

# A66 Northern Trans-Pennine Project

## TR010062

### 5.11 Project Design Principles (Rev 43) (Tracked)~~Clean~~)

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**5.11 PROJECT DESIGN PRINCIPLES**

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## 1 Introduction

### 1.1 Scope of this report

- 1.1.1 This Project Design Principles Report sets out the Project-wide and scheme-specific design principles (“the Design Principles”) for the schemes which make up the A66 Northern Trans-Pennine (NTP) Project between M6 Junction 40 at Penrith and the A1 junction at Scotch Corner (the Project). The Design Principles contained in this report implement the overarching Design Vision for the Project set out at section 2, and which responds to the evidence base gathered in the Environmental Impact Assessment for the Project, notably in relation to integrating the Project within its sensitive and high-quality environmental context. The purpose of this report is to set out the Design Principles in accordance with which the detailed design of the Project will be carried out. The Design Principles apply to the design of the permanent form of the Project; they do not apply to the temporary construction phase. It should also be noted that these Project Design Principles are separate to the illustrative Project Design Report produced for the Project, and which illustrates the Project’s design response to National Highways’ *The Road to Good Design*.
- 1.1.2 The Design Principles in this report are presented in two parts: “Project-wide Design Principles” which are Design Principles which apply to the Project as a whole; and “Scheme-specific Design Principles”, which are more detailed and locally specific, and which apply to each of the individual schemes which make up the Project.
- The Design Principles have been developed in parallel with the Development Consent Order (DCO) preliminary design, in collaboration with key stakeholders. The DCO, in particular the article that sets out the limits of deviation, establishes the parameters that must be met in the final detailed design of the horizontal and vertical alignment, structures and engineering earthworks, landscape and biodiversity integration and ancillary features concerned with the operation of the schemes, which make up the Project.
- 1.1.3 Importantly, the Design Principles also secure the elements of the design that have been used in the development of the preliminary design, shown illustratively in the General Arrangement drawings (Application Document 2.5) and the Environmental Mitigation Maps (Application Document 2.8). It should be noted that both the General Arrangement Drawings and Environmental Mitigation Plans show one way in which the Project could be delivered within the parameters of the limits of deviation and through the application of the Design Principles contained within this document. A Design Principles approach is considered by National Highways to be an appropriate means to provide a proportionate degree of flexibility to ensure the Project can be delivered within the fixed parameters of the limits of deviation, whilst ensuring that key elements of and approaches to, the detailed design are articulated and secured.
- 1.1.4 The Design Principles are submitted for approval as part of National Highways’ application for development consent for the Project and, if development consent is granted by the Secretary of State for Transport,

would become a document certified under the DCO once made. Subsequent detailed design development must be in accordance with these Design Principles.

1.1.5 The Design Principles help align the Project with the three themes and supporting principles set out within National Highways' *The Road to Good Design* (Highways England, 2018)<sup>1</sup>, specifically:

- People
  - Good road design makes roads safe and useful
  - Good road design is inclusive
  - Good road design makes roads understandable
- Connecting Places
  - Good road design fits in context
  - Good road design is restrained
  - Good road design is environmentally sustainable
- Connecting Processes
  - Good road design is thorough
  - Good road design is innovative
  - Good road design is collaborative
  - Good road design is long-lasting.

1.1.6 The Project and component schemes also take account of the strategic principles set out in the National Infrastructure Commission's *Design Principles for National Infrastructure* (National Infrastructure Commission, 2020)<sup>2</sup> around context-driven design, and their four key principles of design for climate, people, place and value. Account is also taken of The Design Council's 2012 publication, *A design-led approach to infrastructure* (Design Council, 2012)<sup>3</sup> and the National Design Guide<sup>4</sup>.

1.1.7 The detailed relevant policy context in relation to the design of the Project is set out in the Legislation and Policy Compliance Statement (Application Document 3.9).

1.1.8 This Project Design Principles report does not seek to duplicate information contained within the relevant technical design standards, although it has been informed by them where relevant.

## 1.2 Project description and objectives

1.2.1 A full description of the Project is given in Chapter 2: Project Description of the Environmental Statement (Application Document 3.2). In summary, the Project has been split into eight schemes (with the original ten schemes making up the Project aggregated into eight, as identified under paragraph 1.2.3 below). It includes upgrading the existing six single carriageway sections to dual two-lane all-purpose roads with a speed limit of 70mph, with the exception of a section of the A66 from the M6 junction 40 through

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<sup>1</sup> Highways England (2018) *The road to good design*, available at:

<https://nationalhighways.co.uk/media/14ihgawx/strategic-design-panel-the-road-to-good-design.pdf>

<sup>2</sup> National Infrastructure Commission (2020) *Design Principles for National Infrastructure*, available at: <https://nic.org.uk/app/uploads/NIC-Design-Principles.pdf>

<sup>3</sup> Design Council (2012) *A design led approach to infrastructure*, available at:

[https://www.designcouncil.org.uk/sites/default/files/asset/document/A\\_design\\_led\\_approach\\_to\\_infrastructure\\_Cabe.pdf](https://www.designcouncil.org.uk/sites/default/files/asset/document/A_design_led_approach_to_infrastructure_Cabe.pdf)

<sup>4</sup> <https://www.gov.uk/government/publications/national-design-guide>

to Kemplay Bank, which will have a speed limit of 50mph. The Project also includes amendments to existing junctions and accesses within these sections, and upgrades to the terminal junctions at M6 Junction 40 and A1(M) Scotch Corner.

1.2.2 Some of the eight schemes which make up the Project involve online widening of the carriageway (i.e. using the existing carriageway) and some are offline (i.e. new sections of road that follow a different route but reconnect into the main A66 alignment).

1.2.3 The eight individual schemes are as follows (noting the aggregation of the original ten schemes, as discussed above):

- M6 Junction 40 to Kemplay Bank (schemes 1 and 2, considered as one)
- Penrith to Temple Sowerby (scheme 3)
- Temple Sowerby to Appleby (schemes 4 and 5, considered as one)
- Appleby to Brough (scheme 6)
- Bowes Bypass (scheme 7)
- Cross Lanes to Rokeby (scheme 8)
- Stephen Bank to Carkin Moor (scheme 9)
- A1(M) Junction 53 Scotch Corner (scheme 11 - there is no scheme 10 on the Project).

1.2.4 The eleven objectives that the Project seeks to deliver are set out in Table 1-1: Project objectives.

Table 1-1: Project objectives

Objectives	Theme
1. Regional: Support the economic growth objectives of the Northern Powerhouse and Government levelling up agenda.	Economic
2. Ensure the improvement and long-term development of the Strategic Road Network (SRN) through providing better national connectivity including freight.	
3. Maintain and improve access for tourism served by the A66.	
4. Seek to improve access to services and jobs for local road users and the local community.	
5. Improve road safety, during construction, operation and maintenance for all, including road users, Walking, Cycling and Horse-riding users (WCHR), road workers, local businesses and local residents.	Transport
6. Improve journey time reliability for road users.	
7. Improve and promote the A66 as a strategic connection for all traffic and users.	
8. Improve the resilience of the route to the impact of events such as incidents, roadworks and severe weather events.	
9. Seek to improve WCHR provision along the route.	
10. Reduce the impact of the route on severance for local communities.	Community
11. Minimise adverse impacts on the environment and where reasonably practicable optimise environmental improvement opportunities.	Environment

## 1.3 Structure of this PDP report

1.3.1 The remainder of this report is structured as follows:

- Section 2 presents the high-level vision for the Project
- Section 3 presents Project-wide Design Principles for the project
- Section 4 presents scheme-specific Design Principles for each of the eight schemes making up the Project.



## 2 Overarching design vision

### 2.1 Vision

- 2.1.1 This section of the report sets out the over-arching design Vision for the Project. The purpose of this is to frame the Design Principles in the later sections of the report and to set out the rationale for them, in terms of response to place, context and particularly sensitive environmental assets the Project needs to respond to and integrate with. This section of the report does not set out commitments with which the Project must comply. Instead, the Vision is the context for the Design Principles set out later in this report and it is those Design Principles that must be complied with.
- 2.1.2 Forming part of the coast-to-coast route, the existing A66 largely follows the alignment of the old Roman Road from Penrith to Scotch Corner. A route of great historic strategic significance and linking the various Roman forts on the route such as Brovacum, Bowes and Carkin Moor, and later a series of medieval castles and settlements, the road traverses a route through nationally designated landscapes including the North Pennines and the Yorkshire Dales. Views from the road and memorable passenger experiences are intrinsic to the Project, as the route enjoys views towards the Lakeland Fells within the Lake District National Park and English Lakes World Heritage Site.
- 2.1.3 With the strength of its landscape setting, the A66 is noted both for its dramatic views, and a broad range of noteworthy recreational and historical tourist destinations. The towns and villages along the route exemplify the historic character and identity of the North Pennines, the Yorkshire Dales and the Lake District in each of these respective areas. The vision for the road improvements is therefore to respect, reinforce and where reasonably practicable further enhance these most valued landscapes and townscapes, and their heritage assets and settings. The Project will contribute to the strong sense of place, or inter-linked series of places, experienced by the road's users, as well as by those who live in, work in and visit its wider setting.
- 2.1.4 This context-led design thinking is applied to both the broad design approach to the proposals, such as the choice and nature of route alignments in relation to existing settlements, and the more detailed design considerations. This includes the response to existing landscape, historic and habitat pattern and the choice of local materials, building techniques and planting types.
- 2.1.5 The landscape framework and the sense of place created by it is an integral part of the Project. Opportunities are sought in the design and management of the landscape elements to promote the conservation, protection and improvement of the physical, natural and historic environment within the Project and its setting, and to ensure the Project is appropriately softened and integrated within its landscape context.
- 2.1.6 Closely linked to landscape is ecological value, connectivity and diversity. The design seeks to diversify and maximise ecological value through retention, as far as reasonably practicable, of existing woodlands, trees and hedgerows, and to enhance these and lateral ecological links through

creation of a diverse and climate resilient habitat network, offering greater botanical and faunal interest.

- 2.1.7 A sensitive approach is taken to visual integration of the schemes delivered by the Project, and of the experience of individual receptors (people) and groups of receptors in relation to the schemes. This extends to the use of simple design approaches for structures and civil engineering elements, and use of landscape earthworks and, where appropriate, planting to integrate engineering features and acoustic barriers within their surrounding visual context.
- 2.1.8 Given the scale of the Project and its potential for effects on receiving communities to last in perpetuity, it is essential that it fits into its landscape and visual context effectively and sympathetically, taking into account the need for the Project to be designed to operate safely, efficiently and in line with national standards. A co-ordinated and inter-disciplinary design approach is therefore needed to the detailed design, and the contractor will need to work with a wide variety of disciplines in developing a collaborative detailed design. The range of these will vary on a case-by-case basis; but may include (and will not be limited to): Landscape; Ecology; Heritage; Sound, Noise and Vibration (SNV); Hydrology and drainage; Lighting, in addition to structures and earthworks.
- 2.1.9 National Highways' vision for the Project will be achieved through the following aiming to follow the processes and activities which form the framework for the Design Principles set out later in this report:
- Respecting and responding positively to each scheme's context and sensitive characteristics and (in the context of the nationally designated landscapes) their special qualities
  - Reducing adverse impacts on communities, the environment and third parties as far as reasonably practicable
  - Collaborative working, listening to and working with our stakeholders and local communities, exploring and acting upon synergies and opportunities, and being open to new approaches
  - Embodying sustainable approaches to design in their broadest sense, by incorporating environmental approaches to design, mitigation and management throughout
  - Seeking to create a high quality and connected natural environment and green and blue infrastructure network to integrate the schemes, where the design of environmental mitigation is, where reasonably practicable, in scale with the engineering design it seeks to integrate, and in each case bespoke to its locality and character
  - High quality and durable design interventions which are low maintenance through good and appropriate design and management.

## 3 A66 Project-wide Design Principles

### 3.1 Introduction

- 3.1.1 This section sets out the Project-wide Design Principles that must be complied with and how they will be applied to the detailed design of the Project as a whole.
- 3.1.2 These Project-wide Design Principles apply to all of the schemes but it should be noted in some instances particular Project-wide Design Principles are not of relevance to a particular scheme. For example, Project-wide Design Principles that relate to the context of an Area of Outstanding Natural Beauty are not relevant to schemes not located in the context of an Area of Outstanding Natural Beauty. In instances where a Project-wide Design Principle does not apply to a specific scheme, such exclusions are listed in the table at the beginning of each scheme-specific section in Section 4.
- 3.1.3 In the event that Project-wide Design Principles contradict the scheme-specific Design Principles, then the scheme-specific Design Principles take priority over the Project-wide Design Principles.
- 3.1.4 Where relevant, the Project-wide Design Principles have been informed by the Design Manual for Roads and Bridges (DMRB) and other relevant technical design standards, and footnotes are set out where appropriate below to demonstrate where these reference materials have been considered.
- 3.1.5 Informed by industry-recognised, integrated and collaborative approaches to the design of linear transport infrastructure projects, and through collaboration with stakeholders, the following over-arching design themes have been used to categorise the Project-wide Design Principles:
- A. Designs that are integrated in context and express character and a sense of place
  - B. Designs to enhance experience for all users and serve the local community
  - C. Designs to restore and enhance habitats and ecological connectivity
  - D. Designs that are climate resilient and resource efficient.

### 3.2 Theme A: Designs that are integrated in context and express character and a sense of place

- 3.2.1 The Project-wide Design Principles under this theme provide for the consideration of appropriate protection, design and management of the landscape and historic environment assets. They ensure consideration is given to the integration of the engineering of the Project with the environmental and landscape context in which it is located, particularly within the North Pennines Area of Outstanding Natural Beauty (AONB) and the setting of the National Parks.
- 3.2.2 This theme incorporates the following:
- Landscape character
  - Landscape integration
  - Identity and placemaking

- Existing valued landscapes, features and designations, including the AONB and National Parks
- Historic environment and cultural pattern.

Table 3-1: Theme A Project-wide Design Principles

Theme and reference	Principle
<b>Landscape character</b>	
LC01	The detailed design must be legible and coherent, using a restrained and simple design aesthetic and material palette, minimising unnecessary visual clutter and distractions, responding to place and context <sup>5</sup> .
LC02	Design scale and the scale of landscape design interventions, must be appropriate both for the landscape context and their function in relation to the Project.
LC03	The detailed design must minimise impacts on mature trees, root protection zones and mature tree canopy cover and so far as is reasonably practicable carry out the detailed design so as to retain mature and established trees as valued landscape features.
LC05	New planting design must consider pattern, connectivity and relationships to landform <sup>6</sup> . In the case of new landforms, consideration must be given to planting across the new landform rather than with/along new landform, to avoid emphasising the landform change and to reduce the perception of linear infrastructure in the landscape. Planting must be drawn from a variety of planting types reflecting the local context, including woodland blocks, woodland edge, belts of trees and shrubs, hedgerows with or without trees, scattered trees, scrub and species rich grassland.
LC06	The planting design must take account of longer term maintenance and management, nature of the road corridor that this is intended for, including operational as well as safety requirements, with shrubs used in edge planting not to be planted within 4.5m from the edge of the carriageway, medium size trees (tree girth less than 450mm) no closer than 7m (i.e. Malus sp, Prunus sp) and larger, climax trees (tree girth greater than 600mm) not within 9m (i.e. Quercus sp, Fagus sp,) unless departures from standards are otherwise agreed by the Overseeing Organisation <sup>7</sup> .
LC07	Planting must be drawn from appropriate grades of nursery stock to promote optimal establishment after implementation, balanced with landscape integration and effective screening requirements.
LC08	Designs must make use of boundary treatments suited to the local landscape character in which they are located e.g. timber post / rails in urban areas and drystone walls, five bar estate railings and stock proof post and wire fences in rural areas, as appropriate and where reasonably practicable.
<b>Landscape integration</b>	
LI01	Planting design must be grounded in a thorough understanding of the area, context and valued features to retain, respect and enhance, in order to provide an appropriate rationale for proposed planting types and features <sup>8</sup> . New woodland planting sites and new field boundaries must appropriately integrate with and reflect the existing landscape, landscape pattern and scale.
LI02	Use locally specific materials for new structures where reasonably practicable to integrate them with their context.

<sup>5</sup> National Highways, The Road to Good Design, Principles 3 and 5

<sup>6</sup> Design Manual for Road Building (DMRB) LD 117 Landscape Design (DMRB LD117), National Highways, 2020, section A4

<sup>7</sup> DMRB LD117, paragraph 3.4.1

<sup>8</sup> DMRB LD117, section A5

Theme and reference	Principle
LI03	The detailed design of structures and alignments of carriageways of new and improved trunk roads, and the associated essential mitigation to integrate them, must have regard to the need to make efficient use of land required for the operation of the Project.
LI04	<p>New structures such as overbridges and viaducts must, where reasonably practicable, be designed to promote an open appearance and maintain the continuity of the associated road earthworks<sup>9</sup>. Where structures are in close proximity to watercourses, they must also be designed to have regard to accommodating geomorphological changes and the need to conserve and maintain the integrity of riverbanks to prevent erosion and maintain habitat connectivity and fluvial geomorphological processes, and be able to adapt to increased risks of bank erosion due to climate change and natural geomorphological processes.</p> <p>Overbridges over the A66 are to be constructed to a minimum vertical clearance of 5.7m plus S (sag curve compensation) to remove the need to design the superstructure for impact loading except where the contractor agrees with National Highways (in line with the requirements of the Design Manual for Roads and Bridges, having regard to safety, operation and other factors considered relevant) that a reduced minimum vertical clearance of 5.3m plus S (sag curve compensation) should apply to a particular overbridge.</p>
LI05	The visual complexity of structures must be minimised, and the overall form of structures is to be designed to minimise visual bulk and obstruction of views to the surrounding landscape, where reasonably practicable <sup>10</sup> .
LI06	For overbridges and viaducts, the proportions of deck spans, their thicknesses and substructure heights must be considered as part of the detailed design development, having appropriate regard to the symmetry and line of principal elements of the structures, balanced with structural and operational requirements <sup>11</sup> .
LI07	Bridge piers are to be proportionally elegant and designed with a clean, simple and uncluttered appearance <sup>12</sup> .
LI08	Access requirements of structures during construction, future inspection and maintenance are to be considered as an integral part of overbridge design and must not be compromised when developing the design and aesthetic appearance <sup>13</sup> .
LI09	Context-informed approaches to landscape integration must be proportionate to the quality and sensitivity of the landscape and the sensitivity of receptors. This will include the use of approaches such as landscape earthworks and false cuttings to integrate engineering design and acoustic design (landscape integration of acoustic barriers to address potential Sound Noise and Vibration or SNV effects) where appropriate and reasonably practicable, as well as planting to abutments to structures where appropriate, to tie them into the landscape.
LI10	A minimum 1:3 grade is needed for engineering earthworks to be able to support planting. Where landscape integration earthworks are returned to previous agricultural use (subject to operational requirements for the land and the quantity of land available to National Highways for the purposes of the Project), they must, where reasonably practicable and appropriate be at a grade ranging from 1:8-1:20 in line with Ministry of Agriculture, Fisheries and Food – Agricultural Land

<sup>9</sup> National Highways A66 Northern Trans-Pennine: Aesthetic Appraisal Document – Overbridges. Document ref: HE565627-AMY-SGN-S00-RP-CB-000003

<sup>10</sup> Ibid

<sup>11</sup> Ibid

<sup>12</sup> Ibid

<sup>13</sup> Ibid

<sup>15</sup> Not Used

Theme and reference	Principle
	<p>Classification guidance, (depending on local context) rather than the standard 1:3 slope used for engineering earthworks. Landscape integration earthworks in grade range 1:8-1:20 are appropriate primarily in relation to tying the scale of the engineering design into their context in flatter, more gently undulating locations or heritage/setting sensitive locations where the Project is visually prominent, and to integrate the design into such contexts appropriately. Specific examples are given in the scheme-specific Design Principles following this section.</p> <p>However, the minimum 1:3 grade commitment can be departed from where consultation with National Highways (in respect of standards and maintenance requirements), the Environment Agency (in respect of fluvial areas) and Natural England (in respect of sensitive landscapes) has been undertaken on any proposed departure and on the condition that such a departure would not compromise the effectiveness or feasibility of any other mitigation or design commitments secured through the DCO.</p>
L111	<p>New and reinstated field boundaries must be designed to be appropriate to the local landscape and their proposed function, such as hedgerows, hedgerows with trees, drystone walls (responding to the local vernacular variations and styles prevalent along the route) estate fences or stock-proof fences.</p>
L112	<p>The provision of fencing must be rationalised in the detailed design, to avoid duplication with other boundary treatments and to minimise clutter in the landscape.</p> <p>Verges must be designed to minimise visual clutter, to maintain visibility of boundary features, and also for visibility of roadside signage and safety purposes.</p>
L113	<p>Reinstated, restored and new drystone walls should seek to take advantage of opportunities to use materials sourced within the locality, where reasonably practicable and reinstated in a locally appropriate construction style and pattern.</p>
L114	<p>Vegetated drainage features must be designed to integrate with the landscape and enhance and complement the wider landscape beyond the immediate limits of the chosen vegetated drainage system. This may be achieved through hedgerows, woodland areas tying into the surrounding landscape context, shrubs/woodland edge, specimen or landmark trees and species rich/wildflower grassland integrated as appropriate, with proposals to restore and enhance surrounding habitats, where reasonably practicable<sup>14</sup>. Where reasonably practicable, locally sourced plant material (including species local to the specific catchment) and locally sourced soils must be used to aid integration within the landscape context. Plant species used must also not pose biosecurity risks to the catchment.</p> <p>Where vegetated drainage features are to be provided adjacent to an existing watercourse, an appropriate margin (to be consulted on with the relevant land drainage authority and riparian owners) is to be provided to allow for access and maintenance by riparian owners and land drainage authorities.</p> <p>Vegetated drainage features must also not prejudice the stability of cuttings, embankments or other highway structures.</p>
L115	<p>Ditches must be positioned such that surface water does not contribute to slope instability and they must be sized appropriately to local conditions. Ditches must consist of earth channels lined with native grass species/combination of native species (drawn from a palette of species local to the relevant catchment), where reasonably practicable to provide erosion resilience<sup>15</sup>.</p>

<sup>14</sup> Highways England (2021) Design Manual for Roads and Bridges CD 532 Vegetated drainage systems for highway runoff, available at: [cfba97e7-5c58-4b50-ac54-c4d2a2bfe363\(standardsforhighways.co.uk\)](https://cfba97e7-5c58-4b50-ac54-c4d2a2bfe363(standardsforhighways.co.uk))

<sup>15</sup> ibid

Theme and reference	Principle
	<p>In the design of ditches, the long-term drainage characteristics of sensitive soils, and the water table in the context of sensitive sites such as Scheduled Monuments, must be maintained (ref. Design Principle HEC01).</p> <p>Where reasonably practicable, having particular regard to the amount of land required, existing ditches are to be widened, their slopes slackened and emergent reed-type vegetation from a locally appropriate, catchment specific planting palette introduced, to resemble natural streams. Plant species used must also not pose biosecurity risks to the catchment.</p>
L116	<p>The minimum size of an attenuation pond is governed by the catchment area draining into it. The design and form of new attenuation ponds must use the layout and form of their context (i.e. respond to local topography) to reduce use of materials and minimise visual impact where reasonably practicable (having regard to the functions of the pond), supported by strategic planting, drawn from a native species palette local to the catchment (albeit where those species are procured from is not limited). They must be integrated into the landscape with carefully designed landforms<sup>16</sup> to tie into the local context and conditions, and avoiding use of geometric shapes and steep, uniform bank profiles. Plant species used must also not pose biosecurity risks to the catchment.</p>
L117	<p>The depth of new attenuation ponds must be between 0.5m and 2m, with a nominal permanent water depth of 0.5m.</p> <p>Outfalls from the drainage system to watercourses with natural bank profiles must not have engineered headwalls and must discharge via open ditches. New hard drainage structures must not be located within 8m of the watercourses (measured from bank full bank top); for watercourses within the River Eden SAC (and functionally linked watercourses) this distance will be extended to 20m. New hard drainage structures will be designed to avoid any increased risk of erosion within watercourses. Existing hard structures may be utilised by the new drainage system where they are suitable and fit for purpose. Outfalls must be suitably sized compared to the size of the channel and footprint minimised. Structures within watercourses are to be designed in accordance with CD 529 (Design of outfall and culvert details) and CIRIA C786. Such structures must also be designed to allow for fish passage to be compliant with the Institute of Fisheries Management Fish Pass Manual<sup>17</sup>.</p>
L118	<p>Where their provision is reasonably practicable, any shelves within new attenuation ponds must be gently sloping to provide appropriate conditions for marginal and emergent planting, along with shallow sides and draw-down zones, and with the design of such ponds to allow margins where land and water meet to develop with vegetation to create opportunities for wildlife. Plant species must be native to the relevant catchment where reasonably practicable, appropriate for local context, climate, depth of water and any variations in water depth<sup>18</sup>.</p>
L119	<p>The detailed design of any new, realigned, or improved watercourse channels to be provided as part of the Project is to be undertaken with hydromorphology and geomorphology principles considered in the design, in accordance with best practice<sup>19</sup>. Any realigned watercourses must provide a 10m buffer strip on both sides of the new channel, where reasonably practicable, to allow for implementation of marginal and riparian habitat improvements. The Project should where practicable avoid the use of hard engineering and permanent (non-biodegradable) geotextiles in relation to watercourses.</p> <p>Where a 10m buffer strip on both sides of the watercourse cannot be provided, evidence will need to be submitted to the relevant drainage authority (Environment Agency, Lead Local Flood Authority and / or Local Authority) to</p>

<sup>16</sup> *ibid*

<sup>17</sup> [FISH PASSES \(ifm.org.uk\)](http://ifm.org.uk)

<sup>18</sup> *ibid*

<sup>19</sup> Manual of River Restoration Techniques (River Restoration Centre 2019)

Theme and reference	Principle
	<p>justify any reduction of buffer width.</p> <p>Geomorphological diversity will be encouraged with techniques such as riparian planting, bank reprofiling, low flow channel creation and re-naturalisation of the watercourse planform where appropriate. The design of watercourse crossings and drainage outfalls is to be undertaken with the involvement of experienced hydromorphology, geomorphology, and ecology professionals, with further hydraulic and geomorphological modelling of realigned sections of channel to be undertaken where required.</p>
LI20	<p>A context informed design approach will be taken to the design of acoustic barriers, with the design to be sensitive as far as reasonably practicable to receptors and the physical environmental characteristics and features to which they relate. In urban areas, opportunities are to be taken where reasonably practicable to integrate their design with a distinctive road corridor landscape<sup>20</sup> (including through appropriate use of materials), whilst in rural areas use is to be made of materials and palettes which reflect the colour palette of the local landscape and will weather appropriately, as well as the use of well-sited new planting and landforms such as false cuttings to integrate acoustic barriers.</p>
LI21	<p>Beyond the engineering works – existing woodland within the order limits must be retained as far as reasonably practicable.</p>
LI22	<p>Where reasonably practicable the Project should minimise encroachment on and landtake in relation to Mineral Safeguarding Areas (MSAs) either operational sites or sites identified within strategic planning documents for the extraction of minerals.</p>
<p><b>Identity and place-making</b></p>	
IP01	<p>Conserve and, wherever reasonably practicable, enhance views to landmarks on the route to provide a sense of place and time, whilst also having regard to other Design Principles (e.g. those Design Principles in relation to Historic Environment and Cultural Pattern (HEC) and Valued Landscapes (VL), below). Views and landmarks important to specific schemes are highlighted as appropriate in the scheme-specific Design Principles at section 4.</p>
IP02	<p>Where reasonably practicable, use new large-scale engineering and landscape earthworks as opportunities to create well-sited landform and planting interventions which respond to local character and context and where appropriate having regard to other Design Principles (in particular the Historic Environment and Cultural Pattern (HEC) and Valued Landscapes (VL) reference Design Principles), highlighting landmarks or creating opportunities for views from the road/for passenger experience<sup>21</sup>.</p>
<p><b>Existing valued landscapes, features and designations, including the AONB and National Parks</b></p>	
VL01	<p>Where reasonably practicable, conserve and enhance key views to/associated with designated landscapes – (specifically AONB and National Parks).</p>
VL02	<p>The detailed design of the Project must have regard to the Special Qualities of designated landscapes (as set out in the relevant Management Plan for the AONB/National Park) and the associated mitigation commitments made in relation to the North Pennines AONB in the Landscape and Visual Impact Assessment for the DCO Environmental Statement (Chapter 10 of the Environmental Statement), and have regard to valued features of landscapes and heritage assets. Opportunities should be explored through the detailed design to further reduce impacts upon designated and valued landscapes and heritage assets as far as reasonably practicable, or where appropriate, to improve the presentation of such features and their relationships to one another.</p>

<sup>20</sup> DMRB LD117, section A4

<sup>21</sup> DMRB LD117, section A4



Theme and reference	Principle
VL03	The detailed design of the Project must have regard to seeking to maintain the prominence of valued landscape and historic features such as the lines of the Roman roads through the landscape, or parkland belts and plantations, through retention of structure planting which defines such features (or replacement of such planting with appropriate species and grade of nursery stock where retention is not reasonably practicable), and maintaining their dominance as skyline features.
<b>Historic environment and cultural pattern</b>	
HEC01	Where appropriate and reasonably practicable, facing materials and details of new structures must be compatible with the visual character of existing adjacent heritage assets.
HEC02	The detailed design of the Project must maintain and, where reasonably practicable, enhance historic, designated and designed views and vistas with which the Project interacts, developing sensitive and contextually appropriate design solutions to minimise adverse impacts where appropriate <sup>22</sup> .
HEC03	The detailed design of the Project must support the legibility of heritage assets and key aspects of their functions, as well as, where appropriate and reasonably practicable, providing opportunities for the interpretation and understanding of the significance of heritage assets.
HEC04	Any trees that need to be removed in the curtilage or setting of a listed building or structure or in a conservation area must be replaced with a species that relates to the character of the area, on a site as close as reasonably practicable to the original position, and within order limits.
HEC05	The detailed design of the Project must seek opportunities to reinstate historic field patterns and scales where these are lost to the Project where reasonably practicable.

<sup>22</sup> DMRB LD117, section A7

### 3.3 Theme B: Designs to enhance experience for all users and serve the local community

- 3.3.1 The Project-wide Design Principles within this theme provide details on how to improve people’s experience of the A66 and its context, including the experience of road users and those using local footpaths and bridleways.
- 3.3.2 This theme incorporates the following:
- Views from the road and landmarks; orientation and navigation
  - Accessibility
    - Active transport and connectivity to wider networks, amenity, recreation and health / well-being

Table 3-2: Theme B Project-wide Design Principles

Theme and reference	Principles
<b>Views from the road and landmarks; orientation and navigation</b>	
VR01	Conserve and, where reasonably practicable, seek to enhance views for road users to landmarks on the route which provide a valuable sense of orientation and relationship to place and time for travellers using the A66. Such landmarks include views to/along sections of the Roman Road, Roman fortifications, castles and keeps, designed parklands and their houses, and other monuments on the route, taking into account, where it applies, the need for the detailed design to seek to avoid or minimise adverse effects to the settings of designated heritage assets.
VR02	Conserve and where reasonably practicable seek to enhance long views for road users across designated landscapes which create a strong sense of driver and passenger experience, such as views across the North Pennines, Yorkshire Dales and across to the Lakeland Fells, taking into account (where relevant), the need for the design to seek to avoid or minimise adverse landscape and visual effects.
VR03	Use new large-scale engineering and landscape earthworks as opportunities to create landform and planting interventions which, where appropriate, create opportunities for visual interest for road users and views from the road.
VR04	Consider design speed in relation to legibility of design elements when developing the detailed design of roadside plantings and landforms, so they are coherent when seen at design speed, and for their ability to form effective reference/orientation points along the route.
<b>Accessibility</b>	
AC01	Surfacing for walking, cycling and horse-riding (WCH) routes is to be appropriate to context and anticipated type and level of use. Gates and boundary fences for such routes are to be sensitive to local context in terms of materials and style, and must avoid duplication with other similar features, to avoid clutter in the landscape. New or upgraded WCH routes must facilitate equal access, as appropriate.
<b>Active transport and connectivity to wider networks, amenity, recreation and health/wellbeing</b>	
AT01	Where Public Rights of Way (ProWS) and non-motorised user routes are to be provided or re-aligned to accommodate the Project, consideration must be given to both the utility and the aesthetic qualities of the detailed design of such routes (e.g. surface and boundary treatment, visual outlook and interface), to maximise their potential use for sustainable travel and commuting.

### 3.4 Theme C: Designs to restore and enhance habitats and ecological connectivity

3.4.1 The Project-wide Design Principles within this theme provide details on the protection of existing habitats and species and the design and management of proposed habitats on the Project.

3.4.2 This theme expands on the following:

- Biodiversity
- Habitat protection, enhancement and connectivity
- Biodiversity enhancement
- Green and blue infrastructure.

Table 3-3: Theme C Project-wide Design Principles

Theme and reference	Principles
<b>Biodiversity</b>	
BNG01	The Project is to achieve No Net Loss for biodiversity while maximising opportunities for enhancement, measured by the relevant Defra Biodiversity metric.
BNG02	Woodland of conservation value that is required to be removed to facilitate the Project will be replaced at a suitable ratio to account for the longevity of that habitat. The ratio is to be dictated by the relevant Defra Biodiversity metric. Any very high value habitats which are considered to be irreplaceable need bespoke mitigation to be developed in consultation with Natural England. Any additional planting for landscape purposes will be reviewed to maximise opportunities for biodiversity enhancement.
BNG03	Planting required for landscape integration, visual screening or water attenuation will all be designed having regard to opportunities to maximise biodiversity with regards to other disciplines.
<b>Habitat protection, enhancement and connectivity</b>	
HP01	Obstacle planting (continuous hedges or lines of closely spaced trees) to encourage barn owl to fly above the height of traffic must be planted at locations identified within the ES Chapter 6: Biodiversity (Application Document 3.2). Obstacle planting must be as close to the highway verge as safety and operational requirements allow. Following completion of safety risk assessments at the 29 identified barn owl traffic accident blackspots, where the risk assessment deems appropriate, the contractor must seek a departure from standard from National Highways to facilitate a design that provides planting closer than the standard 4.5m from the highways verge. Planting must be completed as early as reasonably practicable in the construction process.
HP02	Where the A66 carriageway and junctions are lit, lighting is to tie in with any existing lighting to create a consistent lighting environment and be kept to a minimum. Lighting must only be implemented where road safety audits identify the need for it. Where lighting is required, suitable lighting choices or adaptations will be designed into the lighting scheme to avoid light spill within sensitive habitats and also to avoid commuting areas for relevant species.
HP03	Maintain and seek to enhance (where reasonably practicable) wildlife connectivity, both east-west and north-south, to enable dispersal between local populations.
HP04	Seek to enhance habitats for invertebrate species by increasing structural diversity and variety of habitat niches within created and retained habitats, such as the provision of deadwood (standing and fallen), where reasonably practicable.
<b>Biodiversity enhancement</b>	
BE01	Use species rich verges where these are appropriate to biodiversity and landscape integration objectives, benefiting both biodiversity and invertebrates, as well as

Theme and reference	Principles
	complementing initiatives such as 'Get Cumbria Buzzing' by Cumbria Wildlife Trust for creating local species rich planting.
BE02	All native hedgerow creation is to be species rich native hedgerows.
BE03	A number of overbridges on the Temple Sowerby to Appleby, Appleby to Brough, Bowes Bypass, Cross Lanes to Rokeby, and Stephen Bank to Carkin Moor schemes require greening measures to provide bat corridors for ecological connectivity. Where the design requires an overbridge to incorporate planting for connectivity, that planting (a planted strip or hedgerow as appropriate to the bridge's specific context, with native species of a low maintenance, woody character, locally specific where reasonably practicable) must sit behind sight lines and visibility splays and allow for road visibility in accordance with operational and safety standards and must accommodate bridge maintenance requirements. The design of the bat corridors must be such that the integrity of the bridge deck waterproofing (or any other part of the bridge structure) is not compromised during the bridge lifespan, and that the surface and subsurface drainage of the bridge operates effectively with the inclusion of the bat corridors.
<b>Green and blue infrastructure</b>	
GB01	Green infrastructure connectivity: Proposed woodland is to be designed where reasonably practicable to incorporate lateral connectivity and where reasonably practicable to address severances to existing woodlands created by the Project, as well as facilitating the potential for species migration in climate change.
GB02	Where blue infrastructure is to be extended it should where reasonably practicable create resilient, connected wetland networks. However, opportunities to extend blue infrastructure should be reviewed if there is evidence to demonstrate that it would cause harm to species or habitats in adjacent catchments.
GB03	To avoid loss of riparian habitat, fragmentation of riparian corridors and impacts to riverbeds, new bridges across watercourses are to be designed as clear spanning structures with abutments set back sufficiently from the watercourse's edge to provide for wetland habitat connectivity to riverbanks (precise offsets to be determined by specific site conditions and requirements for each bridge); this applies to the Trout Beck watercourse crossing within the SAC, and other new crossings of sensitive and functionally linked watercourses in the Appleby to Brough scheme.

### 3.5 Theme D: Designs that are climate resilient and resource efficient

3.5.1 Climate resilient design and carbon and resource efficiency is an important part of the Project. The Project-wide Design Principles in this theme provide for the realisation of National Highways' commitment to playing its part in reducing carbon emissions, whilst supporting the Government's plan to cut environmental emissions.

3.5.2 This theme expands on the following:

- Adaptability and future-proofing  
Carbon impact and contribution to UK's net zero targets.

Table 3-4: Theme D Project-wide Design Principles

Theme and reference	Principles
<b>Adaptability and future-proofing</b>	
AF01	<p>As well as planting designs drawing from a native species palette (of local provenance where reasonably practicable), planting design must take account of climate change and propose an appropriately resilient species list, based on current and recognised industry good practice.</p> <p>Appropriately adaptive planting species palettes must also be compliant with recognised industry good practice with regard to biosecurity and the taking of the required steps in this regard: approved species and the specification of these and minimising the risks of pathogens and disease<sup>23</sup>.</p>
AF02	<p>The detailed design of the Project must take account of increased flood risk as a result of climate change in accordance with relevant guidance from the EA's published Flood Risk Assessment: Climate Change Allowances.</p>
AF03	<p>For proposed overbridges, integral structures are to be developed where reasonably practicable (i.e. structures which are designed to remove the need for deck expansion joints and bearings at the abutments), to improve the durability and sustainability of these structures.</p>
<b>Carbon impact and contribution to UK's net zero targets</b>	
CI01	<p>The Project is to minimise the need for lighting which will also assist in minimising embodied carbon and is also to minimise embodied carbon through use of existing road alignments and build-ups, where appropriate and practicable<sup>24</sup>.</p>

<sup>23</sup> <https://www.landscapeinstitute.org/technical/plant-biosecurity-group/>

<sup>24</sup> The carbon mitigation set out in the DCO design is explained in the Environmental Statement, Volume 1: Chapter 7: Climate (Application Document Number 3.2). This also sets out the approach adopted to reducing carbon during option selecting and design development, and opportunities for further mitigation in subsequent stages of the Project to ensure alignment with the Net Zero Highways: 2030/2040/2050 plan (National Highways, 2021, Net zero highways: our 2030/2040/2050 plan, available at: <https://nationalhighways.co.uk/media/eispcjem/net-zero-highways-our-2030-2040-2050-plan.pdf>) and the Department for Transport's Transport Decarbonisation Plan.

## 4 Scheme-specific Design Principles

- 4.1.1 Due to the length and complexity of the Project which traverses varied landscapes and contexts, it is necessary to ensure scheme-specific Design Principles are intrinsic to the next stage of design development. These scheme-specific Design Principles are listed below.
- 4.1.2 For each scheme, a table is provided indicating which of the Project-wide Design Principles do not apply to that scheme. The second table for each scheme sets out scheme-specific Design Principles that must be implemented in the detailed design for that scheme.
- 4.1.3 Supporting design information is contained in the separate Project Design Report (Application Document 2.3)

### 4.1 M6 Junction 40 to Kemplay Bank (schemes 1 and 2)

Table 4-1: Summary of Project-wide Design Principles not applicable to schemes 1 and 2

Site Name: M6 Junction 40 to Kemplay Bank	
Scheme no.	0102
Project-wide Project Design Principles	Principles that do not apply to this scheme
Theme A: Designs that are integrated in context and express character and a sense of place	LI13
Theme B: Designs to enhance experience for all users and serve the local community	VR04
Theme C: Designs to restore and enhance habitats and ecological connectivity	BE04
Theme D: Designs that are climate resilient and resource efficient	-

Table 4-2: M6 Junction 40 to Kemplay Bank Scheme Specific Design Principles

Reference	Scheme-specific design principles
0102.01	Tree removal must be kept to a minimum at Skirsgill Park (CH9400-10000) having regard to the requirements of the Project. Any trees removed within the scheme are to be replaced in as close to the original position as reasonably practicable to ensure visual continuity and ecological connectivity and are to be replaced at a planting ratio of two trees planted for each one removed.
0102.02	Should it need to be implemented in line with the provisions of the Environmental Management Plan, the acoustic barrier providing mitigation for receptors at Skirsgill Lodge (CH9325-9350) must tie in with existing boundary treatments using the same material to reflect the character and heritage of the receptor and its locale as far as reasonably practicable.
0102.03	Retaining walls are to use local materials sensitive to local character, including that relating to the new Kemplay Bank Underpass, unless safety and maintenance access critical finishes are considered to be necessary by National Highways in consultation with the Local Highway Authority. (CH9290-9325)
0102.04	Minimise impacts on mature tree canopy cover at Wetheriggs Country Park to maintain setting and landscape experience as far as reasonably practicable. Opportunities should be explored for the enhancement of Wetheriggs Country Park (CH10000) through woodland management and sensitive replanting.
0102.05	Planting at Carleton Park and Hall (Blue Light Zone) south of the A66 must reflect the existing parkland character and environment (with single specimen trees and coppice form of planting, soft engineered slopes and appropriate ecological

Reference	Scheme-specific design principles
	planting, that is native to the Eden catchment, at the attenuation pond). Any reinstatement of the landscape at Carleton Hall and Park after implementation of the scheme must reflect this parkland character, these planting types and landscape elements.
0102.06	Siting and profiling of the attenuation pond at the Carleton Hall Park (CH11600) designed landscape is to ensure that there is no adverse effect on the existing parkland landscape setting. The pond is to be located away from existing parkland trees and as far away from the River Eamont as reasonably practicable having regard to the relevant environmental constraints and other relevant factors.
0102.07	As this section is existing on line carriageway widening, the detailed design must retain existing open views to Skirsgill Hall, Brougham Castle, the Pennines and Whinfell Forest (CH10300 and CH11500).
0102.08	Existing shared walking/cyclist crossings are to be retained on Kemplay Bank Roundabout (CH10750-10910). The crossings are a mix of controlled (traffic signals) and uncontrolled provision. An existing shared use cycle/footway running along the north side of the scheme and around all arms of the junction is to be retained as far as reasonably practicable.
0102.09	Respond positively to the existing local townscape character around the Penrith gateway by seeking to integrate the Project with existing landscape features such as strong linear belts of vegetation which reinforce the urban highway landscape in this location.
0102.10	Lighting is to tie in with the existing junction lighting and to create a consistent environment to ensure the safety of road users.
0102.11	The small encroachment into Skirsgill Wood County Wildlife Site (CWS) is required for essential drainage upgrades/connections in the event that the existing outfalls cannot be used at detailed design. Investigation to utilise the existing outfalls to avoid the requirement for drainage connection works within the CWS will be undertaken during detailed design in the first instance. Where this is not reasonably practicable, drainage connections/upgrades will be designed to minimise disturbance to the site. The Council and key representatives responsible for these sites will be consulted relating to proposed drainage connection works at this site.
<a href="#">0102.12</a>	<a href="#">The detailed design for Scheme 0102 of this scheme in the vicinity of Ullswater Community College shall must, where reasonably practicable, seek to avoid -any impacts on spectators standoff zones associated with, or drainage of, the sports pitch itself currently located at Ullswater Community College, so as to ensure that pitch remains useable as a sports pitch.</a>

## 4.2 Penrith to Temple Sowerby (scheme 3)

Table 4-3: Summary of Project-wide Design Principles not applicable to scheme 3

Site Name: Penrith to Temple Sowerby	
Scheme no.	03
Project-wide Project Design Principles	Principles that do not apply
Theme A: Designs that are integrated in context and express character and a sense of place	LI20
Theme B: Designs to enhance experience for all users and serve the local community	VR04
Theme C: Designs to restore and enhance habitats and ecological connectivity	HP02, BE04
Theme D: Designs that are climate resilient and resource efficient	-

Table 4-4: Penrith to Temple Sowerby Scheme Specific Design Principles

Reference	Scheme-specific design principles
03.01	Slackening of slopes on new junctions is to integrate within the receiving landscape, allowing land to be returned to agriculture where reasonably practicable. For example, the slackening (1:12 to 1:20 slope) of the northern slopes at the junction at Center Parcs (CH22800-23300) to reduce visual impact of the engineering design for receptors to the north and impacts on the setting of the heritage asset at St Ninians Church.
03.02	As this section is existing on line widening, existing open views to the Countess Pillar, the Pennines and Whinfell Forest must be retained. The design is to include vegetation clearance at the Countess Pillar (CH20585) to enhance the setting of the Scheduled Monument and open up views of this historic landmark from the road.
03.03	Provide connectivity to existing green infrastructure assets at the Rivers Eamont and Lowther (CH21850 and 22300). Connect vegetation such as Hallstead's Wood (CH20900) with Lightwater Bridge, Whinfell Park (CH21800) with Barrackbank Wood, High Moss with Whinfell Forest and Swine Gill Plantation (CH24300) with adjacent vegetation.
03.04	Compensation planting must be provided for the loss of the landmark pine tree at the Center Parcs junction (CH23000), with the new junction at Center Parcs realigned internally to be level with the top of the embankments and this area then to be planted with replacement semi-mature landmark pine tree/s. This will create a distinctive orientation feature in the long term.
03.05	Whinfell Junction (CH20900 to 21550): Slacken slopes where reasonably practicable and appropriate at a grade ranging from 1:12-1:20 (depending on local context) to provide better landscape integration. Delineate the junction with drystone walls which are characteristic of the local environment, using local stone. Plant slopes with native woodland to replace the woodland lost to the scheme.
03.06	Respond positively to the existing local rural landscape character, through sympathetic use of native hedgerows and woodland planting as well as drystone walling, helping to integrate the scheme into the landscape.
03.07	Ensure the settings of key heritage assets are conserved and connect the heritage assets in the area through Walking, Cycling and Horseriding (WCH) provision in accordance with the Rights of Way and Access Plans (Application Document 5.19). Detailed design must retain and, where reasonably practicable, improve connection between the historic assets of Brougham Castle, the Countess Pillar and St Ninians Church (CH21900). New car park (CH21900) to be located north of Whinfell Junction adjacent to Barrackbank Wood.
03.08	Brougham Fort and the Settlement 1/3 mile East-North-East of Brougham Castle: Design of the overbridge and cycleway must minimise encroachment into the boundaries of the Scheduled Monuments as far as reasonably practicable.



### 4.3 Temple Sowerby to Appleby (schemes 4 and 5)

Table 4-5: Summary of Project-wide Design Principles not applicable to schemes 4 and 5

Site Name: Temple Sowerby to Appleby	
Scheme no.	04/05
Project-wide Project Design Principles	Principles that do not apply
Theme A: Designs that are integrated in context and express character and a sense of place	LI20
Theme B: Designs to enhance experience for all users and serve the local community	-
Theme C: Designs to restore and enhance habitats and ecological connectivity	HP02
Theme D: Designs that are climate resilient and resource efficient	-

Table 4-6: Temple Sowerby to Appleby Scheme Specific Design Principles

Reference	Scheme-specific design principles
0405.01	The landscape integration design must respond positively to the existing local landscape character of gently undulating fields, trimmed hedges, occasional hedgerow trees and drystone walls. (CH29550-38700)
0405.02	Planting design is to reflect and reinstate aspects of the historic landscape pattern around Kirkby Thore by creating a finer grain of biaxial fields enclosed by hedgerows and woodland edge planting, seeking to restore and reinstate historic field boundaries where appropriate. Use the new landform created by the false cutting and landscape earthworks as a positive opportunity to restore the currently degraded landscape character. (CH30750-31300)
0405.03	Improve ecological habitat connectivity to the Trout Beck through provision of woodland planting, along with the wider planting of the A66 embankments. The detailed design of the crossing of the Trout Beck must support ecological and landscape connectivity, with a clean and simple, open structure which is economical with use of piers and uprights. The structure must be low key in this rural landscape, i.e. it is not intended to be a 'landmark'. Wherever reasonably practicable there must be a consistent and unified approach to the appearance of the structure and its material components, in particular the most visible aspects such as materials, soffits, parapets, piers and abutments <sup>25</sup> .
0405.04	The structure crossing the Trout Beck must allow for full functionality of normal supporting river processes including flood flows and associated erosion/sediment regime, and the migration of the channel across its floodplain (these are important functions of its role as part of the River Eden Special Area of Conservation or SAC). This is to be achieved using an open multi-span structure, across the entire floodplain of the watercourse, <del>unless otherwise agreed with the Environment Agency and Natural England.</del> <u>and the span arrangements for the Trout Beck viaduct are to be designed such that the vertical clearance from the top of River Bank Level relative to meters Above Ordnance Datum is a minimum of 2.5m and at least 600mm above the 1 in 100 year plus climate change flood level as reported in the ES, unless otherwise agreed with National Highways (in respect of standards and maintenance requirements), the Environment Agency and Natural England.</u>

<sup>25</sup> The general approach to design of structures is that set out in the relevant HE guidance (ref LD 117 and "CD 351 The design and appearance of highway structures.")

Reference	Scheme-specific design principles
	<p>With the Trout Beck viaduct, the orientation of the piers must be informed by detailed flood modelling so that they do not influence the migratory nature of the river. All piers are to be designed as in-channel structures (even if they are not currently in-channel in the DCO scheme design), to allow for the movement of the river and avoid the need to add scour protection in future.</p> <p>The same Design Principles as for the Trout Beck crossing above must be applied to all watercourses which are functionally linked to the SAC – Moor Beck, Cringle Beck – and all crossings of such watercourses are to be open span structures.</p>
0405.05	<p>Creation of a Ha-Ha<sup>26</sup> or false cutting to sensitively integrate the bypass (CH30550-32750) into the landscape and maintain views of the Pennines to the north from receptors at Kirkby Thore. The additional height of the false cutting will also provide noise attenuation from the A66.</p> <p>The false cutting is to be sensitively graded to tie into the wider rural landscape in order to conserve views of the Pennines skyline having regard to the findings within the LVIA. The noise barrier is a combination of cutting and earth bund and must operate as a suitable acoustic barrier and achieve or better the outcomes of the ES assessment. The detailed heights will be confirmed within these parameters during detailed design and taking into account the operational noise modelling and the requirement to maintain views.</p>
0405.06	<p>Use locally characteristic drystone walls to create lynchets (terracing) at the boundary between the A66 and farmland, as part of the approach to the earthworks design for the cutting. (CH30450-32100)</p>
0405.07	<p>Use planting sparingly to integrate earthworks and structures without adversely affecting views of the Pennines, and to respond positively to the relatively open character of the local landscape. (CH30550-32750)</p>
0405.08	<p>To the deep cutting north of Kirkby Thore use locally characteristic drystone walls to create lynchets (terraced) landform to reference historic landscape character. Bespoke planting mix to reflect local landscape character, with planting to be rectilinear in form to reflect the historic field pattern. Planting design interventions are to be appropriately scaled to be legible in relation to the speed of road users and highway design speed. (CH30450-32150)</p>
0405.09	<p>Ensure the detailed design for the cutting earthworks follows a subtly undulating vertical alignment to positively respond to the existing topographical variations, and to enable the 'externally facing' landscape earthworks of the false cutting above and behind to sensitively tie into existing topography. (CH30550-32150)</p>
0405.10	<p>Works to the existing A66 adjacent to the River Eden SAC are to be kept to a minimum (having regard to the requirements of the Project) to avoid disturbance of vegetation and known areas of geotechnical risk.</p>
0405.11	<p>Design of flood compensation at the Trout Beck will be blended into the landscape and designed to tie into existing topographic pattern where reasonably practicable. Flood compensation must be designed to reduce the footprint and visual impact of the proposals and is to be designed sensitively with regard to existing ground levels/profiles and local landscape characteristics. Viaduct piers will be designed and constructed to withstand river erosion in order that no additional bank protection would be required under a future scenario where the river channel has migrated (laterally) and interacts with the piers. Design should have due regard to The Trout Beck river restoration scheme at Sleastonhowe, proposed at the date of this document and managed by the Eden Rivers Trust.</p>
0405.12	<p>Provide appropriate visual screening to Low Moor Caravan Park, using suitable native planting species (locally found species where reasonably practicable) along with earthwork bunding between the old A66 and the new alignment at a gradient between 1:12 to 1:20. Woodland planting with dense understorey planting</p>

<sup>26</sup> Ha-Ha: A recessed design element in the landscape which creates a vertical barrier whilst maintaining an uninterrupted view of the landscape beyond from the other side of the feature.

Reference	Scheme-specific design principles
	(to avoid strobing effect) must be provided along CH30500-30600 as well as drystone walling along CH29950-30550, to help reduce headlight glare from the A66.
0405.13	Native hedgerow planting must be provided along Priest Lane to reinstate the rural character of the road. The existing hedgerow along Priest Lane is in a poor condition, replanting is required to fill in gaps as well as replace any hedgerow that is in poor condition.
0405.14	The avenue of mature trees adjacent to the A66 and along the Roman Road at CH35450-37900 must be retained to conserve the setting and character of this historic feature (and of the associated bridleway) within the landscape. The landscape design in this area is to use species rich grassland to proposed earthworks to reinforce the landscape character and pattern, and to accentuate the prominence of the mature tree line along the Roman Road as a feature within the landscape.
0405.15	The mature oak tree along Sleastonhow Lane must be retained.
0405.16	Greening of overbridges must be implemented to maintain habitat connectivity on the following overbridges – Cross Street (CH31590), Fell Lane (CH34470), Sleastonhow Lane (CH33320) and Rogerhead Farm (CH37550).
0405.17	The small encroachment into Chapel Wood CWS is required for essential drainage upgrades/connections in the event that the existing outfalls cannot be used at detailed design. Investigation to utilise the existing outfalls to avoid the requirement for drainage connection works within the CWS will be undertaken during detailed design in the first instance. Where this is not reasonably practicable, drainage connections/upgrades will be designed to minimise disturbance to the site. The Council and key representatives responsible for these sites will be consulted relating to proposed drainage connection works at this site.

## 4.4 Appleby to Brough (scheme 6)

Table 4-7: Summary of Project-wide Design Principles not applicable to scheme 6

Site Name: Appleby to Brough	
Scheme no.	06
Project-wide Project Design Principles	Principles that do not apply
Theme A: Designs that are integrated in context and express character and a sense of place	-
Theme B: Designs to enhance experience for all users and serve the local community	VR04
Theme C: Designs to restore and enhance habitats and ecological connectivity	HP02
Theme D: Designs that are climate resilient and resource efficient	-

Table 4-8: Appleby to Brough Scheme Specific Design Principles

Reference	Scheme-specific design principles
06.01	Define the transition between the Foothills landscape character to the north and the Broad Valleys landscape character to the south, maintaining views out from the carriageway to the south and restricting larger swathes of planting to the north of the A66.
06.02	Planting to the south of the A66 - Where there is landscape integration, ecological mitigation and visual screening at the Warcop junction, the design of proposed planting needs to avoid negatively affecting the Eden Valley landscape character to the south of the road by retaining uninterrupted views from the road for road users to the local landmarks and orientation features in this scheme (including Brough Castle) where reasonably practicable. Tree planting will be implemented at the Warcop junction (CH44300) to enhance the local character and tie in with existing local parkland character.
06.03	Retain views and enhance driver and passenger experience from the Cringle Beck and Wheat Sheaf Farm where reasonably practicable and particularly where there are panoramic views taking in the Yorkshire Dales and the North Pennines (CH43300 and 42900). This is to be achieved through retaining key views experienced from the new A66 at vantage points along the route e.g. at Cringle Beck and Wheat Sheaf Farm.
06.04	The design must reflect the unique open character of the Foothills and Broad Valleys around Warcop whilst providing an improved gateway experience from the A66 into the settlement (including the crossings of the Moor Beck, Crooks Beck and Mill Leat watercourses, and underbridge to Eden Valley Railway). (CH43800-CH44200)
06.05	Woodland planting design must include a mosaic of habitats and incorporate ponds, rides etc where appropriate to maximise biodiversity and ecological value. New woodland planting must provide connectivity with existing green infrastructure where reasonably practicable. Where reasonably practicable proposed planting must follow existing / historic field boundaries especially if these are fossilised (remnants of early Enclosure and earlier field systems) and therefore historically valuable. The design of new woodland must also be sensitive to existing woodland edge conditions and ecological environments, both with reference to conserving existing woodland edge conditions and through the scale, shape and density of new woodland planting. (CH41300-CH41900)

Reference	Scheme-specific design principles
06.06	Planting design to be irregular woodland edge/ blended and 'mosaic' <sup>27</sup> landscape interface with the North Pennines AONB to integrate junctions, the MOD replacement facility and the scheme with the nationally designated landscape context and its setting.
06.07	Crossings of the sensitive watercourses (CH42900-44300) are to be open structures, ensuring no significant change to the fluvial geomorphological function of the watercourses. This is to retain their function as habitat supporting qualifying features of the River Eden SAC (fish, lamprey species, white-clawed crayfish and otter) and to maintain supporting river processes including flood flows and associated erosion/sediment regime, and wider flood storage functions unless otherwise agreed with Natural England and the Environment Agency.
06.08	Road infrastructure within the North Pennines AONB is to be designed sympathetically in relation to the AONB and its relevant Special Qualities, and consultation must be sought with the joint advisory committee. (CH45100-47100)
06.09	Any barrier required between the A66 and local roads to prevent headlight glare is to be designed to be sympathetic to the AONB, with planting to soften the visual impact over time.
06.10	Boundary treatments on large structures and earthworks need to avoid skylining (i.e. defining the skyline) e.g. at Warcop overbridge where boundary treatments are required on top of associated earthworks, they must be softened by integrating native hedgerows or woodland planting. Appropriate boundary treatments are to reflect the rural nature of the scheme e.g. hedgerow and drystone walls. (CH43100-43600).
06.11	The group of trees to the north of the Dyke Nook properties is to be retained, and any losses to be further reduced through detailed design refinement of proposals. (CH42400)
06.12	At Warcop Roman Camp (CH42800), encroachment of any proposals will be minimised as far as reasonably practicable, having regard to the requirements of the Project. This must be refined and further reduced through the detailed design.
06.13	Detailed design of the attenuation pond and cutting at Sandford Junction (Ch 42100) must aim to avoid direct impact on Dyke Nook fen habitat to the north. The design, including required mitigation, must be informed by further detailed groundwater survey and assessment to ensure that the hydrology of the fen is not affected. If necessary, the location of the junction must be moved within the Limits of Deviation to avoid impact on the fen habitat.
06.14	The relocated Brough Hill Fair site is to be graded as an even surface where reasonably practicable and integrated into the landscape through use of appropriately designed bunding and planting to screen the site from the A66 and adjacent farm business and to reduce headlight glare.
06.15	Greening of overbridge must be implemented to maintain habitat connectivity on Warcop overbridge (CH44340).
06.16	The structures crossing the Moor Beck and Cringle Beck must allow for full functionality of normal supporting river processes including flood flows and associated erosion/sediment regime, and the migration of the channel across its floodplain (these are important functions of its role as part of the River Eden Special Area of Conservation or SAC). This is to be achieved using an open multi-span structure, across the entire floodplain of the watercourse, <del>unless otherwise agreed with the Environment Agency and Natural England, and T</del> the span arrangements for these viaducts are to be designed such that the vertical clearance from the watercourse (River Bank Level in normal conditions) is a minimum of 2.5m-, <u>unless otherwise agreed with National Highways (in respect of standards and maintenance requirements), the Environment Agency and Natural England.</u>

<sup>27</sup> A textured vegetation character, seeking to reflect that of the North Pennines AONB where practicable

Reference	Scheme-specific design principles
	<p>The orientation of the piers must be informed by detailed flood modelling so that they do not influence the migratory nature of the river. All piers are to be designed as in-channel structures (even if they are not currently in-channel in the DCO scheme design), to allow for the movement of the river and avoid the need to add scour protection in future. All crossings of such watercourses are to be open span structures.</p> <p>Viaduct piers will be designed and constructed to withstand river erosion in order that no additional bank protection would be required under a future scenario where the river channel has migrated (laterally) and interacts with the piers.</p>

## 4.5 Bowes Bypass (scheme 7)

Table 4-9: Summary of Project-wide Design Principles not applicable to scheme 7

Site Name: Bowes Bypass	
Scheme no.	07
Project-wide Project Design Principles	Principles that do not apply
Theme A: Designs that are integrated in context and express character and a sense of place	LI20
Theme B: Designs to enhance experience for all users and serve the local community	VR02
Theme C: Designs to restore and enhance habitats and ecological connectivity	BNG02, GB04
Theme D: Designs that are climate resilient and resource efficient	-

Table 4-10: Bowes Bypass Scheme Specific Design Principles

Reference	Scheme-specific design principles
07.01	The landscape integration planting design and planting pattern must, as far as reasonably practicable, respect the prevailing small scale field pattern of fossilised ridge and furrow fields and early Enclosures around the village of Bowes, to assist in ensuring that the sense of time depth <sup>28</sup> and setting of Bowes are retained for the long term.
07.02	Retain the open aspect of this landscape with minimal introduction of woodlands, instead seeking to reinforce existing tree/vegetation belts and layers. Where woodland planting is required to mitigate the loss of existing vegetation on this scheme, it is to be implemented on the closest viable scheme
07.03	Boundary treatments are to reflect the rural character of the scheme with existing treatments comprising of post and rail/wire fencing with some native hedgerows and drystone walling where appropriate. Where vehicle restraint systems (VRS) are required for safety purposes, these are to be designed and sited sensitively in the context of such historic and rural boundary features, whilst having regard to their operational/functional requirements.
07.04	Retain and reinstate drystone walls that contribute to the landscape character, using as much retained local stone as achievable and reflect local variations in construction specific to stone walls around Bowes. CH50400-50600, CH51000-51500, CH52000 and CH52600-53400.
07.05	Use native tree and scrub planting on the new bridge's embankment to screen and soften the structure and its abutments in the wider landscape and from the approach from Bowes village. CH51000.
07.06	Retain the views to Bowes Castle, from the A66, as this is an important landmark and orientation feature. CH50200.
07.07	Provide appropriate visual screening from The Old Armoury Campsite and tie this in with existing field patterns, using suitable locally specific native planting species planted onto bunding, using excavated material (from the scheme). Woodland planting with dense understorey planting (to avoid strobing effect) must be provided along CH50800 – 51100 to help reduce headlight glare from the A66 and screen the junction.
07.08	Retain the distinctive double tree belts which mark the historic alignment of the disused Bowes Railway Line (CH51200).

<sup>28</sup> Time depth can be described as landscape change associated with different eras which affects and changes the landscape and the way in which we perceive it.

Reference	Scheme-specific design principles
07.09	Ensure a sensitive, context-appropriate detailed design for the attenuation ponds, through integration within the surrounding landscape by reflecting the local topography where reasonably practicable and using locally appropriate planting to integrate such features in their context (such as species rich grassland).
07.10	Use a sensitive approach to landform grading to accommodate structures and to tie into the gently undulating wider landscape around Bowes, as opposed to a standard 1:3 slope. Use species rich grassland to tie the feature in, rather than structure planting, which could otherwise visually accentuate the feature within the landscape. CH52500.
07.11	Lighting is to tie in with the existing lighting and to create a consistent environment to ensure the safety of road users.
07.12	Greening of access bridge must be implemented to maintain habitat connectivity on East Bowes accommodation access bridge (CH52490).

## 4.6 Cross Lanes to Rokeby (scheme 8)

Table 4-11: Summary of Project-wide Design Principles not applicable to scheme 8

Site Name: Cross Lanes to Rokeby	
Scheme no.	08
Project-wide Project Design Principles	Principles that do not apply
Theme A: Designs that are integrated in context and express character and a sense of place	VL01
Theme B: Designs to enhance experience for all users and serve the local community	VR02
Theme C: Designs to restore and enhance habitats and ecological connectivity	-
Theme D: Designs that are climate resilient and resource efficient	-

Table 4-12: Cross Lanes to Rokeby Scheme Specific Design Principles

Reference	Scheme-specific design principles
08.01	If implemented in accordance with the provisions of the Environmental Management Plan, the acoustic barrier at North Bitts Farm is to be sensitively designed and to tie in with the existing drystone wall, and to have a maximum height parameter of 4m. Use of local materials to reflect the vernacular of the farm buildings (where reasonably practicable). CH59500.
08.02	Cross Lanes junction: Enhance Princess Charlotte woodland to the north of the junction extending the existing stand of woodland and connecting the green infrastructure north to south at the junction. CH60000.
08.03	Cross Lanes junction: Provide new native woodland drawn from a locally appropriate species palette for the islands and slip roads, using appropriate grades of planting stock to promote establishment of the new planting. This is to integrate the new junction in the landscape and to provide visual screening, as well as to reflect the scale of the engineering design structures at the Cross Lanes Junction (overbridge, abutments, embankments and slip roads) in the landscape design. CH60000.
08.04	Cross Lanes junction – visual impact of the proposals: The detailed design is to be carried out sensitively with regard to existing ground levels/profiles and local landscape characteristics. The footprint of the



Reference	Scheme-specific design principles
	junction must be reduced as far as reasonably practicable so that it minimises encroachment into the Carboniferous Limestone Mineral Safeguarding Area.
08.05	Cross Lanes Junction Overbridge: The design of this structure must be sensitive to the landscape context, enabling the visual continuity of highway earthworks and using a simple, unobtrusive design for the structure. CH60000.
08.06	In relation to the part of the existing A66 that is to be de-trunked to the west of Rokeby Grange junction (CH61950-62200) rationalise and restore field patterns, and where the road is to be removed, restore, reinforce and replant the hedgerow (as a double tree line) to reflect the line of the historic (Roman) road alignment in this location.
08.07	Rokeby Grange drive/approach road: The detailed design must not require the removal of the large pollard sycamores. CH62200.
08.08	Rokeby Chapel and Rectory: Open up views of the Old Rectory by removing dense, inappropriate modern coniferous planting. This will enable the Rectory to relate visually once again to Rokeby Chapel on the northern side of the A66 to be de-trunked, enabling aspects of the original design intent for this part of Rokeby Park to be appreciated. Replace firs with a 'boulevard' or loose avenue of larger grade parkland species trees (planting spacing to be at 10m centres) and reinforce historic planted character of the de-trunked road with appropriate larger grade parkland species tree planting. CH62500.
08.09	Plant native woodland along the northern verge east of the Old Rectory between the existing and proposed alignment to enhance the existing character of Rokeby Park, and to provide visual screening in relation to the new A66 alignment. (CH62500-62850)
08.10	At the Tutta Beck, the outfall is to tie in with the existing outfall as far upstream as reasonably practicable in order to avoid or minimise disturbance of ancient woodland. The area of land within the Order limits directly adjacent to the Ancient Woodland and within 15m of the Ancient Woodland is for planting only, with no excavation or below ground works to take place in this area. CH60900 and 60100.
08.11	Rokeby Park: Replant Church Plantation to the north of the de-trunked road with the same location and species of tree planting, so that the original design and pattern of the loose axial vista in the Church Plantation is mapped and replicated. To the south of the de-trunked road opposite Church Plantation, use larger species tree planting of locally appropriate species, with irregular spacing.
08.12	Alongside the new alignment of the A66 plant larger species trees in a row with irregular spacing and a scalloped edge to aid landscape integration and create a more naturalistic appearance. CH62600.
08.13	Use species rich grassland for the verges, central reservation and roundabout approaches to the new junction with Barnard Castle Road, to visually break up the expanse of hardstanding to the foreground of the historic gates and railings to Rokeby Park. The historic gates, piers and railings must not be disturbed, and the trees associated with this feature must be retained wherever reasonably practicable if overhead utilities works are required in this location. CH62100.
08.14	Reinforce existing tree belts to the south of the A66 east of the Barnard Castle junction with appropriate native parkland tree species. This will help maintain the historic integrity of the small section of the Registered Park and Garden (RPG) south of the 1960s bypass and contain visual impacts of the road upon it.

Reference	Scheme-specific design principles
08.15	Boundary treatments are to tie in with the rural character comprising largely of drystone walling and post and rail fencing. Drystone walls are to be retained/reinstated at the existing police patrol layby, Boldron and Rokeby (CH63350). Where VRS is required it must be integrated with boundary treatments. Any barriers required to prevent headlight glare must be planted up, to soften the visual impact over time with appropriate understorey planting so as to avoid strobing effect.
08.16	Greta Bridge: Works within the Scheduled Monument at Greta Bridge are to be restricted to the highway boundary only and are to be non-intrusive with no excavation outside the highways boundary.
08.17	Greening of overbridge must be implemented to maintain habitat connectivity on Cross Lanes junction overbridge (CH60050).
08.18	At the Rokeby roundabout, lighting must create a consistent lighting environment and be kept to a minimum. Lighting must Be designed in accordance with the requirements of the Design Manual for Roads and Bridges and road safety audit. Where lighting is required, suitable lighting choices or adaptations will be designed into the lighting scheme, in discussion with Historic England, to avoid light spill and the potential for adverse impacts on the designed landscape. A sensitive approach must be used to the design and siting of signage in this location for the same reason whilst meeting the requirements of the Traffic Signs Manual.

## 4.7 Stephen Bank to Carkin Moor (scheme 9)

Table 4-13: Summary of Project-wide Design Principles not applicable to scheme 9

Site Name: Stephen Bank to Carkin Moor	
Scheme no.	09
Project-wide Project Design Principles	Principles that do not apply
Theme A: Designs that are integrated in context and express character and a sense of place	LI20, VL01
Theme B: Designs to enhance experience for all users and serve the local community	VR02
Theme C: Designs to restore and enhance habitats and ecological connectivity	HP02
Theme D: Designs that are climate resilient and resource efficient	-

Table 4-14: Stephen Bank to Carkin Moor Scheme Specific Design Principles

Reference	Scheme-specific design principles
09.01	Retain open views to the south from the A66, over the open moorland landscape (CH 70000-70400 & CH74300-75050), with no woodland or woodland edge to be planted, except for landscape integration and ecological connectivity purposes.
09.02	West Layton Manor: Reinststate and restore the sections of dressed stone estate wall and cappings lost to the scheme, construction to match the existing and maintain the historic feature, re-using the reclaimed material from the wall. Ensure that engineering earthworks are designed to avoid and protect the root protection area of the prominent lone parkland tree at West Layton, and that new planting maintains the dominance of this as a feature. CH72000.
09.03	Conserve and, where reasonably practicable, enhance the channelled views eastwards local to Mainsgill Farm along the A66 towards the Carkin Moor Roman Fort (Scheduled Monument) and associated earthworks/deep cutting. CH73700-73800.
09.04	Retain open views of Carkin Moor Roman Fort from the A66, enhance the experience by clearance of naturalised scrub on the road side approaches to better present the cutting and surviving earthworks of the Scheduled Monument. CH74500.
09.05	Ensure that any structures and design interventions near and adjacent to Carkin Moor Roman Fort Scheduled Monument (CH74500) are minimal and that the new retaining structure to the southern side of the road, to build up the highway to enable the required dualling, minimises any impact on the Scheduled Monument. Any structures and design interventions must minimise encroachment into the boundaries of the Scheduled Monuments as far as reasonably practicable including the works and earthworks to Warrener Lane. Any planting must be open grassland or species rich grassland and non-intrusive e.g. no tree or shrub planting. The adjacent new attenuation ponds must have a compact and minimum footprint to reduce impacts on the archaeology and its setting, by having the minimum number and size of balancing ponds required (having regard to functional requirements of the ponds), as well as locating them as far away from the Scheduled Monument as reasonably practicable.
09.06	Carefully consider new woodland planting sites with new field boundaries that integrate with and reflect the existing landscape and pattern – a landscape of vegetation ‘layers’, with low perception of woodland cover.
09.07	Boundary treatments are to reflect rural character and existing boundary treatments through the scheme. These include hedgerow with post and rail fencing predominantly in agricultural areas, and use of post and rail, hedgerow and

Reference	Scheme-specific design principles
	drystone walls near Layton Nurseries and Mainsgill Farm. Close board fencing must be used at residential properties along Waitlands Lane.
09.08	Greening of overbridge must be implemented to maintain habitat connectivity on Collier Lane, West Layton (CH72080).
09.09	The design, including required mitigation, must be informed by further detailed groundwater survey and assessment to ensure that the hydrology of the fen is not affected.

## 4.8 A1(M) junction 53 Scotch Corner (scheme 11)

Table 4-15: Summary of Project-wide Design Principles not applicable to scheme 11

Site Name: A1(M) junction 53 Scotch Corner	
Scheme no.	11
Project-wide Project Design Principles	Principles that do not apply
Theme A: Designs that are integrated in context and express character and a sense of place	LI14-LI20, IP01, IP02, VL01, VL02, VL03
Theme B: Designs to enhance experience for all users and serve the local community	VR02, VR03
Theme C: Designs to restore and enhance habitats and ecological connectivity	HP02, HP03, HP04, GB03, BE03
Theme D: Designs that are climate resilient and resource efficient	-

Table 4-16: A1(M) junction 53 Scotch Corner Scheme Specific Design Principles

Reference	Scheme-specific design principles
11.01	Lighting is to tie in with the existing junction lighting and to create a consistent environment to ensure the safety of road users.
11.02	Retain the tree line to the south of Middleton Tyas Lane where reasonably practicable. If the tree line is retained, replacement tree planting will not be required. If it cannot be retained, the trees must be replaced in a similar position within Order limits, where reasonably practicable, with suitable native tree species including larger growing species, using an appropriate grade of nursery stock (balancing integration and visual screening with establishment).

## 5 Abbreviation list

Table 5-1: Abbreviations

Term	Definition
AONB	Area of Outstanding Natural Beauty
CCC	Cumbria County Council
CDM	Construction Design and Management
CMS	Construction Method Statement
DCC	Durham County Council
DCO	Development Consent Order
DfT	Department for Transport
DIPs	Delivery Integration Partners
EAR	Environmental Assessment Report
EDC	Eden District Council
EIA	Environmental Impact Assessment
ES	Environmental Statement
HET	Heavy Equipment Transporter
HGV	Heavy Goods Vehicle
HRA	Habitats Regulations Assessment
km	Kilometre
MoD	Ministry of Defence
NN NPS	National Networks National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NTPRSS	Northern Trans-Pennines Routes Strategic Study
NYCC	North Yorkshire County Council
PCF	Project Control Framework
PEIR	Preliminary Environmental Information Report
PMA	Private Means of Access
PRA	Preferred Route Announcement
PRoW	Public Right of Way
RDC	Richmondshire District Council
RIS	Road Investment Strategy
RPG	Registered Park and Garden
SAC	Special Area of Conservation
SAM	Scheduled Ancient Monument
SAR	Scheme Assessment Report
SES	Safety, Engineering and Standards
SPA	Special Protection Area
SRN	Strategic Road Network
SSSI	Site of Special Scientific Interest
TAR	Technical Appraisal Report
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VRS	Vehicle Restraint System
WCH	Walking, Cycling and Horse riding / Walkers, Cyclists and Horse-riders
WPC	Warcop Parish Council

## 6 Glossary

Table 6-1: Glossary of terms

Term	Definition
(The) Act	The Planning Act 2008
Applicant	National Highways
Application	This refers to an application for a Development Consent Order. An application consists of a series of documents and plans which are submitted to the Planning Inspectorate and published on its website.
Area of Outstanding Natural Beauty (AONB)	An area of countryside designated at the National level and considered to have significant landscape value. The designation is underpinned by a suite of Special Qualities articulating what is significant/special about the designated landscape.
Assessment	A process by which information about effects of a proposed plan, project or intervention is collected, assessed and used to inform decision-making.
Baseline environment	The environment as it appears (or would appear) immediately prior to the implementation of the project together with any known or foreseeable future changes that will take place before completion of the project.
Biodiversity	The variety of life forms, the different plants animals and microorganisms, the genes they contain and the ecosystems they form.
Blue light zone	In the context of the police facility at Carleton Hall, an area required for emergency services vehicles access, parking etc.
Consent	A statutory permission given to an applicant by a statutory authority, such as the local planning authority or the Secretary of State, that allows a development to be carried out within a specific area of land.
Consultation	A process by which regulatory authorities, statutory and non-statutory bodies, local authorities, local communities, and those with an interest in the land are approached for information and opinions regarding a development proposal.
Design Manual for Roads and Bridges (DMRB)	A set of documents that provide a comprehensive manual system which accommodates all current standards, advice notes and other published documents relating to the design, assessment and operation of trunk roads.
Development Consent Order (DCO)	The means of obtaining permission for developments categorised as nationally significant infrastructure projects.
Effect	Term used to express the consequence of an impact (expressed as the 'significance of effect'), which is determined by correlating the magnitude of the impact to the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria. For example, land clearing during construction results in habitat loss (impact), the effect of which is the significance of the habitat loss on the ecological resource.
Enhancement	A measure that is over and above what is required to mitigate the adverse effects of a project.
Environmental assessment	A method and a process by which information about environmental effects is collected, assessed and used to inform decision-making.
Environmental Assessment Report	Documents the findings of an Environmental Assessment.
Environmental designation	A defined area which is protected by legislation that is threatened by change from manmade and natural influences (for example Ramsar sites, Sites of Special Scientific Interest and Special Areas of

Term	Definition
	Conservation).
Environmental Impact Assessment (EIA)	A statutory process by which the environmental impact of certain planned projects must be assessed through an EIA before a formal decision to proceed can be made.
Flood zones	Flood Zones refer to the probability of river and sea flooding. They are available to view on the Environment Agency's website.
Geodiversity	The diversity of rocks, fossils, minerals and soils, landforms and geological processes that constitute the topography, landscape and the underlying structure of the Earth.
Green infrastructure	A network of multi-functional green and blue spaces and other natural features, urban and rural, which is capable of delivering a wide range of environmental, economic, health and well-being benefits for nature, climate, local and wider communities and prosperity (Ministry of Housing, Communities & Local Government, July 2021, National Planning Policy Framework). The term green infrastructure also often includes blue infrastructure when considering riparian environments.
Grade-separated junction	Roads crossing the carriageway pass at a different level, so as not to disrupt the flow of traffic. Slip roads connect the carriageway to the junction.
Impact	Change that is caused by an action (for example land clearing (action) during construction which results in habitat loss (impact)).
Landscape	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, European Landscape Convention).
Landscape character	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse (Natural England, 2014, An Approach to Landscape Character Assessment, NE579).
Legislation	A law or set of laws proposed by a government and given force/made official by a parliament.
Listed building	A structure which has been placed on the Statutory List of Buildings of Special Architectural or Historic Interest to protect its architectural and historic interest.
Mitigation	Measures including any process, activity, or design to avoid, reduce, remedy or compensate for negative environmental impacts or effects of a development.
Mitigation measures	Methods employed to avoid, reduce, remedy or compensate for significant adverse impacts of development proposals.
Monitoring	A continuing assessment of the performance of the Project, including mitigation measures. This determines if effects occur as predicted or if operations remain within acceptable limits, and if mitigation measures are as effective as predicted.
National Park	An area of countryside designated at the National level and considered to have significant landscape value. The designation is underpinned by a suite of Special Qualities articulating what is significant/special about the designated landscape. National Parks are underpinned by their own Development Plans and their own planning authorities.
Nationally Significant Infrastructure Project (NSIP)	Large scale developments which require a type of consent known as 'development consent' under procedures governed by the Planning Act 2008.

Term	Definition
Operational	The functioning of a project on completion of construction.
Phase 1 Habitat Survey	Recognised standard methodology for collating information on the habitat structure of a particular site.
Planning Act 2008	Act of Parliament which sets out the statutory requirements and planning application process for nationally significant infrastructure projects, such as energy, water, transport and waste. Applications for Development Consent Order are submitted following the processes set out in the Planning Act. The Act has subsequently been amended.
Preliminary design	The design on which the application for development consent is based.
Receptor	A defined individual environmental feature usually associated with population, fauna and flora that has potential to be affected by a project.
Registered Parks and Gardens	Parks and gardens listed on a register that includes sites of particular historic importance and of special historic interest in England. The main purpose of the register is to celebrate designed landscapes of note and to encourage appropriate protection.
Sensitivity	The extent to which the receiving environment can accept and accommodate change without experiencing adverse effects.
Statutory	Related to legislation or prescribed in law or regulation.
Time depth	Time depth can be described as landscape change associated with different eras which affects and changes the landscape and the way in which we perceive it.