Norfolk County Council

Norwich Western Link

Design and Access Statement

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Acronyms and definitions

Acronym	Definition
BNG	Biodiversity Net Gain
CEMP	Construction Environmental Management Plan
DAS	Design and Access Statement
DEFRA	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
ES	Environmental Statement
HPI	Habitats of Principal Importance
LEMP	Landscape Ecological Mitigation Plan
JCS	Joint Core Strategy

Acronym	Definition
NCA	National Character Area
NCC	Norfolk County Council
NMU	Non-motorised user
NWL	Norwich Western Link
NPPF	National Planning Policy Framework
NSIP	Nationally Significant Infrastructure Project
PRoW	Public Right of Way
RB	Restricted Byway
RNR	Roadside Nature Reserve
RPA	Root Protection Area
SAC	Special Area of Conservation

Acronym	Definition
SSSI	Site of Special Scientific Interest
STS	Sustainable Transport Strategy

1 Introduction

1.1 Purpose of this document

1.1.1 This Design and Access Statement (DAS) supports the planning application for the Norwich Western Link (NWL) scheme, promoted by Norfolk County Council (NCC) as the Applicant.

1.1.2 It presents the Proposed Scheme design submitted for planning permission, providing rationale for how it was developed, alternative ideas that were discounted, and explains how it demonstrates good design.

1.1.3 The DAS is required by NCC's 'National and Local Validation Requirements for County Council (Regulation 3) Planning Applications (June 2023) and makes reference to the requirement in Article 9 of the Town and Country Planning (Development Management Procedure) (England) Order 2015, which sets out the requirements of a DAS. Article 9(3) states:

"A design and access statement must—

(a) explain the design principles and concepts that have been applied to the development;

(b) demonstrate the steps taken to appraise the context of the development and how the design of the development takes that context into account;

(c) explain the policy adopted as to access, and how policies relating to access in relevant local development documents have been taken into account;

(d) state what, if any, consultation has been undertaken on issues relating to access to the development and what account has been taken of the outcome of any such consultation; and

(e) explain how any specific issues which might affect access to the development have been addressed."

1.1.4 NCC's commitment to good design means that the Proposed Scheme responds to the environment and landscape setting in which it is to be situated. Good design is delivered through collaborative working with environmental disciplines and the engineering team, led by landscape architects.

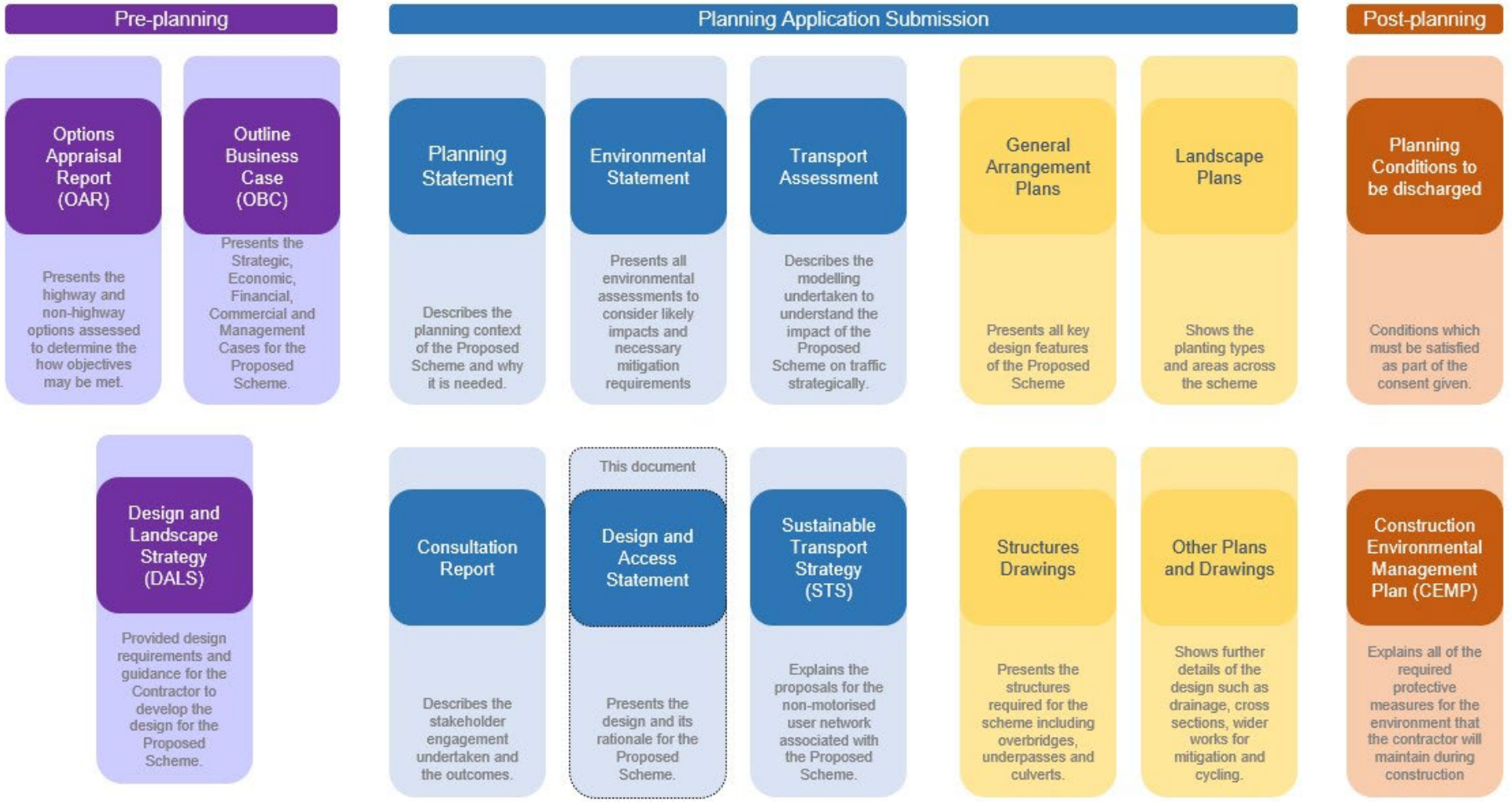
1.1.5 The Contractor has maintained continuity in the approach to design and application of design principles which are also presented in this document.

1.2 Planning application

1.2.1 This Design and Access Statement is part of a suite of documents and drawings prepared as part of the planning application for the Proposed Scheme as shown **Figure 1 1**

1.2.2 The DAS should be read in conjunction with the other planning application documents and drawings.

Figure 1-1 Overview of Planning Application Content



1.3 Project objectives

1.3.1 The project objectives set out what the Norwich Western Link project should provide and enable. The objectives are in two tiers - high-level objectives and specific objectives as follows.

High-level objectives

- *Support sustainable economic growth;*
- *Improve the quality of life for local communities;*
- *Promote an improved environment;*
- *Improve strategic connectivity with the national road network.*

Specific objectives

- *Improve connectivity and journey times on key routes in Greater Norwich;*
- *Reduce the impacts of traffic on people and places within the western area of Greater Norwich;*
- *Encourage and support walking, cycling and public transport use;*
- *Improve safety on and near the road network, especially for pedestrians and cyclists;*
- *Protect the natural and built environment, including the integrity of the River Wensum Special Area of Conservation;*
- *Improve accessibility to key sites in Greater Norwich.*

1.3.2 The Planning Statement (document reference: 1.01.00) describes how the Proposed Scheme fulfils each objective.

1.4 Project wide design principles

1.4.1 Norwich Western Link is a scheme committed to conserving and enhancing natural assets and providing community benefits in its delivery of a new link road for Norwich.

1.4.2 This approach has been supported by periodic design reviews by a 'Local Planning Authority Design Group.' The group comprises officers from various departments in the district and county authorities (such as landscape, ecology, planning, flooding, heritage) to provide their feedback through workshops and ongoing liaison.

1.4.3 The following project wide design principles (DP) were developed collaboratively with the group.

1.4.4 The Proposed Scheme should:

- *(DP1) Respond to the character and landscape in which the Proposed Scheme is situated, with engineered forms integrated with the landscape to minimise their physical and visual impact and provide wider benefits or features;*
- *(DP2) Make a positive contribution to the landscape through conserving and enhancing the natural environment and biodiversity net gain;*
- *(DP3) Strive to minimise adverse impacts on the landscape and seek sustainability in its use of materials, construction techniques, and maximising multi-functional features wherever possible;*
- *(DP4) Maintain and enhance the local Rights of Way where possible, for community accessibility, amenity, and to encourage sustainable modes of travel – with consideration of this beyond the scheme's extent;*
- *(DP5) Adhere to a design narrative which provides a commonality and theme to unify all components of the scheme;*
- *(DP6) Respond to the constraints of the scheme, and consider its whole lifespan including capital and maintenance costs.*

1.4.5 Building on the scheme wide design principles, this document presents the design principles applicable to each component of the Proposed Scheme and how the design responds to them.

1.5 The importance of good design

1.5.1 The applicant is committed to delivering good design for the Proposed Scheme, to ensure that it responds to its setting, is long-lasting, and that wider benefits are realised beyond the primary function as a new link road. This commitment was embedded from the outset of the project, and maintained by all involved in the development of the Proposed Scheme.

1.5.2 Good design is not just about how something looks as an aesthetically pleasing architectural form, but about the process taken to developing the solution and the benefits it can offer for the environment, placemaking for people, and whole life value.

1.5.3 An important part of design development is engagement of appropriate focus groups, and consultation with the public, to inform the design.

1.5.4 An overview of the project timeline with consultation and engagement activities is set out in **Figure 1-2** and described in more detail in the Pre-application Consultation Report (document reference: 5.01.00) and Statement of Community Involvement (document reference: 1.03.00).

1.6 Design Development

1.6.1 The scheme design has developed since a preferred route was adopted in 2019. This was identified through the Options Selection Report process of appraising 82 highway and non-highway options for the scheme. Four routes for the highway were short-listed and consulted on, and assessed comparatively for their environmental, engineering, and economic impacts.

1.6.2 The chosen route was then developed into a 'Reference Design' for the purpose of providing a baseline for environmental scoping, preparation of an Outline Business Case, and procurement of a Design and Build Contractor.

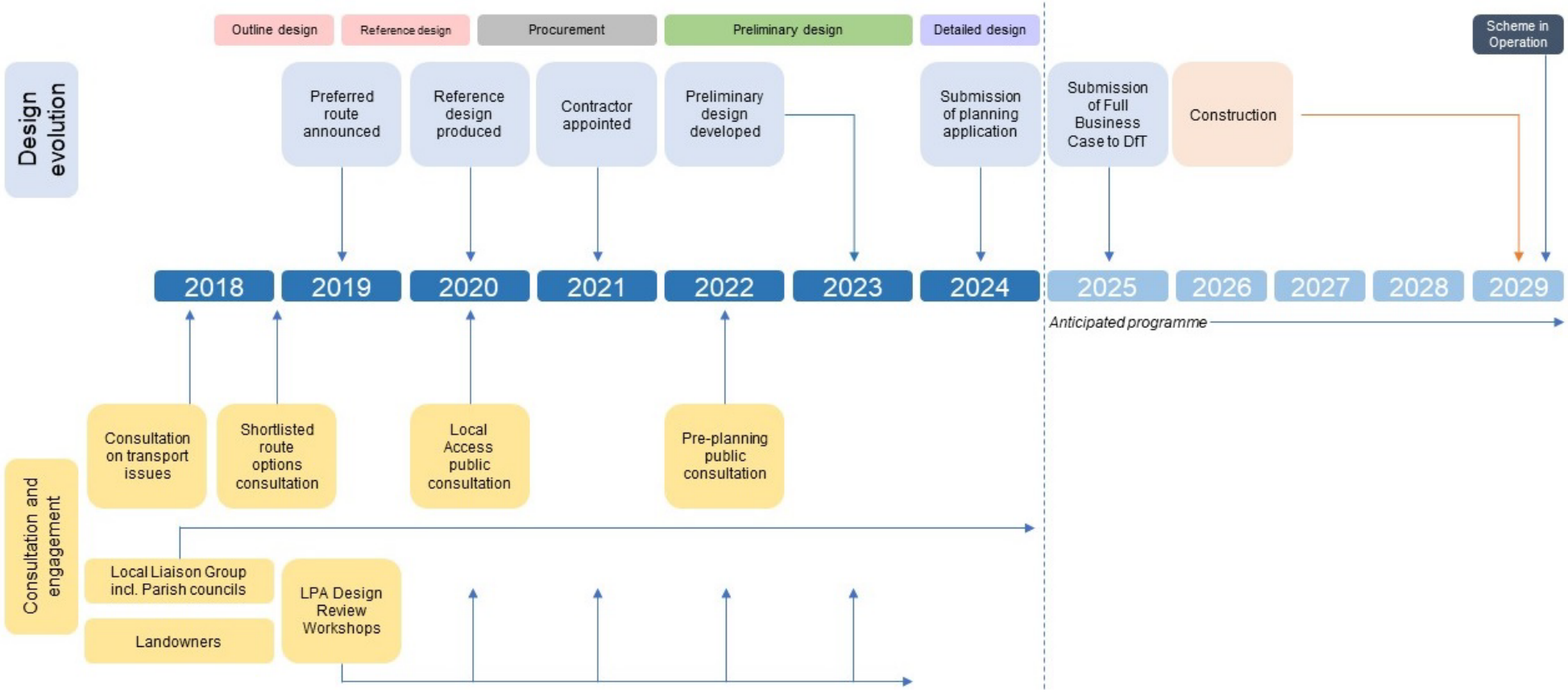
1.6.3 The appointed Design and Build Contractor has developed a design for the Proposed Scheme, for which planning consent is sought. Following consent being granted, detailed design will be completed to inform the construction phase.

1.7 Rochdale envelope

1.7.1 As set out in Chapter 5 of the Environmental Statement (ES) (document reference 3.05.00), the Application and the accompanying ES use the 'Rochdale Envelope' approach to assessing environmental impacts.

The Rochdale Envelope is employed where the nature of a proposed development means that some details of the whole project have not been confirmed when the application is submitted, and some flexibility is sought to address uncertainty.

Figure 1-2 Overview of the project timeline



2 Policy context for good design

2.1 Introduction

2.1.1 The following policies and guidance documents are specifically relevant to design and access. A comprehensive review of the policies acting on the Proposed Scheme is included in the Planning Statement (document reference: 1.01.00).

2.2 National policy

National Planning Policy Framework (December 2023)

2.2.1 The need for good design in development is prevalent in the National Planning Policy Framework (NPPF). Paragraph 131 explains:

"…Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities."

2.2.2 The NPPF goes on to explain the importance of design quality, stakeholder engagement as part of the process and design review panels to achieve well-designed places.

National Policy Statement for National Networks (2014) and Draft published March 2023

2.2.3 Whilst this policy is applicable to Nationally Significant Infrastructure Projects (NSIPs) through the Planning Act 2008, it is of relevance for the design of roads.

2.2.4 It sets out a '*Criteria for 'good design' for national network infrastructure*' in paragraphs 4.28-4.35 (4.24-4.29 in the Draft version) which explains:

"Applying "good design" to national network projects should therefore produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction, matched by an appearance that demonstrates good aesthetics as far as possible."

2.3 Local adopted policy

Norfolk County Council - Transport for Norwich Strategy (2021)

2.3.1 This sets out the transportation strategy for the Norwich area, Chapter 11 states:

'Places: New schemes, enforcement and maintenance activities on the transport network will seek to enhance the character and quality of places with historic, architectural or natural landscape character and ecological value.'

2.3.2 A 'Key Action' following this policy includes:

'Transport schemes developed in places of historical, landscape or architectural importance, including conservation areas, will be designed to ensure that they maintain or enhance the area and improve public realm.'

2.3.3 Whilst the Proposed Scheme does not have an interface with public realm in an urban context, it considers the networks and experiences of non-motorised users in the locality, maintaining access and connectivity.

Greater Norwich Development Partnership - Joint Core Strategy (2014)

2.3.4 This Joint Core Strategy (JCS) developed by Broadland, Norwich and South Norfolk councils sets out a long-term vision and objectives for the area, including strategic policies for steering and shaping development.

2.3.5 Policy 2 for 'Promoting good design' describes how:

'All development will be designed to the highest possible standards creating a strong sense of place. In particular development proposals will respect local distinctiveness including as appropriate…

• the landscape character and historic environment, taking account of conservation area appraisals and including the wider countryside

• *provision of landscaping and public art*

• *the need to ensure cycling and walking friendly neighbourhoods by applying highway design principles that do not prioritise the movement function of streets at the expense of quality of place*

• *designing out crime*

• *the use of sustainable and traditional materials*

• *the need to design development to avoid harmful impacts on key environmental assets and, in particular SACs, SPAs and Ramsar sites.'*

2.3.6 Policy 6 for 'Access and transportation' states:

'*The transportation system will be enhanced to develop the role of Norwich as a Regional Transport Node… and will improve access to rural areas.'*

2.3.7 It goes on to explain that this will be achieved by:

'…improvement to the bus, cycling and walking network…continuing to recognise that in the most rural areas the private car will remain an important means of travel.'

2.3.8 A Sustainable Transport Strategy (STS) (document reference: 4.02.00) has been developed as part of the Proposed Scheme, to support sustainable modes of transport and the non-motorised user network.

Norfolk County Council – Local Transport Plan (2022)

2.3.9 This policy comprises a Strategy and Implementation plan, it covers the period 2021-2036. Policy 10 states:

'We will seek to improve connectivity between rural areas and services in urban centres.'

2.3.10 To achieve this, actions include:

'…extending sustainable walking and cycling networks in the urban areas to connect with longer-distance facilities…and – recognising the significant role that car travel will continue to play in the future – improving some of the road links and connections.'

2.3.11 It goes on to explain:

'Good design will be important to make sure that local walking and cycling facilities are attractive to encourage all users.'

2.3.12 The STS also supports this policy and application of good design to encourage use of the facilities on the network.

Norfolk County Council - Environmental Policy (2019)

2.3.13 This policy embodies the Government's 25-year plan published in 2018 to champion resource efficiency and implement environmental targets.

2.3.14 The key policy aims describe goals relevant to the Proposed Scheme design which have been considered throughout its development. This policy describes the need for biodiversity net gain to be achieved in development and working towards carbon neutrality by 2030.

Broadland District Council – Development Management Development Plan Document (2015)

2.3.15 This document sets out policies applied throughout the Broadland planning authority area, in conjunction with the NPPF and JCS to inform decision-taking for future development.

2.3.16 'Policy GC4 – Design' explains:

'Development will be expected to achieve a high standard of design and avoid and significant detrimental impact. Proposals should pay adequate regard to:

i. The environment, character, and appearance of an area;

ii. Reinforcing local distinctiveness through careful consideration of the treatment of space throughout the development, the appearance of new development, the scale of new development, and landscaping;

iii. Meeting the reasonable amenity needs of all potential future occupiers;

iv. Considering the impact upon amenity of existing properties;

v. Making efficient use of land and resources;

vi. Being accessible to all via sustainable means including public transport;

vii. Creating safe environment addressing crime prevention and community safety;

viii. Incorporating appropriate infrastructure linking to the surrounding area;

ix. The creation of sustainable, inclusive, and mixed communities; and

x. Minimising resource and energy consumption and how it is located and designed to withstand longer term impacts of climate change.

2.4 Design standards and guidance

2.4.1 The following are some of the design standards and guidance applicable to the design, though the list is not exhaustive:

Design Manual for Roads and Bridges

2.4.2 The Design Manual for Roads and Bridges (DMRB) provides standards and advice for the design, assessment and operation of trunk roads and motorways in the United Kingdom. It contains a number of volumes which cover topics such as drainage, pavement design, road geometry, signage, lighting and so on.

2.4.3 The highway authorities retain the right to influence the design, and advise on any relaxations or departures required from the standards as part of the technical approvals process.

2.4.4 Situations may arise which require a relaxation or departure from standard to work with the site

conditions, or accommodate necessary features of the Scheme. These are explained in Appendix 1 of this document 'Departure from Standards Report' (document reference: 1.02.01)

2.4.5 The design for the Proposed Scheme has generally been produced in accordance with the guidance and standards set out in the DMRB.

Manual for Streets (2007) and Manual for Streets 2 (2010)

2.4.6 The guidance set out in Manual for Streets and Manual for Street 2, is for the design of roads not classified as trunk roads. The guidance advises how to enhance streets to create better places, mindful of distinctiveness and identity.

2.4.7 It is relevant to the Proposed Scheme's connections with existing roads and works to other roads required as part of the Proposed Scheme.

Sustrans Design Guidance

2.4.8 Sustrans is a charity that provides advice and collaborates with designers, to improve the safety and quality of pedestrian and cycle environments.

2.4.9 It provides a catalogue of design guidance documents which deal with good practice in design for walking and cycling which is applicable to the STS component of the design.

Norfolk County Council (website): Highway guidance for development

2.4.10 Norfolk County Council's website provides guidance for highway developments including residential areas, highways, and details on drainage and lighting.

3 Landscape Context

3.1 Introduction

3.1.1 The landscape in Norfolk is distinctive and significant in its offering for biodiversity and amenity benefit. The landscape within which the Proposed Scheme is sited,

and its locality is characterised by its relatively flat low-lying areas such as the River Wensum valley at the northern extent of the scheme, undulating slightly south of this between Weston Green and Ringland, before flattening again at the southern extent and the A47.

3.1.2 The landscape in the area is varied and includes arable agricultural land, grassland, wetland floodplains, and areas of dense woodland.

3.1.3 A holistic approach to good design and place-making should consider how to preserve this rural character through sensitive design, whilst acknowledging that the introduction of functional and safe new road infrastructure into this setting will result in unavoidable changes.

3.1.4 It is important for the Proposed Scheme to respond to its context not only visually, but environmentally too by understanding the existing conditions (ecological, geological, topographical, tree cover and type etc.) to ensure a landscape design which respects the natural conditions of the site and its landscape character.

3.1.5 Chapter 9 of the Environmental Statement – 'Landscape and Visual' (document reference: 3.09.00) describes the National Character Areas (NCAs) and Landscape Character Assessments that apply to the site area at a national and district scale. An explanation of how the design responds to the opportunities identified by the NCAs is provided in Table 4-2.

3.2 Biodiversity net gain

3.2.1 Biodiversity Net Gain (BNG) is an approach to development which aims to leave biodiversity in a better condition than it was in before the development. It facilitates an increase in appropriate natural habitat and ecological features over and above that being affected by the proposed development.

3.2.2 The BNG came into force by the Environment Act 2021 in February 2024. Despite the Proposed Scheme application being prepared in advance of this, NCC are committed to achieving at least 10% net gain for applicable habitats, to maintain a responsible approach

to development. This approach is reinforced by the NPPF and NCC's Environmental Policy.

3.2.3 The Department for Environment, Food and Rural Affairs (DEFRA) has developed a metric for quantifying biodiversity as units, through a calculator which establishes a baseline score based on habitat distinctiveness, condition, and area. The calculator enables an assessment to be made of the existing (pre-development) conditions of the site, to understand the impact of the development, and the area and type of habitat enhancement required to provide net biodiversity gain.

3.2.4 The Proposed Scheme has been developed iteratively with specialists to minimise impacts and known ecological features as much as practicable.

3.2.5 Initial BNG calculations were obtained at early stages of the design to provide a high-level understanding of the likely land requirements to mitigate impacts. This has been revisited as the Proposed Scheme was developed to ensure accuracy and robustness in the approach to net gain and is reflected in the Landscape Design (document reference 2.07.00).

3.2.6 Woodland, and habitats of principal importance (HPI) are an important focus for the scheme proposals and habitat creation to achieve net gain. The HPIs present where the Proposed Scheme is situated include:

- Hedgerows
- Floodplain grazing marsh, and
- Lowland mixed deciduous woodland
- Ponds and rivers

3.2.7 The Environmental Statement chapters describe the mitigation requirements which have been identified through assessments and engagement with relevant statutory bodies. This mitigation includes requirements for protected species, to achieve BNG, and to compensate for tree loss which are required as part of the Proposed Scheme.

3.2.8 The Biodiversity Net Gain assessment and conclusions are presented in Chapter 10 ‘Biodiversity’ of the ES (document reference: 3.10.00) and its appendices.

4 The Proposed Design

4.1 Introduction

4.1.1 This section presents the scheme design for which planning consent is sought. It provides an overview of the design for the Proposed Scheme, then describes the design factors that have been applied, for each component of the design.

4.2 Overview of the Scheme Design

4.2.1 The key features of the scheme include:

- A dual carriageway road, including a viaduct over the River Wensum and associated floodplain;
- A roundabout junction with the A1067 and the NWL;
- Dualling of a section of the existing A1067 between the proposed NWL roundabout and existing A1270 roundabout;
- Connection to the National Highways *'A47 North Tuddenham to Easton improvements'* dualling scheme at its proposed junction near Wood Lane;
- An underbridge carrying the NWL over Ringland Lane;
- Dual purpose greenbridges to maintain connectivity for wildlife and routes for non-motorised users;
- Underpasses for wildlife and minor watercourses;
- Surface water drainage – comprising attenuation and infiltration basins, sediment forebays and associated carrier drains/ channels; and
- Earthworks, earth bunds, and extensive planting design to integrate the scheme with the landscape;
- Diversion and extension of existing Public Rights of Way (PRoW) and field paths to create a coherent joined up network;
- Tree planting, habitat creation and enhancement.

4.3 Environmental Constraints

4.3.1 The Scheme design responds to the outcomes of environmental surveys and assessments undertaken, and environmental constraints – of particular importance for the design solution include:

- Designated areas: River Wensum Special Area for Conservation (SAC) and Site of Special Scientific Interest (SSSI), including the associated floodplain / watercourses, County Wildlife Sites, Ancient Woodland;
- Habitat and protected species such as: bats, badgers, water voles;
- Heritage assets;
- Carbon, greenhouse gases;
- Noise; and
- Landscape and visual impact.

4.4 Design Components

4.4.1 This section describes each of the design components explaining the design principles that apply and how the design has responded to them.

4.4.2 For ease of explanation, the design is presented in three sections as shown in **Figure 4-1**:

- Northern section: chainage 0-1750
- Central section: chainage 1750–3600
- Southern section: chainage 3600–5635

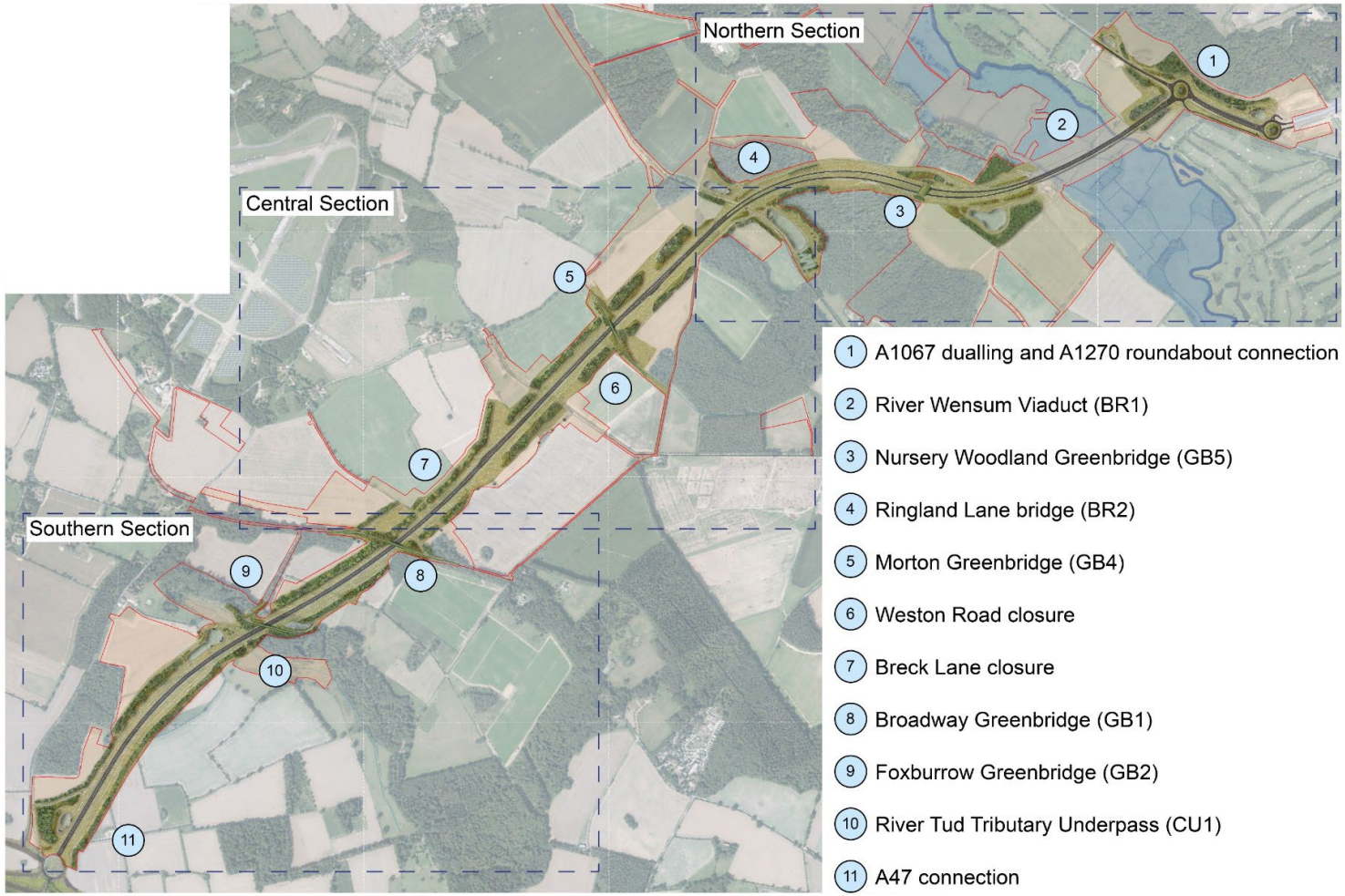
4.4.3 Table 4-1 provides a summary of the proposed structures and references as applied to the drawings, listed from north to south of the design.

Table 4-1 Table of proposed structures

Structure reference	Structure Name	Approx chainage location
BR1	River Wensum Viaduct	0-550
GB5	Nursery Woodland Greenbridge	1000
BR2	Ringland Lane Bridge	1800
GB3	*Reference not in use.*	No data
GB4	Morton Greenbridge	2500
GB1	Broadway Greenbridge	3750
GB2	Foxburrow Greenbridge	4350
CU1	Tud Tributary underpass (culvert)	4450

4.4.4 Chapter 3 of the ES provides description of the Proposed Scheme (document reference: 3.03.00).

Figure 4-1 Overview map of the Proposed Scheme Design and the key features



4.5 The Northern Section: Ch 0-1750

Overview

4.5.1 The northern section of the Proposed Scheme as shown in **Figure 4-2** includes part of the A1067 Fakenham Road, the NWL mainline carriageway to Ringland Lane underbridge, and the River Wensum Viaduct. An illustrative render is also shown in **Figure 4-3**.

4.5.2 The key constraints in this section include:

- River Wensum SAC/SSSI and associated floodplain
- County Wildlife Sites
- Fakenham Road Roadside Nature Reserve
- Variable topography due to the River Wensum floodplain valley
- Ancient Woodland, other woodland, and habitats
- A listed building, a barn at Low Farm
- Presence of protected species such as water voles, and bat species.

4.5.3 The mainline of NWL is a dual carriageway (two lanes in each direction) which separates with a wider central reservation south of the viaduct to facilitate forward visibility for safety requirements.

4.5.4 A retaining wall is proposed where the mainline passes the Ancient Woodland, to minimise the footprint of the design in this area and ensure all works are offset from the trees to maintain a Root Protection Area (RPA).

4.5.5 Drainage basins are required to manage surface water run-off from the carriageway. Each basin features an access track for maintenance, planting, and associate fencing and gates.

4.5.6 Drainage basins in the northern section of the Proposed Scheme are located in the following positions:

- North-west of the A1270 roundabout
- At the western extent of scheme, north of the A1067
- South-west of the viaduct's southern abutment

4.5.7 Access is preserved for affected landowners and parties to nearby property/land.

4.5.8 Existing footpaths in this area are retained, including Ringland Footpaths 1, 2, 3 and 4. An additional footpath route is provided over a dual use maintenance access track alongside the mainline on the western side, between the viaduct southern abutment and Ringland Lane.

Figure 4-2 Illustrative overview plan of the northern section of the Proposed Scheme design

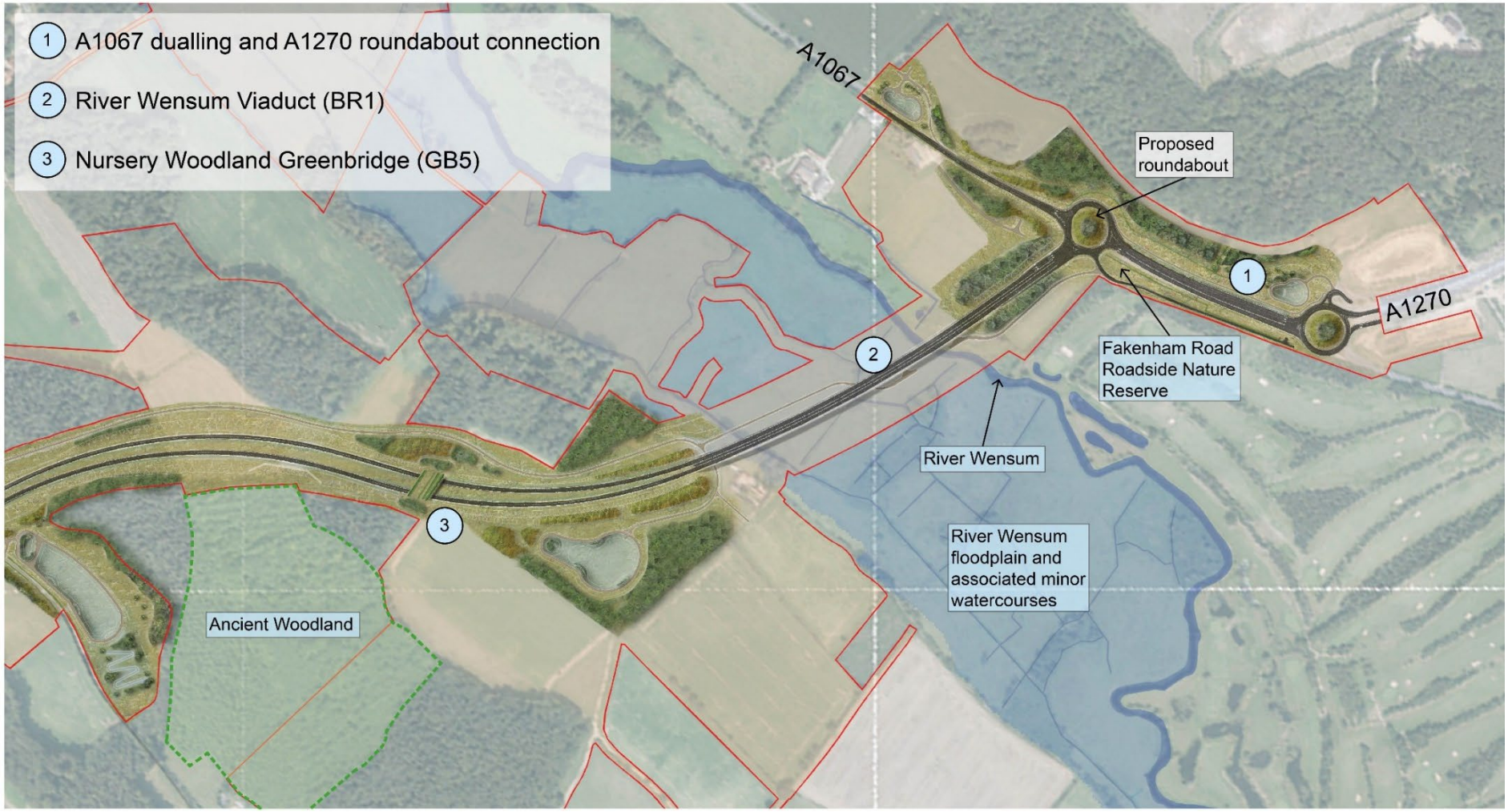


Figure 4-3 Illustrative render of the northern section of the Proposed Scheme design

1 A1067 dualling and connection with A1270 roundabout

4.5.9 A section of the A1067 Fakenham Road is to be dualled between the existing A1270 roundabout connection and the proposed NWL mainline roundabout, to ensure adequate traffic capacity and continuity in carriageway facility.

4.5.10 North of the dualled section of the A1067 will be a grass drainage swale and sloped earthworks, the carriageway is in cutting as the land northwards rises in topography, shown in **Figure 4 4**.

4.5.11 To the west of the NWL roundabout, the A1067 Fakenham Road remains single carriageway.

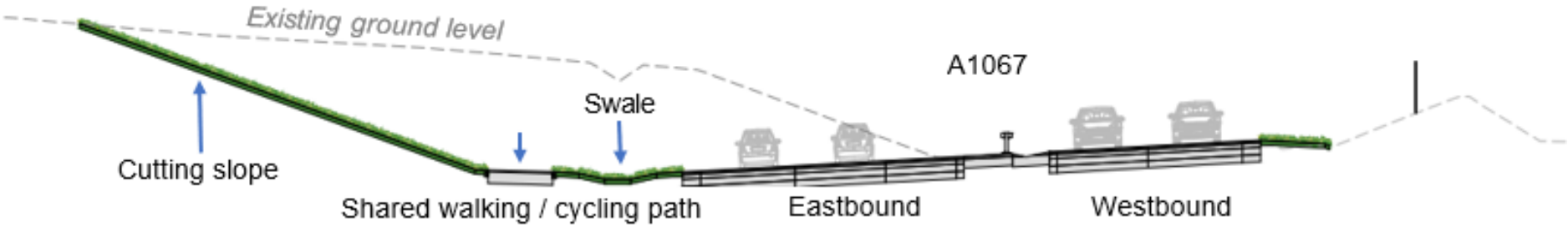
4.5.12 Between the A1270 roundabout connection and the western extent of the scheme on the A1067 is a shared walking and cycling route along the northern side of the carriageway.

Design factors

4.5.13 The Proposed Scheme has been designed to:

- Minimise impact on the adjacent woodland/habitats, and the Fakenham Road Roadside Nature Reserve (RNR) which features *Hoary Mullein*;
- Reuse material won by the dualling earthworks in the local vicinity on the scheme to avoid transportation of new material from further afield reducing construction materials and minimising the generation of waste;
- Maintain connectivity for walking and cycling, to the surrounding network.

Figure 4-4 Cross section of proposed A1067 dualling



2 River Wensum Viaduct (BR1)

4.5.14 A viaduct structure (approximately 491m long) carries the carriageway over the River Wensum and its floodplain as shown in **Figure 4 6**.

4.5.15 This ten-span weathered steel ladder deck structure, comprises three longitudinal I-beam girders supporting a concrete deck. At each of the nine pier locations are three piled cylindrical concrete piled piers as shown in **Figure 4 8**.

4.5.16 Weathering steel is used for all structural steelwork on the viaduct, which is non-reflective and muted in tone. The patination provides a sealed natural finish to the steel negating the need for future painting operations from the floodplain. The reddish-brown rust effect complements the green and blue tones of the landscape and skyline setting it will be viewed upon.

4.5.17 The span lengths vary in length with the longest span of 59.4m over the River Wensum. Six of the ten spans are 53.46m long, the remaining three are shorter to provide the end spans at abutments.

4.5.18 The span arrangement and placement of piers is informed by the environmental constraints in the floodplain, providing an offset from the watercourses in the floodplain, and a suitable height above the river to minimise shading.

4.5.19 The pier shape and size are governed by the substructure pile size and requirement for a small overlap at the base. The top of the pier must provide adequate space for the bridge bearings and for space to perform maintenance or replacements. Aesthetic modifications to the cylindrical shape would necessitate additional material and construction complexity.

4.5.20 Pier heights vary in response to the topography and curvature of the bridge deck above, ranging between 7.2m to 9.9m tall.

4.5.21 A plain concrete finish for the piers provides consistency with the other structures proposed in the design.

4.5.22 Carrier drains are positioned under the deck alongside the longitudinal girders, to avoid penetrating the transverse girders over the piers.

4.5.23 An environmental barrier is fixed to the vehicle restraint system on the outer edges of the structure to manage tyre splash and noise from the road as shown in **Figure 4 5**.

4.5.24 The barrier is transparent to offer uninterrupted views of the floodplain and landscape from the road. This view is served by the absence of lighting or obtrusive signage on the viaduct.

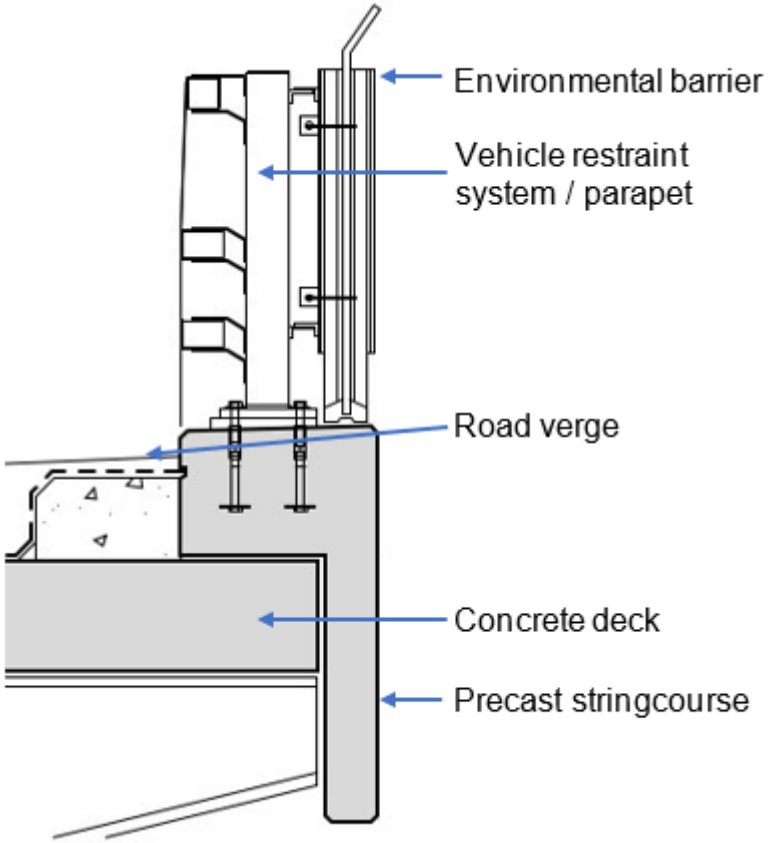
4.5.25 Pre-tensioned steel wire strips will be manufactured within the panels to provide shatter resistance.

4.5.26 The abutments at either end of the viaduct structure are positioned at the floodplain extents with a patterned concrete finish, and sloped earth embankments beyond them to integrate them with the landscape.

4.5.27 It is intended that the viaduct does not detract from the beauty of the landscape in which it is situated by dominating visually in decorative form or colour, informing a prioritisation of a solution that minimises visual impact. This has been expressed by an elemental and uncontrived composition for the viaduct structure.

4.5.28 Distant viewpoints reveal the structure in elevation - a low horizontal line across the valley with the vertical piers largely obscured within the landscape tapestry as shown in **Figure 4 6** and **Figure 4 7**. Reducing the depth of horizontal line is important in the drive towards a visually minimal intervention to provide a structure threaded through the landscape rather one than imposed upon it.

Figure 4-5 Section view through the viaduct parapet and environmental barrier



Design factors:

4.5.29 The Proposed Scheme has been designed to:

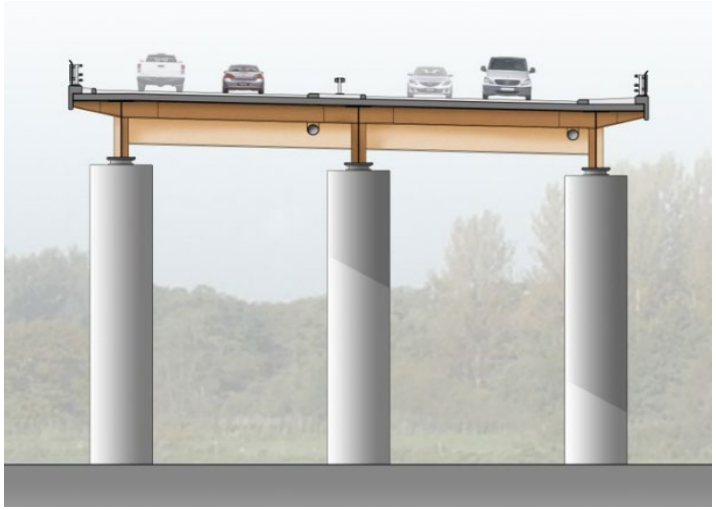
- Consider the visual impact of the structure in the landscape, and how it is perceived by people near (including drivers on the structure) and far from it;
- Not adversely impact the integrity of the environmental designations of the River Wensum (SAC/SSSI), or the wider floodplain;
- Enable continued movement of wildlife beneath the structure with planting placed appropriately to guide birds and bats;
- Minimise maintenance requirements with the materials and design details used;
- Enable a construction methodology that responds to the environmental constraints and need to minimise impact on the floodplain.

Figure 4-6 Illustrative long section of the viaduct Structure spanning across the floodplain

Figure 4-7 Photomontage view of the viaduct structure in the landscape

Figure 4-8 Photomontage view of the viaduct structure from the floodplain

Figure 4-9: Illustrative cross section of the viaduct structure showing the deck and piers



4.5.30 The viaduct construction methodology is described by section 3.6 in Chapter 3 of the ES 'Description of the Proposed Scheme' (document reference: 3.03.00). It is summarised as follows:

- Land north-west and south-east of the viaduct will be used temporarily for construction compounds, welfare facilities, and storage areas for materials;
- A temporary works platform will facilitate construction of the viaduct by providing a workspace and haul roads above the floodplain ground level which floods frequently, particularly in winter months;
- A temporary ('Bailey') bridge will be installed to allow access across the River Wensum during construction;
- Piles and piers will be installed at each location;
- The ladder beam steel girders and pre-cast concrete deck will be lifted into place by cranes for each span of the structure, with poured concrete connections;
- Temporary tracks, excess materials, the temporary bridge, and the platform will be removed once construction is complete, with areas reinstated.

3 Nursery Woodland Greenbridge (GB5)

4.5.31 A greenbridge will maintain wildlife connectivity to woodland parcels either side of the scheme for wildlife including bats as shown in **Figure 4 10**.

4.5.32 The structure spans over the mainline carriageway with a single support in the central reservation and piled abutments either side.

4.5.33 It comprises a series of longitudinal precast concrete beams supporting a concrete deck. Solid infill parapets at the outer edges of the deck maintain a dark corridor over the structure for wildlife.

4.5.34 The surface of the structure features a composition of native hedgerow and shrub planting designed to guide wildlife over the structure. The planting continues over the slopes earth approaches either side of the structure down to existing ground level to provide connectivity to existing woodland.

4.5.35 Of the four greenbridges proposed for the scheme, this is the only one with no central surfaced track as there is no public use proposed for this structure.

Design factors:

4.5.36 The Proposed Scheme has been designed to:

- Maintain connectivity for wildlife to safely cross the scheme;
- Ensure the greenbridge structure has suitable provisions to ensure successful establishment and longevity of the planting;
- Place the road in cutting beneath existing ground level which promotes uninterrupted flight paths of species over the road;
- Minimise loss of existing woodland habitats.

Figure 4-10 Illustrative render of Nursery Greenbridge

4.6 Central Section Ch 1750 – 3600

Overview

4.6.1 This section of the scheme includes the Ringland Lane underbridge, Morton Greenbridge, and closure of two side roads (Church Hill Lane and Breck Road) as shown in **Figure 4 11**.

4.6.2 The main constraints in this area include:

- Existing utility corridors including overhead power lines and a high-pressure gas main;
- Proposed utility corridors such as the Ørsted (Hornsea Three) and Equinor (Sheringham Shoal and Dudgeon Extension Projects DCO) Offshore Wind Farm schemes;
- Side roads and public rights of way which the scheme cross
- Woodland and habitats
- Severance of agricultural fields and the requirement to maintain access

4.6.3 The mainline carriageway crosses over Ringland Lane, where the two carriageways return to the standard central reservation width between them.

4.6.4 From here the carriageway is close to the existing ground level. Earth bunds are provided either side of the carriageway in necessary locations as to provide visual screening for local residents and properties.

4.6.5 The existing unsurfaced road (Blackbreck Lane) will become a Restricted Byway. It will be diverted where it crosses the Proposed Scheme, to provide a connection with Ringland Lane slightly east of its current location.

4.6.6 The closure of The Broadway, Breck Road (Breck Lane) and Church Hill Lane (Weston Road) to traffic (other than access) does not preclude continued movement for non-motorised users with east to west movements maintained via dual purpose greenbridge structures at network connections.

Figure 4-11 Illustrative overview plan of the central section of the Proposed Scheme design

4 Ringland Lane bridge (BR2)

4.6.7 An underbridge maintains access along the current alignment of Ringland Lane for vehicular traffic and non-motorised users, under the mainline as shown in **Figure 4 12**.

4.6.8 Precast concrete beams span between abutments to carry the mainline carriageway, with splayed wingwalls and earthworks to integrate the structure with the earth embankments either side.

4.6.9 Surveys demonstrate the use of Ringland Lane by bats as a flight path, the structure responds to this by maintaining the existing alignment of the road to not obstruct bat movement.

4.6.10 The use of solid infill parapets supports this as a dark corridor, from potential headlight glare. Planting also guides wildlife along Ringland Lane, through the structure.

Design factors:

4.6.11 The Proposed Scheme has been designed to:

- Maintain access along Ringland Lane for users and observed wildlife (including the existing bat flight path present);
- Respond to the species present by maintaining a dark corridor, including no lighting of the structure;
- Promote slower traffic speeds along Ringland Lane;
- Provide continuity in the appearance of structures to provide a clear identity to passers-by, and simplicity in maintenance.

Figure 4-12 Illustrative render of the Ringland Lane bridge

5 Morton Greenbridge (GB4)

4.6.12 A greenbridge will maintain connectivity to vegetation either side of the Proposed Scheme for wildlife including bats.

4.6.13 This structure was positioned and orientated such that it responds to bat flight lines, and aligns with the edge of existing retained woodland to the east, avoiding impact on this habitat.

4.6.14 It is a clear span structure over the mainline carriageway made up of longitudinal precast concrete beams supporting a concrete deck, with piled abutments either side.

4.6.15 Solid infill parapets at the outer edges of the deck maintain a dark corridor over the structure for wildlife.

4.6.16 The structure features a central surfaced track to provide east to west connectivity between Blackbreck Lane and Church Hill Lane (Weston Road) with a new bridleway.

4.6.17 Either side of the track is a composition of native hedgerow and shrub planting designed to guide wildlife over the structure as shown in **Figure 4 13**.

4.6.18 The planting continues over the slopes earth approaches either side of the structure down to existing ground level to provide connectivity to existing woodland.

Design factors:

4.6.19 The Proposed Scheme has been designed to:

- Maintain connectivity for wildlife and non-motorised users to safely cross the scheme;
- Ensure the structure has suitable provision to ensure successful establishment and longevity of the planting;
- Minimise loss of existing woodland habitats.

Figure 4-13 Illustrative typical cross section of a dual-purpose greenbridge structure with a central track

6 Church Hill Lane (Weston Road) closure

4.6.20 Engagement with local parishes and residents demonstrated support for the closure to vehicular traffic of minor rural side roads crossing the scheme.

4.6.21 Turning heads are provided for general traffic either side of the scheme to enable errant drivers to reverse their course. Access is preserved for affected landowners and parties to nearby property/land.

4.6.22 Connectivity is maintained for non-motorised users by a bridleway over Morton Greenbridge (GB4) and along Blackbreck Lane (proposed to be repurposed a restricted byway) as shown in **Figure 4 14**.

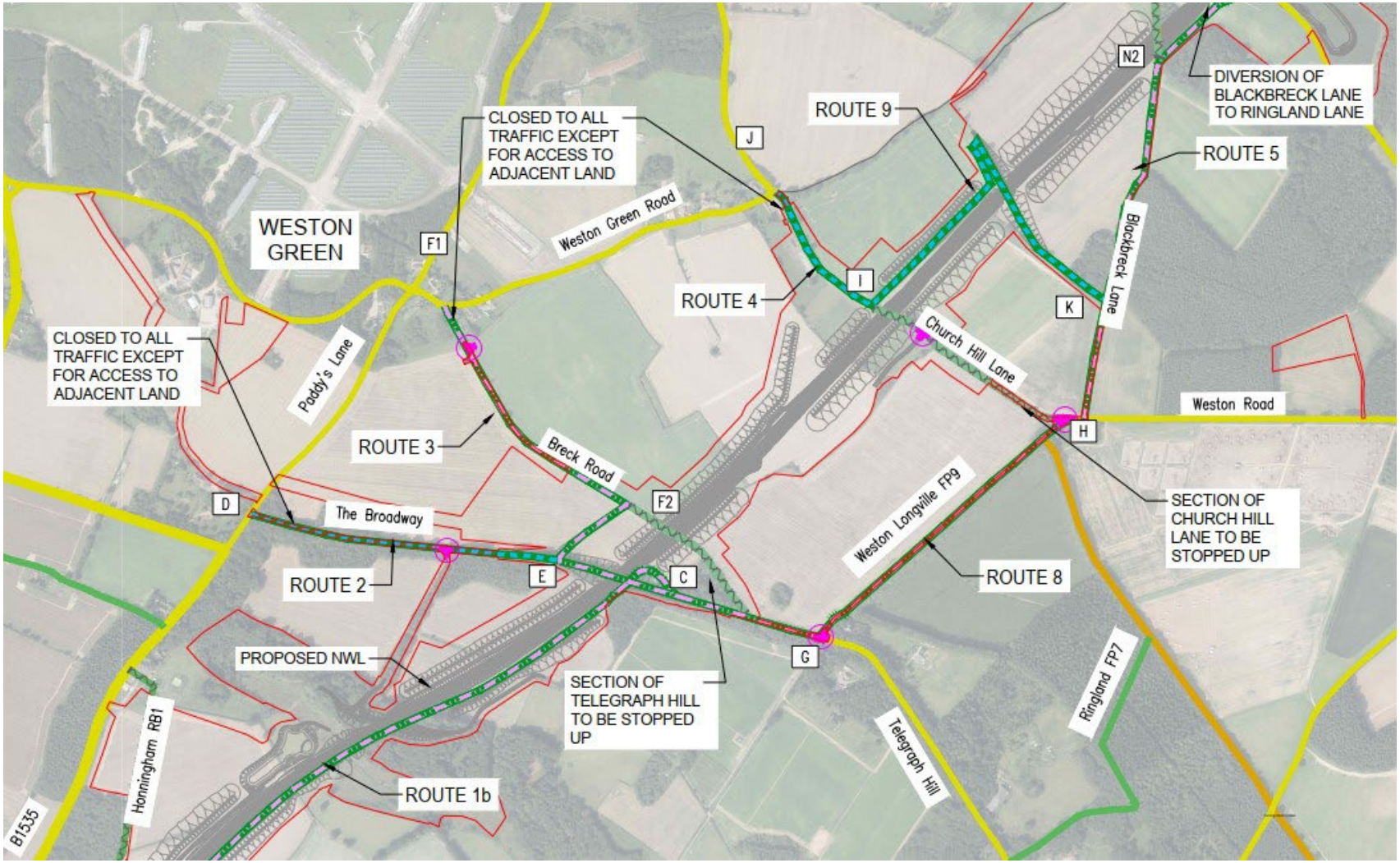
7 Breck Lane (Breck Road) closure

4.6.23 Engagement with local parishes and residents demonstrated support for the closure to vehicular traffic of minor rural side roads crossing the scheme.

4.6.24 Turning heads are provided for general traffic either side of the scheme. Access is preserved for affected landowners and parties to nearby property/land.

4.6.25 Connectivity is maintained for non-motorised users by a restricted byway over Broadway Greenbridge (GB1) as shown in **Figure 4 14**.

Figure 4-14 Extract from non-motorised user strategy plan (document reference 4.02.01)



4.7 Southern Section Ch 3600 – 5635

Overview

4.7.1 This section of the scheme includes The Broadway Greenbridge, Foxburrow Greenbridge, the Tud Tributary Culvert and the A47 connection as shown in **Figure 4 15** and **Figure 4 16**.

The main constraints in this area include:

- Woodland and habitats
- Minor watercourse – a tributary of the River Tud
- The connection with the National Highways A47 dualling scheme

4.7.2 A restricted byway (RB) is provided alongside the mainline on the eastern side, between The Broadway and the A47 connection. This replaces the Honingham RB1 which is severed by the Proposed Scheme.

4.7.3 Access is preserved for affected landowners and parties to nearby property/land.

Figure 4-15 Illustrative overview plan of the southern section of the Proposed Scheme design

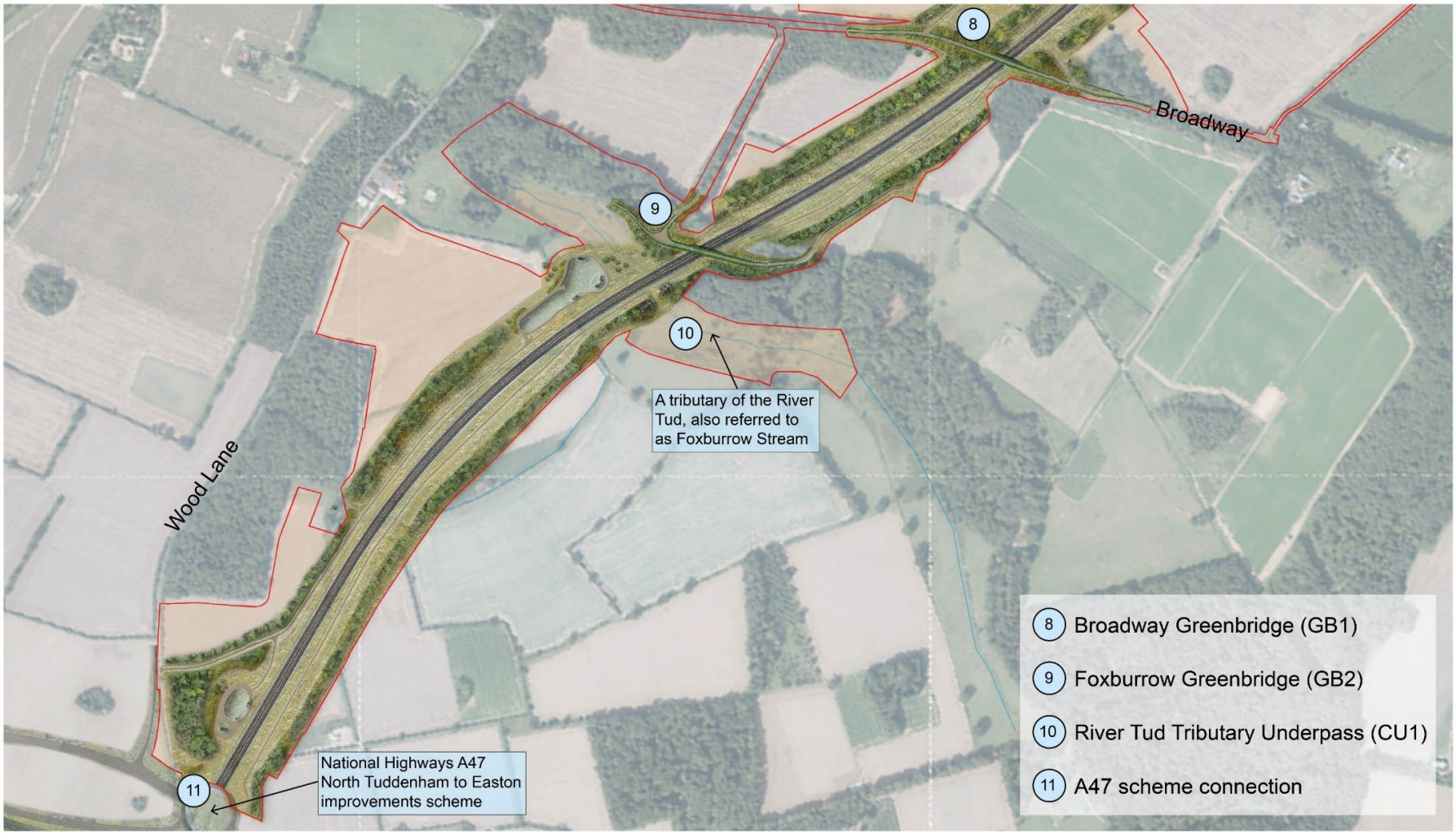
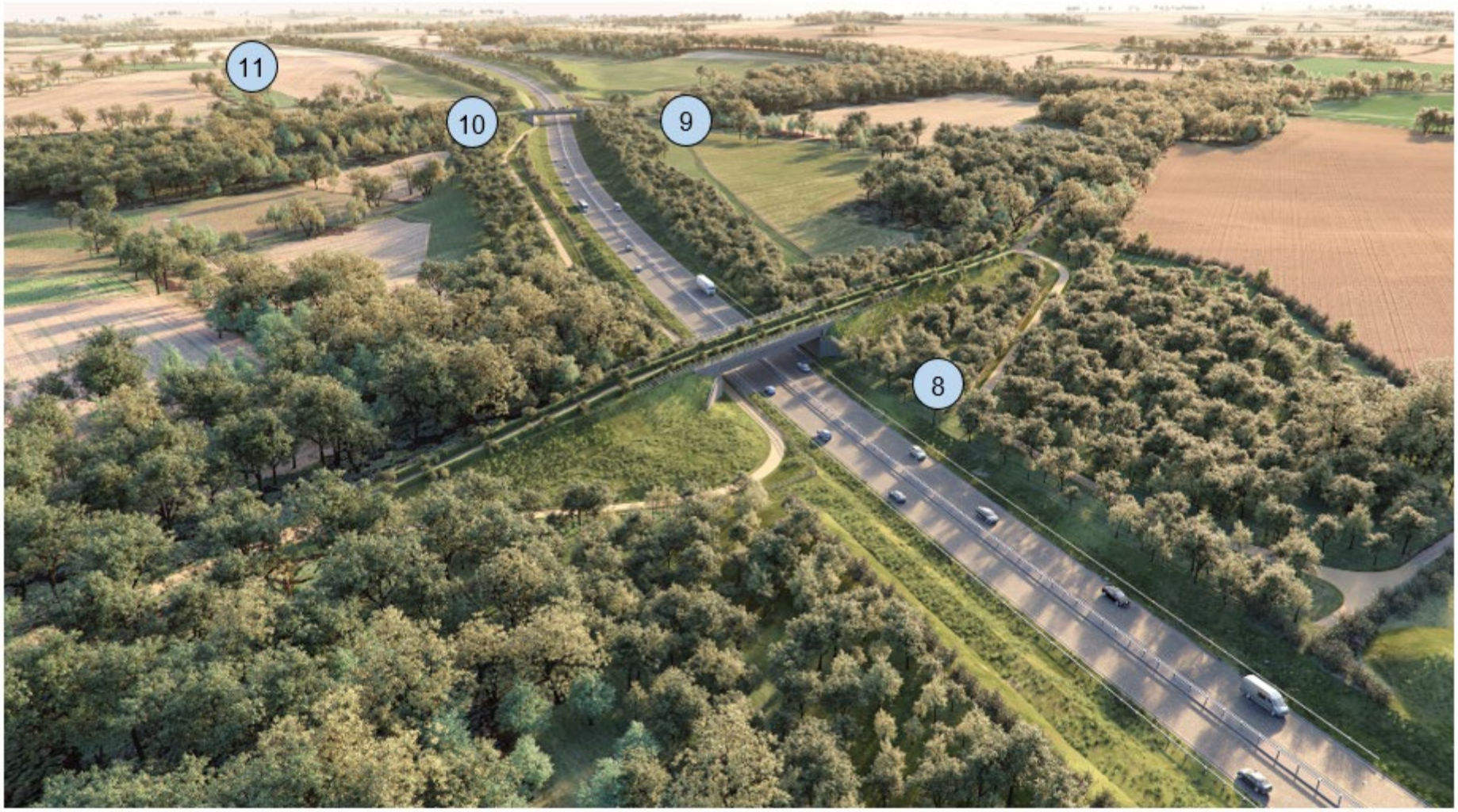


Figure 4-16 Illustrative render of the northern section of the Proposed Scheme design



8 Broadway Greenbridge (GB1)

4.7.4 A greenbridge (as shown in **Figure 4 17**) will maintain connectivity across the scheme for wildlife including bats, which commute along The Broadway at present.

4.7.5 The siting of the structure aligns with The Broadway to maintain this tree-lined bat flight path, with existing trees retained where practicable.

4.7.6 It is a clear span structure over the mainline carriageway made up of longitudinal precast concrete beams supporting a concrete deck, with piled abutments either side.

4.7.7 Solid infill parapets at the outer edges of the deck maintain a dark corridor over the structure for wildlife.

4.7.8 The structure features a central surfaced track to provide east to west connectivity between Blackbreck Lane and Church Hill Lane (Weston Road) with a bridleway.

4.7.9 Either side of the track is a composition of native hedgerow and shrub planting designed to guide wildlife over the structure.

4.7.10 The planting continues over the slopes' earth approaches either side of the structure down to existing ground level to provide connectivity to existing woodland.

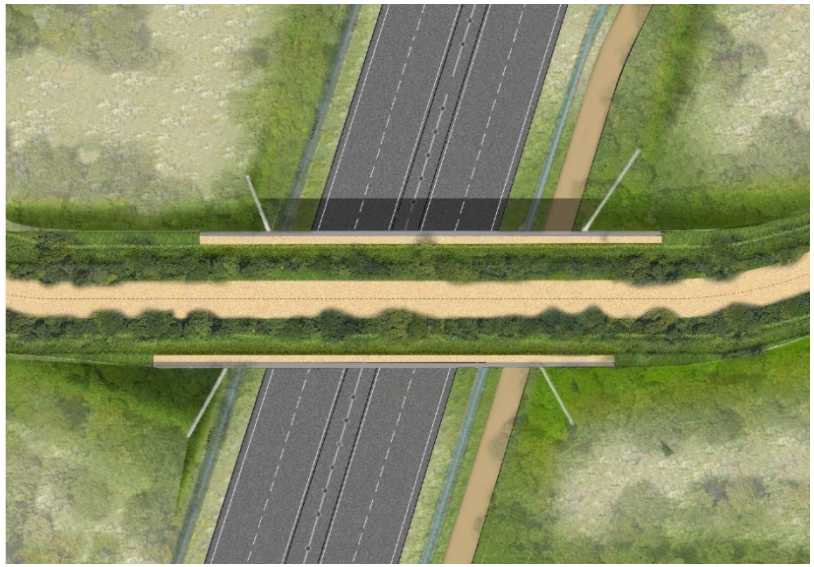
4.7.11 A bridleway passes beneath the structure alongside the mainline carriageway on the eastern side, where it loops back to connect to the north of The Broadway.

Design factors:

4.7.12 The Proposed Scheme has been designed to:

- Maintain connectivity for wildlife and non-motorised users to safely cross the scheme;
- Ensure the structure has suitable provisions to ensure successful establishment and longevity of the planting;
- Minimise loss of existing woodland habitats.

Figure 4-17 Illustrative plan view of a greenbridge



9 **Foxburrow Greenbridge (GB2)**

4.7.13 A greenbridge will maintain connectivity to woodland parcels either side of the scheme for wildlife including bats as shown in **Figure 4 18**.

4.7.14 The design balances the need to retain existing trees and habitat, whilst providing a functional crossing structure for wildlife in this location.

4.7.15 It is a clear span structure over the mainline carriageway made up longitudinal precast concrete beams supporting a concrete deck, with piled abutments either side.

4.7.16 Solid infill parapets at the outer edges of the deck maintain a dark corridor over the structure for wildlife.

4.7.17 The structure features a central surfaced track to maintain connectivity and provide a private means of access for the adjacent landowner.

4.7.18 Either side of the track is a composition of native hedgerow and shrub planting designed to guide wildlife over the structure.

4.7.19 The planting continues over the slopes' earth approaches either side of the structure down to existing ground level to provide connectivity to existing woodland. This greenbridge features a split approach on the western side to maximise connectivity to the woodland clearings which wildlife navigate at present.

4.7.20 A bridleway passes beneath the structure alongside the mainline carriageway on the eastern side.

Design factors:

4.7.21 The Proposed Scheme has been designed to:

- Maintain connectivity for wildlife to safely cross the scheme;
- Ensure the structure has suitable provisions to ensure successful establishment and longevity of the planting;
- Minimise loss of existing woodland habitats.

Figure 4-18 Render of Foxburrow Greenbridge

10 River Tud Tributary Culvert (CU2)

4.7.22 A precast concrete culvert structure will allow a minor watercourse (tributary of the River Tud) and wildlife to pass under the mainline carriageway.

4.7.23 As the culvert will be used by wildlife, it is designed to a suitable height to maintain flightlines.

4.7.24 The structure features splayed wingwalls and sloped earthworks which integrate it with the earth embankments and bunds either side.

Design factors:

4.7.25 The Proposed Scheme has been designed to:

- Maintain connectivity for the minor watercourse, and wildlife to cross beneath the mainline carriageway;

11 A47 connection

4.7.26 The southernmost extent of the Proposed Scheme adjoins the proposed National Highways A47 ‘North Tuddenham to Easton improvements’ dualling scheme at a roundabout junction as shown in **Figure 4 19**.

4.7.27 This scheme was granted development consent in August 2022.

4.7.28 The restricted byway alongside the mainline carriageway on the eastern side continues along the A47 scheme providing a connection south towards Honingham.

Figure 4-19 Render showing southern connection of the Proposed Scheme with the A47

4.8 Landscape Design Principles

4.8.1 The landscape design for the scheme has been developed in response to the following principles to integrate the Proposed Scheme in the landscape with earthworks and planting.

- Protect and preserve the local environment, rural character, and habitats;
- Ensure design is sensitive to the local context and rural setting in appearance, scale, and proportion;
- Consider the sense of place, perspective, and experience of all users;
- Provide a balance between integrating the proposed infrastructure into the landscape to visually 'conceal' it, whilst celebrating features where appropriate, such as the viaduct through high quality design;
- Consider the design at a landscape scale and consider connections to networks and functions beyond the scheme boundary;
- Create visual interest and a positive experience for all users of the scheme;
- Maintain and enhance Public Rights of Way (footpaths, bridleways, side roads and so on) to minimise severance and improve connectivity;
- Minimise the impact of the scheme with environmental barriers where necessary, focussing on natural solutions such as earth bunds, and/or planting to screen views;
- Maximise opportunities to enhance habitats and provide biodiversity net gain;
- Minimise fragmentation of land parcels and utilise planting to define new boundaries and provide a sense of separation where required for landowners;
- Consider maintenance and management in the design, and ensure a robust strategy is developed to enable the success of the planting, with minimal intervention and disturbance of wildlife long-term.

4.8.2 Planting areas support delivery of mitigation for protected species to provide habitat and foraging areas, tree loss compensation, and Biodiversity Net Gain.

4.8.3 This requires a targeted approach to site selection and planting types, which will be managed and protected to

meet certain criteria as set out in the Environmental Statement.

4.8.4 Ecological constraints informed the landscape design to avoid the creation of features that may attract species towards the road, and to provide habitat strata near existing woodlands.

4.8.5 The Proposed Scheme runs across two National Character Areas (NCAs) as identified by Natural England's profile reports published in 2014. These include predominantly NCA 78 - Central North Norfolk, and a small area at the southern extent within NCA 84 - Mid Norfolk.

4.8.6 Each profile defines conservation initiatives and provides a description of the natural and cultural features that shape the landscape, how they have changed over time, and key drivers for ongoing change.

4.8.7 The description provided for NCA 78 - Central North Norfolk acknowledges the similarities with the adjoining NCA 84 - Mid Norfolk area.

4.8.8 Key sensitivities and landscape opportunities identified by the two NCA profiles which are relevant to the development of the Proposed Scheme are presented in **Table 4 2** explaining how the design has responded.

Table 4-2 How the Proposed Scheme responds to the National Character Area opportunities

National Character Area Opportunity:	How the design has responded:
Protect the historic enclosed field pattern, with its characteristic winding lanes and boundary hedges.	Where the scheme severs fields, new boundaries will be created with native hedgerow and fencing. Existing hedges in proximity to the Proposed Scheme are to be retained and enhanced.
Manage and enhance woodlands by replacing conifer and poplar plantations with native tree species, re-introducing traditional coppice management, creating new woodlands, and connecting fragmented habitats.	New tree planting will feature mixed deciduous broadleaved native species providing new woodland areas and wildlife connectivity to existing nearby woodlands. This will be managed in line with best practice methods. Habitat mitigation areas proposing woodland enhancement include species management in favour of native deciduous broadleaved species.

National Character Area Opportunity:	How the design has responded:
Manage and enhance heathland habitats, restoring remnant areas and connecting fragmented habitats.	Whilst the heathland remnants referred to in the NCA are located elsewhere in North Norfolk, the design does respond to habitat connectivity across the landscape for wildlife to reduce fragmentation, with a particular focus on protected species such as bats, water voles, badgers, and barn owls.
Manage and enhance existing arable farmland for wildlife by working with landowners to reinstate hedgerows, increase areas of set aside and arable margins, and adopt wildlife-friendly land management practices through stewardship schemes.	A Landscape Ecological Mitigation Plan (LEMP) will be produced to present management of the landscape areas associated with the Proposed Scheme. Targeted enhancement to local habitat areas includes the reinstatement of hedgerows, new hedgerows with species rich seed mixes beside them to provide field margins, and working with landowners to manage grazing.

National Character Area Opportunity:	How the design has responded:
Plan green infrastructure, including areas of broadleaved woodland to screen new developments, to enhance landscape character, improve biodiversity and recreational opportunities, and to make a positive contribution to climate change.	The use of earth bunds either side of the mainline carriageway in key areas along with extensive planting provides visual screening to local receptors. The landscape design includes areas of tree planting, scrub, hedgerows, species rich grass mixes and planting for wetland areas around drainage basins. Planting areas have been maximised to ensure Biodiversity Net Gain is achieved, and that the road may be obscured from view by native planting replicating that found in the locality. The rural setting of the Proposed Scheme does not lend itself to promoting recreational activities, however sustainable modes of travel are encouraged by the design.
Plan strategic and local networks of sustainable transport and public access linkages to improve recreational opportunities and mitigate for increased visitor pressure.	A Sustainable Transport Strategy (document reference: 4.02.00) presents a strategy for non-motorised users to maintain connectivity across the network as part of the Proposed Scheme. Greenbridges are utilised to provide routes over the mainline carriageway to maintain connectivity for walking and cycling (and horse-riding on some routes) where side roads have been stopped up. The closure of roads will remove ‘rat-running’ traffic from local villages.

National Character Area Opportunity:	How the design has responded:
Minimising the effects of new development by avoiding areas with high tranquillity, incorporating green infrastructure and woodland buffers, and minimising new sources of light pollution.	Whilst the Proposed Scheme is new infrastructure in the landscape, its presence will reduce traffic on other local roads– therefore improving their experience. The design includes extensive areas of tree planting, and new woodland areas. No highway lighting is proposed (other than at the southern-most extent where the scheme meets the A47), and where bat species sensitive to headlights are anticipated to cross the scheme, solid infill barriers maintain dark corridors.
Enhancing sustainable access through the public rights of way network and National Trails, improving recreation and the health of the local community, and protecting agricultural management practices, habitats, and wildlife.	As described above, the non-motorised user network will be enhanced by the Proposed Scheme design with connectivity maintained and roads closed to general traffic. A LEMP will describe the management of habitat areas and agricultural practices to benefit biodiversity.
Investigating opportunities to create and enhance green infrastructure and public access by creating additional linkages between existing public footpaths, settlements, amenities, and transport links.	Greenbridges maintain connectivity for wildlife and non-motorised users, linking with existing routes on the network. The Sustainable Transport Strategy (STS) aligns with the objectives of 'Transport for Norwich' and 'Local Transport Plan 4' which seek to shift travel away from private cars to sustainable modes.

National Character Area Opportunity:	How the design has responded:
Maintaining the protected sites network, ensuring continued protection of priority habitats and species including the Norfolk Valley Fens SAC and River Wensum SAC, and SSSI including Foxley Wood.	The Proposed Scheme has been developed in a sensitive manner, responding to the environmental constraints in the design and construction methodology.
Maintaining and enhancing areas of ancient semi-natural woodland and planting new areas of broadleaved woodland to address fragmentation.	The Proposed Scheme has taken the necessary precautions to avoid impacts such as the use of a retaining wall instead of earth slopes near the Ancient Woodland to reduce the footprint of the scheme and maintain a buffer from the root protection area. The landscape design and essential environmental mitigation provides native tree species and habitats to address fragmentation for wildlife, and target protected species.
Increasing the biodiversity of conifer plantations by re-introducing native broadleaved trees.	The Proposed Scheme delivers Biodiversity Net Gain by providing a range of habitat types and areas, with connections to existing woodlands to provide benefits for wildlife and protected species.

4.9 Other Design Features

Essential environmental mitigation areas

4.9.1 In addition to the extensive planting proposed adjacent to the mainline highway presented in the Landscape Plans (document reference: 2.07.00), additional areas are required to provide essential mitigation for:

- Protected species (including bats, barn owls, water voles) to provide foraging areas and habitat
- Tree loss compensation
- Environmental and ecological mitigation

4.9.2 These areas include the following planting types which are presented on the Essential Environmental Mitigation Area Plan (document reference: 2.11.00):

- Woodland and scrub creation
- Woodland enhancement
- Woodland areas for bat box installation
- Grassland creation and enhancement of existing features
- Hedgerow creation and enhancement of existing features
- Water Framework Directive mitigation to naturalise watercourses

4.9.3 The areas of land identified for use have been selected for their proximity to known flight paths or habitats for protected species where the mitigation will provide benefit and enhance connectivity to existing habitats or foraging areas.

4.9.4 The areas have been developed through an iterative process engaging the landowner for their feedback, to ensure they can maintain operations elsewhere on their landholding. Some expressed preferences for the shape, placement, or enlargement of planted areas – particularly woodland creation, which further benefits biodiversity and offers visual screening to properties.

Earth bunds

4.9.5 Earth bunds have been incorporated in the design either side of the mainline carriageway for much of the length of the mainline carriageway to screen views of the Proposed Scheme from surrounding receptors.

4.9.6 The use of earth bunds and planting reduces the visual impact of the Proposed Scheme by obscuring or screening views to it, and can provide an acoustic screening affect.

4.9.7 Gaps in the earth bunds occur where features cross the mainline carriageway such as structures, Public Rights of Way, overhead and underground utilities. They have not been placed where the footprint of the design needs to be minimised to avoid existing woodland habitats, and the protection of trees contributes to the screening of views to the mainline carriageway.

4.9.8 The earth bunds enable material excavated during construction to be reused locally on site to avoid the need to remove and dispose of it offsite which is costly and less environmentally considerate.

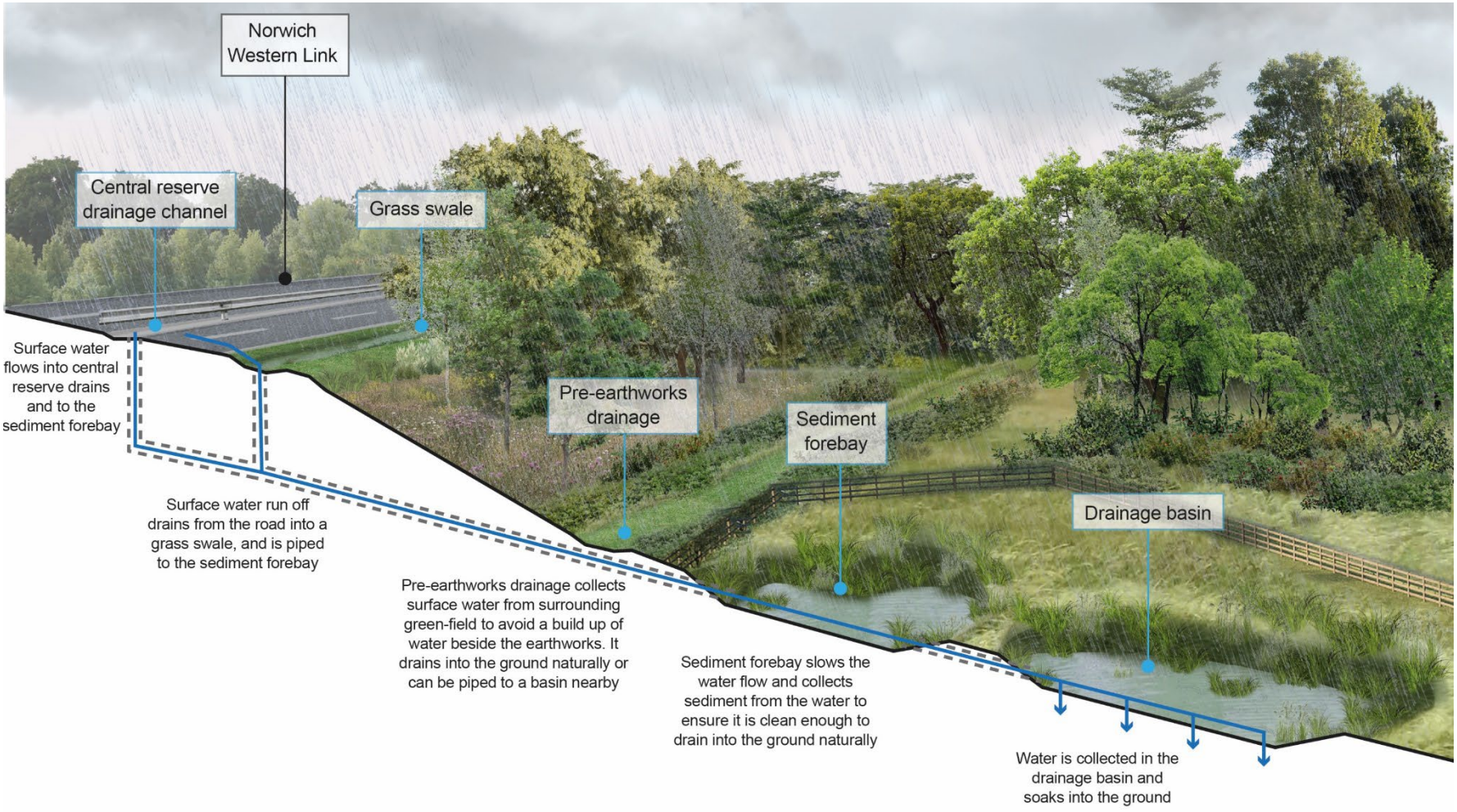
Drainage features

4.9.9 A Drainage Strategy and Design (document reference 2.08.00) have been developed to manage surface water run-off from the carriageway.

4.9.10 The water will flow into channels or grass swales to pipes which flow to a sediment forebay, and drainage basin system as shown in **Figure 4 20**.

4.9.11 The design includes shallow infiltration and attenuation basin types. They ensure the water is suitably treated prior to discharge.

Figure 4-20 Illustrative diagram of the drainage system for the Proposed Scheme



Dual purpose access tracks

4.9.12 Where appropriate for the Public Rights of Way network, maintenance access tracks required to inspect and maintain features of the Proposed Scheme, offer a dual-purpose as routes for non-motorised used.

4.9.13 The use of these tracks by vehicles is anticipated to be infrequent, however bays are provided for passing or stopping during maintenance activities.

4.9.14 Dual-purpose access tracks are used for a footpath between Ringland Lane and the Viaduct (Route 10 on the 'non-motorised user strategy plan' – document reference: 4.02.01), small sections of the shared pedestrian/cycleway to allow access to drainage basins (Route 11), and a bridleway between Church Hill Lane and GB4 (Route 9).

4.9.15 They also provide Private Means of Access for properties where the route is to be closed to general traffic, such as The Broadway.

4.9.16 By providing dual purpose access tracks, the lengths of hard-standing required are rationalised to minimise impacts on the environment and land take, while maintaining access.

4.9.17 Access to the tracks will be suitably managed with gates, bollards, or similar features to deter prohibited users, and maintain landowner access where required.

Carbon and sustainability

4.9.18 In accordance with overarching planning policy and the DMRB LA 114 Climate guidance document, the design has sought to minimise carbon emissions as far as possible in order to contribute to the UK's net reduction in carbon emissions.

4.9.19 A hierarchical approach to carbon management has been applied, (as described in PAS 2080: Carbon Management in Infrastructure) which applies the principles of build nothing, build less, build clever, build efficiently.

4.9.20 Carbon emissions for the Proposed Scheme have been calculated for the design, this has allowed for the consideration of carbon in the design process, resulting in the development of a carbon baseline from which further reductions may be made.

4.9.21 Monitoring and management of carbon will continue throughout the construction period to ensure an ongoing focus on climate change mitigation. Further information on the assessment of carbon emissions and the impact of the Proposed Scheme on or by climate change is presented in ES Chapter 15 Climate (document reference: 3.15.00).

4.10 Access: Non-Motorised Users

4.10.1 The access provision that forms part of the Proposed Scheme design has been presented throughout the Design and Access Statement design description.

4.10.2 Wayfinding signage and interpretation boards will be provided at key locations for non-motorised users to aid navigation and awareness of natural features and species that may be observed in the locality.

4.10.3 A Sustainable Transport Strategy (STS) (document reference: 4.02.00) has been developed as part of the Proposed Scheme's planning permission and statutory orders seeking public rights of way and other changes to local highways including the public highways.

4.10.4 The 'Non-motorised user strategy plan' (document reference: 4.02.01) presents the proposals for the PRoW and how they connect with the surrounding network.

4.10.5 Improvements for non-motorised users as part of the Proposed Scheme reach from a crossing at the A1067 and Marl Hill Road near Attlebridge in the north, to the A47 near Honingham to the south. This extends from Ringland in the east, to Weston Longville in the west and consider safe, convenient routes for all users for leisure or commuting purposes to promote sustainable travel modes.

4.10.6 It also considers a wider package of complementary measures. Some measures may be delivered alongside the Proposed Scheme as separate works but address the redirection of traffic from the local roads to the major roads and making those routes suitable for sustainable transport methods. The Proposed Scheme sets the conditions to enable those complementary measures to come forward subsequently.

4.10.7 This will support sustainable modes of transport and the non-motorised user network, maintaining accessibility and routes even where they have been closed to general traffic.

4.10.8 The strategy has been informed by stakeholder engagement, and the Local Access Forum Consultation event which feedback to be given on the proposed design.

5 Conclusion

5.1.1 The approach to the design of the Proposed Scheme has been based on the principles described. The principles were adopted to deliver good design outcomes, responding to environmental constraints and opportunities in the landscape and local context.

5.1.2 Design decision making has been influenced by the principles, and stakeholder feedback throughout the design development process.

5.1.3 The design has sought to avoid or minimise impacts, whilst realising opportunities for enhancement and delivery of Biodiversity Net Gain.

5.1.4 The design responds to policy and guidance relating to design and access for infrastructure projects, with the specific Strategies within the planning application for environmental, accessibility and user needs to be delivered as part of the Proposed Scheme. These include strategies for Essential Environmental Mitigation, Sustainable Transport measures, and Biodiversity Net Gain to deliver benefits for the environment and local community beyond the primary functions and advantages of the new road.