REPORT

Exceat Bridge Replacement: Non-Statutory Environmental Assessment Report

Prepared for

East Sussex County Council

Date: 27th September 2023

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Document Issue

Revision History

Issue	Author	Date	Description
1	I. PEARCE	27/09/2023	Non-Statutory Environmental Assessment - 2023 construction compound

Technical Check

Role	Name	Signature	Date
Technical Director	P. Gambrill	PG	27/09/2023

Approval

Role	Name	Signature	Date
Design Manager	B. Lawal-Shekoni	BLS	27/09/2023

ESH Approval

Role	Name	Signature	Date
Project Manager	B. Lawal-Shekoni	BLS	27/09/2023

Acronyms and Abbreviations

Term	Definition
AADT	Annual average daily traffic
ANA	Archaeological Notification Area
AQO	Air Quality Objective
ASSIs	Area of Special Scientific Interest
AXO	Abandoned Explosive Ordnance
BAP	Biodiversity Action Plan
BEV	Battery-Powered Electric Vehicles
BNG	Biodiversity Net Gain
BNL	Baseline Noise Level
BOCC	Birds of Conservation Concern
BRE	Building Research Establishment
BS	British Standard
CEMP	Construction Environmental Management Plan
CFGM	Coastal floodplain grazing marsh
CIEEM	Charted Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association.
CO_2	Carbon Dioxide
CoPA	Control of Pollution Act
cSAC	Candidate for Special Area of Conservation
CWSs	County Wildlife Sites
dB	Decibels
Defra	Department for Environment, Food and Rural Affairs
DM	Do minimum scenario utilised in air quality and noise modelling
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
ECoW	Environmental Clerk of Works
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESCC	East Sussex County Council
FCEV	Fuel Cell Electric Vehicles
GCN	Great Crested Newt
GHG	Greenhouse Gas
GI	Ground Investigation
GIR	Ground Investigation Report
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GPP	Guidance for Pollution Prevention
ha	Hectares
HE	High Explosive
IAQM	Institute of Air Quality Management
IB	Incendiary Bombs
IEMA	Institute of Environmental Management and Assessment

Term	Definition
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
km	Kilometre
kW	Kilowatt
LCU	Landscape Character Unit
LDC	Lewes District Council
LI	Landscape Institute
LiDAR	Light Detection and Ranging, a surveying method
LNCSs	Local Nature Conservation Sites
LNR	Local Nature Reserve
LOAEL	Lowest observed adverse effect level
LSA	Land Service Ammunition
LVIA	Landscape Visual Impact Assessment
LWS	Local Wildlife Site
m	Metre
MAGIC	Multi-Agency Geographic Information for the Countryside
MCZ	Marine Conservation Zone
N	Nitrogen
NERC	Natural Environment and Rural Communities
NIA	Nature Improvement Area
NNR	National Nature Reserves
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_X	Generic term for nitrogen oxides
NPPF	National Planning Policy Framework
NRV	Notable Road Verge
PLDP	Primary Long-Distance Path
PPE	Personal Protective Equipment
PPG	Pollution Prevention Guidelines
PRoW	Public Right of Way
pSAC	Potential Special Areas of Conservation
pSPA	Potential Special Protection Area
PSSR	Preliminary Sources Study Report
RLB	Red Line Boundary
RPR	Rare Plant Register
SAA	Small Arms Ammunition
SAC	Special Area of Conservation
SCI	Sites of Community Importance
SDNP	South Downs National Park
SDNPA	South Downs National Park Authority
SNCI	Site of Nature Conservation Importance
SLNCI	Sites of Local Nature Conservation Importance
SOAEL	Significant observed adverse effect level
SPA	Special Protection Area

Term	Definition
SSSI	Site of Special Scientific Interest
t	tonne
TCO2e	Tonnes of Carbon dioxide Equivalent
UXO	Unexploded Ordnance
WCA	Wildlife and Countryside Act
WCH	Walkers, Cyclists and Horse Riders
WSI	Written Scheme of Investigation
WWII	World War II

1 Introduction

The planning application for Exceat bridge replacement scheme (Ref SDNP/21/02342/FUL) was recommended for approval on 8th December 2022. The initial Environmental Statement (ES) (2021)[1], located the construction compound just west of Seaford, identified as the 2021 Construction Compound (Option A). The ES Addendum (2022)[2] assessed the location of Option A as well as an additional proposed construction compound located adjacent to the Cuckmere River, closer to the Exceat Bridge, named the 2022 Construction Compound (Option B). Option A concluded to be the more preferable option due to its reduced environmental impact relative to Option B. The locations of these can be shown in Figure 1.1.

Figure 1.1: The location of the 2021 (Option A) and 2022 (Option B) Construction Compound

Following the planning application and further discussions with the landowner of Dymock Farm, there has been a change in the chosen location Option A. The new construction compound will be located on the same field, further to the east between the proposed 2021 and 2022 construction compounds (See Figure 1.2).

This report is supported by the following appendices:

- Appendix A – Ecosystems Services Statement
- Appendix B- Assessment Methodologies taken from the Environmental Statement (2021)
- Appendix C – Biodiversity Net Gain Tool
- Appendix D – Air Quality Environmental Baseline

[1] East Sussex Highways. Exceat Bridge Replacement: Environmental Statement Volume 2. (Document reference: 3520000-ESH-ENV-SY2-0129-DO-0001)

[2] East Sussex Highways. Exceat Bridge Replacement: Environmental Statement Addendum. (Document reference: 3520000-ESH-EAC-DE-LE-0002)

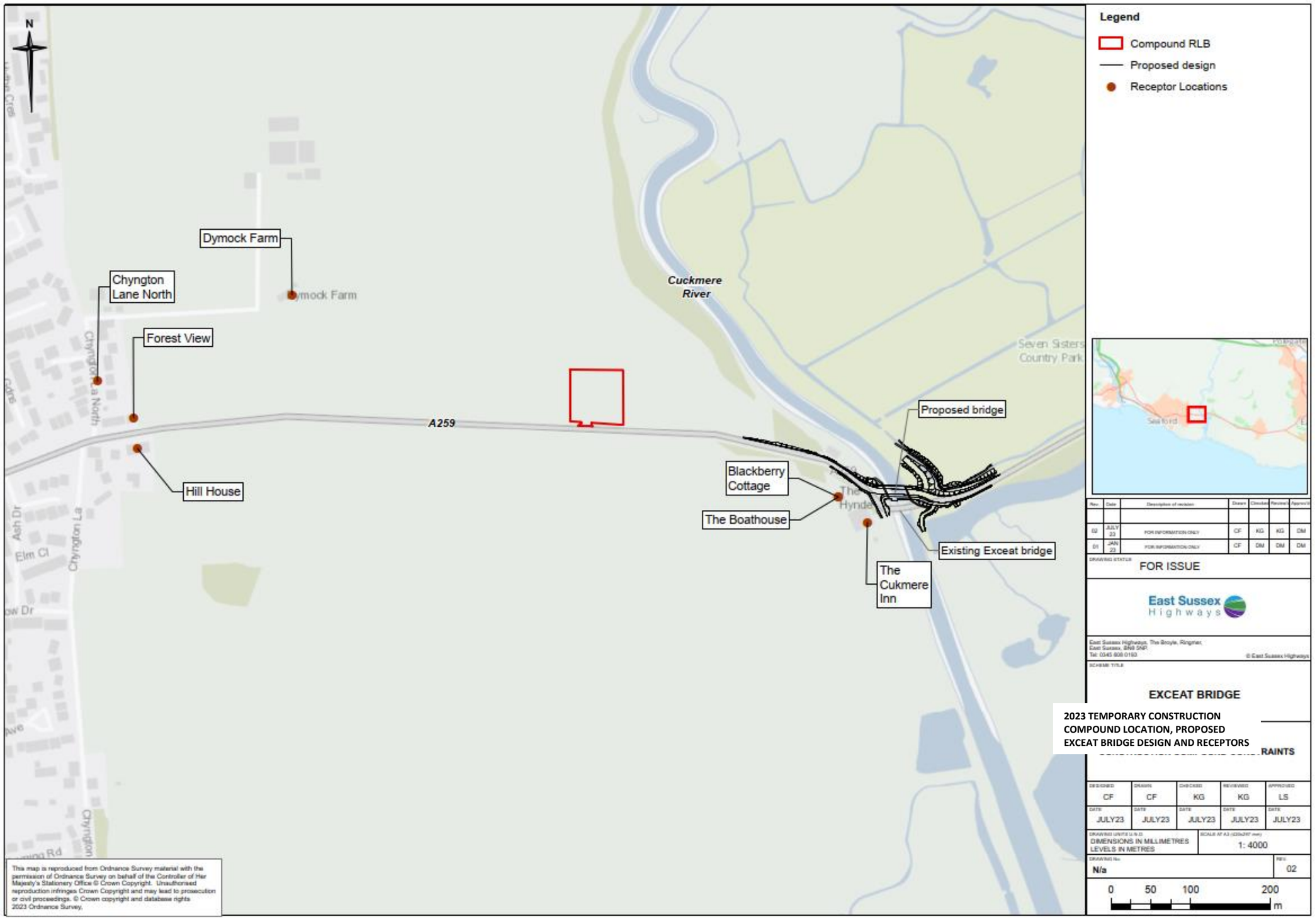

Figure 1.2: The 2023 revised site for the temporary construction compound location

2 Purpose of this report

2.1 Purpose

Since the publication of the ES Addendum (2022), the landowner has requested that the location of the construction compound be moved east of the 2021 construction compound location along the A259 albeit within the same arable field as that of the 2021 compound. The alternative 2023 construction compound proposed is shown in Figure 1.2

Having regard to the selection criteria in Schedule 3 of the *EIA Regulations*[3], specifically the location, which is very sensitive to change, the types and characteristics of the potential impacts, in particular the nature, complexity, and the spatial extent of those impacts, the South Downs National Park Authority (SDNPA) has adopted the opinion that the 2023 compound does require a level of EIA assessment and consideration.

This technical note documents any changes to the baseline, the impacts and potential significance of effects associated with the 2023 compound where not originally captured in the ES Addendum (2022). This note does not intend to duplicate baseline material or assessment aspects captured in the previous assessments. Rather, it will present any deviations identified in the baseline, potential significance of effects and identified mitigation.

2.2 Structure

The structure of this report following the previous ES (2021) and ES Addendum (2022) and is set out as follows:

- Site Location
- Overall assumptions the assessments have been founded upon
- Environment aspect sections which present assessment methodology, baseline conditions, potential effects and their significance of the 2023 compound, mitigation and any residual effects is reported. This report will include the following topics:
    - Geology and Soils
    - Air Quality
    - Archaeology and Cultural Heritage
    - Biodiversity
    - Climate
    - Landscape and Visual
    - Lighting
    - Noise and Vibration
    - Population and Human Health
- Summary and Conclusions
- Supporting Appendices

[3] The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk)

3 Site Location

The 2023 compound is located immediately north of the A259, Eastbourne Road and east of Exceat Bridge. The construction compound is situated within Dymrock Farm, on arable agricultural land. The site lies on relatively flat ground above, outside of the Cuckmere valley within South Downs National Park (SDNP). It is approximately 0.7km east of Seaford and 0.25km west of the River Cuckmere. A Red Line Boundary (RLB) of the compound is presented in Figure 1.2 The centre of the proposed compound is situated at grid reference TV 51041 99456.

The 2023 compound size and arrangement echo that of the 2021 compound, that being 0.35ha, with access onto the A259 Eastbourne Road. This size is well within the thresholds of *Part 10f of Schedule 2 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017*, herein referred to as the *EIA Regulations 2017*[4]. The 2023 compound is located approximately 0.45km closer to the bridge than the 2021 compound.

[4] The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk)

4 Assumptions

The assumptions identified for this specific site and assessment are as follows:

- This assessment only considers the potential environmental impacts in regard to the 2023 compound. It is assumed all other elements of construction for the wider scheme echo that reported in the ES Addendum (2022) and will not be repeated here.
- The environmental commitments included in the Construction Environmental Management Plan[5] (CEMP) remain valid and unchanged and therefore will not be repeated here. The CEMP has been produced for the entire scheme, however, includes information specific to measures which should be implemented for the site compound construction and temporary operation and decommissioning (to be issued as part of this planning application for information).
- The Planning Policy Context outlined in the Environmental Statement, 2021 Section 3.2 remains valid therefore, will not be repeated in this report. An Ecosystem Services Technical advice note has been prepared to support this application (see Appendix A).
- The baseline conditions (with exception of biodiversity) documented in the ES Addendum are considered fit for purpose and relevant given it has been less than six months since baseline conditions were captured and documented in the ES Addendum (2022).
- The assessment methodologies documented in the ES (2021) are considered applicable for this smaller element of the wider scheme. Refer to the ES Sections 7, 8 and 10 for topic specific assessment methodologies and criteria. See Appendix B for details of these assessment methodologies. Assessment methodologies for Biodiversity, Landscape and Visual, Noise and Vibration, and Population and Human Health are not within the Appendix as they have been amended for this report.
- The 2023 compound size and arrangement echo that of those compounds assessed in the ES Addendum (2022), that being 0.35ha.
- Certain species have been scoped out of the biodiversity assessment, where there are no additional construction or operational impacts, mitigation, compensation or changes in residual effects when compared to the ES Addendum (2022).

[5] East Sussex Highways. Exceat Bridge Replacement: Construction Environmental Management Plan. (document reference: 3520000-ESH-EAC-DE-LE-0004) – to be issued for information as part of this planning application

5 Geology and Soils

5.1 Baseline Conditions

The screening and scoping report[6] provided a summary of the geological and soil conditions for the original scheme boundary. This section updates pertinent information for the revised temporary construction compound location.

5.1.1 Soils

Provisional agricultural land classification data for the site indicate the land to be of Grade 3 (good to moderate) quality, with no site-specific post-1988 data available. Soilscapes data (Cranfield Soil and Agrifood Institute, 2023) indicate shallow lime-rich soils over chalk or limestone to be present.

5.1.2 Geology

No designated sites of geological importance have been identified within the site boundary.

5.1.3 Land contamination

The geotechnical Preliminary Sources Study Report (PSSR)[7] and subsequent ground investigations were prepared based on the original scheme boundary and did not cover the revised temporary construction compound location. However, small-scale historical mapping within the PSSR did include the revised construction compound location, and this indicated that the site has been in agricultural use since the late 1800s, with a low likelihood of potential contamination.

No historical or authorised landfills have been identified within the vicinity of the site either. Notwithstanding, there remains the potential for unexpected contamination from past agricultural activities or localised infilling of land.

5.1.4 Unexploded Ordnance

Preliminary and detailed Unexploded Ordnance (UXO) threat and risk assessments were undertaken by 6 Alpha Associates (October 2017 and January 2019) as part of the PSSR and in advance of the 2019 Ground Investigation works. Both assessments found the risk level posed by UXO to be very high. Potential threat sources identified include:

- Abandoned Explosive Ordnance (AXO), Land Service Ammunition (LSA) and Small Arms Ammunition (SAA) associated with former World War II (WWII) military training areas which could be encountered in previously undisturbed ground to approximately 2m below ground level. The possibility of deeper encounters was raised as a result of the potential for removal and replacement of river sediment from tidal action;
- WWI and WWII sea mines;
- German High Explosive (HE) bombs and Incendiary Bombs (IB); and
- British Anti-Aircraft Ammunition.

It is noted that the preliminary and detailed UXO threat assessments were undertaken prior to the identification of the location for the temporary construction compound. Given the very high

[6] East Sussex Highways, 2018: Environmental Screening and Scoping Report, SY2-0129. Costain-Jacobs JV, Ringmer.

[7] A copy of the PSSR can be provide on request being held by Jacobs.

risk from UXO in the general area of Exceat Bridge, it is probably that a similarly very high risk would apply to the location of the temporary construction compound.

5.2 Potential construction and operational impacts

The following potential effects could arise as a result during the construction phase due to the formation and operation of the revised temporary construction compound:

- Degradation of soil quality during trafficking, handling and reinstatement.
- Harm to human health and controlled waters arising from the disturbance and mobilisation of unforeseen contamination.
- Harm to human health due to the potential disturbance of UXO.

5.3 Mitigation

To manage the potential risks identified above, a programme of ground investigations will be carried out to gain certainty on the extent of any contamination and the potential for unstable ground or other ground hazards that could result in adverse effects on resources or receptors (identified above) or affect the design or working methods of the Project. The assessment will include a full risk assessment of UXO. Mitigation measures will be identified to either avoid or reduce any adverse effects or risks identified to an acceptable level. These will be reported in full in a Ground Investigation Report and carried through into Project design, the working methods specification or the CEMP.

The following mitigation measures would be applied to manage the potential risks identified above:

- A further detailed UXO threat assessment should be undertaken where the new construction compound will be carried out[8].
- Suitable construction methods and procedures shall be identified in advance of construction to address any residual risks from UXO.
- An unexpected contamination plan should be developed and implemented on site.
- Protective measures should be put in place to prevent contamination of surface waters or groundwater from run-off or accidental spillages.
- Any contaminated material not suitable for re-use on site should be sent to a suitably licensed waste facility.
- Access routes and construction areas shall be defined in advance and demarcated on site to prevent potential damage to soils and agricultural land within and surrounding the construction compound site.
- The Contractor shall produce and implement a Soil Resource Plan, with soil handling works to be undertaken in accordance with the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites and the Good Practice Guide for Handling Soils in Mineral Workings.
- The rainfall and soil moisture criteria set out in Good Practice Guide for Handling Soils in Mineral Workings shall be adopted to ensure that soils are only handled when they are in a suitable condition. This includes soil moisture tests to determine when soil handling can be carried out.

[8] See CEMP Mat061

- Soils shall be handled using excavators rather than dozers to reduce the potential for compaction. All plant and machinery must be maintained in a good working condition to ensure that soils are stripped correctly.
- The main cause of soil compaction is the traversing of soils with earth-moving machinery and the inherent increased likelihood of adverse soil compaction is the weight (i.e. the contact pressure) of the machinery. To reduce the potential for soil compaction, it is anticipated that the Delivery Partner would utilise the lightest machines as is practicable to undertake all soil stripping and soil handling activity.
- Topsoil and subsoil shall be stripped and stored separately to avoid cross-contamination.
- The soil handling environmental management clauses shall be communicated to all personnel involved in ground works through appropriate toolbox talks setting out the principles of good practice in soil management, the site constraints and objectives, as well as the contents of the Soil Resource Plan.
- The Contractor shall produce and implement a ground reinstatement programme, to return the land to its baseline agricultural quality post-construction.

The unexploded ordnance mitigation, soil resource plan and unexpected contamination plan would be specified by the Delivery Partner to the satisfaction of the SDNPA.

5.4 Residual effects

It is considered that with an appropriate CEMP implemented, there will be no significant residual effects on geology and soils during the construction phase of the Project, including the construction compound.

6 Air Quality

6.1 Baseline conditions

The construction compound site is located within Lewis District Council (LDC) (ID 2304) administrative area. The most recent air quality Annual Status Reports (ASRs) published by LDC (LDC, 2020) have been reviewed and considered in order to understand LAQM activities within the study area.

Currently, there are two AQMAs within LDC administrative boundary, both of which have been declared due to exceedances of the annual mean NO_2 Air Quality Objectives (AQO). These are:

- Lewes Town Centre, located in the centre of Lewes.
- A1259 Newhaven Ring Road, which covers the centre of Newhaven.

As the ARN does not extent into these AQMAs they are considered unlikely to be affected by the construction compound.

6.1.1 Local Air Quality Monitoring

LDC and Worthing District Council undertook ambient monitoring of NO_2 across their administrative areas using a network of four automatic monitoring stations and 60 passive NO_2 diffusion tubes in 2019. One monitoring site, the location of which is shown in Figure 7.1 (See Appendix D, grid reference TV 50077 99291), falls within the air quality study area of the Project. There are no continuous monitoring stations within the study area of the Project. There have been no exceedances of annual mean NO_2 AQO within the air quality study area in recent years.

Table 6.1: Wealden District Council and Lewes District Council monitoring sites within the study area

Site ID	Site Name	Site Type	Location (X, Y)	NO_2 Annual Mean Concentration (µg/m^3)				
				2015	2016	2017	2018	2019
30	ESCC 20 -A259 SFD (nr Chyngton Gardens)	Roadside	(550077, 99291)	30.0	35.0	33.5	30.2	29.0

6.1.2 Mapped background concentrations

Background NO_2, PM_{10} and $PM_{2.5}$ concentrations, based on the 2018 reference year, corresponding to the 1km x 1km grid squares covering the air quality study area were obtained from the LAQM support tools provided by Defra for use in air quality assessments (Defra, 2020a).

A summary of the minimum and maximum concentrations across the study area for the base and opening year is provided in Table 6.2, which indicates that background concentrations for all pollutants are well within the relevant AQOs (i.e. 40µg/m^3 for NO_2 and PM_{10}, and 25 µg/m^3 for $PM_{2.5}$.)

Table 6.2: Defra background concentrations (2019 and 2022)

Pollutant	Mapped Annual Mean Background Concentrations (µg/m³)			
	2019		2022	
	Min.	Max.	Min.	Max.
NO_2	8.0	9.3	7.2	8.5
PM_{10}	11.8	13.2	11.2	12.6
$PM_{2.5}$	8.0	8.9	7.6	8.4

6.1.3 Modelled Base Year Concentrations

Annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations at sensitive human health receptors were modelled for the 2019 base year. All receptor results were well within the annual mean NO_2 concentration AQO of 40µg/m³, with the highest concentrations being 19.0µg/m³ at R5. Annual mean PM_{10} and $PM_{2.5}$ concentrations were also modelled to be well within the respective AQOs (40µg/m³ and 25µg/m³, respectively) at all receptors.

Table 6.3: Baseline human health receptor modelling results (2019)

Receptor ID	Address	Modelled Annual Mean Concentration (µg/m³)		
		NO_2	PM_{10}	$PM_{2.5}$
R1	The Hynde, Exceat Bridge, Seaford, East Sussex	12.6	14.1	9.4
R2	The Boat House, A259, Eastbourne Road, Seaford	16.4	16.2	10.6
R3	Cuckmere Inn, Exceat Bridge, Seaford, East Sussex	14.7	14.7	9.8
R4	Exceat Cottage, East Dean Road, East Sussex	15.3	14.7	9.8
R5	Chyngton Lane, Seaford, East Sussex	19.0	18.1	11.7
R6	Eastbourne Road, Seaford, East Sussex	14.5	15.9	10.4

6.1.4 Designated ecological sites

Baseline rates of nitrogen deposition within each of the designated ecological sites identified in the air quality study area were obtained from Air Pollution Information System (APIS) as shown in Table 6.4. Data is provided as a model 3 year mean for the period 2016 - 2018 at 5km * 5km resolution for deposition to ground level vegetation (grassland) and forests, respectively.

Table 6.4: Baseline rates of nitrogen deposition within designated ecological habitats / features

Designated habitat/feature	Nitrogen Deposition (Kg N/ha/year)	
	Grassland	**Forest**
South Downs Way ahead	10.08	15.96
Seaford to Beachy Head	10.08	15.96
Seaford Head	10.08	15.96

6.1.5 Receiving environment sensitivity

As there are both human and ecological receptors within 50m of roads triggering the traffic change criteria (i.e. the ARN), the sensitivity of the receiving environment for this assessment has been classified as 'high'.

6.2 Potential construction and operational impacts

The relocation of the construction compound eastward compared to the 2021 construction compound will reduce the number of sensitive receptors (e.g., residential properties) within 350m (the distance over which the Institute of Air Quality Management (IAQM) suggests that construction dust effects have the potential to occur).

Consequently, the potential for dust effects to occur during the construction phase of is likely to be reduced compared to that reported in the ES Addendum (2022). However, the overall risk of dust effects associated with the construction phase which ultimately determines the type and level of mitigation required, remains unchanged, as this risk is driven by the proximity of sensitive receptors to the construction works at Exceat Bridge itself, rather than to the construction compound.

Operational impacts include the transportation of materials, construction plant and machinery to and from site, including transport of the surface materials (Type 1 material), cabins, enabling works, concrete wagons, rebar delivery, structural steel delivery, crane delivery, piling rig delivery and earthworks. The combined carbon emissions from construction traffic and raw materials used for construction of the Project are less than 1% of the National Carbon Budget thereby, constituting an impact of low magnitude, which is not significant. The operation of the construction compound is understood to be significantly less than the 1% borne by the entire Project.

The construction compound will result in the temporary loss of part of an agricultural field from agricultural production for the 22-month period. This impact on GHG emissions will be temporary and not significant.

6.3 Mitigation

Measures to control fugitive emissions such as those outlined in IAQM guidance (IAQM, 2016), Greater London Authority's best practice guidance (Great London Authority, 2014) and Building Research Establishment (BRE) guidance (BRE, 2003) are documented in the CEMP.

Given that the works are to occur within a floodplain, it is not expected that materials and soils would be able to be stored at the works site. Instead, materials would need to be transported to and from the construction compound.

Given that the soils would be removed from an area with a high-water table, it is anticipated that wet sediment would be trafficked on to the highway. Consequently, road sweeping

operations would be required immediately after the movement of materials to and from the works site.

While the suppression of dust is frequently achieved using water, there is a risk that the excessive use of water particularly in the vicinity of the bridge could lead to increased sediment loading of runoff entering the river. To suppress dust at works in the vicinity of the Cuckmere River, a fine suppressive spray rather than a high-pressure spray shall be deployed including in the vicinity of the construction compound[9].

6.4 Residual effects

It is considered that with an appropriate CEMP implemented, there will be no significant effects on air quality during the construction phase of the Project associated with the construction compound. The aim of the site management measures set out in the CEMP will be to achieve zero complaints regarding dust during the construction phase. However, the measures will be kept under review and, where appropriate, adjusted to deal with any complaints received from members of the public.

[9] See CEMP clause Air004

7 Archaeology and Cultural Heritage

7.1 Baseline conditions

The archaeology and cultural heritage baseline conditions have been updated to incorporate the information for the proposed 2023 compound. As such, this would be located within an Archaeological Notification Area (ANA) associated with WWI practice trenching. The ANA also relates to the possible site of a medieval chapel (MES1754) approximately 50m east of the compound. As the location is based on a 1618 map of "the Alfriston levels" by John Dewarde which is annotated with "*the rynes of and ancyent chapel*" its precise location and extent (perhaps including a burial ground) is unlikely to be accurate.

As the WWI trenches are derived from a single aerial photograph it is possible that additional trenches and other features may also be present, including from earlier periods.

A 25cm LiDAR survey for this area suggests some slight features within the proposed new compound location of uncertain origin. The compound also lies in an area of Holocene alluvium hence the implications of these deposits need some consideration.

7.2 Potential construction and operational impacts

7.2.1 Archaeological remains

There will be no effect on any Scheduled Monument by the Project. The one Scheduled Monument within the wider study area is sufficiently removed from the Project such that there will be no effect due to change to its setting.

Impacts from the Project on non-designated archaeological remains are most likely to occur from groundwork in areas of new land take. This will predominantly comprise the following construction activities and potential impacts on archaeological remains:

- The creation of the construction compound:
    - The construction compound will be stripped of topsoil and a small amount of subsoil prior to laying down a geotextile material and a working surface of crushed stone. It is unlikely that this work would fully expose or remove any archaeological remains which may be present but damage to underlying archaeological remains may occur through partial exposure/removal during works or compaction. The magnitude of impact has therefore been assessed to be minor.
    - No archaeological remains are recorded at the proposed construction compound location but there is the potential for groundworks at this site to impact on any unknown archaeological remains, if present.
    - Any unknown archaeological remains would have to be of high value for a moderate, and therefor significant, effect to be present. Through desk-based assessment, there is no indication of high value archaeological remains at this location, therefore the effect of any unknown archaeological remains, if present would likely be of Slightly adverse significance.

No likely significant effects on archaeological remains are anticipated.

7.2.2 Historic Buildings

It is not anticipated the construction compound will not have physical impacts on historic buildings.

7.3 Mitigation

The construction compound site would be required to be area stripped prior to archaeological remains sample excavated and recording.

In the case of the 2023 compound, a geophysical survey would be undertaken across the area. Once the results from this initial survey are known the need for trial trenching or whether stripping the full extent would be determined.

The following measures would be delivered through compliance with the CEMP:

- Construction plant: The use of low compaction plant over areas of wet ground.
- Fencing: Areas outside the footprint of the works would be temporarily fenced to demarcate the works boundary.
- Geophysical survey: A geophysical survey of the temporary construction compound would be undertaken in advance of soil stripping. The geophysical survey and reporting would be undertaken sufficiently in advance to allow for subsequent trial trenching and, if required, mitigation to be completed in advance of construction commencing.
- Written Scheme of Investigation (WSI): A WSI would be submitted to the East Sussex County Archaeologist for approval in advance of all archaeological works. The WSI would be prepared by the appointed archaeological contractor.

7.4 Residual effects

The 2023 construction compound will have no impact and no effect on designated archaeological remains. No significant residual effects on cultural heritage are anticipated.

8 Biodiversity

8.1 Assessment methodology

The approach to the assessment is mostly aligned (exceptions are outlined below) to the Design Manual for Roads and Bridges (DMRB) LA 108 Biodiversity (Highways England, 2020a) and the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2022).

8.1.1 Study area

For the ecological assessment, the 'zone of influence' has been defined as an area over which ecological features may be affected as a result of the construction compound and associated activities during construction or operation. The zone of influence varies for different impacts and may extend beyond the construction compound boundary.

8.1.2 Data Sources

Desk study data to support the assessment has been provided by a number of sources including:

- Multi-Agency Geographical Information for the Countryside (MAGIC) http://magic.gov.uk (Defra, 2020b)
- Sussex Biodiversity Record Centre (2020)

Specific ecological records relevant to the assessment are detailed in the baseline reports presented in Appendices 9.1 to 9.9 (ES, 2021; ES Addendum, 2022). These have been used during the development of the field survey design and to provide context for the impact assessment. A Preliminary Environmental Assessment (PEA) survey was carried out in February 2023, and the information inserted straight into the report Exceat Bridge Replacement: construction compound variation[10].

8.1.3 Consultations

Natural England and SDNPA have been closely involved in the development of the project proposal and management activities to optimize the projects results, including the location of the construction compound.

8.1.4 Impact assessment methodology

The significance of effects has been assessed taking into account the nature and magnitude of potential impacts (including duration, extent, and reversibility) and their consequent effects on ecological features.

Factors considered in the definition of importance of an ecological feature include the rarity, ability to resist or recover from environmental change, and uniqueness of an ecological feature, function/role within an ecosystem, and level of legal protection or designation which is afforded to the feature.

General potential impacts on ecological features of the study area are described below and specific potential impacts on ecological features are set out in Table. This includes ecological features of at least local importance and higher. Features of less than local importance have not been considered.

[10] East Sussex Highways. Exceat Bridge Replacement: Site compound variation. (document reference: 3520000-ESH-EAC-VS-0001)

Similarly, where a potential impact has been assessed as not significant, it has not been considered further unless measures are required to comply with relevant legislation. Standard construction and design best practices will be used to mitigate non-significant impacts.

Table 8.1 sets out, following the guidance of CIEEM (2022) and DMRB Sustainability & Environment Appraisal LA 108 Biodiversity Revision 1, examples of resource valuation based on geographical level (adapted from LA 108 Revision 1).

Table 8.1: Factors for assessing the value of ecological resources

Level of value	Examples
International or European	*Sites* Natura 2000 sites including: Sites of Community Importance (SCIs); Special Protection Areas (SPAs), potential SPAs (pSPAs); Special Areas of Conservation (SACs); candidate or possible SACs (cSACs or pSACs); and Wetlands of International Importance (Ramsar sites). Biogenetic Reserves, World Heritage Sites and Biosphere Reserves. Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such. *Species* Resident, or regularly occurring, populations of species which may be considered at an International or European level where: • The loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; or • The population forms a critical part of a wider population at this scale; or • The species is at a critical phase of its life cycle at this scale.
UK or national	*Sites* Designated sites including: SSSIs; Areas of Special Scientific Interest (ASSIs), Marine Protected Areas (MPAs) including MCZs, National Parks and National Nature Reserves (NNR). Areas which meet the published selection criteria (e.g. JNCC (1998)) for those sites listed above but which are not themselves designated as such. *Habitats* Areas of UK BAP priority habitats, habitats included in the relevant statutory list of priority species and habitats and, areas of irreplaceable habitats including ancient woodland, ancient or veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh, lowland fen. Areas of habitat which meet the definition for habitats listed above but which are not themselves designated or listed as such. *Species* Resident, or regularly occurring, populations of species which may be considered at an International, European, UK or National level where: • The loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; or • The population forms a critical part of a wider population at this scale; or, • The species is at a critical phase of its life cycle at this scale.
County or equivalent authority Importance	*Sites* Designated sites including: LWSs, Local Nature Conservation Sites (LNCSs), Local Nature Reserves (LNRs), Sites of Importance for Nature Conservation (SINCs), Site of Nature Conservation Importance (SNCIs), Notable Road Verge (NRV); County Wildlife Sites (CWSs) designated at a county or unitary authority level. *Habitats* Areas of habitat identified in county or equivalent authority plans or strategies (where applicable). Areas of key/priority habitats identified in the Local BAP; and areas of habitat identified in the appropriate Natural Area Profile (or equivalent). *Species*

Level of value	Examples
	Species listed in accordance with the requirements of section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Resident or regularly occurring, populations of species which may be consider at an International, European, UK or National level where: a) The loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; or b) The population forms a critical part of a wider population at this scale; or c) The species is at a critical phase of its life cycle at this scale. d) Species identified in a county or equivalent authority area plans or strategies.
Local	*Sites* Designated sites including: LWSs, LNCs, LNRs, SINCs, Sites of Local Nature Conservation Importance (SLNCIs) designated at a local level. *Habitats* Areas of habitat considered to enrich appreciably the habitat resource within the local context (such as veteran trees), including features of importance for migration, dispersal or genetic exchange. *Species* Populations/communities of species considered to appreciably enrich the habitat resource within the local context including features of importance for migration, dispersal or genetic exchange.

8.1.5 Impact Characterisation

Potential biophysical changes arising from the construction and operation of the Project have been identified taking account of measures incorporated within the design to avoid potential impacts but in the absence of any other mitigation, in order to identify the need for further mitigation and/or any compensation requirements.

The nature of change has been defined by reference to the following factors:

- Positive or negative (e.g. adverse/beneficial);
- Impact extent/magnitude (e.g. entire habitat loss, partial habitat loss or indication over specific area affected);
- Duration of impact (short-term, medium-term, long-term or permanent);
- Reversibility of impact (reversible or irreversible); and
- Frequency of impact (single event, recurring or constant).

Impact Characterisation criteria are defined in terms of magnitude of effect in Table 8.2.

Table 8.2: Magnitude of effect for ecology and nature conservation

Level of impact (change)		Typical description
Major	Adverse	1) Permanent and irreversible damage to a biodiversity resource 2) the extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource
	Beneficial	) Permanent addition of, improvement to, or restoration of a biodiversity resources 2) the extent, magnitude, frequency, and/or timing of an impact positively affects the integrity of key characteristics of the resource
Moderate	Adverse	1)Temporary and reversible damage to a biodiversity resource 2) the extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource

Level of impact (change)		Typical description
	Beneficial	1)Temporary addition of, improvement to, or restoration of a biodiversity resource 2) the extent, magnitude, frequency, and/or timing of an impact positively affects the integrity of key characteristics of the resource
Minor	Adverse	1) Permanent and irreversible damage to a biodiversity resource 2) the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource
	Beneficial	1) Permanent addition of, improvement to, or restoration of a biodiversity resource 2) the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource
Negligible	Adverse	1) Temporary and reversible damage to a biodiversity resource 2) the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource
	Beneficial	1) Temporary addition, of improvement to or restoration of a biodiversity resource 2) the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity of key characteristics of the resource
No Change	Not Applicable	No observable impact, either positive or negative

8.1.6 Impact significance

CIEEM (2022) notes that impacts likely to be relevant in an assessment are those that are predicted to lead to significant effects (negative or positive) on important ecological features. Significant effects are those that either support or undermine biodiversity conservation objectives for important ecological features or for biodiversity in general. The conservation status for habitats is determined by the sum of the influences acting on the habitat and its typical species that may affect its long-term distribution, structure and function. It is also determined by the long-term distribution and abundance of the species' population within a given geographical area. The conservation status for species is determined by the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its population within a geographical area.

Knowledge and assessment of construction methods and operational activities, together with the ecological knowledge of ecologists with experience of similar scale infrastructure projects have been used to identify the potential impacts of the project on ecological features.

Effects evaluated as being of moderate or greater significance have been considered to constitute a likely significant effect in terms of the EIA Regulations 2017.

Following the above approach, the assessment has aimed to characterise ecological impacts rather than place a reliance only on magnitude. The character of an impact has been used to inform the determination of whether or not the impact on the feature in question is a significant one. The level of significance has been defined as outlined in Table 8.3.

Table 8.3: Significance matrix

Resource importance	Level of impact				
	No change	**Negligible**	**Minor**	**Moderate**	**Major**
International or European importance	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
UK or national importance	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
Regional importance	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
County or equivalent authority importance	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
Local importance	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

The mitigation measures described within this section, that have been incorporated into the Project design and programme, have been considered in the assessment of the significance of effects. The hierarchical approach to mitigation aims to avoid or negate impacts on ecological features in accordance with best practice guidance and UK, and local government environmental impact, planning and sustainability policies.

Impacts that are not significant (including those where compliance with regulation is required) would be expected to be avoided or reduced through the application of the standard mitigation commitments and good working practice (e.g. mitigation of potential pollution impacts through adherence to legislative requirements and standard best practice and guidelines). Significant ecological effects are expected to be mitigated through a combination of best practice/typical mitigation methods and also mitigation targeted to specific locations as described in this assessment.

8.1.7 Biodiversity Net Gain metric

The requirement for Biodiversity Net Gain (BNG) was introduced to the development planning system under Part 6 of the Environment Act 2021 and is further required under the National Planning Policy Framework (NPPF). This Project has undertaken the requirement to ensure a provision of betterment. The requirement for this planning application has arisen from the relocation of construction compound associated with the Exceat Bridge Replacement development, which has been subject to a previous planning application.

The location of the 2021 construction compound featured in the Exceat Bridge Replacement development application and the 2023 compound are within the same field, but new construction compound is located further west and are proposing to take the same area and habitat types of the same condition and distinctiveness. Additionally, the proposals for reinstatement and enhancement afterwards remain the same. Therefore, the figures entered into the BNG metric for the Exceat Bridge Replacement development application remain largely unchanged (The BNG metric output of Exceat Bridge Replacement development updated for this compound location can be found in Appendix C). This application has arisen from the location change of the construction compound. However, the habitat values and predicted habitat values, including the size of the compound area that will be temporarily loss, will be exactly the same as the previous compound and application.

The baseline habitat values and the predicted habitat values post construction are based upon habitat surveys undertaken for the Project and the design of the project post construction (refer to Appendix 9.1 and Appendix 9.2 in the April 2021 ES submission and Appendix 9.8 in the appendices submitted with the ES Addendum).

The bespoke approach to achieve BNG for the Exceat Bridge Replacement Project provides benefits for the SSSI and delivers positive ecological outcomes by the creation and enhancement of new habitat at an offsite compensatory habitat area, which includes the spreadsheet used to calculate the BNG gains and losses[11].

Relevant to this planning application will be the temporary removal of 0.35ha of crop land, no hedgerows will be impacted or any other habitats. This cropland will be reinstated after use and enhancements to the grassland and heathland/shrubs within the application boundary will be provided. Therefore, no additional provision from BNG is required other than reinstatement compound habitats to as good a condition as from pre-construction.

8.2 Assumptions and Limitations

8.2.1 Assumptions

Based on consultations with SDNP, the following assumptions underpin the assessment:

- Reinstated habitat will achieve the same or better condition to the pre-construction condition. This will be achieved through best practice site management measures.
- Habitat that is to be created would establish itself within a specified timeframe (determined within the Defra BNG Metric 3.1). Refer to the CEMP for onsite and Appendix 9.8 (ES Addendum) for further details.

8.2.2 Limitations

Although the data provided from a combination of field surveys, Sussex Biodiversity Record Centre and consultees, are the most complete set of species data available, the absence of records should not be taken as an indication of absence of species. Species may be present in any given area, but not necessarily recorded or recognised.

Data obtained from open source and government datasets are considered accurate and reliable in this instance as having and, in most cases, have been verified. However there remains a possibility for errors in data provided.

8.3 Baseline conditions

8.3.1 Designated Sites

Details of the statutory and non-statutory designated nature conservation sites are presented in Table 8.4 and Table 8.5.

There are no Natura 2000 sites within 5km of the Project.

There are five statutory designated sites within 2km of the compound.

Table 8.4: Statutory designated sites

Site name	Description	Location
Seaford to Beachy Head SSSI	Designated for its biological and geological features. The diverse range of habitats includes herb-rich chalk grassland, chalk heath (a unique, rare habitat on chalk soils), maritime grassland, foreshore and chalk cliffs, river meanders and Greensand reef. Together, these habitats support nationally rare, nationally scarce and nationally significant plants, invertebrates and birds. This site is of national value.	The site is approximately 110m to the north-east
South Downs National Park (SDNP)	The Park comprises 80ha of chalk cliffs, meandering river valley and open chalk grassland. This site is of national value.	The compound lies entirely within this site.

[11] East Sussex Highways. Exceat Bridge Replacement: 2021 ES Appendices (Doc Ref: 3520000-ESH-EAC-DE-LE-0003)

Site name	Description	Location
Seven Sisters Country Park	The Park comprises 80ha of chalk cliffs, meandering river valley and open chalk grassland. This site is of national value by virtue of being located within South Downs National Park (SDNP).	The site is approximately 130m to the north-east
Beach Head West (MCZ) - Reference UKMCZ0002	The coastal waters to the south of the Project are designated to protect ten habitat features (high energy circalittoral rock, moderate energy circalittoral rock, intertidal coarse sediment, subtidal mixed sediment, subtidal mud, subtidal sand, infralittoral muddy sand, infralittoral sandy mud, infralittoral rock and thin sandy sediment, subtidal chalk, littoral chalk communities) and three species features (blue mussel *Mytilus edulis* beds, native oyster *Ostrea edulis* and short snouted seahorse *Hippocampus hippocampus*). The site is also known as a key nursery and spawning ground for several fish. This site is of national value.	This site is approximately 1.8km to the south of the compound
Seaford Head LNR	This site covers an area from Seaford Head Golf Course eastwards to the Cuckmere valley and north to Exceat Bridge. The site lies partly within Seaford to Beachy Head SSSI, within the SDNP, part of the Sussex Heritage Coast and is home to many nationally rare and significant species of plants, birds and insects. This site is of county value.	This site is approximately 350m south-east of the compound

There are five non-statutory designations located within a 2km study area. Details of which are presented in Table 8.5.

Table 8.5: Non-statutory designated sites

Site name	Description	Location
South Downs Way Ahead Nature Improvement Area (NIA)	The South Downs Way Ahead NIA project aims to protect wildlife habitats and the environmental, economic and social benefits they bring. Partly within Seaford to Beachy Head SSSI, as such this site is of national value.	Approximately 370m to the east of the compound.
Friston Forest LWS	The site is a large beech and pine plantation situated on the Downs north-east of Cuckmere Haven. The plantation is commercially managed for its timber. This site is of county value.	Approximately 650m to the east of the compound
Seaford Head LWS	An area of grassland which occurs on the western side of Beachy Head sandwiched between a golf course and Seaford to Beachy Head SSSI. The grassland is, in general, unimproved chalk grassland. This site is of county value.	Approximately 1.6km to the south-west of the compound
Litlington To the Seven Sisters NRV	Designated for numerous toads *Bufo bufo*, grass snakes *Natrix helvetica* and adder *Vipera berus* in spring and summer. This is site is of county value.	Approximately 600m to the east of the compound
Seven Sisters NRV	This site supports red star-thistle *Centaurea calciptrapa* – a Nationally Scarce, Sussex Rare Plant Register (RPR), Priority Species, that is critically endangered. This site is of county value.	Approximately 870m to the east of the compound

8.3.2 Habitats

A Preliminary Environmental Assessment (PEA) survey was carried out in February 2023. The survey encompassed the compound site and a 30m buffer. Habitats were recorded following the UK Habitats (UKHab) classification system and are shown on Figure 8.1 (below). with habitats summarised in Table 8.6. Hedgerows, a priority habitat and included in the Sussex biodiversity action plan (BAP), were recorded, but only within the buffer area.

Table 8.6: Habitat classification of the compound site

UK habitat classification	Priority habitat	Sussex biodiversity action plan	Value	Area within compound	Baseline description
Heathland and scrub (h)	-	-	Negligible	Approximately 13.5m	A strip of scrub bordering the fence along the whole southern edge of the compound and access route. Dominated by bramble *Rubus fruticosus* agg. and/or hawthorn *Crataegus monogyna*
Hedgerow	Hedgerows	✓	Negligible	0	Within the buffer, comprising elder *Sambucus nigra*, hawthorn, gorse *Ulex europaeus* and blackthorn *Prunus spinosa* to the west and east of the bramble strip
Cropland (c)	-	-	Negligible	0.4 ha	An intensively farmed arable cereal crops
Grassland (g)	-	-	Negligible	Approximately 0.008 ha	Improved grassland on neutral soils with rye-grass *Lolium* spp. and white clover *Trifolium repens*
Urban (u)	-	-	Negligible	0	Within the buffer, hardstanding along the A259

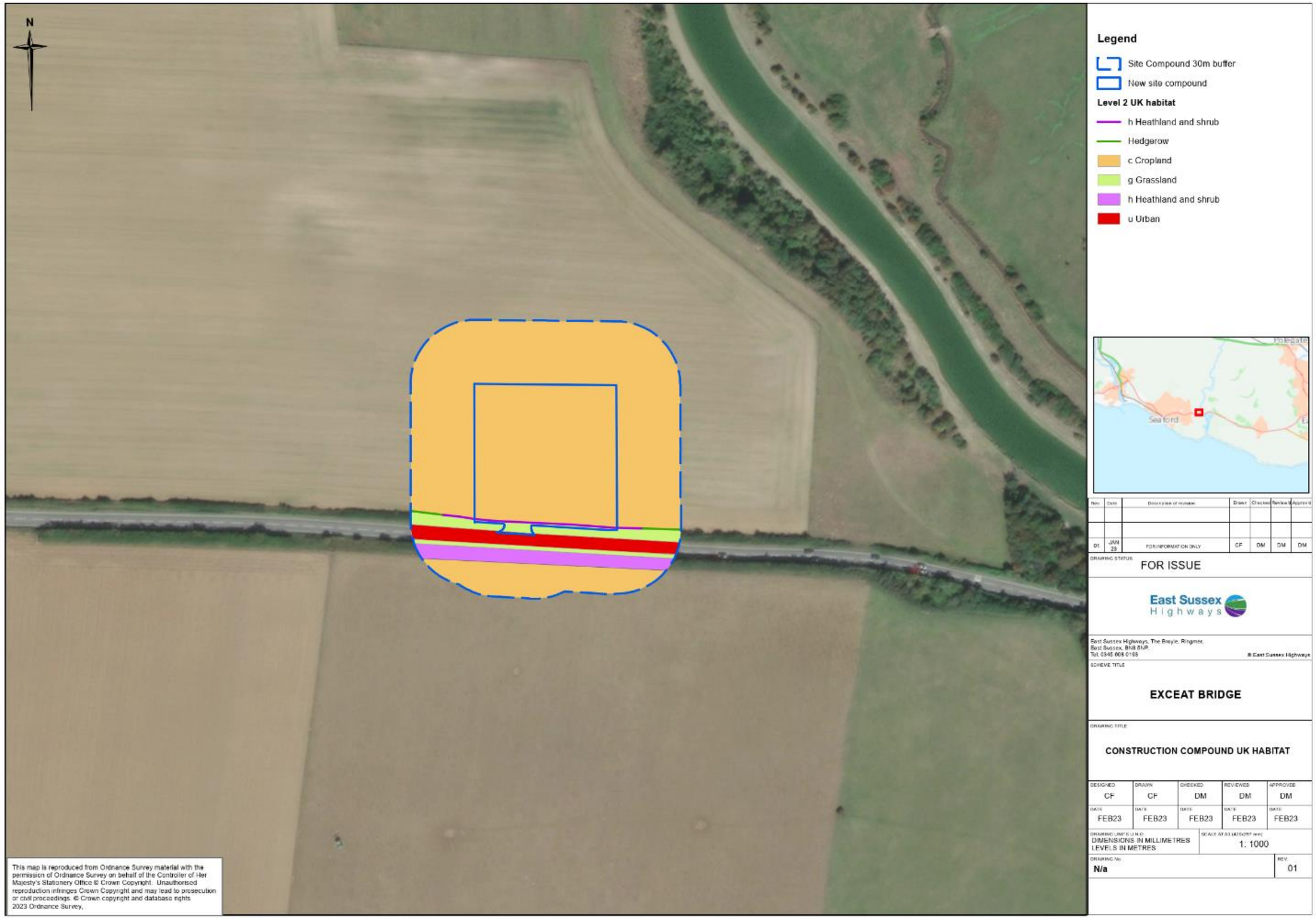

Figure 8.1: Pre-construction UK Habitat Classification plan

8.3.3 Protected fauna and flora

Badger

Evidence of badgers *Meles meles* has not been recorded in the study area, but suitable foraging habitat does exist within and adjacent to the compound site.

Badgers have been scoped out from further assessment as any protection they have is due to persecution rather than ecological value/rarity. Therefore, badgers are not discussed further.

Bats

Desk-study data provided a single bat roost record within 1.5km of the Project boundary within the last 10 years. This was a common pipistrelle *Pipistrellus pipistrellus* recorded roosting within Foxhole Barn, Cuckmere Haven in 2018, to the south-east of the study area.

Foraging and commuting habitat was present along the A259, however no trees or structures that may provide suitable roosting features are present.

Birds

Desk-study records have highlighted 48 notable bird species within the wider area. These include:

- Three species listed under the Birds Directive (2009/147/EC) Annex 1 – osprey *Pandion haliaetus*, black winged stilt *Himantopus himantopus* and kingfisher *Alcedo althis*.
- Eight species listed under Schedule 1 (part 1) of the Wildlife and Countryside Act (WCA) 1981 (as amended) – osprey, black-winged stilt, little ringed plover *Charadrius dubius*, barn owl *Tyto alba*, kingfisher, Bee-eater *Merops apiaster*, Cetti's warbler *Cettia cetti* and cirl bunting *Emberiza cirlus*.
- 15 ''priority species' as listed in Section 41, NERC Act 2006 (NERC, 2006).
- 15 species on the Red list of Birds of Conservation Concern (BOCC) 4 (Eaton *et al,* 2015).
- 21 species on the Amber list of Birds of Conservation Concern (BOCC) 4 (Eaton *et al*, 2015).

Within the 2023 compound, a short section of heathland and shrub habitat to the north of the A259 may provide suitable foraging and nesting habitat for bird species.

Amphibians (Great Crested Newts)

Desk-study showed that Great Crested Newts (GCN) *Triturus cristatus* have been recorded in 2019 in a pond over 500m to the south-east of the study area, which identified a medium-sized population.

The location of the construction compound site had not been decided at the time of the newt survey, so this pond not assessed as part of this study. However, it was not considered necessary to subsequently extend the scope of the survey to cover this pond, as the pond lies at more than 350m to the north-west from compound with intensively-farmed arable land (considered a barrier to dispersal to GCN) between it and the pond, meaning the potential of GCNs being present is considered negligible to low for this location.

No evidence of GCN was found within the site.

The value of GCNs rare of county value due to the medium population of GCNs recorded to the south of the compound site.

Reptiles

Desk-study records of slow worm *Anguis fragilis*, grass snake *Natrix helvetica* and adder *Vipera berus* are present in the wider area.

Rabbit burrows within the verge and underneath bramble scrub and hedgerow bordering the A259 road may potentially be used as hibernacula by reptiles.

No evidence of reptile was recorded during the site visit.

The value of reptiles is considered to be of local ecological value.

Invasive non-native species (INNS)

The desk-study returned records of American mink Neovison vison between 2012 to 2021 within the vicinity of Exceat Bridge. This species is listed under Schedule 9 of the WCA 1981 (as amended) which makes it an offence to release or allow to escape into the wild.

INNS have not been included in further assessment due to their lack of conservation status in accordance with DMRB LA108 and so are not discussed further in this context. However, INNS present a threat to biodiversity (Department for Environment, Food and Rural Affairs (Defra, 2015) and have been discussed in this context and, under the Wildlife and Countryside Act (WCA) 1981 (as amended), the legal responsibilities to prevent their spread.

8.4 Potential construction and operational impacts

8.4.1 Designated and non-designated sites – construction effects

This section considers the likely effects that construction of compound and ongoing use could have on ecological receptors but in the absence of specific mitigation, as shown in Table 8.7 for designated sites and Table 8.8 for non-designated sites.

8.4.2 Habitat - construction effects

There are no anticipated environmental impacts that would arise from the construction activities on habitats.

8.4.3 Habitat – potential losses and gains

Temporary habitat losses through direct impacts arising from the construction and use of the compound have been calculated as part of the BNG assessment (refer to Appendix 9.8). Impacts are temporary as habitats - arable crops, grassland, and heathland and shrub, of negligible value, would be reinstated following the end of the construction period.

8.4.4 Non-priority habitat

Temporary losses of non-priority habitats within the compound are:

- Heathland and shrub – the loss of a narrow linear strip approximately 13.5m;
- Improved grassland – the loss of 0.008 ha of grassland; and
- Arable – the loss of 0.4ha of arable farmland.

Mitigation measures for the compound would deliver habitat that will achieve the same or better condition to the pre-construction condition.

8.4.5 Protected species – construction effects

The construction effects upon protected and notable fauna and flora species during construction, before mitigation are assessed in Table 8.9.

Table 8.7: Assessment of construction effects upon designated sites without mitigation during construction

Receptor	Locations affected	Level of value	Potential impacts during construction	Level of Impact	Significance of Effect (before mitigation)
Seaford to Beachy Head SSSI	Approximately 110m to the north-east of the compound	National	No impacts to the SSSI are expected owing to the distance, lack of connectivity and localised disturbance.	**No change**	**Neutral**
SDNP	Lies entirely within the compound boundary	National	Potential indirect impacts from vegetation clearance. However, habitats which the park is designated for, will not be impacted.	**Negligible**	**Slight**
Seven Sisters Country Park	Approximately 130m to the north-east of the compound	National	Impacts as for the SDNP	**Negligible**	**Slight**
Seaford Head LNR	Approximately 350m south-east of the compound	County	No impacts to the LNR are expected owing to the distance and lack of connectivity.	**No change**	**Neutral**

Table 8.8: Assessment of construction effects upon non-designated sites without mitigation during construction

Receptor	Locations affected	Level of value	Potential impacts during construction	Level of Impact	Significance of Effect (before mitigation)
South Downs Way Ahead Nature Improvement Area (NIA)	Approximately 370m to the east of the compound.	National	No impacts to the NIA are expected owing to the distance, lack of connectivity and localised impacts.	**No change**	**Neutral**
Friston Forest LWS	Approximately 650m to the east of the compound	County	No impacts to this LWS are expected owing to the distance, lack of connectivity and localised impacts.	**No change**	**Neutral**
Seaford Head LWS	Approximately 1.6km to the south-west of the compound	County	No impacts to this LWS are expected owing to the distance, lack of connectivity and localised impacts.	**No change**	**Neutral**
Litlington To the Seven Sisters NRV	Approximately 600m to the east of the compound	County	No impacts to the NIA are expected owing to the distance, lack of connectivity and localised impacts.	**No change**	**Neutral**
Seven Sisters NRV	Approximately 870m to the east of the compound	County	No impacts to the NIA are expected owing to the distance, lack of connectivity and localised impacts.	**No change**	**Neutral**

Table 8.9: Assessment of construction effects on flora and fauna during construction without mitigation

Receptor	Locations affected	Level of value	Potential impacts during construction	Level of Impact	Significance of Effect (before mitigation)
Bats	Recorded commuting and foraging in the wider area	Local	The loss of heathland and shrub habitat to the north of the A259 is not considered of a sufficient length to have a negative impact on the local bat population. Artificial lighting at the construction compound at night may impact foraging behaviour, although it is expected that the main construction would take place during the winter months, when bats should be in hibernation. If construction takes place during the spring/summer this may result in a negative impact on the local bat assemblage, especially on slower broad-winged species (*Myotis* sp. bats) which tend to avoid artificially lit up areas, so are less able to forage successfully and efficiently, which puts them at a competitive disadvantage. Artificial lighting has been shown to be particularly harmful if used along river corridors and near linear lengths of scrub/hedgerow. **Potential indirect adverse effects to commuting and foraging bats at a minor level.**	**Minor Adverse**	**Neutral or Slight Negative**
Birds – Breeding	Approximately 41 bird species likely to be breeding within the localised area	National	No direct impacts are predicted as scrub and hedgerow removal would be undertaken before the start of the breeding bird season. There is potential for minor temporary indirect impacts from the loss of foraging, nest bulding, refuge and perching habitat from scrub and hedgerow clearance. Habitat for this purpose was not considered to be high quality, however. Other potential indirect impacts include temporary increased noise, vibration, human disturbance and artificial lighting as a result of the construction compound. **Potential indirect adverse effects to breeding birds foraging, nest building, refuging and perching at a minor level.**	**Minor Adverse**	**Slight Negative**
Birds – passage and wintering	Recorded commuting and foraging within the wider area	National	Visual disturance and light pollution have the potential to impact on the nationally significant number and diversity of birds within the SSSI and within other designations. Works are approximately 300m from where birds have been recorded and where suitable habitat is present, so impacts are considered minimal. It is not considered that the presence of construction plant and the workforce within the compound will give rise to visual disturbance to birds given the distances involved. Given the distances, no change is anticipated due to visual disturbance and thus being of neutral significance. **Potential indirect adverse impacts to passage and wintering birds at a minor level.**	**Minor Adverse**	**Slight Negative**
GCN	Suitable terrestrial habitat	County	The potential for mortality and injury of individuals during the removal of vegetation and groundworks is low given the distance of the nearest pond and the nearest breeding pond, with barriers of dispersal in between, but cannot be ruled out entirely.	**Minor Adverse**	**Neutral or Slight Negative**

Receptor	Locations affected	Level of value	Potential impacts during construction	Level of Impact	Significance of Effect (before mitigation)
	within the compound		Indirect impacts include the potential temporary loss of foraging habitats and cover.		
Reptiles	Suitable terrestrial habitat within the compound	Local	There is a potential for mortality and injury of individuals during the removal of vegetation. However, the area which may be suitable for reptiles and to be cleared of vegetation is a linear strip of heathland and shrub habitat (13.5m) and 0.0078 ha of grassland, so impacts are considered to be low, but cannot be ruled out entirely. Indirect impacts include the potential temporary loss of foraging habitats and cover.	**Minor Adverse**	**Neutral or Slight Negative**

8.4.6 Assessment of operation effects

This considers the likely effects that operation of the Project could have on ecological receptors but in the absence of specific mitigation.

The Project due to its small size, would provide reinstated habitat within the site on a like by like basis.

8.5 Mitigation

8.5.1 Introduction

All developments are required to avoid adverse effects as far as possible in accordance with best practice guidance (following the Mitigation Hierarchy as set out in Principle 1 of the Biodiversity Net Gain Good Practice Guidance for development (CIEEM, CIRIA IEMA 2016)), and UK and local government environmental impact, planning and sustainability policies. To adequately mitigate any effects that cannot be avoided, and to provide compensatory measures only as a last resort. The approach to mitigation adopted for the Project follows the mitigation hierarchy, whereby priority has been given to:

- avoiding or preventing effects; and then (if this is not possible),
- to reducing or mitigate them; and then, if necessary,
- to offsetting them through repair (restoration or reinstatement) or compensation.

Where avoidance and mitigation cannot adequately reduce adverse effects, compensatory measures are required to be provided and are a last resort to offset significant residual effects. Compensation would be provided through the provision of replacement areas, which should seek to offset as many of the features that were lost as possible.

Where these impacts can be fully mitigated, they would not be considered significant under the terms of the EIA Regulations.

It is expected that all effects of negligible significance and the majority of non-significant effects would be mitigated through the application of generic mitigation measures and best working practices throughout the construction and operational phases of the use of the compound.

8.5.2 Generic

The term generic mitigation measures addresses environmental management measures that are delivered as standard practice across highway projects.

The following generic mitigation measures would be implemented throughout the pre-construction and construction phases of the Project:

- Pre-construction surveys would be undertaken prior to the commencement of vegetation clearance to confirm the absence of protected species: reptiles, amphibians and breeding birds, where they were recorded as potentially being present.
- Prior to construction, a suitably qualified Ecological Clerks of Work (EcCoW) would be appointed by the Delivery Partner, under the Environmental Clerk of Works (ECoW) who retains overall responsibility for environmental issues. The EcCoW would:
    - Provide ecological advice over the duration of the entire construction programme;
    - Undertake or oversee pre-construction surveys for protected species in the areas affected by the Project;
    - Ensure ecological mitigation measures are implemented; and

- Monitor the implementation of mitigation measures during the construction phase to ensure compliance with protected species legislation.
- Provide supervision of soil management in accordance with the principles set out within the CEMP and the Soil Management Plan.

- Site staff would be provided with toolbox talks to inform them of the importance of the site for protected species, as well as the need for careful implementation of avoidance/ mitigation of any impacts.
- Prevention of access by construction plant or workforce beyond the works site.
- Construction activity would be primarily limited to day-time hours, 07.30 to 16:30 Monday to Friday. The construction compound is anticipated to operate over longer hours than the works site, with the lighting of the construction compound to be agreed between the delivery partner and the SDNPA. However, the main objective will be to reduce impacts to bats and the International Dark Sky Reserve. Controls will be put in place on compound lighting, so the ecological and Dark Skies Area objectives are achieved. These are discussed in Section 11 Lighting.
- All excavations to be left overnight would be provided with a ramp or other easy means for animals such as badger to escape.
- Standard site procedures, including those working within and around watercourses (e.g. adherence to best practice where possible and any guidance that's historically been issued, such as Guidance for Pollution Prevention and Pollution Prevention Guidelines (GPP/PPG) (NetRegs 2019). The CEMP provides for the following:
  - Chemicals, oils and fuels would be safely stored and kept away from drainage systems would be appropriately managed;
  - Construction plant and machinery must not be fuelled within 10m of a drainage system, or as advised by the ECoW;
  - Sites would be restored on completion of works; and
  - Emergency procedures and spillage kits are to be available when working near drainage systems and construction staff must be familiar with emergency procedures.
- The Delivery Partner would ensure that its sub-contractors and site workforce are made aware of their responsibilities to comply with pollution prevention measures.
- Soil decompaction measures would be implemented, to maximise the opportunity for successful ecological restoration.
- Post-construction, disturbed habitats in temporary working areas would be returned to their original condition or better and enhanced where possible as quickly as possible to minimise loss of ecological function and colonisation by invasive plants.

8.5.3 Construction

Bats

In terms of the provision of mitigation for impacts on any commuting or foraging bats that may use the wider habitat that could be potentially disturbed from construction activities, the following measures would be undertaken:

- Lighting of the construction compound is to be agreed between the delivery partner and the SDNPA.
- Compound lighting measures are to be put in place to address any risk to bats from lighting, particularly during the spring/summer when slower broad-winged species (Myotis sp. bats) would tend to avoid illuminated areas. Other bat species (pipistrelle

bats) may exploit the increased insect concentrations present due artificial light sources.

Breeding and Wintering Birds

- All vegetation suitable for breeding birds would be removed before the start of the works, outside of the normal bird breeding season (March - August), with the exception of certain areas where removal is to be delayed protecting other species.
- Should any construction or habitat removal works need to be undertaken within the bird breeding season where suitable bird breeding habitat exist, a site check for breeding birds would be undertaken by the EcCoW no more than two days prior to works commencing.
- If breeding birds, or nests (including the beginnings of a nest) are found during the works, these would be left intact until the young have fledged, or the nest becomes disused. All work that could cause disturbance would cease and the EcCoW would define the work exclusion zone and its duration.
- Unmitigated noise disturbing activities should be restricted where possible during the winter period and ideally undertaken between May and August inclusive to reduce impacts to wintering (water) birds if there is no conflict with requirements of breeding birds.

Great Crested Newts

- Due to the low but non-negligible risk of GCN occurring in compound area, any works to take place in this area should be done following the measures laid out in a Precautionary Method of Working (PMW) which should be included within the Environmental Management Plan or equivalent for the works, and included as part of the construction contractors working method statement pack.
- Should GCNs be discovered during construction, works would cease and the advice of the EcCoW sought. A strategy would be agreed with Natural England potentially requiring a disturbance licence.
- Vegetation clearance in the area is to be undertaken during the GCN active period between March and October.

Reptiles

The availability of suitable habitat suggests that reptiles may be present in small numbers along the road verge and to the immediate south of the heathland and shrub area, particularly as there is suitable connected habitat present along the verge of Exceat Road. As a result, a precautionary approach to works would be undertaken and habitat clearance would only be undertaken using hand tools between November and February to above ground level, followed by full vegetation clearance undertaken during the reptile active period between March and October.

Habitat restoration

As the passage of vehicles across soils risks causing soil compaction, site restoration would include restoring compacted soils to their former condition.

The reinstated habitats would be monitored to ensure they are establishing as expected. Such remedial action could include using a local green hay mix.

8.5.4 Operation

Mitigation measures are proposed for both habitats and protected species.

Habitats

Mitigation for habitats in the compound would commence once all works have been completed and the compound is dismantled, when planting and other works required to initially establish the target habitats would be carried out.

During the operational phase, mitigation for habitats would continue through implementation of the management measures set out in a habitat management plan.

8.6 Residual effects

Residual effects on ecological receptors are discussed in Table 8.10 with the feature's importance and the impacts with assumed mitigation to provide the significance of residual impact.

Table 8.10: Assessment of residual effects

Ecological feature	Level of Value	Impact stage	Magnitude of the impact	Pre-mitigation of effect and significance	Significance of residual effect (after mitigation)
Designated Sites					
Seaford to Beachy Head SSSI		Construction and Operation	No change	Neutral	**Neutral**
South Downs National Park	**National**	Construction	Negligible	Slight Negative	**Neutral**
		Operational	No Change	Neutral	
Seven Sisters Country Park	**National**	Construction	Negligible	Slight Negative	**Neutral**
		Operational	No Change	Neutral	
Seaford Head LNR	**County**	Construction and Operation	No Change	Neutral	**Neutral**
Non-designated Sites					
South Downs Way Ahead NIA	**National**	Construction and Operation	No Change	Neutral	**Neutral**
Friston Forest LWS	**County**	Construction and Operation	No change	Neutral	**Neutral**
Seaford Head LWS	**County**	Construction and Operation	No change	Neutral	**Neutral**
Litlington To the Seven Sisters NRV	**County**	Construction and Operation	No change	Neutral	**Neutral**
Seven Sisters NRV	**County**	Construction and Operation	No change	Neutral	**Neutral**
Protected Fauna Species					
Bats	**Local**	Construction	Minor Adverse	Slight Negative	**Neutral**
		Operational	No Change	Neutral	
Birds - breeding	**National**	Construction	Minor Adverse	Slight Negative	**Neutral**
		Operational	No Change	Neutral	
Birds – passage and wintering	**National**	Construction	Minor Adverse	Slight Negative	**Neutral**
		Operational	No Change	Neutral	
Great Crested Newt	**County**	Construction	Minor Adverse	Neutral or Slight Negative	**Neutral**
		Operational	No Change	Neutral	

Ecological feature	Level of Value	Impact stage	Magnitude of the impact	Pre-mitigation of effect and significance	Significance of residual effect (after mitigation)
Reptiles	**Local**	Construction	Minor Adverse	Neutral or Slight Negative	**Neutral**
		Operational	No Change	Neutral	

9 Climate

9.1 Baseline Conditions

The Met Office data for Southern England details the baseline climate conditions for the area around Exceat Bridge. The mean annual temperatures along the coast is 9.5C, and January is the coldest month. July is the warmest month in the region with average temperatures of 21C. Extreme maximum temperatures occur in July and August and are often associated with heat waves that last several days. A high of 35.4C was recorded in North Heath, Sussex on 26 June 1976. In winter, coastal areas are milder than inland but can have cold winds and gale conditions. The south coast is one of the sunniest places in the UK, with average annual sunshine durations exceeding 1,800 hours with the highest hours recorded in Eastbourne. The South Downs have an average rainfall of 950mm per year and periods of prolonged rainfall can cause localised flooding, as can be seen in the area surrounding Exceat Bridge.

It is anticipated that as a result of global climate change, the weather in the Project area will become gradually warmer and wetter with more frequent extreme weather events over time.

The Project is located within a Flood Zone 3. This indicates that the land has been assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

The Flood Risk Assessment carried out for the Project notes that there have been 28 flood alerts for the River Cuckmere in the last 5 years, with flooding being present for several months in some years. Fluvial and coastal flooding are the primary sources of flooding in this area.

It is anticipated that flooding is likely to increase locally as a result of climate change, as reflected in the EA flood management strategy, Natural England aspirations for the SSSI and SDNP management aspirations for the Country Park, all of which encompass a change towards a more naturally functioning flood plain in the lower reaches of the Cuckmere valley.

9.2 Potential construction and operational impacts

The development of Exceat Bridge requires a construction compound to facilitate the works safely. Therefore, the overall climate and carbon assessments need to be considered as a whole. However, the temporary construction compound construction, operation and decommissioning is unlikely to have a significant impact on overall climate issues.

9.2.1 Construction greenhouse gas emissions

The ES (2021) observed that approximately 62% of GHG emissions would be associated with the transport of materials and construction plant. Whilst operational emission would amount to 38%. The ES recorded the following estimated emissions:

- Construction transport – 423.5tCO2e.
- On-site operations – 265.8tCO2e.
- Total – 689.3tCO_2e.

The pre-construction carbon assessment presented in Appendix 10 of the ES (2021) has assessed the design of the bridge in terms of materials to be used as 1,189.3tCO2e.

The combined carbon emissions from construction traffic and the raw materials used for construction of the Project amount to a total of 1,878.6tCO2e. This is both less than 1% of the

national carbon budget of 1,950 million tCO2e and less than 25,000tCO_2e in any year, thereby constituting an impact of low magnitude, which is not significant.

9.2.2 Climate change vulnerability

The construction compound would be located beyond the floodplain and is not considered unduly vulnerable to climate change. On site construction operations would however be more vulnerable to climatic factors. Consequently, there would be no storage of materials beyond that for immediate use within the floodplain[12].

9.3 Mitigation

There are no mitigation measures to further reduce GHG emissions in relation to the construction compound. There remain opportunities to reduce GHG emissions during construction. These following measures are set out in the CEMP:

- Power generation**:** Alternatives to diesel would be sought by the delivery partner[13] which would include:
  - Grid connection for the provision of power to site welfare and facilities.
  - An off-grid power supply integrating solar and battery with back-up diesel.
  - Hybrid generators with supporting battery.
- Welfare**:** Low carbon alternatives to traditional diesel generator powered welfare facilities would be determined by site requirements and constraints[14], with a preference to utilise hydrogen, solar or grid power over diesel. An example includes the Ecosmart ZERO CO_2 welfare unit which utilises solar energy.
- Lighting: Where possible, site and task lighting would be provided by non-diesel sources[15] with solar tower lighting being a preferred solution although hybrid tower lighting could be used.
- Electric vehicle charging points: At least one electric vehicle charging station would be provided[16] in accordance with SD22.2 and SD48.3 regulations from SDNPA. A standard 7.2kW pedestal charger is recommended.
- Plant and power tools: Where feasible and allowable within the constraints, electric (or hydrogen where commercially available) plant and equipment would be selected[17].
- Clean Heavy Goods Vehicles for transport: The use of zero (BEV or FCEV) or low emissions (hybrid) transport for materials would be used where commercially available. The supply chain would be made aware of this requirement during the procurement process[18].
- Biodiesel: The delivery partner would be expected to encourage the supply chain to maximise use of blended diesel with the highest possible content of biodiesel (high grade) for all construction plant and equipment where there is not a commercially available low-carbon alternative[19].

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[12] See CEMP clause Wat008

[13] See CEMP clause Gen033

[14] See CEMP clause Gen034

[15] See CEMP clause Gen035

[16] See CEMP clause Gen036

[17] See CEMP clause Gen037

[18] See CEMP clause Gen038

[19] See CEMP clause Gen039

- Transport logistics. Materials would be locally sourced to reduce vehicle journey time where commercially acceptable. Similarly, licensed waste disposal contractors from the local area would be used where commercially acceptable[20].
- Carbon reduction plan: The delivery partner would be required to develop a carbon reduction plan and direct their supply chain to:
    - Reduce energy use and associated GHG emissions.
    - Select low carbon materials.
    - Reduce the amount of virgin materials used in operations.
    - Reduce waste arisings including the amount sent to landfill.
    - Monitor fuel use on site.
    - Train plant operatives in fuel efficient driving techniques[21].

The materials with the greatest influence on GHG emissions are steel, concrete and hot rolled asphalt. As the selection and procurement of materials are commercial matters for the delivery partner, the carbon reduction plan would address how to lower the temperature of asphalt and use a lower carbon cement and GEOfoam for example.

The delivery partner would be requested to provide a baseline estimate of carbon emissions associated with construction of the proposed Project and then record in the CEMP those actions taken to reduce the amount of carbon emissions by 10%.

Table 9.1 provides a list of potential carbon reduction measures that the delivery partner would explore and record their contribution towards achieving the target reduction in carbon emissions during construction works. The delivery partner would be requested to submit this table as part of the CEMP to demonstrate its commitments to reduce carbon[22].

While the National Highways carbon reporting tool is intended for National Highway Schemes, the delivery partner would be requested to provide six monthly returns to East Sussex Highways Authority to demonstrate progress in reducing carbon emissions.

[20] See CEMP clause Mat067

[21] See CEMP clause Gen038 Gen039

[22] See CEMP clause Gen040, Gen041

Table 9.1: Potential carbon reduction measures

Objective		10% reduction from baseline			
Baseline		<XX> t/CO_2e/km		**Target**	<XX> t/CO_2e/km
		<XX> t/CO_2e/£M			<XX> t/CO_2e/£M
Carbon reduction measures					
Action	**Adopt**	**Targeted savings** t/CO2e/km	**Targeted savings** t/CO2e/£M	**Owner**	**Assumptions, uncertainties and risks to delivery**
Reduced sheet steel piling	<Y/N>				
Reuse of steel	<Y/N>				
Reduced use of concrete	<Y/N>				
Use of gabions as retaining walls	Not permitted				
Reduce excess procurement	<Y/N>				
Local sourcing of materials	<Y/N>				
Use of recycled plastic products	<Y/N>				
Use of GEOfoam alternative to piling	<Y/N>				
Community re-use of surplus materials	<Y/N>				
Local recycling of materials	<Y/N>				
Local waste disposal	<Y/N>				
Onsite concrete crushing	<Y/N>				
Procurement of green energy	<Y/N>				
Compound energy management system	<Y/N>				
Compound solar energy	<Y/N>				
Compound flywheel energy storage	<Y/N>				
Electric site vehicles	<Y/N>				
Electric site plant	<Y/N>				
Hydrogen site plant	<Y/N>				
Driver behaviour	<Y/N>				
Foam mix tarmac	<Y/N>				
Low temperature tarmac	<Y/N>				
Low carbon flood lighting	<Y/N>				
Environmental Monitoring and Inspections					
Action		**Frequency**		**Owner**	**Reporting**

9.4 Residual effects

The construction compound does not give rise to significant impacts from GHG emissions.

10 Landscape and Visual

10.1 Assessment methodology

The assessment methodology has been developed from DMRB LA 107 Rev 2 Landscape and visual effects (Highways England, 2020b) and the 'Guidelines for Landscape and Visual Impact Assessment (GLVIA) Third Edition, Landscape Institute (LI) and Institute of Environmental Management and Assessment (IEMA and LI, 2013). The Landscape and Visual Impact Assessment (LVIA) has identified and assessed the significance and the effects of change from the proposed construction compound on the landscape as a resource, and people's views and visual amenity.

For this study, Table 10.1 and Table 10.2 present the definitions of the sensitivity of the landscape to change and the magnitude of impact on landscape respectively. Table 10.3 and Table 10.4 present the definitions of the sensitivity of views to change, and the magnitude of impact on views. Table 10.5 presents the significance of effect based on value of receptor and magnitude of impact.

Table 10.1: Landscape sensitivity and typical descriptions

Landscape sensitivity	Typical description
Very high	Landscapes of very high international/national importance and rarity or value with no or very limited ability to accommodate change without substantial loss/gain (i.e. national parks, internationally acclaimed landscapes – UNESCO World Heritage Sites)
High	Landscapes of high national importance containing distinctive features/elements with limited ability to accommodate change without incurring substantial loss/gain (i.e. designated areas, registered parks and gardens, country parks)
Medium	Landscapes of local or regional recognition of importance able to accommodate some change (i.e. features worthy of conservation, some sense of place or value)
Low	Local landscape areas or receptors of low to medium importance with ability to accommodate change (i.e. non-designated or designated areas of local recognition or areas of little sense of place)
Negligible	Landscapes of very low importance and rarity able to accommodate change

Table 10.2: Magnitude and nature of impacts on the landscape and typical descriptions

Magnitude of impact		Typical description
Major	Adverse	Total loss or large-scale damage to existing landscape character or distinctive features or elements; and/or addition of new uncharacteristic, conspicuous features or elements
	Beneficial	Large scale improvement of landscape character to features and elements; and/or addition of new distinctive features or elements, or removal of conspicuous elements
Moderate	Adverse	Partial loss or noticeable damage to existing landscape character or distinctive features or elements; and/or addition of new uncharacteristic, noticeable features or elements
	Beneficial	Beneficial Partial or noticeable improvement of landscape character by restoration of existing features or elements; or addition of new characteristic features or elements or removal of noticeable features or elements
Minor	Adverse	Slight loss or damage to existing landscape character of key features and elements; and/or addition of new uncharacteristic features and elements
	Beneficial	Slight improvement of landscape character by the restoration of key existing features and elements; and/or the addition of new characteristic features
Negligible	Adverse	Very minor loss, damage or alteration to existing landscape character of one or more features and elements
	Beneficial	Very minor noticeable improvement of character by the restoration of one or more existing features and elements
No change		No noticeable alteration or improvement, temporary or permanent, of landscape character of existing features and elements

Table 10.3: Visual sensitivity (susceptibility and value) and typical descriptions

Visual sensitivity	Typical description
Very high	• Static views from and of major tourist attractions • Views from and of very important national/international landscapes, cultural/historical sites (e.g. National Parks, UNESCO World Heritage sites) • Receptors engaged in specific activities for enjoyment of dark skies
High	• Views by users of nationally important Public Rights of Way (PRoW) / recreational trails (e.g. national trails, long distance footpaths) • Views by users of public open spaces for enjoyment of the countryside (e.g. country parks) • Static views from dense residential areas, longer transient views from designated public open space, recreational areas • Views from and of rare designated landscapes of national importance
Moderate	• Static views from less populated residential areas, schools and other institutional buildings and their outdoor areas • Transient views from local/regional areas such as public open space, scenic roads, railways or waterways, users of local/regional designated tourist routes of moderate importance • Views from and of landscapes of regional importance
Low	• Views by users of main roads or passengers in public transport on main arterial routes • Views by indoor workers • Views by users of recreational/formal sports facilities where the landscape is secondary to enjoyment of the sport
Negligible	• Quick transient views such as from fast moving vehicles • Views from industrial area, land awaiting re-development • Views from landscapes of no importance with no variety or distinctiveness

Table 10.4: Magnitude of visual impact and typical descriptions

Magnitude of visual impact	Typical description
Major	The project would become the dominant feature or focal point of the view
Moderate	The project would form a noticeable feature or element of the view which is readily apparent to the receptor
Minor	The project would be perceptible but not alter the overall balance of features and elements that comprise the existing view
Negligible	Only a very small part of the project would be discernible, or being at such a distance it would form a barely noticeable feature or element of the view
No change	No part of the project work or activity would be discernible

Table 10.5: Significance of effects based on value of sensitivity of the receptor and the magnitude of impact

Magnitude of visual impact	Sensitivity				
	Very high	High	Medium	Low	Negligible
Major	Very large	Large/ Very large	Large/ Moderate	Slight/ Moderate	Slight
Moderate	Large/ Very large	Large/ Moderate	Moderate	Slight	Slight/None
Minor	Large/ Moderate	Moderate/Slight	Slight	Slight/None	Slight/None
Negligible	Slight	Slight	None/Slight	None/Slight	None
No change	None	None	None	None	None

10.2 Baseline conditions

The proposed Exceat Bridge 2023 compound lies north of the A259 within an arable field, being located approximately 550m East of the properties on Chyngton Lane and 370m West from the current bridge over the Cuckmere River.

10.2.1 Landscape character

For the purposes of this assessment, the landscape has been further broken down into local landscape character units (LCUs). The proposed 2023 compound falls within the South Downs National Character Area (NAC 125). On a local level the proposed construction compound sits entirely under landscape character unit (LCU) 4 valley sides – arable which is characterised by thicker soils on the shallow valley sides support predominantly arable farmland, comprising large, 20th century fields represent extensive re-organisation of the landscape from the historic pattern. Sensitivity of LCU4 is low.

10.2.2 Landscape elements

The construction compound is located within the SDNP. National Parks are recognised as landscapes of exceptional beauty, fashioned by nature and the communities which live in them. Therefore, the sensitivity of the SDNP to change is very high.

The Seven Sisters Country Park is made up of chalk cliffs, the meandering River Cuckmere valley and open chalk grassland. It is a popular place for outdoor activities including walking, bird watching, cycling, canoeing and paddle boarding, therefore, the sensitivity of the Country Park to is high.

10.2.3 Perceptual qualities

The construction compound is located within large, 20th century arable fields which represent extensive re-organisation of the landscape from the historic pattern. Therefore, it is considered that for this location time depth has a low sensitivity.

In May 2016 the SDNP became an International Dark Sky Reserve (IDSR). The construction compound lies within the Transition Zone of the dark night skies area therefore is considered to have a high sensitivity.

The busy nature of the Exceat area, and the noise and visual intrusion of the traffic on the A259, contrasts with that of the surrounding area. It is the hub from which paths radiate out into the surrounding, quieter landscape. The tranquillity of the compound area therefore has low sensitivity to change.

10.2.4 Visual baseline conditions

For people in vehicles and buses using the A259 there are partial and oblique views of the compound, due to scrub growing along the side of the road. Drivers are primarily interested in getting to their destination rather than appreciating their surroundings. Passengers, particularly on the top deck of buses, have more time to look around and appreciate their surroundings. People in vehicles and buses therefore have low to medium sensitivity to change.

Cyclist on National Cycle Route 2 have views of the construction compound largely enclosed by vegetation with glimpses and broader views of the wider landscape from some locations, mostly during winter and so they have a medium sensitivity to change.

Residents of the Chyngton Lane North (eastern side), Dymock Farm and Hill House live on the suburban edge of Seaford will experience long distance views across a farmed rural landscape towards construction compound. Residents are likely to be living in the location at least partly because of the setting and therefore have a high sensitivity to change.

10.3 Potential construction and operational impacts

10.3.1 Landscape character

During the 22 months of the works, large construction plant, site fencing, site facilities and stored materials will be apparent in the landscape at the construction compound which is located in an area of relatively flat arable land north of the A259.

The construction compound although located in an open arable field and partially hidden from view by the roadside hedge and landform will create noticeable damage to the existing landscape character having a moderate impact on the landscape character unit, which has a Low/Medium sensitivity to change resulting in an effect of slight adverse significance for 22 months.

Landscape character unit	Sensitivity	Impact	Effect
LCU 4 valley sides – arable	Low	Moderate	Slight adverse

10.3.2 Landscape elements

The construction compound will affect a very small part of the National Park and Country Park for a limited period of 22 months, because of the introduction of urban elements into the rural landscape. Therefore, it is envisaged that the construction compound will have an impact of negligible magnitude on the National Park as a whole, which has a very high sensitivity to change resulting in an effect of slight adverse significance.

The construction compound will have an impact of negligible magnitude on the Seven Sister Country Park, which has a high sensitivity to change resulting in an effect of slight adverse.

Landscape character unit	Sensitivity	Impact	Effect
SDNP	Very High	Negligible	Slight adverse
Seven Sisters Country Park	High	Negligible	Slight adverse

10.3.3 Perceptual qualities

The construction works will only have a duration of 22 months and so have an impact of Negligible magnitude on the landscape, resulting in an effect of none/slight adverse significance.

The construction compound will be present only temporally and work the works will be taking place during the daytime except for the lifting of the main girders of the bridge. The lighting requirements for the construction compound will have an overall negligible impact on the dark night skies that has a high sensitivity, resulting in a slight adverse effect. It will sit along the busy and noisy A259 and will have a negligible impact on tranquillity that has a low sensitivity, resulting in a none/slight adverse effect.

Perceptual qualities	Sensitivity	Impact	Effect
Time Depth	Low	Negligible	None/slight adverse
Dark night skies	High	Negligible	Slight adverse
Tranquillity	Low	Negligible	None/slight adverse

10.3.4 Potential visual construction impacts

Vehicle users will have a glimpse of the construction compound for short periods only as the traffic moves past. The magnitude of the impact will be negligible adverse on users who have low to medium sensitivity to change resulting in an effect of none to none/slight adverse.

Cyclist along NCR2 will have a glimpse of the construction compound for short periods only as the traffic moves past. The Magnitude of the impact will be negligible adverse on users who have medium sensitivity to change resulting in an effect of none/slight adverse.

Residents of Chyngton Lane North, Dymock Farm, Hill House will barely notice the presence of the construction compound, therefore the magnitude of effect will be negligible. The high sensitivity of the residents combined with a negligible magnitude of impact results in a slight adverse effect.

Visual receptors	Sensitivity	Impact	Effect
People in vehicles along A259	Low to Medium	Negligible	None to None/slight
Cyclist along NCR2	Medium	Negligible	None/Slight
Residents of Chyngton Lane North, Dymock Farm, Hill House	High	Negligible	Slight

10.3.5 Potential landscape and visual operation impacts

It is envisaged that when the works have been completed the area where the 2023 compound is located will be reinstated to its original condition. There will therefore be no landscape and visual operational impacts.

10.4 Mitigation and residual effects

The approach to the Project design has been to incorporate enhancement measures, and to design-out the need for mitigation wherever possible by incorporating ways to eliminate, reduce or manage adverse impacts within the Project design for example to locate the construction compound away from receptors, minimising the need for mitigation. Therefore, there are no significant construction or operation adverse effects associated with the construction compound of Exceat Bridge Replacement project.

11 Lighting

11.1 Assessment Methodology

The management of lighting should ensure any lighting proposed during construction complies with SDNP requirements and / or industry best practice, whichever is more stringent at the time of writing. The impact of artificial light at night (ALAN) should be minimised on the SDNP during construction.

The Dark Skies Policy is seen as one of the perceptual qualities of the landscape where it was recognised as being of high sensitivity to change.

11.2 Potential construction and operational impacts

11.2.1 Construction impacts

Construction lighting is expected to be required during the winter months to aid with safe return of workers to the compound site. However, the lighting duration would be limited to be off after dusk period during winter months, it is envisaged this will reduce the impacts of ALAN. As the proposed Project is situated within a Dark Skies Area and as poorly directed lighting will have an adverse effect upon local ecology, reflecting upon the SSSI status of the works site, controls would be placed upon construction lighting via the CEMP.

As works would normally cease at 16:30, construction lighting would only be required within the works site including the construction compound prior to dusk and for the safety of the workforce.

To achieve the ecological and Dark Skies Area objectives the following controls would be placed upon construction lighting.

- All work site lighting to be extinguished before 07:00 and after 17:00 unless extensions are agreed with the SDNPA[23].
- A lighting strategy plan is to be prepared and submitted to SDNPA for approval prior to the commencement of works[24].
- Weekly inspection of the location and orientation of the lighting shall be undertaken by the Environmental Manager to address any inadvertent or temporary repositioning of the equipment[25].

11.2.2 Lighting strategy

The lighting strategy recorded that the proposed lighting sought to achieve the best possible solution whilst trying to maintain the natural beauty of the area, ensuring compliance with the Dark Night Skies policy, and having minimal impact to the local flora and fauna. It sought to provide some levels of lighting in the areas where the departures are taking place to lessen the extent of the lack of standard levels of illumination.

At night-time, it is important to curtail the perception of light intrusion and glare to road users as well as those within the public house and surrounding dwellings.

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[23] See CEMP clause Land052

[24] See CEMP clause Land053

[25] See CEMP clause Land051

11.3 Mitigation

Except for night working to lift the main bridge girders into place, construction activity within the works site would be restricted to between 07:30 to 16:30. Lighting is anticipated to continue for half an hour either side of the working period during winter months.

Given the observations made on the ES (2021), and the evolution in the design of the proposed Project, the following potential in-combination effects have been considered and addressed:

- Operational road lighting has been reduced in terms of the number of lanterns and further consideration is to be given to the introduction of vehicle activated lighting during the period 12:00 to 03:30.
- As construction activities would not extend beyond 16:30 at the works site, construction lighting would not have a bearing upon the dark skies policy.

12 Noise and vibration

12.1 Assessment methodology

The elements covered and the assessment methodologies used for the noise and vibration assessment of the construction compound are summarised in Table 12.1.

Table 12.1: Construction compound assessment methodologies

Topic	Methodology
Construction compound noise	DMRB LA 111 and BS 5228-1:2009+A1:2014
Construction compound vibration	DMRB LA 111 and BS 5228-2:2009+A1:2014 (partially sourced from BS 7385-2:1993)

Further details for each methodology are set out in the following sections.

A summary of the magnitude of the impacts for noise and vibration from the different elements within the scope of the assessment, together with a summary of the sensitivity of receptors and the definition of significance of effects, is provided at the end of this Section.

12.1.1 Study Area

In accordance with LA 111, the study area for construction noise covers a distance of 300m from the construction works footprint.

For construction vibration, the study area covers a distance of 100m. Since the closest sensitive receptors are almost double this distance from the compound, construction vibration is scoped out from this assessment.

12.1.2 Baseline data collection method

The methods contained in BS 7445-1:2003: 'Description and measurement of environmental noise: Guide to quantities and procedures' (BSI, 2003), which sets out the requirements of the noise measurement equipment for environmental noise surveys, the type of location to be used for environmental measurements and the requirement to record the environmental conditions under which measurements are taken, has been followed for the measurement of baseline environmental noise.

12.1.3 Construction noise assessment method

The methods of BS 5228:2009+A1:2014 have been used for the assessment on construction noise, as advised in LA 111.

BS 5228:2009+A1:2014 Part 1: Noise (BSI, 2014) proposes the ABC method for evaluating the significance of effects of construction noise based on the existing noise level. The ABC method criteria have been reproduced from Table E.1 in Annex E of the standard in Table 12.2.

Table 12.2: ABC method criteria for assessing construction noise from BS 5228-1:2009+A1:2014

Period	Category A (dB)	Category B (dB)	Category C (dB)
Daytime weekday (07:00-19:00) and Saturdays (07.00-12.00)	65	70	75
Evenings weekday (19:00-23:00), Saturdays (13:00-23:00) and Sundays (07:00-23:00)	55	60	65
Night-time (23:00-07:00)	45	50	55

Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A.

Note: If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.

In relation to construction noise, the daytime period is 07:00 to 19:00, evening is 19:00 to 23:00 and night is 23:00 to 07:00. The construction of the compound will be undertaken during weekdays. The operation of the compound will also mainly be weekdays, however, two night-sifts between 21:00 and 05:00 are proposed for the positioning of the bridge girders and it is possible that under exceptional circumstances, some works may occur during the evening. The compound would be in use during these evening and night periods. All three periods have, therefore, been considered in the assessment.

Although the criteria in Table 12.2 from BS 5228-1:2009+A1:2014 only apply to residential receptors, it is considered suitable to apply them to other sensitive receptor categories with lower sensitivities such as the Cuckmere Valley Canoe Club and The Cuckmere Inn pub and restaurant within the study area.

In line with the guidance in LA 111, the LOAEL has been considered to represent existing baseline noise levels at the receptor locations and the SOAEL has been based on the ABC Method from BS 5228-1:2009+A1:2014 in Table 12.3.

Table 12.3: LOAEL and SOAEL values adopted for construction noise

Period	LOAEL (dB) [1]	SOAEL (dB)
Daytime weekday (07:00-19:00)	56 (at The Boathouse) 62 (at The Cuckmere Inn) 57 (at Blackberry Cottage)	65
Evenings weekday (19:00-23:00)	54	55
Night-time (23:00-07:00)	49	50

[1] Numbers are rounded to the whole number. The LOAEL has been considered to be the measured $L_{Aeq,T}$ at the relevant time period at the receptor location.

Noise levels measured during the day at the three monitoring locations indicate that the SOAEL is 65 dB as the existing measured noise levels are all below 65 dB. The existing measured daytime noise levels varies slightly between locations. The noise levels measured at The Boathouse covering the entire daytime period (i.e. 07:00-19:00) are considered to be the most representative for construction noise assessment and also the most conservative as they were the lowest obtained between the three monitoring locations. Therefore, this level of 56 dB, indicated in Table 12.3, is used as the LOAEL for all assessment locations.

The evening and night-time LOAELs and SOAELs have been obtained from the long-term noise survey undertaken at The Boathouse. These are considered to be representative and apply to the other sensitive receptors included in the construction noise assessment.

The magnitude of impact scale for construction noise has been determined in accordance with LA 111, as presented in Table 12.4.

Table 12.4: Magnitude of impact – Construction noise (LA 111)

Magnitude of impact	Construction noise level	Noise level criteria (dB)		
		Day	Evening	Night
Major	Above or equal to SOAEL +5dB	≥ 70	≥ 60	≥ 55
Moderate	Above or equal to SOAEL and below SOAEL +5dB	65.0- 69.9	55.0 - 59.9	50.0 - 54.9
Minor	Above or equal to LOAEL and below SOAEL	55.0- 64.9	53.0- 54.9	49.0 - 49.9
Negligible	Below LOAEL	< 55	< 53	< 49

12.1.4 Assessment of magnitude and significance

This section summarises the proposed magnitude of an environmental impact and significance of effect defined for construction noise based on the methodologies described in the sections above.

Magnitude of impact

The magnitude of the impact for noise from the construction and operation of the construction compound is defined in Table 12.5.

Table 12.5: Criteria for classifying the sensitivity of receptors

Element	Criteria	Magnitude of impact			
		Negligible	Minor	Moderate	Major
Construction noise	Predicted daytime noise level is:	Less than 56 dB	Between 56 to 65 dB	Between 65 to 70 dB	Greater than or equal to 70 dB
	Predicted evening noise level is:	Less than 54 dB	Between 54 to 55 dB	Between 55 to 60 dB	Greater than or equal to 60 dB
	Predicted night-time noise level is:	Less than 49 dB	Between 49 to 50 dB	Between 50 to 55 dB	Greater than or equal to 55 dB

Significance of effect

In order to convey the level of impact on noise it is necessary to determine its significance. The 'significance' of an environmental effect is a function of the 'sensitivity' of the receptor and the 'scale' or magnitude of the impact.

The significance of effects has been assessed as a function of the 'sensitivity' of the receptor and the 'scale' or 'magnitude' of the impact. The matrix is reproduced in Table 12.6 for reference.

Table 12.6: Derivation of significance based on value of receptor and magnitude of impact

Magnitude (+/-)	Sensitivity/Value of receptor				
	Very High	**High**	**Medium**	**Low**	**Negligible**
Major	**Very large**	**Very large**	**Large**	Moderate	Slight
Moderate	**Very Large**	**Large**	Moderate	Slight	Slight
Minor	**Large**	Moderate	Slight	Slight	none
Negligible	Slight	Slight	None	None	None

Environmental impacts from construction noise are categorised as adverse only. This assessment has considered that a significant adverse environmental effect from noise is likely to occur as a result of a 'Very large' or 'Large' significance of effect as highlighted in bold in . 'Slight' and 'None' effects are deemed not significant.

In addition to the significance matrix in Table 12.6, the significance of effects associated with construction noise has been assessed in according to the LA111 guidance, which states that a significant residual adverse effect is likely to occur from construction noise where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

- 10 or more days or nights in any 15 consecutive days or nights
- a total number of days exceeding 40 in any 6 consecutive months

12.2 Assumptions and limitations

12.2.1 Baseline

A baseline noise survey has been undertaken in June 2019 to support of the noise and vibration assessment. It is considered that the locations selected for the baseline noise survey are representative of the closest noise sensitive receptors to the Project. In line with LA 111, baseline noise monitored levels have been used in the assessment of construction noise to set out the LOAEL and SOAEL, while the operational assessment uses the results from the Do Minimum 2024 noise modelling scenario to determine the operational noise baseline as advised in LA 111.

12.2.2 Construction

The assessment has been based on the construction programme provided by the contractor. Professional judgement and conservative assumptions have been used to assign typical plant and equipment from similar schemes. The noise emission data from plant and equipment reported in Annexes C and D of BS 5228-1:2009+A1:2014 (BSI, 2014) has been used in the assessment.

In line with the construction programme, the predictions have considered working shifts within Monday to Friday between 07:30 to 16:30, with the exception of the activity associated with the erection of the two main bridge girders is anticipated to require two night shifts likely to be between 21:00 to 05:00. No works will be undertaken during weekends or Bank Holidays.

12.3 Baseline conditions

Baseline noise conditions have been established from the results of a noise survey carried out at the closest noise sensitive receptors to the Project.

The noise climate in the immediate vicinity of the Project is dominated by noise from traffic using the A259. Away from the A259, levels of road traffic noise are reduced due to distance attenuation, where other noise sources such as local residents' activities and birdsong may then become more dominant. There are no other major noise sources identified in the area.

12.3.1 Sensitivity of receptors

Noise-sensitive receptors identified within the area are listed in Table 12.7 together with the associated sensitivity. These are not all within the assessment study area but have been included to indicate distances in either direction.

Table 12.7: Sensitivity of identified receptors

Receptor	Sensitivity
Construction noise	
Residential properties at: • The Boathouse on Eastbourne Road A259 at approximately 300 m from the construction compound. • Blackberry Cottage on Eastbourne Road A259 at approximately 320 m from the construction compound. • Residential properties on Chyngton Lane N. The closest properties are located approximately 500 m to the west of the construction compound.	High
Other sensitive receptors • The Cuckmere Inn pub and restaurant on Eastbourne Road A259 at approximately 350m from the construction compound.	Low

The Project is also located within the Seven Sisters Country Park and the Seaford to Beachy Head SSSI. The noise climate in these areas will vary, with some locations having a high contribution of noise from the A259.

12.3.2 Baseline noise survey

The baseline noise survey was conducted between the 03 and 04 June 2019 to reflect the residential locations (and representative of others approximately equidistant) likely to be affected by the construction and/or operation phases of the Project. Three noise sensitive locations were selected for the baseline survey.

A combination of short term and long-term surveys were undertaken. Two short-term attended noise surveys were undertaken during daytime hours at The Cuckmere Inn and Blackberry Cottage. A long-term unattended 24-hour survey was undertaken at The Boathouse. The baseline noise monitoring locations and noise monitoring periods are presented in Table 12.8.

Table 12.8: Baseline noise monitoring locations

Location No.	Location name	Coordinates	Noise survey period	Microphone position
1	The Boathouse	50°46'28.02"N 0° 8'42.39"E	Long-term 24-hour between: 3 June 2019 13:00 to 4 June 2019 13:00	Free field position at approx. 10m from the dwelling façade facing the river to the north west from Exceat Bridge. The A259 is located to the south west of the microphone at approx. 20m distance.
2	The Cuckmere Inn	50°46'25.00"N 0° 8'45.00"E	Short-term 20-minute (3 samples) taken on 3 June 2019 at: • 13:18 to 13:38 • 13:39 to 13:59 • 14:01 to 14:21	Free field position at approx. 4m from the dwelling façade. Microphone facing the A259 and Exceat Bridge at approx. 5m from the road. Located to the west of Exceat Bridge.
3	Blackberry Cottage	50°46'26.00"N 0° 8'43.00"E	Short-term 3-hour on 4 June 2019 between 10:40 to 13-40	Free field position at approx. 4m from the dwelling façade. Microphone located to the south west of A259 at approx.15m distance.

Table 12.9 shows the results from the baseline noise survey. The relevant noise indices; LAeq,T, LA10 and LA90 have been reported together with the noted noise sources.

Table 12.9: Baseline noise survey results

Loc. No.	Measurement period	$L_{Aeq,T}$ dB	L_{A90} dB	L_{A10} dB	Noted noise sources
1	Daytime, 16hr (07:00-23:00)	52.1	45.2	54.4	Road traffic on the A259 at approx. 20m from the microphone location is the main noise source noted. Bird song, tree leaves and water motion due to the wind are part of the background sound at the location.
	Daytime, 12hr (07:00-19:00)	52.5	46.8	54.5	
	Evening, 4hr (19:00-23:00)	50.7	34.0	53.9	
	Night-time, 8hr (23:00-07:00)	46.4	18.9	50.2	
2	Sample 1, 20min	61.1	49.5	61.4	Road traffic on the A259 at approx. 5m from the microphone location is the main noise source noted. People walking in and out the pub also contributed to the measured levels together with birdsong.
	Sample 2, 20min	59.2	52.9	61.7	
	Sample 3, 20min	59.1	52.6	61.3	
3	Sample 1, 3hr	54.4	49.2	56.2	Road traffic on the A259 at approx. 15m from the microphone location is the main noise source noted. Local residents walking by, bird song and tree leaves motion due to the wind are part of the background sound at the location.

12.4 Potential construction and operational impacts

Construction activities have the potential to adversely affect the noise and vibration sensitive receptors identified within the study areas. These would generally be temporary impacts and are likely to be controlled by standard mitigation measures, such as best practicable means.

The construction activities for the compound will include site preparation works and the installation of offices and welfare rooms. This would be undertaken during the weekday daytime only.

The operation of the compound would mainly involve the delivery and storage of materials and the use of site offices, and this would mainly be undertaken during the daytime. However, the work on the main bridge deck is estimated to require two night-time shifts, and the compound would be in use during this period.

12.5 Mitigation

Construction noise will be controlled by the application of BPM under Section 72 of CoPA 1974 and good practice under BS 5228 Part 1: Noise (BSI, 2014) throughout the construction period. The general principles will include:

- All materials will be handled in a manner which minimises noise. This includes minimising drop heights into hoppers and lorries;
- All staff and operatives will be briefed on the requirement to minimise nuisance from site activities;
- Audible reversing warning systems used on mobile plant and vehicles of a type, whilst still giving proper warning, will have a minimum noise impact on persons outside the site boundaries;
- Working hours will be restricted to 7:30 and to 16:30 on weekdays with no working on weekends or bank holidays, as far as practicable;
- Any work outside of normal working hours will be agreed with the EHO at SDNP and notice will be given prior to the works to the local residents; and
- A representative will be available on site during working hours to answer queries or address any concerns expressed by members of the public.

The majority of the above measures are considered standard good practice measures, which local authorities are likely to require as part of a 'best practicable means' approach. These measures are included within the SEC as presented in Section 17 and have been included within the CEMP.

12.6 Residual effect

This section presents an assessment of the likely noise effects from the construction and operation of the construction compound.

The construction of the compound will involve different activities undertaken over a number of phases. The predicted noise levels from these activities is presented in Table 12.10.

Table 12.10: Predicted construction noise levels from the construction compound

Activity	Working period	No. days	Estimated Noise Level ($L_{Aeq,T}$ dB)		
			Cuckmere Inn	Blackberry Cottage	The Boathouse
Receptor sensitivity			**Low**	**High**	**High**
Site compound establishment	Day		54	54	55
Site compound operation	Day/Evening /Night	Full duration	33	33	34
Impact Magnitude – Daytime			**Negligible**	**Negligible**	**Negligible**
Impact Magnitude – Evening			**Negligible**	**Negligible**	**Negligible**
Impact Magnitude – Night			**Negligible**	**Negligible**	**Negligible**

During the establishment of the construction compound daytime construction noise levels would be below the daytime SOAEL of 65dB, and also below the LOAEL of 56dB. The magnitude of impact is therefore negligible, indicating slight adverse effect at The Boathouse and Blackberry Cottage and No effect at Cuckmere Inn, indicating no significant effect.

During construction compound operation a diesel generator will provide the power and will be required during the two evening and night-time working shifts, as well as during the typical daytime construction working shifts. The estimated noise levels during the operation of the construction compound would be below both SOAEL and LOAEL for all time periods. The magnitude of impact is therefore negligible, indicating slight adverse effect at The Boathouse and Blackberry Cottage and No effect at Cuckmere Inn, indicating no significant effect.

A summary of predicted residual effects from noise and vibration during the construction and use of the construction compound is presented in Table 12.11.

Table 12.11: Summary of noise residual effects from the construction compound

Impact	Magnitude of impact	Mitigation	Residual effect
Construction noise and vibration			
Construction noise Noise impacts from the worst-case activities during the construction and operation of the compound.	Negligible	None required.	**No significant adverse effects** from construction noise.

13 Population and Human Health

13.1 Introduction

Road projects have potential improve connections for people and places, supporting businesses, healthcare, education and community assets. Conversely, they may affect private property, community and businesses, and agricultural land. As such, this assessment will report on the following elements in regard to population and human health associated with the construction compound required for the proposed Exceat Bridge development:

- Land use and accessibility including:
- Private property and housing.
- Community land and assets.
- Development land and businesses.
- Agricultural land holdings.
- Walkers, cyclists and horse-riders (WCH).

Human health including:

- Health profiles
- Health determinants (e.g. noise/air pollution)
- Likely health outcomes

A statement of community involvement was prepared and was provided in Section 6 of the Planning Statement (East Sussex County Council, 2021) and is not repeated here.

13.2 Assessment methodology

This assessment takes into consideration that the overall development cannot function without the construction compound.

Covering the DMRB LA 112 Population and Human Health (Highways England, 2020c), Table 13.1 outlines the relevant sensitive receptor criteria.

Table 13.1: Relevant LA 112 receptor sensitivity criteria

Receptor sensitivity	Description
Housing and property	
Medium	• Houses or land allocated for housing located in a local authority area where the number of households is expected to increase by >6-15% by 2041 (ONS data); and/or • Existing housing and land allocated for housing (e.g. strategic housing sites) covering <1h and/or <30 houses
Low	• Proposed development on unallocated sites providing housing with planning permission / in the planning process
Community land and assets	
Very high	• Complete severance between communities and their land/assets, with little or no accessibility provision • Alternatives are only available outside the local planning authority area • The level of use is very frequent (daily) • The land and assets are used by the majority (≥50%) of the community
High	• There is substantial severance between community and assets, with limited accessibility provision • Alternative facilities are only available in the wider local planning authority area • The level of use is frequent (weekly) • The land and assets are used by the majority (≥50%) of the community

Receptor sensitivity	Description
Medium	• There is severance between communities and their land/ assets but with existing accessibility provision • Limited alternative facilities are available at a local level within adjacent communities • The level of use is reasonably frequent (monthly) • The land and assets are used by the majority (≥50%) of the community
Development land and businesses	
Medium	• Areas of land in which the enterprise is partially dependent on the spatial relationship of land to key agricultural infrastructure • Access between land and key agricultural infrastructure is required on a reasonably frequent basis (monthly)
Low	• Areas of land which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure • Access between land and key agricultural infrastructure is required on an infrequent basis (monthly or less frequent)
Walkers, cyclists and horse-riders (WCH)	
Very high	• National trails and routes likely to be used for both commuting and recreation that record frequent (daily) use. Such routes connect communities with employment land uses and other services with a direct and convenient WCH route. Little or no potential for substitution. • Routes regularly used by vulnerable travellers such as the elderly, school children and people with disabilities, who could be disproportionately affected by small changes in the baseline due to potentially different needs. • Rights of way for WCH crossing roads at grade with >16,000 vehicles per day.
High	• Regional trails and routes (e.g. promoted circular walks) likely to be used for recreation and to a lesser extent commuting, that record frequent (daily) use. Limited potential for substitution; and/or • Rights of way for WCH crossing roads at grade with >8,000 - 16,000 vehicles per day
Medium	• Public rights of way (PRoW) and other routes close to communities which are used for recreational purposes (e.g. dog walking), but for which alternative routes can be taken. These routes are likely to link to a wider network of routes to provide options for longer, recreational journeys, and / or • Rights of way for WCH crossing roads at grade with >4000 - 8000 vehicles per day

DMRB LA 112 also sets out the following criteria to define the magnitude of change.

Table 13.2: Impact magnitude criteria

Magnitude of impact	Description
Major	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: • Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements. e.g. direct acquisition and demolition of buildings and direct development of land to accommodate highway assets; and/or • Introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision. WCH: • >500m increase (adverse) / decrease (beneficial) in WCH journey length.
Moderate	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: • Partial loss of/damage to key characteristics, features or elements, e.g. partial removal or substantial amendment to access or acquisition of land compromising viability of property, businesses, community assets or agricultural holdings; and/or • Introduction (adverse) or removal (beneficial) of severe severance with limited / moderate accessibility provision. WCH: • >250m - 500m increase (adverse) or decrease (beneficial) in WCH journey length.
Minor	Private property and housing, community land and assets, development land and businesses and agricultural land holdings:

Magnitude of impact	Description
	• A discernible change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements, e.g. amendment to access or acquisition of land resulting in changes to operating conditions that do not compromise overall viability of property, businesses, community assets or agricultural holdings; and/or • Introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision. WCH: • >50m - 250m increase (adverse) or decrease (beneficial) in WCH journey length.
Negligible	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: • Very minor loss or detrimental alteration to one or more characteristics, features or elements. e.g. acquisition of non-operational land or buildings not directly affecting the viability of property, businesses, community assets or agricultural holdings; and/or • Very minor introduction (adverse) or removal (beneficial) of severance with ample accessibility provision. WCH: • <50m increase (adverse) or decrease (beneficial) in WCH journey length.
No Change	• No loss or alteration of characteristics, features, elements or accessibility; no observable impact in either direction.

13.3 Baseline conditions

Significant changes to the baseline in terms of population and human health resources have not been identified that would alter the sensitivity of the receiving community and environment. The construction compound remains in the same field adjacent to the A259 as previously assessed and there is no change on the impact on land use.

13.3.1 Private property and housing

The construction compound lies within the land of Dymock Farm. The landowner would be entering into a commercial contract with the delivery partner for the selected 2023 compound site therefore, the site has not been assigned a sensitivity rating. No residential development land is within the construction compound.

The handful of dwellings on the edge of Seaford are approximately 530m to the west of the 2023 construction compound and remain as not assigned a sensitivity rating.

All land outside the urban boundary of Seaford is protected as part of the SDNP from further urbanisation and there are no known proposals for further residential development at the time of reporting.

13.3.2 Community land and assets

There are no community land or assets defined as common land, village greens, open green space, allotments and sports pitches within 500m of the existing bridge or construction compound.

The Seven Sisters Country Park and visitor centre is located to the east of the Cuckmere River. The Seven Sisters Country Park is composed of chalk cliffs, the meandering Cuckmere River valley and open chalk grassland. It is a popular place for outdoor activities including walking, bird watching, cycling, canoeing and paddle boarding.

There is a visitor centre with a café, parking and other facilities adjacent to the A259 on the eastern side of The Causeway. Near to Exceat Bridge, the Country Park includes the valley floor to the south of The Causeway with the iconic Cuckmere River meanders and the chalk downland on the east side of the valley, south of the A259, heading towards the coast at Cuckmere Haven.

The Seven Sisters Country Park features amongst the most visited open access sites in East Sussex along with Ashdown Forest, Hastings Country Park, the neighbouring Crowlink and Seaford Head and the Eastbourne Downland (including Beachy Head).

The Seven Sisters Country Park has a very high value for sensitivity. Sensitivity is defined in terms of severance, loss and frequency of use. The basis of this assigned value is presumed to be on the daily use. The sensitivity criteria require a combination of factors and as the Seven Sisters Country Park would not be severed and there are alternative assets within the local authority area, for the purposes of this report this has been assumed to be of high sensitivity rather than the very high value previously assigned.

Land owned by the National Trust at Chyngton Farm and Exceat, is the closest National Trust land to the proposed Project. Another National Trust site is located at Birling Gap to Beachy Head. Given the proximity of alternative land within the local authority area and assuming a high level of use a high sensitivity has been assigned to these.

Walmer Road recreation ground and Cuckmere House School both within Seaford, are over 750m from the 2023 construction compound site. Both have been assigned medium sensitivity given the absence of alternatives in the immediate area and the assumed high level of use.

13.3.3 Development land and businesses

Businesses within 500m of the 2023 construction compound include:

- Dymock Farm Shop and Market Garden, associated with Dymock Farm, sells local and seasonal farm produce, located approximately 440m to the northwest of the compound.
- Hill House in Seaford Bed and Breakfast, south side of A259, located on the eastern edge of Seaford, approximately 480m to the west of the compound.

The sensitivity criteria for existing employment sites are based upon the site area and those occupying less than 1ha. Based on this, the businesses identified above are considered to have medium to low sensitivity.

13.3.4 Agricultural land holdings

The 2023 compound is located within agricultural land of Dymock Farm, which is currently used for arable crop production. As the construction compound would not compromise the enterprise a low sensitivity has been applied.

13.3.5 Walkers, cyclists and horse-riders

There are no PRoW within the field where the construction compound will be located therefore, there will be no change or effect. Although, there are several well used paths and routes utilised by walkers, cyclists and horse-riders in and around Exceat Bridge which might be affected by the bridge development. Among the important routes are: The South Downs Way, a National Trail or Primary Long- Distance Path (PLDP). It is the only National Trail open to cyclists and horse-riders, being mainly bridleway. The Vanguard Way, referred to as Secondary Long-Distance Path (SLDPs) is another important route. The impacts to these from the wider development are addressed in the ES (2021) and ES Addendum (2022).

13.3.6 Health, employment and local economy

There are no health facilities in the study area. Facilities providing employment are those described above, namely, the Seven Sisters visitor centre, which is open daily in the summer and at weekends in November to March, the tearoom, the Cuckmere Inn and the Cuckmere Canoe Club. These contribute to the local economy and more widely to that of the surrounding villages.

13.4 Potential construction and operational impacts

13.4.1 Community land and assets

The 2023 construction compound will result in temporary disturbance during the construction phase to community land and assets as it lies within Dymock Farm. Once in operation, there will be no impacts and no effect on the use of community land or assets.

The construction compound does not affect accessibility to development land and business properties within 500m therefore, there will be no impacts or effects.

Any temporary effects can be mitigated by the adoption of standard environmental management practices during construction, and access will be maintained throughout, such that there will likely be no significant effect.

13.4.2 Development land and businesses

There will be no impact and no effect on any development land and businesses identified within 500m of the construction compound.

13.4.3 Agricultural land holdings

The use of agricultural land as a temporary construction site would be a matter for commercial negotiation between the delivery partner and the Dymock Farm and hence no change would result from an assessment perspective.

Private property and housing; Walkers, Cyclists and Horse-riders; and Human health, employment and local economy are likely to have no change and no significant effect.

13.5 Mitigation

It is expected that the delivery partner would liaise closely with the three property owners to develop arrangements that would permit access to and from the properties with minimal disruption to their daily routine.

13.6 Residual effects

The construction compound site intends to be within Dymock Farm holding. The use of agricultural land within the farm is a matter of commercial negotiation and it will return to normal operation post construction therefore, there will be no residual effect.

14 Summary and Conclusions

This Non-Statutory Environmental Assessment Report has been produced to support the planning application for the proposed construction compound to facilitate the Exceat Bridge Replacement development, which is located within the South Downs National Park, following a decision to relocate the construction compound site from the original application site. Whilst the construction compound remains situated within the same arable agricultural land of Dymock Farm, north of the A259. This application is separate to the previous ES (2021) and ES Addendum (2022) however, where assessment methodologies echo these previous reports, they have not been repeated and can be referred to in those previous reports and the Appendix where applicable.

The change in the location of the construction compound is not expected to create significant adverse effects on the environment. Following construction of Exceat Bridge, the land will be returned to agricultural use resulting in no residual effects. Mitigation measures will be adopted to prevent impact on the environment during the construction, operation and decommissioning of the compound site. Where possible, measures should be undertaken to create a net benefit to the environment, which will be driven through competent contractor input and management.

The construction compound will facilitate the construction of Exceat Bridge Replacement development, which will help to create a location at Exceat that can offer an enhanced experience for all users in the long term that aligns with the aims and objectives of the SDNPA and other bodies with responsibilities for managing and safeguarding the area.

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Appendix A – Ecosystems Services Statement

Exceat Bridge Replacement: Site compound Ecosystem Services Statement

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DATE:	July 26th 2023
PROJECT NUMBER:	B23738SC
DOCUMENT CODE	
REVISION NO.:	1
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Introduction

The Exceat Bridge Replacement Scheme has embedded the idea that a positive impact on the ability of the natural environment will be achieved, with the new compound application an extension of those ideals and aims.

Elements included as part of the construction compound consist of its creation and operation, access onto the A259, the car park, storage yard, welfare and office facilities to support the Exceat Bridge Replacement development (SDNP/21/02342/FUL), on land to the north of A259, Eastbourne Road and east of Exceat Bridge.

Government policy states that the planning system should recognise the wider benefits of Ecosystem Services. This is carried through to the South Downs Local Plan with Core Policy SD2[26], which is the authority's core policy on protecting and enhancing Ecosystem Services and applies to all planning applications made in the National Park. The Ecosystem Services approach is a way of considering the landscape and environment in terms of its functions and the wider benefits it provides.

Implementation

South Downs National Park (SDNP) has a list of Ecosystem Services aims in which development proposals have opportunities to have an overall positive impact on the ability of the natural environment These are listed in Table 1: Ecosystem Services Policy SD2 Criteria.

Where the Project has identified opportunities/development proposals in line with SDNP's aims, these have been identified on Figure 1 Ecosystem Services Interventions, which shows the boundary of the site, and cross referenced with Table 2.

[26] https://www.southdowns.gov.uk/wp-content/uploads/2018/04/Core-07-Ecosystem-Services-Technical-Advice-Note-non-householder.pdf

Table 1: Ecosystem Services Policy SD2 Aims

	Sustainably manage land and water environments
	Protect and provide more, better and joined up natural habitats
	Conserve water resources and improve water quality
	Manage and mitigate the risk of flooding
	Improve the National Park's resilience to, and mitigation of climate change
	Increase the ability to store carbon through new planting or other means
	Conserve and enhance soils
	Support the sustainable production and use of food, forestry and raw materials
	Reduce levels of pollution
	Improve opportunities for peoples' health and wellbeing
	Provide opportunities for access to the natural and cultural resources which contribute to the special qualities

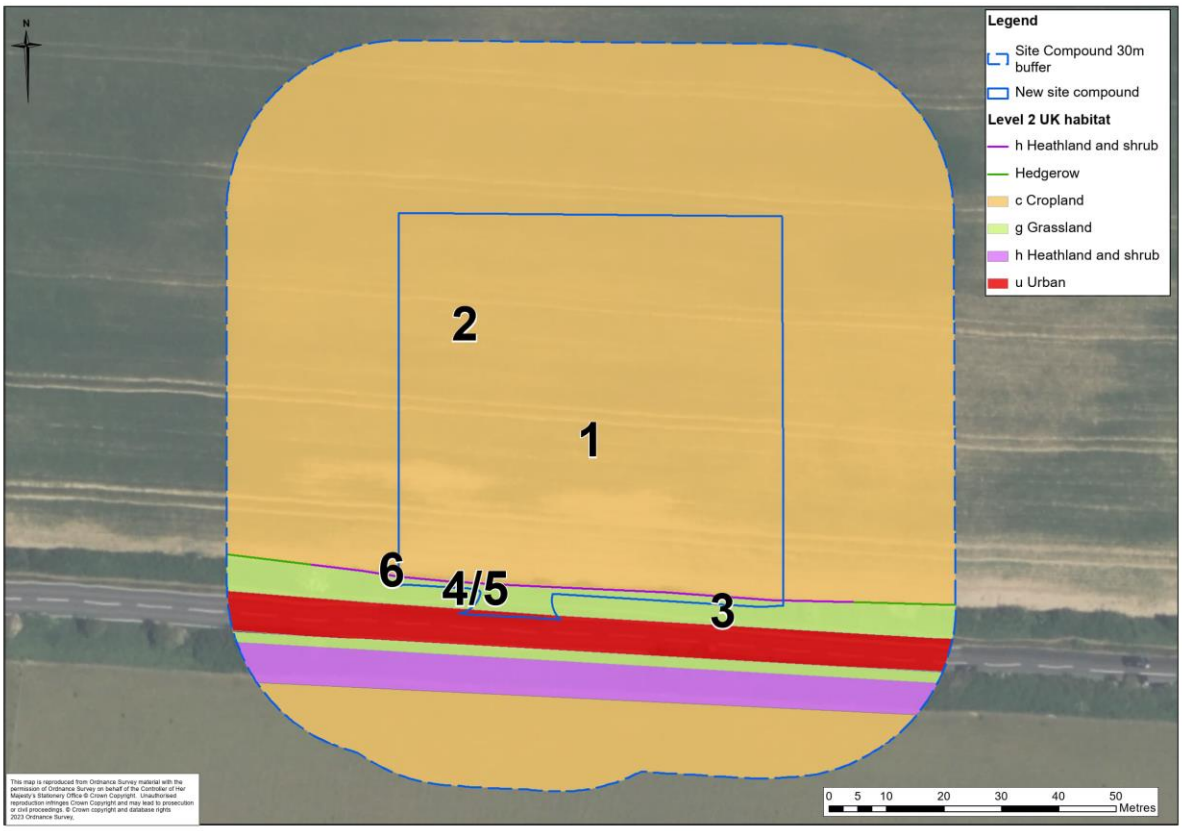


Figure 1: Ecosystem Services Interventions

Table 2: Opportunities

Ecosystem Services Policy SD2 Aims	Opportunities
	1. Lighting fixtures to be minimised/be bat friendly to reduce impacts on Dark Night Skies and protected species.
	2. Habitat restoration to include the restoration of compacted soils to their former condition.
	3. Recycled water that has been treated could be used from sewage treatment works could be used as a source of water to water habitats that are being reinstated where they show signs of drought
	4. Reinstatement of heathland and shrub habitats, improved grassland and arable land which will go towards achieving 10% Biodiversity Net Gain (BNG), in combination with Exceat Bridge Replacement Scheme – which is required to meet legal minimum requirements
	5. Heathland and shrub planting and seeding/green hay of improved grassland will be used to reinstate any areas of these habitats lost during the works, and to continue the line of shrub/scrub habitat that runs along the road verge.
	6. The field boundary fence will be replaced like for like using locally resourced chestnut (from within the South Down National Park)

Biodiversity Net Gain (BNG)

The boundaries of the Exceat Bridge Replacement development are within the Cuckmere Valley SSSI, and as such a bespoke approach to providing BNG and compensation for the loss of coastal salt marsh was required. This was developed in consultation with SDNPA and National England to ensure adequate provision, given the difficulties with the Defra metric 3.1 calculating BNG within SSSI.

As stated in Principle 4 (p15) of the metric 3.1 user guide, the Defra BNG metric 3.1 guidance does not provide for the impacts upon the qualifying features of a SSSI.

'Impacts on protected sites (e.g. SSSIs) and irreplaceable habitats are not adequately measured by this metric. They will require separate consideration which must comply with the existing national and local policy and legislation. Data relating to these can be entered into the metric, to give an indicative picture of the biodiversity value of the habitats present on a site, but this should be supported by bespoke advice'.

The application for Exceat Bridge Replacement, which comprised a previous compound site, included a bespoke approach to achieve BNG for the Exceat Bridge Replacement Project, with 1.37ha of coastal floodplain grazing marsh (CFGM) habitat and neutral grassland off-site at an area adjacent to the existing SSSI, along with habitat enhancement, creation and reinstatement, which would equate to a BNG of 11.6%, providing resilience to the Cuckmere Valley SSSI and the wider area from climate change and the likely sea level rises.

This application has arisen from the location change of the construction compound. However, the present and predicted habitat values, including the size of the compound area that will be temporarily loss, will be exactly the same as the previous compound site.

Government policy states that the planning system should recognise the wider benefits of Ecosystem Services. This is carried through to the South Downs Local Plan with Core Policy SD2, which is the authority's core policy on protecting and enhancing Ecosystem Services and applies to all planning applications made in the National Park. The Ecosystem Services approach is a way of considering the landscape and environment in terms of its functions and the wider benefits it provides.

The Exceat Bridge Replacement Scheme has embedded the idea that a positive impact on the ability of the natural environment will be achieved, with the new compound application an extension of those ideals and aims.

Appendix B- Assessment Methodologies- Environmental Statement (2021)

Air Quality (see Section 7.2 of ES)

Guidance

The assessment of air quality has been completed using the following guidance:

- Design Manual for Roads and Bridges (DMRB) Sustainability & Environment
- Appraisal, LA 105 Air quality (Highways England, 2019)
- Institute of Air Quality Management (**IAQM**) Guidance on the assessment of dust from
- demolition and construction (IAQM, 2016)
- Local Air Quality Management (LAQM) Technical Guidance, LAQM.TG(16) (Defra, 2018)

Data Collection

Information for the assessment of air quality has been collected through the use of:

- LAQM review and assessments and air quality monitoring undertaken by Wealden District Council (WDC, 2020) and Lewes District Council (LDC, 2020) and reported in their Air Quality Annual Status Reports (ASRs)
- Defra background maps, for a 2018 reference year (Defra, 2020)
- Observed meteorological data at Herstmonceux in 2019
- The Atmospheric Dispersion Modelling Software (ADMS)-Roads air dispersion model,
- which was used to estimate annual mean pollutant concentrations at sensitive receptors (see Appendix 7.2)
- A Vissim traffic model, which provided data on traffic flow, composition and speed on the local road network (both with and without the Project)
- Ordnance Survey (OS) datasets, including AddressBase Plus (to identify sensitive human receptors), MasterMap and Highway Network
- MAGIC (Defra, 2020), Ancient Tree Inventory (Woodland Trust, 2020) and local
- ecological datasets to identify designated ecological habitat locations

Air Pollution Information Systems (APIS) for baseline rates of nitrogen deposition in designated habitats

Study area

<u>Construction Phase Effects</u>

DMRB LA 105 (Highways England, 2019) suggests a simple approach for assessing construction dust risks. However, the more detailed approach for assessing construction dust risks set out in the IAQM guidance (IAQM, 2016) has been used instead, the outputs of which can be directly linked to good practice mitigation measures defined in the IAQM guidance itself, depending on the level of risk identified.

IAQM guidance (IAQM, 2016) indicates that an assessment will normally be required where there is:

- A ‘human receptor’ within:
  - 350 m of the boundary of the site
  - 50 m of the route(s) used by construction vehicles on the public highway, up to
  - 500 m from the site entrance(s)
- An ‘ecological receptor’ within:
  - 50 m of the boundary of the site

- 50 m of the route(s) used by construction vehicles on the public highway, up to
- 500 m from the site entrance(s)

As such, the study area for the assessment of construction phase air quality effects has been defined based on a distance of 350 m from the boundary of the site and 50 m of the routes likely to be used by construction vehicles on the public highway, up to 500 m from the site entrance, the extent of which is shown in **Figure 7.5**. These distances have been applied to both main site at Exceat Bridge and the construction compound along the A259 towards Seaford.

Operational Phase Effects

The study area for the assessment of operational phase air quality effects has been defined in line with DMRB LA 105 (Highways England, 2019). The extent of the air quality study area, also referred to as the Affected Road Network (**ARN**), was defined by identifying any road links (and adjoining roads within 200 m) likely to experience any of the following changes between the Do-Something (**DS**) traffic (with the Project) compared to the Do-Minimum (**DM**) traffic (without the Project) in the opening year:

- Annual average daily traffic (AADT) ≥1,000;
- Heavy duty vehicle (HDV) AADT ≥200;
- A change in speed band; or
- A change in carriageway alignment by ≥5 m.

The term 'speed band' referred to above refers to a range of categories for which outputs from the traffic model are grouped into to describe their emissions. This process, which is defined in DMRB LA 105 (Highways England, 2019), and associated emission factors (which are not published, and only available upon request from Highways England) are, however, only relevant to Highways England projects. As such, the following criteria (taken from previous Highways England air quality guidance HA 207/07 (Highways England, 2007), were used to identify road links where changes in vehicle speeds have the potential to result in air quality effects:

- Daily average speeds change by 10 km/hour or more
- Peak hour speed changes by 20 km/hour or more

It should be noted that these changes in speed are considered equivalent to those required to result in a change in 'speed band' and are therefore comparable to the speed change criteria proposed in DMRB LA 105 (Highways England, 2019). DMRB LA 105 states that the traffic scoping criteria should only be applied to the area covered by the traffic model that the competent expert for traffic has identified as reliable for inclusion in an environmental assessment, referred to as the traffic reliability area (**TRA**). For the purposes of this assessment, the full extent of the traffic model has been used, as this was confirmed to be sufficiently reliable for inclusion in an environmental assessment by the competent expert for traffic.

Data from the traffic modelling described in the Transport Assessment (**TA**) have been used to define the study area in accordance with the criteria described above, the extent of which is shown in **Figure 7.1** (see Appendix D). As the criteria for road alignment described above are exceeded on a number of road links, this confirms the need for an air quality assessment.

Sensitive Receptors

Construction Phase

With regards to construction phase effects, different types of receptors can be considered to be of low, medium or high sensitivity to dust soiling effects, health effects of PM_{10} and ecological effects, as described in **Appendix 7.4**. Such receptors include the human health and ecological receptors considered within the operational phase assessment described below, as well as other receptors where adverse effects could be experienced during construction, including car parks, parks and places of work.

Operational Phase – Human Health

Within the study area, residential properties are the only sensitive human receptors present and have therefore been considered for the assessment of annual mean air quality thresholds. Based on a review of baseline conditions (see Section 7.3), there is considered to be a low risk of short term air quality thresholds (e.g. the hourly mean NO_2 and daily mean PM_{10} AQOs) being exceeded in the study area and, as such, sensitive receptor locations relevant to these thresholds, such as gardens and playing fields, have not been considered.

Building usage has been determined using the Ordnance Survey Address-Base Plus dataset and pollutants concentrations estimated at the nearest building façade to the busiest road.

A total of six human health receptors were included in the air quality assessment (the locations of which are shown in **Figure 7.2**). Results for all modelled receptors are provided in Section 7.4.

Operational Phase - Compliance Risk

In accordance with DMRB LA 105, a compliance risk assessment is required to determine whether the Project has the potential to affect the UK's reported ability to comply with air quality Limit Values in the shortest timescales possible.

The guidance states that a compliance risk assessment should be carried out for those PCM road links that are within the ARN of the Project. In this case, there are no road links from the PCM model in the study area of the Project and therefore the Project does not affect the UK's reported ability to comply with the Air Quality Directive in the shortest timescales possible. As such, no further assessment is required.

Operational Phase - Ecological Receptors

Receptors representing all internationally, nationally and locally designated sites of ecological conservation importance on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity (known as 'designated habitats') within 200 m of the ARN have been included in the air quality assessment.

Designated habitats, as defined within DMRB LA 105 (Highways England, 2019) include Ramsar sites, Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Sites of Special Scientific Interest (SSSIs), Local Nature Reserves (LNRs), Local Wildlife Sites (LWSs), Nature Improvement Areas (NIAs), ancient woodland and veteran trees. National Nature Reserves (NNRs) are also assumed to be relevant, although there are none within the air quality study area.

For each designated habitat considered sensitive to nitrogen deposition, transect receptor points at 10 m intervals were modelled, starting from the nearest point of the designated habitat to the road, up to a maximum distance of 200 m. Where multiple, overlaying designated habitats were present along a transect, at different distances from the road, additional receptor points were placed at the closest part of each habitat to the roadside.

A summary of the designated habitats and features included in the assessment is provided in Section 9, the locations of which are shown in **Figure 7.1**. These sites are considered to have the potential to contain features which are sensitive to nitrogen deposition.

Table 7.1: Designated ecological habitats and features included in assessment

Designated habitat/feature	Habitat Description	Designation	Broad Habitat Type
South Downs Way ahead	Calcareous grassland, coastal floodplain grazing marsh	SSSI	Grassland
Seaford Head	Calcareous grassland, coastal floodplain grazing marsh	LNR	Grassland
South Downs Way Ahead	Calcareous grassland, coastal floodplain grazing marsh, native broadleaved, mixed-yew woodland	NIA	Forest and Grassland

Assessment Methodology

Construction Phase

This assessment considered the potential impacts of dust and PM_{10} at sensitive receptors following the methodology outlined within the IAQM Guidance on the assessment of dust from demolition and construction (IAQM, 2016). The assessment has been undertaken using the best available information at the time of writing and any assumptions made have been clearly stated. The dust assessment provides a qualitative risk-based appraisal with reference to the Project in relation to sensitive locations, the planned construction process and local site characteristics. The methodology for the construction dust assessment is provided in greater detail in Appendix 7.4. A summary is provided in Table 7.2.

Table 7.2: Summary of IAQM construction and dust assessment methods

Step	Assessment methods
1	Screen the need for a detailed assessment
2a	Determine the potential dust emission magnitude - Small, Medium or Large, for each site activity– Demolition, Earthworks, Construction and Trackout.
2b	Define the sensitivity of the area – Low, Medium or High, which includes specific sensitivities of receptors based on proximity and numbers of those receptors and the local background PM_{10} (pertinent to human health effects).
2c	Define the risk of impacts, based on the dust risk and area sensitivity conclusions from Step 2a and 2b (without mitigation).
3	Define site specific mitigation (if required).
4	Determination of residual effects.

Operational Phase

A detailed assessment of the potential air quality effects of the Project has been undertaken using the dispersion modelling software, ADMS-Roads. This is an atmospheric dispersion modelling system that focuses on road traffic as a source of pollutant emissions and is a recognised tool for carrying out air quality impact assessments. Version 5.0 (March 2020) was used for this assessment. Further information on the modelling methodology followed can be found in Appendix 7.2.

Air quality modelling, like all modelling, is inherently uncertain, but it is the most reliable, reasonable and robust tool available to determine whether a project has the potential to have a significant air quality effect. To help manage uncertainty in the air quality modelling, the modelled concentrations in the base year were verified against air quality monitoring data in accordance with the methodology described within LAQM.TG(16) (Defra, 2018). The verification adjustment factor derived was applied to the modelled concentrations in the base year, DM (without the Project in place) and DS (with the Project in place) scenarios. A

description of the model performance, including details of model verification and performance statistics, is provided in **Appendix 7.3**.
Uncertainty in future air quality is one of the key assumptions in air quality modelling. Therefore, the approach for addressing uncertainty in predicted future roadside NO_2 trends set out in DMRB LA 105 (Highways England, 2019) has been followed, as described in Appendix 7.3. This approach uses a Gap Analysis method to apply projected Long-Term Trends (termed '**LTTE6**') to model predictions, whereby an adjustment is made to model predictions based on the difference between the predicted rate of improvement in NO_2 concentrations between the modelled base and opening years, and that projected by LTTE6 (which is more conservative).

At the start of the assessment, the Opening Year was assumed to be 2022, but this has since been amended to 2024. Vehicle traffic is not anticipated to change substantially within the study area between 2022 and 2024. In addition, there will be an improvement in vehicle emission rates and background air pollutant concentrations over this period. Model predictions for 2022 have therefore been used for the purposes of the air quality assessment, which is considered a conservative approach, as absolute pollutant concentrations are likely to be lower in 2024 than 2022.

Temporal Scope
The assessment of operational air quality effects has considered the following scenarios:

- The base year (2019), to allow model outputs to be verified against monitoring results
- The DM scenario in the modelled Project opening year (2022 DM)
- The DS scenario (i.e. with the new bridge) in the modelled Project opening year (2022 DS)

Magnitude and Significance

Operational phase – Human Health
Predicted annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations were compared to the relevant AQOs set out in Error! Reference source not found. for each of the scenarios modelled in this assessment.

Table 7.3: Relevant National Air Quality Objectives for human health

Pollutant	Threshold Concentration (µg/m3)	Averaging period
NO_2	40	Annual Mean
PM_{10}	40	Annual Mean
$PM_{2.5}$	24	Annual Mean

In order to convey the level of impact on air quality, it is necessary to determine its significance. The 'significance' of an environmental impact is a function of the 'sensitivity' of the receptor and the 'scale' or magnitude of the impact. The model results were used to assess whether there are any significant effects as a result of the Project in accordance with Highways England's approach to evaluating significant air quality effects, as set out in DMRB LA 105 (Highways England, 2019).

The DMRB approach to air quality assessment identifies and assesses sensitive receptors near roads where air quality might be affected, in particular, in areas where AQOs are exceeded or are close to being exceeded, such as within AQMAs. The model results were used to identify receptors in exceedance of the relevant AQOs in either the DM or DS scenario.

These are the only receptors that are considered in the judgement of significance. The change in predicted concentration is then calculated as the difference between DS and DM model results at these receptors. Where the difference in concentrations are less than or equal to 1

% of the AQO (e.g. less than or equal to 0.4 µg/m3 for annual average NO_2) then the change at these receptors is considered to be imperceptible and can be scoped out of the judgement on significance.

Highways England has developed a framework to provide guidance on the number of receptors for each of the magnitude of change categories that might result in a significant effect. These are guideline values only but have been used to inform professional judgement of the significance of the effects of the Project. The guideline bands are based on Highways England's considered opinion and are intended to help provide consistency across all Highways England schemes, but are considered equally applicable to the Project.

A receptor with a predicted change in annual mean NO_2 or PM_{10} concentration greater than 'imperceptible' (i.e. greater than a magnitude of 0.4 µg/m3) is assigned to one of six categories (large, medium and small for either worsening or improvement) where there is a predicted AQO exceedance. If any exceedances are predicted, the number of receptors in each category are compared to guideline ranges provided in Table 2.92N of DMRB LA 105 (Highways England, 2019), as presented in Error! Reference source not found.. Where the AQO is not modelled to be exceeded at any receptors in either the DM or DS scenarios, the effect would be considered 'not significant'.

Table 7.4: Guideline band for the number of properties informing a judgement of significant air quality

Magnitude of change in annual mean NO_2 or PM_{10} concentration (µg/m³)	**Total number of receptors with:**	
	Worsening of AQO already above objective or creation of a new exceedance	**Improvement of an AQO already above objective or the removal of an existing exceedance**
Large (>4)	1 to 10	1 to 10
Medium (>2)	10 to 30	10 to 30
Small (>0.4)	30 to 60	30 to 60

Where the number of receptors falls below the lower value of the range in all given categories, it is considered that the Project is likely to have a 'not significant' effect (e.g. small increases at a total of 20 receptors exceeding the AQO would be considered 'not significant'). Conversely, where the number of receptors is greater than the upper limit of the range for any given category, it is considered that the potential impact of the Project is likely to cause a 'significant' effect (e.g. medium increases at a total of 40 receptors exceeding the AQO would be considered 'significant').

Where the number of receptors lies within the guideline ranges for any given category, further consideration based on a balanced judgement of the overall impacts across the whole study area is undertaken, including consideration of:

- The absolute concentration at each receptor (i.e. is the modelled concentration 40 µg/m3 or 60 µg/m3?)
- How many receptors are there in each of the magnitude of change criteria (i.e. does the project create more 'worsenings' than 'improvements'?)
- The magnitude of change in concentration at each receptor (e.g. 0.6 µg/m3 vs 1.8 µg/m3)

<u>Operation Phase – Ecological</u>

An assessment of the impacts of changes in nitrogen deposition rates resulting from the Project on designated ecological habitats has been undertaken using the outputs from the air quality modelling. As suggested in DMRB LA 105, the assessment of significant air quality

effects on designated habitats has been undertaken by the competent expert for biodiversity (see Section 9 - Biodiversity).

Archaeology and Cultural Heritage (see Section 8.2 of ES)

The method of assessment for value, magnitude of impact, and significance of effects on archaeology and cultural heritage has followed DMRB LA 106, Cultural heritage assessment (Highways Agency, 2020) and LA 104 as outlined in Section 6. Specific examples relating to the assessment of value for cultural heritage receptors are presented in **Table 8.1** and the criteria for assessing the magnitude of impact are presented in **Table 8.2.**

Table 8.1: Assessing the value of cultural heritage receptors

Value	Criteria
Very high	*Very high importance and rarity, international scale and very limited potential for substitution* For example: World Heritage Sites (including buildings and those inscribed for their historic landscape • qualities) • Assets of acknowledged international importance • Assets that can contribute significantly to acknowledged international research objectives • Extremely well-preserved historic landscapes with exceptional coherence, time-depth or other critical factors
High	*High importance and rarity, national scale, and limited potential for substitution* For example: • Scheduled Monuments (including standing remains) • Designated historic landscapes of outstanding interest • Undesignated assets of schedulable quality and importance • Assets that can contribute significantly to national research objectives • Designated structures (i.e. Listed Buildings) • Conservation Areas containing very important buildings • Undesignated structures of clear national importance • Undesignated landscapes of outstanding interest, high quality or importance and of • demonstrable national value • Well-preserved historic landscapes, exhibiting considerable coherence, time-depth or other • critical factors
Medium	*Medium or high importance and rarity, regional scale, limited potential for substitution* For example: • Designated or undesignated assets that contribute to regional research objectives • Undesignated historic landscapes that would justify special historic landscape designations, or landscapes of regional value • Averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factor • Conservation Areas containing buildings that contribute significantly to its historic character • Historic Townscape or built-up areas with important historic integrity in their buildings, settings or built settings
Low	*Low or medium importance and rarity, local scale* For example: • Designated and undesignated assets of local importance • Robust undesignated historic landscapes and historic landscapes with importance to local • interest groups • Historic landscapes whose value is limited by poor preservation and / or poor survival of • contextual associations • Assets compromised by poor preservation and/or poor survival of contextual associations • Assets of limited value, but with potential to contribute to local research objectives • 'Locally Listed' buildings

Value	Criteria
	• Historic (unlisted) buildings of modest quality in their fabric or historical association • Historic Townscape or built-up areas of limited historic integrity in their buildings or built settings
Negligible	*Very low importance and rarity, local scale* For example: • Assets with very little or no surviving archaeological interest • Buildings of no archaeological or historical note, or buildings of an intrusive character • Landscapes with little or no significant historical interest

Table 8.2: Criteria for assessing the magnitude of impact.

Magnitude or impact	Typical description
Major	Loss of resource/receptor and/or its quality and integrity; severe damage or major improvement to key characteristics, features or elements. Large scale or major improvement of resource or receptor quality; extensive restoration; major improvement of attribute quality.
Moderate	Loss of resource/receptor but not adversely affecting its integrity; partial loss or damage to key characteristics, features or elements. Benefit to or addition of key characteristics, features or elements; improvement of attribute quality.
Minor	Some measurable change in attributes, quality or vulnerability; minor loss or alteration to one or more key characteristics, features or elements. Minor benefit or positive addition to one or more key characteristics, features or elements; some beneficial impacts on attribute or a reduced risk of negative impact occurring.
Negligible	Very minor loss or detrimental alterations to one or more characteristics, features or elements. Very minor benefit or positive addition to one or more characteristics, features or elements.
No change	No loss or alteration

The significance of effects has been determined by consideration of the value of receptors and magnitude of impacts as discussed in Section 6.

Study Area

The study area has been defined as the footprint of the temporary and permanent components of Project (including the Red Line Boundary of the Project and the extended highways boundary where smaller works such as kerb replacements and the installation of signage are proposed) as shown in Figure 4.1 and Figure 4.2 (Section 4), plus a surrounding buffer of 300 m (hereafter 'the wider study area'). The study area is in accordance with the DMRB LA 106 guidance.

The data used to determine the baseline conditions for this appraisal were accessed from the following sources:

- National Heritage List for England (**NHLE**) for information of designated cultural heritage assets
- East Sussex Historic Environment Record (**HER**) for information on non-designated cultural heritage assets and previous archaeological interventions
- The National Trust Heritage Records for information on heritage assets within National Trust land
- SDNPA for information on Conservation Areas and buildings of local importance
- Sussex Historic Landscape Characterisation (**HLC**) project
- Historic mapping available online.

Climate (see Section 10.2 of ES)

Greenhouse Gas Emissions

The methods of assessment are based on the guidance of DMRB LA 114 on Climate (Highways England, 2019). This requires that the assessment reports on construction and operational GHG emissions:

- The assessment of construction impacts includes emissions derived from emissions associated with the raw materials used during construction, construction activities and changes in land use.
- The assessment of operational impacts includes emissions derived from traffic and any maintenance activities over design life of the Project.

Any GHG emissions associated with decommissioning are not assessed due to the length of the operational phase, designed to be 100 years. In accordance with standard convention, GHG emissions have been assessed in terms of tonnes of carbon dioxide equivalents (**tCO_2e**). An energy assessment of emissions associated with construction has been carried out in accordance with SD48: Climate Change and Sustainable Use of Resources" from the Sustainable Construction Supplementary Planning Document published by South Downs National Park Authority (August 2020). A copy of the full assessment report and the assumptions made are presented within the CEMP. A summary is presented in this section.

A separate assessment of emissions associated with the raw materials used during construction has also been carried out. The bridge design was analysed using an attributional approach (SimaPro, Release date April 2019). A copy of the assessment report is presented in Appendix 10.

The criteria used to define the magnitude of GHG emissions has been based on definitions used by The International Finance Corporation (IFC). These provide GHG reporting thresholds for projects to which the Corporation contributes funding of over 25,000 tCO2e in any year (IFC, 2011). The definitions, whereby the magnitude of impact is determined by a boundary of less than or more than 1% of the carbon budgets, or more than 25,000 tCO2e in any year, are outlined in Table 10.1.

The carbon budget set for the period of 2023 to 2027 in the UK at 1,950 million tCO2e, dropping to 1,725 million tCO2e for the budgetary period of 2028 to 2032.

Table 10.1: Magnitude criteria for GHG emissions

Magnitude	Criteria
High	Annual GHG emissions are more than or equal to 1% of the relevant annual National Carbon Budget or are more than 25,000 tCO2e in any year.
Low	Annual GHG emissions represent less than 1% of the relevant annual National Carbon Budget or are less than 25,000 tCO2e in any year.

The significance of effects has been determined by consideration of both the magnitude of effects and the sensitivity of the receiving environment as shown in **Table 10.2**. However, it should be noted that, for climate, the sensitivity of the receptor (the global climate) to changes in GHG emissions is always assigned a sensitivity of 'High'. Combined with the magnitude of impact as defined above in terms of either low of high, the significance of effect is defined as being either Minor (Not significant) or Major (Significant). This is in line with the IEMA guidance (IEMA, 2017), which states that the application of the standard EIA significance criteria is not considered to be appropriate for climate change mitigation assessments.

Table 10.2: Determination of significance of effects for GHG emissions

Magnitude of impact	Sensitivity of receptor
	High
Low (<1% of carbon budget or less than 25,000 tCO_2e in any year)	Minor (not significant)
High (≥1% of carbon budget or more than 25,000 tCO_2e in any year)	Major (significant

The study area for the assessment of operational traffic comprises the affected road network (**ARN**) defined in the Project's traffic model.

Climate change resilience

The assessment of the vulnerability of the Project to climate change has been based on a review of baseline weather conditions, how these are predicted to change over time, and the effects of these on the Project and users of the Project. In this case, the Project has been designed on the basis of a flood risk assessment and to accommodate a 1 on 200-year flood event taking account of predicted climate change over the design life of the Project of 100 years (further details of the assessment scenarios and design parameters relating to flood risk can be found in the Flood Risk Assessment submitted as part of the planning application).

Specific receptors or users of the Project considered vulnerable to climate change comprise:

- the construction process (comprising the workforce, plant and machinery)
- the assets and their operation, maintenance and refurbishment (including the new bridge, the pavements, earthworks, drainage and lighting)
- end-users (comprising members of public and traffic)

The study area for the assessment of the Project's vulnerability to climate change has been based on the construction footprint and Project boundary.

Appendix C- Biodiversity Net Gain Tool

Results Tab

Headline Results

Return to results menu

On-site baseline	*Habitat units*	12.31
	Hedgerow units	0.00
	River units	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	6.46
	Hedgerow units	0.00
	River units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	-47.57%
	Hedgerow units	0.00%
	River units	0.00%
Off-site baseline	*Habitat units*	8.14
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	15.40
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	1.40
	Hedgerow units	0.00
	River units	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	11.38%
	Hedgerow units	0.00%
	River units	0.00%
Trading rules Satisfied?	No - Check Trading Summary ▲	

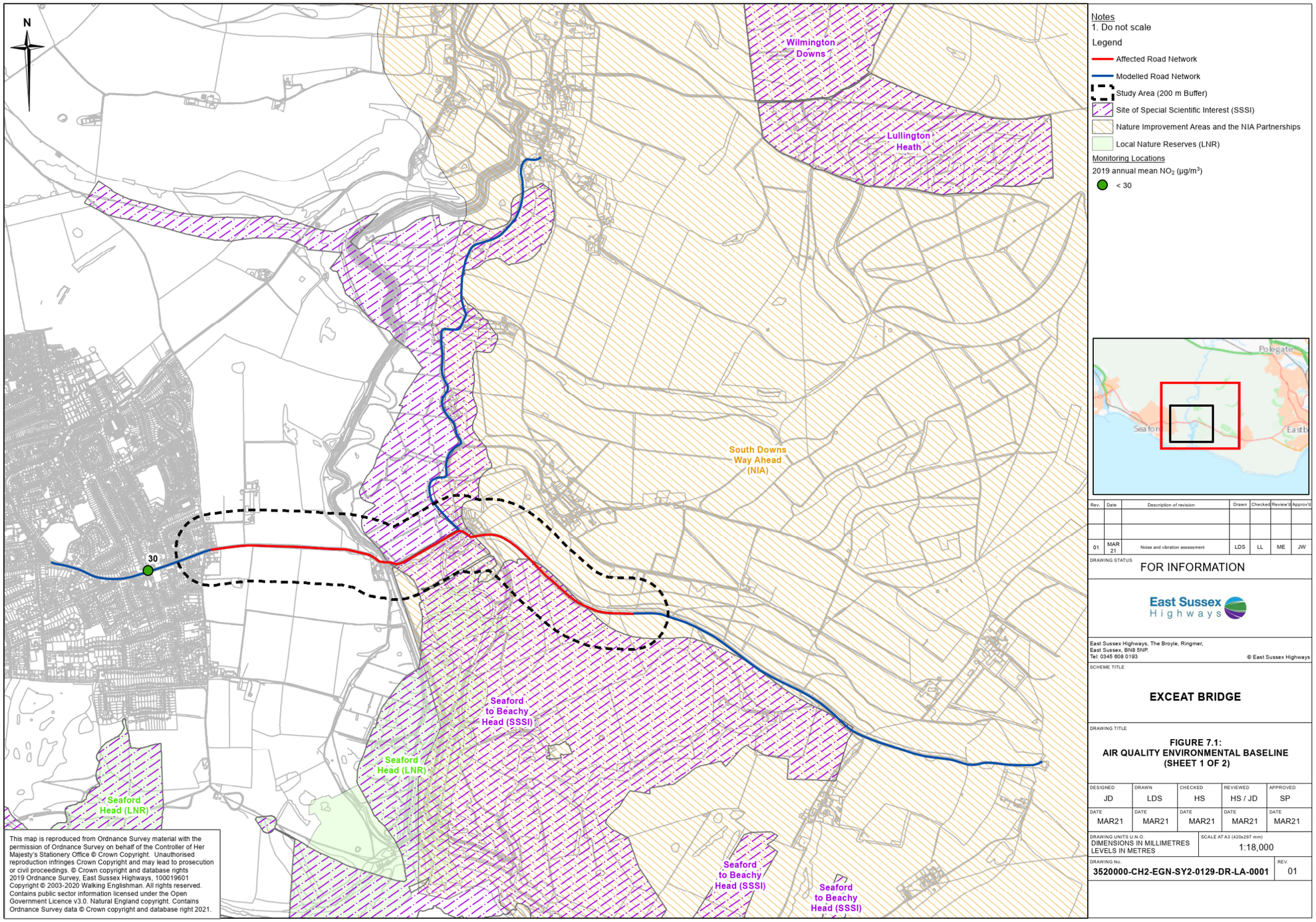
Site habitat baseline

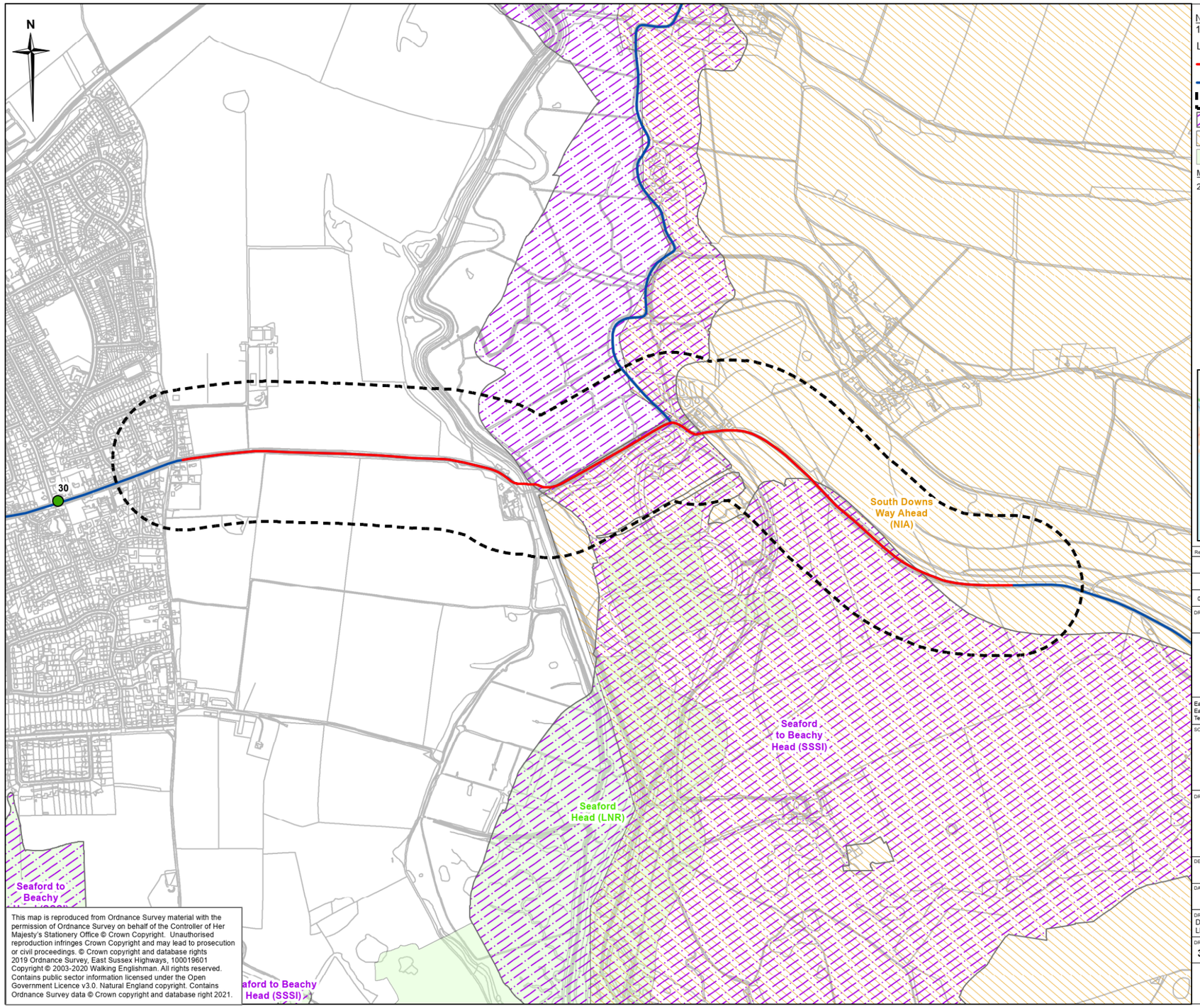
	Habitats and areas			Distinctiveness		Condition		Strategic significance			Suggested action to address habitat losses	Ecological baseline	Retention category biodiversity value						Bespoke compensation agreed for unacceptable losses
Ref	Broad Habitat	Habitat Type	Area (hectares)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic Significance multiplier		Total habitat units	Area retained	Area enhanced	Baseline units retained	Baseline units enhanced	Area habitat lost	Units lost	
1	Grassland	Other neutral grassland	0.376	Medium	4	Good	3	Formally identified in local strategy	High strategic significance	1.15	Same broad habitat or a higher distinctiveness habitat required	5.19			0.00	0.00	0.38	5.19	Yes
2	Heathland and shrub	Mixed scrub	0.197	Medium	4	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required	0.79			0.00	0.00	0.20	0.79	
3	Coastal saltmarsh	Saltmarshes and saline reedbeds	0.1	High	6	Good	3	Formally identified in local strategy	High strategic significance	1.15	Same habitat required =	2.07			0.00	0.00	0.10	2.07	
4	Urban	Developed land; sealed surface	0.419	V.Low	0	N/A - Other	0	Formally identified in local strategy	High strategic significance	1.15	Compensation Not Required	0.00			0.00	0.00	0.42	0.00	Yes
5	Grassland	Floodplain Wetland Mosaic (CFGM)	0.18	High	6	Good	3	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	Same habitat required =	3.56			0.00	0.00	0.18	3.56	Yes
6	Cropland	Cereal crops winter stubble	0.35	Low	2	Condition Assessment N/A	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required ≥	0.70			0.00	0.00	0.35	0.70	Yes

Site Habitat Creation

Broad Habitat	Proposed habitat	Area (hectares)	Distinctiveness		Condition		Strategic significance			Temporal multiplier						Difficulty multipliers				Habitat units delivered
			Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic position multiplier	Standard time to target condition/years	Habitat created in advance/years	Delay in starting habitat creation/years	Standard or adjusted time to target condition	Final time to target condition/years	Final time to target multiplier	Standard difficulty of creation	Applied difficulty multiplier	Final difficulty of creation	Difficulty multiplier applied	
Grassland	Other neutral grassland	0.264	Medium	4	Good	3	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	10	0	0	Standard time to target condition applied	10	0.700	Low	Standard difficulty applied	Low	1	2.44
Heathland and shrub	Mixed scrub	0.215	Medium	4	Good	3	Formally identified in local strategy	High strategic significance	1.15	10	0	0	Standard time to target condition applied	10	0.700	Low	Standard difficulty applied	Low	1	2.08
Coastal saltmarsh	Saltmarshes and saline reedbeds	0.113	High	6	Good	3	Formally identified in local strategy	High strategic significance	1.15	15	0	0	Standard time to target condition applied	15	0.586	High	Standard difficulty applied	High	0.33	0.45
Urban	Developed land; sealed surface	0.45	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0	0	0	Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Medium	0.67	0.00
Grassland	Floodplain Wetland Mosaic (CFGM)	0.23	High	6	Good	3	Formally identified in local strategy	High strategic significance	1.15	20	0	0	Standard time to target condition applied	20	0.490	High	Standard difficulty applied	High	0.33	0.77
Cropland	Cereal crops winter stubble	0.37	Low	2	Condition Assessment N/A	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	1	0	0	Standard time to target condition applied	1	0.965	Low	Standard difficulty applied	Low	1	0.71

Appendix D – Air Quality Environmental Baseline





Notes
1. Do not scale

Legend

- Affected Road Network
- Modelled Road Network
- Study Area (200 m Buffer)
- Site of Special Scientific Interest (SSSI)
- Nature Improvement Areas and the NIA Partnerships
- Local Nature Reserves (LNR)

Monitoring Locations

2019 annual mean NO_2 ($\mu g/m^3$)

- < 30

Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
01	MAR 21	Noise and vibration assessment	LDS	LL	ME	JW

DRAWING STATUS

FOR INFORMATION

East Sussex Highways

East Sussex Highways, The Broyle, Ringmer,
East Sussex, BN8 5NP.
Tel: 0345 608 0193

SCHEME TITLE

EXCEAT BRIDGE

DRAWING TITLE

**FIGURE 7.1:
AIR QUALITY ENVIRONMENTAL BASELINE
(SHEET 2 OF 2)**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
JD	LDS	HS	HS / JD	SP
DATE	DATE	DATE	DATE	DATE
MAR21	MAR21	MAR21	MAR21	MAR21

DRAWING UNITS U.N.O.
DIMENSIONS IN MILLIMETRES
LEVELS IN METRES

SCALE AT A3 (420x297 mm)
1:10,000

DRAWING No.
3520000-CH2-EGN-SY2-0129-DR-LA-0001

REV.
01