EARBA STORAGE

A GILKES ENERGY COMPANY

Earba Pumped Storage Hydro Scheme

EIA Report

Appendix 17.1: Transport Assessment

February 2024

Pell Frischmann

Earba Pumped Storage Hydro Scheme

Transport Assessment

January 2024

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1 Introduction

1.1 Purpose of the Transport Assessment

Pell Frischmann (PF) has been commissioned by Earba Limited to undertake a Transport Assessment (TA) for the Proposed Development, which comprises of a new 1,800 Megawatt (MW), 40 Gigawatt-hour pumped storage scheme, located between Loch Leamhain and Loch Earba, to the west of Dalwhinnie.

The TA identifies the key transport and access issues associated with the Proposed Development and the likely traffic impacts in the study area. The TA identifies where mitigation works may be required to accommodate the predicted traffic impacts associated with the construction of the Proposed Development, to be developed during detailed design.

1.2 TA Structure

Following this introduction, the TA is structured as follows:

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

2 Site Background

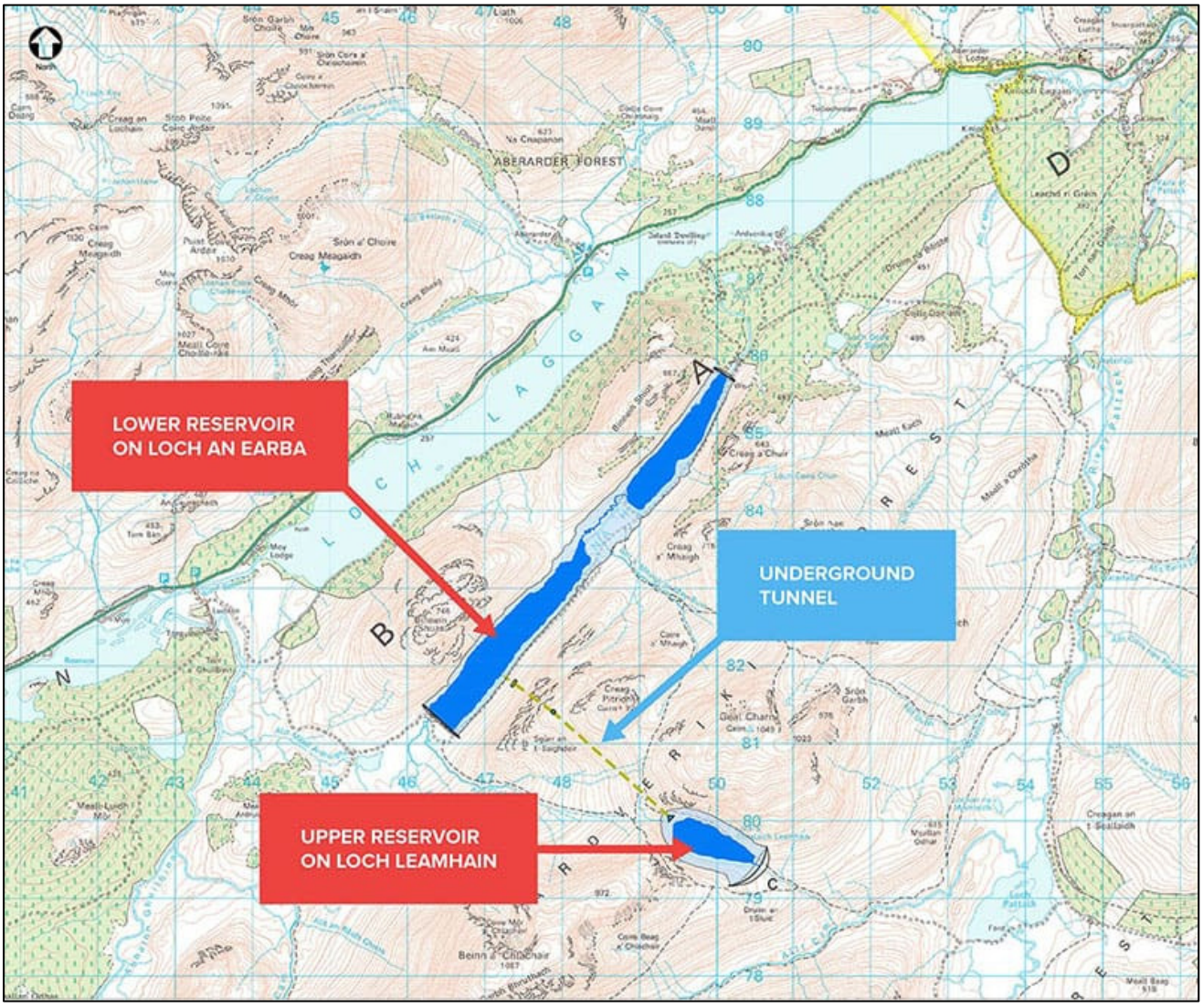
2.1 Site Location

The Proposed Development is located to the south of the A86 Lach Earba. The location of the route for the Proposed Development is shown in Figure 1.

The project will store up to 40,000MWh of energy which will make it the largest such scheme in the UK in terms of energy stored. The scheme will use Loch Leamhain as the upper reservoir and Loch Earba as the lower reservoir. Up to three tunnels approximately 3 kilometres (km) long will connect the two water bodies.

A powerhouse will be constructed on the shore of Loch Earba which will extend deep underground. The turbines will be located at the bottom of the powerhouse shaft and will generate electricity in times of national demand or pump water for energy storage in times when there is surplus electricity on the national grid.

Figure 1 Site Location

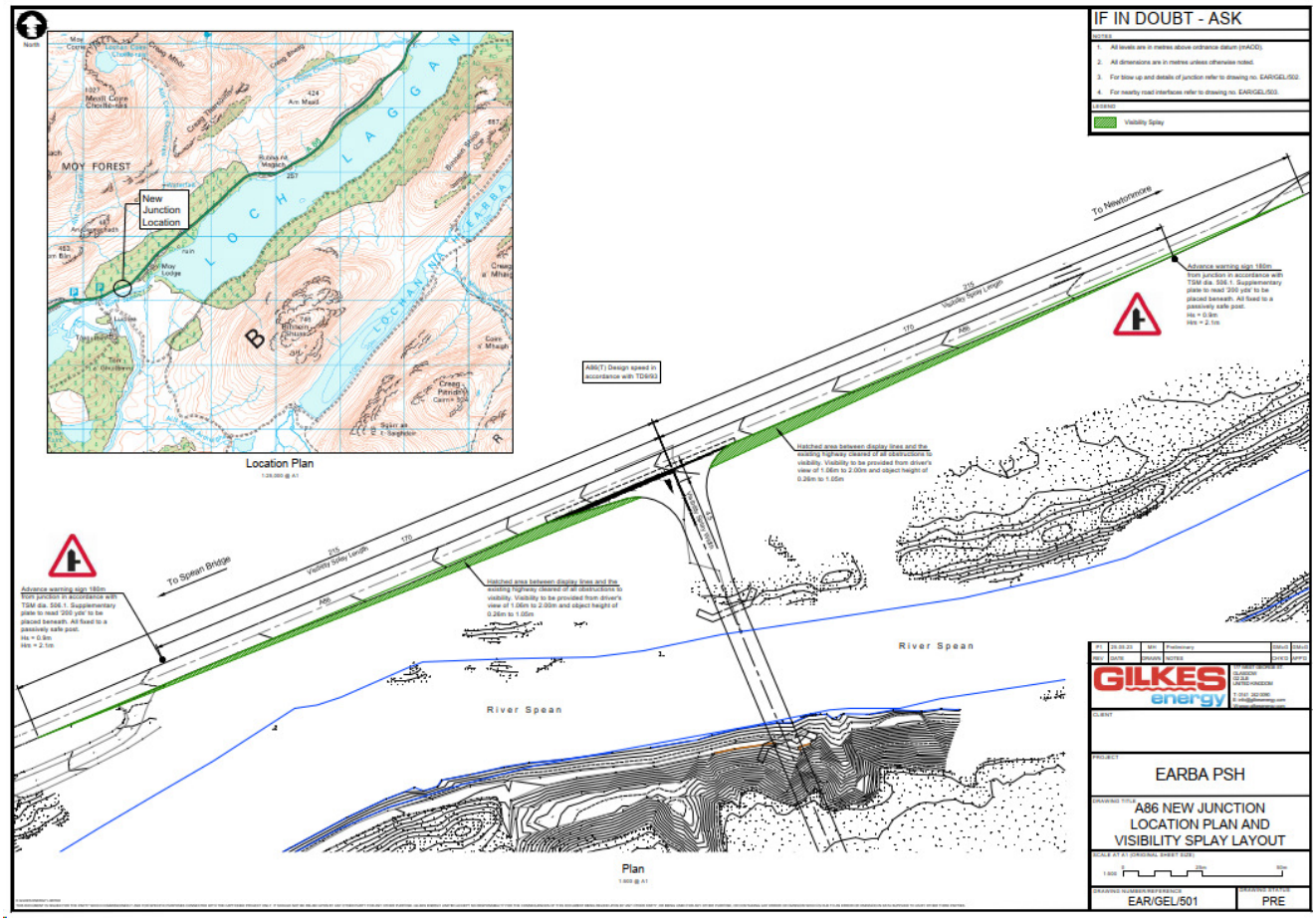


2.2 Proposed Access Strategy

The Proposed Development is to be accessed directly from the A86 trunk road via a new priority access junction. The new junction is located to the east of the existing crossing over the River Spean.

The layout of the junction is illustrated in Figure 2.

Figure 2 Proposed Site Access Junction



The proposed access junction has been discussed with Transport Scotland's network manager who has accepted the principle of the junction, its visibility and design.

Initial Site works including the detailed Site investigation and access track and new river crossing works would be undertaken using the existing access junction. This would be a temporary phase only and once all works on the new junction and bridge had been concluded, the new access track would be the only means of access to the Site for construction activities.

Further details of the Site access junction are provided in Annex A.

3 Transport Policy Review

3.1 Introduction

This part of the TA provides an overview of the relevant national and local transport planning policy and guidance.

3.2 National Policy and Guidance

3.2.1 3.2.1 National Planning Framework 4 (2023)

The Revised Draft National Planning Framework 4 (RDNPF4) was laid in Parliament on 08 November 2022. The RDNPF4 was approved by Scottish Parliament on 11 January 2023 and was then passed to Scottish Ministers who adopted the National Planning Framework 4 (NPF4) on 13 February 2023.

With regards to traffic and transport and the Proposed Development, Policy 11: Energy within the NPF4 notes that:

"a) Development proposals for all forms of renewable, low-carbon and zero emissions technologies will be supported. These include:

ii. enabling works, such as grid transmission and distribution infrastructure;

iii. energy storage, such as battery storage and pumped storage hydro;

e) In addition, project design and mitigation will demonstrate how the following impacts are addressed:

iii. public access, including impact on long distance walking and cycling routes and scenic routes;

vi. impacts on road traffic and on adjacent trunk roads, including during construction;

xi. proposals for the decommissioning of developments, including ancillary infrastructure, and site restoration;

xiii. cumulative impacts."

3.3 Local Policy and Guidance

3.3.1 Highland-wide Local Development Plan (2012)

The Highland-wide Local Development Plan (HwLDP) was adopted by The Highland Council (THC) in April 2012 and is the established development plan policy for the Highlands. It sets out a settlement strategy and spatial framework as to how THC foresees development occurring in a twenty-year period.

The HwLDP does not contain any specific policy guidance for the Proposed Development. However, Policy 56 is relevant with regards to general transport policy. The relevant transport elements from this policy are:

"Development proposals that involve travel generation must include sufficient information with the application to enable the Council to consider any likely on- and off- Site transport implications of the development and should:

- *incorporate appropriate mitigation on Site and/or off Site, provided through developer contributions where necessary, which might include improvements and enhancements to the walking/cycling network and public transport services, road improvements and new roads; and*
- *incorporate an appropriate level of parking provision, having regard to the travel modes and services which will be available and key travel desire lines and to the maximum parking standards laid out in Scottish Planning Policy or those set by the Council.*

When development proposals are under consideration, the Council's Local Development Strategy will be treated as a material consideration.

The Council will seek the implementation and monitoring of Green Travel Plans in support of significant travel generating developments."

3.3.2 The West Highlands and Islands Local Development Plan (2019)

The West Highlands and Islands Local Development Plan (WestPlan) was adopted in 2019 and along with HwLDP and Supplementary Guidance forms 'the development plan' which directs future developments within the Highlands. In relation to connectivity and transport, the outcome of the WestPlan's policies are as follows:

"Public agencies and other partners co-ordinate and optimise their investment in agreed growth locations. Communities are better supported to become more self-reliant, to have more pride in their area and identity, to diversify their populations, and to have more control of local resources."

3.3.3 Onshore Wind Energy Supplementary Guidance (2016)

The Onshore Wind Energy Supplementary Guidance was adopted by THC in 2016. Whilst not directly applicable to hydro schemes, elements of it are relevant to energy construction traffic. In relation to traffic and transport interests, the guidance document notes that:

"All proposals should seek to avoid significant adverse effects on the public road network individually and cumulatively with other built and permitted proposals as well as valid planning applications not yet determined (the weight apportioned to each will reflect their position in the planning process).

The proposals for the use of the public roads and mitigation works will require the approval of the Roads Authority. Developers will be required to enter into a Section 96 (Roads Scotland Act) agreement with the Council to cover damage to the public roads by construction traffic and may be required to provide a bond as surety.

Developers will be required to undertake a Transport Assessment to establish the transport impacts of the construction traffic associated with the development, the suitability of the existing road network, the impact on existing road users and adjacent communities, and the requirement for any mitigation works."

3.3.4 Guidance on the Preparation of Transport Assessments (2014)

THC has prepared guidance on how TA should be prepared for development Sites within the Highlands. The guidance was published by THC in November 2014.

This TA has been prepared having noted the guidelines and it provides the required assessment in accordance with the guidelines.

3.3.5 Roads and Transport Guidelines for New Developments (2013)

This THC document outlines the guidance and standards for the provision of infrastructure within the Council area, which includes the design and construction of all new roads associated with development proposals.

THC's Roads and Transport Guidelines for New Developments document provides guidance in relation to transport implications of onshore wind farm developments. Whilst the development proposals are not for the development of a wind farm, elements of the policy are applicable, namely:

"…a developer should be aware that the Council will require a Transportation Assessment (TA) to be submitted that must consider the existing road network, transportation constraints and potentially sensitive routes or communities.

A wind farm vehicular Site access must provide appropriate visibility splays and suitable surface water drainage. Within the Site, the wind turbines are likely to be located some distance from the nearest public road, requiring

internal access tracks to be constructed. As the access tracks need to accommodate abnormal loads, they have to be of a suitable width. These tracks are normally constructed from hard-core material and the developer will usually be encouraged/allowed to use material obtained from borrow pits within the Site area, to reduce construction traffic. On-Site concrete batching should also be considered, as this can also result in a reduction of associated vehicles on the local road network.

A suitable turning area must be constructed within the Site, to accommodate abnormal load delivery vehicles, construction vehicles and future maintenance vehicles. During the construction period, a wheel-wash system shall be provided."

3.4 Conclusion

The above summaries of policy statements are considered the most relevant to this TA.

4 Study Methodology

4.1 Introduction

The two key phases of the life of the Proposed Development are as follows:

- The Construction Phase; and
- The Operational Phase.

4.2 Project Phases – Transport Overview

Of the aforementioned phases, the construction phase is considered to have the greatest impacts in terms of transport. Construction plant, bulk materials and construction materials will be transported to Site, and these movements may potentially cause a significant increase in traffic on the network within the study area. It should be noted however that the construction effects are temporary and transitory in nature.

The operational phase is restricted to trips associated with the occasional maintenance of the Proposed Development which would generate significantly lower volumes of traffic, and which are not considered to be in excess of daily traffic variation levels on the road network. Therefore, no separate assessment for the operational phase is considered to be required.

4.3 Scoping Discussions

The Applicant submitted a request for a Scoping Opinion to the Scottish Ministers in respect of the Environmental Assessment (EA) which included a section considering traffic and transport. A full review of the Scoping Opinion and other consultation responses received is provided in EIA Report (EIAR).

5 Baseline Conditions

5.1 Study Area

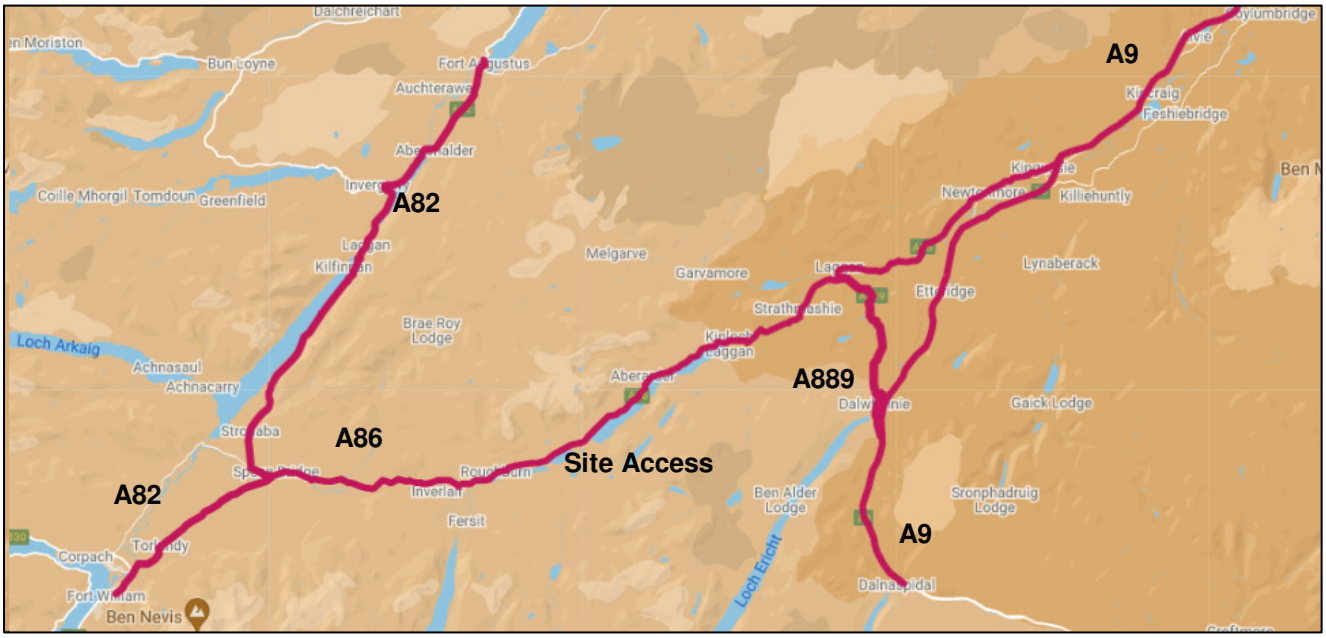
Access to the Proposed Development will be from the A86 via a new access junction and crossing of the River Spean.

The proposed study area is based upon the road network required to access the Proposed Development and based upon potential trunk road routes that would be used to allow the delivery of construction materials. The proposed study area is as follows:

- The A82 between Fort William and Fort Augustus;
- The A86 between Spean Bridge and Kingussie;
- The A9 between Aviemore and Dalnaspidal; and
- The A889 between Laggan and Dalwhinnie.

The extent of the study area is defined by the red lines in Figure 3. The two access tracks are shown in green.

Figure 3 Study Area



5.2 Pedestrian and Cyclist Networks

A review of Core Paths[1] directly affected by the Proposed Development works has been undertaken. There are no Core Paths located within the development Site or in close proximity to it. The nearest Core Paths are located approximately 6km to the west.

A review of Sustrans' National Cycle Route (NCR) map[2] indicates that NCR 7 Sunderland – Inverness uses part of the A889 between its junction with the A9 and General Wade's Road to the northeast of Dalwhinnie. No other NCR are located on roads forming part of the study area.

[1] The Highland Council, https://www.arcgis.com/apps/webappviewer/index.html?id=2fd3fc9c72d545f7bcf1b43bf5c8445f
[2] Sustrans, https://www.sustrans.org.uk/national-cycle-network

5.3 Road Access

A82 (T)

The A82 (T) is a two-way single carriageway which forms part of the trunk road network and provides a connection between Glasgow and Inverness, via Fort William. The A82 (T) is maintained by BEAR Scotland and is generally subject to the national speed limit, which reduces when travelling through towns and villages. An advisory speed limit of 40 miles per hour (mph) is recommended along this route for vehicles which are 7.5 tonnes and over.

A9

The A9 forms the principal north – south link between Stirling and Inverness. The road is a mix of sections of single carriageway and dual carriageway and is operated by BEAR Scotland on behalf of Scottish Ministers. The road is subject to average speed camera on single carriageway sections, with Heavy Goods Vehicle (HGV) traffic restricted to a limit of 50mph.

A889

The A889 is a two-way single carriageway which forms part of the trunk road network and provides a connection between the A9 at Dalwhinnie and the junction with the A86 near Laggan. The A889 is maintained by BEAR Scotland and is generally subject to the national speed limit, which reduces when travelling through Dalwhinnie.

A86

The A86 is a two-way single carriageway which forms part of the trunk road network and provides a connection between the A9 at Kingussie and the A82 at Spean Bridge. The A86 is maintained by BEAR Scotland and is generally subject to the national speed limit, which reduces when travelling through towns and villages on the route.

5.4 Existing Traffic Conditions

Traffic data used in the assessment has been sourced from the following sources:

1. A86 West of the Site Access - Department for Transport Count Site (Ref 40848);
2. A86 Spean Bridge - Transport Scotland Database Count Site (Ref 0000ATC01049);
3. A889 North of Dalwhinnie - Transport Scotland Database Count Site (Ref 000000001167);
4. A86 West of Newtonmore - Transport Scotland Count Site (Ref 0000ATC01051);
5. A9 North of Kingussie - Transport Scotland Count Site (Ref 0000ATC00150);
6. A9 South of Dalwhinnie - Transport Scotland Count Site (Ref 000000000148);
7. A82 North of Spean Bridge - Transport Scotland Count Site (Ref 0000ATC01036); and
8. A82 North of Corpach - Transport Scotland Count Site (Ref 000000001035).

The locations of the count points are shown in Figure 4. The traffic data was factored using National Road Transport Forecast (NRTF) low growth factors to create the 2023 traffic flows.

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

A summary of the 24-hour average daily traffic for each of the count sites is presented in Table 1. All data excludes data collected during Covid restrictions.

Figure 4 Traffic Count Location Points

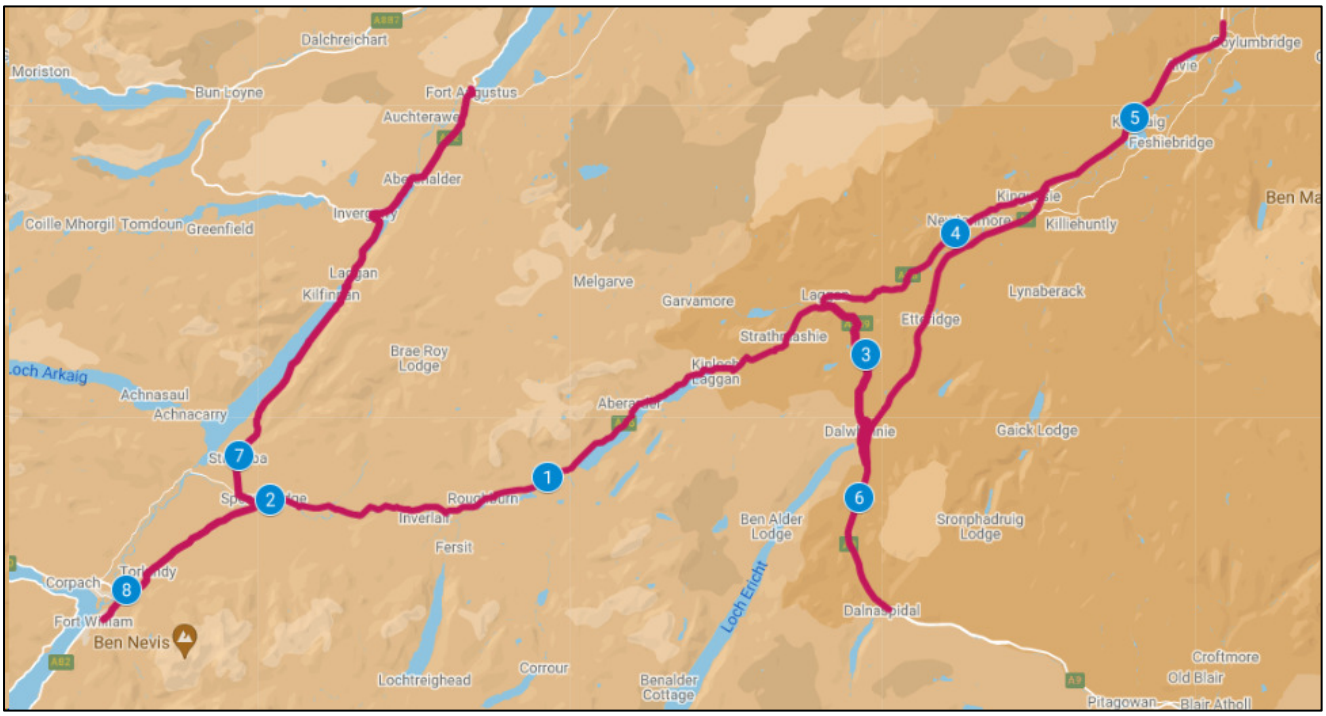


Table 1 24-hour Average Daily Traffic Data (2023)

Site Ref.	Survey Location	Cars & LGV	HGV	Total
1	A86 Site Access	888	71	960
2	A86 Spean Bridge	2,149	244	2,393
3	A889 North of Dalwhinnie	927	87	1,014
4	A86 West of Newtonmore	758	184	942
5	A9 North of Kingussie	8,126	2,265	10,392
6	A9 South of Dalwhinnie	8,112	2,066	10,178
7	A82 North of Spean Bridge	3,165	772	3,937
8	A82 North of Corpach	4,690	353	5,043

5.5 Accident Review

Road traffic accident data for the five-year period commencing 01 January 2017 through to the 31 December 2021 was obtained from the online resource Crashmap[3] which uses data collected by the police about road traffic crashes occurring on British roads.

The statistics are categorised into three categories, namely “slight” for damage only incidents, “serious” for injury accidents and “fatal” for accidents that result in a death. These are summarised in Table 2 for the A86 and A889, these being the two links with closest proximity to the Proposed Development and subject to the highest level of construction activity.

Table 2 Accident Summary

Survey Location	Slight	Serious	Fatal	HGV Incidents
A86	13	13	0	5 (3 slight & 2 serious)
A889	2	1	0	1 (slight)

[3] CrashMap: www.crashmap.co.uk

The majority of accidents on the A86 occurred at the sinuous section near Strathmashie or to the west of Murlaggan. Of the recorded accidents, seven serious incidents involved motorcycles or young drivers.

In general, there are no significant clusters of accidents at any location or high numbers of accidents involving HGVs for example. It is however acknowledged that there has been a reasonably high number of accidents involving motorcycles, which could be attributed to the fact the local road network is used by a high number of tourists, including those undertaking motorcycle touring holidays.

Based on the information available, it has been established that there are no specific road safety issues within the immediate vicinity of the Proposed Development that currently require to be addressed or would be exacerbated by the construction of the Proposed Development.

5.6 Future Baseline

Construction of the project is expected to commence in 2026, if consent is granted, and is anticipated to take 64 months, depending on weather conditions and ecological considerations.

A review of the construction programme suggests that the peak of construction activities will occur in 2029.

To assess the likely effects during the construction and typical operational phase, base year flows were forecast by applying a NRTF low growth factor to the 2023 flows in Table 1. The NRTF low growth factor for 2023 to 2029 is 1.036.

Table 3 24-hour Average Daily Traffic Data (2029)

Site Ref.	Survey Location	Cars & LGV	HGV	Total
1	A86 Site Access	920	74	995
2	A86 Spean Bridge	2,226	253	2,479
3	A889 North of Dalwhinnie	960	90	1,051
4	A86 West of Newtonmore	785	190	976
5	A9 North of Kingussie	8,419	2,347	10,766
6	A9 South of Dalwhinnie	8,404	2,140	10,544
7	A82 North of Spean Bridge	3,279	799	4,078
8	A82 North of Corpach	4,859	366	5,224

Please note minor variances due to rounding may occur.

A review of consented developments in the study area has been undertaken. The consented developments of relevance are Coire Glas Pumped Storage Scheme, Cloich Wind Farm and Dell Wind Farm.

The construction of these projects may coincide with the construction activities associated with the Proposed Development and as such, the construction peak traffic flows have been obtained from the respective planning application documents for each application.

The Base + Committed Development traffic flows are summarised in Table 4. These flows will be used in the Construction Peak Traffic Impact Assessment.

Table 4 24-hour Average Daily Traffic Data (2029) Base + Committed Development

Site Ref.	Survey Location	Cars & LGV	HGV	Total
1	A86 Site Access	920	101	1,022
2	A86 Spean Bridge	2,226	253	2,479
3	A889 North of Dalwhinnie	960	117	1,078
4	A86 West of Newtonmore	785	217	1,003
5	A9 North of Kingussie	8,419	2,347	10,766
6	A9 South of Dalwhinnie	8,404	2,140	10,544

Site Ref.	Survey Location	Cars & LGV	HGV	Total
7	A82 North of Spean Bridge	3,327	926	4,253
8	A82 North of Corpach	4,907	466	5,372

Please note minor variances due to rounding may occur.

6 Construction Trip Generation and Distribution

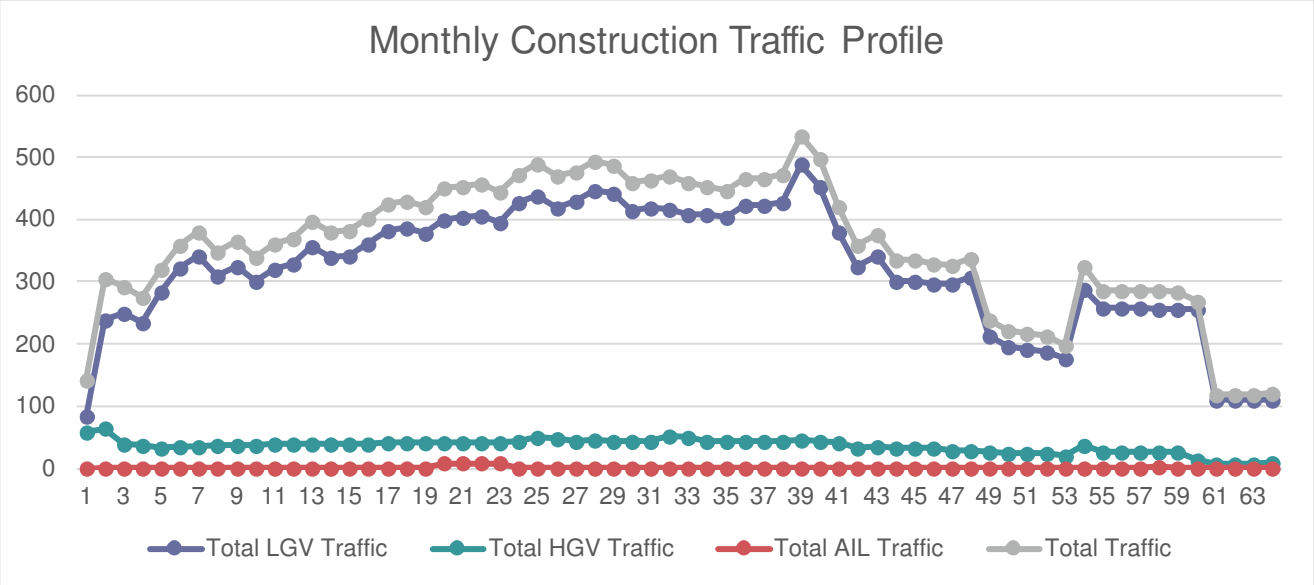
6.1 Trip Derivation

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

- Staff transport, in either cars or staff minibuses to a residential camp to be founded within the Proposed Development area;
- Light Goods Vehicles (LGV) providing supplies, provisions and deliveries to the construction offices and residential camp;
- Construction consumables such as fuel and oil deliveries made in HGVs;
- Construction equipment, plant and machinery by HGV low loader (or similar);
- Bulk materials such as cement and aggregate (the majority of aggregates will be won from the Site); and
- Abnormal Indivisible Loads (AIL) associated with the High Voltage (HV) transformer equipment and tunnel linings.

The traffic generation associated with the Proposed Development has been based upon similar scale projects undertaken by Gilkes Energy engineers and is based upon their recent experience. The traffic generation is illustrated in Figure 5.

Figure 5 Construction Traffic Profile (2 Way Trips)



The peak month for construction traffic is Month 39. The traffic flows associated with this peak are as follows:

- Peak Car / LGV Traffic: 490 movements (245 Inbound and 245 Outbound) per day;
- Peak HGV Traffic (including AIL): 46 movements (23 Inbound and 23 Outbound) per day; and
- Total Peak Construction Traffic: 536 movements 268 Inbound and 268 Outbound) per day.

The car & LGV traffic flows assumes no staff travel plan is in place. The use of minibuses to access the Site will be provided given the remote nature of the Site and the need to promote sustainable travel practices. As a result, minibus and coach connections will be provided to the railways stations at Roy Bridge, Dalwhinnie and Newtonmore as well as to Spean Bridge and Aviemore. This will help reduce the need for individual travel and is expected to reduce single car occupancy significantly accounting for a reduction in over 50%. This can be enforced by the requirement to use these public transport links via the construction contracts, remote location of the Site and on-site management.

To further reduce traffic to the Site, Amazon, online shopping and postal deliveries will be made to Site lockers to be provided at Dalwhinnie, with daily deliveries from this location to residential camp made by one vehicle, rather than multiple deliveries.

To provide a robust assessment, it is assumed that the travel plan will provide a reduction in car and LGV access by 30% from the initial Site traffic estimate. The assessment peak traffic is therefore as follows:

- Peak Car / LGV Traffic: 342 movements (171 Inbound and 171 Outbound) per day;
- Peak HGV Traffic (including AIL): 46 movements (23 Inbound and 23 Outbound) per day; and
- Total Peak Construction Traffic: 388 movements (194 Inbound and 194 Outbound) per day.

6.2 Abnormal Indivisible Loads

AIL traffic will be associated with three types of load, namely:

- Delivery of construction plant (large dump trucks, bulldozers, etc), abnormal in terms of their width (up to 3.5m), rather than weight;
- Delivery of tunnel lining sections (abnormal in width, rather than weight); and
- Delivery of HV transformer equipment Abnormal in terms of width and weight.

AIL traffic associated with construction plant and tunnel lining will be from the A9 corridor and will access the Site from the east. AIL traffic associated with the HV transformers (up to three loads) will be from the Port at Corpach and will access the Site from the A830, A82 and A86.

A Route Survey Report (RSR) for the AIL movements has been undertaken and is provided in Annex B.

6.3 Trip Distribution

Traffic associated with Site material deliveries is all assumed to access the Proposed Development from the A9 corridor. It has been assumed that cement deliveries will originate from the A9 corridor, with access being made via the A86. Other peak traffic is assumed to access the Site via the A9, A889 and A86.

The split between HGV traffic to the north and south is assumed to be 40% / 60% based upon likely traffic movements.

10% of Car / LGV traffic is associated with Site and residential camp supply deliveries and will access the Site from the A9 from the central belt. The remaining provision is related to staff and visitor movements and traffic has been distributed to the nearest centres of population where off-site accommodation can be found. The proposed distribution of these is as follows:

- Aviemore, Kingussie & Newtonmore: 60%;
- A9 South: 15%;
- Fort William & Spean Bridge: 15%; and
- Fort Augustus: 10%.

6.4 Peak Construction Traffic Flows

The peak traffic flows have been assigned to the study area network. The resulting traffic flows are summarised in Table 5.

Table 5 Peak Construction Traffic Flows

Site Ref.	Survey Location	Cars & LGV	HGV	Total
1	A86 Site Access	342	46	388
2	A86 Spean Bridge	77	5	82
3	A889 North of Dalwhinnie	80	28	108
4	A86 West of Newtonmore	185	14	198
5	A9 North of Kingussie	154	14	168
6	A9 South of Dalwhinnie	80	28	108
7	A82 North of Spean Bridge	31	0	31
8	A82 North of Corpach	46	5	51

Please note minor variances due to rounding may occur.

6.5 Operational Phase Traffic

During the operation of the Proposed Development, up to 15 staff may be at the Site to operate the equipment, monitor the operation and undertake maintenance.

The traffic generation with the operational phase is minimal and would not trigger the need for a separate impact assessment.

7 Construction Traffic Impact Assessment

The peak month traffic data for the Proposed and Associated Development was combined with the future year (2029) traffic data to allow a comparison between the baseline results to be made. The increase in traffic volumes is illustrated in percentage increases for each class of vehicle. This is illustrated in Table 6.

Table 6 2029 Base + Proposed & Associated Development Traffic Volumes and Impact

Survey Location	Cars & LGV	HGV	Total	Cars & LGV	HGV	Total
A86 Site Access	1262	147	1410	37.18%	45.75%	37.98%
A86 Spean Bridge	2303	257	2561	3.46%	1.82%	3.29%
A889 North of Dalwhinnie	1041	145	1185	8.37%	23.56%	10.02%
A86 West of Newtonmore	970	231	1201	23.52%	6.35%	19.80%
A9 North of Kingussie	8573	2361	10934	1.83%	0.59%	1.56%
A9 South of Dalwhinnie	8484	2168	10652	0.96%	1.29%	1.02%
A82 North of Spean Bridge	3358	926	4284	0.93%	0.00%	0.72%
A82 North of Corpach	4953	470	5423	0.94%	0.99%	0.95%

Please note minor variances due to rounding may occur.

The total traffic movements are not predicted to increase by more than 37.98% on the whole study area network. The construction phase is transitory in nature and the peak of construction activities is short-lived.

A review of existing road capacity has been undertaken using the Design Manual for Roads and Bridges, Volume 15, Part 5 “The NESA Manual” [4]. The theoretical road capacity has been estimated for each of the road links for a 12-hour period that makes up the study area. The results are summarised in Table 7.

Table 7 2029 Daily Traffic Capacity Review

Site Ref.	Survey Location	2029 Baseline Traffic Flows	2029 Base + Proposed & Associated Development Traffic Flows	Theoretical Road Capacity (12hour)	Spare Road Capacity (%)
1	A86 Site Access	1022	1410	19200	92.66%
2	A86 Spean Bridge	2479	2561	21600	88.14%
3	A889 North of Dalwhinnie	1078	1185	19200	93.83%
4	A86 West of Newtonmore	1003	1201	19200	93.74%
5	A9 North of Kingussie	10766	10934	28800	62.04%
6	A9 South of Dalwhinnie	10544	10652	28800	63.01%
7	A82 North of Spean Bridge	4253	4284	21600	80.17%
8	A82 North of Corpach	5372	5423	21600	74.89%

The results indicate there are no road capacity issues with the combined development and ample spare capacity exists within the trunk and local road network to accommodate construction phase traffic.

Whilst no capacity issues are predicted, there are mitigation measures that can be used to reduce the impact of the construction traffic on other road users and nearby residents. These are outlined in the following chapter.

[4] Design Manual for Roads and Bridges (DMRB) Volume 15 Part 5: Traffic Modelling in NESA (Network Evaluation from Surveys and Assignment), Chapter 3. July 2005.

8 Proposed Traffic Mitigation Measures

8.1 Construction Phase

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

- Where possible the detailed design process would minimise the volume of material to be imported to Site to help reduce HGV numbers;
- A Site worker transport and travel arrangement plan, including transport modes to and from the work Site (including pick up and drop off times);
- All materials delivery lorries (dry materials) should be sheeted to reduce dust and stop spillage on public roads;
- Specific training and disciplinary measures should be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- Wheel cleaning facilities may be established at the Site entrance, depending on the views of Transport Scotland;
- Appropriate traffic management measures would be put in place on the A86 to avoid conflict with general traffic, subject to the agreement of the Transport Scotland. Typical measures would include HGV turning and crossing signs and / or banksmen at the Site access and warning signs;
- Provide construction updates on the project website and or a newsletter to be distributed to residents within an agreed distance of the Site;
- Adoption of a voluntary speed limit of 15 mph for all construction vehicles travelling through local villages and towns;
- All drivers would be required to attend an induction to include:
    - A tool box talk safety briefing;
    - The need for appropriate care and speed control;
    - A briefing on driver speed reduction agreements (to slow Site traffic at sensitive locations such as Kingussie, Newtonmore and Dalwhinnie); and
    - Identification of the required access routes and the controls to ensure no departure from these routes.

Transport Scotland may require an agreement to cover the cost of abnormal wear and tear on the A86 in close proximity to the access junction. Video footage of the pre-construction phase condition of the construction vehicles route would be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline would inform any change in the road condition during the construction stage of the Proposed Development. Any necessary repairs would be coordinated with the Roads Authority. Any damage caused by traffic associated with the Proposed Development, during the construction period that would be hazardous to public traffic, would be repaired immediately.

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

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

8.2 A86 Improvement Works

The proposed development will increase traffic flows on the A86, which is narrow in sections over the construction period.

To assist with traffic management, it is proposed to offer Transport Scotland financial support to introduce improved measures on the route. These can take the form of enhanced signage, clearance of vegetation / slopes to improve forward visibility and enhanced laybys / passing areas to ease access.

It is proposed to offer a financial contribution to a fixed amount to Transport Scotland. This would allow the authority to undertake any planned works early. This goodwill gesture will assist in improving the road network for the benefit of all road users prior to works commencing on Site and will allow Transport Scotland to bring forward its own considered works.

8.3 Abnormal Load Mitigation Works

An abnormal load RSR highlights a number of constraint points which have been assessed within the report using swept path assessment software. The locations of the constraint points and the swept path drawings are included Annex B.

The RSR identifies key points and issues associated with the route that require mitigation works. These works are to be agreed with Transport Scotland and other relevant stakeholders.

The abnormal loads mitigation works can be designed to be temporary in nature to enable the restoration to their original condition, if required by Transport Scotland.

8.4 Abnormal Load Management Plan

Before the abnormal loads traverse the route, the following tasks would be undertaken to ensure load and road user safety:

- Ensure any vegetation which may foul the loads is trimmed back to allow passage;
- Confirm there are no roadworks or closures that could affect the passage of the loads;
- Check no new or diverted underground services on the proposed route are at risk from the abnormal loads; and
- Confirm the police are satisfied with the proposed movement strategy.

There are a number of traffic management measures that could help reduce the effect of abnormal load convoys.

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

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

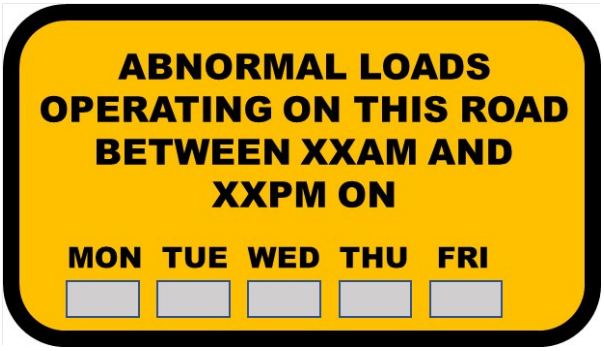
Potential conflicts between the abnormal loads and other road users can occur at a variety of locations and circumstances. The main potential conflicts are likely to occur:

- On the A86 and A82 where the loads may straddle the centre line, where fast moving oncoming traffic may be encountered, etc.;
- Where loads turn from the A82 onto the A86;
- Where traffic turns at a road junction, requiring other traffic to be restrained on other approach arms; and
- In locations where high speeds of general traffic are predicted.

Advance warning signs would be installed on the approaches to the affected road network. Information signage could be installed to help assist drivers and an example is illustrated in Figure 6. Flip up panels (shown in grey)

would be used to mask over days where convoys would not be operating. When no convoys are moving, the sign would be bagged over by the Traffic Management contractor.

Figure 6 Example Information Sign



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

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

The Abnormal Load Transport Management Plan would also include:

- Procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles are not impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates and agreeing communication protocols and lay over areas to allow overtaking;
- A diary of proposed delivery movements to liaise with the communities to avoid key dates such as local events;
- A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic; and
- Proposals to establish a construction liaison committee to ensure the smooth management of the project / public interface with the applicant, the construction contractors, the local community, and if appropriate, the police forming the committee. This committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.

8.5 Construction Staff Travel Plan

A Travel Plan for construction staff will be developed to reduce dependency on single occupancy car trips. The Travel Plan will be a contractual requirement for contractors working on the Site and would include the following elements:

- The provision of staff minibus / coach links from railway stations at Roy Bridge, Dalwhinnie and Newtonmore. Links would also extend to Aviemore and Spean Bridge town centres;
- The use of limited parking spaces at the residential camp. The level of parking will be agreed with Transport Scotland, prior to works commencing;
- The encouragement for car sharing amongst staff and visitors;
- The provision of an online shopping / Amazon delivery locker in Aviemore and provision of a dedicated postal link from this to the residential camp to reduce single delivery vehicle trips;
- Provision of emergency taxi links from the Site to Aviemore and Inverness in the event of family emergency requirements;
- Subsidised rail tickets for use to get from Inverness / Lochaber and the Central Belt to the minibus pick up areas;

- Reviewing shift changes to ensure that large numbers of staff movements occur outside peak network times to reduce the impact on school trips etc. These could be co-ordinated with other large construction schemes with significant traffic generation in the study area, if required; and
- The provision of a staff travel co-ordinator to assist in organising the travel links, reviewing their operation and monitoring compliance with the contractual requirements.

8.6 Public Information

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

8.7 Operational Phase Mitigation

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

9 Summary & Conclusions

Pell Frischmann (PF) has been commissioned by Earba Ltd to undertake a Transport Assessment for the Proposed Development.

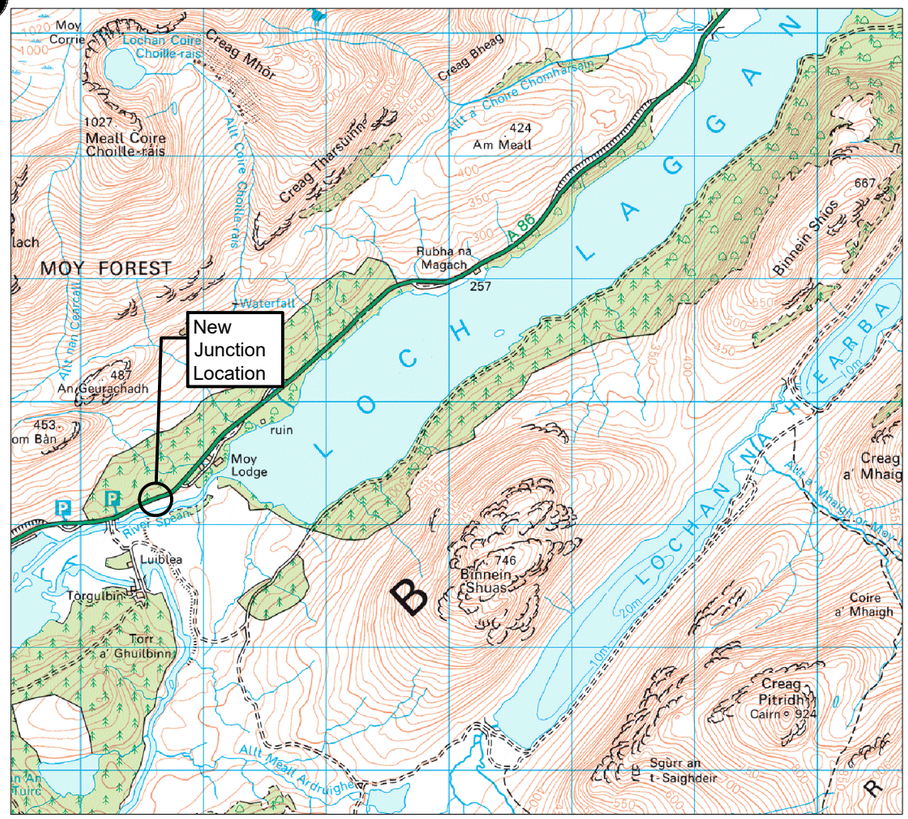
An assessment of average daily development trips is considered an appropriate method of assessing the impacts of the Proposed Development on the study area roads. The construction traffic would result in a temporary increase in traffic flows on the road network surrounding the Proposed Development.

A series of mitigation measures and management plans have been proposed to help mitigate and offset the impacts of both the construction and operational phase traffic flows. It is considered that these can be secured by condition with THC.

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

Annex A Site Access Junction Drawings

North



Location Plan

1:25,000 @ A1

IF IN DOUBT - ASK

NOTES

1. All levels are in metres above ordnance datum (mAOD).
2. All dimensions are in metres unless otherwise noted.
3. For blow up and details of junction refer to drawing no. EAR/GEL/502.
4. For nearby road interfaces refer to drawing no. EAR/GEL/503.

LEGEND

Visibility Splay

Plan

1:500 @ A1

REV	DATE	DRAWN	NOTES	CH'K'D	APP'D
P1	25.05.23	MH	Preliminary	GMcG	GMcG

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CLIENT

PROJECT

EARBA PSH

DRAWING TITLE

A86 NEW JUNCTION LOCATION PLAN AND VISIBILITY SPLAY LAYOUT

SCALE AT A1 (ORIGINAL SHEET SIZE)

1:500 0 25m 50m

DRAWING NUMBER/REFERENCE

EAR/GEL/501

DRAWING STATUS

PRE

Annex B Route Survey Report

Pell Frischmann

Earba Pumped Storage Hydro Scheme

Abnormal Indivisible Load Route Survey

December 2023

107333

Report Ref.		**231202 Earba Rsr**				
File Path		**https://pellf.sharepoint.com/sites/EdinburghOfficeTeam/Shared Documents/General/Projects/107333 Gilkes Earba/01 - WIP/Reports/231202 Earba RSR.docx**				
Rev	**Suit**	**Description**	**Date**	**Originator**	**Checker**	**Approver**
01		Draft	02/12/2023	G Buchan	T Lockett	G Buchan

Ref. reference. Rev revision. Suit suitability.

Prepared for

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Prepared by

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93 George Street
Edinburgh
EH2 3ES

Contents

Figures

Tables

Appendices

1 Introduction

1.1 Purpose of the Report

Pell Frischmann (PF) has been commissioned by Gilkes Energy (Gilkes) to undertake a route survey review of a potential delivery route for an electrical transformer and other Abnormal Indivisible Loads (AIL) associated with the construction and development of a new energy storage facility located to the southwest of Kintore, Aberdeenshire.

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

The detailed assessment and subsequent designs of any remedial works are beyond the agreed scope of works between Pell Frischmann and Gilkes at this point in time.

It is the responsibility of the developer to ensure that the entirety of the proposed access route is suitable and meets with their satisfaction. The developer will be responsible for ensuring that the finalised proposals meet with the appropriate levels of health and safety provision for all road users and is in accordance with the relevant legislation at the time of delivery.

2 Site Background

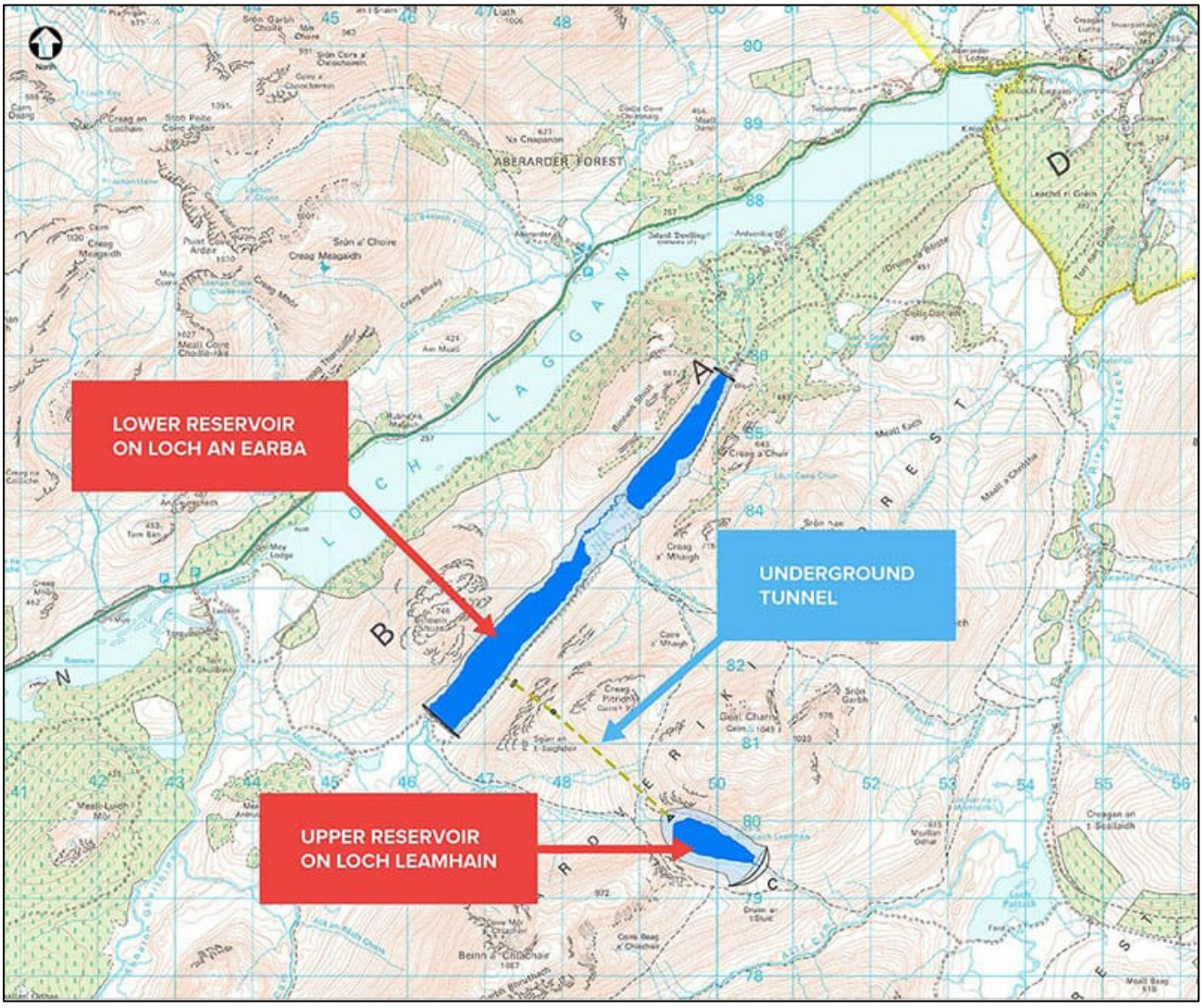
2.1 Site Location

The Proposed Development is located to the south of the A86 Loach Earba. The location of the route for the Proposed Development is shown in Figure 1.

The project will store up to 40,000MWh of energy which will make it the largest such scheme in the UK in terms of energy stored. The scheme will use Loch Leamhain as the upper reservoir and Loch Earba as the lower reservoir. A tunnel approximately 3 kilometres (km) long will connect the two water bodies.

A powerhouse will be constructed on the shore of Loch Earba which will extend deep underground. The turbines will be located at the bottom of the powerhouse shaft and will generate electricity in times of national demand or pump water for energy storage in times when there is surplus electricity on the national grid.

Figure 1 Site Location



2.2 Candidate Loads

Gilkes have indicated that they wish to consider access for a 340MVA transformer. Indicative transformer details and a similar transport solution were provided by Gilkes and Pell Frischmann has developed the assessment on these details. The indicative transformer details are provided in Table 2-1.

In addition to the transformer, tunnel lining sections will need to be transported to the site. These would arrive in sections that would be assembled on site due to their external dimensions and for reasons of ease of placement on the site.

The tunnel liner sections sizes are also summarised in Table 2-1.

Table 2-1: Transformer Component and Tunnel Lining Summary

Component	Length (m)	Width (m)	Height / Min Diameter (m)	Weight (t)
Transformer (excluding oil and in transport configuration)	10.000	3.400	4.500	150.000
Tunnel Lining Section	5.500	5.500	3.500	14.000

2.3 Proposed Delivery Equipment

To provide a robust assessment scenario based upon the known issues along the access route, it has been assumed that the transformer would be carried in a girder trailer supported by two nine axle bolsters at either end. A heavy load tractor unit would pull the trailer and a drogue unit may be required in areas with significant gradients.

Trailer details are provided in Appendix A for the transformer loads. The tunnel lining will be transported on a standard HGV trailer, with loads carried end down to ensure they can be transported under overhead structures and utility lines.

Figure 2-2: Example Transformer Transport

3 Access Route Review

3.1 Port of Entry

Two Ports of Entry (POE) are proposed. The transformer loads would be transported from Corpach Harbour in Lochaber to site. This is the closest heavy lift port to the proposed development site and it has been used by heavy load and abnormal load deliveries in the past. The port has sufficient quay and storage space and is well located for the strategic trunk road network.

The tunnel lining could be transported from either the Port of Inverness or from a manufacturing facility located in the central belt. This would be confirmed post planning determination, with an AIL planning condition suggested once all points of origin are confirmed and once all of the external dimensions have been clarified.

3.2 Proposed Access Route

The proposed access route from Corpach harbour to site would be as follows:

- Depart the port at the access gate and enter the A830 eastbound;
- Turn left onto the A82 northbound and proceed towards Spean Bridge;
- Turn right onto the A86 at Spean Bridge;
- Loads will continue eastbound on the A86. At the site access junction, they will turn right and will then proceed to site using private access tracks.

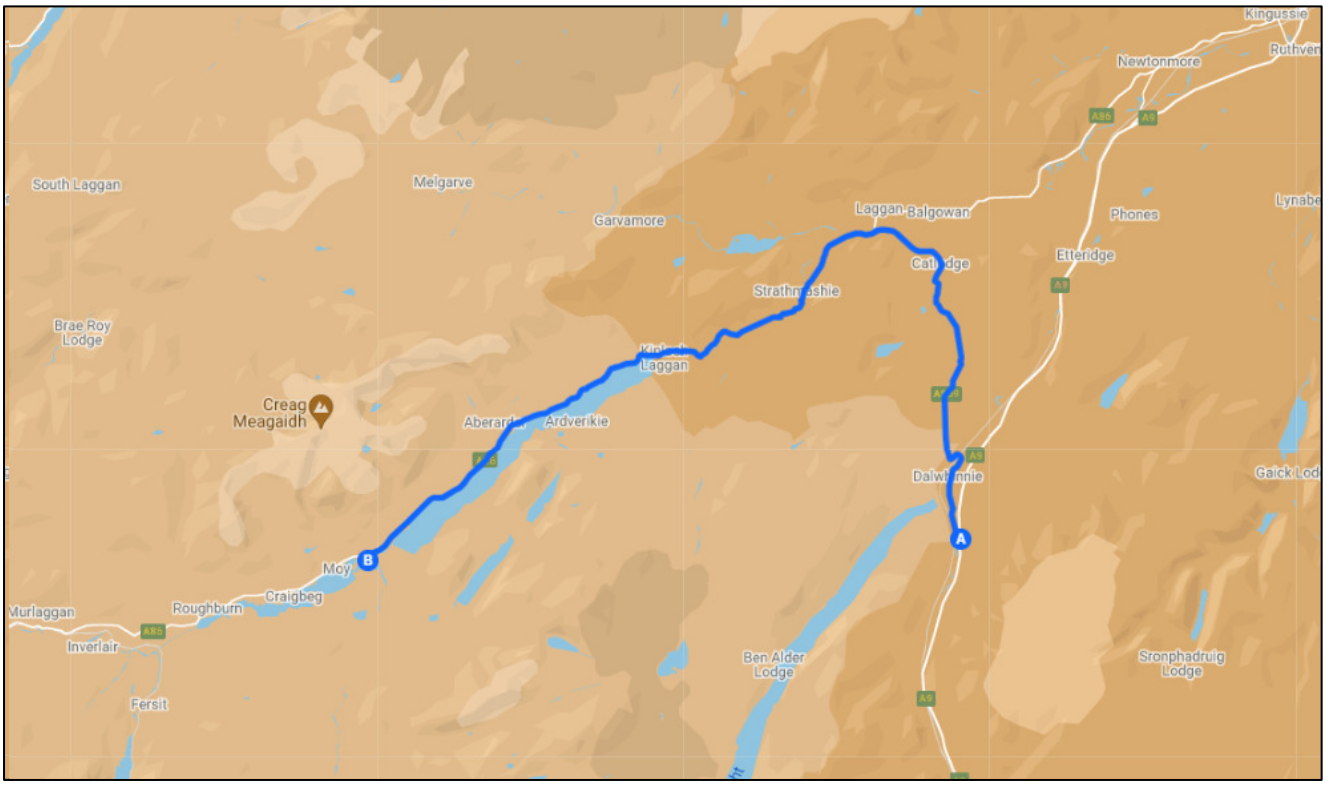
The proposed access route is illustrated in Figure 3-1.

The route has been reviewed during a site visit and constraints were noted.

Figure 3-1: Transformer Access Route

The route for the lining sections has been considered from the junction of the A9 and A889. The route to site for these loads in illustrated in Figure 3-2.

Figure 3-2: Tunnel Lining Access Route



3.3 Route Constraints

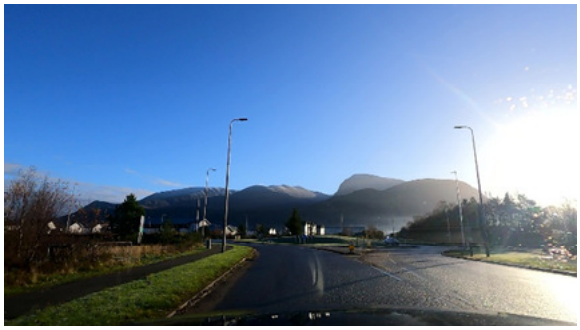
The constraints noted on the site visit are detailed in the table below. These cover all constraints noted on the access routes described previously. All operational traffic management measures during deliveries will be managed by the Police, in accordance with AIL legislation and the Movement Order for the delivery convoy.

Plans illustrating the location of the constraints are provided in Appendix B.

Table 3-1: Constraint Points and Details

POI	Key Constraint	Details
Transformer Loads		
1	**Port Access** 	Loads will exit the port using the BSW access gate onto the A830. An agreement with BSW will be required. Loads will turn right onto the A830 and will proceed eastbound. A swept path assessment has been undertaken and indicates that loads will over-run the northern footway of the A830 where a load bearing surface will be required. Protection of the kerbs will be required. Loads will oversail the inside of the turn where a wooden fence should be removed and the crossing sign head turned. Discussions with Network Rail will be required once the final component size has been confirmed. Loads will inform Network Rail when they intend to depart to ensure that crossings are made outwith rail service and engineering works intervals.

POI	Key Constraint	Details
2	**A830 Pedestrian Crossing** 	The bollards on the crossing island at this location should be removed to allow loads to oversail.
3	**A830 Pedestrian Crossing** 	The bollards on the crossing island at this location should be removed to allow loads to oversail.
4	**A830 Pedestrian Crossing** 	The bollards on two crossing islands at this location should be removed to allow loads to oversail.
5	**A830 Pedestrian Crossing** 	The bollards on the crossing island at this location should be removed to allow loads to oversail.
6	**Caledonian Canal Swing Bridge at Banavie** 	Loads will cross the swing bridge. A structural assessment of the bridge will be undertaken prior to loads moving once the component dimensions and weights have been confirmed. Loads will cross the bridge at caution and will advise the swing bridge control room that loads will be passing prior to them leaving Corpach.

POI	Key Constraint	Details
7	**Blar Mhor Roundabout** 	Loads will take the second exit at the roundabout to continue on the A830 via a **contraflow** manoeuvre. A swept path assessment has been undertaken and indicates that loads will require a small area of load bearing surfacing and kerb protection on the island of the entry splitter island. Loads will oversail the edge of the roundabout central island, however no physical works will be required.
8	**A830 / A82 Roundabout** 	Loads will proceed ahead and will cross the River Lochy Bridge. A structural assessment of the bridge will be undertaken prior to loads moving once the component dimensions and weights have been confirmed. At the roundabout, loads will take the first exit onto the A82 northbound. A swept path assessment has been undertaken and indicates that loads will require access to all lanes on the entry and exit lanes to the junction. Loads will oversail the footway in the norther verge. They will also over-run the entry lane splitter island loads where they will require a small area of load bearing surfacing and kerb protection on the island. On the exit of the junction, loads will over-run the island and a load bearing surface and fill kerb protection will be required. All street furniture should be removed from the island.
9	**A82 Tree Canopy** 	The tree canopy on the A82 should be trimmed to ensure a 5m clear height throughout the route. Trimming works can be subject to ecological and seasonal restrictions and early engagement with Transport Scotland is recommended.

POI	Key Constraint	Details
10	**A82 / A86 Junction, Spean Bridge** 	Loads will proceed ahead and will cross the River Spean Bridge. A structural assessment of the bridge will be undertaken prior to loads moving once the component dimensions and weights have been confirmed. At the junction with the A86, loads will turn right and join the A86 eastbound. A swept path assessment has been undertaken and indicates that loads will require a load bearing surface on the western footway of the A82. Kerbs should be protected in this area. On the A86 northern footway, loads will over-run the footway and one lighting column will need to be removed. Loads will also over-run the southern footway where two road signs should be temporarily removed. Load bearing surfaces and kerb protection is required.
11	**A86 Low Overhead Utilities** 	A review of overhead utility lines should be undertaken once the final component and vehicle details have been confirmed. Engagement with the utility providers should be undertaken to identify any low utility lines that will require modification to allow loads to pass under them. The tree canopy on the A82 should be trimmed to ensure a 5m clear height throughout the route. Trimming works can be subject to ecological and seasonal restrictions and early engagement with Transport Scotland is recommended.
12	**A86 Bend** 	Loads will continue eastbound on the A86 and will proceed around the bend. A swept path assessment has been undertaken and indicates that loads will require access to both lanes. No physical mitigation works are required. Oncoming traffic will need to be held back from this section and an AIL Transport Management Plan for the route is suggested to set out the AIL movement strategy once the component details have been confirmed. It is suggested that this is secured via a suitably worded planning condition.
13	**A86 Bend** 	Loads will continue eastbound on the A86 and will proceed around the bend. A swept path assessment has been undertaken and indicates that loads will require access to both lanes. No physical mitigation works are required. Oncoming traffic will need to be held back from this section and an AIL Transport Management Plan for the route is suggested to set out the AIL movement strategy once the component details have been confirmed. It is suggested that this is secured via a suitably worded planning condition.

POI	Key Constraint	Details
14	**A86 Site Access Junction** 	Loads will turn right into the new site access junction. A swept path assessment has been undertaken and indicates that loads will require an oversail area on the inside of the turn into the junction. All obstructions in the area should be removed.
Tunnel Lining Route		
15	**A9 / A889 Junction** 	Loads will turn from the A9 onto the A889 at this junction. A swept path assessment has been undertaken for loads arriving from both the north and south of the A9. The assessment indicates that no physical mitigation works are required.
16	**Highland Mainline Railway Bridge** 	Loads will proceed ahead on the A889 and will cross the Highland Mainline Railway Bridge. A swept path assessment has been undertaken and indicates that loads will oversail both verges on the approach and over the bridge. It is suggested that the traffic signal poles are hinged to improve clearances during deliveries. The loads will oversail the safety railings.
17	**A889 / A86 Junction** 	Loads will turn left onto the A86 at its junction with the A889. A swept path assessment has been undertaken and indicates that loads will oversail the inside of the junction where one road sign and one bollard should be relocated.

POI	Key Constraint	Details
18	**A86 Bend** 	Loads will continue westbound on the A86 and will proceed around the bend. No physical mitigation works are required. It is however suggested that prior to works commencing that verge vegetation is trimmed back to ease access along the A86. Oncoming traffic will need to be held back from this section and other sinuous sections. An AIL Transport Management Plan for the route is suggested to set out the AIL movement strategy once the component details have been confirmed. It is suggested that this is secured via a suitably worded planning condition.
14	**A86 Site Access Junction** 	Loads will turn left into the new site access junction. A swept path assessment has been undertaken and indicates that no additional mitigation works are required.

3.4 Swept Path Assessment Results and Summary

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

The colours illustrated on the swept paths are:

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

Where mitigation works are required, the extents of over-run and over-sail areas are illustrated on the swept path drawings.

Please note that where assessments have been undertaken using Ordnance Survey (OS) base mapping, there can be errors in this data source.

Where provided by the client, topographical data has been utilised. Please note that Pell Frischmann cannot accept liability for errors on the data source, be that OS base mapping or client supplied data.

3.5 Weight Review

A weight review has been undertaken via the ESDAL (Electronic Service Delivery for Abnormal Loads) contacts database using the Highways Agency website www.esdal.com. Two original access options for the transformer loads were originally considered, however only one access from Corpach is now proposed.

All of the relevant ESDAL contacts are noted in Table 3-2 and all have been contacted to ascertain if there are any relevant constraints that should be noted. The feedback from the consultees is provided in Appendix D.

Table 3-2: ESDAL Contacts

Organisation	Email Address
The Highland Council	abnormal.loads@highland.gov.uk
Scottish Canals	scabnormal.loads@scottishcanals.co.uk
Police Scotland	OSDAbnormalLoadsScotland@scotland.pnn.police.uk
Network Rail	AbLoadsESDAL@networkrail.co.uk
Historic Rail Estate	rsgbrb@jacobs.com
Transport Scotland	AbnormalLoads@transport.gov.scot

3.6 Land Ownership

The limits of road adoption can vary depending upon the location of the site and the history of the road agencies involved. The adopted area is generally defined as land contained within a defined boundary where the road agency holds the maintenance rights for the land. In urban areas, this usually defined as the area from the edge of the footway across the road to the opposing footway back edge. In rural areas the area of adoption can be open to greater interpretation as defined boundaries may not be readily visible. In these locations, the general rule is that the area of adoption is between established fence / hedge lines or a maximum 2m from the road edge. This can vary between areas and location.

3.7 Summary Issues

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

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

4 Summary

4.1 Summary of Access Review

PF has been commissioned by Gilkes to prepare a Route Survey Report to examine the issues associated with the transformer and tunnel lining components for a pumped storage hydro scheme at Loch Earba.

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

The report is presented for consideration to Gilkes. Various road modifications, structural reviews, and interventions are required to successfully access the site. If these are undertaken, access to the site is considered feasible for the assessed loads.

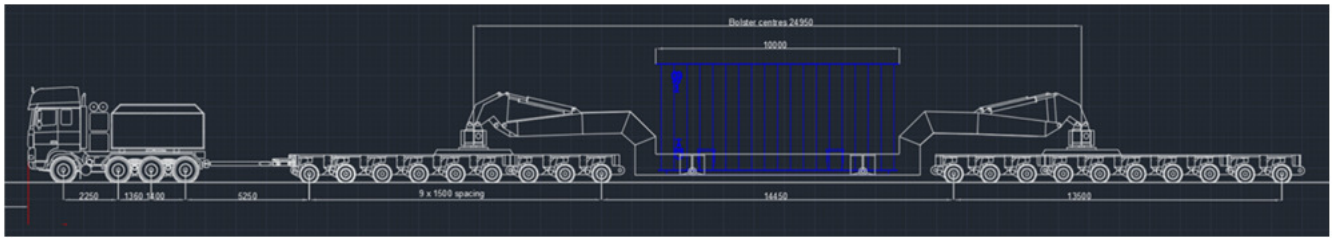
4.2 Further Actions

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

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

Appendix A Load Details

Indicative Load Details



Trailer weight (t)

Weight of transformer	230.00
Trailer weight	114.75
Combined weight	344.75
Load per trailer	172.38
Load per axle line	17.24
Load per axle	8.62
Load per wheel	2.15
Overall ground bearing pressure	9.98

Tractor weights (t)

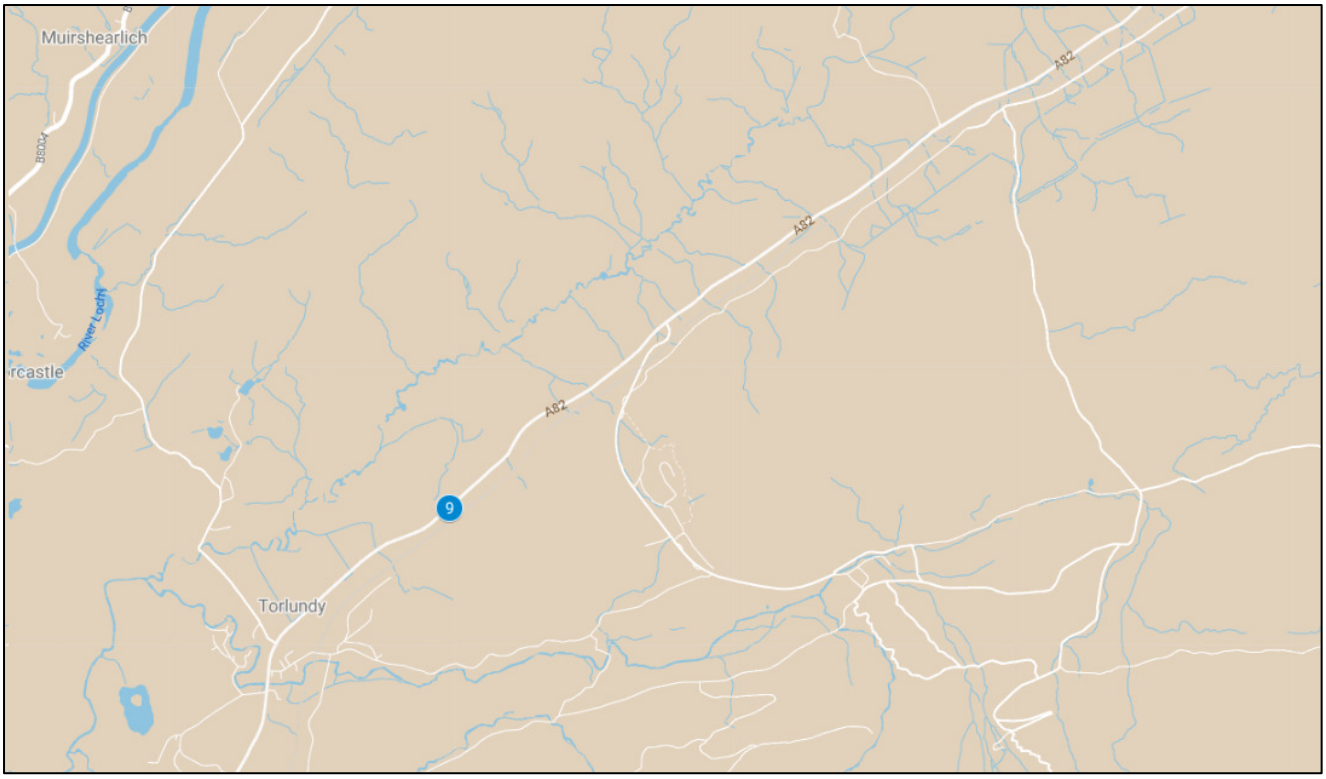
Total weight	42
Axle 1 (front)	8
Axle 2	10
Axle 3	12
Axle 4	12

Delivery train dimensions

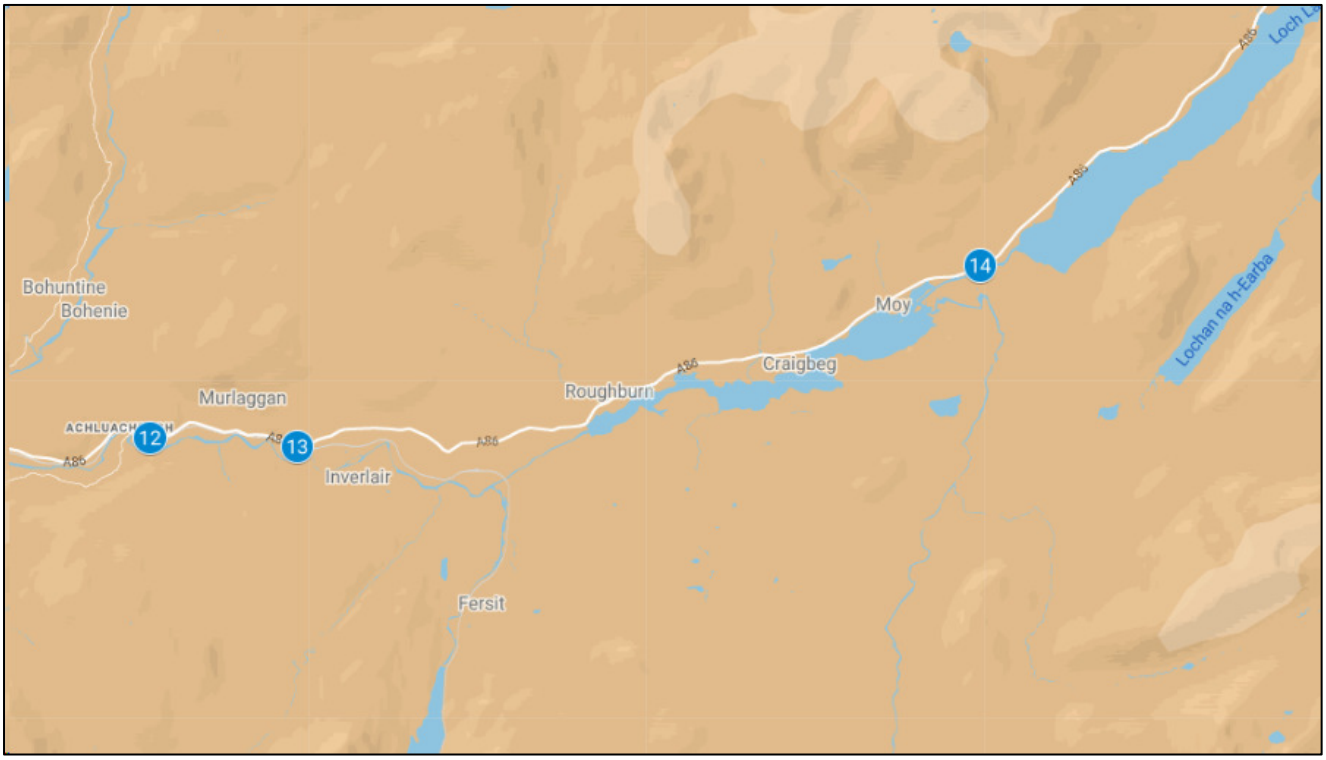
Maximum length (m)	54.050
Maximum Width (m)	6.000
Maximum Height (m)	5.200

Appendix B Points of Interest

The following plans can be viewed electronically here:
https://www.google.com/maps/d/edit?mid=1x5C39n9ZPqxH3l6K7t_xTZ7N7cTPiOs&usp=sharing




Spean Bridge
Tirindrish
A86
A82
River Spean
Allt Garbh
Killiechonate
10
11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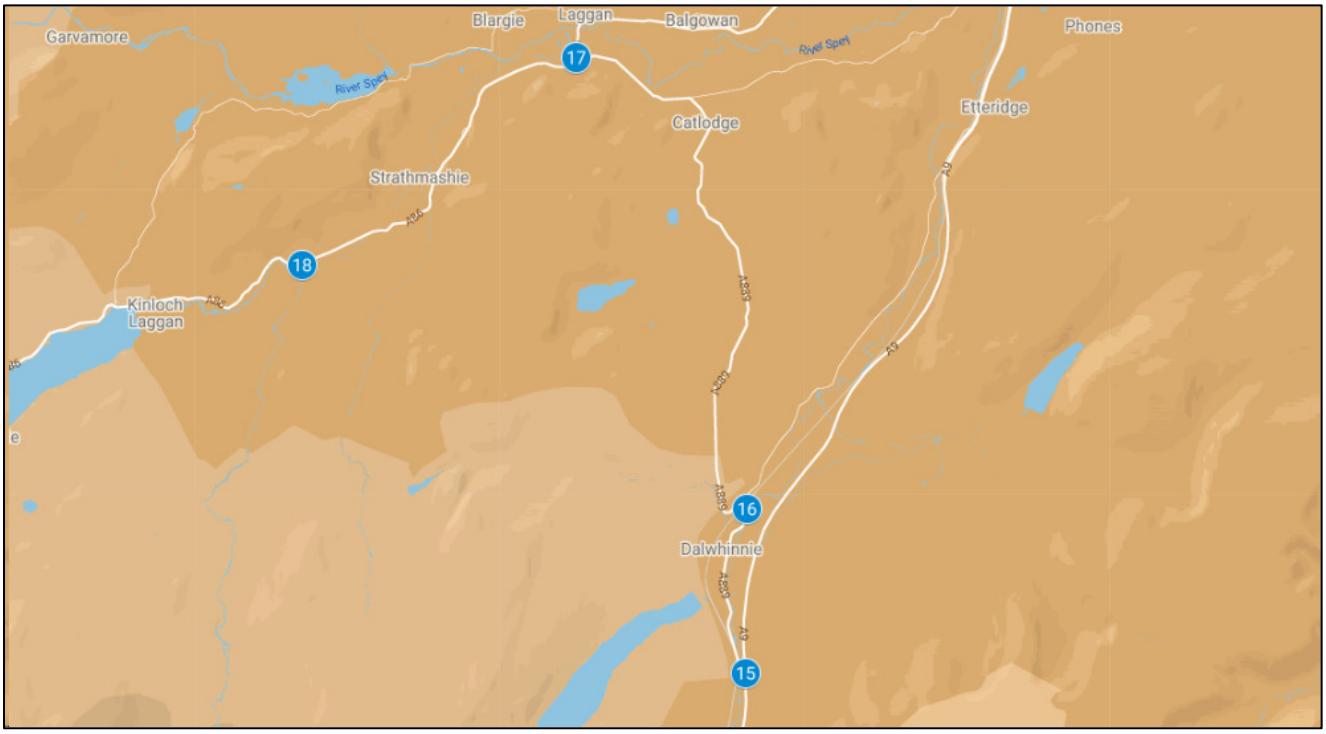
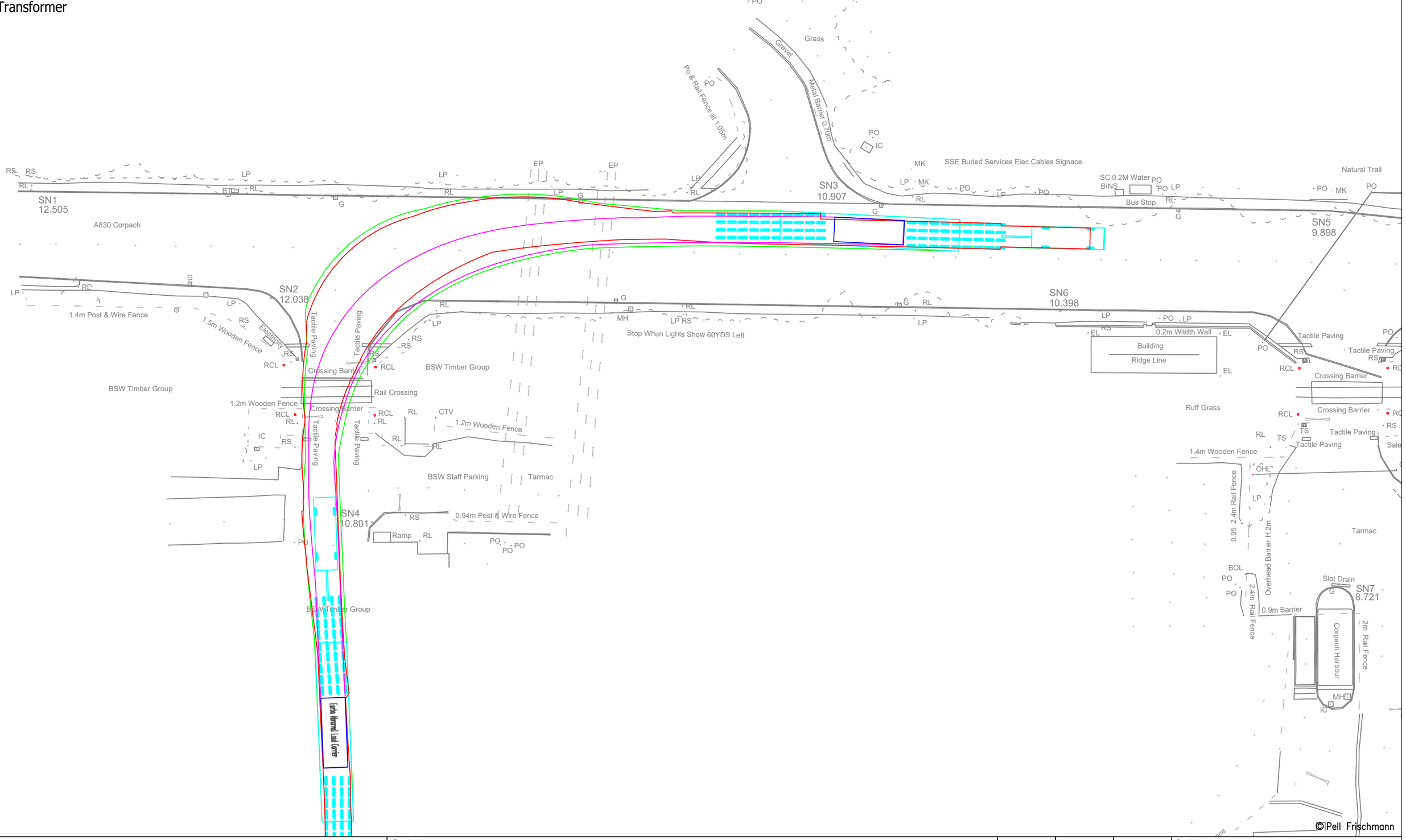
Bohenie
Murlaggan
Roughburn
Craigbeg
Moy
Inverlair
Fersit
Lochan na h-Earba
A86
12
13
14


Garvamore
Blargie
Laggan
Balgowan
Phones
River Spey
17
Catlodge
Etteridge
Strathmashie
A86
18
Kinloch
Laggan
A889
A9
16
Dalwhinnie
15

Appendix C Swept Path Assessments

Transformer



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

Client: GILKES ENERGY

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

Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: BSW Access Junction, Corpach Harbour

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		1

Scale: 1:500 @ A3

File No.: 231202 Tracking.dwg

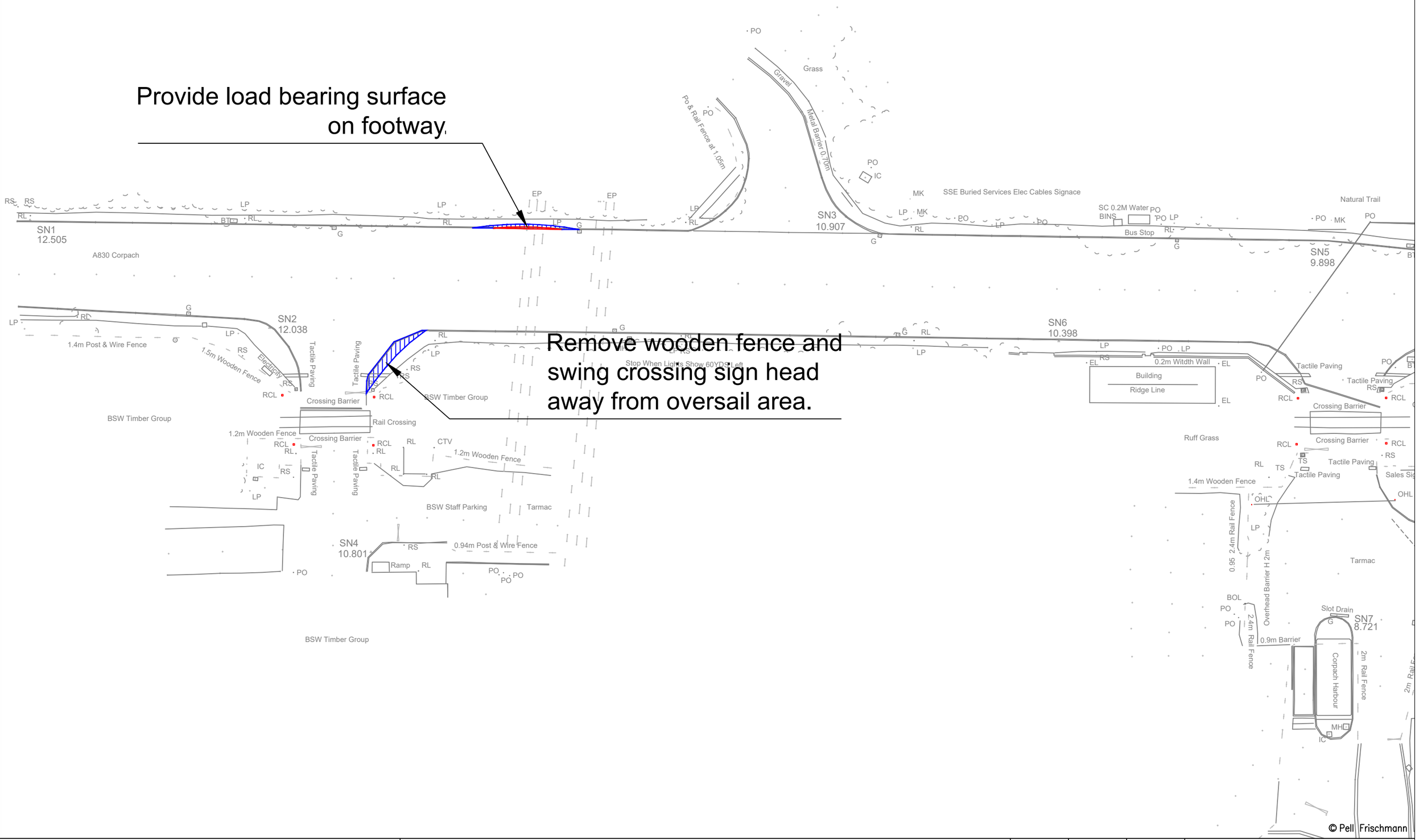
Drawing Status: Draft

Drawing No.: SK01

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

Revision: 0

NO MITIGATION REQUIRED



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Client: GILKES ENERGY

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

Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: BSW Access Junction, Corpach Harbour

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		1

Scale: 1:500 @ A3

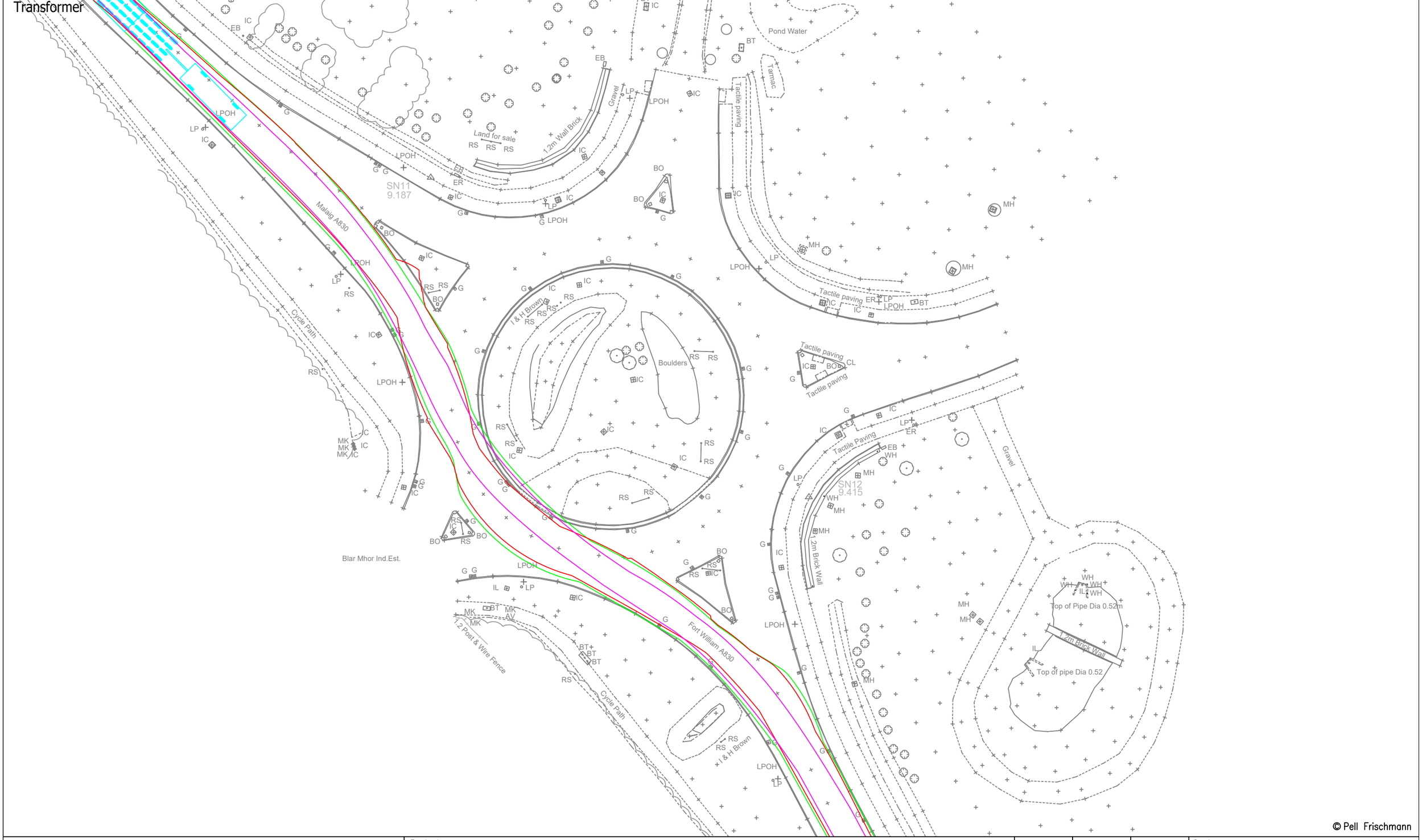
File No.: 231202 Tracking.dwg

Drawing Status: Draft

Drawing No.: SK01A

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

Revision: 0



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www.pellfrischmann.com

Client: GILKES ENERGY

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

Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: Blar Mhor Roundabout

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		7

Scale: 1:500 @ A3

File No.: 231202 Tracking.dwg

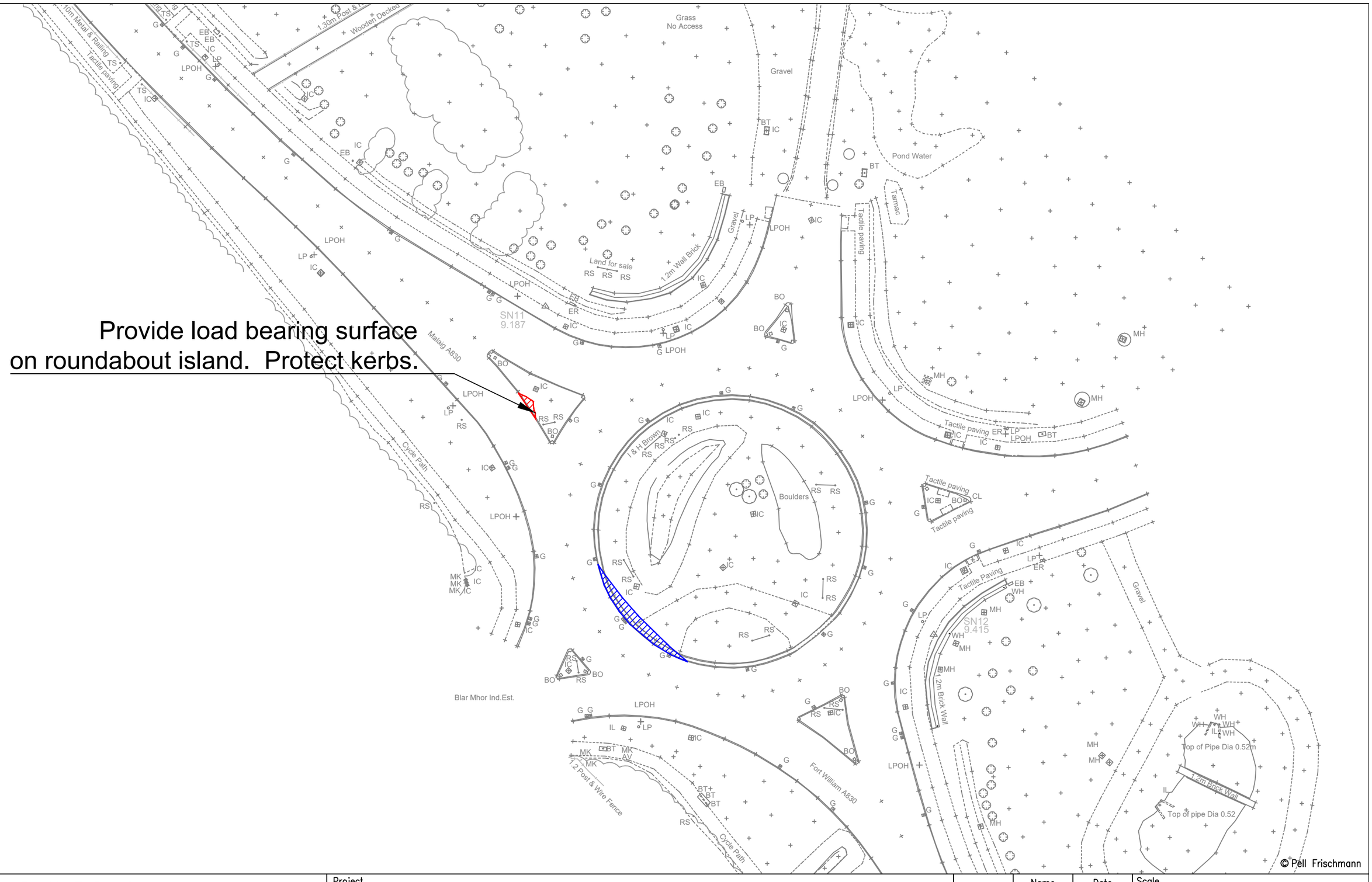
Drawing Status: Draft

Drawing No.: SK02

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

Revision: 0

NO MITIGATION REQUIRED



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Client: GILKES ENERGY

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

Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: Blarr Mhor Roundabout

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		7

Scale: 1:500 @ A3

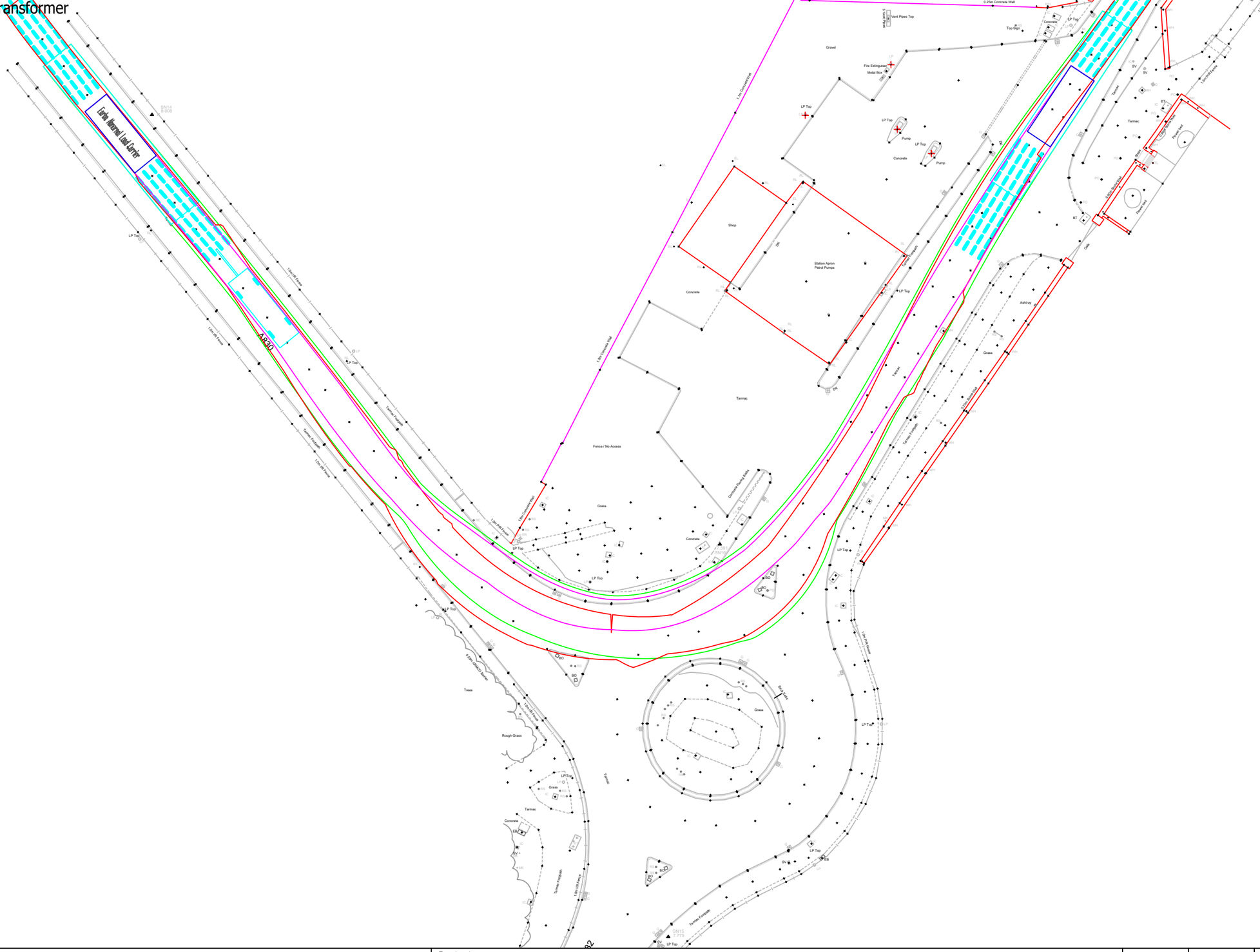
File No.: 231202 Tracking.dwg

Drawing Status: Draft

Drawing No.: SK02A

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

Revision: 0



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www.pellfrischmann.com

Client: GILKES ENERGY

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

Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: A830 / A82 Roundabout

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		8

Scale: 1:500 @ A3

File No.: 231202 Tracking.dwg

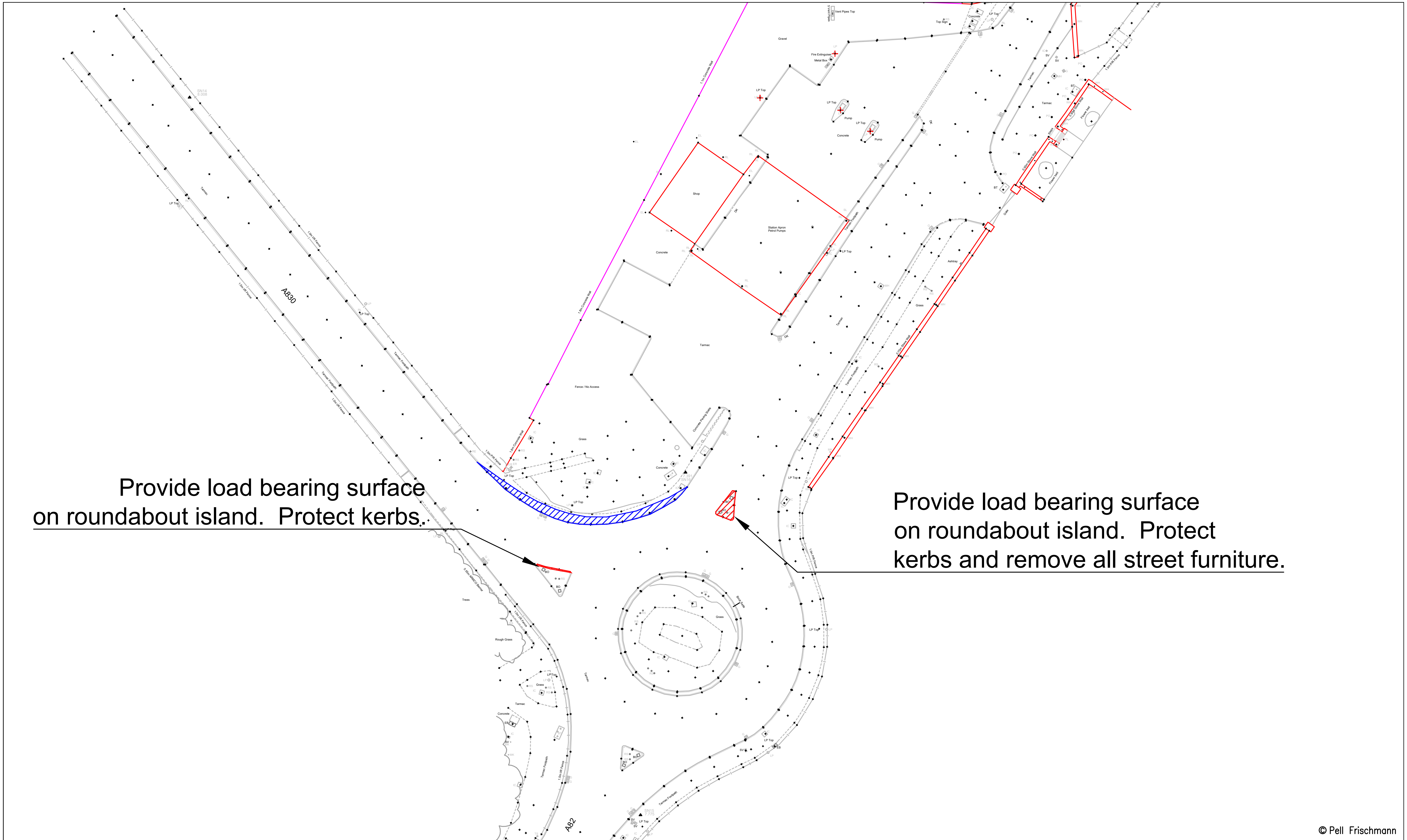
Drawing Status: Draft

Drawing No.: SK03

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

Revision: 0

NO MITIGATION REQUIRED



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Project: EARBA PUMPED STORAGE HYDRO SCHEME

Client: GILKES ENERGY

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: A830 / A82 Roundabout

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

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		8

Scale: 1:500 @ A3

File No.: 231202 Tracking.dwg

Drawing Status: Draft

Drawing No.: SK03A

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

Revision: 0

Transformer

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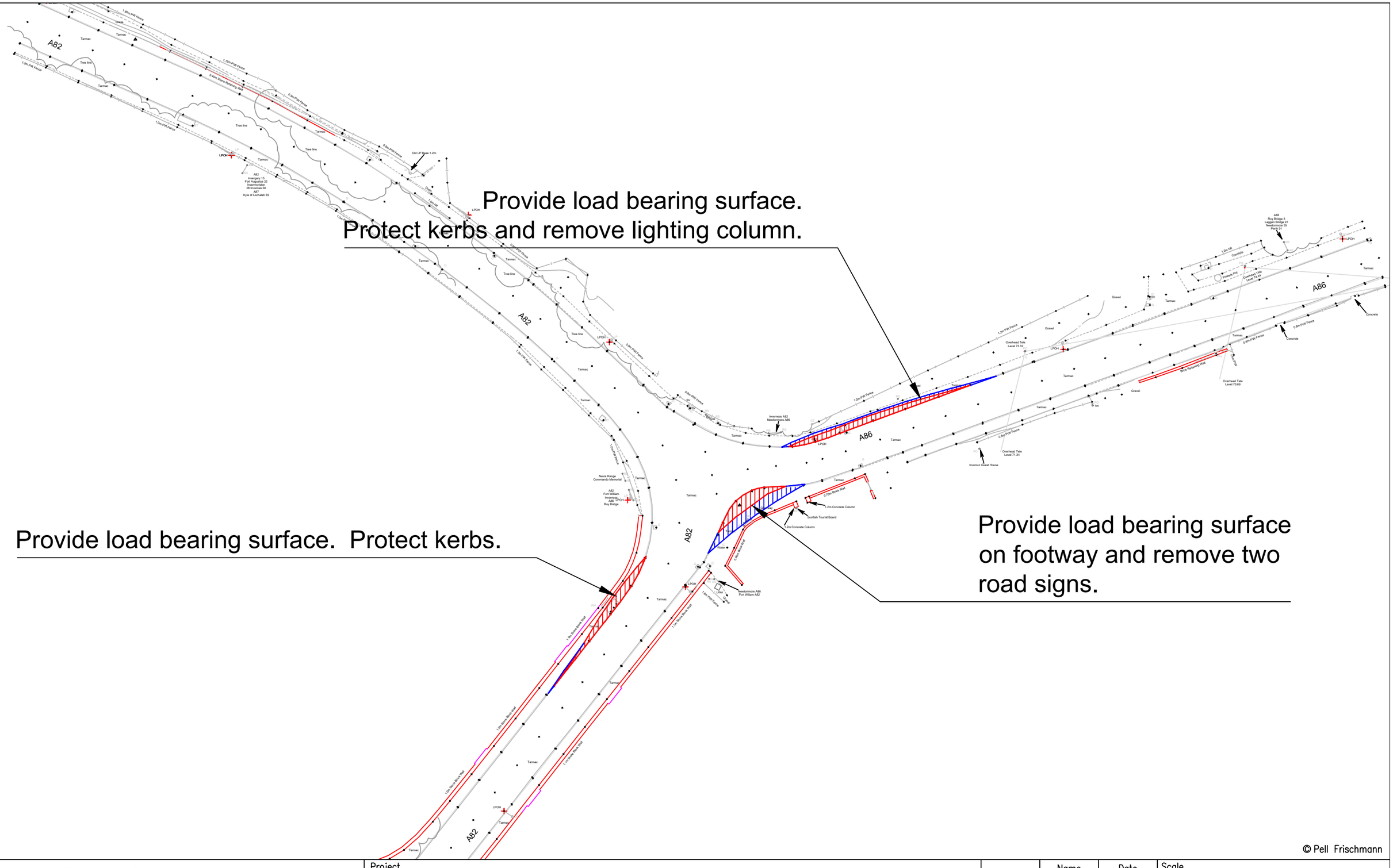
Project	EARBA PUMPED STORAGE HYDRO SCHEME			
		Name	Date	Scale: 1:500 @ A3
	Drawn	GB	04/12/2023	
	Designed	GB	03/12/2023	File No.: 231202 Tracking.dwg
	Checked	TL	04/12/2023	Drawing Status: Draft
	Point of Interest		10	
Client	GILKES ENERGY			
Drawing Title	TRANSFORMER & TUNNEL LINING SECTIONS			
SPA Location	A82 / A86 Junction			
Drawing No.	SK04			Revision: 0

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

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

NO MITIGATION REQUIRED



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Client: GILKES ENERGY

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

Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: A82/ A86 Junction

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		10

Scale: 1:500 @ A3

File No.: 231202 Tracking.dwg

Drawing Status: Draft

Drawing No.: SK04A

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

Revision: 0

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Client: GILKES ENERGY

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

Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: A86 Bend West of Roy Bridge

NO MITIGATION REQUIRED

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		12

Scale: Custom @ A3

File No.: 231202 Tracking.dwg

Drawing Status: Draft

Drawing No.: SK05

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

Revision: 0

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Client: GILKES ENERGY

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

Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: A86 Bend

NO MITIGATION REQUIRED

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		13

Scale: 1:500 @ A3

File No.: 231202 Tracking.dwg

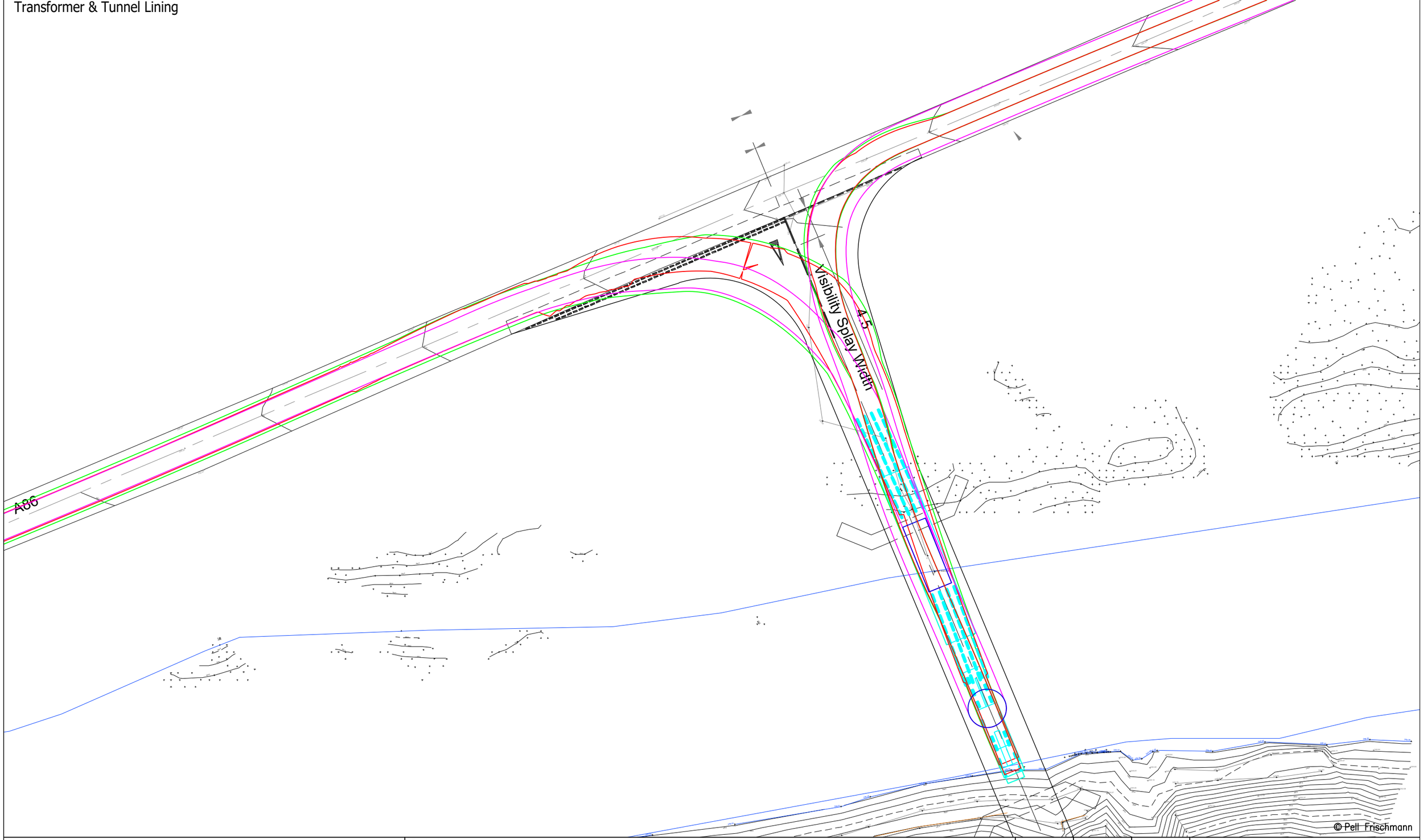
Drawing Status: Draft

Drawing No.: SK06

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

Revision: 0

Transformer & Tunnel Lining



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Client: GILKES ENERGY

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

Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: Site Access Junction

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		14

Scale: 1:500 @ A3

File No.: 231202 Tracking.dwg

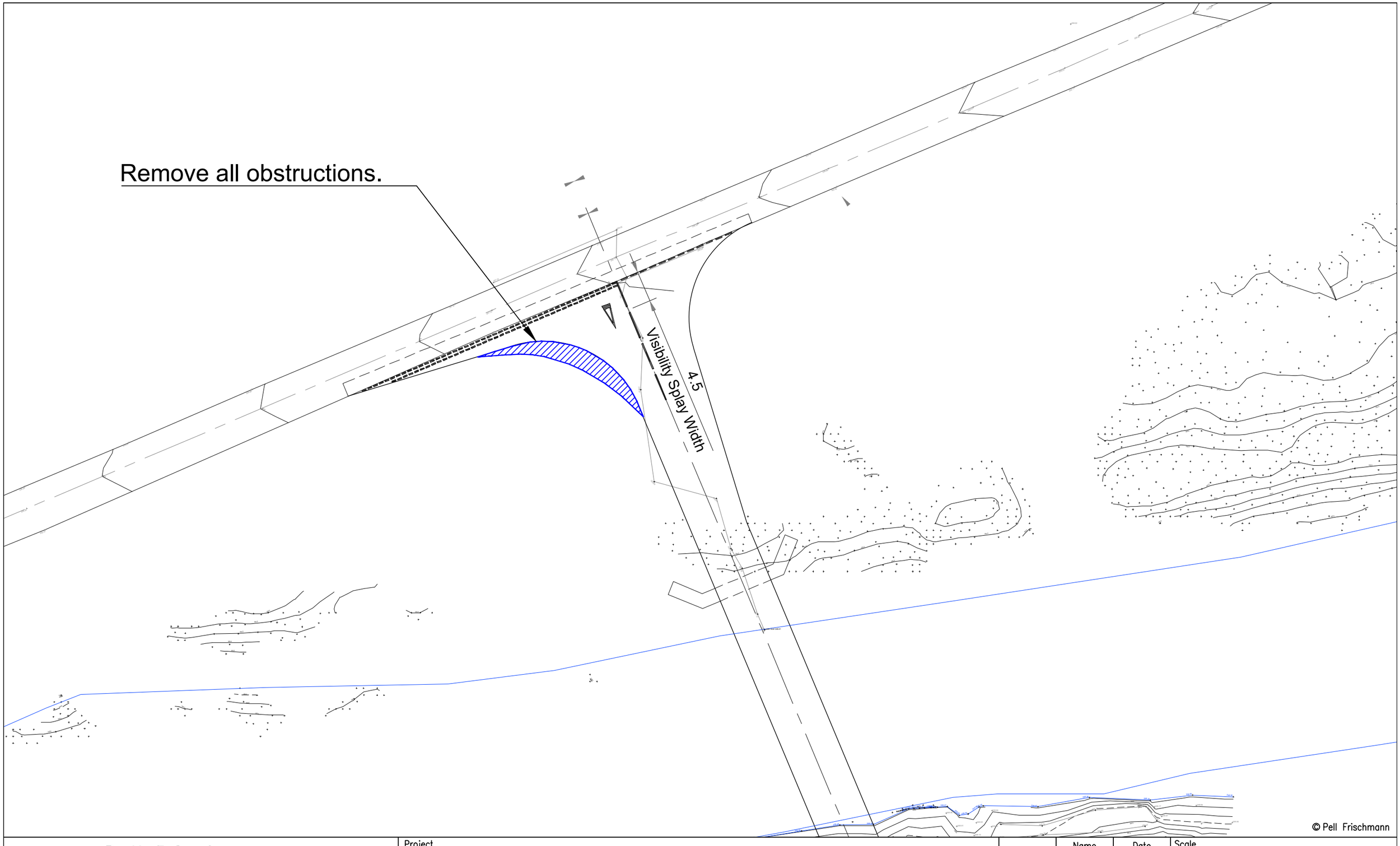
Drawing Status: Draft

Drawing No.: SK07

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

Revision: 0

NO MITIGATION REQUIRED



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Client: GILKES ENERGY

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

Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: Site Access Junction

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		14

Scale: 1:500 @ A3

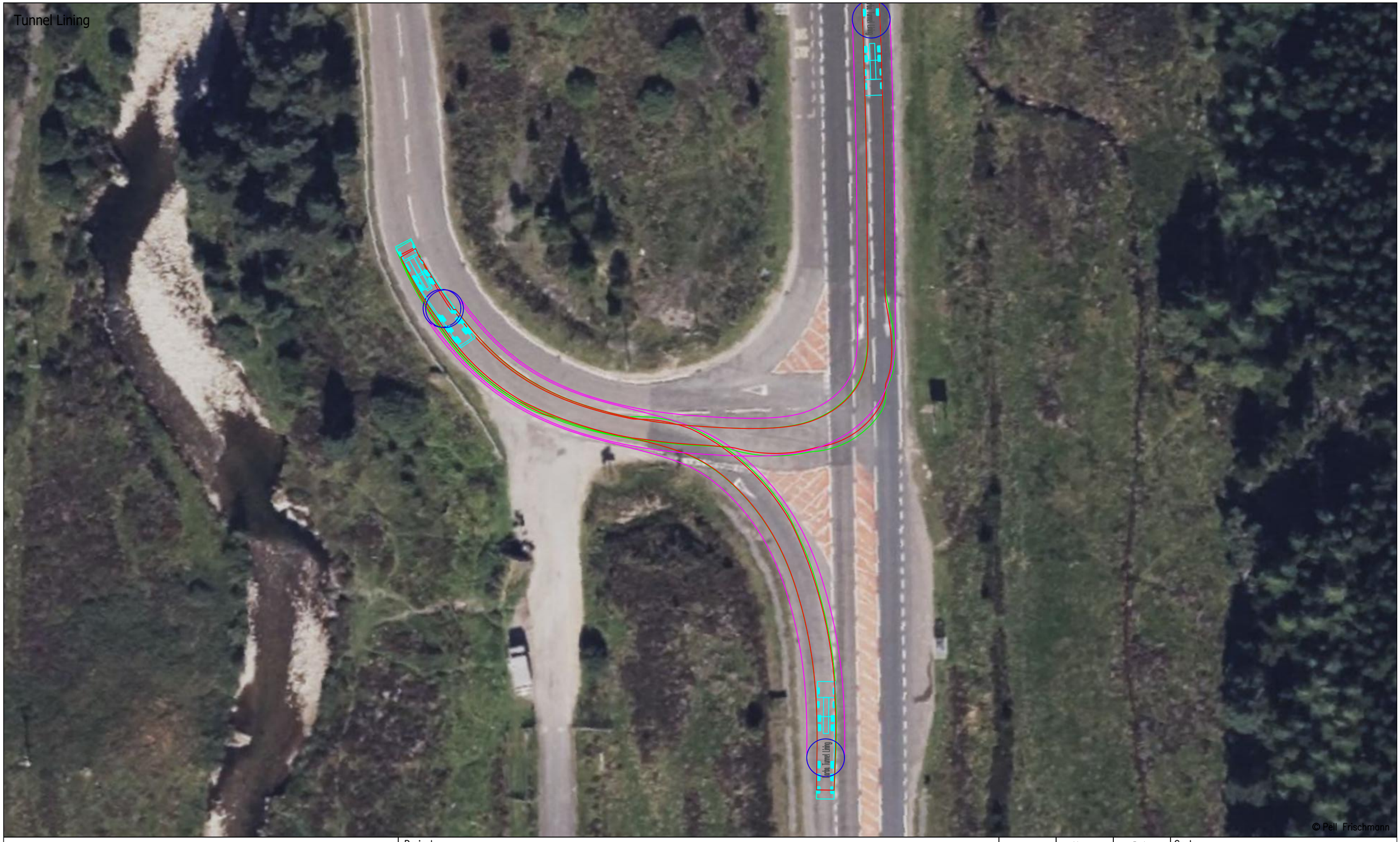
File No.: 231202 Tracking.dwg

Drawing Status: Draft

Drawing No.: SK07A

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

Revision: 0



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Client: GILKES ENERGY

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

Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: A9 / A889 Junction

NO MITIGATION REQUIRED

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		15

Scale: 1:500 @ A3

File No.: 231202 Tracking.dwg

Drawing Status: Draft

Drawing No.: SK08

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

Revision: 0

Tunnel Lining

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Client: GILKES ENERGY

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

Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: Highland Mainline Railway Bridge

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		16

Scale: 1:500 @ A3

File No.: 231202 Tracking.dwg

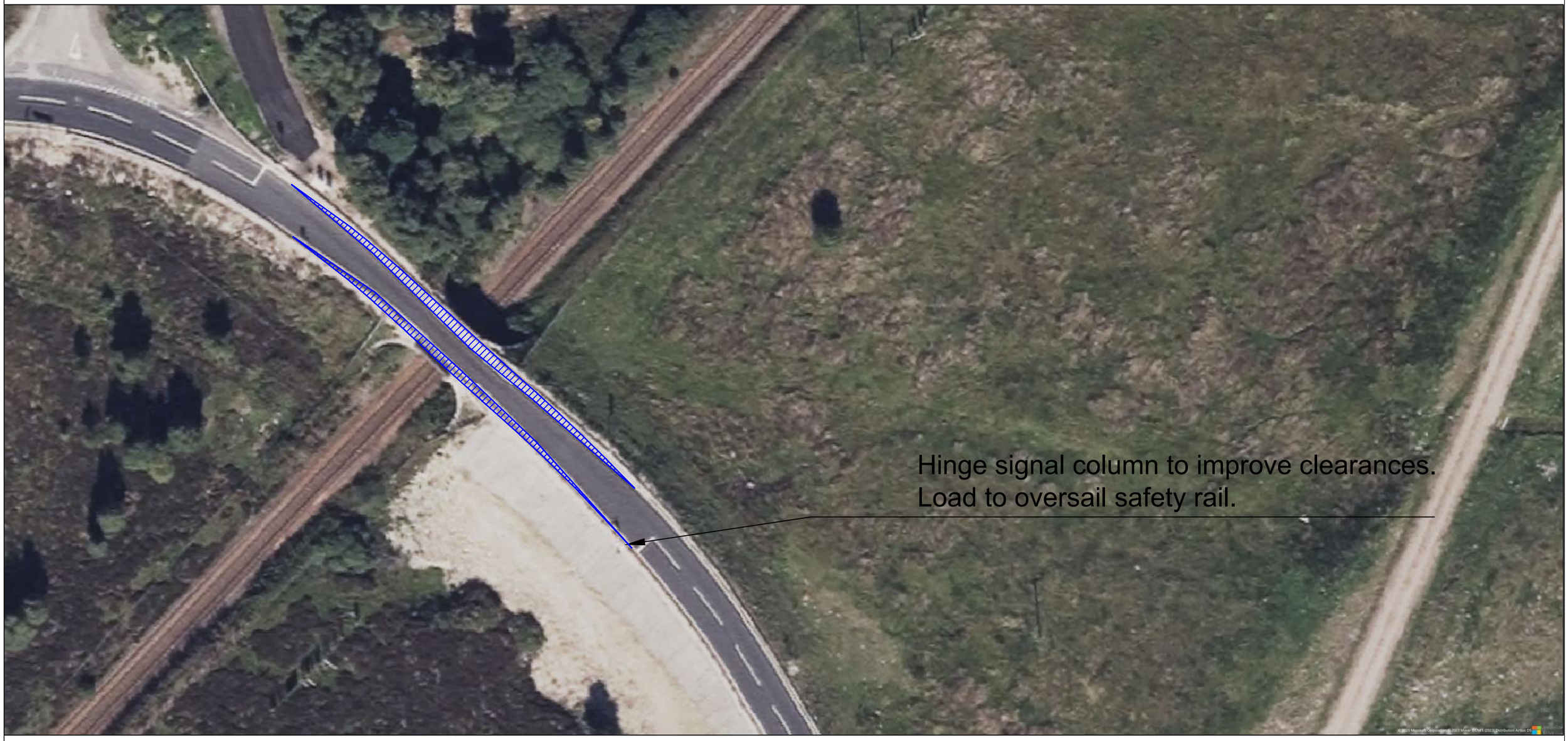
Drawing Status: Draft

Drawing No.: SK09

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

Revision: 0

NO MITIGATION REQUIRED



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Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: Highland Mainline Railway Bridge

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		16

Scale: 1:500 @ A3

File No.: 231202 Tracking.dwg

Drawing Status: Draft

Drawing No.: SK09A

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

Revision: 0

Tunnel Lining

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Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: A889 / A86 Junction

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		17

Scale: 1:500 @ A3

File No.: 231202 Tracking.dwg

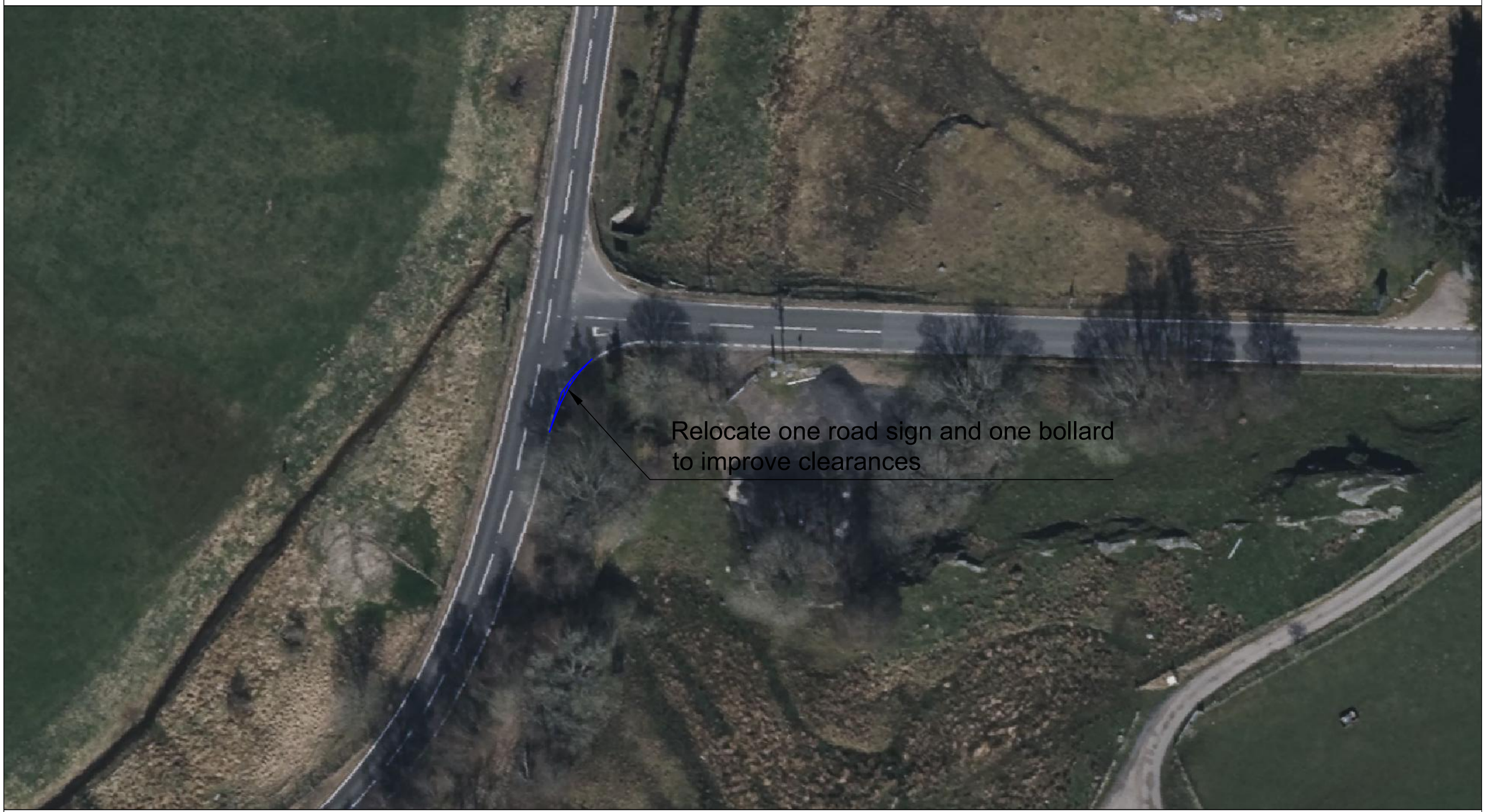
Drawing Status: Draft

Drawing No.: SK10

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

Revision: 0

NO MITIGATION REQUIRED



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Project: EARBA PUMPED STORAGE HYDRO SCHEME

Drawing Title: TRANSFORMER & TUNNEL LINING SECTIONS

SPA Location: A889 / A86 Junction

	Name	Date
Drawn	GB	04/12/2023
Designed	GB	03/12/2023
Checked	TL	04/12/2023
Point of Interest		17

Scale: 1:500 @ A3

File No.: 231202 Tracking.dwg

Drawing Status: Draft

Drawing No.: SK10A

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

Revision: 0

Appendix D ESDAL Correspondence

From: Stephen Oakley
Sent: 31 October 2023 11:35
To: Gordon Buchan
Cc: NW AbnormalLoad
Subject: RE: Eraba Hydro

Good morning,

I have checked the structures on the two routes with the ALR software available to BEAR. This software is not capable of assessing the more complex structures on the routes.

On the route from Corpach the two structure that would require further assessment is Banavie Swing bridge on the A830. Cailich is a short span bridge that should be OK at 45 HB. We are content that the results exceeding 0.85 are satisfactory as the ALR tool does not include load factors for the axle weights in the check.

On the route from Inverness the structures that would require further assessment are Findhorn, Slochd Beag and Dulnain on the A9 and Laggan on the A86. Findhorn has also been assessed for SV vehicles with vehicles between SV100 and SV196 needing to cross the bridge with no other traffic on the same carriageway. The other structures that cannot be assessed by ALR are shorter single span structures that at 45HB should not be a problem. We are content that the results exceeding 0.85 are satisfactory.

I have included the structures on the A9 and A889 that would be used if the vehicle was travelling via Dalwhinnie. The bridge where the A889 crosses the railway line has only 4.75 m between the verge safety barriers and there are other bridges on the route with approximately 6.5 m between the parapets. On this route Spey bridge would require further assessment.

Regards

Stephen Oakley

Bridge Engineer | BEAR Scotland | North West Unit

From: SC Abnormal Loads

Sent: 25 August 2023 10:23

To: Gordon Buchan

Subject: RE: Eraba Hydro

Good morning,

No Scottish Canals structures affected.

Thanks,

Brian.

From: Sunil Maniraj On Behalf Of Abnormal Loads Enquiries

Sent: 29 August 2023 09:49

To: Gordon Buchan

Subject: RE: AB-44123/SM Eraba Hydro

OFFICIAL

Dear Gordon

We have no objections to this particular movement. Please note this only applies to this route enquiry.

We check the load carrying capacity of Network Rail owned road over rail bridges affected. We do not check anything else, including:

* Load carrying capacity of level crossings

* Clearance to bridge parapets

* Clearance under a rail bridge

* Clearance to overhead wires at level crossings

Many Thanks

Sunil Maniraj

Abnormal Loads Clerk

From: Irene Young

Sent: 25 August 2023 08:56

To: Gordon Buchan

Subject: RE: Eraba Hydro

Morning Gordon,

Thank you for both of your emails which Transport Scotland received this morning.

We have passed your emails onto Bear (North West) Scotland as this is the operating company that will be able to give you more information.

Bear (North West) Scotland can be contacted at the email below.

Thank you.

Kind Regards

Irene Young

Network Administrator

Administration Team Roads Directorate