

# **Wylfa Newydd Project**

## **8.24.7 Site Selection Reports – Volume 7 – A5025 Off-Line Highways Improvements**

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## 1 Introduction

### 1.1 The Wylfa Newydd DCO Project

- 1.1.1 Horizon Nuclear Power Wylfa Ltd (Horizon) is applying to the Secretary of State for a Development Consent Order (DCO) under the Planning Act 2008, to construct, operate and maintain a new nuclear power station on land west of Cemaes on Anglesey. The Wylfa Newydd Project comprises the construction, operation and decommissioning of the Wylfa Newydd DCO Project.
- 1.1.2 The Wylfa Newydd DCO Project is defined as those parts of the Wylfa Newydd Project which are to be consented by the DCO, comprising: the Power Station; other on-site development; Marine Works; the Off-Site Power Station Facilities; and the Associated Development. Please refer to Environmental Statement Volume A Chapter A2 (Application Reference Number: 6.1.2) for a more detailed description of the Wylfa Newydd DCO Project.

### 1.2 Off-line Highway Improvements

- 1.2.1 Horizon is proposing a package of highway improvements to the A5025, between Valley and the Power Station Site. These improvements include both On-line Highway Improvements and Off-line Highway Improvements. There are key differences between the on-line and off-line works, which are explained below.
- 1.2.2 The Off-line Highway Improvements comprise the construction of new sections of highway to bypass villages along the A5025, the formation of new junction arrangements, and localised improvements to existing bends. The Off-line Highway Improvements are classed as 'Associated Development' for the purposes of the DCO application. The Planning Act 2008 [RD1] defines Associated Development as development which is associated with a Nationally Significant Infrastructure Project (NSIP), i.e. the Power Station. Please refer to section 2 of this report for more detail in respect of the Off-line Highway Improvements.
- 1.2.3 The On-line Highway Improvements comprise works largely within the existing highway boundary of the A5025. In summary, these comprise improvement of the existing pavement through the application of a surface dressing; reconstruction and localised widening of the existing pavements; modifications and improvements to existing signage and road markings; and the construction of a Temporary Construction Compound (incorporating a temporary pavement recycling facility), immediately adjacent to the A5025.
- 1.2.4 The On-line highway improvements are not covered in this report as they do not form part of the DCO application and would instead be consented through the submission of planning applications under the Town and Country Planning Act (TCPA) 1990 [RD2]. Agreements may also be formed with the Isle of Anglesey County Council (IACC) under section 278 of the Highways Act 1980

[RD3] to ensure that the On-line Highway Improvements works can be carried out appropriately.

## 1.3 Purpose of this Report

- 1.3.1 The purpose of this report is to outline Horizon’s reasoned approach to the selection of locations and high-level solutions for the Off-line Highway Improvements required for the Wylfa Newydd DCO Project. This includes, for example:
- the location of the improvements on the A5025;
  - whether the proposal is for a bypass or roundabout; or
  - whether a bypass should be located to the east or west of the A5025.
- 1.3.2 For the avoidance of doubt, detailed design matters, such as the location of drainage and field accesses, are considered in the Design and Access Statement Volume 3 (Application Reference Number: 8.2.3); not in this report.
- 1.3.3 The information set out in this report summarises all site selection work carried out to date in respect of the Off-line Highway Improvements and provides final conclusions regarding site selection.
- 1.3.4 Importantly, this report should be read in conjunction with Site Selection Report (SSR) Volume 1 (Application Reference Number: 8.24.1). SSR Volume 1 introduces the site selection process undertaken for the Wylfa Newydd DCO Project, explains the structure of the SSR, the planning policy context for site selection, the history of site selection, and the key factors that have determined the approach adopted by Horizon.

## 1.4 Structure of this report

- 1.4.1 The remainder of this report is therefore structured as follows:
- Section 2 – provides a more detailed description of the proposed Off-line Highway Improvements;
  - Section 3 – details the general approach and methodology utilised to identify locations and preferred solutions;
  - Section 4 to 6 – sets out the findings of the DMRB Stages 1-3; and
  - Section 7 – provides a summary and conclusion.
- 1.4.2 The report also includes numerous tables and figures to aid in presenting the site selection process and conclusions reached.

## 2 Off-line Highway Improvements

- 2.1.1 The Off-line Highway Improvements comprise new sections of road along the A5025 between Valley and the Power Station Site (the A5025 route corridor) to improve access and safety.
- 2.1.2 The improvements involve the construction of new bypasses to take construction traffic away from residential properties and community facilities, and new junctions and bend improvements to increase the accessibility and manoeuvrability for HGVs. The improvements also seek to address potential environmental effects on communities, including noise, road traffic and severance.
- 2.1.3 The A5025 route corridor between Valley and the Power Station Site is approximately 16.2 kilometres (km) in length and can broadly be split into eight sections. The sections that require Off-line Highway improvement are as follows.
- Section 1 – A5 east of Valley Junction to north of Valley Junction (A5/A5025) (A5025 Chainage 0m to 500m);
  - Section 3 – north of Llanyngchedl to north of Llanfachraeth (A5025 Chainage 3400m to 5600m);
  - Section 5 – south of Llanfaethlu to north of Llanfaethlu (A5025 Chainage 8300m to 9800m); and
  - Section 7 – north of Llanrhuddlad to north of Cefn Coch (A5025 Chainage 13100m to 14400m).
- 2.1.4 The location of each of the above sections is illustrated in section 4 of this report (figure 4-1). The remainder of this report explains the site selection process applied to identify appropriate locations and solutions for the Off-line Highway Improvements.

## 3 Methodology

### 3.1 Introduction

- 3.1.1 This section sets out the process applied to select locations and high-level solutions for the Off-line Highway Improvements. Information relating to the detailed design of the Off-line Highway Improvements is only included where it is directly relevant to the selection of appropriate locations.
- 3.1.2 As previously stated, detailed design considerations, such as the detailed alignment of the road improvements, and location of drainage and field accesses, are considered in the Design and Access Statement Volume 3 (Application Reference Number: 8.2.3).

### 3.2 Methodology overview

- 3.2.1 The site selection methodology for the Off-line Highway Improvements can be illustrated in the form of the three design-development stages set out in the DMRB Guidance 2017 [RD4], as follows:
  - **DMRB Stage 1** (undertaken by Horizon during 2010–2014): Involving the identification of environmental, engineering, economic and traffic advantages, disadvantages and constraints associated with broadly defined improvement strategies. Horizon prepared a **Stage 1 Scheme Assessment Report (SAR) (RD5)** to present the technical information associated with this stage;
  - **DMRB Stage 2** (undertaken by Horizon during 2014–2015): Involving the identification of the factors to be taken into account in choosing alternative routes or improvement schemes and to identify the environmental, engineering, economic and traffic advantages, disadvantages and constraints associated with those routes or schemes. Horizon prepared a **Stage 2 SAR (RD6)** to present the technical information associated with this stage; and
  - **DMRB Stage 3 (RD7)** (undertaken by Horizon during 2015–2017): Involving the clear identification of the advantages and disadvantages, in environmental, engineering, economic and traffic terms, of the preferred solution(s). This stage also requires an assessment of the significant environmental effects of the preferred solution to be undertaken, in accordance with the statutory obligations under the prevailing EIA Regulations. Horizon prepared a **Stage 3 SAR** to present the technical information associated with this stage.

- 3.2.2 DMRB Stage 1 contains the most relevant information in terms of selecting locations for the Off-line Highway Improvements (see section 4 of this report). DMRB Stage 2 and 3 (see sections 5 and 6 of this report) are referred to only where the review and refinement of the design options led to the revision of the proposed locations for the improvements.

- 3.2.3 The three SARs correspond to each DMRB stage and were prepared by Horizon's appointed highway consultants between 2011 and 2017. The purpose of the SARs was to review the A5025 route corridor and propose a series of highway improvements to accommodate increased traffic associated with the Wylfa Newydd DCO Project. Furthermore, to identify options and preferred solutions for highway improvements.
- 3.2.4 In accordance with the above DMRB stages, the development of both the location and design of the A5025 Off-line Highway Improvements comprised a collaborative, multi-disciplinary approach; jointly led by engineering and environmental specialists. In addition to the production of engineering and environmental studies, workshops were held with stakeholders (including the IACC and general public) to narrow options proposed in the SARs at each stage.

## 4 DMRB Stage 1

### 4.1 Introduction

4.1.1 This section sets out the process associated with DMRB Stage 1, including the initial selection of locations for the Off-line Highway Improvements.

### 4.2 Development of preliminary location options

4.2.1 Meetings were held between Horizon, the IACC and Mott MacDonald (Horizon's appointed highway design and environmental assessment consultant) in 2011 to develop the preliminary highway improvements into a suite of conceptual design options. These are set out in the following documents:

- Halcrow – Nuclear Power Project – Site Development: Heavy Route and MOLF Strategy Study (May 2010) ;
- RPS – Wylfa B – Initial Transport Study (July 2010) ;
- RPS – Wylfa – Transport Strategy Overview (August 2011) ;
- Grontmij – Transport Position Statement for Major Developments – Revision C (September 2011) [RD8];
- Grontmij – Transport Position Statement for Wylfa New Nuclear Power Station – Revision A (September 2011) [RD9]; and
- Grontmij – Strategic Transport Study for Major Developments – Final Report – Revision C (September 2011).

4.2.2 The development of the locations and designs for the Off-line Highway Improvements took account of various considerations, including existing traffic conditions; physical constraints, such as carriageway width; overtaking opportunities; capacity; public transport provision; public rights of way and committed developments, such as unrelated improvements planned on the highway network.

4.2.3 Consideration was also given to existing environmental and social interests and sensitivities along, and in proximity to, the A5025 that could present a constraint to, or influence, option development. For example, designated landscapes, recorded heritage features and ecologically sensitive areas.

4.2.4 Based on an evaluation of the above, DMRB Stage 1 identified a number of potential options for the following four locations along the A5025.

#### **Valley**

4.2.5 It was concluded that a new section of off-line carriageway would be required to enable traffic to bypass the existing signalised junction within the settlement of Valley. This was due to concerns over the existing junction being able to accommodate the future traffic flows. Two options were accordingly developed:

- Option 1 comprised a new direct link between the A55 junction 3 and the A5025 which was proposed to directly bypass the Valley area and the existing junction, the concept being to create another arm from the existing A55 roundabout and provide a new link road to tie into the A5025 at a point north of Valley; and
- Option 2 comprised a new three-arm roundabout connecting the A5025 with the A5, located approximately 250 metres (m) south east of the existing crossroads.

### ***Llanfachraeth***

4.2.6 A range of options were developed, comprising localised widening of the existing highway and provision of off-line bypasses to the east of Llanfachraeth. These can be summarised as follows:

- A ‘Do Minimum’ option - localised widening of the existing highway through the village to achieve a minimum carriageway width;
- Option 1 - a new bypass to the east of the village, the alignment of which kept as close as possible to the edge of the village to reduce land take;
- Option 2 - an alignment that would provide limited overtaking opportunities, but would still provide clearance between the highway and adjacent properties; and
- Option 3 - a straight alignment, the purpose of which was to provide additional overtaking opportunities.

### ***Llanfaethlu***

4.2.7 A review of the existing highway conditions identified a requirement to address two bends that do not meet appropriate design standards. Furthermore, the review identified various dwellings in close proximity to the highway that could be impacted by the Wylfa Newydd DCO Project. The following options based on bend relaxation and off-line solutions were developed:

- Option 1 - a design which sought to relax the existing highway alignment through the two bends, and incorporated an off-line extension north of the two bends, which would interface with the A5025 via a new three-arm roundabout;
- Option 2 - a shorter version of Option 1 which did not include the off-line extension; and
- Option 3, Option 4 and Option 5 - off-line bypasses that would take traffic away from the community, the alignments of which varied in distance from the eastern edge of the settlement.

### ***Llanrhwydrus (Caerdegog Bend)***

- 4.2.8 A review of the existing highway identified that the carriageway comprises one large curve which does not meet appropriate design standards. The following localised widening and bypass options were therefore developed:
- A Do Minimum option, which comprised localised widening of the existing highway to achieve improved carriageway width; and
  - Option 1 comprised a new off-line section of carriageway which would bypass the existing bend and take traffic on a straighter alignment.
- 4.2.9 The DMRB Stage 1 options for Valley, Llanfachraeth, Llanfaethlu and Llanrhwydrus (Caerdegog Bend) are illustrated at appendix 4.1 of this report.

## **4.3 Stakeholder workshop**

- 4.3.1 Following the identification of the DMRB Stage 1 options, a stakeholder workshop was held between Horizon, Mott MacDonald and the IACC in October 2011 to review the preliminary options and agree those to be taken forward for appraisal and evaluation at DMRB Stage 2.
- 4.3.2 The following decisions were made at the workshop.
- **Valley** – attendees agreed that the Option 1 (red) should not be taken forward for further appraisal due to the potential constraints and difficulties associated with connecting to the existing A55 junction 3 roundabout. It was concluded to take Option 2 (blue) forward for more detailed appraisal.
  - **Llanfachraeth** – attendees agreed that bypassing Llanfachraeth via an eastern alignment was the most appropriate design solution, concluding that the Anglesey Area of Outstanding Natural Beauty (AONB) and adjacent Beddmanarch-Cymyran Site of Special Scientific Interest (SSSI) would constrain any westerly alignment. It was accordingly concluded to take Option 1 (red), Option 2 (blue) and Option 3 (green) forward for further appraisal. Notwithstanding this, attendees also concluded that the Do-Minimum option, involving localised widening within Llanfachraeth, should also be developed and taken forward for appraisal as a potential option.
  - **Llanfaethlu** – attendees agreed that bypassing Llanfaethlu via an eastern alignment was preferable over bypassing the village to the west. It was concluded not to take Option 1 (red), Option 3 (green), Option 4 (aqua) and Option 5 (yellow) forward, and to progress Option 2 (blue) forward to detailed appraisal.
  - **Llanrhwydrus (Caerdegog Bend)** – attendees concluded that Option 1 (red) should be taken forward for more detailed appraisal only if the Do Minimum option was unable to adequately address the identified constraints on this bend.

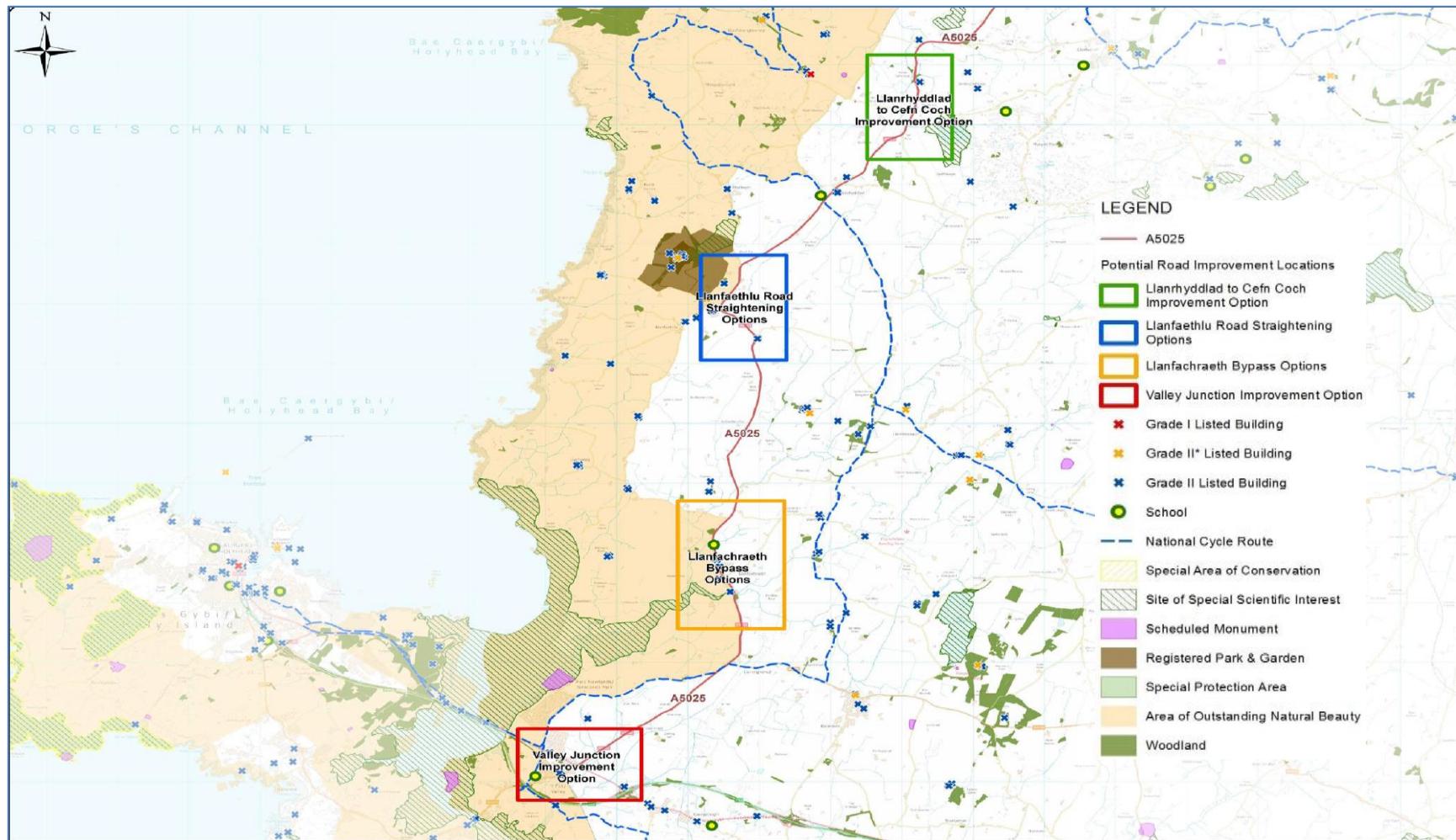
- 4.3.3 Additionally, the workshop attendees noted a potential benefit in developing a further option for Llanfaethlu, based on an amended version of Option 2 (blue), which would re-route the carriageway to pass further to the west of properties adjacent to the A5025, and incorporating a roundabout or suitable junction arrangement to reduce severance.
- 4.3.4 Following the stakeholder workshop, a further option emerged at Llanrhwydrus (Caerdegog Bend) – termed Option 2 (blue) – which involved extending the Option 1 (red) bypass alignment further south of the Caerdegog bend to address a number of other highway alignment issues near Cefn Coch. This was accordingly taken forward and Option 1 (red) was discounted from further consideration.
- 4.3.5 The DMRB Stage 1 options that were developed are illustrated in appendix 4.1. These were then subjected to a high-level appraisal as part of the Stage 1 SAR to establish their relative environmental, social and transport planning advantages and disadvantages.
- 4.3.6 Although the appraisal did not identify any major differentiators between the DMRB Stage 1 options on environmental grounds, the outcomes of the process were used to inform consultation and the design-development process.

## 4.4 Summary of DMRB Stage 1 findings

- 4.4.1 The process identified the following locations for improvement to be taken forward for assessment at DMRB Stage 2:
  - Route Section 2: Proposed option for Off-line Highway Improvements at A5025 Valley;
  - Route Section 3: Initial options for Off-line Highway Improvements, to provide a bypass to the east of Llanfachraeth;
  - Route Section 4: Initial options for the Off-line Highway Improvements to provide bend relaxation at Llanfaethlu; and
  - Route Section 7: The initial options for Off-line Highway Improvements between Llanrhyddlad and Cefn Coch.
- 4.4.2 Figure 4-1 on the following page illustrates the locations selected for A5025 the Off-line Highway Improvements.

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**Figure 4-1 Location of A5025 route sections selected for off-line improvement**



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## 4.5 Stage One Pre-application Consultation

- 4.5.1 Prior to DMRB Stage 2, the proposed Off-line Highway Improvements were published at Stage One Pre-application Consultation. Table 4-1 below sets out the changes which were made in part as a result of feedback from consultees.

**Table 4-1 Further design changes to Stage 1 SAR proposed improvements**

A5025 Route section	Change	Rationale
<b>Pre-Application Consultation Stage 1 September-December 2014</b>		
Llanfachraeth Bypass (Stage 1 SAR Route Section 3)	The bypass was altered to link in further away from the Llanfwrog/caravan site junction and the junction would be on a quieter road.	This change was made in part due to responses received from the public during the Stage One Pre- application Consultation.
Llanfachraeth Bypass (Stage 1 SAR Route Section 3)	Option 1 was chosen as the preferred option.	This was in part due to the positive responses received from the public during the Stage One Pre- application Consultation.

## 4.6 Re-evaluation of DMRB Stage 1 options

- 4.6.1 A decision was also made to review the design principles and assumptions that underpinned the DMRB Stage 1 options, prior to carrying these through to DMRB Stage 2. This confirmed that it would be environmentally unacceptable to develop alternative off-line alignment options:
- to the west of Llanfachraeth (section 3), as this would require permanent land take within the Anglesey AONB, and the Beddmanarch-Cymyran SSSI;
  - to the west of Llanfaethlu (section 5), as this would also require permanent land take within the Anglesey AONB and would potentially bring traffic in closer proximity to the more developed areas of the village; and
  - to the east of the A5025 near the settlement of Cefn Coch (Section 7), as the local topography of the area would require considerable earthworks to achieve the required levels and road profile, which could appear incongruous in the local landscape.

## 5 DMRB Stage 2

### 5.1 Introduction

- 5.1.1 This section sets out the process associated with DMRB Stage 2, including further assessment of the proposed solutions for the Off-line Highway Improvements.
- 5.1.2 Following completion DMRB Stage 1 and during Stage One Pre-application Consultation, Horizon appointed URS (now AECOM) and Jacobs in late 2014 to commence engineering design work and undertake environmental studies respectively for DMRB Stage 2.
- 5.1.3 The purpose of DMRB Stage 2 was to identify potential alternative solutions and to assess the associated environmental, engineering, economic and traffic advantages, disadvantages and constraints. Up to four detailed alternatives/improvement options were considered for each of the options selected at DMRB Stage 1.

### 5.2 Route sections

- 5.2.1 The route section numbers for the Off-line Highway Improvements were revised in the Stage 2 SAR to those listed below:
  - **Section 1** – A5/A5025 Valley Junction Improvements (previously section 2)
  - **Section 3** – Llanfachraeth Bypass (remained as section 3)
  - **Section 5** – Llanfaethlu Bypass (previously section 4)
  - **Section 7** – Cefn Coch Bypass (remained as section 7)
- 5.2.2 The locations of the proposed Off-line Highway Improvements did not change between DMRB Stage 1 and DMRB Stage 2.

### 5.3 Environmental constraints

- 5.3.1 Key environmental constraints were identified and applied to the route sections in order to further assess the proposals. The consideration of the environmental constraints is summarised below:
  - Section 1 – Agricultural land bounds either side of the A5025 corridor, with settlements and buildings primarily located around the existing junction within Valley. The Anglesey AONB is located to the west of the village, and National Cycle Network Routes 5 and 8 are located to the north and west of the existing junction. The area immediately south-east of the village is known to be at risk of flooding and has a network of watercourses. The village also has a number of community facilities including schools and places of worship;

- Section 3 – Agricultural land is located east of Llanfachraeth, with the Anglesey AONB and Beddmanarch-Cymyran SSSI located to the west of the village. Several listed buildings and community facilities are also located within the village, in proximity to the existing A5025;
- Section 5 – The boundary of the Anglesey AONB is formed by the A5025 and the northern fringes of Llanfaethlu village. The southern boundary of the Llyn Garreg-lwyd SSSI lies within 500m of the A5025, and Capel Soar standing stone (a Scheduled Monument) lies adjacent to the A5025 south of the village; and
- Section 7 – The A5025 is bounded by agricultural land interspersed by isolated dwellings, and is in close proximity to the Llyn Llygeirian SSSI, part of which is also designated as a Special Protection Area (SPA). The eastern boundary of the Anglesey AONB is located west of the A5025.

## 5.4 Assessment of the Stage 1 proposals

- 5.4.1 The Off-line Highway Improvements established at DMRB Stage 1 were reviewed and several further options considered.
- 5.4.2 The Stage 2 SAR sets out the analysis, comparison and evaluation of the proposed options against the following environmental topic areas:
- air quality;
  - noise and vibration;
  - landscape and visual effects;
  - cultural heritage;
  - terrestrial and freshwater ecology;
  - traffic and transport;
  - the water environment;
  - geology and soils;
  - socio-economic effects; and
  - public access and recreation.
- 5.4.3 The full assessment is set out in Annex A of the Stage 2 SAR ‘Assessment Summary Tables’ [RD6]. Tables 5-1 to 5-4 on the following page set out the options presented in the Stage 2 SAR. These options were taken forward for further assessment at DMRB Stage 3 (see section 6 of this report).

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**Table 5-1 Valley Bypass – Stage 2 SAR Off-line Improvement Options**

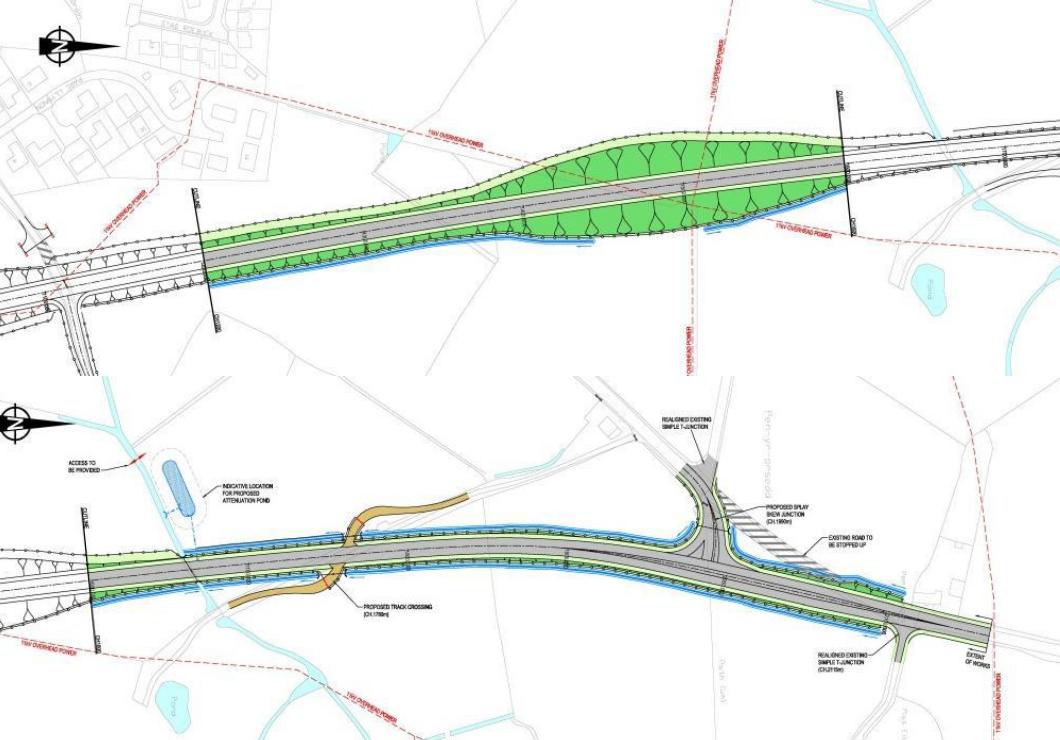
Route section 1	Junction 3 of the A55 to Valley Junction A5/A5025 (Valley Bypass) (Stage 2 SAR Summary)	Stage 2 SAR Figure
Option 1	<p>Option 1 is a three-arm roundabout connecting the A5 with the A5025 to the east of the existing signalled junction. It is proposed to locate the roundabout close to the existing junction and at the rear of residential and commercial properties comprising a vehicle repair garage and funeral parlour.</p> <p>See appendix 5.1 for full size plans.</p>	

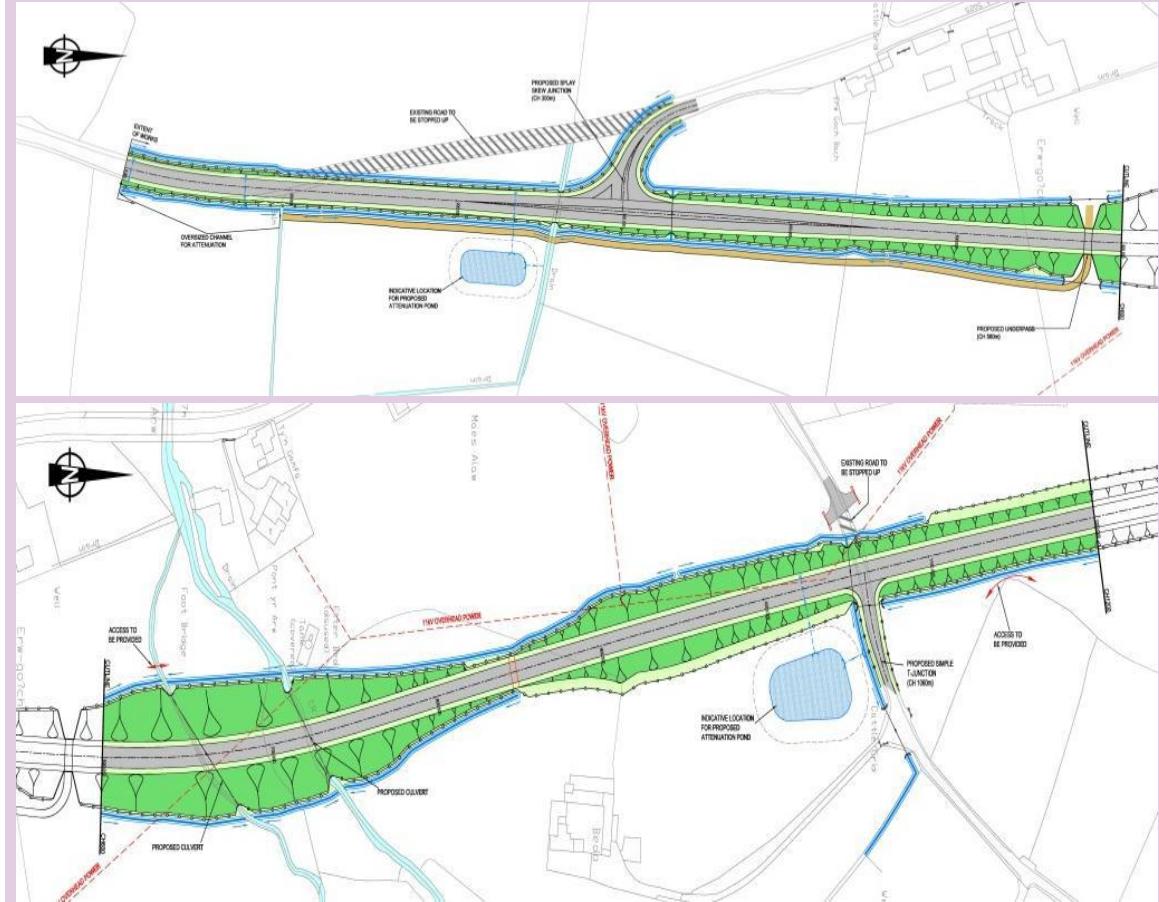
Route section 1	Junction 3 of the A55 to Valley Junction A5/A5025 (Valley Bypass) (Stage 2 SAR Summary)	Stage 2 SAR Figure
Option 2	<p>Option 2 is a four-arm roundabout connecting the A5 with the A5025 to the east of the existing signalised junction. The roundabout is located further east of the existing junction than in Option 1 and further from the properties on the A5025.</p> <p>See appendix 5.1 for full size plans.</p>	



**Table 5-2 Llanfachraeth Bypass – Stage 2 SAR Off-line Improvement Options**

Route section 3	Llanfachraeth Bypass (Stage 2 SAR Summary)	Stage 2 SAR Option Figure
Option 1	<p>Option 1 moves the alignment away from the existing A5025 and away from the properties located to the west of the existing highway. This removes an existing bend at the start of the bypass and provides an overtaking distance of 1075m, which equates to approximately 50% of the overall bypass length. The bypass then ties back into the existing alignment north of Llanfachraeth village.</p> <p>See appendix 5.1 for full size plans.</p>	

Route section 3	Llanfachraeth Bypass (Stage 2 SAR Summary)	Stage 2 SAR Option Figure
		

Route section 3	Llanfachraeth Bypass (Stage 2 SAR Summary)	Stage 2 SAR Option Figure
Option 2	<p>Option 2 provides a straighter alignment than Option 1 from Chainage 0m to 700m, and then continues along a very fairly similar alignment from this point to the tie-in to the existing A5025. The carriageway is located around 10m further east than Option 1, between Chainages 700m and 1700m, but then converges back on to the same alignment north of this point. This alignment provides an overtaking distance of 950m, which equates to approximately 45% of the overall bypass length. There are two slightly different vertical alignments that have been designed for this option, which include or exclude a private vehicular underpass at Chainage 580m to maintain landowner access on either side of the proposed highway. The two alternative vertical alignments for Option 2 would be referred to as follows:</p> <p><b>Option 2A</b> – Underpass included at Chainage 580m</p> <p><b>Option 2B</b> – Underpass not included at Chainage 580m</p> <p>See appendix 5.1 for full size plans.</p>	

Route section 3	Llanfachraeth Bypass (Stage 2 SAR Summary)	Stage 2 SAR Option Figure
		

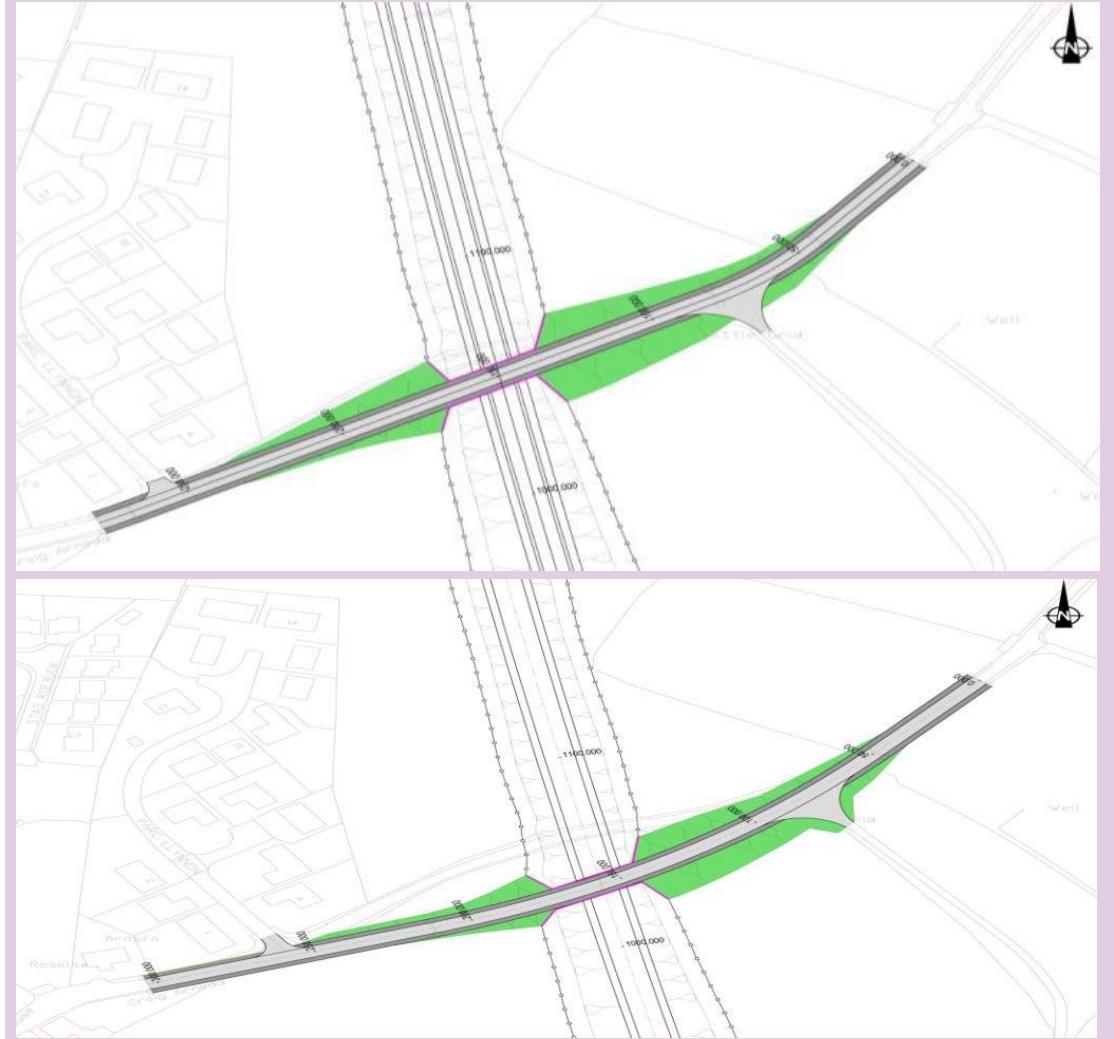
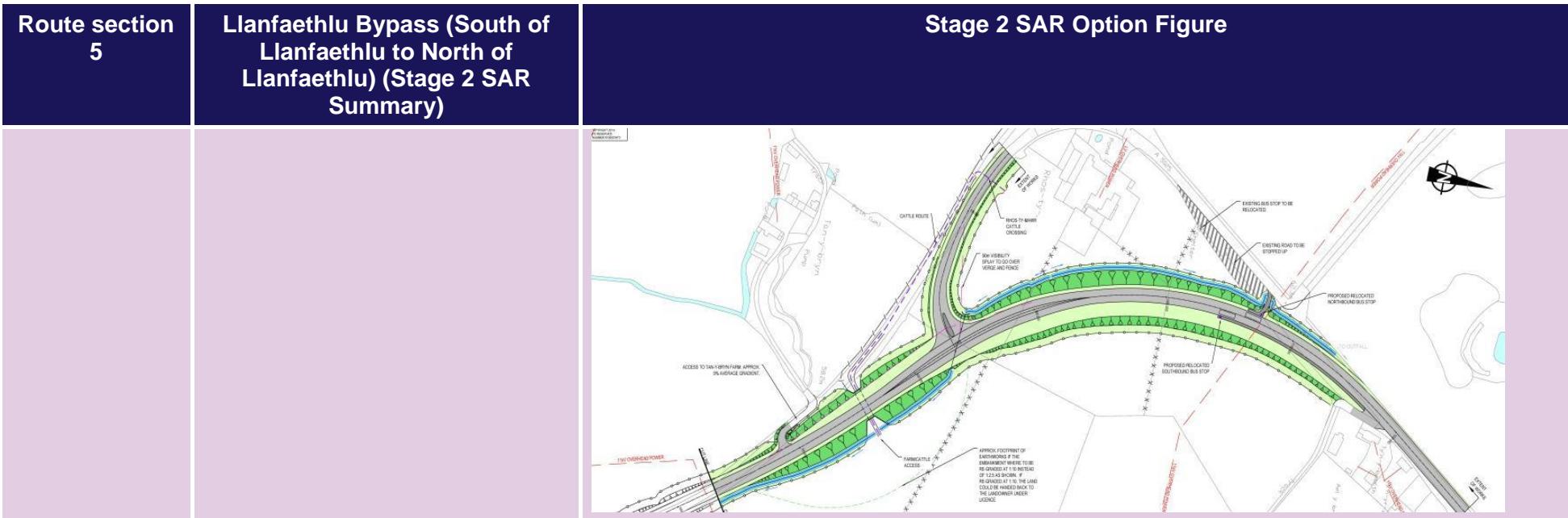
Route section 3	Llanfachraeth Bypass (Stage 2 SAR Summary)	Stage 2 SAR Option Figure
Option 3	<p>Option 3 has the same mainline alignment as Option 2 but with the inclusion of an overbridge for the existing side road that is proposed to be stopped-up as part of the proposals for Option 2. This means that the proposed simple T-junction at Chainage 1060m from Option 2 would no longer be required, and direct access to/from Llanfachraeth can be provided without east and westbound vehicles having to access the realigned A5025. The overbridge could be provided with either of the vertical alignments (2A and 2B) as the vertical alignment for both these alternatives is the same at Chainage 1060m.</p> <p>Two alternative side road overbridge options have been designed as part of Option 3. They would be referred to as follows:</p> <p><b>Option 3A</b> – Overbridge at approximate Chainage 1060m on-line of existing side road</p> <p><b>Option 3B</b> – Overbridge at approximate Chainage 1060m off-line of existing side road</p> <p>See appendix 5.1 for full size plans.</p>	

Table 5-3 Llanfaethlu Bypass – Stage 2 SAR Off-line Improvement Options

Route section 5	Llanfaethlu Bypass (South of Llanfaethlu to North of Llanfaethlu) (Stage 2 SAR Summary)	Stage 2 SAR Option Figure
Option 1	<p>Option 1 is to realign the existing A5025 and bypass the two sharp radii bends in the vicinity of Llanfaethlu. The alignment ties back into the straight section between the bends, to maintain access to two farms along this section of the highway. Access to the existing properties adjacent to the Black Lion pub would be re-provided from a new side road, and another side road would be provided to give direct access to the residential area within Llanfaethlu. Two private cattle underpasses are proposed at Chainage 410m and 760m to allow agricultural usage of fields either side of the highway.</p> <p>See appendix 5.1 for full size plans.</p>	

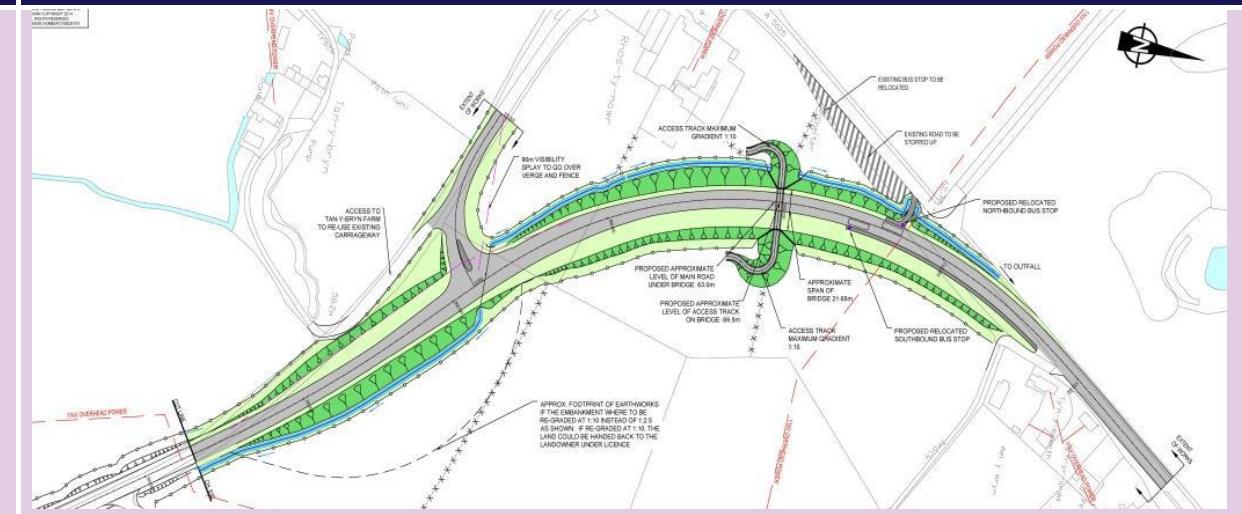


Route section 5	Llanfaethlu Bypass (South of Llanfaethlu to North of Llanfaethlu) (Stage 2 SAR Summary)	Stage 2 SAR Option Figure
Llanfaethlu Bypass Option 2	<p>Option 2 realigns the existing A5025 and bypasses the two sharp bends in the vicinity of Llanfaethlu. The horizontal and vertical alignment is the same as proposed in Option 1, as there are constraints in this area that limit the possible alignment. These constraints include nearby properties and the tie-in to the existing A5025. Access to the properties adjacent to the Black Lion pub and Llanfaethlu would be provided, as proposed in option 1. However, the Llanfaethlu junction has been moved 20m to the north. The main distinguishing feature of Option 2 is the inclusion of a private accommodation overbridge at Chainage 1000m instead of the underpass proposed at Chainage 760m in Option 1. The overbridge is to provide a cattle crossing at Rhos-Ty-Mawr farm. A private underpass would be provided at Chainage 410m, to allow agricultural usage of fields either side of the highway to be maintained.</p> <p>See appendix 5.1 for full size plans.</p>	

**Route section  
5**

**Llanfaethlu Bypass (South of  
Llanfaethlu to North of  
Llanfaethlu) (Stage 2 SAR  
Summary)**

**Stage 2 SAR Option Figure**



Route section 5	Llanfaethlu Bypass (South of Llanfaethlu to North of Llanfaethlu) (Stage 2 SAR Summary)	Stage 2 SAR Option Figure
<p>Llanfaethlu Bypass Option 3</p> <p>Option 3 has the same initial alignment as Option 1 up to Chainage 620m, where the 11kv overhead power cables cross the alignment. From this point, the alignment changes significantly and the bypass crosses the existing highway at the point where Option 1 ties back into the alignment. From this point the new alignment is relatively straight and runs along the west side of the existing A5025 for 350m where it ties into a farm access track as a simple priority controlled cross roads junction. The alignment then bears to the right for 200m and a new four-arm roundabout junction replaces the existing simple T-junction at Pen Bodowen. The south-western arm and north-eastern arm of the roundabout tie the new alignment back into the existing A5025 and the north arm ties into Chapel Street, heading towards Rhyd-wyn. The southern arm of the roundabout links back into the A5025 and provides access to residential and commercial properties at Pen-y-Graig.</p> <p>See appendix 5.1 for full size plans.</p>		

**Route section  
5**

**Llanfaethlu Bypass (South of  
Llanfaethlu to North of  
Llanfaethlu) (Stage 2 SAR  
Summary)**

**Stage 2 SAR Option Figure**

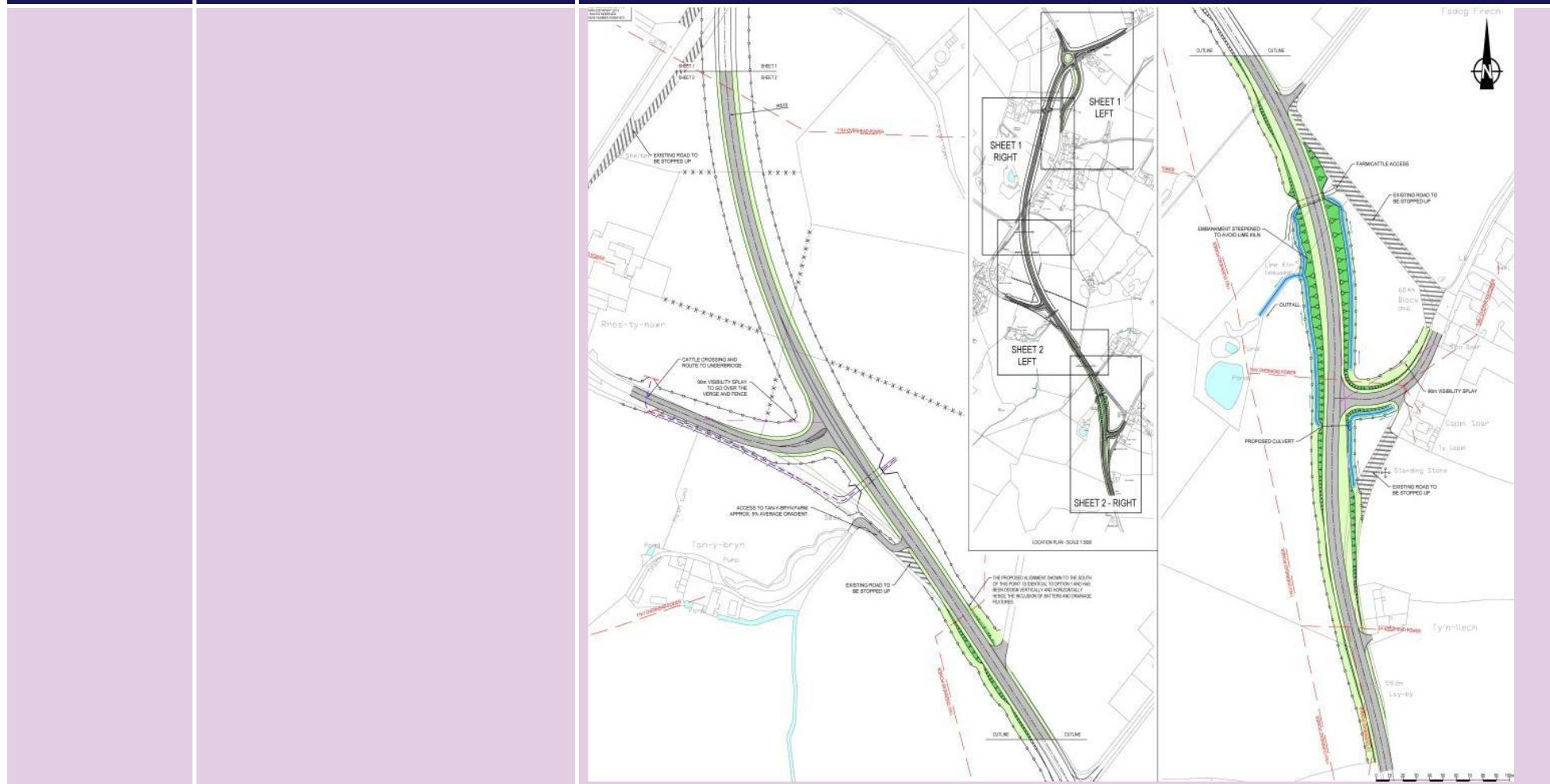


Table 5-4 CefnCoch Bypass – Stage 2 SAR Off-line Improvement Options

Route section 7	CefnCoch Bypass (North of Llanrhuddlad to North of Cefn Coch) (Stage 2 SAR Summary)	Stage 2 SAR Option Figure
CefnCoch Bypass Option 1	<p>Option 1 proposes a staggered junction at approximate Chainage 650m close to the existing crossroad junction at 'White House' / 'Ty Capel Seilo' as a means of access onto the existing severed road. This option proposes to stop up the highway at the intersections points between the proposed bypass and existing road at either end, without the provision of access onto the existing road.</p> <p>See appendix 5.1 for full size plans.</p>	 

Route section 7	CefnCoch Bypass (North of Llanrhuddlad to North of Cefn Coch) (Stage 2 SAR Summary)	Stage 2 SAR Option Figure
CefnCoch Bypass Option 3	<p>Option 3 proposes to provide a staggered junction at approximate Chainage 650m at the existing severed side road and stop up the existing A5025 at this junction. Access to the existing A5025 is provided at either end of the bypass. Access to fields either side of the proposed alignment is maintained through the inclusion of a private vehicular underpass.</p> <p>See appendix 5.1 for full size plans.</p>	

CefnCoch  
Bypass Option 4

Option 4 proposes a combination of all options by providing a staggered T-junction at approximate Chainage 650m and simple T-junction at the southern end of the bypass. The existing section of the A5025 towards the north of the bypass would be stopped-up and access is provided from the staggered junction or simple T-junction. The reason for providing a number of junctions to the existing A5025 is that it provides the shortest route for all journeys, from the adjoining side roads and properties, to the new alignment.

See appendix 5.1 for full size plans



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## 6 DMRB Stage 3

### 6.1 Introduction

- 6.1.1 The purpose of DMRB Stage 3 and the corresponding Stage 3 SAR was to identify the advantages and disadvantages of the DMRB Stage 2 preferred options, in order to select the final proposals for the DCO application. This included further, detailed consideration of relevant environmental, engineering and economic matters.
- 6.1.2 The remainder of this section sets the final assessment carried out for each of the preferred DMRB Stage 2 options and the rationale for selecting the proposed solution for the DCO application. It is notable that the broad locations of the proposed Off-line Highway Improvements remain the same as originally set out in the Stage 1 SAR.

### 6.2 Section 1 – Valley Bypass

- 6.2.1 The final assessment of section 1 is set out in table 6-1 below.

**Table 6-1 Section 1 – Valley Bypass final assessment**

Section 1 – Valley Bypass	Option Description
Option 1	Option 1 was a 3-arm roundabout to the east of the existing signalised junction in Valley. It was proposed to locate the roundabout close to the existing junction to reduce land take and severed land to the west of the bypass. The roundabout was to be constructed off-line of the A5 in order to maintain vehicular usage of the highway throughout the majority of the works.
Option 2	Option 2 was a 4-arm roundabout to the east of the existing signalised junction in Valley. The roundabout was to be located further east of the existing junction than proposed for Option 1. It would be constructed on the line of the A5 to reduce land take and visual impact. The additional fourth arm of the roundabout is a direct access to the freight yard to the south of the A5.
Option 3 (Preferred)	Option 3 was also a 4-arm roundabout to the east of the existing signalised junction. The roundabout was to be situated off-line of the existing A5 in order to reduce the construction impact on the highway network and the fourth arm of the roundabout provides direct access to the freight yard south of the A5.

Preferred Option Rationale	Summary
Proximity to the village	The roundabout being located further from the village means that noise, vibration and air quality impact is reduced when compared with Option 1. Furthermore the possible impact of street lighting pollution will be decreased due to the alignment being located further from the village.
Construction Impact	Option 3 being constructed off-line of the existing A5 means that it will not be as disruptive to the highway network during construction when compared with Option 2. In comparison with Option 1, there will be less noise impact during construction as the majority of the works will take place further from the village.
Flooding	The majority of the site is contained within an existing flood plain and the location of Option 1 would have been through some of the worst affected areas of this flooding. The alignment location for Option 3 is further from the area of flooding though it will still have to be addressed in the design to ensure the bypass doesn't increase flooding in the area.
Transport Safety	The length of the western roundabout arm of Option 3 is significantly longer than Option 1 giving more time for westbound vehicles approaching Valley to slow down on the approach to the village in advance of the signalised junction. The inclusion of a four arm to the roundabout for the freight yard terminal means that an additional access close to the roundabout is not required.
Non-Motorised Users	Inclusion of cycling and pedestrian provisions to the south of the roundabout and away from the carriageway edge provides safer NMU routes around the bypass.

6.2.2 Please refer to appendix 6.1 of this report for the final section 1 preferred option drawings.

## 6.3 Section 3 – Llanfachraeth Bypass

6.3.1 The final assessment of section 3 is set out in table 6-2 below.

**Table 6-2 Section 3 – Llanfachraeth Bypass final assessment**

Section 3 – Llanfachraeth Bypass	Option Description
Option 1	<p>Option 1 proposed a mainline alignment that took the bypass further from the village on a large radius curve. The alignment is initially on embankment to cross 2 existing watercourses and then goes into cutting as it passes Llanfachraeth village. The existing road crossing the proposed mainline alignment would be stopped up to the west and connected to the mainline via a simple T-junction to the east.</p>
Option 2	<p>Option 2 was a mainline alignment that remained closer to the village on a straighter alignment than Option 1 for the first 400m of the bypass. From this point it was a very similar horizontal alignment to Option 1. Option 2A followed a similar vertical alignment to Option 1 however Option 2B followed a slightly different vertical alignment due to the exclusion of an underpass at Chainage 580m. The removal of an underpass meant that the height of the embankment is reduced at the southern end of the bypass.</p>
Option 3 (Preferred) (Option 3B)	<p>Option 3 was a variation of Option 1 with the inclusion of a side road overbridge to replace the side road junction at Chainage 1080m. The mainline alignment is as proposed for Option 1. There were 2 different options for the overbridge which were referred to as Option 3A and 3B. Option 3A provided an overbridge on the existing side road alignment and Option 3B was a realignment of the existing road to the south of its current position.</p>
Preferred Option Rationale	Summary (Option 3B)
Proximity to the village	<p>The southern end of the bypass being located further from the village as proposed by Option 3B reduces the impact of noise and vibration post construction when compared with Option 1. The location of the junction connecting to the southern end of the village will also be located further from residential properties. From Chainage 400m northwards the mainline alignment for all options is very similar.</p>

Construction Impact	<p>The southern end of the bypass in Option 3B is located further from the existing A5025 meaning that construction noise and dust is reduced when compared with Option 2. Furthermore the larger area of land created between the existing A5025 and proposed bypass presents an opportunity for a site compound area that is bounded by the two roads and does not extend further than the east side of the bypass. The Option 3B side road overbridge is proposed to be constructed offline of the existing side road to minimise disruption to the highway network throughout the construction period. The overbridge proposed for Option 3A was to be built online of the existing side road requiring closure of this road for longer period during construction. The side road overbridge is to be constructed on the south side of the existing road and therefore further from the residential estate ParcLlynnon to reduce noise impact for the local residents.</p>
Transport Safety	<p>One of the objectives of the Llanfachraeth bypass is that it provides increased opportunity for safe vehicle overtaking to reduce driver frustration and both mainline Options 1 and 2 provide a similar amount of overtaking opportunities. Providing a simple T-junction connection to the bypass at Chainage 1080m, as proposed by Options 1 and 2, permits overtaking to be carried out although may cause visibility issues for vehicles emerging from the junction whilst vehicles are overtaking on the mainline. Providing an overbridge, as proposed for Option 3B, means that the risk of reduced visibility for vehicles emerging from the side road is eliminated.</p>
Design standards and traffic counts	<p>Traffic counts were taken in August and November 2014 and indicated that a larger number of vehicles were using the side road junction at Chainage 1080m than originally assumed. Design Manual for Roads and Bridges (DMRB) TD 42/951 states that a simple T-junction may not be a suitable arrangement at this location to facilitate this amount of vehicles and a ghost island junction may be required. Providing a ghost island junction will severely reduce the amount of safe overtaking opportunities along the bypass and therefore minimises the benefits of the bypass. For this reason the overbridge proposed in Option 3B to connect to the side road is the preferred option as it facilitates overtaking on the mainline and removes the need for a ghost island junction at this location.</p>
Non-Motorised Users	<p>Both mainline alignments have a similar impact on NMUs and will facilitate Public Right of Way (PRoW) crossings in similar ways. The inclusion of the overbridge in Option</p>

3B avoids severing NMU routes to access Llanfachraeth village and provides opportunities for improved access to the village and linking two existing PRoW.

- 6.3.2 Please refer to appendix 6.1 of this report for the final section 3 preferred option drawings.

## 6.4 Section 5 – Llanfaethlu Bypass

- 6.4.1 The final assessment of section 5 is set out in table 6-3 below.

**Table 6-3 Section 5 – Llanfaethlu Bypass final assessment**

Section 5 – Llanfaethlu Bypass	Option Description
Option 1	Option 1 straightened out the Black Lion bend to the west of the existing bend and tied back into the existing alignment of the A5025 for a 200m stretch. The alignment then bypassed Llanfaethlu village to the west on a standard radius curve before tying back in to the existing A5025 to the north of the village. Severance of two landowners' agricultural land was addressed by the inclusion of 2 cattle underpasses at Chainage 410m and 760m.
Option 2	Option 2 followed the same alignment as Option 1 but severance of two landowners' agricultural land was addressed by the inclusion of a cattle underpass at Chainage 410m and an accommodation overbridge at 1000m.
Option 3	Option 3 followed a similar initial alignment to both Options 1 and 2 around the Black Lion bend and tied back into the existing A5025. From this point it bypassed Llanfaethlu and crossed the existing A5025 to the north of the village on a desirable minimum radius curve. The alignment then straightened out, running almost parallel to the existing road, and a four-arm roundabout junction was provided to connect the existing A5025 to the new alignment and Chapel Street, providing access to Rhyd-wyn.
Preferred Option Rationale	Summary (Option 2)
Construction Impact	Options 1 and 2 would have a similar construction impact due to the alignments being very similar. The removal of the accommodation overbridge from Option 2 means that the construction process is simplified and therefore shortened as a result. The overall length of Option 3 is

	approximately twice that of Options 1 and 2 and therefore a much longer construction period would be needed to complete the works. All options tie back in to the existing A5025 for a short stretch between the Black Lion pub and Llanfaethlu village and would therefore have a similar impact on the highway network during construction in this area. However, Option 3 also crosses the existing A5025 twice to the north of the village and this would require temporary diversions during construction of these areas. One of these crossings would require construction of a new 4-arm roundabout on-line of the existing junction to Rhyd-wyn.
Environment Impact	The proposed alignment for Option 3 passes through a designated Area of Outstanding Natural Beauty (AONB). Option 2 ties back in to the existing A5025 before the AONB and therefore would significantly reduce the environmental impact on this area.
Visual impact and severance	The visual impact of Option 3 would be much more significant than Options 1 or 2. The alignment would be in a deep cutting as it bypasses the village for Options 1 and 2 to reduce the visual and noise impact of the road. Option 3 would also be in cutting at this point however would need to be on embankment as the alignment heads north of the village to provide a suitable cut-fill balance. This embankment would be clearly visible from the village and from the properties located along the bypassed section of the A5025. Option 3 would also sever additional land to the west of the existing A5025, within the AONB, that access would need to be re-provided to.
Transport Safety	The inclusion of a roundabout at the northern extent of the bypass in Option 3 introduces an additional major junction to the A5025. The majority of accidents occur in proximity of junctions and therefore by removing this, as proposed for Option 2, it would reduce the risk of accidents occurring in this area. Due to the layout and configuration of a roundabout, traffic on the A5025 would not have priority and this may lead to driver frustration.

- 6.4.2 Please refer to appendix 6.1 of this report for the final section 5 preferred option drawings.

## 6.5 Section 7 – Cefn Coch Bypass

- 6.5.1 The final assessment of section 7 is set out in table 6-4 below.

**Table 6-4 Section 7 – Cefn Coch Bypass final assessment**

Section 7 – Cefn Coch Bypass	Option Description
Option 1	Option 1 proposed to stop up the ends of the existing A5025 with access to the bypass is maintained via a staggered T-junction onto the bypass. A vehicle underpass is provided at Chainage 920m to facilitate the safe movement of cattle between the severed fields and maintain operation of the farm post construction.
Option 2	Option 2 followed a different vertical alignment to all the other options to provide a more economical cut-fill balance. This vertical alignment requires an existing side road to be stopped up to the east of the proposed bypass due to the alignment being in deep cutting at this point. A simple T-junction can be provided to the west of the bypass to maintain access to this side of the highway. T-junctions are provided at both ends of the bypass to connect the existing A5025 to the proposed alignment. Due to the alignment being in cutting towards the northern extents, an accommodation overbridge is provided at Chainage 1030m to facilitate the safe movement of cattle between the severed fields and to maintain operation of the farm post-construction.
Option 3	Option 3 followed the same vertical alignment as Option 1 but provides both a staggered T-junction at the centre of the bypass and two simple T-junctions at either end of the bypass. A vehicle underpass is provided at Chainage 920m to facilitate the safe movement of cattle between the severed fields and maintain operation of the farm post construction.
Option 4	Option 4 was similar to Option 3 in that it provides a T-junction to the south of the bypass and a staggered T-junction at the centre however it removes the junction at the north end of the bypass. This is in order to stop up the existing A5025 along this section and allow safe movement of cattle from a nearby farm across this section of the existing A5025. A vehicle underpass is provided at Chainage 920m to facilitate the safe movement of cattle between the severed fields and maintain operation of the farm post construction.
Preferred Option Rationale	Summary (Option 2)
Visual Impact	The majority of the alignment for Options 1, 3 and 4 would be on an embankment and therefore would have a

	significant visual impact on the existing landscape. Option 2 would be in a cutting along the northern end of the bypass and would not be visible from the existing A5025 and residential properties in the area.
Transport Safety	Option 2 stops up the road to the east of the proposed road and removes the staggered T-junction reducing the risk of slow moving vehicles manoeuvring between the two junctions. A staggered T-junction increases the risk of vehicles on the mainline having to slow down quickly to allow vehicles to cross the bypass between the 2 junctions on either side of the highway. Traffic counts taken in August and November 2014 indicate that there are very few vehicle movements on this road daily and therefore it is unfeasible to provide a vehicle overbridge.
Noise and vibration	The introduction of a cutting in the northern section of the bypass reduces noise and vibration levels for Option 2. All other options are on embankment through this section and would therefore have an increased level of noise in comparison to Option 2.
Construction Impact	The more economical cut-fill balance of Option 2 means that less fill material is required to be imported to the site. This means a significant reduction in the number of HGVs delivering material to the site when compared to all other options.

- 6.5.2 Please refer to appendix 6.1 of this report for the final section 7 preferred option drawings.

## 6.6 Design optimisation

- 6.6.1 Modifications were made to the DMRB Stage 3 proposals between October 2016 and May 2017 in response to a design review workshop, Pre-application Consultation Stage Two, the ongoing Environmental Impact Assessment process, and landowner discussions.

### **Power Station Access Road Junction**

- 6.6.2 As part of the latter stages of DMRB Stage 3, a decision was made by Horizon to revisit the inclusion of the Power Station Access Road Junction into the package of Off-line Highway Improvements.
- 6.6.3 It was concluded that the design of the three-arm roundabout junction proposed as part of the Power Station south of Tregele should be incorporated into the overall scope of the improvements and developed to a standard comparable to the improvements proposed within sections 1, 3, 5 and 7.
- 6.6.4 The Power Station Access Road Junction south of Tregele had previously been included as part of the package of works associated with the design-development of the Power Station. The trigger for inclusion as part of the Off-

line Highway Improvements was that it was deemed necessary to move the junction approximately 500m south (away from the Power Station Site) to preserve a Cwt Dyrnwr (threshing shed); a feature of agricultural history.

### ***Locational changes***

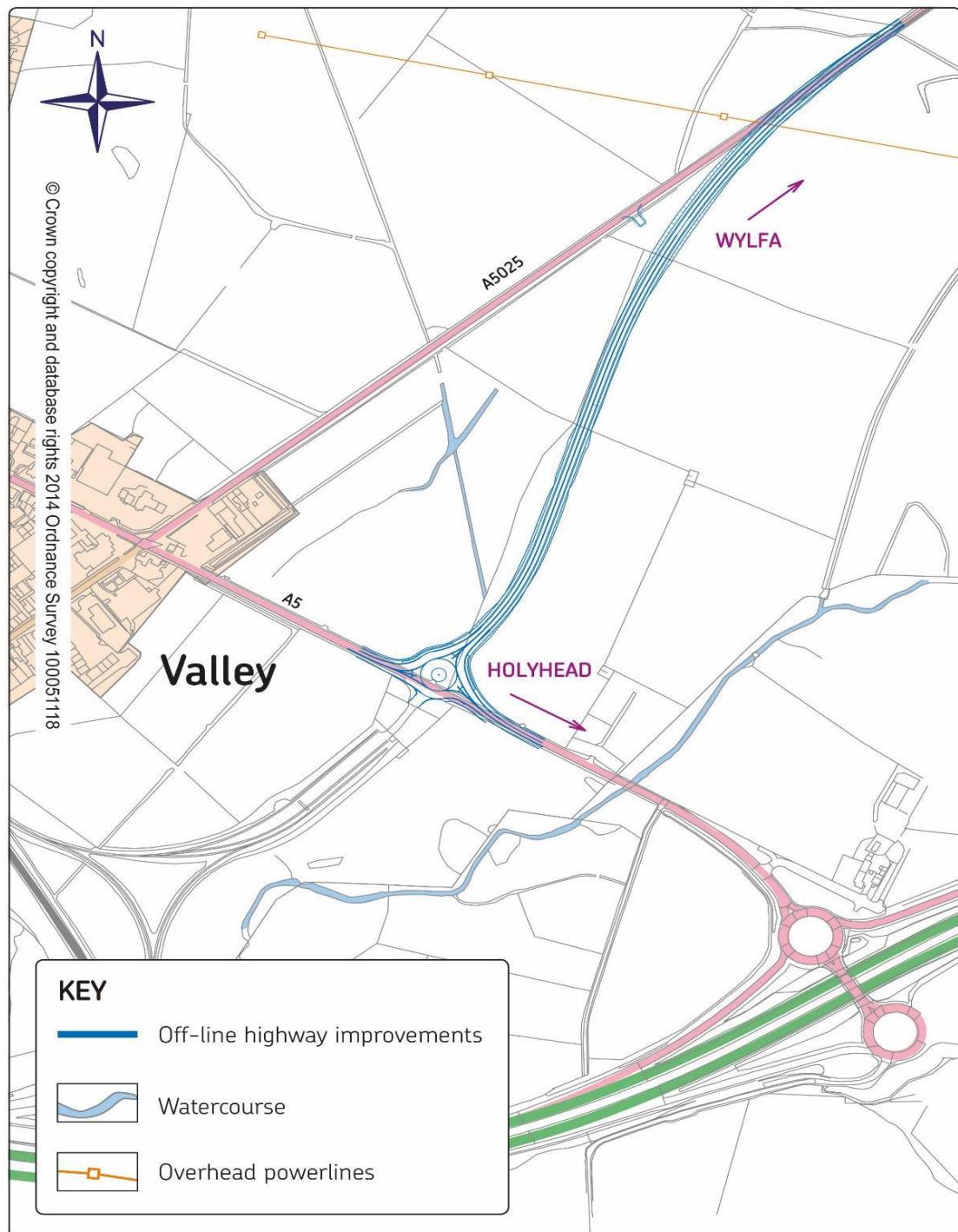
- 6.6.5 The only change to the location of the existing DMRB Stage 3 solutions was in respect of section 1. This included movement of the horizontal alignment of the bypass further to the east and amendments to the roundabout junction design to bring this closer to the existing A5.

## 7 Summary and conclusion

- 7.1.1 The Off-line Highway Improvements that form part of the DCO application have been developed through the staged DMRB process. This included detailed consideration of engineering and environmental matters, and thorough consultation with stakeholders.
- 7.1.2 The DMRB process included the following stages:
  - **DMRB Stage 1** – Locations selected for off-line improvement, with broad strategy outlined for works based on stakeholder workshops;
  - **DMRB Stage 2** – Route sections individually assessed and off-line improvement options presented taking into account Stage One Pre-Application Consultation feedback; and
  - **DMRB Stage 3** – Options individually assessed to identify the final solutions for the Off-line Highway Improvement.
- 7.1.3 The final Off-line Highway Improvements are summarised in the remainder of this section on the following pages.

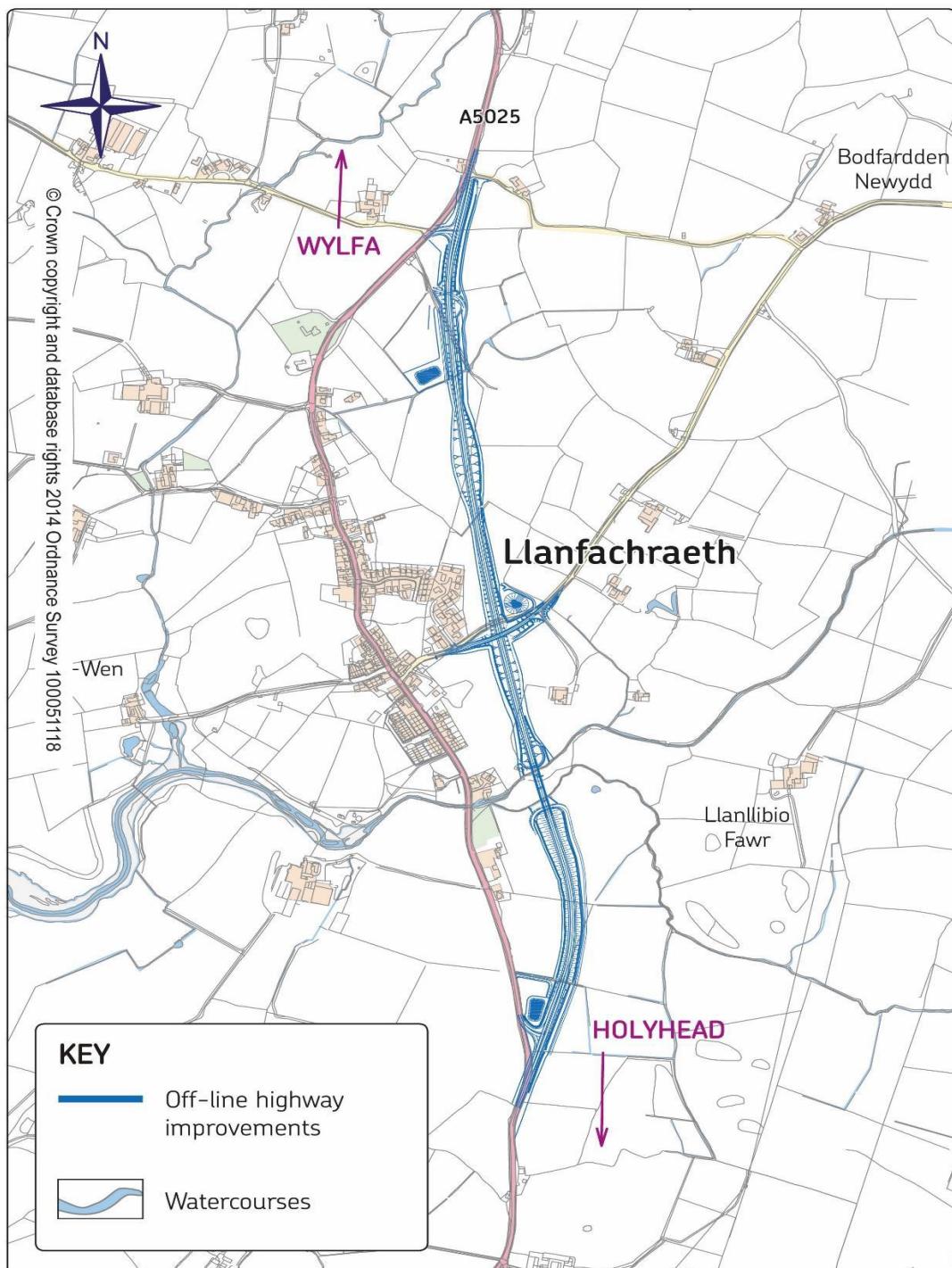
7.1.4 **Route Section 1 (A5/A5025 Junction Improvements):** Bypass Valley to the east of the village, between the A5 (south of Valley) and a new junction with the A5025 to the north of Valley. A four-arm roundabout is proposed at the southern extent.

**Figure 7-1 Route Section 1 (A5/A5025 Junction Improvements)**



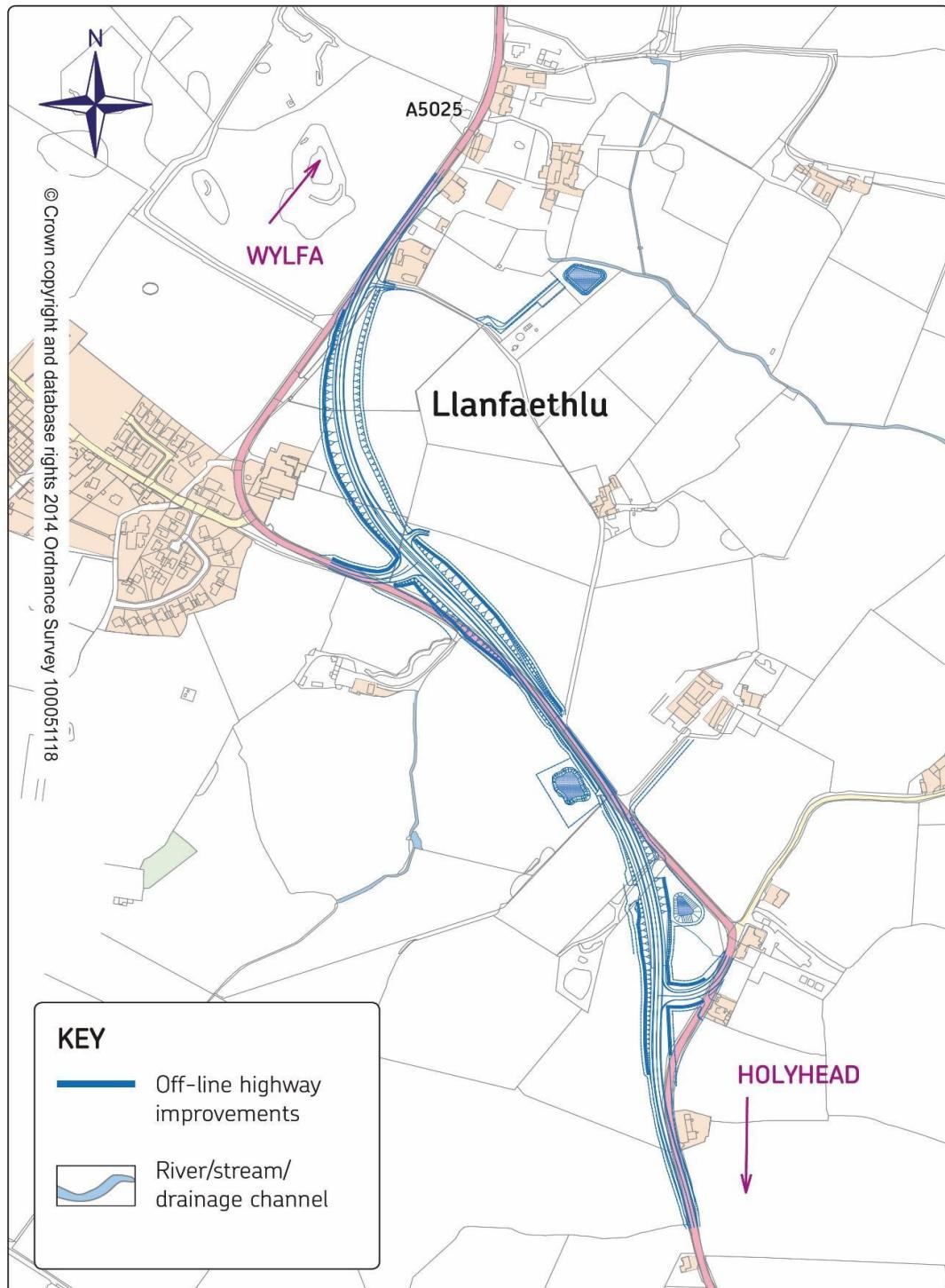
7.1.5 **Route Section 3 (Llanfachraeth Bypass):** Bypass Llanfachraeth to the east with a new 2km highway. The bypass is proposed to improve visibility, avoid an increase in vehicles passing in opposite directions through the village, and is to be located away from the village.

**Figure 7-2 Route Section 3 ((Llanfachraeth Bypass)**



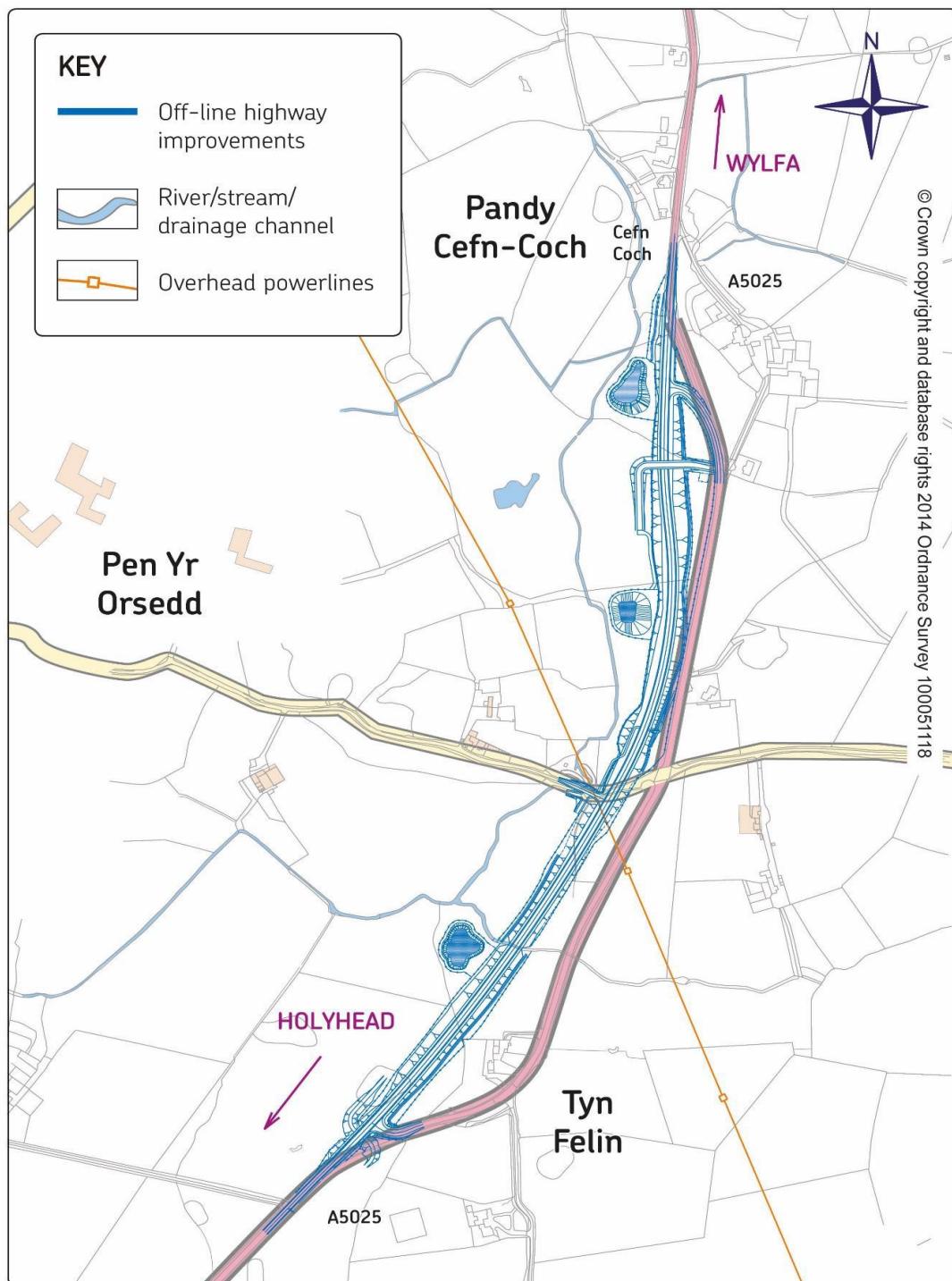
7.1.6 **Route Section 5 (Llanfaethlu Bypass):** Bypass Llanfaethlu and two existing substandard bends near the Black Lion pub and the Old Coffee Shop. The improvements will also reduce congestion passing through the village.

**Figure 7-3 Section 5 (Llanfaethlu Bypass)**



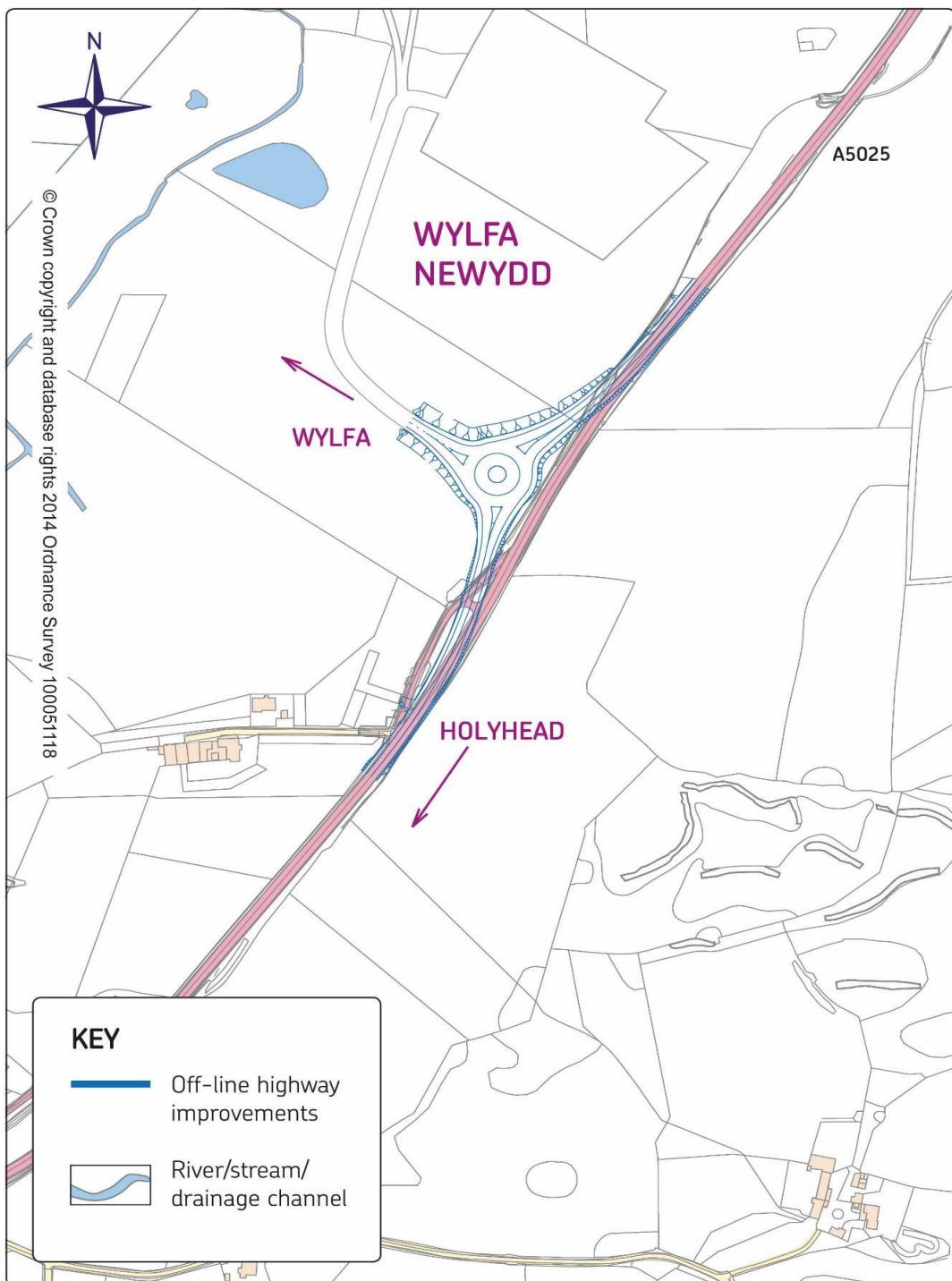
7.1.7 **Route Section 7 (CefnCoch Bypass):** Bypass the existing substandard bends in Llanrhwydrus between Llanrhyyddlad and CefnCoch. The road leading to Llanfechell to the east of the proposed bypass will be stopped-up and the existing staggered cross-roads along the A5025 between Llanrhwydrus and Llanfachell will be removed.

**Figure 7-4 Section 7 (CefnCoch Bypass)**



- 7.1.8 **Power Station Access Road Junction:** provide a new junction from the A5025 to link with the Power Station Access Road. A new roundabout junction will be designed to provide access to the proposed Power Station Site via a new access road.

**Figure 7-5 Power Station Access Road Junction**



## 8 References

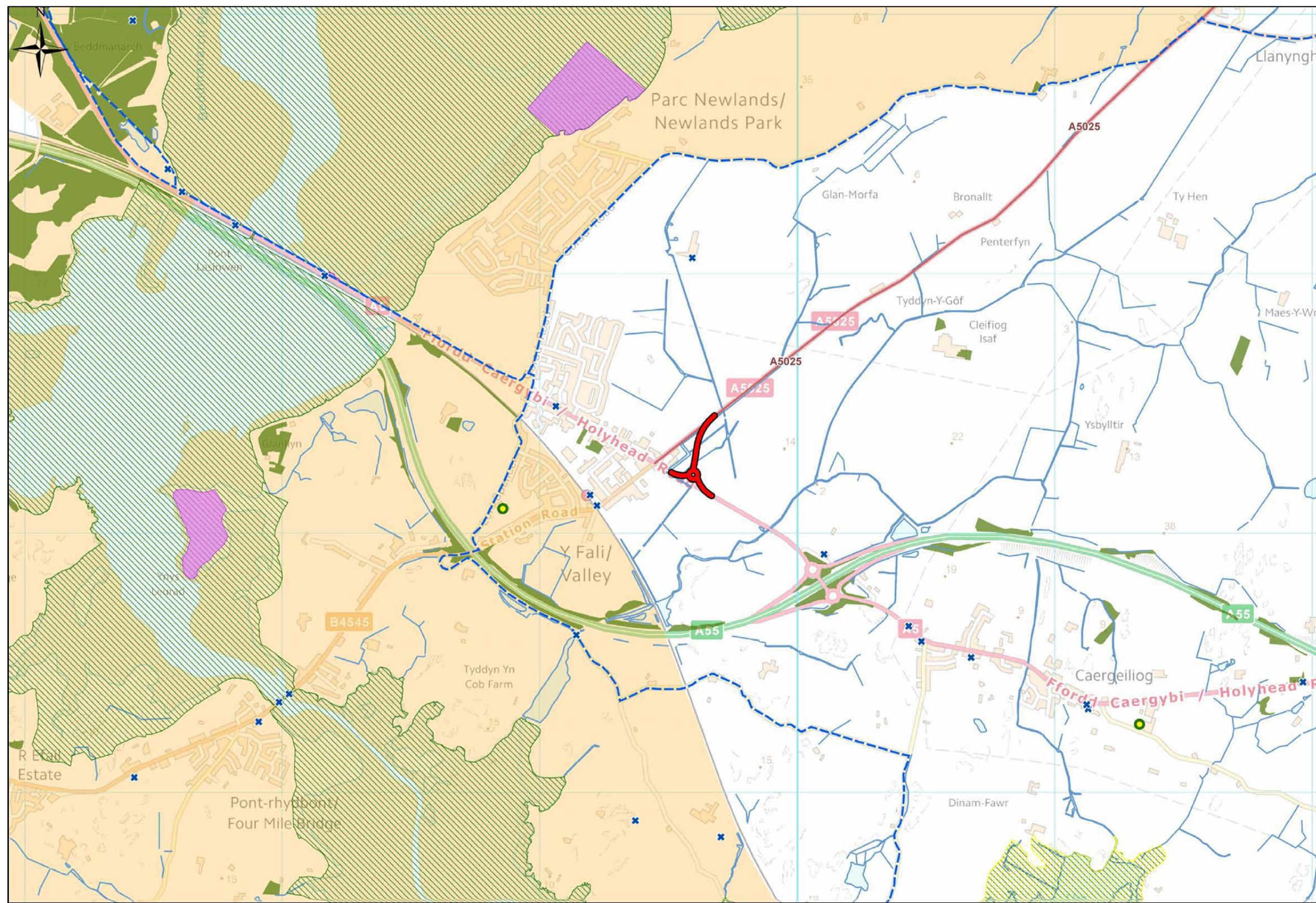
**Table 8-1 Schedule of References**

ID	Reference
RD1	The Planning Act 2008. 2008. [Online]. [Accessed: 22 January 2018]. Available from: <a href="https://www.legislation.gov.uk/ukpga/2008/29/contents">https://www.legislation.gov.uk/ukpga/2008/29/contents</a> .
RD2	Town and Country Planning Act (TCPA) 1990. 1990. [Online]. [Accessed: 22 January 2018]. Available from: <a href="https://www.legislation.gov.uk/ukpga/1990/8/contents">https://www.legislation.gov.uk/ukpga/1990/8/contents</a>
RD3	Highways Act 1980, Section 278. 1980. [Online]. [Accessed: 22 January 2018]. Available from: <a href="https://www.legislation.gov.uk/ukpga/1980/66/section/278">https://www.legislation.gov.uk/ukpga/1980/66/section/278</a> .
RD4	Department for Transport. 2017. <i>Design Manual for Roads and Bridges (DMRB) Guidance 2017</i> . [Online]. [Accessed: 22 January 2018]. Available from: <a href="http://www.standardsforhighways.co.uk/ha/standards/dmrb/">http://www.standardsforhighways.co.uk/ha/standards/dmrb/</a> .
RD5	Mott MacDonald, October 2011 Stage 1 Scheme Assessment Report – WYB0849 Route Improvement Contract - Version Ref: WYL-PD-SDT-REP-00009
RD6	URS, December 2014, Wylfa Highway Works, Stage 2 Scheme Assessment Report, Rev 05, WN02.05-URS-REP-001
RD7	AECOM 2018, A5025 Highways Improvements: Stage 3 Scheme Assessment Report, Project ref: 47071078
RD8	Grontmij. 2011. <i>Transport Position Statement for Major Developments – Revision C (September 2011)</i> . [Online]. [Accessed: 22 January 2018]. Available from: <a href="http://www.anglesey.gov.uk/Journals/2011/09/21/enc-b-enviro-scrutiny-27-09-11.pdf">http://www.anglesey.gov.uk/Journals/2011/09/21/enc-b-enviro-scrutiny-27-09-11.pdf</a> .
RD9	Grontmij. 2011. <i>Transport Position Statement for Wylfa New Nuclear Power Station – Revision A (September 2011)</i> . [Online]. [Accessed: 22 January 2018]. Available from: <a href="http://www.anglesey.gov.uk/Journals/2011/09/21/enc-b-enviro-scrutiny-27-09-11.pdf">http://www.anglesey.gov.uk/Journals/2011/09/21/enc-b-enviro-scrutiny-27-09-11.pdf</a>

## **Appendix 4.1- DMRB Stage 1 Options Drawings**

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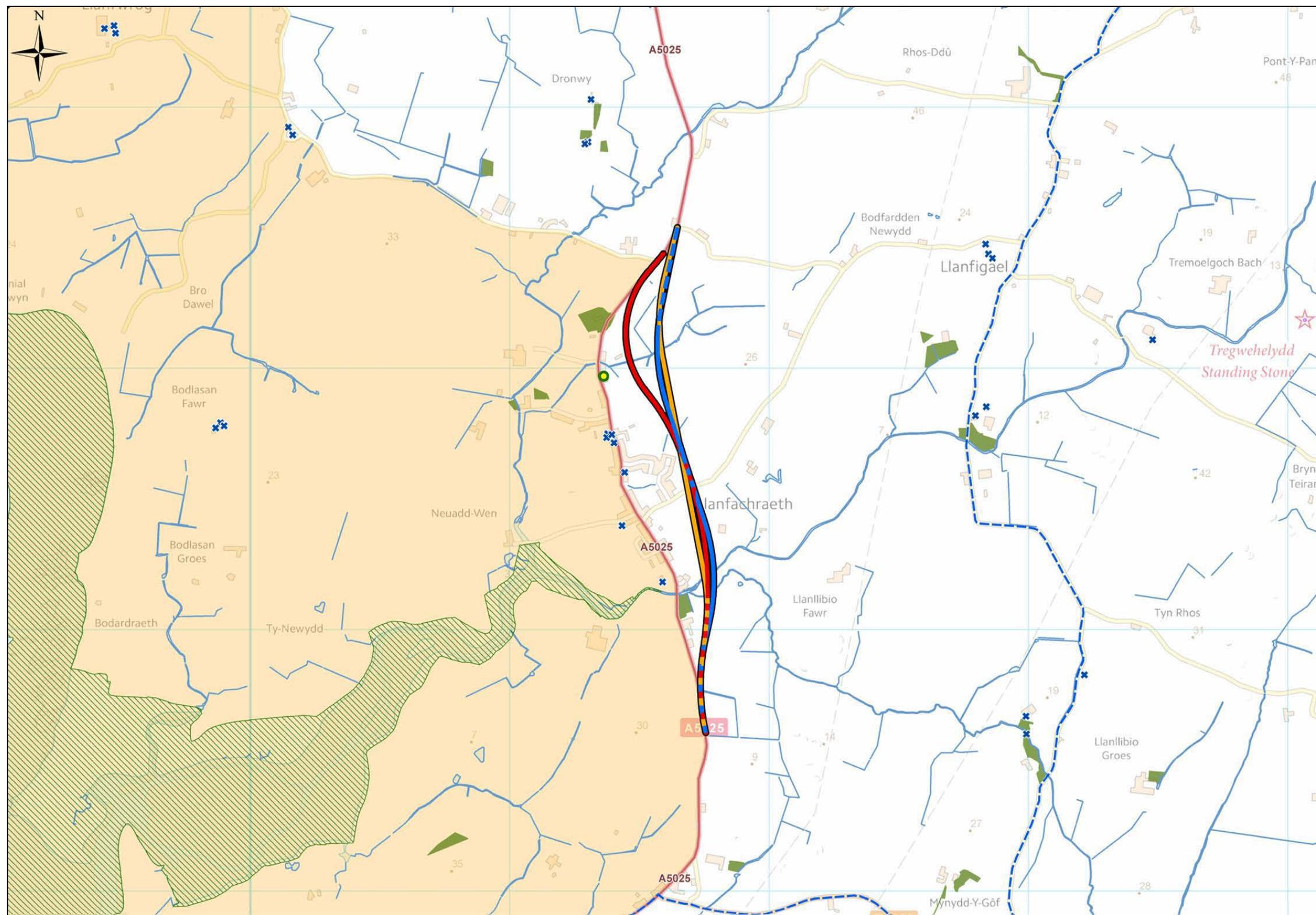
## A5/A5025 Valley Junction Improvements



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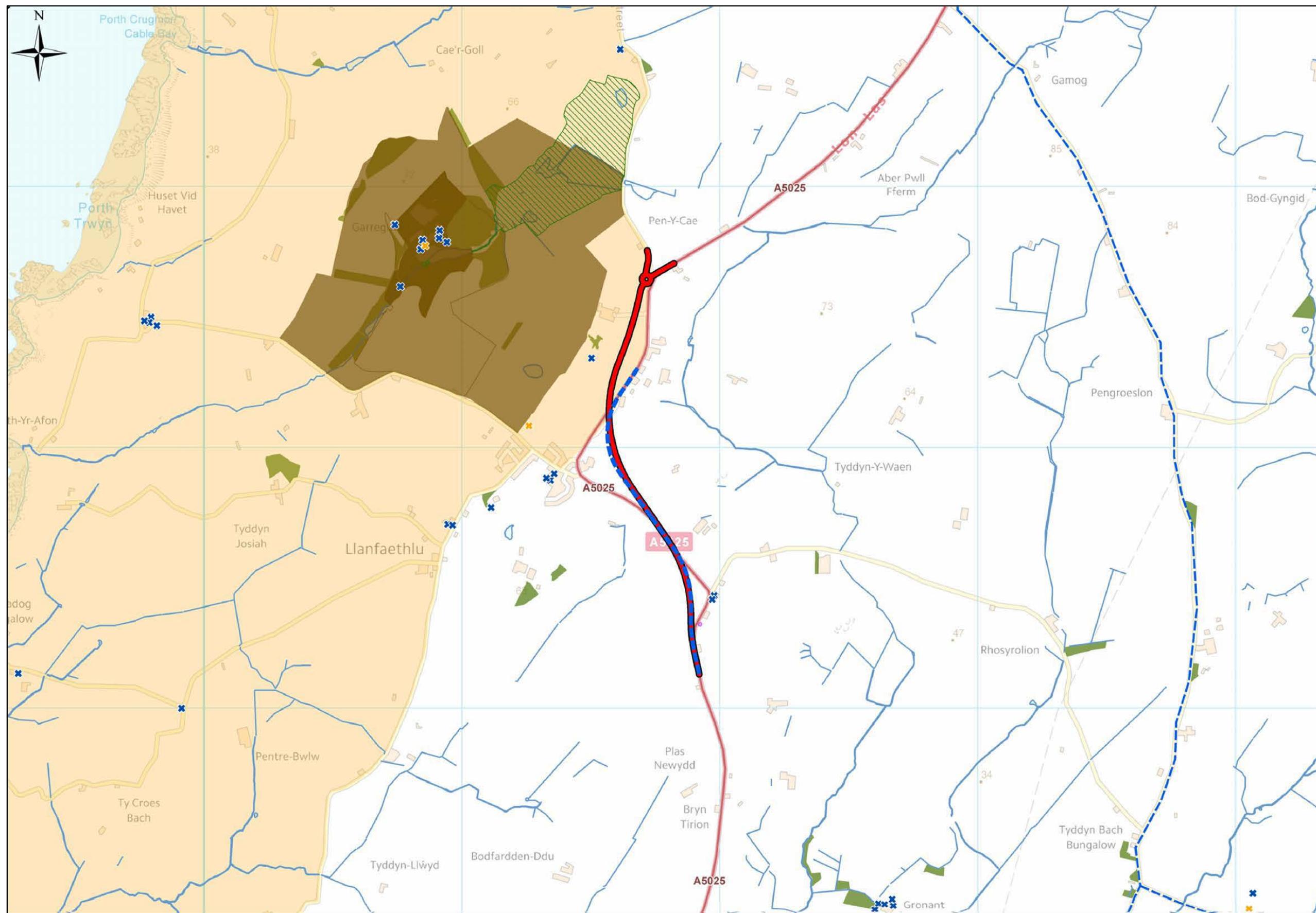
## Appendix 4.1 – S1SAR A5025 Off-line Highway Improvement Drawings

### Llanfachraeth Bypass



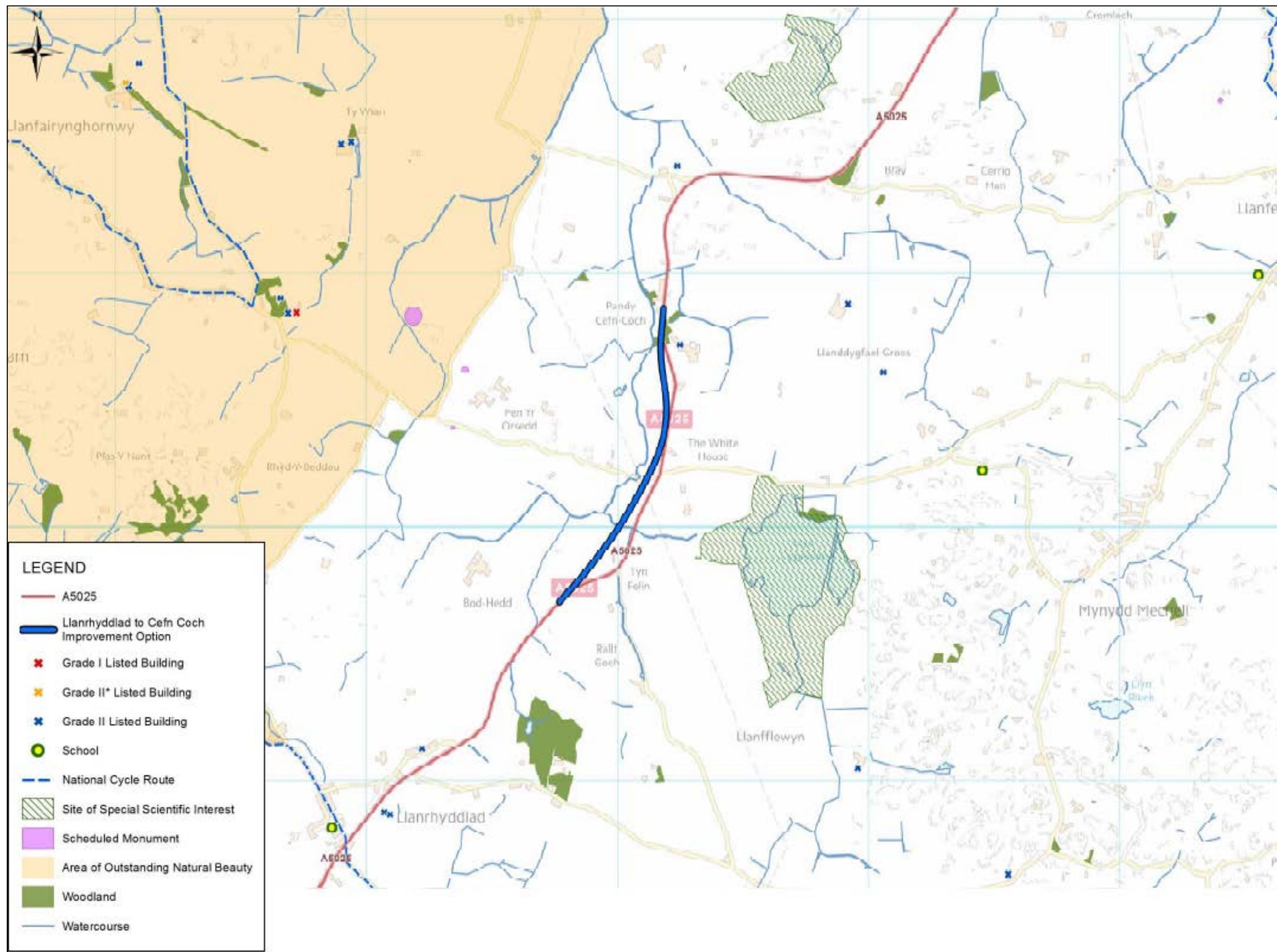
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## Llanfaethlu Bypass



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## Cefn Coch Bypass



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## **Appendix 5.1 - DMRB Stage 2 Options Drawings**

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## Appendix 5.1 – S2SAR Off-line Highway Improvement Option Drawings

## A5/A5025 Valley Junction Improvements

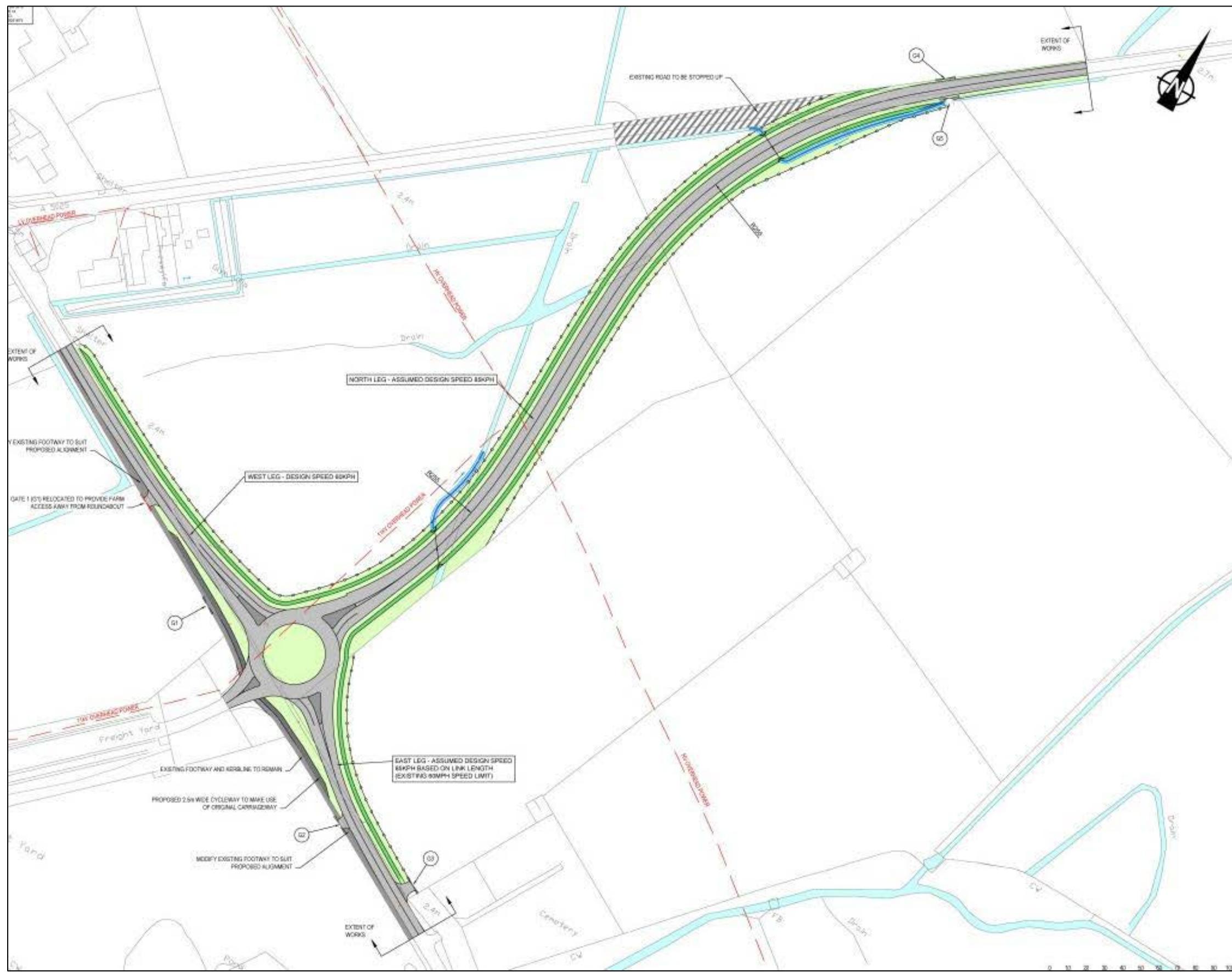
## Option 1



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Appendix 5.1 – S2SAR Off-line Highway Improvement Option Drawings

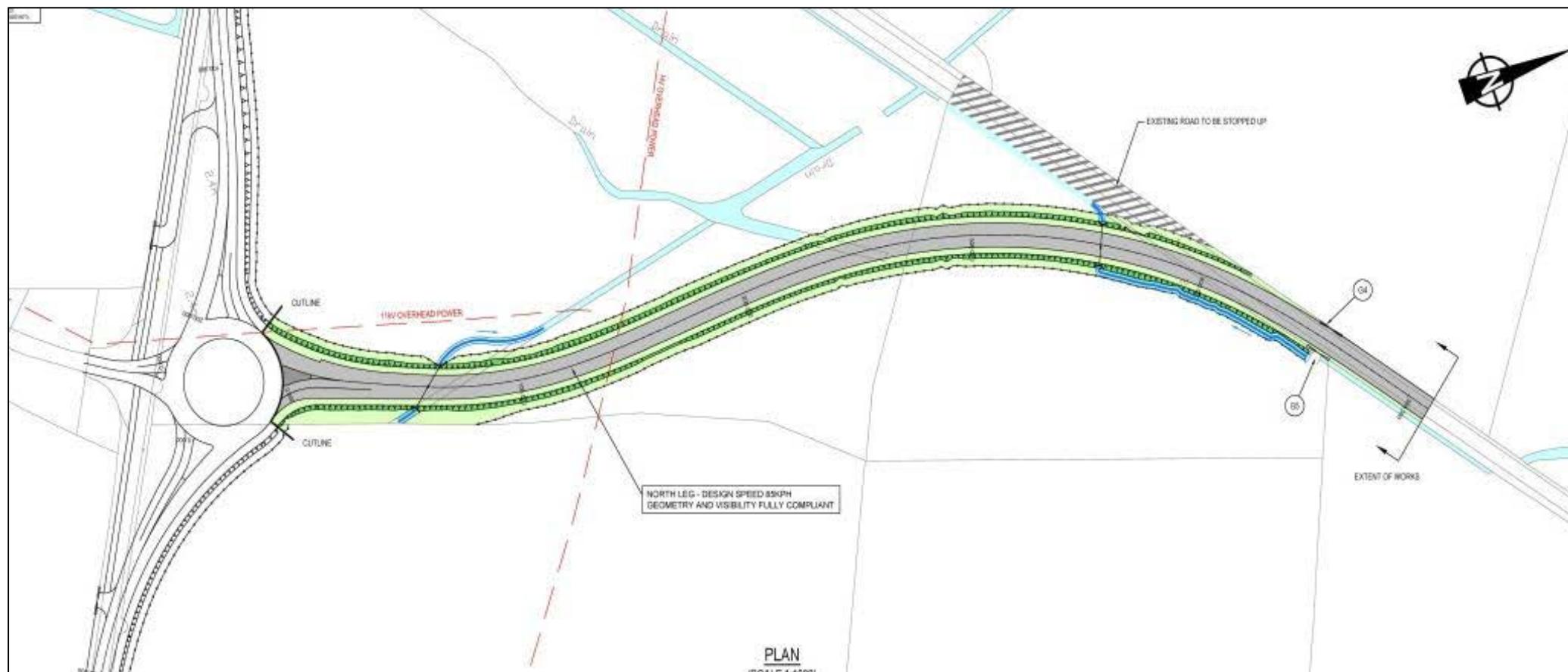
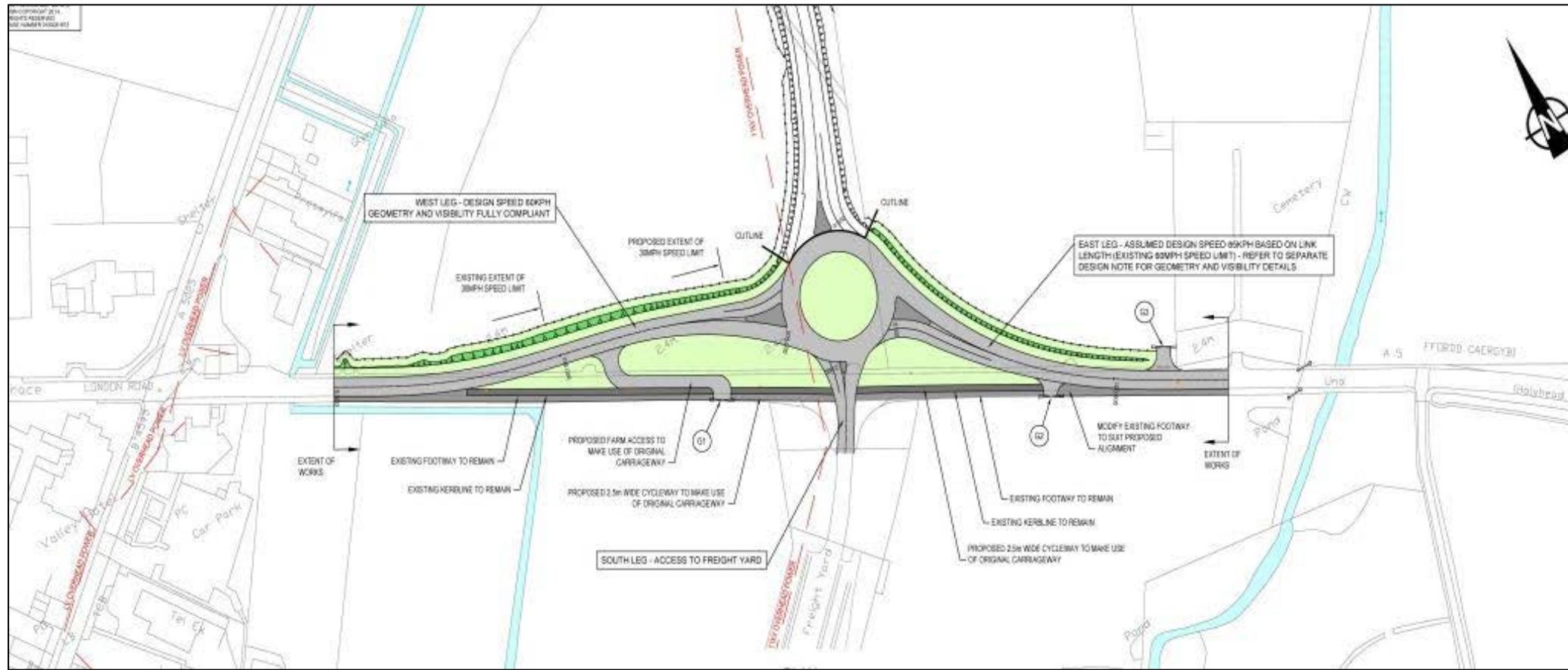
## Option 2



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**Appendix 5.1 – S2SAR Off-line Highway Improvement Option Drawings**

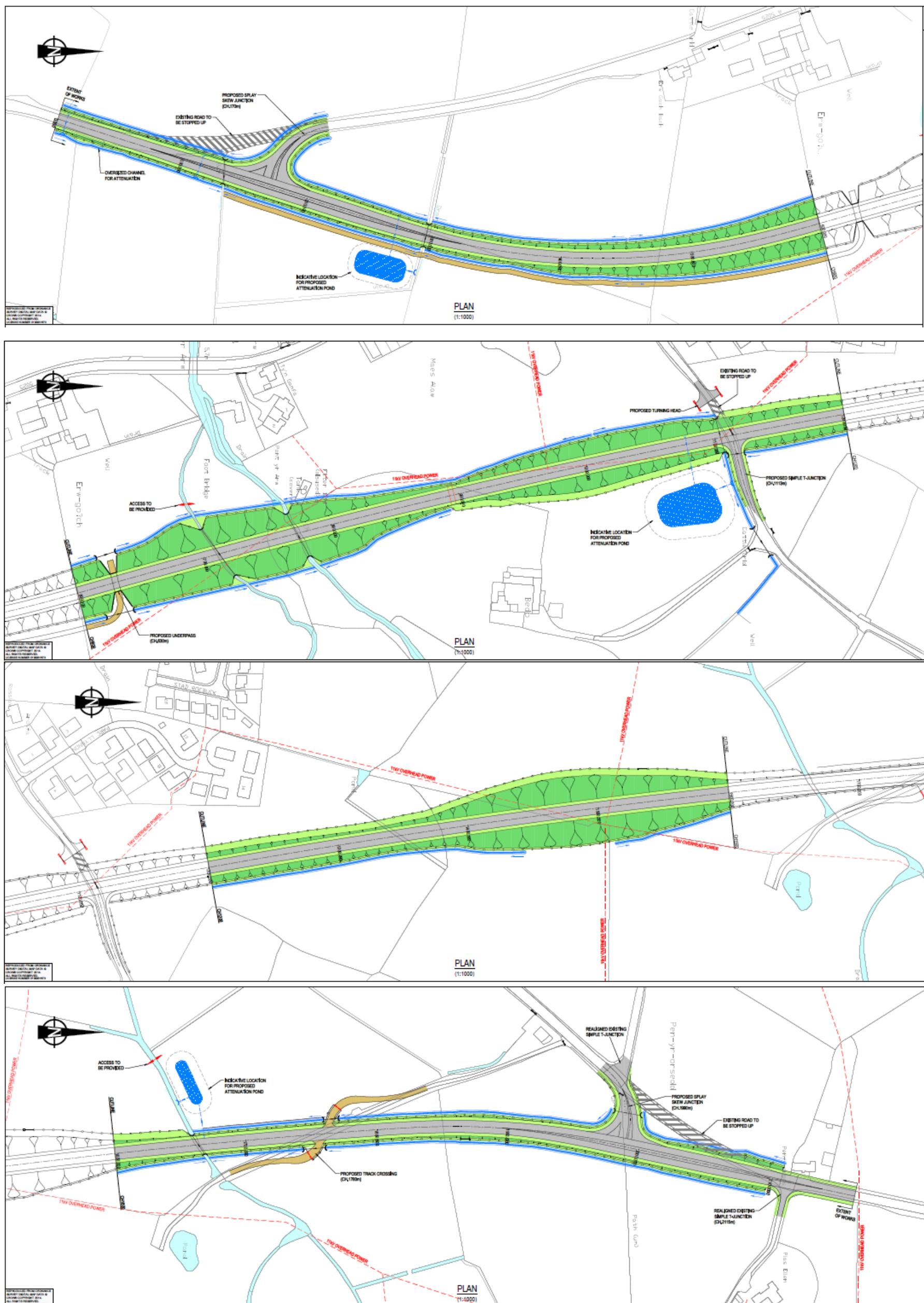
## Option 3



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# Llanfachraeth Bypass

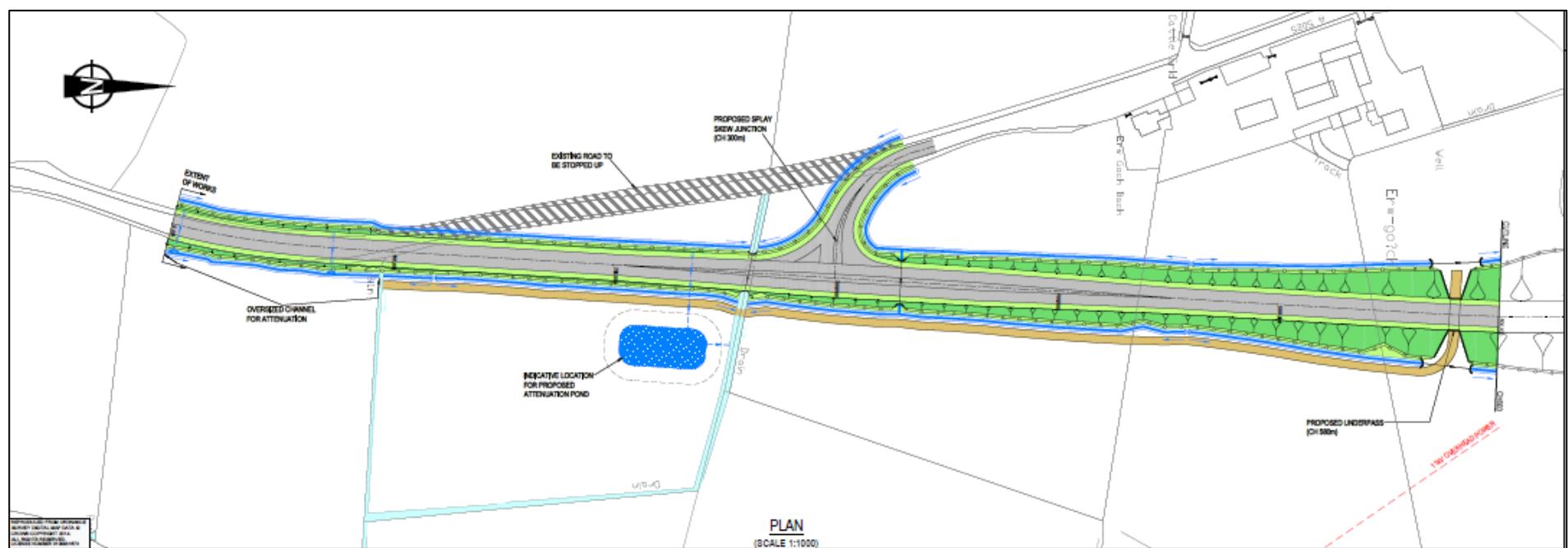
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## Appendix 5.1 – S2SAR Off-line Highway Improvement Option Drawings

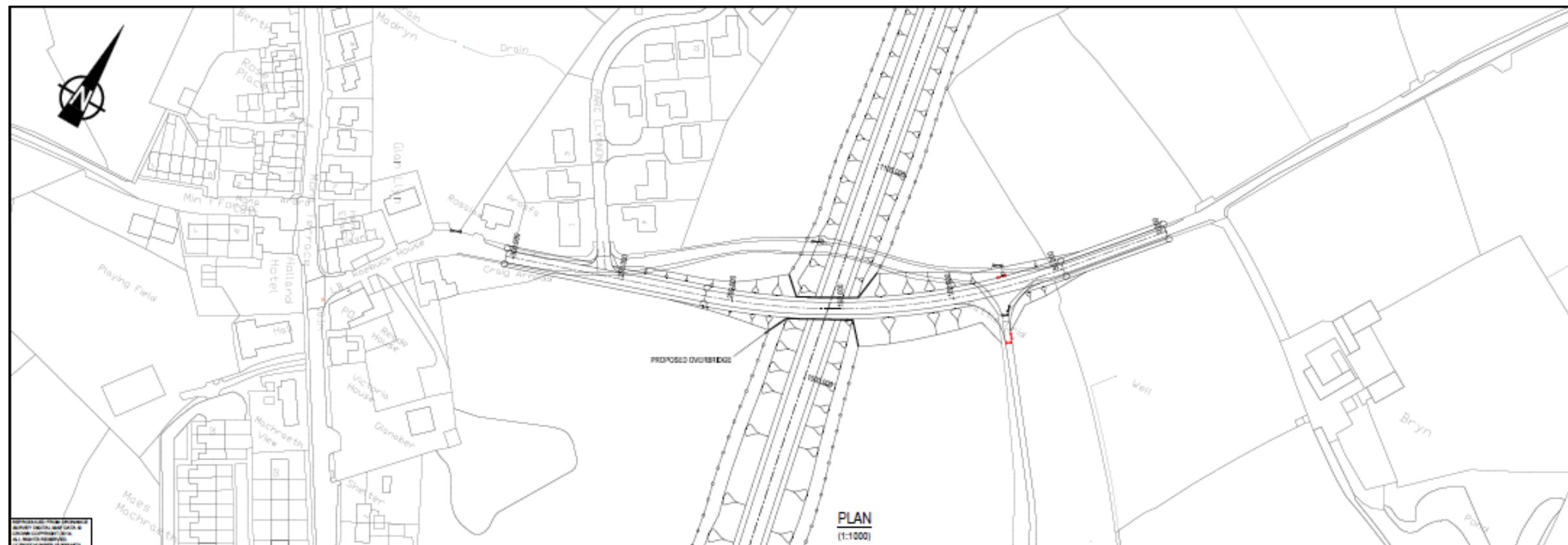
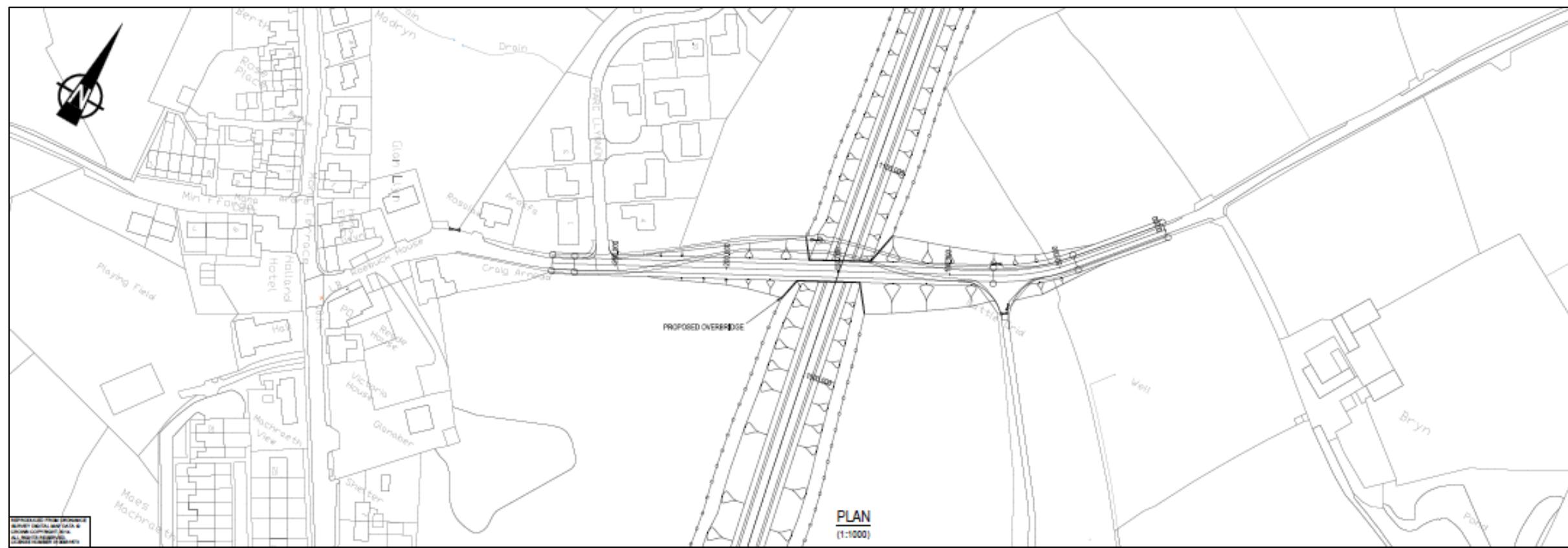
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## Appendix 5.1 – S2SAR Off-line Highway Improvement Option Drawings

### Option 3

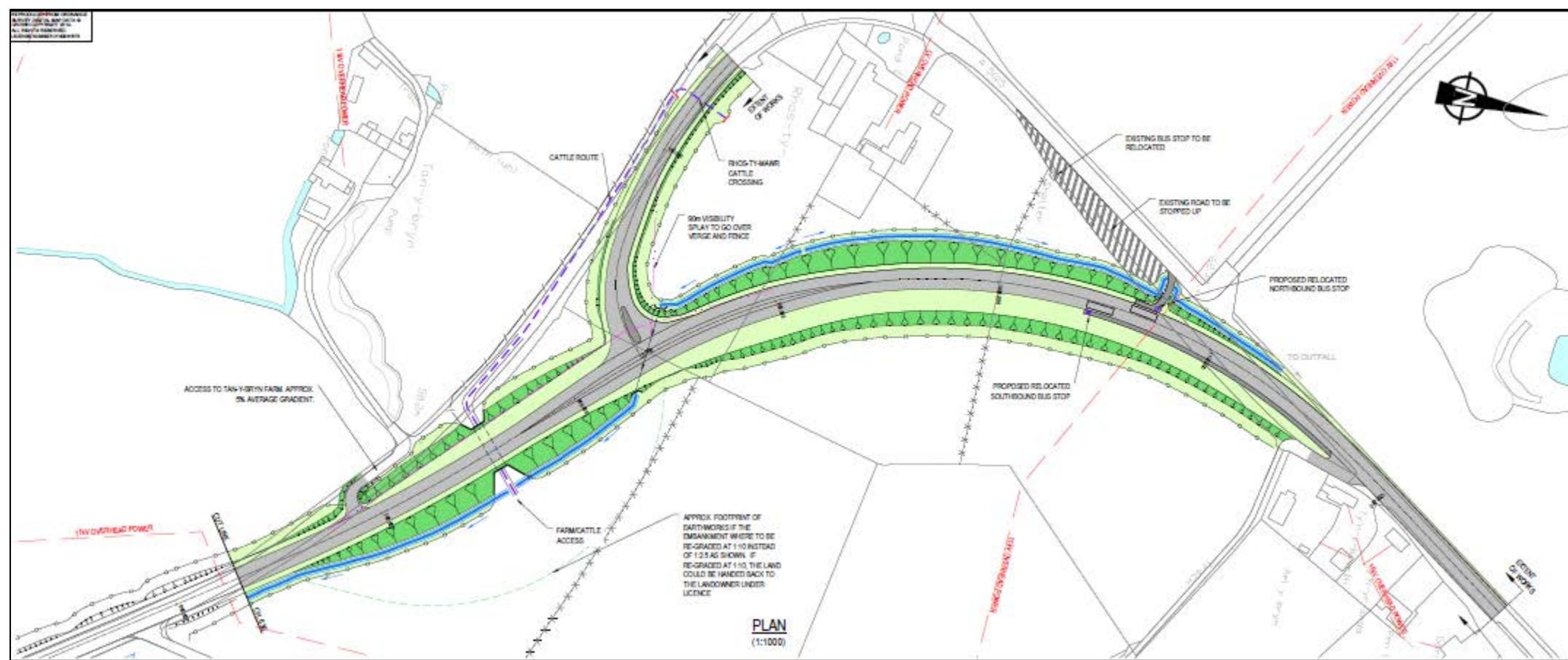
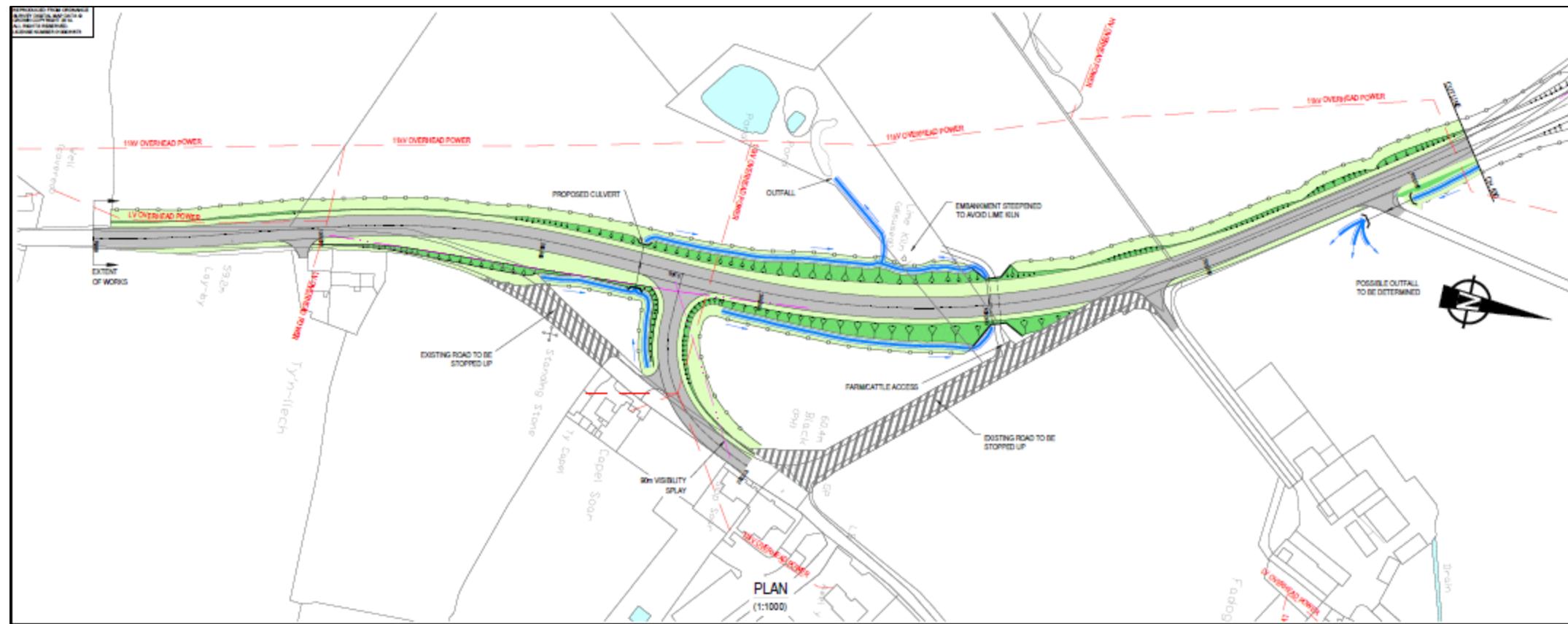


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## Appendix 5.1 – S2SAR Off-line Highway Improvement Option Drawings

# Llanfaethlu Bypass

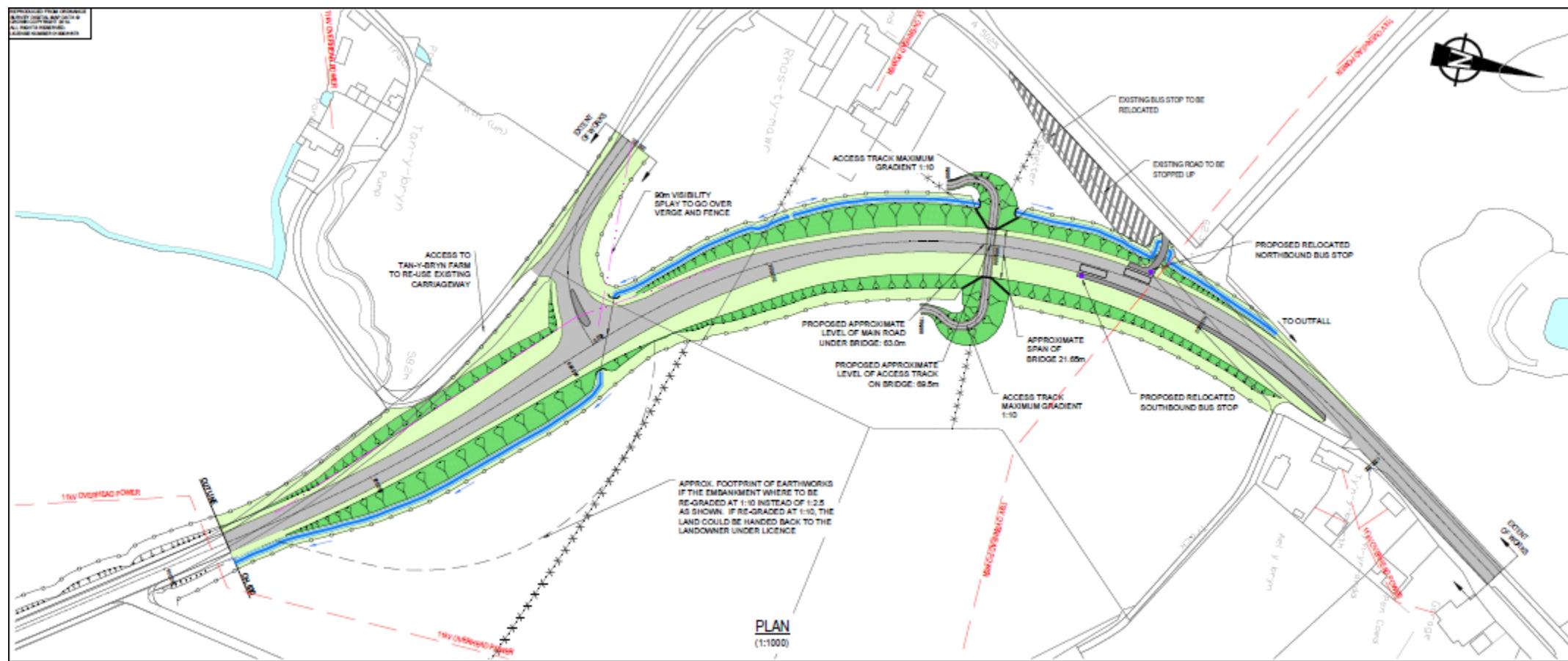
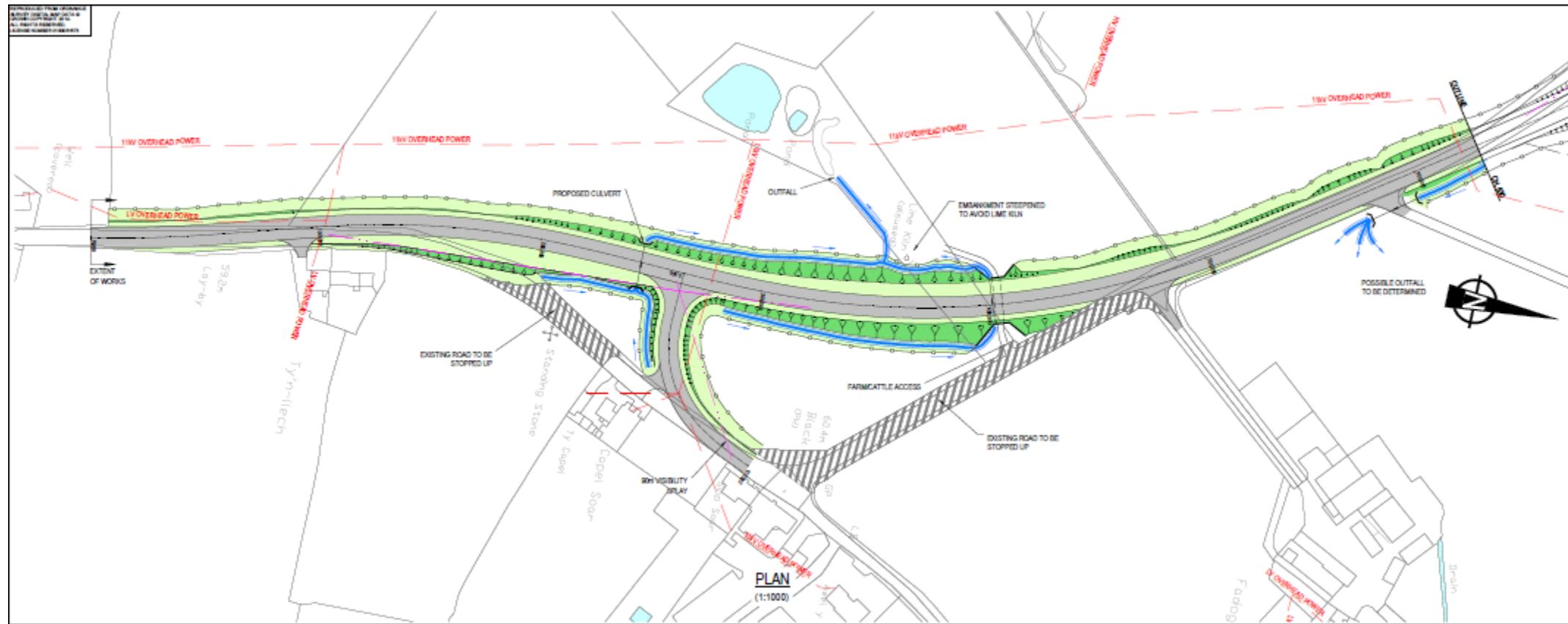
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## Appendix 5.1 – S2SAR Off-line Highway Improvement Option Drawings

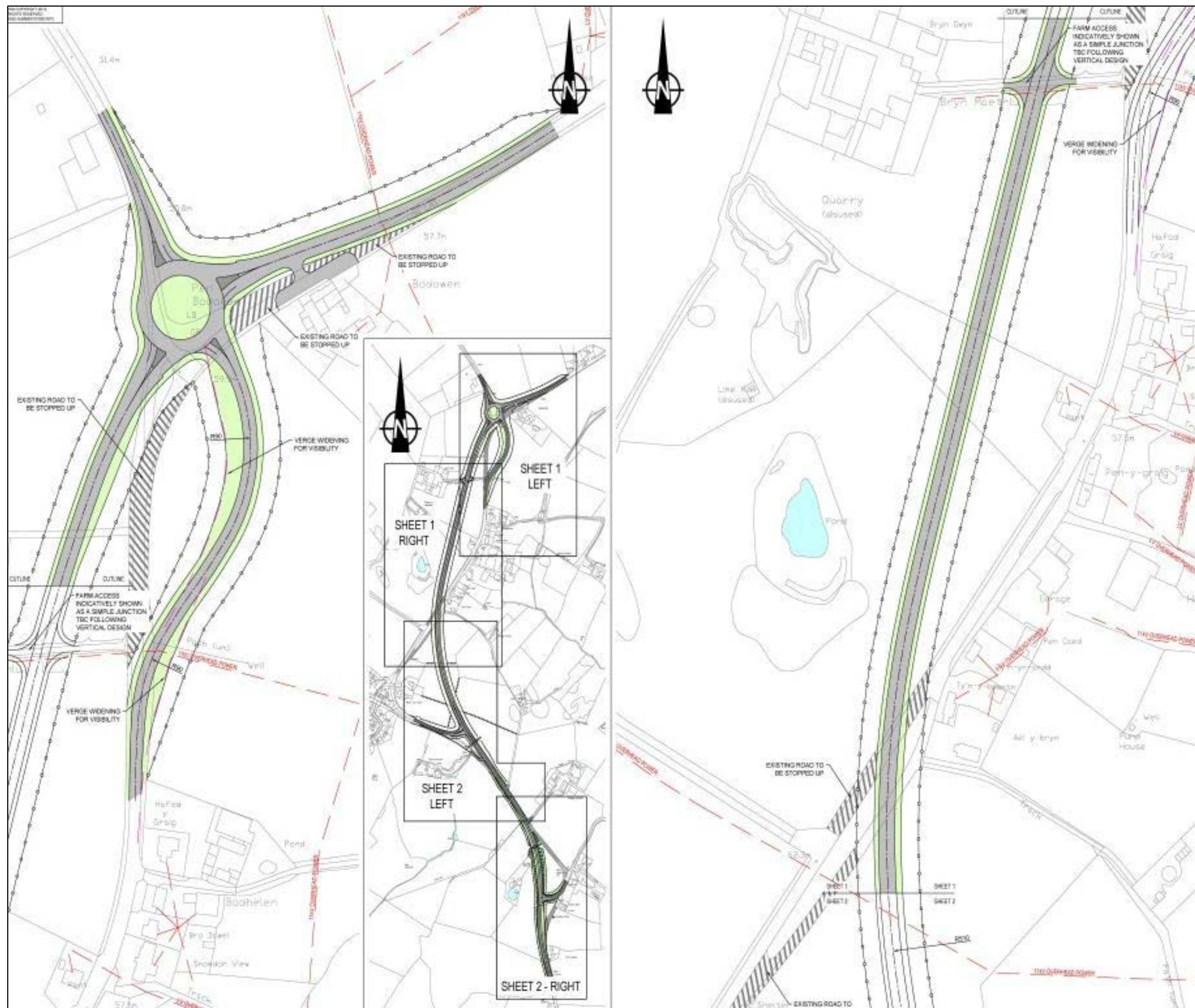
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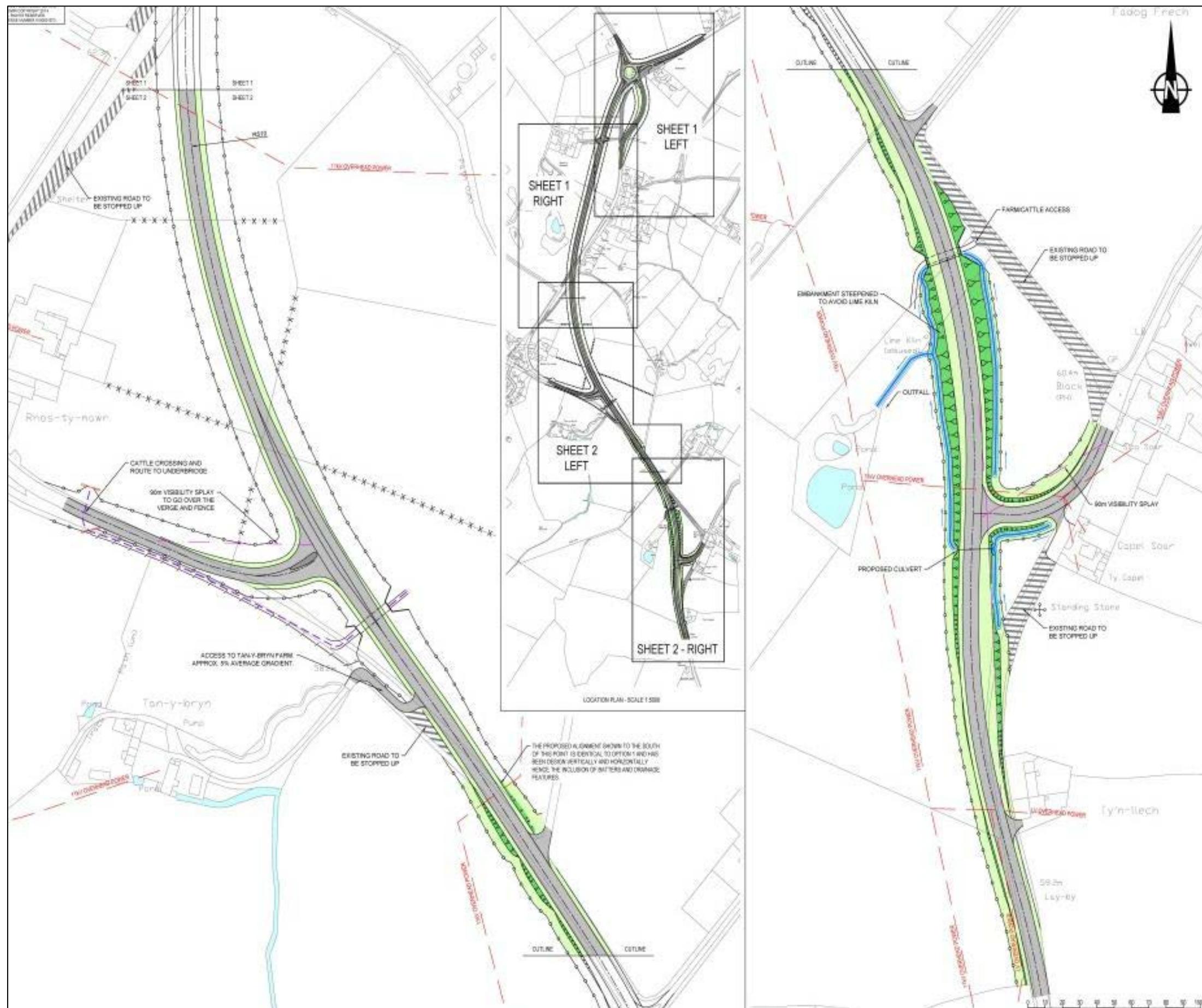
## Appendix 5.1 – S2SAR Off-line Highway Improvement Option Drawings

## Option 3



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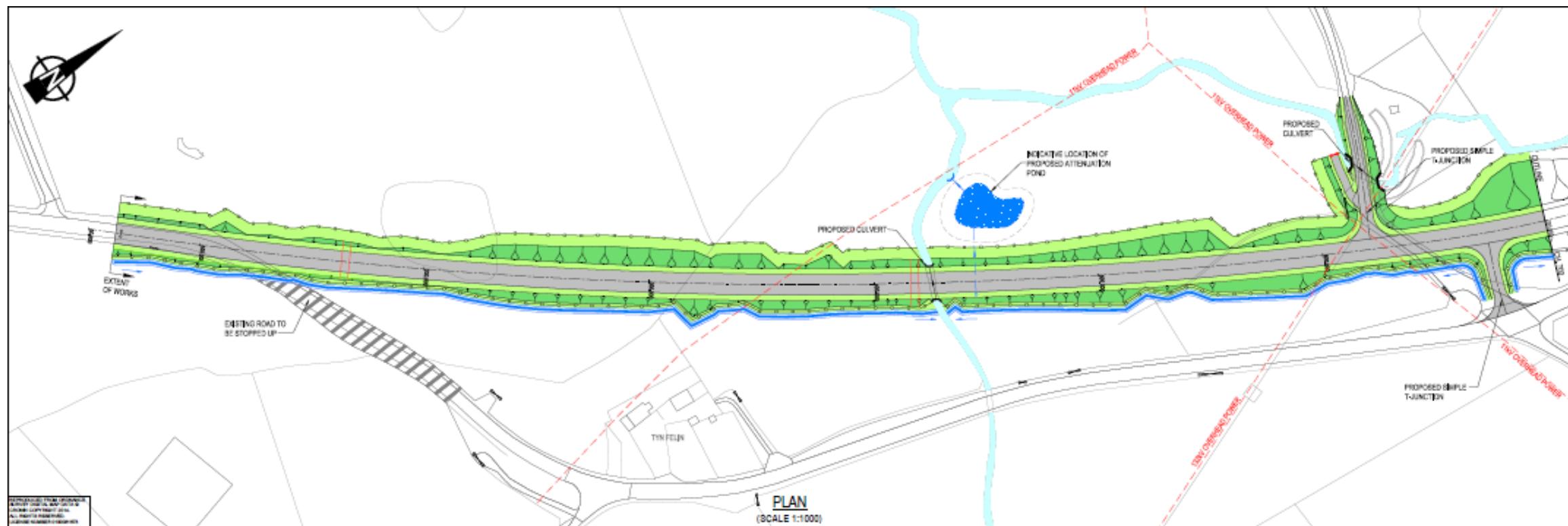
Appendix 5.1 – S2SAR Off-line Highway Improvement Option Drawings



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## Cefn Coch Bypass

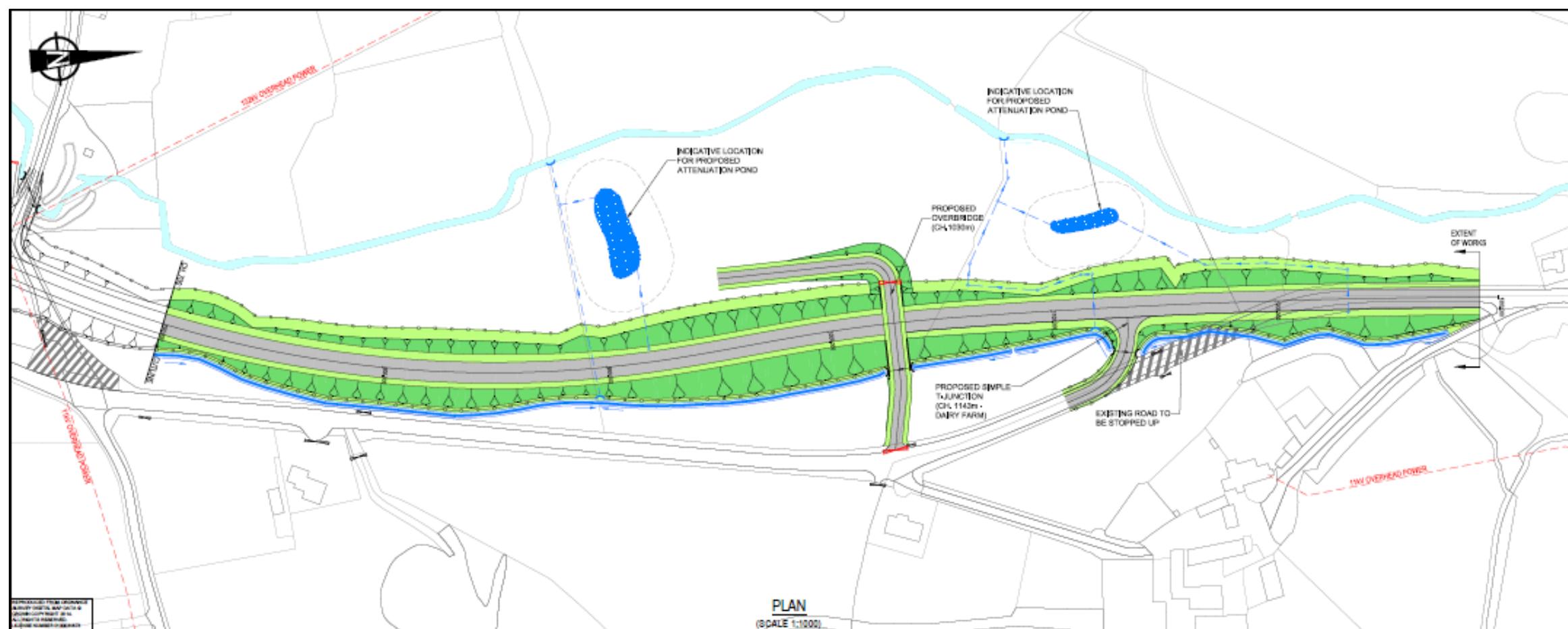
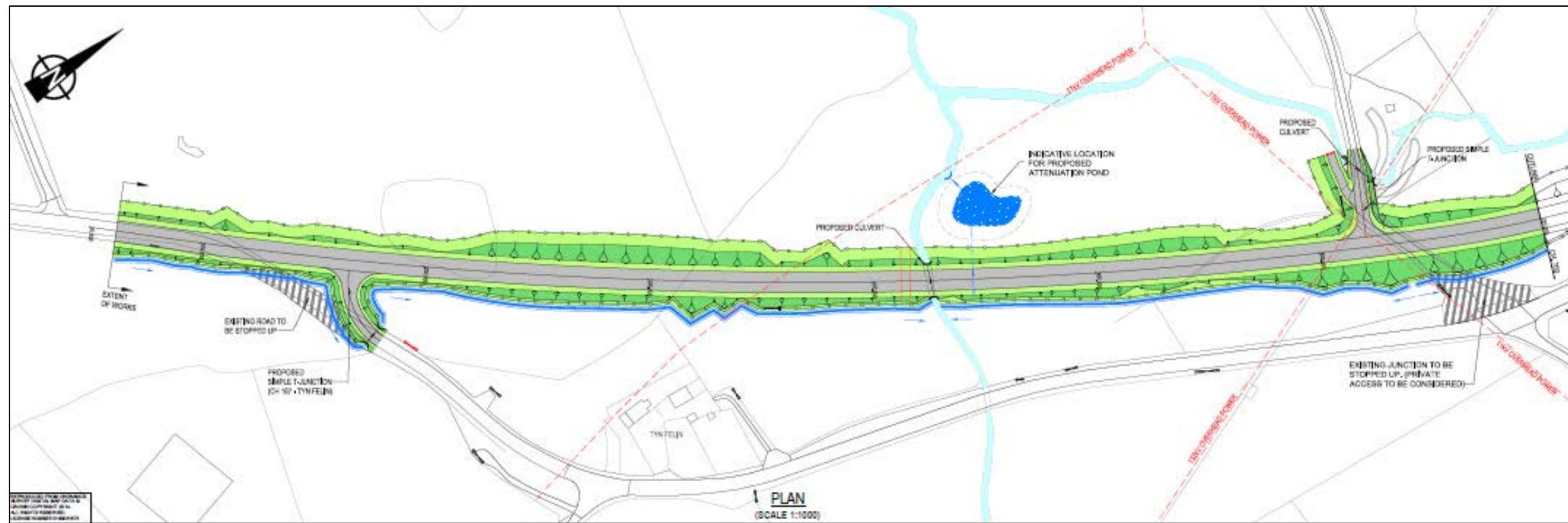
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Appendix 5.1 – S2SAR Off-line Highway Improvement Option Drawings

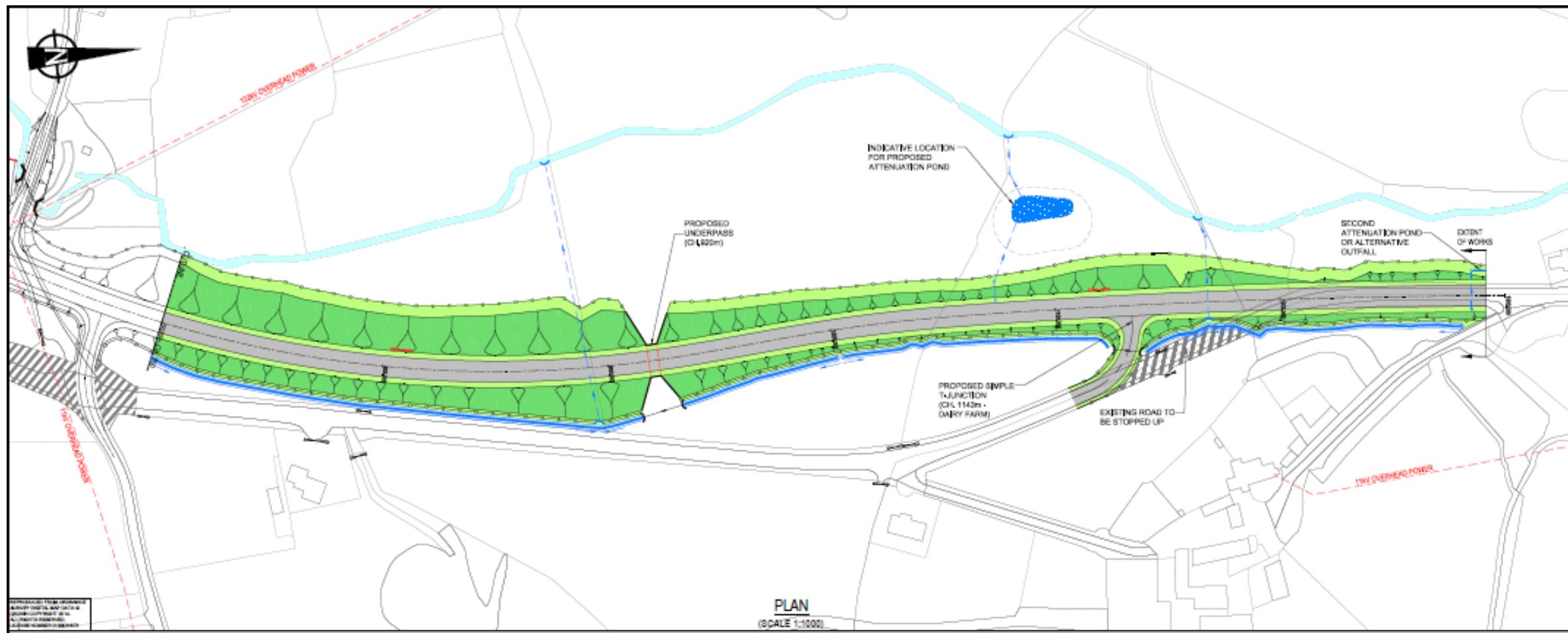
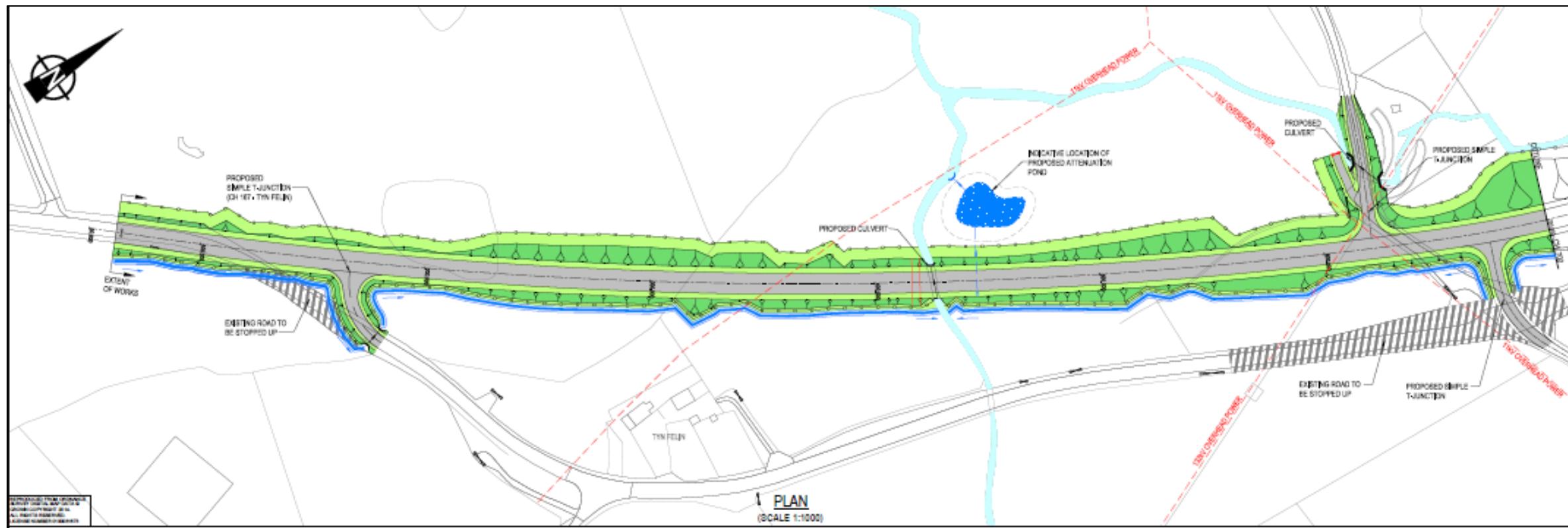
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## Appendix 5.1 – S2SAR Off-line Highway Improvement Option Drawings

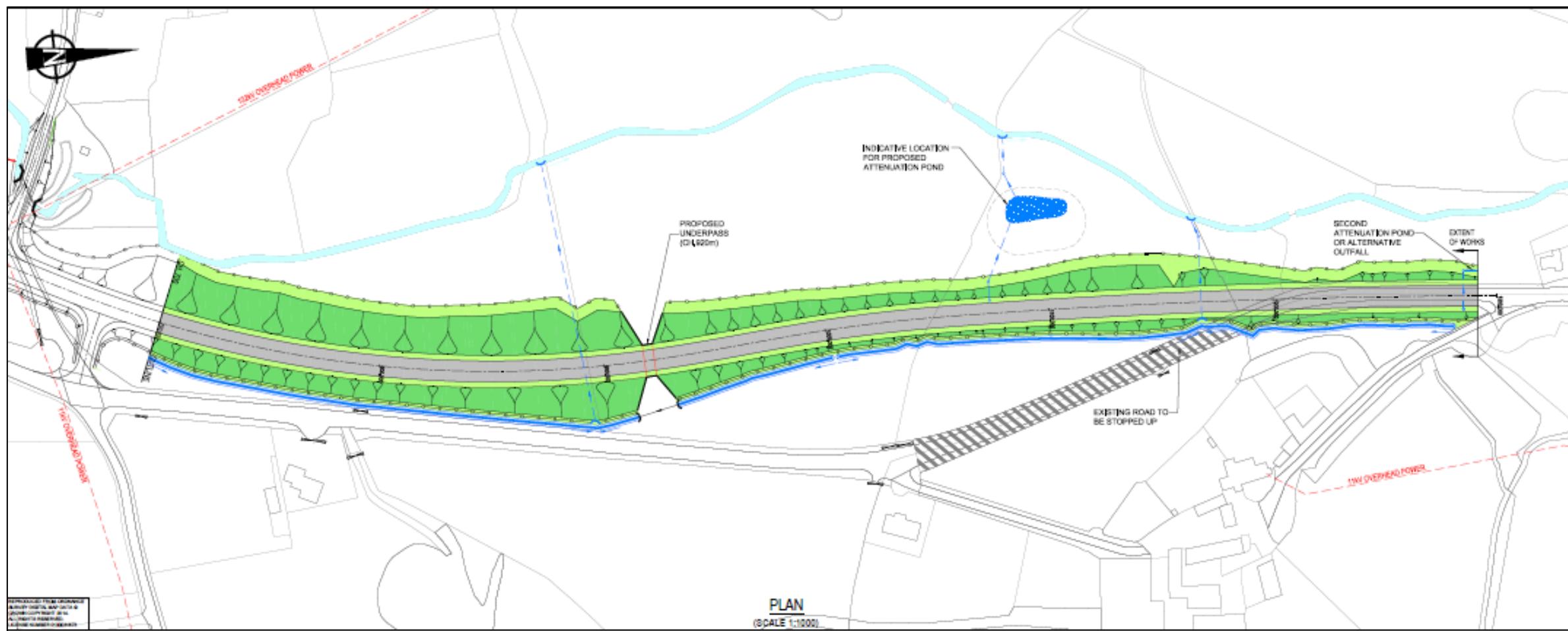
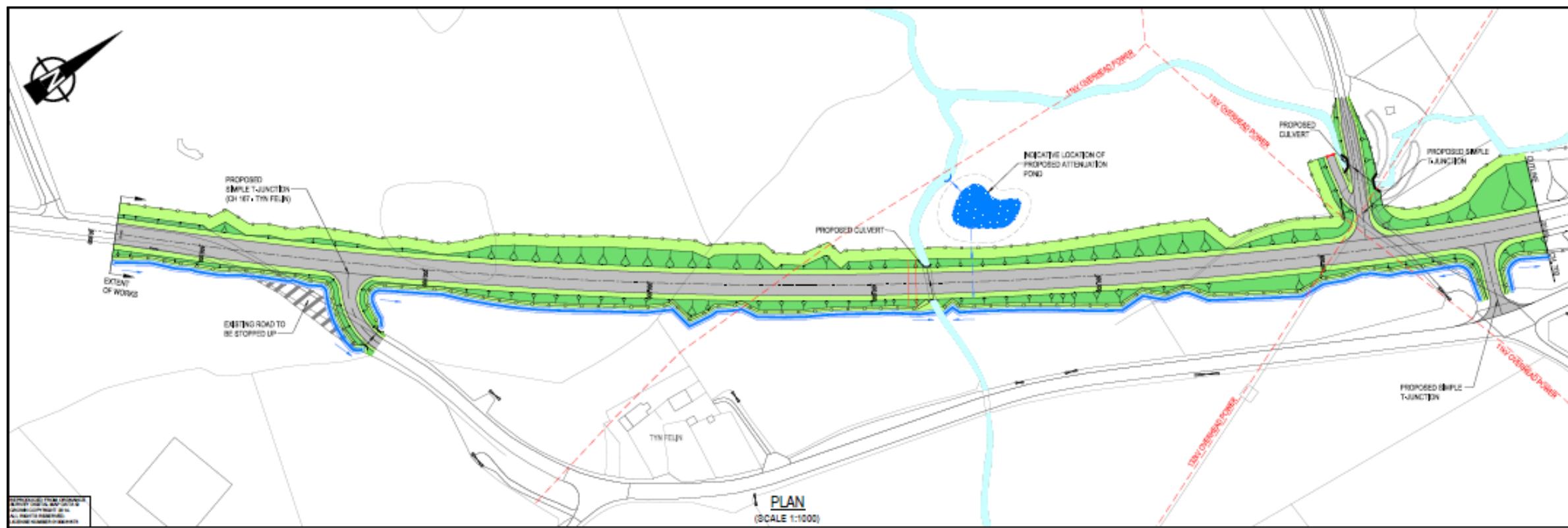
### Option 3



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## Appendix 5.1 – S2SAR Off-line Highway Improvement Option Drawings

### Option 4



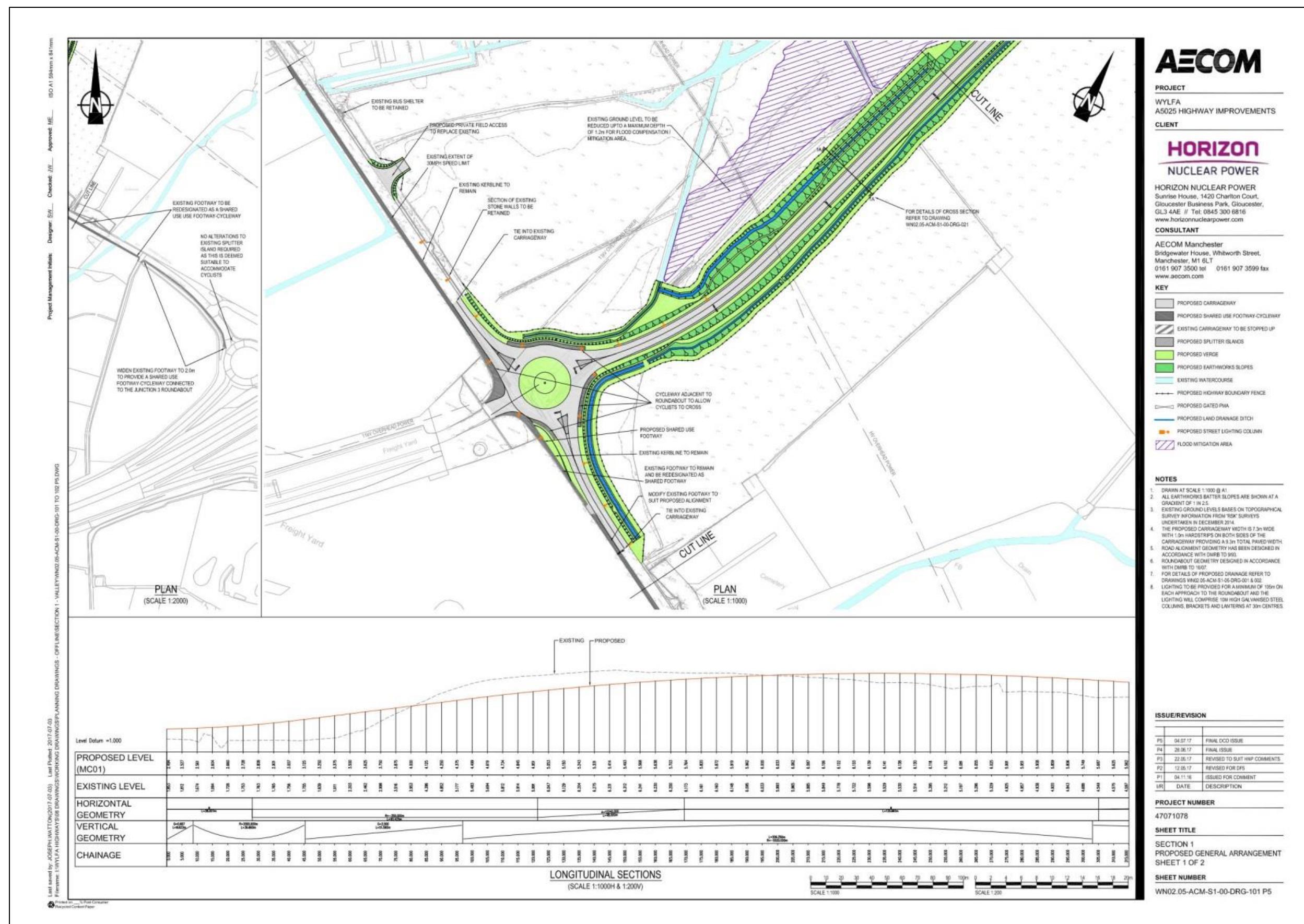
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## **Appendix 6.1- Stage 3 Selected Solutions**

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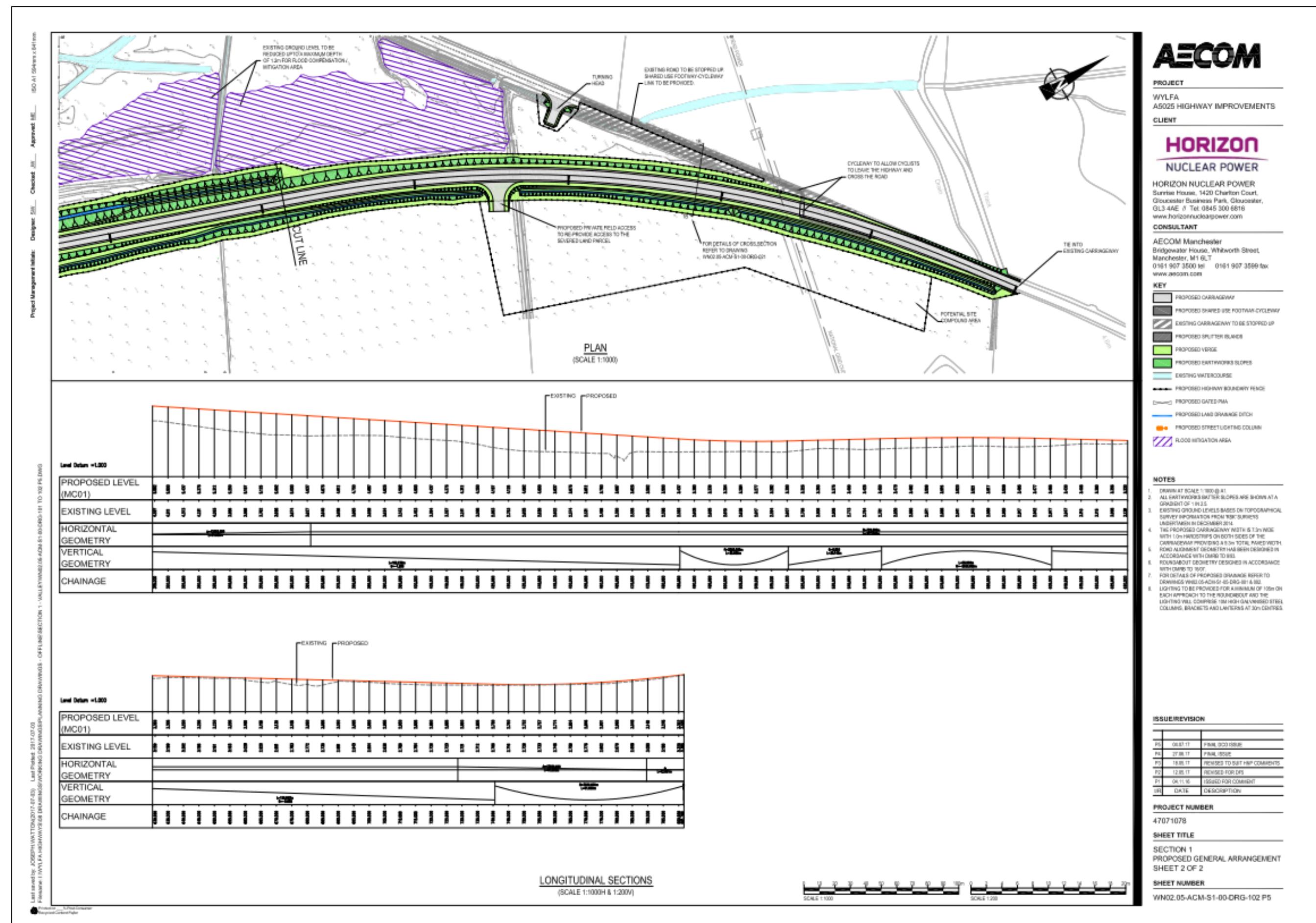
## **Appendix 6.1 – S3SAR Off-line Highway Improvements – Preferred Option Drawings**

## A5/A5025 Valley Junction Improvements – Preferred Option



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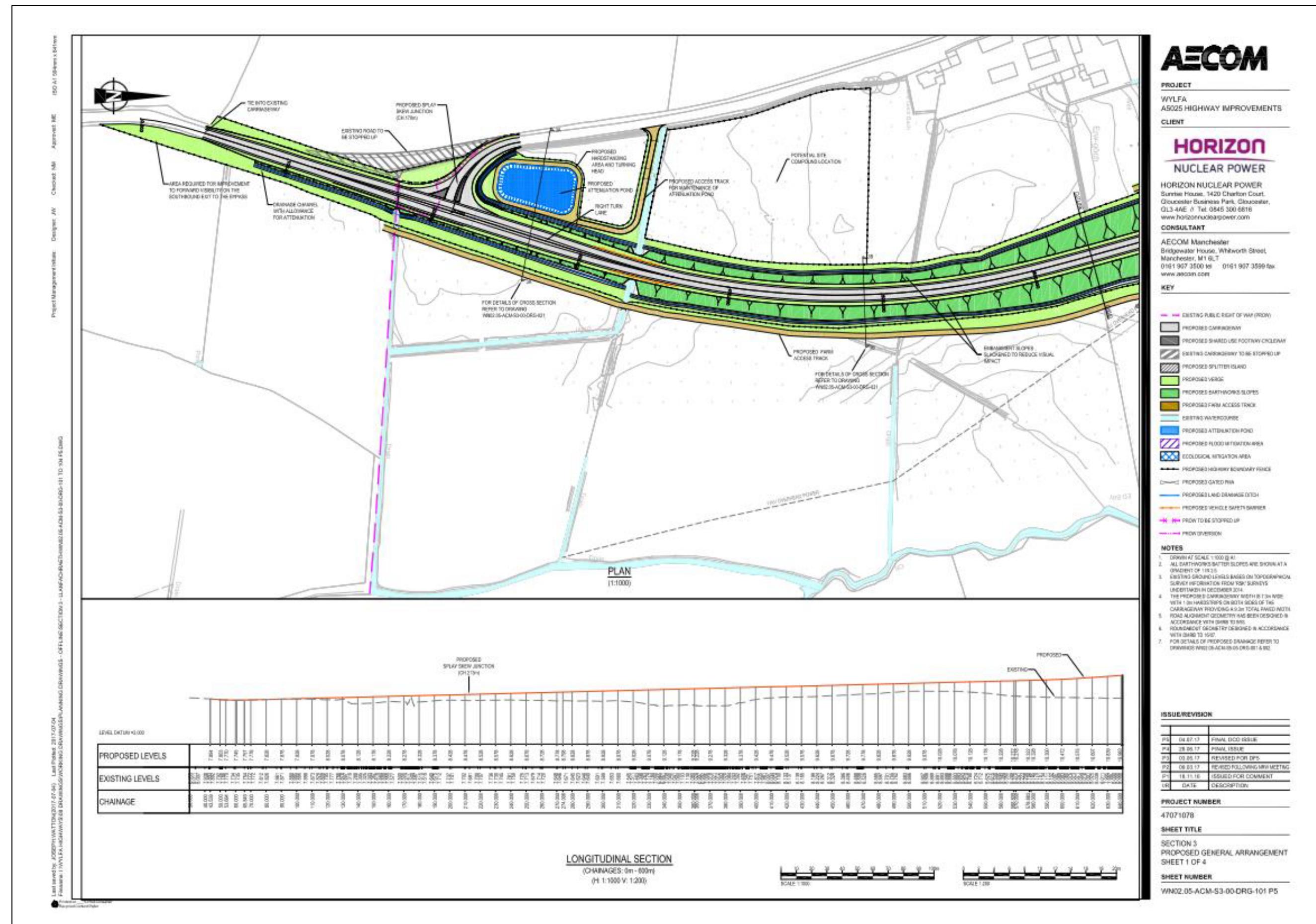
Appendix 6.1 – S3SAR Off-line Highway Improvements – Preferred Option Drawings



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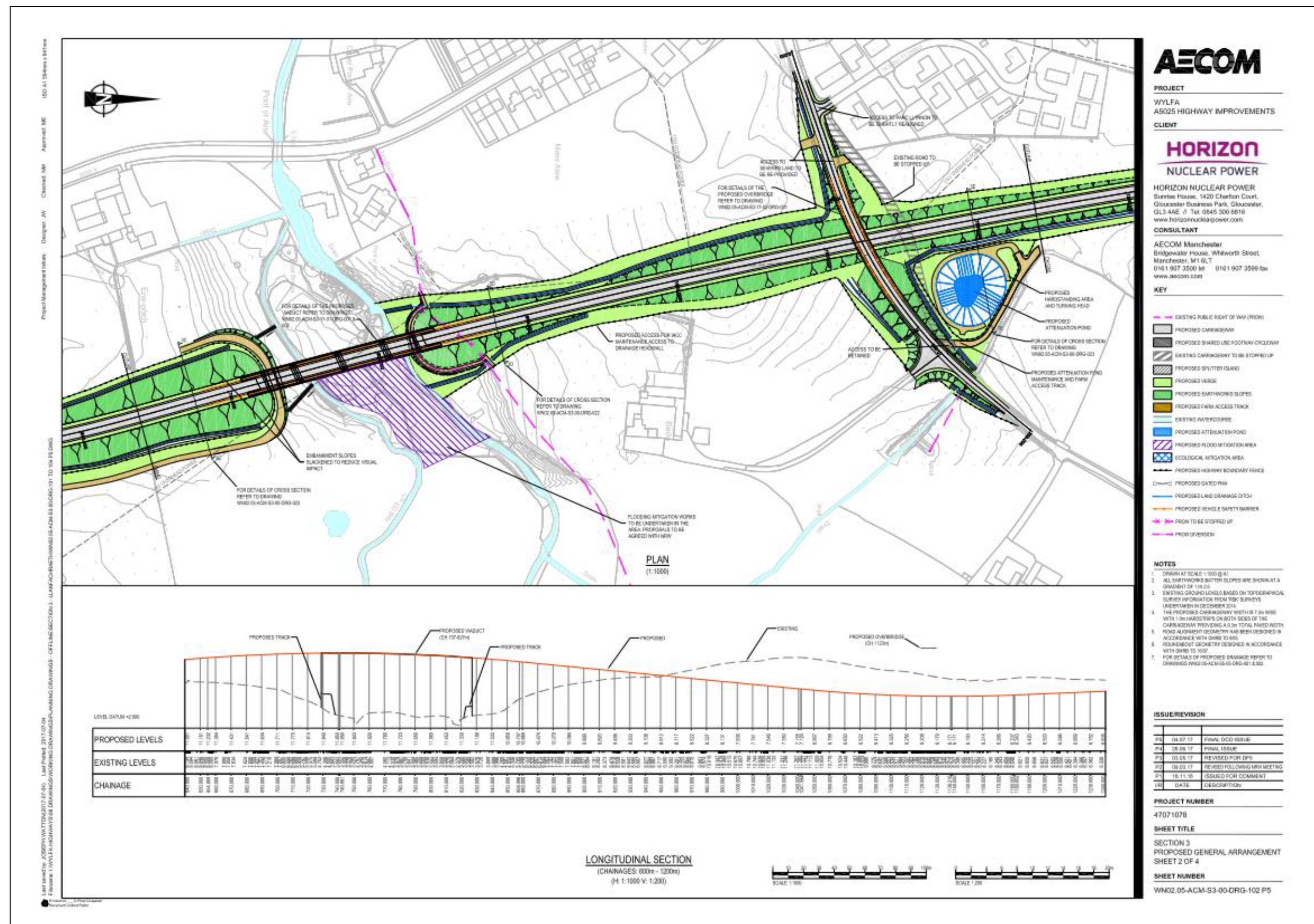
Appendix 6.1 – S3SAR Off-line Highway Improvements – Preferred Option Drawings

## Llanfachraeth Bypass – Preferred Option



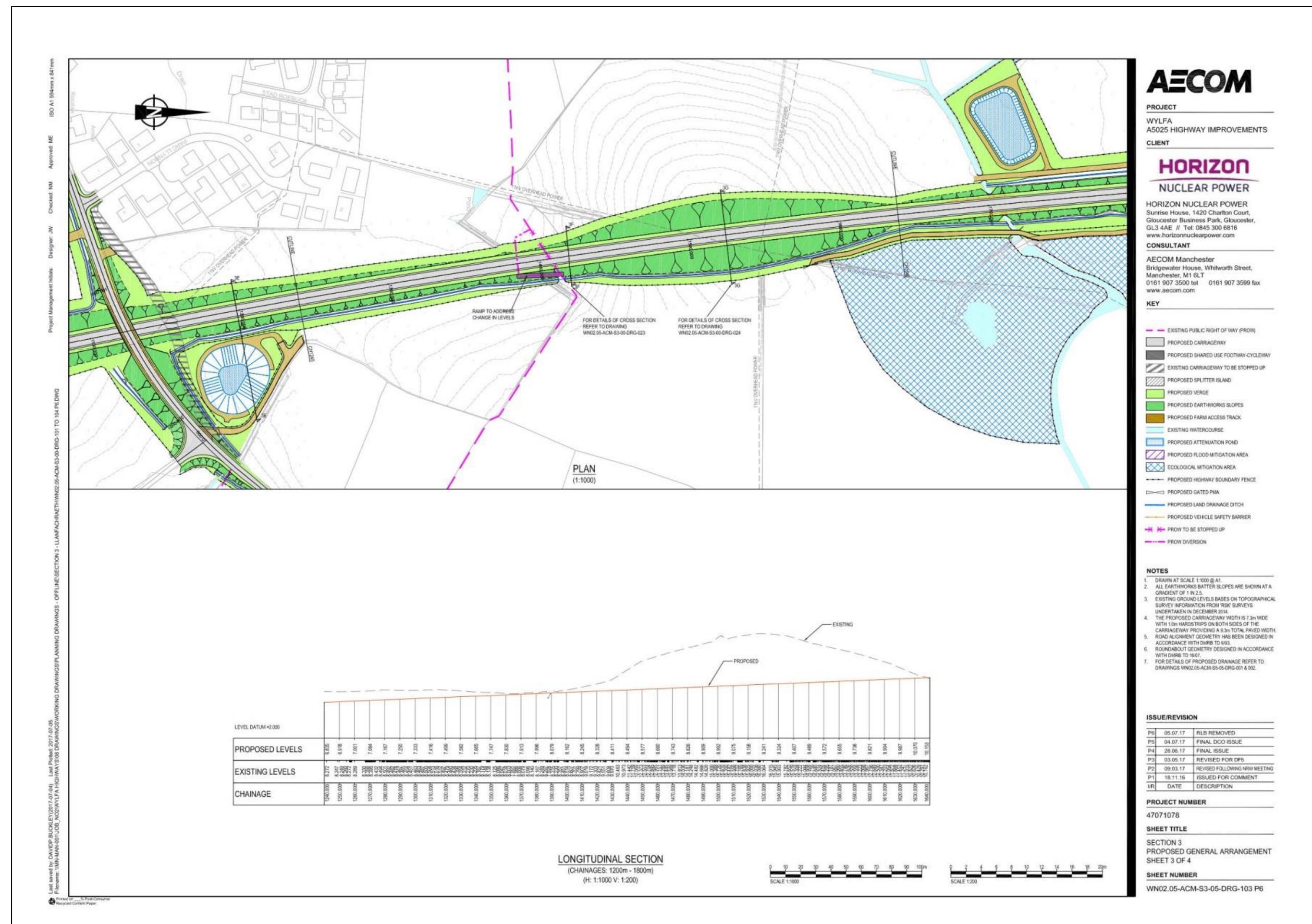
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Appendix 6.1 – S3SAR Off-line Highway Improvements – Preferred Option Drawings



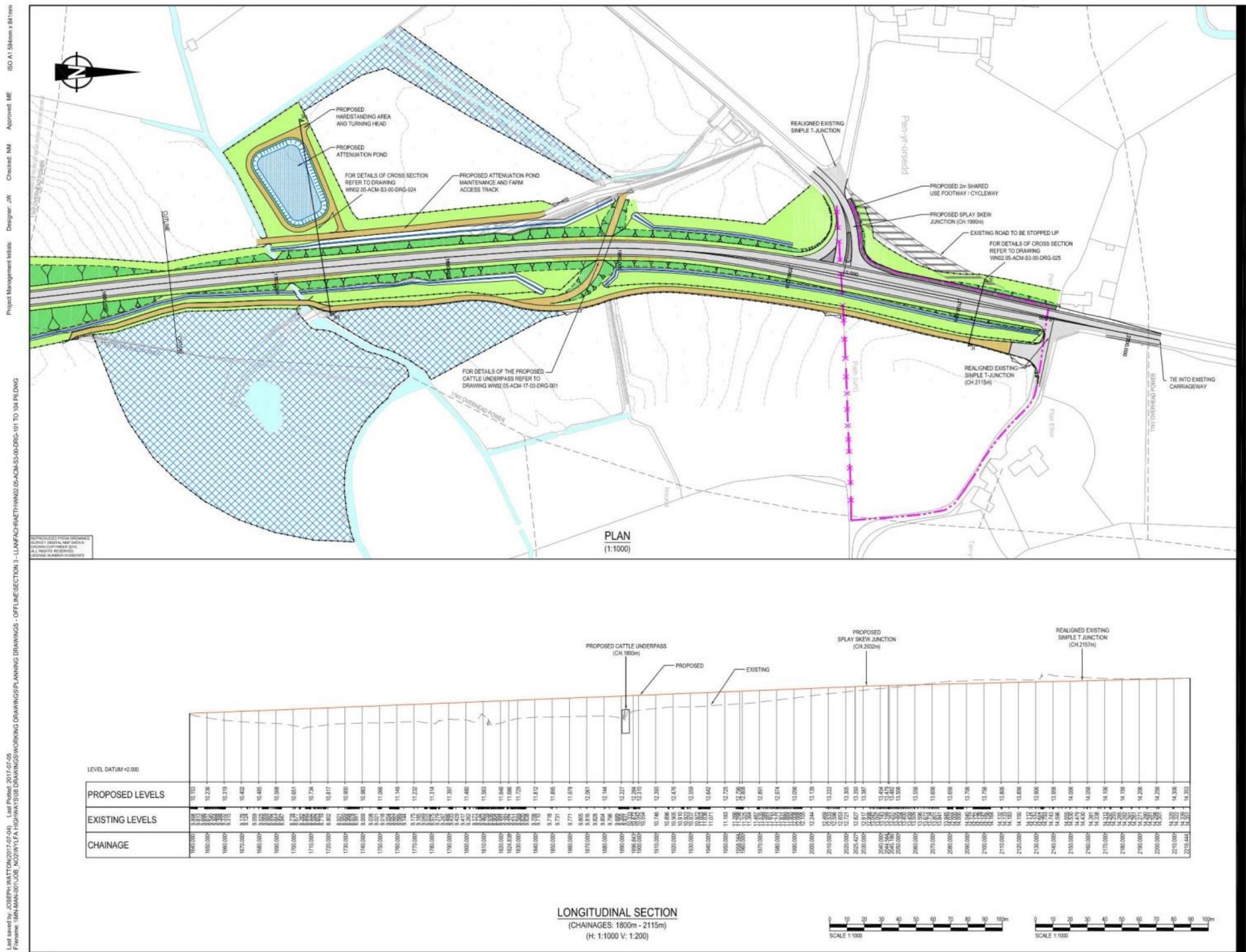
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Appendix 6.1 – S3SAR Off-line Highway Improvements – Preferred Option Drawings



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Appendix 6.1 – S3SAR Off-line Highway Improvements – Preferred Option Drawings



**AECOM**

**PROJECT**  
**WYLFA**  
**A5025 HIGHWAY IMPROVEMENTS**

# HORIZON NUCLEAR POWER

**HORIZON NUCLEAR POWER**  
Sunrise House, 1420 Charlton Court,  
Gloucester Business Park, Gloucester,  
GL3 4AE // Tel: 0845 300 6816  
[www.horizonnuclearpower.com](http://www.horizonnuclearpower.com)

**CONSULTANT**  
**AECOM Manchester**  
Bridgewater House, Whitworth Street,  
Manchester, M1 6LT  
0161 907 3500 tel 0161 907 3599 fax.  
[www.aecom.com](http://www.aecom.com)

## KEY

• 1000 •

— EXISTING PUBLIC RIGHT OF WAY (PROW)

**PROPOSED CARRIAGeway**

PROPOSED SHARED USE FOOTWAY/CYCLEWAY

EXISTING CARRIAGEWAY TO BE STOPPED UP

PROPOSED SPLITTER ISLAND

PROPOSED VERGE

PROPOSED EARTHWORKS SLOPES

PROPOSED FARM ACCESS TRACK

EXISTING WATERCOURSE

PROPOSED ATTENUATION POND

PROPOSED FLOOD MITIGATION AREA

ECOLOGICAL MITIGATION AREA

PROPOSED HIGHWAY BOUNDARY FENCE

PROPOSED GATED PMA

PROPOSED LAND DRAINAGE DITCH

PROPOSED VEHICLE SAFETY BARRIER

PRONY TO BE STOPPED UP

BROW DIVERSION

**NOTES**

1. DRAWN AT SCALE 1:1000 @ A1.
2. ALL EARTHWORKS BATTER SLOPES ARE SHOWN AT A GRADIENT OF 1IN 2.5.
3. EXISTING GROUND LEVELS BASES ON TOPOGRAPHIC SURVEY INFORMATION FROM 'RSK' SURVEYS UNDERTAKEN IN DECEMBER 2014.
4. THE PROPOSED CARRIAGeway WIDTH IS 7.3m WIDE, WITH 1.0m HARDSTAPS ON BOTH SIDES OF THE CARRIAGeway PROVIDING A 9.3m TOTAL PAVED WIDTH.
5. ROAD ALIGNMENT GEOMETRY HAS BEEN DESIGNED IN ACCORDANCE WITH DMRB TD 9/03.
6. ROAD DRAINAGE SYSTEM DESIGNED IN ACCORDANCE WITH DMRB TD 9/03.
7. FOR DETAILS OF PROPOSED DRAINAGE REFER TO DRAWDRAWING 19/2-14-AC-05-05-DRG-001-1.PDF.

<b>ISSUE/REVISION</b>		
P6	05.07.17	RLB REMOVED
P5	04.07.17	FINAL DCO ISSUE
P4	27.06.17	FINAL ISSUE
P3	03.05.17	REVISED FOR DPF
P2	09.03.17	REVISED FOLLOWING NRW MEETING
P1	18.11.16	ISSUED FOR INFORMATION

**PROJECT NUMBER**

47071078

**SHEET TITLE**

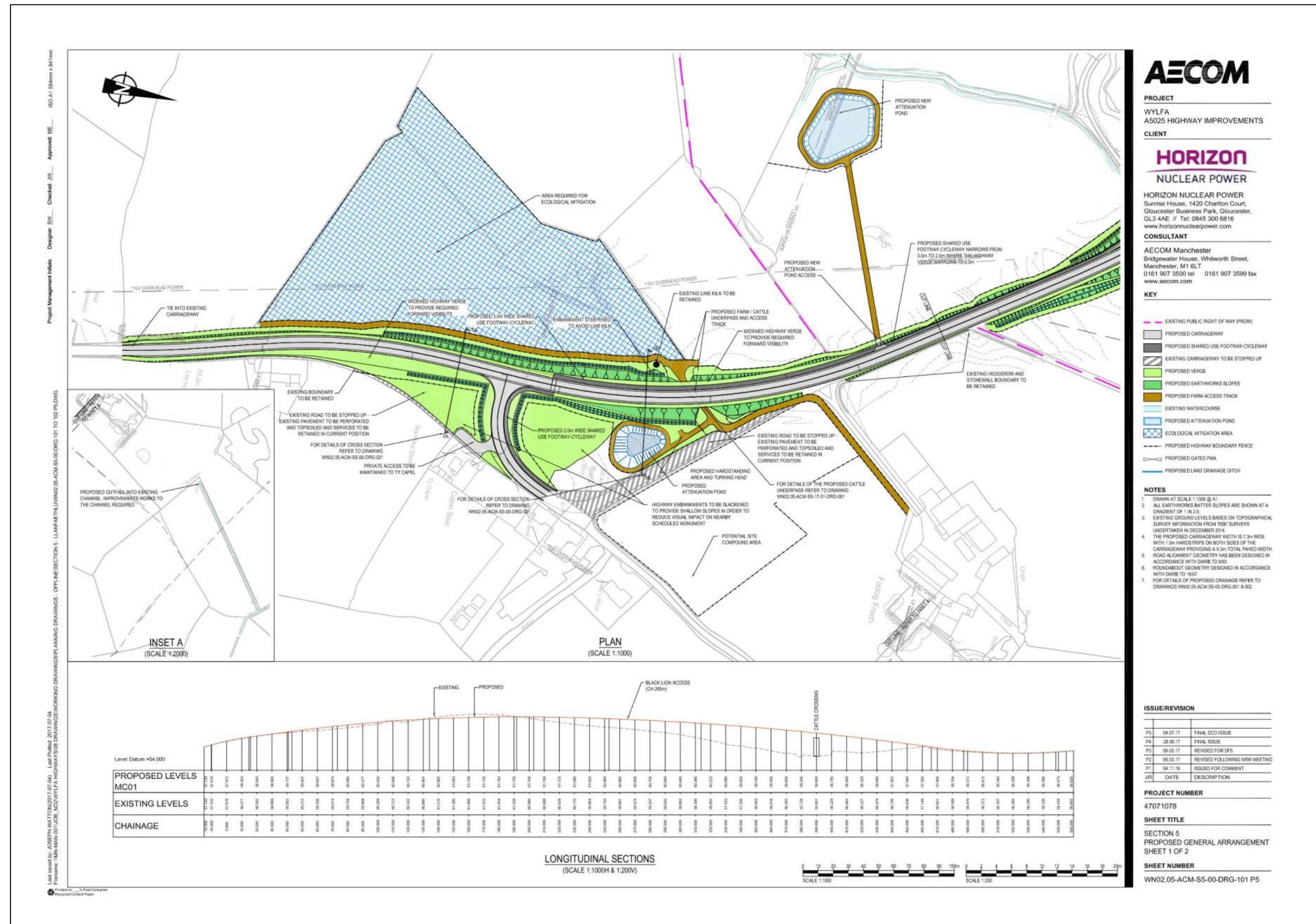
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**SHEET 4 OF 4**

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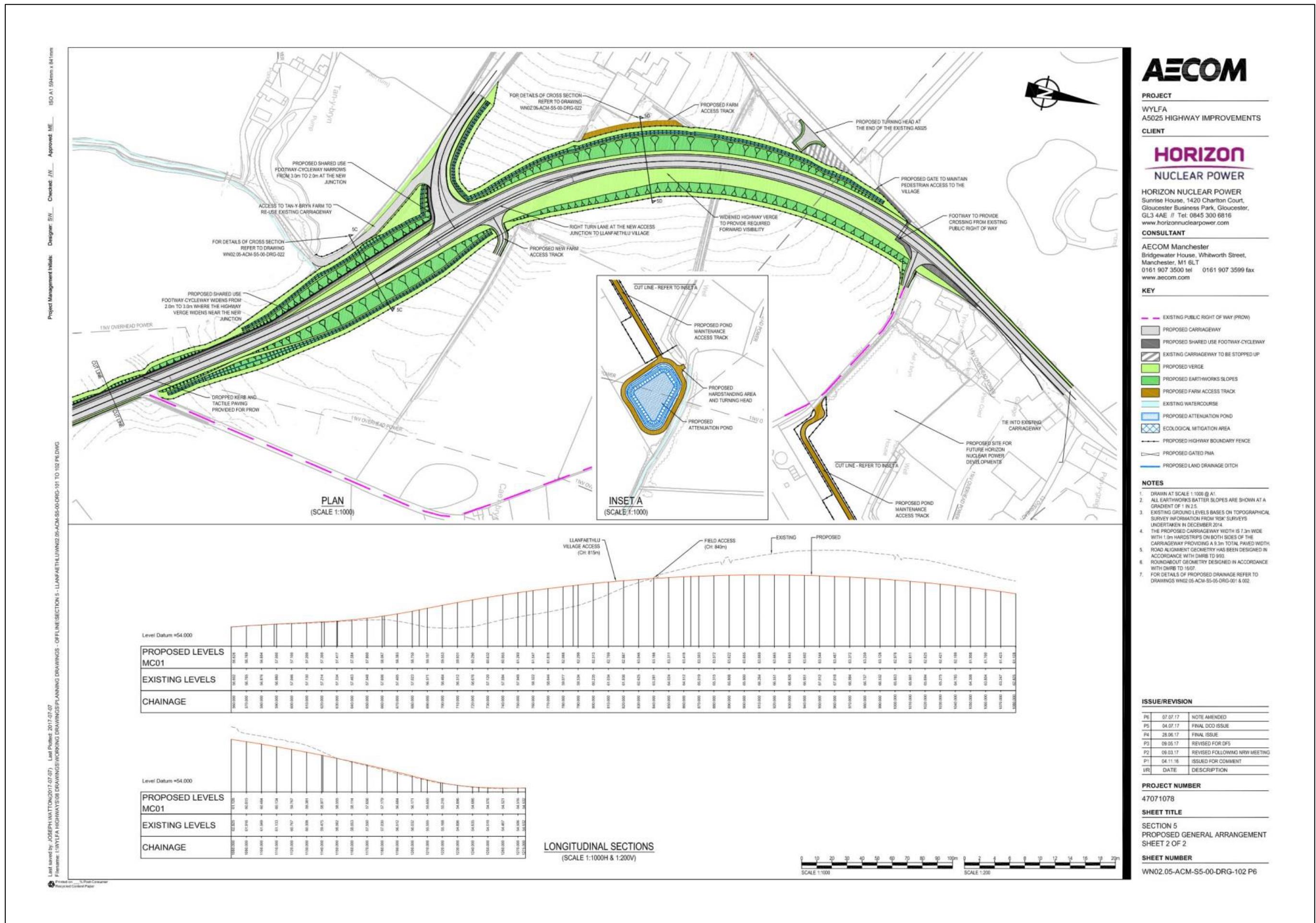
## Appendix 6.1 – S3SAR Off-line Highway Improvements – Preferred Option Drawings

### Llanfaethlu Bypass



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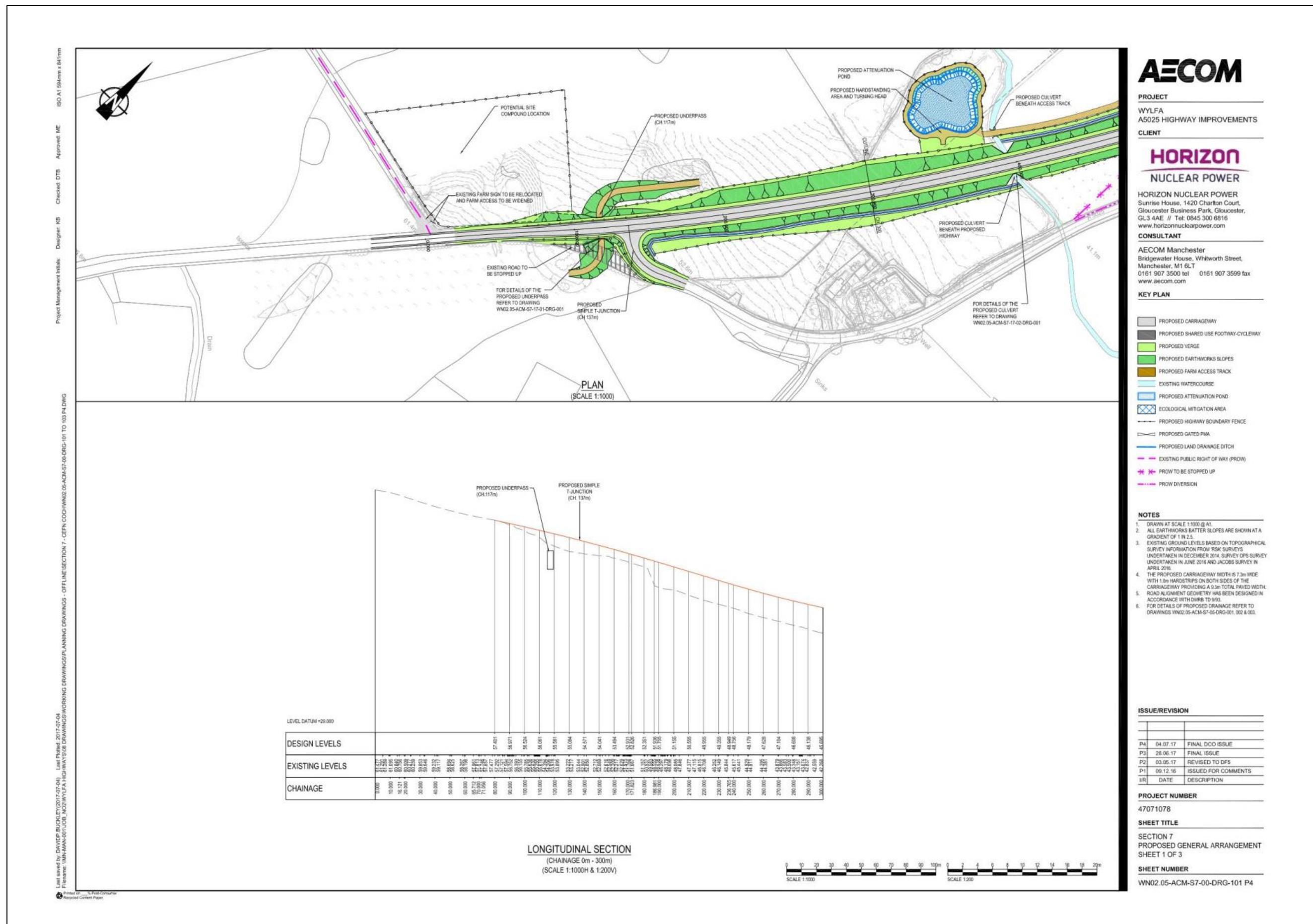
## Appendix 6.1 – S3SAR Off-line Highway Improvements – Preferred Option Drawings



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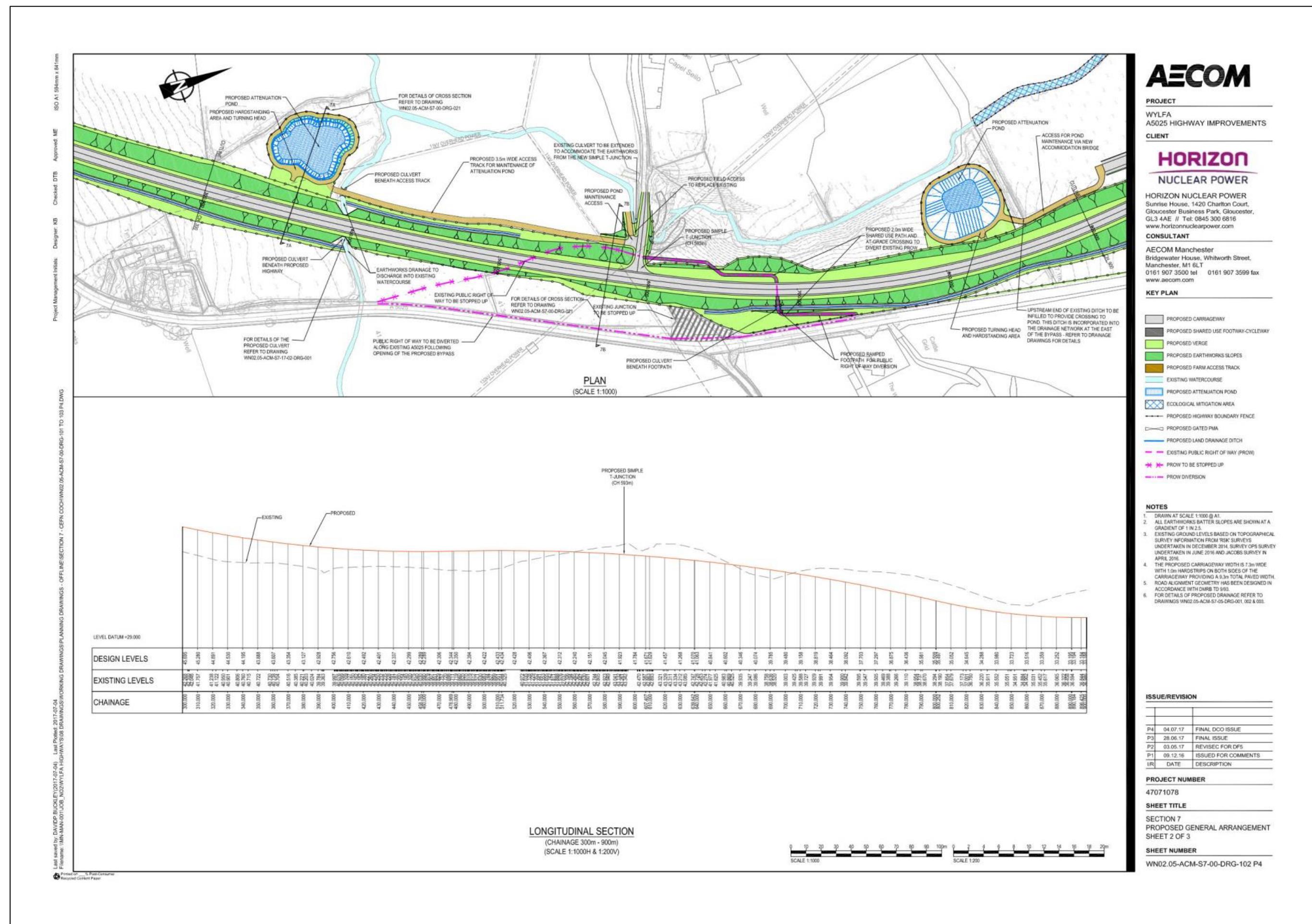
## Appendix 6.1 – S3SAR Off-line Highway Improvements – Preferred Option Drawings

### Cefn Coch Bypass



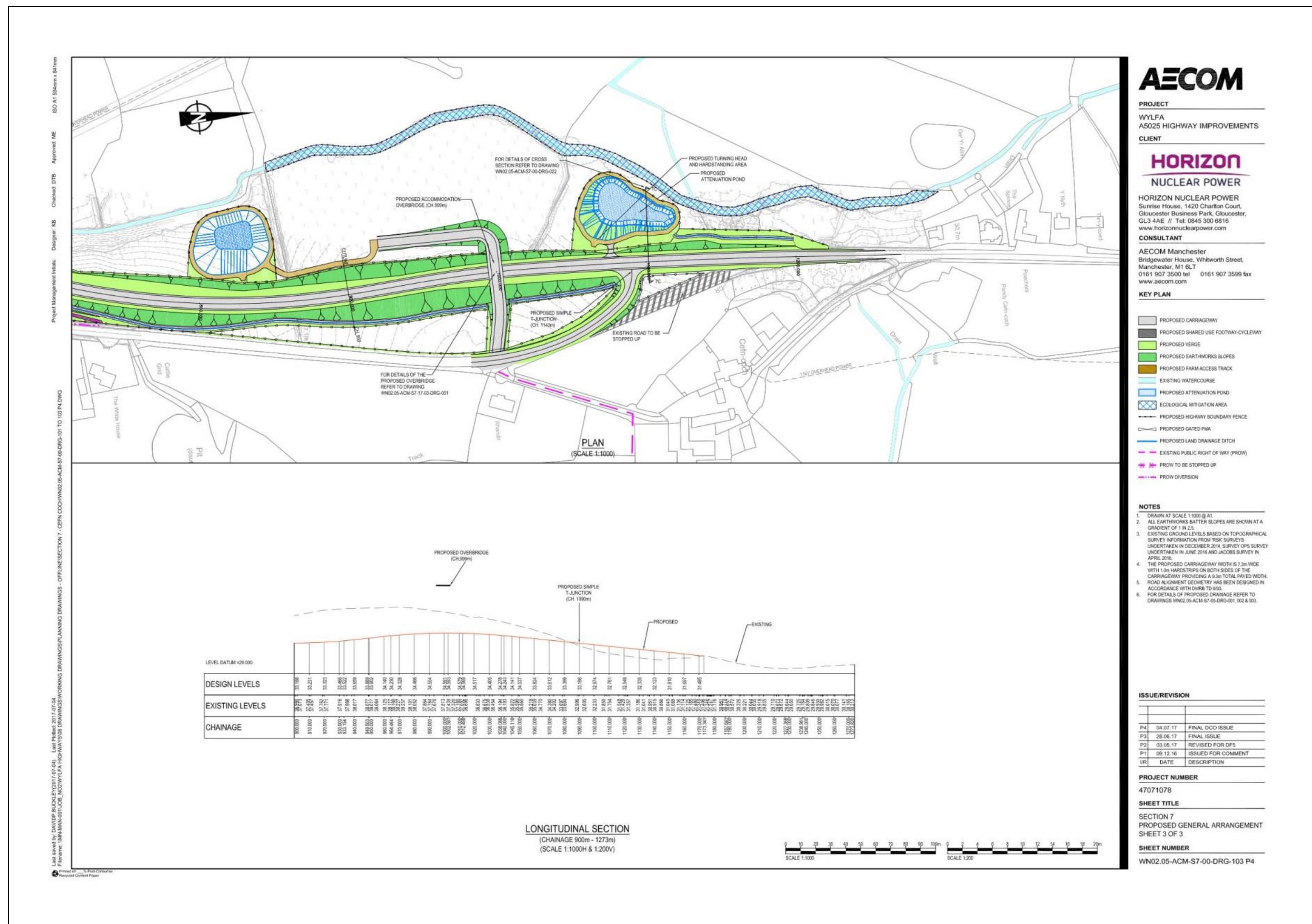
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Appendix 6.1 – S3SAR Off-line Highway Improvements – Preferred Option Drawings



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## Appendix 6.1 – S3SAR Off-line Highway Improvements – Preferred Option Drawings



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