

## **1 INTRODUCTION**

### **1.1 This document**

This document is the Technical Assessment Report (TAR) (Volume 1) of the Environmental Statement (ES) for the A487 Caernarfon and Bontnewydd Bypass Scheme hereinafter referred to as the “Scheme”.

The ES for the Scheme is reported in the following four Volumes:

Non-Technical Summary

Volume 1 – Technical Assessment Report

Volume 2 – Figures

Volume 3 – Technical Appendices

The ES provides detailed information to help anyone with an interest in the Scheme understand the proposals and express an opinion on them before the Welsh Ministers decide whether to proceed with the development. The ES describes the proposals, identifies the main environmental effects on both the manmade and natural environment and describes the proposed measures to avoid, remedy or reduce impacts and provide environmental enhancement where practicable. The ES is used to inform Welsh Ministers of any potential environmental issues or concerns prior to making their decision as to whether or not to approve the project.

#### *The EIA Directive*

The legislative framework for EIA within which this ES has been completed, is set by European Directive 2011/92/EU, as amended by Directive 2014/52/EU (collectively referred to as the EIA Directive). The Directive is transposed into UK law by Section 105A of the Highways Act 1980 (as amended). This legislation is enacted by the Highways (Assessment of Environmental Effects) Regulations 2007 (as amended). These are often collectively termed the EIA Regulations. The Directive requires EIA to be undertaken in support of an application for development consent for certain types of scheme.

Directive 2014/52/EU requires Member States to transpose its requirements into national law by 16 May 2017, setting out arrangements for a transitional period from the that proposed by Directive 2011/92/EU. These transitional measures require that the provisions of Directive 2011/92/EU apply to schemes for which the EIA process has been initiated or for which the ES has been submitted within the transitional period. For the purposes of the Scheme therefore, Directive 2011/92/EU remains the relevant consideration.

This ES has been completed in accordance with EC Directive 2011/92/EU as amended (the Environmental Impact Assessment (EIA) Directive) and the Public Participation Directive 2003/35/EC which is transposed into UK law by Section 105A of the Highways Act 1980 (as amended). This legislation is enacted by the Highways (Assessment of Environmental Effects) Regulations 2007 (as amended). These are often collectively termed the EIA Regulations.

The Highways Agency (HA) publishes detailed guidance on the completion of EIAs under the above legislation, namely the Design Manual for Roads and Bridges

(DMRB). Volume 11 of the DMRB relates to Environmental Assessment. The Contractor has used this guidance as a basis for the EIA together with other guidance as evidenced in each topic chapter. Additional to this are Interim Advice Notices (IANs), which provide supplementary information not contained within current guidance. Highways England are now currently the body responsible for updating the DMRB. In Wales, all IAN's have to be developed into IAN(W) to ensure there are no policy or legal conflicts with Wales only policy and legislation. In the interim period between publication of an English Interim Advice Note (IAN) and development of a Welsh equivalent, it is recognised that the new English IAN may constitute an improvement in current environmental practice. However, in applying the English IAN it is important to ensure that the Welsh legal and policy requirements are adequately addressed and confirmation provided as to how the English IAN has been applied in the Welsh context.

For some of the chapters, further specialist guidance is available which may be advantageous to use, supplementary to that in DMRB (i.e. where it provides more detailed assessment criteria). Where this is the case, it is referred to in individual chapters within this ES.

In April 2016 the requirements of the Well-being of Future Generations (Wales) Act 2015 came into force. A separate Sustainable Development Report is being prepared to explain how those requirements have been met.

*Statement to Inform an Appropriate Assessment (SIAA)*

In accordance with Regulation 61 of The Conservation of Habitats and Species Regulations 2010, a Statement to Inform an Appropriate Assessment (SIAA) has been prepared on the possible impacts associated with the Scheme on the following Special Areas of Conservation (SAC):

- Afon Gwyrfai SAC
- Menai Strait and Conwy Bay SAC
- Glynllifon SAC
- Meirionnydd Oakwoods and Bat Sites SAC
- Gwydir Forest Mines SAC

Further detail on the nature and qualifying features of these sites is provided in the SIAA, which is included in Volume 3, Appendix E.2. of this ES.

Section 28G of the Wildlife and Countryside Act 1981 places duties on section 28G authorities (which includes Ministers, Government Departments, local authorities, statutory undertakers and any other public body) in relation to Sites of Special Scientific Interest (SSSI) and set out procedures that must be followed when carrying out the authorisation of *'operations which are likely to damage the special interest features of SSSIs'*

Under the authorities' general duties, an authority:

*'(1)...shall have the duty set out in subsection (2) in exercising its functions so far as their exercise is likely to affect the flora, fauna or geological or physiographical features by reason of which a site of special scientific interest is of special interest.*

*(2) The duty is to take reasonable steps, consistent with the proper exercise of the authority's functions, to further the conservation and enhancement of the flora, fauna*

*or geological or physiographical features by reason of which the site is of special scientific interest.'*

Although the Scheme does not fall within a SSSI boundary, its affect must be considered in relation to the Glynllifon SSSI and Afon Gwyrfa a Llyn Cwellyn SSSI, due to the mobile nature of their qualifying features (bats and Otters respectively). Consultation with Natural Resources Wales (NRW) and other statutory environmental bodies has taken place in relation to these qualifying features.

#### *Water Framework Directive (WFD) Assessment*

The WFD aims to protect and enhance water quality through the protection of designated water bodies within the EU. Developers must ensure that new highways projects or improvement projects which will cause discharges to receiving water bodies do not lead to deterioration in its classification status. The Scheme will be located within and in close proximity to a number of WFD water bodies. A WFD Compliance Assessment is therefore required by the Statutory Authorities (i.e. NRW) to assess whether the proposed new section of motorway is compliant with WFD legislation. This is included in Chapter 14 – Road Drainage and the Water Environment.

## **1.2 Location of the proposed project**

The Welsh Ministers propose to provide a 9.7km long Trunk Road to the west of Bontnewydd and to the east of Caernarfon in Gwynedd, north Wales. The Scheme is located between the Plas Menai Roundabout north of Caernarfon (Grid ref. 53.167961, -4.237478) and the Goat Roundabout south of Llanwnda (Grid ref. 53.094795, -4.282511) along the A487 Trunk Road (refer to Volume 1, Figure 1.1 below).



**Volume 1, Figure 1.1 Location of the Scheme**

A more detailed Scheme location is shown in Volume 2, Figure 1.1 and the Scheme on aerial photograph is shown in Volume 2, Figure 1.2.

### 1.3 Context

#### 1.3.1 Why the Scheme is needed

The A487 forms part of the strategic road network in north west Wales. It links the region of north west Wales into the A55 Corridor on the north Wales coast which provides an important link into Ireland and England. Currently the A487 at Caernarfon and Bontnewydd is a substandard section of this network.

The Scheme would be attempting to address the following issues:

- Traffic volumes are increasing, causing traffic congestion and increasing journey times.
- Poor road infrastructure, particularly poor connections to Bangor and the A55, may be hindering economic development.
- Quality of life in the settlements alongside the A487 is adversely affected by the high volumes of traffic.
- There is a high risk of collisions in urban areas, particularly with heavy goods vehicles accessing Cibyn industrial estate and vehicles travelling at inappropriate speeds.
- Vehicles use unsuitable country roads to bypass the A487.

- Road maintenance is difficult due to high traffic levels and lack of suitable alternative routes.

WG conclude that if nothing is done, traffic flows are predicted to increase causing the following problems:

- Longer queues at the A499/A487 Goat roundabout
- Higher volumes of vehicles passing through settlements along the route
- Queues and delays on the A487, particularly at Eagles Junction, St David's and Morrisons roundabouts in Caernarfon, and at Plas Bereton.

At present, traffic congestion through built up areas along the A487 also lead to poor air quality. The Scheme would aim to address this by taking traffic off the main line and away from these areas.

### 1.3.2 Background

In the early 1990s Parkman Consulting was commissioned by the Welsh Office Highways Directorate to undertake studies in the Caernarfon area to determine if a bypass of Caernarfon was feasible. A report was published in 1992 confirming that there were potentially feasible routes to bypass Caernarfon.

From 1992 to the present a number of trunk road and major transport infrastructure projects were undertaken in the area, namely; A487 Felinheli Bypass, A487 Point Seiont, A487 Llanllyfni to south of Llanwnda, A487 Porthmadog Bypass together with A499 Llanelhaearn to Aberdesach and A497 Abererch to Llanystumdwy on the Llyn.

Arup was commissioned in February 2007 by WG to undertake a WeITAG Planning Stage and Stage 1 Study to consider transport issues and options in the Llanwnda to Plas Menai corridor using the draft version of WeITAG. A number of options were identified and a combination of these and online measures were recommended for further testing under the WeITAG Stage 1 Appraisal process.

In 2009 the WG commissioned a study to address transport problems on the A487 Fishguard to Bangor Trunk Road through Caernarfon and Bontnewydd. This study utilised the earlier work undertaken separately. The more recent WeITAG Stage 2 study included an initial public consultation that took place between March and May 2010 and a supplementary public consultation that took place between November 2010 and January 2011.

The Scheme, with the objectives to reduce journey times, accidents, and the number of vehicles passing through residential communities and improve network resilience forms part of the WG's main transport policy aims. The A487 trunk road is an important part of the WG's strategic road network and it serves as the major north/south route along the west Wales coast linking Fishguard, Cardigan, Aberystwyth, Machynlleth, Dolgellau, Porthmadog, Caernarfon and Bangor.

The Key Stage 2 Study for the Scheme was carried out by WSP/Parsons Brinckerhoff. Following the investigation of route options and two public consultations, a Preferred Route (Purple Route) was recommended. This Preferred Route was announced by the Minister for Local Government and Communities in July 2012.

As a result of budgetary constraints the Minister for Economy, Science and Transport decided to review the options and in May 2013 adopted the Yellow Option as the preferred route.

The Balfour Beatty/ Jones Brothers Joint Venture (hereinafter referred to as the JV Team) was commissioned in December 2014 to develop the Scheme and prepare draft Orders and accompanying information during Key Stage 3 (KS3). The JV Team will support the Welsh Government (WG) through the Statutory Process in Key Stage 4 (KS4) and would proceed to construction in Key Stage 6 (KS6) on the award of a separate contract between the Contractor and the Welsh Government. A summary of the project Key Stages is shown below:



## **1.4 Project objectives and reasons for the project**

### **1.4.1 Welsh Government's Objectives**

The Wales Transport Strategy sets out the policy framework for transport investment decisions across Wales. The National Transport Finance Plan published in July 2015 sets out the timescale for financing and delivery of schemes. The A487 Caernarfon and Bontnewydd bypass (Scheme Ref R17) is identified for delivery at between 2015/2016 and 2018/2019'

WG's objective for the Scheme is to provide an improvement to Caernarfon and Bontnewydd in accordance with the findings of the Key Stage 2 study, and to include the commitments made at the Public Consultation undertaken as part of this study. This is to be carried out through appointment of a design and build Contractor under an Early Contractor Involvement (ECI) contract to be managed following the principles of PRINCE2 project management system and to deliver the works to programme, budget, and with due regard to the Welsh Ministers policies.

### **1.4.2 Scheme planning objectives**

The following five specific Transport Planning Objectives for the Scheme have been developed:

#### *Objective 1*

Reduce journey time (between Llanwnda and Plas Menai) and improve journey time reliability to within +/- 3 minutes of the average journey time throughout the day.

#### *Objective 2*

Reduce journey time (between Llanwnda and Caernarfon) and improve journey time reliability to within +/- 3 minutes of the average journey time throughout the day.

#### *Objective 3*

Reduce the number of vehicles passing through residential communities; including Llanwnda, Dinas, Bontnewydd and Caernarfon.

*Objective 4*

Scheme to contribute to the Welsh Government casualty reduction targets:

- 40% reduction by 2020
- 25% reduction in motorcyclist casualties by 2020; and
- 40% reduction in the number of young children killed or seriously injured by 2020.

*Objective 5*

Improve network resilience – Increase the amount and/or capacity of alternative routes to improve the resilience of the network.

1.4.3 General Objectives

To meet all of the above objectives whilst ensuring regard for the environment.

1.4.4 Specific environmental design objectives

Key aims are;

- to avoid or to mitigate adverse effects of the Scheme upon designated features, sites and species
- to reflect the landscape character through which the Scheme passes
- to maintain the connectivity of vegetation and to allow permeability within the Scheme to sustain the Lesser Horseshoe Bat population
- to maintain linkages and provide routes for non-motorised users (NMU)

1.4.5 Draft Orders

The following Draft Orders have been prepared for the Scheme and are published concurrently with the ES:

- The Welsh Ministers (The Fishguard to Bangor Trunk Road (A487) (Caernarfon and Bontnewydd Bypass)) Compulsory Purchase Order 201-
- The Fishguard to Bangor Trunk Road (A487) (Caernarfon and Bontnewydd Bontnewydd Bypass) (Side Roads) Order 201-
- The Fishguard to Bangor Trunk Road (A487) (Caernarfon and Bontnewydd Bypass and De-trunking) Order 201-

Copies of the ES and draft Orders may be inspected free of charge during normal office hours throughout the objection period as set out in the Public Notice, at the following premises:

- Welsh Government Offices, Cathays Park, Cardiff, CF10 3NQ
- Welsh Government Offices, Sarn Mynach, Llandudno Junction, LL31 9RZ
- Gwynedd Council, Shirehall Street, Caernarfon, LL55 1SH
- Caernarfon Library, Pavilion Hill, Caernarfon, LL55 1AS

Copies of the ES can be purchased from the Welsh Government in Cardiff at the following address:

- Orders Branch, Transport, Welsh Government, Cathays Park, Cardiff CF10 3NQ

These are as follows:

- Volume 1 (Technical Assessment Report) – £90
- Volume 2 (Figures) – £80
- Volume 3 Parts A to C (Technical Appendices) – £60 (per part)
- Statement to Inform an Appropriate Assessment (SIAA) – £20.

Electronic copies of the ES can be purchased at a cost of £5. Further copies of this Non-Technical Summary may be obtained free of charge from the Welsh Government at the address shown above or via the following websites:

[www.gov.wales/transport](http://www.gov.wales/transport)

[www.cbbypass.co.uk](http://www.cbbypass.co.uk)

## **1.5 Overview of the ES and EIA process**

### **1.5.1 ES Structure**

The ES for the Scheme is reported in the following four Volumes and has followed guidance given in the DMRB Volume 11 Sections 1, 2, 3 and 4:

- Non-Technical Summary
- Volume 1 – Technical Assessment Report
- Volume 2 – Figures
- Volume 3 – Technical Appendices

The Non-Technical Summary is a report, which summarises the findings of the EIA in non-technical language in both English and Welsh.

Volume 1 (this document) is the main Technical Assessment Report (TAR), which details the methodologies and results of the EIA. It sets out ways in which identified impacts can be mitigated. Volume 2 is a set of supporting figures which should be read alongside Volume 1. Volume 3 is a set of technical appendices which should also to be read alongside Volume 1. Some figures and technical appendices are not available to the public as they contain sensitive information regarding protected species or local landownership. These are highlighted in the contents pages where applicable.

#### *Strategy documents and plans*

WG has proposed the Scheme through the Wales Transport Strategy and National Transport Finance Plan (refer to Section 4.2).

WG is obliged to undertake Equality Impact Assessments under race, disability and gender legislation such as public sector duties and under Section 77 of the Government of Wales Act 2006.



### 1.5.2 Screening

The requirement to undertake an EIA has been established through the EIA screening process which has been carried out in accordance with HD 47/08; the outcome of which is provided in the Record of Determination (refer to Volume 3, Appendix A.1) which was produced in line with IAN 126/09.

An EIA is a mandatory requirement for those developments which are listed in Annex I of the EIA Directive. For those developments listed in Annex II of the Directive the completion of an EIA is discretionary, depending on the likely environmental effects having regard for the criteria listed in Annex III of the Directive. The construction of a new road, which is not a motorway, falls under Annex II of the EIA Directive. It must therefore be assessed whether it has sufficient potential environmental impacts as to warrant an EIA. In Wales, the threshold for project size and environmental sensitivity are defined under the Highways (Assessment of Environmental Effects) Regulations 1999 (as amended). The Regulations define a 'relevant' Annex II project as:

*'a project for constructing or improving a highway where the area of the completed works together with any area occupied during the period of construction or improvement by requisite apparatus, equipment, machinery, materials, plant, spoil heaps or other such facilities exceeds 1 hectare or where any such area is situated in whole or in part in a sensitive area'.*

The Scheme is situated within 'sensitive area', as defined by the EIA Regulations as amended and the project size does exceed 1 hectare. Thus the proposed project is classified as a 'relevant project'. All 'relevant' Annex II projects require a determination to be undertaken to confirm whether the project is considered likely to have a significant environmental effect. This examines the characteristics of the proposed project in terms of its location and the potential impacts that may arise and is informed by the selection criteria in Annex III of the EIA Directive.

### 1.5.3 Scoping

An Environmental Scoping Report (Report No. 5105742/ENV/SR/RT203/A1) was prepared outlining the proposed approach, methodology and surveys to be documented in the ES. This report was circulated to the following statutory consultees for their comment:

- Natural Resources Wales (NRW)
- Cadw
- Gwynedd Council (GC)

Other non-statutory consultees to which the ES was circulated for comment were:

- Gwynedd Archaeological Trust (GAT)
- North and Mid Wales Trunk Road Agency (NMWTRA)

Comments were received from the above and were used to establish further survey and assessment work required along with measures to mitigate potential impacts.

A copy of the combined Schedule of Comments (SOC) from the consultees together with the response from the JV Team is available in the scoping response in Volume 3, Appendix A2.

A working draft of the Environmental Scoping Report was issued to the consultees listed above in March 2015 for their comment. A copy of the combined Schedule of Comments (SOC) from the consultees together with the response from the JV Team is also available in Volume 3, Appendix A2.

#### 1.5.4 Consultation

A proactive approach has been taken to consultation to ensure that issues have been addressed during the design development phase wherever possible. Consultation with statutory environmental bodies and other stakeholders has been key in determining the work required to inform the ES and the measures required to mitigate potential environmental impacts. This consultation has been carried out on both a formal and informal basis. Volume 3, Appendix A.7 provides an overview of the main consultation and ES reviews that have taken place during the EIA process.

The Scheme Environmental Liaison Group (ELG) consists of a number of statutory and non-statutory environmental bodies and stakeholders. The ELG meet on a quarterly basis throughout the outline design, pre-construction and construction period (KS3 and 6 of the contract) and during the statutory process (KS4) as required. Following completion of the Scheme, the ELG would meet less frequently over the five-year post construction aftercare and monitoring period. In addition to the formal ELG meetings, there have also been meetings with NRW on 19<sup>th</sup> February 2015 to discuss the impact of the proposed Scheme on bats. Minutes from the ELG and NRW meetings are available in Volume 3, Appendix A.3.

A further meeting and site walkover was held with NRW on the 24<sup>th</sup> and 25<sup>th</sup> May 2016 to discuss the ecological mitigation. An additional meeting and site walkover was held between NRW, WG, GC and NMWTRA on 7<sup>th</sup> and 8<sup>th</sup> July 2016 respectively to further discuss ecological mitigation, particularly in relation to bats and fisheries.

Formal consultation has taken place with the general public through public information exhibitions. Exhibition were held in Caernarfon on 17<sup>th</sup> March 2015 & 25<sup>th</sup> June, Bontnewydd on 18<sup>th</sup> March 2015 & 26<sup>th</sup> June and Caeathro on 19<sup>th</sup> March and 27<sup>th</sup> June 2015.

An initial meeting was held with the Design Commission for Wales (DCfW) on 20<sup>th</sup> August 2015 in order to seek input on good design and review design proposals. A further presentation will be held after the public inquiry in 2016.

In addition to the formal meetings there has been close liaison between the environmental specialists and the statutory, non-statutory and interest groups as appropriate to request baseline information, obtain their views and concerns with regards the design development of the Scheme, confirm methodologies and discuss mitigation measures. Information about progress with the Scheme can be found on the Welsh Government website at:

*<http://gov.wales/topics/transport/roads/schemes/a487/a487caernarfon/>*

The JV Team would hold meetings with landowners and local residents whose properties or private accesses would be directly affected by the Scheme and local and national elected members. Presentations would also be made to the Community

and Town Councils to obtain their views and address their concerns wherever possible.

Service providers have been consulted regarding diversions and protection of infrastructure.

Table 1.5.1 Summary of Consultation summarises what consultation has taken place with different stakeholders.

**Table 1.5.1 Summary of Consultation**

Stakeholders	Consultation undertaken
Statutory Environmental Bodies (SEBs) – e.g. Natural Resources Wales, Cadw, Gwynedd Archaeological Planning Service (GAPS), Gwynedd Council	<ul style="list-style-type: none"> <li>• Meetings (ELG and individual meetings)</li> <li>• Correspondence by phone and email</li> <li>• Comments and input on work undertaken (e.g. responses to Environmental Scoping Report, Draft ES etc.)</li> <li>• Public Information Exhibitions (17<sup>th</sup>, 18<sup>th</sup> &amp; 19<sup>th</sup> March 2015 &amp; 25<sup>th</sup>, 26<sup>th</sup> &amp; 27<sup>th</sup> June 2015)</li> </ul>
Other non-statutory consultees – e.g. Community and Town Councils, Design Commission for Wales	<ul style="list-style-type: none"> <li>• Meetings</li> <li>• Presentations</li> <li>• Correspondence by phone and email</li> <li>• Public information exhibitions (17<sup>th</sup>, 18<sup>th</sup> &amp; 19<sup>th</sup> March 2015 &amp; 25<sup>th</sup>, 26<sup>th</sup> &amp; 27<sup>th</sup> June 2015)</li> </ul>
Land owners and property owners	<ul style="list-style-type: none"> <li>• Meetings</li> <li>• Correspondence by phone, letter and email</li> <li>• Public information exhibitions (17<sup>th</sup>, 18<sup>th</sup> &amp; 19<sup>th</sup> March 2015 &amp; 25<sup>th</sup>, 26<sup>th</sup> &amp; 27<sup>th</sup> June 2015)</li> </ul>
Utility companies	<ul style="list-style-type: none"> <li>• Meetings</li> <li>• Correspondence by phone, letter and email</li> </ul>
Businesses	<ul style="list-style-type: none"> <li>• Meetings</li> <li>• Correspondence by phone, letter and email</li> <li>• Public Information Exhibitions (17<sup>th</sup>, 18<sup>th</sup> &amp; 19<sup>th</sup> March 2015 &amp; 25<sup>th</sup>, 26<sup>th</sup> &amp; 27<sup>th</sup> June 2015)</li> </ul>
Public	<ul style="list-style-type: none"> <li>• Public Information Exhibitions (17<sup>th</sup>, 18<sup>th</sup> &amp; 19<sup>th</sup> March 2015 &amp; 25<sup>th</sup>, 26<sup>th</sup> &amp; 27<sup>th</sup> June 2015)</li> <li>• Press releases</li> <li>• Public liaison officer</li> </ul>

Going forward, continuing consultation will take place with Statutory Environmental Bodies (SEBs) and many of those outlined in table 1.5.1. Details of consultation arrangements will be included in the Construction Environmental Management Plan (CEMP), which will be produced prior to the commencement of construction. A draft template of the CEMP can be found in Volume 3, Appendix L.1. A Maintenance Environmental Management Plan (MEMP) will also be produced, which will outline commitments to consultation during the ten-year aftercare period where applicable.

#### 1.5.5 Assessment of cumulative impacts

The consideration of potential cumulative and in-combination effects is an important aspect of the EIA process. The assessment of cumulative effects within this report is based on current best practice guidance and consultation with SEBs. The

assessment of cumulative impacts and in-combination effects is addressed in Section 15 of this ES.

#### 1.5.6 Consideration of EIA Directive 2014/52/EU

Although, as previously stated, this ES has been written in accordance with EIA Directive 2011/92/EU, elements of Directive 2014/52/EU have been taken in to consideration in some chapters. Annex IV Directive 2014/52/EU states what information should be included in the Environmental Impact Assessment report (i.e. ES), and includes the following areas which differ from Directive 2011/92/EU:

##### *Heat and radiation*

Given the nature and scale of the Scheme, there are not anticipated to be any significant effects from heat or radiation and these have not been included in this assessment.

##### *Material assets*

Annex IV of the EIA Directive includes reference to 'material assets'. The phrase 'material assets' has a broad scope, which may include assets of human or natural origin, valued for socio-economic/community or heritage reasons. Material assets are in practice considered across a range of topic areas within this ES, in particular Chapter 6 - Cultural Heritage and Chapter 13 - Community and Private Assets.

##### *Effects of the Scheme on climate*

Atmospheric emissions associated with use of the Scheme during construction and operation are assessed within Chapter 7 of the ES.

##### *Human health*

Although no overall assessment of the Scheme on human health has been undertaken, the thresholds on which the assessment of the impact of noise is based, is largely concerned with how noise can effect human health (Chapter 11 – Noise and Vibration). The assessment of air quality highlighted in Chapter 5 -Air Quality, also highlights how the Scheme will impact on human health.

##### *Vulnerability of the Scheme to climate change*

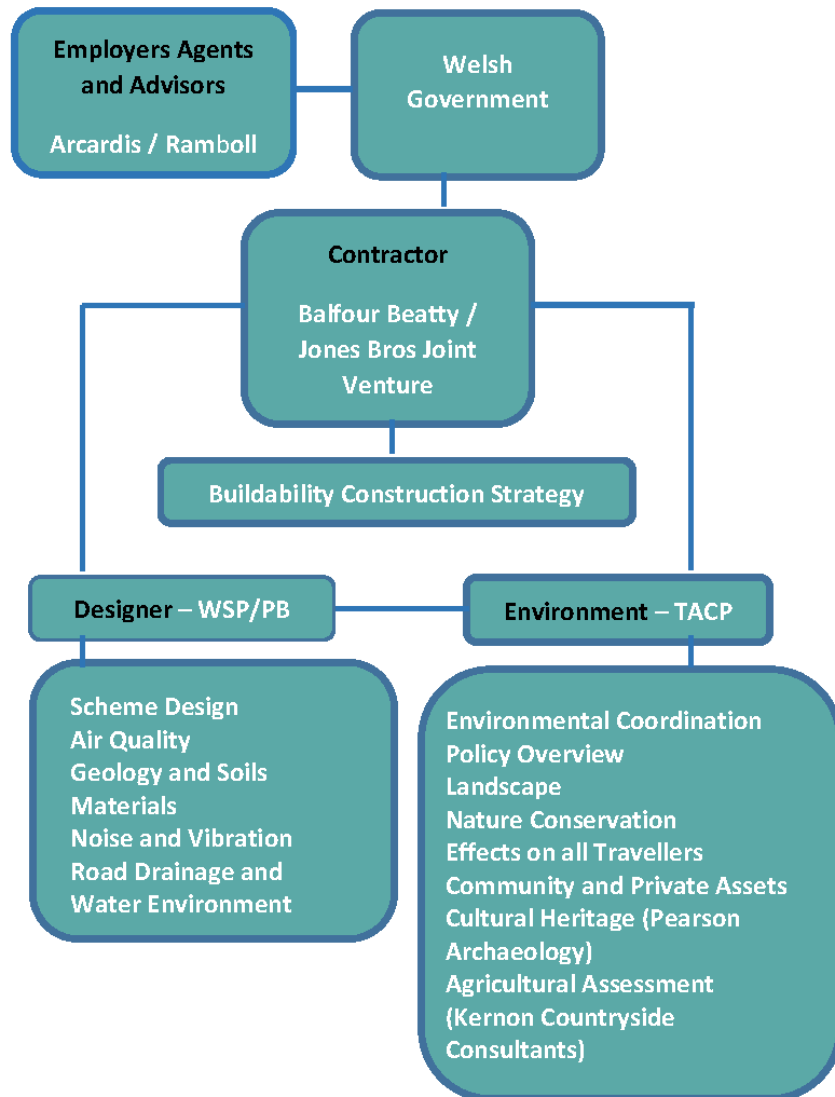
Climate change has been considered during the Scheme design process. The design has taken into account, for example, future flood risk and resilience to extreme weather events. In the case of flooding, this is considered in Chapter 14 – Road Drainage and the Water Environment.

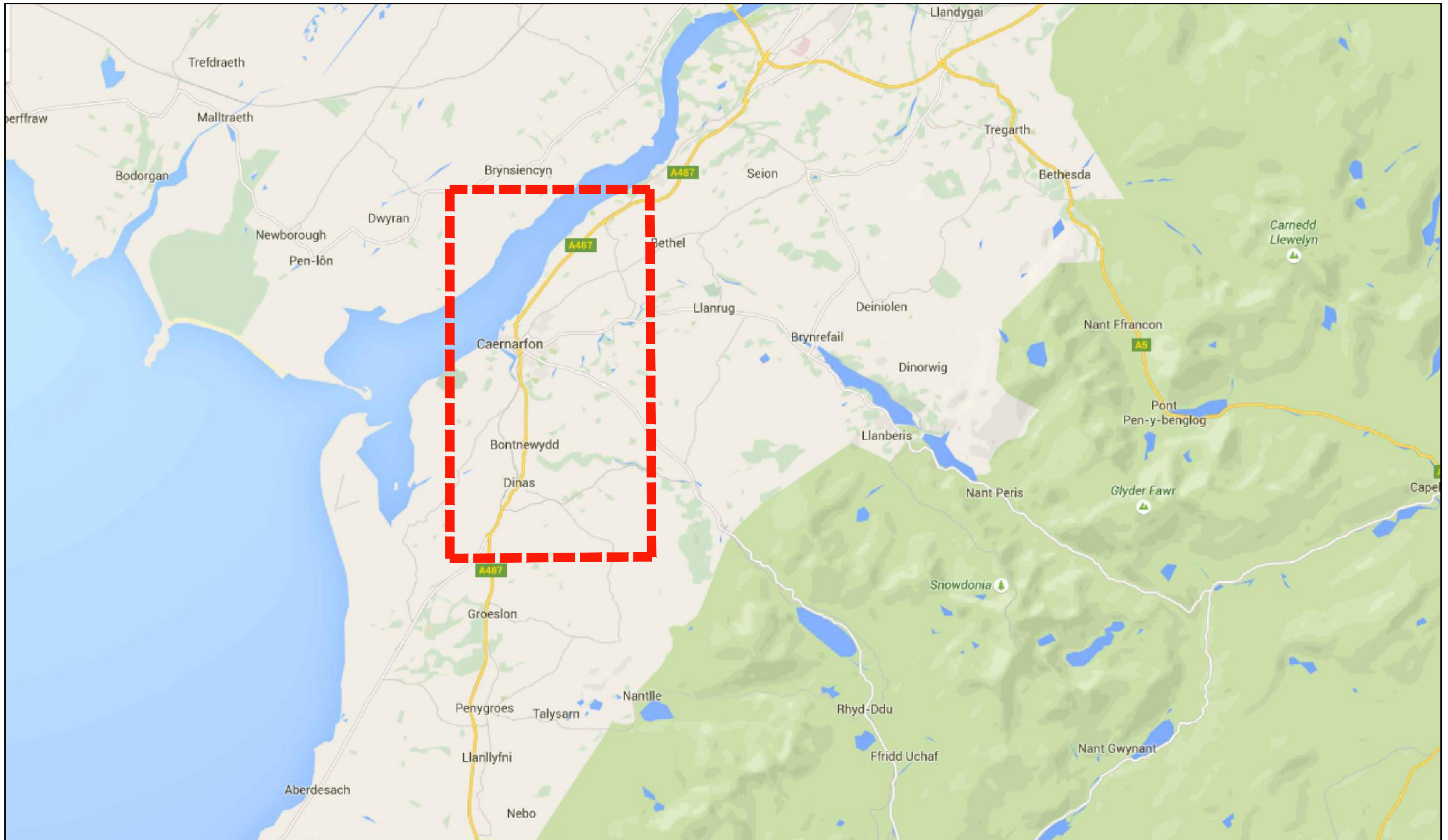
#### 1.5.7 Project Team

The Welsh Government (Overseeing Organisation) awarded the JV Team (the Contractor) the Early Contractor Involvement (ECI) contract for the Scheme. The JV Team (hereinafter referred to as the JV Team) includes WSP/Parsons Brinckerhoff as Designers and TACP as Environmental Consultants. The Welsh Government's Team include Arcadis as the Employers' Agent and Ramboll as their Adviser.

TACP is responsible for coordinating the environmental components for the Scheme and preparing the ES. Specialist environmental inputs have been undertaken by WSP/Parsons Brinckerhoff, TACP, Pearson Archaeology and Kernon Countryside Consultants. Technical input regarding the Scheme design has been provided by WSP/Parsons Brinckerhoff Highways and Transportation team. The JV has prepared the Construction Strategy and has inputted as relevant throughout the assessment process to ensure that proposed mitigation is practical, buildable and value for money. The Diagram 1.2 below summarises the inputs into the ES from the different team members and shows who is responsible for each specialist environmental topic chapter.

Diagram 1.2 – Project Organogram





REV	DATE	DESCRIPTION	BY	CHKD	APPD

• TITLE  
**A487 CAERNARFON AND BONTNEWYDD BYPASS**

Introduction  
 Location Plan (a-b)  
 Sheet 1 of 2

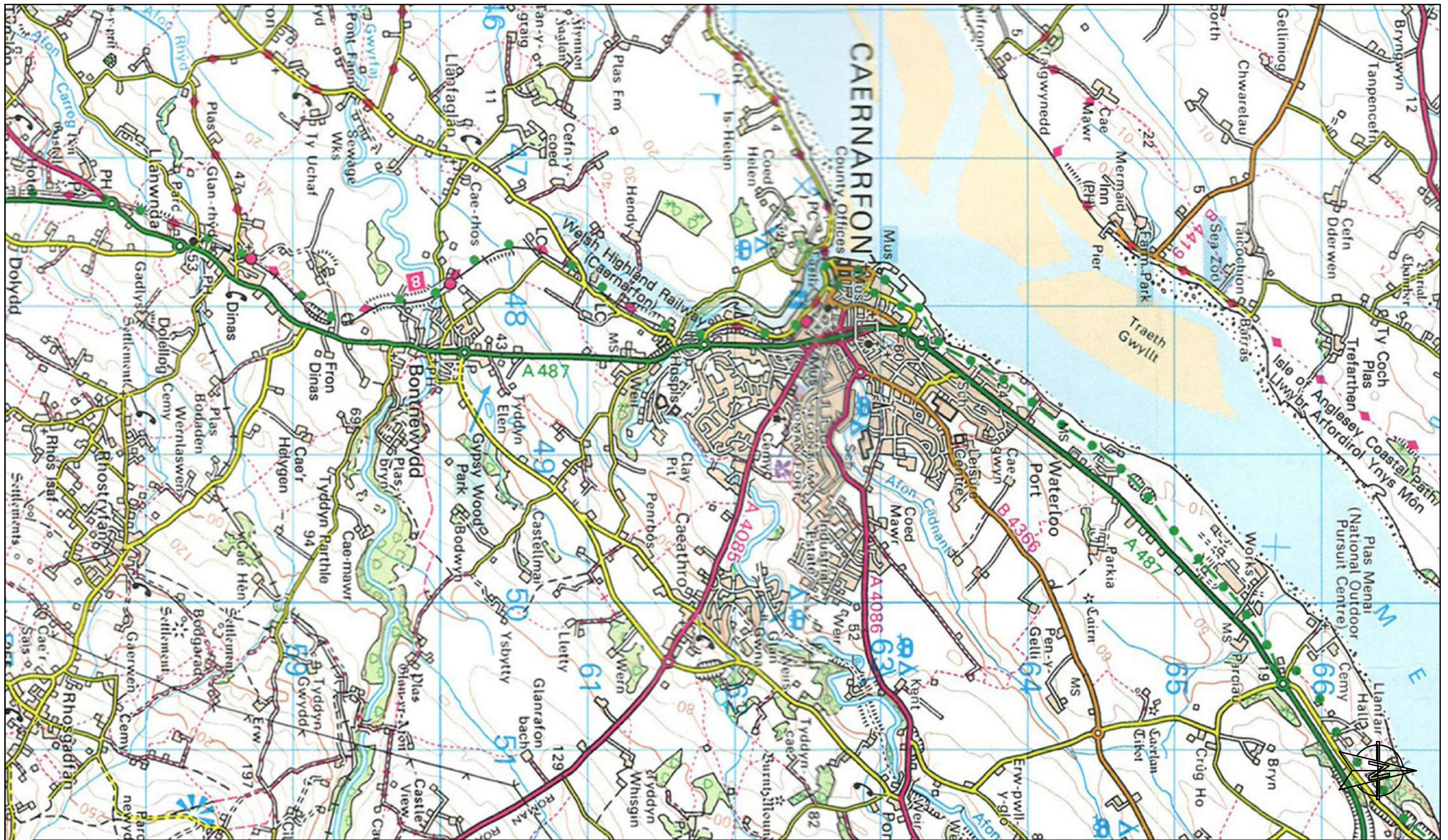
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REV	DATE	DESCRIPTION	BY	CHKD	APPD

• TITLE  
**A487 CAERNARFON AND BONTNEWYDD BYPASS**

Introduction  
 Location Plan (a-b)  
 Sheet 2 of 2

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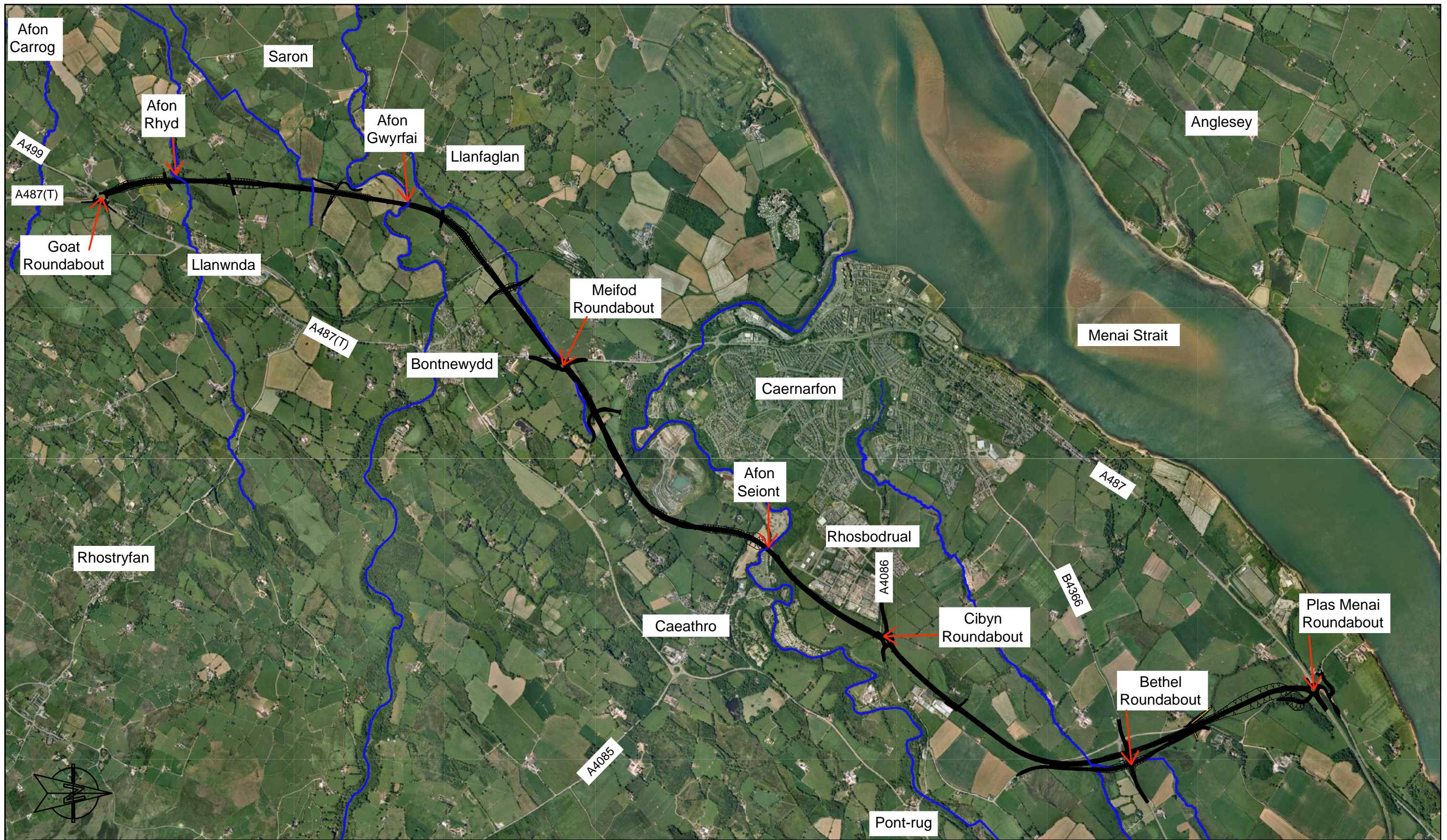
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TITLE  
**A487 CAERNARFON AND BONTNEWYDD BYPASS**  
 Introduction  
 Scheme on Aerial Photograph

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