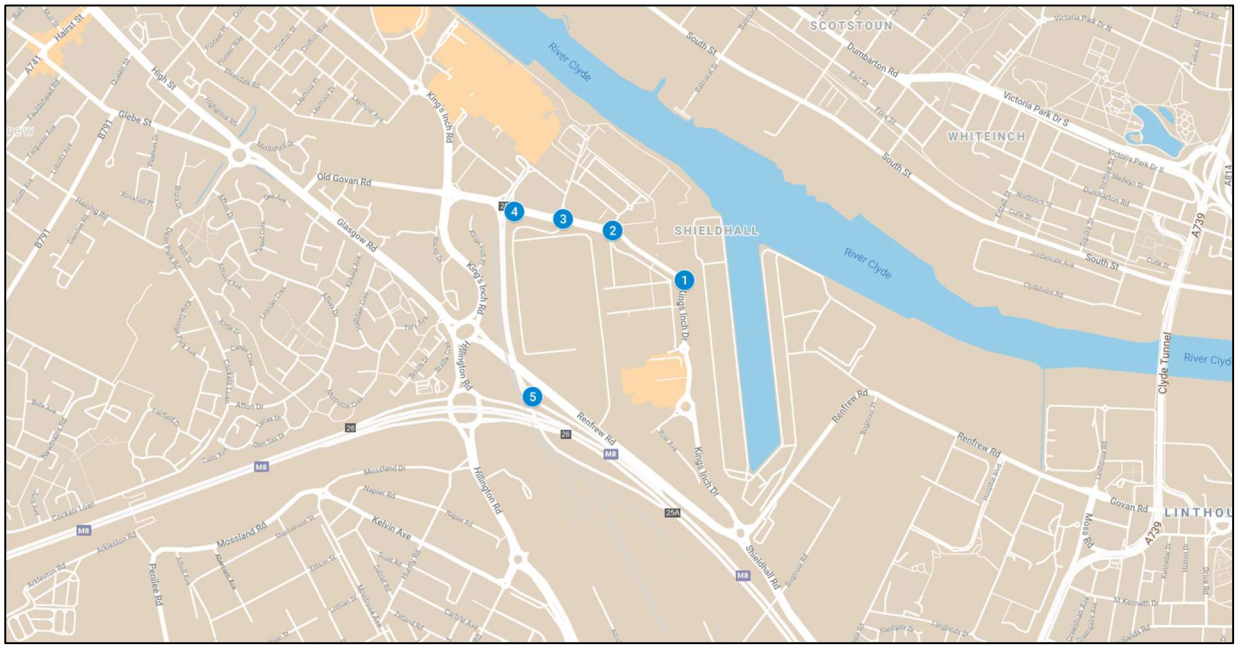
The report is presented for consideration to RWE. Various road modifications, structural reviews and interventions are required to successfully access the site. If these are undertaken, access to the consented wind farm site is considered feasible.

4.2 Further Actions

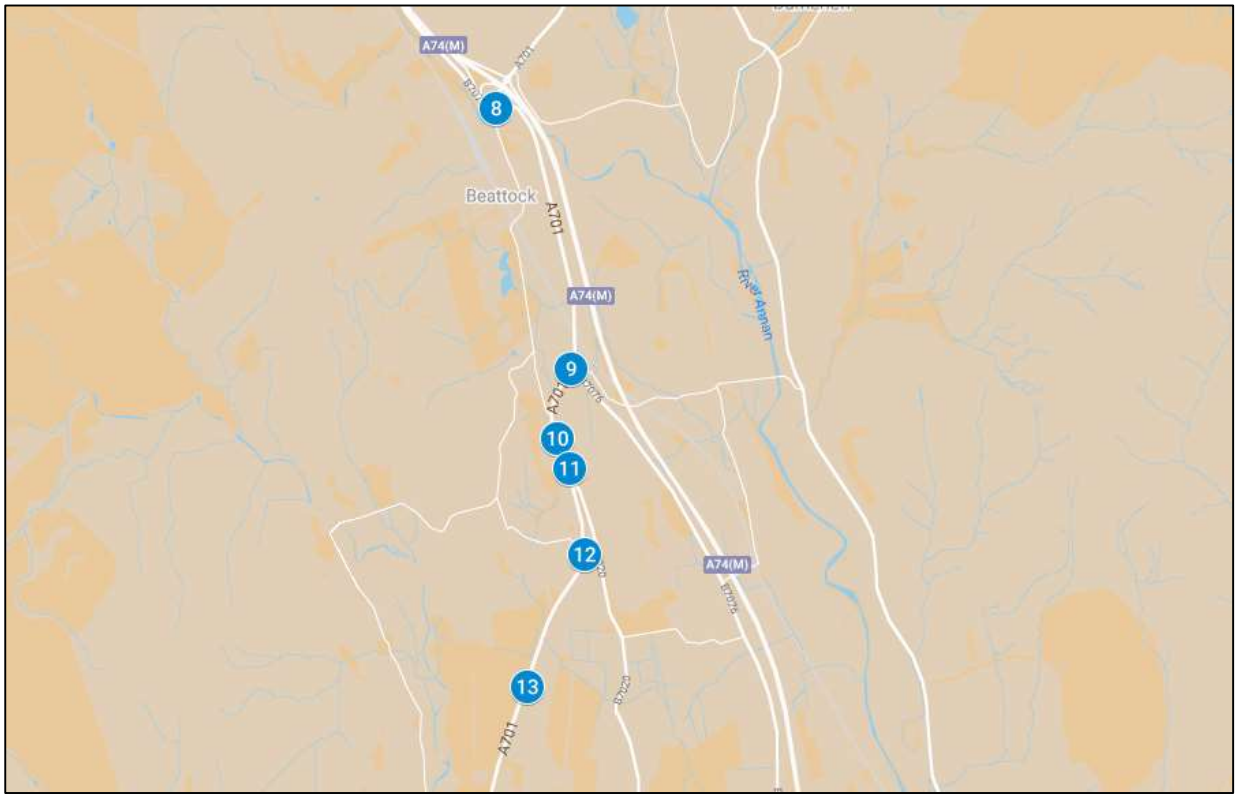
The following actions are recommended to pursue the transport and access issues further:

- Prepare detailed mitigation design proposals to help inform consultee / licence discussions;
- Undertake discussions with the affected utility providers and roads agencies;
- Obtain the necessary statutory licences to enable the mitigation measures; and
- Develop a detailed operational Transport Management Plan to assist in transporting the proposed loads.

Appendix A
Points of Interest Locations

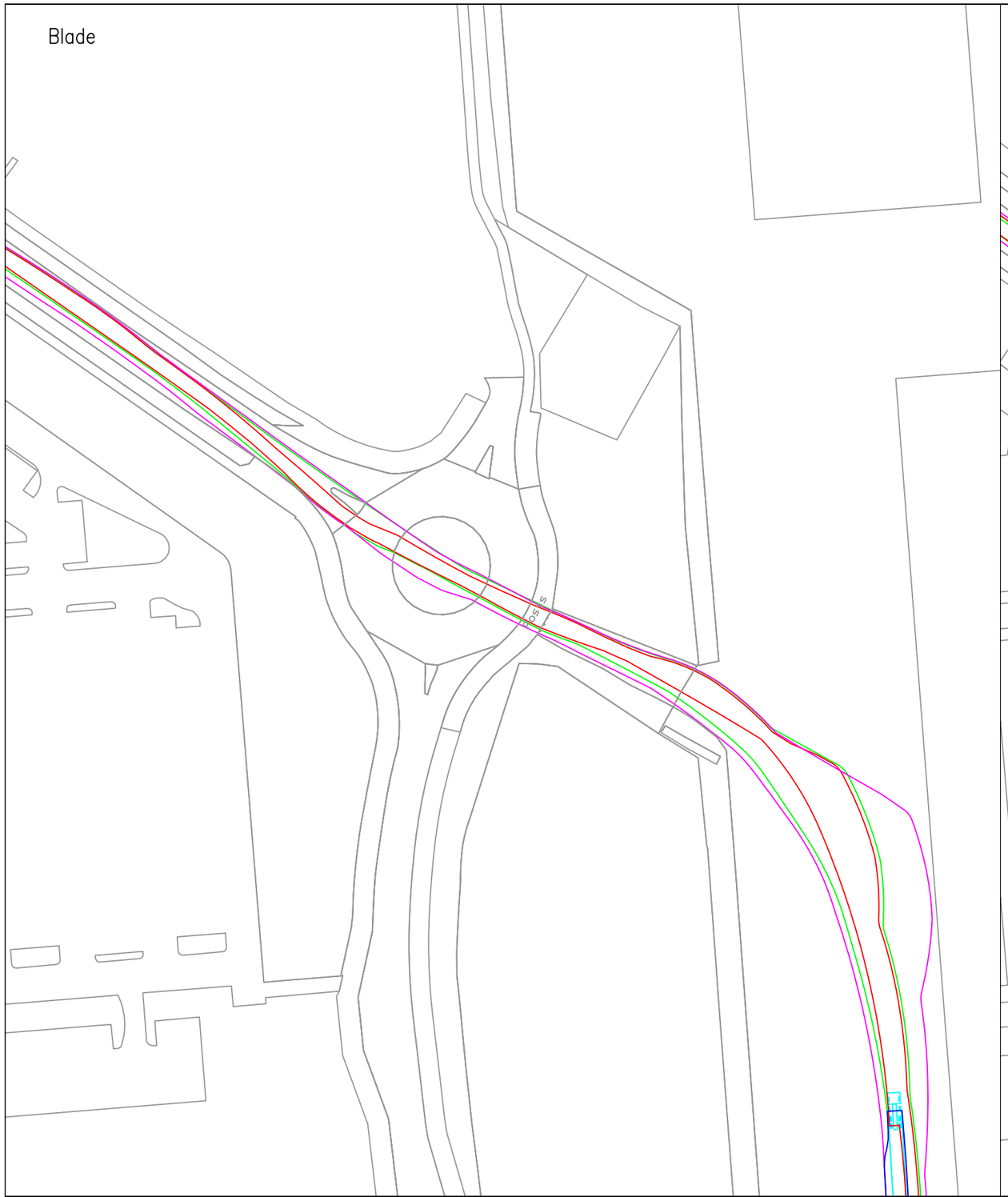

River Clyde
SCOTSTOUN
WHITEINCH
SHIELDHALL
Old Govan Rd
Glasgow Rd
Renfrew Rd
Mossland Rd
Hillington Rd
Clyde Tunnel
1
2
3
4
5


Crawfordjohn
Abington
Crawford
River Clyde
Elvanfoot
Leadhills
Glenochar
A74(M)
6
7


A74(M)
8
Beattock
A701
A74(M)
River Annan
9
A701
10
11
12
A74(M)
13
A701

Appendix B
Swept Path Assessments

Blade



Tower

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Kings Inch Drive Roundabout 1

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		1

Scale: 1:1000 @ A3

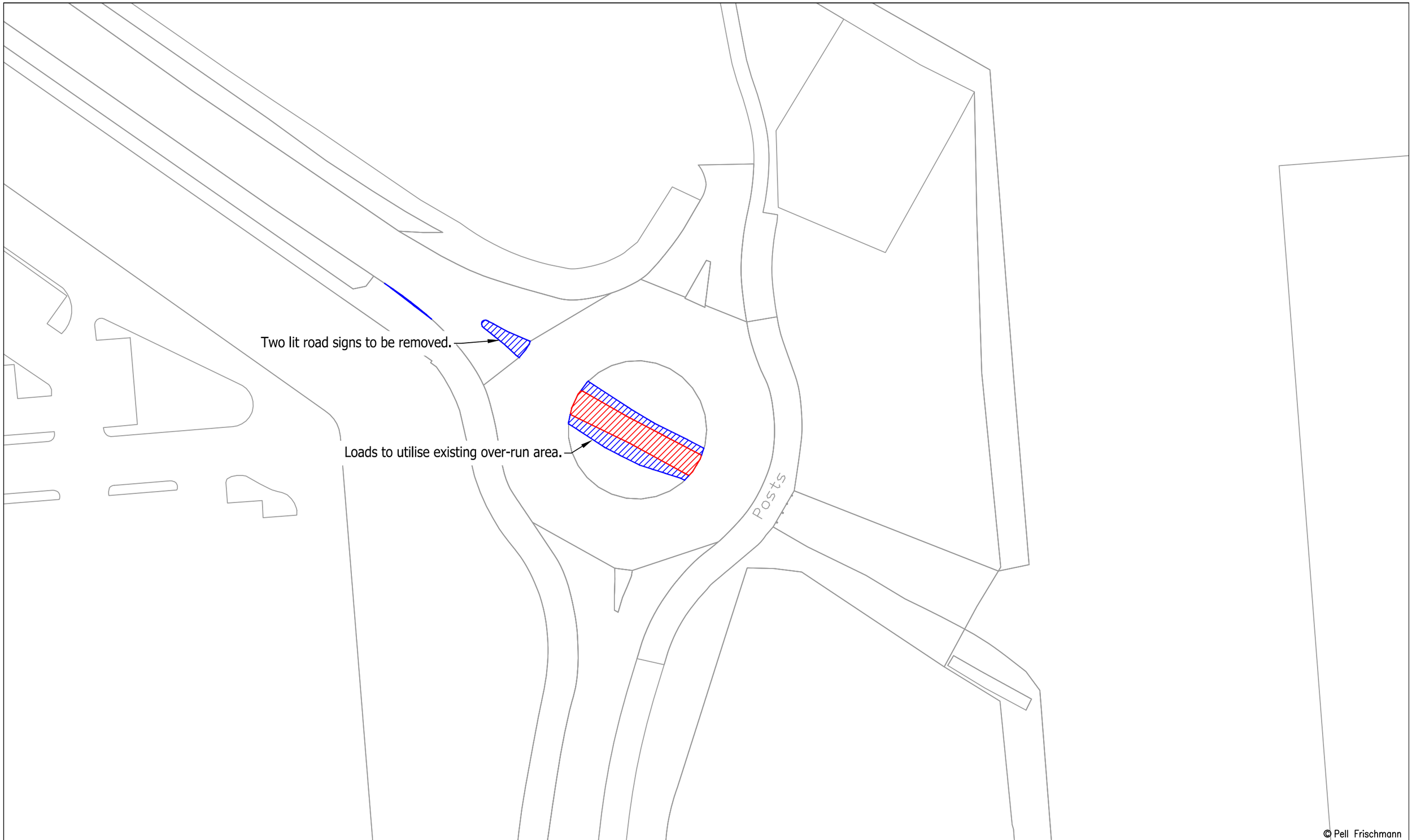
File No.: Daer Tracking.dwg

Drawing Status: Draft

Drawing No.: SK01

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: XXX



Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Kings Inch Drive Roundabout 1

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		1

Scale: 1:500 @ A3

File No.: Daer Tracking.dwg

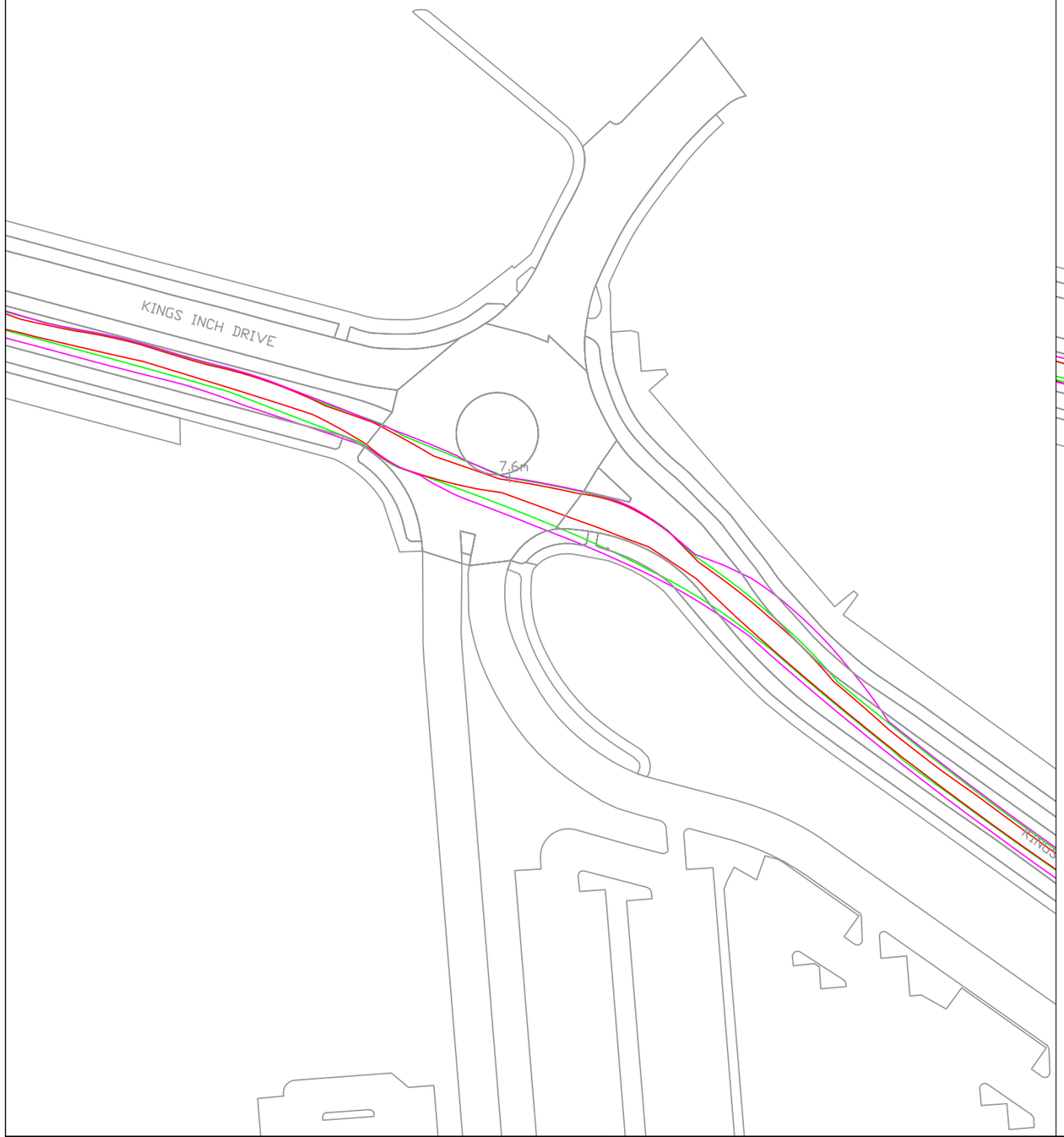
Drawing Status: Draft

Drawing No.: SK01A

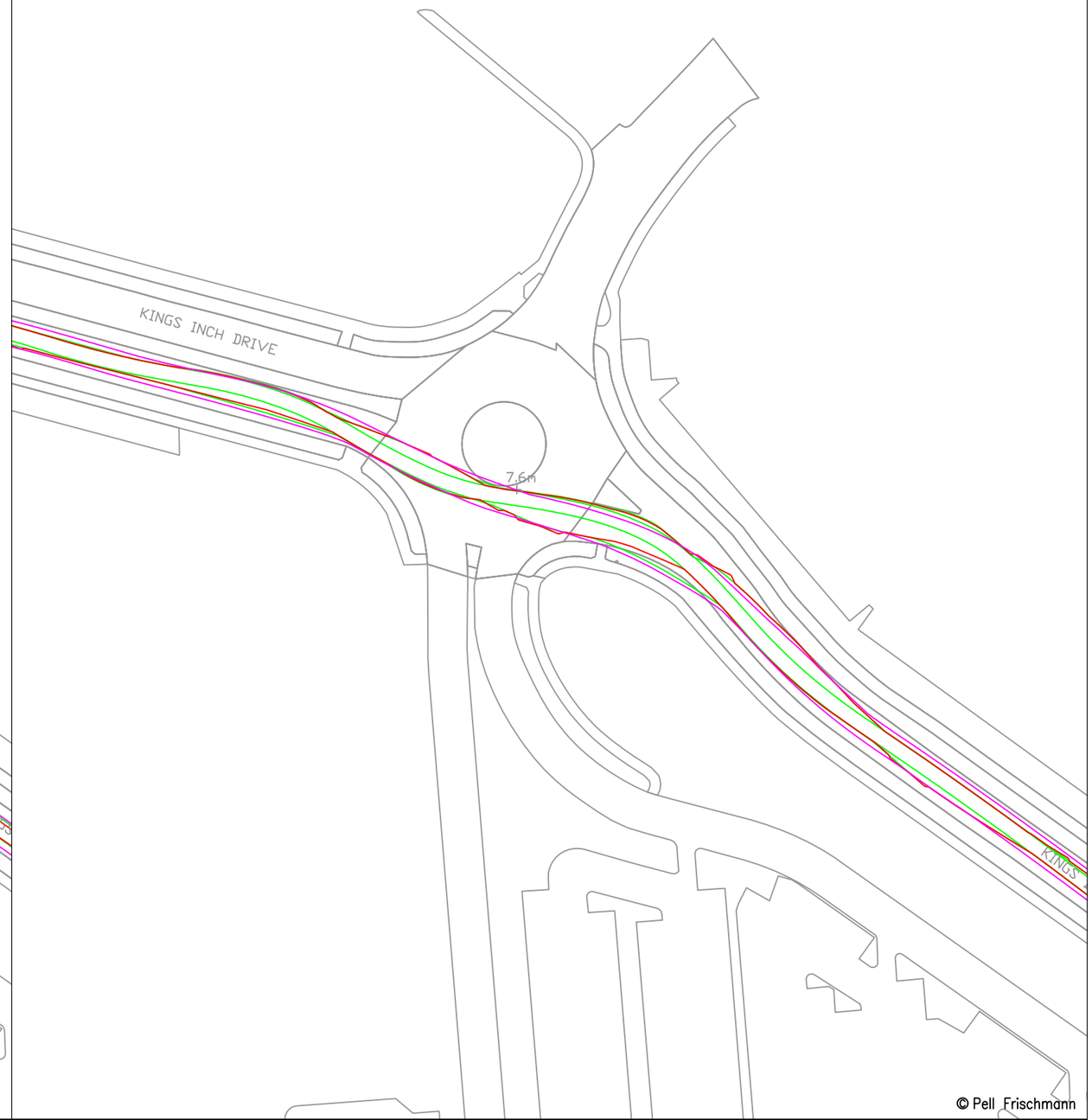
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: XXX

Blade



Tower



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Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Kings Inch Drive Roundabout 2

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		2

Scale: 1:1000 @ A3

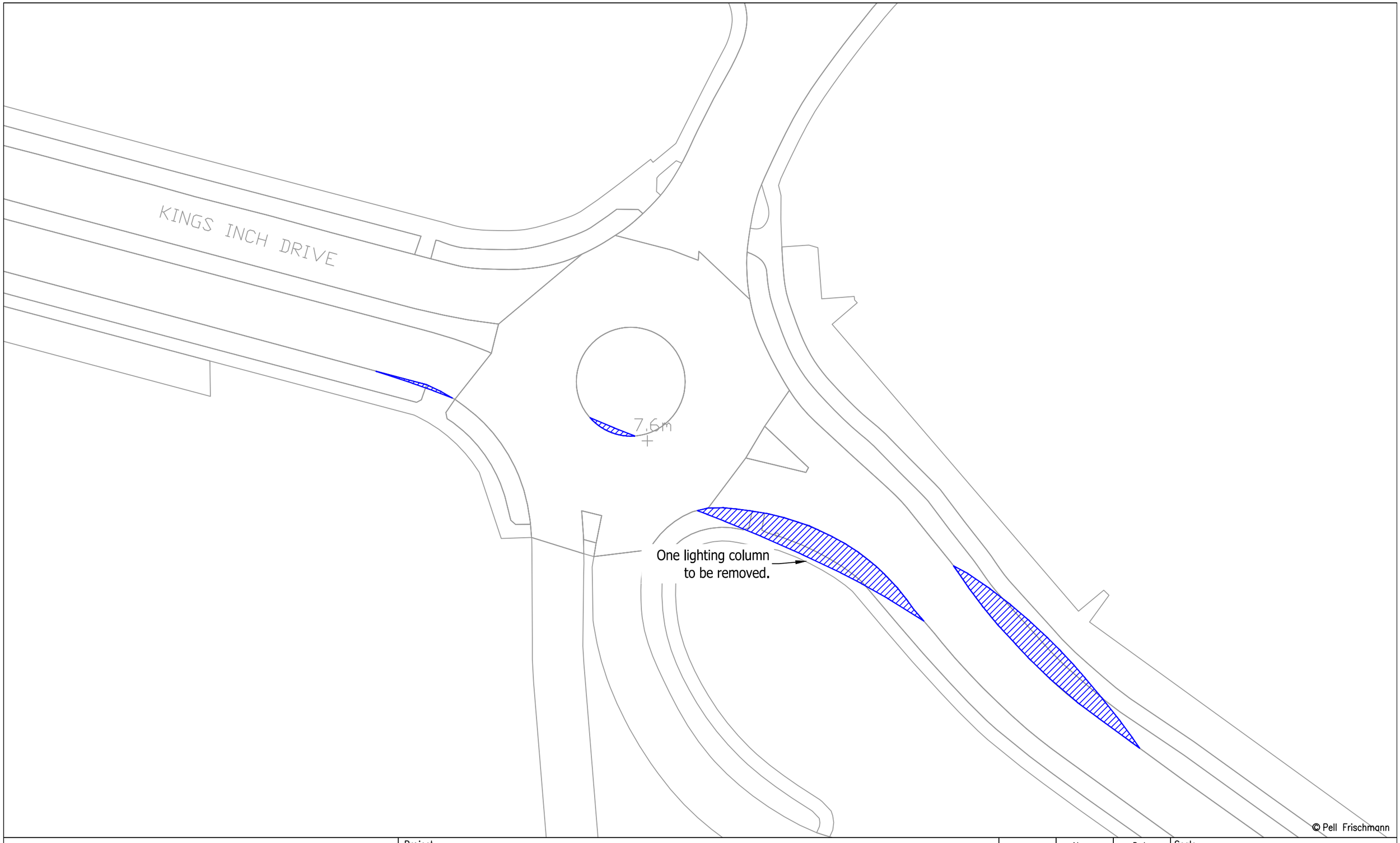
File No.: Daer Tracking.dwg

Drawing Status: Draft

Drawing No.: SK02

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: XXX



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Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Kings Inch Drive Roundabout 2

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		2

Scale: 1:500 @ A3

File No.: Daer Tracking.dwg

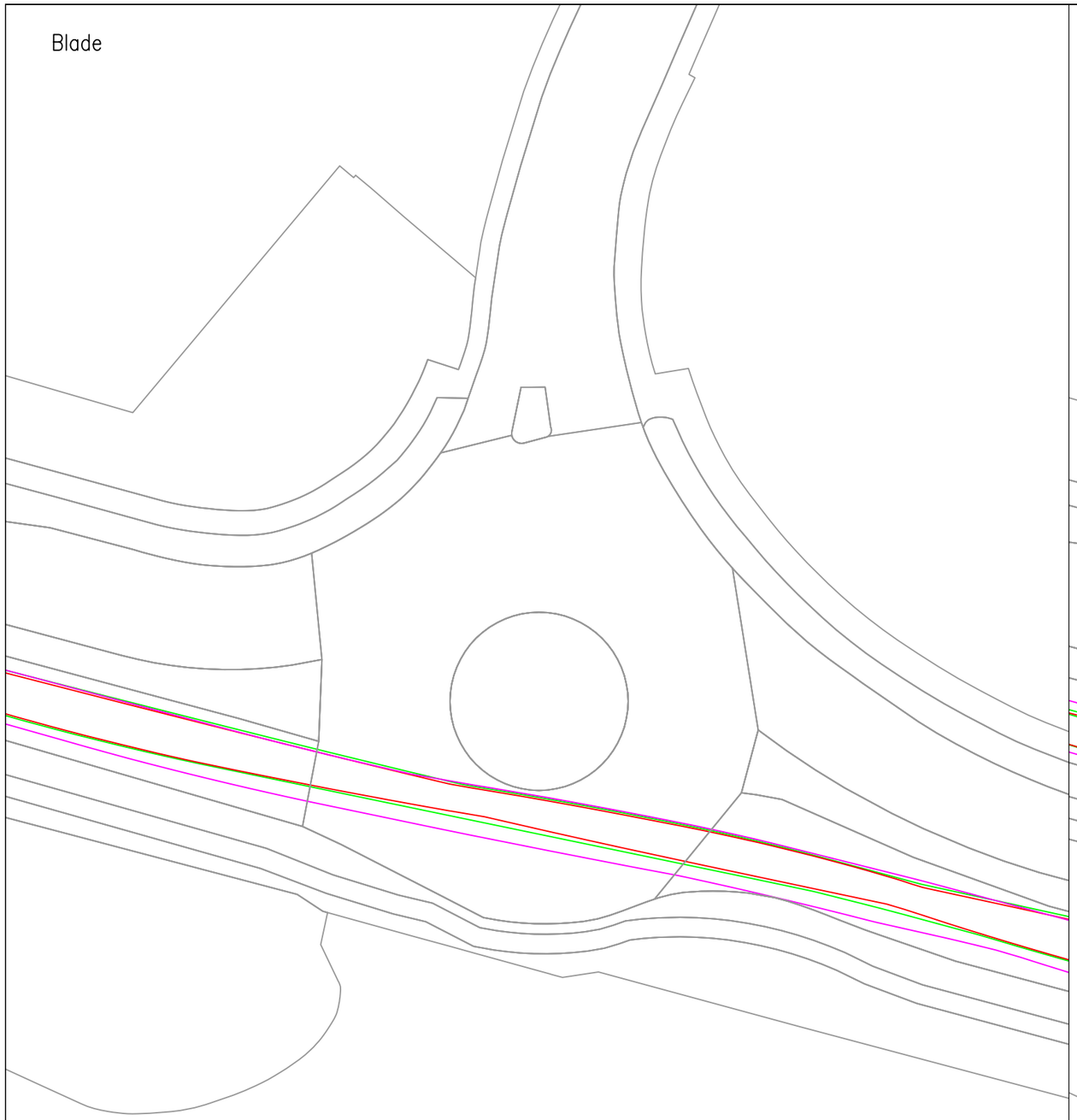
Drawing Status: Draft

Drawing No.: SK02A

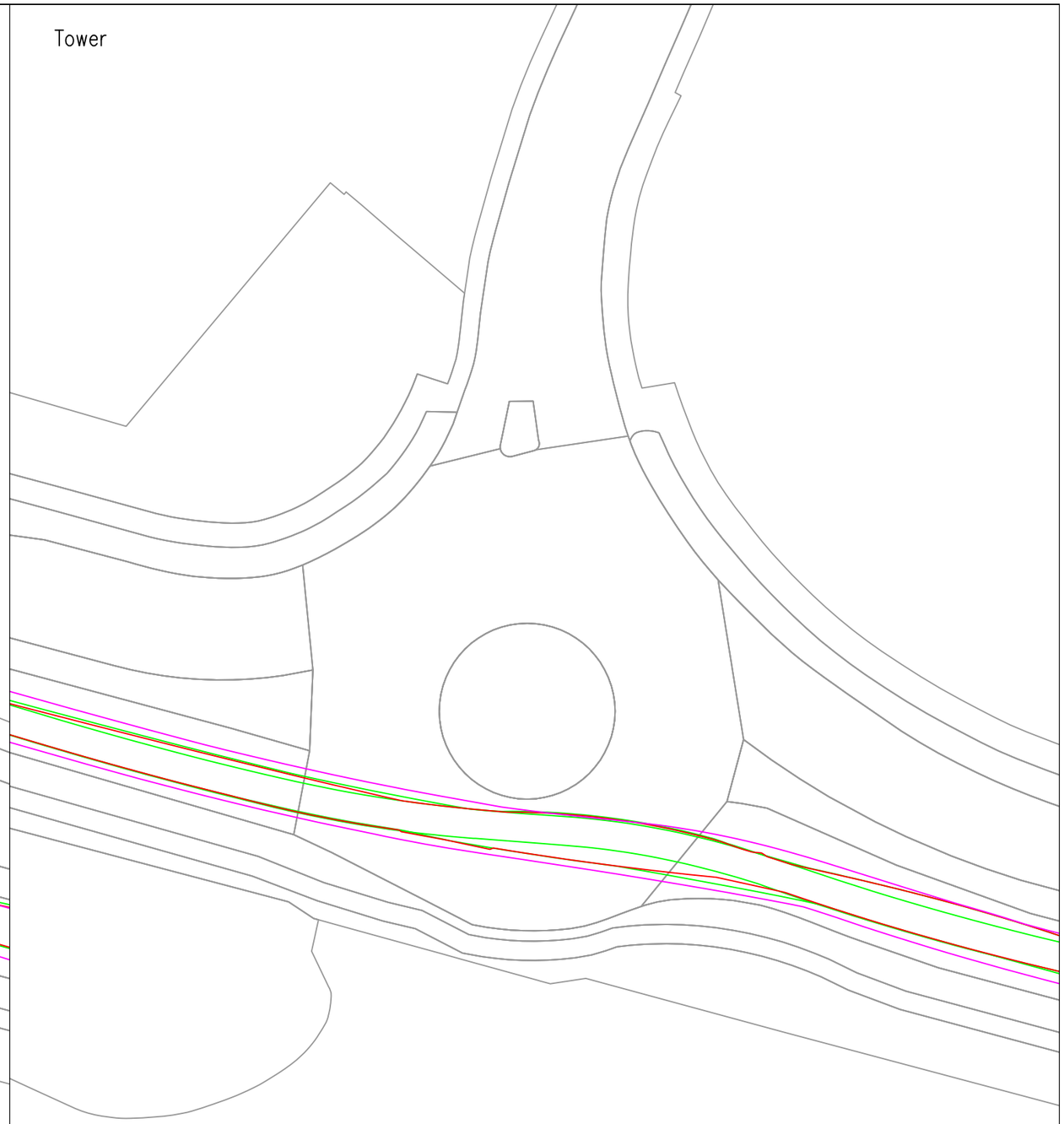
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: XXX

Blade



Tower



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Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower — NO MITIGATION

SPA Location: Kings Inch Drive Roundabout 3

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		3

Scale: 1:500 @ A3

File No.: Daer Tracking.dwg

Drawing Status: Draft

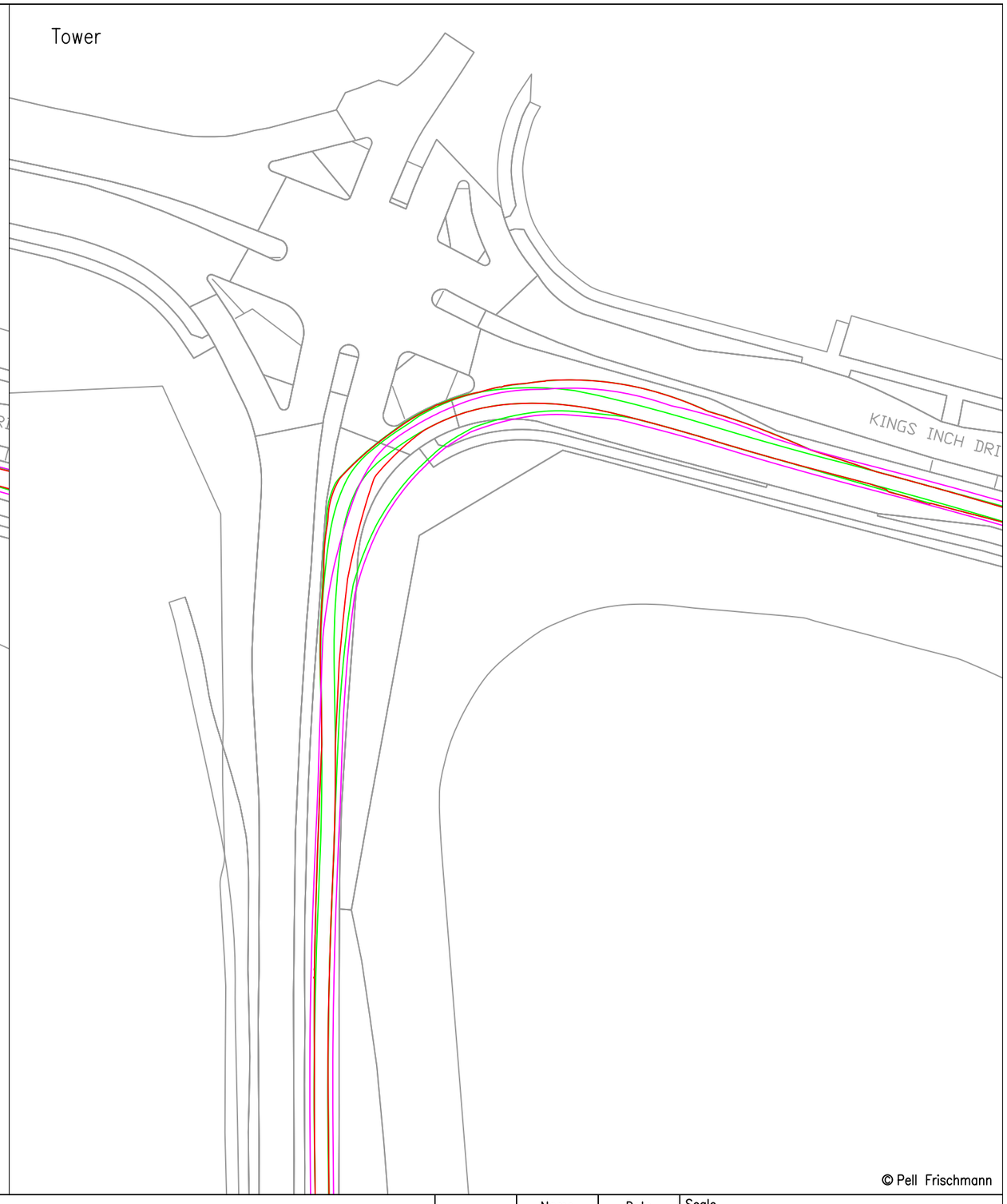
Drawing No.: SK03

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: XXX

Blade

Tower



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Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Kings Inch Drive / Mayo Avenue Junction

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		4

Scale: 1:1000 @ A3

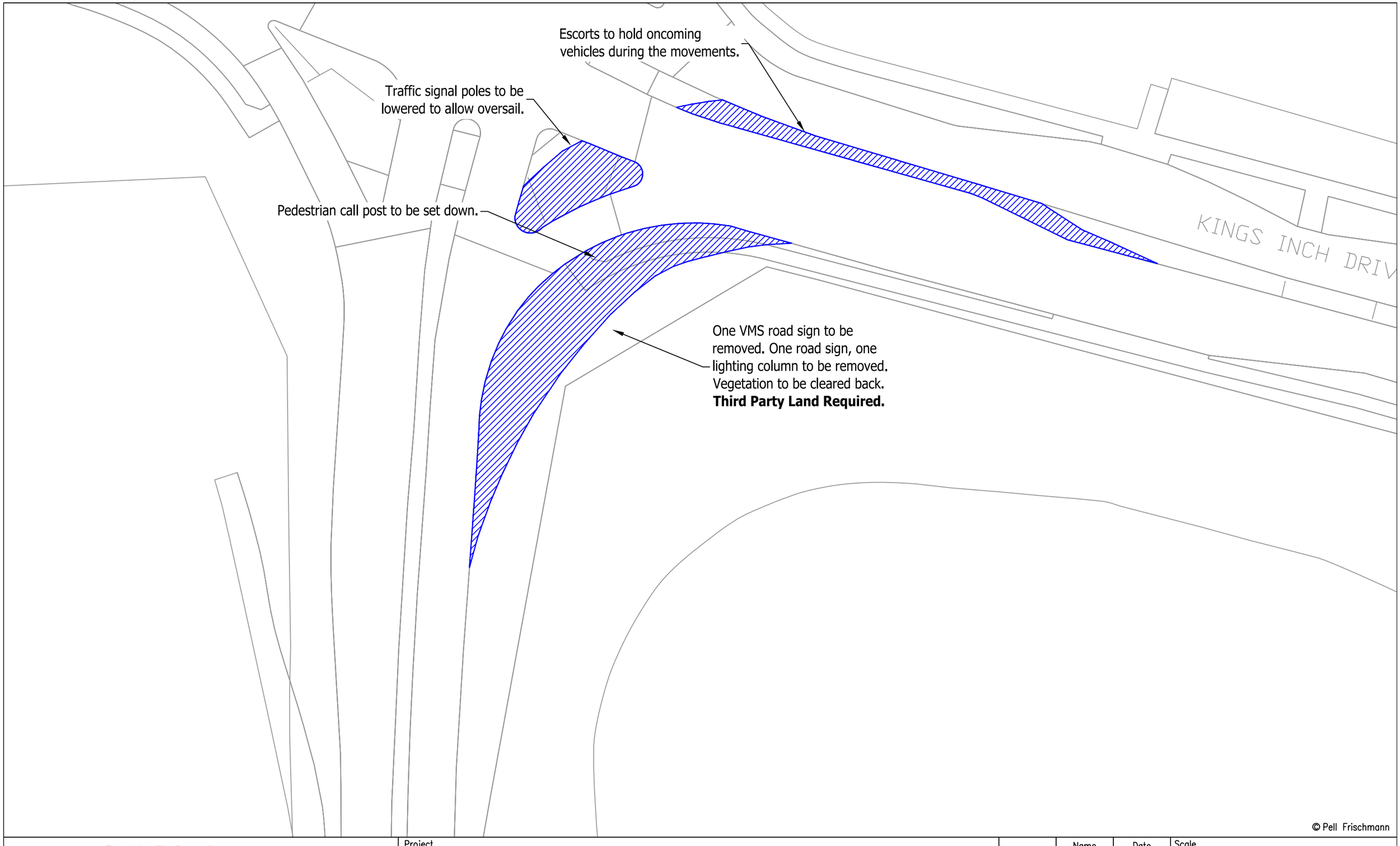
File No.: Daer Tracking.dwg

Drawing Status: Draft

Drawing No.: SK04

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: XXX



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93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over–run | Over–sail

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Kings Inch Drive / Mayo Avenue Junction

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		4

Scale: 1:500 @ A3

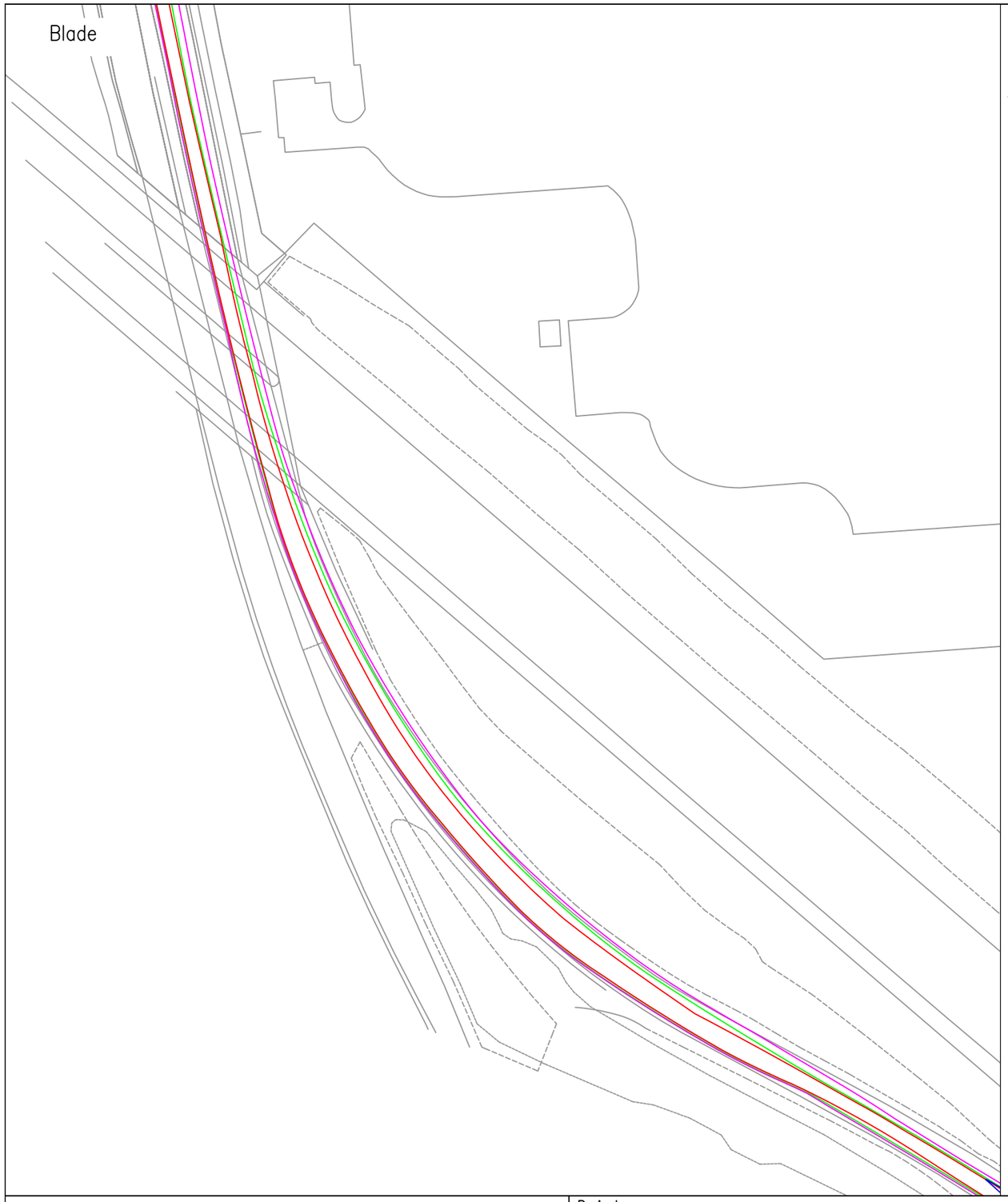
File No.: Daer Tracking.dwg

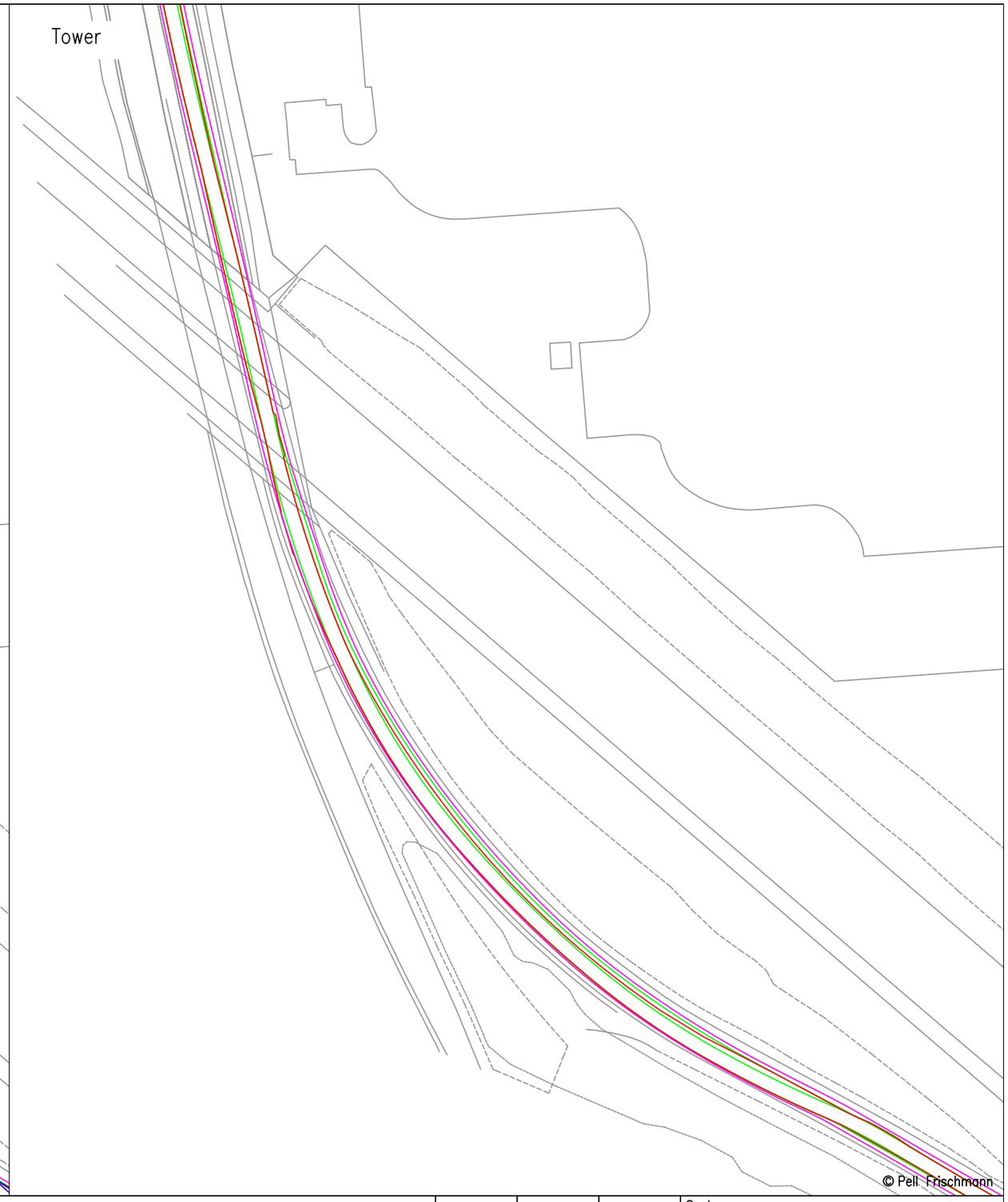
Drawing Status: Draft

Drawing No.: SK04A

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: XXX





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93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: M8 Junction 25a Slip Road

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		5

Scale: 1:1000 @ A3

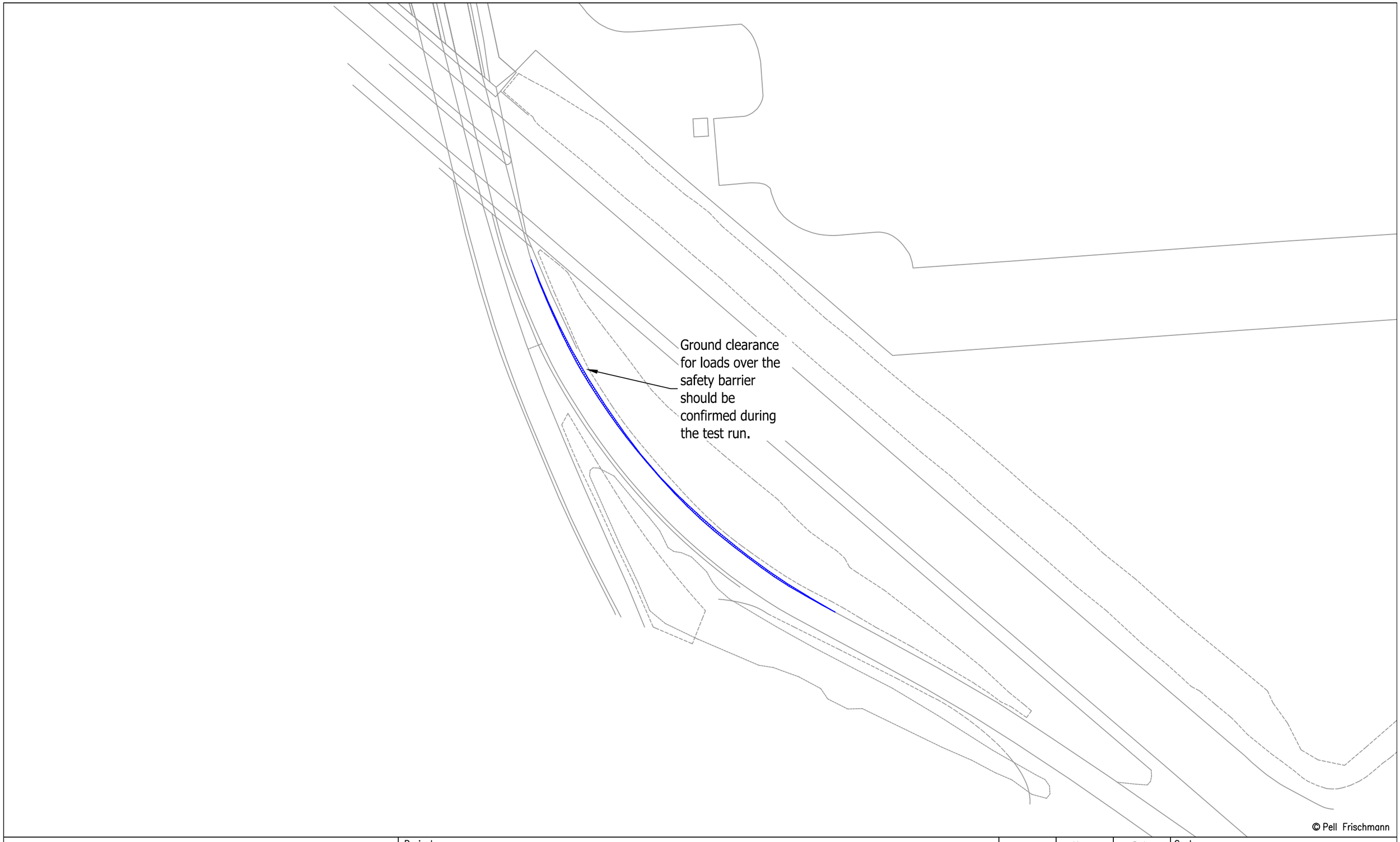
File No.: Daer Tracking.dwg

Drawing Status: Draft

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: XXX



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93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
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Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: M8 Junction 25a Slip Road

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		5

Scale: 1:1000 @ A3

File No.: Daer Tracking.dwg

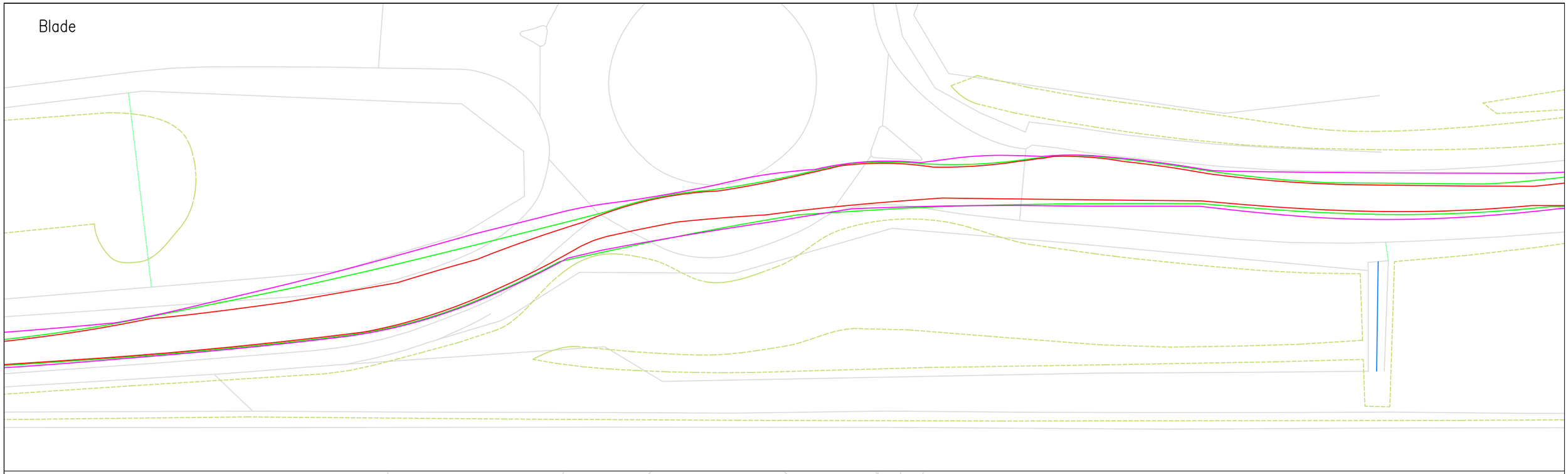
Drawing Status: Draft

Drawing No.: SK05A

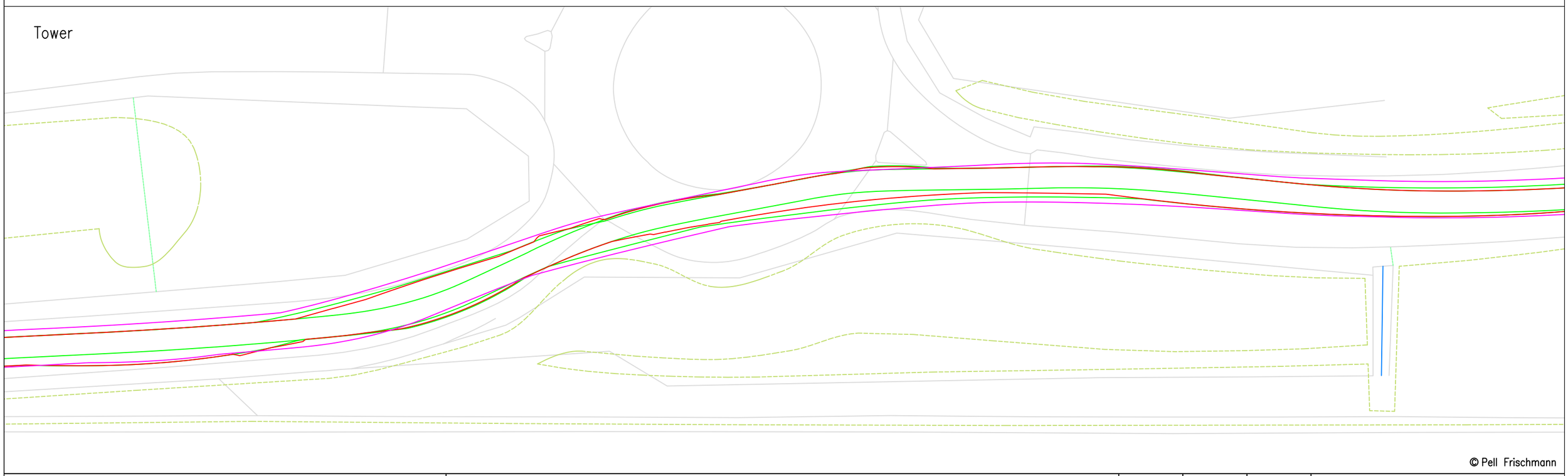
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: XXX

Blade



Tower



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Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Junction 14 Slip Road Roundabout

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		6

Scale: 1:500 @ A3

File No.: Daer Tracking.dwg

Drawing Status: Draft

Drawing No.: SK06

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: XXX

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Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Junction 14 Slip Road Roundabout

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		6

Scale: Custom @ A3

File No.: Daer Tracking.dwg

Drawing Status: Draft

Drawing No.: SK06A

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: XXX

Blade

Tower

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Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Junction 14 On-Slip Roundabout

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		7

Scale: 1:500 @ A3

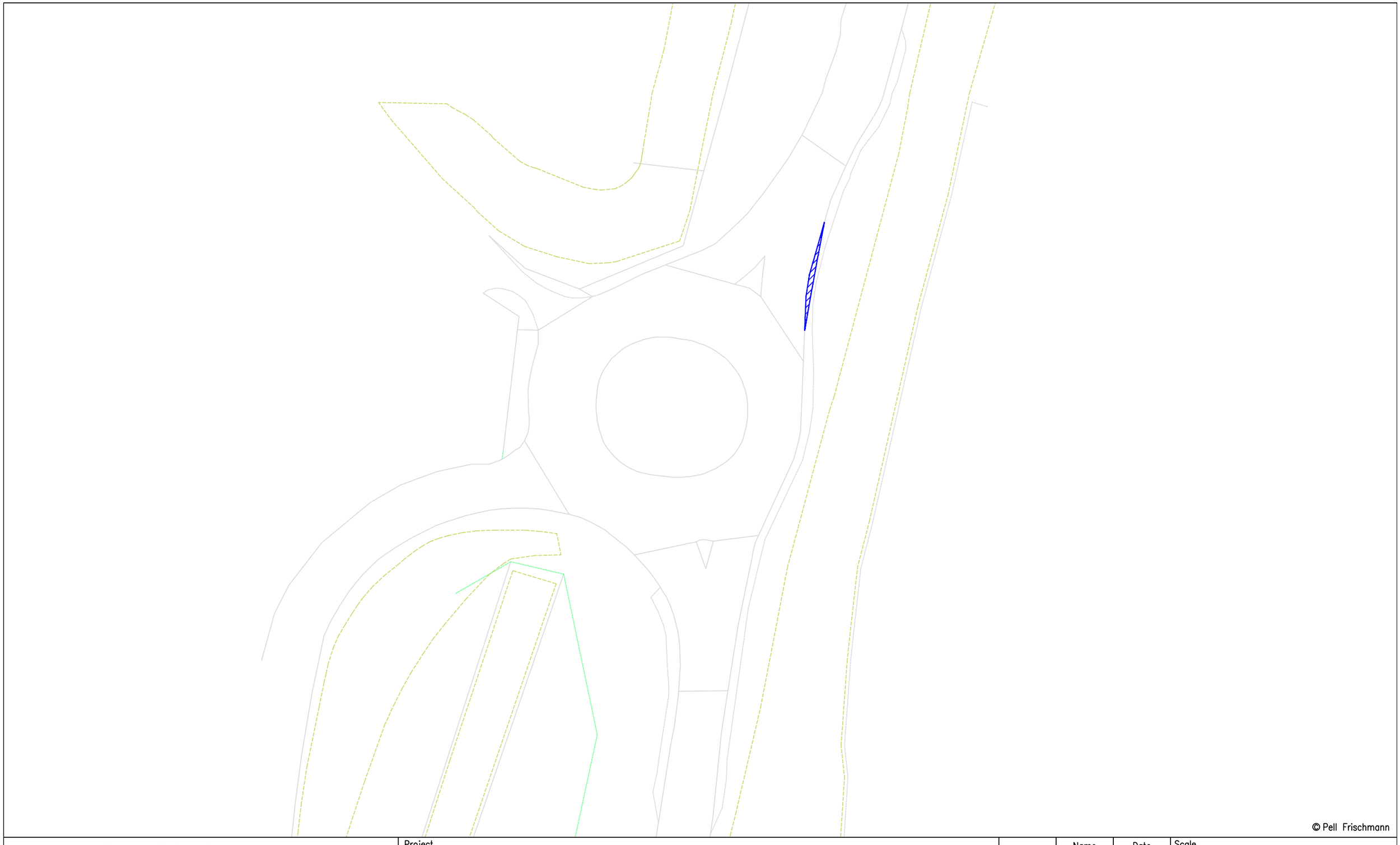
File No.: Daer Tracking.dwg

Drawing Status: Draft

Drawing No.: SK07

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: XXX



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Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Junction 14 On-Slip Roundabout

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		7

Scale: 1:500 @ A3

File No.: Daer Tracking.dwg

Drawing Status: Draft

Drawing No.: SK07A

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: XXX

Blade

A701

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93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over–run | Over–sail

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Junction 15 Roundabout

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		8

Scale: 1:500 @ A3

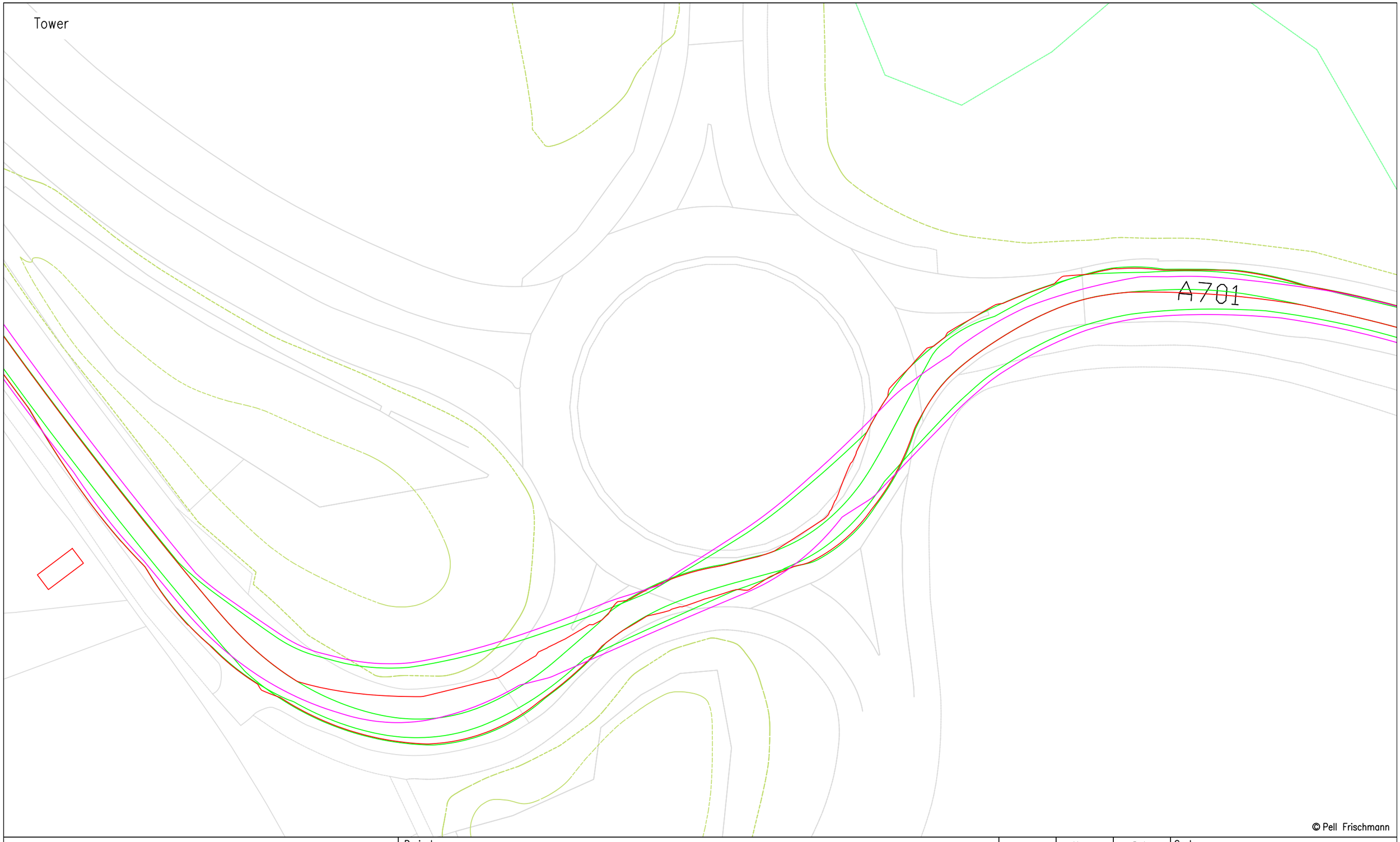
File No.: Daer Tracking.dwg

Drawing Status: Draft

Drawing No.: SK08

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: XXX



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Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Junction 15 Roundabout

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		8

Scale: Custom @ A3

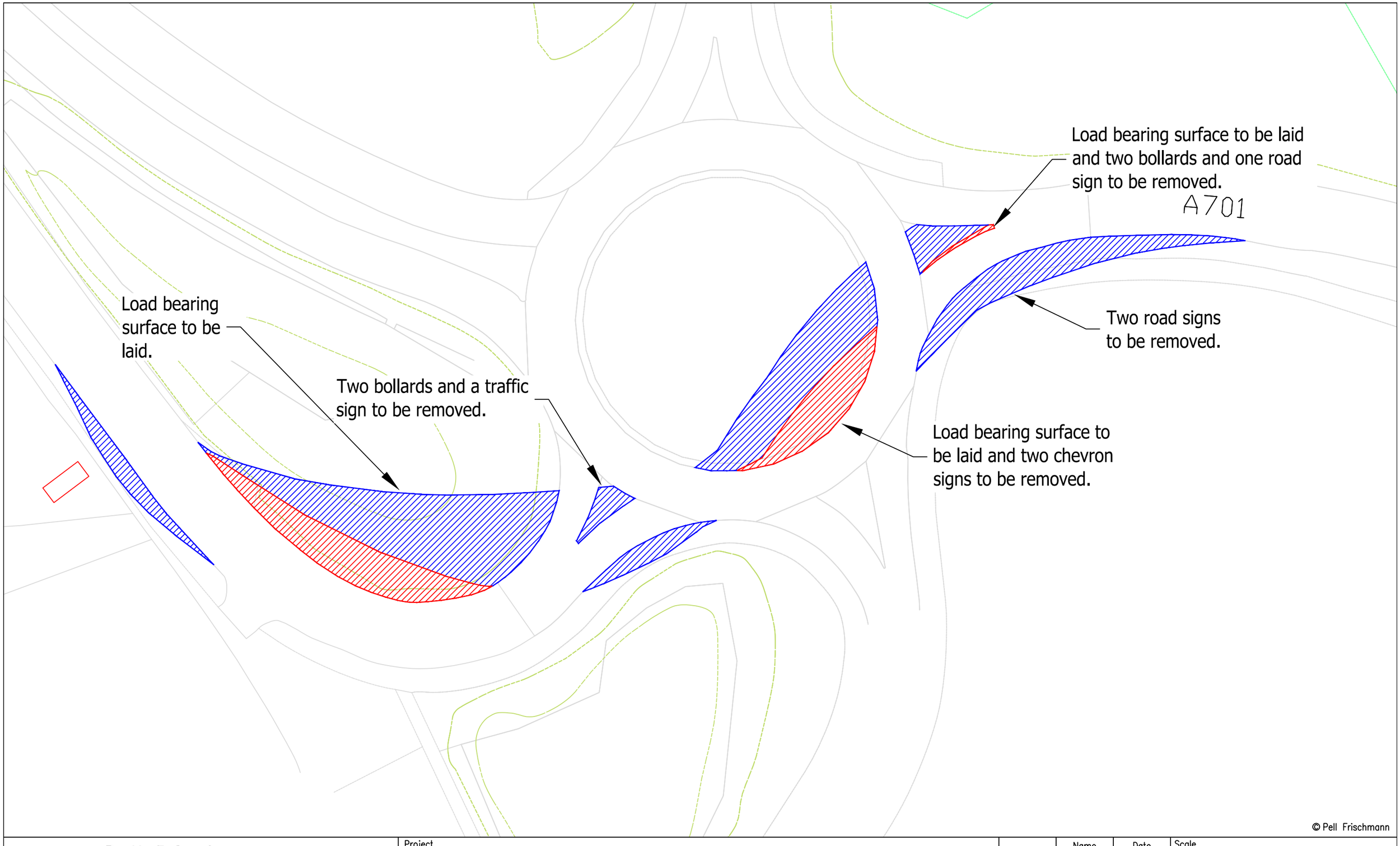
File No.: Daer Tracking.dwg

Drawing Status: Draft

Drawing No.: SK08A

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: XXX



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Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Junction 15 Roundabout

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		8

Scale: 1:500 @ A3

File No.: Daer Tracking.dwg

Drawing Status: Draft

Drawing No.: SK08B

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: XXX

Blade

Tower

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Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Site Access Junction

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		13

Scale: 1:1000 @ A3

File No.: Daer Tracking.dwg

Drawing Status: Draft

Drawing No.: SK09

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: XXX

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Client: RWE

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

Project: Daer Wind Farm

Drawing Title: Siemens Gamesa SG155 Blade and Mid Tower

SPA Location: Site Access Junction

	Name	Date
Drawn	TL	25/09/2020
Designed	CN	24/09/2020
Checked	GB	25/09/2020
Point of Interest		13

Scale: Custom @ A3

File No.: Daer Tracking.dwg

Drawing Status: Draft

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: XXX

Appendix C
ESDAL Responses

From: Dimitrov, Vassill
Sent: 05 November 2020 10:05
To: Tim Lockett
Subject: Potential Impact on Infrastructure

Dear Sir,
Thank you for the all detailed vehicle configurations submitted to us for transporting the wind turbine elements.
It is confirmed that the submitted vehicle configurations will have no negative impact on the structures along the Amey South West Unit controlled road network.

Kind Regards
Vassil Dimitrov

From: Ab Loads
Sent: 02 October 2020 11:07
To: Tim Lockett
Subject: Potential Impact on Infrastructure

Timothy,

In its current form, this route poses no risk to any road structures within the Glasgow City Council boundary.

If any amendments are made and/or the load is required to come off the trunk roads and onto Glasgow's streets then the route will need to be reviewed again.

Thanks for the email.

Regards,

--
James Ford
Technician
Structures
Technical Services
Neighbourhoods & Sustainability
Glasgow City Council

From: Fiona Green **On Behalf Of** M6 (Abnormal Loads) 006257
Sent: 04 November 2020 16:56
To: Tim Lockett
Subject: RE: Potential Impact on Infrastructure

Hi Tim

We have no objections, in relation to the attached movements, with regards height & weight but it is up to the haulier to ensure the route is surveyed, in advance, in relation to Swept Path Analysis.

However, in order to ensure that you are fully aware of planned road works on our network please provide a contact email address of the haulier to allow our Network Manager (david.morton@m6dbfo.co.uk) to include them in the distribution of our Programme of Intent which will detail where and when planned road works are taking place. The Programme of Intent is issued on a Thursday for the following Monday in advance of planned road works and is subject to review. It should be noted that we will be undertaking major, routine and cyclical maintenance works which will require single lane running at various times throughout the year. As part of these works it is possible that single lane running may be used during the daytime for specialist activities such as principal bridge inspections. Please ensure that lines of communication are maintained by yourselves and our Network Manager when planning these movements.

Lastly, please provide in advance your proposed schedule of planned movements along with any other relevant information in order for us to ensure that no conflicts will arise on our network.

Should you require any further information please do not hesitate in contacting our Project Office on 01576 205200 to discuss any queries you may have.

Regards,

Fiona Green
Receptionist
Sir Robert McAlpine Ltd
www.srm.com

From: M8DBFO Abloads
Sent: 29 September 2020 09:00
To: Tim Lockett
Subject: RE: Potential Impact on Infrastructure
Importance: High

When crossing Raith Bridge 0.25 miles south of J5 of the M74 any vehicle over 100te but not exceeding 150te MUST straddle lanes 1 and 2. No other traffic should be on the bridge at the same time.

Iain Franklin
Principal Project Manager | M8 DBFO | Transport Infrastructure
Amey | Bargeddie Office | Langmuir Road | Bargeddie | G69 7TU

From: Paul.Winn
Sent: 29 September 2020 14:33
To: Tim Lockett
Subject: RE: Potential Impact on Infrastructure

Hi

We would be OK with this in principle if the other consultees have no objections.

Thanks,
Paul

Paul Winn
Network Administrator
Administration Team
Roads Directorate

transport.gov.scot

From: OSD Abnormal Loads Scotland
Sent: 02 November 2020 10:26
To: Tim Lockett
Subject: RE: Potential Impact on Infrastructure [OFFICIAL]

OFFICIAL

Good Morning,

In response to your email enquiry dated 14th October 2020, I can provide the following information on behalf of Police Scotland.

When a haulier has been selected for a particular project and they have been furnished with precise dimensions of the load to be transported by road, thereafter as part of the planning process a detailed route survey is produced by the haulier identifying all potential issues often referred to as “pinch points” along the entire proposed route. The route is then examined and commented upon by Transport Scotland /Transerv and the relevant Local Council amongst other partners.

Police Scotland consider the proposed route primarily from a road safety perspective .If due to the abnormal dimensions it is apparent other road users will be required to be directed to stop along the route by police in order to safely facilitate the movement or encroachment into an opposing undivided carriageway will occur, then police officers will be deployed to warn other road users of the presence of the abnormal load. The timings of the movements are dependent on many factors dependant on the route and Transport Scotland may place restrictions on travel during peak times to ensure journey time reliability along their trunk road network.

In general terms the movement of Abnormal Indivisible Loads (A.I.L) along most if not all routes in more rural areas, from my experience has an impact on the infrastructure of the general area and local community although Police Scotland are not best placed to comment in detail on this subject. Examples of this from previous projects could include, delays to freight traffic travelling to or from ferry ports, delays experienced by bus services including tourist bus tours operated in the area (Invergordon Port being a cruise ship port), delays to teachers and or pupils attending for scheduled school start times and delays to staff and the public attending hospital or medical appointments.

Regards

Frankie Anderson
Business Support Administrator
Vehicle Recovery & Abnormal Loads
Police Scotland
Fife Divisional HQ
Detroit Road
Glenrothes
Fife
KY6 2RJ

Appendix B
Indicative Construction Programme

		Month																	
Activity	**Class**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Site Establishment & Remediatio	HGV	100	50															100	50
General Site Deliveries	HGV	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Initial Bulk Material Deliveries	HGV		735	735	735														
Plant Deliveries	HGV		40														40		
Batching Plant Raw Materials	HGV				148	148	148	148	148	148	148	148							
Reinforcement	HGV				29		29		29		29								
Cable & Ducting Deliveries	HGV						14	14	14	14	14	14							
Cabling Sand	HGV						160	160	160	160	160	160							
Geotextile Deliveries	HGV		18			18		18		18									
Substation & HV Building	HGV											42	42						
AIL Cranage	HGV													20			20		
AIL Deliveries	HGV													112	112	112	112		
AIL Escorts	Car & LGV													120	120	120	120		
Commissioing	Car & LGV																88	88	
Staff	Car & LGV	264	528	1056	1056	1056	1056	1056	1056	1056	1056	1056	1056	1056	1056	1056	1056	528	528
Total HGV		*140*	*883*	*775*	*952*	*207*	*391*	*380*	*391*	*380*	*391*	*404*	*82*	*172*	*152*	*152*	*212*	*140*	*90*
Total Cars / LGV		*264*	*528*	*1056*	*1056*	*1056*	*1056*	*1056*	*1056*	*1056*	*1056*	*1056*	*1056*	*1176*	*1176*	*1176*	*1264*	*616*	*528*
Total Movements		**404**	**1411**	**1831**	**2008**	**1263**	**1447**	**1436**	**1447**	**1436**	**1447**	**1460**	**1138**	**1348**	**1328**	**1328**	**1476**	**756**	**618**
Total HGV per Day		6	40	35	43	9	18	17	18	17	18	18	4	8	7	7	10	6	4
Total Cars / LGV per Day		12	24	48	48	48	48	48	48	48	48	48	48	53	53	53	57	28	24
Total per Day		**18**	**64**	**83**	**91**	**57**	**66**	**65**	**66**	**65**	**66**	**66**	**52**	**61**	**60**	**60**	**67**	**34**	**28**