APPENDIX 4.1: LANDSCAPE AND VISUAL IMPACT ASSESSMENT METHODOLOGY

1.0 Introduction

1.1. The assessment considers two separate (but inter-related) components as a result of the Proposed Development:

- Effects on the Landscape as a resource (including landscape elements and landscape character); and
- Effects on Visual Amenity including views.

1.2. As the two components are inter-related, the assessment of one has been undertaken alongside the other and this resultant document referred to as the Landscape and Visual Impact Assessment (LVIA).

1.3. This methodology and assessment has been undertaken in accordance with:

1. Guidance for Landscape and Visual Assessment - 3rd Edition, (GLVIA) produced by the Landscape Institute and Institute of Environmental Management and Assessment (2013);
2. An Approach to Landscape Sensitivity Assessment by Natural England (July 2019);
3. Photography and Photomontage in Landscape and Visual Impact Assessment (Technical Guidance Note 06/19), published by the Landscape Institute (2019).

2.0 Assessment Approach

2.1. The assessment necessarily includes a combination of objective and partly subjective judgement based on professional expertise. Objective landscape judgements may include quantification of the loss or addition of landscape fabric. Objective visual judgements may include describing the geographical extent of visibility of the Proposed Development from a given receptor with reference to a Zone of Theoretical Visibility Plan and site visit. Partly subjective judgement are based on professional expertise and include decisions on which assessment categories a predicted effect falls into.

2.2. The assessment allows for the maximum effect or 'worse case' scenario i.e. in winter in conditions of good visibility, although indications are given as to the effects under 'normal conditions' including the seasonal effects of vegetation.

2.3. No assessment has been made of impacts upon the setting of cultural heritage receptors including Conservation Areas, Scheduled Monuments and Listed Buildings. The presence of such receptors where present has however been recorded to inform baseline landscape value.

2.4. Both the landscape and visual assessment have been undertaken against a set of Baseline Conditions (the Baseline Situation), which has been established during the first stage of the assessment process, using a combination of desk study and field survey work in the summer of 2019. This provides a transparent basis from which assessment results have been determined and against which professional judgements have been made.

2.5. A Zone of Theoretical Visibility (ZTV) of the Proposed Development was used in combination with the Designations Plan to assist in identifying the Study Area. In line with paragraph 5.2 of GLVIA 3 the Study Area includes the Site and the full extent of the wider landscape around it which the Proposed Development could potentially influence in a significant manner, which was assessed to extend up to a 3km radius from the Site boundary. The key receptors within the Study Area where there is the potential for significant effects and consequently to be assessed in detail, were refined following the field survey.

3.0 The Assessment Process

3.1. A step-by-step process is adopted as set out in GLVIA3 to allow the identification of **Significant** effects to be as transparent as possible. The term Significant is used where overall effects upon a receptor are identified are at a level greater than Moderate.

3.2. The initial step when assessing the impact of the Proposed Development upon both landscape and visual receptors is to consider the receptor **sensitivity** which comprises judgements of the **value** of the receptor and the **susceptibility** of that receptor to change arising from the Proposed Development.

3.3. The second step is to assess the **magnitude** which comprises judgments on the size and scale of the effect, geographical extent of the area affected and the duration and reversibility of the effect.

3.4. Finally judgements made on **sensitivity** and **magnitude** are combined to establish the overall level of effect and whether it is **Significant** or not.

3.5. Stages in a project life cycle have the potential to result in changes to the landscape and visual effects experienced and therefore where applicable the operational phase of the quarry and residual phase (following completion of restoration), assuming the phased growth of any mitigation planting which is described and assessed separately where required.

3.6. The landscape and visual assessment process consists of a number of stages as set out below:

1. Identification of the source/aspects of the development likely to give rise to Significant effects during the different stages in the life of the project;
2. Identification of components/receptors most likely to be Significantly affected by the development (this will vary during the different stages in the life of the project);

3. Description of the interaction of the receptors with aspects of the development (this will vary during the different stages in the life of the project);
4. Assessment of the Sensitivity of the Landscape and Visual Receptors in relation to the identified aspects of the development;
5. Assessment of the Magnitude of Effects in light of both the primary and secondary Mitigation Measures adopted (see below); and
6. Assessment of the of the Overall Effects (with additional mitigation) and whether it is Significant (greater than Moderate).

4.0 Mitigation of landscape and visual effects

4.1. GLVIA 3 at paragraph 4.21 states that measures proposed to prevent/avoid, reduce and where possible offset or remedy (or compensate for) any Significant adverse landscape and visual effects should be described. In practice such mitigation measures are now generally considered to fall into three categories:

- Standard construction and operational management practices for avoiding and reducing environmental effects;
- Primary measures, developed through the iterative design process, which have become integrated or embedded into the project design; and
- Secondary measures, designed to address any residual adverse effects remaining after primary measures and standard construction practices have been incorporated into the scheme.

5.0 Landscape Baseline

5.1. Paragraph 2.2 of GLVIA 3 states that since the European Landscape Convention (ELC) in 2002 which the UK has signed and ratified, the ELC adopts a definition of landscape that is now being widely used in many different situations and is adopted in GLVIA 3 i.e. *'Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'* (Council of Europe, 2000).

5.2. The study of the Baseline Situation includes a review of available document sources that includes published Landscape Character Assessments (including LANDMAP), Historic mapping and Landscape Planning Policy (at national and local level), Ordnance Survey map data, historical maps and aerial photographs.

5.3. The field survey of the Study Area verifies and augments the results of the desktop study to establish the following aspects of baseline landscape character to establish the following:

- Physical Elements:
  Including geology, soils, landform, drainage and water bodies, land cover, including different types of vegetation;

- Influence of Human activity:
  Including land use and management, the character of settlements and buildings, and pattern and type of fields and enclosure; and

- Aesthetic and perceptual aspects:
  Including scale, complexity, openness, tranquillity or wildness.

5.4. Published landscape character assessments are reviewed to assist in the identification of any distinctive Landscape Character Types or areas and the key characteristics of the landscape.

5.5. The baseline work identified those landscape elements on or adjoining the Site where there is the potential for Significant landscape effects arising from the Proposed Development and also Landscape Character Types and/or Areas (LCTs/LCAs) covering the Site and surrounding Study Area where there is the potential for direct and/or indirect effects upon landscape character.

6.0 Sensitivity of Landscape Receptors

6.1. **Sensitivity** of a landscape receptor is dependent upon the **Value** attached to it and it's **Susceptibility** to change to the development proposed.

6.2. The **Value** of a landscape receptor is determined by a range of factors set out below (based on Box 5.1 of GLVIA3). All factors listed below apply to landscape character areas although some may not be relevant to an individual landscape receptor.

- Landscape quality (condition);
- Scenic quality;
- Rarity and representativeness;
- Conservation interests;
- Recreation Value;
- Perceptual aspects; and
- Associations.

6.3. Indicative criteria are used to determine the value of landscape receptors (see Tables 1a to 1g below). The resulting value levels under each criteria are recorded and an overall judgement of the level of Value is reached.

Table 1a: Indicative Criteria used to determine the Landscape Quality (Condition) Value of the Landscape Receptor

Value Level	Landscape Condition Criteria
High	Consistently, characteristics are in very good condition and present in a unified manner. Landscape and cultural elements are all intact and in a strong functional and visual condition. In rural landscapes may include a diverse range of large and continuous habitats of very high importance. Likely to include High value agricultural land.
Medium	Generally, characteristics in good to average condition but sometimes masked or disrupted by incongruous elements: some level of deterioration evident. Visual and functional condition of characteristic landscape and cultural elements generally (but not necessarily entirely) reasonable; some evidence of decline. In rural landscapes any semi-natural habitats are in discrete units with potentially some opportunity for cross-interaction. Likely to include moderately valued agricultural land.
Low	Weak or degraded landscape character with a small number of key characteristics present and/or at least as many incongruous elements present. Visual and functional condition of landscape and cultural elements generally poor. In rural landscapes, the semi-natural habitats are of very limited area and patchy, providing no opportunity for cross-interaction. Likely to include low value agricultural land.
Very Low	Heavily degraded landscape character dominated by incongruous elements in poor condition. Land has been subject to extensive alteration of distinctive landscape components removing any historical and cultural significance. In rural areas, there is negligible semi-natural vegetation present, too isolated to allow natural repopulation. Likely to include none or very poor agricultural land.

Table 1b: Indicative Criteria used to determine the Scenic Quality Value of the Landscape Receptor

Value Level	Scenic Quality Criteria
High	None or very few detracting characteristics. Presence of diversity and balance of form, colour, texture and contrast with interesting or captivating scenery in an aesthetically pleasing and uncommon way.
Medium	Some detracting characteristics balancing a number of aesthetically pleasing aspects, but fairly common over the locality.
Low	A number of detracting characteristics, with little variation or colour, texture, form or contrast generally outweighing aesthetically pleasing positive contributing characteristics to the scene.
Very Low	Few, if any, positive characteristics present within the scene with no balance or diversity, little interest and very low aesthetic appeal.

Table 1c: Indicative Criteria used to determine the Rarity and Representativeness Value of the Landscape Receptor

Value Level	Rarity and Representativeness Criteria
High	Distinctive, rare landscape key characteristics contributing to individual character. Landscape characteristics / character overall are an exceptional example of its kind
Medium	Locally distinctive landscape characteristics contributing to local character. Some landscape characteristics / character represent good examples of their kind
Low	Occasional individual locally distinctive landscape characteristics. Commonly encountered examples of similar unremarkable landscape characteristics / character
Very Low	Very commonly found, indistinctive landscape characteristics present that are subservient to man-made urban development

Table 1d: Indicative Criteria used to determine the Conservation Interest Value of the Landscape Receptor

Value Level	Conservation Interest Criteria
High	Numerous and/or extensive international or nationally important features or elements of wildlife, earth science, archaeological, historical or cultural interest
Medium	Some nationally important and/or locally important features or elements of wildlife, earth science, archaeological, historical or cultural interest.
Low	Occasional locally important features or elements of wildlife, earth science, archaeological, historical or cultural interest.
Very Low	Few, if any, elements of wildlife, earth science, archaeological, historical or cultural interest.

Table 1e: Indicative Criteria used to determine the Associations Value of the Landscape Receptor

Value Level	Associations Relevant Criteria
High	Landscape strongly associated with important prominent people, artists or writers and/or important well-known events in history.
Medium	Landscape with some associations to prominent people, artists or writers and/or events in history.
Low	Landscape potentially weakly associated or not known to be associated with any known prominent people, artists or writers or events in history.
Very Low	No known associations or likelihood of potential associations.

Table 1f: Indicative Criteria used to determine the Recreational Value of the Landscape Receptor

Value Level	Recreational value Criteria
High	May include promoted area or routes for tourism and recreational use.(e.g. country park or extensively promoted scenic routes such as national trails). Clear evidence that the area is extensively used for recreation e.g. worn footpath routes.
Medium	Land contains some public open recreation and/or routes e.g. public rights of way and/or open access land. May also include other commercial uses (e.g. golf course, fishing, boating). Evidence of regular use.
Low	Permissive, informal and/or general access routes or open access land which may be infrequent and/or fairly inaccessible. Some limited evidence of use.
Very Low	Access and recreational value limited or absent due to incompatible land-uses.

Table 1g: Indicative Criteria used to determine the Perceptual Aspects Value of the Landscape Receptor

Value Level	Perceptual Aspects Criteria
High	Strong sense of remoteness or isolation with virtually no obvious human influences present - Relative abundance of landscape characteristics contributing to an experience of tranquillity.
Medium	Wildness is not a strong contributing characteristic and human influences are evident, with scattered villages and other development present, detracting from an experience of tranquillity, which would be confined to localised places.
Low	Human presence is more dominant with a corresponding lack of wildness evident, despite some potential rural influences. Experience of tranquillity would be rare in this landscape e.g. due to main roads and industrial facilities.
Very Low	Human presence in terms of people, noise, movement and development dominant such that there is an absence of tranquillity or wildness

6.4. The **Susceptibility** of a receptor to change is defined as being 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 a particular aesthetic and perceptual aspect) to accommodate the Proposed Development without undue consequences for the maintenance of the baseline situation.

6.5. Indicative criteria used to determine the *susceptibility* of landscape receptors to change are set out below in Tables 2a to 2h below. This selection has been adapted from the susceptibility criteria for settlement areas as set out as Example 6, Annex 2 of Natural England Guidance covering Landscape Sensitivity Assessment published in June 2019. The resulting susceptibility levels under each criteria are recorded and an overall judgement of the level of Susceptibility is reached.

Table 2a: Indicative Criteria used to determine the Scale and Openness Susceptibility of the Landscape Receptor

Susceptibility Level	Scale and Openness Susceptibility Criteria
High	Large scale open rural landscapes with limited built development and enclosure that are susceptible to expansion of quarries
Medium	Medium scale rural landscapes that are semi-enclosed and have some degree of susceptibility to change due to expansion of quarries.
Low	Small scale enclosed landscapes closely associated with existing settlements that are less susceptible to quarry development.
Very Low	Small scale and enclosed locations within settlements where the proposed development would not extend the perception of the quarry in the landscape

Table 2b: Indicative Criteria used to determine the Landform Susceptibility of the Landscape Receptor

Susceptibility Level	Landform Susceptibility Criteria
High	Dramatic, highly distinctive, rugged & complex natural landscapes with landform features that would be clearly diminished directly or indirectly by the introduction of new development
Medium	Undulating landform with natural profiles that lacks the complexity and dramatic character of the highest category but would contrast directly or indirectly from the introduction of the Proposed Development
Low	Predominantly flat landform with largely uniform features and likely to include some man-made landform modifications that that have some influence on underlying natural landform patterns

Very Low	Highly modified landform including man-made embankments e.g. motorway corridors, quarry extractions, landfill and modified watercourses, that have a substantial influence on underlying natural landform patterns

Table 2c: Indicative Criteria used to determine the Landcover Susceptibility of the Landscape Receptor

Susceptibility Level	Landcover Susceptibility Criteria
High	Landcover of high quality (condition) rural elements and/or containing historic built development that would contrast strongly with the Proposed Development
Medium	Landcover is relatively simple comprising with few distinctive landcover elements but will represent a contrast to the Proposed Development
Low	Extensive areas of simple and regular landcover e.g. intensive farming and forestry that will have low susceptibility to the Proposed Development.
Very Low	Landcover with very low susceptibility to the Proposed Development e.g. Brownfield and/or industrial land

Table 2d: Indicative Criteria used to determine the Complexity and Patterns Susceptibility of the Landscape Receptor

Susceptibility Level	Complexity and Patterns Susceptibility Criteria
High	Complex and/or irregular patterns e.g. historic field boundaries that could be directly affected by the Proposed Development or indirectly diminished by the Proposed Development.
Medium	Some moderately complex patterns in areas that could be directly affected by the Proposed Development or indirectly diminished by the Proposed Development
Low	Simple landscape patterns with a low level of complexity in areas that could be directly affected by the Proposed Development or indirectly diminished by the Proposed Development
Very Low	Very simple complexity of landscape characteristics with limited or no discernible patterns.

Table 2e: Indicative Criteria used to determine the Built Environment Susceptibility of the Landscape Receptor

Susceptibility Level	Built Environment Susceptibility Criteria
High	No built development or where present limited traditional built character that may include conservation areas and scattered listed buildings.
Medium	Development does not currently dominate the landscape and typically contains modern and potentially some historic built elements. Other infrastructure may occasionally be present e.g. pylons, masts and roads
Low	Modern settlement in regular patterns dominates the landscape (noting that visual susceptibility of residents is different and assessed separately). Other infrastructure present e.g. pylons and masts.
Very Low	Predominantly modern development that is dominated by industrial buildings/infrastructure and/or major highways (motorways/dual carriageways). Other infrastructure frequently occurs e.g. pylons and masts.

Table 2f: Indicative Criteria used to determine the Backdrop/Skyline/Focal point Susceptibility of the Landscape Receptor

Susceptibility Level	Backdrop/Skylines and focal points Susceptibility Criteria
High	Areas with highly distinctive backdrops, skylines and/or key focal points that are a key characteristic of the area and would be interrupted by the Proposed Development
Medium	Areas with moderately distinct backdrops, skylines and/or key focal points that are a key characteristic of the area and would be interrupted by the Proposed Development
Low	Areas with limited backdrops, skylines and/or key focal points that would be interrupted by the Proposed Development
Very Low	No backdrops, skylines and/or key focal points that would be interrupted by the Proposed Development

Table 2g: Indicative Criteria used to determine the Wildness and Tranquillity Susceptibility of the Landscape Receptor

Susceptibility Level	Wildness and Tranquillity Susceptibility Criteria
High	Areas that are remote, peaceful and with a high degree of wildness (e.g. semi-natural Moorland) and have a high level of tranquillity which would be interrupted by the Proposed Development.
Medium	Area includes parts that are largely devoid of the more pervasive man-made influences such as industrial uses, major transport corridors, major settlement and overall have a moderate level of tranquillity which would be interrupted by the Proposed Development
Low	Area includes frequent pervasive man-made influences such as industrial uses, major transport corridors, major settlement, lighting and overall has a low level of tranquillity.
Very Low	Area is dominated by pervasive man-made influences such as industrial uses, major transport corridors, major settlement and lighting and overall has a very low level of tranquillity.

6.6. The assessment of both *Susceptibility* and *Value is* based on a four point textual scale: *Very Low*, *Low, Medium* and *High*. This information is then combined to arrive at an overall sensitivity - see Table 3 below. Professional judgment is used where the overall sensitivity level is borderline between two categories.

Table 3: Overall Sensitivity of Landscape Receptor

		VALUE			
		High	**Medium**	**Low**	**Very Low**
SUSCEPTIBILITY	**High**	High	High to Medium	Medium	Medium to Low
	Medium	High to Medium	Medium	Medium to Low	Low
	Low	Medium	Medium to Low	Low	Low to Very Low
	Very Low	Medium to Low	Low	Low to Very Low	Very Low

7.0 Landscape Magnitude of Effect

7.1. Following an assessment of the sensitivity of the landscape receptor an assessment is made of the magnitude of effects associated with the Proposed Development. Those elements of the development that may affect landscape character can be either associated with direct or indirect effects.

7.2. Direct and indirect effects on the landscape receptor potentially affected by the Proposed Development can be defined as comprising:

- Direct physical changes to the actual fabric of the landscape, including loss or changes to individual elements such as landform, agricultural fields, trees, hedges, ditches, paths etc.

- Direct or indirect effects caused by the development to the overall character of the landscape and changes to the key characteristics that help define and create the distinctiveness of the local landscape, including aesthetic and/or perceptual aspects.

7.3. In relation to Magnitude of effects GLVIA 3 states at paragraph 5.48 that each effect on landscape receptors needs to be assessed in terms of its **size or scale**, the **geographical extent** of the area influenced, and its **duration and reversibility**.

7.4. Receptor proximity to the Appeal Site is described at **Close range** (up to 500m), **Medium range** (between 500m and 1.5km) and **Long range** (over 1.5km).

7.5. The assessments in relation to size, scale, geographical extent, duration and reversibility are expressed in terms on a four point textual scale i.e. ***Very Low***, ***Low***, ***Medium and High***. Duration is expressed for the Operational Period as **Short term** (up to 3 years), **Medium term** (3-10 years) **or Long term** (more than 10 years) ; and reversibility is expressed as either ***fully reversible, partially reversible or permanent***.

7.6. These aspects of magnitude are then combined to arrive at an evaluation of the overall magnitude of effects on individual landscape elements and/or character areas/types. The effects are considered according to whether they are ***adverse***, ***neutral*** **or** ***beneficial*** in nature. The effects are categorised on a four point textual scale**:** ***Very Low***, ***Low***, ***Medium***, **and** ***High*** as detailed in Table 6 below:

Table 6: Indicative Magnitude of Effect upon Landscape Receptors

Summary of Effect	Criteria
High Adverse	The proposed development is damaging to the baseline landscape that would result in one or more of the following: • At variance with the landform, scale and/or pattern of the landscape. • Is likely to degrade and/or diminish the integrity of a range of key characteristics. • Resulting in a fundamental change in the landscape that would be diminished in condition (quality). • Development is unable to be adequately mitigated. • Development is in clear conflict with policy in respect to enhancing landscape character and set out in current or emerging LDP's and/or the NPPF and other gudiance. Changes are likely to be permanent and long term duration
	The propsoed development is at some odds with the baseline landscape that would result in one or more of the following: • At some variance with the landform, scale and/or pattern of the landscape. • Is likely to diminish the integrity of some key characteristics. • Resulting in some changes in the landscape that would be diminished in condition (quality). • Some aspects of the development and/or resulting effects are unable to be mitigated. • Development has some conflict with policy in respect to enhancing landscape character and set out in current or emerging LDP's and/ or the NPPF and other gudiance. Changes are likely to be permanent or partially reversible and of Medium to Long duration.
Low Adverse	The propsoed development would result in some small adverse changes to the baseline landscape in that would result in one or more of the following: • Small variances with the landform, scale and/or pattern of the landscape. • Likely to slightly diminish the integrity of some key characteristics. • Resulting in some minor changes in the landscape that would be diminished in condition (quality). • Some small aspects of the development and/or resulting effects are unable to be fully mitigated. • Development has minor conflict with policy in respect to enhancing landscape character and set out in current or emerging LDP's and/ or the NPPF and other gudiance. Changes would likely be of modest size and scale and geographical extent but permanent and of long duration. Alternatively changes could be more noticeable in size, scale and geographical extent but reversible and short term in nature.

Summary of Effect	Criteria
Very Low Adverse	The proposed development would result in some very small adverse changes relative to the baseline landscape in that would result in one or more of the following: • Very small variances with the landform, scale and/or pattern of the landscape. • Likely to very slightly diminish the integrity of some key characteristics. • Resulting in some very small changes in the landscape that would be diminished in condition (quality). • Some very small aspects of the development and/or resulting effects are unable to be fully mitigated. • Development has a very minor conflict with policy in respect to enhancing landscape character and set out in current or emerging LDP's and/ or the NPPF and other gudiance. Changes could be of very modest size and scale and geographical extent but permanent and of Long duration. Alternatively changes could be more noticeable in size, scale and geographical extent but reversible and short term in nature.
Neutral Effect	• The development is likely to be able to complement and fit into the scale, landform and pattern of the baseline landscape and would maintain existing landscape features and character.
Very Low Beneficial ↕ High Beneficial	The development would respond well to the landform, pattern and historical use of the area by: • Incorporating measures for mitigation to ensure that landscape character is marginally enhanced and improved, such as habitat creation, restoration of previously degraded landscape. • Partly adressing planning policy aims and objectives to enhance landscape character (on restoration) as set out in current or emerging LDP's and/or the NPPF and other gudiance Changes could be of very modest size and scale and geographical extent but permanent and of Long duration. Alternatively changes could be more noticeable in size, scale and geographical extent but reversible and short term in nature.
	The proposal would fit well in the landform, pattern and historical use of the area by: • Incorporating measures for mitigation to ensure that landscape character is clearly enhanced and improved, such as habitat creation, restoration of previously degraded landscape. • Adressing planning policy aims and objectives to enhance landscape character as set out in current or emerging LDP's and/or the NPPF and other gudiance Changes are likely to be permanent or partially reversible and of Medium to Long duration.
	The proposal would enhance the landform, pattern and historical use of the area by: • Incorporating measures for mitigation to ensure that landscape character is substantially enhanced and improved, such as habitat creation, restoration of previously degraded landscape. • Fully adressing planning policy aims and objectives to enhance landscape character as set out in current or emerging LDP's and/or the NPPF and other gudiance. Changes are likely to be permanent and long term

8.0 Overall Landscape Effects

8.1. The Sensitivity of the Receptor is combined with the Magnitude to reach an Overall Effect. For consistency and transparency this assessment was assisted by use of a matrix table (see Table 8).

Table 8: Overall Landscape Effects: Correlation of Sensitivity and Magnitude

Receptor Sensitivity	Magnitude of Impact			
	High	Medium	Low	Very Low
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Minor/Negligible
Very Low	Moderate/Minor	Minor	Minor/Negligible	Negligible

8.2. The analysis of potential effects must allow for the exercise of professional judgement and the matrix at Table 8 is only used as a guide for consistency and is not a prescriptive tool e.g. in some instances a particular parameter may be considered as having a determining effect on the analysis (when this occurs it is clearly stated in the assessment).

8.3. Where the landscape effect is assessed as greater than Moderate, this is considered to be a **Significant** effect.

9.0 Visual Baseline

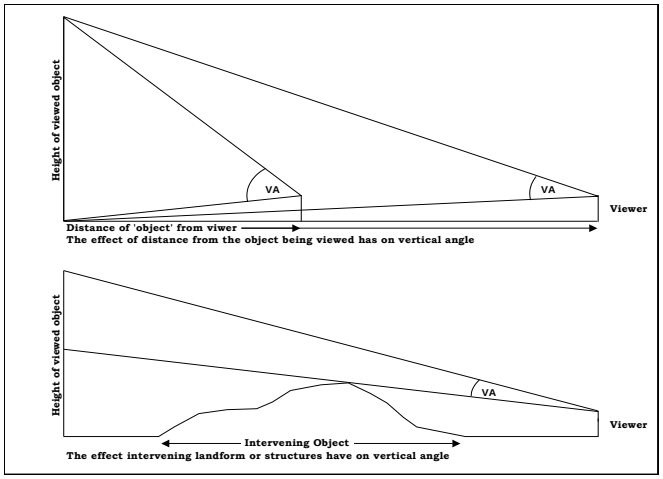
9.1. The identification of visual receptors within the Study Area focusses on the publicly accessible areas that fall within the Zone of Theoretical Visibility (ZTV).

9.2. A computer generated Zone of Theoretical Visibility (ZTV) has been generated using Terrain 5 Ordnance survey data to create a Digital Terrain Model (DTM), on top of which the main blocks of woodland and settlements have been added at conservative heights of 12m and 8m respectively to combine with the landform to create a Digital Surface Model (DSM). The heights are considered to be conservative as woodland is frequently taller than 12m high. A ZTV of the Study Area will always illustrate a maximum effect scenario, with some of the land covered by the ZTV unlikely in reality to afford views of the Proposed Development due to the presence of intervening surface features in addition to woodland and settlements e.g. local landform features, hedgerows, individual trees and other built structures outside settlements.

9.3. The ZTV computer models used specialised software to generate digital models of the landform to determine the site's Zones of Theoretical Visibility (ZTV), based on mathematically generated vertical angles of view.

9.4. The ZTV assists in objectively defining the magnitude of visual effects of the Proposed Development. This is achieved by analysing the vertical angle subtended by the top and bottom extremities of the object that is viewable, from which a 'contour' model is generated (see Figure 1 below). The contour model provides a measure of how much of a given vertical field of view is occupied by the object when viewed from different locations and automatically takes into account effects of distance from the Site i.e. an object close to the viewer occupies a greater vertical angle [field of view] than a feature further away. Where a zero value is returned, the viewpoint lies outside or on the edge of the Visual Envelope, delineating the areas from which views of the Proposed Development would not be possible (uncoloured).

Figure 1: A Diagram to Illustrate Vertical Angles



9.5. Table 9 below illustrates the mathematical relationship between a 12 metre high object, its distance from the viewer and the vertical angle it would subtend compared to the main vertical field of view of the viewer.

Table 9: Table illustrating the relationship of distance and vertical angle subtended

Distance From Viewer of 12m high object	Vertical Angle Subtended (Total Field of View = @ 90°)
10.0 Km	0.07°
6.8 Km	0.1°
3.5 Km	0.2°
2.3 Km	0.3°
1.0 Km	0.7°
0.7 Km	1.0°
0.5 Km	1.4°
0.2 Km	3.0°
0.1 Km	6.8°

9.6. Based on experience, photographic studies and the mathematical table, certain 'contour' values are assessed as potentially indicating differences in magnitude of effect. A classification using six 'contour' values was used to inform the assessment of magnitude. Those receptors where the angle of view subtended the largest angle being likely to receive the highest magnitude of effect. Conversely, those where the angle of view subtended the smallest angle being likely to receive the lowest magnitude of effect.

9.7. During the field study a photographic record was undertaken to record a range of viewpoints towards the Site, from available viewpoints. The camera used was a digital SLR with full frame sensor and fixed 50mm lens and a tripod with a panoramic head was used. The resulting images were stitched together using digital imaging software to provide a 'panorama image', and reproduced to be compliant with Technical Guidance Note 06/19: Visual Representation of Development Proposals, published by the Landscape Institute in September 2019. The images presented in this evidence comprise Type 1 Annotated Viewpoint Photographs and Type 3 Photomontages.

9.8. Typically receptors within the Study Area include:

- People at home and in their gardens;
- Recreational/leisure receptors including anglers, walkers, water users and cyclists;
- Road and rail users; and
- People at their place of work.

9.9. Where relevant, locations were selected to represent more than one type of receptors e.g. at the junction of a footpath and road. Access to the rear garden of a single private dwelling was obtained with consent of the landowner, otherwise all assessment was undertaken from publicly accessible locations.

9.10. Guidance on the selection of final viewpoints is provided at paragraph 6.20 of GVLIA 3 which states that the selection 'should take account of a range of factors, including:

- the accessibility to the public;
- the potential number and sensitivity of viewers who may be affected;
- the viewing direction, distance (i.e. short-, medium- and long-distance views) and elevation;
- the nature of the viewing experience (for example static views, views from settlements and views from sequential points along routes);
- the view type (for example panoramas, vistas and glimpses); and
- the potential for cumulative views of the Proposed Development in conjunction with other developments.'
- The role of scoping out visual receptors at the baseline stage that are unlikely to experience significant visual effects is described at paragraph 6.24 of GLVIA3 which states:
  'Visual receptors, viewpoints and views that have been identified as unlikely to experience significant visual effects either at the scoping stage or in establishing the baseline should not be included in detailed reporting but should be noted, with reasons given for their exclusion'

10.0 Sensitivity of Visual Receptors

10.1. The nature or sensitivity of visual receptors is dependent upon the *value* attached to the view and the *susceptibility* to change of the receptor with respect to the Proposed Development.

10.2. Judgements on value take into account any recognised importance of the view (e.g. in relation to valued landscapes or features, or through planning designations) and any indicators of value attached to views by visitors e.g. guidebooks and tourist maps.

10.3. Susceptibility to change, in relation to the Proposed Development, is influenced by the following factors:

- Location and context of the viewpoint;

- Characteristics of the view, e.g. whether it is continuous or intermittent and static or transient; and
- The activity or expectations of the receptor at the viewpoint.

10.4. Those receptors most susceptible to change include local residents, particularly those dwellings that have been designed to maximise views across the surrounding landscape of recognised value, such as experienced from patios, conservatories, picture windows etc. Whilst it is an accepted planning principle that there is 'no right to a view' residents are recognised as having the potential to be most susceptible to changes in their visual amenity (paragraph 6.33 of GLVIA 3rd Edition 2013).

10.5. Indicative criteria used to help determine the degree of susceptibility of visual receptors to change and the value of views is given below in Tables 10 and 11 respectively.

Table 10: Indicative criteria used to determine the Value of Visual Receptor Groups

Visual Receptor Category	Value
Views across rural landscapes with scenic value that may or may not be recognised by formal designation. Views in urban locations associated with demonstrable townscape value.	High
Views across rural landscapes with scenic value that may or may not be recognised by formal designation and may have minor detracting elements. Views in urban locations associated with moderate townscape value.	
Views across rural landscapes with scenic value that are unlikely to be recognised by formal designation and have some detracting elements. Views in urban locations associated with low townscape value.	
Unimportant views over degraded rural landscapes. Views in urban locations of industrial/commercial landscapes.	Very Low

Table 11: Indicative criteria used to determine the Susceptibility of Visual Receptor Groups

Receptors		Comments	Susceptibility
Residential Buildings			
Housing estates and isolated dwellings	Primary living space	Containing windows on ground or upper floors such as living rooms, dining rooms and/or kitchens where people may spend significant periods of waking time. Parts of gardens with greater usage e.g. patios	**High**
	Secondary living space	Bedrooms, bathrooms and other rooms typically not used in daylight hours or parts of the garden with less frequent usage.	**Medium**
Commercial Premises			
Industrial units		Users unlikely to be sensitive to off-site views	**Very Low**
Retail Units and Offices		Users unlikely to be overly sensitive to off-site views but may contain aspects where outward looking views are possible.	**Low**
Transport/Recreational Routes/Public Open Space			
Public Rights of Way and and Open Access Areas		Rural paths/bridleways/open access heavily influenced by urban/industrial development and/or major transport routes and/or with limited countryside.	**Low to Medium**
		Rural paths/bridleways/open access land used for general recreational purposes capable of gaining views across open countryside.	**High**
Public Open Space - Rivers/Urban Parks/ Golf Courses/Car Parks/Beaches etc.		Recreational grounds that are primarily used for active sports where views of the landscape are incidental to the activity e.g. football, rugby etc..	**Low**
		Recreational grounds that are primarily used for sporting activities where appreciation of the surrounding landscape setting has some level of importance e.g. fishing, golf, cricket etc.	**Medium**
		Public Open Space in regular use that is promoted for outdoor recreation where the surrounding landscape of is integral to the experience e.g. picnic sites	**High**
Cycleways/ Roads/Railway	National Cycle Routes and unclassified/Minor roads	Roads and/or tracks within a rural location and promoted as a national route for the enjoyment of the open countryside	**High**
	Unclassified/Minor Roads/ Local Rail Network	Rural location and relatively slow traffic speeds, possibly in conjunction with greater use by cyclists or walkers may influence sensitivity to visual impacts.	**Medium**
	Main Roads/ Trunk Roads/Motorways/ High Speed Rail links	Traffic speed and primary use likely to limit sensitivity to visual effects.	**Low**

10.6. An assessment of both the Susceptibility and Value of visual receptors was based on a four point textual scale: *Very Low*, *Low, Medium* and *High*. This information is then combined to arrive at an overall sensitivity of the receptor as set out in Table 12 below. Professional judgment is used where the Overall Sensitivity level is borderline between two categories.

Table 12: Overall Sensitivity of Visual Receptor

		VALUE			
		High	**Medium**	**Low**	**Very Low**
SUSCEPTIBILITY	**High**	High	Medium to High	Medium	Medium to Low
	Medium	Medium to High	Medium	Medium to Low	Low
	Low	Medium	Medium to Low	Low	Low to Very Low
	Very Low	Medium to Low	Low	Low to Very Low	Very Low

11.0 Visual Magnitude of Effect

11.1. The magnitude of effects as a result of the Proposed Development is determined according to the criteria set out in Table 13 below and assisted by the ZTV figures and photomontages (where prepared). Each of the visual effects is evaluated in terms of its size or scale, the geographical extent of the area influenced and its duration and reversibility.

11.2. Receptor proximity to the Site is described at Close range (up to 500m), Medium range (between 500m and 1km) and Long range (over 1km).

11.3. Duration is expressed for the Operational Period as **Short term** (up to 3 years), **Medium term** (3-10 years) **or Long term** (more than 10 years) ; and reversibility is expressed as either ***fully reversible, partially reversible or permanent***. Unless otherwise specifically stated all effects are assumed to be long term and permanent.

Table 13: Indicative Magnitude upon Visual Receptors

Summary of Effect	Criteria
High Adverse	Views are typically unrestricted, direct and from close range. The view would be affected in a pronounced manner and would be difficult to reverse e.g. clear loss of features and/or addition of discordant new elements in the view that are permanent.
	Views are typically unrestricted or partly restricted, direct or partly oblique and from close to medium range. The view would be noticeably affected but may be reversible e.g. some loss of features and/or addition of discordant new elements in the view that are likely to be medium to long term and permanent in nature
	Views are typically partly restricted and/or oblique and from medium to long range. The view would be affected to a minor degree and could be permnanet or temporary in nature e.g. minor loss of features and/or addition of discordant new elements in the view.
Very Low Adverse	Views are typically partly restricted and/or oblique and from long range. The view would be affected to a negligible degree and is likely to be short term temporary effects and/or barely discernible e.g. very minor loss of features and/or addition of discordant new elements in the view.
Neutral Effect	No perceived change in the view or the very small changes are perceived to be neither adverse or beneficial in nature
Very Low Beneficial	Views are typically partly restricted and/or oblique and from long range. The view would be affected to a negligible degree and is likely to be is likely to be short term temporary effects and/or barely discernible e.g. very minor loss of discordant features and/or addition of new elements that improve visual amenity.
	Views are typically partly restricted and/or oblique and from medium to long range. The view would be affected to a minor degree and could be permnanet or temporary in nature e.g. minor loss of discordant features and/or addition of new elements that improve visual amenity.
	Views are typically unrestricted or partly restricted, direct or partly oblique and from close to medium range. The view would be noticeably affected but may be reversible e.g. some loss of discordant features and/or addition of new elements that noticeably improve visual amenity. Changes are likely to be medium to long term and permanent in nature

Summary of Effect	Criteria
High Beneficial	Views are typically unrestricted, direct and from close to medium range. The view would be affected in a pronounced manner and would be difficult to reverse e.g. clear loss of discordant features and/or addition of new elements that substantially improve visual amenity in the long term and are permanent.

12.0 Overall Visual Effects

12.1. The Sensitivity of the Receptor is combined with the Magnitude of the Effect to reach an Overall Effect. For consistency and transparency this assessment was assisted by use of a matrix table (see Table 14). Effects are described on a four point textual scale: Major, Moderate, Minor or Negligible with intermediate categories if required.

Table 14: Overall Visual Effects: Correlation of Sensitivity of Receptor with Magnitude of Effect

Receptor Sensitivity	Magnitude of Effect			
	High	Medium	Low	Very Low
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Minor/Negligible
Very Low	Moderate/Minor	Minor	Minor/Negligible	Negligible

12.2. The analysis of potential effects must allow for the exercise of professional judgement and the matrix at Table 14 is only used as a guide for consistency and is not a prescriptive tool e.g. in some instances a particular parameter may be considered as having a determining effect on the analysis (when this occurs it is clearly stated in the assessment).

12.3. Where the visual effect is assessed as greater than Moderate, this is considered to be a **Significant** effect.