



The Sizewell C Project

8.3 Two Village Bypass Landscape and Ecological Management Plan

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EXECUTIVE SUMMARY

This version of the Two Village Bypass Landscape and Ecology Management Plan supersedes the Outline Landscape and Ecology Plan to Landscape and Ecology Plan previously submitted as part of the Accepted Changes (January 2021) [[AS-263](#)]. The approach aligns with the **draft DCO** (Doc Ref. 3.1(D)) requirement 22A which requires the two village bypass works to be carried out in accordance with this plan.

The **Landscape and Ecology Management Plan (LEMP)** seeks to provide clear objectives and principles for the establishment and long-term management of the landscape, and ecological mitigation proposals identified for the soft estate within the boundaries of the two village bypass (hereafter referred to as the 'site'), following construction of the two village bypass. The spatial extent of the **LEMP** is the same as the area within the **Illustrative Masterplan** provided at **Figures 5.2.2 to 5.2.5** within **Environmental Statement Addendum – Volume 2: Environmental Statement Addendum Figures – Chapter 5 Two Village Bypass** [[AS-197](#)]. The aim of the **LEMP** is to ensure post-construction habitats are created correctly and managed for their successful establishment and integrated within the surrounding landscape.

Objectives for post-construction habitats and landscape areas have been informed and established through a review of ecological survey information, the landscape strategy, policy requirements and in response to site specific mitigation and consultation.

The overriding intention of the site re-instatement, once the two village bypass has been constructed, is to conserve, restore and enhance landscape character and biodiversity at a landscape scale to provide long-term benefits to the biodiversity of Suffolk as a whole. Where possible, existing landscape features of importance for ecology and visual screening would be retained during construction.

New habitats would contribute to enhancing the landscape character of this section of the Rolling Estate Claylands, Rolling Estate Sandlands and Valley Meadowlands. They would also minimise the visual impact of the two village bypass in views from the surrounding landscape, minimise impacts on cultural heritage resources, improve access and recreation infrastructure and ensure the long-term sustainability and resilience of the landscape, including to predicted climate change.

Habitat creation approaches and subsequent management proposals for those habitats are outlined within this document including time frames.

Monitoring of post-construction and existing habitats would be undertaken to measure the success of the habitat establishment and subsequent management proposals and to determine if interventions are required.

This **Two Village Bypass Landscape and Ecology Management Plan** is an appendix to the **Associated Development Design Principles** [[REP3-023](#)] which is a certified document within Schedule 22 of the **draft DCO** (Doc Ref. 3.1(D)) and, in

respect of the two village bypass, is secured by Requirement 22A within Schedule 2 of the **Draft DCO** (Doc Ref. 3.1(D)).

1 INTRODUCTION

- 1.1.1 This **two village bypass LEMP** seeks to provide clear objectives and principles for the establishment and longer-term management, of the landscape, and ecological mitigation proposals identified for the soft estate within the two village bypass site (hereafter referred to as the site), following construction of the two village bypass site. The spatial extent of the **LEMP** is the same as the area covered by the **Illustrative Masterplan** provided at **Figures 5.2.2 to 5.2.5** within **Environmental Statement Addendum – Volume 2: Environmental Statement Addendum Figures – Chapter 5 Two Village Bypass** (Doc Ref. 6.14).
- 1.1.2 The aim of the **LEMP** is to ensure newly created post-construction habitats are successfully created and then correctly managed to ensure their successful establishment and integration within the surrounding landscape.
- 1.1.3 This **two village bypass LEMP** is an appendix to the **Associated Development Design Principles** [[REP3-023](#)] which is secured by requirements within Schedule 2 of the **draft DCO** (Doc Ref. 3.1(D)). The **LEMP** is intended to be an operational document that provides guidance for contractors and land managers.
- 1.1.4 The overarching objective of the **LEMP** is to provide an overview of how the habitats to be established along the two village bypass would be created and then managed in the long-term. Objectives for these habitats and areas have been informed and established through a review of ecological survey information, the landscape strategy, policy requirements and in response to site specific mitigation and consultation.
- 1.1.5 The **LEMP** will be reviewed throughout the detailed design process to ensure it continues to reflect the details of the target communities identified. Details of how the implementation of the **LEMP** will be monitored are set out in section 6 of this **LEMP**.
- 1.1.6 The **LEMP** would be managed by SZC Co. for a total of five years, or until adoption by the Highways Authority. It is expected that the detailed monitoring prescriptions will be managed in accordance with the monitoring principles as set in Table 6.1.
- 1.1.7 Detailed descriptions of the proposed development and the different phases of development are provided in **Volume 3, Chapter 5, Appendix 5.2.A** of the **ES Addendum** [[PDB-003](#)].
- 1.1.8 This document should be read in conjunction with the following documents:

- **Code of Construction Practice (CoCP)** (Doc Ref. 8.11(C));
- **Associated Development Design Principles** [[REP3-023](#)];
- **Two Village Bypass Plans – Plans for Approval: Two Village Bypass Proposed Landscape Masterplan and Finished Levels – Sheets 1 and 2** [[REP4-003](#)]; and
- mitigation strategies for relevant protected and notable species, as identified in **Volume 5, Chapter 7** of the **ES** [[APP-425](#)].

2 DOCUMENT STRUCTURE

2.1.1 The structure of this document is as follows:

- **Section 3:** sets out the baseline for the existing landscape typologies, habitats and soils types within the site;
- **Section 4:** sets out the landscape and ecological vision of the **LEMP**;
- **Section 5:** sets out management prescriptions per habitat type;
- **Section 6:** sets out monitoring requirements per habitat type; and
- **Section 7:** lists the document references.

2.1.2 In addition to the above, this **two village bypass LEMP** is supported by **Figures 1 and 2**. These figures appeared originally as **Figure 7.1** within **Volume 5, Chapter 7** of the ES [\[APP-427\]](#), and **Figure 6.3** within **Volume 5, Chapter 6** of the ES [\[APP-423\]](#) but have been updated in this LEMP to reflect the current proposals. **Figure 3** has been produced specifically for this document.

3 BASELINE

3.1 Existing habitats and landscape typologies

a) National Character Areas

3.1.1 The Suffolk Coast and Heaths NCA 82 (Ref. 1.1) is situated on the North Sea coast between Great Yarmouth to the north and the port town of Harwich to the south. It forms a long, narrow band extending between 10 kilometres (km) and 20km inland. The South Norfolk and High Suffolk Claylands NCA 83 (Ref. 1.2) is located on the western boundary of NCA 82. It occupies a large area of central East Anglia, stretching from just below Norwich in the north to the River Gipping in the south.

3.1.2 As shown on Figure 1, the majority of the site and surrounding area are situated within National Character Area (NCA) Profile 82: Suffolk Coast and Heaths. NCA82 shows characteristics of gently undulating farmland with areas of woodland and forest plantation in the surrounding area. This NCA is described within the NCA summary as sparsely settled and “...mainly flat or gently rolling, often open but with few commanding viewpoints”. More than half of the NCA is utilised for arable and pig farming. The remainder of the NCA (beyond the study area) is coast, lowland heaths (Sandlings) and forest plantations. Settlement within the NCA consists “mainly of small villages and iconic coastal market towns” and “remains a lightly populated, undeveloped area”. The main settlements (Lowestoft, Ipswich and Felixstowe) are restricted to the northern and southern extremes of the NCA.

3.1.3 West of the Park Gate Farm (see Figure 1), as well as at the northern edge of the study area, the landscape transitions into NCA83: South Norfolk and High Suffolk Claylands. This NCA covers a large area of central East Anglia and is a predominantly flat clay plateau incised by numerous small-scale wooded river valleys. Large areas of woodland are noted as being scarce within this Landscape Character Assessment, with views frequently open and occasionally exposed “although within the valleys it is possible to find quite confined landscapes with intimate views”. NCA83 is also “an area of mixed settlement patterns with nucleated villages found in the west and along the river valleys, intermixed with dispersed hamlets and moated farmsteads. Large, often interconnected village greens or commons are a key feature of the area”. The description also notes that “PRoW, including the Boudicca Way and Angles Way long-distance footpaths, and country estates and parklands continue to provide recreational opportunities”.

3.1.4 The site and surrounding study area are generally representative of NCA82, being predominantly located on arable farmland with areas of woodland and forest plantation.

b) Local landscape character areas/types

3.1.5 The following LCTs, as identified within the Suffolk Landscape Character Assessment (Ref. 1.3), are located within 2km of the site and are shown on **Figure 1**:

- Ancient Estate Claylands;
- Estate Sandlands;
- Plateau Estate Farmlands;
- Rolling Estate Claylands;
- Rolling Estate Sandlands; and
- Valley Meadows.

3.1.6 Most of the site lies within the Rolling Estate Sandlands LCT, transitioning to the Valley Meadowlands LCT at Whin Covert in the west, then Rolling Estate Claylands LCT at the north-western corner of the site around Park Gate Farm.

3.1.7 The Rolling Estate Sandlands LCT is described in the Suffolk Landscape Character Assessment as a “*complex and intimate landscape on valley sides*”. It is located on the valley sides of the River Alde, with tree belts and plantations a common feature that help create the complex and intimate landscape. This LCT is generally a focus of settlement, although less so within the study area.

3.1.8 The Valley Meadowlands LCT is located along the valley floor of the River Alde and its tributaries, west of Whin Covert. It is a generally flat landscape, often formed of grassland divided by wet ditches. Many fields are pasture and are grazed by cattle, but there are areas where fields have been converted to arable. Within the study area there are also some areas of carr or scrubby riparian woodland breaking up views along the valley, which is generally unsettled.

3.1.9 The Rolling Estate Claylands LCT is found on rolling valley sides, which within the study area includes the east facing valley slopes of the River Alde. These are broadly characteristic of this LCT, having a rolling

landform and fragmented woodland cover, as well as containing the landscape park at Glemham Hall and several areas of woodland.

c) Baseline habitats

- 3.1.10 **Figure 2** details the broad habitat categories as defined by the Phase 1 habitat categories (Ref. 1.4), present within the site.
- 3.1.11 The habitats present within the site boundary predominantly comprise predominantly intensively managed arable fields with no scarce arable weeds or other notable plant species identified. Arable field margins are a habitat listed under Suffolk's Priority Species and Habitats List. However, no botanically rich arable margins were identified within the site.
- 3.1.12 There are also small areas of semi-improved grassland which are heavily grazed by cattle and a horse paddock, as well as improved managed floodplain grassland within the River Alde corridor, interspersed with patches of tall ruderal and scattered scrub. A section of the River Alde and a related seasonally wet ditch system is within the site.
- 3.1.13 The fields are bounded by fences and hedgerows, with the majority of the hedgerows present being intact species-poor hedgerows, species-rich hedgerows with trees and defunct species-poor hedgerows although intact species-rich hedgerows, defunct species-rich and species-poor hedgerows with trees are also present.
- 3.1.14 Several blocks of woodland are present within the surrounding area. Foxburrow Wood CWS is an ancient woodland located immediately to the east of the site. There are seven other small, broadleaved copses present within the surrounding area comprising lowland mixed deciduous woodland.
- 3.1.15 Twenty-five ponds have been identified within 500m of the site.
- 3.1.16 Protected species relevant to the scheme include, terrestrial invertebrates, the breeding bird assemblage, bat assemblage and both otter and water vole which are present along the River Alde corridor.
- 3.1.17 Further information can be found in **Volume 2, Chapter 14** of the Environmental Statement [[APP-224](#)].

3.2 Soils

- 3.2.1 The underlying geology predominantly comprises sands and gravels, with overlying deposits of alluvium in places. The differences in the solid and drift geology present have resulted in differences in the characteristics of

the soils present and will have influenced the land management practices undertaken, and therefore the habitat types present.

- 3.2.2 In the western part of the site (with the exception of the area around the floodplain associated with the River Alde) the soils are slightly acid loamy and clayey soils with impeded drainage. These soils belong to the Burlingham 3 Soil Association¹. The main land use associated with these soil types is cereals, sugar beet and other arable crops.
- 3.2.3 Within the area of the River Alde floodplain, the soils are deep peat soils associated with clayey over sandy soils which in part are very acidic. These soils belong to the Mendham Soil Association. The main land use on these soils is permanent grassland, cereals, sugar beet and potatoes (where groundwater control (i.e. lowering) is possible).
- 3.2.4 Across the rest of the site the soils are freely draining slightly acid sandy soils belonging to the Newport Soil Association. The main land use on these soils is arable crops such as barley, other cereals and sugar beet, with some coniferous woodland and lowland heath habitats.

¹ A Soil Associations represents a group of soil types which are typically found occurring together in the landscape.

4 LANDSCAPE AND ECOLOGY VISION

4.1 Objectives

- 4.1.1 The objectives that underpin this management plan are designed to contribute towards the overall design vision and landscape strategy for the development as articulated in the **Associated Development Design Principles** [\[REP3-023\]](#).
- 4.1.2 The overriding intention is to conserve, restore and enhance landscape character and biodiversity. Where possible, existing landscape features of importance for ecology and visual screening would be retained during the construction of the two village bypass, such as Foxburrow Wood, Pond Wood and Nuttery Belt.
- 4.1.3 Inevitably given the scale of development, construction would result in the removal of vegetation and habitat loss and fragmentation (but mainly of relatively lower value arable land). The intention is to integrate the two village bypass into the landscape that it passes through to contribute to enhancing the landscape character of this section of the Rolling Estate Claylands, Rolling Estate Sandlands and Valley Meadowlands.
- 4.1.4 Other design objectives are to create and manage planting to minimise the visual impact of the two village bypass in views from the surrounding landscape. This would minimise impacts on cultural heritage resources, improve access and recreation infrastructure and ensure the long-term sustainability and resilience of the landscape – including to predicted climate change.
- 4.1.5 Specific landscape and ecological objectives, which will guide long-term management, are as follows:
- To return the temporary construction areas along the route to their current uses, which are predominantly arable and improved pasture agriculture respectively.
 - To reinforce and expand existing linear wooded corridors and create others to provide greater long-term connectivity for bats and other species on a landscape scale. Specifically, native woodland would be created in the vicinity of Foxburrow Wood.
 - To maximise the capacity of wildlife and landscape to cope with climate change, using a planting palette of species resilient to drought and disease that are not reliant on irrigation measures.

- To ensure mitigation structures such as oversized culverts remain functional and provide safe crossing points for protected species over the course of the operational phase.
- To ensure the River Alde corridor remain as naturalistic as practicable and remains vegetated to provide greater long-term connectivity for a range of species.
- To ensure landscape features and mitigation areas for nocturnal species are not illuminated or subject to light spill and that dark corridors are provided.
- To provide enhancement ponds which would provide additional pond habitat in the area and contribute to bio-diversity net gain and which will function as an enhancement of the aquatic habitats and habitat connectivity within the site post development.

4.1.6 These management objectives have been designed with the aim of enabling restoration at a landscape scale. The integration of infrastructure, landscape and access; and minimising habitat severance and increasing connectivity would provide long-term benefits to biodiversity of Suffolk as a whole rather than at a site level.

4.2 Habitat types

4.2.1 This **two village bypass LEMP** provides management and monitoring specifications for the following broad landscape types that are proposed to be created, enhanced or restored following completion of construction within the development site boundary. **Figure 3** illustrates the habitat types that would be created on the post-construction site within the DCO boundary, subject to this **two village bypass LEMP**. The habitat types are as follows:

- arable farmland;
- improved grassland;
- broadleaved woodland;
- scattered trees;
- native hedgerows;
- ponds / waterbodies; and

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- semi-improved grassland.; and
- floodplain grassland.

4.3 Habitat Types

a) Arable Farmland

4.3.1 Areas subject to temporary possession would be restored back to arable agriculture, where that is the current land use. These fields would revert back to and continue to be managed by the landowner as they are at present with field margins being retained and are therefore not the focus of this **two village bypass LEMP**.

b) Improved Grassland

4.3.2 Following completion of construction, several fields along the River Alde would be reseeded with grass and returned to pasture. These fields would continue to be managed by the landowner as they are at present and are therefore not the focus of this **two village bypass LEMP**.

c) Broadleaved Woodland

4.3.3 New areas of woodland would be established through planting. The new woodland would buffer and link existing areas of woodland within the site, as well as provide visual screening, and would be predominantly native broadleaved with a small component of mixed woodland (to increase climate change resilience). It would have structural and species diversity, and management would be aimed at enhancing biodiversity value rather than commercial timber management.

d) Scattered Trees

4.3.4 New areas of scattered trees are proposed around some road junctions and infiltration basins in order to provide a transition between broadleaved woodland and grassland. The trees would be native broadleaved, with species diversity, and management would be aimed at enhancing biodiversity value.

e) Speciment Trees

4.3.5 Planting of individual specimen trees is proposed in the vicinity of veteran or ancient trees that would be lost as part of the proposals. These trees would be of the same species as the veteran or ancient trees lost, and of local provenance where possible. Management would be aimed at allowing trees to develop an open crown that could mature into a veteran or ancient tree over time.

f) Native Hedgerows

- 4.3.6 New and replacement hedgerows would be created along much of the route of Two village bypass, to provide landscape integration and habitat linkages. Hedgerows would contain native species, including a proportion of tree species, and be species rich.

g) Grassland

- 4.3.7 Following completion of construction, those sections of the post-construction area comprising clay soils (to the east of the River Alde) would be seeded to create species rich grassland, that is neutral semi improved grassland. There would be different end use requirements dependant on specific locations of the grassland e.g. around infiltration basins and swales or at created ponds. The grassland would comprise a native species mix including the following grass species: Crested Dog's-tail (*Cynosurus cristatus*), Quaking-grass (*Briza media*), Sweet Vernal-grass (*Anthoxanthum odoratum*), Yellow Oat-grass (*Trisetum flavescens*), Red Fescue (*Festuca rubra*) and Common Bent (*Agrostis capillaris*). Forb species would include the following: Common Knapweed (*Centaurea nigra*) Oxeye Daisy (*Leucanthemum vulgare*), Common Bird's-foot-trefoil, Lady's Bedstraw (*Galium verum*), Common Sorrel (*Rumex acetosa*), Meadow Vetchling (*Lathyrus pratensis*), Meadow Buttercup (*Ranunculus acris*), Ribwort Plantain (*Plantago lanceolata*), Cowslip (*Primula veris*) and Cat's-ear (*Hypochaeris radicata*).
- 4.3.8 Those sections of the alignment which sit on free draining acid soils would be seeded to create species-rich grassland, that is semi-improved acid grasslands. The grassland would comprise a native species mix including the following grass species: Sheep's Fescue (*Festuca ovina*), Slender Red Fescue (*Festuca rubra subsp. litoralis*), Common Bent, Crested Dog's-tail, Sweet Vernal Grass and Wavy Hair-grass (*Deschampsia flexuosa*). Forbe species would include the following: Yarrow (*Achillea millefolium*), Autumn Hawkbit (*Scorzoneroides autumnalis*) Common Knapweed, Ribwort Plantain, Lady's Bedstraw, Cat's-ear, Common Bird's-foot-trefoil, Meadow Buttercup, Ragged-Robin (*Silene flos-cuculi*), Common Sorrel, Sheep's Sorrel (*Rumex acetosella*), Devil's-bit Scabious (*Succisa pratensis*) and Tufted Vetch (*Vicia cracca*).
- 4.3.9 Where areas cannot be practically seeded such as steep embankments in areas of cutting bare substrate will be left to naturally colonise with vegetation from surrounding habitat.

h) Floodplain Grassland

- 4.3.10 Following completion of construction, an area of approximately 2.77ha of existing improved grassland adjacent to the River Alde crossing within the

site boundary would be enhanced to create floodplain grassland to mitigate for the loss of improved floodplain grassland during construction. The existing floodplain grassland within this area is of low value, comprising predominantly a sown agricultural ley of perennial ryegrass and the focus would be on the creation of higher quality habitats, through improving both the diversity of the grassland sward and the habitats within ditches close to the River Alde.

i) Ditches

- 4.3.11 New wetland channels would mitigate the loss of approximately 143m of ditch associated with the land take from the proposed bypass footprint in this location which form the most valuable element of the existing floodplain grassland.

5 MANAGEMENT PROPOSALS

5.1 Overview

5.1.1 **Table 5.1** sets out an overview of the construction phase and pre-establishment management proposals. **Table 5.2** sets out the management proposals for habitats that would be created. **Table 5.3** sets out faunal enhancement management outline proposals.

5.1.2 Establishment and aftercare works are to be carried out by an approved landscape sub-contractor in accordance with good horticultural practice and the relevant British standards at the time of implementation.

5.1.3 Management procedures would be reviewed annually by the approved sub-contractor to ensure management proposals are aligned with habitat creation.

5.2 Ground preparation and soil management

5.2.1 The availability of soil resources in the right condition would be critical to the establishment of the required habitats. Topsoil and subsoil would be stripped and stockpiled (separately) on site so that it is available for reinstatement.

5.2.2 All soils would be handled in accordance with the **Outline Soil Management Plan [REP3-018]**, with a detailed soil resource plan to be prepared for the site by the contractor at a later date, as per the Code of Construction Practice (Doc Ref. 8.11(C)). This would set out the ways in which soils would be stripped, transported, stockpiled and restored, with a reconditioning step detailed should it be required. These would follow published best practice guidance and ensure that reinstated soils have the right physical and chemical characteristics for their required end use.

5.2.3 Soil materials with different characteristics would be stockpiled separately. This would ensure that the soil types which support the different habitats can be recreated in the required locations.

5.2.4 The requirements and methods for habitat creation would be included in dedicated habitat creation method statements.

Table 5.1: Construction phase proposals

Management Item Reference	Management Item	Proposed Management	Timeframe/Frequency on Management Actions
Watering			
W1	Planting and seeding	Planting should be aligned with appropriate seasons (spring and late autumn) to reduce the requirement for watering. The Contractor shall monitor watering requirements for all new seeding and planting until all establishment works are completed. Any losses are to be replanted in the next dormant season.	As required
Use of Herbicides and Fertilisers			
HF1	Herbicides and fertilisers	Following reinstatement, herbicides or fertilisers shall not be used for any maintenance or management operations that may cause harm to existing land uses (i.e. publicly accessible areas, or agricultural areas) or existing habitats.	Following reinstatement

Table 5.2: Proposed management proposals for newly created habitats

Management Item Reference	Management Item	Proposed Management	Timeframe/Frequency on Management Actions
Weed Control			
WC1	Injurious weeds	Weed control relates to infestations of injurious weeds as follows: Broad-leaved Dock (<i>Rumex obtusifolius</i>), Curled Dock (<i>Rumex crispus</i>), Common Ragwort (<i>Senecio jacobaea</i>), Creeping Thistle (<i>Cirsium arvense</i>) and Spear Thistle (<i>Cirsium vulgare</i>).	March-October As required

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Management Item Reference	Management Item	Proposed Management	Timeframe/Frequency on Management Actions
		Injurious weed control would use mechanical means of control such as topping or pulling where appropriate. In the event that injurious weeds are found on site specialist advice would be sought for any occurrences of invasive species, including Giant Hogweed (<i>Heracleum mantegazzianum</i>) and Japanese Knotweed (<i>Fallopia japonica</i>).	
WC2	Invasive species	In the event that species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) (Ref. 1.38) are found on site during the monitoring, an invasive weeds specialist should develop an Invasive Species Management Plan to specify the treatment methods and measures to prevent the spread of these species.	March-October As required
WC3	Herbicide application	Where weed killing is by a selective translocated herbicide, the herbicide shall be applied during a period of active growth in accordance with the manufacturer's instructions. Weed-killing shall be achieved by the total die-back of weeds. In the case of selective weed control there shall be not more than 5% re-growth during the season.	March-October As required
WC4	Herbicide application	Where weed control is by spot application, a translocated herbicide shall be applied with a device that ensures that the herbicide touches weed species only.	March-October As required
WC5	Removal of weeds by hand	Where weed control by pulling/hand-weeding, the work shall consist of the removal of the entire weed, including roots, by digging, forking, hoeing or pulling. Weeds shall be removed prior to flowering and the arisings removed from site.	March-October As required

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Management Item Reference	Management Item	Proposed Management	Timeframe/Frequency on Management Actions
Broadleaved Woodland			
BW1	Planting	<p>Planting would be undertaken in the dormant season (November to February) in random single species groups of 5 – 20 plants at centres varying between 1.4 –2.5m, to avoid excessive overcrowding and shading out problems.</p> <p>Planting shall be done on a ratio of roughly 40% to 50% canopy trees, 20% to 30% understorey trees and scrub, and c.30% open space.</p> <p>Tree guards will be used to protect woodland planting.</p> <p>Any stakes, guards and ties are to be monitored, replaced and adjusted to ensure tree growth is not adversely affected.</p>	<p>Construction Phase</p> <p>November to February</p>
BW2	Tree replacement	Any trees that fail or become damaged or diseased shall be removed and replaced in the next planting season with others of similar size and species.	<p>To be undertaken in planting season - November to February</p> <p>As required</p>
BW3	Weeding	All weed growth shall be controlled using mechanical means, such as strimming. Chemical treatments are to be used only as a last resort and should not be used in areas accessible to the public.	<p>May-October</p> <p>As required</p>
Scattered/Specimen Trees			
ST1	Planting	<p>Planting would be undertaken in the dormant season (November to February) in random single species groups of 3 - 5.</p> <p>Tree guards will be used for individual trees.</p>	<p>Construction Phase</p> <p>November to February</p>

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Management Item Reference	Management Item	Proposed Management	Timeframe/Frequency on Management Actions
		Any stakes, guards and ties are to be monitored, replaced and adjusted to ensure tree growth is not adversely affected.	
ST2	Tree replacement	Any trees that fail or become damaged or diseased shall be removed and replaced in the next planting season with others of similar size and species.	To be undertaken in planting season - November to February As required
ST3	Weeding	All weed growth shall be controlled using mechanical means, such as strimming. Chemical treatments are to be used only as a last resort and should not be used in areas accessible to the public.	May-October As required
Native Hedgerows			
H1	Planting	Planting of whips would be undertaken in the dormant season (November to February). Whips should be planted in double rows at a spacing of 20—30cm. Any stakes, guards and ties are to be monitored, replaced and adjusted to ensure hedgerow growth is not adversely affected.	Construction Phase November to February
H2	Hedgerow replacement planting	Any sections of hedgerows that fail or become damaged or diseased shall be removed and replaced in the next planting season with similar species.	To be undertaken in planting season - November to February One per annum
H3	Hedgerow margins	Hedgerow margins of a minimum 2m are to be left undisturbed. The margins should be cut either annually or bi-annually in late summer, after the flowers have seeded.	Main cut late Summer (late July/early August) One per annum

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Management Item Reference	Management Item	Proposed Management	Timeframe/Frequency on Management Actions
Grassland			
G1	Grass cutting	To be determined based on final specified grassland mixes.	To be based on specified grassland mixes.
G2	Scrub removal	Unless required for screening, or where it provides a boundary habitat, or is developing into desirable areas of scrub, scrub shall be managed and should only be removed outside the breeding bird season to retain an open grassland sward and maintain the grassland and scrub mosaics.	September to February inclusive One per annum
Floodplain Grassland			
FG1	Grass cutting	In areas of the site where grassland is retained, enhancement would be delivered via enhancement management regimes by cutting and the removal of arisings on a bi-annual/annual basis. Where areas of grassland are newly created under a dedicated habitat creation plan, once these become established, enhancement would be delivered via enhancement management regimes by cutting and the removal of arisings on a bi-annual/annual basis.	Spring and autumn (April/May and September/October) One/two per annum.
FG2	Scrub removal	Unless required for screening, or where it provides a boundary habitat, or is developing into desirable areas of scrub, scrub shall be managed and should only be removed outside the breeding bird season to retain an open grassland sward and maintain the grassland and scrub mosaics.	September to February inclusive One per annum

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Management Item Reference	Management Item	Proposed Management	Timeframe/Frequency on Management Actions
New ditches within River Alde corridor			
D1	Ditch management	<p>Ditches to be slubbed as required (but no more frequently than 1 in 5 years), between mid-September and the end of February to avoid breeding birds unless other ecological mitigation measures have been agreed.</p> <p>Water vole mitigation required, with pre-cutting to discourage voles in advance.</p> <p>Only short lengths to be slubbed rather than whole ditch lengths. Management of one side of a ditch only at any one time.</p> <p>Scrub will be managed to ensure it does not encroach on ditches to prevent overshadowing.</p>	<p>September-February</p> <p>One per annum</p>
Ponds			
P1	Water depth management	<p>Monitor water and silt levels in June</p> <p>Top up using non-chlorinated/untreated water as required to ensure depth of ca. 50% of planned maximum.</p> <p>Undertake general aquatic vegetation removal in December-January to maintain silt level below 500mm from original pond base</p>	<p>December-January</p> <p>One per annum.</p>
P2	Vegetation Removal	<p>Monitor balance of open water to aquatic/marginal vegetation in June every 2 years.</p> <p>Undertake clearance of vegetation on a rotational basis (5-7 years or as required)</p>	<p>December-January</p> <p>As required.</p>

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Management Item Reference	Management Item	Proposed Management	Timeframe/Frequency on Management Actions
		Removal of vegetation to be undertaken/supervised in December-January.	
P3	Scrub removal	Monitor scrub encroachment around banks in June. Ensure scrub does not dominate and shade pond. Cut scrub back in November to ensure shading of pond is less than 25%.	Every 2 years
P4	Pollution	Ensure pond is not degraded through pollution. Monitor for signs of eutrophication (algal blooms) or vegetation yellowing or death.	One/two per annum As required.
P5	Non-native species management	Inspect ponds for invasive aquatic species. Do not transfer water/sediment/vegetation from other waterbodies. Removal of non-native aquatic vegetation to be immediately undertaken if noted.	As required.

Table 5.3: Faunal enhancement management proposals

Management Item Reference	Management Item	Proposed Management	Timeframe/Frequency on Management Actions
FE1	Reptile hibernacula	No maintenance is required for the hibernacula, but if the structure is no longer suitable for wildlife (i.e. collapsed such that there are no longer cavities) then replace like for like.	One check per annum

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Management Item Reference	Management Item	Proposed Management	Timeframe/Frequency on Management Actions
FE2	Reptile egg laying	No maintenance is required for the reptile egg laying sites, but if the structure is no longer suitable for wildlife (i.e. collapsed such that there are no longer cavities) then replace like for like.	One check per annum
FE3	Bat boxes	Any lost or damaged bat boxes to be replaced once they have been checked by a licenced bat worker to ensure that no bats are present.	As required

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6 MONITORING REQUIREMENTS

6.1 General Monitoring

- 6.1.1 During the short-term (initial establishment) period which is likely to be twelve months from completion of construction, inspections shall take place by a suitably qualified specialist biannually in spring and late summer. After the first twelve months inspections would be carried out annually in late summer, until adoption of the scheme by the Highways Authority. These monitoring inspections will be used to measure the success of the management proposals and determine if interventions are required in order to deliver the landscape and ecology vision. This will be undertaken by the Environment Review Group. Monitoring proposals as detailed in **Table 6.1**, all specific detailed monitoring prescriptions will be in accordance with the requirements set out below.

Table 6.1: Monitoring proposals

Habitat / Feature Type	Party responsible	Timing of Monitoring	Requirements
Establishment	SZC Co. will be responsible for a total of 5 years from completion of works or until adoption by Highways Authority	Various	<p>There is always uncertainty where new habitat is being established. This is impacted by weather conditions, the quality of seed stock or green hay, variations in the conditions of the site, and problems with pernicious weeds. It is therefore recommended the management and monitoring of the target habitats be intensive during the first year and frequent over the subsequent four years to ensure any problems are identified early and resolved as quickly as possible.</p> <p>Checks would be undertaken by a suitably qualified specialist.</p> <p>The inspections would be undertaken to assess the establishment of habitats and the effectiveness of the LEMP and aftercare prescriptions, paying particular attention to:</p> <ul style="list-style-type: none"> • the success of establishment including disease, damage or death of planting; • inappropriate use or vandalism; • general appearance and condition; • the presence of invasive or non-native species that may require treatment; and • any evidence of protected species that could have implications for future management. <p>Safety issues reported by the public shall also be investigated as soon as practically possible and remedial works undertaken as necessary Public Engagement.</p> <p>Public engagement would be undertaken by SCZ Co. to keep users of the site informed of the works.</p> <p>A monitoring report would be prepared for SZC Co.</p>

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Target Communities	SZC Co. will be responsible for a total of 5 years from completion of works or until adoption by Highways Authority	Check bi-annually years 0, 1 and 2 Check annually year 3 – 5 Years 5-10 – A review of monitoring requirements would be undertaken in year 5 to detail timings for Years 5-10. If objectives are not met, then the LEMP would require amendment.	Before and after enhancement, reinstatement or creation a full botanical species list and quality assessment should be carried out to monitor the success of restoration and as a baseline for monitoring, this should include the presence and abundance of species. The NVC may be an appropriate method for collecting data for monitoring or this may be bespoke to the target communities. This would also include monitoring with regards to achieving the desired communities and quality as demonstrated in the biodiversity net gain report (ES Volume 5, Appendix 7A.4). Monitoring is essential to track the development of the target habitat(s) and troubleshoot any problems. Target communities would be set for each habitat type for years 1, 2, 5 and 10. Success would be monitored via the yearly monitoring surveys and reporting.
Woodland	SZC Co. will be responsible for a total of 5 years from completion of works or until adoption by Highways Authority	As above	Targets would be set according to thresholds identified for Section 41/Biodiversity Action Plan quality woodland in the Countryside Stewardship Higher Tier Scheme made specific to the site. Regular checks, at least one per annum, shall be made during the first five years of establishment to replace dead or diseased specimens, control weeds, re-stake plants as necessary and check deer/rabbit fencing. Monitoring would follow the Common Standards Monitoring Guidance for Woodland Habitats. This would weight desirable species against the injurious ones.
Scattered/Specimen Trees	SZC Co. will be responsible for a total of 5 years from completion of works or until adoption by	As above	Regular checks, at least one per annum, shall be made during the first five years of establishment to replace dead or diseased specimens, control weeds, re-stake plants as necessary and check deer/rabbit fencing. Individual specimen trees planted as compensation for the loss of ancient or veteran trees shall be monitored to ensure suitable space is available around the trees for an open crown to develop.

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	Highways Authority		
Hedgerows	SZC Co. will be responsible for a total of 5 years from completion of works or until adoption by Highways Authority	As above	Targets would be set according to thresholds identified for Section 41 of the NERC Act/Suffolk Biodiversity Action Plan quality hedgerows in the Countryside Stewardship Higher Tier Scheme made specific to the site. Regular checks, at least one per annum, shall be made during the first five years of establishment to replace dead or diseased specimens, control weeds, re-stake plants as necessary and check deer/rabbit fencing. Monitoring would follow the Hedgerow Survey Handbook.
Grassland	SZC Co. will be responsible for a total of 5 years from completion of works or until adoption by Highways Authority	As above	Regular checks, at least one per annum, of the newly established areas of grassland shall be made during the first five years of establishment. Targets would be set for each grassland type according to the species list gathered before construction and thresholds identified for Section 41 of the Natural Environment and Rural Communities (NERC) Act (Ref. 1.5)/Suffolk Biodiversity Action Plan (Ref. 1.6) as well as the Joint Nature Conservation Committee guidance. Monitoring would follow the Common Standards Monitoring Guidance for Lowland Grassland. This would weight desirable species against the injurious ones.
Floodplain Grassland	SZC Co. will be responsible for a total of 5 years from completion of works or until adoption by Highways Authority	As above	Regular checks, at least one per annum, of the newly established areas of grassland shall be made during the first five years of establishment. Targets would be set for each grassland type according to the species list gathered before construction and thresholds identified for Section 41 of the Natural Environment and Rural Communities (NERC) Act (Ref. 1.5)/Suffolk Biodiversity Action Plan (Ref. 1.6) as well as the Joint Nature Conservation Committee guidance. Monitoring would follow the Common Standards Monitoring Guidance for Lowland Grassland. This would weight desirable species against the injurious ones.

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New ditches within River Alde corridor	SZC Co. will be responsible for a total of 5 years from completion of works or until adoption by Highways Authority	As above	Regular checks, at least one per annum, of the newly established ditch habitat shall be made during the first five years of establishment to control scrub encroachment. Monitoring would follow the Common Standards Monitoring Guidance for Ditches.
Ponds	SZC Co. will be responsible for a total of 5 years from completion of works or until adoption by Highways Authority	As above	Regular checks, at least one per annum, of the newly established ponds shall be made during the first five years of establishment. Targets would be set for ponds according to thresholds identified for Section 41 of the Natural Environment and Rural Communities (NERC) Act (Ref. 1.5)/Suffolk Biodiversity Action Plan (Ref. 1.6) as well as the Joint Nature Conservation Committee guidance.
Year five survey and review	SZC Co.	Year 5	The following surveys, as a minimum, shall be included in the year five review: 1 protected species surveys; 2 monitoring surveys of bat and bird boxes; and 3 the reptile population. The results of the surveys shall be reviewed to identify any revisions to the management prescriptions deemed to be required to meet the objectives for the medium and long-term. Revised prescriptions shall be produced to guide the next five years. This information shall be presented as a 'Five Year Monitoring Report' to be shared with relevant stakeholders, upon which the Highways Authority will adopt the scheme.

REFERENCES

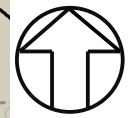
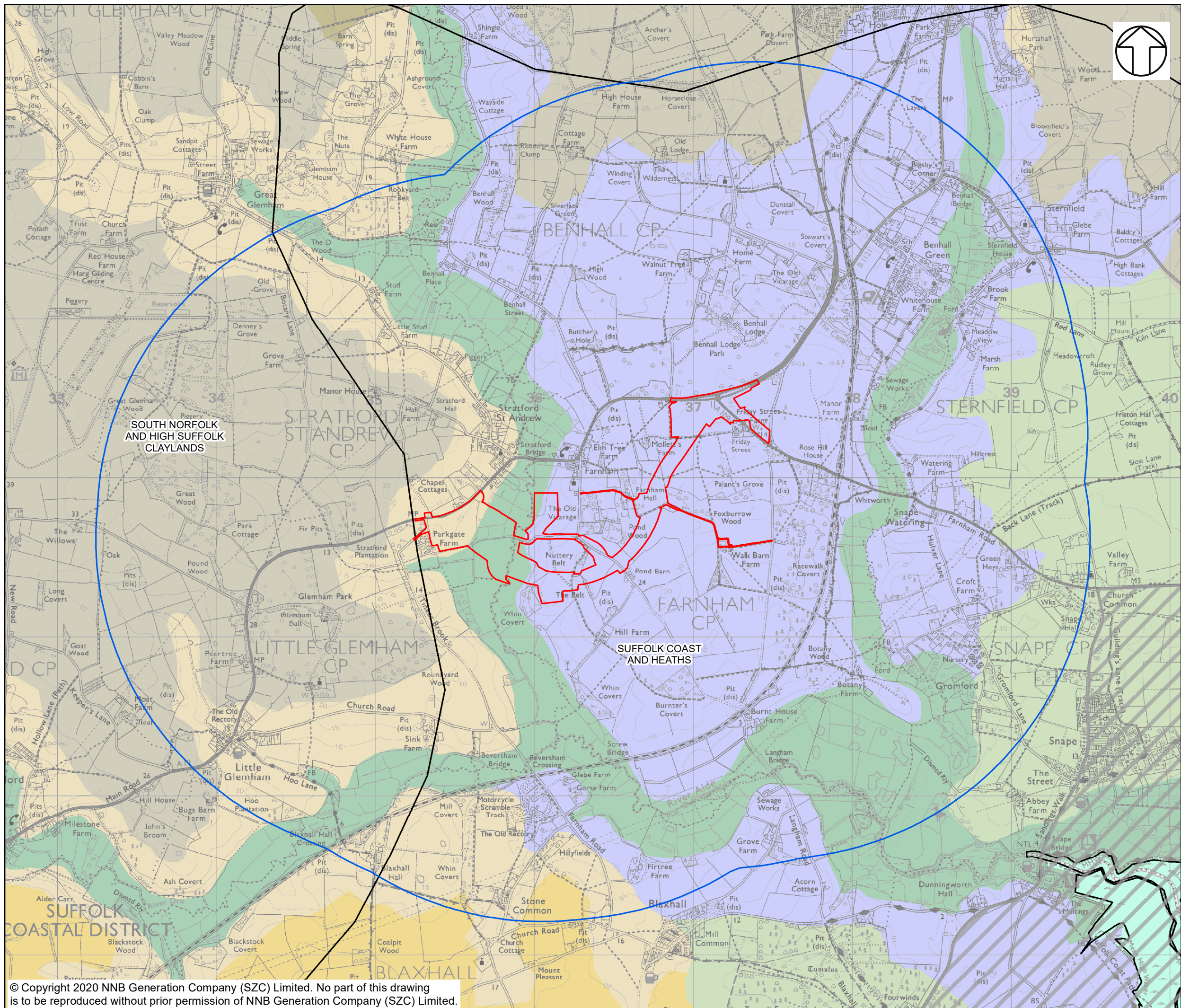
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FIGURES

Figure 1: Landscape Character within 5km of two village bypass

Figure 2: Phase 1 Habitat Plan

Figure 3: Proposed LEMP Habitat Typology



NOTES

KEY

- TWO VILLAGE BYPASS DEVELOPMENT SITE BOUNDARY
 - STUDY AREA (2KM FROM SITE BOUNDARY)
 - AREA OF OUTSTANDING NATURAL BEAUTY (AONB)
 - NATIONAL CHARACTER AREAS
- LANDSCAPE CHARACTER TYPES**
- ANCIENT ESTATE CLAYLANDS
 - ESTATE SANDLANDS
 - PLATEAU ESTATE FARMLANDS
 - ROLLING ESTATE CLAYLANDS
 - ROLLING ESTATE SANDLANDS
 - ROLLING VALLEY CLAYLANDS
 - SALT MARSH AND INTERTIDAL FLATS
 - VALLEY MEADOWLANDS

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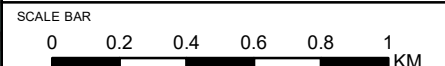


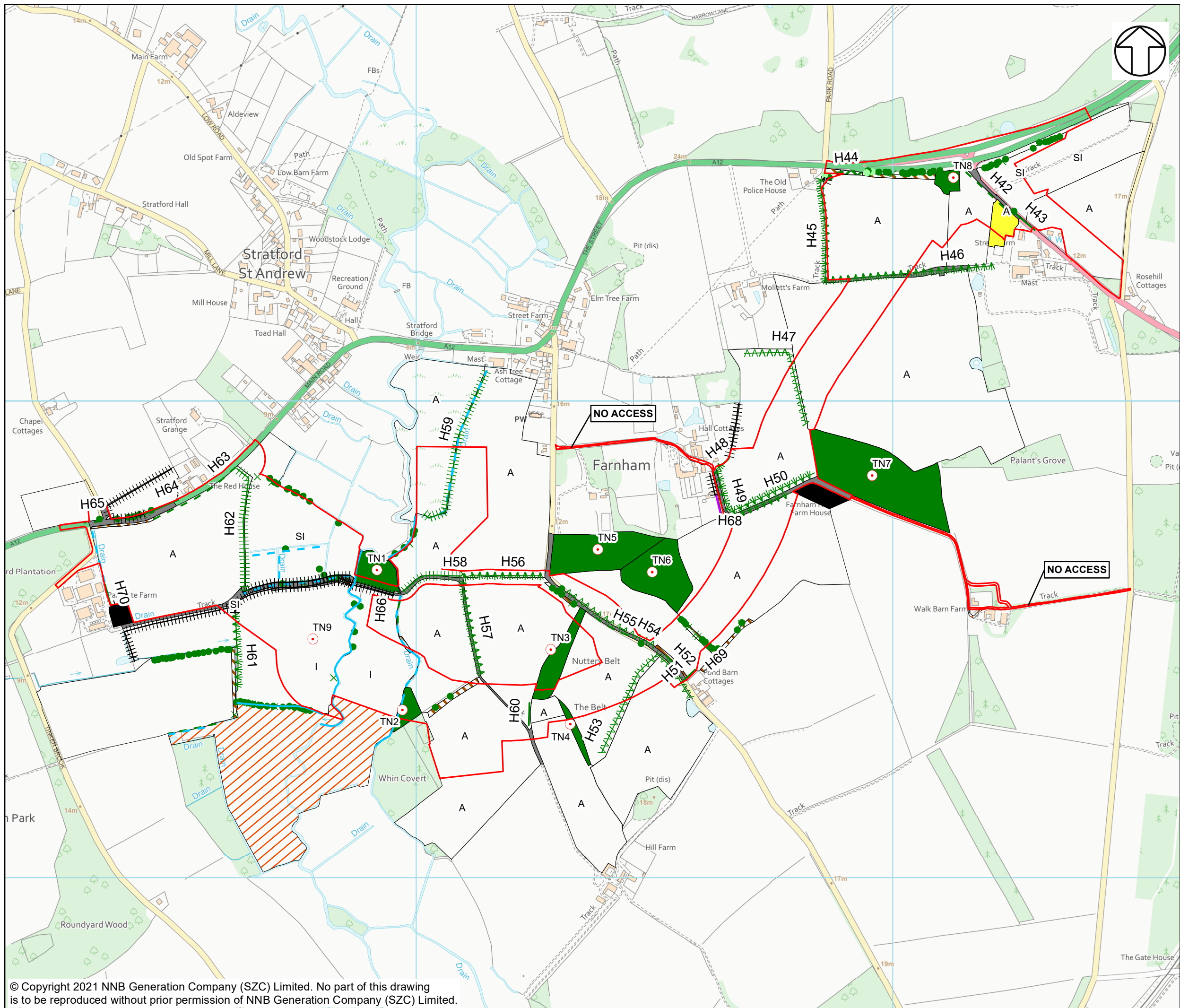
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 LANDSCAPE AND ECOLOGY MANAGEMENT PLAN (LEMP)
 TWO VILLAGE BYPASS

DRAWING TITLE:
 LANDSCAPE CHARACTER WITHIN 2KM

DRAWING NO:
 FIGURE 1

DATE: JUL 2021 **DRAWN:** V.W. **SCALE:** 1:22,500 @A3





NOTES

KEY

- TWO VILLAGE BYPASS DEVELOPMENT SITE BOUNDARY
- TARGET NOTE
- × SCATTERED SCRUB
- SCATTERED BROADLEAVED TREES
- SCATTERED CONIFEROUS TREES
- DRY DITCH
- DEFUNCT HEDGE - SPECIES-POOR
- DEFUNCT HEDGE - NATIVE SPECIES-RICH
- FENCE
- HEDGE WITH TREES - NATIVE SPECIES-RICH
- HEDGE WITH TREES - SPECIES-POOR
- INTACT HEDGE - SPECIES-POOR
- INTACT HEDGE - NATIVE SPECIES-RICH
- RUNNING WATER
- WALL
- CULTIVATED/DISTURBED LAND - GRASSLAND
- CULTIVATED/DISTURBED LAND - AMENITY GRASSLAND
- BUILDINGS
- HARDSTANDING
- INTRODUCED SHRUB
- POOR SEMI-IMPROVED GRASSLAND
- IMPROVED GRASSLAND
- SCRUB - DENSE/CONTINUOUS
- OTHER TALL HERB AND FERN -
- NO ACCESS

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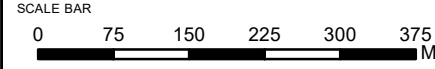


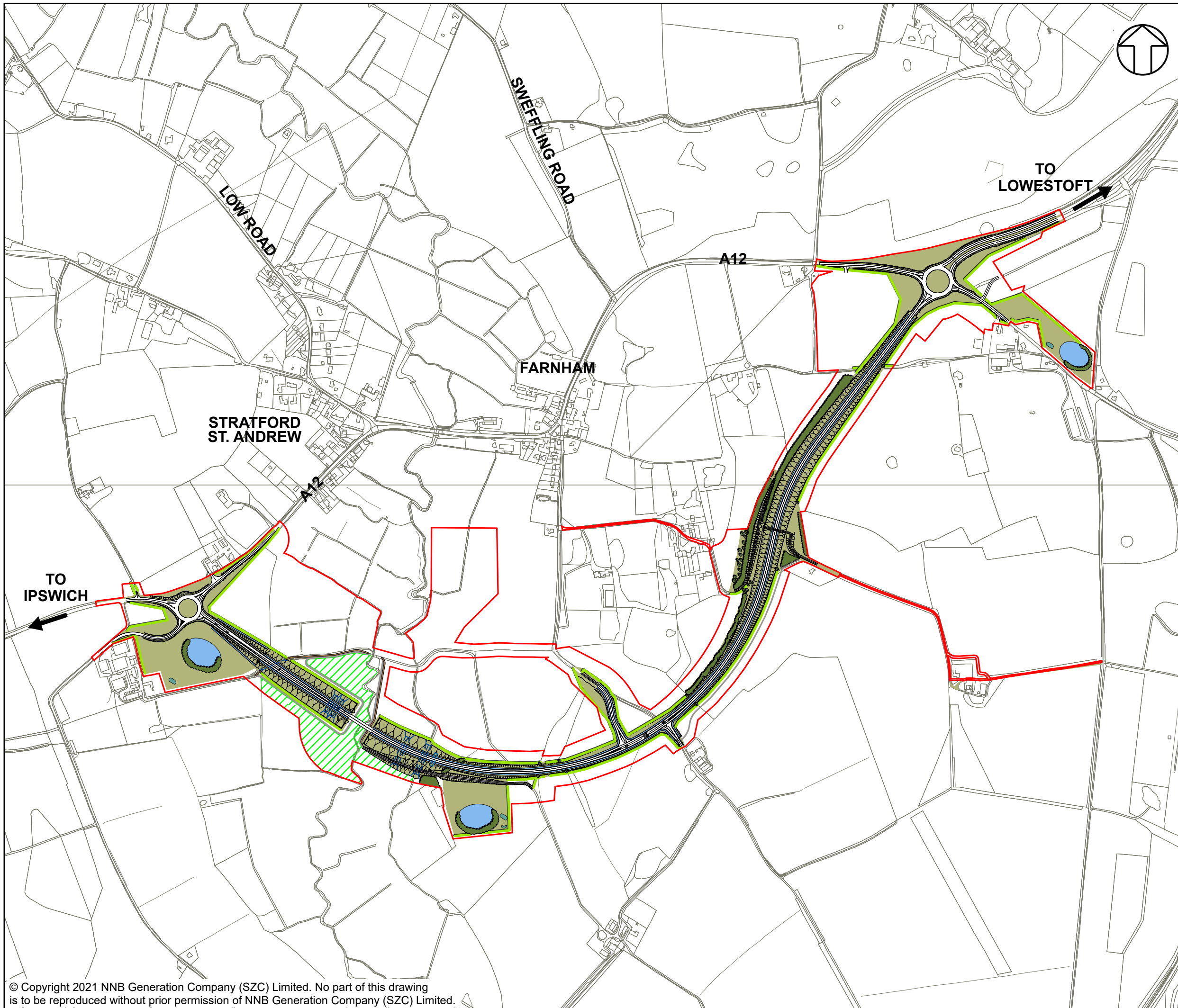
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 TWO VILLAGE BYPASS

DRAWING TITLE:
 PHASE 1 HABITAT PLAN FOR
 TWO VILLAGE BYPASS

DRAWING NO:
 FIGURE 2

DATE: JULY 2021 **DRAWN:** R.G. **SCALE:** 1:7,500 @A3 **REV:** 01





NOTES

KEY

- TWO VILLAGE BYPASS DEVELOPMENT SITE BOUNDARY
- BROADLEAVED WOODLAND
- SCATTERED TREES
- NATIVE HEDGEROW
- GRASSLAND
- INDICATIVE POND
- INDICATIVE ATTENUATION BASIN
- INDICATIVE SWALE
- INDICATIVE FLOODPLAIN GRASSLAND MITIGATION AREA

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 TWO VILLAGE BYPASS

DRAWING TITLE:
 HABITAT TYPOLOGY

DRAWING NO:
 FIGURE 3

DATE: JUL 2021	DRAWN: V.W.	SCALE: 1:25,000 @A3
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