

## **APPENDIX 8.1: LVIA METHODOLOGY**

### **LVIA METHODOLOGY**

#### ***Introduction***

This Appendix sets out the methodology applied to the Landscape and Visual Impact Assessment (LVIA) carried out for the proposed IAMP ONE Phase Two development site.

#### ***Assessment process***

In accordance with the current Guidelines for Landscape and Visual Impact Assessment (GLVIA 3), effects on landscape character and effects on visual amenity are reported separately, albeit within the same chapter (chapter 8) of the ES.

#### ***Thresholds and criteria***

GLVIA 3 (paragraph 1.20) states that the guidance is “*not intended to be prescriptive, in that it does not provide a ‘recipe’ that can be followed in every situation. It is always the primary responsibility of any landscape professional carrying out an assessment to ensure that the approach and methodology adopted are appropriate to the particular circumstances.*” This assessment has therefore defined a set of criteria to assess the potential landscape and visual effects of the proposed development that reflect the circumstances of the site and the surrounding area.

Both landscape and visual effects can be adverse, beneficial or neutral, short, medium or long term, permanent or temporary, reversible or irreversible, direct (an effect that is directly attributable to the proposed development) or indirect (effects resulting indirectly from the development as a consequence of the direct effects), and cumulative (relating to additional changes that may arise when the proposed development is considered in conjunction with other similar developments).

#### ***Assessment of effects on landscape character and the landscape resource***

Landscape effects associated with a development relate to changes to the fabric, character and quality of the landscape as a resource and how it is experienced. This requires consideration of the character of the landscape, the elements and features that it contains, and any value attached to the landscape (whether formally or informally).

Landscape assessment studies:

- direct effects upon special landscape elements, especially prominent and eye catching features;

- change in character, which is the distinct, recognisable and consistent pattern of elements that creates distinctiveness and a sense of place;
- subtle effects that contribute towards the experience of intangible characteristics such as tranquillity, wildness and cultural associations; and
- effects on designated landscapes, conservation sites and other acknowledged special areas of interest.

The nature or sensitivity of a landscape receptor combines judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape, as defined in the GLVIA glossary and in paragraph 5.39 of GLVIA 3. Paragraph 5.39 of GLVIA 3 also states that LVIA sensitivity is similar to the concept of landscape sensitivity used in landscape planning, but is not the same as it is specific to the particular project or development proposed and the location in question. Thus, assessment of sensitivity is not strictly part of the initial baseline study of landscape character; it is considered as part of the assessment of impacts of the development.

The nature or magnitude of the effects on the landscape receptors depends upon the size or scale of the changes, the geographical extent of the area influenced, and the duration and reversibility of the effects.

The landscape receptors include the elements that comprise the landscape features present within the site and surrounding area; the Landscape Character Type(s) that the site is within, and those of the surrounding area; and any designated landscapes within the study area (including Registered Parks and Gardens).

#### *Susceptibility to change*

This is defined as the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular landscape type or area, or an individual element and/or feature, or particular aesthetic and perceptual aspects) to accommodate the proposed development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies (see paragraph 5.40 of GLVIA 3). As noted above, susceptibility is combined with landscape value (see below) to determine the sensitivity of a receptor landscape to the type of change proposed. Susceptibility and sensitivity are therefore not the same, in the context of LVIA.

Table A/1, below, explains how criteria are applied to arrive at an assessment of susceptibility to change, in this assessment.

Table A/1 Criteria for the Assessment of Susceptibility of the Receptor Landscape to Change	
Level	Typical Criteria
High	Key characteristics of the landscape are highly vulnerable to change. The nature of the development would result in a significant change in character.
Medium	Some of the key characteristics of the landscape are vulnerable to change. Although the landscape may have some ability to absorb some development, it is likely to cause some change in character.
Low	Few of the key characteristics of the landscape are vulnerable to change. The landscape is likely to be able to accommodate development with only minor change in character.
Negligible	Key characteristics of the landscape are robust and would not be adversely affected by development.

Factors influencing the susceptibility of the landscape to change of the sort associated with industrial development include:

- 1 Scale: whether or not the landscape includes human scale elements, and the presence or absence of enclosing features. The presence of human scale elements may suggest a lower susceptibility.
- 2 Landform: Landform may be undulating, rolling or flat, and may display more or less variation in form / gradient. Featureless, convex or flat landscapes with an absence of strong topographical variety suggests a lower susceptibility, with very complex landforms exhibiting strong topographical variety at the other end of the scale.
- 3 Landscape pattern and complexity: including presence or absence of cultural pattern; time depth; landscape structure/fabric; enclosure patterns; and interplay of colour and texture. Simple, large-scale patterns (large conifer plantations, arable fields), and/or regularly disturbed, fragmented land covers are less susceptible to change. Intricate, varied patterns, and undisturbed consistent patterns of land cover or land use, and historic field patterns are more susceptible to change.
- 4 Settlement and human influence: including time depth, age, nature, form and level of settlement. The following tend to indicate a lower susceptibility to change: concentrated settlement pattern, presence of contemporary structures e.g. utility, infrastructure or industrial elements, and hard or eroded settlement edges. A higher susceptibility to change may be indicated by: dispersed settlement pattern; absence of modern development; presence of small scale, historic or vernacular settlement; and a porous / soft landscape edge with settlement well integrated with the landscape.
- 5 Condition: Landscapes with a low level of intactness with landscape elements in poor state of repair are considered to have a lower susceptibility to change; with, on the other hand, landscapes having a high level of intactness and a very good state of repair having a higher susceptibility to change.

- 6 **Typicality and Rarity:** A lower susceptibility to change is associated with areas which have no rare features or a weak association with the key characteristics of the landscape. Conversely, a higher susceptibility to change is associated with areas which have rare features of regional importance or a very strong correspondence with the key characteristics of the landscape.
- 7 **Perceptual aspects** such as tranquillity (including noise and lighting) and sense of remoteness. Areas which are not tranquil, having much human activity, noise and light, are considered to have a lower susceptibility to change and vice versa. Presence or proximity to human activity or modern development or industrial structures (e.g. utilities, infrastructure) decreases susceptibility, whereas areas having a strong sense of remoteness; being either physically remote or having a perception of being remote, are considered to have a higher susceptibility to change.
- 8 **Skylines:** A visual component of landscape character but obviously interdependent with topography. Where the development has no relationship to the skyline, or the skyline is either not prominent / screened, or developed and/or otherwise cluttered the susceptibility to change is lower. Where there is a strong relationship to prominent, simple and undeveloped skylines, or a skyline with important historic landmarks the opposite is the case.
- 9 **Intervisibility:** As with skylines, this is a visual component of landscape character but obviously interdependent with enclosure. As might be expected, landscapes which are self-contained with restricted intervisibility have a lower susceptibility to change than landscapes which are extensively intervisible and part of a wider landscape.
- 10 **Views and Landmarks:** As with skylines and intervisibility, this is a visual component of landscape character but has some relationship to typicality and rarity. An area which contains no landmarks and is not a feature in local views is considered to have a lower susceptibility. On the other hand, a landscape which includes important landmarks or is important in views across a wide area has a higher susceptibility.
- 11 **Visual Receptors:** As with skylines, intervisibility, and views and landmarks, this is a visual component of landscape character but obviously has a strong converse relationship to remoteness. In other words, locations having a higher visibility from main transport routes and a larger number of properties are considered to have a higher susceptibility to change (depending on the nature and extent of the change), whereas areas with a low number of viewers from properties and transport routes would have a lower susceptibility.

### *Landscape value*

Assessment of value is concerned with the relative value attached to different landscapes by society. A consideration of value at the baseline stage informs judgements of the significance of effects. Landscapes can be valued by different people for different reasons connected to a range of factors including landscape quality (condition), scenic quality, rarity, representativeness, conservation interests, recreation value, perceptual aspects and associations (see GLVIA 3 Box 5.1 for definitions). This consensus can be recognised at a local, regional or national or international scale. Table A/2 explains how criteria are applied to arrive at an assessment of landscape value in this assessment. It is derived from GLVIA 3.

Table A/2: Criteria for the assessment of landscape value			
Value	Typical criteria	Typical scale	Typical examples
High	<ul style="list-style-type: none"> <li>Excellent condition, high importance, scenic quality, rarity</li> <li>No or limited potential for substitution</li> </ul>	International, national, regional	<ul style="list-style-type: none"> <li>World Heritage Site, National Park, Area of Outstanding Natural Beauty (AONB), Registered Historic Parks and Gardens</li> <li>Undesignated but valued for the density or high numbers of important /protected features present therein</li> </ul>
Medium	<ul style="list-style-type: none"> <li>Good condition, medium importance, scenic quality, rarity</li> <li>Some or good potential for substitution</li> </ul>	Regional, local authority, local community	<ul style="list-style-type: none"> <li>Local landscape designations</li> <li>Undesignated but value expressed for instance in demonstrable use</li> </ul>
Low	<ul style="list-style-type: none"> <li>Poor condition, low importance, scenic quality, rarity</li> </ul>	Local community	<ul style="list-style-type: none"> <li>Areas identified as having some redeeming feature or features and possibly identified for improvement</li> <li>Areas identified for recovery</li> </ul>

The EIA Regulations do not require study of whether a development complies with planning policy, but planning policy is important and relevant to LVIA when it is a recognition or reflection of the value placed upon a particular landscape, or its attributes, by society. Thus, designations like National Parks and AONBs have relevance since they identify a consensus about this value. Reference to planning policy can therefore assist the assessor in identifying sensitive receptors.

The designation of an area of land as Green Belt (a planning designation) is not an indication of the quality or condition of the landscape; this designation relates to controlling urban sprawl, safeguarding countryside, and maintaining a permanency of the 'openness' between built-up areas. The NPPF states that the essential characteristics of Green Belts are their openness and permanence (para. 137).

### ***Sensitivity of the landscape receptors to development***

As described above, sensitivity combines judgements on the susceptibility of landscape receptors to change of the type proposed, with the value attached to the landscape. Generally, a higher sensitivity will be ascribed to landscapes which have a high value, and which are highly susceptible to change, and vice versa. However, as GLVIA 3 (para. 5.46) recognises, these relationships are complex, particularly when considering change within or adjacent to designated landscapes.

Para. 5.46 states:

*“For example:*

- *An internationally, nationally, or locally valued landscape does not automatically, or by definition, have a high susceptibility to all types of change;*
- *It is possible for an internationally, nationally or locally important landscape to have relatively low susceptibility to change resulting from the particular type of development in question, by virtue of both the characteristics of the landscape and the nature of the proposal;*
- *The particular type of change or development proposed may not compromise the specific basis for the value attached to the landscape.”*

The sensitivity of the landscape of the project area, to the type of development proposed, is considered in detail within the main body of the LVIA. This assesses the susceptibility of the landscape to the proposed development, in conjunction with the value of the landscape, in accordance with para. 5.39 of GLVIA 3.

For the purpose of this LVIA, sensitivity is defined through application of the criteria described in Table A/3, below

<b>Table A/3: Criteria for the Assessment of Sensitivity of Landscape Receptors</b>	
<b>Level</b>	<b>Typical criteria</b>
High	Many of the key characteristics and qualities of the landscape are susceptible to change from the type of development being assessed and/or the value ascribed to the landscape is high.
Medium	Some of the key characteristics and qualities of the landscape are susceptible to change from the type of development being assessed and/or the value ascribed to the landscape is medium
Low	The key characteristics and qualities of the landscape are robust and are less likely to be adversely affected by the type of development being assessed and/or the value ascribed to the landscape is low.

### ***Magnitude of landscape effects***

Table A/4, below, sets out how criteria are applied to arrive at an assessment of magnitude (using the factors set out above), derived from GLVIA 3.

<b>Table A/4: Criteria for the assessment of magnitude – landscape effects</b>	
<b>Level</b>	<b>Typical criteria (not all of which need be applicable)</b>
High	<ul style="list-style-type: none"> <li>• Total loss of or major alteration to key features or perceptual aspects of the baseline and/or the addition of new features considered to be totally uncharacteristic when set within the attributes of the receiving landscape</li> <li>• The effects would be of a large scale influencing several landscape character types/areas</li> <li>• The effects would be long term and/or irreversible</li> </ul>
Medium	<ul style="list-style-type: none"> <li>• Partial loss of or alteration to key features or perceptual aspects of the baseline and/or the addition of new features that may be prominent but may not necessarily be considered to be substantially uncharacteristic when set within the attributes of the receiving landscape</li> <li>• The effects would be at the scale of the landscape character type/area within which the proposal lies</li> <li>• The effects would be medium term and/or partially reversible</li> </ul>
Low	<ul style="list-style-type: none"> <li>• Minor loss of or alteration to key features or perceptual aspects of the baseline and/or the addition of new features that may not necessarily be considered to be uncharacteristic when set within the attributes of the receiving landscape</li> <li>• The effects would be at the level of the immediate setting of the site</li> <li>• The effects would be short term and/or reversible</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>• Very minor loss of or alteration to key features or perceptual aspects of the baseline and/or the addition of new features that are not uncharacteristic with the surrounding landscape - approximating the 'no change' situation</li> <li>• The effects would be at the site level, within the development site itself</li> <li>• The effects would be very short term and/or reversible</li> </ul>

### ***Significance of effects on the landscape resource***

Consideration of the sensitivity of the landscape receptors to the development and the magnitude of the change resulting from the development, determines the level of the predicted impact, and its significance. The relationship between sensitivity and magnitude to reach the level of effect is sometimes presented in the form of a matrix. However, such a matrix may lead to the same weighting of each criterion, which might not always be appropriate and may lead to a formulaic approach and therefore a matrix is not used in this assessment. Descriptions of how overall effects have been determined are provided and a conclusion is given on whether or not an effect is assessed as significant or not (see paragraphs 3.34 and 3.35 of GLVIA 3).

There is no requirement to identify the level, or degree of significance of an effect, merely whether it is considered (using professional judgement) to be significant, or not. If a

distinction is required between levels of significance then a word scale can be used, provided that these are clearly defined, to identify the distinctions between (for instance) minor and major significance of effect.

Overall, effects may be adverse, neutral or beneficial, and are assessed (in accordance with the requirements of the EIA Regulations) as either Significant or Not Significant. Table A/5 assigns typical criteria to the determination of significance, as applied in this assessment. It should be noted that various different scenarios of susceptibility to change, landscape value, the size or scale, geographical extent and/or duration and reversibility of impacts could apply to result in adverse effects as described in the assessment. The criteria and guidelines in Table A/5 are therefore provided as typical examples

Table A/5: Criteria for determining significance – landscape effects		
Significance	Definition	Guideline threshold
Significant effect	A fundamental change to the environment or a change which is non-fundamental but still considered to be material	High or moderate levels of change to a highly sensitive or nationally valued landscape. High levels of change to a moderately sensitive and/or regionally valued landscape. The character of the landscape is defined by the presence of the proposed development, or the proposed development becomes a key feature of the landscape. Substantial or partial loss of landscape elements considered to be of high importance.
Non-significant effect	A detectable but non-material change to the environment, or one which is barely discernible	Low levels of change to a highly sensitive landscape. Moderate or low levels of change to a landscape considered tolerant of such change. Negligible change to a landscape. The baseline characteristics remain as the defining influence on the character of the landscape. Unlikely to be material effects on landscape elements considered to be of high importance.

It is relevant to note that the assessed levels of effect and their likely significance merely form one element of the way in which a proposed development is determined. Other factors (e.g. environmental, economic, societal) will also play a role in the decision-making process.

### ***Assessment of effects on visual amenity***

Effects on visual amenity relate to the effects of change and development on the views available to people and their visual amenity (GLVIA 3, para. 6.1).



As with landscape effects, consideration of the sensitivity of the visual receptors (people) and the magnitude of the change determines the level of significance of the predicted effect on views and visual amenity.

Visual receptors include the public or community at large, residents, visitors, workers and people travelling through the landscape.

*Susceptibility of visual receptors and the value of views*

Sensitivity is determined through the analysis of the susceptibility of the receptor to the type of change proposed (i.e. the ability to accommodate the change without undue negative effects), in combination with the value attached by people to the affected views (GLVIA 3, para. 6.31).

The susceptibility of visual receptors to changes in views and visual amenity is reflected in the level of sensitivity ascribed to the various categories of receptors, as set out below. Residential receptors are considered potentially highly susceptible to changes in the views from their properties; users of the local road network are considered only of intermediate susceptibility to changes in the view from the road. Users of recreational routes / rights of way are also considered to be potentially highly susceptible to changes in views from these routes, particularly in tourist areas. Table A/6 sets out the criteria applied to the assessment of susceptibility to visual change.

Table A/6: Criteria for the Assessment of Susceptibility to Visual Change	
Level	Typical Criteria
High	Occupiers of residential properties whose main view is towards the proposed development; people engaged in outdoor recreation, including public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views; visitors to heritage assets and other attraction where views of the surroundings contribute to the experience; communities where views contribute to the landscape setting enjoyed by residents in the area; users of scenic routes where the awareness of views is likely to be high.
Medium	Occupiers of residential properties with only partial or restricted views towards the proposed development; people engaged in outdoor recreation for whom the view is not an important consideration; travellers on roads, railways or other transport routes for whom the view is not an important aspect of the journey.
Low	People engaged in outdoor sports and recreation for whom appreciation of the view is not an important part of their activity; people at their place of work for whom the setting is not important to the quality of working life.
Negligible	Receptors with no or very limited views of the proposed development.

The value attached to a view reflects the type of view and how it is experienced, so views from residential properties or settlement edges can expect to be given a higher value than views from places of work, or from outdoor recreation areas where the focus is not on the

surrounding landscape (for instance, playing fields). Value will vary depending on the nature of the visual receptors present at that location; any use of planning designations attaching value to a location; any heritage assets present at that location; and any value attached by visitors that relate to present or previous historic or cultural references. Value is assessed on a scale of high to low.

Sensitivity of the visual receptor to the type of change proposed, in this instance the development of major industrial units, is determined separately for each of the receptors / receptor groups identified.

The sensitivity of the visual receptors takes into consideration their susceptibility to change and the value of the view and uses a scale of high, medium and low; intermediate levels of sensitivity can also be applied. The assessment is not matrix-based but uses the judgement of experienced professionals to determine sensitivity.

#### *Magnitude of effect*

The nature or magnitude of the effects on visual receptors depends upon the size or scale of the changes, the geographical extent of the area influenced, and the duration and reversibility of the effects. In visual assessment, magnitude is also determined by the distance from the viewer, the extent of change in the field of vision, the proportion or number of viewers affected and the duration of activity apparent from each viewpoint, or a sequence of points that may have transient views, for instance along a road or path. Greater weight is given to the visual impacts upon public viewpoints than upon views from private properties; this does not however affect the sensitivity of the receptors experiencing views.

Magnitude is influenced by the effects of distance, which can influence how a development is perceived, as well as scale and the amount of any tall structure that is visible. The extent to which a development occupies or is present on the horizon is also a factor affecting its prominence. Magnitude can vary greatly in differing weather conditions. Direction of light at different times of day also alters magnitude of change in a view at some viewpoint positions, so whether the development is seen against the background of the sky or the landscape makes a difference. The EIA has to take into account a worst-case scenario and the time duration it is experienced.

The following tables set out the sensitivity (Table A/7), magnitude (Table A/8) and significance (Table A/9) criteria that have been used in this visual amenity assessment.

Table A/7: Criteria for the Assessment of Sensitivity of Visual Receptors	
Level	Typical criteria
High	<ul style="list-style-type: none"> <li>Public views within areas of protected landscapes such as National Parks and AONB</li> <li>Users of outdoor recreational facilities including public rights of way, or visitors to heritage assets or other attractions whose attention or interest is focused on the landscape and where tolerance to change is likely to be low, with near views of the development</li> <li>Communities where the development results in noticeable changes in the landscape setting of the community or to valued views enjoyed by the community</li> <li>Occupiers of residential properties with near views affected by the development</li> <li>Tourists travelling through or past the area of the proposed development, in cars, on trains or other transport routes and whose attention or interest is focused on the landscape and where tolerance to high levels of change is likely to be low</li> </ul>
Medium	<ul style="list-style-type: none"> <li>Occupiers of residential properties and settlement area with middle-distance (or greater) views of the proposed development</li> <li>People, such as commuters and hauliers (not tourists) travelling through or past the area of the proposed development in cars, on trains or other transport routes and where the nature of the view may be a secondary experience</li> <li>Users of outdoor recreation facilities where nature of view is only partially relevant to the activity being undertaken</li> </ul>
Low	<ul style="list-style-type: none"> <li>People engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape</li> <li>People at their place of work, or engaged in similar activities, whose attention may be focused on their work or activity, not their surroundings, and where setting is not important to the quality of working life</li> <li>Views from urban roads, footways, railways and industrial areas whose attention may be focused away from the landscape and where tolerance to change is likely to be high</li> </ul>

Table A/8: Criteria for the assessment of magnitude – visual effects	
Level	Typical criteria (not all of which need be applicable)
High	<ul style="list-style-type: none"> <li>Total loss of or major alteration to views and/or the addition of new features that would be very prominent, and/or would greatly contrast with the existing view</li> <li>Full, open views, experienced for the majority of a journey or full duration of an activity</li> <li>The views would be close, direct and/or totally occupied by the proposed development</li> <li>The effects would be long term and/or irreversible</li> </ul>
Medium	<ul style="list-style-type: none"> <li>Partial loss of or alteration to views and/or the addition of new features that would be prominent, and/or would contrast with the existing view</li> <li>Partial views, experienced for part of a journey or activity</li> <li>The views would be middle distance, partially oblique and/or partially occupied by the proposed development</li> <li>The effects would be medium term and/or partially reversible</li> </ul>

Table A/8: Criteria for the assessment of magnitude – visual effects	
Level	Typical criteria (not all of which need be applicable)
Low	<ul style="list-style-type: none"> <li>Minor loss of or alteration to views and/or the addition of new features that would not be prominent, and/or would not contrast with the existing view</li> <li>Glimpsed views, experienced for a small part of a journey or activity</li> <li>The views would be distant, oblique and/or only a small part of the view would be occupied by the proposed development</li> <li>The effects would be short term and/or reversible</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>Very minor loss of or alteration to views and/or the addition of new features that would be almost imperceptible - approximating the 'no change' situation</li> <li>Very brief glimpsed views</li> <li>The views would be very distant, very oblique and/or only a tiny part of the view would be occupied by the proposed development</li> <li>The effects would be very short term and/or reversible</li> </ul>

Table A/9: Criteria for determining significance – visual effects		
Significance	Definition	Typical examples
Significant effect	A fundamental change to the visual amenity of the receptor concerned or a change which is non-fundamental but still considered to be material	<p>High or moderate levels of change in the views and visual amenity of highly sensitive receptors.</p> <p>High levels of change in the views and visual amenity of moderately sensitive receptors.</p>
Non-significant effect	A detectable but non-material change to the visual amenity of the receptor concerned or one which is barely discernible	<p>Low levels of change in the views and visual amenity of highly sensitive receptors.</p> <p>Moderate levels of change in the views and visual amenity of moderately sensitive receptors.</p> <p>High levels of change in the views and visual amenity of low sensitivity receptors.</p>

### *Significance of visual effects*

As with landscape effects, consideration of the sensitivity of the visual receptors to the development and the magnitude of the change resulting from the development, determines the level of the predicted effect, and its significance. Again, a matrix is not used; descriptions of how the levels of impact have been determined are provided.

Table A/9 assigns typical criteria to each level for visual effects, as applied in this assessment; however, it should be noted that various different scenarios of susceptibility to change, the value of views, the size or scale, geographical extent and/or duration and reversibility of effects could apply to result in the overall level of effects as described in the assessment (see paragraphs 3.34 and 3.35 of GLVIA 3).

Overall, effects may be adverse, neutral or beneficial.

Where significant effects are predicted, these are highlighted in bold text within the ES chapter. Whilst significant adverse effects may be identified in connection with a proposed development, this does not imply necessarily that the development taken as a whole would be unacceptable in environmental terms.

### ***Sequential effects***

Sequential effects on visibility and visual amenity occur when the observer / visual receptor is moving through the landscape and may experience views of the same development, or of other similar developments, from more than one location. Roads, long distance paths and railways are modes of travel that may give rise to sequential effects.

Sequential effects are assessed taking into consideration the angle of view towards the proposed development, in relation to the direction of travel; the presence or absence of roadside vegetation, buildings, or near distance changes to the landform that may interrupt views; the potential speed of travel; frequency of use; and potential sensitivity of the visual receptor.

### ***Cumulative landscape and visual impacts***

#### *Assessment process*

In accordance with GLVIA 3, the approach to the cumulative landscape and visual impact assessment of the proposed IAMP ONE Phase Two development has focussed on the schemes most likely to result in significant effects. This has therefore concentrated initially on those existing, consented but not constructed, and 'in planning' developments within close proximity to the site. Developments at the scoping stage are not included as these are not sufficiently developed to any degree of certainty.

#### *Cumulative landscape effects*

Cumulative landscape effects are likely to include effects on:

- the fabric of the landscape, as a result of the removal of or changes to individual elements or features of the landscape, and/or the introduction of new elements or features;
- the aesthetic aspects of the landscape, for instance its scale, sense of enclosure, diversity, pattern and colour, and/or on its perceptual or experiential attributes, such as a sense of naturalness, remoteness or tranquillity; and

- the overall character of the landscape as a result of changes to the landscape fabric and/or to aesthetic or perceptual aspects, leading to the modification of key characteristics, and the possible creation of new landscape character types, if the changes are sufficiently great.

Cumulative landscape effects are likely to be greatest in areas that are of greater susceptibility to change and of higher value, all other factors being equal. Other factors that would determine the significance of the effects include the size or scale of the cumulative effects, the extent of the geographical area influenced by the cumulative effects, and the duration of the cumulative effects. Areas where there are concentrations of people and where the landscape character is an accepted backdrop to settlements could also be particularly sensitive to cumulative landscape effects.

Significant adverse cumulative landscape impacts are more likely to occur where schemes would be close to the proposed development and the ZTVs overlap, resulting in unacceptable levels of change to the landscape character of the area.

#### *Cumulative visual effects*

The study of cumulative visual effects concerns the effects on views and visual amenity enjoyed by people, which may result either from adding the effects of the Development to the effects of the other developments on the baseline conditions, or from their combined effect. This may result from changes in the content and character of the views experienced in particular places due to the introduction of new elements, or removal of or damage to existing elements (GLVIA para. 7.29).

Cumulative visual effects are considered in terms of:

- the susceptibility of the visual receptors that have been assessed, to changes in views and visual amenity;
- the value attached to the views they experience;
- the size or scale of the cumulative visual effects identified;
- the geographic extent of the cumulative visual effects identified; and
- the duration of the cumulative visual effects, including the timescales relating to both the development and the other developments under consideration, and the extent to which the cumulative effects may be considered reversible.

In addition to the above, for sequential cumulative visibility, potential cumulative visual effects are considered in terms of:

- the frequency and duration of the sequential effects (frequent or occasional, glimpsed or prolonged);
- the scale and nature of the views (near or distant views, oblique or direct views, filtered or open views);
- the speed of travel and distance and time between views; and
- the context(s) of the sequential views.

An effect may exist but may not be significant. Significant adverse cumulative visual effects are anticipated to be more likely in areas where one or more development is visible at the same time and in the same field of view as the proposed development, and/or particularly where the viewer is close to the development and there are open views.

### *Summary*

In essence, the significance of cumulative landscape effects relates to the degree to which specific developments become the defining characteristic of the landscape and affect the values and experiences associated with it; whereas the significance of cumulative visual effects relates to the degree to which specific developments are featured in views.

The cumulative assessment is focussed on the operational stage of the proposed development, as this is more likely to be significant than any short-term, temporary effects associated with the construction phase.

### ***Software and hardware tools***

This LVIA has been carried out using the following computer programmes:

- Photoshop and GIS software, for the production of ZTVs, wireframes and montages; and
- ArcView, a Geographical Information System (GIS) used to produce other mapping information.

Hardware used has included:

- an accurate Global Positioning System (GPS) to position the photomontage and wireline viewpoints; and
- a full frame digital SLR camera with a fixed 50mm lens, mounted on a stable, levelled tripod with a professional panoramic head attached (see sections below, for the methodology used in the production of the various LVIA figures).

### ***Zones of Theoretical Visibility diagrams (ZTVs)***

Zones of Theoretical Visibility (ZTVs) are also referred to as Zones of Visual Influence diagrams (ZVIs) or visual envelope maps (VEMs); however, ZTV is the preferred term as it emphasises the key factors of the plans – that they are theoretical and that they indicate potential visibility by coloured shading overlain on an Ordnance Survey background, to illustrate the areas within the surrounding landscape from which the proposed development is theoretically visible. As they are based upon computer modelling of inter-visibility based upon bare ground topography, they do not show the effects of screening of buildings or trees, or of localised changes in the topography that may not be included in the Digital Terrain Model (DTM). They are thus a worst-case scenario. They do not convey the nature or significance of effects; in particular, it is relevant to note that the mapping depicts the theoretical view of the whole development in the same way as the theoretical view of a small part of the uppermost part of a single building.

For this LVIA a ZTV has been created based on the landform of the existing site and the indicative masterplan for the site, using an assumed building height of 25m above ground level. This is shown on ES Figure 8.1.

### ***Selection of viewpoint locations***

Viewpoints are chosen to illustrate the visual effects of a scheme. The principal criterion is that they must be representative of the range of views and viewer types likely to experience the development (paragraphs 6.19 and 6.20 of GLVIA 3). Specific points may also be chosen because they are important existing viewpoints in the landscape.

View types typically include:

- areas of high value such as designated landscapes, long distance footpaths and cycle routes etc;
- those to illustrate different LCTs rather than specific receptors;
- viewpoints that may have wide panoramic views or by contrast focused views;
- viewpoints at different distances;
- viewpoints at different elevations;
- viewpoints from different aspects;
- sequential views for instance along roads; and
- viewpoints where the development would be visible together with other major developments in the area.



Viewer types (receptors) typically include:

- views from residences, roads or recreational points where visitors may experience the landscape; and
- viewpoints where viewers would be likely to be stationary, as well as those where they would be moving through the landscape.

Representative viewpoints were identified for the IAMP ONE EIA, as explained in the 2018 ES at chapter F, section F3.3. Sixteen viewpoints were used in that LVIA (section F4.2.3 refers). Given the smaller nature of the Site, it was agreed as part of the informal consultation on this LVIA (see section 8.2 of ES chapter 8) that only three of these viewpoints would be of relevance. These are viewpoints 1, 13 and 16.

Photographs have been taken from these viewpoint locations, in October 2019, in order to ensure that the baseline images are up to date. The photographs were taken with a full frame digital SLR camera with a fixed 50mm lens, mounted on a stable, levelled tripod with a professional panoramic head attached. This positions the focal centre of the camera lens above the pivot of the tripod and allows the photographs to be stitched together accurately using software.

Viewpoints 1, 13 and 16 (numbering is retained from the 2018 IAMP ONE ES for ease of cross-reference) illustrate the site in the context of its surroundings and are presented on ES Figures 8.6 – 8.8. Each viewpoint figure includes the following:

- the OS grid reference and elevation (height AOD) of the viewpoint location;
- the distance from the proposed development boundary (closest point) to the viewpoint;
- a location map for the viewpoint;
- information on the camera type, height, time and date of the photograph, with weather conditions; and
- horizontal scale and horizontal and vertical field of view.

Text describing the existing and predicted view during construction and post-completion of the development, and any cumulative visual effects for each viewpoint location is set out in section 8.6 of ES chapter 8.

### ***Perception***

A number of factors can influence the way a development is perceived. As noted above, weather conditions and daylight are very important. For some viewpoint angles and light

conditions, the building(s) would be seen backlit against the sky and this may cause them to appear more dark-coloured and thus more prominent.

This study takes a worst-case scenario that predicted effects are adverse.

## **METHODOLOGY FOR THE PRODUCTION OF ZTVs**

### ***Introduction***

A Zone of Theoretical Visibility diagram (ZTV) illustrates the area of the landscape from which a viewer can theoretically see the object in question. This is often also referred to as the visual envelope and the map can also be known as the visual envelope map (VEM), or zone of visual influence diagram (ZVI). However, Zone of Theoretical Visibility is the preferred term as it makes it clear that the information being presented is theoretical. This is a desk-based technique and provides a framework and structure for the subsequent fieldwork.

This kind of information can be manually derived from cross sections, but the process is laborious. Computer software is usually now used to provide this information.

### ***Method***

#### ***The ground model***

The first step in the production of a ZTV is to obtain a computer representation of the ground surface in the vicinity of the proposed development, referred to as a Digital Terrain Model (DTM).

The data used for this project was obtained from the Ordnance Survey. The DTM used for the ZTV analysis was derived from OS Terrain 50 mapped on grid post spacing of 50m.

#### ***The model of the development***

To produce a ZTV, the XYZ data of the viewpoint or object under analysis is required. XYZ data is the easting and northing point plus the height or Z co-ordinate of the subject above the ground level. In the case of the proposed IAMP ONE Phase Two development, an assumed height of 25m above ground level.

The XYZ object data for the development is then entered into the ZTV program that uses the DTM to compute theoretical inter-visibility.

### ***Presentation of results***

The ZTV is indicative of general areas from which the whole or part of the proposed building(s) could be theoretically visible, within the limits of accuracy of the data used. The

ZTV analysis does not indicate significance of impact, merely the presence of a theoretical line of sight.

The results of the analysis are mapped by colour shading to indicate if any part of the site is theoretically visible. This information is then overlaid onto the OS map of the proposed site and surrounding area so that the information may be properly understood and analysed. Viewpoints used in the text have also been included on the ZTV drawing (Figure 8.1).

The ZTV analysis uses a test height from the normal eye level of a standing person. Theoretical visibility from cars and upper storeys of buildings may vary somewhat. This method produces a bare ground ZTV that relies solely upon topography and does not take into account the screening provided by trees or buildings, or minor change in topography that are not included in the DTM. Neither does it address the effects of distance. This means that the results provide a worst-case scenario of the visibility of the building(s).