Energy Storage System at Land North of Bronwylfa Road

Construction Traffic Management Plan

On behalf of **Innova Renewables Developments**

Project Ref: 332610070 | Rev: - | Date: November 2023

Registered Office: Buckingham Court Kingsmead Business Park, London Road, High Wycombe, Buckinghamshire, HP11 1JU
Office Address: Lakeside House, Blackbrook Business Park, Blackbrook Park Avenue, Taunton, TA1 2PX
T: +44(0) 1823 218940 E: taunton.uk@stantec.com

Document Control Sheet

Project Name: **Energy Storage System at Land North of Bronwylfa Road**

Project Ref: **332610070**

Report Title: **Construction Traffic Management Plan**

Doc Ref: **Pre-application Issue**

Date: **November 2023**

	Name	Position	Signature	Date
Prepared by:	Jacob Cook / Natasha Lovell	Apprentice Transport Planner / Transport Planner	JC 	16/11/2023
Reviewed by:	Sarah Ledger	Principal Engineer		16/11/2023
Approved by:	Jon Berry	Senior Associate		16/11/2023
For and on behalf of Stantec UK Limited				

Revision	Date	Description	Prepared	Reviewed	Approved
DRAFT	15/06/2023	Additional information needed	JH	JB	JB
DRAFT	05/10/2023	Updated trip rates	JC	SL	JB
-	16/11/2023	Pre-application issue	NL	SL	JB

Contents

Tables

Appendices

1 Introduction

1.1 Brief

1.1.1 Stantec has been appointed by Innova Renewables Developments to prepare an outline Construction Traffic Management Plan (CTMP) to support a planning application for an Energy Storage System (ESS) on land north of Bronwylfa Road, Rhosyllen, Wrexham.

1.1.2 The CTMP provides details of the development proposal, the local area, the forecast traffic movements, details of the site access and the measures that would be taken to mitigate the impact of the traffic during construction.

1.1.3 The CTMP also includes details of the construction traffic routing, swept path analysis and the access arrangements.

1.2 Purpose of a CTMP

1.2.1 The purpose of a CTMP is to ensure that the impact of construction traffic and delivery vehicles on the surrounding highway network is minimised during the build phase. This is achieved by identifying the main highway issues associated with the construction of the scheme and introducing appropriate mitigation measures to minimise the impact on existing highway users.

1.2.2 This outline CTMP seeks to identify the main issues and the measures that will be implemented by the appointed contractor for the proposed scheme. The main issues and measures identified are summarised below:

- The suitability of the local highway network surrounding the site;
- Routing of construction traffic vehicles and site access strategy;
- Type and volume of construction traffic; and
- Management of construction traffic.

1.2.3 A detailed CTMP will be submitted following determination of the application, and this will seek to confirm further matters including the management of the cable route construction.

1.3 Report Structure

1.3.1 The remainder of this report is structured as follows:

- Chapter 2 sets out the location of the proposals;
- Chapter 3 provides a summary of the local highway network surrounding the site;
- Chapter 4 presents the proposed scheme and access arrangements for the site;
- Chapter 5 forecasts the potential traffic generation during the construction and operational phases;
- Chapter 6 details the measures that will be implemented to minimise the impact of the construction traffic on the local highway network surrounding the site and on the amenity of local residents; and
- Chapter 7 provides a summary and conclusion.

2 Site and Surrounding

2.1 Overview

2.1.1 The site is located approximately three kilometres southwest of Wrexham town centre, and approximately 250 metres northwest of Junction 3 of the A483, known as the Croesfoel Interchange.

2.1.2 The site currently comprises of 5.5ha of agricultural land, and is bounded to the north and east by a tree belt and to the south and west by hedgerows. A dismantled railway line, which extends at a higher elevation, and its associated embankment additionally fronts onto the site's northern boundary, and to the west there is a single-track lane which separates the site boundary from the neighbouring field and Bersham Cricket Club. The A483 lies to the east and is also elevated, with an associated embankment and mature vegetation.

2.1.3 The main access to the site is provided via the B5097 which abuts the southern boundary, approximately 150 metres from the junction with the B5098 Bronwylfa Road. The topography of the site is generally flat, however, the B5097 rises to the east of the site to cross the A483 carriageway and therefore there are embankments associated with this at the eastern extent of the site.

2.1.4 The site and surroundings are shown on the plan which is included as **Appendix A**.

3 Highway Network

3.1 Overview

3.1.1 The strategic road network (SRN) in the region consists of the A483 which is managed by the North and Mid Wales Trunk Road Agent (NMWTRA). The A483 is a dual carriageway which connects northwards to Wrexham and Chester, and provides further connections onward to North Wales, Liverpool, and Manchester. Southbound, the A483 connects to Ruabon which allows further connections along the SRN to Shrewsbury and Birmingham.

3.1.2 Access to the A483 from the site is provided via the Croesfoel Interchange. This is a grade separated junction with a roundabout and on and off-slip roads in both directions. Wrexham Road, which comprises the western arm of the junction, provides access to the site via the B5098, which extends north from Wrexham Road to the B5097 as a single carriageway rural road, subject to a 50mph speed limit.

3.1.3 The site fronts onto the B5097 on its southern boundary. The B5097 is a typical rural road, subject to a 50mph speed limit, and is not street-lit adjacent to the site frontage. There is a short section of footway on the north side of the road that extends from the site to the east, across the A483 towards Rhostyllen. This connects to an existing Public Right of Way (PRoW) which crosses the site and runs north beyond the dismantled railway.

3.1.4 The A483, Wrexham Road, the B5098, and the B5097 will provide the main route to the site for the majority of vehicles. These roads are not subject to weight restrictions and are considered appropriate for normal construction traffic. This is outlined further in **Chapter 6** of this CTMP.

4 Development Proposals

4.1 Overview

4.1.1 The development comprises a 400MW ESS facility with substation which will connect to the National Grid to provide storage for electricity during peak production for use during peak demand. In simple terms, the facility would enable energy from renewables, like solar and wind, to be stored and released back to the grid when the power is needed most.

4.1.2 The facility consists of the following equipment:

- 246 x Energy Storage containers;
- 123 X MV Skids;
- 4 x 33/132kV Compounds; and
- 1 x 400Kv Substation and concrete bases for batteries to be constructed onsite.

4.1.3 Access to each Energy Storage container will be provided through a network of internal access tracks, which will accommodate the majority of construction movements as well as future maintenance requirements of the site. The site layout is shown in **Appendix A**.

4.1.4 The primary vehicle access for the construction phase of the development is provided at the existing access off the B5097. The access layout is shown on **Drawing STN-HGN-ZZ-DR-H-5501** provided in **Appendix B**.

4.1.5 Visibility splays of 2.4 metres x 160 metres have been shown to be achievable at the junction between this access and the B5097. This is in line with the Design Manual for Roads and Bridges (DMRB) requirement for a design speed in line with the 50mph speed limit that the B5097 is subject to along the site frontage.

4.1.6 Swept path analysis has been undertaken for construction traffic, including articulated HGVs, for this access junction. This is shown on **Drawing STN-HGN-ZZ-DR-H-5502** provided in **Appendix B**. The swept path analysis demonstrates that the HGV swept paths allow HGVs to turn into / out of the access from all directions, although in some instances, HGVs may have to use the oncoming lane to complete the turning movement.

4.1.7 A secondary access is also proposed off the unnamed lane that runs north from the B5097 along the western boundary of the site during the construction period, and a temporary construction compound is proposed in the field to the north of the new access road.

4.1.8 Some enabling works are required to facilitate delivery of the main substation building to the site. A permanent haulage road is required in the field immediately to the east of Bersham Cricket Club, to allow the delivery vehicle for the substation to access the substation location without tracking through the main site area.

4.1.9 During the operational phase of the development, primary access will be taken from unnamed lane on the western boundary of the site.

5 Traffic Generation

5.1 Construction Period

5.1.1 The construction of the ESS will be carried out over the course of approximately 24 months. This includes the preparation of the site, erection of security fencing, assembly, and installation of substation and cable works. This, along with the construction traffic forecast per delivery type, should allow an average number of daily movements to be forecast (assuming a 22-day working month and even distribution of deliveries over the construction period).

5.1.2 It has been assumed that there will be a maximum of 55 construction workers on site at any given time and that 50% will arrive by private car, whilst the remainder will either lift share or use minibus transport. This would therefore suggest there could be in the region of 30-40 additional trips on the network at the start end of the day as a result of construction workers travelling to/from the site. The origin of the workforce is unknown at this stage but regardless of this it is expected that they will use local accommodation and transport provided via minibus wherever possible. Staff will generally arrive in the morning and leave in the evening but there will inevitably be some trips during the day, including ones by visitors to the site.

5.2 Main Construction Movements

5.2.1 The majority of construction traffic will enter / exit the site via the primary site access on the B5097 as shown in **Drawing STN-HGN-ZZ-DR-H-5501** provided in **Appendix B**, with the remainder of the traffic accessing the site via the proposed temporary access road on the site's western boundary.

5.2.2 The main construction movements of HGVs associated with the implementation of the scheme are outlined below alongside the forecast total number of trips.

Item	Quantity per Load	Requirement (Approx.)	Total Two-Way Trips
Mobilisation, site set-up and welfare	-	-	188
Battery & MV Skid foundations	20 tonnes	2,330 tonnes aggregate	116
Battery & MV Skid units	1	246 Battery blocks 123 MV Skid blocks	369
Stone crush between units	20 tonnes	5,554 tonnes aggregate	278
Cabling	-	-	888
33-132kV compound	-	5	160
400kV Substation plant delivery	-	-	81
400kV Substation general deliveries	-	-	540
400kV Cable plant delivery	-	-	102
400kV Cable general deliveries	-	-	390
Total	-	-	**3,716**

Table 5-1: HGV trips

5.2.3 Based on an even distribution of trips over the 24-month construction period and assuming a 22-day working month, this translates to an average of 7 HGV two-way trips per day.

5.2.4 It is also anticipated that there will be up to 5 LGV movements per day bringing smaller equipment and contractors to site, and therefore the total number of daily LGV/HGV two-way trips will be in the order of 13 vehicles.

5.2.5 This is considered to represent an immaterial impact on the local highway network since there are very few receptors likely to be impacted by this increase in traffic.

5.3 Abnormal Load Delivery

5.3.1 The scheme requires the delivery of 2 transformers via 6 abnormal load deliveries. This vehicle requires specialists to make the arrangements for the delivery route and to manoeuvre the vehicle. The delivery will also require road closures and an escort which the specialist company will arrange.

Item	Quantity per Load	Requirement (Approx.)	Total Two-Way Trips
Transformers	1	2	6

Table 5-2: Abnormal load trips

5.3.2 The abnormal load will arrive in Ellesmore Port in Cheshire, and will take one of two routes in accordance with the specialist assessment commissioned by the client. It will route along the B5097 to the special access proposed for the abnormal load. Due to the swept path of the abnormal load and the need to ensure access is available in future maintenance scenarios, a

separate access will be provided for use by the abnormal load. This is because the primary access and the site layout will not accommodate the abnormal load vehicle. This secondary access with access track is proposed to be provided east of Bersham Cricket Club access via the B5097.

5.4 Operational Traffic

5.4.1 The majority of traffic will be generated during the construction period of the development. In the scheme's operational phase, there will be limited access requirements for the site which will be limited to maintenance requirements only. On this basis, trips during the operational phase of the scheme are expected to be approximately 2 (two-way) trips per month.

6 Traffic Management

6.1 Traffic Management

6.1.1 Construction vehicles will route towards the site from the A483 at the Croesfoel Interchange west along Wrexham Road, and north along the B5098 to the B5097. Vehicles will therefore use the A483 to travel to / from the site on the basis that the SRN will be able to appropriately accommodate the volume / HGV composition of the construction traffic flow and will prevent impact on the nearby community in Rhostyllen. The main site construction access would be in the same position as the primary access, though it is likely to take a more temporary form prior to completion of the construction phase. The only exception to this would be construction traffic associated with the delivery of the substation, for which an abnormal load assessment has been instructed separately by the client.

6.1.2 No construction traffic is proposed to travel west of Bersham Cricket Club, nor run any further west along Wrexham Road than the junction with the B5098. Further to this, no construction traffic is proposed to be permitted to run east of the A483 / Croesfoel Interchange in the vicinity of the site where applicable. The proximity of the site to the SRN and routing of vehicles means that the impact on the local highway network and local residents is likely to be minimal.

6.1.3 The delivery route for the abnormal load vehicle will be provided by a specialist company. Full details of the delivery will be in their information pack. Drawings showing the swept path of the abnormal load for access into the site are shown in **Stantec Drawing STN-HGN-ZZ-DR-H-5505** which is provided in **Appendix B**.

6.1.4 Temporary signage will be provided to direct deliveries onto the correct routes, and to advise drivers in the area to be aware of the presence of construction traffic. Signs will be located on the approaches to the site from the Croesfoel Interchange, with signs at the start of Wrexham Road, at the junction between the B5098 and the B5097, and at the access to the site.

6.1.5 There is potential for the use of delivery slots during particularly busy periods. HGV drivers would be instructed to call the site office to confirm their delivery slot when they know their estimated time of arrival in order to ensure that there is sufficient room on-site to accommodate their vehicle. HGV delivery vehicles could wait either at the ‘Esso Rontec Ruabon’ service station if coming from the south, or at the layby approximately 1.5 kilometres from the Croesfoel Interchange if coming from the north, unless other alternative arrangements are made. This solution would prevent waiting vehicles from blocking the B5097.

6.1.6 Marshalls with radio communication to the site would be employed and stationed at the site access points to manage and direct traffic movements, and to accommodate safe access and egress.

6.1.7 Notice boards would be placed at key locations to provide details of the contractor and site manager emergency telephone numbers.

6.1.8 A temporary construction compound would be set up in the field to the west of the unnamed lane to provide a hardstanding to store materials, a staff parking area, and to accommodate welfare buildings. The parking area provided for site employees would ensure that parking on the B5097 is avoided and the route is therefore unobstructed.

6.1.9 A pressure washing bowser would be provided at the exit to the site during the enabling works and when the site is being constructed in order to clean the wheels of vehicles leaving the site, and to thereby prevent the deposit of mud onto the public highway.

7 Conclusion

7.1 Conclusion

7.1.1 The development proposal for an Energy Storage System (ESS) on land north of Bronwylfa Road requires the delivery of equipment, construction plant, and construction materials, and the undertaking of temporary works over a 24-month period. The purpose of this report is to demonstrate that construction traffic can be managed effectively and safely to minimise the impact on the local and strategic highway network.

7.1.2 It is forecast that approximately 3,716 two-way HGV trips will be generated by the construction of the scheme, amounting to an estimated 7 two-way HGV and 5 two-way LGV trips per day on average over the course of the construction period. It is further estimated that 30 to 40 car/van trips will be generated per day arising from site workers. This is considered to represent an immaterial impact on the local highway network, considering that the majority of these trips are unlikely to route through local settlements in the vicinity of the site.

7.1.3 The designated route for HGV construction traffic would be from the Croesfoel Interchange via Wrexham Road and via the B5098, to the site entrances on the B5097.

7.1.4 Access to the site during the construction period would primarily be via the improved existing field access. HGV drivers would be instructed to call the site office to give their expected time of arrival, and to get clearance to deliver their load. If necessary, HGV delivery vehicles would be instructed to park up until a delivery slot becomes available. Marshalls with radio communication to the site would be employed to manage the movement of delivery vehicles to and from the site accesses, and to ensure safe access and egress.

7.1.5 A further 6 abnormal load trips are forecast to be required to accommodate the delivery of the substation to the site. An abnormal load route assessment has been completed as commissioned by the client. Delivery of the substation will require an abnormal load vehicle with different access requirements to the majority of the construction traffic, and as such, an additional access and haulage road is proposed to be provided in the land to the east of Bersham Cricket Club to accommodate this delivery.

7.1.6 A temporary compound would be set up in the field to the west of the unnamed lane to provide hardstanding to store materials and to accommodate an area for staff parking and welfare buildings.

7.1.7 During the operational phase of the development, access will be achieved via the unnamed lane that runs north from the B5097 along the western boundary of the site.

7.1.8 Temporary signage will be provided on the Croesfoel Interchange, Wrexham Road, the B5098, and the B5097 to provide information to delivery drivers and construction traffic in order prevent construction traffic using unsuitable roads to the west of the site. It will also advise drivers in the area to be aware of the presence of construction traffic on the highway network.

7.1.9 All delivery and staff vehicles will use the designated site access and egress points. A pressure washing bowser will be provided at the exit to the site during the enabling works and during site construction in order to clean the wheels of vehicles leaving the site, and to thereby prevent the deposit of mud onto the public highway.

7.1.10 Noticeboards will be placed at key locations to provide the details of the contractor and site manager's emergency telephone numbers.

7.1.11 The impact of construction traffic will be for a limited period, and measures will be put in place to manage the safe arrival and departure of deliveries of plant and equipment to the site for the duration of the construction period, and to manage construction workers travelling to/from the site. It is also considered that construction vehicles can access the site directly from the nearby SRN, and as such it is anticipated that the impact on the local highway network will not be significant.

Appendix A Site Masterplan

KEY:

- Site Boundary
- MV Skid
- Energy Storage Container
- 400kV Substation
- 33kV Bay
- Access tracks
- PRoW
- 10m Wide Woodland Structure
- Hedgerow Enhancement
- Fenceline
- Access Gate
- Root Protection Zone

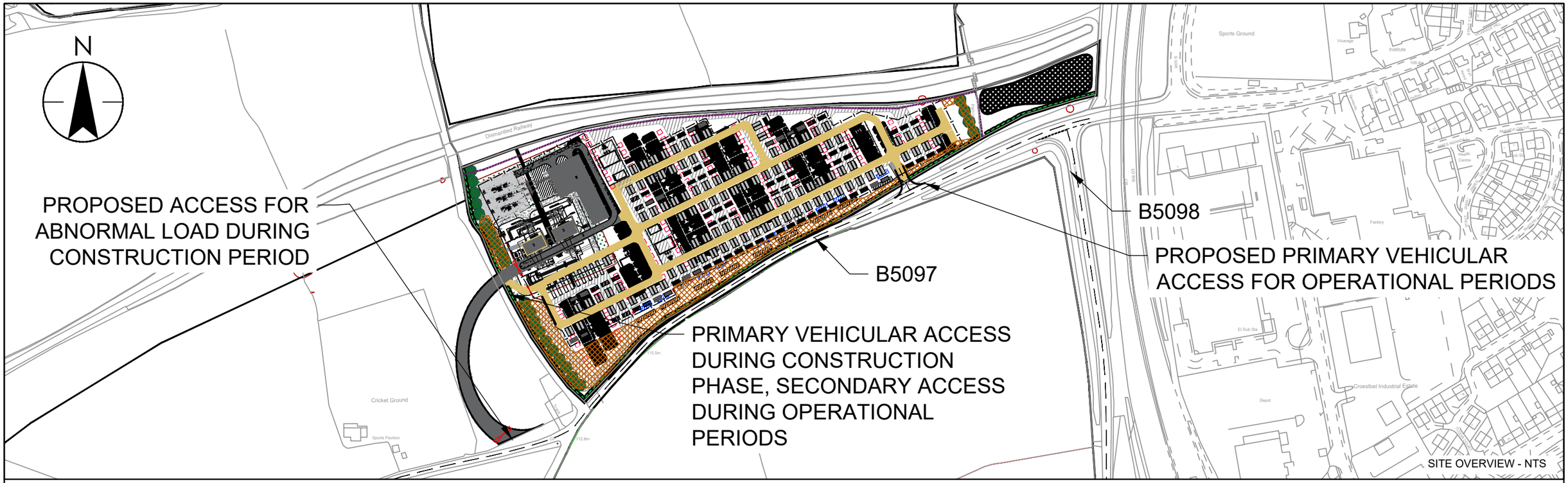
General Information:

Total Capacity: 492MW

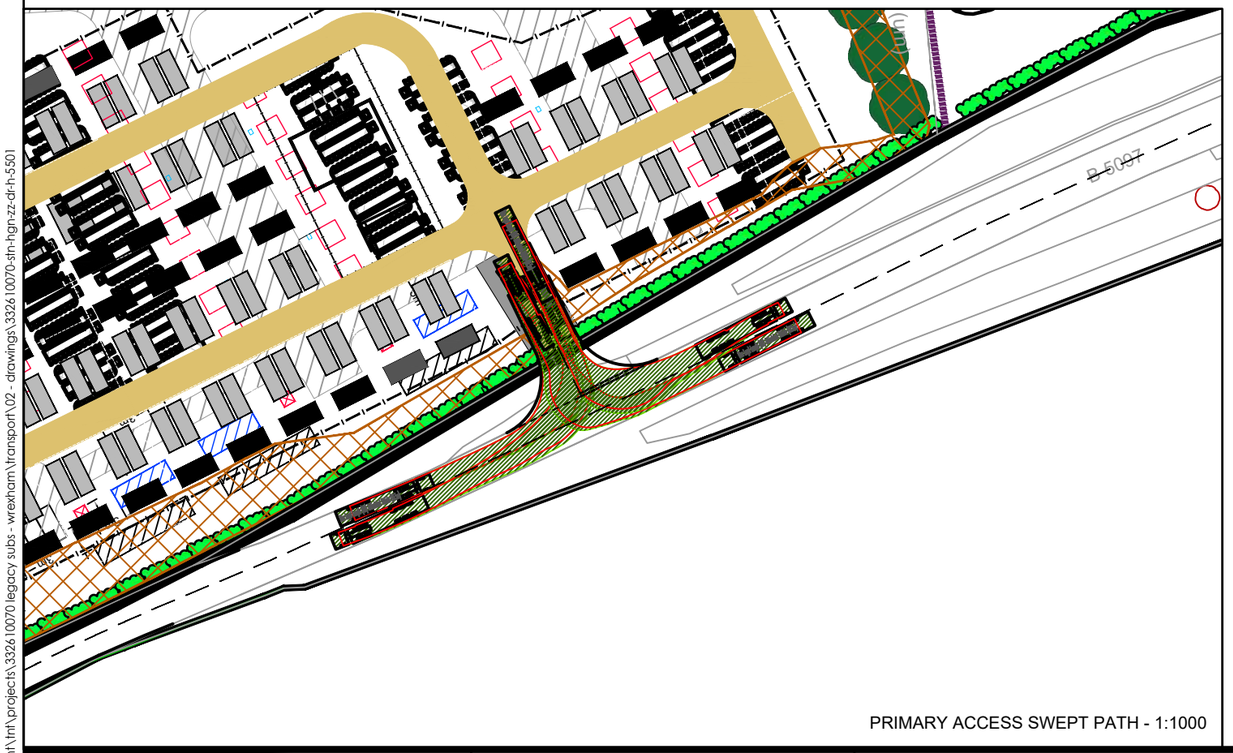
novus

DATE:	03/08/2023
PROJECT TITLE:	Legacy
DRAWING TITLE:	Layout Plan
DRAWING VERSION NUMBER:	L8
SCALE:	1:2000
PAGE SIZE:	A3
DRAWN BY:	DD
APPROVED BY:	WG

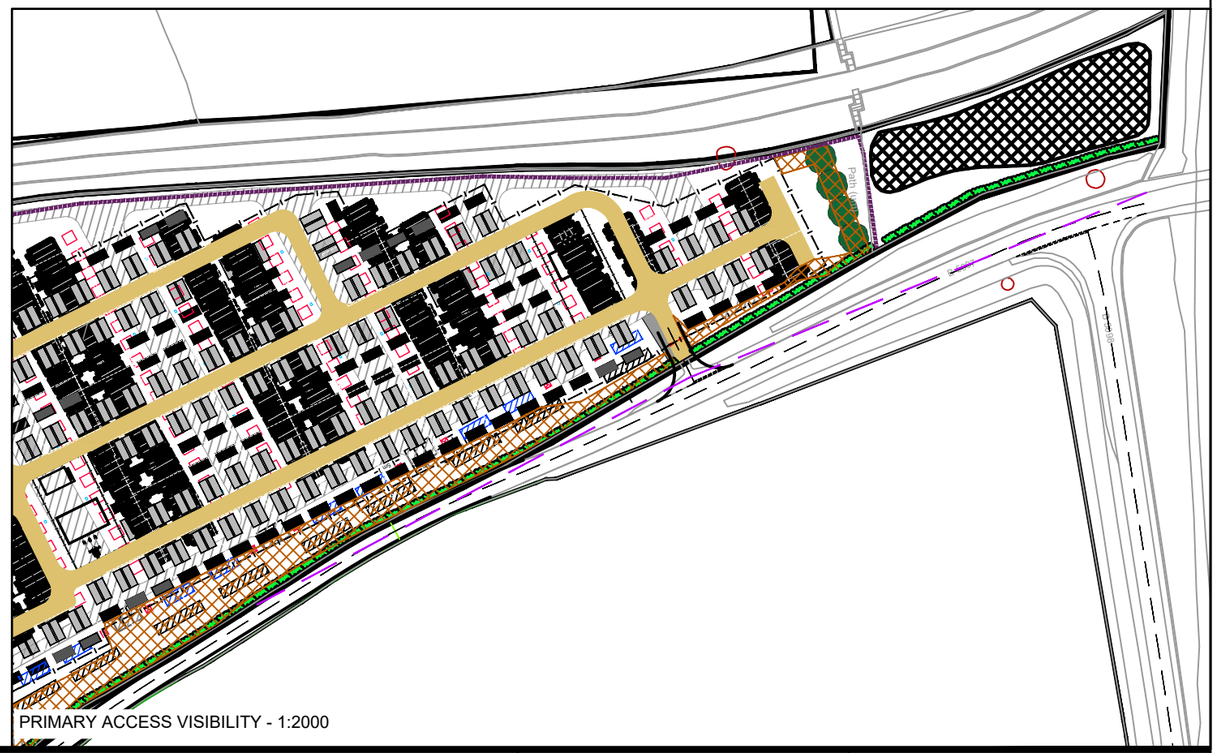
Appendix B Vehicle Tracking



SITE OVERVIEW - NTS



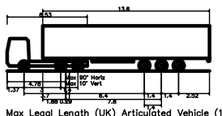
PRIMARY ACCESS SWEPT PATH - 1:1000



PRIMARY ACCESS VISIBILITY - 1:2000

Stantec

Stantec UK Limited
Lakeside House, Blackbrook Business Park, Blackbrook Park Avenue
Taunton
TA1 2PX
Tel. +44 1823 218 940
www.stantec.com/uk



Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.881m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

KEY:

- RED LINE BOUNDARY
- HMPE BOUNDARY INTERPRETED BY STANTEC
- 2.4m x 160mVISIBILITY SPLAYS IN ACCORDANCE WITH DMRB CD123 3.8 & DMRB CD109 TABLE 2.10 BASED ON 50MPH POSTED SPEED LIMIT

Client/Project:
INNOVA RENEWABLES DEVELOPMENTS
ENERGY STORAGE SYSTEM AT LAND NORTH OF BRONWYLFA ROAD
Project No.:
332610070

Title
PROPOSED ACCESS LOCATIONS WITH VISIBILITY SPLAYS

Revision:	Date:	Drawing No.
	2023.11.15	STN-HGN-ZZ-DR-H-5501

Plotted: 15.11.2023 2023.11.15 4:08:04 PM By: Cook, Jacob
ORIGINAL SHEET - ISOA3 \\pba.int\int\projects\332610070 legacy subs - wrexham\transport\02 - drawings\332610070-stn-hgn-zz-dr-h-5501

Dismantled Railway

HEDGEROW TO BE REMOVED FOR ABNORMAL LOAD DELIVERY

HEDGEROW TO BE REMOVED FOR ABNORMAL LOAD DELIVERY

ACCESS DESIGNED FOR EXISTING LEVELS TO ACCOMMODATE ABNORMAL LOAD VEHICLE WITHOUT CHANGING LEVEL OF EXISTING HIGHWAY

TEMPORARY WORKS WILL BE REQUIRED ON EXISTING HIGHWAY VERGE TO ACCOMMODATE SWEPT PATH OF ABNORMAL LOAD

Track

Cricket Ground

Sports Pavilion

112.8m

115.5m

SCALE 1:1250

SWEPT PATH CONFLICTS WITH SMALL EMBANKMENT IN VERGE IN SOUTH WESTERN CORNER OF THE SITE. SOME LOCALISED RELEVELLING AND RELOCATION OF THE EXISTING HEDGEROW MAY BE REQUIRED TO ACCOMMODATE SWEPT PATH OF ABNORMAL LOAD.

NTS

ABNORMAL LOAD OVERHANGS TRACK IN SOME LOCATIONS SO ADDITIONAL LAND BUFFER BEYOND TRACK WILL NEED TO BE KEPT CLEAR

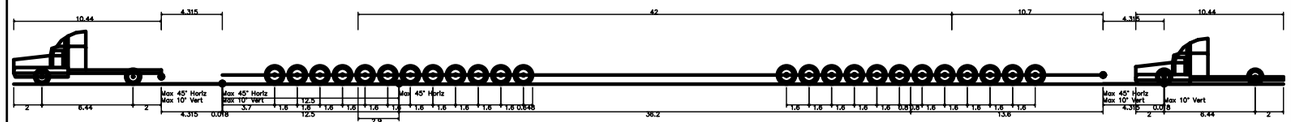
NTS

KEY

INDICATIVE EXTENT OF ADOPTED HIGHWAY

Stantec

Stantec UK Limited
Lakeside House, Blackbrook Business Park, Blackbrook Park Avenue
Taunton
TA1 2PX
Tel. +44 1823 218 940
www.stantec.com/uk



Copy Of Girder Trailer

Overall Length	89.810m
Overall Width	5.000m
Overall Body Height	3.725m
Min Body Ground Clearance	0.015m
Max Track Width	3.700m
Lock to lock time	6.00s
Wall to Wall Turning Radius	23.000m

Client/Project:
INNOVA RENEWABLES DEVELOPMENTS
ENERGY STORAGE SYSTEM AT LAND NORTH OF BRONWYLFA ROAD
Project No.:
332610070

Title
ABNORMAL LOAD TRACKING - TEMPORARY ACCESS ARRANGEMENT

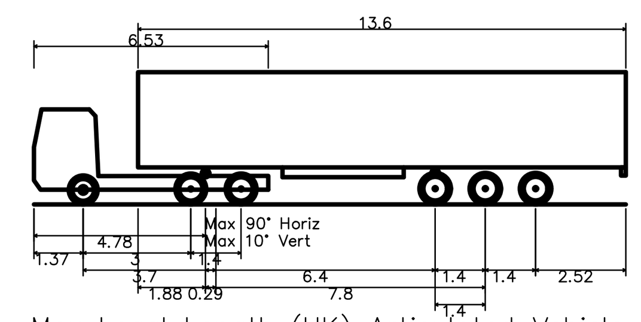
Revision:	Date:	Drawing No.
P02	2023.08.03	STN-HGN-ZZ-DR-H-5505

Plotted: 15.11.2023 2023.11.15 4:10:16 PM By: Cook, Jacob
ORIGINAL SHEET - ISO A3 \\pba.int\tnf\projects\332610070 legacy subs - wrexham\transport\02 - drawings\332610070-stn-hgn-zz-dr-h-5505

Notes

UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake their own investigation where the presence of any existing sewers, services, plant or apparatus may affect their operations.

VEHICLE DETAILS



Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

KEY:

RED LINE BOUNDARY

HMPE BOUNDARY INTERPRETED BY STANTEC

N

P01 FIRST ISSUE		JHo	JB	2023.05.09
Issued/Revision		By	Appd	YYYY.MM.DD
	JC	JC	JHo	2023.05.09
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Issue Status

S2 - FOR INFORMATION

This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.

Client/Project Logo

Client/Project

INNOVA RENEWABLES DEVELOPMENTS

ENERGY STORAGE SYSTEM AT LAND NORTH OF BRONWYLFA ROAD

WREXHAM

Title

SWEPT PATH ANALYSIS

MAX LENGTH HGV

Project No.	A1 Scale
332610070	1:500

Revision	Drawing No.
P01	STN-HGN-ZZ-DR-H-5502