



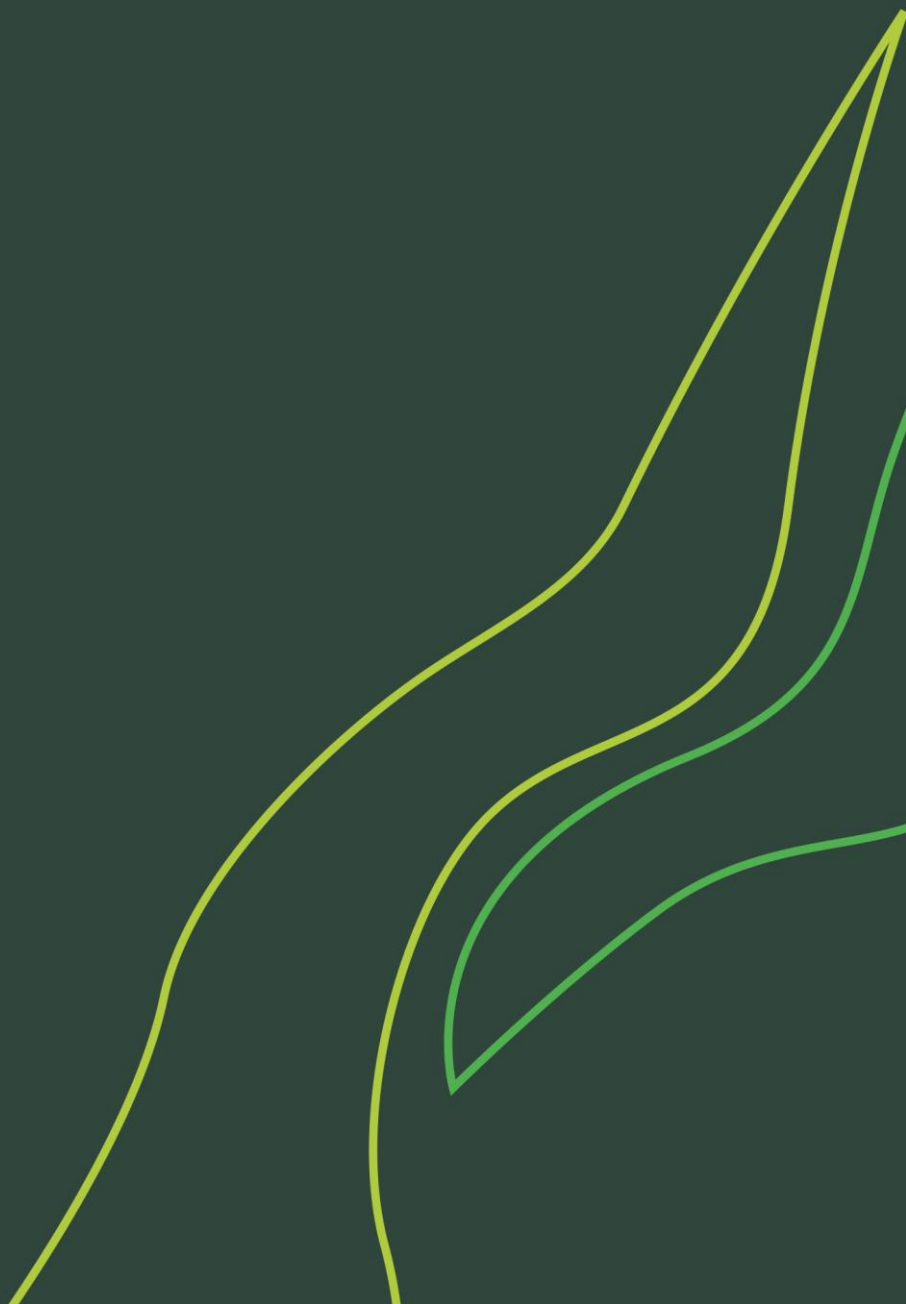
Landscape and Visual Appraisal

Site: Land at MoD Sealand, Green Lane East, Deeside, CH5 2LS

Client: EMCOR Ltd

Document reference: J251173-GCL-XX-XX-T-L-0630

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DOCUMENT CONTROL SHEET

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<i>Author</i>	<p>Sarah Brooks CMLI PIEMA <i>Principal Landscape Architect, Ground Control</i></p> <p>Ground Control Limited, Kingfisher House, Radford Way, Billericay, Essex, CM12 0EQ E: sarah.brooks@ground-control.co.uk</p>		
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Contents

1.1	Introduction	1
1.2	Appraisal Process	2
1.3	Planning Policy and Designations	6
1.4	Baseline Landscape Character	10
1.5	Baseline Views and Visual Amenity	16
1.6	Proposed Development	18
1.7	Appraisal of Landscape Effects	20
1.8	Appraisal of Visual Effects	23
1.9	Conclusion	27
1.10	References	28
	Appendix 1 - Appraisal Criteria	
	Appendix 2 - Zone of Theoretical Visibility Methodology	
	Appendix 3 – Figures and Viewpoints	

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1.1 Introduction

1.1.1 EMCOR Ltd (the Applicant) is submitting a full planning application to develop a ground-mounted solar photovoltaic (PV) electricity generating scheme on land at MoD Sealand, Green Lane East, Deeside (the Application Site).

1.1.2 The full description of the proposed development is as follows:

'Installation of ground mounted photovoltaic (PV) solar arrays to provide 3MW generation capacity with ancillary infrastructure including inverters, HV / LV connection, cabling, internal access track and access gates.'

1.1.3 New development and changes in land use can result in changes to landscape character, views and visual amenity which need to be considered as part of the planning process. This Landscape and Visual Appraisal (LVA) prepared by Ground Control Ltd (GC Ltd) identifies the likely effects of the proposals on landscape elements and character (landscape receptors) and on people (visual receptors) including their views and visual amenity. The LVA accompanies the planning application for the proposed scheme and has been undertaken by a Chartered Landscape Architect with experience of assessing this type of development.

1.1.4 The Application Site is centred on national grid reference 333794,370472 and it occupies 3.2 hectares (ha) of 'brownfield' land comprising a disused playing field. It is located in the northern part of the MoD Sealand base and to the south of the junction of the A494 and the A548 (see Figure A below). To the west of the road corridor lies the Deeside Industrial Park and to the east lies Green Lane East and undeveloped agricultural land. Flintshire County Council is the Local Planning Authority (LPA) for the area.



Figure A - Application Site at MoD Sealand, Deeside (not to scale, grid square = 1km)

1.2 Appraisal Process

Guidance

1.2.1 The appraisal has been undertaken in accordance with the following published guidance:

- Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3) (2013) Landscape Institute and the Institute for Environmental Management and Assessment (this is also the guidance recommended for preparing a Landscape and Visual Appraisal);
- Notes and Notes and Clarifications on Aspects of GLVIA3: Technical Guidance Note 24/01 (TGN 24/01) (August 2024) Landscape Institute;
- Visual Representation of Development Proposals: Technical Guidance Note 06/19 (TGN 06/19) (September 2019) Landscape Institute.
- Using LANDMAP in Landscape and Visual Impact Assessments (GN46) (November 2025) Natural Resources Wales.

Approach to the Appraisal

1.2.2 The landscape and visual effects of proposed development are two distinct but related areas. Landscape effects can result from the physical changes brought about by development due to the loss or alteration of landscape elements such as trees, hedges or buildings, or the introduction of new components, and may have consequent effects on the perception of the landscape and landscape character. Visual effects relate to changes to the composition and availability of views experienced by people and the overall visual amenity of an area (or the pleasantness of its views). As such the appraisals of landscape effects and visual effects have been undertaken separately as part of an iterative process with the findings of each process used to inform the study of the other.

1.2.3 The appraisal study area is established through an evaluation of the landscape and visual context of the Application Site. Relevant planning policy, landscape character studies and other published information are reviewed, and potential landscape and visual receptors are identified and evaluated. A number of representative Key Viewpoints are identified and following a site visit the visual appraisal process uses these as a proxy for exploring the potential visual impacts of the proposals on visual receptors.

1.2.4 The proposed development is described and potential landscape and visual impacts arising from the proposals are identified taking account of any integrated mitigation. Appraisal criteria are used to estimate the level of the effect resulting from the proposed development and whether it would be beneficial, neutral or adverse. Where necessary recommendations are made for further mitigation measures to avoid, reduce or compensate for adverse landscape and visual effects, and any remaining residual effects are summarised.

Appraisal Criteria

1.2.5 The GLVIA3 states that judgements about the landscape and visual effects of development should be *'reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others'*. To minimise the subjective influence on the appraisal process defined word scales and descriptive categories are used to summarise judgements about the sensitivity of a landscape or visual receptor, the magnitude of change brought about by the proposals, and the consequent relevance of any effects. These are set out in Appendix 1 and the process is summarised below.

- 1.2.6 The sensitivity of landscape and visual receptors to the type of development proposed is a function of the receptor's value and its susceptibility to change, and the magnitude of change brought about by the development can be considered in terms of its size and scale, geographical extent, duration and reversibility. Value is the relative value or importance attached to individual landscape elements, character, views or visual amenity through statutory designation, support through national and local policy, and in respect of undesignated areas which may have notable landscape or visual attributes or importance for local people.
- 1.2.7 Sensitivity and magnitude of change are described on a qualitative scale of Very High, High, Medium, Low and Negligible, and the type of change can be beneficial (an improvement), adverse (detracting or damaging) or neutral (neither beneficial or adverse or the landscape character or balance of the view is maintained).
- 1.2.8 The relevance of an effect is derived from the combination of the sensitivity of the receptor and the magnitude of change likely to occur and is described on a qualitative scale as being Substantial, Large, Moderate, Slight or No Change. In general, a higher level of relevance is associated with larger-scale effects and effects on more sensitive receptors. It is also possible for small effects on highly sensitive receptors to be of greater relevance than large effects on less sensitive receptors. Effects of particular relevance may have the potential to impose adverse change which is unacceptable or change which is beneficial and potentially welcome. Residual effects are those which remain after the implementation of agreed mitigation measures or where there is no feasible mitigation.

Desktop Study

- 1.2.9 A desktop study has been undertaken to gather information to inform the baseline studies and appraisal criteria, and has included the following sources:
- Relevant legislation;
 - National and local planning policy;
 - National and local landscape character studies;
 - Multi Agency Geographic Information for the Countryside (<https://magic.gov.uk>), Natural Resources Wales (<https://naturalresources.wales>), Flintshire County Council mapping (<https://fccmapping.flintshire.gov.uk>) and other digital sources as referenced;
 - Ordnance Survey 1:25,000 mapping
 - Aerial photography.
- 1.2.10 The LVA has been informed by the following design and survey information:
- Planning application drawings (GC Ltd, February 2026)
 - Planning Statement (GC Ltd, March 2026)
 - Design and Access Statement (GC Ltd, March 2026); and
 - Preliminary Ecological Appraisal and Biodiversity Impact Assessment (Ramm Sanderson, January 2026).

Study Area

- 1.2.11 The GLVIA3 stresses the need for a proportionate approach to appraisal which reflects the scale of the development being assessed and the nature of its likely effects. Receptors found to be visually screened from the Application Site and proposed development by existing built structures, landform or vegetation, or where it became evident during the early stages of the appraisal that the level of effect on the receptor was likely to be below the levels of perception, have been 'scoped-out' of the appraisal.
- 1.2.12 A desktop review of OS mapping and online resources and the analysis of Zone of Theoretical Visibility (ZTV) modelling has informed the extent of the study area. The ZTV estimates the likely visibility of the proposed development based on a digital model of the existing ground surface, built features and main areas of vegetation screening as well as the height of the development (the methodology for the preparation of the ZTV model is included in Appendix 2). Visibility of the proposed development has also been verified through site survey.
- 1.2.13 Figure 1 illustrates the likely ZTV of the proposed solar arrays and suggests that beyond the immediate vicinity of the Application Site there would be very limited potential to see the development. Due to the high level of screening provided by existing adjacent buildings and landform and intervening vegetation the proposals are unlikely to be visible from the main areas of population within the study area at Garden City approx. 1.0km to the south-west, Shotwick approx. 1.2km to the north or at Saughall approx. 2.2km to the east. Visual receptors at these locations have therefore been 'scoped-out' of the appraisal.
- 1.2.14 The ZTV mapping suggests that the scheme is likely to be visible adjacent to the site and potentially within approx. 2km at locations mainly to the north-east and east, and theoretically visible from distant locations approx. 5km to the south-west. In practice any views of the proposed solar PV scheme are likely to be imperceptible beyond 2km and the study is limited to this area.
- 1.2.15 From the desktop review and ZTV analysis a range of potential landscape and visual receptors and the possible locations of Key Viewpoints within a refined 2km study area of the Application Site have been identified. Landscape receptors include features within and adjacent to the site and locations which are potentially intervisible with the site where scenic value as a component of landscape character may be important. Visual receptors (people) have been identified through analysis of land use and location and therefore peoples' occupation or activity which can affect their sensitivity to change and the potential for views of the site.

Consultation

- 1.2.16 The GLVIA3 recommends early consultation with the LPA on the extent of the study area and the approach to be taken to the appraisal. Flintshire CC was contacted in November 2025 to discuss the findings of the ZTV analysis and the location of proposed Key Viewpoints to represent a range of views towards the proposed development for use in the visual appraisal but no response was received.
- 1.2.17 The LPA's response to an earlier formal pre-application consultation of the proposals by EMCOR Ltd during 2024 has informed the appraisal.

Site Visit

- 1.2.18 A site visit was undertaken on the 8th December 2025 to confirm information derived from the desktop study and to obtain photography for the appraisal from publicly accessible locations. The weather was initially dry with sunny spells and good visibility later turning wet with poor visibility although this is not considered to have influenced the conclusions of the appraisal.

Visualisation Techniques

- 1.2.19 Plans and photographs included in Appendix 3 are used to illustrate the appraisal and identify the Application Site and potential landscape and visual receptors in context.
- 1.2.20 The methodology for the preparation of the ZTV modelling is included at Appendix 2.
- 1.2.21 Photographs for the Key Viewpoints were obtained using a full-frame DSLR camera with a fixed 50mm lens mounted on a panoramic head and tripod at a viewing height of 1.60m. Images were taken in portrait format with a 15-degree (approx. 50%) overlap and stitched and formatted using digital photo editing software. The images have been prepared as 'Type 1' visualisations or annotated viewpoint photographs in line with LI TGN 06/19.

Limitations

- 1.2.22 Although the Key Viewpoints and other illustrative material are used to support the appraisal a site visit is recommended to properly understand the context of the viewing locations and the likely effects of the proposals on landscape character, views and visual amenity.
- 1.2.23 A solar PV array height of 2.8m was used for the generation of the ZTV mapping and initial desk studies. Further design considerations have identified that the mounted height of the arrays would be in the range of approx. 2.8m – 3.0m. The ZTV based on a height of 2.8m is still considered to be representative of the overall effect of the intervisibility of the proposed development which has been confirmed by a site visit.
- 1.2.24 The LVA does not constitute an assessment of visual effects for the purposes of a Residential Amenity Assessment.

1.3 Planning Policy and Designations

1.3.1 Statutorily protected features, other features of interest and planning policy relevant to the appraisal are summarised below and illustrated on Figure 2 Landscape Context.

Designations

1.3.2 The Application Site is not covered by statutory or non-statutory environmental or landscape designations.

1.3.3 The wider study area includes several statutorily designated features which reflect the area's importance for the natural environment and these include the following:

- The River Dee and Bala Lake Special Area of Conservation (SAC) approx. 2.2km to the south-west;
- The Dee Estuary Special Protection Area (SPA) located approx. 2.6km to the south-west;
- The River Dee and Dee Estuary Sites of Special Scientific Interest (SSSI) approx. 2.5km south-west;

1.3.4 The setting of features of historical importance has the potential to be affected by changes in landscape character and visual amenity brought about by new development. Several designated heritage features within the wider study area contribute to its historical character and landscape value. However, either intervisibility with the Application Site and the development proposals is restricted or the context of the feature is such that its setting would not be affected by the proposals and as individual landscape receptors they have been scoped-out of the appraisal. Within 1km of the Application Site these include the following:

- Shotwick Castle motte and bailey and late medieval gardens approx. 1km to the east is designated as a Scheduled Monument. It is screened from the wider landscape by mature trees.
- Listed Buildings between approx. 0.25km and 0.5km to the south-west comprising three pairs of former aircraft hangers set with the industrial context of the Deeside Industrial Park;
- Listed Building at Old Marsh Farm approx. 0.6km to the south and beyond MoD Sealand.

1.3.5 The use and amenity of a public right of way (PROW) such as a footpath, bridleway or byway, Access Land and public open space can be affected by development proposals. There is no public access or PROW within the Application Site and few routes generally in the surrounding landscape and the Application Site is no longer used for recreation. The public highways adjacent to the Application Site including Green Lane East and the A548 and the wider urban fabric of the Deeside Industrial Park to the west include publicly accessible locations and footways.

1.3.6 Designated PROW with some potential intervisibility with the Application Site include the following:

- Bridleway BW309/7/20 along Green Lane East adjacent to the MoD Sealand site.
- Footpath FP309/13/10 across the open agricultural land approx. 380m to the north-east.
- Bridleway BW267/3/1 Shotwick Park 3 approx. 1.2km to the north-east; and
- The Chester Millenium Greenway off-road multi-user route approx. 0.5km to the south.

European Landscape Convention

- 1.3.7 The European Landscape Convention (ELC) (Council of Europe, 2000) draws together a range of concepts of why the landscape as a resource is important in its own right. It highlights the potential conflict between the economic benefits associated with the exploitation of natural resources and land use, recreation and tourism, and the general health and wellbeing of society including the non-monetary benefits of the landscape as a resource.
- 1.3.8 The ELC became binding in March 2007 and defines landscape as '*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*'. The term applies to all landscapes, urban and rural, in any condition and the Convention requires signatories to develop planning and other policies specifically for the protection and management of the landscape.

Development Plan

- 1.3.9 The development plan for the Application Site comprises the following documents:
- Future Wales: The National Plan 2040, Welsh Government 2021.
 - Flintshire Local Development Plan 2015 – 2030, adopted January 2023.

Future Wales: The National Plan 2040

- 1.3.10 Future Wales: The National Plan 2040 is the national development framework for Wales and forms the upper tier of the statutory development plan for the Application Site. Its purpose is to ensure that all tiers of the planning system are consistent with and support the delivery of Welsh Government strategic aims and policies.
- 1.3.11 Policy 17 'Renewable and Low Carbon Energy and Associated Infrastructure' supports the development of renewable energy technologies at all scales and confirms that 'proposals should demonstrate that they will not have an unacceptable adverse impact on the environment'. The Plan goes on to confirm that 'irrespective of location or scale, the design and micro-siting of proposals must seek to minimise the landscape and visual impact, particularly those in close proximity to homes ...' (page 97).

Flintshire Local Development Plan

- 1.3.12 Strategic Policy STR13: Natural and Built Environment, Green Networks and Infrastructure confirms that development should:
- i. Protect open countryside ...;
 - ii. Protect the open character and appearance of green wedges;
 - iii. Conserve, protect and enhance the quality and diversity of Flintshire's natural environment including landscape, biodiversity, the Dee Estuary ...;
 - iv. Promote opportunities to enhance biodiversity and ensure resilience;
 - v. Maintain, enhance and contribute to green infrastructure;

vii. Conserve, protect and enhance the local distinctiveness and quality of Flintshire's built and historic environment including listed buildings, conservation areas, registered historic parks, gardens and landscapes, scheduled ancient monuments and other locally important historic assets.

- 1.3.13 The Application Site is allocated under Policy PE2 as a Principal Employment Area (PEA) which extends to cover the Deeside Industrial Park and the rest of the MoD Sealand site (excluding existing residential areas). A range of land uses are anticipated including B1 business use, B2 general industry and B8 storage and distribution. The policy states that development in the PEA should be 'of an appropriate type and scale for both the site and its surroundings ...' and should satisfy other Plan policies.
- 1.3.14 Policy PC3: Design confirms that all new development should 'retain existing landscape and nature conservation features and incorporate opportunities to enhance biodiversity and ecological connectivity' as well as 'protect the living conditions of nearby occupiers from any harmful effects of new development including ... harm to outlook ...'.
- 1.3.15 Policy EN4: Landscape Character states that 'New development, either individually or cumulatively, must not have a significant adverse impact on the character and appearance of the landscape. Landscaping and other mitigation measures should seek to reduce landscape impact and where possible bring about enhancement.'. The supporting text also highlights the use of the LANDMAP data sets in evaluating landscape character to inform planning decisions about the new development.
- 1.3.16 Undeveloped agricultural land to the east of Green Lane East is identified as area '15: Sealand – Cheshire Border (N of R. Dee)' under Policy EN11: Green Wedges. Development is required to maintain the openness of the Green Wedge and not conflict with the purposes of including land within it. One of the purposes of Green Wedges is to 'assist in urban regeneration by encouraging the recycling of derelict and other urban land'. The site lies to the south of the border with England where land within the district of Cheshire West and Chester is designated as Green Belt with similar objectives and purposes.
- 1.3.17 Policy EN13: Renewable and Low Carbon Energy Development confirms that small scale (less than 5MW) proposals for solar renewable energy may be permitted in appropriate locations subject to meeting a range of criteria as follows:
- ii. the siting, design, layout, type of installation and materials used do not have a significant adverse effect on the character and features of the proposed location;
 - iii. there would not be unacceptable loss of public amenity or accessibility to the area;
 - iv. the impact of the development upon agriculture, forestry, recreation and other land uses is minimised to permit existing uses to continue unhindered;
 - v. there would be no individual or cumulative significant adverse effect on the landscape ...;
 - vi. any associated ancillary buildings or structures are sensitively sited and designed to minimize their impact on the character and quality of the locality;
 - viii. adequate provision has been made in the scheme for the restoration and aftercare of the site on the cessation of use.

Planning Policy Wales 12 (edition 12, Welsh Government, February 2024)

- 1.3.18 Planning Policy Wales 12 (PPW12) sets out the Welsh Government’s land use planning objectives and how these should be achieved through the development plan.
- 1.3.19 Section 3 ‘Strategic and Spatial Choices’ focuses on placemaking and the importance of good design based on site analysis and including the efficient use and protection of natural resources, enhancing biodiversity, designing for change, and supporting decarbonisation & clean growth.
- 1.3.20 Section 6 ‘Distinctive and Natural Places’ covers the environmental and cultural components of placemaking and suggests that the value of all landscapes is protected for their distinctive character and special qualities. It confirms at paragraph 6.3.4 that ‘Where adverse effects on landscape character cannot be avoided, it will be necessary to refuse planning permission’. LANDMAP data sets are proposed for use in local distinctiveness, design and landscape sensitivity studies and in development management decisions.

Designing for Renewable Energy in Wales (Design Commission for Wales, November 2023)

- 1.3.21 The Design Commission for Wales is the national advisory body for design quality in the built and natural environment and in relation to the proposed development its guidance supports Policy 17 for renewable energy in Future Wales: The National Plan 2040. Section 6.0 confirms that solar PV schemes should ‘be designed in a manner that complements the qualities of existing landscapes’ and it identifies the design issues which should be addressed including location, layout and response to landscape scale, perimeter screening in relation to unacceptable local impacts, colour, reflection, and potential to provide nature conservation and biodiversity enhancement.

Planning Applications

- 1.3.22 An application for heat source pumps, acoustic fencing and a hedgerow on land to the south-east of the Application Site was recently approved in December 2025 (reference FUL/000958/25).

1.4 Baseline Landscape Character

The Application Site

- 1.4.1 The Application Site covers 3.2 hectares (ha) of 'brownfield' land comprising a disused playing field located in the northern part of the MoD Sealand site. It is bordered in the north and west by the A548, to the north-east by Green Lane East and to the east and south by operational areas of the MoD site. These comprise large workshops and external areas of hard standing and car parking. Access to the site is from the service area within MoD Sealand with the wider site accessed off Green Lane East.
- 1.4.2 There is no surface water on the Application Site which is flat at approx. 4.7m above Ordnance Datum (aOD) in the south-west rising to approx. 5.0m aOD in the east. The Application Site sits at a lower elevation than the A548 to the north which rises to form a split-level junction with the A494 Welsh Road, the A550 and Green Lane East. The site appears undisturbed despite the area's history and high level of disturbance in the adjacent areas to the north and west.
- 1.4.3 The area is laid to grass which is mown regularly and there are no trees or areas of established woody vegetation within the Application Site. Scattered individual trees are located beyond the western and south-western boundaries and belts of established mixed woodland are located beyond the northern and eastern boundaries. Existing trees and woodland would not be affected by the proposed development.
- 1.4.4 Habitats associated with the site are evaluated in the Preliminary Ecological Appraisal (PEA) Report submitted with the application. The existing habitat on the site is restricted to species-poor modified grassland of 'limited ecological value' dominated by Rye grass with a range of common forb species such as Buttercup. Based on the PEA there is no evidence of and low potential for the use of the site by protected species such as bats.
- 1.4.5 The site boundary is enclosed by existing tall 2m+ security fencing comprising chain-link fencing or dark plastic-coated metal mesh panels topped. In places the fencing is topped with razor wire. Existing surveillance of the site includes CCTV cameras and the site is partly lit by flood lighting on the wider MoD site and street lighting on the adjacent public highway. A static display comprising a fighter jet plane is located adjacent to the eastern boundary with provision for visitor parking and viewing.

Wider Landscape Context

- 1.4.6 MoD Sealand lies on the northern side of the River Dee floodplain in Deeside in Wales and approx. 0.4km south of the border with England. The settlement of Garden City lies approx. 1.5m to the south-west with Connah's Quay and Shotton on the south side of the River Dee between 3 – 4km from the Application Site. Further south the land rises to around 85m aOD at Ewloe approx. 5km from the site. The River Dee is straightened and enclosed between flood banks through the study area and the adjacent flood plain (which benefits from flood protection measures) is largely urbanised.
- 1.4.7 In the north the land rises beyond the border with England to a lower elevation around 45m aOD. Although lying within the Wirral peninsular it is a predominantly rural landscape within the study area where agricultural land is interspersed with isolated properties and farmsteads, villages and woodland blocks and tree belts. The villages of Shotwick located approx. 1.2km to the north and Saughall approx. 2.2km to the south-east lie at approx. 15m aOD and 25m aOD respectively. Settlement in the north is linked by a sparse

network of lanes and private tracks and there are few off-road public rights of way. Access to the countryside in the north and east of the study area is therefore limited.

- 1.4.8 The road corridor to the west of the Application Site is a wide, six-lane trunk road plus slip lanes comprising the A494 Welsh Road flanked by the A548 to the east bordering the site. Deeside Industrial Park is accessed off the A548 west of the junction and further south via the B5441. This is a very extensive area of large-scale heavy industrial and commercial warehousing. Land uses include power generation and transmission infrastructure, TATA's Shotton steel works, Shotton paper mill and the Toyota manufacturing plant in the west and smaller-scale warehousing and commercial units in the east.
- 1.4.9 Historically the eastern part of the industrial park comprised the Sealand airstrip which was further developed east of Welsh Road to become MoD Sealand during World War Two. The three pairs of listed former aircraft hangers in the southern part of the industrial park and the remaining MoD Sealand base are a visible legacy of the area's war-time land use.
- 1.4.10 Energy-related land uses on the Deeside Industrial Park include the Flintshire Bridge HVDC Converter Station (part of an under-sea high voltage electricity connection to Scotland) and a small 3.8MW ground-mounted solar PV scheme at the Toyota manufacturing plant approx. 1.8km to the west of the Application Site. The large 45.7MW Shotwick Solar Park is located approx. 1.5km to the north-west of the Application Site. Further afield the small 1.6MW Crumps Yard solar PV scheme and the large-scale Connah's Quay power station are located approx. 4km and 5.5km to the south-west respectively. A consequence of the importance of the area for high energy-demanding land uses and generation is the incidence of multiple pylons and overhead electricity lines which are a distinct and repetitive component of the skyline on the edges of the study area.
- 1.4.11 The Northern Gateway mixed-use development site comprises the land between the River Dee and the Deeside Industrial Park, separated by the multi-user Chester Millenium Greenway along a former rail corridor which also provides a bridge crossing over the A494. The area is part-built with an immature landscape of new access roads, warehousing, offices and estate housing.

Landscape Character

- 1.4.12 Landscape character is the distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another (rather than better or worse) and which creates a particular sense of place. Published landscape character assessments have been reviewed to help define the landscape character of the study area supported by evidence from the site visit.

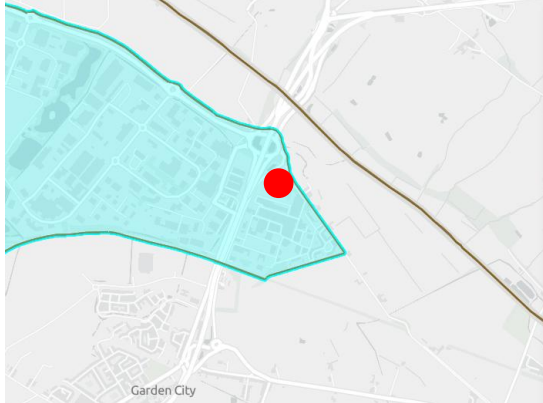
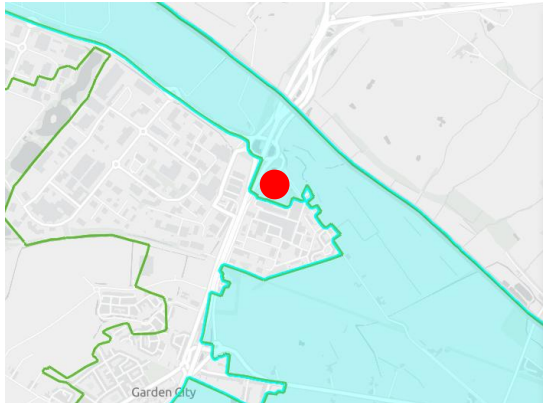
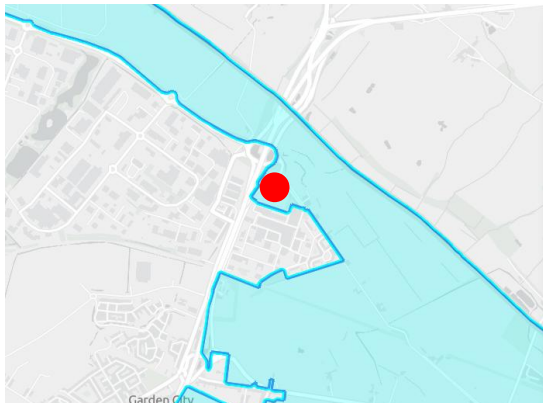
National Landscape Character

- 1.4.13 Natural Resources Wales (NRW) maintains the LANDMAP system which uses five 'aspects' or spatial datasets (geological landscape, landscape habitats, visual and sensory, historic landscape and cultural landscape services) to classify the landscape into character areas with descriptive profiles at all scales.
- 1.4.14 At a national level, The Application Site lies on the northern edge of National Landscape Character Area (NLCA) '13 Deeside and Wrexham' in the reclaimed and industrialised lowland and estuary landscape of the River Dee while most of the NLCA lies inland and extends south to Wrexham. The Application Site comprises a very small part of NLCA13 and the industrial character of the wider area would be reinforced by its development although on a very small scale. NLCA13 is not considered further in the appraisal.

Local Landscape Character

At a local level the information for each aspect covering the Application Site is shown below along with the Visual and Sensory and the Cultural Services aspect information for the land to the east of Green Lane East within the ZTV of the proposals within 1km.

Table 1 – LANDMAP Aspect Information for the Application Site (red dot)

Aspect	Data
<p>Geological Landscape – GL530 Deeside Industrial</p> 	<p>Description: Extensive area of industrial development and made-ground on reclaimed former saltmarsh. Includes some artificial lakes/pools and traces of possible borrow pits. Effectively enclosed by flood-defence bank, railway embankment and road system.</p> <p>Condition: Poor – Significant parts or characteristics have been damaged or lost.</p> <p>Overall evaluation: Low- Reclaimed former saltmarsh with extensive areas of made ground and industrial development.</p>
<p>Landscape Habitats – LH025 Sealand Grassland</p>  <p>Description: This very flat and fertile area is a mixture of arable and pasture fields. There are a</p>	<p>few hedges in the area but many ditches separate the fields. The wildlife value of the area is greatly enhanced by the presence of small ponds which support an internationally important population of great crested newts. This area could be threatened by rising sea levels and continuing intensification of agricultural activities.</p> <p>Condition: Unassessed</p> <p>Overall evaluation: Moderate – The habitats within the area are mainly improved grass fields and arable land. The river Dee passes through the area, however its course has been canalised and therefore is less useful for wildlife. However the ditches, ponds and semi-natural grassland do support an internationally important population of great crested newts giving a borderline moderate to high evaluation.</p>
<p>Historic Landscape – HL603 Sealand</p>  <p>Description: Flat and low-lying fieldscapes on the northern side of the Dee Estuary, below 10</p>	<p>metres above sea level, systematically reclaimed from former salt marsh between 1749 and 1916, following the construction of the New Cut of the river Dee in 1737. The modern landscape is characterised by a series of substantial embankments enclosing a pattern of drainage dykes, straight-sided fields with boundaries marked by post-and-wire fences and hedges, and straight roads. Settlement represented by dispersed farmsteads. Dominant period is the Post Medieval (1536+) and Recent.</p> <p>Condition: not reported</p> <p>Overall evaluation: High - A large and well ordered reclaimed area with the potential for significant archaeological recovery of buried landscape, but little above ground interest</p>

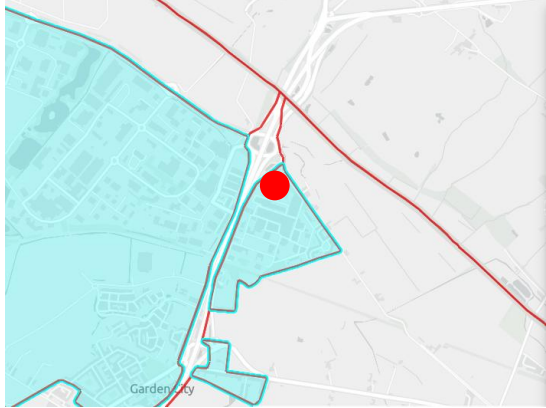
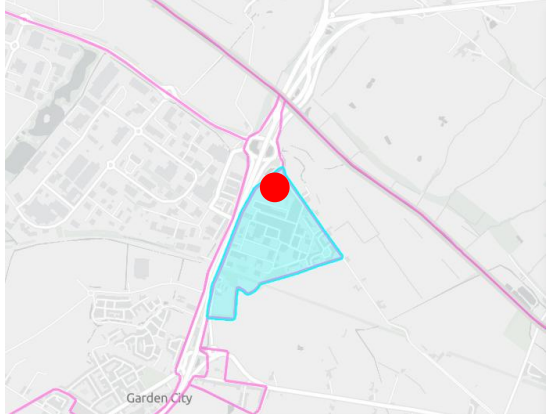
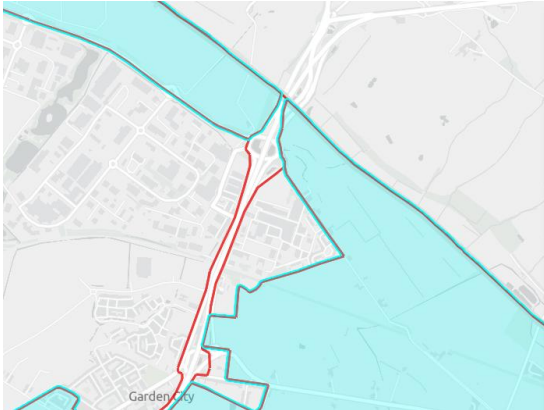
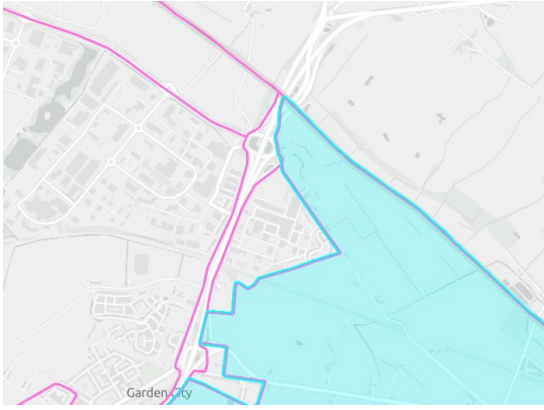
Aspect	Data
<p>Visual & Sensory – VS021 (no name)</p>  <p>Description: Garden City coastal and estuary urban area - an extensive, often linear and interconnected urban area along the edge of the coast & estuary, with larger towns, sprawling suburban edges and large scale heavy industry including docks.</p> <p>Views: No attractive views in or out of the area, unattractive views both into and out of the area.</p> <p>Perceptual sensory qualities: Unattractive. Noisy. Threatening. Settled.</p>	<p>Sense of Place: Weak - few distinctive characteristics</p> <p>Condition: Unassessed</p> <p>Key elements and qualities to conserve and enhance: Coastal & estuary levels influences.</p> <p>Scenic quality: Low – Landscapes with very limited aesthetically pleasing scenes.</p> <p>Integrity: Low – Few characteristic features remain intact, and these are highly fragmented or spoiled by large-scale, visually intrusive, or other inharmonious development.</p> <p>Character: Low – Very little local character in keeping with the natural or built environment. A weak sense of place lacking in distinctive identity.</p> <p>Rarity: Low – Characteristic features and qualities present are common or widely distributed across the study area (county) or beyond.</p> <p>Overall evaluation: Low – Very low quality visual & sensory experience.</p> <p>Light pollution: Substantial</p>
<p>Cultural Landscape – CLS046 (no name)</p> 	<p>Light pollution: Substantial</p> <p>Views: No attractive views in or out of the area.</p> <p>Perceptual and sensory qualities: Unattractive. Noisy. Threatening. Settled.</p> <p>Sense of Place: Weak - few distinctive characteristics</p> <p>Visual and sensory landscape evaluation: Low – Very low quality visual & sensory experience.</p> <p>Scenic quality: Low – Landscapes with very limited aesthetically pleasing scenes.</p> <p>Character: Low – Very little local character in keeping with the natural or built environment. A weak sense of place lacking in distinctive identity.</p> <p>Associations: no information</p>

Table 2 – LANDMAP Selected Aspect Information for land adjacent to the Application Site

Aspect	Data
<p>Visual and Sensory – VS076 Dee Coastal Levels</p>  <p>Description: Dee Coastal Levels - open strip of coastal & estuary levels with diverse mixture of rectilinear fertile arable & pastoral farmland drained by ditches with wetland and urban fringe uses. There are significant areas under clear/white plastic. Uses which tend the degrade the landscape include turf and soil sale. Settlement is scattered including farmsteads with glass and ribbon development in places. Hedgerows are low cut and gappy in places and there are few trees such as sycamore or beech</p> <p>Views: No attractive views in or out of the area, unattractive views out of the area.</p> <p>Perceptual sensory qualities: Exposed. Settled.</p>	<p>Sense of Place: Moderate – Exhibits common but distinctive characteristics which may be repeated throughout the locality.</p> <p>Condition: Fair</p> <p>Key elements and qualities to conserve and enhance: Openness. Hedges, native tree screening belts, wetland, plus ditches.</p> <p>Scenic quality: Moderate – Landscapes with a few scenes of a picturesque quality, which are aesthetically pleasing in composition. These areas are notable locally for these.</p> <p>Integrity: Moderate – Some characteristic features remain intact, but others are fragmented, and/or partly spoilt by some large-scale, visually intrusive, or other inharmonious development.</p> <p>Character: Moderate – Landscapes with some distinctive characteristics whose patterns of elements and features contribute to a local sense of place.</p> <p>Rarity: High – Includes characteristic features and qualities features that are uncommon in a regional or county context.</p> <p>Overall evaluation: Moderate – Three moderates and one high equals moderate value.</p> <p>Light pollution: Moderate</p>
<p>Cultural Landscape – CLS119 Dee Coastal Levels</p> 	<p>Light pollution: Moderate</p> <p>Views: No attractive views in or out of the area.</p> <p>Perceptual and sensory qualities: Exposed. Settled.</p> <p>Sense of Place: Moderate – Exhibits common but distinctive characteristics which may be repeated throughout the locality.</p> <p>Visual and sensory landscape evaluation: Moderate</p> <p>Scenic quality: Moderate – Landscapes with a few scenes of a picturesque quality, which are aesthetically pleasing in composition. These areas are notable locally for these.</p> <p>Character: Moderate</p> <p>Associations: no information</p>

Landscape Value

1.4.15 The LANDMAP data sets suggest that overall the components and character of the Application Site have a **low value** described as being a ‘very low quality visual & sensory experience’. The site falls between the obviously developed character of the Deeside Industrial Park and the open character of the Dee Coastal

Levels to the east. Although the evaluation for landscape habitats is moderate and that for historic landscape is high these are more representative of the value of the Dee Coastal Levels which is a largely undisturbed landscape and which includes a greater range of habitats with the potential for protected species (none have been identified on the Application Site) and the Scheduled Monument at the site of Shotwick Castle. The Application Site has a low scenic quality defined in LANDMAP as having 'very limited aesthetically pleasing scenes', and a low landscape character defined as 'very little local character in keeping with the natural or built environment. A weak sense of place lacking in distinctive identity'. Deeside Industrial Park to the west also has a low value for the same reasons.

- 1.4.16 The undeveloped landscape of the Dee Coastal Levels to the east of Green Lane East has an overall **moderate value** with a moderate scenic quality defined in the LANDMAP system as 'landscapes with a few scenes of a picturesque quality, which are aesthetically pleasing in composition. These areas are notable locally for these' and a moderate landscape character defined as 'landscapes with some distinctive characteristics whose patterns of elements and features contribute to a local sense of place'.

1.5 Baseline Views and Visual Amenity

Existing Visual Amenity

- 1.5.1 Landscape elements individually and in combination influence the views that are available to people and how pleasant they are, i.e. visual amenity.
- 1.5.2 The A494 / A548 road junction acts as visual watershed with the industrialised character of the river floodplain through Deeside to the south-west dominated by large-scale warehousing, heavy industry, infrastructure, overhead lines and planned residential estates. Visual amenity is poor and the LANDMAP system refers to the area having a 'very low quality visual & sensory experience'. Areas of heavy industry and energy generation such as the power station at Connah's Quay, whilst not aesthetically pleasing, may be local landmarks and carry an inherent element of visual interest due to their large scale and detail. Overhead power lines can be visually intrusive across the skyline in the south-west where several lines converge resulting in poor visual amenity. Where land rises to the north and east, and more noticeably further south, open, more rural areas have a higher, ordinary visual amenity with fewer visual detractors and occasional distant views.
- 1.5.3 Visual amenity along the A494 road corridor and immediately adjacent land including the Application Site is poor. It is characterised by the wide multiple-lane carriageway, an abundance of lighting columns, and security fencing and amenity is further degraded by the noise and movement of high volumes of traffic. The southern part of MoD Sealand with its low-rise red-brick former barracks and generously laid-out external areas is distinctive and contrasts with the large workshops in the north of the site and warehousing and commercial property to the west of the A494 which presents a succession of gently sloping grey rooflines to the road corridor. Green Lane East and the mature Lombardy poplars along its verge which filter views between east and west separate the developed area from the farmland where visual amenity is ordinary and less influenced by the trunk road.

Zone of Theoretical Visibility

- 1.5.4 Figure 1 illustrates the ZTV of the proposed solar scheme based on a digital surface model (DSM) prepared from Lidar data which takes account of the visual screening effects of buildings and main areas of vegetation as well as the underlying topography.
- 1.5.5 The height of the solar panels used for the ZTV is approx. 2.8m above ground level and a viewing height of 1.6m agl has been used in the analysis in line with the guidance listed in Section 1.2. Along with a review of baseline information about the site and surroundings a ZTV plan based on a DSM provides a good basis for identifying potential viewpoints to visit and analyse for the appraisal.
- 1.5.6 Buildings within MoD Sealand to the south and south-east of the Application Site contain the ZTV of the proposed solar PV scheme although the open boundary to the west allows views of the Application Site from the A494 road corridor and filtered views between gaps in the building line from the industrial areas and the B5441 to the west. The ZTV extends along the road corridor to the south-west to the line of the Chester Millennium Greenway which crosses the road corridor on a bridge allowing elevated views northwards over a short distance.

- 1.5.7 The solar PV scheme is unlikely to be visible from the main areas of population within the study area at Garden City approx. 1.0km to the south-west, Shotwick approx. 1.2km to the north or at Saughall approx. 2.2km to the east due to the high level of screening provided by existing adjacent buildings, changes in landform around the A494 junction to the north and intervening vegetation.
- 1.5.8 The ZTV mapping suggests that the scheme is likely to be visible adjacent to the site, along the northern part of Green Lane East and within 2km at locations mainly to the north-east and east.

Appraisal Viewpoints

- 1.5.9 Taking account the likely intervisibility of the proposed development, the low frequency of publicly accessible viewing opportunities within the landscape and the sensitivity of viewers to the changes brought about by the proposed development the following potential viewpoints which cover a range of distances and elevations in the surrounding area have been used for the appraisal and are also identified on Figure 1.
- 1.5.10 Viewpoint locations were verified during the field survey and resulted in fewer viewpoints being used for the appraisal than originally anticipated. During the site visit it became apparent that views of the Application Site from the south-eastern end of PRow 309/13/10 which crosses the fields to the east of MoD Sealand were partially obscured by intervening farming stores and in terms of aspect and distance were very similar to the view from the western part of the route. Only one view from PRow 309/13/10 was included and is representative of views from the route.
- 1.5.11 The viewpoints are listed below and are described under the appraisal of effects. The value of each has been determined in terms of the criteria set out in Appendix 1 and following the site visit. Generally, viewers likely to be most sensitive to the changes brought about by the proposals are those with a higher viewing expectation, either when at home or whose activity is related to the landscape setting.

Table 3 - Appraisal Viewpoints

Ref	Location	Distance (km) and Direction from Site	Visual Receptor	Value of View
1	DECA Sealand site	0.01km north	Workers	Low
2	Green Lane East / PRow 309/7/20 (FCC)	0.05km west	Travellers Recreational users	Low Medium
3	Footway along A494 / A548	0.01km east	Travellers Pedestrians	Low Low
4	Chester Millenium Greenway	0.57km north-east	Pedestrians Recreational users	Low Low-Medium
5	PRow 309/13/10 (FCC)	0.87km west	Recreational users	Medium
6	PRow 267/3/1 Shotwick Park 3 (CW&C)	1.5km south-west	Recreational users	Medium

1.6 Proposed Development

- 1.6.1 The Application Site extends to 3.2 hectares comprising a former playing field within the existing secured grounds of MoD Sealand. The proposed development involves the construction and operation of a ground-mounted solar photovoltaic (PV) scheme with a generating capacity of 3MW. As a 'private-wire' scheme which would distribute electricity directly to the existing 11kV grid within MoD Sealand there is currently no proposal for a connection to the national grid.
- 1.6.2 The solar PV scheme is anticipated to be operational for at least 40 years after which the components of the proposed development could be decommissioned, dismantled and removed and the land restored or a further application may be submitted for renewing or 're-powering' the system.
- 1.6.3 The layout of the proposed development is shown on Figure J251173-GCL-ZZ-ZZ-D-L-0102 and scheme components are illustrated on Figure J251173-GCL-ZZ-ZZ-D-L-0103 within the planning drawings. Key proposals are summarised below in relation to features which have the potential to affect landscape character and visual amenity.

Access and Layout

- 1.6.4 The physical characteristics of the site, which is flat and open with no environmental restrictions, support a scheme design which maximises use of the available space to achieve an efficient layout. Solar panels would be mounted on metal frames to form rows or arrays which would extend across the site from east to west either side of a stone access track which would run south to north between two sides of the scheme and along the south-west boundary of the site to the location of the HV / LV connection.
- 1.6.5 Access to the site would be from the private MoD Sealand service road off Green Lane East. The scheme layout incorporates the potential for site access via existing vehicle gates along the east side of the security perimeter fence onto Green Lane East. New gates would be added to the southern boundary perimeter fencing to allow direct vehicular access from the existing service area to the maintenance track.

Components

- 1.6.6 The proposed solar PV scheme would comprise a range of components which are described below:
- Solar PV panels to a height of approx. 2.8-3.0m above ground level (agl) set on metal frames and tilted at approx. 20 - 25 degrees from the horizontal with an orientation to the south to maximise solar gain. The panels would have a clearance of approx. 0.8m agl along their southern edges. Rows of panels or 'arrays' would be spaced at intervals of approx. 7.5m from south to north with approx. 3.0m between the front edge of one row and the rear edge of the next row.
 - Cabling from the solar panels would be collected via pairs of string combiners and inverters mounted on metal posts or the mounting frame and from these underground cables in trenches alongside the site access track would run to the HV / LV containerised connection.
 - A containerised HV / LV connection point would be located in the south-west corner of the site to connect with the wider site's existing 11kV grid and site network. The dimensions of the container would be up to approx. H2635mm x L6055mm x D2435mm, and its colour would be either light grey or dark green.

- A new site access track formed from free-draining crushed aggregate would be constructed through the centre of the array and along the south-west boundary to provide a surfaced route for maintenance vehicles.
- New vehicle access gates up to approx. 2.4m high would be installed in the existing metal mesh and chain-link security fencelines. These currently comprise fencing to a height of approx. 2.1 – 2.4m with barbed wire / razor wire along the top.
- Existing CCTV cameras which cover the Application Site would continue to be used. No additional lighting is proposed.

Integrated Mitigation

- 1.6.7 The proposals include elements of integrated environmental mitigation and enhancement which have been identified at an early stage and incorporated into the proposals as follows:
- Retained grassland, which currently has a low value for biodiversity, would be enhanced over an area of at least 0.25ha through the introduction of a locally appropriate range of wildflower species. Long-term management including more sympathetic seasonal cutting would support its establishment and diversification and improve the structure of other areas of retained grassland to secure a Net Benefit for Biodiversity.
- 1.6.8 No other requirement for additional mitigation for landscape and visual effects has been identified.

1.7 Appraisal of Landscape Effects

1.7.1 The appraisal of landscape effects draws on the criteria set out in Appendix 1 for sensitivity, magnitude of change and level of effect and the consideration of further professional judgement which is described where necessary. As no additional mitigation has been proposed the landscape effects reported are the residual effects of the scheme.

Landscape Sensitivity

1.7.2 The GLVIA3 advises against placing any significant weight on published assessments of overall sensitivity which have not been considered in relation to a particular type of development. As such the appraisal considers the value of the landscape receptors identified through the LANDMAP analysis and site visit and their susceptibility specifically to change brought about by the proposed solar PV scheme to understand their sensitivity.

Landscape Effects

1.7.3 The landscape effects of the development of solar PV energy generation would result from the following changes in the landscape components of the Application Site:

- Temporary removal of an area of approx. 1050m² species-poor improved grassland cover (less than 3.5% of the area of the site) and reinstatement during restoration.
- lifting of site soils and temporary storage on site.
- construction of a free-draining vehicular access track.
- installation of new gates in the existing security fencing to create access points.
- localised ground disturbance for trenching to install underground cabling.
- installation of the solar PV panels on metal frames to form arrays across the site.
- installation of the containerised HV / LV switchgear and connection to the existing 11kV site grid.
- enhancement of an area of at least 0.25ha of retained grassland in the south of the site by the addition of native wildflower and grass species to increase species diversity.
- enhancement of all retained grassland through a more sympathetic cutting regime.
- Installation of artificial invertebrate habitat e.g. bee banks / boxes, log piles.

Effects on the Application Site

1.7.4 The Application Site has few components comprising the ground which is flat and formed by site soils which appear intact despite the high level of disturbance in the adjacent areas, and a vegetation cover of species-poor improved grassland. These are common for the site's location on the edge of the floodplain. The site is no longer used for recreation, has no public access and the land is classed as 'brownfield' and allocated for development so change in the landscape character of the site is anticipated. The components and character of the Application Site are of **low value** with a **low susceptibility** to change brought about by a ground-mounted solar PV scheme and they have a **low sensitivity**.

- 1.7.5 The changes resulting from the development of the proposed solar PV scheme would be small-scale and temporary due to the removal of a small area of existing species-poor grassland, localised disturbance to the ground surface, and introduction of new features including the access track, solar PV arrays and containerised HV / LV connection.
- 1.7.6 The overall height of the solar arrays at up to 3.0m is low and would have little effect on the sense of openness of the site and no effect on skylines unless perceived at very close proximity. However, the change from a site with an apparently undeveloped character to one with a cover of solar panels over much of its area would have the effect of industrialising the site.
- 1.7.7 Enhancement of at least 0.25ha of retained grassland and management of all retained grassland would provide a better habitat for pollinators and a Net Benefit for Biodiversity. The inclusion of artificial habitat would also support invertebrate populations. These changes would become more valuable over time and would be a permanent benefit of the development.
- 1.7.8 As temporary development the solar PV scheme components would be removed after 40 years (unless a further consent was granted) and the site restored to its original character with the additional benefits of improved soil health and habitat enhancement retained.
- 1.7.9 There would be a **low magnitude** of change and a temporary **slight adverse effect** on the landscape character of the Application Site during construction and operation, and a permanent **slight beneficial effect** following restoration where lasting biodiversity enhancement is a legacy of development.

Effects on MoD Sealand and Deeside Industrial Park

- 1.7.10 MoD Sealand and Deeside Industrial Park have a **low value** and **low susceptibility** to change with a high capacity to accommodate change in scenic quality and a **low sensitivity** to this type of development. The area has a low scenic quality and a weak sense of place lacking in distinctive identity.
- 1.7.11 The installation of the solar PV scheme would have the effect of extending the developed industrial character of the adjacent MoD Sealand base, effectively consolidating the north-east edge of the wider Deeside Industrial Park. There would be a **negligible neutral** magnitude of change and **no change** in the character of the wider area.

Effects on the Dee Coastal Levels

- 1.7.12 The landscape character of the largely undeveloped Dee Coastal Levels to the north and east of the Application Site has a **medium value** with common but distinctive characteristics and a moderate scenic quality although no notable attractive views. It has a **medium susceptibility** with some capacity to accommodate change in scenic quality and a **medium sensitivity** to this type of development.
- 1.7.13 The majority of the Dee Coastal Levels character area lies to the south-east of the Application Site and is not intervisible with it. To the east of Green Lane East the scenic quality of the landscape is derived from its rural context and generally intact landscape components although the workshops at MoD Sealand and lighting associated with the A494 corridor are evident in the landscape. The proposed solar PV scheme would be lower in the landscape and its addition would barely add to the impression of development along

the western edge of the area. It would have a **negligible neutral** magnitude of change on the scenic qualities of the landscape and **no change** in the character of the wider area.

Summary

1.7.14 The effects of the proposed ground-mounted solar PV scheme on the landscape are summarised below.

Table 4 – Summary of Landscape Effects

Receptors	Landscape Effect - Construction / Operation	Landscape Effect - Restoration
Landscape components and character of the Application Site	Slight adverse	Slight benefit
Landscape Character – MoD Sealand and Deeside Industrial Park	No change	No change
Landscape Character – Dee Coastal Levels	No change	No change

1.8 Appraisal of Visual Effects

1.8.1 The appraisal of visual effects draws on the criteria set out in Appendix 1 for sensitivity, magnitude of change and level of effect and the consideration of further professional judgement which is described where necessary. As no additional mitigation has been proposed the visual effects reported are the residual effects of the scheme.

Visual Sensitivity

1.8.2 Viewers likely to be most sensitive to the changes brought about by the proposals are those with a higher viewing expectation, either when at home or whose activity is related to the landscape setting, and include the following:

- residents with views of the Application Site.
- users of PROW particularly where these are recognised routes in landscapes designated for their natural beauty and scenic qualities.

1.8.3 Six key viewpoints have been considered to explore the likely effects of the proposals on a representative range of visual receptors located across the study area and their sensitivity has been considered specifically in relation to the proposed development. Where more than one type of non-residential visual receptor is potentially affected the one with greater sensitivity to the development of solar PV energy generation has been used for the appraisal representing a worst-case scenario.

Visual Effects

1.8.4 Visual effects can arise through the removal, introduction or change in landscape components and the levels of human activity in a view. The main visual effects of the development of solar PV energy generation would involve the following:

- construction activity including heavy plant and the movement of materials around the site.
- installation of the solar PV panels on metal frames to form arrays across the site.
- installation of the containerised HV / LV switchgear in the south-west corner of the site.
- enhancement of retained grassland to produce a more naturalistic looking grassland cover.

1.8.5 The viewpoints are illustrated on Figures 3 – 8 and descriptions of the views and the effects of the proposals on visual receptors is described below.

Viewpoint 1: MoD Sealand – adjacent to the Application Site

1.8.6 This view is adjacent to a seating area available for use by workers at MoD Sealand next to the south-east corner of the Application Site. The view extends across the open grassed site to the wooded junction of the A494 and includes two lines of security fencing which are prominent in the view and interrupt the skyline. The A494 corridor is evident with moving vehicles and beyond this the low warehousing of the Deeside Industrial Park. In the context of the adjacent operational site the view represents a break in the industrial outlook. Recently approved development of a heat source pump, acoustic fence and a hedgerow will

introduce new components into the adjacent area (out of shot to the right). The view has a **low value** and viewers would have a **low susceptibility** to change and overall a **low sensitivity**.

- 1.8.7 The new solar PV scheme would be prominent in the view seen as horizontal band of dark panels extending across the site. The arrays would be low in height and sit below the top of the inner fenceline although much of the distant woodland around the road junction would be obscured and the view would be foreshortened. The southern-most rows would effectively screen the arrays behind to the north with the inclined front face of the panels facing the view. The retained and enhanced grassland in the foreground between the two fencelines would become more diverse and add interest to the view. There would be a **high adverse** magnitude of change during operation and a very localised **moderate adverse** effect on users. Following restoration the magnitude of change would be **negligible beneficial** due to the more naturalistic appearance of the grassland but overall **no change** in the view.

Viewpoint 2: Green Lane East / PRoW 309/7/20

- 1.8.8 Green Lane East provides access for travellers and is also used recreationally as a PRoW where enjoyment of the surrounding landscape including the open countryside to the east is important. Views from Green Lane East extend between mature trees across the MoD Sealand service road and then across the Application Site to the low MoD Sealand workshops, the A494 road corridor and woodland around the junction, and the rooflines of warehouses on the edge of the Deeside Industrial Estate. The static display jet fighter is prominent focal point. The view has a **medium value** and recreational users would have a **medium susceptibility** to change and overall a **medium sensitivity**. Travellers would have a lower sensitivity to change.
- 1.8.9 There would be partially restricted oblique views of the eastern side of the arrays and views would extend between the rows across parts of the site to the western boundary although the overall effect would be of a staggered solid profile and the change would be noticeable. The arrays would be low in height and sit below or at the height of the perimeter fencing. The distant skyline formed by mature trees along the A494 and roofline of the Deeside Industrial Park would be retained and the solar arrays would be viewed in the context of the surrounding industrial land uses and A494 corridor from a short section of the overall route. For this reason the magnitude of change would be a **low-medium adverse** during operation with a **slight-moderate adverse** effect on the views of recreational users. Following restoration the magnitude of change would be **negligible neutral** and overall **no change** in the view.
- 1.8.10 The residential property Maes Gwyn which on Green Lane East further south of the viewpoint is a detached two-storey house with first floor windows facing west towards the Application Site. Viewers would have a **high susceptibility** to change and **high sensitivity**. Views from Maes Gwyn are effectively screened at ground level by boundary vegetation and from upper storeys the mature trees along the road and the tree belt east of the Application Site screen much of the Application Site with only a very restricted view from one rear-facing upper window of the north-east part of the array beyond the static display. There would be a **negligible adverse** magnitude of change and **no change** in the view from the property.

Viewpoint 3: A494 / A548 Footway/Cycleway

- 1.8.11 The footway / cycleway is located alongside the busy A548 / A494 road corridor where views are dominated by moving traffic but extend to the east across the open expanse of the Application Site to the trees along

Green Lane East, and the tree belt and workshops in the northern part of MoD Sealand. It is unlikely that users of the footway / cycleway would be using it for recreation and the view has a **low value** and the experience of using the route is further degraded by the noise and movement of vehicles. Users would have a **low susceptibility** to change and a **low sensitivity**.

- 1.8.12 The proposed solar PV scheme would be prominent in the view, occupying a large extent of the view horizontally and extending vertically to the approximate height of the perimeter security fencing and the view would be foreshortened. The views would be oblique, close and unrestricted along the western side of the development, extending between rows. The overall effect would be of a staggered solid profile across the skyline which would not be dissimilar to the roofline of the adjacent workshop building and the type of development would have some consistency with the character of adjacent industrial land uses. The view near the development would be seen from a short section of the overall route alongside the road corridor. There would be a **moderate-high adverse** magnitude of change during operation and a **slight-moderate adverse** effect. Following restoration, the magnitude of change would be **negligible neutral** and **no change** in the view.

Viewpoint 4: Chester Millenium Greenway

- 1.8.13 Elevated views from the off-road route extend north along the A494 corridor which is enclosed in the west by the Deeside Industrial Park and in the east by MoD Sealand. The Application Site is a small component in the view, largely screened by intervening buildings and vegetation canopies. Users of the route could be commuters or those using it for recreation (where the expectation of scenic quality isn't high) and although dominated by the road corridor where visual amenity is poor the view provides some interest due to its elevated position and it has a **low value**. Users would have a **low susceptibility** to change and a **low-medium sensitivity**.
- 1.8.14 Views of the proposed solar PV scheme would be distant and oblique and the development would be partially screened by intervening buildings and vegetation. The colour and scale of the visible development would mean that it would be almost imperceptible from the combined effect of adjacent fencelines and lighting columns on the western edge of MoD Sealand and the road corridor. There would be a **negligible neutral** magnitude of change and **no change** during operation or following restoration.

Viewpoint 5: PRow 309/13/10

- 1.8.15 This footpath crosses the agricultural land to the east of the Application Site and there are open, oblique views across fields towards the eastern boundary of the Application Site. Views from the northern part of the route extend to the native hedgerow along Green Lane East above which the mature poplars and tree belts filter views of the Application Site. The upper part of the static display on the site's eastern boundary and the roofline of the MoD Sealand workshops south of the site are visible but the site is screened at ground level. Views have a **medium value** related to the recreational use of the route and the expectation of higher scenic quality although the industrial land uses to the west and the A494 road corridor are components of the view. Footpath users have a **medium susceptibility** to change and a **medium sensitivity**.
- 1.8.16 The upper part of the solar PV arrays would be components of the view but barely discernible through the intervening vegetation and against the backdrop of the workshop roofline. There would be a **negligible neutral** magnitude of change and **no change** during operation or following restoration.

Viewpoint 6: PRoW 267/3/1

- 1.8.17 The Application Site is screened by intervening tree canopies or is indistinguishable from adjacent areas and the proposed solar PV scheme would not be visible from this location. There would be **no change** during operation or following restoration.

Summary

- 1.8.18 The effects of the proposed development on views are summarised below.

Table 5 – Summary of Visual Effects

Ref	Location	Visual Receptor	Visual Effect - Construction / Operation	Visual Effect - Restoration
1	DECA Sealand site	Workers	Moderate adverse	No change
2	Green Lane East / PRoW 309/7/20 (FCC)	Recreational users	Slight-Moderate adverse	No change
n/a	Green Lane East - Maes Gwyn	Residents	No change	No change
3	Footway along A494 / A548	Pedestrians / cyclists	Slight-Moderate adverse	No change
4	Chester Millenium Greenway	Recreational users	No change	No change
5	PRoW 309/13/10 (FCC)	Recreational users	No change	No change
6	PRoW 267/3/1 Shotwick Park 3 (CW&C)	Recreational users	No change	No change

1.9 Conclusion

- 1.9.1 The appraisal has considered the potential landscape and visual effects of the development of a ground-mounted solar PV energy generation scheme on private land comprising a former playing field at MoD Sealand, Deeside.
- 1.9.2 The landscape effects of the proposed solar PV scheme would be slight adverse and limited to a change in character at the site-level from that of an open, disused playing field to a developed, industrialised area with a coverage of solar panels. The site is allocated for industrial development within the existing Deeside Industrial Park and there is an expectation of change in the landscape. The Application Site comprises a small part of the industrial area and is physically contained on all sides and visually contained in the east such that the effects of the change in landscape character would not affect the scenic qualities of the adjacent undeveloped Dee Coastal Levels character area.
- 1.9.3 Enhancement of at least 0.25ha of retained grassland through diversification of the grass sward and more sympathetic management of all retained grassland would provide a Net Benefit for Biodiversity and a permanent slight benefit for the landscape. As temporary development the solar PV scheme components would be removed after 40 years (unless a further consent for operation was granted) and the site restored with the landscape benefits of improved soil health and habitat enhancement retained.
- 1.9.4 The visual changes brought about by the scheme would be prominent in close views resulting in a very localised moderate adverse visual effect within the Application Site or slight-moderate adverse visual effects at locations adjacent to the Application Site on Green Lane East and the A494 / A548 footway / cycleway. The Zone of Theoretical Visibility of the proposed development is limited and there are few opportunities for viewing the scheme from publicly accessible locations in the wider landscape. Generally, the visual effects of the proposed solar PV scheme would be indistinguishable from adjacent industrial land uses or screened by intervening buildings and vegetation and there would be no change in views from PRoW and residential areas. Following restoration there would be no change in views from all locations.
- 1.9.5 The proposed solar PV scheme would not have any unacceptable adverse effect on landscape character or visual amenity. It would not alter the scenic qualities of the landscape of the Dee Coastal Levels to the east of the Green Lane East, or the openness of the countryside which is covered by a Green Wedge policy, and there would be no adverse effect on the views of nearby residents or the wider visual amenity.
- 1.9.6 The scheme would include the enhancement of the grassland habitat of the site, delivering a permanent Net Benefit for Biodiversity and helping to support green infrastructure and the resilience of natural ecological systems.
- 1.9.7 The proposed solar PV scheme is in accordance with national and local planning policy for the protection of landscape character and visual amenity alongside the development of a ground-mounted solar PV scheme.

1.10 References

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Appendix 1 - Appraisal Criteria

Guidance

The appraisal criteria have been developed following guidance within the 'Guidelines for Landscape and Visual Impact Assessment' (GLVIA3) 3rd Edition prepared by the Landscape Institute and the Institute for Environmental Management and Assessment in 2013, and subsequent clarifications published by the LI.

The GLVIA3 summarises the key principles and good practice to be considered when undertaking landscape and visual impact assessment (LVIA) or appraisal (LVA) and stresses the need for '*a reasonable approach which is proportional to the scale and nature of the proposed development*'. In this respect it confirms that in contrast to LVIAs, which are prepared to inform an environmental impact assessment, there is no requirement in LVAs to determine the likely significance of the potential effects of development. The other steps in the process remain and the LVA describes the nature of the proposed development, identifies the sensitivity of the landscape and visual resource in relation to the likely impacts of the development, and estimates the effects or changes likely to occur if the development goes ahead.

The guidance confirms that the landscape and visual effects of development are separate but related issues and that the process '*must deal with and clearly distinguish between the assessment of landscape effects, dealing with changes to the landscape as a resource, and the assessment of visual effects, dealing with changes in views and visual amenity*'. In practice the assessment / appraisal of landscape effects and visual effects are undertaken separately but as part of an iterative process with the findings of each process used to inform the study of the other.

The appraisal therefor considers the impacts of proposed development on:

Landscape receptors – the landscape as a resource comprising:

- The individual landscape elements or components which make up the physical landscape and how it is used and managed;
- the aesthetic and perceptual aspects of the landscape such as the scale, complexity, openness, tranquillity, seclusion or wildness, presence of detracting elements and scenic quality; and
- the overall landscape character and its key characteristics.

Visual receptors:

- peoples' views of the landscape from different locations, and
- visual amenity or the pleasantness of a view.

Finally in order to minimise the subjective influence on the assessment the GLVIA3 states that judgements about the effects of development should be '*reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others. Professional judgements must be based on both training and experience*'.

Landscape Sensitivity

Landscape sensitivity is the extent to which a landscape can accept change without unacceptable effects on its character. It is a function of the value attributed to it which is related to its condition or representation of existing character, and its susceptibility to change or the extent to which defining characteristics could be altered. In some cases a landscape with important components may be of a lower sensitivity as a result of its

potentially lower susceptibility to change e.g. a variable landform or high levels of tree cover. Conversely, a landscape with few features of interest may be of a higher sensitivity because it is more vulnerable to the introduction of development e.g. a flat landscape or one which is of particular value to local people.

Table 1 – Landscape Sensitivity Criteria

Value	Sensitivity	Susceptibility
<p>Landscape of international or national value, usually statutorily designated for its natural beauty, e.g. National Parks and Areas of Outstanding Natural Beauty.</p> <p>Usually including very high levels of scenic quality / tranquillity / wildness, high recreational value related to the experience and enjoyment of the landscape, and important or statutorily protected cultural / conservation interests.</p> <p>Maintained in very good condition with a strong distinctive character often with important and rare components forming key characteristics, and an absence of detracting influences</p>	Very High	<p>Very high susceptibility due to very low capacity to accommodate change, no existing characteristic land use or suitable context for the development proposed, and very limited potential for substitution of landscape elements.</p>
<p>Landscape of regional or more than local value, often valued for its scenic quality and which may be identified in local policy documents for its character and associations, e.g. Registered Park and Garden, locally designated landscape area.</p> <p>Often including high levels of scenic quality / tranquillity / wildness, good recreational and amenity value related to the experience and enjoyment of the landscape, and regionally important cultural or natural heritage / green infrastructure interests.</p> <p>Maintained in good condition with a recognisable character, sometimes with important and rare components forming key characteristics, and discordant elements do not detract from the overall character.</p>	High	<p>High susceptibility due to limited capacity to accommodate change, little existing characteristic land use or suitable context for the proposed development, and limited potential for substitution or enhancement.</p>
<p>Landscape with components of local value, importance and local distinctiveness which may have some scenic value and is identified through local designation, e.g. open space, Tree Preservation Order.</p> <p>May include some degree of scenic value / tranquillity, local recreational and amenity value and is well-used, and locally important cultural or natural heritage and green infrastructure interests.</p> <p>Maintained in reasonable condition where landscape character is evident in key characteristics but possibly including some degraded and / discordant elements which may influence character.</p>	Medium	<p>Medium susceptibility due to some capacity to accommodate change, with some existing characteristic land use or context and some potential for substitution or enhancement.</p>
<p>Landscape with components of less than local / low value, importance and rarity with few distinctive or valued characteristics and very limited scenic value, low levels of tranquillity, but of some amenity / recreation / green infrastructure value.</p> <p>May be maintained in poor condition but with the potential for improvement, with poorly defined landscape character, often including incongruous / discordant elements which detract from character.</p>	Low	<p>Low susceptibility due to high capacity to accommodate change, with existing landscape context inc. characteristic land uses and with high potential for substitution or enhancement.</p>

<p>Landscape with components of very low value, importance and rarity, valued characteristics are barely evident and which provides very little scenic, amenity, recreation or green infrastructure value.</p> <p>May be maintained in very poor condition, possibly with evidence of abuse and intentional damage resulting. Weak and very degraded character where incongruous / discordant elements dominate.</p>	<p>Negligible</p>	<p>Very low susceptibility where the existing landscape may be in need of regeneration / recreation to define a new landscape character.</p>
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Landscape Magnitude of Change

The magnitude of change to landscape elements and character is determined by the nature and scale of the change (the loss or alteration of existing landscape elements, aesthetic and perceived aspects or key characteristics and the introduction of new elements), its geographical extent (changes restricted to the site or influencing a wider area), duration (short-, medium-, or long-term) and potential to be reversed.

Table 2 - Magnitude of Landscape Change Criteria

Magnitude	Typical Criteria
<p>Very High</p>	<p>Substantial and extensive damage to or complete loss of landscape elements, aesthetic and perceptual aspects and key characteristics which define character; introduction of new highly unnatural / unattractive features which severely compromise existing character; very large-scale degradation in condition and integrity of landscape elements and character.</p> <p>Substantial and extensive enhancement or complete restoration / recreation of landscape elements, aesthetic and perceptual aspects, and key characteristics; removal of existing detractors which previously defined character or introduction of new well-designed features; very large-scale improvement in condition of landscape elements and greater integrity of landscape character.</p> <p>The character of the wider area is greatly altered to the extent that it has been redefined and / or effects may influence the character of adjacent areas at some distance from the development.</p> <p>The change is very long term, or very unlikely or very difficult to reverse, or permanent.</p>
<p>High</p>	<p>Large scale damage to or partial loss of landscape elements, aesthetic and perceptual aspects and key characteristics which define character; introduction of new or unnatural / unattractive features which undermine existing character; large scale degradation in condition and integrity of landscape elements and character.</p> <p>Large scale enhancement or partial restoration / recreation of landscape elements, aesthetic and perceptual aspects, and key characteristics; removal of existing detractors which previously influenced character or introduction of new well-designed features; large scale improvement in condition of landscape elements and greater integrity of landscape character.</p> <p>The character of the wider area may be slightly altered or character within a smaller area is greatly altered; changes may result in some key characteristics becoming more or less influential on overall character affecting peoples’ perception of the area, but overall character remains the same; changes are unlikely to affect the character of adjacent areas.</p> <p>The change is long term or partially reversible if necessary.</p>

Medium	<p>Limited damage to or loss of landscape elements, aesthetic and perceptual aspects and key characteristics which define character; introduction of new or unnatural / unattractive features which may be partially integrated through mitigation; localised degradation in condition of landscape elements and character.</p> <p>Limited enhancement of landscape elements, aesthetic and perceptual aspects, and key characteristics, removal of existing detractors or introduction of new well-designed features may strengthen character; localised improvement in condition of landscape elements and greater integrity of landscape character.</p> <p>Defining key characteristics are largely unaltered and overall the character of the area is retained; changes are restricted to the immediate character area.</p> <p>The change is medium term or partially or wholly reversible if necessary.</p>
Low	<p>Minor damage, alteration or enhancement of landscape elements, aesthetic and perceptual aspects and key characteristics; successful integration of new or unnatural / unattractive features through mitigation; landscape condition is maintained.</p> <p>Defining key characteristics are unaltered and overall the character of the area is retained; changes are very localised.</p> <p>The change is short term and / or easily reversible.</p>
Negligible	<p>No or barely perceptible alteration of landscape elements, aesthetic or perceptual aspects, or character.</p> <p>Changes are very short term, or very easily reversed, or there are no discernible changes.</p>

Visual Sensitivity

The sensitivity of a visual receptor is heavily influenced by the availability, context and composition of views and the value attributed to them, the number of potential viewers, and their occupation or activity which has a bearing on their viewing expectations and the focus of their activity, and consequently their susceptibility to visual change. As a general guide residential receptors, tourists, users of public rights of way and people at sites designated or recognised for their visual characteristics are considered to have a higher sensitivity to change in their views than people driving or at their place of work.

Table 3 – Visual Sensitivity Criteria

Value	Sensitivity	Susceptibility
Views from and to international or national designated landscapes (NP, AONB) and highly important and rare buildings / features of cultural significance including grounds, where visual amenity is very important and views are very highly valued.	Very High	<p>Very high susceptibility to change.</p> <p>Visitors where activity is directly associated with the experience and enjoyment of the landscape and there is a very high expectation of scenic quality.</p>
<p>Views of local value to everyday life from residential properties and within communities where the degree of visual amenity contributes to the satisfaction of living there.</p> <p>Views from and to landscapes of regional or more than local value, which may be identified in local policy, on mapping or in literature, e.g. AHLV / SLA, Registered Park and Garden, recognised vistas and designated viewpoints, public right of way (PROW) where visual amenity is important and views are highly valued.</p>	High	<p>High susceptibility to change.</p> <p>Occupants of residential property inc care homes etc.</p> <p>Visitors to specific landscape destinations and users of PROW, designated trails and open access areas where the focus of activity is on the experience and enjoyment of landscape and there is a high expectation of scenic quality.</p> <p>Users of public and informal open space valued for its scenic quality or visual</p>

		amenity characteristics, including tourist routes and locations.
Views of local value where the visual setting complements the use of the location, such as: Churches, schools, hospitals and hotels. Public and informal open space, cemeteries, allotments and golf courses. PROW where visual amenity may be ordinary but still valued Views from tourist routes on A and B class roads. Lanes, C-class roads and passenger railways with incidental views. Urban residential roads.	Medium	Medium susceptibility to change. Users of public and civic buildings where the setting enhances the use and enjoyment of the site. Users of public, formal and informal open space, PROW, and people walking / travelling in the local area on a regular basis or visiting with an expectation of reasonable visual amenity.
Views of less than local / low value where the visual context is not related to the use of the location, such as: Offices, commercial developments and industrial sites. Outdoor recreational facilities, e.g. outdoor pitches. Main A and B class roads (except as recognised approaches to tourist locations), motorways, and urban non-residential roads.	Low	Low susceptibility to change. People at their place of work where setting is not related to the use and enjoyment of the site. Users of outdoor recreational facilities where the focus is on the activity. Travellers on main A and B class roads, motorways and urban non-residential roads, where expectations of visual amenity may be low.
No views of the proposals.	Negligible	No users.

Visual Magnitude of Change

The magnitude of change to views and visual amenity is determined by the nature and scale of the change (the loss, addition or alterations of features in the view, changes to its composition and the proportion of the view occupied by the development, the degree of contrast or integration with the remaining landscape elements in terms of form, line, colour, texture and scale, and the nature of the view – whether full, partial or glimpsed), its geographical extent (the angle of view, distance to the development, area of visibility), its duration (short-, medium-, or long-term) and potential to be reversed.

Table 4 –Magnitude of Visual Change Criteria

Magnitude	Typical Criteria
Very High	Substantial and extensive changes where the loss or addition of components is dominant; the proposals considerably alter the composition of the view and occupy most of the field of view both horizontally and vertically; views of the proposals are full and unrestricted. The proposals are incongruous in terms of form, line, colour, texture and scale contrasting sharply with the surrounding area. Direct views at close range and available over a very extensive area; views of the proposals are unavoidable and are available to many or nearly all viewers. The change is very long term (20 years+), or very unlikely or very difficult to reverse, or permanent.

High	<p>Large scale changes where loss or addition of components is prominent; the proposals greatly alter the composition of the view and occupy a large proportion of the field of view either horizontally and vertically or both; views of the proposals are full and unrestricted.</p> <p>The proposals are less incongruous in terms of form, line, colour, texture and scale contrasting to some extent with the surrounding area.</p> <p>Direct views at medium range and oblique views at close range over a large area; views of the proposals are obvious and are available to many viewers.</p> <p>The change is long term or partially reversible if necessary.</p>
Medium	<p>Limited changes where loss or addition of components is noticeable; the proposals alter the composition of the view to a limited degree and occupy a limited extent of the field of view either horizontally or vertically; views of the proposals are full or partially restricted or filtered.</p> <p>The proposals are inconsistent in terms of form, line, colour, texture and scale contrasting to a limited extent with the surrounding area.</p> <p>Direct views at long range and oblique views at medium range over a restricted area; views of the proposals are recognisable and are available to some viewers.</p> <p>The change is medium term or partially or wholly reversible if necessary.</p>
Low	<p>Small scale changes where loss or addition of components is perceptible; the proposals slightly alter the composition of the view and occupy a very limited extent of the field of view either horizontally or vertically; views of the proposals are largely restricted, filtered or glimpsed.</p> <p>Overall, the proposals are consistent in terms of form, line, colour, texture and scale and contrast to a small extent with the surrounding area.</p> <p>Direct views at very long range and oblique views at a long range over a restricted area, views of the proposals are discernible and are available to a few viewers.</p> <p>The change is short term and / or easily reversible.</p>
Negligible	<p>The loss or addition of components is not visible or imperceptible; the proposals minimally alter the composition of the view and occupy a fraction of the horizontal or vertical field of view.</p> <p>Overall the proposals are harmonious in terms of form, line, colour, texture and scale and compliment the surrounding area.</p> <p>Proposals are not visible or barely evident due to the effects of viewing angle or screening, or visible at a greater distance yet indistinguishable from their surroundings; very few or no viewers are affected.</p> <p>Changes are very short term, or very easily reversed, or there are no discernible changes.</p>

Level of Effects

The level of an effect is derived from the combination of the sensitivity of the landscape or visual receptor and the magnitude of change brought about by the proposals. Residual effects are those which remain after the implementation of agreed mitigation measures, or where there is no feasible mitigation. Changes may be beneficial (an improvement), adverse (detracting or damaging) or neutral (changes are neither beneficial or adverse or the overall character or impression of the view is maintained).

The appraisal relies upon common sense, experience and reasoned judgement applied systematically and supported by evidence. In assessing the level of an effect therefore, an assessor may for example consider changes of a relatively low magnitude to be relevant if they relate to a highly sensitive (or “important” or “vulnerable”) landscape or visual receptor.

To ensure a systematic approach to the appraisal the thresholds or combinations of sensitivity and magnitude of impact shown in Table 5 below have been used as a starting point for determining the level of effect. Any deviation from this approach, for example where the further application of professional judgement suggests a different outcome, is discussed fully in the landscape and visual appraisal.

Table 5 Thresholds for the Level of Landscape and Visual Effect

Receptor Sensitivity	Magnitude				
	Negligible	Low	Medium	High	Very High
Very High	No Change	Moderate or Large	Large	Large or Substantial	Substantial
High	No Change	Moderate	Moderate or Large	Large	Large or Substantial
Medium	No Change	Slight or Moderate	Moderate	Moderate or Large	Large
Low	No Change	Slight	Slight or Moderate	Moderate	Moderate or Large
Negligible	No Change	No Change	No Change	No Change	No Change

The application of the matrix leads to the determination of the likely level of effect on a four-point scale of Large, Moderate, Slight and No Change. These terms can be interpreted using the criteria set out in Table 6 below as a starting point with any deviation described in the appraisal.

Table 6 Level of Effect

Level of Effect	Description
Substantial	The proposals are likely to result changes in landscape character and / or views and visual amenity which are very important considerations.
Large	The proposals may result changes in landscape character and / or views and visual amenity which are important considerations.
Moderate	The proposals may result in changes in landscape character and / or views and visual amenity which may be important considerations either alone or cumulatively with other issues.
Slight	The proposals may result in changes in landscape character and / or views and visual amenity which are unlikely to be important but which may be relevant in identifying measures to enhance the subsequent design of the project.
No Change	No effects or those that are beneath the levels of perception.

Appendix 2 - Zone of Theoretical Visibility Methodology

The purpose of this methodology is to explain the process by which the visualisation materials accompanying this document have been created. Visualisations are considered best practice for major developments and serve as valuable tools for understanding potential visual impacts. Current best practice regarding the production of visualisations is set out in Guidelines for Landscape and Visual Impact Assessment (GLVIA3) and Technical Guidance Note 24/01, ensuring consistency and reliability in the assessment process.

The ZTV mapping uses a digital surface model (DSM) derived from high-resolution (1m) data from the National LIDAR Programme ([LIDAR Composite Digital Surface Model \(DSM\) - 1m](#)) which is integrated into QGIS, an open-source geographic information system, to produce a digital model of the study area.

The height of the proposed development and a viewing height above ground level (agl) are added to the model as follows:

- proposed ground-mounted solar PV array at approx. 2.8m agl.
- viewing height of 1.6m agl.

With these parameters the model generates an estimate of theoretical intervisibility between the proposed development and locations within the surrounding landscape. The DSM takes account of the Earth's curvature and atmospheric refraction as well as the underlying topography and barriers in the landscape such as existing buildings and distinct areas of vegetation (hedgerows, woodland blocks etc) which would influence the visibility of the development.

ZTVs are theoretical constructs and do not guarantee actual visibility. The following limitations exist:

- The ZTV indicates where parts of a development might be seen from but does not differentiate between full and partial views or whether the view is publicly accessible.
- The DSM-based ZTV assumes that vegetation and structures form solid visual barriers, which may not reflect seasonal changes or the type of structure.
- Since the DSM captures a single moment in time, it may not account for new buildings or the demolition, tree growth, or vegetation removal. This can lead to underestimation or overestimation of visibility.
- Additionally, the DSM does not distinguish between ground and elevated surfaces, potentially suggesting visibility from unrealistic vantage points like treetops or rooftops.

To address these limitations, ZTVs are supplemented by fieldwork and site visits, which help validate the model's accuracy through ground-truthing. This ensures that the theoretical outputs align with real-world conditions. Viewpoint selection is guided by the ZTV outputs combined with desk-based research and locations are verified in the field.

Appendix 3 – Figures and Viewpoints

Refer to separate documents



Ground Control Limited
Kingfisher House
Radford Way
Billericay
EssexCM12 0EQ

T: 01277 650 697

E: info@ground-control.co.uk

www.ground-control.co.uk