TECHNICAL APPENDIX 8 – ROADS AND TRAFFIC

TA8.1: Framework Construction Traffic Management Plan

TA8.2: Abnormal Load Access Study

TA8.3: Assessment of the Consented Scheme based on 2023 Baseline

TA8.1: Framework Construction Traffic Management Plan

Strathy South Wind Farm
Technical Appendix 8.1

Framework Construction Traffic Management Plan

3 August 2020

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Strathy South Wind Farm
Technical Appendix 8.1

Framework Construction Traffic Management Plan

3 August 2020

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1 Introduction

1.1 General

Mott MacDonald has been commissioned by SSE Generation Limited ('the Applicant') to prepare a framework Construction Traffic Management Plan (CTMP) in support of the proposed Strathy South Wind Farm (hereafter referred to as the Proposed Varied Development).

Mott MacDonald produced the Abnormal Load Access Study (EIAR Volume 4: Technical Appendix 8.2) and Chapter 8: Traffic and Transport Chapter (EIAR Volume 2) to support the Environmental Impact Assessment (EIA) process for the Proposed Varied Development. It was identified through the EIA process that a CTMP would be required.

The framework CTMP provides preliminary details of proposed traffic management measures and associated interventions to be implemented during the construction phase of the Proposed Varied Development to minimise disruption and enhancing safety. The CTMP would be enhanced and expanded as appropriate by the Applicant's appointed contractor(s), prior to commencement of construction activities and as necessary during the construction phase; the CTMP is considered a 'live' document.

1.2 The Proposed Varied Development

Access to the site would be taken from the A836, situated approximately 1.2 km east of Strathy village, via the existing access track to the Strathy North wind farm. See Figure 8.1.1 in Appendix A for details of the site access route from the A836 to the site.

The Proposed Varied Development would consist of 39 turbines, with associated infrastructure including wind turbine foundations and hardstandings, access tracks, an on-site substation and underground power cables.

1.3 Structure of this Report

The report is sub-divided into the following Sections:

Section 2 sets out background information associated with the Proposed Varied Development and presents the traffic management mitigation measures proposed during the construction phase of the Proposed Varied Development.

Section 3 presents the measures to monitor and implement the CTMP.

Section 4 provides a summary statement for the CTMP.

This Report's Appendix A provides further relevant information regarding the proposed signage on the A836 and the access route from the A836 to the site.

2 Construction Traffic and Mitigation

2.1 Construction Programme

Construction is expected to commence in January 2023 with a scheduled duration of 24 months. A copy of the construction programme is presented in Chapter 2: Description of Development (EIAR Volume 2).

2.2 Construction Traffic

The construction traffic would comprise construction workers, Heavy Good Vehicles (HGV) carrying construction material / plant and abnormal loads carrying wind turbine components.

It is estimated that at the peak of construction activities in 2024 the workforce would be approximately 150 individuals, this would include foresters, civils contractors, turbine contractors, electrical contractors and project management staff.

Construction activities would be limited to the working hours of 0700 to 1900 Monday to Friday, and 0700 to 1200 on Saturday which means that staff would arrive and depart outside the traditional peak hours associated with the surrounding road network.

The majority of these movements are likely to be undertaken by car or by works mini-bus and outside network peak periods. In these circumstances, the effects of this traffic are considered to be negligible.

The predicted number of HGV traffic movements (note: one trip = two movements; i.e. one delivery and one return journey) generated by construction activity are summarised in **Table 2-1**.

Table 2-1: Predicted Number of HGV Movements Generated by Construction Activity

Construction Activity	Type of Vehicle	Total HGV Movements
Delivery of plant & equipment	Standard articulated lorry / low loader	98
Forestry felling	Standard articulated lorry	8,328
Delivery of stone for access track construction	Rigid Tipper	4,392
Delivery of steel reinforcement	Standard articulated lorry	430
Delivery of cement	Standard articulated lorry	986
Delivery of aggregate for concrete	Rigid Tipper	4,124
Delivery of sand for concrete	Standard articulated lorry	3,122
Delivery of sand for cabling trenches	Standard articulated lorry	1,792
Delivery of cables	Standard articulated lorry	42
Delivery of turbines – Abnormal Loads	Specialist vehicle	353
Delivery of turbines – Standard HGV	Standard articulated lorry	353
Other materials and equipment (e.g. pipes, geotextiles etc.)	Standard articulated lorry / rigid truck	258
Substation	Standard articulated lorry / rigid truck	40
Site servicing	20t HGV	154
Removal of plant and equipment	Standard articulated lorry / low loader	98
TOTAL HGV TRAFFIC MOVEMENTS		**24,570**

Source: Mott MacDonald

As indicated in **Table 2-1** the total HGV traffic generated by the Proposed Varied Development is estimated to be 24,570 movements; spread over the 24 months construction period.

The number of HGV movements associated with construction of access track and turbine foundations have been derived based upon the following assumptions:

- Concrete would be batched on-site with water abstracted on-site. Sand, aggregates and cement would be imported to the site and sourced from local providers/quarries.
- Stone associated with the construction of the access tracks would be obtained primarily from on-site borrow pits.

Table 2-2 indicates the estimated number of HGVs assigned to each task for each month of the construction period.

HGV traffic is estimated at an average of 44 movements a day over the entire construction period, with a maximum of 88 movements occurring per day between May 2023 and August 2023 (the ‘peak period’).

Table 2-2: Anticipated Number of HGV Movements per Month

Task	2023												2024												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Delivery of plant & equipment	98																							0	**98**
Forestry felling	534	534	534	534	534	534	534	534	534	534	534	534	160	160	160	160	160	160	160	160	160	160	160	160	**8,328**
Track Construction			732	732	732	732	732	732																	**4,392**
Foundations				666	666	666	666	666	666	666	668	666	666	666	668	666									**8,662**
Cabling trench					152	154	152	154	152	154	152	154	152	154	152	152									**1,834**
Delivery of turbines – Abnormal Loads										40	40	40	40	40	40	40	40	33							**353**
Delivery of turbines – Standard HGV										40	40	40	40	40	40	40	40	33							**353**
Other materials and equipment (e.g. pipes, geotextiles etc.)	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	**258**
Substation																						40			**40**
Site servicing	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	16	6	6	**154**
Removal of plant and equipment																								98	**98**
Total HGV Movements	**649**	**551**	**1283**	**1,949**	**2,101**	**2,103**	**2,101**	**2,103**	**1,369**	**1,451**	**1,451**	**1,451**	**1,075**	**1,077**	**1,077**	**1,075**	**257**	**243**	**177**	**177**	**177**	**227**	**177**	**275**	**24,570**

2.3 Access to Site

It is anticipated that HGVs, LGVs (private cars / vans) accessing the site during the construction phase would travel to / from the site via the A9 (T) routing through Thurso and onto the A836 westwards and continue via the existing access track to the Strathy North wind farm. See Figure 8.1.1 in Appendix A for details of the site access route from the A836 to the site.

Abnormal loads would access the site from Scrabster Harbour via the A9 (T) onto the A836 and continue via the existing access track to the Strathy North wind farm.

2.4 Measures to Minimise and Mitigate Construction Traffic Impacts

There are a number of traffic management measures proposed to help reduce potentially disruptive impacts associated construction traffic. These measures are described as follows:

2.4.1 Time Control

The Proposed Varied Development would operate a 5.5 day working week with operations/ deliveries typically being undertaken between 07:00 and 19:00 on weekdays and 07:00 to 12:00 on Saturdays. If works are to be undertaken outside these hours, for example for delivery of abnormal loads, then prior notification would be provided, and agreement sought from The Highland Council (THC).

The Applicant would be required to plan and manage deliveries and collections from the site to minimise the impact on the surrounding road network and to minimise the impact on the local community.

The Applicant would liaise with the relevant Roads Authority upon finalisation of the construction programme to ensure (as far as is reasonably practicable) that no conflict with planned road works in the vicinity of the site occurs, so as to not further impede local motorists.

Deliveries would be scheduled, as far as is reasonably practicable, to avoid network peak hours and passing by schools around drop-off and pick-up times.

Accordingly, the Applicant would discuss and agree with THC times to be avoided at schools and other community receptors at peak periods of the construction programme in order to minimise disruption.

The Applicant would liaise with THC regarding local events dates and seek to avoid traversing affected route sections at agreed times.

2.4.2 Designated Construction Route to Site

The designated route to the site for construction vehicles (HGVs) has been identified as the A9 (T) and A836. Construction deliveries would be restricted to that route, so that the impacts of the construction traffic could be managed and monitored while preventing potential disruption on other routes.

2.4.3 Transportation Protocol

All contractors would adhere to the agreed CTMP and any agreed conditions imposed by THC.

Prior to leaving the Quarries/Site, all vehicles would:

- display a unique identification number shown on a plate clearly visible;
- be securely sealed;
- record origin, destination and route of the vehicle;
- not leave in convoy; and
- ensure all vehicle identifications including registration plates on the vehicle are clearly visible.

On route to and from their destinations all vehicles would:

- use only approved routes as specified by the CTMP;
- strictly observe speed limits;
- be driven in a safe and courteous manner with due care and consideration for other road users both vehicular and pedestrian;
- all drivers should be aware and alert whilst driving through towns and villages particularly at school times;
- strictly adhere to the hours of operation detailed by the CTMP; and
- vehicles shall not deliberately wait or stack on any public road.

The Applicant would maintain a management system whereby the following records are kept and are available to THC:

- the number of vehicles leaving and their destination;
- all complaints received regarding transport and resultant action taken; and
- all instances where protocol has been breached and resultant action taken.

The Applicant would supply the following information to THC, which would be treated in confidence:

- action to be taken when protocol is breached; and
- keep a log of vehicle movements.

2.4.4 Wheel Wash and Road Cleaning / Sweeping

In order to reduce the potential for mud and other debris being deposited onto the local road network in the vicinity of the site access, a wheel washing facility would be installed on-site during the construction period. This would minimise the amount of deleterious material deposited on the road surface and the appointed contractor would ensure that the nearest public road (A836) would be kept clear of debris by monitoring and then utilising a road sweeper where necessary.

2.4.5 Speed Restrictions

On-site operatives would be briefed on the speed limits (mandatory or advisory) on public roads through induction sessions and through regular staff briefings. Other parties responsible for site deliveries would also be instructed on the need for compliance with speed limits on all roads.

2.4.6 Temporary Signage

During the construction phase, signage would be installed to warn road users to the presence of the works access and the associated likely presence of large or slow-moving construction traffic.

Figure 8.1.2 included in **Appendix A**, provides an illustrative signage arrangement in the vicinity of the A836 site access.

General information signage would be installed to inform road users and local communities of the nature and location of the works, including contact details should they require additional information.

Temporary signage would be formally agreed with THC prior to installation and commencement of construction.

2.4.7 Public Transport

The appointed contractor would discuss with THC and Transport Scotland (TS) regarding matters that could affect the flow of buses, particularly in relation to the bus stop situated on the A836 adjacent to the Strathy North site entrance, and, as appropriate, would take reasonable precautions to mitigate any disruption to bus services.

2.4.8 Parking for Vehicles of Site Personnel, Operatives and Visitors

To minimise inconvenience to the local community in terms of obstructive parking, adequate car parking for permanent site staff, visitors and deliveries would be provided within the site compound.

Adequate vehicle parking space would be provided on-site and car parking would not be permitted on the public road network adjacent to the site so that sight lines would be maintained at the site access junction and to minimise the potential for obstruction and delay for other road users.

Car sharing would be promoted to construction staff by the contractor during the induction process.

2.5 Abnormal Load Deliveries

The Proposed Varied Development is for 39 wind turbines and it is anticipated that this would generate 353 abnormal load deliveries. Once the turbine components have been delivered to site, the abnormal load delivery vehicles would be able to retract to regular HGV dimensions, so their impact tends to be in the inbound direction only.

2.5.1 Abnormal Load Route

The proposed abnormal load route to the site is summarised below:

- Exit Scrabster Harbour westbound onto the A9.
- Continue southbound on the A9 until the A836.
- Join the A836 westbound.
- Continue on the A836 westbound for c. 30 km and turn left into the existing Strathy North Wind Farm access.

A separate study has been undertaken to assess the suitability of the abnormal load route for the transportation of abnormal loads. The findings of this study including the Swept Path Analysis (SPA) of the vehicle passing through identified pinch points along with identified mitigation measures are contained within Technical Appendix 8.2: Abnormal Load Access Study (EIAR Volume 4).

2.5.2 Notifications for Abnormal Load Delivery

Notifications for abnormal loads are required where loads or vehicles exceed maximum vehicle weight, axle weight or dimensions in the Construction and Use (C&U) Regulations. The relevant roads authorities would be given appropriate written notice of abnormal load deliveries and weekly updates would be provided as the delivery timetable is finalised with the supplier during the delivery period. At least four weeks prior to construction, details of the vehicle dimensions, maximum weights and axle loadings of the abnormal loads would be submitted in writing to the relevant Roads Authorities.

The Police would be notified of abnormal load movements at least one week prior to delivery, in relation to the provision of a Police escort. Details of vehicle configurations, delivery route and project contacts would be provided.

Specific requirements for a trial run (if required) and abnormal load delivery would be identified and agreed with the relevant Roads Authorities and approvals obtained in line with statutory requirements.

2.5.3 Bridges and other Structures

BEAR Scotland (Transport Scotland's operating company for the North West Trunk Road Network) and THC were consulted to verify the structural adequacy of bridges and culverts along the proposed abnormal load access route and to clarify and residual requirements.

Accordingly, it was agreed that an assessment of structures along the route would be undertaken prior to abnormal load deliveries commencing. Six structures have been identified as requiring assessment, see **Table 2-3**.

Table 2-3: List of Structures to be Assessed

Bridge Code	Bridge Name	Coordinates
A08360400	FORSS	303723, 968665
A08360390	ISAULD	297650, 965035
A08360380	OLD REAY	296980, 964902
A08360370	NEW REAY	295730, 964613
A08360360C73	DRUMHOLLINSTON NO 2	293880, 964490
A08360360	HALLADALE	289470, 963180

2.6 Public Road Infrastructure Accommodation Works

The Abnormal Load Access Study identified potential constraints and associated infrastructure accommodation works which are likely to be required in order to safely transport abnormal loads.

Prior to commencement of works, the Applicant would provide details of proposed infrastructure accommodation works to the relevant Roads Authority for approval. Road Opening Permit or Road Construction Consent, as appropriate, would be required for sections of the route where infrastructure works are scheduled to take place. In this regard, the appointed contractor would liaise with the relevant Roads Authority in line with statutory requirements. No works within or adjacent to a THC or TS maintained road would commence until there is agreement with THC/TS.

2.7 Route Condition Surveys

The Applicant would enter into a legal agreement under Section 96 of the Roads (Scotland) Act 1984 to formalise an inspection and maintenance regime with THC for agreed sections of public road.

The Applicant would ensure that a baseline road condition survey is undertaken prior to the commencement of construction works in relation to each agreed phase. The baseline survey would record structures (bridges and culverts), road surface and verge conditions.

An interim inspection regime would be agreed with THC and (if agreeable to THC) monthly meetings between the Applicant and THC would be held to discuss the condition of relevant sections of road.

A final survey/inspection would be completed 1 – 3 months post construction to identify any deterioration in infrastructure condition that has occurred during the construction period, that is reasonably attributable to the Proposed Varied Development, and detail proposed repair measures, if required.

THC would be offered the opportunity to attend whilst surveys are undertaken.

The Applicant would fund the completion of the pre-construction, interim and post-construction surveys referred to above. It is envisaged that road condition surveys would be carried out jointly with THC and subsequent survey outputs would be agreed by the Applicant and THC. The persons completing the survey would be approved as suitably competent by THC.

The Applicant would monitor construction vehicle activity aligned with the aim that damage to walkways, driveways, accesses, bridges, walls, verges, roads and private property does not occur.

Monitoring would highlight any damage that has occurred and, if this is agreed as reasonably attributable to the Proposed Varied Development, it would be repaired with the repairs implemented and/or funded by the Applicant in consultation with THC.

2.7.1 Methodology

The proposed methodology for road condition surveys is as follows:

1. Sections of route would be driven and recorded on high quality digital video. The driver and/or passenger would be an experienced transport infrastructure professional whose competency would be approved in advance by THC.
2. A photographic survey would be undertaken at c. 100 m intervals identifying details of specific defects within defined chainages along the public road and incorporated within a survey report. Chainages would be recorded in such a way that they can be easily identified during follow up surveys – e.g. through use of marker posts and/or reference to fixed reference points.
3. Accompanying site notes could be recorded via microphone with the digital video or typed in Microsoft (MS) Word format.
4. The video would be transferred to transportable media (e.g. pen drive) and filed safely with site notes and photographs.
5. A survey report would be produced following each survey undertaken.

Road condition surveys would be carried out in accordance with the UKPMS Visual Survey Manual, Chapter 7[1] and record any of the following type defects:

- Wheel track cracking
- Wearing Course Deterioration (Major Cracking)
- Wearing Course Deterioration (Potholes)
- Settlement
- Edge Deterioration

During the construction phase, agreed sections of public roads would be inspected fortnightly by the contractor to determine any deterioration in the road condition. A record of these inspections would be maintained on-site, confirming the date of the inspection, details of the defects and the date and time of corrective repair work. This record would be subject to audit by THC at any time. The 'Well Maintained Highways – Code of Practice for Highway Maintenance Management'[2] produced by the UK Roads Liaison Group would be complied with. In addition, the road would not be allowed to deteriorate to a point where it becomes uncomfortable to drive and ongoing repairs could be required to prevent this.

Very minor repairs e.g. cold tar repairs of small potholes <1 sqm taking less than 30 minutes can be classed as Minor Works (Mobile and Short Duration) and do not require noticing under the New Roads and Street Works Act 1991 (NRSWA)[3]. Reference should be made to the Scottish Government publication 'Code of Practice for the Co-ordination of Works in Roads'[4] for further information.

[1] Pavement Condition Information Systems. (2009). The UKPMS User Manual, Volume 2, Chapter 7. UK Roads Liaison Group
[2] Well Maintained Highways – Code of Practice for Highway Maintenance Management. (2005). The Stationery Office
[3] The New Roads and Street Works Act. (2013), Scottish Government
[4] Code of Practice for the Co-ordination of Works in Roads. (2013). Scottish Government

3 Implementation and Monitoring of the CTMP

3.1 General

The implementation of the CTMP would be the responsibility of the Applicant who would also be responsible for monitoring the Plan. Further evolution of this CTMP would likely be required during the detailed project planning stages and during the construction period itself.

The Applicant could employ a number of contractors on the site and all would fall under the umbrella of the CTMP and would have an obligation to adhere to the Plan, this obligation would form part of the procurement process and would be written into any contract of employment.

Compliance would be monitored by the Project Manager, on behalf of the Applicant, via spot checks to ensure that vehicles follow the measures set-out in the CTMP and recording of any complaints. The Applicant would stipulate that all contractors disseminate these rules to their sub-contractors.

Non-compliance with the CTMP, would constitute a breach of contract, and action would be taken against the contractor or supplier should repeated non-compliance be verified. Details of the proposed monitoring and enforcement regime would be supplied to THC on request.

3.2 Responsibilities of the Applicant

The Applicant would nominate a person to be responsible for the co-ordination of all elements of traffic and transport during the construction process (Liaison Officer). This person would liaise with the local community so that the community has a direct point of contact within the developer organisation who they could contact for information purposes or to discuss matters pertaining to traffic management or site operation.

Contact details for the Liaison Officer would be made available to all relevant parties prior to commencement of works on-site. The details would be provided to the local community.

The Applicant would review and update the number of site personnel, traffic numbers, and the construction programme as the project progresses. Regular updates would be provided to THC, TS and Police Scotland. Any substantial changes would be discussed and agreed with both THC and TS (if appropriate).

As necessary, meetings would be held with THC / TS and the Applicant to discuss the CTMP and to discuss any issues raised by the local community.

3.3 Transport Co-ordination

The Applicant would be responsible for the co-ordination of all elements of heavy goods and abnormal vehicle transport to and from the site. The Applicant would be responsible for co-ordination and liaison with contractors, THC, TS, Police Scotland, emergency services and the local community.

Use of the agreed routes by hauliers would be monitored by spot checks undertaken by the Applicant and / or the roads authority. These spot checks would take the form of occasional observations at key locations.

The information collected by these spot checks would be held by the Applicant and would be available to THC, TS, Police Scotland and the local community on request.

The Liaison Officer would inform THC and TS of any important matters that could affect traffic movement by means of reports issued at regular intervals or by day-to-day reports of any substantial, essential changes to transport plans necessitated by circumstances.

3.4 Communication and Consultation

As indicated above, the Applicant would nominate a Liaison Officer to act as a point of contact with the local community. The Liaison Officer would be responsible for keeping the local community informed of progress on the site and warning them of upcoming activities which could give rise to increased construction vehicle movements.

The Liaison Officer would be able to attend Community Council meetings to provide a report and to be on hand to answer any questions that the local community may have. Contact details would be provided for the Liaison Officer (telephone number and email address) would be made available locally so that members of the public have an opportunity to ask questions and provide feedback.

The Applicant would also make use of the local press in order to disseminate information regarding traffic management and the movement of abnormal loads.

Signs would be erected on fences surrounding the construction compound to provide contact details of the Applicant's Project Manager. These contact details would also be provided directly to the emergency services.

3.5 Liaison with Other Construction Sites

It is recognised that there is a possibility that the construction period associated with the Proposed Varied Development could coincide with the construction of similar proposed developments where abnormal loads would travel through the same area and use the same roads.

If the construction phase of any notably sized development(s), e.g. wind farm development(s) appears likely to overlap with the Proposed Varied Development, the Applicant would seek to liaise with the appropriate developer organisation regarding the scheduling of deliveries to identify potential means of reducing the effects of combined construction.

4 Summary Statement

4.1 Statement

This CTMP represents a commitment to satisfy Road Authority requirements and sets out proposed traffic management and contingency planning measures to enhance road safety and limit adverse effects of construction traffic on the existing road network and the communities it serves.

It is anticipated that once the suppliers, Principal Contractor and haulage contractor are appointed, further useful information would become available, including a finalised delivery programme, and such details would be submitted to THC for information and/or agreement as appropriate.

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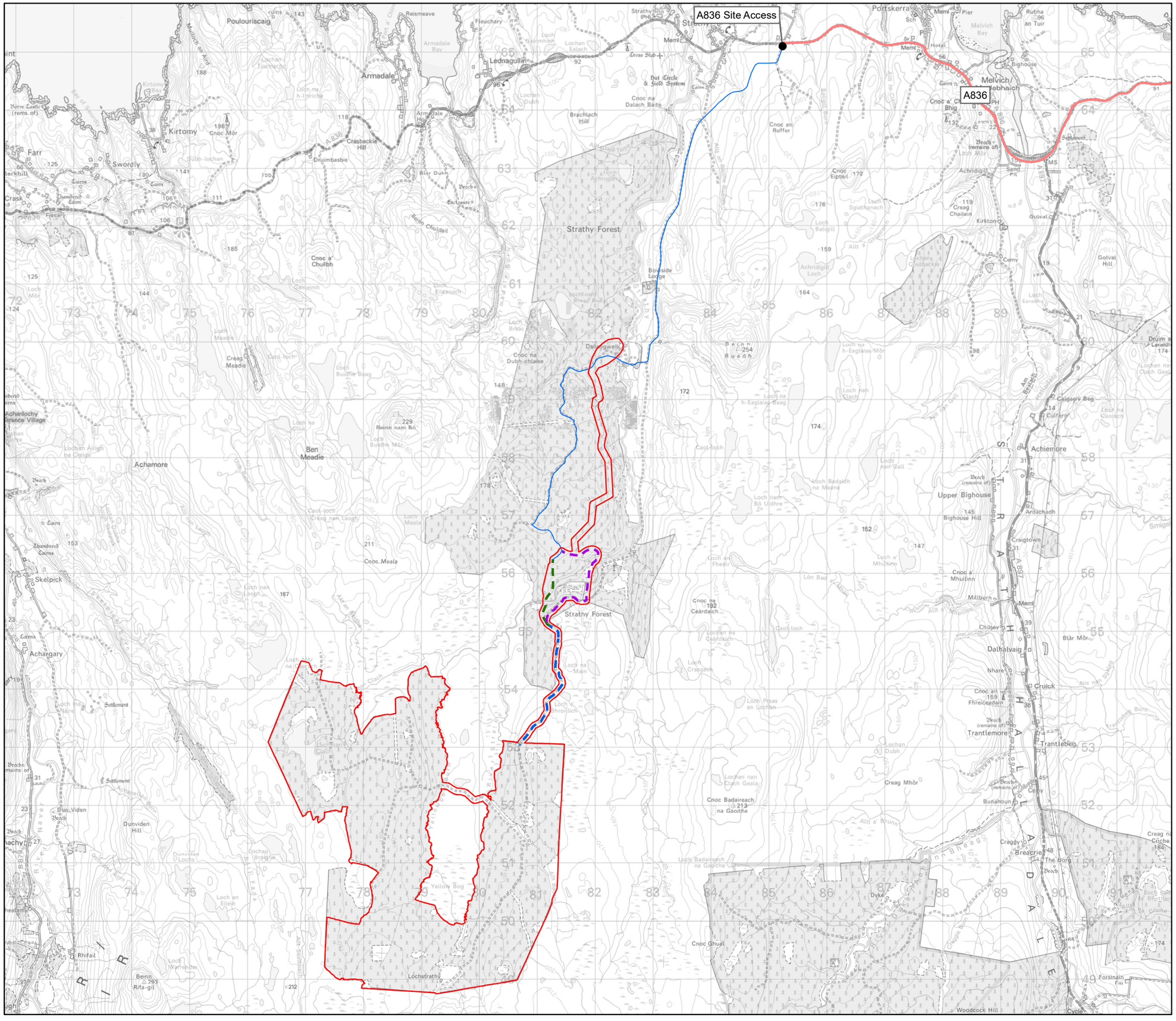
A. Construction Traffic Management Plan Drawings



Key

Site Boundary

Strathy Northern Access Route

Potential Access

Preferred Access Route

Alternative Access Route

Common Access Route

Abnormal Load Access Route

Scale 1:63,000 @ A3

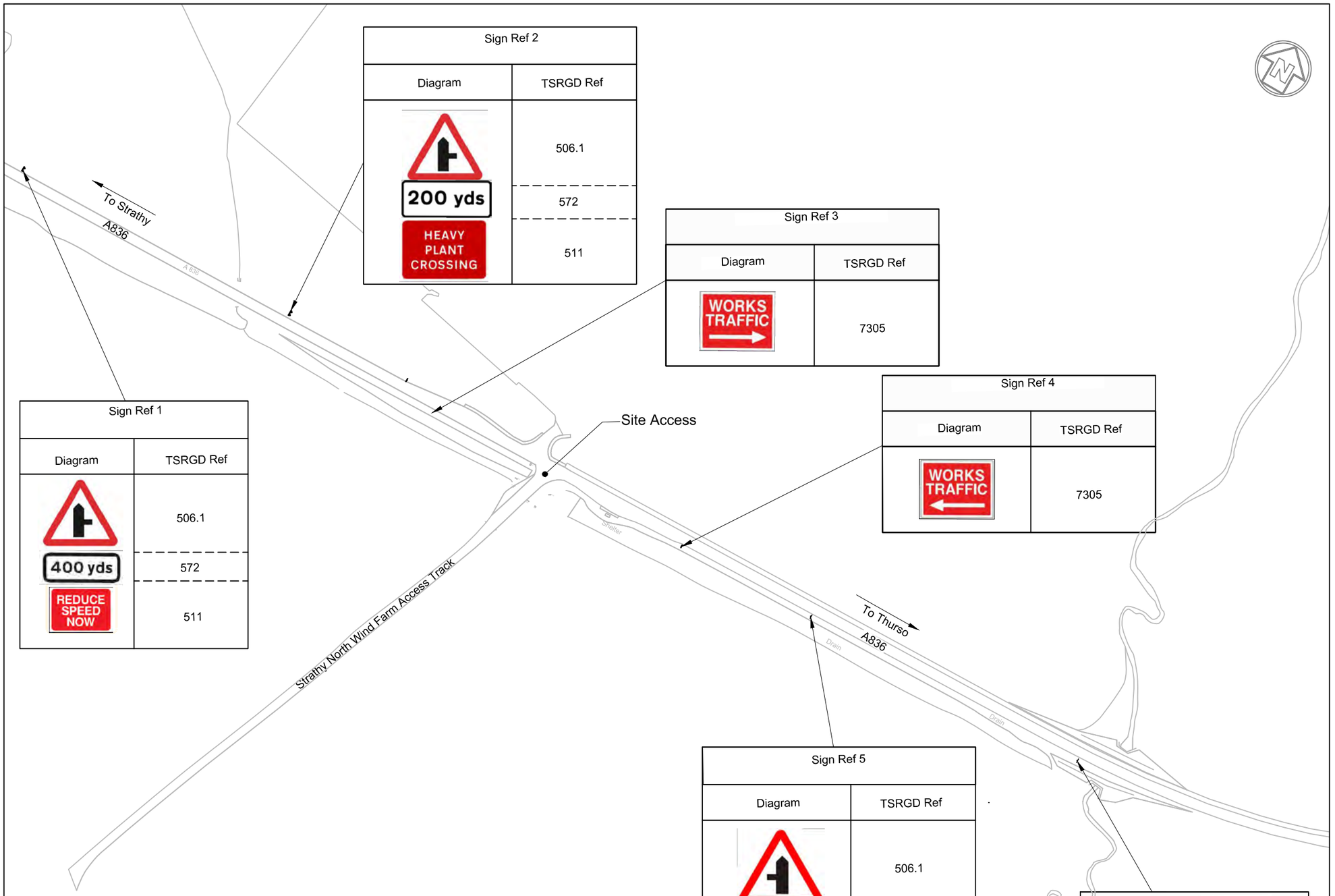
0 1 2 km

N

Figure 8.1.1

Access Route from A836 to Site

Strathy South Wind Farm
EIAR 2020



Sign Ref 2	
Diagram	TSRGD Ref
	506.1 572 511

Sign Ref 3	
Diagram	TSRGD Ref
	7305

Sign Ref 4	
Diagram	TSRGD Ref
	7305

Sign Ref 1	
Diagram	TSRGD Ref
	506.1 572 511

Sign Ref 5	
Diagram	TSRGD Ref
	506.1 572 511

Sign Ref 6	
Diagram	TSRGD Ref
	506.1 572 511

sse Renewables

Notes:

1. **All road signs to Traffic Signs Regulations and General Directions (TSRGD) 2016.**
2. **Road signs to be positioned at a minimum of 0.6m offset from road edge.**
3. **The contractor to check and expose all existing services using a cat scanner and hand dug trial pits as necessary prior to commencement of civils works and any discrepancies encountered should be notified immediately to the engineer.**

Figure 8.1.2
A836 Site Access - Proposed Signage

Strathy South Wind Farm
EIAR 2020

TA8.2: Abnormal Load Access Study

MOTT MACDONALD

Strathy South Wind Farm
Technical Appendix 8.2

Abnormal Load Access Study

3 August 2020

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Abnormal Load Access Study

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1 Introduction

1.1 Project Background

SSE Generation Limited ('the Applicant') proposes to submit an application for consent to construct and operate Strathy South Wind Farm (the "Proposed Varied Development"). The site is located within the Strathy South conifer plantation, approximately 12 km south of Strathy Village in Sutherland.

Mott MacDonald have been commissioned by the Applicant to complete a study of access for the delivery of abnormal indivisible loads for the Proposed Varied Development.

1.2 General

The Abnormal Load Access Study has focussed on the proposed abnormal load access route between Scrabster Harbour and the existing A836 access for Strathy North wind farm, situated approximately 1.2 km east of Strathy village.

This study identifies potential constraints and associated infrastructure accommodation works which are likely to be required in order to safely permit transportation of abnormal loads. Where considered beneficial, proposed recommendations for further assessment are defined.

1.3 Structure of the Report

The report is sub-divided into the following Sections:

- Section 2, sets out the study methodology;
- Section 3, documents a review of the infrastructure at the Scrabster Harbour;
- Section 4, documents the abnormal load vehicle access assessment; and
- Section 5, provides a summary of the study findings and supporting recommendations.

This Report's appendices provide further relevant information. **Bold text** formatting is used to highlight key recommendations.

2 Study Methodology

2.1 Overview

The Abnormal Load Access Study has focussed on the proposed abnormal load access route between Scrabster Harbour and the existing A836 access for Strathy North wind farm, situated approximately 1.2 km east of Strathy village.

The proposed abnormal load route to the site is summarised below:

- Exit Scrabster Harbour westbound onto the A9.
- Continue southbound on the A9 until the A836.
- Join the A836 westbound.
- Continue on the A836 westbound for c. 30 km and turn left into the existing Strathy North wind farm access.

The assessed route and constraints locations identified are illustrated on Figure 8.2.1, see **Appendix A**.

2.2 Consultation

Mott MacDonald consulted via email with a Bridges Engineer at BEAR Scotland (Transport Scotland's operating company for the North West Trunk Road Network) and a Principal Engineer at The Highland Council (THC) on the 13th August 2019 and 29th July 2019 respectively, to verify the structural adequacy of bridges and culverts on the proposed abnormal load access route. See **Appendix B** for consultation responses and **Section 4.3** for further details.

2.3 Site Inspection

A site visit was undertaken by experienced Mott MacDonald staff on 4th and 5th June 2019; the visit involved a drive through of the access route to appraise potential suitability and to identify potential constraints to abnormal load transport movements.

Mott MacDonald met with Scrabster Harbour Authority to ascertain local experience and capability for handling wind turbine components.

A digital video was recorded along the route supplemented by a series of still photographs at locations of potential constraints.

Professional judgement was utilised to assist in the identification of potentially significant route constraints and to appraise the likely magnitude and feasibility of infrastructure accommodation works which could be required (e.g. road carriageway widening).

2.4 Swept Path Analysis (SPA)

SPA was undertaken along the entire abnormal load route and focussed on key constraint locations identified through a combination of desk-top assessment and site inspection. SPA simulated the transportation of the most onerous transporter loading configurations; specialist vehicles carrying candidate turbine components.

Individual turbine components vary in size and weight, however for the purpose of this assessment and as agreed with the Applicant, the following transport configurations were considered:

- Specialist vehicle transporting a 79.5 m turbine blade; and
- Specialist vehicle transporting a 30 m tower section of 4.6 m diameter.

Outputs of SPA are presented in plan drawing format, see **Appendix A**, associated commentary is provided in **Section** Error! Reference source not found..

SPA utilised manual rear axle steering option, as required, which allows tighter turns and hence can reduce over-run and over-sail. Where this technique has been employed this is clearly annotated on the respective plan drawing.

The specification of the transporter vehicle carrying a wind turbine blade was modelled to simulate a 'clamp and dolly' transport system and is illustrated in Figure 8.2.21, included in Appendix A.

It should be noted that the actual vehicle and load configuration adopted could vary from those assessed and documented in this report. Accordingly, the arrangement should be verified with the appointed haulier and the SPA checks updated per the actual specification and configuration. It is recommended that the SPA should be verified through an in-situ trial run.

3 Scrabster Harbour Infrastructure Review

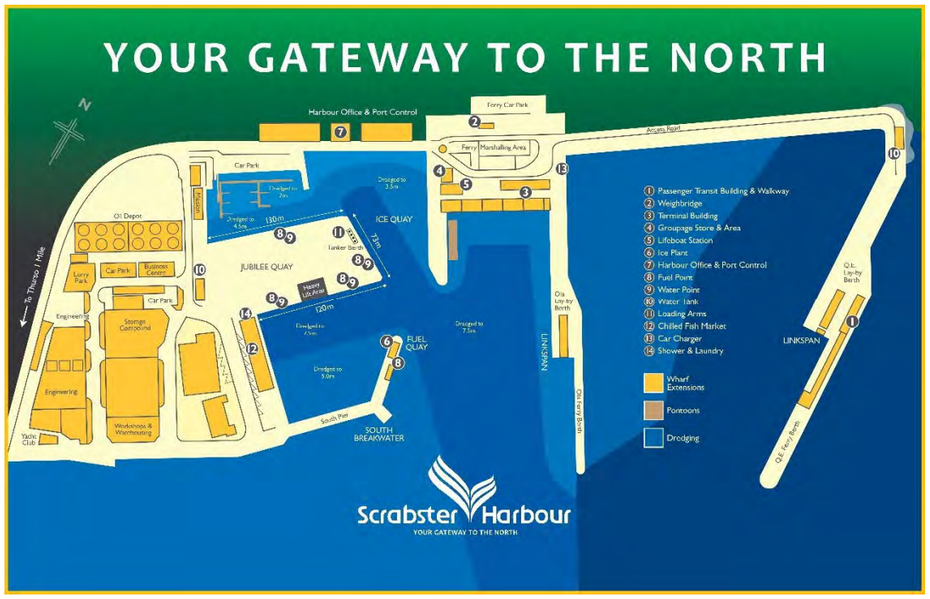
3.1 Overview

Scrabster Harbour is the expected port of entry for wind turbines components for the Proposed Varied Development.

Scrabster Harbour is a multi-purpose harbour situated on the north coast of Scotland, 3 km north of Thurso and 12 km west of Castletown. Scrabster is a key hub of economic activity in the region, catering for a wide variety of sectors including oil and gas, renewables, fishing and tourism (cruise ships). **Figure 1** shows a diagrammatic plan of the Harbour arrangement.

Scrabster Harbour operates 24 hours a day and 365 days per year; subject to weather conditions.

Figure 1: Scrabster Harbour



3.2 Harbour Survey / Inspection

A meeting was held with representatives from Scrabster Harbour Authority, the Applicant and Mott MacDonald at the Harbour offices on 4th June 2019 including:

- Harbour Master (Scrabster Harbour)
- Trust Manager (Scrabster Harbour)
- Project Manager (SSE)
- Community Liaison Manager (SSE)
- Construction Manager (SSE)
- Principal Engineer (Mott MacDonald)
- Transport Planner (Mott MacDonald)

Following the meeting a walkover of Scrabster Harbour was undertaken. Notes recorded during the meeting and site walkover are included in **Appendix C**.

3.3 Berthing Facilities

Scrabster Harbour consists of the following:

- Queen Elizabeth Berth;
- St Ola Pier; and
- Jubilee Quay

Mott MacDonald was advised during the site visit by the Harbour Master at Scrabster Harbour that:

- Scrabster Harbour has some previous experience of handling wind farm projects;
- Largest turbine blade handled up to date is 40 m;
- both the Queen Elizabeth Berth (160 m long) and Jubilee Quay (120 m long) could accommodate vessels transporting turbine components;
- the St. Ola Pier is only suitable for smaller vessels and storage. In its current state the St. Ola pier would not be suitable for loading/unloading of heavy/large components; however significant upgrades are planned for the proposed redevelopment of the St. Ola pier.

Post-Site Inspection Note: Scrabster Harbour Trust of Scrabster Harbour, has been granted a marine licence for the redevelopment of the St Ola Pier by Scottish Ministers. It is recommended that the Applicant maintains communication with Scrabster Harbour to keep up to date with the ongoing development of the St. Ola Pier and confirms adequacy of the upgraded St. Ola Pier to safely accommodate delivery and transfer of the anticipated wind turbine components.

3.4 Laydown Facilities

Mott MacDonald was advised during the site visit by the Harbour Master at Scrabster Harbour that the following storage is available:

- Jubilee Quay primarily used for storage due to its large size; c. 11,000 m²
- Scrabster harbour storage compound; c. 2,500 m²
- Additional compound available at nearby business park

The suitability of the laydown areas, identified during the field visit, to store turbine components should be verified by the relevant turbine supplier post-consent.

4 Route Assessment

4.1 Assessment

Table 1 provides summary information relating to the potential constraints identified on the abnormal load delivery route and includes a description of recommended residual actions. The requirement for potential infrastructure accommodation works was informed by SPA undertaken at each constraint location; SPA was based upon OS digital mapping.

The assessed route and constraints locations are illustrated on Figure 8.2.1, see **Appendix A**.

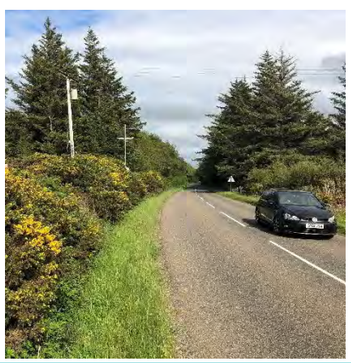
For individual SPA plan figures, see **Appendix A**.

Table 1: Constraints Summary

Constraint Ref. / Site Photograph	Comment and Recommendations
Constraint 1: A9 bend at West End House **NGR:** 309981, 970308 	**79.5 m Turbine Blade, assessed accommodation works requirement:** The turbine blade would require to oversail beyond the existing wall **and into third party land** to the north of the A9. It would be required to relocate lighting columns (2 no.). Road signposts (3 no.) would require to be replaced in new retention sockets to allow temporary removal during abnormal load delivery and one information sign would need to be temporarily removed. Use of manual rear wheel steering has been simulated to allow the vehicle to complete the turn. **30 m Tower Section, assessed accommodation works requirement:** The load would require to oversail beyond the existing fence **and into third party land** to the west of the access road. It would be required to remove and temporarily realign a section of fence. It would also be required to remove existing concrete bollards (7 no.) and replace them with demountable bollards. **Recommended actions:** • Discuss proposed accommodation works with Transport Scotland and/or their agent (currently BEAR Scotland) and Scrabster Harbour Authority. • Commence land and servitude negotiations with relevant third parties. • Verify SPA findings against a topographic survey. **Figures reference number:** • Figure 8.2.2 (79.5 m turbine blade) • Figure 8.2.20 (30 m Tower Section)
Constraint 2: A9 junction with A836 **NGR:** 310754, 968859	**79.5m Turbine Blade, assessed accommodation works requirement:** It would be required to form a new hardstanding construction area to accommodate vehicle overrun in the land south of the A836. Based on available information, it is understood that new construction would **extend into third party land.** It would be required to relocate lighting columns (2no.). Road signposts (3no.) would require to be replaced in new retention sockets to allow temporary removal during abnormal load delivery. Use of manual rear wheel steering has been simulated to allow the vehicle to complete the turn. **30m Tower Section, assessed accommodation works requirement:** Accommodations works assessed as less onerous than the 79.5m turbine blade.
	**Recommended actions:** • Discuss proposed accommodation works with Transport Scotland and/or their agent (currently BEAR Scotland). • Commence land and servitude negotiations with relevant third parties. • Verify SPA findings through the in-situ trial run. **Figure reference number:** • Figure 8.2.3 (79.5 m turbine blade)
Constraint 3: Right hand bend at Burnside Burn **NGR:** 310245, 968786 	**79.5m Turbine Blade, assessed accommodation works requirement:** Vehicle over-run of existing hard strip would be required. It would be required to relocate 1no. lighting column. **30m Tower Section, assessed accommodation works requirement:** No remedial works anticipated. **Recommended actions:** • Discuss proposed accommodation works with THC. • Verify SPA findings through the in-situ trial run. **Figure reference number:** • Figure 8.2.4 (79.5 m turbine blade)
Constraint 4: S-Bend by Thurso Baptist Church **NGR:** 309869, 968849 	**79.5m Turbine Blade, assessed accommodation works requirement:** Road signposts (1no.) would require to be replaced in new retention sockets to allow temporary removal during abnormal load delivery. **30m Tower Section, assessed accommodation works requirement:** No remedial works anticipated. **Recommended actions:** • Discuss proposed accommodation works with THC. • Verify SPA findings through the in-situ trial run. **Figure reference number:** • Figure 8.2.5 (79.5 m turbine blade)
Constraint 5: Left hand bend at Scrabster Lodge **NGR:** 308595, 969484	**79.5m Turbine Blade, assessed accommodation works requirement:** No remedial works anticipated. **30m Tower Section, assessed accommodation works requirement:** No remedial works anticipated. **Recommended actions:** • Verify SPA findings through the in-situ trial run. **Figure reference number:** • Figure 8.2.6 (79.5 m turbine blade)

Constraint Ref. / Site Photograph	Comment and Recommendations
	
Constraint 6: Bridge of Forss (1 of 2) **NGR:** 303758, 968708 	**79.5m Turbine Blade, assessed accommodation works requirement:** The turbine blade would require to oversail beyond the existing wall **and into third party land** to the north of the A836. Requirement for tree pruning/felling to be verified either against a topographic survey or through the in-situ trial run. It would be required to form a new area of road construction to accommodate vehicle over-run. Road signposts (2no.) and verge markers (3no.) would require to be replaced in new retention sockets to allow temporary removal during abnormal load delivery and one information sign would need to be temporarily removed. Use of manual rear wheel steering has been used to allow the vehicle to complete the turn. **30m Tower Section, assessed accommodation works requirement:** Accommodations works assessed as less onerous than the 79.5m turbine blade. **Recommended actions:** • Verify SPA findings against a topographic survey. • Discuss proposed accommodation works with THC. • Commence land and servitude negotiations with relevant third parties. **Figure Reference Number:** • Figure 8.2.7 (79.5 m turbine blade)
Constraint 6: Bridge of Forss (2 of 2) **NGR:** 303549, 968537 	**79.5m Turbine Blade, assessed accommodation works requirement:** The turbine blade would require to over-run and oversail beyond the existing fence line **and into third party land** to both sides of the A836. It would be required to form new areas of road construction to accommodate vehicle over-run. It would be required to relocate one telegraph pole and one information sign will need to be temporarily removed. Use of manual rear wheel steering has been used to allow the vehicle to complete the turn. **30m Tower Section, assessed accommodation works requirement:** Accommodations works assessed as less onerous than the 79.5m turbine blade. **Recommended actions:** • Verify SPA findings against a topographic survey.

Constraint Ref. / Site Photograph	Comment and Recommendations
	• Discuss proposed accommodation works with THC. • Commence land and servitude negotiations with relevant third parties. • Commence liaison with BT to ascertain feasibility/process for relocating the telegraph pole. **Figure Reference Number:** • Figure 8.2.8 (79.5 m turbine blade)
Constraint 7: Left hand bend at Lybster **NGR:** 302333,968887 	**79.5m Turbine Blade, assessed accommodation works requirement:** The turbine blade would require to oversail beyond the public road boundary (assumed to be 3m from the edge of the road carriageway) **into third party land** to the north of the A836. Road signposts (2no.) would require to be replaced in new retention sockets to allow temporary removal during abnormal load delivery. **30m Tower Section, assessed accommodation works requirement:** Accommodations works assessed as less onerous than the 79.5m turbine blade. **Recommended actions:** • Discuss proposed accommodation works with THC. • Commence land and servitude negotiations with relevant third parties. • Verify SPA findings through the in-situ trial run. **Figure Reference Number:** • Figure 8.2.9 (79.5 m turbine blade)
Constraint 8: Right hand bend at Bridge of Isauld **NGR:** 297645, 965031 	**79.5m Turbine Blade, assessed accommodation works requirement:** The turbine blade would require to oversail beyond the existing fence line **into third party land** to the east of the A836. It would be required to form new areas of road construction to accommodate vehicle over-run **including into third party land** to the south of the A836. Road signposts (2no.) and verge markers (6no.) would require to be replaced in new retention sockets to allow temporary removal during abnormal load delivery and one road sign would need to be relocated. It would be required to relocate on electricity pole. Use of manual rear wheel steering has been used to allow the vehicle to complete the turn. **30m Tower Section, assessed accommodation works requirement:** Accommodations works assessed as less onerous than the 79.5m turbine blade. **Recommended actions:** • Verify SPA findings against a topographic survey. • Discuss proposed accommodation works with THC. • Commence land and servitude negotiations with relevant third parties. • Commence liaison with the power line owner to ascertain feasibility/process for relocating the electrical pole. **Figure Reference Number:** • Figure 8.2.10 (79.5 m turbine blade)
Constraint 9: Right hand bend at memorial **NGR:** 297645, 965031	**79.5m turbine blade, assessed accommodation works requirement:** The turbine blade would require to oversail beyond the existing dry stone wall **into third party land** to the north of the A836. It would be required to form a new area of road construction to accommodate vehicle over-run to the south of the A836 and over-run a section of existing hard strip. Road signposts (2no.) would require to be replaced in new retention sockets to allow temporary removal during abnormal load delivery and one

Constraint Ref. / Site Photograph	Comment and Recommendations
	information sign would need to be temporarily removed. It would be required to relocate one lighting column. Use of manual rear wheel steering has been used to allow the vehicle to complete the turn. **30m Tower Section, assessed accommodation works requirement:** Accommodations works assessed as less onerous than the 79.5m turbine blade. **Recommended Actions:** • Verify SPA findings against a topographic survey. • Discuss proposed accommodation works with THC. • Commence land and servitude negotiations with relevant third parties. **Figure Reference Number:** • Figure 8.2.11 (79.5 m turbine blade)
Constraint 10: Bridge of Reay **NGR:** 295731, 964614 	**79.5m turbine blade, assessed accommodation works requirement:** The turbine blade would require to oversail beyond the existing fence line **into third party land** to the south of the A836. It would be required to over-run a section of existing hard strip. It would be required to relocate one lighting column. Use of manual rear wheel steering has been used to allow the vehicle to complete the turn. **30m Tower Section, assessed accommodation works requirement:** Accommodations works assessed as less onerous than the 79.5m turbine blade. **Recommended Actions:** • Discuss proposed accommodation works with THC. • Commence land and servitude negotiations with relevant third parties. • Assess the existing road vertical profile through this section during the trial run to ensure adequate ground clearance is available. **Figure Reference Number:** • Figure 8.2.12 (79.5 m turbine blade)
Constraint 11: Left hand bend by Craigielea **NGR:** 294791, 964622 	**79.5m turbine blade, assessed accommodation works requirement:** No remedial works anticipated **30m Tower Section, assessed accommodation works requirement:** No remedial works anticipated **Recommended actions:** • Verify SPA findings are verified through the in-situ trial run. **Figure Reference Number:** • Figure 8.2.13 (79.5 m turbine blade)
Constraint 12: A836 south of Creagan Loisgte Quarry **NGR:** 294492, 964573	**Potential vertical constraint**

Constraint Ref. / Site Photograph	Comment and Recommendations
	**Recommended actions:** • Assess the existing road vertical profile through this section during the trial run to ensure adequate ground clearance is available. **Drawing Reference Number:** • N/A
Constraint 13: Left hand bend next to Drumhollistan Moss **NGR:** 293261, 964522 	**79.5m turbine blade, assessed accommodation works requirement:** One road signpost would require to be replaced in new retention socket to allow temporary removal during abnormal load delivery. Use of manual rear wheel steering has been used to allow the vehicle to complete the turn. **30m Tower Section, assessed accommodation works requirement:** No remedial works anticipated. **Recommended actions:** • Discuss proposed accommodation works with THC. • Verify SPA findings through the in-situ trial run. **Figure Reference Number:** • Figure 8.2.14 (79.5 m turbine blade)
Constraint 14: Right hand bend by Cnoc a' Mhail **NGR:** 291207, 964309 	**79.5m turbine blade, assessed accommodation works requirement:** No remedial works anticipated **30m Tower Section, assessed accommodation works requirement:** No remedial works anticipated. **Recommended actions:** • Verify SPA findings through the in-situ trial run. **Figure Reference Number:** • Figure 8.2.15 (79.5 m turbine blade)
Constraint 15: Right hand bend by Clach Sgoilte **NGR:** 290875, 964188 	**79.5m turbine blade, assessed accommodation works requirement:** The turbine blade would require to oversail on the inside of bend. Note the presence of large rock outcrop adjacent to the road (north) verge which may restrict overhang. It is likely this can be avoided through localised use of manual steering, alternatively the road could be widened to the south, however works in this area would be limited by the adjacent watercourse. **30m Tower Section, assessed accommodation works requirement:** No remedial works anticipated. **Recommended Actions:** • Verify SPA findings through the in-situ trial run.

Constraint Ref. / Site Photograph	Comment and Recommendations
	Figure Reference Number • Figure 8.2.16 (79.5 m turbine blade)
Constraint 16: Right hand bend in Melvich **NGR:** 287821, 964894 	**79.5m turbine blade, assessed accommodation works requirement:** No remedial works anticipated. Use of manual rear wheel steering has been used to allow the vehicle to complete the turn. **30m Tower Section, assessed accommodation works requirement:** No remedial works anticipated. **Recommended actions:** • Verify SPA findings against a topographic survey. **Figure Reference Number** • Figure 8.2.17 (79.5 m turbine blade)
Constraint 17: Left hand bend in Melvich **NGR:** 287691, 965065 	**79.5m turbine blade, assessed accommodation works requirement:** No remedial works anticipated. Use of manual rear wheel steering has been used to allow the vehicle to complete the turn. **30m Tower Section, assessed accommodation works requirement:** No remedial works anticipated. **Recommended actions:** • Verify SPA findings against a topographic survey. **Figure Reference Number** • Figure 8.2.18 (79.5 m turbine blade)
Constraint 18: A836 Site Access **NGR:** 285254, 965154 	**79.5m Turbine Blade, assessed accommodation works requirement:** The turbine blade would require to oversail beyond the public road boundary (assumed to be 3m from the edge of the road carriageway) **into third party land** to the north of the A836. It would be required to form a new hardstanding area to accommodate vehicle over-run to the south of the A836. **30m Tower Section, assessed accommodation works requirement:** Accommodations works assessed as less onerous than the 79.5m turbine blade. **Recommended actions:** • Verify SPA findings against a topographic survey. • Discuss proposed accommodation works with THC. • Commence land and servitude negotiations with relevant third parties. **Figure Reference Number** • Figure 8.2.19 (79.5 m turbine blade)

Source: Mott MacDonald

4.2 Potential Overhead Constraints

Several overhead power and communication lines were observed crossing the proposed abnormal load route. Existing vertical clearances were measured[1] and recorded during the route survey. A summary is provided in **Table 2**.

It is recommended that the appointed haulier ensure, through consultation with the relevant utility provider, that there is sufficient vertical clearance including an appropriate safety margin.

Table 2: Overhead Lines Record

Reference	Easting	Northing	Vertical Clearance recorded	Type
001	309732	968830	7.5m	Power Line
002	306305	969573	7m	Power Line
003	305947	969497	6.2m	Phone Line
004	305688	969424	6m	Phone Line
005	304783	969003	7.5m	Power Line
006	304679	968963	8m	Power Line
007	304109	968793	8.4m	Power Line
008	301960	968637	8m	Power Line
009	301059	967976	6m	Phone Line
010	300163	967345	7.5m	Phone Line
011	299006	966227	5.8m	Phone Line
012	298572	965941	Not possible to measure in a safe manner	Power Line
013	297810	965346	Not possible to measure in a safe manner	unknown
014	297406	965008	5.4m	Phone Line
015	297085	964965	Not possible to measure in a safe manner	unknown
016	296855	964815	5.4m	Phone Line
017	296650	964801	7.5m	Power Line
018	296207	964772	7m	Phone Line
019	296068	964730	6m	Phone Line
020	295181	964581	7.4m	Phone Line
021	294841	964616	8.9m	Power Line
022	291335	964431	Not possible to measure in a safe manner	Power Line
023	290424	964160	Not possible to measure in a safe manner	Power Line
024	289006	963569	7.8m	Power Line
025	288353	964615	6.8m	Phone Line
026	288294	964665	6.8m	Phone Line
027	287693	965070	6.1m	Phone Line
028	287494	965157	7.3m	Power Line
029	306963	969584	7.5m	Power Line
030	297648	965054	8.5m	Power Line
031	295884	964687	6.5m	Phone Line
032	296175	964762	8.5m	Power Line

[1] Overhead line vertical clearances were measured on site using a handheld cable height meter (SupaRule Model 600)

Reference	Easting	Northing	Vertical Clearance recorded	Type
033	296872	964821	9m	Power Line
034	297603	964997	7.5m	Power Line
035	297669	965084	6.5m	Phone Line
036	299816	967087	8m	Power Line
037	299854	967117	6m	Power Line
038	302474	968851	7.2m	Power Line
039	302530	968836	7.9m	Phone Line
040	303656	968572	8m	Power Line
041	303683	968598	7.5m	Phone Line
042	304640	968955	7.4m	Phone Line
043	305229	969131	6.8m	Power Line
044	305332	969163	6m	Phone Line
045	305390	969179	7m	Power Line
046	306944	969587	6m	Phone Line
047	299775	967052	6m	Phone Line
048	297563	964996	Not possible to measure in a safe manner	unknown
049	287663	965103	6.8m	Power Line
050	302564	968824	9m	Power Line
051	288556	964292	9.2m	Power Line
052	288556	964292	9m	Power Line
053	288556	964292	8m	Power Line

Source: Mott MacDonald Site Visit June 2019

4.3 Structures

As indicated in **Section 2.2** of this Report, Mott MacDonald consulted via email with BEAR Scotland and THC, to verify the structural adequacy of bridges and culverts along the proposed abnormal load access route. See **Appendix B** for a record of consultation.

Precise configurations for turbine component transporters including individual axle loads and vehicle gross weights are not yet defined. Detailed transport configurations are typically only identified once a turbine supplier has been selected.

For the purpose of the assessment and associated consultation with Roads Authorities, it has been assumed that the heaviest component will be c. 90 tonnes with an individual total weight of transport vehicle c. between 120 tonnes - 135 tonnes gross weight.

4.3.1 A9 Trunk Road Section

BEAR Scotland has confirmed that the following trunk road structures are located on the proposed access route and that none of the structures would require to be formally assessed:

- A9 1960 W97 Scrabster Harbour RB – masonry gravity wall buried in rock armour. Located on south side of road immediately exiting the harbour.
- A9 1960 W80 Scrabster Oil Depot RB – RC cantilever wall. Located on east side of road behind oil dept at bottom hill.
- A9 1960 W 62 Scrabster Appr'ch RB – RC wall with post tensioned anchors. Located on east side of road on hill out of Scrabster harbour.
- A9 1960 Burnside Burn – 3.3 m span RC portal. Located 260 m before junction with A836

4.3.2 A836 Public Road Section

Table 3 summarises structures identified by THC on the proposed route and their comments.

Accordingly, it was agreed that an assessment of structures along the routes would be undertaken prior to abnormal load deliveries commencing. Six structures have been identified as requiring assessment, see Table 3.

Table 3: A836 Structures

Bridge Code	Bridge Name	Coordinates	Comments
A08360409	SMITHY	309521, 968843	Able to carry proposed AIL.
A08360400C 29	BRIMS	305240, 969135	Able to carry proposed AIL.
A08360400C 01	UNNAMED	303790, 968720	Able to carry proposed AIL. AVOID MASONRY FLAG SECTION ON UPSTREAM SIDE.
A08360400	FORSS	303723, 968665	Previously assessed. Assessments should be re-visited for this proposed wind farm
A08360390	ISAULD	297650, 965035	Previously assessed. Assessments should be re-visited for this proposed wind farm
A08360380	OLD REAY	296980, 964902	Previously assessed. Assessments should be re-visited for this proposed wind farm
A08360370	NEW REAY	295730, 964613	Previously assessed. Assessments should be re-visited for this proposed wind farm
A08360360C 73	DRUMHOLLI NSTON NO 2	293880, 964490	Previously assessed. Assessments should be re-visited for this proposed wind farm
A08360360	HALLADALE	289470, 963180	Able to carry proposed AIL.
A08360349	ALLT NA CLEITE	287000, 965100	Able to carry proposed AIL.
A08360339	BALIGILL	285600, 965300	Able to carry proposed AIL.

Source: The Highland Council July 2019

5 Summary

5.1 Overview

Mott MacDonald has been commissioned by the Applicant to complete a study of access for the delivery of abnormal indivisible loads for the Proposed Varied Development.

The Abnormal Load Access Study has focussed on the proposed abnormal load access route between Scrabster Harbour and the existing A836 access for Strathy North wind farm, situated approximately 1.2 km east of Strathy village.

5.2 Scrabster Harbour Infrastructure Review

In June 2019, an accompanied site walkover was undertaken, with Scrabster Harbour Authority personnel, to ascertain the adequacy of the Scrabster Harbour infrastructure.

Only the Queen Elizabeth Berth and Jubilee Quay are expected to be sufficient for accommodating the delivery and offloading of the proposed turbine components.

The St. Ola Pier is only suitable for smaller vessels and storage. In its current state the St. Ola Pier would not be suitable for loading/unloading of heavy/large components; however substantial upgrades are proposed a St. Ola Pier which may change the situation.

It is recommended that the Applicant maintains communication with Scrabster Harbour to keep up to date with the ongoing development of the St. Ola Pier and confirms adequacy of the upgraded St. Ola Pier to safely accommodate delivery and transfer of the anticipated wind turbine components.

Various options were identified, during the site walkover, for temporary storage areas as detailed in **Section 3.4**.

The suitability of the laydown areas, identified during the field visit, to store turbine components should be verified by the relevant turbine supplier post-consent.

5.3 Abnormal Load Access Route

SPA was undertaken at identified locations of constraint on the proposed abnormal load route. SPA simulated the transportation of the most onerous transporter loading configurations; specialist vehicles carrying candidate turbine components.

Individual turbine components vary in size and weight, however for the purpose of this assessment and as agreed with the Applicant, the following transport configurations were considered:

- Specialist vehicle transporting a 79.5 m turbine blade; and
- Specialist vehicle transporting a 30 m tower section of 4.6 m diameter.

SPA drawings were prepared indicating infrastructure accommodation works and third-party land required at each location.

Commentary is provided in **Table 1** and presented on plan drawings included in **Appendix A**.

5.4 Way Forward

To formally verified the results of SPA it would be essential to commission a trial run, to simulate abnormal load delivery vehicle in real conditions, this should be undertaken by a suitably experienced abnormal load haulage contractor.

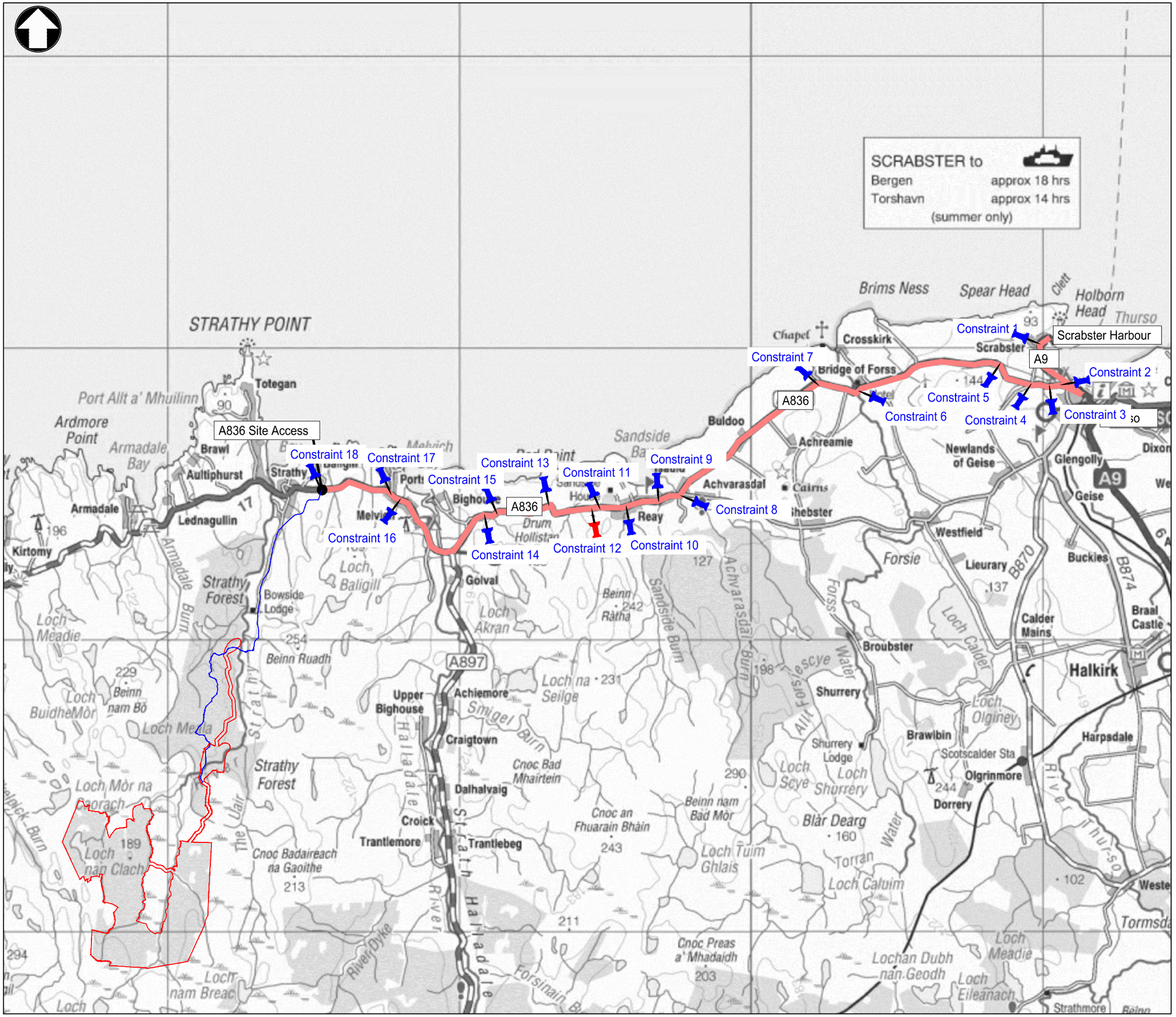
Several potential access constraints were identified on the proposed abnormal load route and the following associated actions are recommended:

- commission topographic survey at constraints 1, 6, 8, 9, 16, 17 and 18 to verify SPA findings;
- discuss potential accommodation works requirements, associated implications and the aligned approvals process with relevant Roads Authority and Scrabster Harbour Authority;
- undertake structural assessment of the 6 structures identified on the A836 in liaison with THC;
- commence land and servitude negotiations with relevant third parties;
- commence liaison with the utility provider(s) at Constraint 6 and 8 to ascertain feasibility/process for relocating the utility poles;
- the appointed haulier should ensure, through consultation with relevant utility providers, that there would be sufficient vertical clearance; including an appropriate safety margin; and
- assess the existing road vertical profiles at both Constraint 10 and 12 during the trial run to ensure adequate ground clearance would be available.

Appendices

A. Key Plan and Swept Path Analysis Drawings 11
B. Roads Authorities Consultation Summary 12
C. Scrabster Harbour Consultation Summary 13

A. Key Plan and Swept Path Analysis Drawings



sse Renewables

Key

- Abnormal Load Access Route
- Site boundary
- Strathy Northern Access Route
- Horizontal Constraint
- Vertical Constraint

Scale 1:125000 @ A3

0 1000 2000 3000 4000 m

Figure 8.2.1
Key Plan

Strathy South Wind Farm
EIAR 2020

Turbine blade overhang extending beyond existing road edge and into third party land. Existing fence to be temporarily realigned for the entire duration of the abnormal load delivery progamme.

Existing information sign to be temporarily removed for the entire duration of the abnormal load delivery programme.

Existing lighting Columns (x2) to be relocated to accommodate turbine delivery. Position and specifications to be agreed with Transport Scotland and/or their agent. (currently BEAR Scotland)

Existing road sign posts to be replaced in retention socket to allow temporary removal/demounting during abnormal load delivery

West End House

4.6m

Club

Oil Distribution Depot

Tanks

1

2

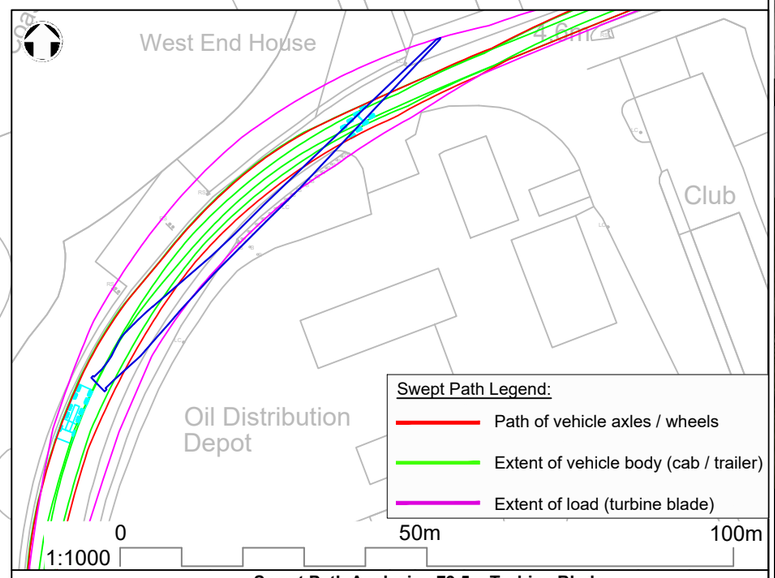
0 25m 50m

1:500

Key

- Vehicle/load overhang beyond road carriageway edge.
- Vehicle/load overhang into third party land
- B Bollard
- RS Road Sign
- LC Lighting Column

CONSTRAINT 1:
A9 Bend at West End House
(NGR (⌖): 309981, 970308)



Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:1000 @ A3)

Notes

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3. Street furniture is indicative only.
4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect manual steering.

Existing site conditions
(Photograph locations shown - 1)

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P1	04.05.20	JB	Issue 1 - Draft for Client Review	FJ	JD
P2	18.06.20	RG	Issue 2 - Added Figure Reference	FJ	JD

Title

Figure 8.2.2
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 1: A9 Bend at West End House

Drawn	J Bell	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:500 or As Shown

Drawing Number
409481-MMD-00-XX-DR-C-3002

Security	Status	Rev
STD	PRE	P2

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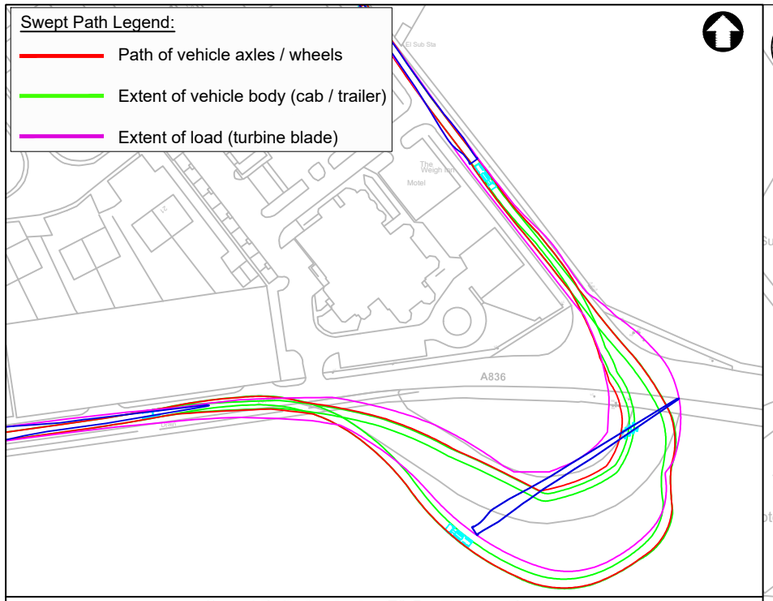
Swept Path Legend:

- Path of vehicle axles / wheels
- Extent of vehicle body (cab / trailer)
- Extent of load (turbine blade)



Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:2000 @ A3)

CONSTRAINT 2:
A9 Junction with A836
(NGR (⊕): 310754, 968859)

Key

- Vehicle/load overhang beyond road carriageway edge.
- Proposed new hardstanding area (unbound Type 1 construction) to accommodate vehicle over-run, shown indicative.
- Proposed new hardstanding area to match adjacent existing (i.e. concrete).
- LC — Lighting column
- RS — Road sign
- CP — Control Pillar

Existing illuminated road sign post to be replaced in retention socket to allow temporary removal / demounting during abnormal load delivery

Existing road sign posts to be replaced in retention socket to allow temporary removal/ demounting during abnormal load delivery

Existing lighting columns (x2) to be relocated to accommodate turbine delivery. Position and specifications to be agreed with Transport Scotland and/or their agent (currently BEAR Scotland).

1:2000 0 100m 200m

1:1000 0 50m 100m

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3. Swept path analysis should be verified through in-situ trial run.
4. Swept paths reflect manual steering.
5. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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P1	04.05.20	RG	Issue 1 - Draft for Client Review	FJ	JD
P2	18.06.20	RG	Issue 2 - Added Figure Reference	FJ	JD

Title

Figure 8.2.3
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 2: A9 Junction with A836

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:1000 or as Shown

Drawing Number	Security	Status	Rev
409481-MMD-00-XX-DR-C-3003	STD	PRE	P2

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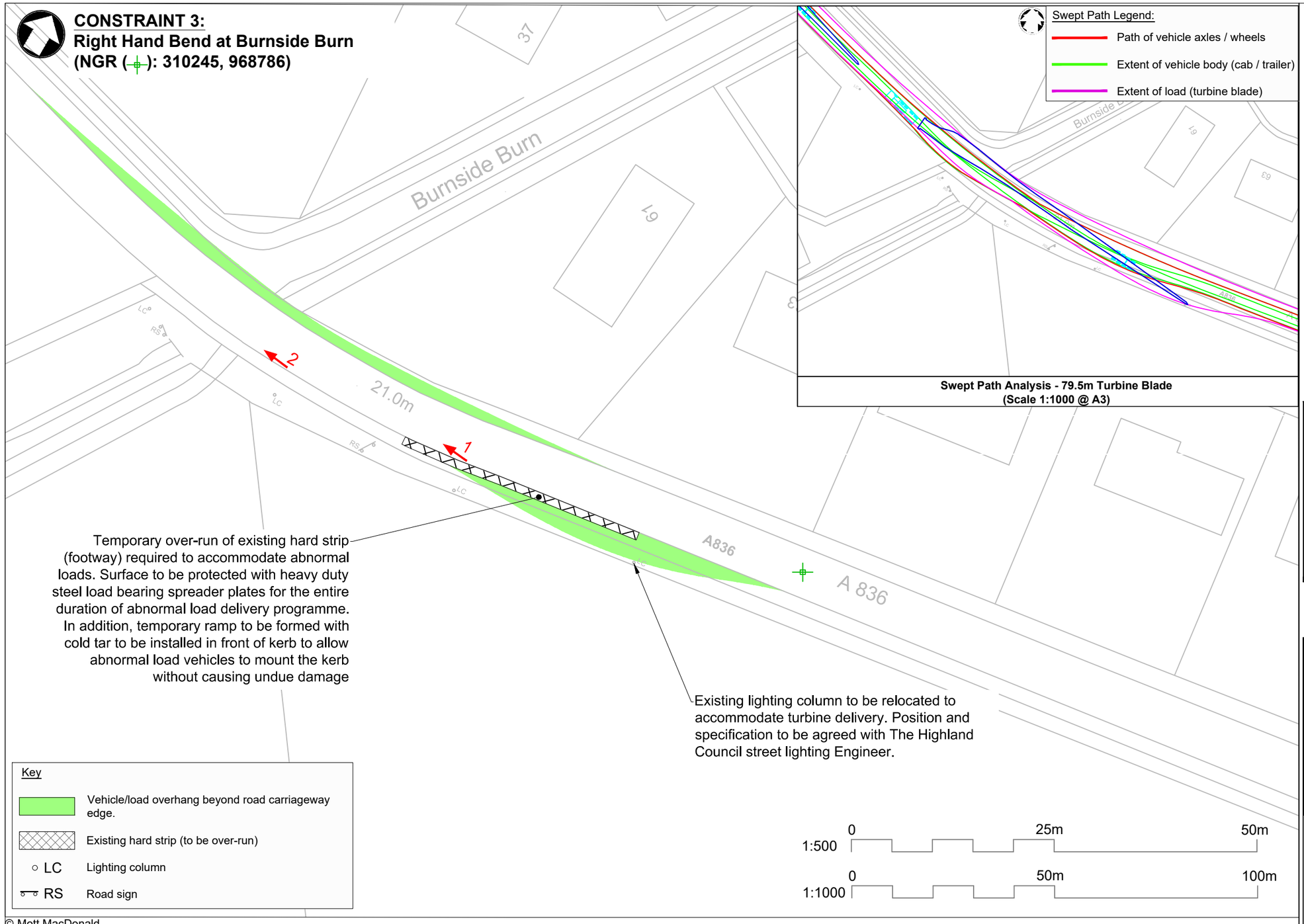
GRE87086

CONSTRAINT 3:
Right Hand Bend at Burnside Burn
(NGR (⊕): 310245, 968786)



Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:1000 @ A3)

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3. Swept path analysis should be verified through in-situ trial run.
4. Swept paths reflect automatic steering.
5. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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P1	04.05.20	RG	Issue 1 - Draft for Client Review	FJ	JD
P2	18.06.20	RG	Issue 2 - Added Figure Reference	FJ	JD

Title

Figure 8.2.4
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 3: Right Hand Bend at Burnside Burn

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:500 or as shown

Drawing Number
409481-MMD-00-XX-DR-C-3004

Security	Status	Rev
STD	PRE	P2

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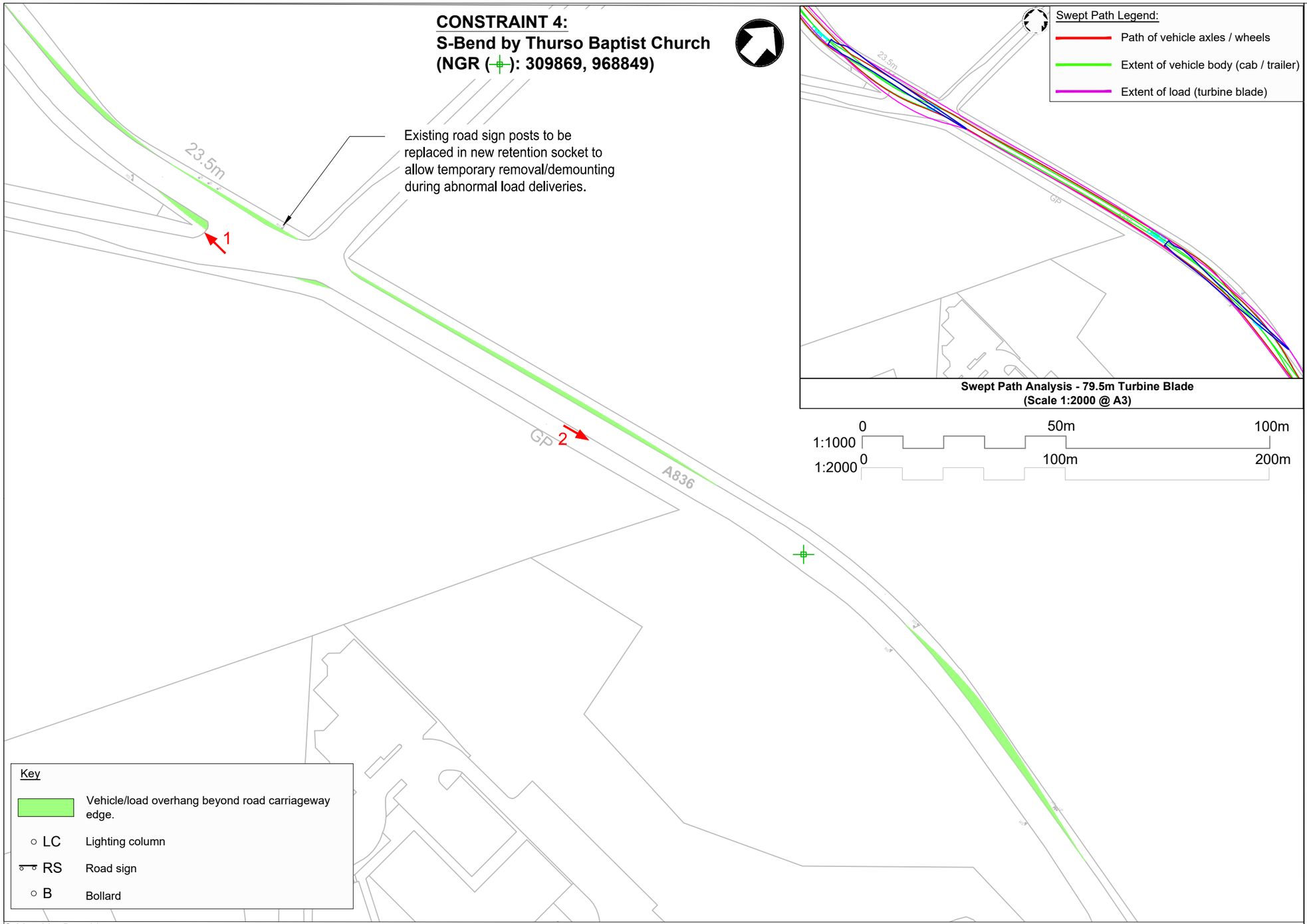
CONSTRAINT 4:
S-Bend by Thurso Baptist Church
(NGR (⊕): 309869, 968849)



Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:2000 @ A3)

1:1000 0 50m 100m
1:2000 0 100m 200m

Key

- Vehicle/load overhang beyond road carriageway edge.
- ○ LC — Lighting column
- RS — Road sign
- ○ B — Bollard

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3. Street furniture is indicative only.
4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect automatic steering.

Existing site conditions
(Photograph locations shown - 1)

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P1	04.05.20	RG	Issue 1 - Draft for Client Review	FJ	JD
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Title

Figure 8.2.5
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 4: S-Bend by Thurso Baptist Church

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:1000 or as shown

Drawing Number
409481-MMD-00-XX-DR-C-3005

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STD	PRE	P2

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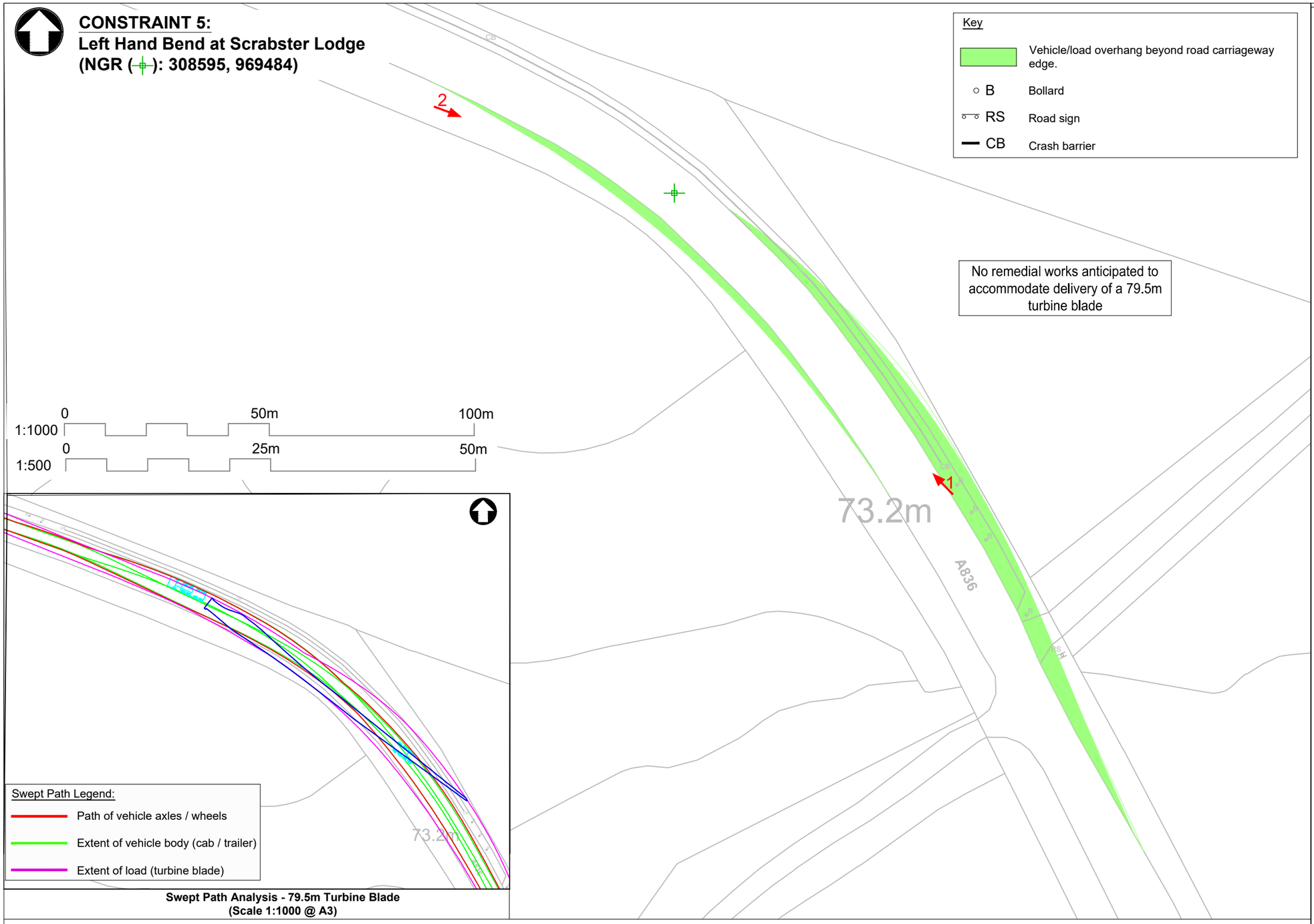
GRE87086

CONSTRAINT 5:
Left Hand Bend at Scrabster Lodge
(NGR (⊕): 308595, 969484)



Key

	Vehicle/load overhang beyond road carriageway edge.
○ B	Bollard
RS	Road sign
CB	Crash barrier

No remedial works anticipated to accommodate delivery of a 79.5m turbine blade

Notes

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3. Street furniture is indicative only.
4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect automatic steering.

Existing site conditions
(Photograph locations shown - 1)

Swept Path Legend:
- Path of vehicle axles / wheels
- Extent of vehicle body (cab / trailer)
- Extent of load (turbine blade)

Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:1000 @ A3)

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Title

Figure 8.2.6
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 5: Left Hand Bend at Scrabster Lodge

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:500 or as shown

Drawing Number
409481-MMD-00-XX-DR-C-3006

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Key

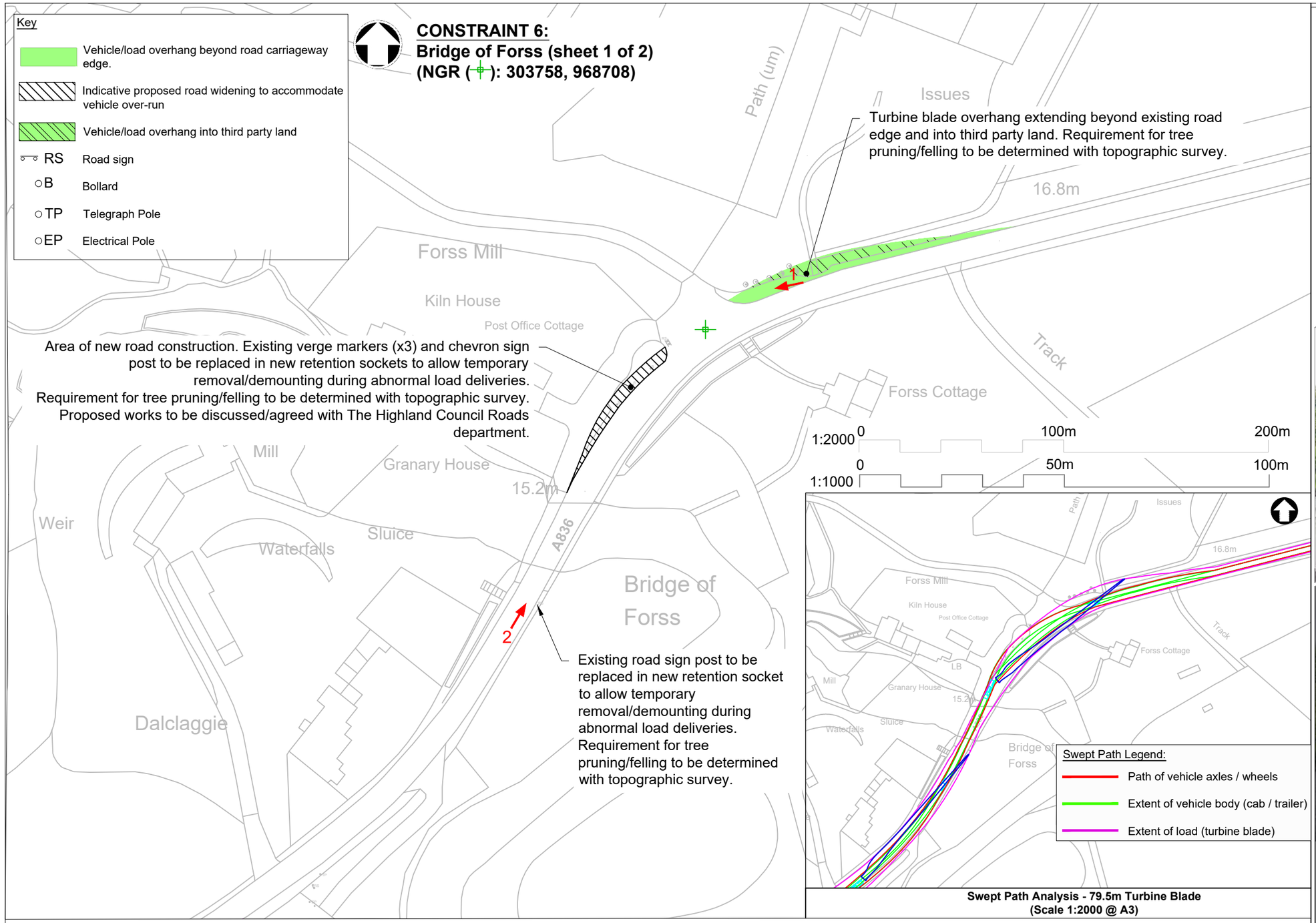
- Vehicle/load overhang beyond road carriageway edge.
- Indicative proposed road widening to accommodate vehicle over-run
- Vehicle/load overhang into third party land
- RS Road sign
- B Bollard
- TP Telegraph Pole
- EP Electrical Pole

CONSTRAINT 6:
Bridge of Forss (sheet 1 of 2)
(NGR (⌖): 303758, 968708)

Turbine blade overhang extending beyond existing road edge and into third party land. Requirement for tree pruning/felling to be determined with topographic survey.

Area of new road construction. Existing verge markers (x3) and chevron sign post to be replaced in new retention sockets to allow temporary removal/demounting during abnormal load deliveries. Requirement for tree pruning/felling to be determined with topographic survey. Proposed works to be discussed/agreed with The Highland Council Roads department.

Existing road sign post to be replaced in new retention socket to allow temporary removal/demounting during abnormal load deliveries. Requirement for tree pruning/felling to be determined with topographic survey.



Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:2000 @ A3)

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3. Street furniture is indicative only.
4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect manual steering.
6. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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P1	04.05.20	RG	Issue 1 - Draft for Client Review	FJ	JD
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Title

Figure 8.2.7
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 6: Bridge of Forss (Sheet 1 of 2)

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:1000 or As Shown

Drawing Number
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STD	PRE	P2

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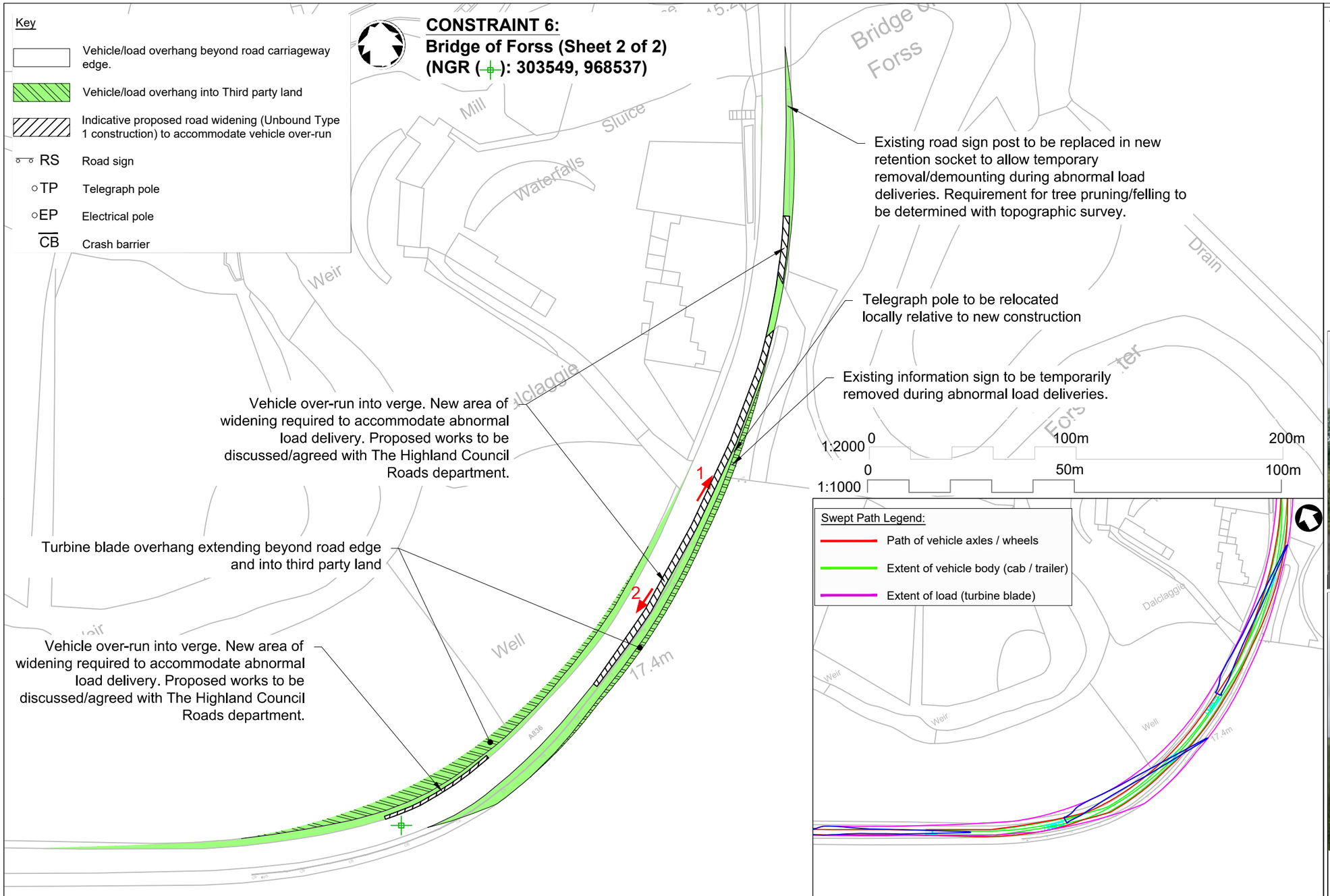
Key

- Vehicle/load overhang beyond road carriageway edge.
- Vehicle/load overhang into Third party land
- Indicative proposed road widening (Unbound Type 1 construction) to accommodate vehicle over-run
- RS Road sign
- TP Telegraph pole
- EP Electrical pole
- CB Crash barrier

CONSTRAINT 6:
Bridge of Forss (Sheet 2 of 2)
(NGR (⊕): 303549, 968537)



1:2000 0 100m 200m

1:1000 0 50m 100m

Swept Path Legend:

- Path of vehicle axles / wheels
- Extent of vehicle body (cab / trailer)
- Extent of load (turbine blade)

Swept Path Analysis - 79.5m Turbine Blade (Scale 1:2000 @ A3)

Notes

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5. Swept paths reflect manual steering.
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Existing site conditions
(Photograph locations shown - 1)

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Title

Figure 8.2.8
Strathy South Windfarm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 6: Bridge of Forss (Sheet 2 of 2)

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:1000 or as shown

Drawing Number
409481-MMD-00-XX-DR-C-3008

Security	Status	Rev
STD	PRE	P2

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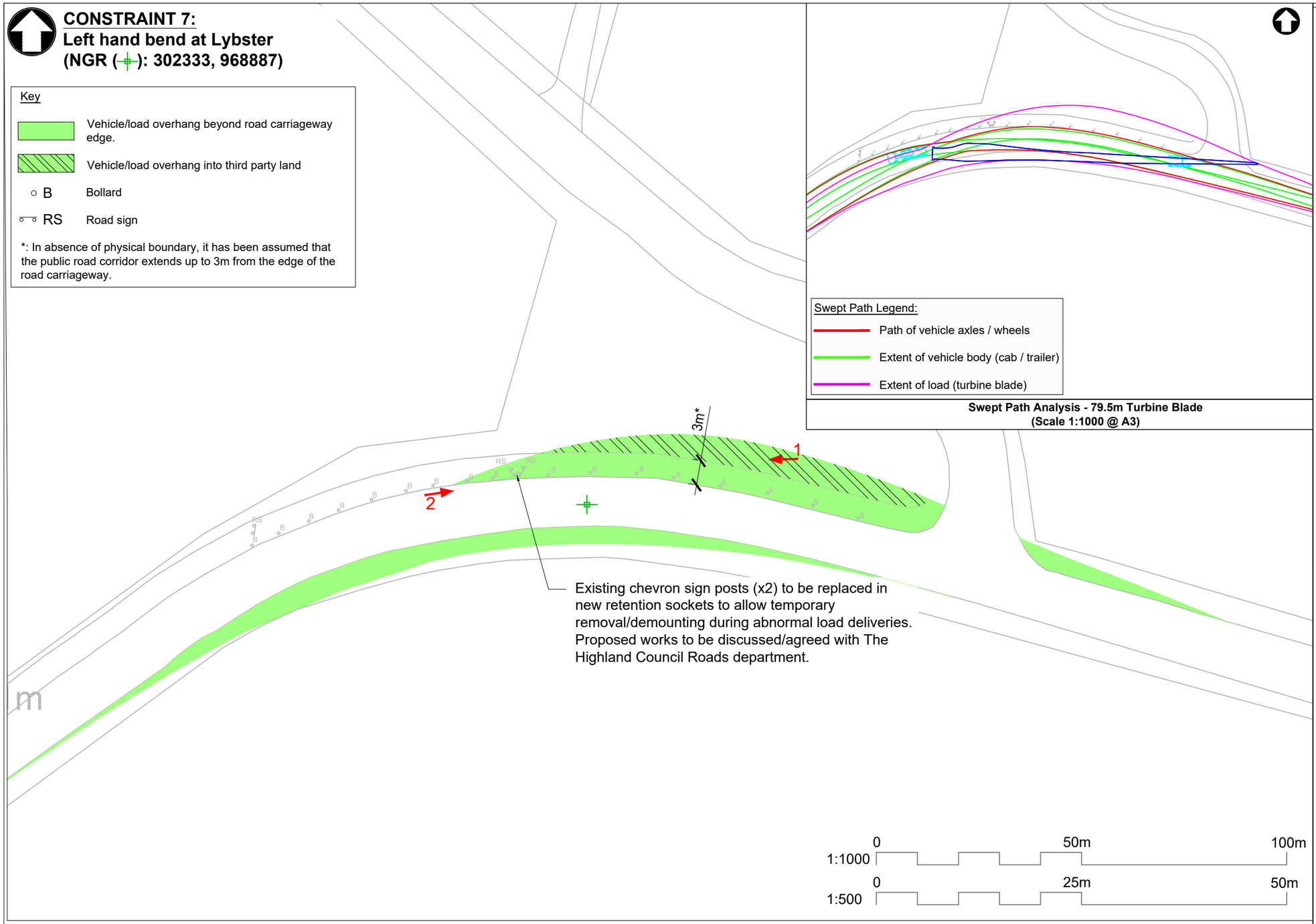
CONSTRAINT 7:
Left hand bend at Lybster
(NGR (⊕): 302333, 968887)

Key

- Vehicle/load overhang beyond road carriageway edge.
- Vehicle/load overhang into third party land
- ○ B — Bollard
- RS — Road sign

*: In absence of physical boundary, it has been assumed that the public road corridor extends up to 3m from the edge of the road carriageway.



Swept Path Legend:

- Path of vehicle axles / wheels
- Extent of vehicle body (cab / trailer)
- Extent of load (turbine blade)

Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:1000 @ A3)

0 50m 100m
1:1000

0 25m 50m
1:500

Notes

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3. Street furniture is indicative only.
4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect manual steering.

Existing site conditions
(Photograph locations shown - 1)

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Title

Figure 8.2.9
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 7: Left Hand Bend at Lybster

Drawn	R Gregg	
Checked	F J ahnke	
Approved	J Dooley	

Scale at A3
1:500 or as shown

Drawing Number
409481-MMD-00-XX-DR-C-3009

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STD	PRE	P2

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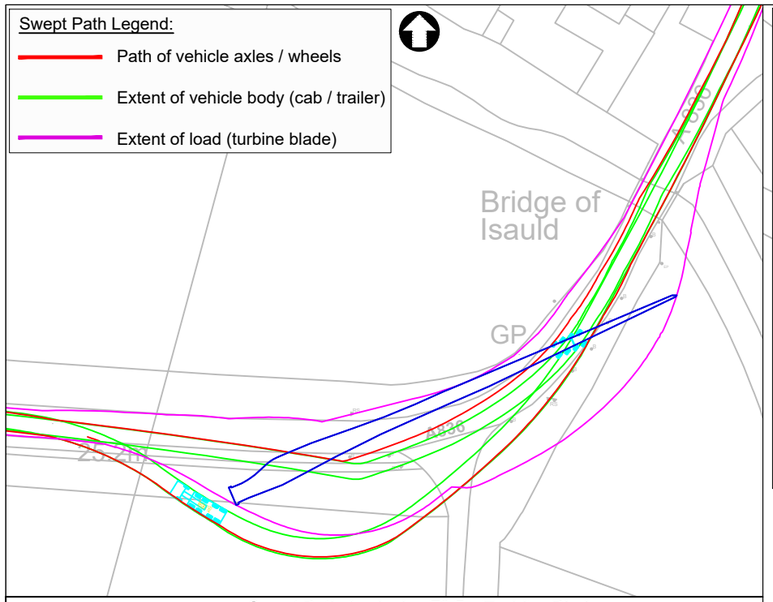
GRE87086

CONSTRAINT 8:
Right Hand Bend at Bridge of Isauld
(NGR (⊕): 297645, 965031)

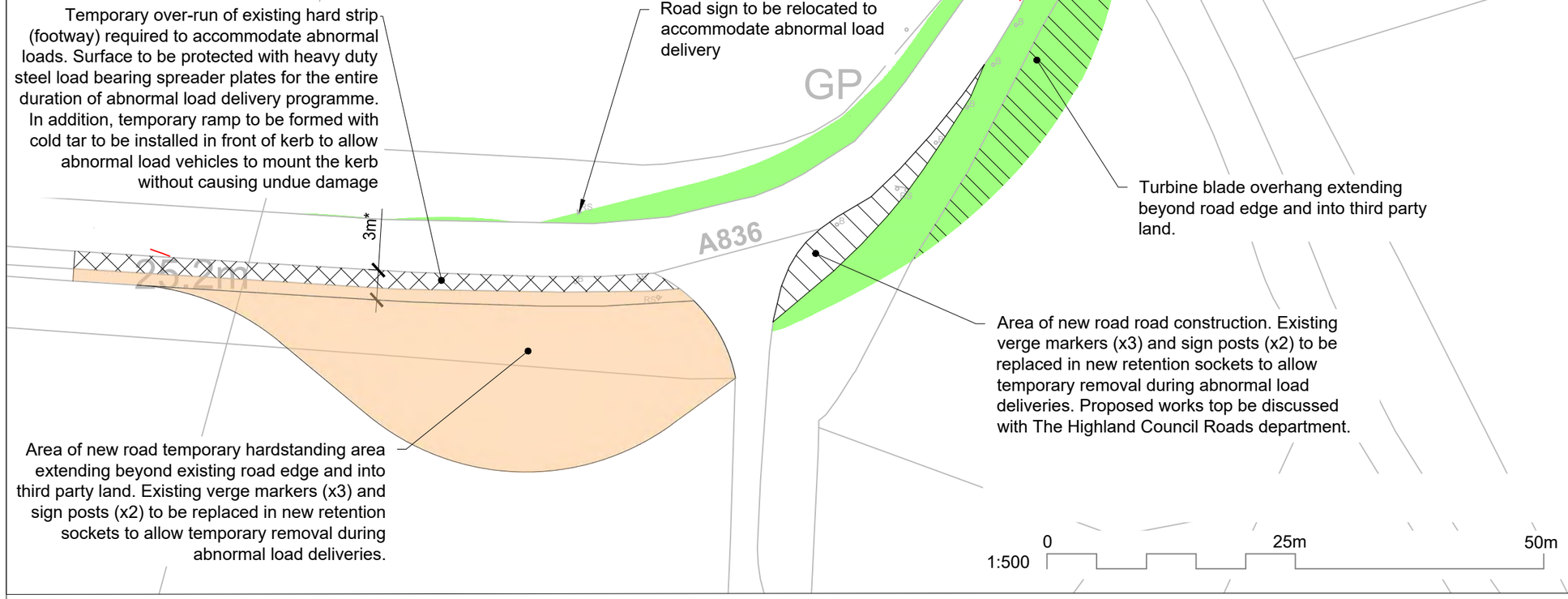
Swept Path Legend:
- Path of vehicle axles / wheels
- Extent of vehicle body (cab / trailer)
- Extent of load (turbine blade)



Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:1000 @ A3)

Key
- Vehicle/load overhang beyond road carriageway edge.
- Vehicle/load overhang into third party land
- Indicative proposed road widening to accommodate vehicle over-run
- Indicative proposed road widening (Unbound Type 1 construction) to accommodate vehicle over-run into third party land
- EP Electrical pole
- RS Road sign
- B Bollard

3*: In absence of physical boundary, it has been assumed that the public road corridor extends up to 3m from the edge of the road carriageway.



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3. Street furniture is indicative only.
4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect manual steering.
6. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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Title
Figure 8.2.10
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 8: Right Hand Bend at Bridge of Isauld

Drawn	J Bell	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:500 or as shown

Drawing Number
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Security	Status	Rev
STD	PRE	P2

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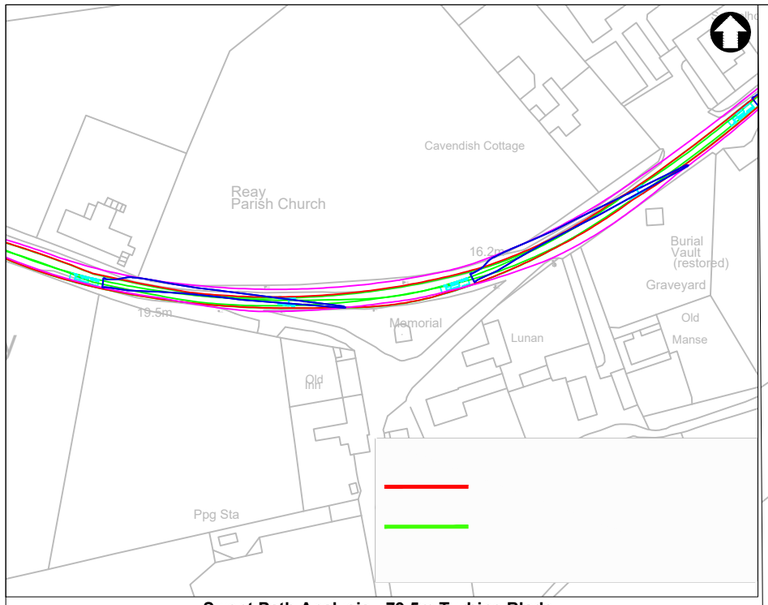
CONSTRAINT 9:
Right Hand Bend at Memorial
(NGR (⊕): 296822, 964804)



Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:2000 @ A3)

Key

- Vehicle/load overhang beyond road carriageway edge.
- Existing hard strip (to be over-run)
- Vehicle/load overhang into third party land
- Indicative proposed road widening (unbound Type 1 construction) to accommodate vehicle over-run
- ○ LC — Lighting Column
- Road Sign

Existing sign post to be replaced in new retention sockets to allow temporary removal/demounting during abnormal load deliveries. Proposed works to be discussed/agreed with The Highland Council Roads department.

Turbine blade overhang extending beyond existing road edge and into third party land.

Area of road widening required to accommodate vehicle over-run.

Temporary over-run of existing hard strip required to accommodate abnormal loads. Surface to be protected with heavy duty steel load bearing spreader plates for the entire duration of abnormal load delivery programme. In addition, temporary ramp to be formed with cold tar to be installed in front of kerb to allow abnormal load vehicles to mount the kerb without causing undue damage

Existing lighting column to be relocated to accommodate turbine delivery. Position and specification to be agreed with The Highland Council street lighting Engineer.

1:2000 0 100m 200m

1:1000 0 50m 100m

Notes

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3. Street furniture is indicative only.
4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect manual steering.
6. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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P1	04.05.20	RG	Issue 1: Draft for Client review	FJ	JD
P2	18.06.20	RG	Issue 2 - Added Figure Reference	FJ	JD

Title

Figure 8.2.11
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 9: Right Hand Bend at Memorial

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:1000 or as shown

Drawing Number
409481-MMD-00-XX-DR-C-3011

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CONSTRAINT 10:
Bridge of Reay
(NGR (⊕): 295731, 964614)

Key

- Vehicle/load overhang beyond road carriageway edge.
- Vehicle/load overhangs into third party land
- Existing hard strip (to be over-run)
- ○ LC — Lighting column
- RS — Road sign

Turbine blade overhang extending beyond verge and into third party land.

Existing lighting column to be relocated to accommodate turbine delivery. Position and specification to be agreed with The Highland Council street lighting Engineer.

Temporary over-run of existing hard strip (verge) required to accommodate abnormal loads.

Reay
The Smiddy
16.2m
A836
LC
1
2

0 25m 50m
1:500

Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:1000 @ A3)

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4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect manual steering.
6. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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P1	04.05.20	RG	Issue 1 - Draft	FJ	JD
P2	18.06.20	RG	Issue 2 - Added Figure Reference	FJ	JD

Title

Figure 8.2.12
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 10: Bridge of Reay

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:500 or As Shown

Drawing Number
409481-MMD-00-XX-DR-C-3012

Security	Status	Rev
STD	PRE	P2

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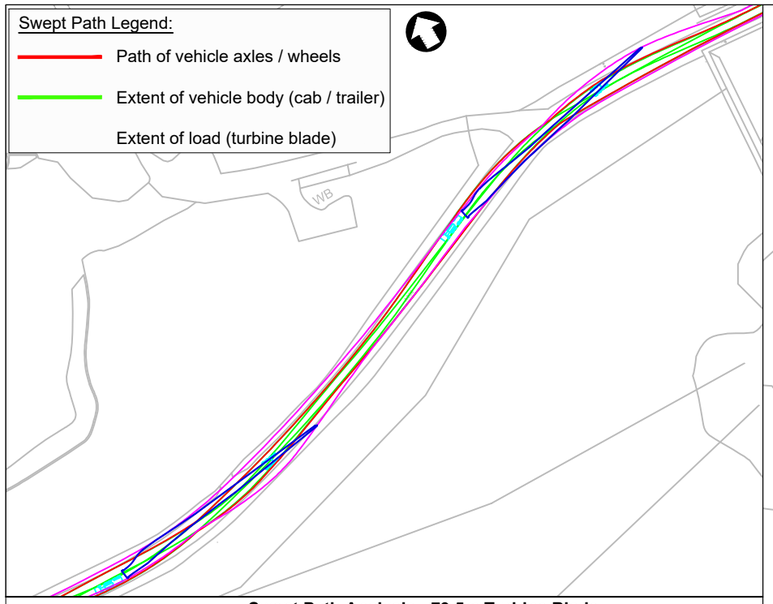
Swept Path Legend:

- Path of vehicle axles / wheels
- Extent of vehicle body (cab / trailer)
- Extent of load (turbine blade)



Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:2000 @ A3)

1:2000 0 100m 200m

1:1000 0 50m 100m

CONSTRAINT 11:
Left hand bend by Craigielea
(NGR (⌖): 294791,964622)

No remedial works anticipated to accommodate delivery of a 79.5m turbine blade

Key

- Vehicle/load overhang beyond road carriageway edge.
- EP Electrical Pole
- RS Road sign

Notes

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3. Street furniture is indicative only.
4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect automatic steering.
6. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

2

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P1	04.05.20	RG	Issue 1 - Draft for Client Review	FJ	JD
P2	18.06.20	RG	Issue 2 - Added Figure Reference	FJ	JD

Title

Figure 8.2.13
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 11: Left hand bend by Craigielea

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:1000 or as shown

Drawing Number
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Security	Status	Rev
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CONSTRAINT 13:
Left Hand Bend Next to Drumhollistan Moss
(NGR (⊕): 293261, 964522)

Existing Road sign post to be replaced in new retention sockets to allow temporary removal/demounting during abnormal load deliveries. Proposed works to be discussed/agreed with The Highland Council Roads department.

Key

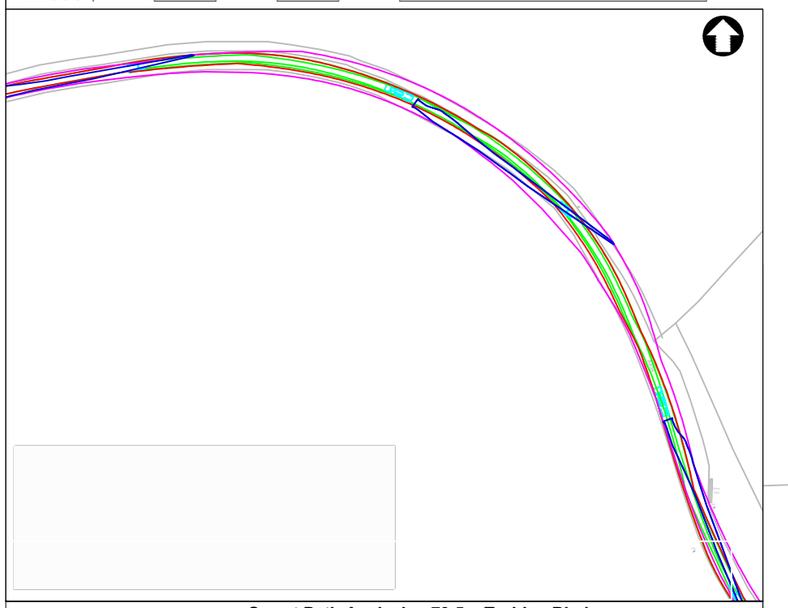
Vehicle/load overhang beyond road carriageway edge.

RS Road sign

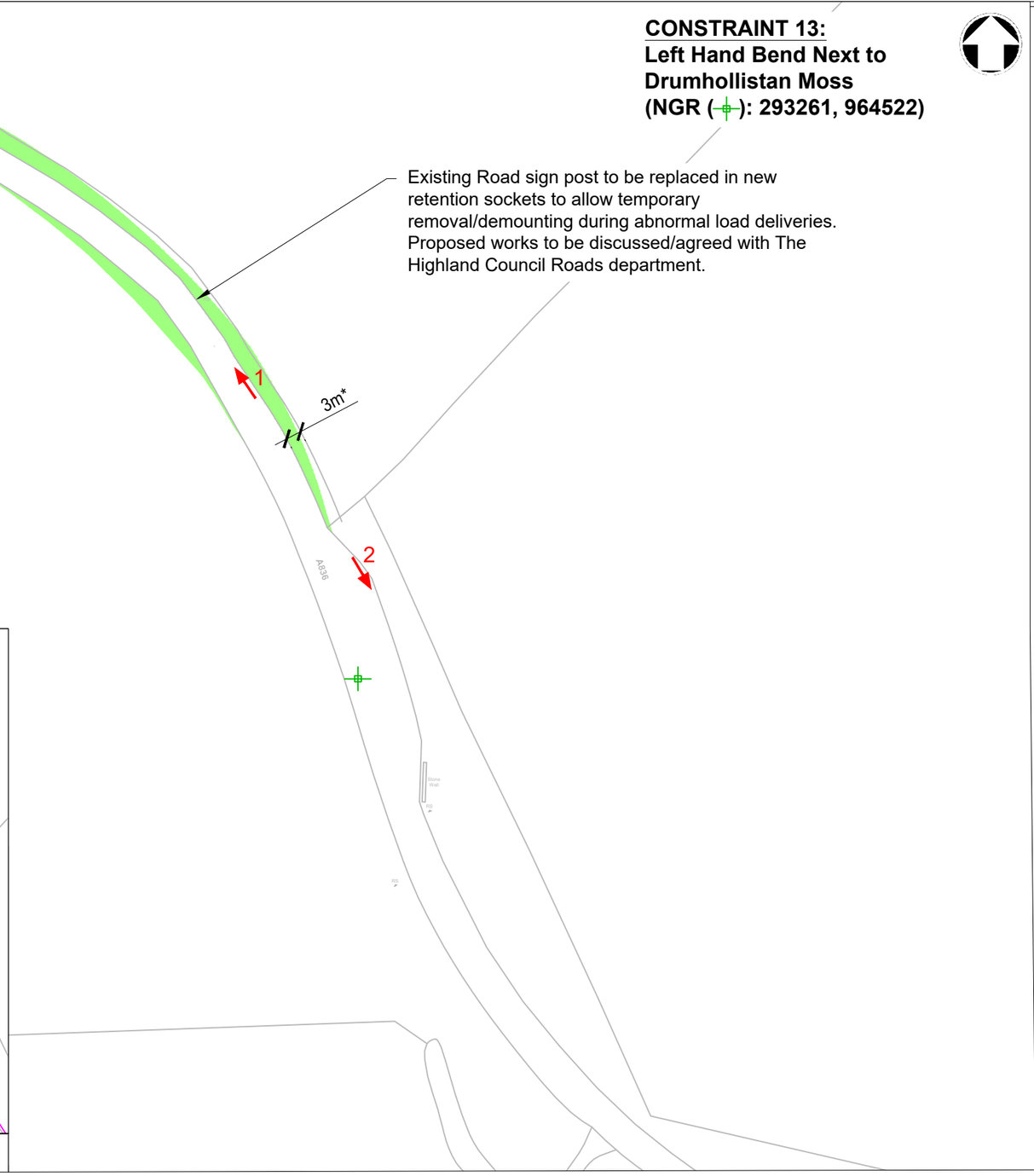
*:In absence of physical boundary, it has been assumed that the public road corridor extends up to 3m from the edge of the road carriageway.

1:2000 0 100m 200m

1:1000 0 50m 100m



Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:2000 @ A3)



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3. Street furniture is indicative only.
4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect manual steering.
6. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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P1	04.05.20	RG	Issue 1: Draft for Client review	FJ	JD
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Title

Figure 8.2.14
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 13: Left Hand Bend Next to Drumhollistan Moss

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:1000 or As Shown

Drawing Number
409481-MMD-00-XX-DR-C-3014

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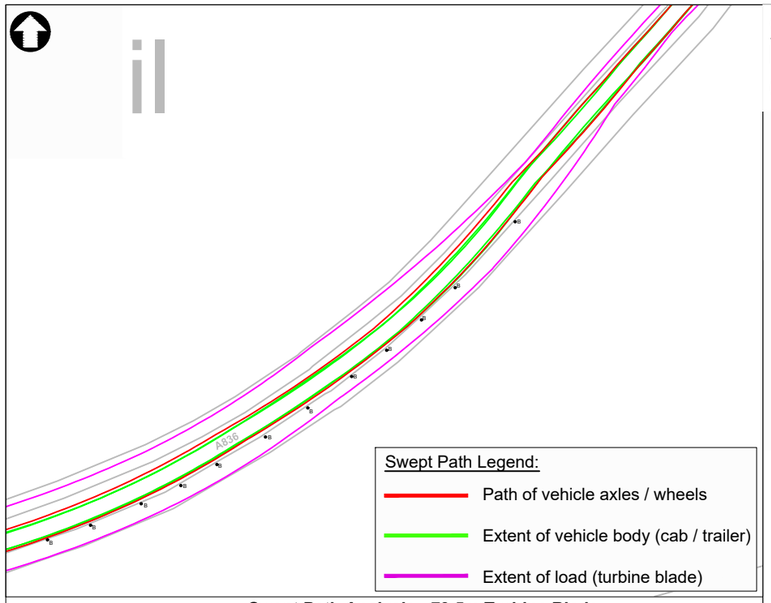

Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:1000 @ A3)

Key

Vehicle/load overhang beyond road carriageway edge.

◦B Bollard

*:In absence of physical boundary, it has been assumed that the public road corridor extends up to 3m from the edge of the road carriageway.

CONSTRAINT 14:
Right hand bend by Cnoc a' Mhail
(NGR (⌖): 291207,964309)

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3. Street furniture is indicative only.
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5. Swept paths reflect manual steering.
6. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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P2	18.06.20	RG	Issue 2 - Added Figure Reference	FJ	JD

Title

Figure 8.2.15
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 14: Right hand bend by Cnoc a' Mhail

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:500 or as shown

Drawing Number
409481-MMD-00-XX-DR-C-3015

Security	Status	Rev
STD	PRE	P2

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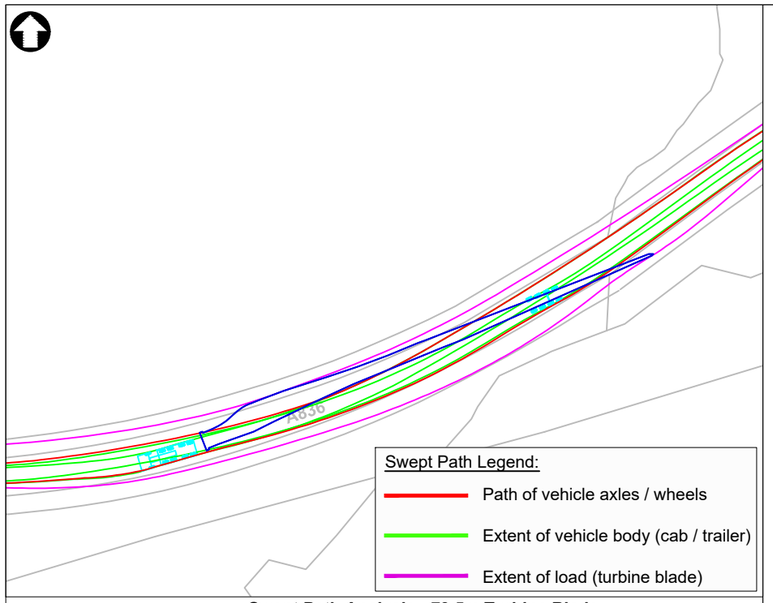

Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:1000 @ A3)

CONSTRAINT 15:
Right hand bend by Clach Sgoilt
(NGR (⊕): 290875, 964188)

Key

Vehicle/load overhang beyond road carriageway edge.

Rock outcrop
(shown indicative)

Turbine blade overhang extending over verge. Note the prescence of a large rock outcrop adjacent to the road (north verge) which may restrict overhang. It is likely this can be avoided through localised use of manual steering, alternatively the road could be widened to the south, however works in this area will be limited by the adjacent watercourse.

Notes

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5. Swept paths reflect automatic steering.
6. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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Title

Figure 8.2.16
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 15: Right hand bend by Clach Sgoilte

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:500 or as shown

Drawing Number
409481-MMD-00-XX-DR-C-3016

Security	Status	Rev
STD	PRE	P2

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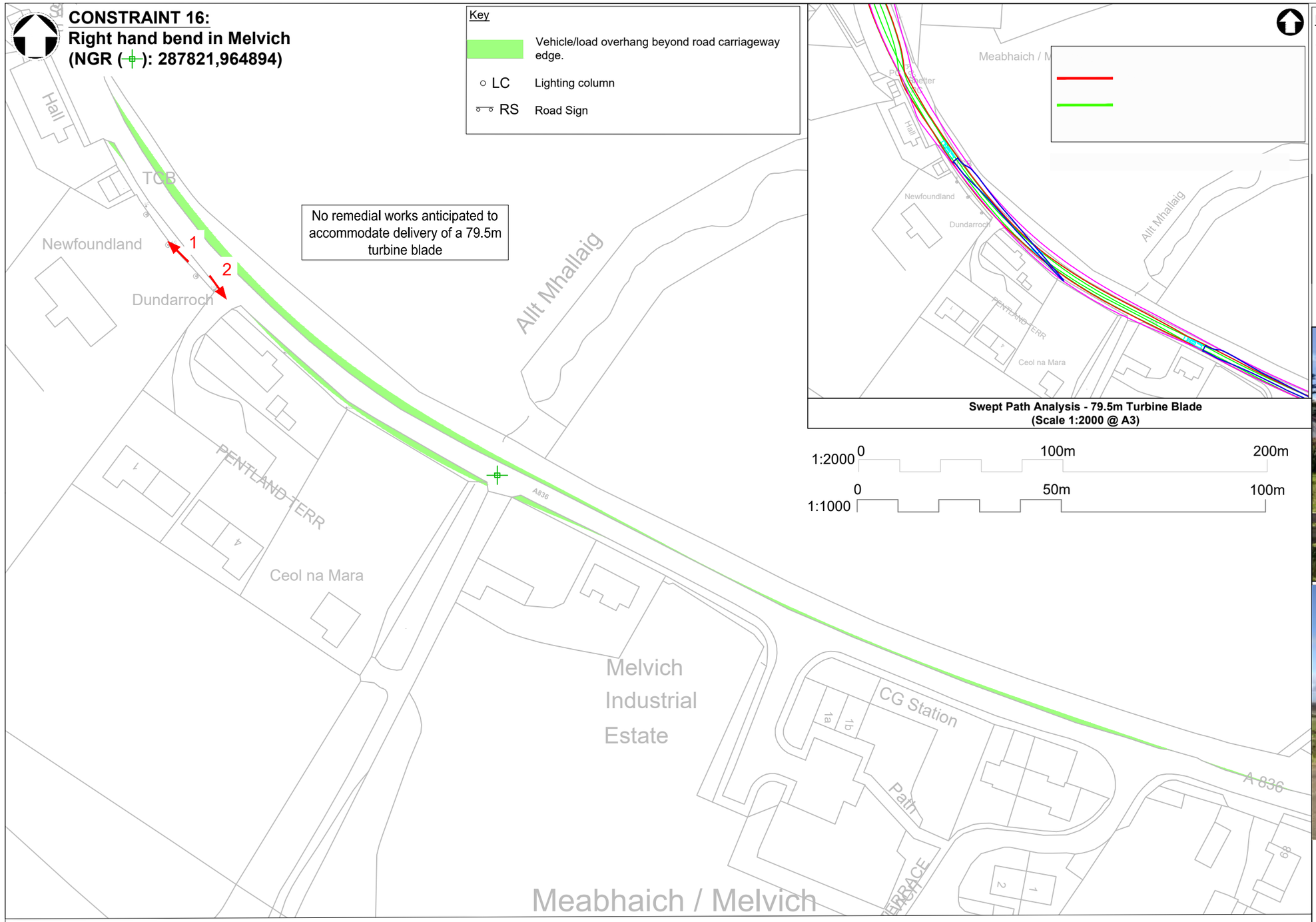
CONSTRAINT 16:
Right hand bend in Melvich
(NGR (⊕): 287821,964894)

Key

- Vehicle/load overhang beyond road carriageway edge.
- ○ LC — Lighting column
- RS — Road Sign

No remedial works anticipated to accommodate delivery of a 79.5m turbine blade



Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:2000 @ A3)

1:2000 0 100m 200m

1:1000 0 50m 100m

Notes

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3. Street furniture is indicative only.
4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect automatic steering.
6. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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P1	04.05.20	JB	Issue 1: Draft for Client Review	FJ	JD
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Title

Figure 8.2.17
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 16: Right Hand Bend in Melvich

Drawn	J Bell	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:1000 or as shown

Drawing Number
409481-MMD-00-XX-DR-C-3017

Security	Status	Rev
STD	PRE	P2

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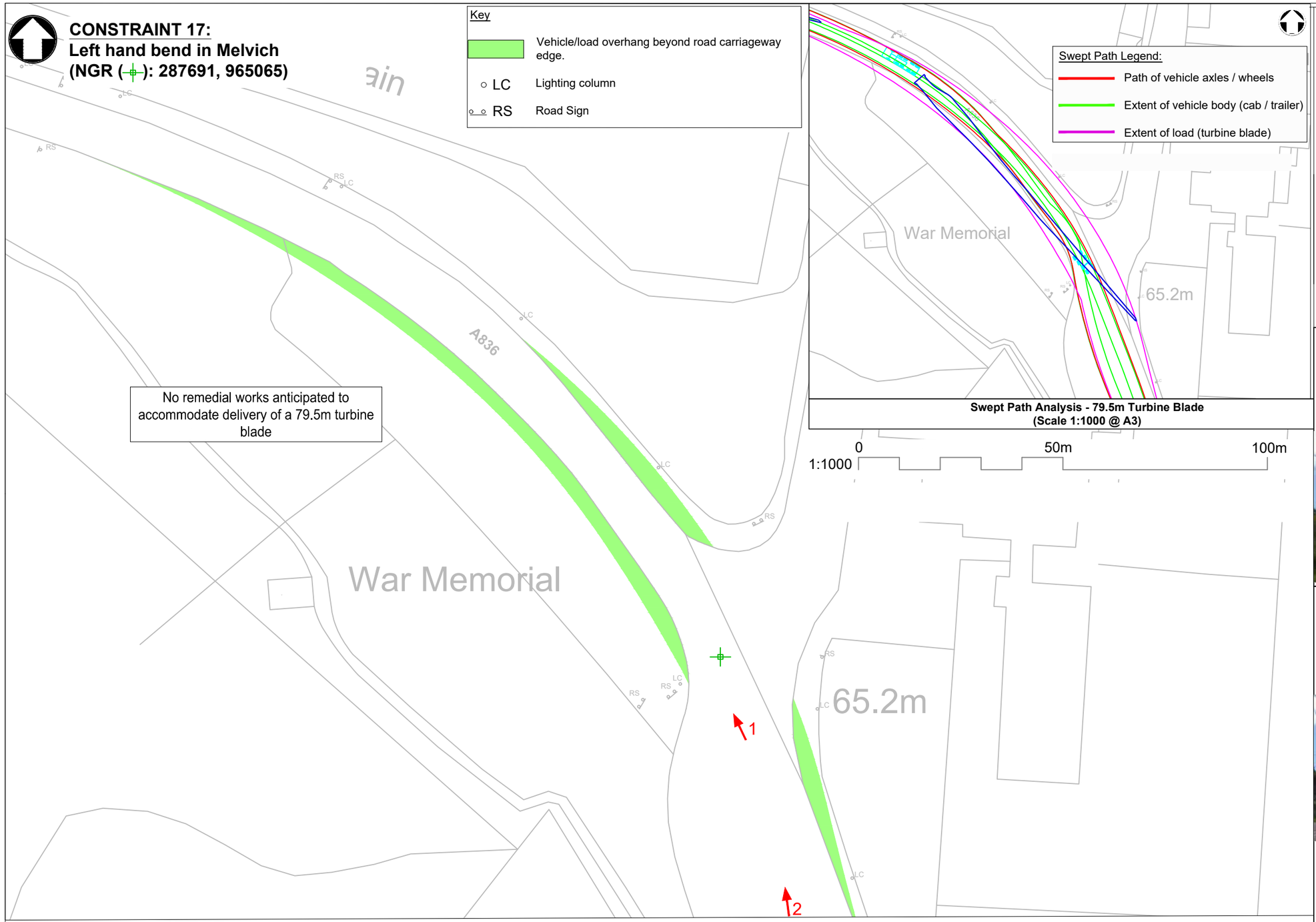
CONSTRAINT 17:
Left hand bend in Melvich
(NGR (⊕): 287691, 965065)

Key

- Vehicle/load overhang beyond road carriageway edge.
- ○ LC — Lighting column
- ○ RS — Road Sign

No remedial works anticipated to accommodate delivery of a 79.5m turbine blade



Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:1000 @ A3)

1:1000 — 0 — 50m — 100m

Notes

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3. Street furniture is indicative only.
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5. Swept paths reflect automatic steering.
6. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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P1	04.05.20	JB	Issue 1: Draft for Client Review	FJ	JD
P2	18.06.20	RG	Issue 2 - Added Figure Reference	FJ	JD

Title

Figure 8.2.18
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 17: Left hand bend in Melvich

Drawn	J Bell	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:500 or as shown

Drawing Number
409481-MMD-00-XX-DR-C-3018

Security	Status	Rev
STD	PRE	P2

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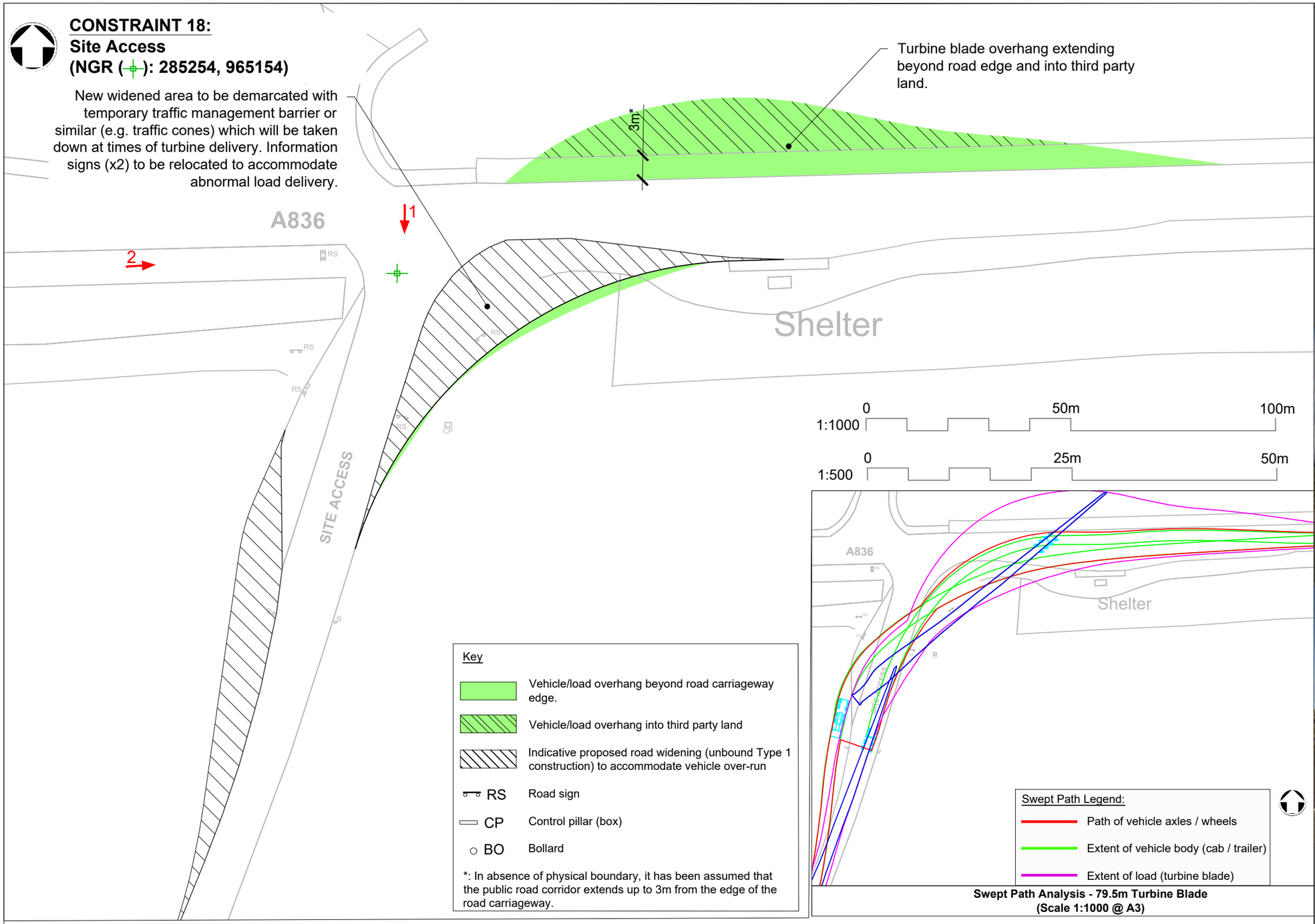
CONSTRAINT 18:
Site Access
(NGR (⊕): 285254, 965154)

New widened area to be demarcated with temporary traffic management barrier or similar (e.g. traffic cones) which will be taken down at times of turbine delivery. Information signs (x2) to be relocated to accommodate abnormal load delivery.

Turbine blade overhang extending beyond road edge and into third party land.



Key

- Vehicle/load overhang beyond road carriageway edge.
- Vehicle/load overhang into third party land
- Indicative proposed road widening (unbound Type 1 construction) to accommodate vehicle over-run
- RS Road sign
- CP Control pillar (box)
- BO Bollard

*: In absence of physical boundary, it has been assumed that the public road corridor extends up to 3m from the edge of the road carriageway.

1:1000 0 50m 100m

1:500 0 25m 50m

Swept Path Legend:

- Path of vehicle axles / wheels
- Extent of vehicle body (cab / trailer)
- Extent of load (turbine blade)

Swept Path Analysis - 79.5m Turbine Blade
(Scale 1:1000 @ A3)

Notes

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3. Street furniture is indicative only.
4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect manual steering.
6. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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P1	04.05.20	JB	Issue 1: Draft for Client Review	FJ	JD
P2	18.06.20	RG	Issue 2 - Added Figure Reference	FJ	JD

Title

Figure 8.2.19
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 79.5m Turbine Blade
Constraint 18: Site Access

Drawn	J Bell	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:500 or as Shown

Drawing Number
409481-MMD-00-XX-DR-C-3019

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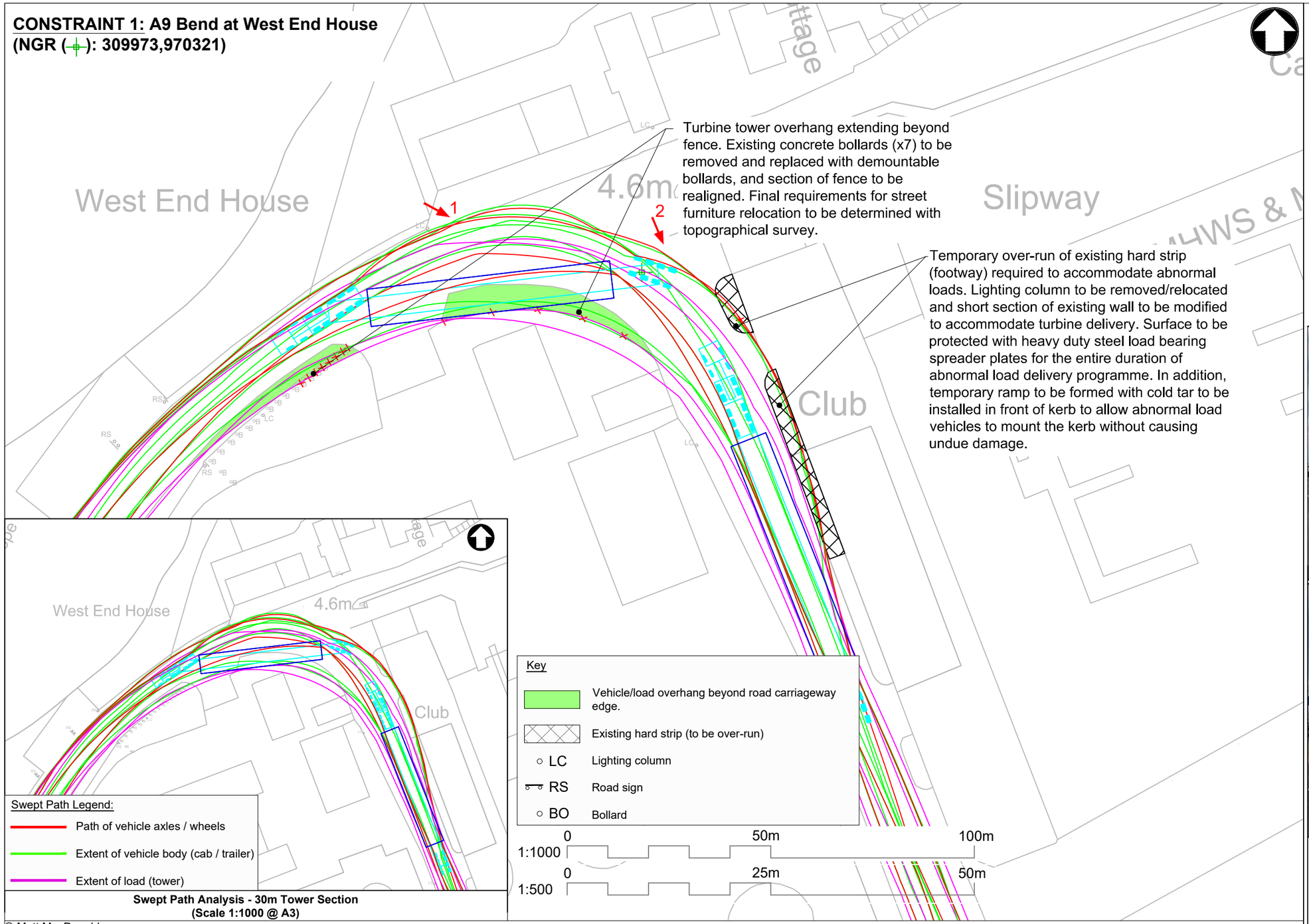
CONSTRAINT 1: A9 Bend at West End House
(NGR (⊕): 309973,970321)



Swept Path Analysis - 30m Tower Section
(Scale 1:1000 @ A3)

Notes

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2. The vehicle represents a 30m long, 4.6m diameter tower carried using clamps. Subject to confirmation with haulier
3. Street furniture is indicative only.
4. Swept path analysis should be verified through in-situ trial run.
5. Swept paths reflect automatic steering.
6. Potential conflict with buried utility apparatus below areas of road widening to be determined through utility search, and appropriate remedial works implemented as required.

Existing site conditions
(Photograph locations shown - 1)

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P2	18.06.20	RG	Issue 2 - Added Figure Reference	FJ	JD

Title
Figure 8.2.20
Strathy South Wind Farm
Abnormal Load Access Study
Swept Path Analysis - 30m Tower Section
Constraint 1: A9 Bend at West End House

Drawn	J Bell
Checked	FJahnke
Approved	J Dooley

Scale at A3
1:500 or as shown

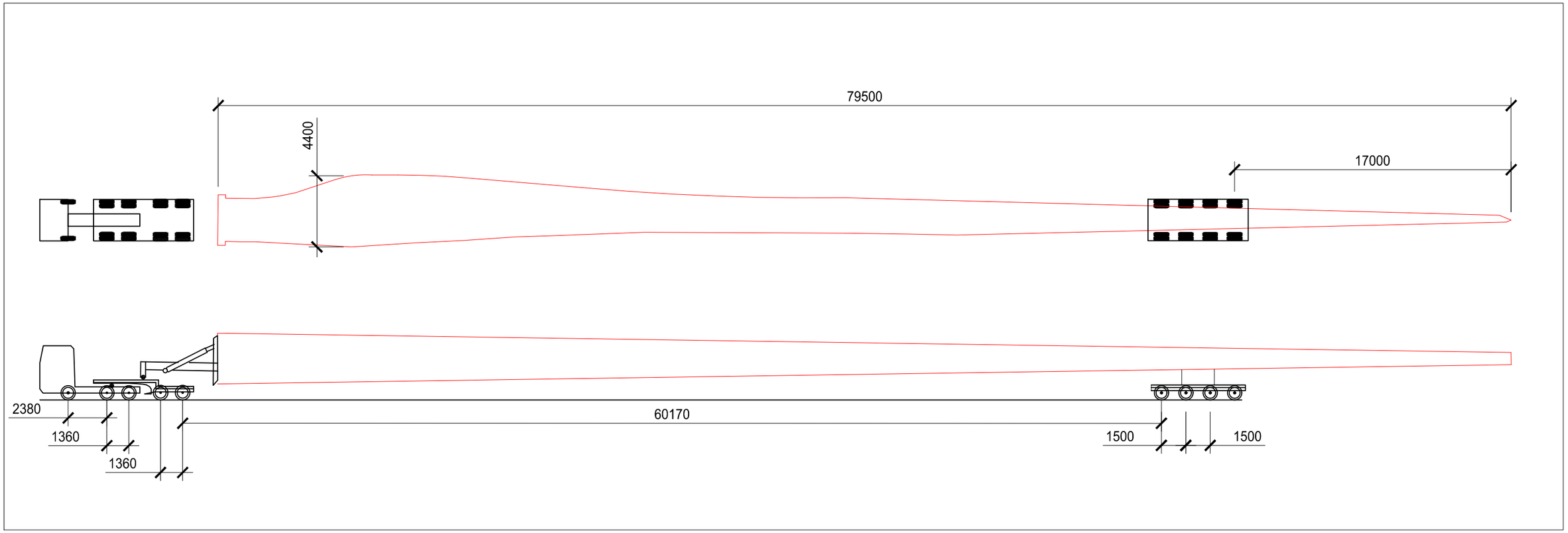
Drawing Number
409481-MMD-00-XX-DR-C-3020

Security	Status	Rev
STD	PRE	P2

P:\Glasgow\ITG\Transport Planning\Projects\409841 - Strathy South WF\CAD\Working\409841-MMD-00-XX-DR-C-3020 -P2.dwg Jun 18, 2020 - 3:57PM GRE87086

Notes

1. All dimensions are in millimeters unless noted otherwise.
2. The vehicle configuration represents a 79.5m turbine blade transported with a clamp and dolly system. Vehicle configuration is subject to confirmation with haulier.



1:250 0 12.5m 25m

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Client

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	18.06.20	RG	Issue 1 - Draft for Client Review	FJ	JD

Title

Figure 8.2.21
Strathy South Wind Farm
Abnormal Load Access Study
79.5m Turbine Blade Delivery Vehicle
Indicative Arrangement

Drawn	R Gregg	
Checked	F Jahnke	
Approved	J Dooley	

Scale at A3
1:250

Drawing Number
409481-MMD-00-XX-DR-C-3021

Security	Status	Rev
STD	PRE	P1

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JAH59220

B. Roads Authorities Consultation

[redacted]

From: [redacted]
Sent: 30 July 2019 08:04
To: [redacted]
Cc: [redacted]
Subject: RE: Strathy South Wind Farm - Roads Consultation
Attachments: Proposed Strathy South.xls; Xerox Scan_29072019160108.pdf

[redacted]

Thanks for clarification of proposed lifting equipment and ballast.

Please see attached spreadsheet listing the structures to be crossed.

Structures A08360360 through to A08360400 (6 structures highlighted on lines 7 to 12) were previously assessed for the specific vehicle attached as pdf here and also in Sheet 2 of the spreadsheet, and think their assessments should re-visited for this proposed wind farm

I would suggest that you review the above with a view to proposing how you would like to progress.

Regards,

[redacted]

From: [redacted]
Sent: 29 July 2019 10:37 am
To: [redacted]
Cc: [redacted]
Subject: FW: Strathy South Wind Farm - Roads Consultation

[redacted]

I'm following up regarding our previous conversation on the Strathy South Wind Farm construction route. I've now had a chance to discuss with colleagues and gather a bit more information regarding the likely construction vehicles (cranes/bases) that will be used during this phase of the proposed works.

It is likely that the main crane used during construction will be of similar spec to the Liebherr LG1750 mobile crane and has a max. load capacity of 750t (details in link below):

https://www.liebherr.com/en/gbr/products/mobile-and-crawler-cranes/mobile-cranes/lg-lattice-mast-cranes/details/lg1750.html

Hopefully this information is of some use. If there is anything further you need to discuss, please feel free to get back in touch.

Kind regards,

[redacted]

[redacted]

From: [redacted]
Sent: 09 July 2019 12:16
To: [redacted]
Cc: [redacted]
Subject: Strathy South Wind Farm - Roads Consultation

[redacted]

Mott MacDonald have been commissioned by SSE to carry out an abnormal load access route study for the proposed Strathy South Wind Farm. The Site is located within the Strathy South Forest block, approximately 12km south of Strathy Village in Sutherland.

We would be most appreciative if you could provide a list of structures on the route and highlight structure(s) that would require to be assessed. Exact transport vehicle configurations are not known yet, however it is expected that the heaviest component will be approx. 90 tonnes with an individual total weight of transport vehicle approx. between 120 t -135 t gross weights.

It is anticipated that wind turbine components will be delivered at Scrabster Harbour. The proposed abnormal load route is described below (and shown HERE on Google):

- From Scrabster Harbour, join the A9 and continue up to its junction with the A836
- Join the A836 westbound
- Continue on the A836 for approx. 30km
- Turn left and join the existing Strathy North Wind Farm access road

We are also consulting with BEAR Scotland separately to discuss the road sections within their remit.

Please let me know if you require any additional information.

Kind regards,

[redacted]

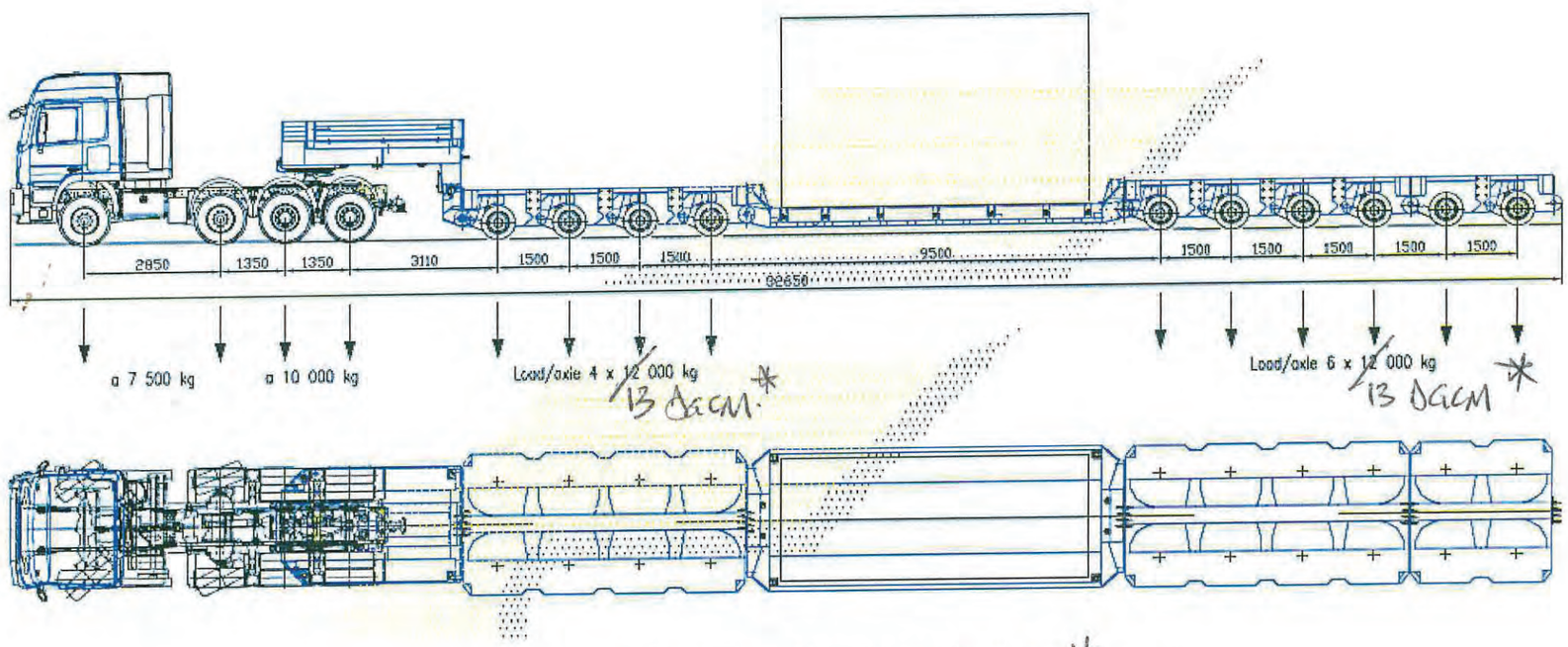
MOTT MACDONALD

[redacted]

PROPOSED STRATHY SOUTH WIND FARM

29/07/2019

Item Type	Bridge Code	Bridge Name	Easting	Northing	No Of Spans	Overall Length of Structure (m)	Structural Form	Superstructure Type	Comments
BRIDGE	A08360409	SMITHY	309521	968843	1	4	New structure	Concrete Slab	**Able to carry proposed AIL.**
BRIDGE	A08360400C29	BRIMS	305240	969135	1	2.88	Simply Supported Deck,	Concrete Slab	**Able to carry proposed AIL.**
BRIDGE	A08360400C01	UNNAMED	303790	968720	1	2.5	Simply Supported Deck, Arch Fixed Ends	Masonry Arch widened with Concrete Slab	**Able to carry proposed AIL.** **AVOID MASONRY FLAG SECTION ON UPSTREAM SIDE.**
BRIDGE	A08360400	FORSS	303723	968665	2	16	Arch Fixed Ends	Masonry Arch widened in concrete	**Previously Assessed for delivery vehicle in sheet 2**
BRIDGE	A08360390	ISAULD	297650	965035	2	8	Arch Fixed Ends	Masonry Arch	**Previously Assessed for delivery vehicle in sheet 2**
BRIDGE	A08360380	OLD REAY	296980	964902	1	4.02	Arch Fixed Ends	Masonry Arch	**Previously Assessed for delivery vehicle in sheet 2**
BRIDGE	A08360370	NEW REAY	295730	964613	2	18.4	Arch Fixed Ends	Masonry Arch	**Previously Assessed for delivery vehicle in sheet 2**
BRIDGE	A08360360C73	DRUMHOLLINSTON NO 2	293880	964490	1	2.85	Simply Supported Deck	Concrete Slab	**Previously Assessed for delivery vehicle in sheet 2**
BRIDGE	A08360360	HALLADALE	289470	963180	2	48.8	Simply Supported Deck	Pre-stressed Concrete Beams/Slab	**Previously Assessed for delivery vehicle in sheet 2**
BRIDGE	A08360349	ALLT NA CLEITE	287000	965100	1	3	New structure		**Able to carry proposed AIL.**
BRIDGE	A08360339	BALIGILL	285600	965300	1	5	New structure		**Able to carry proposed AIL.**



Replace 12t axles with 13t

[redacted]

From: [redacted]
Sent: 14 August 2019 10:44
To: [redacted]
Cc: [redacted]
Subject: RE: Abnormal Load Query - Strathy South Wind Farm Mott MacDonald

Good morning,

The following trunk road structures are located on the proposed route;

A9 1960 W97 Scrabster Harbour RB – masonry gravity wall buried in rock armour. Located on south side of road immediately exiting the harbour.
A9 1960 W80 Scrabster Oil Depot RB – RC cantilever wall. Located on east side of road behind oil dept at bottom hill.
A9 1960 W 62 Scrabster Appr'ch RB – RC wall with post tensioned anchors. Located on east side of road on hill out of Scrabster harbour.
A9 1960 Burnside Burn – 3.3 m span RC portal. Located 260 m before junction with A836

None of the structures would require to be assessed for the proposed movement.

Regards

[redacted]
Bridges Engineer | **Bridges Team**
BEAR Scotland | **North West Unit**
[redacted]
Visit us @ www.bearscot.com

Please consider the environment before printing this email

From: [redacted]
Sent: 13 August 2019 15:28
To: [redacted]
Cc: [redacted]
Subject: Abnormal Load Query - Strathy South Wind Farm Mott MacDonald

Good afternoon,

Mott MacDonald have been commissioned by SSE to carry out an abnormal load access route study for the proposed Strathy South Wind Farm located approximately 12km south of Strathy Village in Sutherland.

I spoke to a contact at BEAR Scotland yesterday (Murray MacLeod) who advised getting in touch via this email address in order to provide further information regarding our query.

As per our phone conversation, we have been commissioned to undertake an abnormal load access route study and would be most appreciative if you could provide a list of structures on the proposed route and highlight structure(s) that would require to be assessed. It is anticipated that wind turbine components will be delivered at Scrabster Harbour – the proposed abnormal load route is described below (and shown HERE on Google):

- From Scrabster Harbour, join the A9 and continue up to its junction with the A836

- Join the A836 westbound
- Continue on the A836 for approx. 30km
- Turn left and join the existing Strathy North Wind Farm access road

Exact transport vehicle configurations are not known yet, however it is expected that the heaviest component will be approx. 90 tonnes with an individual total weight of transport vehicle approx. between 120 t -135 t gross weights. Please note that we are also consulting with The Highland Council separately to discuss the road sections within their remit.

Kind regards,

[redacted]

M
MOTT M
MACDONALD

[redacted]

C. Scrabster Harbour Consultation

Record of meeting/discussion

MOTT MACDONALD

Project title	Strathy South WF	Division	ITD
Subject	Meeting to discuss access and transport	Project no	409841
Location	Scrabster Harbour	Date of meeting	04/06/19
Present	[redacted], SSE [redacted], SSE [redacted], SSE [redacted], Scrabster Harbour [redacted], Scrabster Harbour [redacted], MM [redacted], MM		

Recorded by	Distribution
SS	Attendees

Item	Notes	Action on
1.0	**Project Background** JS provided an introduction to the project. SSE recently submitted a revised scoping report (May 2019) for an increase in blade tip height (up to 200m) for the consented Strathy South WF. JS highlighted current Programme as below: ▪ End of Year 2019: SSE to submit S36 Application ▪ 2021: Discharge of planning conditions ▪ March 2022: Construction start ▪ June 2022: Turbine deliveries start ▪ April 2023: Grid connection date JS advised that SSE is considering Scrabster Harbour for the delivery of the wind turbine components.	
2.0	**Scrabster Harbour** JH and SM provided an overview of the harbour facilities: ▪ QE pier currently used as embarkation point for Northlink passenger ferries to Orkney/Shetland ▪ St. Ola pier only suitable for smaller vessels and storage at the moment. JH advised that in its current state the St. Ola pier would not be suitable for loading/unloading of heavy/large components. Possible structural issues with pier, however this is due for significant redevelopment ▪ Jubilee Quay primarily used for storage due to significant size (c. 11,000m^2)	

	▪ Circa 2,500m^2 storage available within Scrabster harbour storage compound ▪ Additional compound available at business park JH advised that significant upgrades are planned for the proposed redevelopment of the central (St. Ola) pier at Scrabster Harbour. ▪ Scrabster Harbour is expecting to hear this month (June) for the last part of the funding. ▪ Project currently at EIA Stage awaiting response from Marine Scotland (expected Nov 2020). ▪ Current (expected) timescales are Jan 2020 construction start with completion in May/June 2021. JH agreed to send current proposals to MM/SSE. JH advised that a 47m pipe Ø3m have been successfully delivered from the Jubilee Quay before. FJ asked if topographic survey of the harbour was available. JH to review what is available and send to MM/SSE. The meeting was followed by a walkover of the harbour facilities where additional measurements/observations were recorded by MM.	**Scrabster Harbour** **Scrabster Harbour**

END

[redacted] 10th June 2019

TA8.3: Assessment of the Consented Scheme based on 2023 Baseline

Technical Appendix 8.3: Strathy South Wind Farm

Consented Scheme: Assessment of the potential traffic and transport effects (based on 2023 Baseline)

3 August 2020

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Technical Appendix 8.3: Strathy South Wind Farm

Consented Scheme: Assessment of the potential traffic and transport effects (based on 2023 Baseline)

3 August 2020

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	22.03.2020	Sean Stephen	Fabien Jahnke	John Dooley	Issue 1: 1st Draft for Client Review
B	15.04.2020	Fabien Jahnke	John Dooley	John Dooley	Issue 2: 2nd Draft for Client Review
C	17.06.2020	Fabien Jahnke	John Dooley	John Dooley	Issue 3: 2nd Draft for Client Review
D	03.08.2020	Fabien Jahnke	John Dooley	John Dooley	Final Issue

Document reference: 409841|ITD|004|D

Information class: Standard

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1 Introduction

1.1 Project Background

SSE Generation Limited ('the Applicant') proposes to submit an application for consent to construct and operate Strathy South Wind Farm (the "Proposed Varied Development"). The Proposed Varied Development is located within the Strathy South conifer plantation, approximately 12 km south of Strathy Village in Sutherland.

An application under Section 36C of the Electricity Act 1989 (the "S36C application") proposes the variation of the Section 36 consent granted by Scottish Ministers on 27 April 2018 under the Electricity Act 1989 for the construction and operation of the Consented Scheme.

1.2 General

Mott MacDonald have been commissioned by the Applicant to produce Chapter 8: Roads and Traffic for the Proposed Varied Development's Environmental Impact Assessment Report (EIAR).

It was identified through the technical assessment process that the methodology adopted for the Proposed Varied Development assessment differs from the one that was previously used to assess the Consented Scheme; key changes to the approach include:

- The Study Area has been extended to include the A9 (T) from its junction with the A99 and the A836 to the west of Thurso;
- The scope of the assessment has been expanded to include potential cumulative effects with 'committed' developments and include the following categories of potential effects:
  - road safety; and
  - community effects (severance, pedestrian amenity / fear and intimidation and pedestrian delay).

In order to be able to compare 'like for like' the effects between the Consented Scheme and the Proposed Varied Development, it was decided to prepare an updated assessment of the Consented Scheme against the 2023 baseline.

This report documents an updated assessment of the potential traffic and transport effects associated with the construction of the Consented Scheme. Cumulative effects associated with cumulative [1] developments which are likely to generate traffic that would utilise local public roads within the Study Area at the same time as traffic generated by the Consented Scheme have also been assessed.

1.3 Structure of the Report

Further to this introductory section the report is structured as follows:

Section 2 sets out the assessment methodology

Section 3 presents the assessment of the potential significant effects and a summary

[1] Those developments which have permission/consent or are under construction or are the subject of an application for planning permission/consent

2 Assessment Methodology

2.1 Study Area

The Study Area incorporates the following public road Route Sections; illustrated contextually in Figure 8.3.1 (EIAR Volume 3a):

- Route Section (RS) 1 – A9(T) between the A99(T) and the A836.
- RS2 – A9(T) between the A836 (east) and the A836 (west).
- RS3 – A9(T) between Scrabster and the A836.
- RS4 – A836 between the A9(T) and the A897.
- RS5 – A836 between the A897 and the site access.

2.2 Scope of the Assessment

The following categories of potential effects have been assessed for route sections within the Study Area during the main construction phase for the Consented Scheme in isolation and cumulatively with cumulative developments which are likely to utilise local roads at the same time as traffic generated by the Consented Scheme:

- driver delay;
- road safety;
- community effects (severance, pedestrian amenity / fear and intimidation and pedestrian delay); and
- the physical effects (wear and tear) of HGV (including abnormal load) traffic on the public road infrastructure.

2.3 Method of Assessment

The methodology used in this assessment adheres to that set out in the IEMA Guidelines and follow similar methodology to the one indicated in Chapter 8: Roads and Traffic (EIAR Volume 2).

2.4 Assumptions and Limitations

The assumptions used in this assessment remains as per the ones identified in 2013 ES Addendum and subsequent 2014 Further Information Report (FIR); these are described in the following paragraphs.

The main construction phase would be expected to take place over a period of 24 months with works undertaken on site six days per week for an average of 24 days per month.

Construction related activities for the Consented Scheme comprise all activities relating to tree felling, construction/upgrading of access tracks, construction of turbine foundation, cabling installation and erection of wind turbines.

It has been assumed that concrete would be batched on-site with water extracted from on-site. Sand, aggregates and cement would be imported to the site and sourced from local providers/quarries. Concrete related deliveries would be routed via the A9 (T) and access the site locally from the A836.

Steel reinforcement deliveries for turbine foundations and electrical equipment are assumed to originate from the Central Belt. These deliveries would be routed via the A9 (T) and access the site locally from the A836.

Stone associated with the construction of the site access tracks would comprise of a mixture of stone imported for off-site quarries and obtained from on-site borrow pits. Stone deliveries would be routed via the A9 (T) and access the site locally from the A836.

It has been assumed that timber resulting from tree felling would be exported to local sawmills or locations in the Central Belt. Timber trucks would be routed via the A836 and A9 (T).

It is assumed that during construction, site personnel would be transported to and from the site by car, mini-bus or van; all classed as Light Goods Vehicles (LGVs). It is not intended that these vehicles would be restricted to specific site access routes. For the purpose of this assessment it has been assumed that site personnel would approach from the A9 (T) and access the site locally from the A836.

The number of personnel employed on-site would vary dependent upon the phase of construction. For the purpose of this assessment it has been assumed that there would be approximately 100 daily movements to the Consented Scheme associated with construction staff.

Table 2-1 summarises an estimate of construction vehicle movements generated by construction activity.

Table 2-1 Estimated Vehicle Movements Generated by the Construction of the Consented Scheme

Construction Activity	Vehicle Type	Total Vehicle Movements
Delivery of plant & equipment	Standard articulated lorry / low loader	98
Forestry felling	Standard articulated lorry	2,172
Delivery of stone for access track construction	Rigid Tipper	3,144
Delivery of steel reinforcement	Standard articulated lorry	330
Delivery of cement	Standard articulated lorry	526
Delivery of aggregate for concrete	Rigid Tipper	1,738
Delivery of sand for concrete	Standard articulated lorry	1,738
Delivery of sand for cabling trenches	Standard articulated lorry	1,792
Delivery of cables	Standard articulated lorry	42
Delivery of turbines – Abnormal Loads	Specialist vehicle	353
Delivery of turbines – Standard HGV	Standard articulated lorry	353
Other materials and equipment (e.g. pipes, geotextiles etc.)	Standard articulated lorry / rigid truck	258
Substation	Standard articulated lorry / rigid truck	40
Site servicing	20t HGV	154
Removal of plant and equipment	Standard articulated lorry / low loader	98
Construction Staff	Private cars, small vans and mini-bus	57,600
Total No. of HGV Movements		**12,836**
Total No. of LGV Movements		**57,600**
Total Traffic Movements		**70,436**

3 Assessment of Potential Significant Effects

As per the accompanying Chapter 8: Roads and Traffic (EIAR Volume 2), only the potential traffic and transport effects associated with the main construction phase of the Consented Scheme have been assessed.

3.1 Potential Construction Effects

3.1.1 Traffic Impact

As indicated in **Table 2-1** the total traffic generated by the Consented Scheme is estimated as 70,436 movements, of which 12,836 HGV movements over the 24-month construction period.

Referencing the indicative construction programme and the anticipated vehicle movements for each activity, the number of vehicle movements that are anticipated for each month of the construction programme has been calculated. The vehicle movements calculated have then been distributed over each route section as per the assumptions documented in **Section 2.4**.

Estimated daily and monthly traffic movements generated by construction of the Consented Scheme against the programme are shown in **Table 3-1**.

Table 3-1 Consented Scheme Construction Traffic Generation

Month	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	Jul 23	Aug 23	Sep 23	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24	Apr 24	May 24	Jun 24	Jul 24	Aug 24	Sep 24	Oct 24	Nov 24	Dec 24
Total Daily Movements	172	172	106	106	126	126	126	126	126	126	126	140	140	122	122	122	106	106	106	106	106	108	106	106
Daily HGV Movements	72	72	6	6	26	26	26	26	26	26	26	40	40	22	22	22	6	6	6	6	6	8	6	6
Daily LGV Movements	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Construction traffic is estimated at an average of 123 vehicle movements (note: one trip = two movements; i.e. one delivery and one return journey), a day over the entire construction period, with a maximum of 172 vehicle movements occurring per day between January 2023 and February 2023. The 'peak period' for the purpose of this assessment is therefore considered to be January 2023 to February 2023 inclusive. **Table 3-2** presents a summary of this information by route section. Route sections are illustrated in Figure 8.3.1.

Table 3-2 Consented Scheme Construction Traffic Increases

Route Section	Entire Construction Phase		Peak Period	
	Average Increase in Total Traffic (HGV + LGV)	Average Increase in HGV Traffic	Average Increase in Total Traffic (HGV + LGV)	Average Increase in HGV Traffic
RS1 A9 (T) between the A99 (T) and the A836	6%	11%	6%	13%
RS2 A9 (T) between the A836 (east) and the A836 (west)	1%	10%	1%	12%
RS3 A9 (T) between Scrabster and the A836	<1%	1%	0%	0%
RS4 A836 between the A9 (T) and the A897	5%	33%	5%	37%
RS5 A836 between the A897 and the site access	18%	122%	19%	137%

3.1.2 Link Capacity Review

The average link capacities for the various route sections within the Study Area have been estimated using the NESA Manual[2].

The theoretical capacities are detailed in **Table 3-3**.

Table 3-3 Study Area Route Section Link Capacities

Route Section	Link Capacity
RS1 A9 (T) between the A99 (T) and the A836	**c. 28,000** vehicles (two-way flows) per 12 hours
RS2 A9 (T) between the A836 (east) and the A836 (west)	**c. 20,000** vehicles (two-way flows) per 12 hours
RS3 A9 (T) between Scrabster and the A836	**c. 24,000** vehicles (two-way flows) per 12 hours
RS4 A836 between the A9 (T) and the A897	**c. 20,000** vehicles (two-way flows) per 12 hours
RS5 A836 between the A897 and the site access	**c. 20,000** vehicles (two-way flows) per 12 hours

From review of **Table 3-2**, the greatest effect of construction traffic would be on the A836 between its junction with the A9 and the site access. However, this reflects the low number of existing HGV traffic volume on these sections of the road network. When comparing the traffic volume generated by the construction of the Consented Scheme with the theoretical link capacities displayed in **Table 3-3**, it should be noted that there is significant spare capacity on

[2] Scottish Government (2005), NESA Manual, DMRB, Volume 15, Economic Assessment of Road Schemes in Scotland.

the local road network and no link capacity issues associated with the construction traffic of the Consented Scheme would be anticipated.

The 'IEMA Guidelines' suggest that a 10% traffic increase threshold should be used for sensitive road links to determine whether a detailed assessment of traffic effects is required. Route sections RS2 and RS4 are considered to be sensitive and from review of **Table 3-2** it can be seen that this condition is forecast to be breached for HGV traffic, both, throughout the duration of the entire construction period and during the 'peak period' of construction activity therefore a more detailed assessment has been undertaken for these route sections.

The 'IEMA Guidelines' suggest that a 30% traffic increase threshold should be used (for non-sensitive road links) to determine whether a detailed assessment of traffic effects is required. RS5 is not considered to be sensitive and from review of **Table 3-2** it can be seen that this condition is forecast to be breached for HGV traffic, both, throughout the duration of the entire construction period and during the 'peak period' of construction activity therefore a more detailed assessment has been undertaken for this route section.

Effects on RS1 and RS3 of the proposed construction access route are not considered to be of sufficient scale to warrant further assessment as the percentage increase in total traffic or HGV traffic is less than 30%.

3.1.3 Detailed Assessment

3.1.3.1 Driver Delay

There is potential for occasional driver delay during the movement of the abnormal loads, although this would only likely occur over a short time period during the construction phase. It should be noted that abnormal load deliveries would be typically undertaken outside peak hours and would be escorted by the police.

Once these turbine components have been delivered, vehicles would then convert to standard HGV dimensions and would not qualify as abnormal loads on their return journey. Empty turbine component delivery vehicles would travel at a similar to speed to general HGV traffic and would not require an escort.

HGV traffic volumes are projected to increase on the A836 and although the percentage increase is assessed as being low for RS4 and high for RS5, the maximum number of additional HGV movements per day would be 72; equating to approximately six HGV movements per hour. The magnitude of change in HGV traffic volume with regards to driver delay is therefore assessed to be negligible (not significant). Furthermore, the link capacity of RS4 and RS5 as highlighted in **Table 3-3** indicates that there is significant residual capacity on these links to accommodate the expected additional traffic. On this basis and considering the 'medium' sensitivity of RS4 of the A836, the driver delay effects associated with construction traffic generated by the Consented Scheme for users of the A836 are considered to be not significant in the context of the EIA Regulations 2017.

Similarly, HGV traffic levels are projected to increase on the A9; however, the percentage increase is assessed as being negligible. On this basis and considering the high sensitivity of RS2 of the A9, the driver delay effects associated with construction traffic generated by the Consented Scheme for users of the A9 are considered to be not significant in the context of the EIA Regulations 2017.

3.1.3.2 Road Safety

The NESA Manual suggests that where traffic flow doubles, it can be expected that road traffic collisions will double (i.e. the increase in collisions is likely to be approximately proportional to the increase in traffic).

Accordingly, if it is assumed that the number of collisions were to increase proportionally with the increase in traffic, the impact of the construction traffic on road safety per route section can be forecast. The results of this analysis are summarised in **Table 3-4**.

Table 3-4 Projected Personal Injury Collision (PIC)

Route Section	Average No. of Collisions (2023 Baseline)	Average No. of Collisions (2023 Baseline + Traffic Generated by Consented Scheme)
RS2 A9 (T) between the A836 (east) and the A836 (west)	1.75	1.77
RS4 A836 between the A9 (T) and the A897	4.2	4.4
RS5 A836 between the A897 and the site access	0	0

Using this basis of assessment, there would be a negligible increase in PICs in RS2 and RS4 route sections within the Study Area as a consequence of the increased traffic generated by the Consented Scheme and no increase on RS5. On this basis and considering the high and medium sensitivity of RS2 and RS4 respectively, the road safety effects associated with construction traffic generated by the Consented Scheme for users of the A9 and the A836 are considered to be not significant in the context of the EIA Regulations 2017.

3.1.3.3 Community Effects (severance, pedestrian amenity / fear and intimidation and pedestrian delay)

The 'IEMA Guidelines' define severance as *"the perceived division that can occur within a community when it becomes separated by a major traffic artery"*. Severance may result from a road carrying large traffic flows or a physical barrier created by the road itself, and the 'IEMA Guidelines' suggest that consideration is given to the severity of existing severance and how this might be exacerbated by proposed construction traffic generated by a development. RS2, RS4 and RS5 would continue to operate below their theoretical capacity, even with the addition of traffic generated by construction of the Consented Scheme. Severance should not occur when there is such a notable level of residual road capacity and traffic generated by the Consented Scheme would be relatively low (six HGV movements per hour). On this basis, the effect on severance for users of the A9 and A836 associated with construction traffic generated by the Consented Scheme is considered to be not significant in the context of the EIA Regulations 2017.

Traffic volume, composition, speed and the presence (or otherwise) of pedestrian footways and crossings all contribute to the level of general pleasantness, fear, intimidation and delay experienced by pedestrians and other vulnerable road users.

Site observations indicate that pedestrian activity on RS5 is low. It is therefore assessed that the sensitivity of this location to pedestrian delay and amenity effects is negligible. The magnitude of the increase in construction traffic is assessed to be negligible (six HGV

movements per hour); on this basis and considering the low sensitivity of RS5, the effects to pedestrian delay and amenity effects to users of RS5 associated with construction traffic generated by the Consented Scheme are considered to be not significant in the context of the EIA Regulations 2017.

The construction access route traverses Thurso (RS2), where pedestrian activity can be notable. The magnitude of the increase due to construction traffic is however assessed to be negligible (6 HGV movements per hour). It should also be noted that there is an existing pedestrian infrastructure network in Thurso; including footways, controlled crossings and informal crossings. On this basis and considering the high sensitivity of RS2 of the A9, the effects to pedestrian delay and amenity effects to users of RS2 associated with construction traffic generated by the Consented Scheme are considered to be not significant in the context of the EIA Regulations 2017.

The construction access route passes through Reay (RS4), where a school is situated in close proximity to the A836 and pedestrian activity can be notable during school pick-up and drop-off times. The magnitude of the increase due to construction traffic is, however, assessed to be negligible (6 HGV movements per hour). It should be noted that there are local traffic management features including illuminated 20 mph signs (which operate at beginning and end of school day) to encourage low speeds and footway provision in Reay. On this basis and considering the medium sensitivity of RS4 of the A836, the effects to pedestrian delay and amenity effects to users of RS4 associated with construction traffic generated by the Consented Scheme are considered to be not significant in the context of the EIA Regulations 2017.

Overall based on professional judgment, the effects upon community receptors associated with construction traffic generated by the Consented Scheme are considered to be not significant in the context of the EIA Regulations 2017.

3.1.3.4 The physical effects (wear and tear) of HGV (including abnormal load) traffic on the public road infrastructure.

Based on site observations and professional judgement, the current standard of RS2, RS4 and RS5 public road infrastructure is considered adequate to withstand the predicted ‘wear and tear’ of the construction traffic associated with the Consented Scheme.

On this basis, the effects to the RS2, RS4 and RS5 public road infrastructure associated with construction traffic generated by the Consented Scheme are considered to be not significant in the context of the EIA Regulations 2017.

3.2 Potential Cumulative Construction Effects

An assessment of the likely construction effects of the Consented Scheme and other cumulative developments has been undertaken to robustly take account of the likely interrelation of overlapping construction programmes and the resultant cumulative effect upon the local road network.

As indicated and explained in the Method of Assessment section of Chapter 8: Roads and Traffic (EIAR Volume 2) the following developments have been included together with the Consented Scheme for the cumulative traffic and transport assessment:

- Strathy Wood Wind Farm (Strathy Wood Wind Farm, Further Environmental Information, Chapter A 12 Traffic, Transport and Access, dated May 2015);
- Limekiln Wind Farm (Limekiln Wind Farm Resubmission Environmental Statement, Chapter 7 Traffic and Transport, dated June 2016).

3.2.1 Wind Farms Access Arrangements

The following assumptions have been made to inform the assessment, as derived from review of relevant supporting ES Reports for the cumulative developments:

- Construction traffic accessing the cumulative developments would do so from the east via the A836.

Table 3-5 details how much traffic would be added to each route section by the cumulative developments, during the most intense period of construction.

Table 3-5 Strathy Wood and Limekiln Wind Farms Traffic Generation

Route Section	Daily Additional Traffic (LGV + HGV)	Daily Additional HGV Traffic
RS1 A9 (T) between the A99 (T) and the A836	0	0
RS2 A9 (T) between the A836 (east) and the A836 (west)	0	0
RS3 A9 (T) between Scrabster and the A836	153	73
RS4 A836 between the A9 (T) and the A897	153	73
RS5 A836 between the A897 and the site access	49	9

3.2.2 Total Cumulative Construction Effects

This section documents an assessment of the maximum development case assuming that all the cumulative developments being considered as part of the cumulative assessment would proceed to construction.

It is uncertain if and when the construction phases of the cumulative developments and the Consented Scheme could overlap. To robustly assess cumulative traffic generation, cumulative assessment has been undertaken for route sections within the Consented Scheme Study Area that are utilised by other cumulative developments. This is based on the of sum of the average traffic generation of the cumulative developments and the Consented Scheme peak traffic generation. This is considered to represent a robust case scenario as, in reality, it is considered highly improbable that peak traffic generation for all developments would align.

Table 3-6 presents a summary of predicted traffic increases generated cumulatively during the ‘peak period’ of construction activity (January 2023 to February 2023 inclusive).

Table 3-6 Summary of Predicted Traffic Increase Generated Cumlatively (i.e. Consented Scheme + Cumulative Developments) during the 'peak period'

Route Section	Peak Period	
	Average Increase in Total Traffic (HGV + LGV)	Average Increase in HGV Traffic
RS1 A9 (T) between the A99 (T) and the A836	6%	13%
RS2 A9 (T) between the A836 (east) and the A836 (west)	1%	12%
RS3 A9 (T) between Scrabster and the A836	4.5%	72.3%
RS4 A836 between the A9 (T) and the A897	12.5%	207.1%
RS5 A836 between the A897 and the site access	32.7%	426.3%

From review of **Table 3-6**, the greatest impact of construction traffic would be on the A836 between its junction with the A9 and the site access, i.e. RS4 and RS5 . However, it should be noted that this reflects the low number of existing HGV traffic volume on these sections of the road network.

When comparing the traffic volume generated cumulatively by the developments with the theoretical link capacities, (as indicated in **Table 3-3**) it should be noted that there is significant spare capacity on the local road network and no link capacity issues associated with the construction traffic generated cumulatively would be anticipated.

The IEMA Guidelines suggest that a 10% traffic increase threshold should be used for sensitive road links to determine whether a detailed assessment of traffic effects is required. Route sections RS2 and RS4 are assessed to be sensitive and from review of **Table 3-6**, it can be seen that this condition is forecast to be breached for both HGV traffic and total traffic (HGV + LGV) on RS4 and for HGV traffic on RS2, therefore a more detailed assessment has been undertaken for RS2 and RS4.

The 'IEMA Guidelines' suggest that a 30% traffic increase threshold should be used (for non-sensitive road links) to determine whether a detailed assessment of traffic effects is required. Route sections RS3 and RS5 are not considered to be sensitive and from review of **Table 3-6**, it can be seen that this condition is forecast to be breached for both HGV traffic and total traffic (HGV + LGV) on RS5 and for HGV traffic on RS3, therefore a more detailed assessment has been undertaken for RS3 and RS5.

Effects on RS1 of the proposed construction access route are not considered to be of sufficient scale to warrant further assessment as the percentage increase in total traffic or HGV traffic is less than 30%.

3.2.3 Cumulative Detailed Assessment

3.2.3.1 Driver Delay

In the cumulative scenario, the cumulative developments would generate several abnormal load deliveries and create a notable increase in the volume of traffic (particularly HGV traffic). It should be noted however, that abnormal load deliveries would typically be undertaken outside peak hours and would be escorted by the Police. Empty turbine components delivery vehicles would reduce to standard HGV dimensions, and so would not qualify as abnormal loads on the return journey and would travel at a similar to speed to general HGV traffic and would not require escort.

HGV traffic levels are projected to increase on RS2 of the A9, however the percentage increase is assessed as being negligible. On this basis and considering the high sensitivity of RS2 of the A9, the driver delay effects associated with traffic generated cumulatively for users of the A9 are considered to be not significant in the context of the EIA Regulations 2017.

HGV traffic levels are predicted to increase on RS3 where HGV traffic flow generated cumulatively would reach 73 HGV movements per day, this would equate to approximately six HGV movements per hour. The magnitude of change in HGV traffic level with regards to driver delay is therefore assessed to be negligible. The link capacity of RS3 (as highlighted in **Table 3-3**) indicates that there is significant residual capacity along these links to readily accommodate the expected additional traffic flow. On this basis and considering the low sensitivity of RS3 the driver delay effects associated with traffic generated cumulatively for users of RS3 are considered to be not significant in the context of the EIA Regulations 2017.

HGV traffic levels are predicted to increase notably on the A836, specifically on RS4 where HGV traffic flow generated cumulatively would reach 145 HGV movements per day, this would equate to approximately 12 HGV movements per hour. The magnitude of change in HGV traffic level with regards to driver delay is therefore assessed to be low. Furthermore, the link capacity of RS4 (as highlighted in **Table 3-3**) indicates that there is significant spare capacity along this link to accommodate the expected additional traffic flow. On this basis and considering the medium sensitivity of RS4, the driver delay effects associated with traffic generated cumulatively for users of RS4 are considered to be not significant in the context of the EIA Regulations 2017.

HGV traffic levels are predicted to increase on RS5 and although the percentage increase is assessed as being high, the maximum number of additional HGV movements generated cumulatively per day is 81, this would equate to approximately seven HGV movements per hour. The magnitude of change in HGV traffic level with regards to driver delay is therefore assessed to be negligible. Furthermore, the link capacity of RS5 (as highlighted in **Table 3-3**) indicates that there is significant spare capacity along this link to readily accommodate the expected additional traffic flow. On this basis and considering the low sensitivity of RS5 of the A836, the driver delay effects associated with traffic generated cumulatively for users of the A836 are considered to be not significant in the context of the EIA Regulations 2017.

3.2.3.2 Road Safety

The NESA Manual suggests that where traffic flow doubles, it can be expected that road traffic collisions will double (i.e. the increase in collisions is likely to be approximately proportional to the increase in traffic).

Accordingly, if it is assumed that the number of collisions were to increase proportionally with the increase in traffic, the impact of the construction traffic on road safety per route section can be forecast. The results of this analysis are summarised in **Table 3-7.**

Table 3-7 Projected PIC (Cumulative)

Route Section	Average No. of Collisions (2023 Baseline)	Average No. of Collisions (2023 Baseline + Cumulative Traffic Generated by Consented Schemes)
RS2 A9 (T) between the A836 (east) and the A836 (west)	1.75	1.77
RS3 A9 (T) between Scrabster and the A836	0	0
RS4 A836 between the A9 (T) and the A897	4.2	4.7
RS5 A836 between the A897 and the site access	0	0

Using this basis of assessment, there would be a negligible increase in PICs in RS2 and RS4 route section within the Study Area as a consequence of the increased traffic generated cumulatively by the developments and no increase on RS3 and RS5. On this basis and considering the high and medium sensitivity of RS2 and RS4 respectively, the road safety effects associated with traffic generated cumulatively for users of the A9 and the A836 are considered to be not significant in the context of the EIA Regulations 2017.

3.2.3.3 Community Effects (severance, pedestrian amenity / fear and intimidation and pedestrian delay)

The 'IEMA Guidelines' define severance as 'the perceived division that can occur within a community when it becomes separated by a major traffic artery'. Severance may result from a road carrying large traffic flows or a physical barrier created by the road itself, and the 'IEMA Guidelines' suggest that consideration is given to the severity of existing severance and how this might be exacerbated by proposed construction traffic generated by a development. RS2, RS3, RS4 and RS5 would continue to operate comfortably within their respective capacity, even with the addition of traffic generated cumulatively. Severance should not occur when there is such a notable level of residual road capacity and traffic generated cumulatively would be relatively low (maximum 12 HGV movements per hour). On this basis, the effect on severance for users of the A9 and A836 associated with traffic generated cumulatively is considered to be not significant in the context of the EIA Regulations 2017.

Traffic volume, composition, speed and the presence (or otherwise) of pedestrian footways and crossings all contribute to the level of general pleasantness, fear, intimidation and delay experienced by pedestrians and other vulnerable road users.

The construction access route traverses Thurso (RS2), where pedestrian activity can be notable. The magnitude of the increase in construction traffic is however assessed to be low (seven HGV movements per hour). It should also be noted that there is an existing pedestrian infrastructure network in Thurso; including footways, controlled crossings and informal crossings. On this basis and considering the high sensitivity of RS2 of the A9, the effects to pedestrian delay and amenity to users of RS2 associated with traffic generated cumulatively are considered to be not significant in the context of the EIA Regulations 2017.

The construction access route traverses Scrabster (RS3), where pedestrian activity can be notable. The magnitude of the increase in construction traffic is however assessed to be negligible (six HGV movements per hour). It should also be noted that there is existing footway provision along that route section and local traffic management features including speed limit roundel road markings to encourage low speeds On this basis and considering the low sensitivity of RS3 of the A9, the effects to pedestrian delay and amenity to users of RS3 associated with traffic generated cumulatively are considered to be not significant in the context of the EIA Regulations 2017.

The construction access route traverses Reay (RS4), where a school is situated in close proximity to the A836 and pedestrian activity can be notable during school pick-up and drop-off times. The magnitude of the increase in construction traffic is however assessed to be low (12 HGV movements per hour). It should be noted that there are local traffic management features including illuminated 20mph signs (which operate at beginning and end of school day) to encourage low speeds and footway provision in Reay. On this basis and considering the medium sensitivity of RS4 of the A836, the effects to pedestrian delay and amenity to users of RS4 associated with traffic generated cumulatively are considered to be not significant in the context of the EIA Regulations 2017.

Site observations indicate that pedestrian activity on RS5 is low. It is therefore assessed that the sensitivity of this location to pedestrian delay and amenity effects is negligible. The magnitude of the increase in construction traffic is assessed to be negligible (seven HGV movements per hour). On this basis and considering the low sensitivity of RS5, the effects to pedestrian delay and amenity to users of RS5 associated with traffic generated cumulatively are considered to be not significant in the context of the EIA Regulations 2017.

Overall based on professional judgment, the effects upon community receptors associated with traffic generated cumulatively are considered to be not significant in the context of the EIA Regulations 2017.

3.2.3.4 The physical effects (wear and tear) of HGV (including abnormal load) traffic on the public road infrastructure.

Based on site observations and professional judgement, the current standard of RS2, RS3, RS4 and RS5 public road infrastructure is considered adequate to withstand the predicted 'wear and tear' associated of the construction traffic generated cumulatively by the developments. On this basis, the effects to the RS2, RS3, RS4 and RS5 public road infrastructure associated with traffic generated cumulatively are considered to be not significant in the context of the EIA Regulations 2017.

3.3 Mitigation

No potentially significant effects are identified based on the results of the above. However, public road infrastructure accommodation works would be necessary to safely accommodate the abnormal load vehicle movements for the Consented Scheme. Further consultation with THC, as local roads authority, would be required to further develop and agree the necessary infrastructure accommodation works and it is proposed that the full extent of all improvements works would be agreed through the Construction Traffic Management Plan (CTMP) as a condition of consent

3.3.1 Additional Good Practice Measures

Whilst not necessary to address the environmental effects associated with the increase in traffic within the Study Area (in terms of EIA Regulations 2017), it is proposed that construction traffic would be managed (through adoption of a regulated and approved CTMP).

The CTMP would document outline measures to promote the efficient transportation of components and materials to site, whilst reducing congestion and disruption which might impact negatively on local communities or general traffic and in particular the emergency services.

The CTMP should be considered a 'live' document that includes:

- Proposed traffic management and mitigation measures on the access route.
- Proposed measures to mitigate the impact of general construction traffic on the local road network following detailed assessment of relevant roads.
- A procedure for the regular monitoring of road conditions and the implementation of any remedial works required during the construction period.
- Details of appropriate upgrading works at the junction of the site access and the public road.
- Measures to ensure that all affected public roads are kept free of mud and debris arising from the development.
- A contingency plan prepared by the abnormal load haulier.
- A detailed protocol for the delivery of abnormal loads/vehicles, prepared in consultation and agreement with interested parties, including Highland Council, the Police, Transport Scotland and, as required, community representatives.
- A detailed delivery programme for abnormal load movements.

3.4 Assessment of Residual Effects

3.4.1 Residual Construction Effects

No significant construction effects have been identified in relation to road and traffic receptors and therefore there are no residual effects.

3.4.2 Residual Cumulative Construction Effects

Whilst no significant cumulative construction effects have been identified, if the construction of any notably sized development(s), e.g. wind farm development(s) (as considered in the cumulative assessment) appears likely to overlap with the Consented Scheme, as a matter of best practice, the Applicant would seek to liaise with the appropriate developer organisation regarding the scheduling of deliveries to identify potential means of reducing the effect of combined construction.

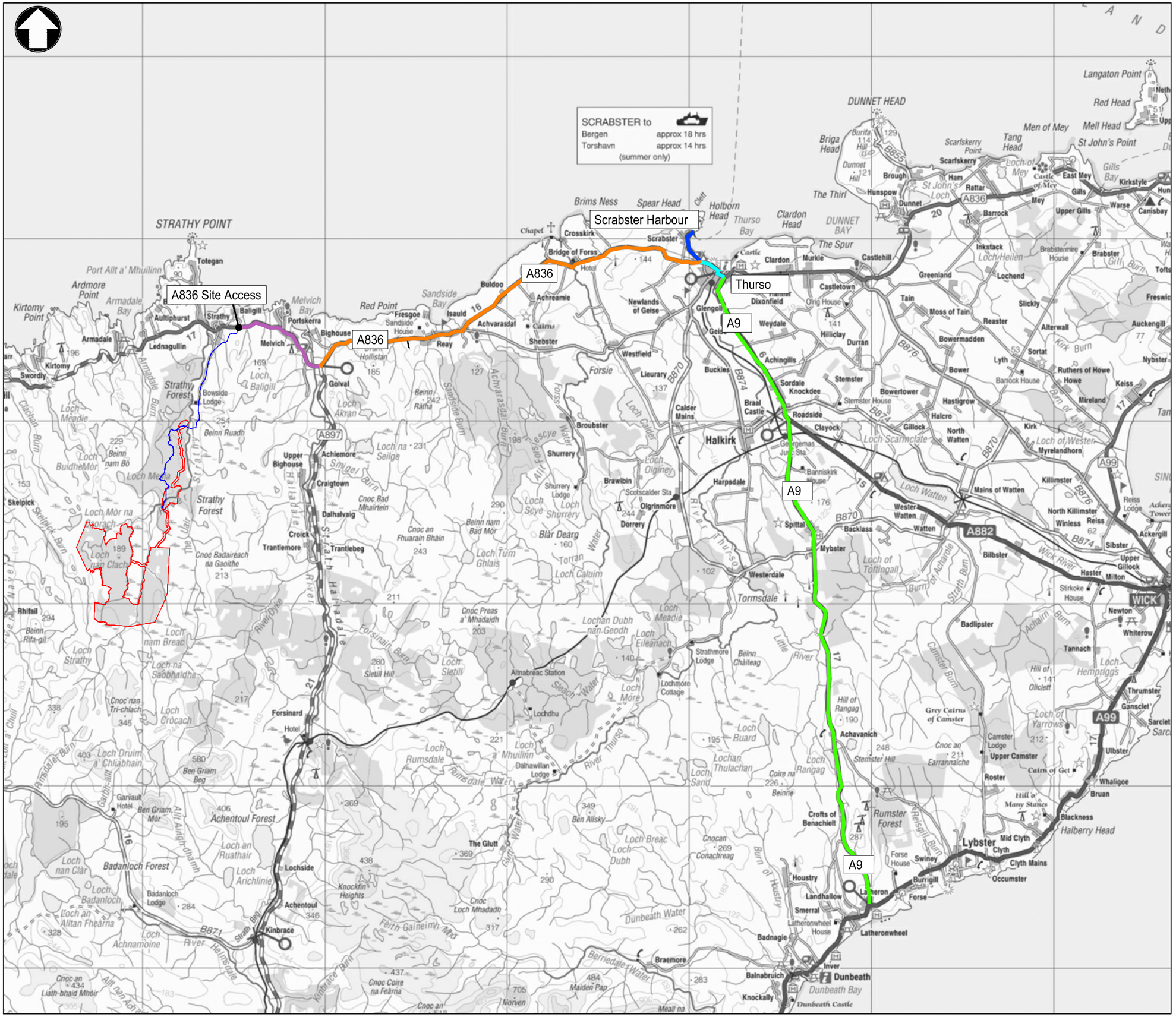
3.5 Summary

A summary of effects before and after proposed mitigation measures is provided in **Table 3-8**.

Table 3-8: Summary of Potential Significant Effects of the Consented Scheme

Potential Significant Effect (without mitigations)	Mitigation Proposed		Outcome / Residual Effect
Construction Effects			
Driver Delay	No significant effects predicted	N/A	N/A
Road Safety	No significant effects predicted	N/A	N/A
Community Effects (severance, pedestrian amenity / fear and intimidation and pedestrian delay)	No significant effects predicted	N/A	N/A
The Physical Effects (wear and tear) of HGV (including abnormal load) traffic on the public road infrastructure	No significant effects predicted	N/A	N/A
Cumulative Effects			
Driver delay	No significant effects predicted	N/A	N/A
Road Safety	No significant effects predicted	N/A	N/A
Community Effects	No significant effects predicted	N/A	N/A
The physical effects	No significant effects predicted	N/A	N/A

This assessment has considered the potential traffic and transport effects associated with the construction of the Consented Scheme. During construction, effects would be temporary, and the robust case residual traffic and transport effects have been assessed as being not significant in terms of the EIA Regulations 2017.



Key

- Route section 1
- Route section 2
- Route section 3
- Route section 4
- Route section 5
- Site Boundary
- Strathy Northern Access Route

Figure 8.3.1
Construction Access Routes Plan

Strathy South Wind Farm
EIAR 2020