



Wylfa Newydd Project

6.6.31 ES Volume F - Park and Ride App F10-5 - Photomontage viewpoints

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1 Introduction

- 1.1.1 This methodology is intended to provide transparency of the photomontage production process undertaken in accordance with the following core guidance documents:
- Landscape Institute Advice Note 01-11 Photography and photomontage in landscape and visual impact assessment [RD1]; and
 - Guidelines for Landscape and Visual Impact Assessment, Third Edition [RD2].
- 1.1.2 The approach aligns with the methodologies used for photomontages in the following volumes (with the exception of D10 (landscape and visual) (Application Reference Number: 6.4.10), (see Appendix D10-8 photomontage views Application Reference Number: 6.4.65) which differs in some minor aspects):
- Off-Site Power Station Facilities: AECC, ESL and MEEG E10 (landscape and visual) (Application Reference Number: 6.5.10);
 - A5025 Off-line Highway Improvements G10 (landscape and visual) (Application Reference Number: 6.7.10); and
 - Logistics Centre H10 (landscape and visual) (Application Reference Number: 6.8.10).
- 1.1.3 The photomontages have been produced for illustrative purposes only, meaning that they have not been used to inform the landscape and visual impact assessment but are provided to sit alongside the chapter for information.
- 1.1.4 The figures reflect a reasonable 'worst case' based on the best available information at the time of preparation and have been undertaken to show the highways junction arrangements, internal road and car parking layout, bus terminal area, bus transport facility building and cycle store as well as all associated landscape planting and boundary fencing identified in chapter F1 (proposed development) (Application Reference Number: 6.6.01) . They reflect two scenarios from each viewpoint location and are illustrated on the figures underneath the existing 'baseline' views:
- operation Year 1 scenario (winter): with proposed buildings, highways and landscape mitigation at the beginning of the operational stage; and
 - operation Year 5 scenario (winter (viewpoint 2) and summer (viewpoint 4)): with proposed buildings, highways and landscape mitigation following 5 years of establishment and at the end of the operational stage.
- 1.1.5 The locations for the photomontage viewpoints are shown on insert plans on figures 60PO8077_DCO_VOL_F_APP_10_05_01 to 04 as well as figure F10-5 viewpoint locations and visual receptors (Application Reference Number: 6.6.38), which accompanies chapter F10 (Application Reference Number 6.6.10).

2 Assumptions, limitations and additional modelling work

2.1 Accuracy

- 2.1.1 Whilst every effort has been made to ensure a suitable level of accuracy was maintained throughout the production of the photomontages, no final image can be 100% accurate. As far as practicable, all design information available has been represented accurately (a list of the design information used for modelling purposes is provided in section 4.2 below).
- 2.1.2 The following sections identify the assumptions made, data discrepancies and limitations encountered during the production of photomontages.

2.2 Survey, photography and existing base information

- 2.2.1 Viewpoint 4 has been illustrated for winter in Year 1 and summer in Year 5 as is standard to represent a worst case in winter Year 1 and to reflect the function of embedded mitigation in summer Year 5.
- 2.2.2 Viewpoint 2 was added at a late stage during consultation and so it was only possible to take photographs to represent the winter season. Whilst both operation Year 1 and operation Year 5 scenarios for this viewpoint have been reflected in winter, this has a benefit to enable representation of the schemes' embedded mitigation function in winter.
- 2.2.3 The following list summarises the accuracy of the base information:
- The accuracy of Handheld Global Positioning System (GPS) surveys is dependent on the available satellites at the time of recording, as identified by Ordnance Survey (OS): *"positional accuracy with a single receiver, to civilian users approximately equals 5m to 10m, 95% of the time, and the height accuracy is generally 15m to 20m 95% of the time. Military users receive a more accurate coded signal from the satellite"* [RD3];
 - The tolerance of the Satmap Active12 used for this project is between +/- 1m and 4m in horizontal and vertical axis;
 - OS 2m contour data used for topography terrain is based on Digital Terrain Modelling generally considered to be accurate to +/- 2m; and
 - The baseline photographs that form the basis of the photomontage are a flattened 2D representation of what the eye would see.

2.3 Modelling assumptions

- 2.3.1 The following lists summarise the limitations, omissions and assumptions encountered during three-dimensional modelling work undertaken to core design information. These were required to inform the final three-dimensional

model as agreed for use by the client for the purposes of these photomontages:

General

- Existing vegetation growth has not been represented due to uncertainty of age, growth rates as well as landowner maintenance regimes.
- The exception to the above is recently planted vegetation along the A5 Holyhead Road which is shown on the masterplan to be part of proposed woodland planting on its southern boundary. This recent planting is assumed to be currently between 1.5m and 2.5m tall and would have grown to a height of 3m to 4m by Year 5.
- Tree and shrub planting for the operation Year 1 scenario has not been modelled. This is to reflect a worst case scenario whereby the smallest plants within the range of proposed planting heights at Year 1 (300mm to 600mm (hedges) and 600mm to 800mm (woodland)) would not be visible above the shelters.
- Proposed hedgerow planting growth has been assumed to have reached a maximum of 2m above ground after 5 years as a precautionary estimate based on the exposed conditions prevailing on Anglesey.
- Proposed woodland planting growth has been assumed to have reached a maximum of 2.7m above ground after 5 years as a precautionary estimate based on the exposed conditions prevailing on Anglesey.

2.4 Additional modelling work

2.4.1 A list of core design information can be found in section 4.2, Construction of the three dimensional design models, which sets out the drawing models used in the development of the photomontages.

2.4.2 Additional modelling work undertaken to refine the core design information is described below:

- Buildings: the design freeze three-dimensional buildings from the architect's three-dimensional design model were adjusted to match the building footprints shown on the Park and Ride (Dalar Hir) Masterplan Figure drawing model. This required moving the models to suit and repositioning to match site levels. The following list details the building heights and their vertical position on the ground as stated in height Above Ordnance Datum (AOD):
 - Bus transport facility building: 5m tall at approximately 17.5m AOD;
 - Cycle Store: 5m tall at approximately 17m AOD; and
 - Bus shelters: 5m tall approximately 17.5m AOD.

- Highways & earthworks: AutoCAD (CAD) polylines taken from the Park and Ride (Dalar Hir) Masterplan Figure drawing model were used to create kerbs, road edges and verges and then modelled in to reflect 1 in 3 slope earthworks, tying into the architect's three-dimensional model and toposurvey modelled terrain;
- Lighting: The previous column locations were logically realigned with the new road and car park layouts with columns modelled at between 6 and 12m tall in accordance with the previous lighting design layout;
- Road markings: Polyines from the masterplan CAD drawing used only.
- Landscape: The electricity substation and part of the stone wall has been agreed with the landscape architects and client to be retained; and
- Fencing: A 2.4m perimeter fence was modelled based on the fence alignment shown on the masterplan figure, overlaid on the existing and proposed terrain model.

3 Viewpoint photographic survey

3.1 Viewpoint locations

- 3.1.1 The locations of viewpoints have been selected by the landscape architect to identify the most suitable and representative views of the structures and/or features as explained in chapter F1 (Application Reference Number: 6.6.1). These locations have been formally agreed with Natural Resources Wales and the Isle of Anglesey County Council.
- 3.1.2 Winter photographs were taken in March and November 2016 at a time when weather conditions provided suitable light levels. Summer photography was undertaken in July 2016.
- 3.1.3 The viewpoint locations were recorded using a handheld GPS and the height of the camera above ground level was also noted. The locations were recorded in OS National Grid co-ordinates to enable viewpoints to be reproduced in AutoCAD relative to the subject of the photomontage, which was also located using OS National Grid co-ordinates in line with *Landscape Institute Advice Note 01-11 Photography and photomontage in landscape and visual impact assessment* [RD1].
- 3.1.4 The baseline photographs were taken using a Canon EOS 5D Mark II Digital Single Lens Reflex camera with a fixed 50mm lens. All photographs were taken on a tripod levelled to the vertical and horizontal axes, as well as using a high resolution setting for the images.
- 3.1.5 The panoramic photography was undertaken using a series of photographs taken with a panoramic tripod head set to provide a 60% overlap (15° increments) between frames to reduce barrel distortion. The photographs were taken in a landscape orientation due to the rural settings of most viewpoints in line with *Landscape Institute Advice Note 01-11 Photography and photomontage in landscape and visual impact assessment* [RD1].
- 3.1.6 These photographs were then manually stitched together in Adobe Photoshop software to produce a single panoramic image. During this process only minor improvements have been made to the photographs to balance brightness, contrast etc. where necessary. None of the base photographs have been distorted. All survey information as well as other important information has been provided on the viewpoint figures.
- 3.1.7 Final images were then cropped to an 80° field of view to ensure a suitable image size for a comfortable viewing distance (approximately 27cm from eye) using A3 printed figures.

3.2 Site photography survey data

- 3.2.1 At each viewpoint location, the following survey data was collected:
- GPS reference noting the location of the camera;
 - date and time photograph was taken;
 - the height of the camera above ground level (approximately 1.6m); and

- weather conditions at the time of photograph.

4 Photomontage creation

4.1 Construction of the three-dimensional base model and camera matching

- 4.1.1 To assist the process of matching the baseline photograph with the three-dimensional base model, reference points were identified at each viewpoint location. Reference points are features within a photograph that can be identified from a topographical survey, OS map and/or aerial photographs. Examples of features include telegraph poles, field boundaries and pylons.
- 4.1.2 From the baseline panoramic images, single background frames for use in the camera matching process were cropped to match the 4:3 ratio of a 50mm lens image. These frames were then used as backdrops to the equivalent 50mm three-dimensional camera within Autodesk three-dimensionalS Max Design software, which is the main three-dimensional modelling software.
- 4.1.3 The base three-dimensional model (i.e. existing environment and site context) was modelled at a local grid with a common global shift from OS National Grid identified. This was produced using information from topographical surveys and 2D and three-dimensional OS contour information to vertically place reference objects.
- 4.1.4 In three-dimensionalS Max Design software, the locations of the viewpoints were added to the model using the survey data (see section 2 above). The viewpoints were then used as a starting point for fixing the location of the three-dimensional camera by matching terrain, reference points and other information in the model to the corresponding features in the background image (i.e. the three-dimensional camera backdrop).

4.2 Construction of the three-dimensional models

- 4.2.1 Three-dimensional models of the proposals were produced in three-dimensionalS Max Design software using the three-dimensional models provided by the architects for the Park and Ride development, and added to the three dimensional base model. Environmental lighting in the combined model was configured to match the date, time and lighting conditions as surveyed on site at the time of the photography.

Core design information

Architect's three-dimensional model

- 20170420 DALAR HIR MODEL.fbx
- JEG-60PO8081-JAC-CIV-MOD-00024-Model - Site Triangles Jan 2018

Masterplan figure

- 60PO8077-JAC-LSC-MOD-00001_Lighting
- 60PO8081-JAC-LSC-MOD-00004-Hard-and_soft

- 60PO8081-JAC-LSC-MOD-00005-Fencing_and_Walling
- 60PO8081-JAC-LSC-MOD-00010-Legacy_Hard_&__Soft

Mitigation planting details

4.2.2 All embedded mitigation planting proposals have been modelled in accordance with chapter F1, section 1.6, Embedded and tertiary mitigation and section 10.4, Design basis and activities (Application Reference Number: 6.6.01) and the Design and Access Statement - Volume 3 – (Associated Developments and Off-Site Power Station Facilities) (Application Reference Number: 8.2.3). The planting stock height, growth rates and plant protection elements assumed for modelling purposes are described below:

Operation Year 1

- Linear belts of shrub & tree planting: Occasional feathered trees have been modelled in at 0.8m wide x 1.2m tall along with 1.2m tall tree shelters and 600mm tall shrub shelters (both 100mm diameter). No planting has been modelled within these shelters as it is assumed as worst case that the size of plants (between 600 and 800mm) would be at the lower end of the ranges and therefore not be visible above the tops of the shelters);
- Native hedgerow planting – double staggered row of 450mm tall x 40mm diameter spiral guards at 300mm centres (again no plants have been modelled within these to reflect a worst case scenario of lowest of the planting range only (between 300mm and 600mm);
- Native (formal) hedgerow planting – as above; and
- Species rich and wet wildflower seeding: assumed that grassland sward would not have established therefore shown as grass.

Operation Year 5

- Recently planted vegetation along the A5 corridor (woodland planting): 3m to 4m tall;
- Woodland planting: 2.1m to 2.7m tall;
- Native hedgerow (including gap filling to existing): 1.5m wide x 1.5m to 2m tall (unkempt);
- Native hedgerow (formal clipped): 1.5m wide x 1.5m tall clipped native hedges; and
- Species rich/wet wildflower seeding: mix of flowers and wet grass species up to total height of 500mm.

5 Final output

- 5.1.1 Rendered images were generated from three-dimensionalS Max Design software for the final production stage in Adobe Photoshop where they were stitched back together across the panoramic base image.
- 5.1.2 Background base images were adjusted to reflect any elements and/or vegetation lost due to the scheme proposals, and then any retained foreground elements were layered over the top of the rendered layers. Any persons or car number plates in the original images have been blurred out.
- 5.1.3 The final images were then framed in AutoCAD as a sequence of A3 figures, including the existing photograph for direct comparison. For each photomontage viewpoint the following sheets have been provided:
- sheet 1: showing the existing ('baseline') view and an 'after' view for the operation Year 1 scenario, with proposed buildings highways and landscape mitigation at the beginning of the operational stage; and
 - sheet 2: showing the existing ('baseline') view and an 'after' view for the operation Year 5 scenario, with proposed buildings, highways and landscape mitigation after fifteen years of establishment.
- 5.1.4 The figures also include information on the following in accordance with *PINS Advice Note 6: Preparation and submission of application documents Version 7* [RD4]:
- date and time;
 - site conditions when the photography was taken;
 - OS National Grid Reference and elevation;
 - camera specifications;
 - location plan;
 - core design data used for production of proposals; and
 - key notes on use such as details on a comfortable viewing distance from the eye.
- 5.1.5 The locations for the photomontage viewpoints are shown on insert plans on figures 60PO8077_DCO_VOL_F_APP_10_05_01 to 04 as well as figure F10-5 viewpoint locations and visual receptors (Application Reference Number 6.6.38), which accompanies chapter F10 (Application Reference Number: 6.6.10).

6 References

Table 6-1 Schedule of references

ID	Reference
RD1	Landscape Institute. 2011. <i>Photography and photomontage in landscape and visual impact assessment (Landscape Institute Advice Note 01/11)</i> [Online]. [Accessed: November 2016] Available from: https://www.landscapeinstitute.org/PDF/Contribute/LIPhotographyAdviceNote01-11.pdf .
RD2	Landscape Institute and Institute of Environmental Management and Assessment. 2013. <i>Guidelines for Landscape and Visual Impact Assessment</i> . Third Edition. Oxon: Routledge.
RD3	Ordnance Survey. <i>Beginner's guide to GPS</i> . [Online]. [Accessed: 28 March 2017]. Available from: https://www.ordnancesurvey.co.uk/business-and-government/help-and-support/navigation-technology/gps-beginners-guide.html .
RD4	The Planning Inspectorate. 2016. Advice Note 6: Preparation and submission of application documents [Accessed: July 2017]. Available from https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/05/Advice-note-6-version-71.pdf .

EXISTING VIEW - WINTER

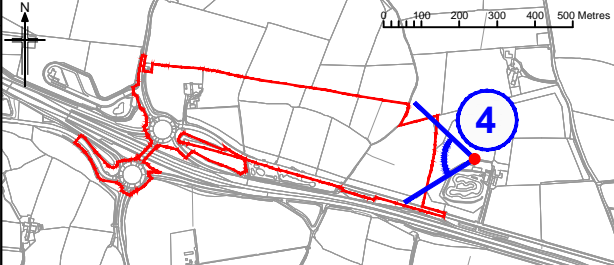


PHOTOMONTAGE - OPERATION YEAR 1 (WINTER)



VIEWPOINT NO 4: View from Go-Kart Cafe


Date of photograph: 23.03.16
Time of photograph: 13:10
Lighting conditions: Clear, cloudy
OS grid reference: 233324, 378312
Viewpoint ground elevation: 20m
Camera height above ground level: 1.6m
Camera type: Canon EOS 5D MARK II
Camera lens size: 50mm
Aperture: f.9
ISO: 200
Shutter speed: 1/200
Included angle of photograph: 80°



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Notes

1. Photomontage is to be used for illustrative purposes only.
2. Refer to the photomontage methodology within this appendix.
3. Viewpoints surveyed using handheld GPS unit.
4. Images (as printed on A3 sheet) are to be viewed at approximately 27cm from the eye.
5. With the exception of planting along the A5, existing vegetation growth has not been represented due to uncertainty of age, growth rates as well as landowner maintenance regimes.

1.0	MAR 18	DCO submission	HNPWL	HNPWL	HNPWL	HNPWL	
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd	
Client							
Project			WYLFA NEWYDD PROJECT ENVIRONMENTAL STATEMENT				

Drawing title			PARK AND RIDE PHOTOMONTAGE VIEWPOINT NO.4 (OPENING YEAR)		
Scale @ A3	AS SHOWN		DO NOT SCALE		
Jacobs No.	60PO8077				
Client No.	-				
Drawing No.					
60PO8077_DCO_VOL_F_APP_10_05_01					
This drawing is not to be used in whole or in part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.					

EXISTING VIEW - SUMMER

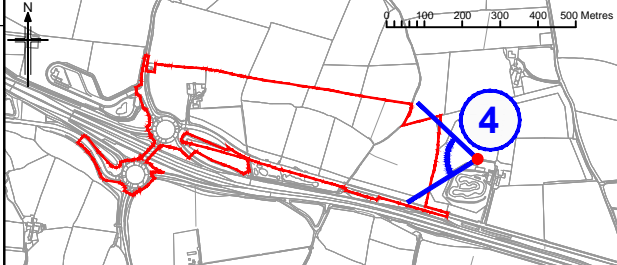


PHOTOMONTAGE - OPERATION YEAR 5 (SUMMER)



VIEWPOINT NO 4: View from Go-Kart Cafe


Date of photograph: 27.07.16
Time of photograph: 16:20
Lighting conditions: Good
OS grid reference: 233327, 378314
Viewpoint ground elevation: 20m
Camera height above ground level: 1.6m
Camera type: Canon EOS 5D MARK II
Camera lens size: 50mm
Aperture: f.6.3
ISO: 200
Shutter speed: 1/1250
Included angle of photograph: 80°



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3. Viewpoints surveyed using handheld GPS unit.
4. Images (as printed on A3 sheet) are to be viewed at approximately 27cm from the eye.
5. With the exception of planting along the A5, existing vegetation growth has not been represented due to uncertainty of age, growth rates as well as landowner maintenance regimes.

1.0	MAR 18	DCO submission	HNPWL	HNPWL	HNPWL	HNPWL	
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd	
Client							
Project			WYLFA NEWYDD PROJECT ENVIRONMENTAL STATEMENT				

Drawing title			PARK AND RIDE PHOTOMONTAGE VIEWPOINT NO.4 (YEAR 5)		
Scale @ A3	AS SHOWN		DO NOT SCALE		
Jacobs No.	60PO8077				
Client No.	-				
Drawing No.					
60PO8077_DCO_VOL_F_APP_10_05_02					
This drawing is not to be used in whole or in part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.					

EXISTING VIEW - WINTER

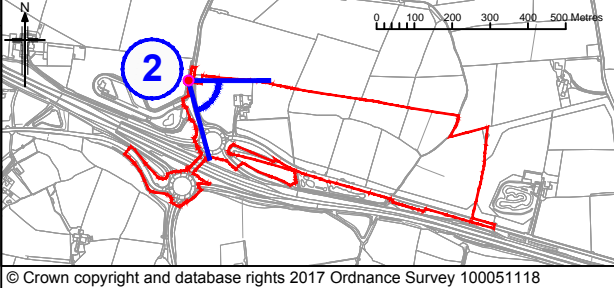


PHOTOMONTAGE - OPERATION YEAR 1 (WINTER)



VIEWPOINT NO 2: View from London Road


Date of photograph: 15.11.16
Time of photograph: 10:45
Lighting conditions: Moderate
OS grid reference: 232434, 378552
Viewpoint ground elevation: 18.2m
Camera height above ground level: 1.6m
Camera type: Canon EOS 5D MARK II
Camera lens size: 50mm
Aperture: f.6.3
ISO: 200
Shutter speed: 1/200
Included angle of photograph: 80°



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Notes

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3. Viewpoints surveyed using handheld GPS unit.
4. Images (as printed on A3 sheet) are to be viewed at approximately 27cm from the eye.
5. With the exception of planting along the A5, existing vegetation growth has not been represented due to uncertainty of age, growth rates as well as landowner maintenance regimes.

1.0	MAR 18	DCO submission	HNPWL	HNPWL	HNPWL	HNPWL
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
Client						
Project			WYLFA NEWYDD PROJECT ENVIRONMENTAL STATEMENT			

Drawing title

PARK AND RIDE

PHOTOMONTAGE VIEWPOINT NO.2 (OPENING YEAR)

Scale @ A3	AS SHOWN	DO NOT SCALE
Jacobs No.	60PO8077	
Client No.	-	

Drawing No.

60PO8077_DCO_VOL_F_APP_10_05_03

This drawing is not to be used in whole or in part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

EXISTING VIEW - WINTER

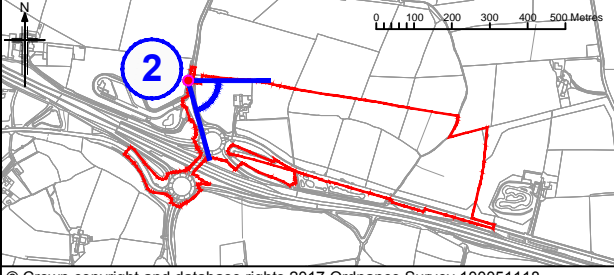


PHOTOMONTAGE - OPERATION YEAR 5 (WINTER)



VIEWPOINT NO 2: View from London Road

Date of photograph: 15.11.16
Time of photograph: 10:45
Lighting conditions: Moderate
OS grid reference: 232434, 378552
Viewpoint ground elevation: 18.2m
Camera height above ground level: 1.6m
Camera type: Canon EOS 5D MARK II
Camera lens size: 50mm
Aperture: f.6.3
ISO: 200
Shutter speed: 1/200
Included angle of photograph: 80°



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3. Viewpoints surveyed using handheld GPS unit.
4. Images (as printed on A3 sheet) are to be viewed at approximately 27cm from the eye.
5. With the exception of planting along the A5, existing vegetation growth has not been represented due to uncertainty of age, growth rates as well as landowner maintenance regimes.

1.0	MAR 18	DCO submission	HNPWL	HNPWL	HNPWL	HNPWL
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
Client			HORIZON NUCLEAR POWER			
Project			WYLFA NEWYDD PROJECT ENVIRONMENTAL STATEMENT			

Drawing title			PARK AND RIDE PHOTOMONTAGE VIEWPOINT NO.2 (YEAR 5)		
Scale @ A3	AS SHOWN	DO NOT SCALE			
Jacobs No.	60PO8077				
Client No.	-				
Drawing No.					
60PO8077_DCO_VOL_F_APP_10_05_04					
This drawing is not to be used in whole or in part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.					