

# **Llandyfaelog Substation** **Outline Construction Traffic** **Management Plan**

On behalf of **National Grid Electricity Transmission**  
**nationalgrid**

Project Ref: 331201429 | Rev: V4 | Date: November 2025

Registered Office: The Stills, 1<sup>st</sup> Floor, 80 Turnmill Street, London, United Kingdom, EC1M 5QU T:  
+44 (0) 2038 246600 E: London.uk@stantec.com

## Document Control Sheet

**Project Name:** Llandyfaelog Substation

**Project Ref:** 331201429

**Report Title:** Outline Construction Traffic Management Plan

**Doc Ref:** V4

**Date:** November 2025

|                     | Name        | Position                    | Signature | Date         |
|---------------------|-------------|-----------------------------|-----------|--------------|
| <b>Prepared by:</b> | Jemima Odom | Assistant Transport Planner | JO        | October 2025 |
| <b>Reviewed by:</b> | Tim Hapgood | Senior Associate            | TH        | October 2025 |
| <b>Approved by:</b> | Adrian Neve | Director                    | AN        | October 2025 |

| Revision | Date       | Description                | Prepared | Reviewed | Approved |
|----------|------------|----------------------------|----------|----------|----------|
| V2       | 28/20/2025 | Clients Comments Addressed | JO       | TH       | AN       |
| V3       | 31/10/2025 | Final Issue                | JO       | TH       | AN       |
| V4       | 10/11/2025 | Appendices Updated         | JO       | TH       | AN       |

This report has been prepared by Stantec UK Limited ('Stantec') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which Stantec was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). Stantec accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this report.

## Contents

|          |                                                        |           |
|----------|--------------------------------------------------------|-----------|
| <b>1</b> | <b>Introduction .....</b>                              | <b>1</b>  |
| 1.2      | oCTMP Objectives .....                                 | 1         |
| 1.3      | Site Context and the Proposed Development .....        | 1         |
| 1.4      | oCTMP Structure.....                                   | 2         |
| <b>2</b> | <b>Context, Considerations and Challenges .....</b>    | <b>4</b>  |
| 2.1      | Site Location Context.....                             | 4         |
| 2.2      | Local Access Context .....                             | 5         |
| 2.3      | Local Amenities .....                                  | 8         |
| 2.4      | Considerations and Challenges .....                    | 9         |
| <b>3</b> | <b>Construction Programme and Methodology .....</b>    | <b>10</b> |
| 3.2      | Construction Programme .....                           | 10        |
| 3.3      | Construction Method.....                               | 10        |
| 3.4      | Plant and Equipment.....                               | 11        |
| 3.5      | Working Hours .....                                    | 12        |
| <b>4</b> | <b>Vehicle Routeing and Access .....</b>               | <b>13</b> |
| 4.1      | Strategic Vehicle Routeing.....                        | 13        |
| 4.2      | Local Vehicle Routeing.....                            | 14        |
| 4.3      | Abnormal Indivisible Loads .....                       | 15        |
| 4.4      | Site Access .....                                      | 16        |
| <b>5</b> | <b>Planned Measures .....</b>                          | <b>18</b> |
| 5.2      | Measures to Encourage Sustainable Freight .....        | 20        |
| 5.3      | Material Procurement Measures .....                    | 21        |
| 5.4      | Wheel Wash and Street Sweeper.....                     | 21        |
| 5.5      | Traffic Management Measures.....                       | 21        |
| 5.6      | PRoW Management.....                                   | 22        |
| 5.7      | Highway Condition Survey .....                         | 22        |
| <b>6</b> | <b>Estimated Vehicle Movements.....</b>                | <b>23</b> |
| 6.2      | Vehicle Types .....                                    | 23        |
| 6.3      | Vehicle Movements.....                                 | 23        |
| <b>7</b> | <b>Framework Construction Worker Travel Plan .....</b> | <b>27</b> |
| 7.1      | Introduction.....                                      | 27        |
| 7.2      | Workforce Numbers .....                                | 27        |
| 7.3      | Objectives.....                                        | 27        |
| 7.4      | Measures.....                                          | 28        |
| 7.5      | Travel Plan Co-Ordinator .....                         | 28        |
| 7.6      | Workforce Parking.....                                 | 29        |
| <b>8</b> | <b>Implementing, Monitoring and Updating .....</b>     | <b>30</b> |
| 8.1      | Overview.....                                          | 30        |

|     |                                            |    |
|-----|--------------------------------------------|----|
| 8.2 | Compliance Arrangements.....               | 30 |
| 8.3 | Reporting and Reviewing Arrangements ..... | 31 |

## Figures

|                                                                               |    |
|-------------------------------------------------------------------------------|----|
| Figure 1-1: Proposed Development.....                                         | 2  |
| Figure 2-1: Site Location (Regional).....                                     | 4  |
| Figure 2-2: Site Location (Local) and Indicative Site Red Line Boundary ..... | 5  |
| Figure 2-3 Public Transport Services in Site Vicinity .....                   | 7  |
| Figure 2-4 Walking and Cycling networks in Vicinity of the Site.....          | 8  |
| Figure 4-1: Strategic Vehicle Routes .....                                    | 14 |
| Figure 4-2: Local Vehicle Routes to the Site .....                            | 15 |
| Figure 4-3: Proposed Route for AILs from Pembroke Docks to the Site.....      | 16 |
| Figure 4-4 Proposed Site Access Road.....                                     | 16 |
| Figure 6-1 Estimated Two-Way Construction Vehicles - Monthly .....            | 25 |
| Figure 6-2 Estimated Two-Way Construction Vehicles - Daily .....              | 26 |

## Tables

|                                                                                      |    |
|--------------------------------------------------------------------------------------|----|
| Table 2-1 Railway Services from Ferryside and Carmarthen Railway Stations .....      | 6  |
| Table 2-2 Bus Services from Llandyfaelog Upland Arms Bus Stop .....                  | 7  |
| Table 3-1 Construction Programme .....                                               | 10 |
| Table 3-2 Summary of Construction Activities .....                                   | 10 |
| Table 3-3 Plant and Equipment .....                                                  | 11 |
| Table 5-1 Medium Impact Site Planned Measures Checklist .....                        | 18 |
| Table 6-1 Estimated Two-Way Construction Vehicles Movements - Monthly and Daily..... | 23 |

## Appendices

|            |                                                            |
|------------|------------------------------------------------------------|
| Appendix A | Construction Programme                                     |
| Appendix B | Negotiability Study of the AIL Access Requirements to Site |
| Appendix C | Site Access and Visibility Splays                          |

This page is intentionally blank

# 1 Introduction

1.1.1 Stantec UK Limited (Stantec) has been appointed by National Grid Electricity Transmission (National Grid), hereby referred to as 'the Applicant', to produce an outline Construction Traffic Management Plan (oCTMP) to support the development of Llandyfaelog Substation, hereby referred to as 'the Proposed Development'. The Proposed Development consists of a new 400kV substation, approximately six kilometres south of Carmarthen, and is hereby referred to as 'the Site'.

## 1.2 oCTMP Objectives

1.2.1 The objectives of this oCTMP are to:

- Demonstrate that construction materials can be delivered, and waste removed, in a safe, efficient, and environmentally friendly way;
- Identify construction deliveries that could be reduced, re-timed, or consolidated, particularly during periods of peak traffic;
- Encourage greater use of water and rail freight modes where practicable;
- Encourage use of modern, low-emission vehicles;
- Enable all contractors, suppliers, and hauliers to be familiar and compliant with the requirements of the oCTMP; and
- Encourage construction workers to travel by non-car modes to the Proposed Development site.

## 1.3 Site Context and the Proposed Development

1.3.1 The Site is located in Llandyfaelog, approximately 6 kilometres south of Carmarthen, and is wholly within the administrative boundary of Carmarthenshire County Council (CCC).

1.3.2 The Site covers a total area of approximately 52 hectares (ha) and comprises of several agricultural fields, in use as grazing and arable farm land. The Site occupies an elevated plateau within which is an area of relatively flat landform.

1.3.3 The Site is bounded by a range of natural landscaping including trees and large hedges.

1.3.4 The existing access to the Site is from a narrow country road the C2074 which is roughly 630m long that branches off the A484. There are multiple existing access points to the fields forming part of the Site from this narrow country road.

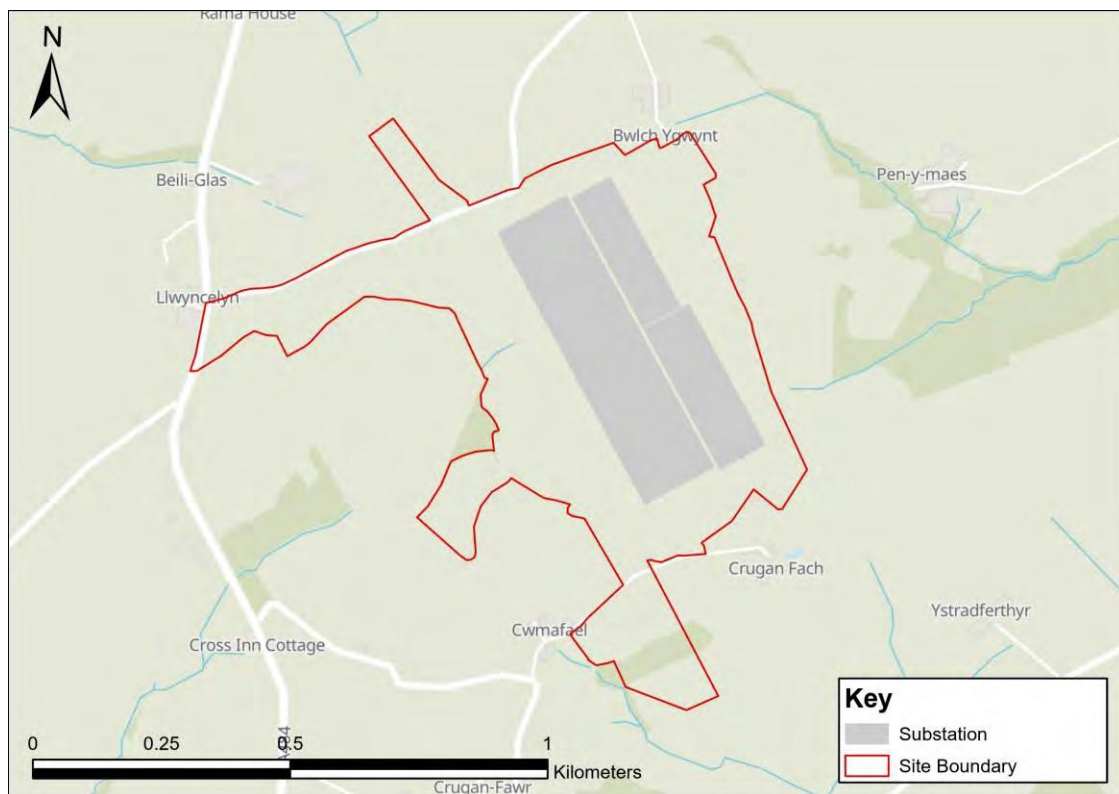


Figure 1-1: Proposed Development

1.3.5 The Proposed Development will consist of:

- Construction of a single level platform (260 metres by 640 metres) on which an Air Insulated Switchgear Substation (AIS) is sited measuring 155 metres by 602 metres
- Bellmouth access to the A484 with an operational access road to connect the platform to the A484
- Modification works to the existing 400kV Overhead Line (OHL) to connect the substation to the existing OHL involving the installation of two new towers (pylons) and one replacement tower (pylon) circa 18 metres and 62 metres
- Associated drainage, and hard and soft landscaping

1.3.6 The proposed Substation will be unmanned during operation. Welfare and Office facilities are included for staff as there will be the requirement for routine site visits for inspection and maintenance.

## 1.4 oCTMP Structure

1.4.1 This document is set out as follows:

- **Chapter 2: Context, Considerations, and Challenges** - provides an overview of the Site location, size, and nature of the Site plus parking, public transport, walking and cycling access.
- **Chapter 3: Construction Programme and Methodology** - provides information on the construction programme and stages and methods of construction.

- **Chapter 4: Vehicle Routeing and Access** - provides details on strategic and local vehicle routes for construction vehicle movements and Site access / egress arrangements.
- **Chapter 5: Strategies to Reduce Impacts** - outlines the planned measures that will be used and indicates how construction vehicles will be managed to / from and on-Site.
- **Chapter 6: Estimated Vehicle Movements** - provides a construction vehicle trip generation profile for the duration of the construction programme.
- **Chapter 7: Implementing, Monitoring, and Updating** - identifies how the implementation of the CTMP will be monitored and managed.

## 2 Context, Considerations and Challenges

### 2.1 Site Location Context

- 2.1.1 The Site is located in Llandyfaelog, approximately six kilometres south of Carmarthen. Figure 2-1 and Figure 2-2 below present the Site's location at regional and local levels respectively.

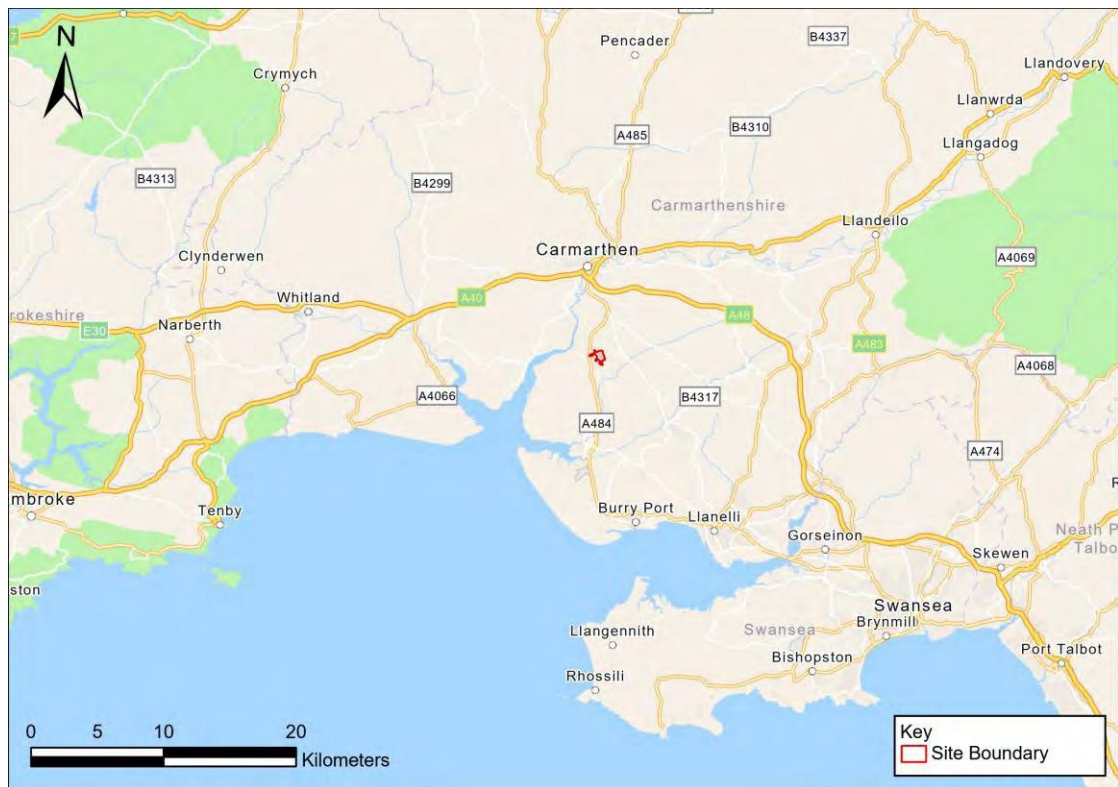


Figure 2-1: Site Location (Regional)



Figure 2-2: Site Location (Local) and Indicative Site Red Line Boundary

## 2.2 Local Access Context

### Highways, Carriageways And Footways

- 2.2.1 The Site is located to the east of A484, which runs north to south between Cardigan to the north and Swansea to the south via Llanelli and Carmarthen. The A484 is a single carriageway road, beginning in the south at a roundabout with the A483 near Fforestfach, and ending in the north at a roundabout adjacent to the Cardigan bypass's Priory Bridge, on A487. Speed limits along the section of A484 in relatively close proximity to the Site vary between 40mph and 50mph, with a section of 30mph when entering the built-up area of Cwmffrwd.
- 2.2.2 The A40 lies approximately 5.5 kilometres north of the Site and forms a vital east-west strategic corridor across South Wales. To the east, the A40 provides direct access to the M4 motorway, facilitating efficient connections towards major urban centres including Newport, Cardiff, and beyond to London. Travelling west, the A40 links seamlessly with Haverfordwest and the broader Pembrokeshire region, supporting both regional and long-distance travel. As a dual carriageway with national speed limits for much of its route, the A40 serves as a key artery for commercial, commuter, and leisure traffic, significantly enhancing connectivity and accessibility for the area surrounding the Site.
- 2.2.3 The B4309 runs approximately 1.75 kilometres to the east of the Site and connects to A484 approximately three kilometres to the north of the Site. B4309 is a single carriageway road with continuous road markings and runs south to Llanelli. Speed limits along B4309 are 50mph on the section between Cloigyn and A484, lowering to 40mph and further to 30mph when approaching Pontantwn.
- 2.2.4 The B4306 connects to the B4309 at a T-junction approximately 2.75 kilometres northeast of the Site, and runs southeast to Hendy, Llanelli. The B4306 is a single-carriageway road with continuous road markings and speed limits of 50mph, lowering to 30mph with speed cameras

when approaching Crwbin. There are multiple cattle grids along the B4306 and signs for crossing animals.

- 2.2.5 The Site is located approximately five kilometres south of A48, which is a trunk road that runs east to west between Highnam and Carmarthen and is a key connector between Newport, Cardiff, Port Talbot, and Swansea. A48 is a dual carriageway with national speed limits.
- 2.2.6 Other roads surrounding the Site consist of rural and agricultural roads with intermittent road markings. Many of these roads are bordered by hedgerows and fencing onto agricultural land.

### Public Transport - Railway

- 2.2.7 The closest railway stations to the Site are Ferryside, situated approximately six kilometres to the south-west, and Carmarthen, around six kilometres to the north. Ferryside offers hourly services operated by Transport for Wales, including routes towards Carmarthen and Cardiff Central, as well as less frequent connections to Swansea, Milford Haven, Pembroke Dock, Fishguard Harbour, Tenby, and Manchester Piccadilly.
- 2.2.8 Both stations are located on the West Wales Line, but their roles and service levels differ. Carmarthen serves as a regional transport hub, acting as a terminus for numerous routes with frequent trains to Swansea, Cardiff, and further destinations such as Manchester and London. Ferryside, by contrast, is a smaller local stop mainly served by trains running between Pembroke Dock, Milford Haven, and Swansea. While both stations have links to nearby locations like Kidwelly, Whitland, and Llanelli, Carmarthen offers more comprehensive facilities and a broader timetable. A summary of services from Ferryside and Carmarthen is provided in Table 2-1. The location of the Ferryside and Camarthan Railway Stations are shown in Figure 2-3.

Table 2-1 Railway Services from Ferryside and Carmarthen Railway Stations

| Station    | Destination           | Frequency (Mon–Sat)   | Avg Journey Time (Mon–Sat) | Frequency (Sun/Bank Hol) | Avg Journey Time (Sun/Bank Hol) |
|------------|-----------------------|-----------------------|----------------------------|--------------------------|---------------------------------|
| Ferryside  | Carmarthen            | Hourly                | ~10 minutes                | Every 2 hours            | ~10 minutes                     |
|            | Swansea               | Every 1-2 hours       | ~50 minutes                | Every 2-3 hours          | ~55 minutes                     |
|            | Pembroke Dock         | Limited (2-3/day)     | ~1 hr 30 mins              | Very limited             | ~1 hr 35 mins                   |
|            | Milford Haven         | Limited (2-3/day)     | ~1 hr 40 mins              | Very limited             | ~1 hr 45 mins                   |
| Carmarthen | Swansea               | Hourly                | ~50 minutes                | Every 1-2 hours          | ~55 minutes                     |
|            | Cardiff Central       | Hourly                | ~1 hr 50 mins              | Every 2 hours            | ~2 hrs                          |
|            | Manchester Piccadilly | 1-2/day (direct)      | ~4 hrs 30 mins             | Limited                  | ~4 hrs 45 mins                  |
|            | London Paddington     | 1-2/day (via Swansea) | ~4 hrs 30 mins             | Limited                  | ~4 hrs 45 mins                  |

## Public Transport - Bus

- 2.2.9 The nearest bus stop to the Site is the Llandyfaelog Upland Arms bus stop, located to the west of the Site along A484.
- 2.2.10 As of October 2025, bus service 198, operated by Morris Travel, runs between Four Roads and Carmarthen Bus Station. This service operates four times daily, with no service on Sundays.
- 2.2.11 In addition, bus service X11, operated by First Cymru, runs between Swansea Bus Station and Carmarthen Bus Station. The X11 offers a twice-hourly service from 06:15 to 18:15 also with no service on Sundays. These services are summarised in Table 2-2 and their locations are shown in Figure 2-3.

Table 2-2 Bus Services from Llandyfaelog Upland Arms Bus Stop

| Bus Stop / Service | Location / Route                             | Operator      | Frequency                  | Sunday Service |
|--------------------|----------------------------------------------|---------------|----------------------------|----------------|
| 198                | Four Roads ↔ Carmarthen Bus Station          | Morris Travel | 4 times daily              | No             |
| X11                | Swansea Bus Station ↔ Carmarthen Bus Station | First Cymru   | Twice hourly (06:15-18:15) | No             |

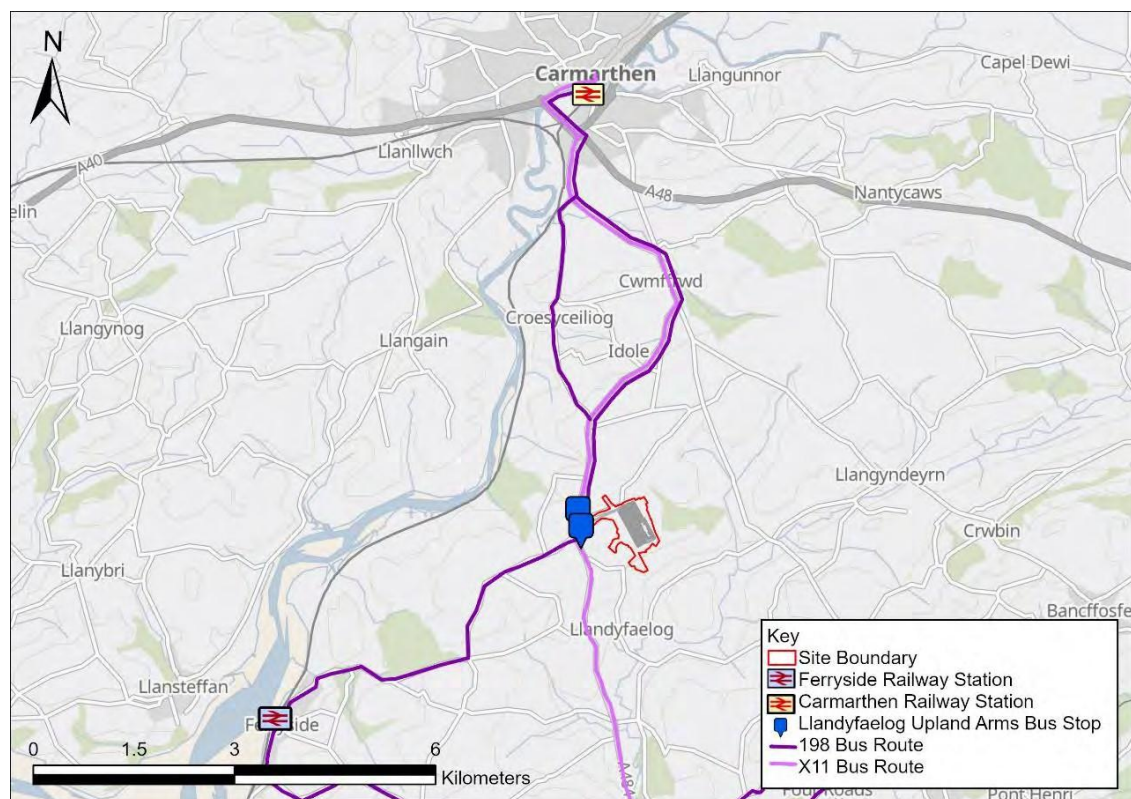


Figure 2-3 Public Transport Services in Site Vicinity

- 2.2.12 The National Cycle Network Route 4 (NCN 4) runs to the west of the site, connecting Ferryside and Carmarthen. While the section of the A484 adjacent to the site is not formally designated as part of NCN 4, it is likely used by cyclists as a link between defined segments of

the route. The nearest designated sections of NCN 4 are located on Carmarthen Road in Ferryside and along the northern stretch of the A484. The location of NCN 4 is shown in Figure 2-4.

2.2.13 The Public Right of Way (PRoW) network in the site's vicinity are listed below and shown in Figure 2-4. Footpath 29/14/2 crosses the southern part of the site, running east to west and directly intersects the Site.

- PRoW 29/10/1 - to the northeast of the Site
- PRoW 29/13/1 - to the east of the Site
- PRoW 29/14/1 & 2 - to the south and east of the Site and intersecting the Site
- PRoW 29/15/1 - to the east of the Site
- PRoW 29/16/1 - to the south of the Site
- PRoW 29/18/1 - to the south of the Site
- PRoW 29/19/1 - to the south of the Site

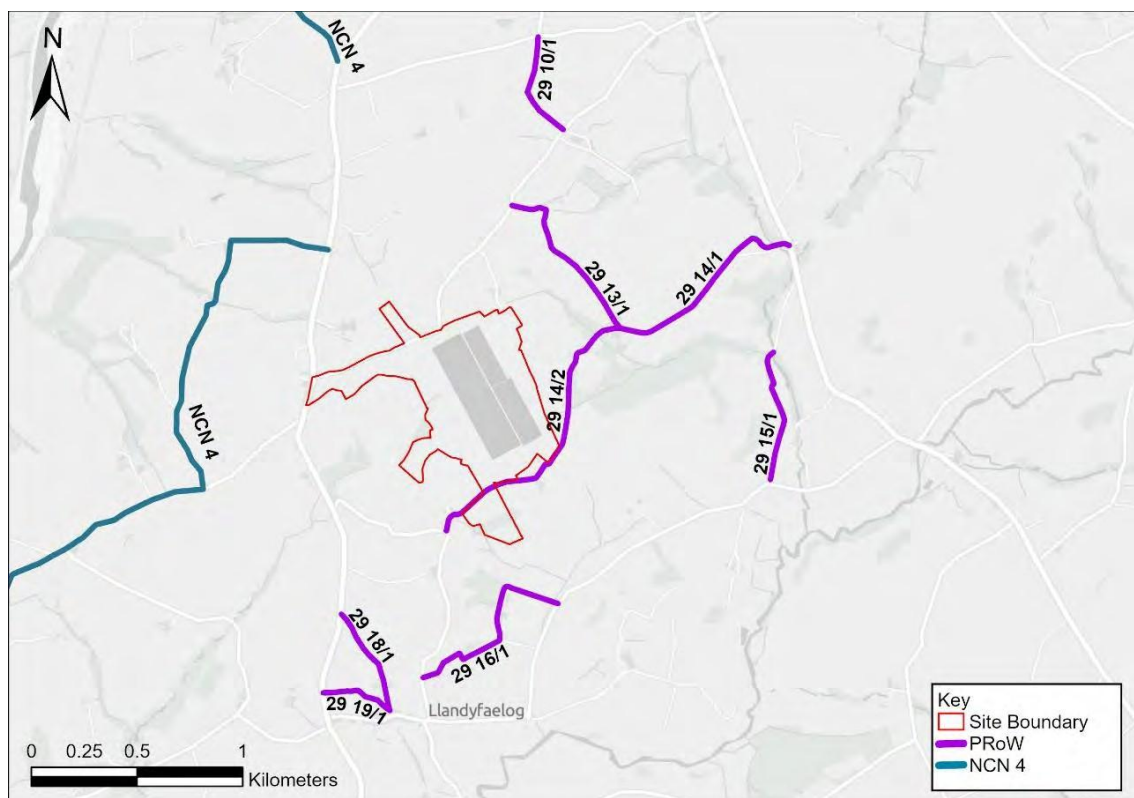


Figure 2-4 Walking and Cycling networks in Vicinity of the Site

## 2.3 Local Amenities

2.3.1 Along the route to the Site, amenities are limited. Meithrinfa Liliwenfach nursery and Cywion Bach Nursery are situated approximately 4 kilometres and 2.75 kilometres north of the Site and is accessible via the A484. Additionally, Coleg Sir Gar – Pibwrlwyd is located about 5 kilometres to the north, also along the A484. Beyond these, key amenities such as primary

and secondary schools, local shops, and community facilities are primarily available in Carmarthen.

## **2.4 Considerations and Challenges**

- 2.4.1 Access for operational and maintenance vehicles to the Site from the A484 will be carefully designed to facilitate safe vehicle movements. The largest Abnormal Indivisible Load (AIL) movement required for construction of the substation is considered in determining the access road layout.
- 2.4.2 Cywion Bach Nursery and Meithrinfa Liliwenfach nursery lie on the route that construction vehicles would use to access the proposed development. Therefore, particular care must be taken in planning vehicle movements to ensure there is no adverse impact on nursery traffic or users, safeguarding both access and safety for this sensitive local amenity.
- 2.4.3 PRow 29/14/2 intersects the southern section of the Site boundary, running east to west through this area. Although this section is included within the Site boundary to allow for potential access to the tower located further south, the substation itself will not extend into the area crossed by the PRow. As such, the PRow is expected to remain open and unaffected.
- 2.4.4 The western edge of the Site borders a single residential dwelling located around 170m south of the C2074, east of the A484. The property has two access points: one directly onto the A484, and another via a gravel track that connects to the C2074 near its junction with the A484. During construction, the proposed substation access road will intersect this gravel track. However, access will still be possible via the A484 entrance. Once operational, the substation will be unmanned and only require occasional maintenance visits. At that stage, access via the gravel track can be reinstated through a managed arrangement using the new substation road.

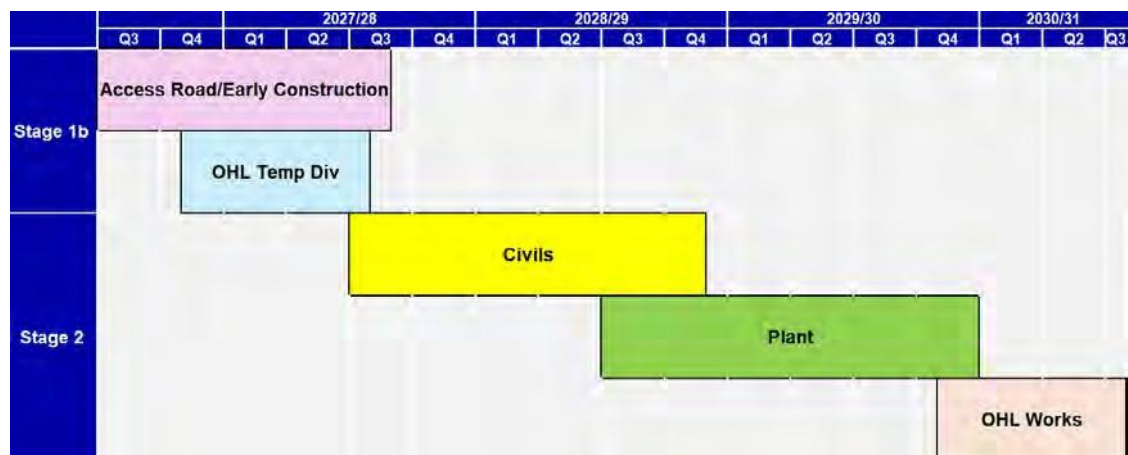
## 3 Construction Programme and Methodology

- 3.1.1 This section provides information on the anticipated construction programme, methodology, and working hours of the Proposed Development. At this stage the construction programme is indicative, and the final construction programme will be confirmed in a detailed CTMP to be submitted post planning consent.

### 3.2 Construction Programme

- 3.2.1 The indicative construction programme shown in Table 3-1 below is based on previous experience and professional judgement. A more detailed version including subtasks is provided in Appendix A. Construction of the substation is expected to take approximately 49 months. At the time of writing the anticipated start date for construction is unknown and will be confirmed in the detailed CTMP produced post consent once a Principal Contractor has been appointed.

Table 3-1 Construction Programme



### 3.3 Construction Method

- 3.3.1 Construction of the substation is expected to take approximately 49 months and is anticipated to require the following activities:

Table 3-2 Summary of Construction Activities

| Phase |                                | Methods and Activities                                                                                                                                                                                                            |
|-------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A     | Access Road/Early Construction | <ul style="list-style-type: none"> <li>Initial CDM Set Up</li> <li>Site Clearance for Access Road</li> <li>Access Road Construction (including drainage)</li> <li>Main CDM Set Up</li> <li>Site Clearance for Platform</li> </ul> |
| B     | OHL Temp Diversion             | <ul style="list-style-type: none"> <li>Foundations and Temp Masts</li> <li>Temporary Diversion of Conductors</li> <li>Tower Removal and Installation</li> <li>Re-stringing of conductors</li> </ul>                               |
| C     | Civils                         | <ul style="list-style-type: none"> <li>Platform Earthworks</li> <li>Platform Drainage</li> <li>Fill Import, Laying, and Compaction</li> </ul>                                                                                     |

|   |                         |                                                                                                                                                                                      |
|---|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                         | <ul style="list-style-type: none"> <li>Internal Roads</li> <li>Platform CDM Establishment</li> <li>Foundations and Civil infrastructure</li> <li>Buildings</li> </ul>                |
| D | Mechanical & Electrical | <ul style="list-style-type: none"> <li>Cable Laying</li> <li>M&amp;E Equipment Delivery and Installation</li> <li>Commissioning</li> </ul>                                           |
| E | OHL Works               | <ul style="list-style-type: none"> <li>Re-stringing of conductors</li> <li>Commissioning</li> <li>Installation of down droppers</li> <li>Connections to the site gantries</li> </ul> |

### 3.4 Plant and Equipment

3.4.1 A range of plant and equipment will be required over the course of the construction period including but not limited to that listed in Table 3-3 below.

Table 3-3 Plant and Equipment

| Phase |                                | Equipment               | Typical Use                                           |
|-------|--------------------------------|-------------------------|-------------------------------------------------------|
| A     | Access Road/Early Construction | Excavators              | Site clearance, digging for access road and platform  |
|       |                                | Telehandlers            | Moving site cabins and materials                      |
|       |                                | Generator Sets          | Powering temporary site facilities                    |
|       |                                | Dump Trucks             | Removing vegetation and transporting debris           |
|       |                                | Compactors/Rollers      | Soil compaction for access roads and platform         |
|       |                                | Water Pumps             | Dewatering excavations and drainage works             |
|       |                                | Site Lighting Towers    | Illumination for early/late shifts                    |
| B     | OHL Temp Diversion             | Mobile Cranes           | Installing temporary masts and towers                 |
|       |                                | MEWPs                   | Accessing elevated areas for OHL works                |
|       |                                | Cable Pulling Equipment | Installing and re-stringing conductors                |
|       |                                | Power Tools             | Fixing insulators and brackets                        |
| C     | Civils                         | Excavators              | Earthworks and trenching for drainage and foundations |
|       |                                | Dump Trucks             | Transporting fill and excavated material              |
|       |                                | Compactors/Rollers      | Compacting fill and sub-base layers                   |
|       |                                | Trenchers               | Digging narrow trenches for cable routes              |

|   |                         |                         |                                                           |
|---|-------------------------|-------------------------|-----------------------------------------------------------|
|   |                         | Concrete Mixers         | Pouring concrete for foundations and infrastructure       |
|   |                         | Welding Machines        | Fabricating steel reinforcement and structures            |
|   |                         | Excavators              | Earthworks and trenching for drainage and foundations     |
| D | Mechanical & Electrical | Cable Pulling Equipment | Laying underground cables                                 |
|   |                         | Telehandlers            | Moving switchgear, transformers, and cable drums          |
|   |                         | Mobile Cranes           | Installing heavy electrical equipment                     |
|   |                         | Generator Sets          | Powering tools and testing systems                        |
|   |                         | MEWPs                   | Accessing elevated installations like lighting or busbars |
| E | OHL Works               | Cable Pulling Equipment | Final conductor installation                              |
|   |                         | Generator Sets          | Commissioning and energisation                            |
|   |                         | Power Tools             | Final electrical and mechanical testing                   |

### 3.5 Working Hours

3.5.1 The construction working hours are expected to be:

- Monday to Friday 08.00 - 18.00;
- Saturday 08.00 - 13.00

3.5.2 This is in line with standard working hours for similar developments. No construction works will take place on Sundays or Bank Holidays. If works are required outside of the specified working hours this will be subject to agreement in advance with CCC. For example, the concrete pour required for the substation plinth may necessitate extended working hours in order to complete the pour which is required to be continuous.

## 4 Vehicle Routeing and Access

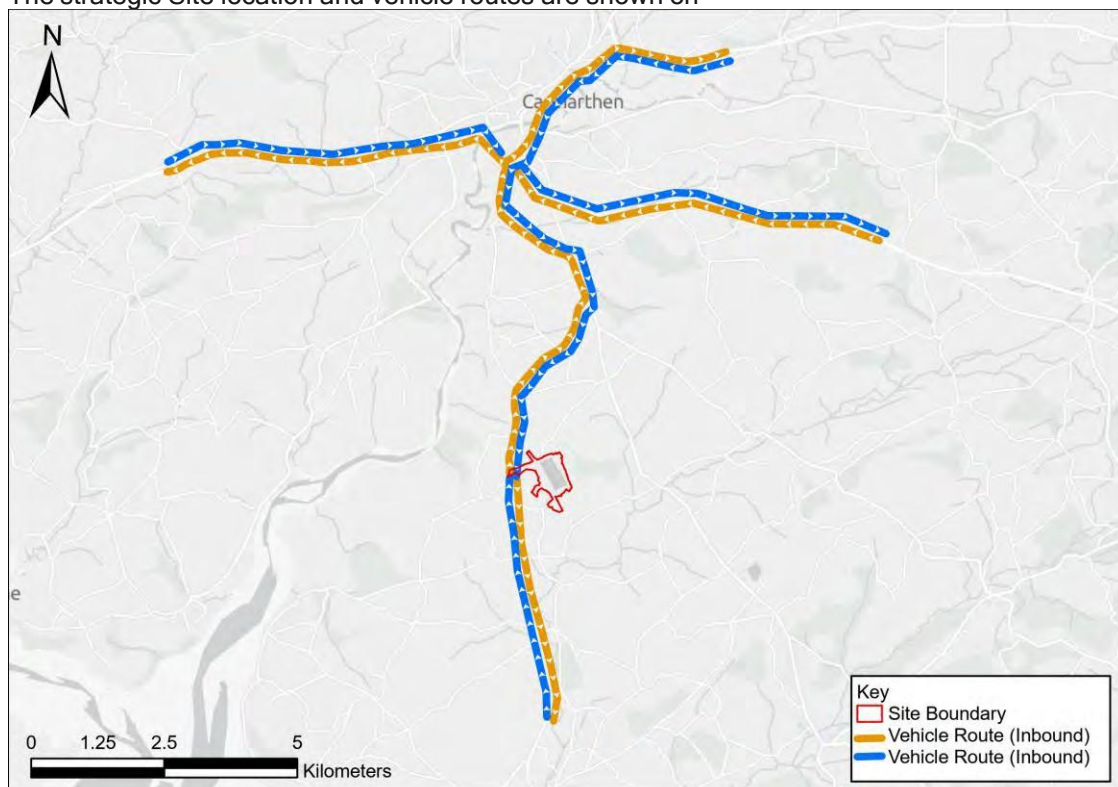
### 4.1 Strategic Vehicle Routeing

4.1.1 To access the Strategic Road network from the Site, vehicles will travel along the following routes:

- From the West:
  - A40 eastbound > Pensarn Roundabout > A484 southbound > Site Access
- From the East:
  - A40 or A48 Westbound > Pensarn Roundabout > A484 southbound > Site Access
- From the South
  - A48 Northbound > Site Access

4.1.2 Inbound traffic will be as above, outbound will be the same but in reverse. Vehicles will be required to adhere to be designated routes as described in this section.

4.1.3 The strategic Site location and vehicle routes are shown on



4.1.4 Figure 4-1.

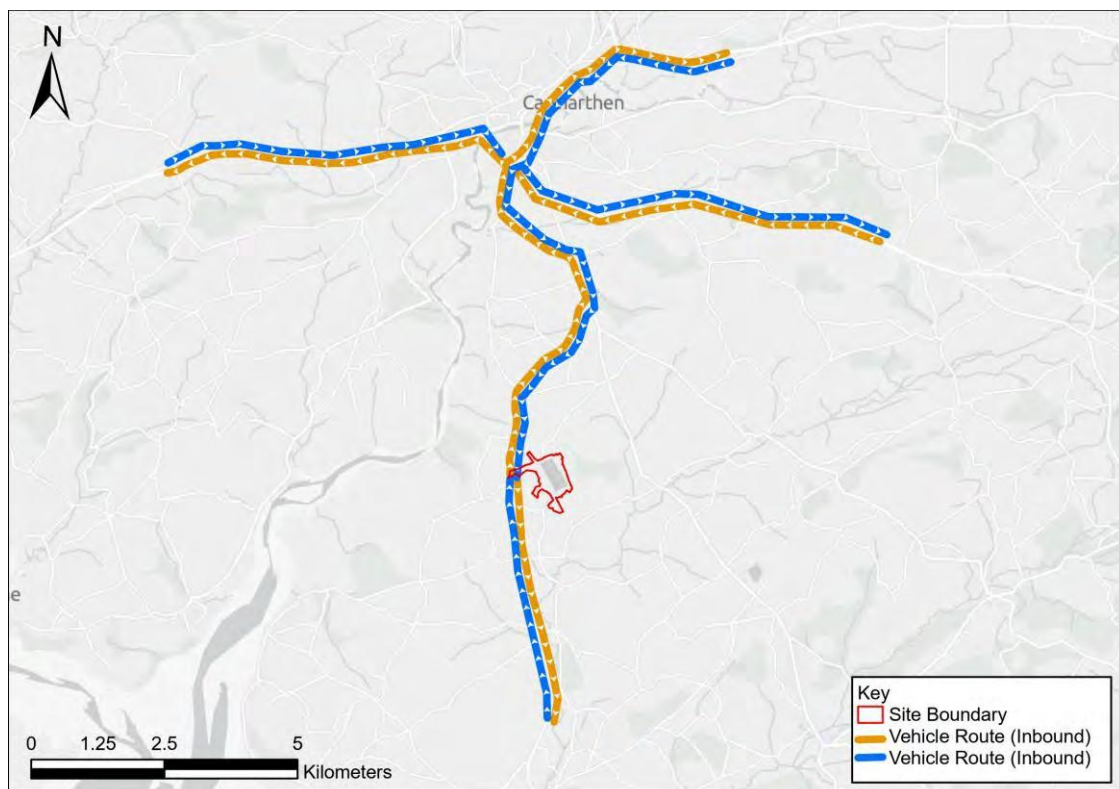


Figure 4-1: Strategic Vehicle Routes

## 4.2 Local Vehicle Routeing

- 4.2.1 Local construction vehicles routeing to the Site are anticipated to travel south on the A484 and access the Site via the new Site access road south of the A484 / C2074 junction in Uplands Arms. The route vehicles will take into the Site is shown in Figure 4-2.

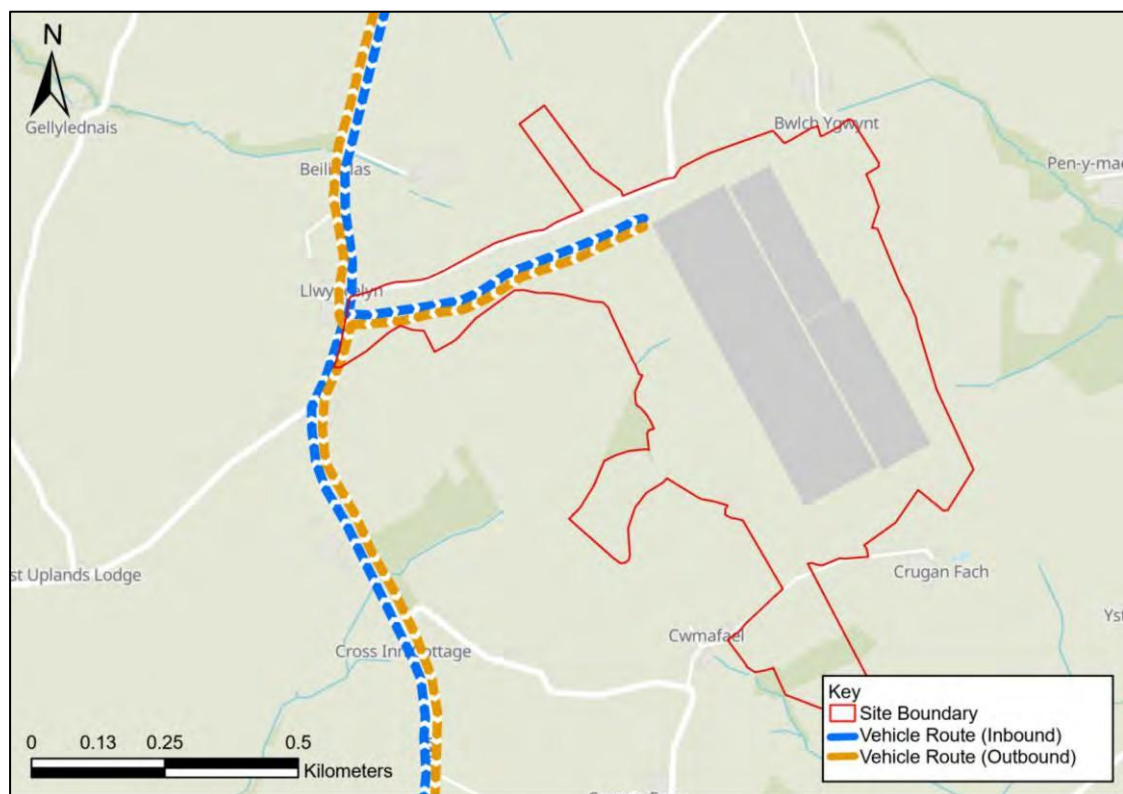


Figure 4-2: Local Vehicle Routes to the Site

### 4.3 Abnormal Indivisible Loads

4.3.1 Abnormal Indivisible Loads (AILs) are anticipated during the construction period to transport specific equipment or components. National Grid have indicated that the largest component to be brought to Site will be the Super Grid Transformers. The likely weight and dimensions of the transformers and the associated AIL vehicle configuration are set out below.

- **Largest associated load:** single component transformer weighing approximately 220te with dimensions of 3.5m width and 4.7m height. There may be 7-8 transformer units required for the substation subject to final design.
- **Vehicle combination:** Up to 32-axle girder frame trailer and two number drive units. Total combined weight (vehicle and load) approx. 390te. Approximate dimensions 90m length, 5m width and 4.75m height.

4.3.2 It is currently envisaged that the transformers will arrive at Pembroke Dock and the AILs will transport the transformers to Site via A4139, A477, A40 and A484 to the junction with the unnamed road in Uplands Arms. Figure 4-3 outlines the proposed route for the AILs.

4.3.3 The preferred route detailed from Pembroke via the A477 and A40 to the A484 has been approved by all structural stakeholders in terms of structural clearance. However, this was only achieved following assessment of 8 SWTRA structures on the A477 and A40. These have all been confirmed as accessible via a comparative load assessment against their recorded capacities of the bridges crossed for 24/28 axle girder frame trailers based on 220te nett SGT weight.

4.3.4 Following these assessments, to meet the technical requirements of SWTRA, it has been confirmed the route below from Pembroke has been confirmed as able to accommodate the proposed loads of up to 220te nett.

- 4.3.5 AIL planning specialists Wynns Ltd undertook a negotiability study of the AIL access requirements to Site including swept path analysis. A copy of the report can be found in Appendix B of the Transport Statement.

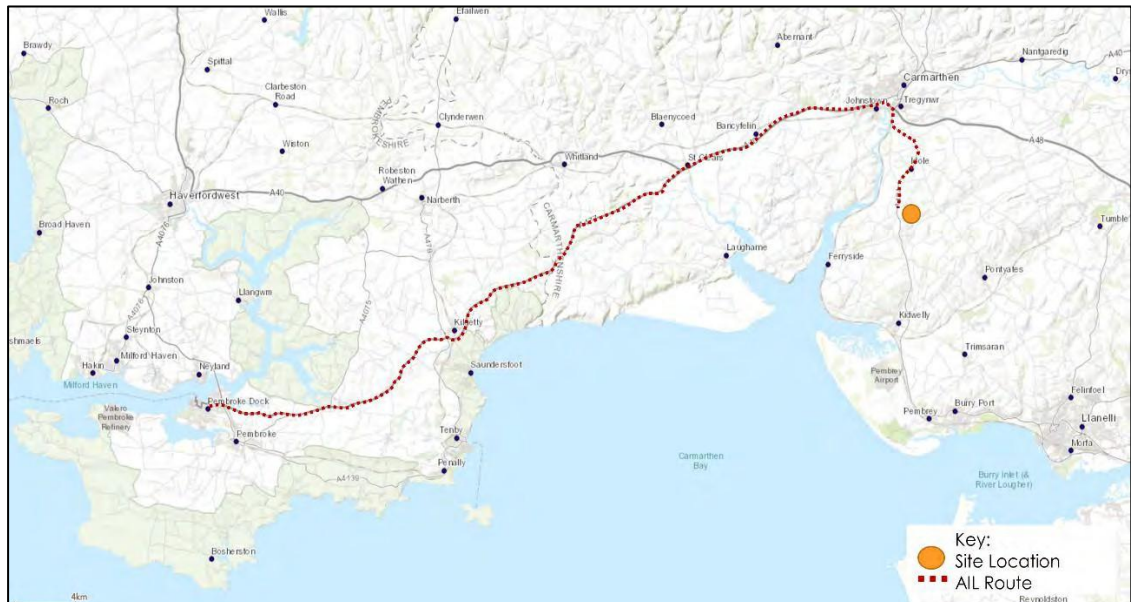


Figure 4-3: Proposed Route for AILs from Pembroke Docks to the Site

## 4.4 Site Access

- 4.4.1 The access road has been designed to accommodate all construction vehicles including the anticipated AILs. Upon entry, vehicles will travel eastbound along the access road to reach the Site and exit by heading westbound. The route vehicles will take into the Site is shown in Figure 4-4. Vehicle tracking demonstrates that a 16.5m Articulated Vehicle is able to access, manoeuvre within, and exit the Site safely, as shown in Appendix C.



Figure 4-4 Proposed Site Access Road

- 4.4.2 A metalled internal access road of approximately 6m wide will be installed and used within the Site. The internal access road will have an adjacent hard standing within which the substation equipment will be Sited.

## 5 Planned Measures

- 5.1.1 The Construction Logistics Plan (CLP) Guidance 2021<sup>1</sup> has been used as the primary framework for identifying and determining strategies to manage the impacts associated with the Proposed Development.
- 5.1.2 In accordance with the CLP Guidance, sites are categorised based on their potential impact level, which considers factors such as site scale, community sensitivity, and anticipated construction costs. For the Proposed Development, the Site has been categorised as a medium impact site. This classification reflects not only the physical scale and associated costs, but also the nature of the surrounding community and the anticipated level of construction activity.
- 5.1.3 Given the rural location, the Site's medium impact classification reflects a balance between its scale and the local sensitivities. Although fewer people are affected compared to urban sites, any impacts on the nearby community and landscape may be significant, making this categorisation appropriate.
- 5.1.4 Table 5-1 below, extracted from page 18 of the CLP Guidance, details the planned measures that have been either committed, proposed, or considered for this Site in line with the requirements for a medium impact development. These measures have been selected to reflect the unique context and challenges of the Site, ensuring that construction vehicle movements, deliveries, and associated activities are effectively managed to minimise disruption and support the overall objectives of the CLP.

Table 5-1 Medium Impact Site Planned Measures Checklist

| Medium Impact Site Planned Measures Checklist                    | Committed | Proposed | Considered |
|------------------------------------------------------------------|-----------|----------|------------|
| <b>Measures influencing construction vehicles and deliveries</b> |           |          |            |
| Safety and environmental standards and programmes                | X         |          |            |
| Adherence to designated routes                                   | X         |          |            |
| Delivery scheduling                                              |           | X        |            |
| Re-timing for out-of-peak deliveries                             |           | X        |            |
| Re-timing for out-of-hours deliveries                            |           | X        |            |
| Use of holding areas and vehicle call off areas                  |           | X        |            |
| Use of logistics and consolidation centres                       |           |          | X          |
| <b>Measures to encourage sustainable freight</b>                 |           |          |            |
| Freight by water                                                 |           |          | X          |
| Freight by rail                                                  |           |          | X          |
| <b>Material procurement measures</b>                             |           |          |            |

<sup>1</sup> Transport for London & CLOCS (2021). Construction Logistics Planning (CLP) Guidance (Version 1.2). Retrieved from <https://content.tfl.gov.uk/clp-guidance-clocs.pdf>

|                                            |  |   |   |
|--------------------------------------------|--|---|---|
| DfMA and off-site manufacture              |  | X |   |
| Re-use of material on site                 |  | X |   |
| Smart procurement                          |  | X |   |
| <b>Other measures</b>                      |  |   |   |
| Collaboration with other sites in the area |  |   | X |
| Implement a worker travel plan             |  | X |   |

*\* If Site, consolidation centre or holding areas are within 100m of foreshore of navigable waterway or rail freight siding.*

## Measures Influencing Construction Vehicles and Deliveries

### Safety and environmental standards and programmes

- 5.1.5 The Principal Contractor will ensure, where possible, that contractor and sub-contractor vehicles arriving at the Site comply with relevant safety measures and requirements relating to Work Related Road Risk. Industry best practice will be adopted wherever possible to support the construction phase. This will be achieved through the procurement process by preferring sub-contractors and supply chain that are members of or signed up to relevant best practice schemes and initiatives including, for example:

- Considerate Constructors Scheme ('CCS'): Promotes best practice that relates to on-Site activities and those in the vicinity of the Site. It is noted that the Site will seek to be registered under this scheme;
- Fleet Operator Recognition Scheme ('FORS'): For suppliers that deliver to, and hauliers that visit the Site, the Applicant will advocate that these businesses are members of FORS; and
- Construction Logistics and Community Safety ('CLOCS'): CLOCS brings the construction logistics industry together to revolutionise the management of work-related road risk and ensure a road safety culture is embedded across the industry. The aim is to protect vulnerable road users who share the roads with construction vehicles.

### Adherence to designated routes

- 5.1.6 To ensure vehicles arriving at the Site adhere the designated access routes (outlined in Section 4), a range of control measures will be implemented. These measures are designed to protect local roads, minimise disruption to the rural community, and ensure safe and efficient site access. These measures include, but are not limited to:

- Driver Inductions: All drivers will receive a site-specific induction, including briefings on approved routes and local sensitivities.
- Route Maps and Signage: Detailed route maps will be distributed, supported by clear signage at key junctions.
- Vehicle Booking Management System: A scheduling system will manage arrival times and prevent route conflicts.

### Delivery scheduling

- 5.1.7 A Vehicle Booking Management System (VBMS) will be used to make sure deliveries and collections are scheduled in advance by booking the vehicle visits with the Site Manager,

using email, telephone, and text messages. It will be required that suppliers and hauliers pre-book delivery or collection slots at least 24 hours in advance or agree on a pre-planned vehicle visit schedule.

- 5.1.8 The Principal Contractor will engage with suppliers and hauliers prior to any scheduling of deliveries to ensure that the scheduling system and process is clearly understood and that drivers are aware of the process for communicating with the Site if there are any unforeseen issues with arrivals or departures.
- 5.1.9 Suppliers that allow deliveries that turn up without a booking will be notified of the non-compliance on the first occasion. Unless there are safety risks in allowing access to the Site at that time, it is not proposed to turn the load away from the Site on the first occasion as this would incur subsequent greater climate impact and road risk. The relevant supplier/hauler will be notified of the requirement to book a delivery slot. Continued failure to comply with this requirement could result in suppliers/haulers being removed from the project.

#### **Re-timing for out of peak deliveries**

- 5.1.10 Deliveries will be re-timed to avoid peak hours, particularly education drop-off and pick-up periods, in response to nurseries located along the A484. The delivery VBMS will restrict scheduling during these times, and suppliers will be informed of the time constraints during induction and booking confirmation.

#### **Re-timing for out of hours deliveries**

- 5.1.11 At this stage out of hours deliveries are not anticipated and deliveries will be made during the construction working hours as stated in Section 3.5.

#### **Use of holding and vehicle call off areas**

- 5.1.12 A designated vehicle holding area will be provided within the Site to manage vehicle arrival and departures. The holding area will allow vehicles to safely access the Site and wait until the worksite is ready to receive them, ensure no vehicle queuing occurs on the A484. The same process will be used for vehicle departures to manage the safe egress of vehicles from Site.

#### **Use of logistics and consolidation centres**

- 5.1.13 The nature of the construction project and the rural location mean the use of a dedicated logistics or consolidation centre is not considered necessary. Suppliers will be encouraged to consolidate loads where feasible to reduce vehicle movements and improve delivery efficiency for both contractors and subcontractors.

## **5.2 Measures to Encourage Sustainable Freight**

### **Freight by Water**

- 5.2.1 The Site is not within 100 metres of a navigable waterway; therefore, it is not considered feasible to transport freight by water for the Proposed Development.

### **Freight by Rail**

- 5.2.2 The Site will not be within 100 metres of a useable rail head or siding, therefore, it is not considered that transporting freight by rail is appropriate for the Proposed Development.

### 5.3 Material Procurement Measures

#### DfMA and off-Site manufacture

- 5.3.1 The potential to use prefabricated assemblies and techniques will be considered as an approach to reduce the number of construction vehicle movements, once a Principal Contractor has been appointed. A decision as to how prefabrication might be integrated into the construction process will be included in the detailed CTMP.

#### Re-use of material on Site

- 5.3.2 Consideration will be given to the reuse of excavated material on site, particularly for the access roads, profiling the Site and landscaping, subject to its suitability. Factors such as potential contamination will be assessed, and where appropriate, suitable soils will be reused to minimise waste disposal. Proposals will be developed as part of the detailed CTMP.

#### Smart procurement

- 5.3.3 Where appropriate suppliers are available and suitable contracts can be negotiated, materials, equipment and plant will be sourced from local suppliers. Suppliers who can demonstrate working arrangements that align with the CTMP objectives, such as reducing vehicle movements, will be preferred.

#### Implement a worker travel plan

- 5.3.4 A Framework Construction Worker Travel Plan (FCWTP) has been included in Section 7 and has been developed to encourage sustainable and coordinated travel to the Site. The aim will be to reduce the number of vehicles using the local road network, particularly during peak hours. Measures may include promoting car sharing, coordinating shift times to avoid congestion, and encouraging use of public transport and worker minibuses where possible.

### 5.4 Wheel Wash and Street Sweeper

- 5.4.1 Methods will be adopted to prevent the introduction of mud and debris from the construction site entering the road network. The primary mechanism for this will be the provision of wheel washing facilities to enable any mud and other detritus to be removed from vehicles when exiting the Site. A wheel wash facility will be located in the compound and will be either a dry wash system or a wet wash system depending on the site conditions. The system specification will be confirmed following the appointment of a Principal Contractor in a detailed CTMP.
- 5.4.2 A supplementary street sweeper may also be available if required to remove mud and detritus from the adjacent road network. The street sweeper would be utilised on a regular schedule or as required depending on the prevailing conditions.

### 5.5 Traffic Management Measures

#### Road Signs

- 5.5.1 During the construction phase, signs will be installed to warn road users of the works accesses, and the likely presence of large and / or slower moving construction traffic. Temporary signing will also be erected confirming the Site access route to contractors and third-party suppliers. General information signs will also be installed to inform road users and local communities of the nature and location of the works, and to provide contact details. Further detail of the agreed signage scheme (layout and a monitoring/maintenance schedule) will be provided in the detailed CTMP.

### Temporary Traffic Management

- 5.5.2 It is anticipated that Temporary Traffic Management (TTM) will be implemented in the vicinity of the Site access on the A484 during construction. This will include a temporary speed reduction to 30 or 40mph under a Temporary Traffic Regulation Order or advisory speed limits as part of TTM signage scheme. It could also include the use of temporary traffic controls or traffic lights to manage vehicles turning movements to/from site, or other such measures to protect the integrity of the public highway and the safety of road users.
- 5.5.3 The appropriate TTM will be discussed and agreed with CCC as part of the preparation of the detailed CTMP once the Principal Contractor has been appointed and following detailed design.

### 5.6 PRow Management

- 5.6.1 As illustrated in Figure 2-4, PRow 29/14/2 intersects the southern section of the site, running east to west across this area. To the east of the site, it connects with PRow 29/14/2 and PRow 29/13/1, forming an important link within the local PRow network. Further reference to this PRow and its location in the wider network is provided in Section 2.2.13.
- 5.6.2 During the construction phase, there are instances where the works and associated access tracks intersect with PRows. In these cases, public access to PRows will be retained wherever practicable. The PRows will be actively managed throughout the construction period to ensure the safety of all users. Once a Principal Contractor is appointed and more detailed information regarding the exact construction dates is confirmed, a Temporary Traffic Regulation Order (TTRO) will be sought from CCC, if deemed appropriate. Continued engagement with the local authority will be maintained if needed to ensure the PRow is managed appropriately and that access is maintained as far as reasonably possible.
- 5.6.3 During the operation phase, vehicle and personnel movements will generally be low in number and are expected to result in minimal impact on PRows. The PRow that runs through the site boundary will be maintained, ensuring continued public access. However, due to the operational nature of the substation and associated safety and security requirements, public access to the substation itself will not be permitted. As the PRow does not intersect the footprint of the substation, access to the PRow can be safely maintained without compromising the integrity or security of the operational site.

### 5.7 Highway Condition Survey

- 5.7.1 The Applicant will agree with CCC the extent and geographical scope of a dilapidation survey of the local road network being used by project. The Applicant and CCC will seek to coordinate and utilise CCCs routine highway condition survey schedule where possible as part of this process. Dilapidation surveys will be completed before construction activities commence to record any existing damage to the surveyed road network. Any works required to make the surveyed road suitable for construction traffic will also be recorded. A further condition survey will be carried out upon completion of construction activities to identify any changes in the condition of the road network.

## 6 Estimated Vehicle Movements

6.1.1 This section provides an overview of the types of construction vehicles and estimated construction vehicle trips to the Site over the duration of the construction programme. At this stage the construction vehicle trip generation estimates should be considered as indicative and will be refined further following the appointment of a Principal Contractor and documented in a detailed CTMP to be produced and agreed with CCC in advance of the works commencing on Site.

### 6.2 Vehicle Types

6.2.1 It is expected that a range of construction vehicle types would access the Site to enable construction, of the Proposed Development. These include but are not limited to the following:

- Light Goods Vehicles (LGVs) i.e., vans and small flatbeds – movements for plant maintenance, PPE, fixings/small components, sundry items, canteen supplies, couriers, post/parcels (note LGVs do not include staff minibuses).
- Heavy Goods Vehicles (HGVs) i.e., 2-6 axle rigid or articulated lorries - movements of materials/component deliveries, plant deliveries, piling rigs, concrete, spoil removal, aggregate supplies, cabling, containerised equipment, fencing etc.
- Abnormal Indivisible Loads (AILs) i.e. up to a 32 – axle girder frame trailer with two drive units and a total combined weight (AIL and load) of approx. 390te. Approximate dimensions of 90 metres length, 5 metres width, and 4.75 metres height.

### 6.3 Vehicle Movements

6.3.1 The estimated vehicle movements have been derived based on the construction schedule outlined in Section 3. These estimates reflect the typical number of vehicles anticipated for each activity outlined in this schedule. The assumptions underpinning these figures are informed by a combination of professional judgement, experience from comparable infrastructure projects, reference to industry standards and guidance documents. Where specific data was unavailable, reasonable assumptions were made to ensure a robust and pragmatic approach to forecasting vehicle activity.

6.3.2 Table 6-1 presents the estimated number of monthly and daily vehicle movements associated with the construction activities. This is split out between construction vehicles and construction workers. For the purpose of this assessment, it has been assumed that each month comprises four weeks, with a working pattern of 5.5 days per week. This includes standard weekday operations (Monday to Friday) and a half-day on Saturdays, which reflects typical industry practice. In Table 6-1, each trip assumes two vehicles movements - one arrival and one departure.

Table 6-1 Estimated Two-Way Construction Vehicles Movements - Monthly and Daily

| Construction Stage                 |                                | Duration of stage (months) | No. of trips (monthly) |                      | No. of trips (daily)  |                      |
|------------------------------------|--------------------------------|----------------------------|------------------------|----------------------|-----------------------|----------------------|
|                                    |                                |                            | Construction Vehicles  | Construction Workers | Construction Vehicles | Construction Workers |
| A - Access Road/Early Construction |                                |                            |                        |                      |                       |                      |
| A1                                 | Initial CDM Set Up             | 2                          | 200                    | 880                  | 9                     | 40                   |
| A2                                 | Site Clearance for Access Road | 3                          | 17                     | 220                  | 1                     | 10                   |

|                                      |                                               |    |      |      |    |     |
|--------------------------------------|-----------------------------------------------|----|------|------|----|-----|
| A3                                   | Access Road Construction (including drainage) | 4  | 1320 | 4400 | 60 | 200 |
| A4                                   | Main CDM Set Up                               | 4  | 100  | 440  | 5  | 20  |
| A5                                   | Site Clearance for Platform                   | 8  | 6    | 83   | 0  | 4   |
| <b>B - OHL Temporary Diversion</b>   |                                               |    |      |      |    |     |
| B1                                   | Foundations                                   | 1  | 66   | 248  | 3  | 11  |
| B2                                   | Temporary Diversion of Conductors             | 1  | 17   | 62   | 1  | 3   |
| B3                                   | Tower Removal and Installation                | 1  | 22   | 83   | 1  | 4   |
| B4                                   | Re-stringing of Conductors                    | 1  | 22   | 83   | 1  | 4   |
| <b>C - Civils</b>                    |                                               |    |      |      |    |     |
| C1                                   | Platform Earthworks                           | 6  | 193  | 587  | 9  | 27  |
| C2                                   | Platform Drainage                             | 3  | 387  | 1173 | 18 | 53  |
| C3                                   | Fill Import, Layering and Compaction          | 5  | 232  | 704  | 11 | 32  |
| C4                                   | Internal Roads                                | 3  | 133  | 733  | 6  | 33  |
| C5                                   | Platform CDM Establishment                    | 2  | 690  | 3300 | 31 | 150 |
| C6                                   | Foundations and Civils Infrastructure         | 12 | 33   | 183  | 2  | 8   |
| C7                                   | Buildings                                     | 3  | 460  | 2200 | 21 | 100 |
| <b>D - Mechanical and Electrical</b> |                                               |    |      |      |    |     |
| D1                                   | Cable Layering                                | 15 | 60   | 176  | 3  | 8   |
| D2                                   | M&E Equipment Delivery and Installation       | 15 | 16   | 440  | 1  | 20  |
| D3                                   | Commissioning                                 | 6  | 15   | 660  | 1  | 30  |
| <b>E - OHL Works</b>                 |                                               |    |      |      |    |     |
| E1                                   | OHL Works                                     | 9  | 29   | 110  | 1  | 5   |
| E2                                   | Re-stringing of conductors                    | 5  | 53   | 198  | 2  | 9   |
| E3                                   | Commissioning                                 | 5  | 53   | 198  | 2  | 9   |

6.3.3 Table 6-1 shows that the construction stage with the highest number of estimated monthly and daily vehicle movements is the Access Road/Early Construction phase. Within this stage, the Access Road Construction (including drainage) activity generates the greatest volume of traffic, with an estimated total of 1,320 two-way construction vehicle movements and 4,400 two-way staff vehicle movements over the course of the month. This equates to an average of approximately 60 two-way construction vehicles and 200 two-way construction worker movements per day, based on the assumed working pattern outlined previously. This peak in vehicle activity reflects the intensive nature of early groundwork operations, which typically require frequent deliveries of materials, plant, and equipment, as well as regular site access for construction personnel.

6.3.4 Figure 6-1 and Figure 6-2 provide a visual representation of the estimated two-way (arrivals and departures) monthly and daily construction vehicle movements throughout the 49 month construction programme. These figures illustrate how traffic volumes fluctuate across different phases of the works and show cumulative totals reflecting the overlap between construction stages and tasks.

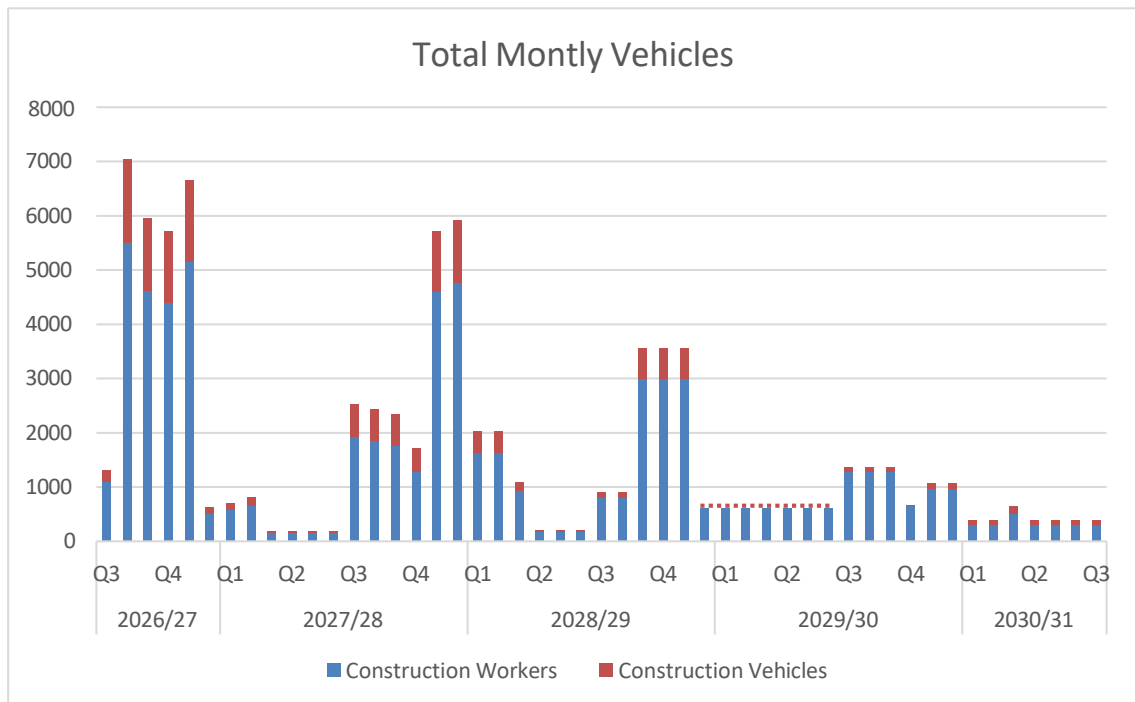


Figure 6-1 Estimated Two-Way Construction Vehicles - Monthly

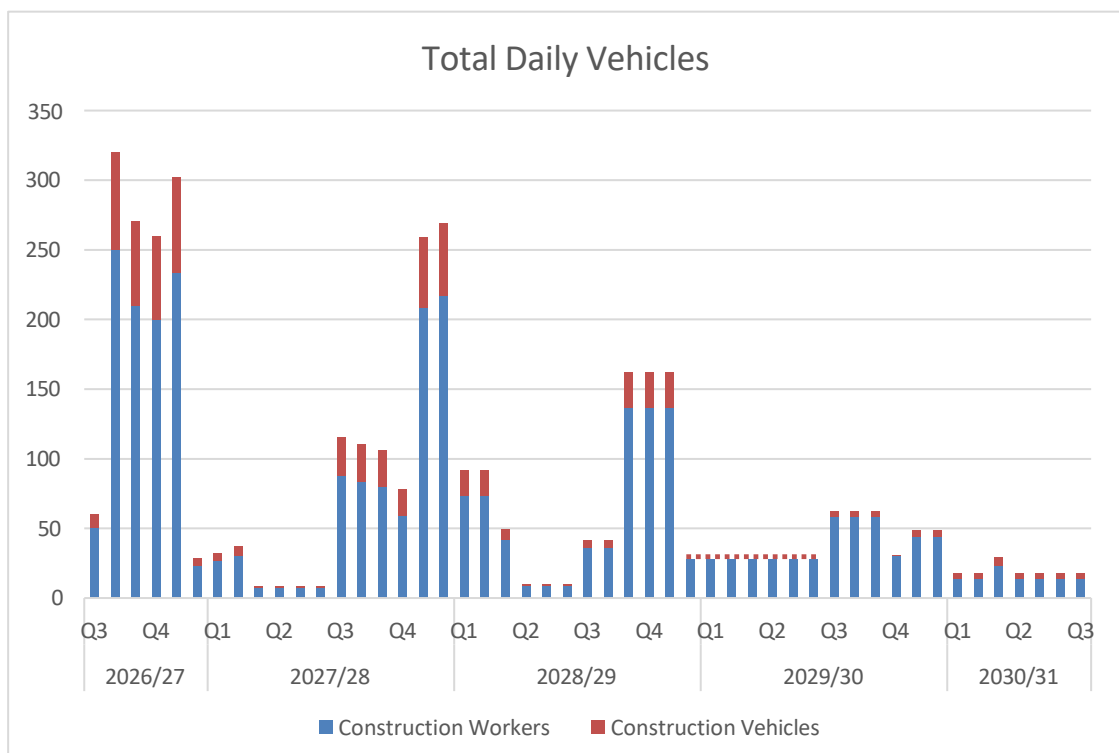


Figure 6-2 Estimated Two-Way Construction Vehicles - Daily

- 6.3.5 Figure 6-1 and Figure 6-2 show that the highest number of vehicle movements occur during Q3 and Q4 of 2026/2027 which is when the Access Road/Early Construction stage occurs, reflecting the intensity of early groundwork and access road construction activities. Following this peak, vehicle movements decrease by more than half during Q4 2026/2027 and Q2 2027/2028 when the OHL temporary diversion occurs.
- 6.3.6 A moderate increase is observed during Q4 2027/2028 which is during the Civils phase, although daily and monthly movements remain slightly below those recorded during Access Road/Early Construction phase. In Q1 to Q3 2028/2029, during the end of the Civils phase and beginning of the Plant phase, vehicle movements will reduce again to less than half of the peak levels. Overall, the greatest impact on the road network is expected during Q3 to Q4 2026/2027, when the Access Road/Early Construction occurs, which is when construction traffic is at its most intensive.
- 6.3.7 A summary of anticipated daily vehicle activity for the duration of the construction programme is provided below, detailing both average and peak vehicle movements:
- **Average:** 14 two-way construction vehicle movements (7 arrivals, 7 departures) and 62 staff movements (31 arrivals, 31 departures).
  - **Peak:** 70 two-way construction vehicle movements (35 arrivals, 35 departures) 250 construction staff movements (125 arrivals, 125 departures).
- 6.3.8 The average figures provide a practical benchmark for the typical daily demands placed on the road network throughout the construction period. This enables a more typical assessment of likely impacts during most days of the works and supports the development of general mitigation strategies.
- 6.3.9 In contrast, peak values reflect the highest levels of activity, which are confined to the initial phase of construction and represent a short-term, worst-case scenario. While these peak movements are not sustained throughout the project, they remain critical for informing mitigation strategies, ensuring infrastructure resilience, and preparing for periods of intensified demand.
- 6.3.10 Together, these figures provide a robust basis for traffic management and impact assessment as the construction programme progresses.

## 7 Framework Construction Worker Travel Plan

### 7.1 Introduction

- 7.1.1 A Framework Construction Workforce Travel Plan (FCWTP) has been developed to promote sustainable transport for workers during the construction phase. This will be developed further once a principal contractor has been appointed, and the final construction programme and worker numbers are confirmed. A CWTP will be incorporated into the detailed CTMP.

### 7.2 Workforce Numbers

- 7.2.1 Approximately 60 workers on average, with a peak of 125 workers, are anticipated to be required on-site per day during the construction period. This includes both labourers and technical/office staff. The location where staff will travel from is currently unknown as it will depend on the appointed principal contractor and sub-contractor teams. It is anticipated that the workforce will be combination of both local and non-local workforce that will stay at local accommodation.
- 7.2.2 No parking will be allowed for construction workers on the public road network in the vicinity of the Site. Upon entrance to and for exit from the Site, workers will report directly to the designated area within the compound for worker parking. This area will have sufficient space for parking and turning as well as dedicated and protected pedestrian walkways from the parking area to the main facilities (welfare cabins, offices, etc).
- 7.2.3 Construction working hours are 08.00 - 18.00. It is therefore assumed that the majority of staff will arrive at Site before 08.00 for the start of the working day. This means staff travel would generally occur between 07.00 – 08.00 before the AM network peak.
- 7.2.4 Staff are then expected to depart Site in a staggered nature across the afternoon, depending on site activities and operational requirements, rather than concentrated within the PM peak hour.

### 7.3 Objectives

- 7.3.1 Through the CWTP, the PC will encourage the workforce and visitors to the Site to:
- Reduce their reliance on car travel;
  - Encourage walking, cycling, public transport where feasible and staff car-sharing and staff minibuses; and
  - Encourage work practices that reduce the need to travel, where practicable - such as hybrid working for design and administrative staff.
- 7.3.2 The PC and subcontractors will seek to use a locally based workforce where practicable to help reduce the distance travelled to Site and increase the potential to use non-car modes.
- 7.3.3 Members of the workforce living within 2km of the Site will be encouraged to walk to work where suitable walking routes are available; those living within 5km of the Site will be encouraged to cycle where suitable cycle routes are available. Cycle parking will be made available in the staff parking area of the compounds according to demand. All staff members will be encouraged to arrive prior to the AM network peak hour.

7.3.4 The following FCWTP objectives describe the key 'goals' that the CWTP seeks to achieve. These are:

- To reduce carbon emissions associated with private car travel by encouraging the workforce to utilise sustainable modes of travel such as walking, cycling, public transport, and staff minibuses;
- To encourage efficiency in travelling to the Site in order to minimise the impact and frequency of travel by the chosen mode such as by car sharing or other shared transport;
- To ensure members of the workforce are aware of the measures in the CWTP;
- To reduce any transport impacts of the Site on the local community; and
- Improve the health and well-being of the workforce by promoting the health benefits of active travel.

## 7.4 Measures

7.4.1 Measures and initiatives will be utilised to encourage sustainable travel choices amongst members of the workforce at the Site. These will actively discourage reliance on private car use by influencing travel behaviour in favour of shared transport; walking and cycling where practicable, and public transport use including staff minibuses.

7.4.2 Use of arranged minibuses and car sharing by workers will be encouraged and the use of work vans and staff minibuses to bring workers to the Site will mean that overall vehicle numbers are minimised. These will be developed further following the appointment of the principal contractor.

## 7.5 Travel Plan Co-Ordinator

7.5.1 The principal contractor may designate a Travel Plan Coordinator ('TPC') to champion initiatives to reduce the environmental impacts of workforce travel and to minimise the impacts of commuting on the local road network.

7.5.2 Any designated TPC would implement and actively promote CWTP measures to maximise the use of shared transport and non-car modes of travel to and from work, such as:

- Providing information on public transport services in the area and the availability of staff minibuses;
- Promoting the use of cycle facilities such as NCN 4;
- Extolling the virtues of active travel and encouraging walking for those living within 2km or cycling for those living within 5km;
- Ensuring the requirements for workforce inductions, briefings and communications include information and guidance on the importance of environmentally friendly commuting;
- Acting as a focal point for workforce commuting issues;
- Managing the monitoring of workforce travel patterns;

- Engaging with subcontractors with workforce at the Site to encourage their workers to commute sustainably to the Site, utilise car sharing or take advantage of the staff minibuses; and
- Encouraging workers that do drive to Site to travel to Site outside of identified network peak hours.

## **7.6 Workforce Parking**

- 7.6.1 The final number of parking spaces needed on Site is still to be confirmed. This will be developed further once principal contractor has been appointed, and the final construction programme and worker numbers are confirmed.
- 7.6.2 The car park for works personnel and visitors will be surfaced with permeable aggregate atop a geogrid mesh base. The surface will be maintained throughout the duration of construction activities. The car parking area will be introduced early in the construction phase and the level of use will increase as the number of staff and workers on Site rises. Dedicated pedestrian routes will be provided from parking areas to on-Site facilities such as welfare cabins and changing facilities. Provision will also be made for parking motorcycles and bicycles.
- 7.6.3 The TPC will monitor and manage car parking provision and will consider the introduction of a permit system should the demand for parking spaces start to exceed provision.

## 8 Implementing, Monitoring and Updating

### 8.1 Overview

- 8.1.1 This section provides an overview of how the CTMP will be implemented, monitored and, if necessary, updated.
- 8.1.2 An appointed Construction Logistics Manager will be in charge of implementing the CTMP on behalf of the Principal Contractor. Using the VBMS method stated in in Section 5. A record will be kept of vehicle visits to the Site to provide evidence on the number and type of vehicles, and the efficiency and accuracy of the visits made. This information will help highlight actual impacts of visits against predictions and identify areas where improvement or remedial measures may be needed. Through the VBMS and Site gate checks the following information will be collected and analysed:
- 8.1.3 Number of vehicle movements to the Site including:
- Total vehicle count by day
  - Vehicle type/ size /age
  - Vehicle arrival, departure, and dwell time
  - Delivery/collection accuracy compared to schedule
- 8.1.4 Breaches and complaints including:
- Vehicle routing
  - Unacceptable queuing
  - Unacceptable parking
  - Supplier FORS accreditation (if applicable)
- 8.1.5 Safety including:
- Logistics-related accidents
  - Record of associated fatalities and serious injuries
  - Staff travelling mode
  - Vehicles and operations not meeting safety requirements

### 8.2 Compliance Arrangements

- 8.2.1 For those suppliers and hauliers that fail to follow advice to avoid delivering during peak periods or conform to other instructions, the Site manager will liaise with these operators to seek improvements in their level of compliance. Should no improvement be forthcoming the supplier may be removed from the contract.
- 8.2.2 An incident/ complaints register will be created into which incidents/ complaints can be recorded. Once entered, the incident/ complaint will be dealt with using the normal procedures that the main contractor has in place for its Site construction works.

### **8.3 Reporting and Reviewing Arrangements**

- 8.3.1 Weekly reviews of vehicle activity will be held between the Site management group using the data collected as stated above. Where an issue or compliant is identified the Site management group and the Construction Logistics Manager will implement remedial actions to provide a resolution.

## **Appendix A      Construction Programme**

## Construction Schedule

[illegible]

## **Appendix B      Negotiability Study of the AIL Access Requirements to Site**



---

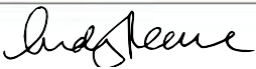
## Abnormal Indivisible Load Access to proposed Llandyfaelog Substation – 220te transformers

---

Prepared for National Grid





| NAME         |             | SIGNATURE                                                                          | DATE     |
|--------------|-------------|------------------------------------------------------------------------------------|----------|
| Prepared by: | Andy Pearce |  | 03.10.25 |
| Checked by:  | Brad Dyke   |  | 06.10.25 |
| Approved by: | Andy Pearce |  | 07.10.25 |

## DISCLAIMER

Any conclusions, calculations or findings presented here should not be changed or altered.

## COPYRIGHT AND NON-DISCLOSURE NOTICE

The contents and layout of this report are subject to copyright owned by Wynns Ltd save to the extent that copyright has been legally assigned by us to another party or is used by Wynns Ltd under licence. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report.

The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Wynns Ltd. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third Party Disclaimer set out below.

## THIRD PARTY DISCLAIMER

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Wynns Ltd at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Wynns Ltd excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

## DOCUMENT REVISIONS

| Issue | Date     | Details |
|-------|----------|---------|
| 0     | 07.10.25 | Report  |
| 1     |          |         |
| 2     |          |         |

## Contents

|                                                                          |    |
|--------------------------------------------------------------------------|----|
| Contents                                                                 | i  |
| Executive Summary                                                        | ii |
| 1. Introduction                                                          | 3  |
| 2. National Highways Agreement in Principle and Legislative Requirements | 3  |
| 2.1. Definition of Abnormal Indivisible Load (AIL)                       | 3  |
| 2.2. Legislation                                                         | 4  |
| 2.3. Water Preferred Policy Requirements                                 | 4  |
| 3. Abnormal Indivisible Load Movements - Highways Act 1980               | 5  |
| 3.1. Recovery of Excessive Maintenance Costs - Section 59 Agreements     | 5  |
| 3.2. The Removal and Replacement of Street Furniture                     | 5  |
| 4. Transport Configurations                                              | 5  |
| 5. Marine Access                                                         | 6  |
| 5.1. Pembroke Dock                                                       | 6  |
| 5.2. Potential Beach Landing at Ferryside                                | 7  |
| 6. Structural Information                                                | 11 |
| 6.1. Route from Pembroke Dock to Llandyfaelog                            | 11 |
| 7. Route Negotiability                                                   | 13 |
| 7.1. Route from Pembroke Docks to Llandyfaelog                           | 13 |
| 8. Summary                                                               | 22 |
| Appendix 1                                                               | 23 |
| Maps                                                                     | 23 |
| Appendix 2                                                               | 24 |
| Transformer Drawings                                                     | 24 |
| Appendix 3                                                               | 25 |
| Trailer Arrangement Drawings                                             | 25 |
| Appendix 4                                                               | 26 |
| Selected Correspondence                                                  | 26 |



## Executive Summary

This report considers marine and land transport feasibility investigations into achieving access for transformers at 220te nett and 178te nett for future delivery to a proposed new National Grid (NG) Substation to be known as Llandyfaelog, which is located approximately 6miles south of Carmarthen, South Wales.

It is understood that there are to be 4 x 460MVA Super Grid Transformers (SGTs) and also 3 x 240MVA SGTs delivered with the first delivery due in approximately 2027.

Due to the overall transport weight of the load being considered (plus carrying trailer) being in excess of 150te gross weight, the move will require a Special Order from National Highways (NA). It should be noted that Government policy is to maximise the use of water for the movement of Special Order (above 150te gross) AIL's wherever possible. NH require that access via the nearest available water access should be considered, as NG would be required to deliver via the nearest available marine offloading point that is practicable for AIL delivery in line with the requirements of the Department for Transport's Water Preferred Policy to deliver Special Order Abnormal Indivisible Loads (AIL). NH Abnormal Loads Team have provided an Agreement in Principle (AiP) for Special Order deliveries to the proposed substation via Pembroke Dock as detailed in AIP Reference Number 894 dated 21.08.24.

At the commencement of the feasibility studies, there were various sites under consideration as the location for the new substation. This meant that options further to the east were investigated including with possible access from Swansea Docks. As the Llandyfaelog site has now been determined, to the west of the overall study area, the access from Swansea and the east is no longer considered. Further information on the issues associated with access from the east can be made available if required but is not thought necessary at this time as an agreed route from Pembroke Dock has been confirmed.

Pembroke Docks remains suitable for the shipment of the transformers via various methods of offloading and is well established for deliveries of AILs such as transformers and project cargo.

The road route from Pembroke to Llandyfaelog was initially rejected by the South Wales Trunk Road Agency (SWTRA) who required a number of bridges to be assessed. The preferred route detailed from Pembroke via the A477 and A40 to the A484 has been approved by all structural stakeholders in terms of structural clearance. However, this was only achieved following assessment of 8 SWTRA structures on the A477 and A40. These have all been confirmed as accessible via a comparative load assessment against their recorded capacities of the bridges crossed for 24/28 axle girder frame trailers based on 220te nett SGT weight.

Following these assessments, undertaken by Aecom, to meet the technical requirements of SWTRA, it has been confirmed the route below from Pembroke has been confirmed as able to accommodate the proposed loads of up to 220te nett.

Exit Docks & Continue Western Way  
Continue A3139 London Road  
Continue A477 London Road  
Continue A477 eastbound to St Clears  
Merge A40 eastbound to Carmarthen  
Turn right A484  
Turn left at OS Ref SN 4117 1338 Unclassified towards Bwlch Y Gwynt .  
Note new access road to be constructed.



It should be noted that SWTRA may require that in the event that the final trailer arrangements selected for actual delivery various from those included in the assessment process that a review of suitability may be required, but no major issues are expected. It is recommended that the appointed haulage contractor is encouraged to submit the formal Special Order notification as soon as possible when final movement dates are known to ensure this process is managed in acceptable timescales.

The route from Pembroke to the A484 is regarded as negotiable with street furniture removal and careful traffic management as detailed. The A484 south from Carmarthen is also negotiable to the point where a new access road is to be created east from the A484 to the new substation. The existing unclassified road is not suitable for access.

The 460MVA Hyundai transformer is also unusually wide and is now understood to be in the region of 6.2m m as per the Hyundai Drawing No TL3972-A02-R00. This requires additional consideration in negotiability requirements.

No specific review of site access is included in the report although it is understood NG are to construct a new substation access road that travels east from the A484 to the substation. Wynns have been involved with initial advice on the new bellmouth and road alignment but have not seen the final design of the access road. This should be confirmed by NG as able to accommodate the AILs vehicles.

The report is intended to be a summary of the Abnormal Indivisible Load (AIL) route access at the current time and is not a guarantee that the route will be cleared in the future. Specific movements will need to be assessed at the time on an individual basis. If any further information is required, it is available on request.



## 1. Introduction

- 1.1. This report considers marine and land transport feasibility investigations into achieving access for transformers at 220te nett and 178te nett for future delivery to a proposed new National Grid (NG) Substation to be known as Llandyfaelog, which is located approximately 6miles south of Carmarthen, South Wales.
- 1.2. It is understood that there are to be 4 x 460MVA Super Grid Transformers (SGTs) and also 3 x 240MVA SGTs delivered with the first delivery due in approximately 2027.
- 1.3. This report is a summary of the status of the current AIL access investigations to the proposed site and seeks to present the situation as it presently stands. The issues highlighted in this report as risks to achieving AIL access in the future, will need to be revisited and progressed as the scheme develops.
- 1.4. This investigation considers the possible land transport routes from Pembroke Dock. Formal movement applications will be necessary upon appointment of a haulage contractor.
- 1.5. As the transformers are destined for a new substation yet to be constructed, no detailed review of site access within the substation layout is included, this will need to be considered along with a detailed appraisal of the technical requirements for handling transformers on-site as the scheme progresses. However, under separate cover Wynns Ltd have provided advice to NG on possible site access road requirements.
- 1.6. The report is intended to be a summary of the AIL route access at the current time and is not a guarantee that the route will be cleared in the future. Specific movements will need to be assessed at the time on an individual basis. If any further information is required, it is available on request.
- 1.7. The report considers access to the proposed Substation site in terms of AIL transportation only and no consideration of wider traffic and transport is discussed.

## 2. National Highways Agreement in Principle and Legislative Requirements

### 2.1. *Definition of Abnormal Indivisible Load (AIL)*

- 2.1.1. The Department for Transport, of which National Highways (NH), is a government-owned company with responsibility for managing the core road network in England, state that the strict definition of an AIL refers to a load which cannot, without undue expense or risk of damage, be divided into two or more loads for the purpose of carriage on roads and which, owing to its dimensions or weight, cannot be carried on a vehicle which complies in all respects with the 'standard vehicle regulations' these are:
  - The Road Vehicles (Construction and Use) Regulations 1986 (as amended)
  - The Road Vehicles (Authorised Weight) Regulations 1998 (as amended)
  - The Road Vehicles Lighting Regulations 1989 (as amended).
- 2.1.2. All equipment should be stripped of their ancillaries before they are transported. NH will only accept that further dismantling is not required where it cannot be economically achieved due to the requirement for its construction within specific factory environments or where extremely high tolerances have to be maintained.
- 2.1.3. In Wales the trunk road network is managed by Welsh Government but Special Order movement permissions are still administered by NH AIL Team in Birmingham.



## 2.2. *Legislation*

2.2.1. Conventional heavy goods vehicles have an operating weight limit of 44 tonnes. The category known as abnormal indivisible loads (AIL) covers those vehicles where the gross weight exceeds 44 tonnes. An Abnormal Load is defined as that which cannot be carried under Construction and Use (C&U) Regulations. Items which, when loaded on the load carrying vehicle exceed the weights encompassed by the C&U Regulations, but do not exceed Special Order Permission Limits, are governed by Special Types General Order (STGO) categories 1 to 3 depending on size.

2.2.2. Where dimensions exceed 6.1m in width, 30m in rigid length or 150 tonnes gross weight, Special Order from NH is required.

2.2.3. Special Order category AIL movements are authorised by the NH Abnormal Loads team, based in Birmingham. This is further discussed in section 2.3.

2.2.4. STGO loads orders grant consent for loads that satisfy the following criteria:

|                           |                                                   |
|---------------------------|---------------------------------------------------|
| <u>Category 1 weight</u>  | 44 – 50 tonnes and 11.5te axle weights            |
| <u>Category 2 weight</u>  | 50 – 80 tonnes and 12.5te axle weights            |
| <u>Category 3 weight</u>  | 80 – 150 tonnes and 16.5te axle weights           |
| <u>Width Restriction</u>  | 3.0m (C&U) –5m (VR1 Required)– 6.1m (SO required) |
| <u>Length Restriction</u> | 18.65m (C&U) – 30.0m (SO required)                |

2.2.5. As the load will be above 150te gross, a Special Order permit and Agreement in Principle (AiP) would be required from NH. This would require the loads to be moved from the nearest available port, in line with the Department for Transport (DfT) 'Water Preferred Policy'.

## 2.3. *Water Preferred Policy Requirements*

2.3.1. The Department for Transport has adopted a 'water-preferred' policy for the transport of AILs. This means that, where an application is sought for the movement of a Special Order or VR1 category load (more than 5.0m width) by road, the Department, via NH, will turn down the application where it is feasible for a coastal or inland waterway route to be used instead of road. NH advise that this decision is based on a number of factors including whether the load is divisible, the availability of a suitable route, the amount of traffic congestion that is likely to be caused and the justification for the load to be moved. The NH Abnormal Loads Team is the department responsible for the authorisation of Special Order AIL's and government policy is that the closest available port of access should be used for the delivery of such oversize items.

2.3.2. NH Abnormal Loads Team have provided an Agreement in Principle (AiP) for Special Order deliveries to the proposed substation via Pembroke Dock as detailed in AIP Reference Number 894 dated 21.08.24.

### 3. Abnormal Indivisible Load Movements - Highways Act 1980

#### 3.1. *Recovery of Excessive Maintenance Costs - Section 59 Agreements*

- 3.1.1. Section 59 of the Highways Act 1980 allows the highways authority to raise a charge against a user of the highway to cover repair works necessitated by excessively heavy or unusual loads being carried on the road by that user. This provision is typically used where the passage of heavy lorries to and from industrial premises or building sites causes excessive damage to the road, requiring expensive remedial works by the Council. Under Section 59, the Council may charge on such costs to the organisation responsible for the damage, the amount payable being calculated as the excess cost of repair compared to normal maintenance costs for the road. Rather than wait to be charged such excessive repair costs, the Council and the third party may enter into an agreement under Section 59 whereby the third party accepts liability and makes payment of an agreed sum to the Council to cover the excessive repair costs.

#### 3.2. *The Removal and Replacement of Street Furniture*

- 3.2.1. Where the removal and replacement of street furniture is required for the mobilisation of out of gauge vehicles into existing sites then these are generally managed under Temporary Traffic Regulation Order (TTRO) and Street Works Legislation. These are normally, but not necessarily, organised by the haulage contractor. These requirements are generally to ensure that the supervisors and operatives are competent and that the works will be carried out to a prescribe standard with the appropriate traffic management in place. In some circumstances the Highway Authority or LA will insist that their preferred contractors will carry out such work.

### 4. Transport Configurations

- 4.1. Based on the information available to date the heaviest transformers initially considered within this report is assumed to be 220te nett for 460MVA transformers although it is understood that the design of the new units has been confirmed as the Hyundai SGT shown in Drawing Number TL3972-A02-R00, which shows a transport weight of 213.3te.
- 4.2. There is also a requirement to consider a second a weight of 178te for standard bulk purchase 240MVA transformers.
- 4.3. At theses dimensions it is not possible to transport the transformer under the regulations governing Construction and Use (C&U) vehicles (44 tonne gross, 18.65m long and 2.9m wide) it is also not possible within the Special Types General Order (STGO) regulations as a Category 3 load (80-150te gross) as the gross load will be in excess of 150te. It will therefore be necessary to comply with legislation regarding Special Order movements and to be delivered via the nearest port of delivery.
- 4.4. Based on information available at the commencement of the study works 5 potential trailer arrangements were initially considered as detailed below:
- 16 axle girder frame trailer AL50 at 275.2te gross weight as provided by Mammoet (240MVA SGTS).
  - 18 axle girder frame trailer AL50 at 281.2te gross weight as provided by Mammoet (240MVA SGTS).
  - 16 axle girder frame trailer at 264.8te gross weight as provided by Allelys (240MVA SGTS).
  - 20 axle girder frame trailer at 312.5te gross weight as provided by Colletts. (240MVA SGTS).



- 20 axle girder frame trailer at 359te gross (Wynns drawing Number 23-1156.TC01 for 220te nett load) (460MVA SGTS).

- 4.5. Based on information available at this moment in time it is assumed that the road transport configuration would consist of a ballast tractor pulling a 20/24 axle girder frame trailer for the 460MVA SGTS.
- 4.6. At the time of the works commencing there were three main haulage contractors with equipment able to carry the transformers in the UK, Allelys Heavy Haulage Ltd, Collett & Sons Heavy Haulage and Mammoet. In 2024 Allelys purchased the Mammoet trailers and presently there are just two providers of girder frame trailers in the UK. There are options to procure from Ireland and Europe that can be explored, if necessary, but this is not discussed further here.
- 4.7. Allelys have also made some changes to how they arrange the frame trailers and it will be necessary to confirm exact loaded trailer arrangements prior to use.
- 4.8. The 460MVA Hyundai transformer is also unusually wide and is now understood to be in the region of 6.2m m as per the Hyundai Drawing No TL3972-A02-R00. This requires additional consideration in negotiability requirements.
- 4.9. The loaded trailer arrangements are commercially sensitive and should not be disclosed to other parties. A selection of indicative trailer arrangements relevant to this project are attached within Appendix 3 as Drawings:
- 23-1156.TC01 (20 axle trailer)
  - 23-1156.TC02 (24 axle trailer)
  - 23-1156.TC03 (20 axle trailer)
  - 23-1156.TC04 (24 axle trailer)
- 4.10. As is detailed in Section 6, as additional assessment were required on the A477 and A40, additional trailers have also been presented for consideration in the assessment process.

## 5. Marine Access

### 5.1. Pembroke Dock

- 5.1.1. Pembroke Port has been facilitated many major projects through the port, the most recent being two 500 tonne petrochemical vessels to the Valero refinery on the Milford Haven, and the outbound shipments of the Murco refinery heavy lifts which were all transhipped from Ro/Ro to heavy lift for deep sea shipment to Pakistan.
- 5.1.2. Pembroke commercial port is operated by Milford Haven Port Authority. There are three quays in total. Number 1 Quay is used for heavy lifts.
- 5.1.3. Number 1 quay is some 180 metres in length and has a maintained depth of approximately 8 metres alongside. There was a controlling depth of approximately 5 metres on approach so vessels may need to arrive over high water. A review of Pembroke port recent dredging operations will confirm.
- 5.1.4. The port has been used for the three main modes of heavy lift shipping and is suitable for Heavy Lift Vessels, Roll-on/Roll-Off and Coaster, and Mobile Crane Operations.
- 5.1.5. In summary, there are no restrictions or issues for shipment through Pembroke Port.

5.2. *Potential Beach Landing at Ferryside*

- 5.2.1. A survey was undertaken of Ferryside Beach in order to meet with the requirements of the water preferred policy detailed in Section 2, but also as contingency against there being significant structural issues on the possible routes between Pembroke and Swansea to the possible substation locations being considered at the commencement of the study. This was to consider access from the River Towy.
- 5.2.2. Beach landing at Ferryside is not recommended due to the issues shown below which include the beach geography, egress from the beach, egress onto the public road and the restrictive road widths required to be negotiated to reach the main A484 and the proposed substation.



Photograph 1

Ferryside Beach. Note the raised beach which drops off at low water to the river channel. Beach landing would involve a high degree of civil works to enable.



Photograph 2

View of Ferryside beach from the main access/car park. A beach landing would require the access off the beach to overcome the level change seen here in the foreground which would include significant civil works.



Photograph 3

Ferryside beach looking east towards the beach egress and showing the gradient that would need to be coped with to get from the sea going vessel to the road. Not to be underestimated.



Photograph 4

Access to/from the beach, taken in the opposite direction to picture 2. If a solution can be engineered to land and get up off the beach, the loaded vehicle would enter from behind the camera and move east towards the level crossing and the road network beyond.



Photograph 5

Looking towards the level crossing from Eva Terrace. There is insufficient room for a frame trailer to egress the beach and turn right without contact with the crossing stairways and infrastructure.



Photograph 6

Looking towards Eva Terrace and to the right, Port way. The surveyor recommends a frame trailer cross over Eva Terrace and into Portway in reverse and then drive forward to the right which would minimise street furniture removal at this junction. Swept Path Assessments (SPA's) would be needed to include the height of the retaining wall shown here in the foreground.



Photograph 7

Unclassified Carmarthen Road heading north east from Ferryside at approximate OS Reference SN 3722 1101, Brooklands. Note the restricted width river bridge and level change. SPA needed, but probable removal of offside bridge furniture and subject to structural checking.

- 5.2.3. This bridge is known as Ystrad, Ferryside (Reference C2057/09) and is within the ownership of Carmarthenshire County Council (CCC) and has an advised span of 2.6m. No specific approach to CCC has been made to confirm the structural suitability of this bridge as the overall route is not considered suitable in terms of negotiability for either girder frame or flattop trailers when other routes from the A40 to the north exist but it is not on a route ever used for heavy AILs and as such is unlikely to be suitable without further assessment work.
- 5.2.4. Note the presence of overhead wires and services which would complicate any possible consideration of temporary access arrangements such as temporary bridging equipment that could be considered in the event the bridge was assessed and found to not be structurally acceptable to proposed loads.



Photograph 8

Reverse view of the Ystrad, Ferryside bridge at Brookside on Carmarthen Road. Structural check would be needed, and railings would require removal.



Photograph 9

Carmarthen Road near Is-coed wood. The road is narrow with wires crossing in several areas. A brook is running to the right of the carriageway, and any AIL vehicle would take up the entire road width and several SPA's would be required to confirm remedial works required.



Photograph 10

Continuation of Carmarthen Road at approximate OS Ref SN 3741 1113. The brook can be seen on the right, and it is probable that further survey work would be needed due the proximity of the loaded trailer axles to the edge of the road and subsequent loading charge into the brook retaining wall.

5.2.5. The above limitations to the physical negotiability of the route are considered to be significant and not easily overcome and the route is not discussed further in this report although additional information can be made available if needed. As a route from Pembroke has been identified this is not recommended for further consideration (See sections 6 and 7).

## 6. Structural Information

### 6.1. *Route from Pembroke Dock to Llandyfaelog*

6.1.1. The route to from Pembroke is shown below.

Exit Docks & Continue Western Way  
Continue A3139 London Road  
Continue A477 London Road  
Continue A477 eastbound to St Clears  
Merge A40 eastbound to Carmarthen  
Turn right A484  
Turn left at OS Ref SN 4117 1338 Unclassified towards Bwlch Y Gwynt .  
Note new access road to be constructed.

6.1.2. South Wales Trunk Road Agency (SWTRA) are responsible for the A477 and A40 trunk road from Pembroke to Carmarthen. They advised that a structural screening exercise was required on all of the structures on the proposed route. This was undertaken by Aecom and provided to NG previously (Report 60685775-BR-CAR-SW-SCR-001-Rev 0 dated December 2023 refers).

6.1.3. This report filtered out most of the smaller span structures which were acceptable from all loaded trailer arrangements. However, it was deemed that an additional 8 structures needed more detailed structural assessment. All of these structures passed the detailed assessment process although A40 797 Pont Lesneven (TOWY) bridge (over the river immediately to the south of Carmarthen) was only cleared on a selection of trailers, with the 20 axle arrangement and one of the 24 axle trailers for the 220te nett load failing.

6.1.4. The structures assessed in more detailed are shown in Table 1 below with comments as to the loads approved and any noted cautions but in summary, after a long and costly assessment process SWTRA have approved the loads for both 178te and 220te nett.

**Table 1. SWTRA Structures Assessed By Aecom for SGT loads**

| Reference | Structure Name     | HB Rating  | Trailers Cleared                                                                                                                                          | Notes                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|--------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A40 795   | Railway Carmarthen | HA + 45 HB | Allelys 220Te-24ax<br>Allelys 220Te-28ax<br>Allelys 220Te-32ax<br>Allelys 220Te-24ax (wide)<br>Mammoet 220Te-24ax<br>Wynns 220Te-24ax<br>Wynns 220Te-20ax | AIL vehicles must travel in the centre of the carriageway upon approach and over the structure.<br><br>The AIL vehicle speed must be restricted to 10mph.<br><br>The AIL vehicles are to be escorted on approach, while crossing, and departing the structure with all other traffic kept clear.<br><br>The AIL vehicle axles are to be hydraulically controlled to ensure the wheels always carry equal weight and |



| Reference | Structure Name                 | HB Rating   | Trailers Cleared                                                                                                                                          | Notes                                                                                                     |
|-----------|--------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
|           |                                |             |                                                                                                                                                           | axle spacings are to be fixed and independently certified                                                 |
| A40 797   | Pont Lesnevm (TOWY)            | HA + 45 HB  | Allelys 220Te-24ax<br>Allelys 220Te-28ax<br>Allelys 220Te-32ax<br>Allelys 220Te-24ax (wide)<br>Wynns 220Te-24ax                                           | Wynns 220Te-20ax unacceptable.<br><br>Mammoet 220Te-24ax unacceptable.<br><br>All other cautions as above |
| A40 830   | Railway U/B (Sarnau)           | HA + 45 HB  | Allelys 220Te-24ax<br>Allelys 220Te-28ax<br>Allelys 220Te-32ax<br>Allelys 220Te-24ax (wide)<br>Mammoet 220Te-24ax<br>Wynns 220Te-24ax<br>Wynns 220Te-20ax | All other cautions as above                                                                               |
| A40 860   | Afon Cywyn                     | HA + 45 HB  | Allelys 220Te-24ax<br>Allelys 220Te-28ax<br>Allelys 220Te-32ax<br>Allelys 220Te-24ax (wide)<br>Mammoet 220Te-24ax<br>Wynns 220Te-24ax<br>Wynns 220Te-20ax | All other cautions as above                                                                               |
| A40 890   | Dewi Fawr U/B                  | HA + 45 HB  | Allelys 220Te-24ax<br>Allelys 220Te-28ax<br>Allelys 220Te-32ax<br>Allelys 220Te-24ax (wide)<br>Mammoet 220Te-24ax<br>Wynns 220Te-24ax<br>Wynns 220Te-20ax | All other cautions as above                                                                               |
| A40 895   | Afon Cynin U/B                 | HA + 45 HB  | Allelys 220Te-24ax<br>Allelys 220Te-28ax<br>Allelys 220Te-32ax<br>Allelys 220Te-24ax (wide)<br>Mammoet 220Te-24ax<br>Wynns 220Te-24ax<br>Wynns 220Te-20ax | All other cautions as above                                                                               |
| A477 10   | Pont Newydd                    | HA or 45 HB | Allelys 220Te-24ax<br>Allelys 220Te-28ax<br>Allelys 220Te-32ax<br>Allelys 220Te-24ax (wide)<br>Mammoet 220Te-24ax<br>Wynns 220Te-24ax<br>Wynns 220Te-20ax | All other cautions as above                                                                               |
| A477 21   | St 13 Afon Hydfron Underbridge | SV 196      | Allelys 220Te-24ax<br>Allelys 220Te-28ax<br>Allelys 220Te-32ax<br>Allelys 220Te-24ax (wide)<br>Mammoet 220Te-24ax<br>Wynns 220Te-24ax<br>Wynns 220Te-20ax | All other cautions as above                                                                               |

6.1.5. The Aecom assessment reports (Dated October 2024) have been presented to NG under separate cover and are not attached to this report due to file size but can be made available if required.

6.1.6. It should be noted that SWTRA may require that in the event that the final trailer arrangements selected for actual delivery various from those included in the assessment

process that a review of suitability may be required but no major issues are expected. It is recommended that the appointed haulage contractor is encouraged to submit the formal Special Order notification as soon as possible when final movement dates are known to ensure this process is managed in acceptable timescales.

- 6.1.7. Pembrokeshire County Council (PCC) have confirmed that the route out of Pembroke Dock to the A487 trunk road is acceptable for the proposed loads in terms of structures.
- 6.1.8. Carmarthenshire County Council (CCC) have advised (29.06.23) the section of the route on the A484 has 3 identified known Highway Structures along this section. None are regarded as an issue. These are small spans:
1. A476-5 – Nant Glas Church, Cross Hands (Culvert) – 900mm I.D concrete pipe.
  2. RSA476-040 – 34/36 Llannon Road (Retaining Wall) – 1m average retained height RC Wall.
  3. A476\_4 – Gate House Llannon (Small Culvert) – 375mm I.D concrete pipe.
- 6.1.9. No specific comments have been obtained from the police forces on the proposed route.

## 7. Route Negotiability

### 7.1. *Route from Pembroke Docks to Llandyfaelog*

- 7.1.1. This route is detailed in the notes and photographs below.



Photograph 11

Pembroke port main gate access, Front Street. Vehicle moves towards the camera and turns left onto the A4139 Western Way.



Photograph 12

Western Way/London Road Roundabout. Girder frame trailers move away from the camera, entering the roundabout and exiting via London Road.



Photograph 13

A4139 London Road. Vehicle moves away from camera and continues A4139 London Road. The A4139 London Road is a single carriageway in each direction and as such, the girder frame trailer will occupy both lanes requiring careful traffic management.



Photograph 14

A477 London Road Roundabout. Surveyor recommends the roundabout is taken in contraflow with traffic halted and the girder frame trailer moved under police escort. This is shown to the right of the photograph into the flow of cars, which will make for easier negotiability.

- 7.1.2. The A477 east to the A40 at St Clears and then Carmarthen is negotiable. The route via the A477 is single two way carriageway with intermediate dual carriageways and several roundabouts, all of which are negotiable with furniture removed as appropriate to transporter length and width. The AIL will be taking up the entire road for the non dualled sections and careful traffic management will be needed. There are several laybys that can be used to relive traffic subject to agreement with SWTRA and the police.
- 7.1.3. The route from the A40/A48/A474 roundabout via the A484 is discussed in the following notes and photographs.



Photograph 15

A484 exit, vehicle moves away from the camera. Negotiable.



Photograph 16

Keep left and traffic lights, street furniture removal required.

- 7.1.4. If the load is in excess of 5 meters wide a shunt at the previous main roundabout and temporary wrong side travel may be feasible to the next roundabout south. Exact requirements to be confirmed by appointed haulage contractor after consultation with police. Careful consideration of traffic management required.



Photograph 17

A484 Morrisons roundabout. Vehicle moves away from the camera. Negotiable. Could possibly be in contraflow if shunt previously described is utilised to reduce street furniture removal.



Photograph 18

A484 Morrisons roundabout, Vehicle moves away from, considered negotiable.



Photograph 19

Vehicle exits the roundabout and continues ahead, considered negotiable.



Photograph 20

Approaching second A484 roundabout, vehicle moves away from the camera, considered negotiable with the removal of the chevrons in the centre of the roundabout.



Photograph 21

A484 roundabout, vehicle moves away from the camera, considered negotiable.



Photograph 22

A484 driving through Cwmffrwd, Vehicle moves away from the camera. Negotiable with full occupation of the road. The load will occupy both lanes for the whole length of the A484 and traffic management and escort requirements will need to be carefully considered and managed with the police.



Photograph 23

Keep left approaching Cwmffrwd, curb side may require plating and centre island street furniture removed.



Photograph 24

Second keep left in Cwmffrwd, curb side may require plating and centre island street furniture removed.



Photograph 25

A484, vehicle moves away from the camera, considered negotiable.



Photograph 26

A484, vehicle moves away from the camera, considered negotiable.



Photograph 27

A484, vehicle moves away from the camera, considered negotiable.



Photograph 28

A484 driving through Idole, vehicle moves away from the camera. Negotiable.



Photograph 29

A484, vehicle moves away from the camera. Negotiable.



Photograph 30

A484, vehicle moves away from the camera. Negotiable.



Photograph 31

A484, vehicle moves away from the camera. Tree pruning may be required depending on growth at time of movement.



Photograph 32

A484, vehicle moves away from the camera and approaching left turn towards proposed site.



Photograph 33

Left turn off A484, vehicle moves away from the camera. Not accessible for AILs in the current alignment.

- 7.1.5. The left turn from the A484 is not negotiable and remedial works will be necessary to enable the loads to access this turn and from this point east towards the proposed substation location. The section of road will also be expected to require upgrades for wider Construction and Use traffic associated with the construction of the substation.
- 7.1.6. NG are understood to be constructing a new access road to the substation that travels east from this point. This has been discussed in separate Swept Path Assessment drawings and is not detailed in this report.

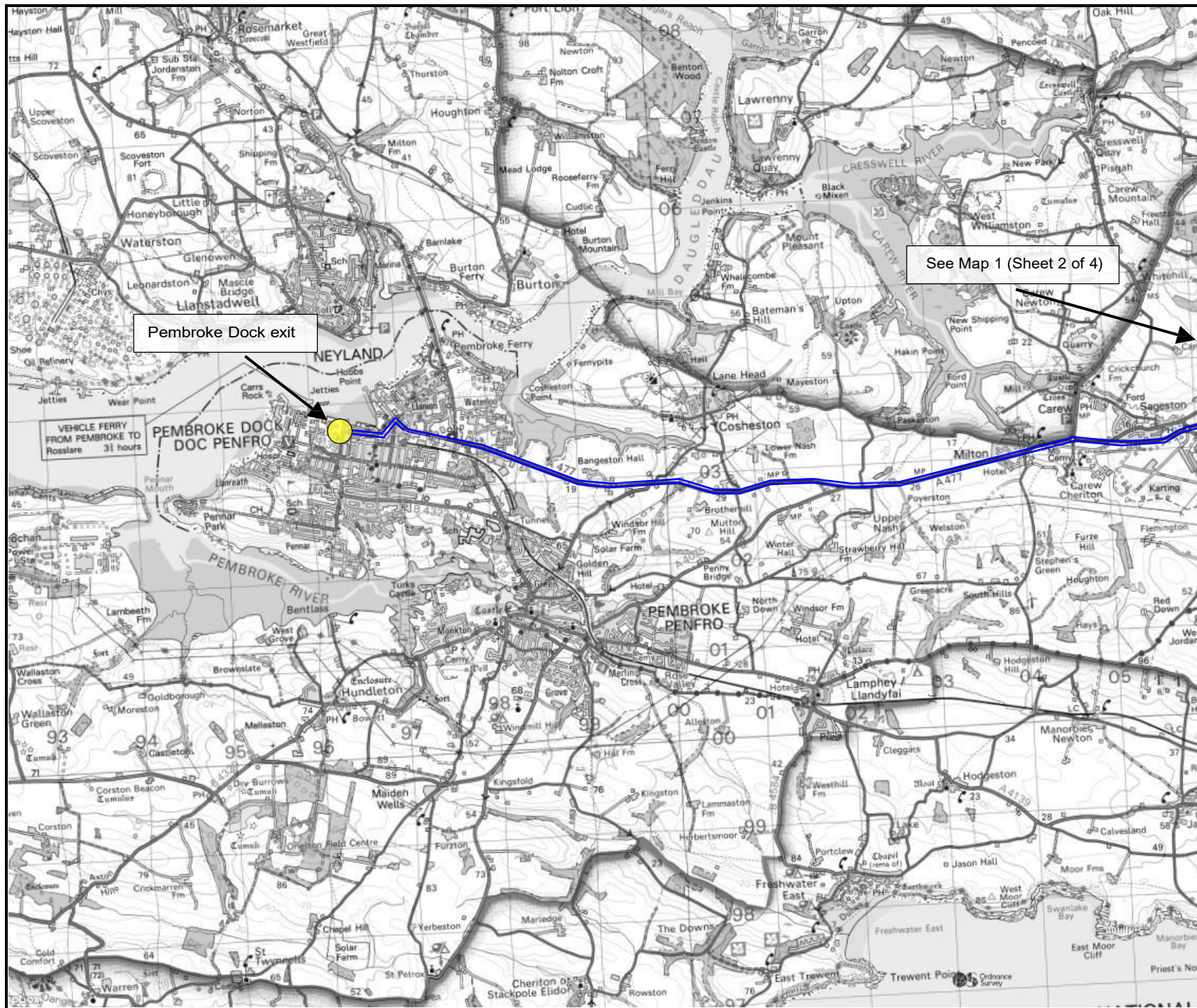
## 8. Summary

- 8.1. The NH Abnormal Loads Team has provided Agreement in Principle (AIP) which confirms the preferred port of access to be via Pembroke Dock, dated 21.08.24 (AIP Reference 894).
- 8.2. Pembroke Docks remains suitable for the shipment of the transformers via various methods of offloading and is well established for deliveries of AILs such as transformers and project cargo.
- 8.3. The preferred route detailed via the A477 and A40 to the A484 has been approved by all structural stakeholders in terms of structural clearance. However, this was only achieved following assessment of the 8 SWTRA structures on the A477 and A40. These have all been confirmed as accessible via a comparative load assessment against their recorded capacities of the bridges crossed for 24/28 axle girder frame trailers based on 220te nett SGT weight.
- 8.4. It should be noted that SWTRA may require that in the event that the final trailer arrangements selected for actual delivery various from those included in the assessment process that a review of suitability may be required but no major issues are expected. It is recommended that the appointed haulage contractor is encouraged to submit the formal Special Order notification as soon as possible when final movement dates are known to ensure this process is managed in acceptable timescales.
- 8.5. At the commencement of the feasibility studies, there were various sites under consideration as the location for the new substation. This meant that options further to the east were investigated including with possible access from Swansea Docks. As the Llandyfaelog site has now been determined, to the west of the overall study area, the access from Swansea and the east is no longer considered. Further information on the issues associated with access from the east can be made available if required but is not thought necessary at this time as an agreed route from Pembroke Dock has been confirmed.
- 8.6. The 460MVA Hyundai transformer is also unusually wide and is now understood to be in the region of 6.2m m as per the Hyundai Drawing No TL3972-A02-R00. This requires additional consideration in negotiability requirements. The route to the A484 is regarded as negotiable with street furniture removal and careful traffic management.
- 8.7. No specific issues have been identified by the police although a police escort would be required for movement the with private escort arrangements also in place and it is recommended that further discussions are undertaken with respect to confirming escort requirements prior to deliveries with the relevant police forces. Very careful consideration on escort requirements will be needed and where traffic must be halted, consultation with the police is necessary as only police escorts can manage the movement. Private escorts are not allowed to direct traffic.
- 8.8. No specific review of site access is included in the report although it is understood NG are to construct a new substation access road that travels east from the A484 to the substation. The existing unclassified road is not suitable for access.



## Appendix 1

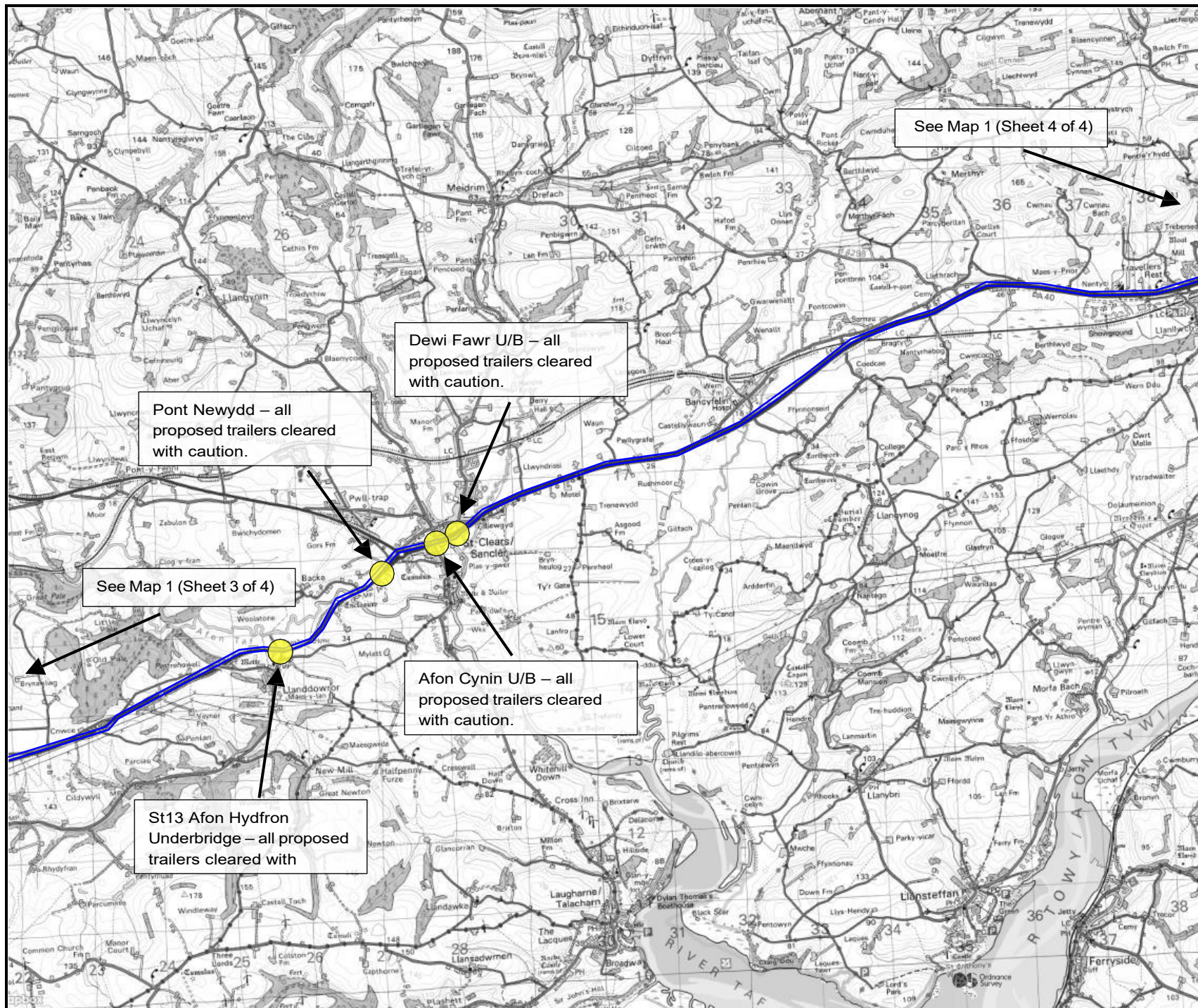
### Maps



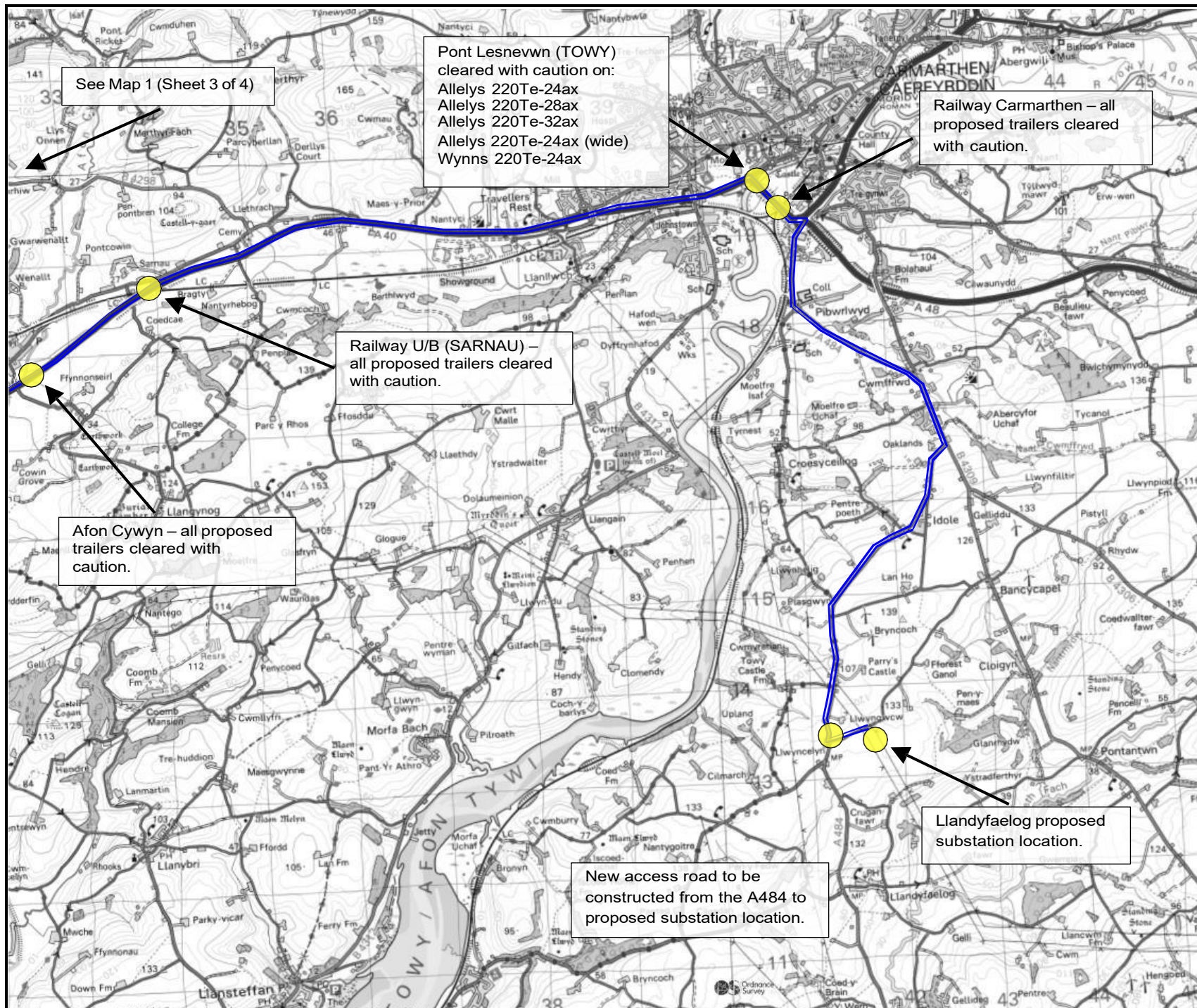
| Key                                                                                 |                    |  |
|-------------------------------------------------------------------------------------|--------------------|--|
|  | Route 1            |  |
|  | Points of interest |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |



| Key                                                                                 |                    |  |
|-------------------------------------------------------------------------------------|--------------------|--|
|  | Route 1            |  |
|  | Points of Interest |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |



| Key                                                                                 |                    |  |
|-------------------------------------------------------------------------------------|--------------------|--|
|  | Route 1            |  |
|  | Points of Interest |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |
|                                                                                     |                    |  |

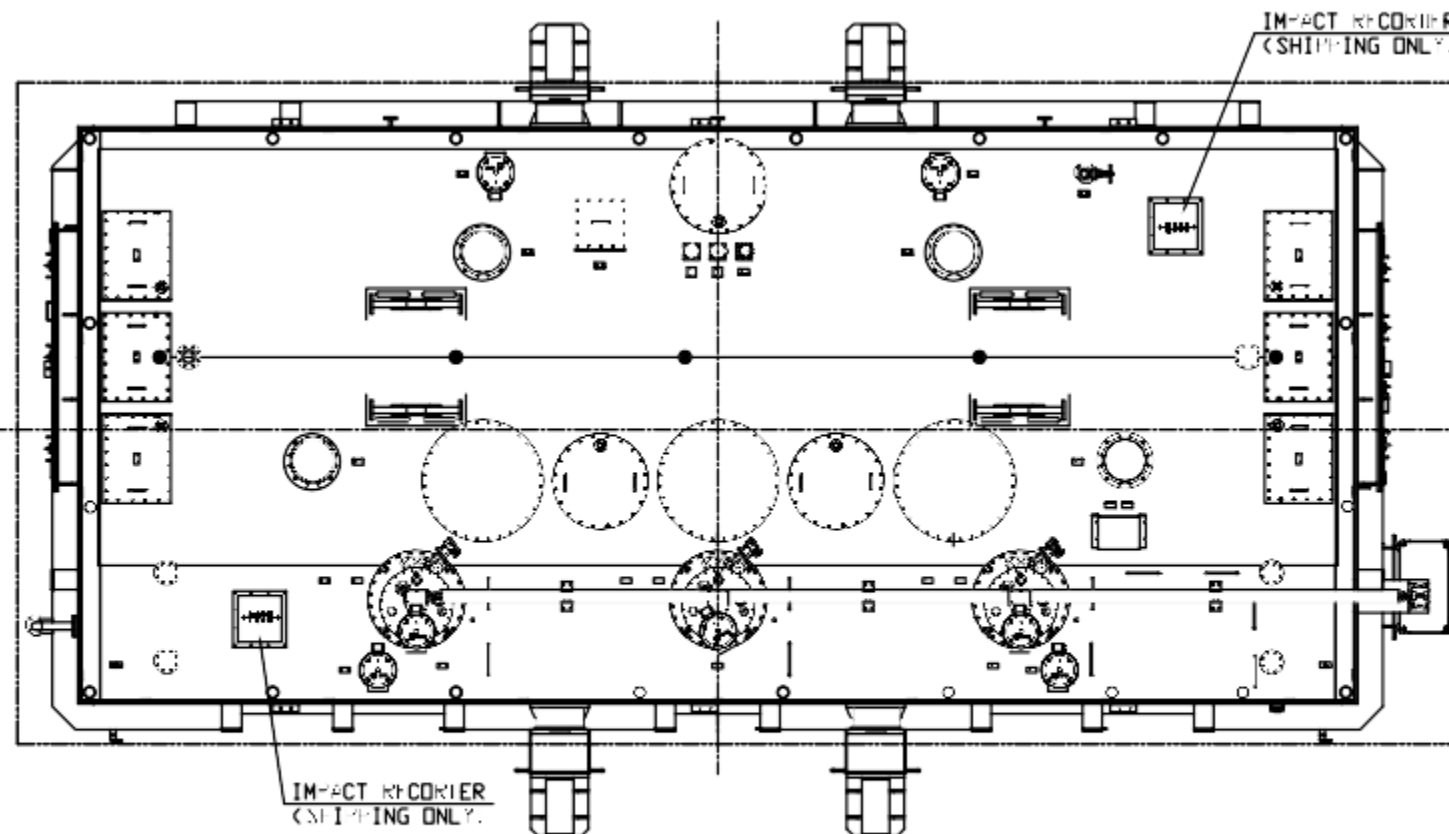


| Key                                                                                                                                                                                                                                                                   |                    |                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|
|                                                                                                                                                                                    | Route 1            |                    |
|                                                                                                                                                                                    | Points of Interest |                    |
|                                                                                                                                                                                                                                                                       |                    |                    |
|                                                                                                                                                                                                                                                                       |                    |                    |
|                                                                                                                                                                                                                                                                       |                    |                    |
|                                                                                                                                                                                                                                                                       |                    |                    |
|                                                                                                                                                                                                                                                                       |                    |                    |
|                                                                                                                                                                                                                                                                       |                    |                    |
| B                                                                                                                                                                                                                                                                     |                    |                    |
| A                                                                                                                                                                                                                                                                     |                    |                    |
| O                                                                                                                                                                                                                                                                     | 06.10.25           | First Issue        |
| Rev                                                                                                                                                                                                                                                                   | Date               | Amendments:        |
| Revisions                                                                                                                                                                                                                                                             |                    |                    |
| <div><div>Wynns Ltd.<br/>Independent<br/>Transportation<br/>Engineers</div></div> <p>Shaftesbury House, 2 High Street, Eccleshall,<br/>Stafford, ST21 6BZ. Tel: (01785) 850411</p> |                    |                    |
| Client:                                                                                                                                                                                                                                                               |                    |                    |
| <div><div>National Grid<br/>Hams Offices<br/>Hams Lane<br/>Coleshill<br/>B46 1AW</div></div>                                                                                     |                    |                    |
| Project:                                                                                                                                                                                                                                                              |                    |                    |
| Proposed Llandyfaelog Substation                                                                                                                                                                                                                                      |                    |                    |
| Title:                                                                                                                                                                                                                                                                |                    |                    |
| Map 1 – Routes to Llandyfaelog<br>Proposed Substation Location.                                                                                                                                                                                                       |                    |                    |
| Drawing Status:                                                                                                                                                                                                                                                       |                    |                    |
| Final Report                                                                                                                                                                                                                                                          |                    |                    |
| Scale (A4):<br>NTS                                                                                                                                                                                                                                                    | Drawn by:<br>BD    | Checked by:<br>ARP |
| Ref No.:<br>23-156 Map 1                                                                                                                                                                                                                                              | Sheet:<br>4 of 4   | Rev.:<br>0         |
| © Wynns Ltd. This drawing is not to be reproduced in whole or in part<br>in any form or by any means, without prior written consent.                                                                                                                                  |                    |                    |
| © Crown Copyright.<br>All rights reserved. Licence No AL100035894                                                                                                                                                                                                     |                    |                    |



## Appendix 2

### Transformer Drawings



[Note]

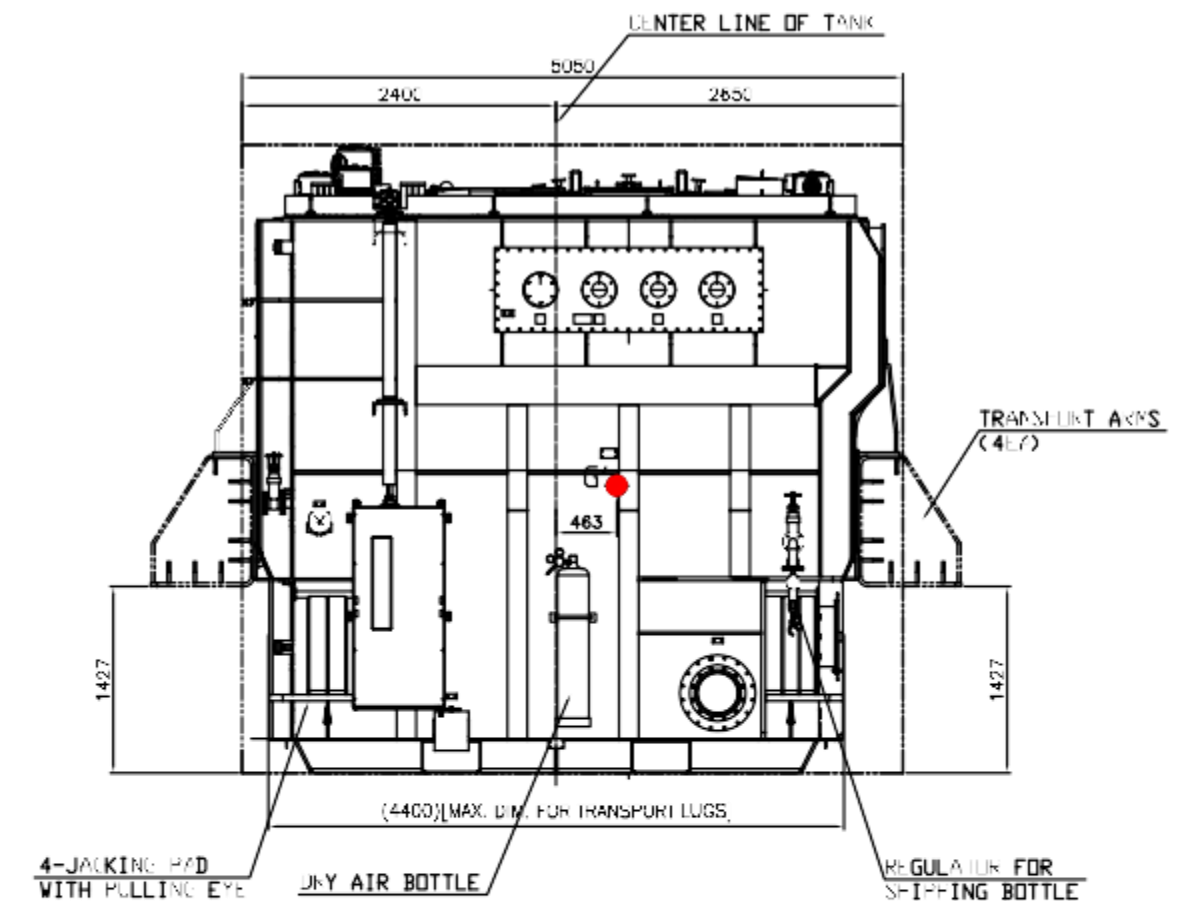
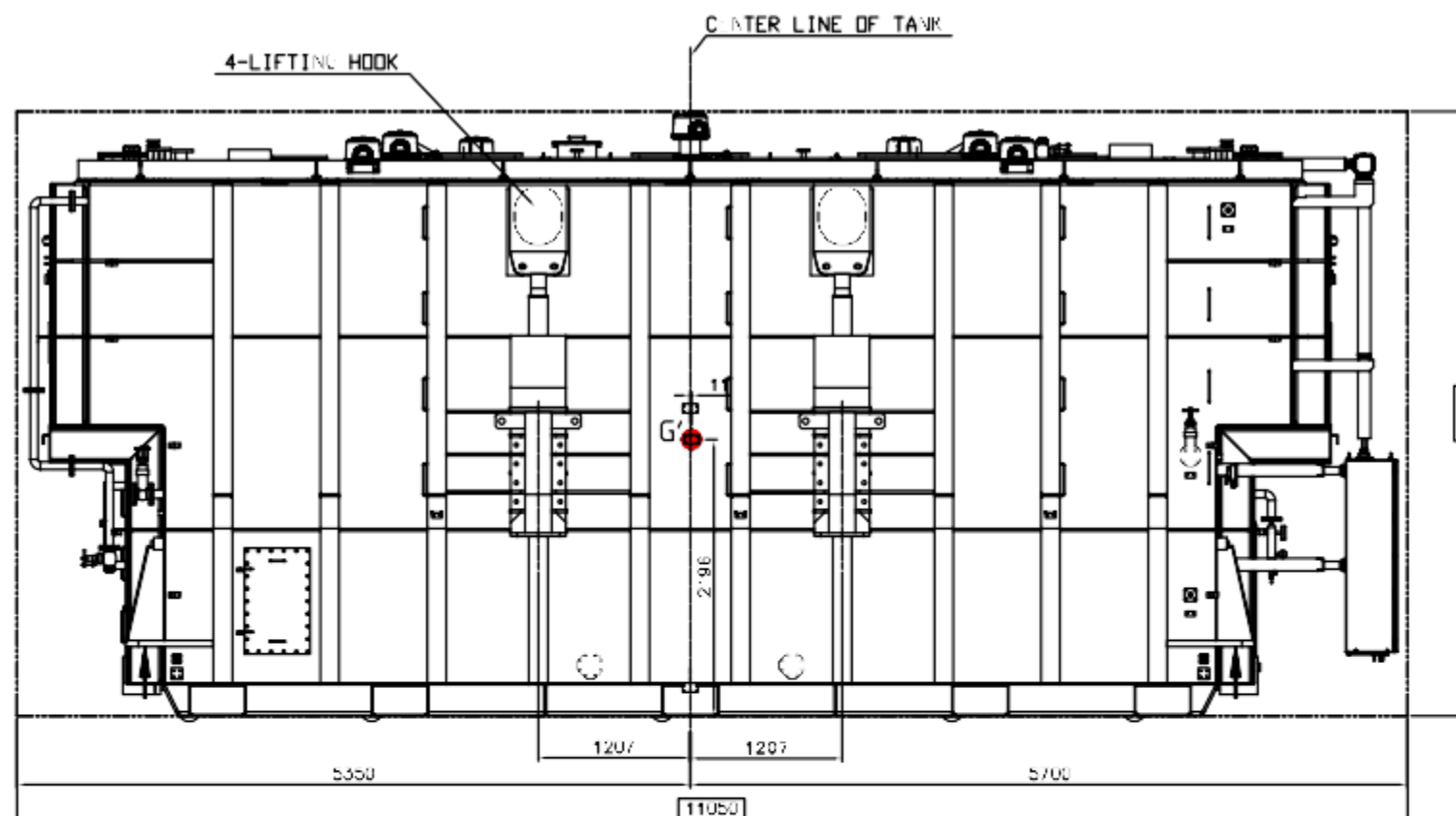
1. While in transit, operate impact recorders after checking the battery and paper.
2. When unloading the TR, make sure the following.
  - 1) The jacking pads are properly fitted.
  - 2) Place lifting jacks only under the jacking pads.

| SHIPPING(MAIN BODY)  |                                  |
|----------------------|----------------------------------|
| DIMENSION            | SIZE<br>L11050XW5050(4400)XH4800 |
| WEIGHT (WITHOUT OIL) | 213,500KG                        |

OVERALL DIMENSION TOLERANCE :  $\pm 2\%$

G : CENTER OF GRAVITY  
(SHIPPING OF MAIN BODY)

↑ : JACKING POINT

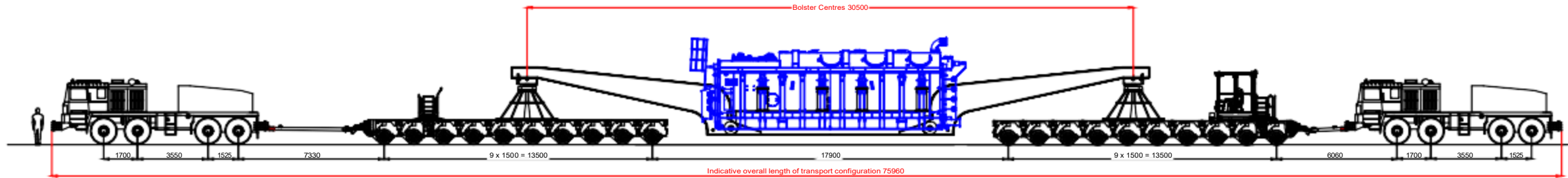


|                        |  |                                           |  |
|------------------------|--|-------------------------------------------|--|
| CUSTOMER               |  | Site                                      |  |
| nationalgrid           |  | Uxbridge 400KV SUBSTATION                 |  |
| Contractor             |  | TITLE                                     |  |
| HID HYDRAULIC ELECTRIC |  | SHIPPING DRAWING OF TRANSFORMER MAIN BODY |  |
| Contract No.           |  | Contractor Project No.                    |  |
| Date                   |  | Contractor Drawing No.                    |  |
| Designed               |  | TL3972-A02                                |  |
| Checked                |  | NG Drawing No.                            |  |
| Approved               |  | -                                         |  |
| Scale                  |  | Sheet                                     |  |
| SUKANI                 |  | 1 / 1                                     |  |
| DATE                   |  | Revision                                  |  |
| JAN 2024               |  | 0                                         |  |

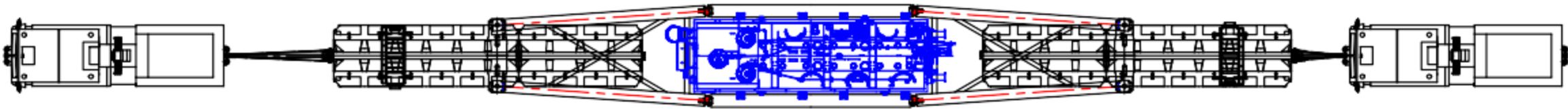


## Appendix 3

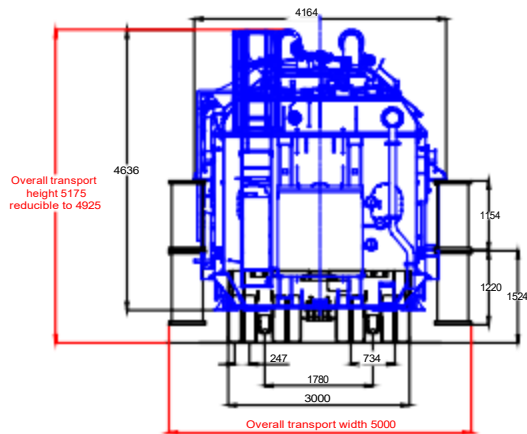
### Trailer Arrangement Drawings



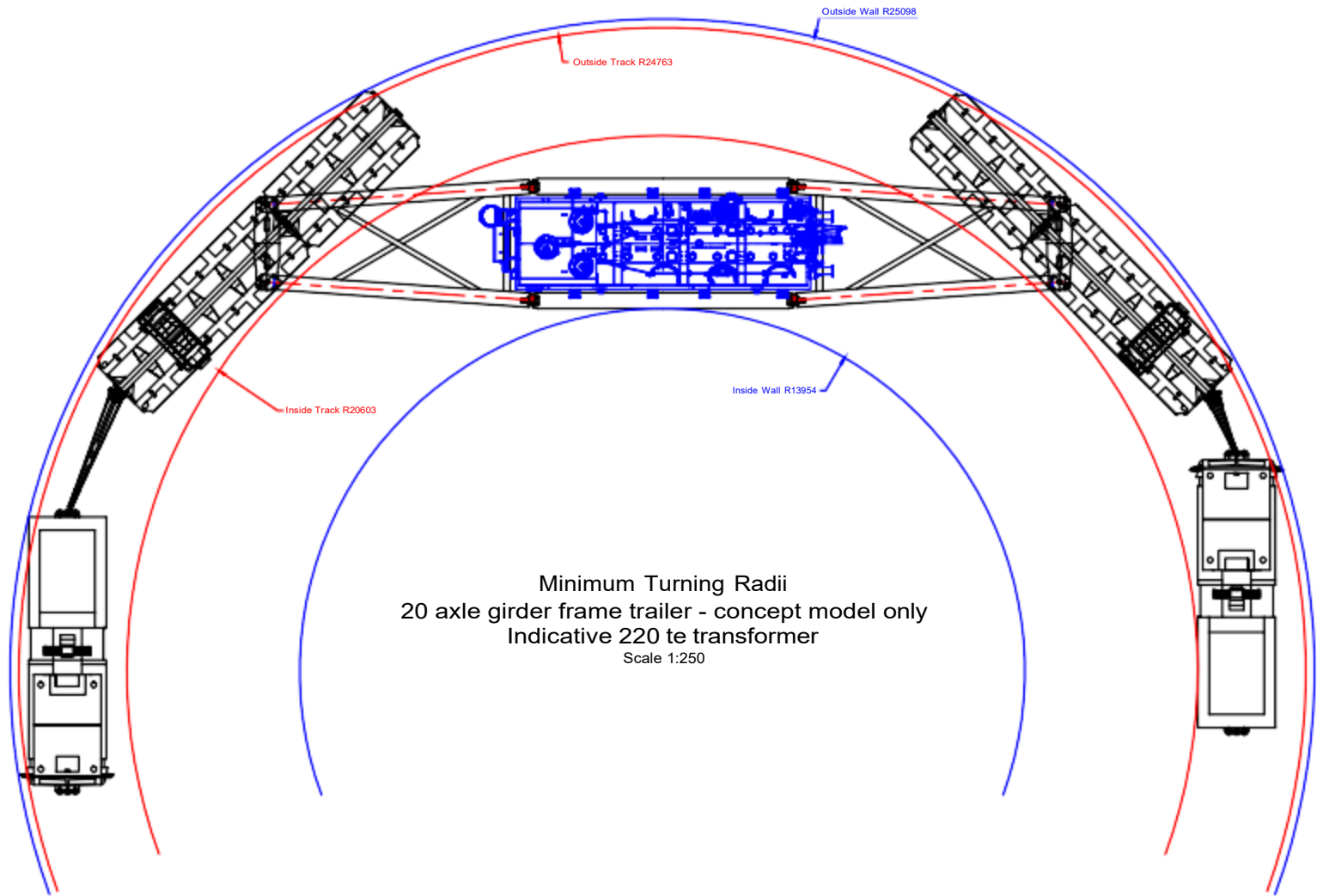
Elevation view - 20 axle girder frame trailer - concept model only  
Indicative 220 te transformer  
Scale 1:250



Plan view - 20 axle girder frame trailer - concept model only  
Indicative 220 te transformer  
Scale 1:250



Profile view  
Scale 1:125



Minimum Turning Radii  
20 axle girder frame trailer - concept model only  
Indicative 220 te transformer  
Scale 1:250

| Load table                              |            |
|-----------------------------------------|------------|
| 20 axle girder frame trailer            |            |
| Self weight of transformer              | 220.0 te   |
| Self weight of trailer                  | 139.2 te   |
| Self weight of aux. steelwork (for L&S) | 0.0 te     |
| Total combined weight                   | 359.2 te   |
| Load per trailer                        | 179.60 te  |
| Load per axle line                      | 17.96 te   |
| Load per axle                           | 8.98 te    |
| Load per wheel (4 per axle)             | 2.25 te    |
| Overall ground bearing pressure         | 4.43 te/m² |
| Tractor(s) (48 te)                      |            |
| Front axle                              | 8.0 te     |
| Second steer                            | 8.0 te     |
| Rear axle                               | 16.0 te    |
| Rear axle                               | 16.0 te    |

Notes:

[1] The figures shown above are representative of the transport configuration portrayed. However, as tractor and trailer arrangements vary then the loads and dimensions indicated should be treated as probable values.

[2] Actual dimensions, including axle spacing and mean running height, may vary slightly depending on manufacturer of trailer deployed.

[3] All linear measures in millimetres unless stated otherwise.

| 1         |          |                    |
|-----------|----------|--------------------|
| 0         | 30.03.23 | Issued for comment |
| Rev.      | Date     | Amendments         |
| Revisions |          |                    |

Prepared by:



Shaftesbury House, 2 High Street,  
Eccleshall, Stafford, ST21 6BZ  
Tel: (01785) 850411

Independent Transportation Engineers

Client:

**nationalgrid**

Project:

Carmarthen

Title:

Indicative transport configuration  
Conceptual 220 te transformer carried within  
20 axle girder frame trailer  
showing minimum turning radii

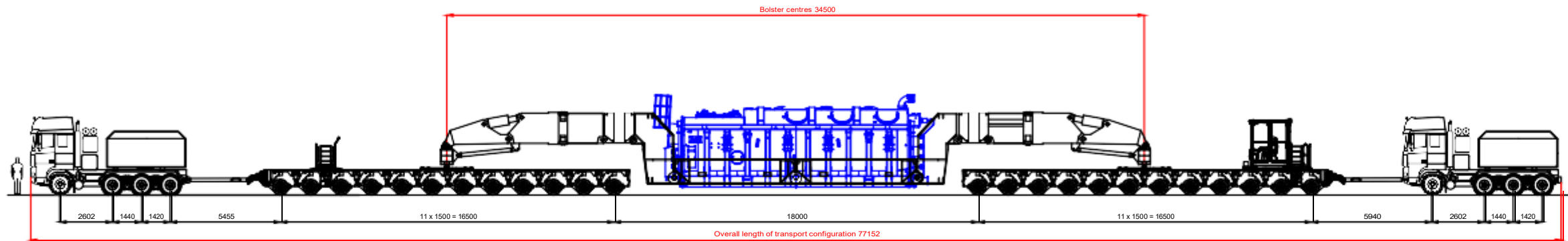
Drawing status:

Final report

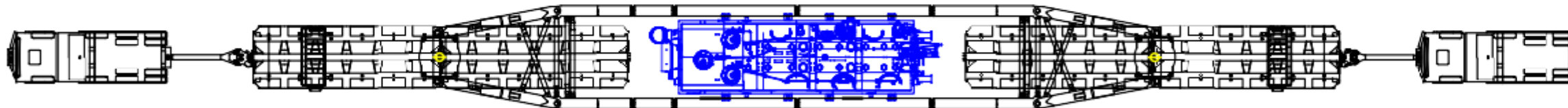
|                          |                  |                    |
|--------------------------|------------------|--------------------|
| Scale (A3):<br>As shown  | Drawn By:<br>MTO | Checked By:<br>ARP |
| Dwg. no:<br>23-1156.TC01 | Sheet:<br>1 of 1 | Rev:<br>0          |

© Wynns Limited. This drawing is not to be reproduced in whole or in part, in any form or by any means, without prior written consent.

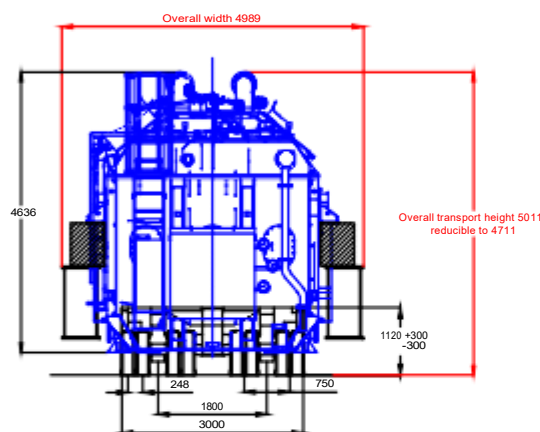
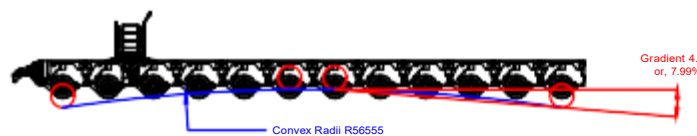
P:\Clients\Existing Clients\National Grid Company\Proposed New sites  
Investigations\23-1156 Carmarthen\23-1156.TC01 Carmarthen 220 te SGT 20 axle  
girder frame R0.dwg



Elevation view - 24 axle girder frame trailer - concept model only  
Indicative 220 te SGT  
Scale 1:250

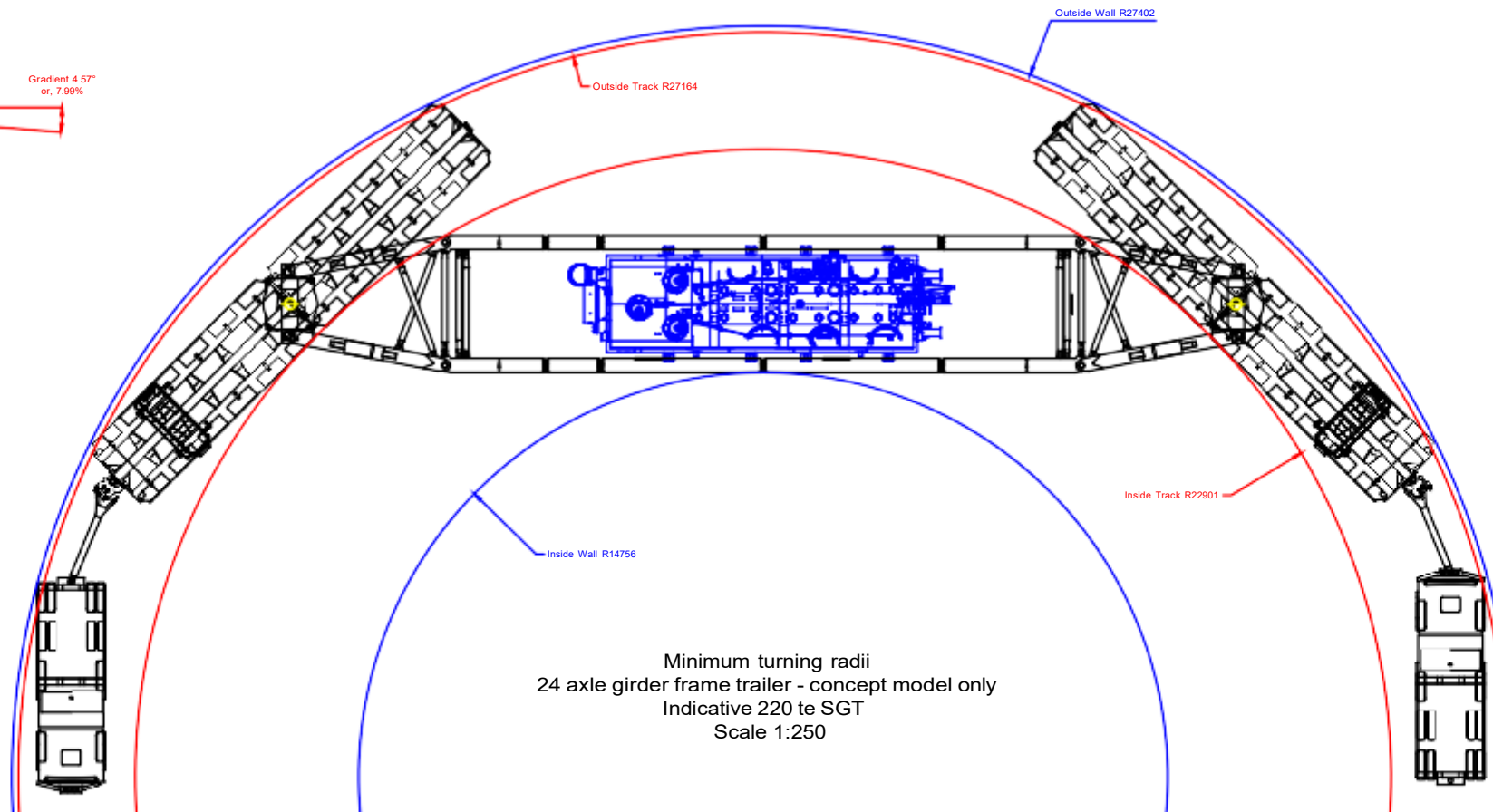


Plan view - 24 axle girder frame trailer - concept model only  
Indicative 220 te SGT  
Scale 1:250



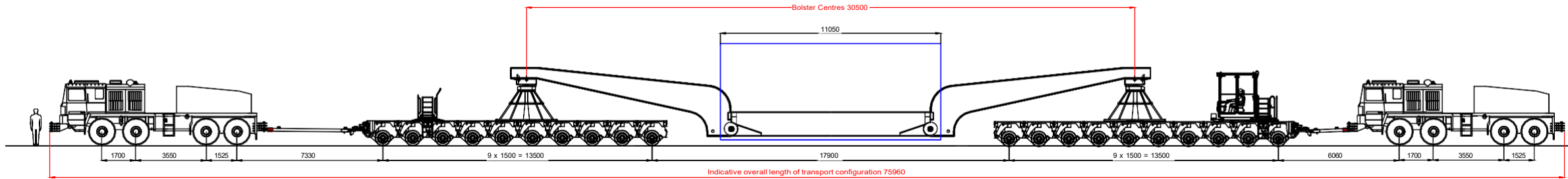
Profile view  
Indicative 220 te SGT  
Scale 1:125

NOTE: Final Design/Transport Arrangement  
to be Determined. Detail is Illustrative Only.

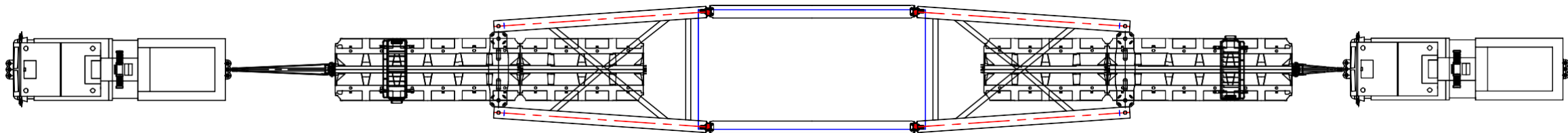


Minimum turning radii  
24 axle girder frame trailer - concept model only  
Indicative 220 te SGT  
Scale 1:250

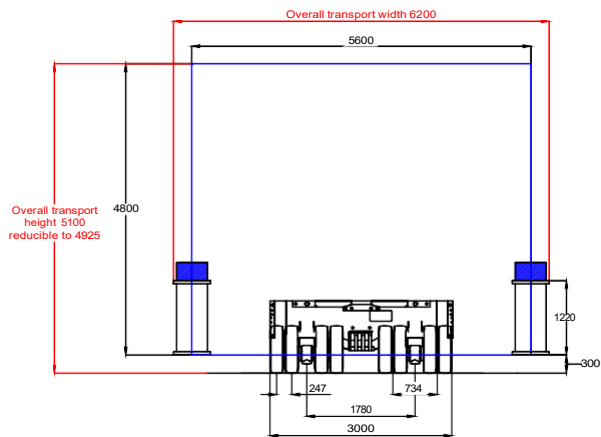
| Load Table                                                                                                                                                                                                                 |            |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| 24 axle girder frame trailer                                                                                                                                                                                               |            |                    |
| Self weight of transformer                                                                                                                                                                                                 | 220.00 te  |                    |
| Self weight of trailer                                                                                                                                                                                                     | 172.12 te  |                    |
| Self weight of aux. steelwork (for L&S)                                                                                                                                                                                    | 0.0 te     |                    |
| Total combined weight                                                                                                                                                                                                      | 392.12 te  |                    |
| Load per trailer                                                                                                                                                                                                           | 196.06 te  |                    |
| Load per axle line                                                                                                                                                                                                         | 16.33 te   |                    |
| Load per axle                                                                                                                                                                                                              | 8.17 te    |                    |
| Load per wheel (4 per axle)                                                                                                                                                                                                | 2.04 te    |                    |
| Overall ground bearing pressure                                                                                                                                                                                            | 3.92 te/m² |                    |
| Tractor(s) (42 te)                                                                                                                                                                                                         |            |                    |
| Front axle                                                                                                                                                                                                                 | 8.0 te     |                    |
| Second steer                                                                                                                                                                                                               | 10.0 te    |                    |
| Rear axle                                                                                                                                                                                                                  | 12.0 te    |                    |
| Rear axle                                                                                                                                                                                                                  | 12.0 te    |                    |
| <b>Notes:-</b>                                                                                                                                                                                                             |            |                    |
| [1] The figures shown above are representative of the transport configuration portrayed. However as tractor and trailer arrangements vary then the loads and dimensions indicated should be treated as probable values.    |            |                    |
| [2] Actual dimensions, including axle spacing and mean running height, may vary slightly depending on manufacturer of trailer deployed.                                                                                    |            |                    |
| [3] All linear measures in millimeters unless stated otherwise.                                                                                                                                                            |            |                    |
| [4] Transformer drawing indicative only.                                                                                                                                                                                   |            |                    |
| 1                                                                                                                                                                                                                          |            |                    |
| 0                                                                                                                                                                                                                          | 01.12.23   | Issued for comment |
| Rev.                                                                                                                                                                                                                       | Date       | Amendments         |
| Revisions                                                                                                                                                                                                                  |            |                    |
| Prepared By:                                                                                                                                                                                                               |            |                    |
|  <div>Shaftesbury House, 2 High Street,<br/>Eccleshall, Stafford, ST21 6BZ<br/>Tel: (01785) 850411</div>                              |            |                    |
| Independent Transportation Engineers                                                                                                                                                                                       |            |                    |
| Client:                                                                                                                                                                                                                    |            |                    |
|                                                                                                                                       |            |                    |
| Project:                                                                                                                                                                                                                   |            |                    |
| Carmarthen                                                                                                                                                                                                                 |            |                    |
| Title:                                                                                                                                                                                                                     |            |                    |
| Indicative transport configuration<br>Conceptual 220 te transformer carried within<br>24 axle girder frame trailer<br>showing minimum turning radii                                                                        |            |                    |
| Drawing Status:                                                                                                                                                                                                            |            |                    |
| Final Report                                                                                                                                                                                                               |            |                    |
| Scale (A3):                                                                                                                                                                                                                | Drawn By:  | Checked By:        |
| As shown                                                                                                                                                                                                                   | MTO        | ARP                |
| DWG. No:                                                                                                                                                                                                                   | Sheet:     | Rev:               |
| 23-1156.TC02                                                                                                                                                                                                               | 1 of 1     | 0                  |
|  Wynns Limited. This drawing is not to be reproduced in whole or in part, in any form or by any means, without prior written consent. |            |                    |
| P:\Clients\Existing Clients\National Grid Company\Proposed New sites Investigations\23-1156 Carmarthen\Transport Configurations\23-1156.TC02 Carmarthen 220 te SGT 24 Axle Girder Frame Trailer. R0.dwg                    |            |                    |



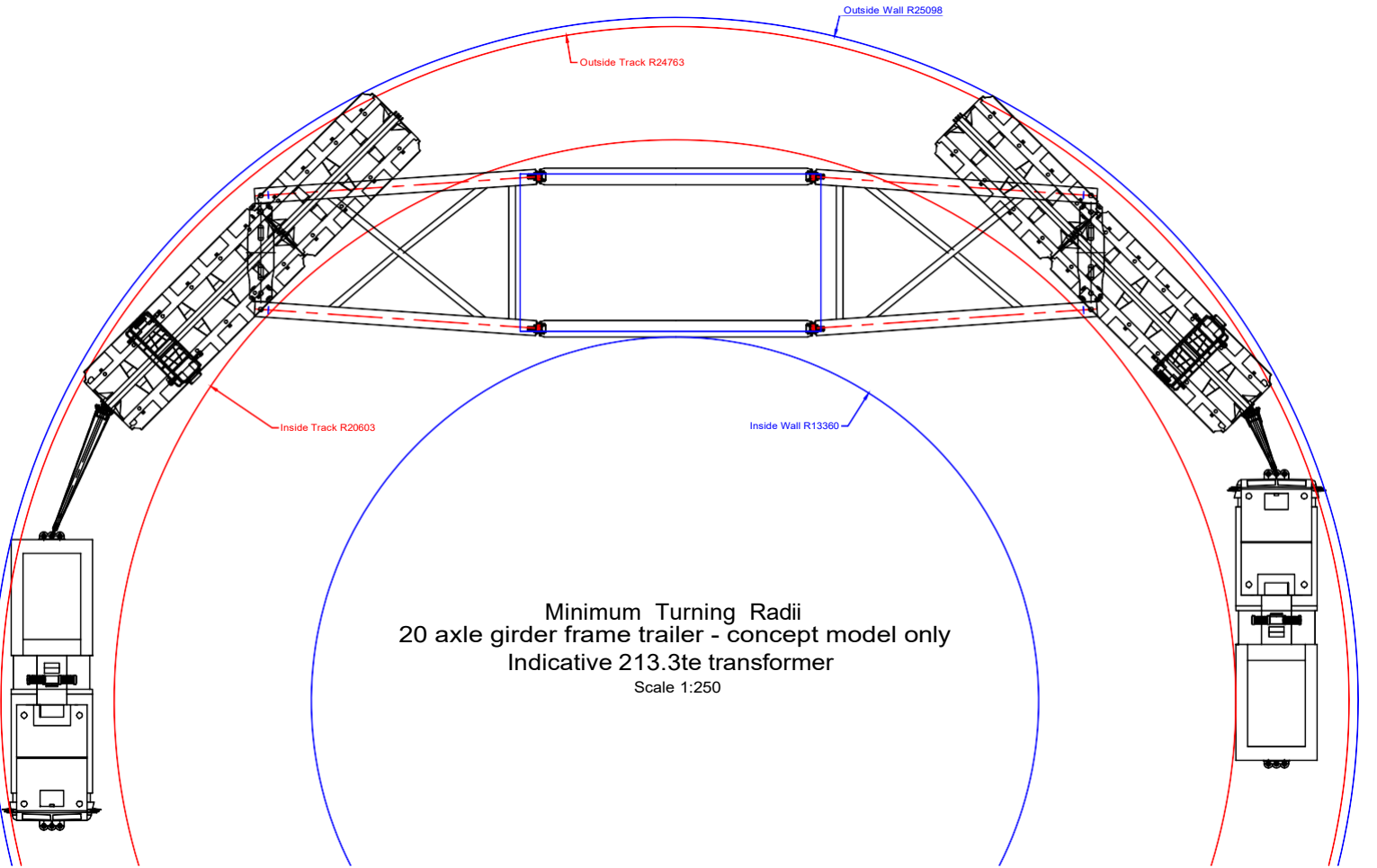
Elevation view - 20 axle girder frame trailer - concept model only  
Indicative 213.3te transformer  
Scale 1:250



Plan view - 20 axle girder frame trailer - concept model only  
Indicative 213.3te transformer  
Scale 1:250



Profile view  
Scale 1:125  
Note: Transport Lugs/Packing Arrangements to be Confirmed, Additionally, CoG to be Confirmed to Ensure Suitability of Arrangement.



Minimum Turning Radii  
20 axle girder frame trailer - concept model only  
Indicative 213.3te transformer  
Scale 1:250

| Load table                              |                        |
|-----------------------------------------|------------------------|
| 20 axle girder frame trailer            |                        |
| Self weight of transformer              | 213.3 te               |
| Self weight of trailer                  | 139.2 te               |
| Self weight of aux. steelwork (for L&S) | 0.0 te                 |
| Total combined weight                   | 352.5 te               |
| Load per trailer                        | 176.25 te              |
| Load per axle line                      | 17.63 te               |
| Load per axle                           | 8.81 te                |
| Load per wheel (4 per axle)             | 2.20 te                |
| Overall ground bearing pressure         | 4.35 te/m <sup>2</sup> |

| Tractor(s) (48 te) |         |
|--------------------|---------|
| Front axle         | 8.0 te  |
| Second steer       | 8.0 te  |
| Rear axle          | 16.0 te |
| Rear axle          | 16.0 te |

Notes:

- [1] The figures shown above are representative of the transport configuration portrayed. However, as tractor and trailer arrangements vary then the loads and dimensions indicated should be treated as probable values.
- [2] Actual dimensions, including axle spacing and mean running height, may vary slightly depending on manufacturer of trailer deployed.
- [3] All linear measures in millimetres unless stated otherwise.

|      |          |                    |
|------|----------|--------------------|
| 1    |          |                    |
| 0    | 03.10.25 | Issued for comment |
| Rev. | Date     | Amendments         |

Revisions

Prepared by:



Shaftesbury House, 2 High Street,  
Eccleshall, Stafford, ST21 6BZ  
Tel: (01785) 850411

Independent Transportation Engineers

Client:



Project:

Llandyfaelog

Title:

Indicative transport configuration  
Conceptual 213.3te 460MVA transformer carried  
within 20 axle girder frame trailer  
showing minimum turning radii

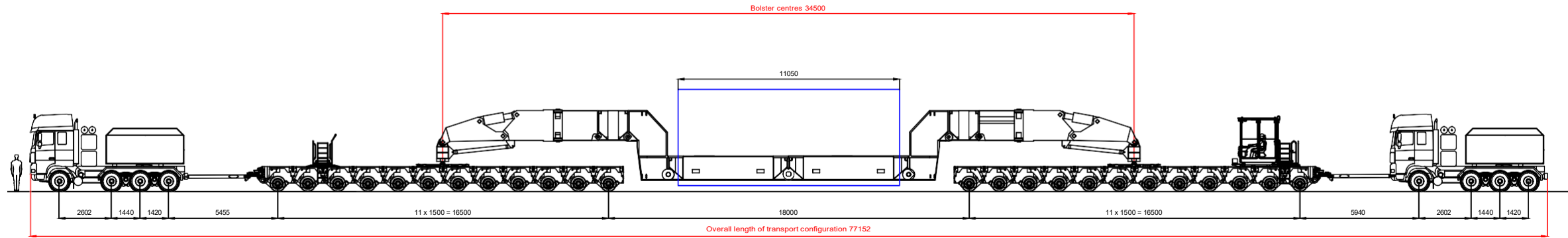
Drawing status:

Final report

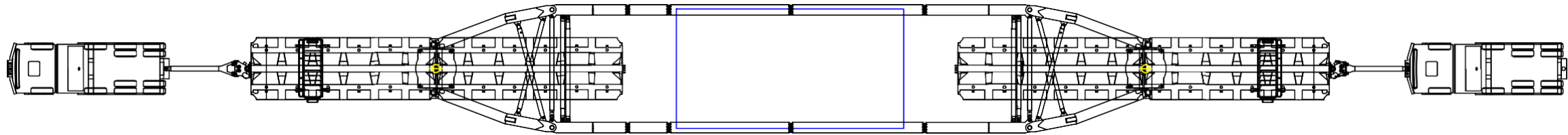
|              |           |             |
|--------------|-----------|-------------|
| Scale (A3):  | Drawn By: | Checked By: |
| As shown     | MTO       | ---         |
| Dwg. no:     | Sheet:    | Rev:        |
| 23-1156.TC03 | 1 of 1    | 0           |

© Wynns Limited. This drawing is not to be reproduced in whole or in part, in any form or by any means, without prior written consent.

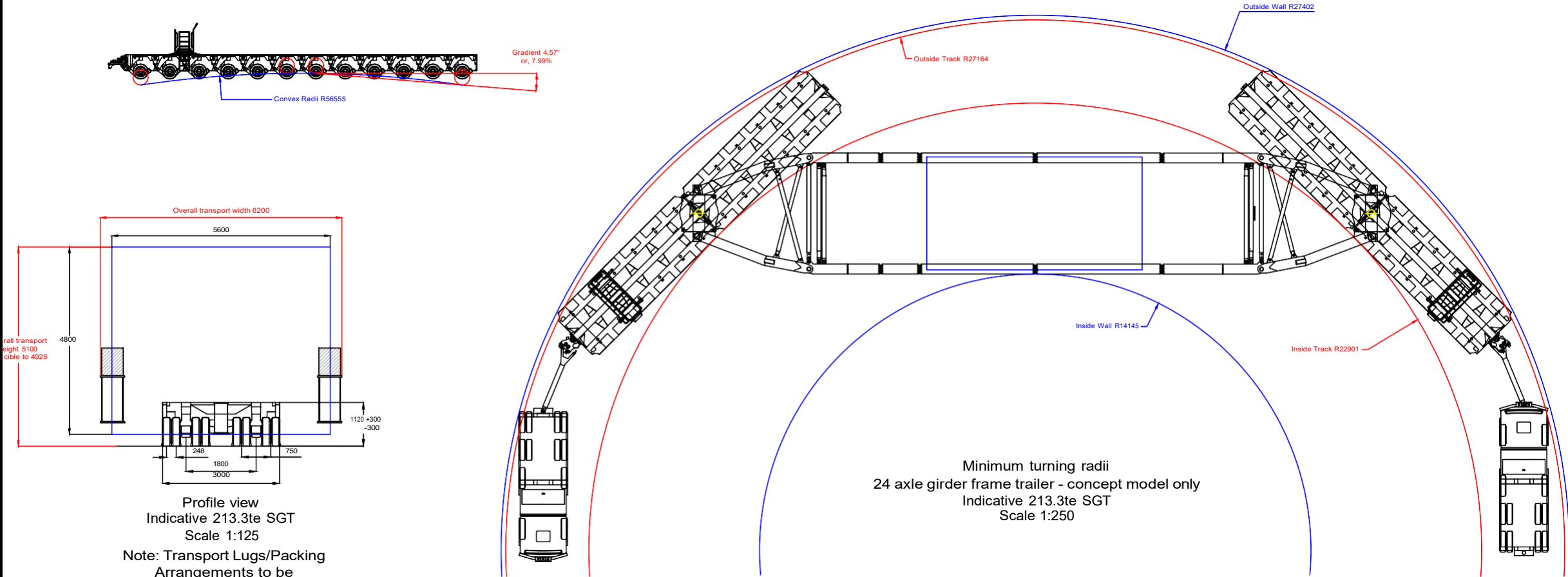
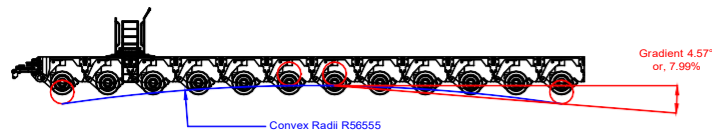
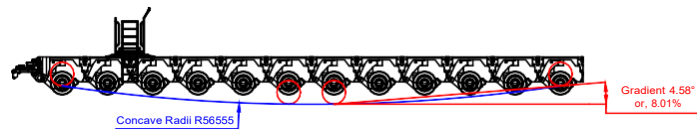
P:\Clients\Existing Clients\National Grid Company\Proposed New sites Investigations\23-1156 Llandyfaelog (was Carmarthen)\Transport Configurations\23-1156.TC03 Llandyfaelog 213.3te SGT 20 axle girder frame (6.20m Wide). R0.dwg



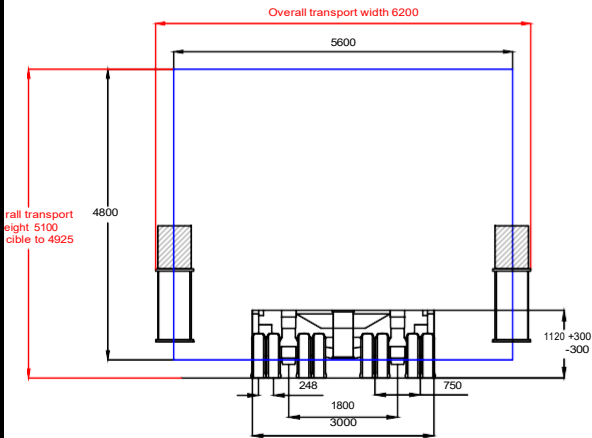
Elevation view - 24 axle girder frame trailer - concept model only  
Indicative 213.3te SGT  
Scale 1:250



Plan view - 24 axle girder frame trailer - concept model only  
Indicative 213.3te SGT  
Scale 1:250



Minimum turning radii  
24 axle girder frame trailer - concept model only  
Indicative 213.3te SGT  
Scale 1:250



Profile view  
Indicative 213.3te SGT  
Scale 1:125

Note: Transport Lugs/Packing Arrangements to be Confirmed, Additionally, CoG to be Confirmed to Ensure Suitability of Arrangement.

| Load Table                              |                        |
|-----------------------------------------|------------------------|
| 24 axle girder frame trailer            |                        |
| Self weight of transformer              | 213.3 te               |
| Self weight of trailer                  | 172.12 te              |
| Self weight of aux. steelwork (for L&S) | 0.0 te                 |
| Total combined weight                   | 385.42 te              |
| Load per trailer                        | 192.71 te              |
| Load per axle line                      | 16.05 te               |
| Load per axle                           | 8.03 te                |
| Load per wheel (4 per axle)             | 2.00 te                |
| Overall ground bearing pressure         | 3.89 te/m <sup>2</sup> |
| Tractor(s) (42 te)                      |                        |
| Front axle                              | 8.0 te                 |
| Second steer                            | 10.0 te                |
| Rear axle                               | 12.0 te                |
| Rear axle                               | 12.0 te                |

- Notes:-
- [1] The figures shown above are representative of the transport configuration portrayed. However as tractor and trailer arrangements vary then the loads and dimensions indicated should be treated as probable values.
- [2] Actual dimensions, including axle spacing and mean running height, may vary slightly depending on manufacturer of trailer deployed.
- [3] All linear measures in millimeters unless stated otherwise.
- [4] Transformer drawing indicative only.

| 1    |          |                    |
|------|----------|--------------------|
| 0    | 03.10.25 | Issued for comment |
| Rev. | Date     | Amendments         |

| Revisions                                                                                                                                                                                     |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Prepared By:                                                                                                                                                                                  |  |  |
|  <div>Shaftesbury House, 2 High Street,<br/>Eccleshall, Stafford, ST21 6BZ<br/>Tel: (01785) 850411</div> |  |  |
| Independent Transportation Engineers                                                                                                                                                          |  |  |

|         |                                                                                       |
|---------|---------------------------------------------------------------------------------------|
| Client: |  |
|---------|---------------------------------------------------------------------------------------|

|          |              |
|----------|--------------|
| Project: | Llandyfaelog |
|----------|--------------|

|        |                                                                                                                                                             |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title: | Indicative transport configuration<br>Conceptual 213.3te 460MVA transformer carried<br>within 24 axle girder frame trailer<br>showing minimum turning radii |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |              |
|-----------------|--------------|
| Drawing Status: | Final Report |
|-----------------|--------------|

|              |           |             |
|--------------|-----------|-------------|
| Scale (A3):  | Drawn By: | Checked By: |
| As shown     | MTO       | ---         |
| DWG. No:     | Sheet:    | Rev:        |
| 23-1156.TC04 | 1 of 1    | 0           |

|                                                                                                                                                                                                                                   |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| © Wynns Limited. This drawing is not to be reproduced in whole or in part, in any form or by any means, without prior written consent.                                                                                            |  |  |
| P:\Clients\Existing Clients\National Grid Company\Proposed New sites Investigations\23-1156 Llandyfaelog (was Carmathen)\Transport Configurations\23-1156.TC04 Llandyfaelog 213.3te SGT 24 axle girder frame (6.20m Wide). R0.dwg |  |  |



## Appendix 4

### Selected Correspondence



Our ref: AIP 894  
Your ref: Llandyfaelog

Andy Pearce  
Wynns Limited  
Shaftesbury House  
High Street  
Eccleshall  
Staffordshire  
ST21 6BZ

Sarah Hollender  
Strategy and Customer Manager National  
Highways  
9th Floor, The Cube  
199 Wharfside Street  
Birmingham  
B1 1RN

21<sup>st</sup> August 2024

Dear Andy,

**AGREEMENT IN PRINCIPLE 894: Pembroke to Llandyfaelog**

Further to your email dated 20<sup>th</sup> August 2024, requesting provision of an AIP for future abnormal load moves into Llandyfaelog (formally Carmarethen) Substation.

I can confirm that an AIP can be provided for the movement of 7 x transformers from Pembroke Dock.

4 x Transformers with nett weight 220te.  
3 x Transformers with nett weight 174te.

Delivery dates approximately 2026.

This will of course be subject to formal application nearer the time at which time National Highways will consult with all relevant parties and take into consideration their views and requirements.

Consequently, any Special Order issued is likely to include specific requirements relating to the day(s) on which movements will be authorised. The Special Order may also prescribe specific times during the day or night when movement will be permitted (which may take into account seasonal variations in traffic) in order to minimise traffic congestion, and disruption to other road users.

It is proposed that this AIP should be valid for a period of least seven years but with the proviso that should a nearer, suitable access become apparent, or prove to be feasible in that time, National Grid will undertake to investigate and assess its potential for future use, with a view to that new facility becoming the agreed access point for any future deliveries

I trust this information is sufficient for your purposes, but please do not hesitate to get in touch if you require anything further.

Yours sincerely  
Sarah Hollender  
Email: [sarah.hollender@nationalhighways.co.uk](mailto:sarah.hollender@nationalhighways.co.uk)

## Andy Pearce

---

**From:** TS Abnormal Loads <AbnormalLoads@carmarthenshire.gov.uk>  
**Sent:** 29 June 2023 17:00  
**To:** Andy Pearce  
**Cc:** Cumming, Matthew  
**Subject:** RE: AIL Access Study – National Grid Proposed Camarthen Substation - FAO Ben Morris (Senior Engineer (Structures))  
**Attachments:** Abnormal Load Review - Highway Structures.docx; AIL Route Investigation 2023.pdf

Hi Andy,

I can confirm that there is one structure 'Pont y Pentre' on the B4306 at grid ref: 253425, 209460 which has an assessed rating of 18Tonnes. This bridge is programmed to be replaced on the 7<sup>th</sup> August 2023 and the road will be closed for a period of 8 weeks during these works.

The haulier will need to confirm that they can navigate the route successfully.

See attached a drafted a report outlining all identified Highway Structures along the routes put forward for review.

Regards

Ben

---

**From:** Andy Pearce <andy.pearce@wynnslimited.com>  
**Sent:** Thursday, June 8, 2023 11:08 AM  
**To:** TS Abnormal Loads <abnormalloads@carmarthenshire.gov.uk>  
**Cc:** Cumming, Matthew <Matthew.Cumming@nationalgrid.com>  
**Subject:** FW: AIL Access Study – National Grid Proposed Camarthen Substation - FAO Ben Morris (Senior Engineer (Structures))  
**Importance:** High

You don't often get email from [andy.pearce@wynnslimited.com](mailto:andy.pearce@wynnslimited.com). [Learn why this is important](#)

Hi Ben,

Any feedback on this yet in terms of structures? I have tried to call you a couple of times on 01267 228307 but the number seems to no longer be working?

Many thanks

Andy Pearce

---

**From:** Andy Pearce  
**Sent:** Thursday, June 1, 2023 4:10 PM  
**To:** TS Abnormal Loads <[AbnormalLoads@carmarthenshire.gov.uk](mailto:AbnormalLoads@carmarthenshire.gov.uk)>  
**Subject:** RE: AIL Access Study – National Grid Proposed Camarthen Substation - FAO Ben Morris

Hi Ben,

Any feedback on this yet in terms of structures?

## Andy Pearce

---

**From:** Morgan, Neil <Neil.Morgan@pembrokeshire.gov.uk>  
**Sent:** 20 April 2023 08:19  
**To:** Andy Pearce  
**Subject:** RE: AIL Access Study – National Grid Proposed Camarthen Substation

If you have received this email in error, please notify us and delete it from your computer immediately. Os ydych chi wedi derbyn yr e-bost hwn trwy gamgymeriad, byddwch cystal â rhoi gwybod inni a'i ddileu ar unwaith oddi ar eich cyfrifiadur.

Andy

Route 4 – No structures affected in Pembrokeshire.

Regards

Neil Morgan  
Bridge Engineer  
01437 776153

---

**From:** Andy Pearce <andy.pearce@wynnslimited.com>  
**Sent:** 19 April 2023 14:53  
**To:** rsgbrb <rsgbrb@jacobs.com>; Abnormal Loads Enquiries <AbnormalLoadsEnquiries@networkrail.co.uk>; Abnormal Loads <Abnormal.Loads@canalrivertrust.org.uk>; Abloads <abloads@pembrokeshire.gov.uk>  
**Subject:** AIL Access Study – National Grid Proposed Camarthen Substation

**EXTERNAL EMAIL – Exercise care with links and attachments E-BOST ALLANOL – Byddwch yn ofalus wrth agor dolenni ac atodiadau.**

Dear All,

I am reasonably sure that none of you has any structure on the proposed routes shown below in South Wales to a proposed new National Grid Camarthen Substation but could you just confirm if that understanding is correct. If not and I have missed something please let me know and I will send specific loaded trailer details to you for consideration but I do not wish to bother you unnecessarily. We are of course Special Order weight with nett transformers of 178te or 220te loaded onto girder frame trailers.

Thanks for your assistance.

### **Route 1 from Swansea and via M4 Junction 48**

Leave Swansea Docks via Kings Road

Turn right Langdon Road

Turn left towards Fabian Way

Turn left A483 Fabian Way

Turn right East Bank Way

Reverse back over New Cut Bridge onto Quay Parade to crossover

Pull forward and continue A483 New Cut Road

*(Note – The above shunt is historical. It may now be able to turn right to A483 New Cut Road following changes to road alignments and this will be confirmed in route surveys)*

Continue B4489 Llangyfelach Street

Continue B4489 Northbound to M4 junction 46

Turn left and join M4 westbound

Continue M4 to junction 48  
Turn left A4138  
Turn Right, Dafen Road/Llethri Road, B4303  
Turn Right, Swiss Valley, A476  
Bear Left B4306  
Turn Left to Unclassified, Heol Bethel,  
Proposed National Grid Carmarthen Sub-station to the left. (SN 51611 09404)

**Route 2 from Swansea from A48 Cross Hands Roundabout**

As route 1 above on M4 and then continue to A48 westbound  
Turn Left, Bryngwili Road, A476  
Bear Left, Llannon Road, A476  
Turn Right, B4306  
**Note:** vehicle to travel in reverse or tractors change end at B4306 junction  
Re-join route 1 above

**Route 3 from Swansea to M4 at junction 42**

Leave Swansea Docks via Kings Road  
Turn right Langdon Road  
Turn left towards Fabian Way  
Turn right A483 Fabian Way and continue to M4 junction 42  
Turn left M4 westbound and continue to junction 46  
Merge with routes 1 and 2 above

**Route 4 from Pembroke Dock**

Exit Docks & Continue Western Way  
Continue A3139 London Road  
Continue A477 London Road  
Continue A477 eastbound to St Clears  
Merge A40 eastbound to Camarthen  
Turn right A48  
Continue A48 to M4 to junction 48  
Turn left A4138 and join route 1 above

**Potential Routes to Proposed National Grid Camarthen Substation Location 2 West**

OS Grid Reference: SN 41615 13475  
Route 6 from Swansea  
As route 2 above to A48  
Continue A48 Camarthen  
Turn Left A484  
Turn Left at OS Ref SN 4117 1338 Unclassified towards Bwlch Y Gwynt  
Proposed National Grid Carmarthen Sub-station to the right. (SN 41615 13475)

**Route 7 from Pembroke**

As route 4 above from Pembroke to A40 at Camarthen  
Turn right A484  
Turn Left at OS Ref SN 4117 1338 Unclassified towards Bwlch Y Gwynt  
Proposed National Grid Carmarthen Sub-station to the right. (SN 41615 13475)

Kind Regards

**Andy Pearce**

General Manager (IOSH)

Tel: + 44 (0)1785 850411

Mobile: + 44 (0)7834 621269

Email: [andy.pearce@wynnslimited.com](mailto:andy.pearce@wynnslimited.com)



Shaftesbury House, 2 High Street, Eccleshall, Staffordshire, ST21 6BZ

Registered in England & Wales No. 3162297

Unless expressly stated to the contrary, the views expressed in this email are not necessarily the views of Wynns Limited or any of its subsidiaries (Group). The directors, officers and employees make no representation and accept no liability for its accuracy or completeness.

This e-mail, and any attachments are strictly confidential and intended for the addressee(s) only. The content may also contain legal, professional or other privileged information. If you are not the intended recipient, please notify the sender immediately and then delete the e-mail and any attachments. You should not disclose, copy or take any action in reliance on this transmission.

Please ensure you have adequate virus protection before you open or detach any documents from this transmission. Wynns Limited do not accept any liability for viruses. An e-mail reply to this address may be subject to monitoring for operational reasons or lawful business practices.

We welcome correspondence in Welsh and English and will respond within a maximum of 15 working days. We will respond in the language in which the correspondence is received (unless you ask us to do otherwise). For a copy in large print, easy-read, Braille, audio or an alternative language, please contact the person who sent this email.

Pembrokeshire County Council: [Website](#) | [Contact Us](#) | [Privacy Notices](#)

Rydym yn croesawu gohebiaeth yn Gymraeg a Saesneg a byddwn yn ymateb cyn pen 15 diwrnod gwaith fan bellaf. Byddwn yn ymateb yn yr un iaith â'r ohebiaeth a dderbyniwyd (oni bai eich bod yn gofyn i ni wneud yn wahanol). Os am gael copi mewn print bras, fformat hawdd ei ddeall, Braille, sain neu iaith arall, cysylltwch â'r sawl a anfonodd yr e-bost hwn.

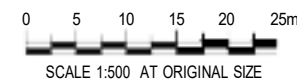
Cyngor Sir Benfro: [Gwefan](#) | [Cysylltwch â ni](#) | [Rhybudd Preifatrwydd](#)

## **Appendix C      Site Access and Visibility Splays**



LEGEND

- 4154 ROAD
- 100.00
- 180.00
- 199.00
- 100.00
- 180.00
- 199.00
- 100.00
- 180.00
- 199.00



Master Scheme No: 101256 Sub-Scheme No: 207820 Site: LLANDYFAELOG SUBSTATION  
Scheme Name: NEW LLANDYFAELOG SUBSTATION

PROPOSED BELLMOUTH PLAN

|                           |                    |                |                  |                    |                  |
|---------------------------|--------------------|----------------|------------------|--------------------|------------------|
| Created by: LW            | Date: 31/10/2025   | Checked by: MK | Date: 31/10/2025 | Approved by: JC    | Date: 31/10/2025 |
| Development Eng: D BANHAM | Document Type: DWG | Scale: 1:500   | Format: A1       | Sheet(s): 01 OF 01 | Rev: B           |

National Grid Document Number: PDD-101256-LAY-096  
FEED Document Number: 331201448-STN-13-XX-LAY-TC-017

|        |   |        |   |        |   |
|--------|---|--------|---|--------|---|
| 100.00 | 2 | 100.00 | 1 | 100.00 | 1 |
| 100.00 | 2 | 100.00 | 1 | 100.00 | 1 |
| 100.00 | 2 | 100.00 | 1 | 100.00 | 1 |
| 100.00 | 2 | 100.00 | 1 | 100.00 | 1 |

THIS DOCUMENT IS A WORKING DRAWING AND IS NOT TO BE USED FOR CONSTRUCTION WITHOUT THE APPROVAL OF THE DESIGNER. IT IS THE RESPONSIBILITY OF THE USER TO ENSURE THAT THE DOCUMENT IS USED IN ACCORDANCE WITH THE INTENT OF THE DESIGNER. THE DESIGNER ACCEPTS NO LIABILITY FOR ANY LOSS OR DAMAGE ARISING FROM THE USE OF THIS DOCUMENT.



# LEGEND

- NEW BOUNDARY
- NEW SUBSTATION
- EXISTING BOUNDARY
- EXISTING SUBSTATION
- EXISTING ROAD
- EXISTING RAILWAY

0 10 20 30 40 50m  
SCALE 1:1000 AT ORIGINAL SIZE



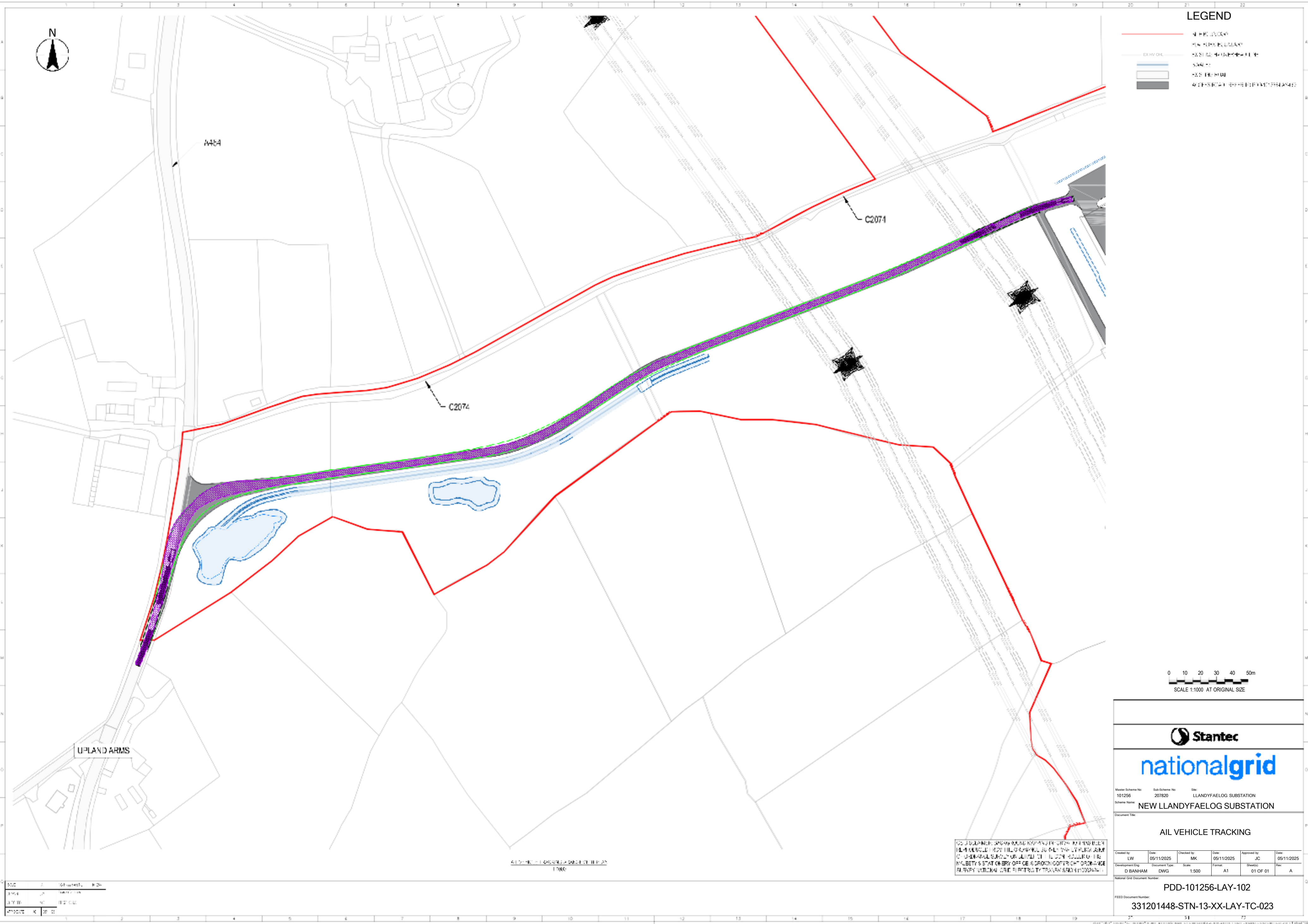
**nationalgrid**

Master Scheme No: 101256  
Sub-Scheme No: 207820  
Site: LLANDYFAELOG SUBSTATION  
Scheme Name: NEW LLANDYFAELOG SUBSTATION

Document Title: AIL VEHICLE TRACKING

|                           |                    |                |                  |                    |                  |
|---------------------------|--------------------|----------------|------------------|--------------------|------------------|
| Created by: LW            | Date: 05/11/2025   | Checked by: MK | Date: 05/11/2025 | Approved by: JC    | Date: 05/11/2025 |
| Development Eng: D BANHAM | Document Type: DWG | Scale: 1:500   | Format: A1       | Sheet(s): 01 OF 01 | Rev: A           |

National Grid Document Number: PDD-101256-LAY-102  
FEED Document Number: 331201448-STN-13-XX-LAY-TC-023



ALL DIMENSIONS ARE IN METERS  
1:1000

THIS DOCUMENT IS THE PROPERTY OF NATIONAL GRID. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED IN THE TITLE. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM. NATIONAL GRID ACCEPTS NO LIABILITY FOR ANY LOSS OR DAMAGE, INCLUDING CONSEQUENTIAL LOSS OF PROFITS, ARISING FROM THE USE OF THIS DOCUMENT.