ERI Limited

ENVIRONMENTAL IMPACT ASSESSMENT: VOLUME 3 - APPENDICES

Chapter 8: Landscape and Visual

JANUARY 2024

PUBLIC

V3-S08/0001

LANDSCAPE AND VISUAL ASSESSMENT METHODOLOGY

Public

ASSESSMENT METHODOLOGY

1.1.1. The methodology is defined by the requirements for environmental assessment, as described in the DMRB and GLVIA3. The assessment methodology is presented in V3-S08/0001.

1.2 ESTABLISHING THE LANDSCAPE BASELINE AND STUDY AREA

1.2.1. The radius of the study area was established through desk-based research and consultation with the CCBC. After reviewing the designations and landscape character areas, it was considered that a 1km buffer was proportionate for the Proposed Scheme. Volume 2, Plan V2-S08/0001 illustrates the national landscape character areas within the study area for this assessment.

1.2.2. Within the study area, the baseline for the assessment was then determined through desk-based research and field survey.

1.2.3. A desktop assessment was made of the local landscape character, drawing on the geographical, ecological, cultural and social aspects / influences of the area to ascertain the value and sensitivity of the landscape. This was based on publicly available data from LANDMAP[1], overlaid by national and regional landscape character areas and locally designated valued landscapes, based on publicly available data from NRW[2],the Welsh Government[3] and CCBC[4]. Named LANDMAP visual sensory aspect areas shared their boundaries with cultural aspects and their boundaries were clearly defined in the field. This was supplemented with field observations and images taken at viewpoint locations and walking and driving through the study area. The site was visited by landscape architects on 6 – 7 March 2023.

1.2.4. Each defined landscape character area was assessed in terms of its sensitivity to change and impacts, using DMRB guidelines to gauge its sensitivity.

1.3 ZONE OF THEORETICAL VISIBILITY

1.3.1. A theoretical visual envelope, referred to as the ZTV, was produced with GIS-based computer modelling software. This approach uses elevation data to create a bare earth digital terrain model of the study area and calculate inter-visibility between points or along lines radiating out from the development location. It uses this to construct a map showing the area from which the proposal may potentially be visible and those from which it is not visible. This was developed using a Digital Terrain Model (DTM) from Lidar data to a resolution of 2m. The same process was then repeated, including surface features to create a surface model.

[1] NRW (2017), *Characteristics of Local Landscapes from LANDMAP Guidance Note 1: LANDMAP and Special Landscape Areas*. Available online at: https://naturalresources.wales/media/680613/landmap-guidance-note-1-landmap-slas-2017.pdf

[2] NRW (2023), *Wales Environmental Information Portal*. Available online at: https://smnr-nrw.hub.arcgis.com/apps/c7770d2881394c899123bae210afe370/explore

[3] Welsh Government (2023) *DataMapWales*. Available online at: https://datamap.gov.wales/

[4] CCBC (2023) *LDP Proposals Map*. Available online at: https://caerphilly.opus3.co.uk/ldf/maps/ldp-proposals-map#x=317246.80349165&y=197758.95134426&scale=100000&117&80&191&76&92&113&127&160&162&436&251&226&356&392&462&282&475&56&104&328&334&376&566&418&499&157&262&341&495&560

1.3.2. The ZTV identifies land that is visually connected (theoretically) with the Proposed Scheme. The graded colours reflect the percentage visibility of the proposed development from any particular viewpoint in the model. These viewpoints represent visual receptors (people) and focus on the more sensitive types of receptors (which are more likely to experience significant effects). The locations of viewpoints were focused on visibility 'hot spots' identified by analysis and professional judgment i.e., areas showing the greatest visibility.

VIEWPOINT SELECTION

1.3.3. The viewpoints for the assessment were chosen by identifying potential receptors within the visual envelope. Ordnance Survey (OS) mapping, aerial photography and PRoW data were all used to identify preliminary viewpoints. These were then tested using Google Street-View (where coverage exists) and verification on site, considering the screening effects of buildings and woodlands within the views.

1.3.4. A final viewpoint study plan was defined, and the viewpoints were established as above. These viewpoints were then assessed in the field using the methodology outlined below. However, only publicly accessible locations were used during the field study.

METHODOLOGY FOR BASELINE VISUAL FIELD SURVEYS

1.3.5. The fieldwork was undertaken on 6 – 7 March 2023. CBCC considered that given the scale of the Proposed Scheme and proposals, the winter images would be sufficient and that summer fieldwork would not be necessary. The following tasks were carried out:

- check the visibility of the Proposed Scheme from the viewpoints identified and agreed in the viewpoint study;
- establish the visual baseline condition;
- carry out a visual impact assessment for each viewpoint; and
- identify and assess any additional viewpoints that would add significant value to the viewpoint study and add them to the assessment (where pertinent).

1.3.6. All viewpoints have been selected as a representative to illustrate a larger number of viewpoints that cannot all be included individually. For example, one house is representative of the views of a number of houses in a settlement, and certain points may be chosen to represent views from key pathways.

1.3.7. The viewpoints were selected to represent views seen by the following groups:

- residents of dwellings;
- walkers, cyclists and horse-riders (WCH) using recreational footpaths, cycle routes or PRoWs;
- users of business parks, e.g. workers, and users of educational facilities; and
- recreational users associated with public open spaces.

1.3.8. Receptor viewpoints were chosen carefully to:

- focus the study;
- represent the receptors most significantly affected;
- represent a proportional range of viewing distances in the study area;
- represent a proportional range of receptor types in the study area; and
- represent both static and moving receptors in the landscape.

1.3.9. In selecting the location of receptor viewpoints, they were split into two types: specific and representative:

- a specific receptor viewpoint records the baseline view of a fixed viewer, e.g. resident at a known location such as a dwelling, other small property, mapped feature, vantage point, or monument, etc; and
- a representative receptor viewpoint records the baseline view of a moving viewer, e.g. walker, commuter etc. In an unfixed location, this is represented through views such as roads, paths, cycle routes, rivers, canals, common land, amenity areas, open spaces, large community facilities, etc.

1.3.10. The final defined study area and receptor viewpoints were agreed upon with CCBC's appointed Landscape Architect. These are shown in Volume 2, Plans V2-S10/0001 to 0004.

1.3.11. For the purpose of this study, significant visual impacts are defined in DMRB i.e., those which give rise to moderate, large or very large impacts (both adverse and beneficial).

IMPACT ASSESSMENT

1.3.12. The baseline information is the starting point for the assessment. Once this information has been gathered, an assessment of visual impacts for pre-mitigation was undertaken.

1.3.13. Upon completion of the design and considering any mitigation measures, an assessment of the Proposed Scheme with mitigation implemented was carried out to identify construction and operational residual impacts.

1.3.14. Because a visual impact assessment cannot be scientifically quantified, it was essential to clearly define the criteria for assessment to ensure that the basis for decisions was consistent and to clarify the rationale for professional judgments. Assessment criteria was based upon the series of tables provided in DMRB LA104 Environmental assessment and monitoring and DMRB LA107 Landscape and visual effects and reproduced in Table 1, Table 2 and Table 3.

1.3.15. Impacts have been identified for the following phases of the Proposed Scheme, and where appropriate, the likely duration stated:

- Construction phase - worst case scenario assumed - peak activity for any given view;
- Operational phase - opening Year 1; and
- Operational phase - Year 15, after mitigation has been established and taken effect.

DETERMINING THE SENSITIVITY OF THE LANDSCAPE AND VISUAL RECEPTORS

1.3.16. Field surveys and desk studies were carried out to determine the 'sensitivity' of each of the landscape receptors (character areas) to change. The values were assigned based on descriptors in Table 1, which is an extract from DMRB LA107, to ensure clarity and consistency. The evaluation of the sensitivity of the receptor was judged on factors such as importance, quality / condition, rarity, value, scale of contribution to the landscape character, and the degree to which the particular characteristics can be protected, mitigated, replaced or substituted. The sensitivity rating is dependent on the nature of the Proposed Scheme and the ability of the existing landscape to accommodate the perceived changes.

1.3.17. The sensitivity of receptors depends on the location, context and expectations of the receptor (viewer), and the duration of time over which the receptor is affected by the change resulting from the development. The identification of various categories of visual receptors and the assumed visual sensitivity of each forms part of the visual baseline against which the change in the view brought about by the proposed development can be assessed. Table 1 outlines the sensitivity ratings applied to the baseline.

Table 1 - Landscape sensitivity (susceptibility and value) and typical descriptions

Sensitivity	Typical Description
Very high	Landscapes of very high international / national importance and rarity or value with no or very limited ability to accommodate change without substantial loss / gain (i.e. national parks, internationally acclaimed landscapes - UNESCO World Heritage Sites).
High	Landscapes of high national importance containing distinctive features / elements with limited ability to accommodate change without incurring substantial loss / gain (i.e. designated areas, areas of strong sense of place - registered parks and gardens, country parks).
Medium	Landscapes of local or regional recognition of importance able to accommodate some change (i.e. features worthy of conservation, some sense of place or value through use / perception).
Low	Local landscape areas or receptors of low to medium importance with ability to accommodate change (i.e. non-designated or designated areas of local recognition or areas of little sense of place).
Negligible	Landscapes of very low importance and rarity able to accommodate change.

Table 2 - Visual sensitivity (susceptibility and value) and typical description

Sensitivity (susceptibility and value)	Typical Descriptions
Very high	1) Static views from and of major tourist attractions; 2) Views from and of very important national / international landscapes, cultural / historical sites (e.g., National Parks, UNESCO World Heritage sites); and 3) Receptors engaged in specific activities for enjoyment of dark skies.
High	1) Views by users of nationally important PRoW / recreational trails (e.g. national trails, long distance footpaths); 2) Views by users of public open spaces for enjoyment of the countryside (e.g. country parks); 3) Static views from dense residential areas, longer transient views from designated public open space, recreational areas; and 4) Views from and of rare, designated landscapes of national importance.

Sensitivity (susceptibility and value)	Typical Descriptions
Moderate	1) Static views from less populated residential areas, schools and other institutional buildings and their outdoor areas; 2) Views by outdoor workers; 3) Transient views from local / regional areas such as public open space, scenic roads, railways or waterways, users of local / regional designated tourist routes of moderate importance; and 4) Views from and of landscapes of regional importance.
Low	5) Views by users of main roads or passengers in public transport on main arterial routes; 6) Views by indoor workers; 7) Views by users of recreational / formal sports facilities where the landscape is secondary to enjoyment of the sport; and 8) Views by users of local public open spaces of limited importance with limited variety or distinctiveness.
Negligible	9) Quick transient views such as from fast moving vehicles; 10) Views from industrial area, land awaiting re-development; and 11) Views from landscapes of no importance with no variety or distinctiveness.

DETERMINING THE MAGNITUDE AND IMPACT

1.3.18. In accordance with the DMRB LA107 guidance, an assessment of the project characteristics, such as size and extent; location and alignment; type and massing; was used to determine the potential landscape impacts.

1.3.19. The magnitude of these effects to each of the landscape receptors was determined by the descriptors set out in Table 3.

Table 3 - Magnitude and nature of effect on the landscape and typical descriptions

Magnitude of effect (change)		Typical Descriptions
Major	Adverse	Total loss or large-scale damage to existing landscape character or distinctive features or elements; and / or addition of new uncharacteristic, conspicuous features or elements (i.e. road infrastructure).
	Beneficial	Large scale improvement of landscape character to features and elements; and / or addition of new distinctive features or elements, or removal of conspicuous road infrastructure elements.

Magnitude of effect (change)		Typical Descriptions
Moderate	Adverse	Partial loss or noticeable damage to existing landscape character or distinctive features or elements; and / or addition of new uncharacteristic, noticeable features or elements (i.e. road infrastructure).
	Beneficial	Partial or noticeable improvement of landscape character by restoration of existing features or elements; or addition of new characteristic features or elements or removal of noticeable features or elements.
Minor	Adverse	Slight loss or damage to existing landscape character of one (maybe more) key features and elements; and / or addition of new, uncharacteristic features and elements.
	Beneficial	Slight improvement of landscape character by the restoration of one (maybe more) key existing features and elements; and / or the addition of new characteristic features.
Negligible	Adverse	Very minor loss, damage or alteration to existing landscape character of one or more features and elements.
	Beneficial	Very minor noticeable improvement of character by the restoration of one or more existing features and elements.
No change		No noticeable alteration or improvement, temporary or permanent, of landscape character of existing features and elements.

1.3.20. The visual assessment of the magnitude of identified impacts records the degree of change in the composition of particular views: comparing the existing view (baseline) to that which would result as a consequence of the Proposed Scheme. In determining the magnitude of an impact, the following were considered:

- Scales of change - large scale projects usually generate a greater magnitude of change, but not always;
- Nature of change - the extent to which a given change is out of character with the existing view can influence the magnitude of the impact;
- Distance - the magnitude of any change would generally decrease with distance, until a point is reached where there is no discernible change;
- Screening - certain features may screen or partially screen particular views. Where the feature is vegetation (e.g. deciduous trees) the screening effect may be seasonal;
- The direction and focus of the view - if the change occurs in the part of the landscape which is the principal area of existing visual interest, the effects are likely to be perceived to be greater than if the proposed change occurs away from the main area of visual interest. This is especially relevant in the context of views from within houses (which are effectively framed by their windows), or from gardens (where views are often restricted by vegetation), and from prominent or locally valued viewpoints;

- Whether the receptor is static or moving – a greater emphasis was placed upon static receptors than moving receptors from a single viewpoint. However, the cumulative effect of several affected views on a moving receptor may have a high magnitude of impact;
- Numbers and types of receptors potentially affected at a viewpoint - (e.g. a popular viewpoint, busy trunk road, little-used path or minor lane); and
- Night time impacts on receptors - street lighting and headlight glare can introduce additional adverse visual impacts after dark. Conversely, feature lighting can have beneficial visual impacts at night time.

1.3.21. The magnitude of impact, or degree of change, is assessed using the criteria in Table 4.

Table 4 - Magnitude (change) of visual effect and typical descriptions

Magnitude (change) of visual effect	Typical descriptions
Major	The project, or a part of it, would become a dominant feature or focal point of the view.
Moderate	The project, or a part of it, would form a noticeable feature or element of the view which is readily apparent to the receptor.
Minor	The project, or a part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view.
Negligible	Only a very small part of the project would be discernible, or it is at such a distance that it would form a barely noticeable feature or element of the view.
No change	No part of the project, or work or activity associated with it, is discernible.

ASSESSING THE SIGNIFICANCE OF LANDSCAPE IMPACTS

1.3.22. The first assessment (preliminary assessment) determined the significance of the landscape effects without mitigation measures.

1.3.23. In accordance with DMRB LA107, this has been assessed at the construction phase, and Year 1 of the operational phase and Year 15. The effects on night-time character has also been taken into consideration. The significance of the landscape effects of the Proposed Scheme was derived by assessing the value, or '*sensitivity*' of the receptor, against the degree of change, or '*magnitude of impact'* resulting from the development. These valuations are combined by referring to a matrix as shown in the table below to identify the '*significance of effects'*.

1.3.24.

1.3.25. Table 5 below is reproduced from Table 3.8.1, DMRB LA 104 Revision 1, Environmental assessment methodology. Paragraph 3.8.1 states: 'Where Table 3.8.1 [DMRB LA 104] includes two significance categories, evidence should be provided to support the reporting of a single significance category'.

Table 5 - Significance Matrix (Landscape)

		Magnitude of impact (degree of change)				
Environmental value (sensitivity)		**No change**	**Negligible**	**Minor**	**Moderate**	**Major**
	Very high	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

1.3.26. In accordance with DMRB, this has been assessed at Construction Phase, Year 1 and Year 15. The effects on the visual receptor at night have also been taken into consideration. The significance of visual effects of the Proposed Scheme was derived by assessing the value, or 'sensitivity' of the receptor, against the degree of change, or 'magnitude of impact' resulting from the development. These valuations are combined by referring to a matrix as shown in the table below to identify the 'significance of effects'.

Table 6 - Significance Matrix (Visual)

	Magnitude of impact (degree of change)					
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
Environmental value (sensitivity)	**Very high**	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or Moderate	Moderate or large	Large or very large
	Moderate	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

1.3.27. Table 7 provides typical descriptors of the significance of effects categories. Effects that are Moderate, Large, or Very Large are considered to be 'significant'.

Table 7 - Significance categories and typical descriptions

Significance Category	Typical description
Very large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making process.
Moderate	Effects at this level can be considered to be material decision-making factors.
Slight	Effects at this level are not material in the decision-making process.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

1.3.28. Table 8 provides typical descriptors of the significance of effects categories. Effects that are Moderate, Large, or Very Large are considered to be 'significant'. Where there are two values in the significance matrix the higher value has been applied to the assessment.

Table 8 - Significance categories and typical descriptions

Significance category	Typical description
Very large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making process.
Moderate	Effects at this level can be considered to be material decision-making factors.
Slight	Effects at this level are not material in the decision-making process.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

IDENTIFYING MITIGATION MEASURES

1.3.29. Design elements will be introduced to mitigate adverse effects of the Proposed Scheme. These mitigation measures are likely to be devised at formal mitigation workshops, meetings and discussions among designers and environmental assessors to consider options to embed mitigation to reduce significant landscape effects and aid integration of the Proposed Scheme with the existing landscape.

1.3.30. Pre-application consultations (PAC) will take place with the local planning authority in 2024.

1.3.31. As a result of the PAC comments, mitigation will be listed as scheduled in the appropriate chapters of this Environmental Statement (ES).

ASSESSING RESIDUAL EFFECTS

1.3.32. Following the introduction of mitigation, landscape receptors that were previously identified to have significant effects will be re-assessed to determine the effect of residual impacts. The effects will be assessed at both the construction phase and Year 1 of the operational phase and Year 15 to demonstrate how adverse landscape effects over time can be effectively mitigated by planting.

1.3.33. Following the introduction of mitigation, visual receptors that were previously identified to have significant effects will be assessed again. This residual impact assessment will determine whether mitigation causes a change in significance of effects. Again, the effects will be assessed at both Construction Phase, and operational Year 1 and at Year 15. The detailed assessment of the residual visual impacts will take into account all proposed mitigation. This may take the form of softening the contours of the created spoil heaps and restored landform to integrate with surrounding topography, which would be effective from the first day of landscape restoration, or screen planting, which would take a number of years to mature and achieve full effect.

IDENTIFYING CUMULATIVE EFFECTS

1.3.34. The cumulative impacts of any proposed developments within the study area have been assessed for all committed or existing developments. Further details of these developments can be found in the Cumulative Effects section (Section 8.11).

OVERALL IMPACT SIGNIFICANCE

1.3.35. An assessment of impact significance was made for each character area. The results from these assessments informed the overall impact assessment on landscape character which is included in the summary (Section 8.12).

1.3.36. An assessment of impact significance was made for each visual receptor. The results from these assessments informed the overall impact assessment on visual amenity which is included in the summary (Section 8.12).