



# The Sizewell C Project

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## 8.1 Main Development Site Design and Access Statement - Clean Version - Part 1 of 3

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September 2021

Planning Act 2008  
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Sizewell Beach







# Executive Summary



# Executive Summary

*“The client and project team have remained diligent and thorough in developing this complex and sensitive proposal over a number of years. We think it is being approached with rigour within the challenge of the generic design and technical constraints.”*

Commission for Architecture and the Built Environment  
(CABE) at Design Council (November 2019)

## Introduction

SZC Co.<sup>1</sup> supports the United Kingdom (UK) Government's efforts to make the transition to a low carbon economy. Large scale investment is now needed to replace existing ageing power stations with modern, low carbon electricity generation which would help the UK meet its climate change targets and improve the security of the UK's energy supplies. The development of new nuclear power stations will be essential in delivering this.

One of SZC Co.'s ambitions is to lead the way in nuclear power generation, which is demonstrated by the approval of proposals for Hinkley Point C and the subsequent commencement of its construction.

This document describes the approach to the design of the proposed nuclear power station including works to Sizewell B power station to enable Sizewell C. It also includes an explanation of the related infrastructure and landscape works on the main development site, including proposals for landscape restoration on the balance of the site to the north and west that would have been affected by the construction works. The proposals cover a total site area of 1011.6ha; of these, 371.7ha are onshore, the remaining 639.9ha are offshore.

The main elements of the proposed new power station on the permanent development site include:

- Nuclear islands;
- Conventional islands;
- Operational building;
- Cooling water pumphouses and associated buildings;
- Ancillary buildings;
- Marine works and associated infrastructure; and
- Other site structures, infrastructure and works, including highway works and earthworks.

These are outlined in more detail in **Section 1.3**.

The first part of this Design and Access Statement describes the area context, project requirements and pre-application consultation feedback that have been taken into account in the scheme design process. This is followed by setting out design principles, which are derived from our understanding of the area context and project requirements and have informed detailed designs and will continue to do so. Detailed designs for permanent development within the main development site will need to be implemented in general accordance with the design principles set out in **Chapter 5**, as secured by a requirement in Schedule 2 of the **draft Development Consent Order** (Doc Ref. 3.1).

The development proposals, which conform to the design principles, are described with further details given in **Chapters 7** and **8** of this statement. Information on how the development should be implemented, the sustainability considerations and post operational use conclude this document.

## Context and Requirements

The Government has identified land at Sizewell as one of eight potential sites in the UK for new nuclear power stations in its National Policy Statement for Nuclear Power Generation (EN-6) (NPS EN-6).

The Sizewell C proposals for the main development site lie within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB). The AONB context of the site has been a key driver in the design process with extensive stakeholder engagement to define the special qualities of the AONB to help support the development of the design.

The main development site for Sizewell C comprises the area required to construct and operate the power station, including development such as sea defences and site access. The site for the power station platform comprises an area of flat open ground with mounding established as part of the Sizewell B site, a small area of wetland, associated tree cover and an area of coastal grassland. The wider area of the main development site extends to include arable farmland with hedgerows, grazing pasture with some mature trees and an area of forest. The proposals require the minor realignment of the Sizewell

Drain, which connects the Sizewell Site of Special Scientific Interest (SSSI) to the wider hydrological area.

It has been the task of the masterplanners and architects to work with SZC Co. to integrate the proposed development with the surrounding environment in a manner that minimises impact as far as practical and is sensitive to the existing landscape, whilst meeting the safety, security and operational requirements of the power station.

The design proposed for Sizewell C has been derived from EDF Energy's extensive experience of operating and developing nuclear power stations, most recently Hinkley Point C. The significant buildings forming the main part of the power station development are subject to rigorous civil and nuclear engineering design, which is assessed by the Environment Agency and the Office for Nuclear Regulation (ONR) as part of their Generic Design Assessment (GDA) process and their site specific regulatory activities.

## Consultation

In advance of making the Development Consent Order (DCO) application, SZC Co. has consulted the local community, statutory bodies and other relevant stakeholders on its development proposals. In response to the consultation process, improvements to the masterplan, building design and landscape proposals have been made to respond to the feedback and comments received.

## Sustainability and Climate Change

The design of Sizewell C has taken into account the important consequences of climate change predictions, to ensure that the power station is resilient to those effects over the period of its planned life cycle, including the mitigation of flood risk. SZC Co. would ensure the power station is resilient to the effects of climate change for at least 80 years and would secure the site against 1 in 10,000-year natural hazards.

The development has been designed to meet high standards in terms of environmental sustainability.

<sup>1</sup> NNB General Company (SZC) Limited



*“The extension of the Sizewell Nuclear Facility to create Sizewell C is a significant intervention in a sensitive and remarkable landscape. Extensive steps are being taken by the project team to carefully integrate the Sizewell C site into its historic, coastal setting. Overall, we think the proposal is being approached with great care and attention across architecture, engineering, landscape design and ecology.”*

Design Council (November 2019)

### Application of this document

This Design and Access Statement will be a certified document, which means it controls delivery of the project. The specific parts of this document that control the project are the design principles contained within **Tables 5.2, 5.3 and A.1**.

**Chapter 5** contains design principles for permanent development, which are split into two categories:

- **Overarching Design Principles:** detailed designs submitted and approved in this application have been informed by the overarching design principles. Alternative designs, or where details have not yet been submitted to the local planning authority for approval, will be informed by the overarching design principles, but they do not control the project.
- **Detailed Design Principles:** detailed designs submitted and approved in this application must be carried out in accordance with these design principles. Alternative designs, or where details have not yet been submitted to the local planning authority for approval, must be in general accordance with these design principles. The detailed design principles are set out in **Tables 5.2 and 5.3**.

**Appendix A** contains design details of the temporary Accommodation Campus. The development will be carried out in general accordance with the Design Principles set out in **Table A.1 of Appendix A**.

Development is also controlled by parameter plans and associated parameter tables that are contained in other documents submitted as part of this application. Further details are set out in **Section 1.3**.

### Design Rationale and Summary of the Development Proposals

The architectural design of the main development site has been underpinned by a strategy to express the flexible elements of the Sizewell C development and to contrast this to elements which are fixed in their designs by the nuclear safety case for the site. This includes screening the lower lying buildings in views from the publicly accessible coastline and

using the proposed sea defences to underline the turbine halls as the focal structures along a continuous north-south building line, established by the Sizewell B dome. These larger, taller buildings within the site would be configured as simple orthogonal forms articulated by a defined palette of materials and colours in conjunction with the operational service centre to form the identifiable set-piece of Sizewell C. Colour studies have been undertaken to address the integration of the turbine halls within the landscape of the AONB. The reactor buildings are required to be constructed of concrete and lie inland of the turbine halls to form a series of background elements. Ancillary, office/access, plant, storage and fuel and waste management buildings would be lower and located to the periphery of the site and are substantially screened from the coast. Where views of the proposed buildings are possible, including from inland areas, they would be partially screened and softened by existing intervening vegetation.

The principles for the design of the landscape include the integration of the main development site and associated infrastructure with the surrounding landscape, where appropriate, to screen the development with landform and planting and to draw upon the wider SZC Co.’s estate landscape to provide screening using existing areas of forestry and natural topography. The landscape strategy for the main development site and ultimately for the wider SZC Co.’s estate, is to establish a coastal grassland and dune landscape that connects to the existing coastal areas to the north and south, and through long term management, establish acid grassland in lieu of intensive farmland and new woodland planting to support the long-term presence of woodland in the landscape and enhance biodiversity.

Following completion of construction activity on the main development site, an enhanced network of public and permissive rights of way would be implemented.

### Post-Operations

At the end of power generation at Sizewell C, the reactor buildings and their auxiliary buildings, including the turbine halls, would be decommissioned. Activities performed during the post operational phase would be subject to a high level of regulatory and management control, as per the regulations in force at that time.

### Parameters for Implementation

The status of the plans, drawings and documents included within the DCO is set out within **Section 4 of the Planning Statement** (Doc. Ref. 8.4). This notes that PINS Advice Note 9 “Using the Rochdale Envelope” recognises that large scale infrastructure projects may require an element of flexibility within clearly defined parameters. Those parameters can set defined envelopes within which the development can take place, such as maximum and minimum heights and the location of buildings.

Sizewell C, like most other NSIPs consented through the DCO process, is a complex development that must satisfy a wide range of operational and regulatory requirements. The design process is lengthy, subject to extensive consultation, and requires continuous refinement. This refinement process extends beyond the granting of the DCO.

In addition, experience at Hinkley Point C has been that even the most carefully prepared application can require revision when the process of contracting and detailed design for project implementation is engaged. The scale and intensity of the project once construction has begun is such that unnecessary delays must be avoided if possible. The DCO consent has a critical role in fixing the environmental parameters for the project but does not need to control the detail of project implementation, as long as that implementation remains within the boundaries of those parameters.

Therefore, in order to take account of changes resulting that may arise from complying with the Nuclear Site Licence, or the design development process, SZC Co. proposes a parameter-based approach for the construction and operation of the power station. Parameters are also provided for both construction and operational of the associated developments.

Some elements of the Sizewell C Project require minimal flexibility (i.e. location and dimensions of the nuclear reactors) owing to the advanced stage of design, and their potential to cause significant adverse environmental effects. Parameters for these elements are, therefore, relatively constrained compared with other elements of the project where designs are less advanced, and/or less likely to cause significant adverse effects.

This approach will ensure that good design is achieved in accordance with national policy.



Sizewell Beach





# Chapter 1

## Introduction





# 1.0 Introduction

## 1.1 Overview of Approach

- 1.1.1 SZC Co. intends to deliver a nuclear power station at Sizewell C that would make a major contribution to the nation's low-carbon energy needs. The development, operation and ultimate decommissioning of the power station would be undertaken in a manner consistent with the highest standards of safety, reliability and sustainability. SZC Co. will strive to ensure that its investment in Sizewell C inherently benefits the local and regional economy.
- 1.1.2 In recognition of the environmental sensitivity of the location, SZC Co. will ensure that the power station is designed and delivered in such a way as to limit any adverse effects on the environment and on local communities, working to detailed design principles. Further details on how the detailed design principles are set out in **Chapter 5**.
- 1.1.3 Sizewell C would represent the third generation of nuclear energy generation in Suffolk. The legacy of nuclear generation is a key consideration that underpins the rigour of the design process SZC Co. has undertaken.
- 1.1.4 The development of the Sizewell C scheme has been championed by a team who recognise and understand the sensitive context within which the proposals would be located. There has been an in-depth undertaking to understand the natural beauty and special qualities of the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) and the natural environment, in order to respond in the most appropriate way to this context. Whilst technical and functional layout requirements must be met with rigour, the role of the team has been to consider how people would be using the power station and more importantly enjoy the adjacent and wider landscape for both recreation as well as an area to live. The design has therefore considered how the building and infrastructure proposals sit within the landscape and how the scheme design can best integrate with its surroundings. The development of the scheme design has taken place through extensive consultation with the local community, statutory bodies and other relevant stakeholders on its development proposals through numerous events; public exhibitions and workshops, during all stages of the design process.

## 1.2 Purpose of this Document

- 1.2.1 This Design and Access Statement for Sizewell C is prepared pursuant to Regulation 5(2)(q) of The Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009 and forms part of a suite of supporting documents for the DCO application.
- 1.2.2 The purpose of this Design and Access Statement is to explain the thinking and processes that have led to the formation of the main development site as a whole and explain the proposals in a clear and structured way. The statement explains the way in which the design of the project has evolved from its inception to the detail of the proposals within this application for development consent. It also provides an explanation of the strategy which has informed the overall scale and extents of the main development site.
- 1.2.3 This Design and Access Statement also highlights the important role played by public consultation and the way in which it has influenced the indicative layout and design of the proposed development.
- 1.2.4 This Design and Access Statement addresses the operational phase of the power station on the main development site. It does not cover the marine environment, other than the provision of the beach landing facility (BLF), or the offsite associated developments. The marine works are described within **Volume 2** of the **Environmental Statement** (Doc. Ref 6.3) (ES). A demarcation line is shown on the site plans in this document, to identify the divide between on shore and off shore elements. Details of off-site associated development are set out in **Volumes 3 to 9** of the **ES**. **Chapter 2** of each volume sets out the description of development for permanent development. Off-site developments are referenced in this document where necessary to describe the wider project and design context.
- 1.2.5 This document does not cover the construction stage of the project; reference instead should be made to **Volume 2, Chapter 3** of the **ES**, which sets out the approach and assumed programme to construction on the main development site. The proposed construction worker Accommodation Campus is the exception to this, which is included at **Appendix A** to this Design and Access Statement. The scale and nature of this temporary development is such that SZC Co. has set out the details of the design process undertaken to date in this document. Further details on the application of this Appendix in future detailed designs are set out below.

- 1.2.6 Further appendices to this Design and Access Statement are **Appendix B**, with further detail on the Design Council Review, and **Appendix C**, with a list of abbreviations, and **Appendix D**, with a figure list.

## 1.3 Application of this Document

- 1.3.1 This Design and Access Statement will be a certified document, which means it controls delivery of the project. The specific parts of this document that control the project are the design principles contained within **Tables 5.2, 5.3** and **A.1**.
- 1.3.2 The design principles will perform five different functions, as explained below.
- 1. Buildings and structures with detailed designs submitted for approval**
- 1.3.3 Detailed designs have been submitted for approval for the majority of the main power station buildings and structures.
- 1.3.4 Once approved, these buildings and structures must be carried out in accordance with the Approved Plans set out in **Schedule 7** of the **draft DCO** (Doc. Ref. 3.1) and in accordance with the Detailed Design Principles set out in **Tables 5.2** and **5.3**, unless alternative plans are submitted to and approved by the local planning authority.
- 1.3.5 Any alternative plans or details submitted must be in general accordance with: the Detailed Design Principles set out in **Tables 5.2** and **5.3**; the maximum building heights and siting zones specified in the **Chapter, 2 Volume 2** of the **Environmental Statement** (Doc. Ref. 6.3); and the **Main Development Site Parameter Plans** set out in **Schedule 6** of the **draft DCO** (Doc. Ref. 3.1).
- 1.3.6 Detailed designs have been submitted for the following buildings and structures:
- Reactor buildings and nuclear auxiliary stacks.
  - Fuel buildings.
  - Fuel building halls.



- Boron storage buildings.
- Safeguard buildings.
- Nuclear auxiliary buildings.
- Access towers.
- Radioactive waste storage building.
- Radioactive waste process building.
- Radioactive waste treatment building.
- Hot laundry building.
- Hot workshop, hot warehouse and facilities for decontamination.
- Effluent tanks and refuelling water tanks.
- Emergency diesel generator buildings and associated stacks.
- Cooling water discharge weir buildings.
- Turbine halls.
- Conventional island electrical buildings.
- Power transmission platform: gas insulated switchgear buildings.
- Power transmission platform: main transformers.
- Power transmission platform: unit transformers.
- Power transmission platform: auxiliary transformers.
- Operational service centre.
- Cooling water pump houses.
- Forebays.

- Outfall pond buildings.
- Filtering debris recovery pits.
- Fire-fighting water distribution buildings.
- Sizewell C pylons.
- Sizewell C monopoles.
- Sizewell B outage store.
- Sizewell B outage laydown area.
- Sizewell B training centre.
- Sizewell B operational car park and access roads.
- Sizewell B outage car park.

## 2. Buildings and structures requiring future detailed design approval

- 1.3.7 Detailed designs have not yet been submitted for approval for a minority of the main power station buildings.
- 1.3.8 The layout, scale and external appearance of these buildings will be designed in accordance with the **Parameter Plans** set out in **Schedule 6** of the **draft DCO** (Doc. Ref. 3.1) and the maximum building heights and siting zones specified in **Chapter 2, Volume 2** of the **Environmental Statement** (Doc. Ref. 6.3). They will be designed in general accordance with the Detailed Design Principles set out in **Tables 5.2** and **5.3**. Details will have been submitted to and approved by the local planning authority before their construction commences.
- 1.3.9 Detailed designs for the following buildings will be submitted to the local planning authority for approval:
- Sky bridges.
  - Intermediate level waste store.
  - Interim spent fuel store.

- Main access control building.
- Sizewell Visitor Centre.
- Relocated facilities administrative buildings.

### 3. Other buildings, structures and plant not requiring detailed design approval

- 1.3.10 Detailed designs for other buildings, structures and plant at the main development site will be carried out in accordance with the **Parameter Plans** set out in **Schedule 6** of the **draft DCO** (Doc. Ref. 3.1) and the maximum building height and siting zones specified in **Chapter 2, Volume 2** of the **Environmental Statement** (Doc. Ref. 6.3). They will be designed in general accordance with the Detailed Design Principles set out in **Tables 5.2** and **5.3**. The designs will not be submitted to the local planning authority for approval.
- 1.3.11 They include (but are not limited to):
- Auxiliary administration building.
  - Emergency response centre.
  - Emergency response energy centre.
  - Secondary access control building.
  - Meteorological station.
  - Demineralisation station.
  - Valve room for the demineralisation station.
  - Auxiliary boilers.
  - Hydrogen storage.
  - Oxygen storage.
  - Hydrazine storage.
  - Chlorination plant.



- Service ventilation building.
- Raw & potable water storage - supply.
- Degassed water storage tanks.
- Cooling water discharge shaft.
- Chemical products storage.
- Garage for handling materials.
- Oil & grease storage.
- Contaminated tools store.
- Sewage treatment plant.
- Conventional island water tanks.
- Nuclear island water tank.
- Conventional waste storage.
- Transit area for very low and low level waste.
- Service access buildings.
- Battery load banks.
- Warehouse.
- Interim spent fuel store equipment storage building.
- Emergency equipment store.
- Ancillary substation and associated compound.
- Off-site delivery check point.
- SSSI crossing.

- Beach landing facility.
- Soft coastal defence feature.
- Hard coastal defence feature.
- National Grid substation.
- Alterations to the existing National Grid substation.
- National Grid pylon and associated infrastructure.

#### 4. Landscape scheme

1.3.12 Detailed designs for the proposed permanent landscape will be submitted to and approved by the local planning authority. The design will be in general accordance with **Chapter 8** and the Detailed Design Principles set out in **Tables 5.2** and **5.3**. The landscape works can be submitted and commenced in parts to allow landscaping works to be implemented at the earliest practicable opportunity. The landscape scheme will include:

- soft landscape details;
- hard surfacing materials;
- proposed finished ground levels;
- vehicular and pedestrian access, parking and circulation areas;
- street furniture, fencing, CCTV, refuse storage structure or other structures;
- an implementation timetable for the works; and,
- a Landscape and Ecology Management Plan, which will be prepared in general accordance with the measures set out in the **Outline Landscape and Ecology Management Plan** (Doc Ref. 8.2).

1.3.13 All landscape works will then be carried out in accordance with the approved landscape scheme and in accordance with appropriate British Standards.

#### 5. Accommodation Campus

1.3.14 The Accommodation Campus is a temporary development and described separately in **Appendix A** of this document. The development will be carried out in general accordance with the Design Principles set out in **Table A.1** of **Appendix A** and in accordance with the **Parameter Plans** set out in **Schedule 6** of the **draft DCO** (Doc. Ref. 3.1).

#### 6. Parameter plans

1.3.15 The Parameter Plans referred to above set parameters within which certain developments can take place, such as maximum building heights. The proposed development is assessed against these parameters in **Volume 2** of the **Environmental Statement** (Doc Ref 6.3), meaning the environmental effect of development within those parameters is anticipated and, if necessary, mitigated. Further details are set out in **Chapter 10** of this document.



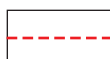
#### 1.4 Summary of Proposals for the Main Development Site

1.4.1 The development site boundary (identified as the red line) for the Sizewell C main development site is illustrated in **Figure 1.1**. This represents the full extent of land required to construct, operate and maintain the power station including land needed to accommodate a number of relocated facilities from within the existing Sizewell B power station site. The development site boundary sits substantially within the wider Estate (also illustrated in **Figure 1.1**); this includes land under the applicant's ownership which is required to mitigate specific impacts arising from the power station development. These areas, and associated proposals (including implemented schemes) are referred to in the Design and Access Statement for context and to explain the design rationale for the illustrative Landscape Masterplan.





**Legend**

-  Sizewell C Development Site Boundary (approx.. 371.7ha excluding marine element)
-  Estate Boundary
-  Demarcation line

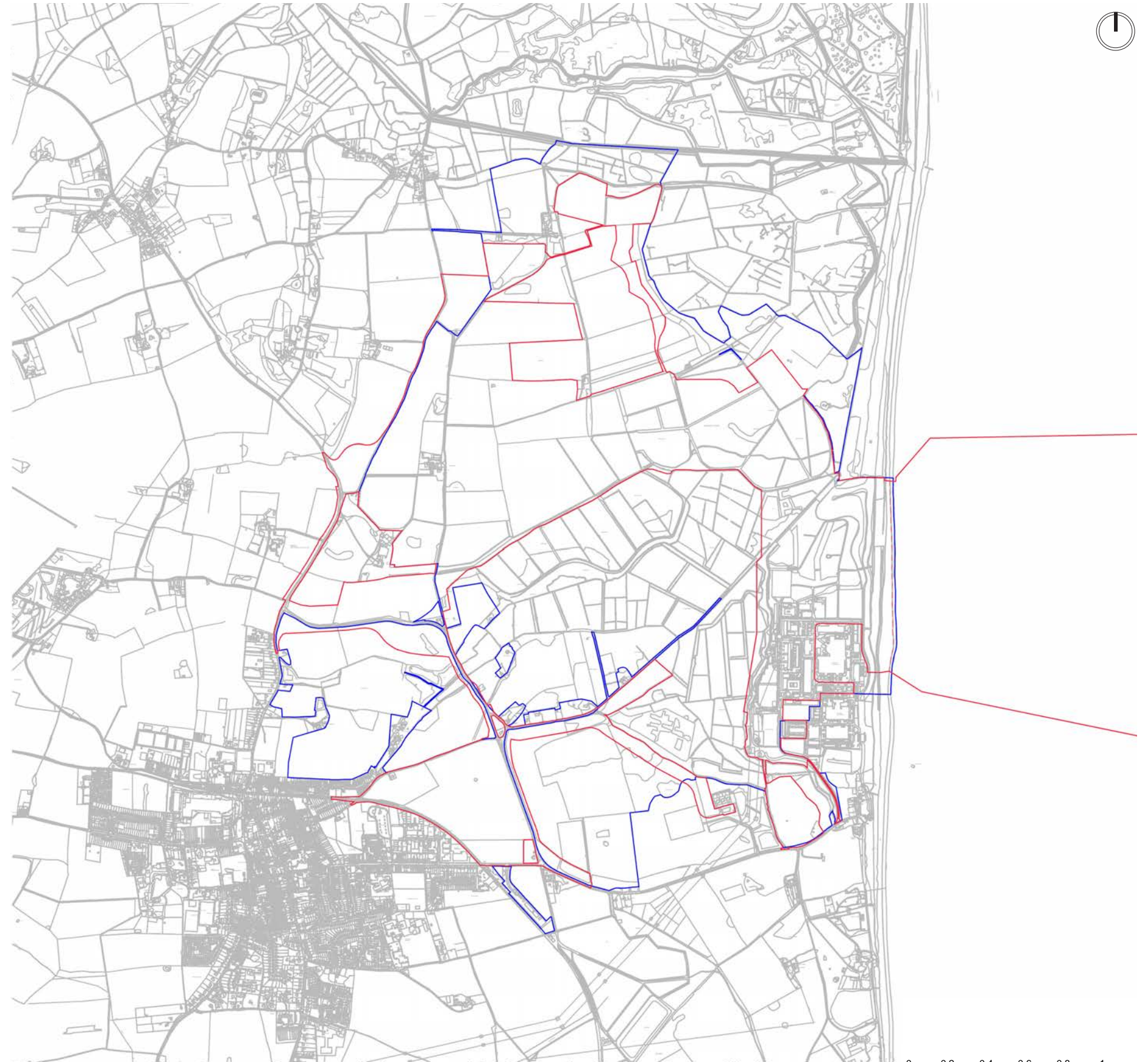


Figure 1.1: Main Development Site



1.4.2 Land within the main development site boundary for which consent is being sought would comprise a range of buildings, above ground, seabed and sub-surface structures and related facilities. The main development site comprises five components, which are described below and illustrated in **Figure 1.2**:

- Sizewell C power station platform (main platform): the area that would become the power station itself;
- Sizewell B relocated facilities and National Grid land: the area that certain Sizewell B facilities would be moved to in order to release other land for the proposed development and land required for the National Grid transmission network;
- Sizewell C offshore works area: the area where offshore cooling water infrastructure and other marine works would be located;
- temporary construction area: the area located primarily to the north and west of the proposed SSSI crossing, which would be used to support construction activity on the main platform; and,
- Land east of Eastlands Industrial Estate (LEEIE): the area including and directly to the north of Sizewell Halt, which would be used to support construction on the main platform and temporary construction area.

1.4.3 Permanent development at the main development site would comprise the following building, engineering or other operations:

1.4.4 Nuclear islands

- Two nuclear islands, including two UK European Pressurised Reactor (EPR™) reactor buildings and associated annexed buildings containing the safety systems, fuel handling systems and access facilities, together with the adjacent emergency diesel generator buildings.

1.4.5 Conventional islands

- Two conventional islands, each including a turbine hall and associated electrical buildings for the export and distribution of electrical power.

1.4.6 Operational building

- An operational service centre (a multi-purpose building), which allows for access into the nuclear island, includes storage areas, workshops, store rooms, laboratories, data centre, offices, training and associated support and welfare facilities, including the staff restaurant.

1.4.7 Cooling water pumphouses and associated buildings

- Two cooling water pumphouses with related infrastructure (one for each UK EPR™ reactor).

1.4.8 Ancillary buildings

- office/access, plant, storage and fuel and waste management.
- National Grid 400 kilovolt (kV) substation.
- Relocation of several Sizewell B buildings including the outage store, training centre, administration, welfare and canteen facilities and visitor centre.
- Associated buildings outside of the power station perimeter.

1.4.9 Off shore marine works and associated infrastructure

- The cooling water system and Combined Drainage Outfall (CDO) in the North Sea.

1.4.10 Other site structures, infrastructure and works, including landscape works, highway works and earthworks.

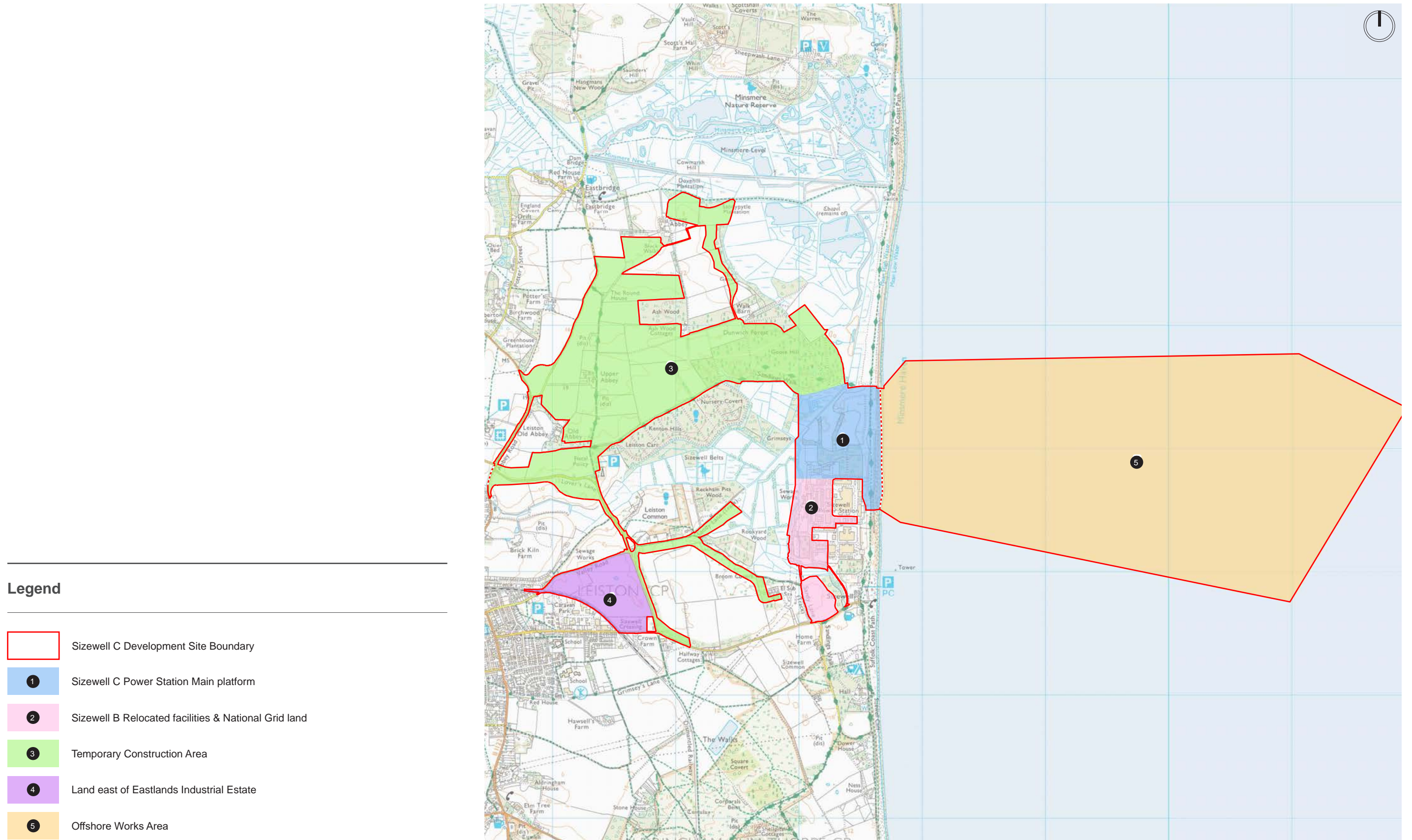
- Overhead power lines and pylons connecting the conventional islands to the National Grid substation.
- Relocation of an existing National Grid pylon and power line south of Sizewell C.
- Vehicular and pedestrian crossing over the Sizewell Marshes SSSI south of Goose Hill in the form of a culverted embankment.
- A beach landing facility (BLF) proposed for freight and AILs arriving by sea.

- Relocation of several Sizewell B facilities including the outage laydown area, operational car parking and access roads and outage car parking and access roads.
- Diversion of rights of way including Bridleway 19.
- Power station access road, linking the SSSI crossing with a new roundabout onto Abbey Road (B1122).
- Flood defences and coastal protection measures.
- Landscape restoration works and planting.
- Fencing, lighting and other security provisions.
- New sports facilities located on existing playing fields at Alde Valley school in Leiston.
- Fen meadow compensation areas located at Halesworth and Benhall.

1.4.11 For clarity, the following terminology is used to describe three indicative masterplans through this document – each of these masterplans are included in **Chapter 8** of this statement and are not for approval.

- Landscape Masterplan – the landscape for the main development site which will be subject to restoration following construction of the power station.
- Landscape Masterplan Context – land outside the main development site boundary and within EDF Energy Nuclear Generation Limited and SZC Co.'s ownership (the 'Estate') which forms an important context for the Landscape Masterplan.
- Estate Operational Masterplan – the overarching landscape strategy for the wider Estate comprising the Landscape Masterplan and its context.





**Legend**

- Sizewell C Development Site Boundary
- 1 Sizewell C Power Station Main platform
- 2 Sizewell B Relocated facilities & National Grid land
- 3 Temporary Construction Area
- 4 Land east of Eastlands Industrial Estate
- 5 Offshore Works Area

Figure 1.2: Location plan

0 0.2 0.4 0.6 0.8 1 KM



**1.5 Structure of Document**

1.5.1 This Sizewell C Design and Access Statement is structured as set out in **Table 1.1**. The purpose of each chapter is shown:

**Table 1.1: Structure and purpose of document**

CHAPTER / APPENDIX	NAME	PURPOSE OF CHAPTER
1.	Introduction	Not for approval.
2.	Site Context	
3.	Project Requirements	
4.	Consultation and Evolution of Design	
5.	Design Principles	Level 1 control document with specific sections secured by dDCO Requirement
6.	Site Response - Delivering Good Design	Not for approval.
7.	Building Proposals	Level 1 control document with specific sections secured by dDCO Requirement
8.	Landscape Proposals	Level 1 control document with specific sections secured by dDCO Requirement
9.	Site Access	Not for approval.
10.	Parameters for Implementation	
11.	Sustainability and Climate Change	
12.	Post Operational Use	
13.	Conclusion	Level 1 control document with specific sections secured by dDCO Requirement
A.	Accommodation Campus	
B.	Design Council Review	
C.	Abbreviations	
D.	Figure List	Not for approval.



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Sizewell Beach







# Chapter 2

## Site Context

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*“Sizewell B is seen as an iconic structure, and one that arguably adds to the intrigue and character of the Suffolk coast.”*

JLAG Sizewell C Suffolk, Design Principles

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# 2.0 Site Context

## 2.1 Introduction

2.1.1 Sizewell is one of several locations identified by the Government as potentially suitable for the deployment of a new nuclear power station before the end of 2025. The nominated Sizewell C site is located on the Suffolk coast approximately mid-way between the towns of Aldeburgh and Southwold, to the north-east of the town of Leiston and north of the village of Sizewell. It is immediately adjacent to the existing Sizewell power station complex, which has been generating electricity for over half a century. The location of the Sizewell C site is illustrated on **Figure 2.1**.

## 2.2 Sizewell C Main Development Site

2.2.1 **Figure 2.1** shows the extent of the proposed Sizewell C main development site, which would accommodate all of the land and sea necessary to build the new power station, including the access road, stockpiles and materials storage areas and the accommodation campus.

2.2.2 The permanent development includes the main power station buildings; access road and crossing over the SSSI; the reconstructed sea defences; BLF and offshore infrastructure. The main development site is also the focus of a comprehensive illustrative Landscape Masterplan that would restore and repair areas of land affected during construction and create a positive legacy for the benefit of people and nature. The illustrative landscape proposals are shown in **Figure 8.3** of this statement.

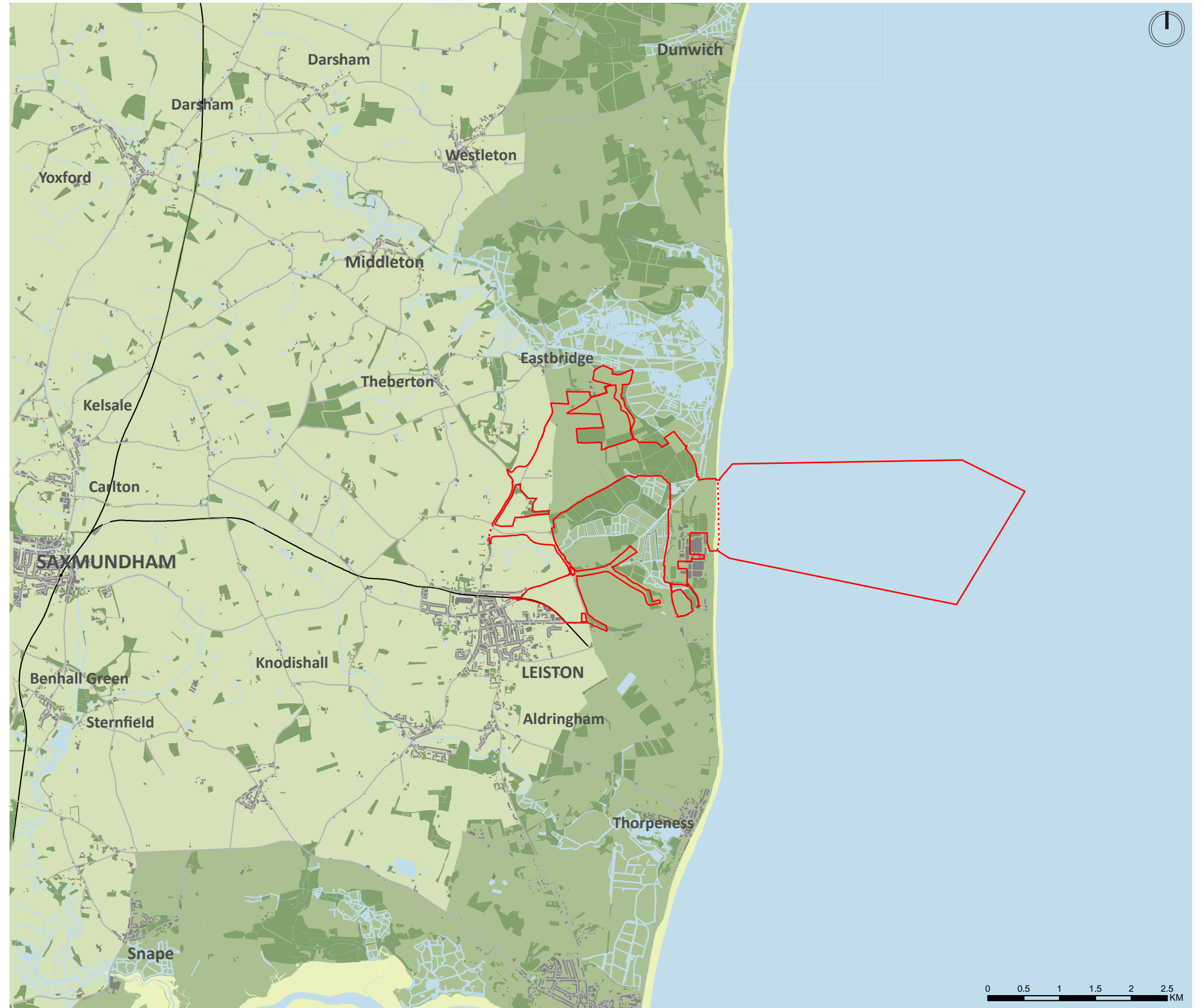
2.2.3 The existing character of the main development site is described below, as shown in **Figure 1.2**:

- **Sizewell C main power station platform:** This area comprises the land that would accommodate the new nuclear power station buildings and majority of ancillary and supporting buildings and infrastructure. It was used during the construction of the existing Sizewell B nuclear power station and is now characterised by regenerating scrub, semi-improved grassland, coniferous plantations and tree belts. To the west and north are areas characterised by semi-natural and plantation woodlands, scrub and marsh / marshy grassland and open water forming part of the Sizewell Marshes SSSI. To the east lies the Northern Mound, a vegetated engineered embankment (known as bent hills) and a lower vegetated shingle bund, which together form the sea defences to the existing Sizewell power stations. Between these features is an area of dune grassland. East of the lower bund is a shingle beach (Sizewell beach), which shelves into the offshore area of the main development site.
- **Sizewell B Relocated Facilities:** This area encompasses land within and adjacent to the existing Sizewell B nuclear power station and is characterised by buildings and infrastructure associated with the operational nuclear power station. Whilst there are some landscaped areas, it displays a strong planned and industrial character. This area also encompasses Coronation Wood, a woodland compartment with a species makeup consisting of a mix of coniferous and broadleaf trees,

and Pillbox Field, which comprises former arable land that has been allowed to revert to grassland. As set out later on in this document, there are two options within the application for the Sizewell B relocated facilities, Option 1 also includes an area of land forming part of the Sizewell A site.

- **Temporary Construction Area:** The temporary construction area extends across woodland plantations at Dunwich Forest, Goose Hill and relatively large geometric arable fields defined by hedgerows and linear tree belts. At Black Walks, south of Lower Abbey Farm, the area comprises semi-improved acid grassland and neutral grassland with scattered scrub. Fields of improved pasture are characteristic of land in the vicinity of Upper Abbey Farm (west of Bridleway 19) and north of Lover's Lane. Semi-improved grassland and acid grassland are also noted at Broom Covert and the land south of Sandy Lane and north of Sizewell Gap.
- **LEEIE:** This area is located on the eastern edge of Leiston and comprises arable fields defined by hedgerows and hardstanding and rail / road infrastructure at Sizewell Halt.
- **Offshore component:** This area of the main development site extends seaward from Sizewell beach and includes the open water environment of Sizewell Bay, in which there are no significant structures or features above sea level.





**Legend**

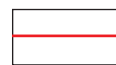

-  Sizewell C Main Development Site Boundary
-  Demarcation Line

Figure 2.1: Site context



## 2.3 Landscape and Seascape Context

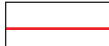


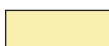






- 2.3.1 The full extent of the onshore part of the main development site is located within the 'Suffolk Coast and Heaths' National Character Area (NCA). This NCA lies along the North Sea coast between Great Yarmouth in the north and Harwich in the south and extends between 10-20km inland. It is described by Natural England as a low-lying landscape with subtle changes in relief and a distinctive coastal pattern of gently sloping sandy hills, called 'Sandlings', separated by inlets and marshland. In the past, the Suffolk Sandlings supported extensive heathlands until irrigation and fertiliser inputs transformed the productivity of the light sandy soils during the second half of the 20th century. Today much of the Suffolk Sandlings heath has been replaced by arable farmland and commercial forestry with only small and fragmented areas of heath remaining. The coast is interrupted by five estuaries (Stour, Orwell, Deben, Alde / Ore and Blyth) with extensive wildlife-rich intertidal areas of mudflat and salt marsh. In some places, old river mouths have become enclosed by sand and shingle bars, creating large areas of brackish or freshwater marshland. The importance of the coast for biodiversity is recognised by its many wildlife designations. The dynamic coastline is formed by long sweeping bays and is characterised by predominantly shingle beaches and low, soft crumbling cliffs in places. Important geomorphological features include shingle structures, such as the 16km long Orford Ness. Views are described as expansive except where enclosed by woodland and there are few commanding viewpoints in the mainly flat or gently rolling landscape. The coastline is described as largely undeveloped with a coast road only between Aldeburgh and
- Thorpeness. The Natural England description adds that settlement patterns are sparse, consisting mainly of small villages, coastal market towns, and larger urban settlements confined to the north and south of the NCA ('Lowestoft, Ipswich and Harwich'). The NCA description also highlights large commercial ports, Sizewell power station, Cobra Mist transmitting station and Orwell Bridge as landmarks contributing to the diversity of the landscape. The area is described as having inspired many artists, writers and naturalists and is recorded as being a recreation and tourist destination with extensive public access.
- 2.3.2 Approximately 1.5km west of the main development site is the 'South Norfolk and High Suffolk Claylands' NCA. The NCA description (Natural England, 2014) records that it is a large plateau area that is flat or gently undulating, and that the edges of the plateau have been dissected by rivers that form greater slopes, especially along the tributaries of the Waveney. Offshore from Sizewell lies the 'Suffolk Coastal Waters' Seascape Character Area. The published description for the Seascape Character Area includes references to the dominance of coastal processes, eroding cliff lines and concentration of vegetated shingle and coastal lagoon habitats. Large scale panoramic views dominated by offshore shipping are highlighted along with the presence of some significant large-scale developments including the existing power station complex at Sizewell, Orford Ness transmitting station, and the commercial docks at Felixstowe.
- 2.3.3 Within the context of the National Character Areas and regional scale Seascape Character Areas, local landscape and seascape character is described in several published assessments. The key references are the Suffolk County Landscape Character Assessment<sup>1</sup> and Seascape Character Assessment of Suffolk, South Norfolk and North Essex<sup>2</sup>.
- 2.3.4 Onshore the majority of the main development site lies within the 'Estate Sandlands' Landscape Character Type, which extends along the coast in a discontinuous belt broadly corresponding with the 'Suffolk Sandlings', the local name for the area of light sandy soils, stretching from Southwold in the north to Felixstowe in the south. The flat or very gently rolling plateaux is characterised by free-draining sandy soils that prior to widespread enclosure were characterised by extensive areas of heathland or acid grassland, remnants of which survive. Plantations and tree belts are common and large coniferous forests are a feature. In the vicinity of Upper Abbey Farm and Old Abbey, part of the main development site lies within the 'Ancient Estate Claylands' Landscape Character Type. This forms part of an extensive dissected boulder clay plateau extending westwards. A small area of the main development site within the Minsmere Level, to the north of Goose Hill, and the Sizewell Belts, to the west of the existing Sizewell power station complex, falls within the Coastal Levels Landscape Character Type. This is a relatively unsettled landscape that occurs in several locations along the coast. The main development site also includes a narrow stretch of the Coastal Dunes and Shingle Ridges Landscape Character Type. Here, beaches are often characterised by a long high ridge, backed by soft cliffs or saltmarsh.
- 2.3.5 The offshore portion of the main development site is located within the 'Nearshore Waters' Seascape Character Type, which extends along the full length of the coastline in the study area. The seascape is characterised by relatively shallow sheltered or moderately sheltered waters adjacent to long curving coastal bays, backed by shingle beaches, low vegetated dunes, low crumbling cliffs and coastal settlements.
- 2.3.6 The distribution of local landscape and seascape character types is illustrated on **Figure 2.2**.

<sup>1</sup> Suffolk County Council. Suffolk Landscape Character Assessment. 2008, revised 2011

<sup>2</sup> LDA Design. Seascape Character Assessment Suffolk, South Norfolk and North Essex. Suffolk County Council, and Suffolk Coastal and Waveney District Council's in Partnership, 2018



**Legend**

-  Sizewell C main development site boundary
-  Demarcation line
- Landscape character types**
-  Ancient estate claylands
-  Coastal dunes and shingle ridges
-  Coastal levels
-  Estate sandlands
-  Rolling estate claylands
-  Valley meadows and fens
-  Urban
- Seascape character types**
-  Nearshore waters

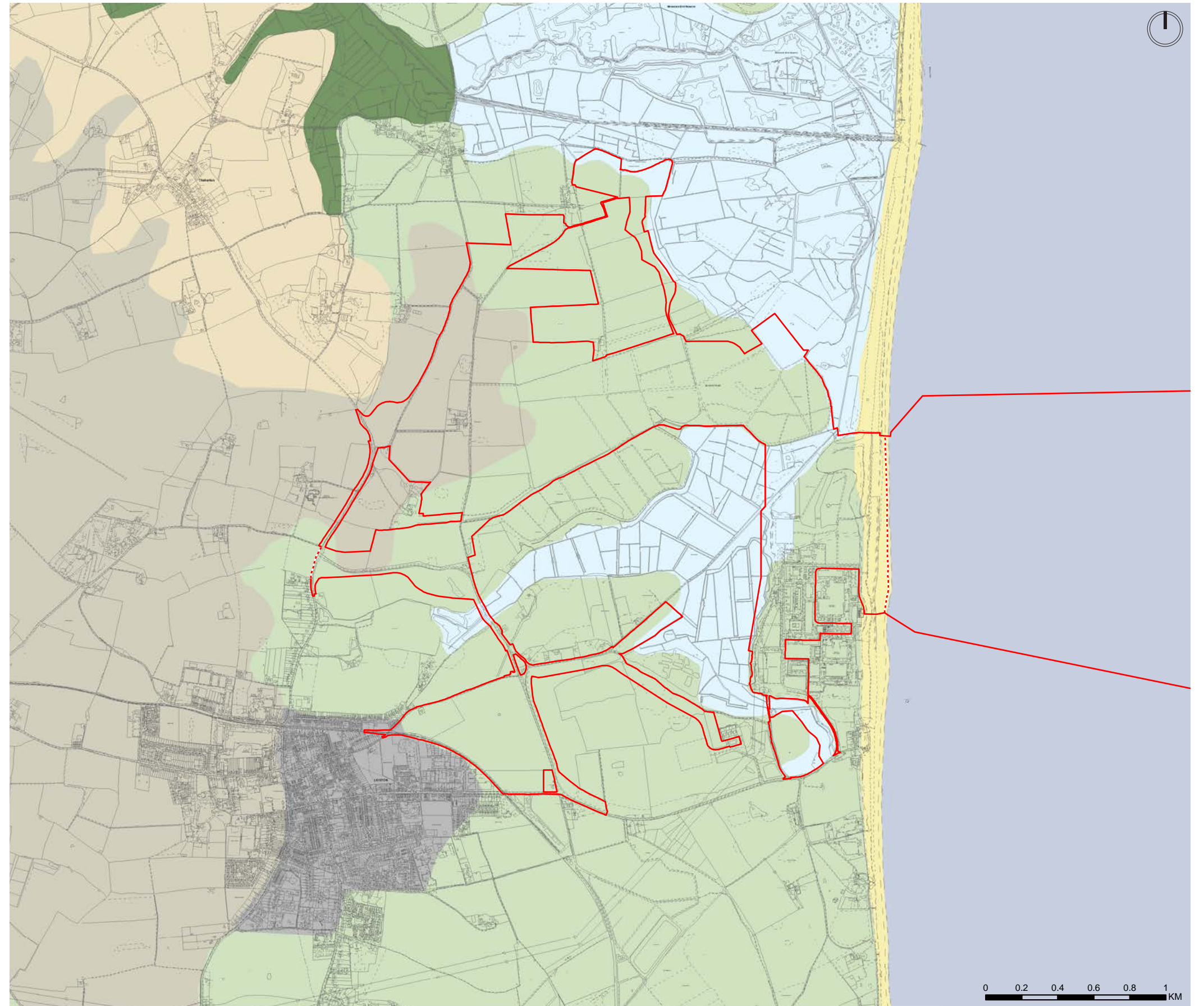


Figure 2.2: Landscape and seascape character



## 2.4 Landscape and Seascape Designations and Definitions

2.4.1 The quality and condition of the landscape and seascape in the vicinity of the Sizewell C main development site is evidenced in the extent of land that is designated nationally and locally. The location of the Sizewell C main development site and extent of the Suffolk Coast and Heaths AONB, Suffolk Heritage Coast and Special Landscape Area are illustrated on **Figure 2.3**.

### 2.4.2 Suffolk Coast and Heaths AONB

2.4.3 The existing Sizewell nuclear power stations and majority of the Sizewell C main development site are located within the Suffolk Coast and Heaths AONB and Suffolk Heritage Coast.

2.4.4 AONBs are statutorily protected landscapes, recognised by Government to be of the very highest quality. The statutory framework for protected landscapes in England was first established in the National Parks and Access to the Countryside Act 1949. The legislation has been amended and added to several times since then. Today, land to be included in an AONB must meet the statutory designation criteria that are set out in the Countryside and Rights of Way Act 2000.

2.4.5 In the legislation, the purpose of the AONB designation is to *'conserve and enhance the natural beauty of the area'*. Legislation requires that a relevant authority shall have 'regard' to the statutory purpose of the designation. The duty applies primarily to relevant authorities operating within the boundaries of an AONB. However, it also applies outside the boundaries of an AONB where activities may have an impact within it.

2.4.6 The Suffolk Coast and Heaths AONB, confirmed as an AONB in March 1970, covers an area of approximately 403 km<sup>2</sup> and stretches from Kessingland near Lowestoft to the River Stour in the south.

2.4.7 The character of the AONB is a product of the underlying geology and its associated natural habitats and has been shaped by the effects of the sea and the interaction with people on the landscape. The seaward boundary of the AONB extends to the mean low water mark – the limit of planning authority for terrestrial planning authorities. However, there are many links between an area's natural beauty and the adjacent marine environment. For example, views out to sea, along the coast, or from sea to land are often part of what makes an area special to people. There can also be ecological and cultural links.

2.4.8 The natural beauty and special qualities of the Suffolk Coast and Heaths AONB are described in the document 'Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB)' by SZC Co. in consultation with the AONB Partnership, Suffolk County Council (SCC) and East Suffolk Council (ESC). This document is appended to the Landscape and Visual Impact Assessment as part of this application.

### 2.4.9 Suffolk Heritage Coast

2.4.10 Heritage Coasts are 'defined' rather than designated and were established to conserve the best stretches of undeveloped coast in England. The purposes of Heritage Coasts are to:

- conserve, protect and enhance;
  - the natural beauty of the coastline
  - their terrestrial, coastal and marine flora and fauna
  - their heritage features
- encourage and help the public to enjoy, understand and appreciate these areas;

- maintain and improve the health of inshore waters affecting heritage coasts and their beaches through appropriate environmental management measures; and
- take account of the needs of agriculture, forestry and fishing and the economic and social needs of the small communities on these coasts.

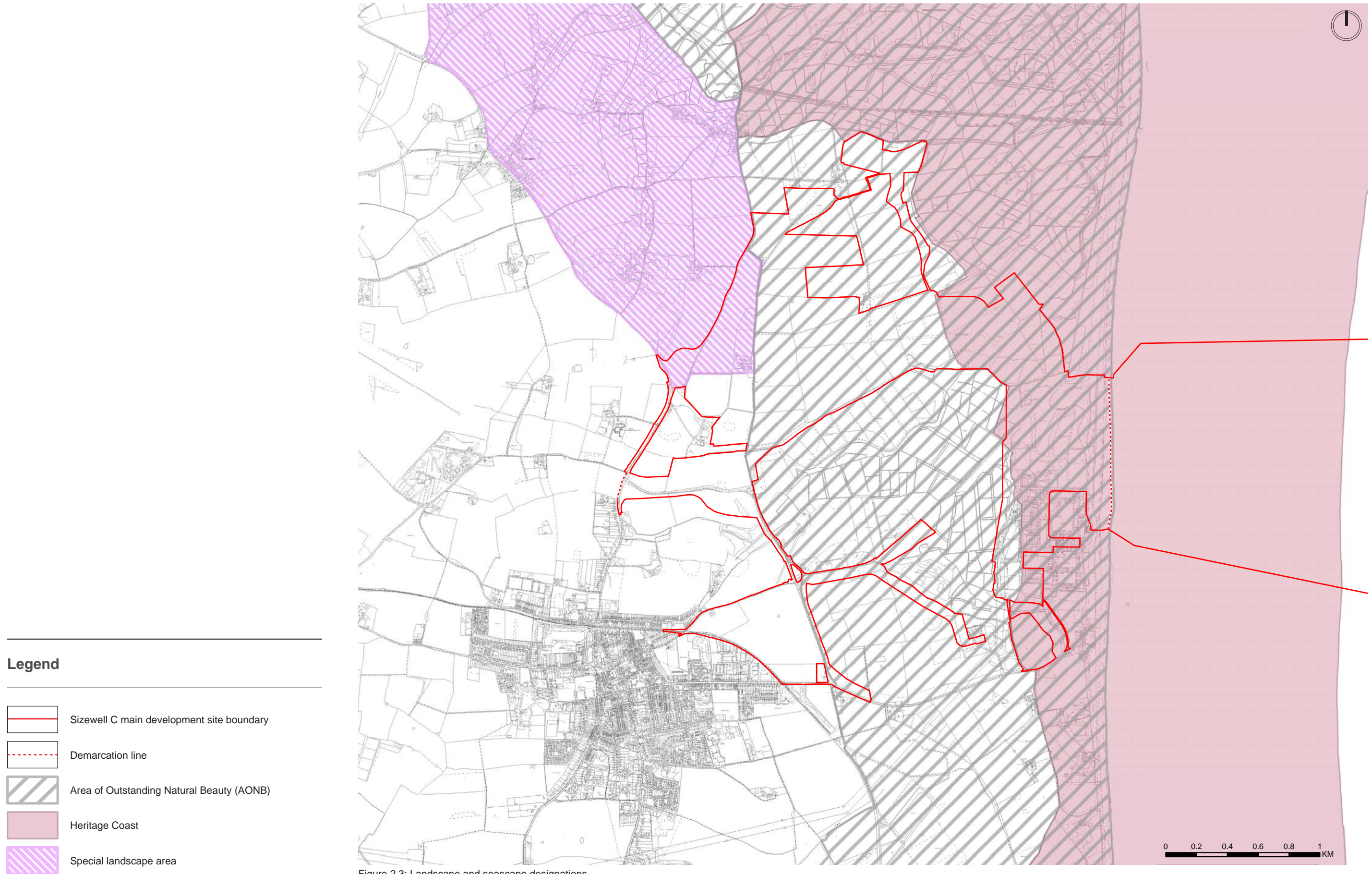
2.4.11 Heritage Coasts are protected through development control with the planning system. Paragraph 173 of the National Planning Policy Framework (February 2019) states that *"Within areas defined as Heritage Coast..., planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character"*.

2.4.12 The Suffolk Heritage Coast was defined in 1973 and is largely contained within the Suffolk Coast and Heaths AONB. It runs from Kessingland to Felixstowe and incorporates the Blyth, Alde and Ore and lower Deben estuaries.

### 2.4.13 Special Landscape Areas

2.4.14 Several areas that lie outside the Suffolk Coast and Heaths AONB are locally designated as a Special Landscape Area. These areas typically follow river valleys or occupy areas of historic parks and gardens and areas of farmland that contribute to their setting.





**Legend**


-  Sizewell C main development site boundary
-  Demarcation line
-  Area of Outstanding Natural Beauty (AONB)
-  Heritage Coast
-  Special landscape area

Figure 2.3: Landscape and seascape designations



## 2.5 Terrestrial and Marine Ecology and Ornithology

- 2.5.1 The Suffolk Coast is characterised by an intimate mosaic of farmland and semi natural habitats including fragmented areas of sandy heath and plantation woodlands on the higher land between the low-lying valleys. Along the coastline are areas of intertidal mudflats and in some locations former river mouths have become blocked by sand and shingle bars giving rise to the formation of extensive brackish and freshwater marshes. The coastline is characterised as shingle and sand beaches, coastal grasslands and low crumbling cliffs leading to the adjacent coastal waters.
- 2.5.2 The importance of this area to nature conservation is evidenced in the extent of terrestrial and marine areas that are designated internationally, nationally and locally (Refer to **Figures 2.4-2.6**).
- 2.5.3 In addition to their intrinsic ecological value, the area's rich biodiversity contributes to the natural beauty of the AONB and recreational value of the landscape. Of particular note is the popularity of bird watching, included at the Royal Society for the Protection of Birds' (RSPB) Minsmere Reserve to the north of the main development site.

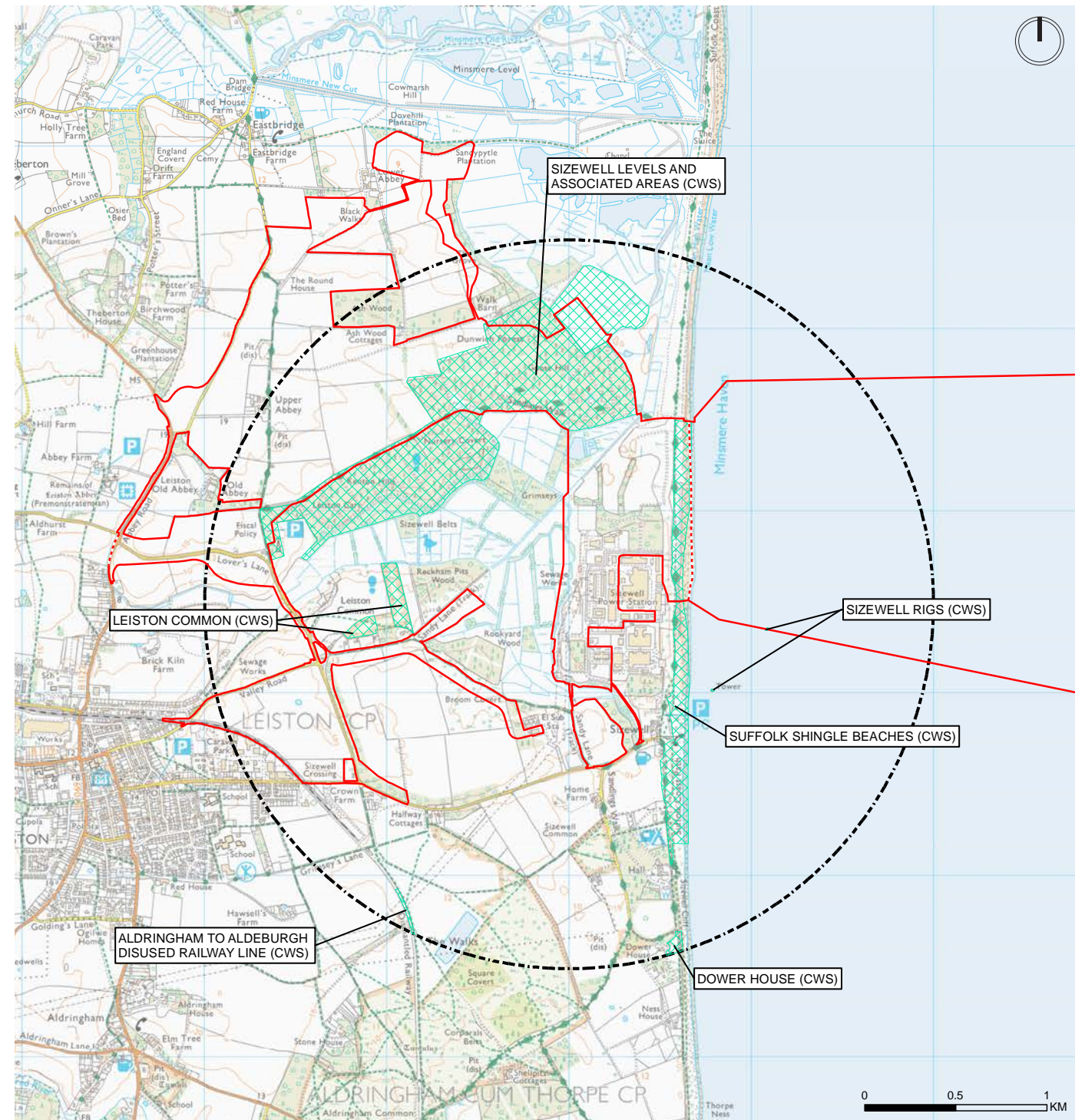


Figure 2.4: Non-statutory designated sites within 2km

### Legend

- Sizewell C Main Development Site Boundary
- - - - Demarcation Line
- Study Area 2km - site centred
- County Wildlife Site (CWS)



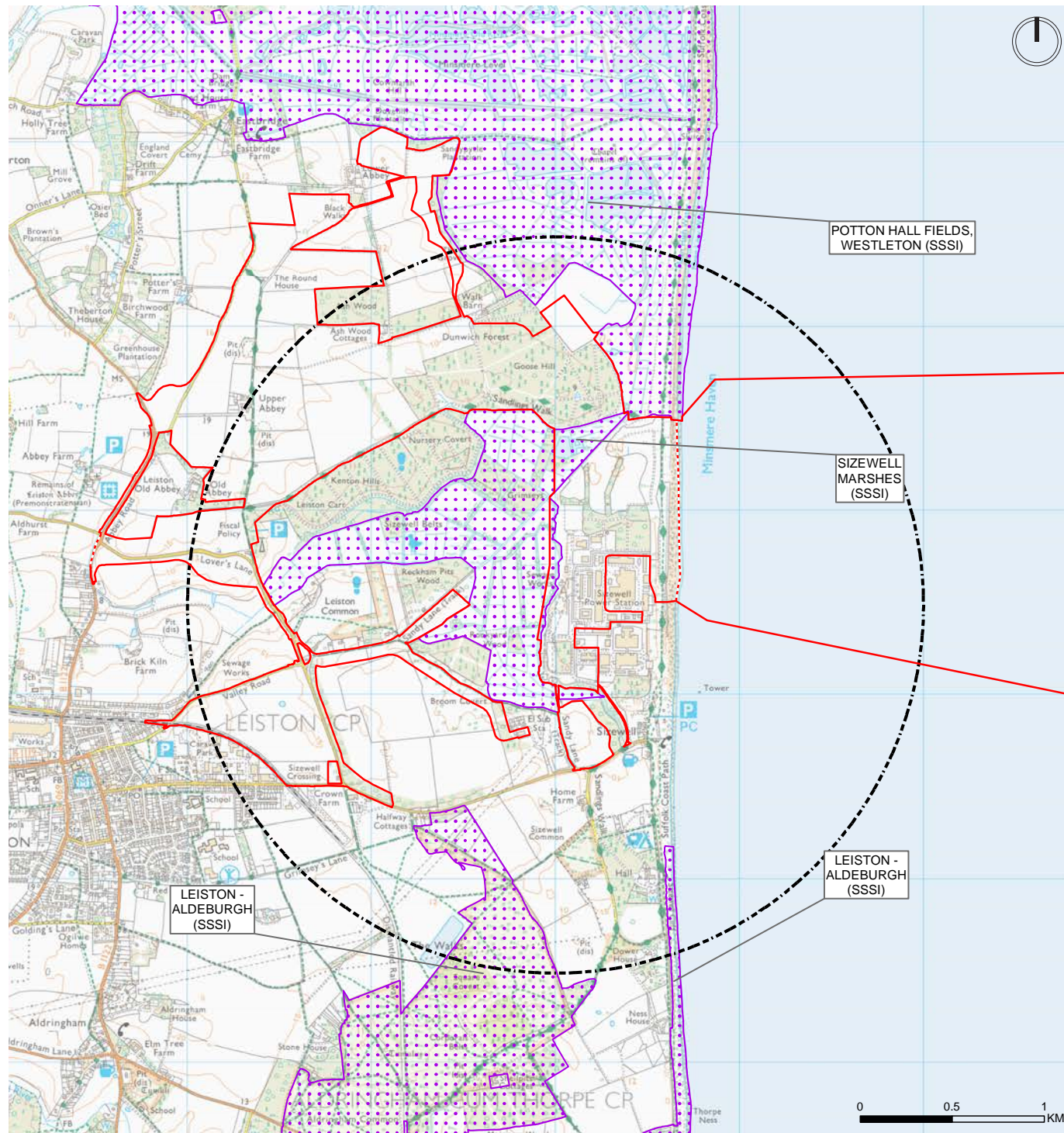


Figure 2.5: National statutory designated sites within 2km

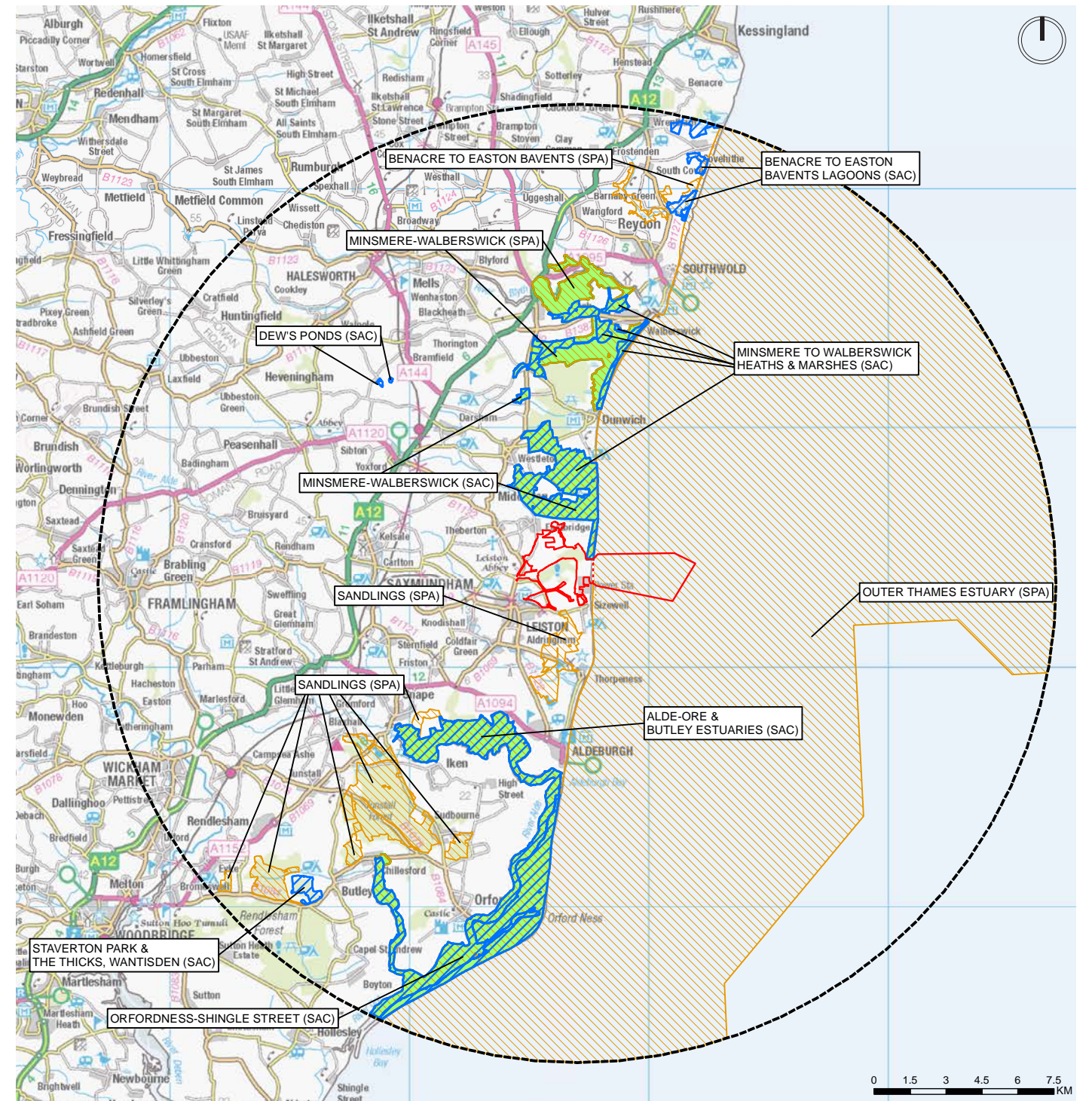


Figure 2.6: European designations

Legend

- Sizewell C Main Development Site Boundary
- - - Demarcation Line
- Study Area 2km - site centred
- Site of Special Scientific Interest (SSSI)

Legend

- Sizewell C Main Development Site Boundary
- - - Demarcation Line
- Study Area 20km - site centred
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- RAMSAR Site































2.5.4 More than a decade of detailed ecological survey has been undertaken to provide a detailed understanding of the habitats and species present within the main development site. This gives the baseline against which to assess the potential impacts arising from the construction and operation of Sizewell C and identify the key ecological issues and opportunities that the post construction illustrative Landscape Masterplan should address.

2.5.5 **Figure 2.7** illustrates the mosaic of habitat types within and adjacent to the main development site. The largest component of the main development site is arable farmland habitat, which is of little intrinsic botanical diversity, although survey indicates that the margins of the fields support two uncommon arable weeds, Corn Spurrey and Shepherd's Cress. The main development site also supports broadleaved woodlands and larger blocks of planted conifers at Kenton and Goose Hill. These habitats occupy what would have historically been open heath and acid grassland, indicated by the presence of small patches of remnant acid grassland. Low lying wetland habitats of Sizewell Marshes and Minsmere Levels lie partially within and adjacent to the main development site, whilst the coast supports a sparse coastal vegetation supporting a number of rare plant species such as Sea Pea and Sea Kale.

2.5.6 Key species supported within the main development site include a population of the nationally scarce water vole; a large population of reptiles, a thriving bat population including the nationally scarce barbastelle and Marsh harriers foraging over arable farmland and wetland.

2.5.7 Many of the habitat types present within and close to the main development site are priority habitats in the Suffolk Biodiversity Action Plan and are habitats of principal importance for the conservation of biodiversity under the Natural Environment and Rural Communities Act 2006.

### Legend

	Sizewell C Main Development Site Boundary		Plantation Mixed Woodland
	Demarcation Line		Dense Scrub
	Scattered Scrub		Semi-Improved Acid
	Broad-leaved Tree		Semi-Improved Neutral Grassland
	Defunct Hedge - Species-Poor		Improved Grassland
	Fence		Marshy Grassland
	Hedge with Trees - Species-Poor		Poor Semi-Improved Grassland
	Intact Hedge - Species-Poor		Bracken
	Native Species Rich Hedge with Trees		Dry Heath / Acid Grassland
	Running Water		Swamp
	Hardstanding		Standing Water
	Semi-Natural Broad-Leaved Woodland		Dune Grassland
	Plantation Broad-Leaved Woodland		Arable
	Plantation Coniferous Woodland		Vegetated Shingle



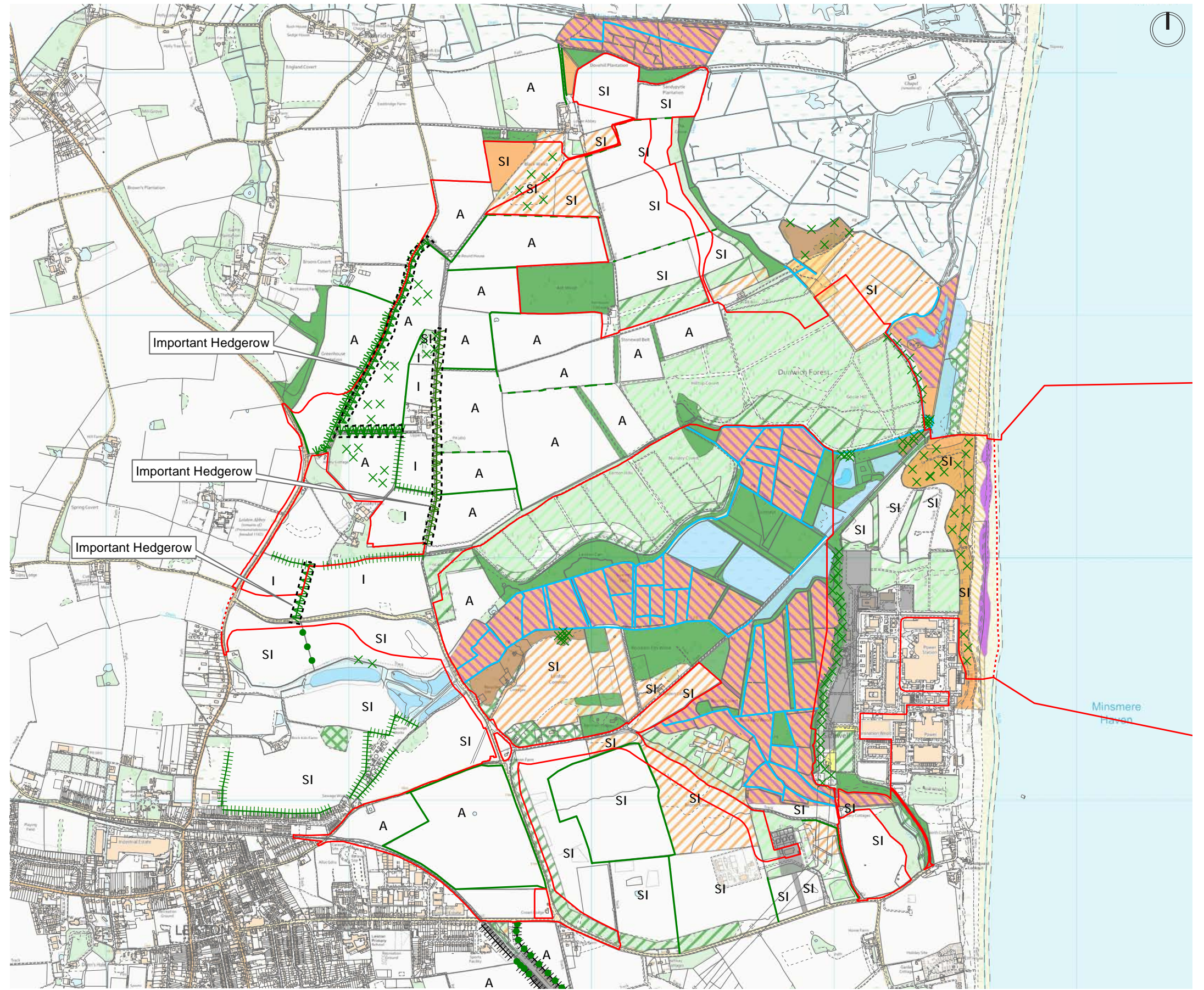
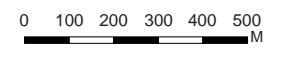


Figure 2.7: Mosaic of Habitat Type





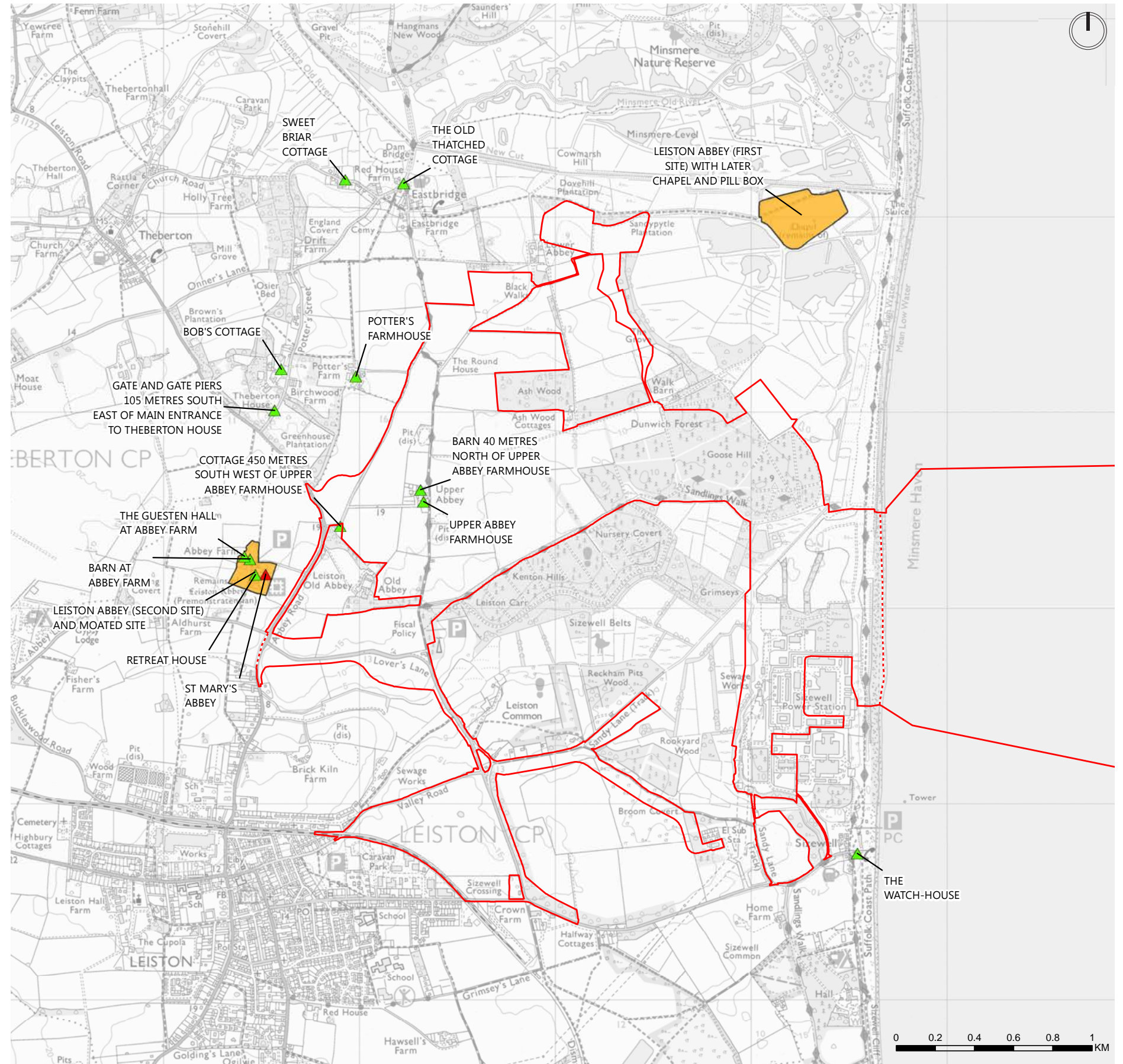
## 2.6 Historic Environment

- 2.6.1 A programme of archaeological evaluation, comprising desk-based appraisal (regression mapping and archival / documentary research) and field survey across the main development site (comprising geophysical survey followed by archaeological trial trenching) has been undertaken to develop a detailed understanding of the evolution of the local landscape and the archaeological potential of the main development site.
- 2.6.2 Peat and estuarine deposits of prehistoric date within the main development site may contain important evidence for the past environment. Geoarchaeological survey comprising geophysical and intrusive survey work has determined that deposits are potentially of high palaeoenvironmental interest as they formed over a prolonged period of time during the Mesolithic and Neolithic periods. The peats are likely to be primarily of interest for their ability to enhance understanding of past environments rather than past human activity. Other prehistoric remains observed to date within the main development site evaluations comprise scattered elements of field systems and possible settlement. These would provide new information to understand the prehistoric occupation of this part of the Suffolk coast, and would be of local to regional importance contributing to a defined regional research context.
- 2.6.3 There is limited evidence for Romano-British activity within the study area, aside from a concentration of artefactual material and features to the south-west of Upper Abbey Farm. Any remains would be of local importance. Remains of local to regional importance dating to early-medieval and medieval periods comprise elements of rural settlement around the villages of Leiston and Sizewell, as well as agricultural and associated industrial exploitation of the site. The main development site remained in agricultural use through the post-medieval period and heritage assets of this period include the farmsteads, field systems and gravel pits.
- 2.6.4 The modern period experienced a general continuity of settlement and agricultural land use. Reflecting the vulnerability of the Suffolk coast over several centuries, extensive works were undertaken as part of the defence of Britain during the Second World War, remains of which include earthworks and features such as anti-tank blocks and obstacles, pillboxes, anti-aircraft batteries and practice trenches. Such remains are generally of local importance.
- 2.6.5 In more recent decades, the Suffolk coast has been the focus of energy generation. The twin reactor Magnox station at Sizewell A was constructed from 1960 and first supplied electricity to the grid in 1966. It ceased generating electricity in 2006 and is being decommissioned. Sizewell B was constructed between 1988 and 1995. It began generating electricity in February 1995. The principle features of these power stations include the main generating structures and ancillary buildings, as well as infrastructure and coastal defences comprising a vegetated embankment and a secondary lower vegetated shingle bund. The Sizewell A intake and outfall headworks structures are also notable features in the marine environment. Sizewell Gap, south-west of Sizewell also accommodates the onshore substations for the Galloper and Greater Gabbard offshore windfarms.
- 2.6.6 **Designated Heritage Assets**
- 2.6.7 There are two designated heritage assets within the main development site, both of which are Grade II listed buildings - Upper Abbey Farmhouse, and the barn, 40m north of Upper Abbey Farmhouse. There are two Scheduled Monuments in relatively close proximity to the main development site – Leiston Abbey (first site) with later chapel and pillbox and Leiston Abbey (second site) and moated site, which also includes the Grade I listed St Mary's Abbey, and Grade II listed barn, Guesten Hall and Retreat House, all of which are of national importance and date to the medieval and post-medieval periods.
- 2.6.8 The location of designated heritage sites and features is illustrated on **Figure 2.8**.
- 2.6.9 **Historic Landscape Character**
- 2.6.10 The preservation of the historic field patterns in the form of hedgerows, routes and woodlands contributes to the historic and archaeological value of the contemporary landscape in which heritage assets, sites and finds can be observed. The dispersed farmsteads within the landscape and the transition from settled farmland into coastal marshes and wetlands and coastal strip also reflects a pattern of land use that has deep historic origins.
- 2.6.11 The main development site contains the following principal areas of historic landscape character:
- The Coast and Coastal Marshlands: The highly dynamic Suffolk coast has seen significant changes over the centuries as a result of changing sea levels and the effects of erosion and deposition. The lost settlement of Dunwich and the formation of the coastal spit at Orford Ness are dramatic evidence of coastal process at work. In several places, coastal marshes have formed, albeit widespread drainage from the medieval period has been undertaken. At Minsmere the land was partially drained since the construction of Minsmere Sluice in the late-18th century, however areas have been allowed to revert to create habitats in the RSPB reserve. The scheduled Leiston Abbey (first site) once sat within this landscape, although was moved in the mid-14th century due to coastal erosion and unsuccessful attempts at land reclamation. The ruins of a later chapel, constructed within the nave of the original church, remain standing on a discernible marsh 'island' within the centre of the designated area. The village of Sizewell was once larger than it is currently, extending into land that has now been lost due to the changing coastline. In the 19th century, agricultural improvements in the immediate area surrounding the asset remodelled the coastal marsh landscape, including extensive water management, the creation of enclosures, canalization of the Minsmere River and the creation of a sea wall.
  - The area of the 'Suffolk Sandlings': a central area of agricultural fields and plantation woodlands, largely created during the 18th and 19th century as part of the improvement and enclosure of common land (typically used for sheep walks and rabbit warrens) characterise the immediate coastal hinterland. Within the main development site, this includes the land around Old Abbey Farm, which has undergone extensive reorganisation and agricultural improvement. 18th century, and earlier enclosures were centred around the Grade II Upper Abbey Farm. In the 1790s, a new house was built and the surrounding enclosures were reorganised with some parts, to the west and north, becoming part of a designed parkland landscape, and others, to the south, being rationalised and extended. The character of this late 18th or early 19th century parkland and reorganised enclosed landscape endures.
  - Western Fringes: An established agricultural landscape on the more elevated clay soils inland from the 'Suffolk Sandlings' lies to the west of the main development site. The origins of the pattern of fields and settlements in this landscape is thought to pre-date the late 18th century.









**Legend**

- Sizewell C Main Development Site Boundary
- Demarcation Line
- Scheduled Monument
- ▲ Grade I Listed Building
- ▲ Grade II Listed Building

Figure 2.8: Location of designated heritage sites and features



### Local Context

- ① Grade I listed Leiston Abbey
- ② Grade II listed barn at Leiston Abbey
- ③ Dunwich Heath and National Trust Dunwich Coastguard Cottages
- ④ Footpath south of Leiston Abbey
- ⑤ RSPB Minsmere Reserve (Bittern Hide)





## 2.7 Flood Risk and Drainage

### 2.7.1 Existing flood zones

2.7.2 The Environment Agency's Flood Map for Planning shows the site is in Flood Zones 1, 2 and 3, (low to high risk of flooding from rivers or the sea). The outputs of both fluvial and tidal modelling informed the flood zone extents.

2.7.3 Flood Zones are defined in **Figure 2.9**. The extents are defined as an undefended flood extent and are drawn without the presences of any flood defences or their standard of protection.

2.7.4 **Figures 2.10 and 2.11** show flood zones, comparing defended and undefended coastal extents.

### 2.7.5 Coastal flood risk

2.7.6 The present-day coastal flood risk depends on a variety of environmental conditions, notably the combined probability of extreme water levels (astronomical tides and surge) and wave climate (off-shore to near-shore).

2.7.7 The coastal formation of the seabed, shoreline and beach influence the wave climate and the wave transformation process. The flood and erosion risk depend on the position and height of the formal and informal flood defences and their interaction with the water.

2.7.8 The existing secondary coastal flood defences in front of the proposed main platform area have a crest level of approximately between 9m Above Ordnance Datum (AOD) to 10m AOD with two low spots at 6.8m AOD. The main shingle defence has a crest of approximately 6.2m AOD. Taking into consideration both still water levels and the nearshore wave height, the risk of the existing coastal defences being overtopped is very low for all considered events, such as 1 in 200-year, 1 in 1,000-year and the 1 in 10,000-year event.

2.7.9 All the shingle ridges are at risk of being overtopped during considered baseline events of 1 in 20-year, 1 in 200-year and 1 in 1,000-year annual probabilities when taking into consideration nearshore wave heights, still water levels and associated climate change. The wave overtopping could also increase the risk of a breach of these shingle ridges.

2.7.10 The sub-tidal part of the beach along the existing power station complex frontage is sand-dominated with inner and outer longshore bars that run parallel to the shore. The longshore bars are a conduit for longshore sand transport and act to dissipate some wave energy by causing waves to break which reduces the remaining wave energy at the shoreline.

2.7.11 The Environment Agency has recently prepared a coastal inundation 2D-TUFLOW model for the East Anglian coastline. The model has divided up the coastline into smaller sections. At each section, the wave overtopping discharges then spreads the water across

the topography associated with the relevant section. This was undertaken for each discreet model area and their associated section for all the modelled event scenarios.

2.7.12 The defended scenarios for the present day show the existing flood defences prevent coastal inundation, while the undefended scenarios show a significant inundation in absence of the flood defences.

### 2.7.13 Breach flood risk

2.7.14 The Environment Agency has provided coastal defence breach flood depth and hazard rating maps, based on a single breach to the north of Minsmere Nature Reserve, Leiston 001. Two return period events were considered in the breach modelling, 1 in 200-year and 1 in 1,000-year, each for present day at 2015 and climate change epoch at 2115.

2.7.15 The breach flood extent is largely contained within existing marshlands of the Minsmere Level and Sizewell Belts for the 1 in 200-year and 1 in 1,000-year present day events. This is due to the topography of the area and is consistent with fluvial flood extents.

### 2.7.16 Fluvial flood risk

2.7.17 Fluvial flood risk is dominated by long duration rainfall in the catchment, which is stored in the extensive low-lying marshlands of the Sizewell Belts and Minsmere levels. It is influenced by the discharge capacity of Minsmere Sluice (including interaction with tides) and the presence of the shingle embankment that separates the levels from the sea.

2.7.18 The main platform, the SSSI crossing and a small area in the east of the temporary construction area are in Flood Zone 2 and Flood Zone 3. To the western edge of the site, a short section of Lover's Lane in the vicinity of the Leiston Drain crossing is in Flood Zones 2 and 3.

### 2.7.19 Surface water (pluvial) flood risk

2.7.20 The Suffolk and Waveney Strategic Flood Risk Assessment indicates flash flooding caused by surface water run-off from saturated catchments has been a source of historical flooding in the district. Records of surface water flooding incidents in the vicinity of the site are limited to the Leiston urban area. One surface water flooding event is recorded on Valley Road, which forms the northern LEEIE boundary.

2.7.21 The Environment Agency 'flood risk from surface water' map identifies the majority of the site is at 'very low' risk of surface water flooding. However, there are very small localised areas of low to high risk of surface water flooding across the site, which are associated with topographical low points and ordinary watercourses.

2.7.22 The minor areas of increased flood risk were identified from national scale modelling and do not appear to coincide with existing property or infrastructure receptors within the site.

### 2.7.23 Groundwater flood risk

2.7.24 Groundwater flooding occurs when water levels in the ground rise above surface elevation. Low-lying areas underlain by unconfined aquifers are most susceptible to this source of flooding, especially after a prolonged rainfall event.

2.7.25 The bedrock geology of the site exhibits high permeability with a high water-storage potential. In other areas of the site, the superficial geology has varying levels of productivity, while elsewhere areas are classed as being unproductive.

2.7.26 In the Suffolk and Waveney Strategic Flood Risk Assessment, the majority of the site was considered as having either 'no' or 'limited' potential for groundwater flooding.

2.7.27 Ground investigations undertaken as part of the design development process indicate that groundwater levels in the dominant aquifer, the Crag Sands, are typically in the range of 0m AOD to 1m AOD with a small tidal variation.

2.7.28 The Conceptual Groundwater Control Scheme for Construction report also states that "*groundwater levels in the superficial deposits could locally be higher than the Crag Sands where perched water tables are present above the Peat or Alluvium*".

2.7.29 Topography across the main development site ranges from approximately 19.7m AOD in the west to approximately 0.0m AOD in the east. At present, there is no evidence of significant groundwater appearing on the surface. Therefore, it is suggested there is low risk of flooding from groundwater across the majority of the main development site.

2.7.30 The peat deposits show hydraulic connectivity with the sustainable urban drainage systems. The groundwater levels respond quickly to rainfall events and to pumping within the drainage system.

### 2.7.31 Sewer flood risk

2.7.32 The site is largely greenfield in nature with a number of existing roads and areas of the existing Sizewell power station complex in the site boundary.

2.7.33 At present only one private sewer system has been identified in the near vicinity of the main development platform, which serves the existing Sizewell B power station. The main platform area is located on a mainly undeveloped area of land with no foul sewers. However, the south-western corner has two auxiliary buildings that are served by foul and surface water sewers with a pumping station. These facilities are being relocated as part of the Sizewell B Relocated Facilities proposals.



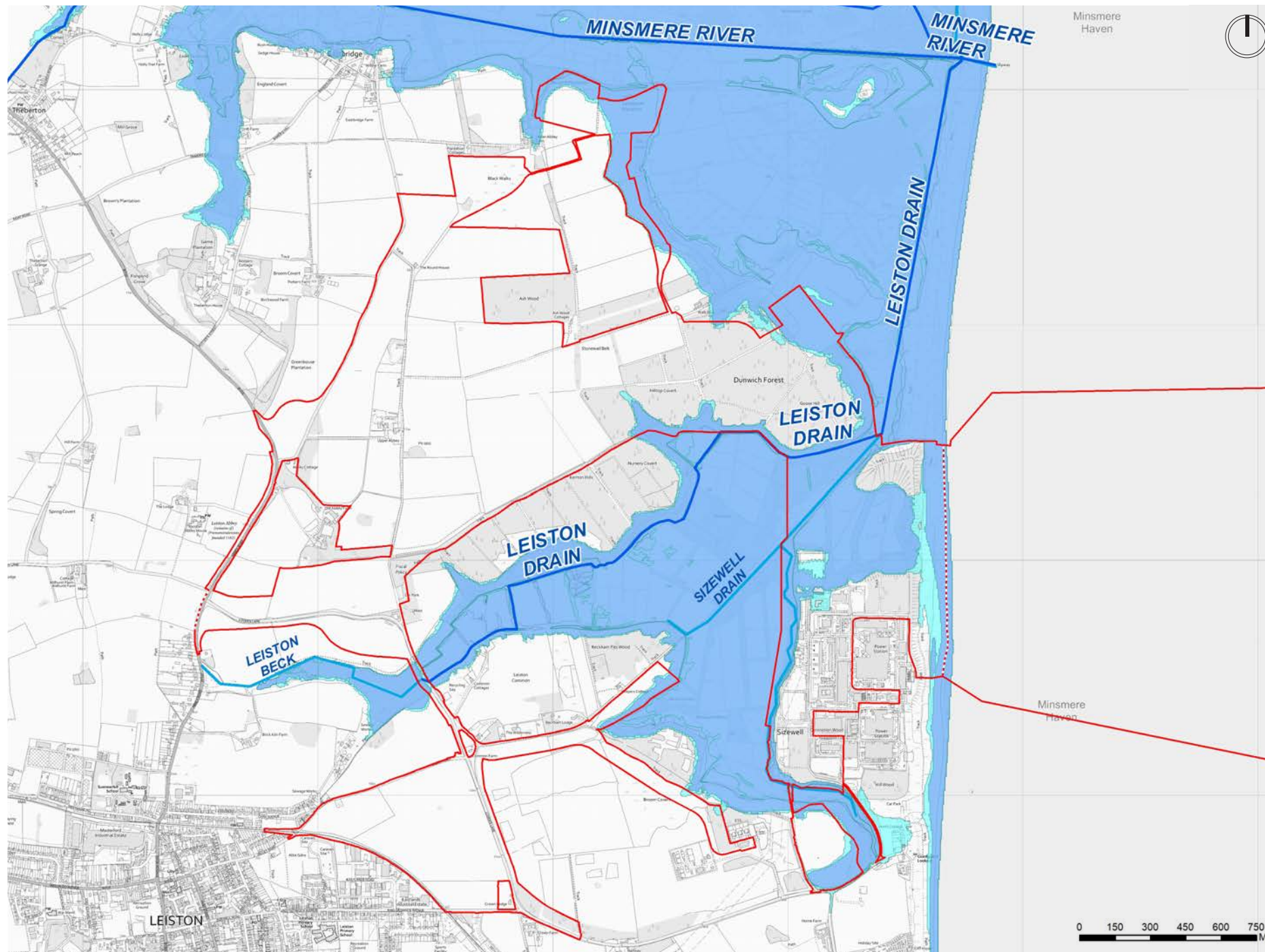
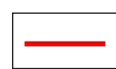





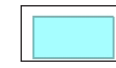
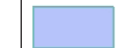
Figure 2.9: Flood map

**Legend**

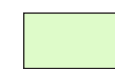


Main Development Site

-  Sizewell C Main Development Site Boundary
-  Demarcation Line
-  Main Rivers

Environment Agency Data

-  Ordinary Watercourses
-  Flood Zone 2
-  Flood Zone 3

Environment Agency Data

-  1 in 20 (5%)
-  1 in 200 (0.5%)
-  1 in 1000 (0.1%)

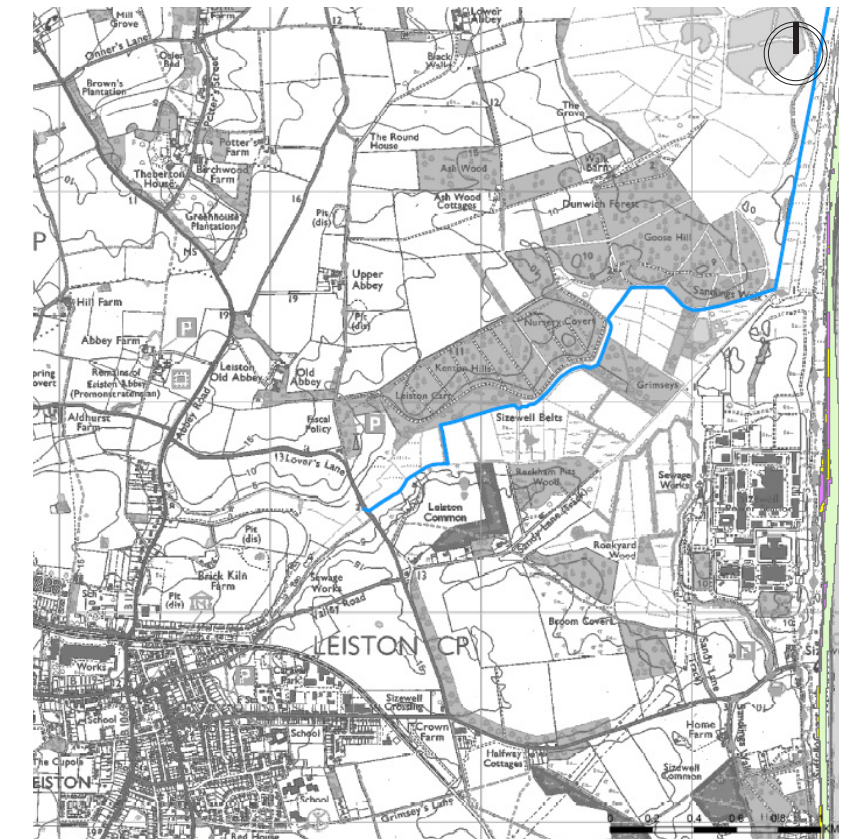


Figure 2.10: Environment Agency Flood Map - 2018 - defended coastal extents

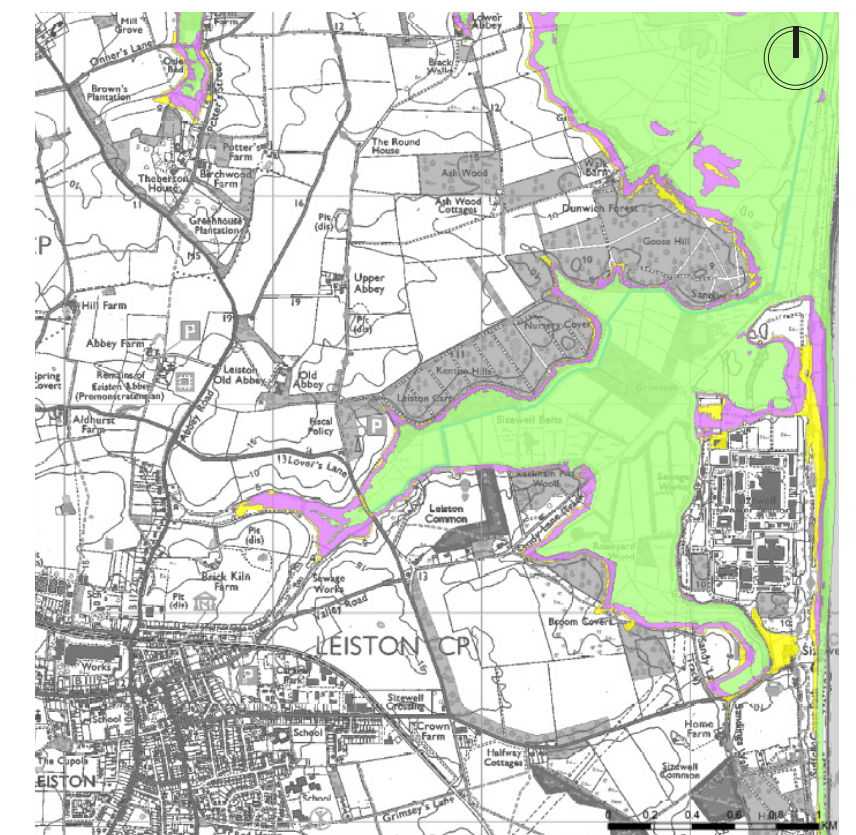


Figure 2.11: Environment Agency Flood Map - 2018 - undefended coastal extents



2.7.34 **Flood risk from reservoirs and other artificial sources**

2.7.35 The Flood Risk from Reservoirs Maps identified the maximum extent of flooding from reservoir failure.

2.7.36 Flooding from Sizewell Walks reservoir is shown to potentially affect the existing access road to the existing Sizewell power station complex, the field east of Sandy Lane and the neighbouring Sizewell Belts. The reservoir is sited at a topographical high point. The associated 'maximum flood extent' for the reservoir are to both the north-east and south-west of the reservoir.

2.7.37 **Summary of existing flood mechanisms**

2.7.38 **Table 2.1** summarises the degree of flood risk for the site:

**Table 2.1: Degree of flood risk for the site**

SOURCE OF FLOODING	FLOOD RISK
<b>Tidal/coastal</b>	Predominantly low, as most of the site is in Flood Zone 1.
	Areas of exception in Flood Zone 2 (medium risk) and 3 (high risk): the SSSI crossing, two attenuation ponds in the temporary construction area and part of the main development platform.
<b>Fluvial</b>	Predominantly low, as most of the site is in Flood Zone 1.
	Areas of exception in Flood Zone 2 (medium risk) and 3 (high risk) include: the SSSI crossing, part of the main development platform, an attenuation pond and a small area west of the main platform on Lover's Lane.
<b>Surface water (pluvial)</b>	Predominantly 'very low' as defined by the Environment Agency Surface Water Flood Map.
	Isolated areas with 'low' to 'high' risk associated with topographical low points, ordinary watercourses and drainage ditches. One historic surface water flooding event is recorded on Valley Road, the northern boundary of the LEEIE.
<b>Groundwater</b>	Low: No evidence of significant groundwater emergence at surface.
<b>Sewers</b>	Low: majority of the site on rural undeveloped land. Existing sewer system privately managed with a maintenance and management plan. One recorded sewer flooding event and one highway drainage flood event recorded on Valley Road along the northern boundary of the LEEIE. Leiston town has a limited surface water sewer capacity which is known to generate flooding.
<b>Reservoirs</b>	Predominantly not at risk of flooding from reservoirs or other artificial sources.
	Areas within the maximum reservoir flood extent include: existing Sizewell power station complex access road and small undeveloped field east of Sandy Lane.

2.7.39 **Overview of current local drainage**

2.7.40 With the exception of the part of the main construction area (MCA) which is currently occupied by some buildings of Sizewell B, the land within the MCA / temporary construction area (TCA) construction site boundary is currently undeveloped and as a result has natural, greenfield drainage. Some rainfall will percolate into the ground contributing to groundwater recharge and some will discharge to natural watercourses, via surface water overland flow.

2.7.41 The only surface land drainage features shown on the 1:25000 Ordnance Survey (OS) mapping within the site boundary are a small length of Leiston Drain which passes through the gap between the MCA and TCA, and Sizewell Drain which passes through the footprint of the MCA.

2.7.42 The low-lying areas, forming Sizewell Belts and part of the MCA footprint, are part of the floodplain for Leiston Drain and Sizewell Drain. **Figure 2.9** shows the extent of land adjacent to watercourses that is flooded due to river flooding during a 1 in 100 year return period rainfall event / 1 in 200 coastal flooding event. This extent is known as Flood Zone 3.

2.7.43 The main watercourse is the Minsmere River which is to the north of and outside of the site boundary. This discharges to sea via the Minsmere Sluice which controls outflow from watercourses to sea whilst preventing large scale backflow from the sea. It is understood that some seawater is permitted to backflow to the freshwater network.

2.7.44 **The Minsmere River and Minsmere Sluice**

2.7.45 Minsmere River is the main river and discharges to sea via Minsmere sluice. It is understood that under normal operation there is no direct interconnection between Minsmere River and Leiston Drain at the sluice. No part of the TCA is currently drained to Minsmere River and under normal operation of Minsmere Sluice there should be no flow from the MCA / TCA catchments via Leiston Drain into Minsmere River. As a result, Minsmere River is not considered further as part of this strategy.

2.7.46 Any overland flow towards Minsmere River would be intercepted by ditches which connect to Leiston Drain in proximity to Minsmere Sluice. As a result, the Flood Risk Assessment predicted that the SZC construction phase development will have no impact on Minsmere River. It is also noted that due to changes of topography to create the construction platforms and the use of infiltration for removal of surface water runoff, it is not intended that there will be any future direct surface water discharge from the site during construction, north to ditches or to Minsmere River.



**2.7.47 The Leiston Drain**

2.7.48 Leiston Drain is a tributary of the Minsmere River also discharging to Minsmere Sluice. The source of Leiston Drain is located at the side of the B1122 (Abbey Road) adjacent to the site of Leiston Abbey. This local watercourse runs alongside the west side of the road before passing into a culvert at the entrance to Leiston.

2.7.49 The Leiston Drain issues from the culvert downstream of Abbey Road and runs through the Aldhurst Farm area to the north of Leiston before passing under Lover's Lane in a culvert to discharge into the Sizewell Belts SSSI. The Leiston Sewage Treatment Works discharges treated final effluent into Leiston Drain via a ditch, upstream of Lover's Lane.

2.7.50 Much of the TCA and the entire MCA are located within the Leiston Drain catchment. A surface water drainage system will drain the TCA and will either infiltrate into the ground or discharge to Leiston Drain at greenfield runoff rates after any contaminant removal treatment has taken place. A surface water drainage network will drain the MCA but will discharge to sea via the CDO. There is a remote separate construction site on LEEIE at Leiston. This falls within the Leiston Drain catchment.

**2.7.51 The Sizewell Drain**

2.7.52 The Sizewell Drain is a tributary of the Leiston Drain connecting to it at the narrow gap between the proposed MCA site platform to the south and Goose Hill (proposed TCA) to the north. The MCA site to the east of Sizewell Drain and south of Leiston Drain currently discharges runoff to Sizewell Drain but will not do so when construction takes place. It is classified as an East Suffolk Internal Drainage Board ESIDB ditch reference DRN163G0202. 1:25000 OS mapping shows it as issuing immediately to the north of the Sizewell Gap road and then running in a defined watercourse along the western boundary with Sizewell A and Sizewell B. However, as part of a scoping investigation for the development of the Flood Risk Assessment hydraulic model, it was found that the Sizewell Drain extends much further north and runs through a wetland such that the channel is not fully defined. At its northern extent there is a complex series of ditches which link in with those connecting to the Leiston Drain.

**2.8 Coastal Resilience**

2.8.1 The shoreline's shape is a result of significant coastal erosion and deposition events from storms during the 1800s. Major erosion of the Dunwich Cliffs to the north of Sizewell released large volumes of sediment (sand and shingle) into the sea for transport along the coast. From the 1830s to the 1880s, the cliffs and beaches north of Minsmere Outfall rapidly moved landwards, although there was little change in the area around the outfall itself. Large amounts of sand and shingle were deposited between the outfall and Thorpeness, forming a wide beach and dune system in front of the former cliffs at Sizewell. These storm-driven processes have led to the shoreline about the Minsmere Outfall to rotate anticlockwise.

2.8.2 The rate of sediment transport along the beach in front of the Sizewell power stations is very slow resulting in a comparatively stable coastline that experiences only very slow change. Shoreline change around the Minsmere Outfall is also slow because the outfall itself partially blocks sediment movement along the shore. In contrast, there is persistent shoreline erosion for 1 or 2km either side of the outfall.

2.8.3 Landward of the shingle beach are the Dunwich to Minsmere and the Sizewell to Thorpeness cliffs or low-lying hinterlands, for example the Walberswick Marshes and the Minsmere Levels. A shingle barrier capped with dune grasses separates the Minsmere Levels from the sea along that stretch of coast.

2.8.4 The intertidal beach is mostly shingle with some sand, either mixed with the shingle or occurring alone as sandy surface layers. The shingle beach part of the beach ends below the low water line where it meets a gently sloping, sandy seabed.

2.8.5 The subtidal beach is sandy and features an inner sand bar approximately 50–150m from the low water mark and another, larger, outer sand bar approximately 150–400m from the low water mark. These two sand bars and play an important role in reducing wave energy and, during large storms, direct sand transport along their crests and troughs.

2.8.6 Seaward of the two sand bars there is a 1.2km wide channel that is up to 9m deep before the seabed rises up to the large Sizewell – Dunwich Bank formation.

2.8.7 The Sizewell – Dunwich Bank is a single feature made up of well-sorted sand currently located between 1.2 and 1.7km from shore. The higher north and south ends, often referred to as Dunwich Bank and Sizewell Bank respectively, are linked by a lower crested bank. Historical records indicate that the western edge of the Dunwich Bank has moved landward at approximately 6m per year and become lower. In contrast, the Sizewell Bank has not moved very much but increased in height, so effectively the Dunwich to Sizewell Bank formation is gradually pivoting anticlockwise (i.e. landward) around a point at its southern end. The growth of Sizewell Bank is sustained by sand supply from the coast, funnelled offshore at Thorpeness.

2.8.8 At Thorpeness, the seabed is made of Coralline Crag which, because it does not erode, fixes the position of the headland (although local changes do occur). The geological foundation of the headland, and its fixed co-location with the Sizewell Bank over several hundred years, suggests that it will remain fixed for substantially longer than the duration of the proposed development.

2.8.9 The Coralline Crag at Thorpeness also interrupts the movement of sediment south and re-directs it offshore.

2.8.10 In summary, the present-day position of the Sizewell shoreline is a result of:

- the wave conditions close to shore, which are affected by wave breaking over the Sizewell – Dunwich Bank and the two sand bars nearer to shore;
- “control points” that do not erode such as the Coralline Crag at Thorpeness and the Minsmere Outfall, which prevent net erosion locally and disrupt longshore sediment transport; and,
- the supply of sediments moving along the coast from beach and cliff erosion in, and north of, the Greater Sizewell Bay.

2.8.11 Before 1925, long-term and persistent erosion occurred north of the Minsmere Outfall while sediment was deposited to the south. Between 1925 to 1940 the opposite occurred and since 1940 change in shoreline has been slower and more variable.

2.8.12 Historical data (maps and aerial photographs) show spatially and temporally variable shoreline behaviour since 1940. Bands of retreat at Dunwich, south of Minsmere and Sizewell Hall, are interspersed by sections of relative stability, or slight seaward advance, north of Dunwich, adjacent to Minsmere Outfall, at Sizewell B and to the north of Thorpeness.



## 2.9 Recreational Amenity and Access

- 2.9.1 The area immediately around the existing Sizewell nuclear power station complex is a popular location for outdoor recreational activities including walking, cycling and bird watching. The coastal strip is popular for pleasure fishing and offshore activities such as recreational sailing. There are a number of car parks located in the vicinity which can be used to access the coast including at Sizewell beach and Kenton Hills.
- 2.9.2 As shown on **Figures 2.12-2.14**, a number of recreational routes and access land for walkers, cyclists and equestrians are located fully or partially within the main development site including: Bridleway E-363/019/0 (Bridleway 19) which links Sizewell Gap to the south and Eastbridge Road in the north; Kenton Hills permissive footpaths network on the SZC Co. Sizewell Estate which links the Kenton Hills car park to the coast; and Sandlings Walk (a long distance walking route) which passes along Bridleway 19 and permissive paths to the coast. There are two long distance walking routes (the Suffolk Coast Path and Sandlings Walk) located within the main development site boundary. The Suffolk Coast Path is an 80km route running between Lowestoft and Felixstowe and the Sandlings Walk is a 96km route running between Southwold and Ipswich, linking the remaining fragments of Sandlings Heath. The future England Coast Path (a proposed National Trail) is currently being consulted on by Natural England under the Marine and

Coastal Access Act 2009. It is likely to follow the current alignment of the Suffolk Coast Path to the east of the main development site. The England Coast Path would include a wider area of 'coastal margin' either side of the path, giving greater statutory protection to public access to the coast.

- 2.9.3 New permanent open access land and a car park will be provided at Aldhurst Farm prior to the commencement of construction. This is described in **section 8.7**.
- 2.9.4 The Suffolk Coastal Cycle Route runs along the coast from Felixstowe to Dunwich before turning inland to the market towns of Framlingham and Woodbridge. The full route is 88 miles (142 km) long and follows the Sustrans Regional Cycle Route 42 at the western boundary of the main development site. This route connects many of Suffolk's recreational attractions and is well used by both locals and visitors to the area.
- 2.9.5 In addition to walking and cycling, there are several visitor destinations close to Sizewell. The RSPB Minsmere Reserve has a visitor centre and provides various trails and bird hides. Further north is the National Trusts Dunwich Heath and Beach, with a visitor centre and café located in the Coastguard Cottages. Leiston Abbey, an English Heritage managed visitor destination, is located directly to the west of the proposed development at Sizewell C.

- 2.9.6 SZC Co. has undertaken visitor surveys at recreational resources near to the site to identify visitor patterns and habits. The most popular primary activities were walking and dog walking, followed by cycling, bird watching, enjoying wildlife, accessing the beach, taking exercise and getting fresh air. A large proportion of walks are undertaken with dogs. The majority of people travel to the start of their route by car, indicating the importance of car parking facilities. The average duration of each visit is relatively short, lasting for approximately 1-2 hours. The existing rights of way and access are shown on **Figure 2.15**.

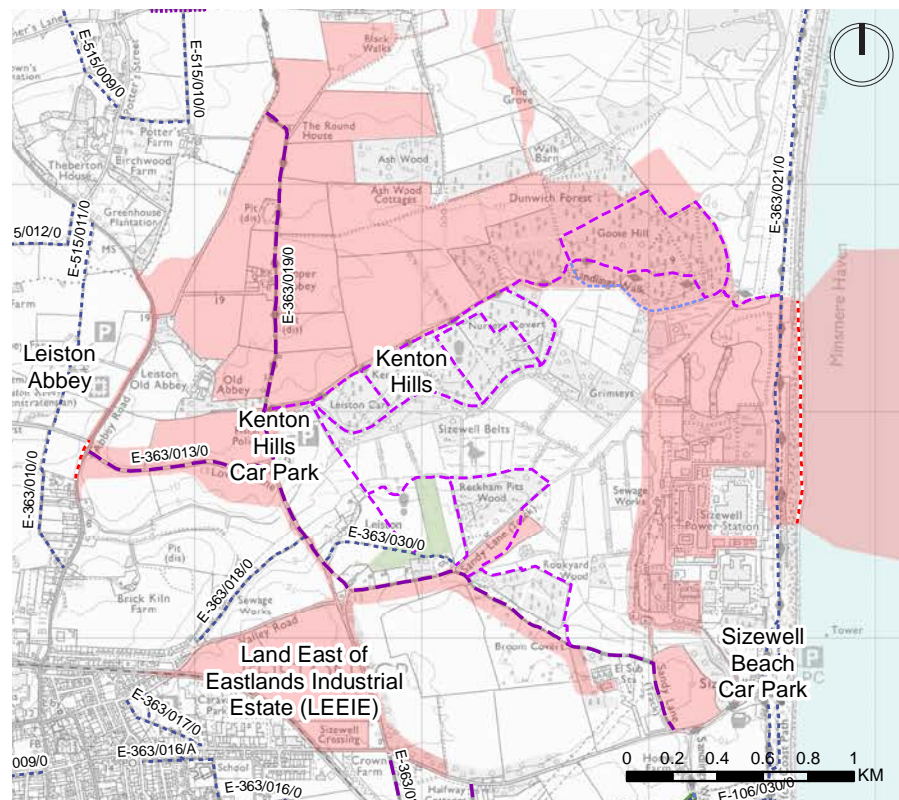


Figure 2.12: Rights of Way and access - existing

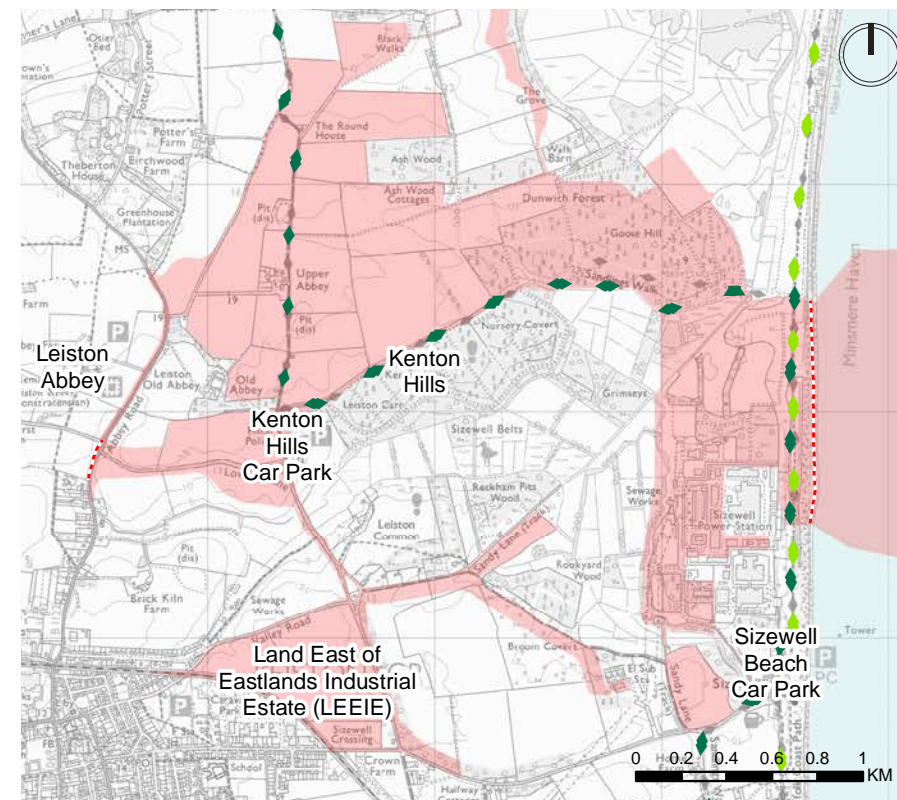


Figure 2.13: Recreational routes

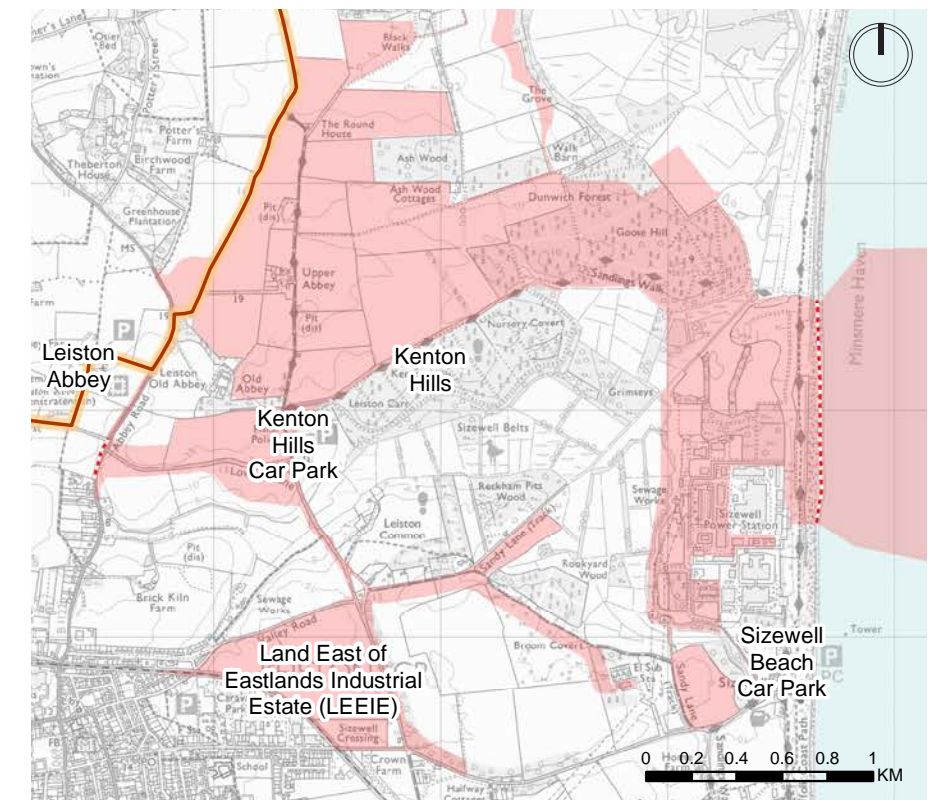
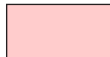

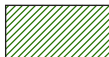






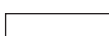



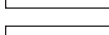
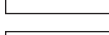



Figure 2.14: Cycling routes



**Legend**

-  Sizewell C main development site
  -  Demarcation line
  -  Registered common land
  -  Open access land
- Recreational Routes**
-  Recreational route: Sandlings Walk (Long distance walking route)
  -  Recreational route: Suffolk Coast Path (Long distance walking route)
- Cycle Routes**
-  Sustrans Regional Cycle Route (RCR) (42)
  -  Suffolk coastal cycle route
  -  Off Road cycle routes
  -  Alternative cycle routes/short cuts/detours on road
- Public Right of Way (Suffolk County Council) and permissive paths**
-  Public footpath
  -  Bridleway
  -  Byway
  -  Restricted Byway
  -  Permissive footpaths in EDF Energy Estate (ADAS)
  -  Permissive footpath informal

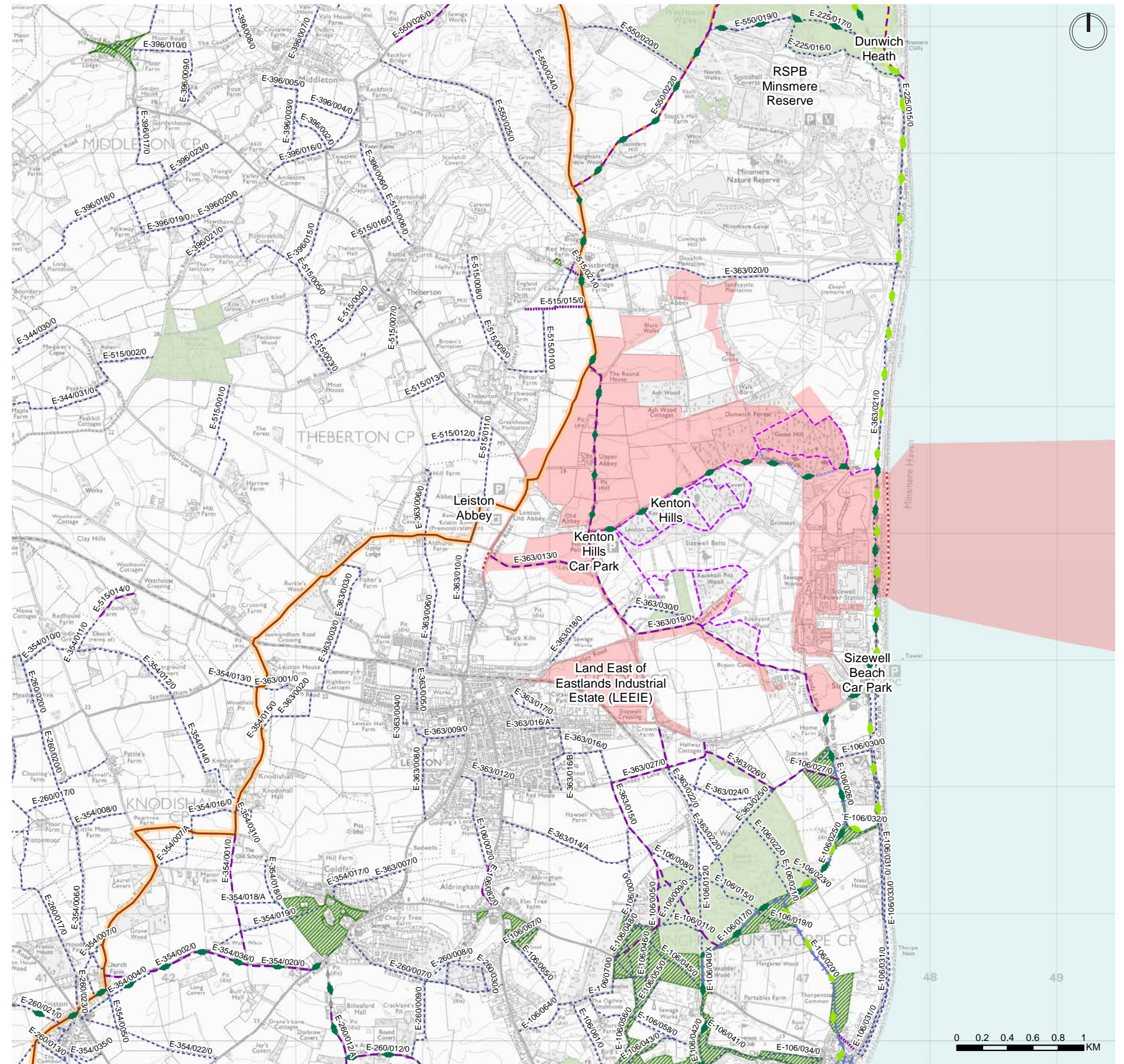


Figure 2.15: Rights of Way and access - existing



## 2.10 Access and Movement

2.10.1 The existing access network which currently services the Sizewell Estate is predominantly characterised by a network of local roads which connect with the wider strategic road network, and a lack of direct rail access to the main development site.

### 2.10.2 Road

2.10.3 The highway network surrounding the main development site is comprised of Local Authority Roads. These roads are managed by Suffolk County Council (SCC) as the Local Highway Authority and include a combination of unclassified roads, B Roads and A Roads. The main local roads which currently serve the existing Sizewell power station complex are as follows:

- Sizewell Gap: This road currently provides the main access to Sizewell B. It is a non-through route providing vehicular access to the Sizewell power station complex, Sizewell beach and a number of private residential dwellings. Sizewell Gap connects with Lover's Lane at the priority junction with King George's Avenue, east of Leiston;
- Lover's Lane: This road connects Sizewell Gap to the east with the B1122 to the north-west and provides access to farmland and a small number of residential properties and commercial premises;
- King George's Avenue / Sizewell Road: This road connects Sizewell Gap and Lover's Lane to the east with the centre of Leiston to the west and provides the main route to Leiston from the Sizewell power station complex;
- B1122: This road connects the A12 in Yoxford to the north with the A1094 in Aldeburgh to the south and routes through the settlements of Aldringham, Leiston, Theberton and Middleton Moor;
- B1069: This road connects Leiston with Rendlesham via the A1094 to the south-east of Friston and routes through the villages of Knodishall, Coldfair Green, Snape and Tunstall;
- A1094: This road connects the A12 at Friday Street with the town of Aldeburgh and routes through the village of Snape Watering;
- B1119: This road connects the A1120 at Saxtead Green with Leiston via Framlingham, Rendham and Saxmundham; and
- A12: This road is the main route between Ipswich and Lowestoft and connects with the strategic road network at Junction 58 of the A14 to the south-east of Ipswich and the A47 at the Bascule Bridge across the Inner Harbour in Lowestoft.

2.10.4 The strategic road network provides connectivity to the wider East Anglia region and the UK as a whole includes the A14, A12 and A47. The A14 connects the M6 at the Catthorpe Interchange at the end of the M6 and Junction 19 of the M1 in Leicestershire with the Port of Felixstowe and provides connectivity to the wider strategic road network at Junction 55 for the A12. The section of the A12 between London and Junction 55 of the A14 forms part of the strategic road network, providing access to settlements to the south of Ipswich including Colchester and Chelmsford. The A47 connects the A1 at Peterborough with Lowestoft via King's Lynn, Norwich and Great Yarmouth.

### 2.10.5 Rail

2.10.6 At present, no direct rail access is provided to the main development site. The closest rail line to the Sizewell power station complex is the Sizewell branch line from Saxmundham which runs as far as Sizewell Halt, at the eastern end of Leiston. This freight-only line was until recently used by occasional nuclear flask trains for Sizewell A. At Saxmundham the branch line joins the East Suffolk Line, a 49 mile (79 km) rural line that runs in a south-west to north-east direction between Ipswich and Lowestoft. The East Suffolk Line connects with the Great Eastern Main Line at Ipswich, the Felixstowe branch line at Westerfield, the Wherry Line at Lowestoft and Saxmundham-Leiston branch line at Saxmundham. There are a total of 12 stations along the lines, of which Saxmundham is the closest to the Sizewell C main development site and approximately equidistant between Ipswich and Lowestoft. Passenger services run approximately once an hour in each direction and are operated by Greater Anglia; when required, the nuclear flask trains along the southern portion of the East Suffolk Line, and the Sizewell branch line, are operated by Direct Rail Services. King George's Avenue crosses the Saxmundham to Leiston branch line via a level crossing located 330m to the west of Sizewell Gap. Existing rail freight sidings are situated to the south of King George's Avenue, east of the Saxmundham to Leiston branch line, and serves the power station.

### 2.10.7 Sea

2.10.8 No maritime access is provided to the Sizewell power station complex. The main development site is bound to the east by a vegetated shingle beach and dunes.

## 2.11 Buildings & Infrastructure

2.11.1 The main reactors at Sizewell A and Sizewell B form prominent features in the local landscape. The main structures are surrounded by ancillary buildings, car parks, hardstanding and access and other forms of infrastructure which are largely screened from locations in the surrounding landscape. South-west of the existing Sizewell power stations are the Galloper and Greater Gabbard onshore substations and high voltage transmission lines that extend westwards towards Wickham Market.

### 2.11.2 Sizewell Power Stations

2.11.3 Sizewell comprises two former and current power generation facilities. The built forms of Sizewell A and Sizewell B are prominent landmarks along the Suffolk coastline, of which Sizewell B is often held in favourable regard as a symbol for the local area's energy coast.

2.11.4 **Figure 2.16** shows the composition of the existing built context.

2.11.5 The existing Sizewell power station complex occupies approximately 40ha for the Sizewell A and B power stations and ancillary facilities.

2.11.6 The reactors at Sizewell A and Sizewell B form prominent features in the local landscape illustrating the evolution of power generation along the Suffolk energy coast. The main structures are examples of nuclear technology at the point of design and construction, which signify the transition between generations of nuclear reactors on-site, they are likewise defined by an architecture representative of the prevalent issues, tastes, considerations of their time.

2.11.7 Both Sizewell A and Sizewell B are assemblies of simple platonic forms with minimal windows. They form a repeated composition of geometric elements as part of the history of energy creation within the UK.

2.11.8 The absence of human scale openings and paraphernalia within views towards the power station creates a perceived calm and static appearance of these external structural shells. The ongoing removal of industrial plant and equipment from the coastal elevation would further emphasise the simplicity of these building profiles and would form the baseline to the additional third generation of nuclear power creation at Sizewell.



### 2.11.9 Sizewell A

- 2.11.10 The Sizewell A station is currently being decommissioned and consisted of two 1,010 MW (thermal) Magnox reactors. The gas-cooled reactors supplied eight boiler units providing steam to feed electrical turbo-generators on-site. The building which houses both reactors is a composite steel and reinforced concrete structure, with a combination of aluminium cladding and an exposed in-situ concrete finish. This has discoloured and aged over its lifespan, currently in excess of 50 years within the marine environment.
- 2.11.11 The aesthetic is rooted in the brutalist era, within which it was designed and built, and the prominent reactor building is not well regarded by the local community. The profiled metal cladding is similar in colour to the concrete finish and is assumed to be a similar finish from distant views.
- 2.11.12 Sizewell A was designed to generate approximately 650MW of electricity at opening in 1967, this gradually reduced throughout its operational life until the station commenced decommissioning in 2006. The power station is due to be put into a care and maintenance phase by 2027, after which buildings would be systematically removed in accordance with Nuclear Decommissioning Authority policy.

### 2.11.13 Sizewell B

- 2.11.14 Sizewell B is the first of the UK's Pressurised Water Reactors (PWRs), it began operation in 1995 and was designed to generate approximately 1,200MW. The station has a full-time workforce of about 800 staff, which includes contract partners. The power station is expected to operate until 2035, with the potential for a lifetime extension for 20 years to 2055.
- 2.11.15 The nuclear reactor, with associated cooling circuit and steam generators, is contained inside a 65m high, 45m diameter pre-stressed concrete building. The power station's clean and simple forms have a clear hierarchy between buildings.
- 2.11.16 The main building plinth is clad in blue polyester powder coated, profiled aluminium cladding. The vitreous enamel clad dome visibly contrasts to this in a gloss white finish. The secondary structures on-site are clad in pale grey profiled metal and form a background to the more prominent main building.

- 2.11.17 A red perimeter rail lines the building parapet, it links the appearance of the buildings and manipulates the perceived scale. Careful detailing of parapets, corners and apertures ties the buildings together to form a clear simple architectural language. The building performs as a sculpted scales object within the landscape at distance and a thoughtfully detailed building on closer inspection, it can be considered a well-designed and appropriate composition for this sensitive site.
- 2.11.18 The site area for Sizewell B alone is approximately 30ha, the power generation for the facility equates to 45MW per hectare. The power station operates on an 18-month cycle of 100% power generation followed by up to a 2 month outage period, where the station shuts down for refuelling and maintenance.

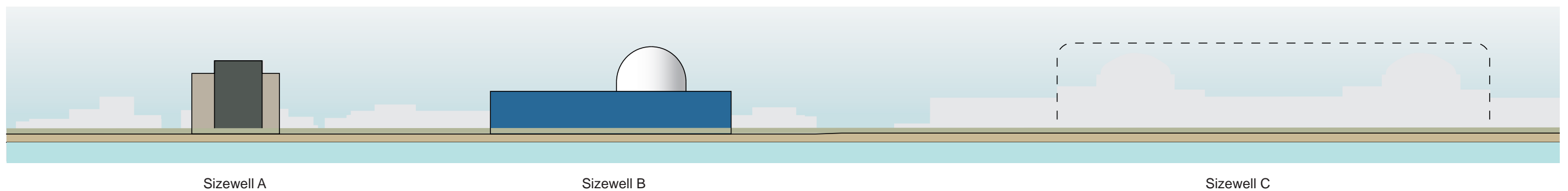


Figure 2.16: Composition of existing Sizewell built context



**2.12 Suffolk Coast and Heaths AONB and the Selection and Use of Colour in Development**

**2.12.1 Colour and the Landscape**

2.12.2 The Suffolk Coast & Heaths AONB 'Guidance on the selection and use of colour in development' document (2019) identifies six simplified landscape character types within Suffolk and provides guidance on the selection and use of colour for building development within the AONB. Each landscape character type has a distinct colour palette, an understanding of which can assist in making appropriate choices for development.

2.12.3 Drawing on the guidance and site visits three landscape character types have been identified in the immediate context of the operational platform:

- Sand dunes and shingle ridges, located along the coastline;
- Saltmarsh and intertidal flats; coastal levels, located in lower lying areas inland of the coast; and
- Estate sandlands, woods and heath.

2.12.4 The existing buildings and structures at Sizewell A and B are also an important component of the context of the Sizewell C Project.

2.12.5 Each of the landscape character types have a subtly different palette with a consistency of greys, shingle tones and deeper greens that are present throughout the coastal environment.




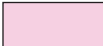

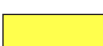
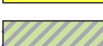
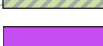
2.12.6 The built forms of Sizewell B, in contrast to this, utilise white and a dominant blue tone which at times recedes into the expanse of sky.

2.12.7 Fringing the western boundary of the AONB are areas of the 'Estate farmlands, clayland edge, farmed estate sandlands' landscape character type and larger towns, such as Leiston are classified as 'Buildings and settlements'.

2.12.8 The guidance states that the degree of colour integration relates in part to the nature of the development and to the sensitivity of the landscape to change. The balance between camouflage and emphasis of certain structures is considered and carefully applied through the development's design. The hierarchy of key proposed buildings responds directly to the varying characters and is identified in **Chapter 7** of this statement.

2.12.9 The Sizewell C development responds to six differing character areas in accordance with Suffolk Coast & Heaths AONB 'Guidance on the selection and use of colour in development' as shown on **Figure 2.17**.

**Legend**

-  Sizewell C Main Development Site Boundary
-  Suffolk Cast & Heaths Area of Outstanding Natural Beauty (AONB)
-  Buildings and settlements
-  Estate sandlands, woods and heath
-  Saltmarsh and intertidal flats; coastal levels
-  Sand dunes and shingle ridges
-  Estate farmlands; clayland edge; farmed estate sandlands
-  Valley meadowlands

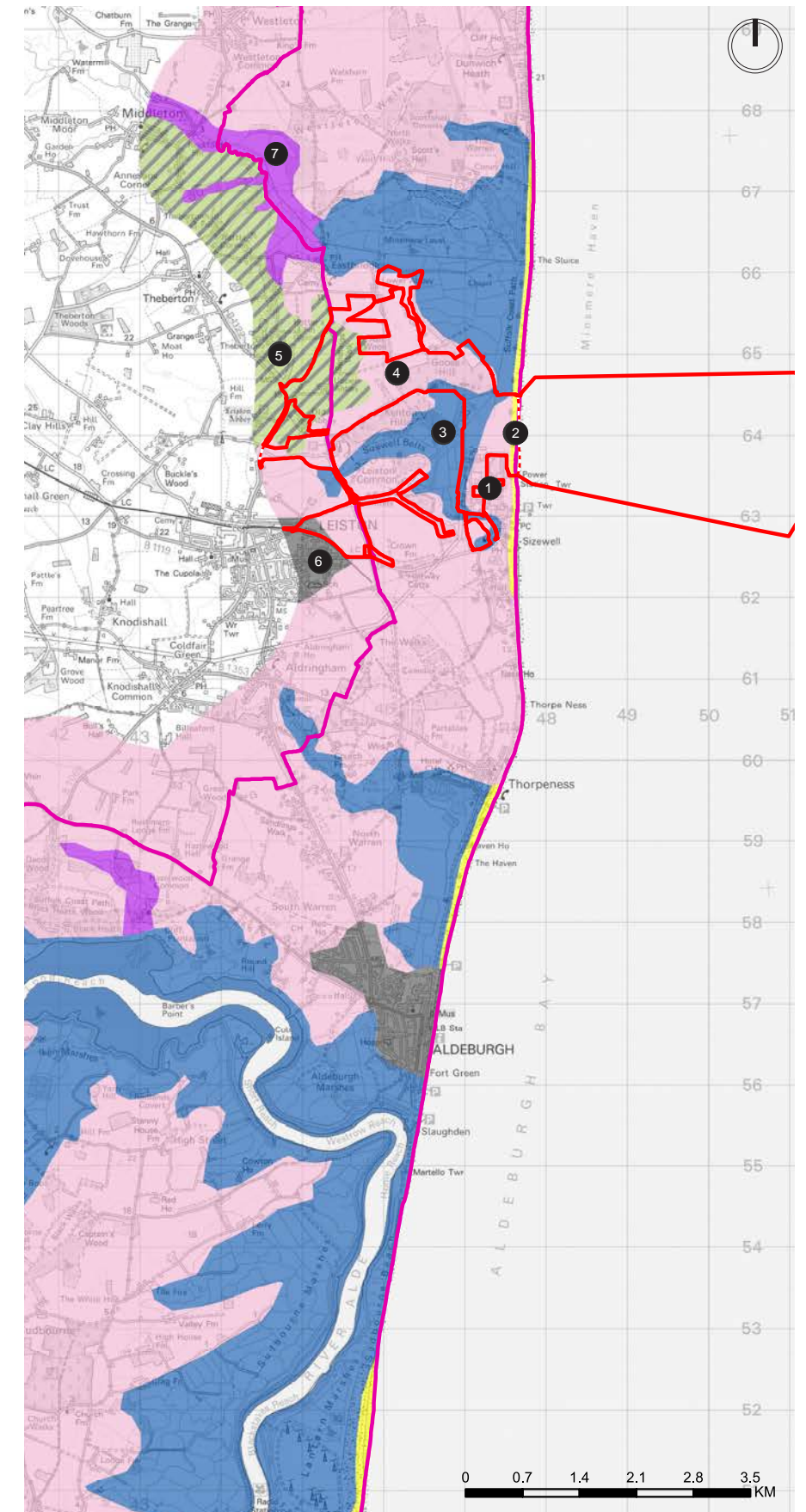


Figure 2.17: Landscape character types for Suffolk Coast & Heaths AONB



## Landscape Character

### 1 Built forms of Sizewell A and Sizewell B

The built forms of Sizewell B are distinct and bold in their use of colour with a palette of blue, white and the red accent of the oversized handrail which utilises high contrast to diminish the buildings scale. The prominent forms contrast to their natural surroundings and utilise complementary tones to the sky in differing conditions. A sequence of different colour tones and textures is established between Sizewell A and B, which express the buildings' industrial nature.

### 2 Sand dunes and shingle ridges

The exposed coastal edge comprises an expanse of sky and / or sea within many views in this area. The open scenes of pebble beaches and sheltered beachy bays are feathered into higher level grassy banks. The colour palette is one of pale bright golden hues with accents of greens and blues which add depth and contrast to the views. The texture is intricate and granular in nature in this area with complex contrasts within a detailed view, whilst providing homogenous sweeping tones to beach forms in the distance.

### 3 Saltmarsh and intertidal flats; coastal levels

The low lands immediately inland of the Sizewell site are characterised by marshes, pastures and grasslands. They have a tapestry of natural textures and provide visually rich and complex views. The colour palette here is layered from the natural grasses and shingle tones through a mix of greens to the deeper richer foliage and shrubland colours.

### 4 Estate sandlands, wood and heath

The woodland area to the north of the site comprises denser shrubland towards Dunwich Heath. The palette of ferns, shrubs and fast growing trees provide an area with rich tones and high contrast light and shade. As a colour scene the rich greens to be found here are complemented by warmer amber and umber shades, which ground the vegetation as a darker textured base.

### 5 Estate farmlands; clayland edge; farmed estate sandlands

The farmlands and exposed clays which lie close to the Sizewell site feature a more mixed palette of browns and earthen tones. Invariably vistas within these areas feature horizontal banding and patterning of greens and beige tones on a deeper umber base. These estate sites are bounded by rich green bands of vegetation and hedges between open land and adjacent sites.

### 6 Buildings and settlements

The combination of local red brick, flints and dark clapboard facades within the Suffolk area is complemented by a range of pastel colours. Bold colours from pale pinks to rich oranges and turquoises are present within this existing higher contrast colour palette of human settlements within the AONB.

### 7 Valley meadowlands


Undulating meadowlands form a natural palette of grasslands, open water and wild seeded planting, this features accent colours from bolder vegetation, shrubs and lichen amongst the predominant green to umber hues.











# Chapter 3

## Project Requirements



# 3.0 Project Requirements

## 3.1 Introduction

- 3.1.1 This chapter describes the project requirements for the Sizewell C Project, starting with a series of strategic objectives, followed by an explanation of the requirements of the actual power station in terms of energy generation, operational requirements as well as design development.
- 3.1.2 The project design principles are explained in detail in **Chapter 5** of this statement. The design principles help structure the design process and provide a control framework against which detailed design will be assessed.
- 3.1.3 **Chapter 6** further explains the rationale behind the design principles that underpin the illustrative Landscape Masterplan and sets out a series of site specific design responses.

## 3.2 Project Objectives

### 3.2.1 Strategic Objectives

3.2.2 The strategic objectives for the Sizewell C Project are:

- to make a major contribution to the nation's low-carbon energy needs;
- for development, operation and ultimate decommissioning to be undertaken in a manner consistent with the highest standards of safety, reliability and sustainability;
- to make the most of its practical contributions to the local and regional economy;
- to design and deliver the project in such a way as to limit any adverse effects on the environment and on local communities as far as is reasonably practicable; and
- to mitigate any significant adverse impacts of the construction, operation or decommissioning of the power station where practical and appropriate in a way that is environmentally responsible and sensitive both to the needs of the community and to the strategies of the relevant authorities.

## 3.3 Power Generation

- 3.3.1 Nuclear power stations create electricity by producing steam for turbines connected to electrical generators. The actual electricity generation is achieved conventionally; nuclear technology generates the steam that drives the turbines.
- 3.3.2 Sizewell C would be powered by two nuclear reactors of a type known as UK European Pressurised Reactor (EPR™). At the centre of each reactor is a thick-walled steel pressure vessel within which a controlled fission reaction takes place. This reaction is capable of producing 4,500 MW of thermal power, which is used to heat a primary circuit of pressurised water to around 330°C. The cooling water in this primary circuit is circulated through four heat exchangers, known as steam generators, where water in a separate secondary circuit is converted to steam. The reactor pressure vessel, steam generators and pressuriser vessel are contained within a pressure-retaining reinforced concrete structure, known as the containment.
- 3.3.3 The secondary circuit steam is used to power a single large turbine per reactor, rotating at around 1,500 revolutions per minute. This is housed in a turbine hall and is connected directly to a three-phase electrical generator capable of producing around 1,770 MW of electrical power, of which around 1,670 MW is exported.
- 3.3.4 Steam leaving the turbine is circulated through condensers, which are cooled by a further separate circuit of sea water, and turned back into water (or condensate). This steam condensate is returned to the steam generators via high pressure pumps.
- 3.3.5 For Sizewell C, the sea water would be taken from the North Sea via two cooling water intake tunnels (one associated with each unit) and returned via a single underground outfall tunnel.
- 3.3.6 Electricity from the Sizewell C generator is stepped up to high voltage (400kV) via transformers before being exported via overhead lines to the National Grid 400kV substation, which connects the generation output to the national electricity transmission system.
- 3.3.7 Emergency diesel generators ensure that power is always available to the safety critical infrastructure, even in the event of loss of connection or supply from the National Grid. These are required to be test run at regular intervals, which generates noise which must be considered in the design of adjacent occupied buildings.
- 3.3.8 The UK EPR™ has the capacity to make more efficient use of fuel than previous designs, thus reducing the quantities of spent fuel that need to be disposed of.
- 3.3.9 **Figure 3.1** shows schematically how the buildings and structures that serve a UK EPR™ reactor are typically arranged.
- 3.3.10 With two reactors, Sizewell C is expected to supply approximately 3,340MW to the National Grid, enough electricity to power approximately six million homes.
- 3.3.11 Depending on the level of maintenance required, it is envisaged that approximately 1,000 additional staff would be employed during planned refuelling and maintenance outages, which are expected to take place approximately every 18 months for each UK EPR™ unit. Each outage would typically last up to two months.







### 3.4 The UK EPR™

- 3.4.1 Nuclear power is a low carbon technology with carbon dioxide emissions far less than from fossil fuelled generation. Emissions are equivalent to, for example, wind power, but electricity can be produced at a greater 'density', i.e. generation of MW per m<sup>2</sup>. It can make a material contribution to mitigating climate change and to helping the UK meet its long-term carbon reduction goals.
- 3.4.2 EDF Energy manages 58 nuclear power stations in France producing 78% of the country's electrical power demand. Sizewell B nuclear power station, is the only commercial PWR in the UK. It is based on a Westinghouse '4-loop' design, and is owned and operated by EDF Energy.
- 3.4.3 The design of the UK EPR™ has been derived from extensive experience of developing PWRs by both EDF Energy's, a major utility operator, and Framatome, a key manufacturer. PWRs have evolved over several generations of design since the 1970s in order to meet more stringent safety demands from the regulators, improve performance and increase power output.
- 3.4.4 The design of the Hinkley Point C power station, which is currently under construction, is the reference plant design for the UK EPR™ and Sizewell C will draw on the learning and experience of this construction project.
- 3.4.5 EDF Energy's approach to evolving the design has already been proven at Hinkley Point C. This process includes enhancing safety, contractibility and operational effectiveness, embodying the learning gathered from completed and operational facilities, and from projects under construction. The advantage of SZC Co.'s approach is increased predictability and safety, while reducing risks to cost, programme to build, operability and maintainability.
- 3.4.6 A number of the significant buildings and structures forming the main part of the power station development are subject to highly stringent civil and nuclear engineering that is assessed by the Environment Agency and the ONR as part of a regulated control process known as the GDA.
- 3.4.7 These buildings are required to withstand a range of onerous natural and artificial dynamic loadings and weather conditions. Any modification of the design that has an impact upon the elements that have been assessed through the GDA process is controlled by a stringent design change process. There is greater flexibility to tailor the design of the remaining buildings to site specific requirements. **Chapter 7** identifies those buildings with a fixed design and those which have opportunities for greater design flexibility.

### 3.5 The GDA

- 3.5.1 The UK EPR™ has gone through a series of design assessments and design iterations. These were the outcome of ongoing GDA, and more specific responses that were developed further from the discharge of requirements associated with the proposals for Hinkley Point C that EDF Energy put forward previously.
- 3.5.2 GDA is the process by which the nuclear regulators, the ONR and the Environment Agency assess new nuclear power station designs. The GDA process allows the regulators to assess the safety, security and environmental implications of new reactor designs. Assessment at the design stage enables identification of any potential issues so that they can be addressed by the requesting party (the company who has submitted a design for assessment) before commitments are made to construct the reactors.
- 3.5.3 Through the GDA process, EDF Energy submitted detailed information on the design of the UK EPR™. A rigorous and structured examination was undertaken, carried out in an open and transparent manner, to facilitate the involvement of the public who were able to view and comment on design information.
- 3.5.4 In December 2012, the ONR issued a Design Acceptance Confirmation (DAC) and the Environment Agency issued a Statement of Design Acceptability (SoDA) for the UK EPR™ design, which concluded the GDA process.
- 3.5.5 The design of the power station, buildings and systems subject to the GDA process are required to meet the highest standards of public and environmental protection and withstand a range of defined natural and human hazards, to ensure protection over the lifetime of the power station.
- 3.5.6 Any modifications to this design would need to undergo a stringent change control process, which would be likely to result in significant programme delays.
- 3.5.7 The design of Sizewell C forms an iteration of the proposals EDF Energy put forward for Hinkley Point C with some site specific changes affecting supporting systems, which are dependent on site location and site characteristics. In addition, the turbine halls external appearance design is in direct response to the local landscape context. The fundamental design of the Nuclear Island remains as per Hinkley Point C and the GDA process.



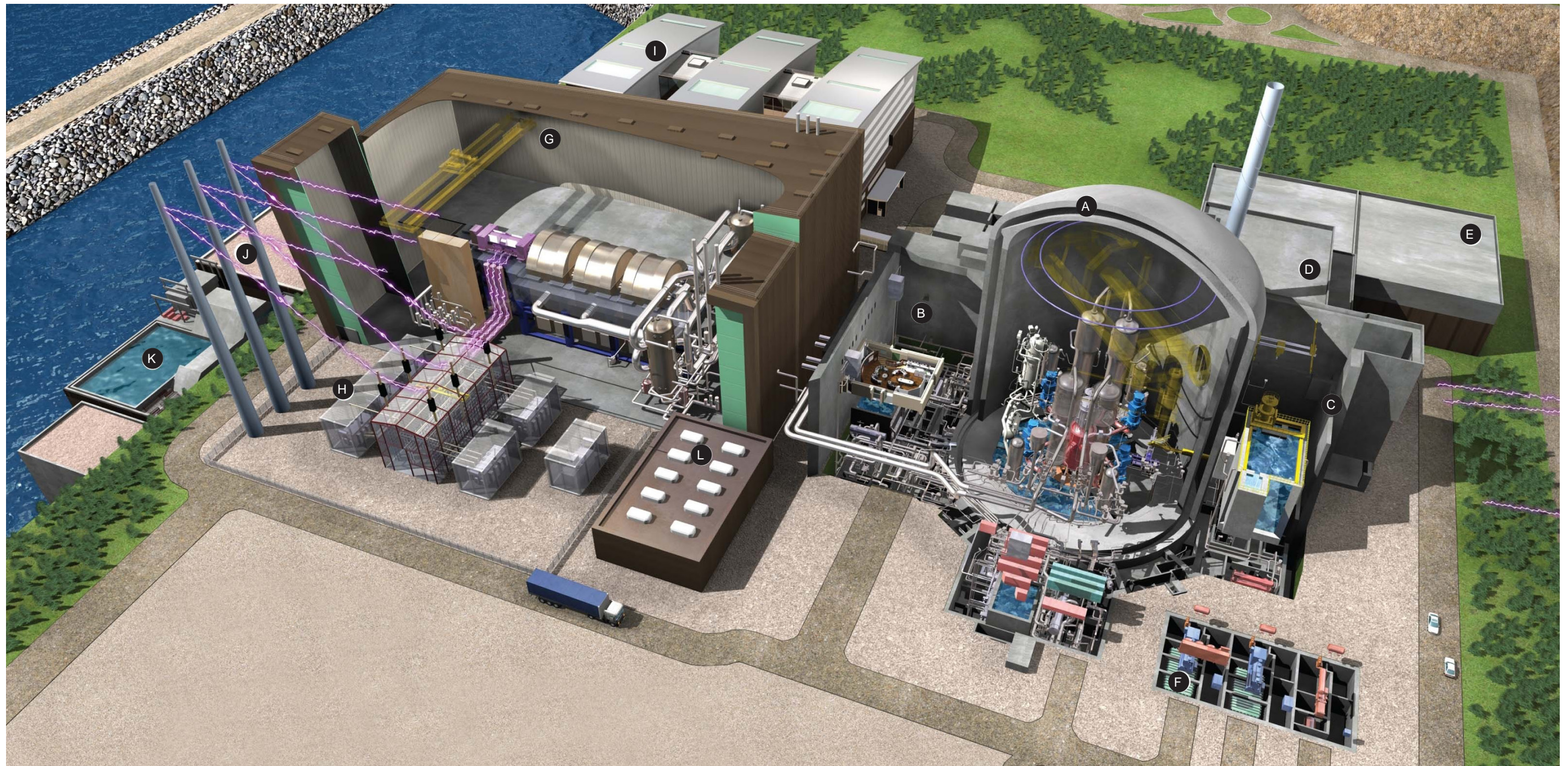


Figure 3.1: UK European Pressurised Reactor (EPR™)

**Legend**

- |  |  |   |
|--|--|---|
| <ul style="list-style-type: none"> <li>Ⓐ Reactor Building</li> <li>Ⓑ Safeguard Buildings</li> <li>Ⓒ Fuel Building</li> <li>Ⓓ Nuclear Auxillary Building</li> </ul> | <ul style="list-style-type: none"> <li>Ⓔ Radioactive Waste Storage Building</li> <li>Ⓕ Emergency Diesel Building</li> <li>Ⓖ Turbine Hall</li> <li>Ⓗ Power Transmission Platform</li> </ul> | <ul style="list-style-type: none"> <li>Ⓘ Operational Service Centre</li> <li>⓵ Cooling Water Pumphouse</li> <li>Ⓚ Forebay</li> <li>Ⓛ Conventional Island Electrical Building</li> </ul> |
|--|--|---|



### 3.6 Principal Components of Sizewell C Development

3.6.1 The Sizewell C main development site (which includes the total area needed for constructing and operating Sizewell C power station) comprises five principal components described below and illustrated in **Figure 1.2**:

3.6.2 Permanent:

- power station platform (main platform): the area that would become the power station itself;
- Sizewell B relocated facilities land: the area that certain Sizewell B facilities would be moved to, in order to release other land for Sizewell C; and
- offshore works area: the area where offshore cooling water infrastructure and other marine works would be located.

3.6.3 Temporary:

- temporary construction area: the area located primarily to the north and west of the SSSI crossing, which would be used to support construction activity on the main platform; and
- LEEIE: the area directly north of Sizewell Halt, which would be used to support construction on the main platform and temporary construction area.

3.6.4 Development at the main development site would comprise the following building, engineering or other operations:

3.6.5 Permanent:

- nuclear power station, including two UK EPR™ reactor units capable of exporting a total of approximately 3,340 Megawatts (MW) to the National Grid;
- associated buildings, plant and infrastructure within the power station perimeter, including overhead power lines and pylons;
- associated buildings, plant and infrastructure outside of the power station perimeter, including BLF and flood defences;
- marine works and associated infrastructure, including a cooling water system and combined drainage outfall in the North Sea;
- National Grid 400 kV substation and associated relocation of an existing pylon and power line south of Sizewell C;

- relocation of certain Sizewell B supporting buildings, plant and infrastructure south of Sizewell C;
- vehicular and pedestrian crossing over the Sizewell Marshes SSSI south of Goose Hill;
- power station access road, linking the SSSI crossing with a new roundabout onto Abbey Road (B1122);
- public access works including permanent and temporary closures and diversions of public rights of way;
- diversion and installation of utilities and services; and
- landscape restoration works, including earthworks and planting.

3.6.6 Temporary:

- a temporary accommodation campus for up to 2,400 construction workers and associated facilities, buildings and infrastructure, located east of Eastbridge Road;
- temporary construction compounds, parking, laydown areas and working areas, plus related works and structures;
- temporary spoil management areas, including borrow pits and stockpiles; and,
- temporary rail infrastructure associated with the green rail route.

3.6.7 Development at LEEIE would comprise the following building, engineering or other operations – (All development in this location would be temporary unless otherwise stated):

- construction compounds, laydown areas and working areas, plus related works and structures;
- spoil management areas, including stockpiles;
- accommodation for approximately 400 caravans and associated welfare and parking;
- heavy goods vehicles (HGVs) and bus management area;
- park and ride facility;
- a new rail spur adjacent to the existing railway track; and
- landscape restoration works and planting (permanent).

3.6.8 For information on construction and demolition, please refer to **Volume 2, Chapter 3** of the **ES**, Description of Construction Development (Doc Ref. 6.3).

3.6.9 Key inheritances from the construction phase that influence the design of the permanent phase design comprise the following:

- highway improvements;
- site access road alignment;
- SSSI causeway and road crossing;
- Northern mound;
- BLF;
- sea defences;
- bridleway route; and
- surplus spoil.

3.6.10 Access Planning in Construction Phase:

- construction of Sizewell C would require significant provision of new and upgraded infrastructure and logistics services to facilitate efficient and sustainable access to the main development site for both the workforce and for freight and material deliveries. A range of transport modes are required including road, rail and marine access; walking and cycling plans are also encouraged as a means of accessing the main development site and the purpose-built park and ride facilities. Further details are provided in the **Construction Worker Travel Plan (CWTP)** (Doc Ref. 8.8); and
- the main infrastructure required to facilitate workforce and freight access is set out below with further details provided in **Chapter 9** of this statement and the **Transport Assessment** (Doc Ref. 8.5).

3.6.11 Workforce Access:

- temporary park and ride facilities at Darsham and Wickham Market; and
- dedicated access to the accommodation campus, site compounds and work areas via a new roundabout junction from the B1122.



<p>3.6.12 Freight Strategy:</p> <p>(i) Road access</p> <ul style="list-style-type: none"> <li>• a package of junction and highway improvements, some of which would be temporary in nature;</li> <li>• two villages bypass schemes at Farnham and Stratford St Andrew; and a new link road, the Sizewell Link Road, which would bypass Theberton and Middleton Moor and extend to join the A12 south of Yoxford;</li> <li>• a freight management facility is proposed at Seven Hills, accessed via Felixstowe Road, which would provide spaces for up to 154 HGVs;</li> <li>• a new roundabout west of Upper Abbey Farm and south of the accommodation campus for road freight access; and</li> <li>• secondary access to the main development using Lover's Lane with connection to the LEEIE during the construction phase, facilitating the delivery of materials from the rail infrastructure to the east of Leiston.</li> </ul> <p>(ii) Rail access</p> <ul style="list-style-type: none"> <li>• new and existing rail connections including extensions from the current Saxmunden to Leiston branch line; and,</li> <li>• new temporary siding within the LEEIE to facilitate early construction access and activity, whilst in later phases a new single-track route would be built which extends into the main development site.</li> </ul> <p>3.6.13 Marine access</p> <p>3.6.14 A BLF with associated haul road at the Northern Mound would be constructed for use in both the construction and operational phases. This would be in place from the early construction phase to support construction of the initial sea defences.</p>	<p><b>3.7 Workforce</b></p> <p>3.7.1 Once operational, Sizewell C would be operated 24 hours a day. To achieve this, a number of operational staff would work shift patterns requiring all day access to the site and facilities.</p> <p>3.7.2 In addition to the industrial activity of power generation and associated storage and materials handling logistics, the proposed power station site would need to provide accommodation for a range of uses including offices, laboratories, education, health and staff welfare.</p> <p>3.7.3 During normal operations the number of staff required on the site would include those involved in material handling, technical support and operations, laboratory work, routine maintenance, training, procurement, security, administration and staff welfare. As the site would be remote from local facilities and would be a secure zone, a range of staff welfare facilities would need to be provided.</p> <p>3.7.4 The majority of the workforce would be based in the operational service centre and other supporting technical and office facilities with movements to the reactor buildings, turbine halls and other ancillary buildings. The majority of the permanent workforce would live within a radius of 25 miles and travel to work either by vehicle share schemes or individually. The remoteness of the site and the shift patterns have been taken into account in determining the scale of the car parking provision.</p> <p>3.7.5 The operational workforce would gradually build up during the commissioning phase and it is anticipated that approximately 700 permanent staff would be employed on-site during normal operations; of which approximately 180 would be employed in professional and managerial positions; 60 in clerical and administration positions; and 460 in industrial positions. There would also be up to an additional 200 contract staff, making a total of around 900.</p> <p>3.7.6 It is anticipated that the operational staff at Sizewell C would follow a similar working pattern to the existing operational staff of Sizewell B. Up to 150 operational staff would work shifts. The remaining 750 staff are likely to work between 08:00 and 16:30.</p>	<p>3.7.7 The two UK EPR™ reactor units would be refuelled and maintained on a phased basis. During a planned outage (a period when power supply is closed down) at Sizewell C it is envisaged that approximately 1000 additional people would work at the site, depending on the level of maintenance required. The outage staff would work day and night shifts with approximately 60% of the workforce working a day shift and 40% working a night shift. It is envisaged that the outage day shift would be 07:00 to 19:00 and the night shift could be 19:00 to 07:00. However, the numbers would depend upon the extent of the maintenance scope of the outage.</p> <p>3.7.8 This temporary population would comprise both local and itinerant specialist workers. Additional facilities are required to support this temporary increase of the workforce on-site including parking, office and welfare facilities.</p> <p><b>3.8 Maintenance and Replacement</b></p> <p>3.8.1 The planned operational life of the power station is 60 years. In addition to outages for routine refuelling and maintenance, major maintenance and replacement would be performed. The most significant elements potentially requiring replacement would be large components such as parts of the generators. These would be delivered to the site by road with the largest items being delivered by sea. Working space around and between the principal buildings is required as a result.</p> <p>3.8.2 At the end of its operational life, the power station would be decommissioned and the buildings, would be removed and the site would be strictly controlled until it is de-licensed over a period of approximately 25 years. <b>Chapter 12</b> of this statement describes the decommissioning process further.</p>
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### 3.9 Functional Layout Requirements

- 3.9.1 The main development site, as illustrated in **Figure 1.1**, covers an area of 371.7ha, including all permanent and temporary development and the on-site accommodation campus, but excluding the area occupied by the cooling water pumphouse and associated structures extending into the marine environment. This is described further in **Volume 2, Chapter 2**; Description of Permanent Development and **Chapter 3**; Description of Construction of the **ES** (Doc. Ref. 6.3).
- 3.9.2 The proposed development comprises the principal facilities previously described, together with internal road infrastructure and external areas for parking and landscape which are all required to be designed and constructed to the highest standards of safety, quality and efficiency.
- 3.9.3 The overall functional layout must be based on construction, operational efficiency, nuclear safety and decommissioning considerations, including:
- facilitating authorised access and minimising adverse interactions; and
  - minimising the handling of materials and the effects of incidents.
- 3.9.4 The overall functional layout must also be informed by site related criteria including:
- proximity to the sea;
  - the landform and levels;
  - the existing environmental considerations;
  - landscape setting;
  - suitability of geology;
  - relationship to the existing Sizewell power station complex; and,
  - existing road access.
- 3.9.5 The configuration of the main nuclear island buildings is standardised and, based on the Flamanville 3 station in France. The layout is generated from the detailed layouts of each building and the complex interconnections between them for the secure movement of people and materials and building services connections. The layout balances the need for minimised distances for operational and land use efficiency and the need to separate buildings for safety considerations such as severe seismic activity, and to facilitate the phasing of construction.

### 3.10 Sustainability and Environmental Design

- 3.10.1 SZC Co.'s environmental policy recognises the Company's duty to care for the environment and the Company will seek continuous improvement in its environmental performance. This includes reducing the environmental effect of its activities by the reduction of waste and the efficient use of resources and promoting the efficient use of energy.
- 3.10.2 The requirements for sustainability and climate change are described in **Chapter 11**.

### 3.11 External Requirements

- 3.11.1 Within, and in the vicinity of the secure perimeter, it is a requirement that the landscape is designed so as not to prejudice security, to minimise the risk of fire, and to facilitate maintenance. This means the roads and hardstanding areas surfaces should support vehicles and be predominantly vegetation free surfaces even where not trafficked.
- 3.11.2 To protect the underground facilities from water infiltration, the majority of the operational site surface is required to have a low level of permeability to limit the level of the water table.
- 3.11.3 The drainage system for the operational power station would need to accommodate rainfall under normal and exceptional conditions. Separate arrangements would be needed to treat all hydro carbon effluent and sewage. All arrangements would need to be implemented without placing any burden on local infrastructure. Further information on drainage arrangements is provided in **Chapter 6** of this statement.



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# Chapter 4

## Consultation & Evolution of Design



# 4.0 Consultation & Evolution of Design

## 4.1 Background

- 4.1.1 As part of the application for the Sizewell C DCO, a **Consultation Report** (Doc Ref. 5.1) has been submitted pursuant to Section 37(3)(c) of the Planning Act 2008 (the Act).
- 4.1.2 Pre-application consultation is a legal requirement for NSIPs. In accordance with the Act, the Consultation Report outlines the pre-application consultation undertaken by SZC Co., sets out the relevant responses received, and explains how SZC Co. has had regard to these.
- 4.1.3 As explained in **Chapter 1** of the **Consultation Report** (Doc Ref. 5.1), the principle of delivering a new nuclear power station at Sizewell C is established within national planning policy. As such, aspects relating to the nature or the location of the proposals did not form part of the consultation process.
- 4.1.4 This chapter provides an overview of the consultation undertaken in connection with the proposals for the main development site, and how SZC Co. took the comments into account and had regard to these in the design of the main development site.

## 4.2 Stages of Consultation

- 4.2.1 SZC Co. has consulted widely on the Sizewell C Project since 2008, through the following non-statutory and statutory phases of consultation:
- **Initial (Non-Statutory) Informal consultation (Pre-Stage 1)**, which ran from 2008 to November 2012. This early engagement prior to statutory consultation informed the community and stakeholders about SZC Co.'s development aspirations from the outset and gave us an early understanding of local issues and priorities.
  - **Statutory Stage 1 consultation**, which ran from 21 November 2012 to 6 February 2013. This sought comments on the overall proposals for Sizewell C, options for associated development, and the potential effects on the local community.

- **Informal (Non-Statutory) Consultation (Development Sites)**, which took place in November 2013. This sought views on reclassified options for the associated development sites further to the Stage 1 consultation and additional technical work. Note that this stage did not however relate to the main development site.
- **Statutory Stage 2 consultation**, which ran from 23 November 2016 to 3 February 2017. This sought views on all elements of the strategy and proposals. SZC Co. was interested in receiving comments across the whole project, and in relation to proposed scheme changes since the Stage 1 consultation.
- **Statutory Stage 3 consultation**, which ran from 4 January 2019 to 29 March 2019. Views were again sought on all elements of the project and in relation to changes proposed since the Stage 2 consultation.
- **Statutory Stage 4 consultation**, which ran from 18 July to 27 September 2019. This provided an update on elements of the proposal that had changed since the Stage 3 consultation and principally sought views on new proposals for the transport of freight and the provision of additional land to compensate for environmental impacts.

4.2.2 The stages of consultation are shown in **Table 4.1**.

4.2.3 In addition to these stages of consultation, SZC Co. has undertaken informal engagement throughout the evolution of the Sizewell C Project.

4.2.4 The four statutory stages of consultation were aligned with the stages of the design process. The comments received at each stage of the consultation were recorded, analysed and used to inform the evolution of the proposals. Full details can be found in the **Consultation Report** (Doc Ref. 5.1) submitted as part of this application.

## 4.3 Consultation and Design Development

- The following section provides a brief summary of the consultations and analysis of comments received at each stage. Further detail on this can be found in the **Consultation Report** (Doc Ref. 5.1) submitted as part of this application.

## 4.4 Approach to Consultation

- 4.4.1 SZC Co. has consulted the local community, statutory bodies and other relevant stakeholders on its development proposals in accordance with the requirements of the Act.
- 4.4.2 A Statement of Community Consultation (SOCC) (2012) and updated SOCC (2016) were prepared, setting out the approach to consultation, as agreed with East Suffolk Council (ESC) and Suffolk County Council (SCC).
- 4.4.3 The Stage 1 consultation was undertaken in accordance with the SOCC (2012). Following the feedback received from consultees at Stage 1, SZC Co. decided to undertake one or more additional stages of formal consultation. To reflect this approach, an updated SOCC (2016) was published and Stages 2, 3 and 4 were undertaken in accordance with this.
- 4.4.4 A wide variety of consultation methods were used to communicate SZC Co.'s proposals to stakeholders. This included:
- the publication of a regular and widely circulated newsletters;
  - the publication of a widely circulated consultation documents for each stage of consultation;
  - public exhibitions, which were advertised through press releases and newspaper advertisements in a variety of local and regional publications;
  - stakeholder and public meetings, held with key community groups;



**Table 4.1: Sizewell C Consultation**

NOV 2012	NOV 2012 - FEB 2013	NOV 2016	NOV 2016 - FEB 2017	JAN 2019 - MAR 2019	JULY 2019 - SEPT 2019	Q1 2020		
Sizewell C Statement of Community Consultation (SoCC) published								
	Stage 1 Consultation							
		Updated Sizewell C SoCC published						
			Stage 2 Consultation					
				Stage 3 Consultation				
					Stage 4 Consultation			
						Application for development consent submitted		
							Planning Inspectorate examination	
								Decision by Secretary of State



- the establishment of a community forum, to provide a mechanism for more regular discussion; and
  - the setting up of a project-specific website, which contained all the consultation information and a mechanism to respond.
- 4.4.5 Issues raised as a result of the consultation process have been noted and addressed within the **Consultation Report** (Doc Ref. 5.1). This Design and Access Statement summarises the design response to the issues raised.
- 4.5 Content of Consultation**
- 4.5.1 The content of the four statutory stages of consultation insofar as they related to the main development site are summarised below.
- 4.5.2 **Stage 1 consultation** considered high level strategic options for the delivery of Sizewell C including:
- SZC Co.'s overall proposals for the Sizewell C power station;
  - options for associated development; and
  - the potential effects on the local community and environment, both positive and negative.
- 4.5.3 **Stage 2 consultation** considered the emerging strategic preferred options for the delivery of Sizewell C taking into account Stage 1 feedback. This included:
- a) Main development site (permanent development)**
- the concept proposals for the external finish of the turbine halls;
  - the junction arrangement for the new access road with the B1122;
  - the location of the crossing of the SSSI, of which there were four options:
    - Option 1: causeway over culvert for both the Construction and operational phase;
    - Option 2: single span bridges with vertical wing walls for both the Construction and operational phases;
    - Option 3: three span bridges for both the construction and operational phases; and,
    - Option 4: a causeway over a culvert with an adjacent short-term bridge.
- The proposals for the flood defence and coastal protection measures;
  - A BLF in the operational phase to receive occasional deliveries of AILs by sea; and
  - The landscape proposals, detailing how the land around Sizewell C would be restored following construction.
- b) Main development site (construction phase):**
- The provision of on-site spoil / stockpile arrangements using a 'borrow pit', for which there were three potential siting options:
    - Option 1: Field east of Eastbridge Road (Field 1), and field west of Eastbridge Road (Field 2);
    - Option 2: Field west of Eastbridge Road (Field 2), and field north of Ash Wood (Field 3); and,
    - Option 3: Field north of Ash Wood (Field 3), and field west of Ash Wood (Field 4).
  - Marine delivery solutions proposed in order to accept bulk construction materials, equipment and AILs to the main development site:
    - Option 1: a wide jetty (temporary);
    - Option 2: a narrow jetty (temporary); and
    - Option 3: a BLF (construction phase).
  - Development of the LEEIE proposed for the following uses:
    - Option 1: for construction and caravan accommodation purposes, and provision for a new rail terminal as an alternative to the green rail route; and,
    - Option 2: if the green rail route is selected, use for construction and caravan accommodation purposes only.
  - An accommodation campus for which there were three potential layout options:
    - Option 1: campus buildings both east and west of Eastbridge Road, with sports facilities on the western land parcel.
    - Option 2(i): campus buildings to the east of Eastbridge Road only, with sports facilities on the western land parcel.
    - Option 2(ii): campus buildings to the east of Eastbridge Road only, with sports facilities to be located off-site in a location to be identified.
- 4.5.4 **Stage 3 consultation** considered amendments to the main development site proposals presented at Stage 2 including:
- Response to rail corridor options presented at Stage 1
    - Green Route - the green and blue routes were the clear preferences for the spur off the Saxmundham to Leiston branch line. SZC Co. consulted on the green route throughout the remainder of the consultation.
  - SSSI crossing: causeway over a culvert for construction and operational phase;
  - sea defence: design for effective sea defence and landscape feature;
  - training building: proposed location at Goose Hill (north of the main platform, adjacent to the main car park);
  - emergency response equipment store and backup generator: equipment store proposed to enable rapid response to an emergency event, with a combined heat and power plant for the accommodation campus retained for backup power during operation;
  - electrical connection: connection to the Grid via an overhead line within the Sizewell C site as further work has shown risks of underground cables;
  - borrow pits: retention of three remaining fields from the Stage 2 options for borrow pits;
  - electrical substation: a new substation, located east of Old Abbey Farm required to complete the electrical connection between Leiston substation at Sizewell Wents, the emergency equipment store and the ancillary buildings; and
  - the junction arrangement for the new access road with the B1122.
- 4.5.5 **Stage 4 consultation** considered changes to proposals as a result of feedback at Stage 3 consultation, ongoing engagement with stakeholders, further technical and environmental assessments, close working with Network Rail, and learning from Hinkley Point C.
- 4.5.6 The aim of Stage 4 consultation was to provide an update on these changes and to introduce an alternative, third strategy (Integrated Strategy) for moving materials on and off the construction site.



- 4.5.7 Stage 4 consultation focused on amendments to the main development site presented at Stage 3, including:
- minor red line changes to include an alternative entrance roundabout layout;
  - minor red line changes to include land necessary for National Grid's electricity pylons;
  - two new options presented for the Sizewell C electricity pylons;
  - a new option for the rail head at LEEIE;
  - minor red line changes to accommodate public rights of way diversions;
  - minor red line changes to amend the off-site sport facilities;
  - minor red line changes to include Round House;
  - minor red line changes to include Kenton Hills car park;
  - proposed sites for ecological compensation land for marsh harriers following workshops and discussions with statutory stakeholders, and environmental surveys and assessments;
  - proposed sites for ecological compensation land for fen meadows following workshops, and discussions with statutory stakeholders and environmental surveys and assessments; and,
  - proposed sites for flood compensation land following workshops and discussions with statutory stakeholders and environmental surveys and assessments.

#### 4.6 Consultation Feedback

- 4.6.1 SZC Co. has fully considered all representations submitted across the formal and informal consultation period and also comments received from stakeholders during a rolling programme of ongoing dialogue as part of an iterative design process.
- 4.6.2 The **Consultation Report** (Doc Ref. 5.1) provides full details of the feedback received at each stage of consultation and SZC Co.'s response. The following paragraphs are a summary of key feedback:

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##### Stage 1 consultation:

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- Concerns about the permanent development related primarily to the designated areas which it borders or encroaches upon. The Suffolk Coast and Heaths AONB, Sizewell Marshes SSSI and RSPB Minsmere were all mentioned by many respondents who were opposed to the development, as well as by those who supported Sizewell C but were anxious to see the effects on these areas minimised.
- The impact on the landscape was another key concern about the proposed development, with many respondents talking about the impact on the character of the coastal area of further 'industrial buildings'.
- Some respondents referred to their experiences with Sizewell A and B, some felt that they have lived with the existing stations happily and so are less concerned by the proposals; others worried that the impacts were significant, and / or felt that the impacts had been downplayed.
- Coastal erosion (sometimes specifically in relation to climate change) was cited by a number of respondents as an objection to the use of the Sizewell site for a new power station.
- Some of those who raised coastal processes did not oppose the development as a whole, but sought reassurance that the design would take account of this concern, up to and including 1 in 10,000 year events.
- A few respondents made reference to the events at the Fukushima nuclear power plant in Japan, expressing concern about safety in the case of extreme weather.
- The extent of land, which is proposed to be used, for the permanent development and especially during construction, was commented upon by a number of respondents. Some felt that given the extent of land already occupied by the Sizewell complex it is unnecessary for so much agricultural land to be used.

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##### Stage 2 consultation:

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- The most common concerns raised related to impact on designated areas, impact on wildlife and ecology, and a lack of details. Concerns regarding coastal processes, noise and vibration, and light pollution were also significant. Respondents commented that they felt mitigation measures were inadequate.
- Many respondents linked their concerns about environmental degradation to a decline in tourism, as the natural environment is an attraction for visitors. Other connections made included health concerns, aesthetic concerns, impact on recreation and impact on overall quality of life for locals.
- Many respondents emphasised the need for mitigation and felt that SZC Co. should work with experts, partners, local stakeholders and action groups to achieve the best outcome.
- Some respondents suggested that as Sizewell C would be next door to the existing stations the resultant visual impact would not be as serious as it would be on a completely new site. However, more respondents raised concerns about increased visual and landscape impacts.



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### Stage 3 consultation:

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- Respondents supportive of Sizewell C expressed support for plans at the main development site, suggesting the plans are “well considered” or expressing “no objections”. Others said that local environmental issues such as Minsmere had been dealt with satisfactorily. Some of these respondents expressed more cautious support for the plans, suggesting that if the power station had to be built then the proposals for the main development site were acceptable.
- A small number of respondents supported the plans but offered specific caveats that they wanted to see addressed. These included;
  - that the site was restored to its pre-development state post construction;
  - that any issues that cropped up continued to be consulted on; and
  - that SZC Co. continued to work with other bodies to mitigate the overall impact of construction.
- Respondents opposed to Sizewell C raised concerns about the size of the development suggesting the plan for the main site was too large, with some saying that it was bigger than the previous Sizewell sites. Several respondents argued that the site took up too much space in designated areas such as the AONB and SSSI.

The range of concerns raised covered:

  - the scale of the site relative to the size of the AONB;
  - the way the site will divide the AONB;
  - the duration of the project;
  - the permanent impact on the area; and
  - the principle of an AONB as an area that should not be developed.
- A small number of respondents commented on heritage assets in the area and argued that the potential damage or loss of these sites should be taken seriously. These included; Sizewell Abbey; Leiston Abbey; The Suffolk Heritage Coast; Coronation Wood; The WWII Pillbox on Pillbox field; and local churches.

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### Stage 4 consultation:

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- As with previous consultations, the size of the site where Sizewell C is intended to be constructed was a concern that many respondents referred to. Some respondents suggested the operational platform itself was too small to fit all the required infrastructure.
- Some respondents were critical of the plans for quarry pits and spoil heaps as they believed the quarry pits could leak pollutants, potentially harming the Minsmere Levels, and the spoil heaps could cause dust pollution as well as being visually intrusive due to their height.
- A few respondents expressed concerns about the helipad as they felt it would be environmentally damaging and was unnecessary.
- One of the most frequently occurring topics was mitigation, with many respondents suggesting that no amount of mitigation could replace the habitats lost. More specific criticism about mitigation included:
  - That habitats created as mitigation would not be functional before construction started and may never be functional, as habitats such as fen meadows were hard to recreate.
  - That many of the areas set aside for mitigation were far away from the original habitat and so would be of little use to displaced wildlife.
  - That the area set aside for marsh harrier compensation land would require the destruction of farmland.
- Some respondents raised concerns that the proposals would seriously damage designated areas, especially Minsmere RSPB Reserve and the Sizewell Marshes SSSI.
- Specific concerns respondents expressed about the designated areas were;
  - the amount of land take required;
  - the impact on wildlife and ecology, especially birds and bats;
  - the potential for damage to the hydrology of the Minsmere Levels; and
  - the effect of the access road on the Area of Outstanding Natural Beauty.
- A few respondents made suggestions about the environment with the most common request being that environmental assessments were conducted if they had not already been, or made publicly available if they had.
- Other suggestions included;
  - the creation of long-term management plans to monitor mitigation sites;
  - the planting and subsequent maintenance of hedgerows;
  - the introduction of pedestrian access to Kenton Hill Walks from the replacement bridleway;
  - the construction of a walkway across the beach and the straightening of the existing beach track; and
  - the use of an independent body to monitor the clearance of vegetation to ensure only necessary work is undertaken.
- Some respondents were critical of the rock armour defence as they felt it was inadequate and would not function effectively for long enough to prevent future coastal erosion.
- A few respondents were positive about the main development site, expressing support for the proposals to mitigate the loss of fen meadow habitat and foraging ground for marsh harriers. Other respondents were positive about the reduction in land required south of Dunwich Forest since Stage 3.



## 4.7 Response to Consultation

- 4.7.1 In response to comments received through the formal consultation and stakeholder engagement, with regard to the main development site, the masterplan and building design, the project design has evolved to respond to matters raised where practicable and follow up meetings organised to explore feedback and explore responses.
- 4.7.2 The project design has been developed in tandem with the EIA process and an understanding of potential impacts addressed through an iterative design process. The project design stages have been informed by early environmental information which informed stage 1 and 2 design, Preliminary Environmental Information which informed stage 3 design and a full EIA which has supported ongoing design development of the proposals to be submitted for the DCO application.
- 4.7.3 Specific matters relating to effects of construction, tourism, loss of farmland and impacts on designated areas and design raised during consultation have all for example, been the subject of ongoing dialogue with stakeholders including RSPB, Suffolk Wildlife Trust, AONB partnership and local authorities and effects of the final proposal assessed in the EIA.
- 4.7.4 The project has been developed in the following key areas in response to consultation.
- 4.7.5 **Design Principles:**
- Design principles for the proposal were consulted upon and have since been developed and refined. They have formed a foundation for the proposals through all stages. The principles are described in **Chapter 5**.
- 4.7.6 **Landscape integration:**
- We undertook a study to define the Natural Beauty and Special Qualities Indicators of the AONB which we consulted upon, which has formed an important point of reference for engagement with stakeholders on the masterplan and scheme design and reporting on the assessment of effects on the AONB in the EIA.
- 4.7.7 We have been working with relevant stakeholders to develop an appropriate design and landscape and habitat management response for the project site following construction which is presented in the **oLEMP** (Doc Ref. 8.2). This management plan and landscape strategy has been developed to complement the development of the existing Estate wide management plan to deliver beneficial landscape and biodiversity outcomes including supporting amongst other things, the development of Marsh Harrier habitat, the creation of acid grassland and mixed woodland areas that will complement the AONB.

4.7.8 A **Landscape and Ecological Management Plan (LEMP)** will be submitted for approval in general accordance with the measures set out in the **oLEMP** (Doc. Ref 8.2), as required by Schedule 2 of the **draft Development Consent Order** (Doc Ref. 3.1).

### 4.7.9 Building location and design:

- The proposed turbine halls have been through significant design evolution in response to the AONB and extensive stakeholder feedback and discussions in response to the need for the project to deliver a place specific design response.
- The relationship between the operational service centre and turbine halls has been improved with the introduction of the linking Sky Bridges and the standardisation of the architectural approach and materials to be used.

## 4.8 Sizewell C Design Council Review

4.8.1 In addition to the formal consultation process, meetings have been held with the Design Council on two separate occasions over the course of developing the proposals.

4.8.2 SZC Co. first consulted the Design Council in March 2014 prior to stage 2 of the consultation on the emerging masterplan and initial design concepts for the turbine halls for the operational phase of the project. Subsequent design development addressed comments raised following that review along with ongoing stakeholder consultation.

4.8.3 SZC Co. reconsulted the Design Council in November 2019 following a considerable period of design development and stakeholder consultation. The strategic design review sought to assess particular aspects of the proposal comprising:

- landscape masterplan;
- turbine halls;
- operational service centre; and,
- worker accommodation campus.

4.8.4 The Design Council noted:

- 'Extensive steps are being taken by the project team to carefully integrate the Sizewell C site into its historic, coastal setting. Overall we think the proposal is being approached with great care and attention...'*
- 'The proposed height, massing, layout and form of buildings on the power plant site and landscape approach are broadly successful, as a result of a robust design process.'*

Two key recommendations were made:

- 1. '...that key design decisions for Sizewell C - The siting and scale of the buildings and infrastructure, and their treatment - have a collective visual impact, and therefore should be made based on their 'composition' within the landscape.....In the overall composition of Sizewell C in its landscape, we strongly recommend the inclusion of the dry fuel store as a detailed component of the DCO application given its key role.'*
- 2. '...that the health and well being of users, particularly staff living and working on the site, be considered more comprehensively and enhanced in the development of the overall proposal...' (of relevance to this document, mention was made of the OSC) 'In particular the current design of the Operational Service Centre (OSC) appears to address the wider site considerations.....at the expense of the staff within the proposed building.'* The report does however note in more general terms, that *'The architecture and external appearance of the ...OSC...is developing well....'*

Regarding the landscape masterplan the report notes:

*'The design ambition for the landscape and its ecological stewardship is exemplary...a coherent design narrative and approach that factors in long term landscape enhancements with short-term requirements for construction. We support the approach to the sea defences ....'*

4.8.5 The Design Council were broadly supportive of the design and design process that the design team were undertaking, with an appreciation of the design exploration of:

- the collective visual impact based on composition within the landscape;
- the approach to the colour and texture of external panels and their detailing to inform how buildings are perceived;
- the tests undertaken in relation to colour, shape, material and orientation, plus behaviour in different conditions; and,
- the exploration of internal / external relationship of OSC / staff experience whilst maintaining the 'calm' appearance of buildings and dark skies.









# Chapter 5

## Design Principles - Framework for Good Design



# 5.0 Design Principles

*“[Design] Principles should act as reminders to the delivery organisation, a steer in the right direction, and a means of restoring focus to the big picture.....Design Principles should be a point of departure, setting out a common understanding [of] the issues to be addressed.”*

*Developing Design Principles for National Infrastructure (NIC, 2018)*

## 5.1 Design Principles - Framework for Good Design

- 5.1.1 The evolution and application of the design principles set out in this chapter align with the core purposes and ambitions of the National Infrastructure Commission design principles. They have been informed by the site context, project requirements and consultation feedback, which are described in **Chapters 2 to 4** of this document.
- 5.1.2 The design principles have been informed through design review by CABA at Design Council undertaken in March 2014 and November 2019. Further details are provided in **Chapter 4** and **Appendix B** of this statement.
- 5.1.3 The design principles have also been informed by consultation with the relevant local authorities (SCC and ESC, formerly Suffolk Coastal District Council (SCDC)) and Natural England during the early stages of the design process.
- 5.1.4 The design brief established with stakeholders in 2014, has heavily informed the design process and forms the basis of many design principles contained within this chapter.
- 5.1.5 Collectively, the design principles help to define and establish how the project will fulfil the criteria of ‘good design’, set out in Overarching National Policy Statement for Energy (EN-1) (NPS EN-1) (Ref 7.3) and NPS EN-6 (Ref 7.4).

- 5.1.6 The design principles are split into two categories as set out in **Figure 5.2**:
- **Overarching Design Principles:** detailed designs submitted and approved in this application have been informed by the overarching design principles. Alternative designs, or where details have not yet been submitted to the local planning authority for approval, will be informed by the overarching design principles, but they do not control the project.
  - **Detailed Design Principles:** detailed designs submitted and approved in this application must be carried out in accordance with these design principles. Alternative designs, or where details have not yet been submitted to the local planning authority for approval, must be in general accordance with these design principles. The detailed design principles are sub-divided into those within the main platform and those beyond the main platform as set out in **Figure 5.1**. Further details are set out below.
- 5.1.7 The specific parts of this chapter that control the project are the detailed design principles contained within **Tables 5.2** and **5.3**.
- 5.1.8 Further details on the specific functions the detailed design principles perform are set out in **Section 1.3** of this document.
- 5.1.9 **Table 5.1** provides the Overarching Design Principles. **Tables 5.2** and **5.3** provide the Detailed Design Principles.

*“Applying “good design” to energy projects should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible.”*

National Policy Statement EN-1; Section 4.5

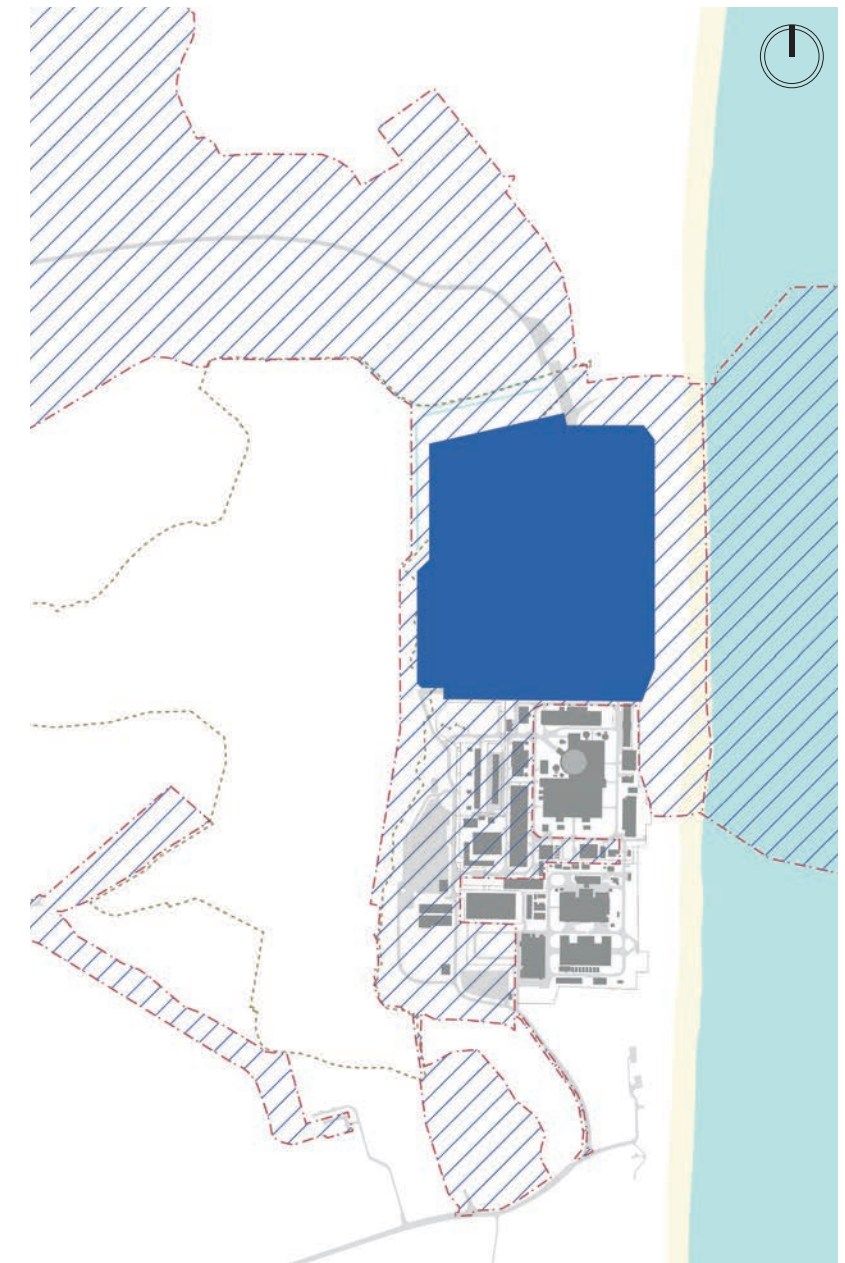




Figure 5.1: Sizewell C main platform extents

### Legend

-  Within Sizewell C main platform
-  Beyond Sizewell C main platform



- 5.1.10 Level 1 control documents will either be certified under the DCO at grant or annexed to the Deed of Obligation (DoO). All are secured and legally enforceable. Some Level 1 documents are compliance documents and must be complied with when certain activities are carried out. Other Level 1 documents are strategies or draft plans which set the boundaries for a subsequent Level 2 document which is required to be approved by a body or governance group. The obligations in the DCO and DoO set out the status of each Level 1 document.
- 5.1.11 This Chapter 5 is a Level 1 document as are Chapter 7 (in part), 8 and Table A.1. There are some elements of the project which must be built in accordance with the design principles in this chapter and other elements where details approved under certain requirements must be in general accordance with the design principles set out in this chapter. These are:
- Requirements 11, 12C and 13 of the **Draft Development Consent Order** (dDCO) (Doc. Ref. 3.1(l)) require that particular works are carried out in accordance with the design principles in this Chapter 5, unless otherwise approved by ESC and any alternative details or plans for these works submitted for approval by ESC must be in general accordance with the design principles.
  - Requirements 12, 12B, 12C, 13A and 14 of the **dDCO** require that the details of particular works which must be submitted for approval by ESC must be in general accordance with the design principles in this chapter 5.
- 5.1.12 Where further documents or details require approval under this chapter, this chapter states which body or governance group is responsible for the approval and/or must be consulted. Any approvals by ESC, SCC or the MMO will be carried out in accordance with the procedure in Schedule 23 of the DCO. Any updates to these Level 1 documents or further documents or details must be approved by the same body or governance group and through the same consultation and procedure as the original document or details.



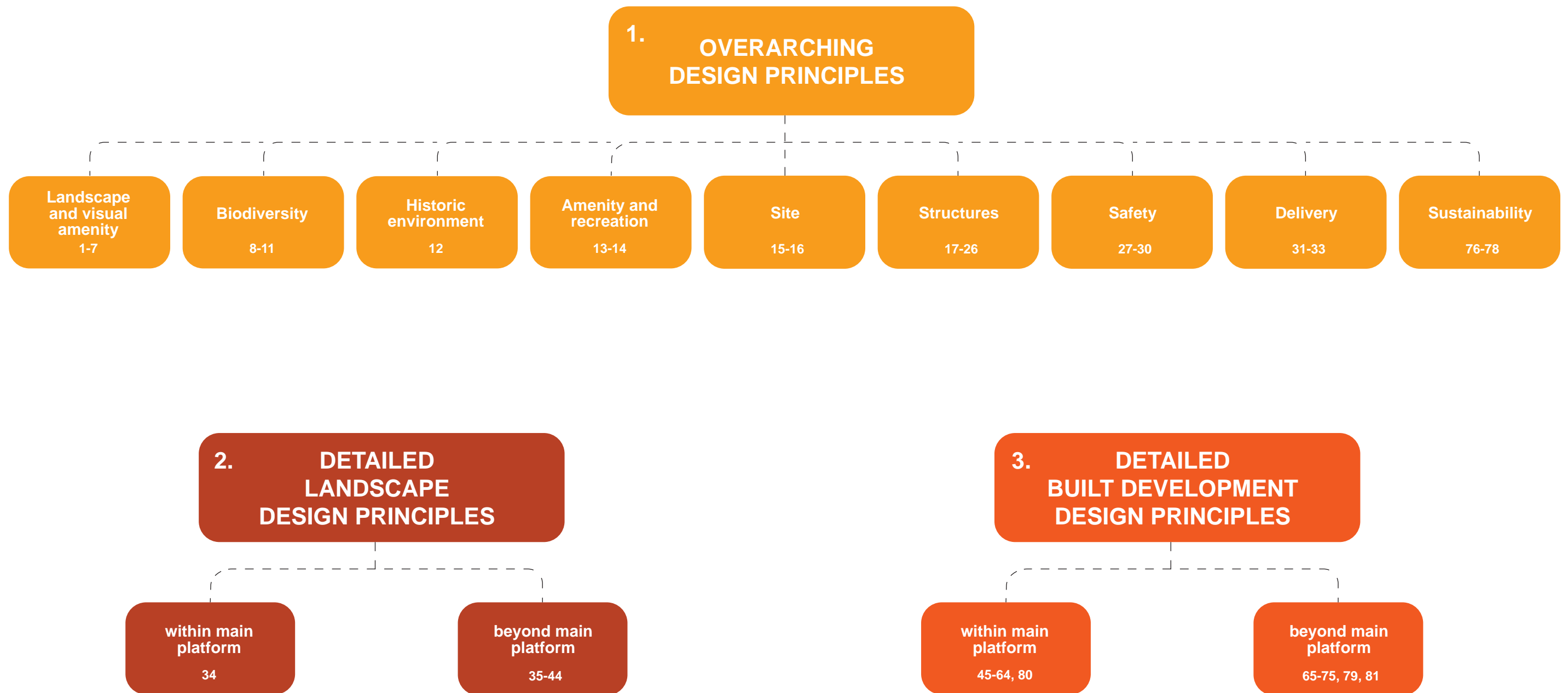


Figure 5.2: Diagram to show organisation of the design principles



Table 5.1 Overarching Design Principles

1. OVERARCHING DESIGN PRINCIPLES	
<b>LANDSCAPE &amp; VISUAL AMENITY</b>	
1	Minimise land take and mitigate landscape and visual effects where practical.
2	Retain existing screening landscape features, where reasonably practicable, and promote appropriate new landscape design (planting and landform) to mitigate the landscape and visual effects of the development.
3	Establish new planting and landform at the earliest practicable opportunity.
4	Plan the development and design of structures to respect the rural and in part wilderness character of the landscape.
5	Select finishes (materials, colour and texture) to be sympathetic to local landscape and seascape and built context, where reasonably practicable
6	Design associated infrastructure, including lighting, access and fencing, to minimise, where reasonably practicable, landscape, seascape and visual effects.
7	Minimise, where reasonably practicable, visual effects at night from lighting and light spill without compromising either safety or security.
<b>BIODIVERSITY</b>	
8	Minimise the likely significant adverse biodiversity effects and seek opportunities post construction through retention of existing habitats, where reasonably practicable, and creation of new habitats.
9	Seek to retain areas of habitat connectivity and continuity as far as possible
10	Design the development, including lighting, access and fencing, to minimise disturbance to protected species, including at night, and severance of habitats, where reasonably practicable.
11	Minimise land take from the SSSI.
<b>HISTORIC ENVIRONMENT</b>	
12	The design of the development will consider potential effects on designated and non-designated heritage assets, including buried archaeology and historic landscape character.
<b>AMENITY &amp; RECREATION</b>	
13	Create and maintain safe public access (pedestrian, equestrian, cycle), integrated with existing networks, where reasonably practicable.
14	Ensure that facilities for public use and enjoyment take into account the balance of other considerations including landscape character, the historic environment and ecology.
<b>SITE</b>	
15	The development will incorporate proportionate security provisions in accordance with ONR requirements and SZC Co. standards.
16	Permanent access to and within the site will meet all operational requirements.
<b>STRUCTURES</b>	
17	Sizewell C will be an efficient and well-ordered facility. It will provide visible reassurance of a properly functioning and safe site, considerate of the area of environmental sensitivity.



## 1. OVERARCHING DESIGN PRINCIPLES (CONT.)

18	Sizewell C structures will complement the existing structures within the landscape, most notably Sizewell A and B, as far as reasonably practicable.
19	Design will be a planned composition with Sizewell A and Sizewell B, balancing proportions and impacts across the sites, as far as reasonably practicable.
20	The power station will be a masterplanned composition as far as reasonably practicable, and not an unplanned series of individual buildings and structures.
21	Design will utilise techniques to reduce the perceived scale of buildings from a distance by manipulating the size and arrangement of visible components and façade details, subject to operational requirements.
22	The crucial differences between the Sizewell C UK EPR™ and Sizewell B will be recognised, including the consequent impacts upon form, construction, materials and appearance.
23	Building finishes will be durable, low maintenance and suitable for a marine environment.
24	Subject to project requirements, visibility from public viewpoints and good masterplanning, where possible, the built forms of Sizewell C will generally be treated with an external colour palette that is responsive to and will aim to form an integrated part of the natural landscape they sit within.
25	SZC Co. will provide a high-quality workplace for the entire power station workforce.
26	New buildings located outside the main Sizewell C platform will be responsive to their individual local context whilst maintaining a coordinated high-quality approach to the whole development.

### SAFETY

27	Sizewell C will be designed to comply with regulatory requirements namely the outcome of the UK EPR™ GDA.
28	The proposed design will ensure that the power station can be constructed safely.
29	Detailed design will ensure the power station can be operated and maintained safely in accordance with the Nuclear Site Licence and other applicable regulations and consents.
30	The power station site and structures will consider safe decommissioning as part of the design.

### DELIVERY

31	Detailed design will maintain the commercial viability of the project and will not delay the assumed construction programme.
32	Detailed designs approved for Hinkley Point C power station will be replicated wherever practicable to avoid redesign costs and ensure consistency of the operational and maintenance regime.
33	SZC Co. will continue to be dedicated to good design for the Sizewell C development.

### SUSTAINABILITY

76	Design and construct for a low carbon future.
77	Adopt a circular economy model.
78	Use water wisely.



Table 5.2 Detailed Landscape Design Principles

2. DETAILED LANDSCAPE DESIGN PRINCIPLES	
<b>WITHIN MAIN PLATFORM</b>	
34	Landscape design will provide character to those external areas and routes within the main platform that are used most intensively by workers on foot.
<b>BEYOND MAIN PLATFORM</b>	
35	Land within the main development site required for operation of the power station will be optimised and disturbance will be minimised to as small an area of the landscape as reasonably practicable.
36	Wherever practicable, existing established plantation woodlands and tree belts will be retained where they contribute to the layers of vegetation that screen views to the power station.
37	Existing retained features, such as woodlands, forested areas and hedgerows will form part of the landscape design.
38	Mature screening, will exploit the existing woodland at Goose Hill and Sizewell Belts to retain and complement the architectural composition of the existing power station with the new Sizewell C structures.
39	New planting and landforms will be established at the earliest practicable opportunity.
40	Landscape design will create a diversity of conditions that will provide subtle variation in grassland habitats allowing a diverse flora to establish, reflecting the floristic diversity of existing Suffolk Sandlings dry grasslands.
41	Any public rights of way, permissive footpaths, access land, promoted cycle routes and all other pre-existing linear and area access (outside the power station complex, on the coast and inland) affected by construction will be restored to at least their original standard and alignment.
42	Facilities for public use and enjoyment will have regard to landscape character, the historic environment and biodiversity.
43	Existing habitats and habitat connectivity will be retained where reasonably practicable and new habitats will be created.
44	Disturbance to protected species and severance of habitats will be minimised, where reasonably practicable.



**Table 5.3 Detailed Built Development Principles**

3. DETAILED BUILT DEVELOPMENT PRINCIPLES		
WITHIN MAIN PLATFORM		
Placemaking	45	The influence of the future form and appearance of Sizewell A will be considered in detailed designs, as far as reasonably practicable.
	46	A sense of place and community for the workplace will be created on the main platform.
	47	Workforce buildings, occupied by large numbers of staff, will respond to occupants' needs for access, daylight, shading and ventilation.
	48	The principal Sizewell C structures will be located in close east-west alignment with the Sizewell B dome and continue the existing axis of Sizewell structures to replicate the 'behaviour' of them in views as platonic geometric forms above a vegetated datum.
Lighting & light spill	49	Eastern facades on the main platform will generally be formed of solid components without glazed openings to reduce light spill.
	50	The external lighting design will respond to the maintenance and security brief but where practicable will minimise light spill beyond the perimeter of the power station site, particularly on the eastern side of the platform.
	51	Security systems and lighting will be integrated, evenly set-out and applied consistently to all facades to reduce the appearance of visual clutter as far as reasonably practicable.
Roof plant and ancillary structures	52	Subject to operational requirements, all roof level plant equipment and protrusions will be concealed behind a raised building parapet as far as is reasonably practicable. Roof parapets will be of a generally consistent design and detail across site structures. A bespoke design will be considered for particularly prominent parapets.
	53	The need for permanent access systems, railings and other secondary structures attached to buildings will be minimised and, where visible from public viewpoints, will maintain a coordinated approach, where reasonably practicable.
Turbine halls / operational service centre	54	The arrangement of the turbine halls on the north-south axis of the site will be spaced symmetrically within the immediate foreground of the nuclear island buildings to provide clear separation of the volumes.
	55	The turbine halls and operational service centre will comprise a formal set-piece with a consistent material finish. The silhouette of these structures would be identifiable as a clean simple profile from coastal views.
	56	The turbine halls cladding (material above the base plinth) will seek to provide a responsive surface treatment which changes in colour and tone, subject to surrounding lighting and climatic conditions and will be made of a material and panel profile/s agreed with East Suffolk Council. The colour palette and panel profile will be discussed and agreed with East Suffolk Council in consultation with the AONB Partnership and the National Trust as part of pre submission discussion/ design review and align with the colour information and study outcomes recorded in the Design and Access Statement Section 7:11 and within a range of light to darker bronze. The information will include details of the manufacturer's maintenance specification for external facing cladding.
Interim spent fuel store	57	The external treatment of the interim spent fuel store will seek to comprise a simple form with minimal external projections and a colour which responds to its setting as far as is reasonably practicable, taking into account the operational and nuclear safety requirements of the building. Reserved Matters applications will include details of the available colour options, including an explanation of how the proposed colour choice has responded to the building's setting. The design will have regard to the AONB and its immediate landscape context, acknowledge the long design life of the building in its material selection and design response, recognising its elevated status relative to other ancillary buildings.
Ancillary and plant buildings	58	The treatment of ancillary and plant buildings within the main platform will seek to comprise pure simple, orthogonal forms and will minimise external projections and add-ons as far as reasonably practicable
	59	Ancillary and plant buildings will have a consistent façade treatment, comprising a visually recessive colour as far as reasonably practicable.
Building finishes	60	All materials will be specified in accordance with the operational and performance requirements for the structure and its constituent components.



## 3. DETAILED BUILT DEVELOPMENT PRINCIPLES (CONT.)

	61	<p>There will be a unifying design approach to provide architectural continuity between each of the three material groups. The three main material groups will be:</p> <ul style="list-style-type: none"> <li>nuclear island, cooling water pumphouse and associated buildings - concrete structures;</li> <li>conventional island primary structures (turbine halls and operational service centre) - anodised aluminium cladding panels and glass-fibre reinforced concrete plinth or similar; and</li> <li>ancillary and plant buildings – majority of which will be profiled sheet metal cladding or similar, subject to operational requirements.</li> </ul>
	62	The structural concrete of the safety related buildings will be exposed, without additional finishes and will be easily accessible without obstruction for ease of maintenance and inspection, in accordance with operational requirements.
	63	Exposed concrete will have a consistent pale grey finish as far as reasonably practicable. Careful on-site attention will be given to the change in batch of aggregates and setting-out of day joints to ensure a consistent even finish can be achieved, subject to operational requirements.
	64	The reactor stack will be a recessive colour appropriate to the backdrop of sky that it will be visible against. The colour palette will be discussed and agreed with East Suffolk Council.
Main Access Building	80	The external treatment of the main access building will recognise that, whilst part of the suite of ancillary buildings, it has a distinct location and function at the main site entrance and will have significant footfall. The building's form and colour will adhere to the design principles set for all ancillary buildings, taking into account the operational requirements and compliance with security rating and safety requirements of the building. Reserved Matters applications will include an explanation of how the proposed exterior design and colour choice have responded to the building's specific function and setting.
<b>BEYOND MAIN PLATFORM</b>		
Placemaking	65	Peripheral buildings that fall outside of the main platform will be treated with an understated external aesthetic which serves to root them in their environment.
	66	Designs for built forms will respond to the 'wilderness quality' of the power station environment by reducing the appearance of human habitation, through reduced human scale openings and external fixtures being visible from coastal views as far as reasonably practicable and within operational requirements.
	67	The material palette for the peripheral buildings will make use of colour tones appropriate to the surrounding landscape and in keeping with the development proposals on the main platform.
Access and parking	68	A power station access road will be provided to the B1122 (Abbey Road) from the north-west of the main platform, which will take into account the surrounding environment.
	69	The access road will be reduced in width post-construction and the surrounding landscape will be reprofiled to create naturalistic landforms covered with Sandlings grassland and pockets of mixed scrub, heath and stands of trees. This area will be designed to also integrate the SSSI crossing into the local landscape and screen / filter views to moving vehicles.
	70	A second independent access point to the power station will be provided, for security purposes.
	71	Access to the main platform will be provided for workers on foot and by cycle.
	72	The Sizewell B outage car park at Pillbox Field, proposed as part of Option 2 for the relocated facilities proposals, will be located and designed to minimise, as far as practicable, its visibility and vehicles using it, deploying sensitive reprofiling of landform working with existing topography.
Coastal defences	73	The design of the coastal defences will be given careful consideration to control the views to the operational site buildings, with a view to minimising visibility of smaller buildings and structures.
	74	The coastal defences will be planted with appropriate species to integrate the new defensive structure into its sensitive coastal landscape and enhance screening over time.
	75	The land take and seaward extent of the Hard Coastal Defence Feature will be minimised as far as practicable within operational and safety constraints
	81	The primary mechanism for establishing shingle and sand dune habitat on the new coastal defences will be by the storage of existing surface layers of the Sizewell beach front and their placement over the new coastal defences.
SSSI Crossing	79	For hard elements of the SSSI Crossing that are visible from public viewpoints and where a colour coating can reasonably be applied, the choice of colour will have regard to the 'Guidance on the Selection and use of Colour in Development' published by the Suffolk Coast and Heaths AONB', where doing so would not give rise to operational, safety or ecological harm. This includes polartactic invertebrates. Elements of the SSSI Crossing that are reasonably required to have a concrete finish are excluded from this design principle.



View south from beach south of Sizewell village and Sizewell power station complex







# Chapter 6

## Site Response - Delivering Good Design



# 6.0 Site Response - Delivering Good Design

*“We encourage the design team to develop a strong, imaginative narrative for the proposal that relates to the context, the Suffolk coastline, and manages to demonstrate the project’s national significance in a simple, compelling fashion. An inspiring approach, both to the landscape around the plant and the additional benefits it can bring to the area, will help root the project firmly in its surroundings, and we urge the client and the design team to continue exploring creative design options”*

CABE at Design Council stage 1 response (2014)

## 6.1 Introduction

- 6.1.1 Detail within this chapter is indicative only and is intended to illustrate how the design principles have informed detailed design work to date. It also identifies the likely way that the scheme would continue to be developed in general accordance with the design principles and the main development site parameter plans, as secured by DCO Requirement in Schedule 2 of the **draft Development Consent Order** (Doc Ref. 3.1).
- 6.1.2 The design principles (refer to **Chapter 5** of this statement) highlight the significant role that a comprehensive understanding of the Safety, Delivery, Environment, Site and Structures must have on the planning and design of a new nuclear power station at Sizewell and all ancillary and supporting development and infrastructure. These 5 categories form the basis of the overarching design principles, as indicated in **Figure 5.2**. Some of these key design principles are highlighted in the red and orange boxes within this chapter.
- 6.1.3 The Safety and Delivery categories are not directly addressed in this Chapter but have been embedded in the design process. This ensures that the designs comply with regulatory requirements, can be constructed safely, can be operated and maintained safely in accordance with regulations and can be safely decommissioned. Likewise, commercial viability and quality have been important considerations that have been embedded in the project throughout the design process.
- 6.1.4 The Site and Structures categories are addressed through an introduction to how the building design has been and will continue to be developed as a response to the context of the site.
- 6.1.5 All Environmental categories (Landscape and Visual, Biodiversity, Historic Environment, Amenity and Recreation) respond specifically to the design principles and explains in detail how these points have been and will continue to be addressed through the design.
- 6.1.6 The landscape and visual category emphasises the significance of the location of the main development site within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB), and the status such a designation has nationally.
- 6.1.7 Suffolk and in particular the area designated as the Suffolk Coast and Heaths AONB has been the subject of several assessments and therefore the contribution various elements and features make to landscape character, biodiversity, cultural heritage, recreation and visual amenity are well understood locally.
- 6.1.8 The Suffolk County landscape character assessment, Suffolk Coast and Heaths AONB Management Plan and the AONBs Landscape Character Guidelines set out clear objectives and guidelines about how new development and landscape management can deliver positive change. Furthermore, SZC Co., the Suffolk Coast and Heaths AONB Partnership, SCC, Suffolk Coastal District Council and Waveney District Council developed a comprehensive description of what constitutes the natural beauty and special qualities of the designated landscape.<sup>1</sup>
- 6.1.9 The architecture and design of built structures within the proposed development are influenced and guided by multiple aspects of the design principles. The design principles determine overall constraints to the power station’s design in order to comply with generic design requirements, overall realisation of the project and operational security. These are defined within the ‘Safety’, ‘Delivery’ and ‘Site’ categories and provide fundamental fixes to critical elements of the Sizewell C power station proposal.
- 6.1.10 The design principles for ‘Structures’ address the Sizewell context and seek to create a holistic design vision for the proposed development. The design principles identify the need for a complementary composition to Sizewell A and B whilst accommodating operational concerns of the third phase of power production on-site. The need for a high-quality workplace with a strong sense of place and community is also established, which safeguards the needs of the site’s workforce.
- 6.1.11 The wider site context of the SZC Co.’s estate is also considered requiring built elements to respond to their immediate and wider contextual setting, whilst adhering to this overall site vision as indicatively set out within **Chapter 7** of this statement.
- 6.1.12 Details of how the associated design principles have been and will continue to be addressed are set out as follows.
- 6.1.13 **Figure 6.1** shows Sizewell C in the context of the wider estates masterplan.

<sup>1</sup> Suffolk Coast & Heaths Area of Outstanding Natural Beauty AONB – Natural Beauty and Special Qualities Indicators v1.8, 21 November 2016)





Landscape & Visual



Biodiversity



Historic Environment



Amenity & Recreation



1 Coastal Dunes and Shingle Ridges



2 Ancient Estate Claylands



3 Coastal levels



4 Estate sandlands



Figure 6.1: Sizewell C within its wider estates masterplan context



# Environment

## 6.2 Landscape and Visual Amenity

6.2.1 This section details how the landscape and visual amenity design principles have been and will continue to be addressed. **Figure 6.2** outlines the relationship the Estate has with the wider context, **Figure 6.3** provides an overview of access and **Figure 6.4** provides an overview of landscape and visual intentions of the proposed scheme. The Landscape Masterplan is set out in **section 8.8** and provides illustrative details about how the landscape scheme may come forward.

### OVERARCHING DESIGN PRINCIPLE 1.

Minimise land take and mitigate landscape and visual effects where practical.

6.2.2 The construction of Sizewell C would result in the loss of several characteristic features comprising some wooded areas, including Coronation Wood and some parts of the conifer plantation Goose Hill as well as arable fields, areas of improved and semi-improved grassland notably around Upper Abbey Farm and in Pillbox Field, and hedgerows. Sizewell Beach and the existing sea defences would also be affected through the removal of part of the existing sea defences and Northern Mound and construction and operation of the BLF and access.

6.2.3 The planning of the project has sought to minimise the land required for construction and operation of the power station and minimise disturbance to as small an area of the landscape as reasonably practicable. Construction phase activity has also been avoided in visually sensitive locations, such as land west of Eastbridge Road to the east of Theberton House. The footprint of the operational site has been compressed to reduce land take in the AONB as well as the Sizewell Marshes SSSI and is approximately 30% smaller than Hinkley Point C, refer to **section 6.9 and 6.10** of this statement.

### OVERARCHING DESIGN PRINCIPLE 2.

Retain existing screening landscape features, where reasonably practicable, and promote appropriate new landscape design (planting and landform) to mitigate the landscape and visual effects of the development.

6.2.4 Wherever practicable, existing established landscape features have been avoided and in particular where they perform specific strategic landscape functions. For example, the physical extents of the main development site boundary has been configured to exclude and protect existing woodland and forested areas at Ash Wood, Great Mount Wood and the northern extents of Dunwich Forest and Goose Hill that provide screening of views to lower level construction activity / vehicle movements from vantage points to the north, such as from National Trust Dunwich Coastguard Cottages, within the RSPB Minsmere reserve and the beach.

6.2.5 Existing woodland, forested areas and belts of vegetation, for example Kenton Hills and Grimseys, vegetation along Bridleway 19, and in the vicinity of Upper Abbey Farm and Old Abbey Farm and along the western perimeter of the existing power station complex within the Sizewell Belts, that provide that screening of views to lower level construction activity / vehicle movements from vantage points to the west have also been retained.

6.2.6 Furthermore, temporary or in some cases permanent landscaped bunds are proposed to contribute to visual screening. For example an earth bund and vegetated retaining structure would be constructed at the northern edge of Kenton Hills during the construction phase that would be retained into the operational phase to contribute to the screening of views of vehicle movements along the proposed access road and contribute to the characteristic wooded backdrop to the lower lying Sizewell Marshes SSSI.

6.2.7 The design of the coastal sea defences has been and will continue to be given careful consideration to control the views to the operational site buildings with a view to minimising visibility of smaller buildings and structures.

### OVERARCHING DESIGN PRINCIPLE 3.

Establish new planting and landform at the earliest practicable opportunity.

6.2.8 Once the permanent elements of the proposed development such as the main power station structures, access road and new sea defences are completed, the remaining area of main development site used during construction would be the focus of works to repair and restore the landscape.

6.2.9 Rather than simply planting trees and hedgerows to reinstate the character and appearance of the pre-construction landscape characterised principally by commercial forestry and arable farmland, SZC Co. would create approximately 121ha of new Sandlings grassland and 51ha mixed woodland. Prior to agricultural improvement, the Suffolk Sandlings landscape was widespread along the Suffolk coast but has become greatly diminished as a result of commercial forestry and agricultural improvement. Remaining areas are relatively small and fragmented. In addition to its greatly enhanced biodiversity value compared to intensively managed arable farmland, the establishment of extensive areas of new Sandlings landscape would also provide the opportunity to utilise material excavated during the construction operations to create naturalistic landforms, echoing the character of Suffolk Sandlings landscapes elsewhere along the coast.

6.2.10 The masterplan seeks to integrate existing retained features, such as woodlands, forested areas and hedgerows to form part of the landscape design for the entire Estate, which would be managed in general accordance with the **oLEMP** (Doc Ref. 8.2) (refer to **Chapter 8** of this statement.). The **oLEMP** (Doc Ref. 8.2) complements the design principles and would be secured as a certified document in Schedule 2 of the **draft Development Consent Order** (Doc Ref. 3.1).



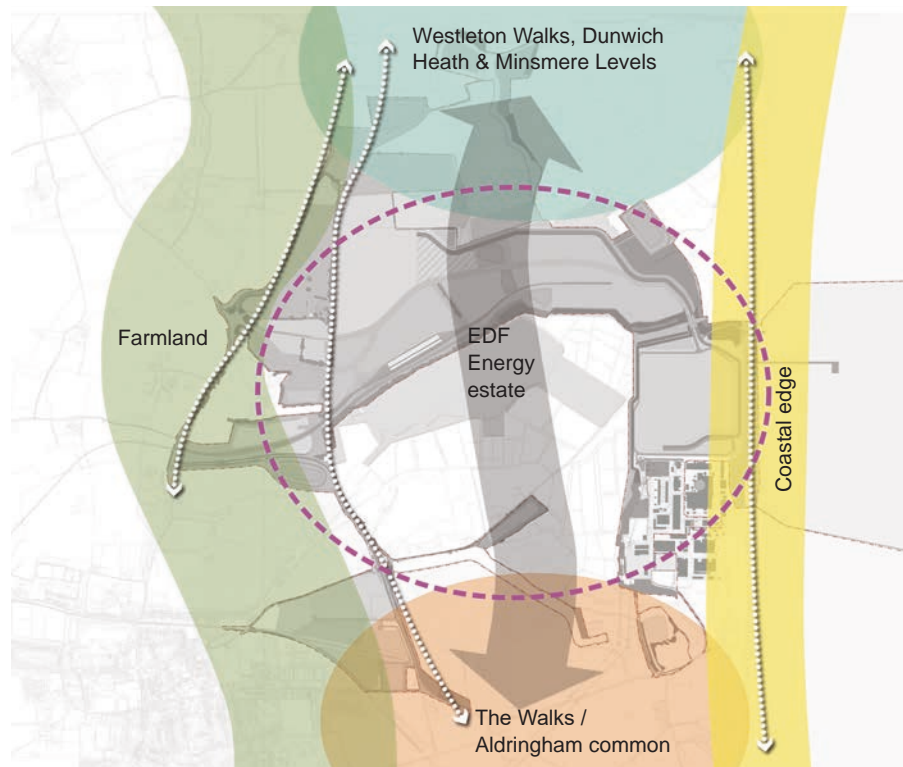


Figure 6.2: Ecology overview



Figure 6.3: Access overview

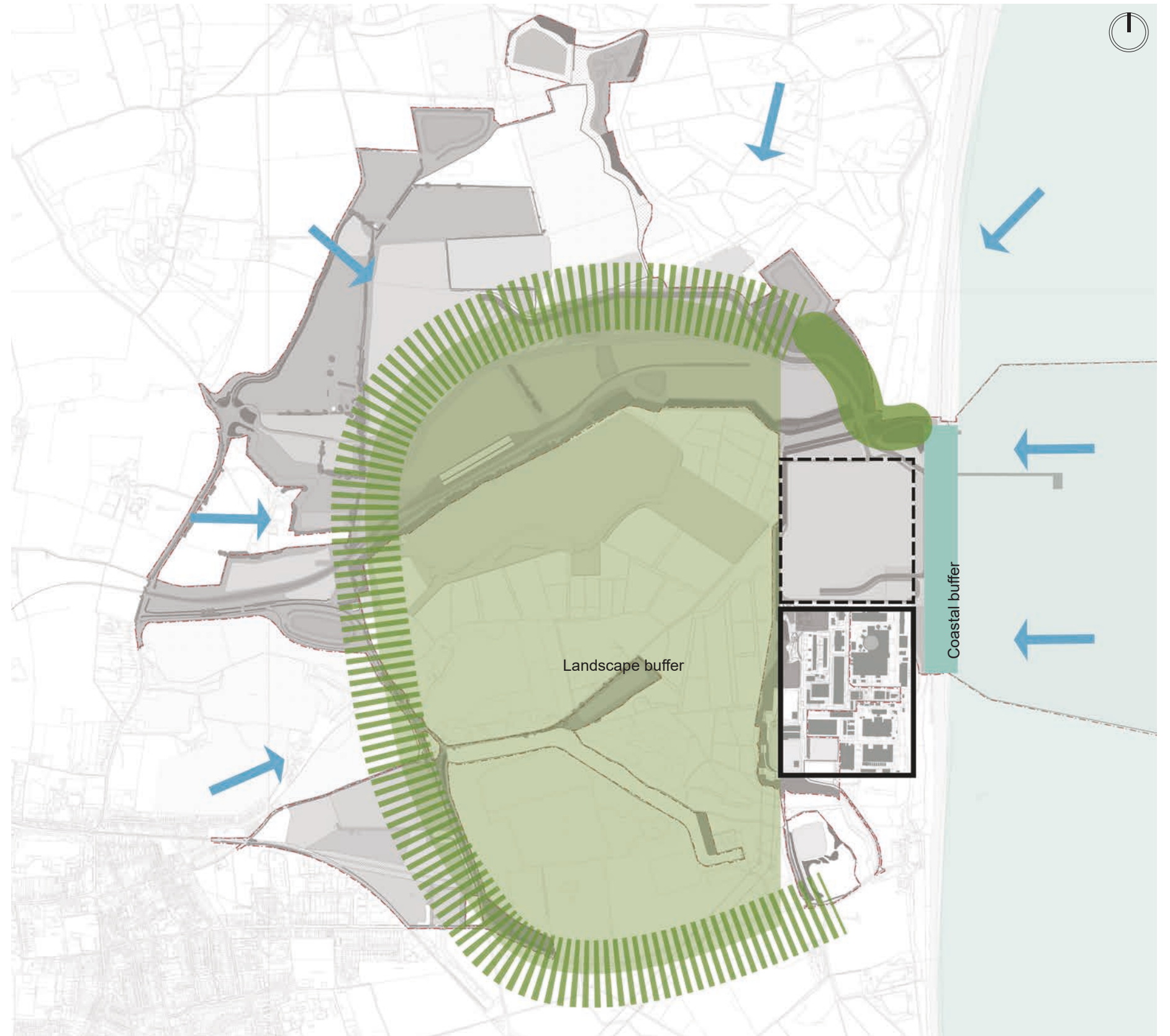


Figure 6.4: Landscape and visual overview



- 6.2.11 Elsewhere within the main development site, mainly on the western fringe, the proposals are to restore areas used in construction to their current state. For example, in the vicinity of Upper Abbey Farm and Lower Abbey Farm, land used during construction would be restored to agricultural use, in part to maintain the farmland setting to historic farms buildings.
- 6.2.12 The Northern Mound and sea defences currently provide screening to views of low-level activity in and around the existing power stations. The Northern Mound and part of the existing Bent Hills coastal feature would be removed during an early phase construction and reinstated at the earliest opportunity to ensure that views along the coast and offshore towards the lower levels structures and infrastructure are reduced. The proposed finished levels of the new sea defences have been and will continue to be carefully planned to maximise screening and would be planted with appropriate species to integrate the new defensive structure into its sensitive coastal landscape and enhance screening over time.
- 6.2.13 In some locations advanced planting has been undertaken or is planned to strengthen existing boundary features. This is illustrated in **Chapter 8** and forms part of the ongoing management of the wider Sizewell Estate. In 2015 this included supplementary hedgerow planting at Eastbridge Walks and Black Walks; woodland planting in within Red Rails and White Gates Fields (in the vicinity of the proposed site entrance); and woodland edge planting to the northern edge of Goose Hill. Further supplementary planting is proposed along Eastbridge Road, the B1122 and Lover's Lane to reinforce existing hedgerow boundaries.

#### OVERARCHING DESIGN PRINCIPLE 4.

Plan the Development and Design of Structures to Respect the Rural and in part Wilderness Character of the Landscape

- 6.2.14 The proposed Sizewell C development is located in a predominantly rural and coastal landscape close to several settlements, visitor destinations and popular walking and cycling routes. It also lies within the setting of several designated heritage assets which are destinations in their own right or lie on the rights of way network including Leiston Abbey (first site) to the north and Leiston Abbey (second site) to the west. The potential for adverse visual impacts has been recognised from the outset of project development and measures have been taken to mitigate effects through detailed site analysis and modelling informing project design.

- 6.2.15 Views towards the existing power stations from inland locations and along the coast, particularly to the north, demonstrate that belts of woodland and areas of forestry contribute to the screening of lower level buildings, infrastructure and activity. As a result Sizewell A and Sizewell B are viewed as benign building forms above a consistent vegetated datum with no significant visible low level 'clutter'. The sea defences and Northern Mound perform a similar function in views towards Sizewell A and Sizewell B from locations along the coast. The existing power stations are aligned parallel to the coast on a common axis, meaning that in views from the north and south, the principal structures are seen in sequence and partially or fully screen each other in some views.
- 6.2.16 The design response has been and will continue to be to locate the principal Sizewell C structures on close east alignment with Sizewell B dome, and to replicate the 'behaviour' of them in views as platonic geometric forms above a vegetated datum. The design rationale which is embedded in the illustrative Estate Operational Masterplan has been to retain, wherever practicable, existing established plantation woodlands and tree belts where they contribute to the layers of vegetation that screen views to the Sizewell power station complex and design the new defences to enable good screening. By way of example the full extent of the plantation at Kenton Hills and the northern edge of Goose Hill and Dunwich Forest have been retained to screen views towards Sizewell C from the north, including in the vicinity of the Leiston Abbey (first site) and elevated locations at Whin Hill in the RSPB Minsmere Reserve and at Dunwich Coastguard Cottages. The illustrative Estate Operational Masterplan (See **Figure 8.5** of this statement) also delivers significant areas of new mixed woodland planting to compensate for any woodland felled to accommodate construction activity and also add to the longer-term screening function of retained woodland and tree belts as well as providing enhanced ecological connectivity for bats and other species. Recognising the importance of woodlands to the character of the local landscape, screening views to the Sizewell power station complex and its habitat, the long-term health and resilience of woodlands within the SZC Co.'s estate would be delivered through the implementation of the **LEMP**.
- 6.2.17 The sea defences would be reconstructed to maintain the function they have in screening views from the beach to the lower level elements of the existing and proposed power stations and integrate the new defences into the coastal sensitive environment and make provision for access to and along the coastline as part of the 'natural' coastline.

- 6.2.18 Comments have also been raised about the visual effects of the proposed access road. Following the construction phase, this would be reduced in width and the surrounding landscape reprofiled to create naturalistic landforms covered with Sandlings grassland and pockets of mixed scrub, heath and stands of trees.

#### OVERARCHING DESIGN PRINCIPLE 5.

Select finishes (materials, colour and texture) to be sympathetic to local landscape and seascape and built context, where reasonably practicable.

- 6.2.19 Details of the approach to the architectural design of several key structures are presented elsewhere in the Design and Access Statement and summarised below: Refer to **Chapter 7** for details. The material groups of buildings are as follows:
- the nuclear island and cooling water pumphouse and associated buildings - concrete structures;
  - the conventional island primary structures (turbine halls & operational service centre) - anodised aluminium cladding panels and glass reinforced concrete plinth or similar; and
  - ancillary and plant buildings: majority of which are profiled sheet metal cladding or similar, subject to operational requirements.
- 6.2.20 The site requires a sensitive approach to its setting and the selection of appropriate finishes has been and will continue to be a key consideration throughout design development. The refinement of an appropriate colour palette for the proposed structures has evolved from the defined existing palettes of the local character areas to a proposed developed palette of appropriate tones. It has been noted that a single colour would not be a suitable solution to complement the characteristics of the local environment, particularly those from long-distance views. This has presented an opportunity to create a dynamic surface treatment to the turbine halls cladding design which would provide a responsive surface treatment which changes in colour and tone, subject to surrounding lighting and climatic conditions.
- 6.2.21 The materiality proposed for the Sizewell C turbine halls and operational service centre aims to respond to the natural surrounding environment in terms of colour and texture. The earthy bronze and sand tones responds to the colour palette found on the sand dunes and shingle ridges of Sizewell Beach. Similarly, in terms of texture the natural palette found in the area has a granularity and detail



which becomes more apparent from close range views for example sand grains, pebbles and grasses. This technique is employed on the design of the surface treatment to the turbine halls, which has a depth and texture revealed upon closer range views. Additionally, due attention has been and will continue to be given to delivering a high-quality external envelope for site structures within the coastal environment. For further detail in relation to the colour study undertaken to assess the colour performance of the façade treatment and its suitability to the Sizewell environment please refer to **section 6.16** and **6.17** of this statement.

**OVERARCHING DESIGN PRINCIPLE 6.**

**Design associated infrastructure, including lighting, access and fencing, to minimise, where reasonably practicable, landscape, seascape and visual effects.**

6.2.22 The permanent development site includes a number of fences to secure the site. Fencing is required around the main power station structures. The perimeter and High Security Area (HSA) fences are provided to surround the site and the Nuclear Island. Fencing is also provided for the vehicle inspection area at the entrance provided within the fencing. Three main types of security fence are proposed for the site, progressively increasing in security level and height in relation to their location proximity to the Nuclear Island. The precise details relating to the types of perimeter and HSA fencing is subject to regulation by the ONR (the nuclear security regulator). This also applies to the location, siting and type of CCTV columns and mountings.

6.2.23 The visual effects of the proposed access road have been and will continue to be carefully considered. The proposed permanent alignment would be established at the construction phase and to support construction. The width of the road would however be reduced for the operational phase and the surrounding area of land reprofiled to establish landform and planting to replicate the Sandlings character.

6.2.24 The only additional permanent structures on the beachfront would be the BLF and its associated access, together with the coastal defences. The BLF is designed to allow the deck sections to be dismantled and stored when not in operational use, with pier supports remaining in-situ as permanent features.

6.2.25 The proposed SSSI crossing would be established to support the construction phase and the road reduced in width post-construction and the margins planted with trees and shrubs to integrate the crossing into the local landscape and screen / filter views to moving vehicles.



**Local Environment**

- 1 Sizewell beach
- 2 Coastal strip
- 3 Westleton Heath
- 4 Wetlands fringing Goose Hill
- 5 Farmland looking towards Kenton Hills



6.2.26 In the Option 2 scenario for the Sizewell B relocated facilities, the Outage Car Park at Pillbox Field has been located and will be designed to minimise as far as practicable its visibility and vehicles using it, deploying sensitive reprofiling of landform working with existing topography.

6.2.27 During the construction phase an accommodation campus would be established for workers. The campus has been subject to massing studies and the preferred option limited in height to three and four storey blocks, and the individual accommodation blocks orientated east west to minimise visual effects (including at night). Structures that are lower in height are located to the north (car deck) and south (amenity hub and ancillary / servicing buildings) to reduce visual effects from in the vicinity of Leiston Abbey and from elevated locations to the north.

**OVERARCHING DESIGN PRINCIPLE 7.**  
Minimise, where reasonably practicable, visual effects at night from lighting and light spill without compromising either safety or security.

6.2.28 The **Lighting Management Plan** in **Volume 2, Chapter 2, Appendix 2B**, of the **ES** (Doc. Ref. 6.3), which covers both the construction and operational phases of Sizewell C, includes objectives to target lighting where it is required; avoid all unnecessary illumination (such as illumination of construction company logos) and minimise upward lighting and light spill to neighbouring areas. Where possible fixed lighting has been minimised within areas of the main development site which are adjacent to sensitive visual receptors including Leiston Old Abbey Nursing Home, residential properties along Lover's Lanes, Sandy Lane and Abbey Road (B1122) and east of Leiston Abbey. Similarly, fixed lighting has been minimised in the area of the sea defences, Northern Mound and beach.

6.2.29 Further details are provided in **Chapter 7** of this statement.

### 6.3 Biodiversity

6.3.1 This section details how the biodiversity design principles have been and will continue to be addressed. **Figure 6.5** provides an overview of biodiversity features.

**OVERARCHING DESIGN PRINCIPLE 8.**  
Minimise the likely significant adverse biodiversity effects and seek opportunities post construction through retention of existing habitats, where reasonably practicable, and creation of new habitats

6.3.2 Sizewell C represents an opportunity to implement a strategy for habitat creation and enhancement at the landscape scale that would leave a positive ecological legacy. Key elements of this are discussed below.

6.3.3 In the 19th century areas along the Suffolk coast would have been characterised by heathland and dry, often acidic, grassland that developed on glacial sandy soils, known locally as Suffolk Sandlings. During the 20th century these areas of low economic value were planted with commercial forest and others were converted to arable agriculture. Areas of surviving heath along this stretch of the Suffolk coast are notable habitat features and support both acid grassland and heather-dominated plant communities with dependent invertebrate and bird communities of high conservation value. However, the lack of traditional management has resulted in successional change and the spread of bracken, shrubs and trees in some areas. The Suffolk Biodiversity Action Plan indicates an 87% decline in heathland within the Suffolk Sandlings since the 1700s with many areas now fragmented and disconnected.

6.3.4 As outlined in the illustrative Landscape Masterplan and the **oLEMP** (Doc Ref. 8.2), following the removal of the temporary construction area, a large tract of new dry Sandlings grassland would be created with discrete areas of tree and scrub planting such as gorse and broom across areas which are currently predominantly agricultural land. Naturalistic landforms would be formed from materials excavated during construction and variations in the material utilised, slope, aspect and nature of adjacent land uses would create a diversity of conditions that would provide subtle variation in grassland habitats allowing a diverse flora to establish reflecting the floristic diversity of existing Suffolk Sandlings dry grasslands.

6.3.5 The varied micro habitats would also benefit fauna such as invertebrates and reptiles. The exact nature of these micro habitats would be dependent on the qualities of the excavated material and further work would be undertaken to ensure correct handling and storage of soils and its associated seedbank and other material in advance of the post construction landscaping. The sand and shingle supporting coastal vegetation would be safeguarded during the construction phase and would be reinstated across the proposed sea defences to allow the seed bank to germinate. Species characteristic of coastal dune habitats would also establish within the sand and shingle substrate through natural seed dispersal from coastal vegetation to the north and south.

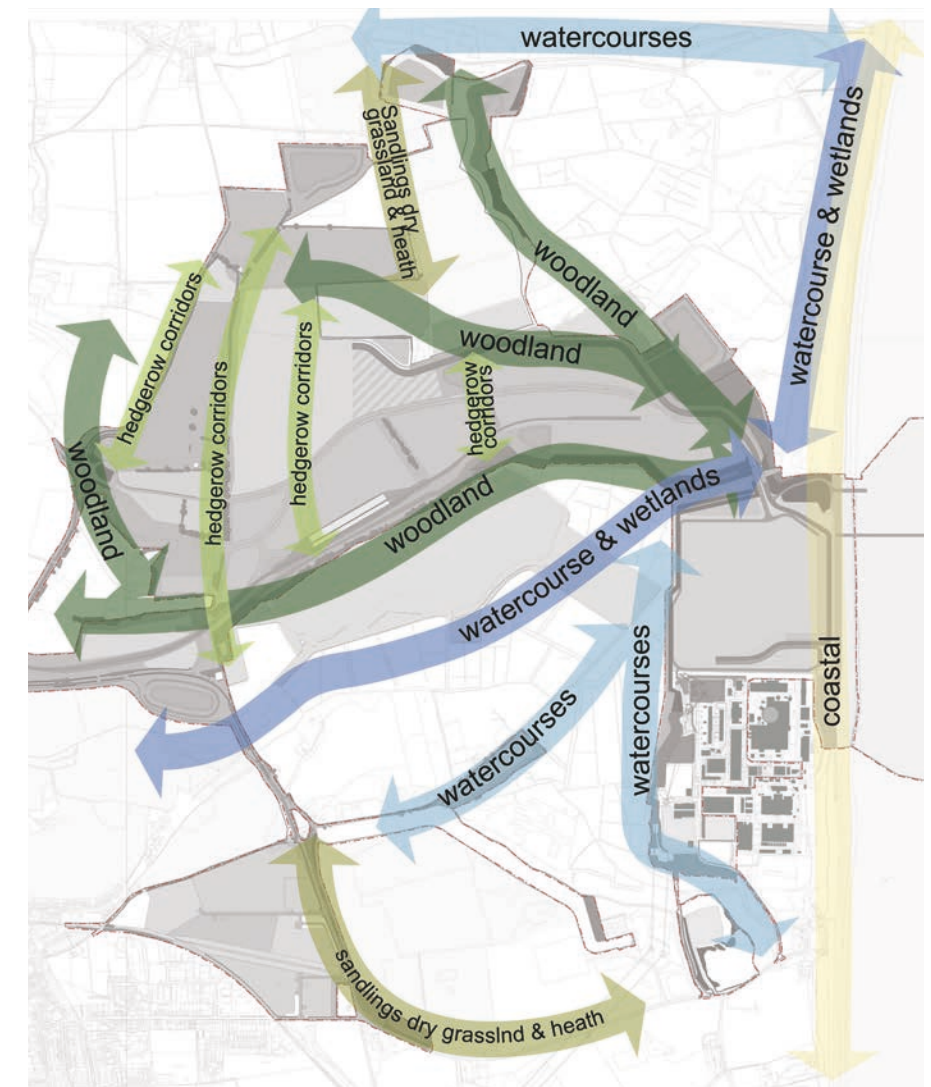
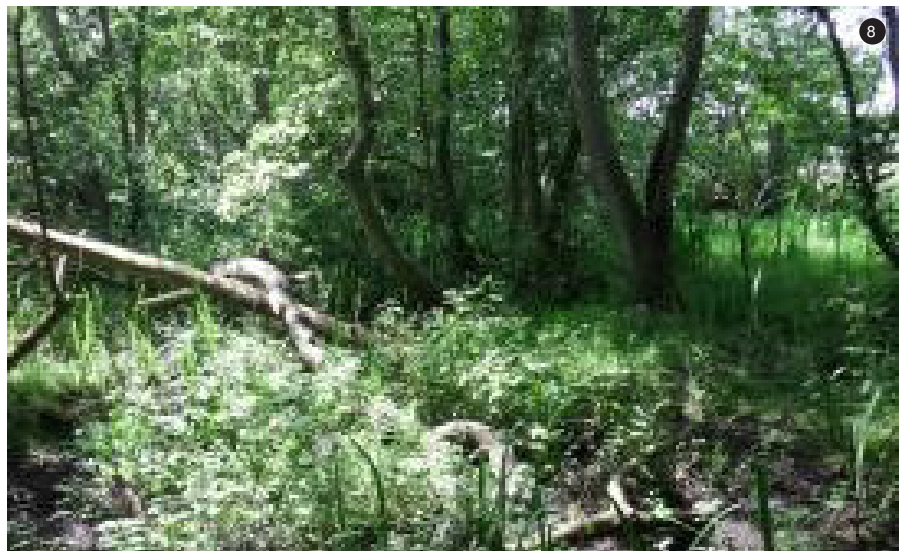


Figure 6.5: Biodiversity overview





**Local Environment**

- 1 2 Power Stations above the datum Sizewell B
- 3 Juvenile adder
- 4 Broom Cover
- 5 Sutton Common
- 6 Ditch habitat (photo by Arcadis)
- 7 Reedbed (photo by Arcadis)
- 8 Wet woodland (photo by Arcadis)



6.3.6 Establishment of dry grassland, scrub and reedbeds. The illustrative Estate Operational Masterplan has been the focus of coordinated activity to conserve, enhance and restore various habitats over recent years. A number of advance mitigation measures have already been implemented at Aldhurst Farm where arable farmland has been restored to dry grassland and scrub and new reedbeds. Within the southern part of the SZC Co.'s estate, land has been taken out of agricultural production and restored to dry grassland with areas of scrub planting and south facing basking banks and hibernacula installed creating a dedicated area of habitat suitable for reptiles. Bat boxes have also been erected in woodland at the extremities of the SZC Co.'s estate. Monitoring of previous ecological works provides valuable insights into the approaches and species that are likely to be more successful in delivering the illustrative Estate Operational Masterplan.

**OVERARCHING DESIGN PRINCIPLE 9.**

Seek to retain areas of habitat connectivity and continuity as far as possible within the EDF Energy estate

6.3.7 Where possible, habitats of importance have been retained within the construction area, including the majority of broadleaved woodland and associated bat roosts and the great majority of the wetland habitats within Sizewell Marshes SSSI. Whilst there would be short-term severance of habitat connectivity during construction the advance habitat creation already carried out and the long-term restoration of the SZC Co.'s estate would ensure connectivity is maintained and enhanced in the longer term.

**OVERARCHING DESIGN PRINCIPLE 10.**

Design the development, including lighting, access and fencing, to minimise disturbance to protected species, including at night, and severance of habitats, where reasonably practicable.

6.3.8 The proposed development has been and will continue to be designed to minimise noise and lighting disturbance on adjacent habitats and the development of the Lighting Management Plan. Boundary treatments (such as acoustic fencing) will take account of ecological features such as roosting and foraging bats as well as foraging marsh harriers to the north and been designed to minimise disturbance as far as possible. Noise disturbance has been identified as having a potential impact on marsh harriers by displacing them from foraging habitat on the SSSI wetlands so additional foraging habitat has been identified to ensure that marsh harriers have additional foraging areas available to them.

**OVERARCHING DESIGN PRINCIPLE 11.**

Minimise land take from the SSSI.

6.3.9 Whilst there would be short-term severance of habitat connectivity the advance habitat creation already carried out and the long-term restoration of the SZC Co.'s estate would ensure connectivity is maintained and enhanced in the longer term.

6.3.10 The design of the development and the construction methodology has sought to minimise land take from within the Sizewell Marshes SSSI. Some habitat loss is unfortunately required to accommodate the proposed development and habitat creation has already occurred at Aldhurst farm creating reedbed and ditch habitat equal or greater to that being lost adjacent to the SSSI ensuring the areas of these habitats are maintained. About 0.7ha of fen meadow habitats would also be lost from the SSSI, but a strategy for developing new fen meadow habitats off-site is being progressed, which whilst not immediately adjacent to the SSSI would increase the extent of fen meadow locally. The exact methodology is being developed but would likely involve some works such as excavation of ditches and installing water control structures. These could include tilting weirs to ensure derelict fen meadow sites retain sufficient water to replicate a fen meadow hydrological regime together with seeding with green hay or similar from an existing flower-rich site. Ongoing management would entail an appropriate grazing or cutting regime. In this way land take is minimised and where unavoidable, additional compensatory habitat is created.

## 6.4 Historic Environment

6.4.1 This section details how the historic environment design principles have been and will continue to be addressed. **Figure 6.6** sets out the key historic features in proximity to the proposed development.

**OVERARCHING DESIGN PRINCIPLE 12.**

The design of the development will consider potential effects on designated and non-designated heritage assets, including buried archaeology and historic landscape character.

6.4.2 Archaeological surveys have established that no designated heritage assets or non-designated heritage assets of equivalent significance to designated heritage assets, would be physically affected by the proposed development. There are two Grade II listed buildings, the barn and farmhouse at Upper Abbey Farm, within the Landscape Masterplan area and these would be retained.

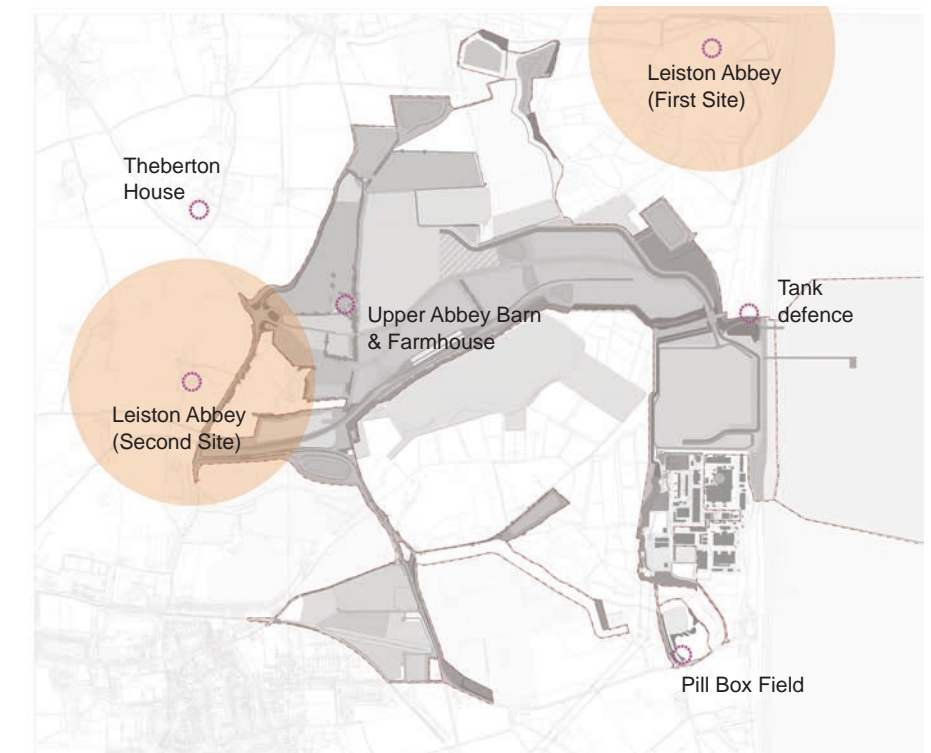


Figure 6.6: Historic environment overview (SZB relocated facilities Option 2 layout)





Local Environment

- 1 Leiston Abbey site 1
- 2 3 Leiston Abbey site 2
- 4 Upper Abbey Farm
- 5 Sailing
- 6 Cycling
- 7 Dog walking (credit Oliver Dixon)
- 8 Local destinations / wayfinding



- 6.4.3 The setting of the assets at Upper Abbey Farm would be respected by the retention of the associated historic non-designated farm buildings and the existing mature tree and hedgerow planting, which provide visual screening and protects the integrity of the farmyard group. Restoration of the agricultural and grazing land around Upper Abbey Farm on completion of construction would respond to the current and historic rural setting of these heritage assets.
- 6.4.4 The Suffolk Sandlings landscape was widespread along the Suffolk coast but has become greatly diminished as a result of commercial forestry and agricultural improvement. The illustrative Estate Operational Masterplan proposes the creation of a Sandlings landscape, which would echo historic landscape patterns within the area - a landscape which once provided the backdrop and grazing land for the villages of Sizewell and Theberton.
- 6.4.5 Within the development site boundary the masterplan seeks to mitigate the effects of the proposed development on a number of designated heritage assets which lie within the vicinity of the main development site. Measures set out to fulfil Generic Design Principle 9 provide a clear framework for the minimisation of change in the setting of heritage assets in the area around the proposed development. In particular, the two former sites of Leiston Abbey, which are protected as scheduled monuments and along with the other listed buildings close to the site.
- 6.4.6 Leiston Abbey (first site) lies within the Minsmere marshes, a rural context that gives a sense of seclusion corresponding with modern perceptions of the medieval Abbey and allows an appreciation of the historic events which led to its relocation in the 14th century. The WWII pillbox which is set within the abbey ruins, provides a sense of the strategic importance and vulnerability of this stretch of the Suffolk coast and visibility of the existing Sizewell B power station provides a juxtaposition that is a vivid reminder of the changing form and use of the Suffolk coast. During the operational phase, mature screening, of tree planting, would exploit the existing woodland at Goose Hill and Sizewell Belts to retain and complement the dramatic architectural composition of the existing power station with the new Sizewell C structures.

- 6.4.7 Leiston Abbey (second site) comprises a scheduled monument, the Grade I listed elements of the former Abbey and three Grade II listed buildings. The setting of the abbey ruins places them in a rural, agricultural context, providing a sense of retreat in which the historic function of the buildings, and their architecture can be appreciated. During construction, measures to retain and enhance existing landscape features and screening and to minimise light spill would reduce the magnitude of any intrusion into the setting, and would form the basis for a restored landscape that would retain the contribution of setting to the assets' significance and preclude views to the proposed development from most parts of the asset group
- 6.4.8 Similarly, the measures to retain and enhance existing landscape features and screening would result in the reduction of adverse effects on Grade II listed buildings at the cottage 450 metres south-west of Upper Abbey Farmhouse and Potter's Farmhouse during construction and allow for the restoration of their rural settings during operation.

## 6.5 Amenity and Recreation

- 6.5.1 This section details how the amenity and recreation design principles have been and will continue to be addressed. **Figure 6.7** provides an overview of amenity and recreation proposals.
- 6.5.2 Further to the design principles, recreational access and amenity proposals are likely to include enhancement of existing recreational rights of way, reinstatement of coastal grassland areas and alternative recreational opportunities.
- OVERARCHING DESIGN PRINCIPLE 13.**

**Create and maintain safe public access (pedestrian, equestrian, cycle) through the EDF Energy estate, integrated with existing networks, where reasonably practicable.**
- 6.5.3 SZC Co. would minimise any physical disruption or any other reduction in amenity on existing public rights of way, permissive footpaths, access land, promoted cycle routes and all other pre-existing linear and area access, on the coast and inland.

- 6.5.4 The need for temporary path closures and diversions would be for as short a duration as necessary and via the most direct and safe route. Where these are unavoidable, SZC Co. would provide and maintain alternative routes to reduce any disruption or loss of amenity to a minimum for pedestrians, equestrians and cyclists. Any reductions in connectivity in and around the main development site would be minimised as far as possible during construction to ensure integration with existing networks. By example, the design of the phasing of the construction of the new coastal defences associated with Sizewell C have been and will continue to be developed to minimise disruption and the need for diversions. SZC Co. would actively explore opportunities to enhance the accessibility, amenity and longevity of existing linear and area public access to land on and adjacent to the SZC Co.'s estate, particularly where this enhances north-south connectivity and reduces the need for pedestrians, equestrians and cyclists to use vehicular highways.
- 6.5.5 To create and maintain safe public access, road crossing points would be minimised and where unavoidable, relevant road safety audits would be carried out to ensure the safety of pedestrians, equestrians and cyclists. SZC Co. would justify, agree and manage temporary closures and publicise works to members of the public in advance, as required and in consultation with relevant authorities.
- 6.5.6 All closures, diversions, new and enhancement works would fulfil the legal requirements of British Standards specifications and the Equality Act 2010 in terms of access infrastructure and management, by minimising the presence of any needless barriers to participation (i.e. stiles) and making reasonable adjustments to facilitate participation by all. Best practice in terms of on-site signage and other information provision, to enhance visitor enjoyment and safety, and reduce any needless potential for conflict would be applied and maintained throughout both construction and operation phases.
- 6.5.7 During the operation of Sizewell C, it would be the intention to restore, to at least their original standard and alignment, any public rights of way, permissive footpaths, access land, promoted cycle routes and all other pre-existing linear and area access, on the coast and inland affected by the development. Some new routes created during the construction phase would also be retained to provide permanently enhanced recreational opportunities.



- 6.5.8 The proposed rights of way diversions and new routes are illustrated in **Figure 8.17** and **8.18**.

**OVERARCHING DESIGN PRINCIPLE 14.**

Ensure that facilities for public use and enjoyment in different parts of the EDF Energy estate take into account the balance of other considerations including landscape character, the historic environment and ecology.

- 6.5.9 Disruption to the accessibility and amenity of the Suffolk Coast Path, Sandlings Walk, the future England Coast Path and the regional cycle network would be kept to a minimum and would only be where necessary for engineering operations. As would disruption to rights of way (public footpaths, bridleways, byways and restricted byways) and the extensive network of permissive paths within the vicinity of the site and within the SZC Co.'s estate.
- 6.5.10 Access to landscape associated assets (i.e. Kenton Hills) and historic attractions (i.e. Leiston Abbey) and to the southern side of the newly created Aldhurst Farm habitat creation area would be retained during construction.
- 6.5.11 The public use and enjoyment of the coast would be maintained where possible with the establishment of a banksman and diversions inland would only take place for short duration and where activities associated with the coastal defences and the BLF were taking place.
- 6.5.12 The proposed rights of way diversions and new routes are illustrated in **Figure 8.17** and **8.18**.
- 6.6 Securing a Long-term Legacy and Responding to Change**
- 6.6.1 The **LEMP** would be used to direct activities to maintain and enhance the quality of the entire Estate in which the main development site sits over the long-term. For the purposes of the DCO, the **oLEMP** (Doc Ref. 8.2) would form the framework for the development of a more detailed **LEMP**, which would then be periodically reviewed and updated, allowing for management and maintenance practices to evolve and respond to changing circumstances, such as the effects of a changing climate on habitats and species. The **LEMP** is secured by a requirement set out in **Schedule 2** of the **Draft DCO** (Doc Ref. 3.1).



Figure 6.7: Amenity and recreation overview (SZB relocated facilities Option 2 layout)



# Main platform

*“The UK EPRTM are designed to generate more electricity from less fuel with less downtime than previous generation stations. They combine familiar and proven technology based on recent reactor designs with performance and safety innovations to effectively meet current and future electricity needs.”*

UK EPR™ Generic Design Assessment

## 6.7 Built environment

6.7.1 Whilst the earlier part of this chapter addresses each of the environmental design principles sequentially, this part of the chapter aims to describe the narrative of the design process and the key decisions that have informed, and will continue to inform, the architectural response to the site. This is split into two sections: first, the main platform and its response to immediate site constraints as well as the site optimisation process; secondly, the built context design response, the seascape composition and its hierarchy of built forms together with the perception of scale and the materiality of the main development site as a whole. The chapter ends with a brief overview of the cladding colour assessment which has been undertaken and a brief description of the strategic approach taken to structures within the SZC Co. wider estate.

## 6.8 Platform constraints

6.8.1 The Sizewell C development is a potentially suitable location for new nuclear power generation as defined within NPS EN-6, and is immediately adjacent to the existing Sizewell B platform and forms part of Suffolk’s energy coast. However, as established in **Chapter 2** of this statement, and as acknowledged in the NPS, the operational platform lies within the Suffolk Coast and Heaths AONB and is tightly constrained on three sides by nationally designated landscapes.

6.8.2 The Sizewell marshes SSSI lies directly adjacent to the existing power station site to the west and north-west and provides lowland wet meadows which support scarce plants, invertebrates and breeding birds. The platform is to be aligned with the eastern boundary of the SSSI. Although land take from the SSSI would be required to deliver the proposed development it would be minimised as far as practicable in order to reduce impacts upon existing habitats.

6.8.3 This SSSI includes an existing drainage channel which flows to the sea. This channel would be re-routed to the north with the least possible displacement in order for its function to be retained and for the Sizewell C site to be accommodated. The diverted channel lies directly adjacent to the proposed platform and forms the development site’s northern-most edge. Land-take to the north would be minimised as far as possible and mitigated as required to ensure reduced disruption and severance to local habitats as well as flora and fauna.

6.8.4 The eastern platform boundary is set according to the location of coastal defences, which are required to run the length of the operational platform as an extension of the bent hills. The Sizewell C coastal defences extend further east than the equivalent Sizewell B defences; this is a consequence of keeping the western platform edge outside of the SSSI boundary to minimise impact on both habitats and the western drainage corridor. The defences are a critical requirement to secure the station’s ability to generate power in the future, in accordance with the GDA safety case and as established within the project’s design principles in **Chapter 5** of this statement. The coastal defences are defined by the extent of the beach at Sizewell and the provision of a right of way along the coastline at the top of the existing beach.

6.8.5 The southern boundary of the development site is defined by and runs parallel to Sizewell B power station’s operational platform. Sizewell B facilities have been reviewed to establish elements that can be relocated elsewhere within the site - refer to **Chapter 7:H** of this statement, for further detail. The Sizewell B structure to the northern edge of the existing station as indicated in **Figure 6.8**, would be required to remain in use long into the operational life of the Sizewell C station and would define the boundary to which the new platform can extend. It also establishes the closest proximity to which the new reactor domes and turbine halls can be located to the existing Sizewell B structures in terms of composition of built forms.



**Legend**



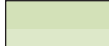
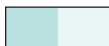
-  Extent of Sizewell marshes SSSI
-  Sizewell B operational boundary for fixed structures
-  Coastal defences along top of beach
-  Proposed / existing location of drainage channel to sea

Figure 6.8: Aerial view indicating site constraints for Sizewell C operational platform





## 6.9 Optimised platform footprint

- 6.9.1 The design principles discussed in **Chapter 5** of this statement established that the project safety case requires that the Sizewell C development avoids significant changes to the GDA approved design of UK EPR™ buildings, structures and main plant connections. SZC Co. has experience with the UK EPR™ new nuclear technology at Hinkley Point C and is applying the learning from Hinkley Point C in order to replicate nuclear sensitive structures and other successful design elements.
- 6.9.2 SZC Co. has, however, challenged the required land take at Sizewell as the full extent of the reference design platform footprint would adversely impact the AONB and the SSSI sites that bound the main platform at Sizewell. **Figure 6.9** and **6.10** show a footprint comparison of the land take for the baseline reference scheme at Hinkley Point C and the reduced platform footprint proposed at the Sizewell C site.
- 6.9.3 This footprint reduction has been achieved by minimising the number of built structures required for Sizewell C, consolidating operational buildings on-site and utilising existing facilities where possible within Sizewell B and Hinkley Point C for potential off-site activities such as pre-operational training. The proposals would optimise the land required for construction and operation of the power station and minimise disturbance to as small an area of the landscape as reasonably practicable.
- 6.9.4 The relocation, reorientation and optimisation of the layout of buildings within the operational platform has resulted in the reduction of overall land take of the station by approximately 30%, in comparison to the Hinkley Point C site. This is a significant reduction which is considered necessary by SZC Co. in order to ensure as much preservation of the special qualities of the Suffolk Coast and Heaths AONB and to minimise land take to the SSSI, as far as reasonably practicable.

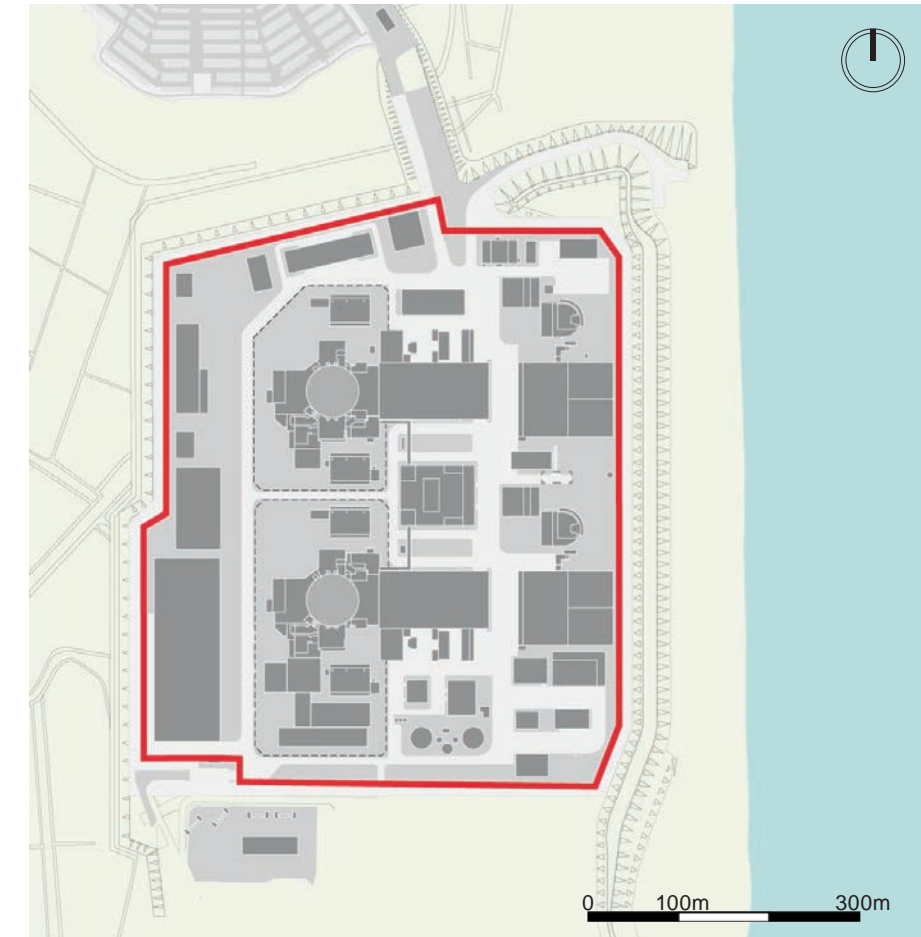


<sup>1</sup> Hinkley Point C site arrangement currently under construction due for completion in 2025. Footprint of operational site inside secure fence line and excluding National Grid substation is approximately 46 ha.

Figure 6.9: Extent of operational platform at Hinkley Point C, Somerset

**OVERARCHING DESIGN PRINCIPLE 17.**

Sizewell C will be an efficient and well-ordered facility. It will provide visible reassurance of a properly functioning and safe site, considerate of the area of environmental sensitivity.



<sup>2</sup> Sizewell C site arrangement to replicate key nuclear safety infrastructure to minimise risk whilst reducing footprint where practicable to reduce local impact. Footprint of operational site inside secure fence line and excluding National Grid substation is approximately 33 ha.

Figure 6.10: Extent of optimised operational platform at Sizewell C, Suffolk



**6.10 Optimised site location**

- 6.10.1 SZC Co. plans to relocate several existing facilities within the Sizewell B station site in order to release land required for the most optimum and minimised main platform configuration at Sizewell C.
- 6.10.2 The platform constraints plan, shown at **Figure 6.8** identified that the Sizewell B interim spent fuel store (and its associated security fences) provides a fixed northern boundary to the Sizewell B facilities. **Figure 6.11** highlights an area of buildings and car parking facilities to the north of Sizewell B which have been identified to be relocated elsewhere on the Sizewell B land. The area contains operational facilities and land formerly used as the Sizewell B power station construction area, which have now been given over to open grassland and linear tree and scrub belts.
- 6.10.3 The majority of the identified relocated facilities would be located within the Sizewell B power station nuclear licensed site, which forms part of this DCO application refer to **Chapter 7:H** of this statement.
- 6.10.4 Where possible, the process of relocating facilities seeks to:
  - rationalise existing operations by co-locating or combining compatible uses;
  - utilise existing space within the Sizewell B power station security perimeter;
  - locate facilities in close proximity to the Sizewell B security perimeter, and
  - identify suitable local land for facilities requiring less intensive interaction with the Sizewell B site.
- 6.10.5 For further information, refer to **Chapter 7:H** of this statement.



**Sizewell B facilities to relocate**

- 01 Outage store
- 02 Outage car park (north car park)
- 03 Civil workshop and store
- 04 Outage lay down
- 05 Outage portakabin city 2
- 06 Technical training centre
- 07 Projects office
- 08 Outage office
- 09 Base area facility
- 10 General store
- 11 Operations training centre
- 12 Visitor centre
- 13 Technical training and pool car park

**Legend**

- Existing Sizewell B buildings to be relocated
- Existing Sizewell B hard standing areas to be relocated

Figure 6.11: Opportunity to relocate existing Sizewell B facilities



# Built context design response

## OVERARCHING DESIGN PRINCIPLE 18.

Sizewell C structures will complement the existing structures within the landscape, most notably Sizewell A and B, as far as reasonably practicable.

### 6.11 Composition

- 6.11.1 The existing built forms of Sizewell A and Sizewell B create a distinct composition along the coast; within which Sizewell B is an identifiable structure, valued by both the public and the local authorities and other key stakeholders, as a successful realisation of industrial architecture.
- 6.11.2 Sizewell A and B are specialist structures which form a narrative of nuclear engineering development in the twentieth century. Sizewell C would in turn provide the third generation of nuclear power to be created at the Sizewell site, where the coastal views illustrate this technological evolution and advancement. The proposed development site has been and will continue to be designed to sit within the landscape as an integrated part of the coastline.
- 6.11.3 Sizewell C provides an opportunity to emphasise and enhance the visual success of this composition of geometric objects within the landscape by utilising its larger volumes to complement the existing coastal forms. The spacing between structures is primarily a product of the functional layout requirements, which also facilitates the definition of the three distinct sites. **Figure 6.12** and **6.13**, illustrates the 3 stations and their building heights and forms.

- 6.11.4 The operational masterplan is organised to locate primary structures within the centre of the site with their support facilities surrounding them at a lower level, more concealed within the limits of the sea defences and perimeter landscaping. The primary structures for Sizewell C are defined as the turbine halls which face the coast, the reactor buildings which sit directly behind them and the operational service centre which sits in-between them.
- 6.11.5 At an early stage of the design development of the masterplan it was established that the principal Sizewell C structures would be located in close east-west alignment with the Sizewell B dome and continue the existing axis of Sizewell structures to replicate the 'behaviour' of them in views as platonic geometric forms above a vegetated datum. This alignment establishes the architectural language of large platonic forms continuing the rhythm of the power station complex along the Sizewell energy coast.
- 6.11.6 The primary structures facing the coast form a classical composition of orthogonal blocks; whose architectural expression would be derived from its simplicity of form at a distance and the detail within its facades at closer range.

- 6.11.7 The arrangement of the turbine halls on the north-south axis of the site would be spaced symmetrically within the immediate foreground of the Nuclear Island buildings to provide clear separation of the volumes. This enables the viewer continued visibility of the white domed structure of Sizewell B clearly sitting on its blue plinth from the distant views along the coast.
- 6.11.8 The expressive articulation of these structures contrasts to the nuclear safety buildings and industrial buildings of Sizewell C, which serve to visually isolate this focal composition from its surroundings and ground it with a recessive matt concrete texture which meets the UK EPR™ generic design technical requirements identified earlier in this report.
- 6.11.9 The majority of the remaining buildings throughout the site are smaller in scale and are treated as understated simple forms to further illustrate the hierarchy of structures and reduce the visual clutter both within the site and from views within the surrounding landscape.
- 6.11.10 The material choices for the lowest level buildings across the Sizewell site would have a common architectural language, be functional and visually recessive in order to ground the development and provide an appropriate backdrop to the primary structures within the main development site.

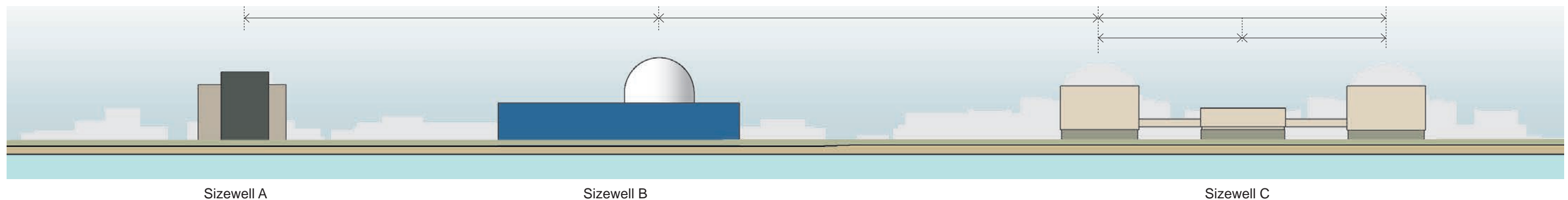


Figure 6.12: Composition of separated elements which form the Sizewell built context





Figure 6.13: Sizewell C axonometric view indicating building heights and forms



## 6.12 Hierarchy of built forms

- 6.12.1 The functional layout requires a variety of distinct buildings within the main development site. During the initial phases of the masterplan development, the hierarchy of these buildings were analysed to understand the relative scale of the buildings and their relationship within the Sizewell A and Sizewell B built context.
- 6.12.2 **Figures 6.15** illustrates the built forms which are visible at various heights AOD levels. The turbine halls and reactor domes are the largest of the buildings identified here and are addressed in the greatest detail over the subsequent pages of this Design and Access Statement. They are the most important structures and would have the greatest visual impact within the surrounding landscape.
- 6.12.3 These key buildings are comparable in scale to the main nuclear safety buildings of Sizewell A and Sizewell B. The buildings' relative heights form a consistency to the rhythm of built forms that comprise the Sizewell coastal composition described in **section 6.11** of this statement. The pattern of large forms with the tallest building heights can therefore be described as proportional within the immediate context; adding two new reactors to the already existing two reactors of Sizewell A and B on-site.

- 6.12.4 At approximately 30m in height the second most prominent form following the turbine halls and reactors is the operational service centre located centrally between the larger structures within the foreground of the site. The interim spent fuel store and the emergency diesel generator buildings also start to become visible at this level datum. These buildings are of a similar height to the blue Sizewell B turbine hall and reactor building, which lies beneath the iconic white dome structure.
- 6.12.5 Towards the perimeter of the site there are a number of smaller scale ancillary buildings and structures which have different functional requirements. These buildings are important for the daily operation of the power station, however in terms of the hierarchy of building forms on-site they are architecturally less significant. There are two measures that have been adopted: the first is to provide a unifying cladding system for architectural continuity between each of the three material groups; and the second is to provide a degree of low-level screening to minimise the perception of clutter from views within the surrounding landscape.

- 6.12.6 It is important to the perception of the site from distant views that the lower level supporting buildings do not interrupt views of the primary structures. This is achieved through largely screening the lower level structures by the coastal sea defences, landscaping and planting. The significant forms which comprise the power station are seen to rise out of the landform with the functional and operational base of the platform being largely unseen.
- 6.12.7 The design of the coastal sea defences would be given careful consideration to control the views to the operational site buildings with a view to minimising visibility of smaller buildings and structures. The sea defences are required to shield the coastal elevation from potential future tidal events and the unlikely event of a significant earthquake in the local area. They provide natural screening at approximately +12m AOD and would be planted along their length in accordance with existing vegetation to provide softer screening to approximately +13.5m AOD.
- 6.12.8 As identified in **Figure 6.14**, from eye level along the coast path directly to the east of the site; the effective visual screening height would vary between +10m and +12m AOD due to planting, depending upon proximity to the sea defences, this would largely mask lower level structures from view.

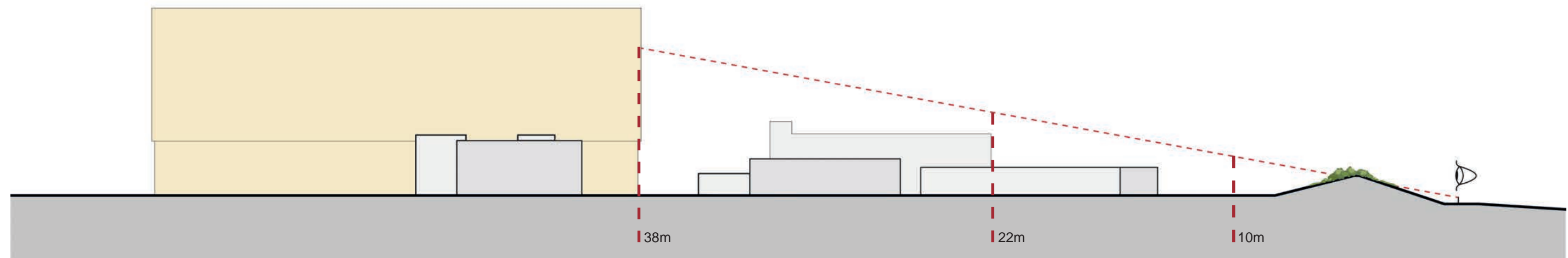


Figure 6.14: Section indicating impact of coastal screening upon visible portion of the Sizewell C development from coastal path immediately east of the site



**OVERARCHING DESIGN PRINCIPLE 19.**

Design will be a planned composition with Sizewell A and Sizewell B, balancing proportions and impacts across the sites, as far as reasonably practicable.

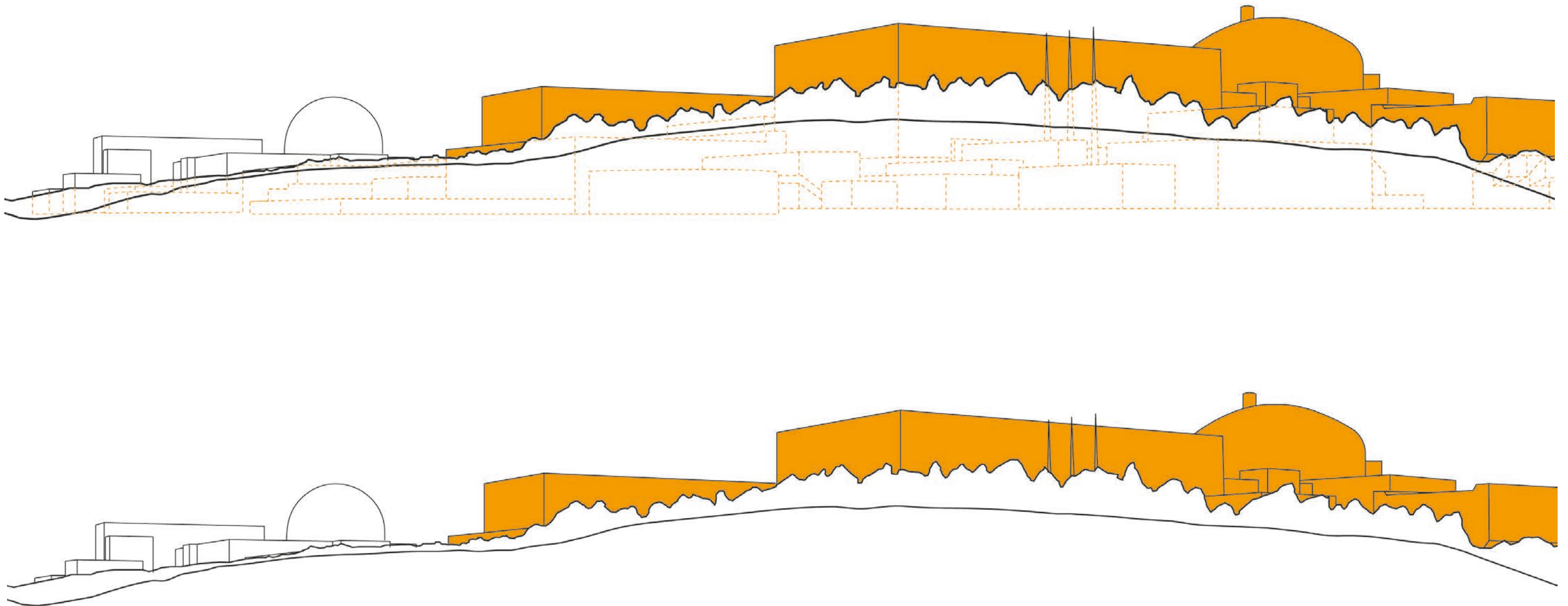


Figure 6.15: Low level visual clutter is masked from view by northern mound and coastal sea defences



**OVERARCHING DESIGN PRINCIPLE 20.**

The power station will be a masterplanned composition as far as reasonably practicable, and not an unplanned series of individual buildings and structures.

**6.13 Character**

6.13.1 The Sizewell C development is a large-scale proposal which is required to respond to the characteristics of different existing environmental conditions as identified in **Chapter 2** and in **Figure 6.16**. The character areas as defined in the Suffolk Coast and Heaths AONB 'Guidance on the selection and use of colour in development' comprise *sand dunes and shingle ridges* to the east, existing built structures to the south, *salt marshes and intertidal flats and coastal levels* to the west and *estate sandlands, wood and heath* to the north. These varying conditions are apparent as the background and immediate backdrop to various viewpoints towards and around the site.

6.13.2 The existing built forms of Sizewell B utilise a restrained palette of materials with bold use of distinctive colours for the blue plinth beneath the white vitreous enamel clad dome. The structures at Sizewell B employ a consistent approach to architectural detailing, with an emphasis on vertical profiles. The distinct design and emerging detail of Sizewell C's structures would form a third element as a continuation from Sizewell A and B. This provides the opportunity to emphasise and celebrate the contrasting technology and expression of significant structures within the context of the three sequential power stations.

6.13.3 The primary structures of Sizewell C would be exposed to long distance views along the coast and would be viewed in the context of the beach front, within the AONB character area of *sand dunes and shingle ridges*. The colour palettes identified in this region are predominantly pale and bright with warm hues, soft sand and green tones. It can also be noted that existing palettes in this character area have a granularity or small pattern to them such as pebbles, sands and grasses which add a further dimension of depth and texture.

6.13.4 The views toward the power station from inland; set within the context of the *saltmarsh and intertidal flats; coastal levels* character area would expose the elevation of storage and reactor buildings to the west of the operational platform. The colour palettes here introduce darker tones and views from this area have more visual complexity and detail in their layered build-up of lowland pastures and marshes. Proposed building profiles will form a simplified backdrop beyond this densely textured foreground landscape.

6.13.5 Views towards the power station from Goose Hill and beyond fall within the *estate sandlands, wood and heath* character area. Due to the wooded nature of this area views from the north-east beyond the SSSI crossing are generally well screened and integrated within their surrounding context. The Sizewell C outage car-park would be located alongside the main access road, although screened in views from the coast by retained and proposed vegetation. Proposals would be well integrated into the setting with a strong tree buffer to the south, tree planting adjacent to the access road and tree-planting within the car park. The parking spaces would

be sub-divided into smaller groupings with intermediate landscape routes providing further screening and clear pedestrian circulation.

6.13.6 **Figure 6.16** identifies the key building forms and illustrates the different contexts they are directly responding to or being integrated within. Subject to project requirements, visibility from public viewpoints and good masterplanning, where possible, the built forms of Sizewell C would generally be treated with an external colour palette which is responsive to and would aim to form an integrated part of the natural landscape they sit within.

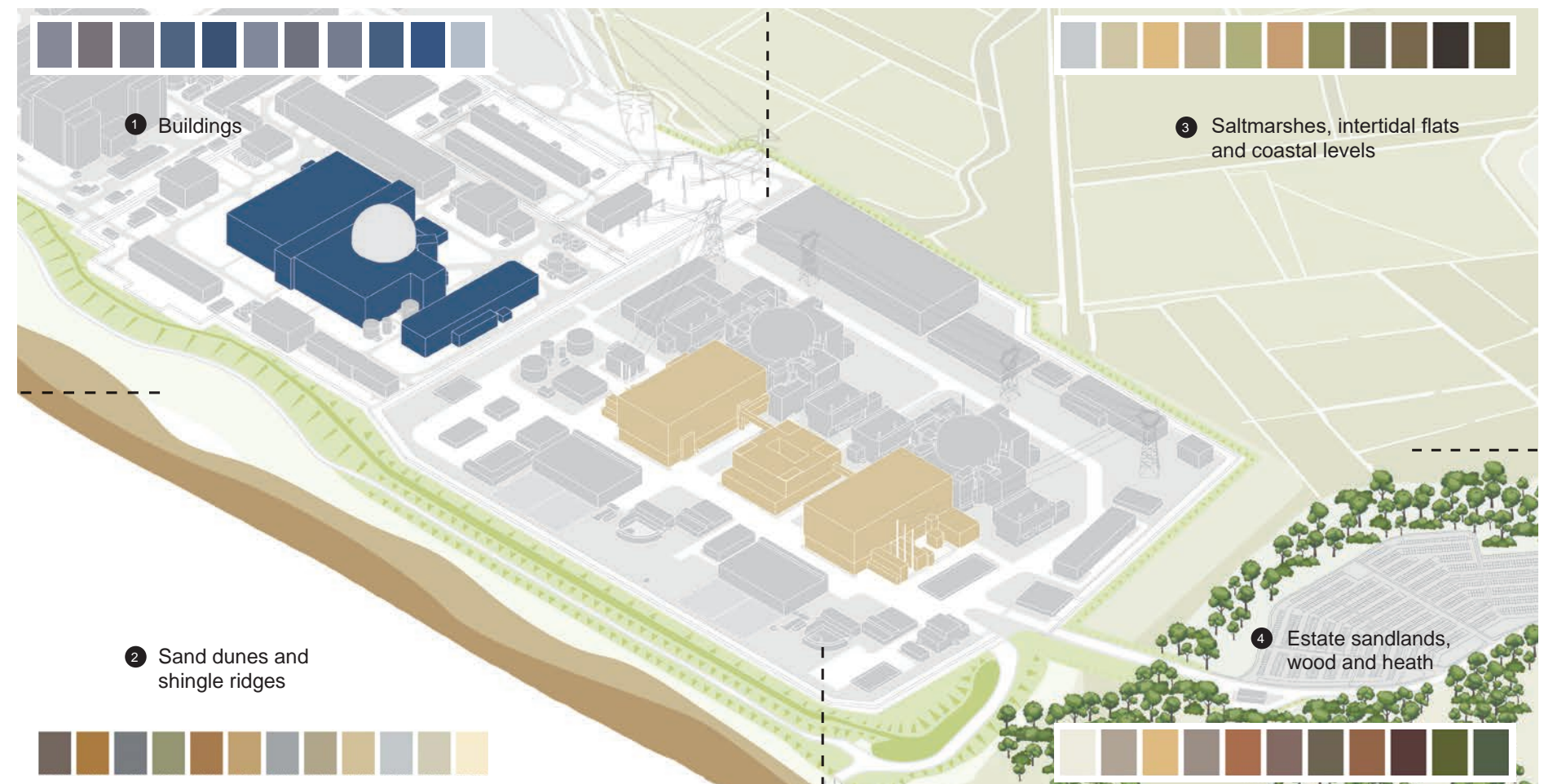


Figure 6.16: Character areas to which Sizewell C operational platform structures respond



**OVERARCHING DESIGN PRINCIPLE 21.**

Design will utilise techniques to reduce the perceived scale of buildings from a distance by manipulating the size and arrangement of visible components and façade details, subject to operational requirements.

**6.14 Perception of scale**

6.14.1 The existing Sizewell B structures employ a technique to manipulate the perceived scale of the buildings by echoing familiar geometries and adjusting the scale of architectural components, illustrated in **Figure 6.17**. The application of visible details adds interest to the power station's façades without providing recognisable, scalable features. The parapet for Sizewell B is topped with an oversized red rail which from afar is interpreted as a familiar human scale handrail, but it is only within close range that it is possible to discern the rail is much larger than a typical handrail. This natural interpretation diminishes the apparent scale of the building and the wider development when viewed from afar.

6.14.2 The design of Sizewell C would utilise techniques to reduce buildings perceived scale from a distance by manipulating the size and arrangement of visible components and façade details, subject to operational requirements. A modular cladding approach to the façades would allow cladding panel details to emerge on approach to the main development site. From a long distance (approx. 1.5km) the sculptural forms of reactor domes and turbine halls would be evident along the coast and then as the building is approached from mid-distance (approx. 400m) the cladding framework/ grid of the modular skin would become visible along with some surface variation of colour and tone. At close proximity it is possible to read the full articulation and variation of the façade system, further interest and detail is revealed upon closer-up views. Additionally, shadow gaps between panels are oversized so that the perception of the cladding panels size is reduced which helps to diminish the overall scale of the building within the landscape.

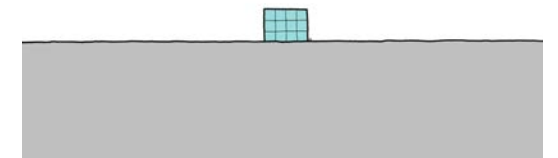
6.14.3 In addition to careful design and detailing of façade panel size and proportion, it is also important for the designs of the built forms of Sizewell C to respond to the 'wilderness quality' of the power station environment by removing the appearance of human habitation, through reduced human scale openings and external fixtures being visible from coastal views as far as reasonably practicable and within operational requirements of the power station. This is achieved by preventing external high-level access around the buildings, for example by designing out the need for any external terraces and maintenance platforms. Human scale openings and external fixtures located along the eastern façade of the turbine halls and the operational service centre are eliminated in order to reduce the apparent scale of the buildings from external views.



Long distance view



Geometric form



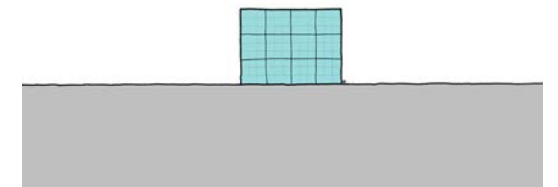
Profile form



Mid-range view



Distinct component detail



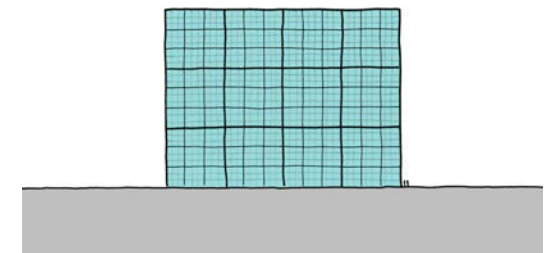
Cladding framework



Short distance views



Cladding detail



Panel texture

Figure 6.17: Existing perception of scale of Sizewell A and B at different view points along the east coast



## OVERARCHING DESIGN PRINCIPLE 22.

The crucial differences between the Sizewell C UK EPR™ and Sizewell B will be recognised, including the consequent impacts upon form, construction, materials and appearance.

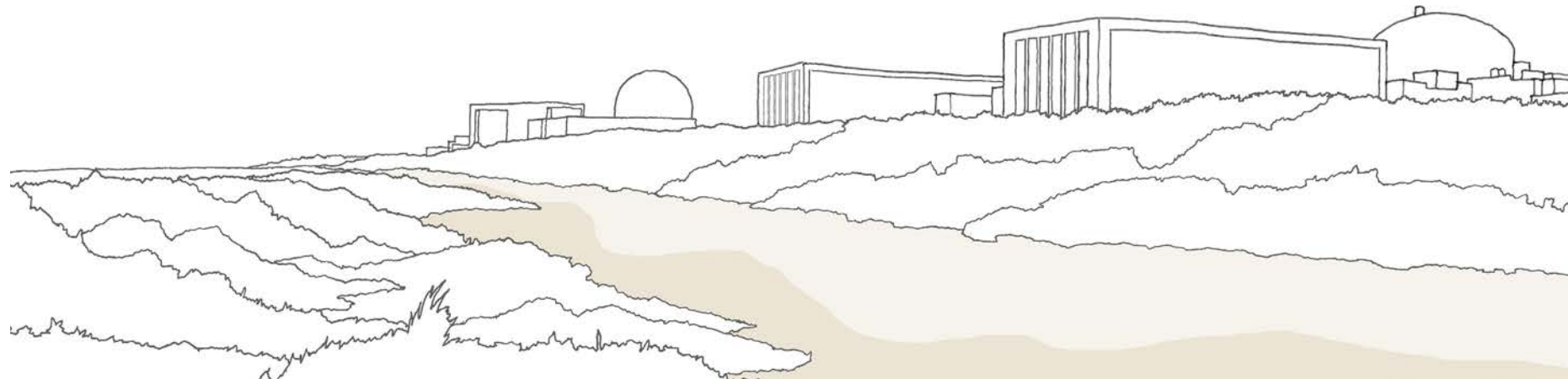


Figure 6.18: Coastal view south towards Sizewell showing the Hinkley turbine hall and operational service centre design

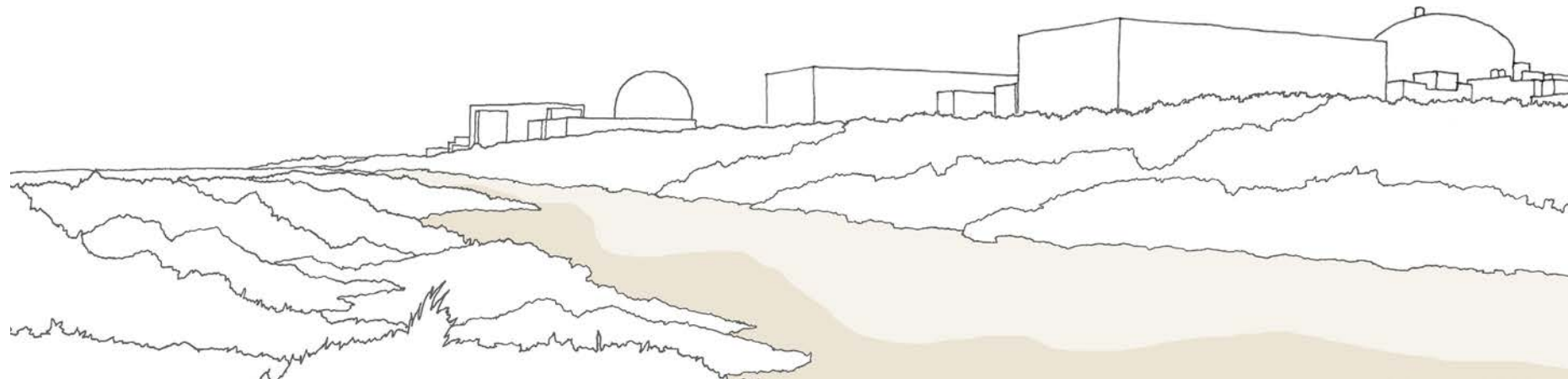


Figure 6.19: Coastal view towards Sizewell with a simplified form suitable for the local context

## 6.15 Simplification of form

- 6.15.1 Sizewell A and Sizewell B power stations make clear architectural gestures and as previously described, they form a sequence of platonic elements along the coastline with a simple articulated form.
- 6.15.2 A study to test the visual impact of locating the Hinkley Point C turbine halls within the Sizewell context as an example of the new nuclear plant requirements, demonstrated the visual dominance of the Hinkley Point C reference design buildings within exposed coastal views, refer to **Figure 6.18**. A series of design studies exploring different volumes and roof forms for the buildings were also conducted and it became clear that more sculpted forms appeared incongruous with the elegant geometric forms of Sizewell B.
- 6.15.3 By simplifying the form of the turbine halls for the Sizewell C development, the distinct features upon the Sizewell skyline can form a clear rhythm of legible geometric objects within the seascape setting. The minimal profile reduces overall visual clutter of the site, as illustrated in **Figure 6.19**, which identifies the primary structures of the turbine halls and operational service centre as pure volumes with no definable scale.
- 6.15.4 The turbine halls establish a clear relationship with the operational service centre, as one of the intermediary scale buildings within the platform. The three buildings are physically connected and visibly unified by elevated sky bridges, which are partially visible from direct views towards the power station from the beach. The formal relationship between the building forms would be reinforced by the careful selection of a material palette which provides a refined homogeneity to each building. The turbine halls, operational service centre and connecting skybridges would comprise a formal set-piece with a consistent material finish. The silhouette of these structures would be identifiable as a clean simple profile from coastal views.
- 6.15.5 This approach extends to the physical expression of buildings and forms throughout the site. The industrial structures of the reactor domes express pure simplified geometry with minimised additional extensions and fixtures as far as reasonably practicable, which would otherwise dilute the visual effect of the rational building forms. The treatment of ancillary buildings would seek to comprise pure simple, orthogonal forms and to minimise external projections and add-ons as far as is reasonably practicable.
- 6.15.6 Façade openings are consolidated where possible to simplify the building envelope and to help provide a recessive backdrop to the more prominent structures on-site as a whole. Subject to operational requirements, all roof level plant equipment and protrusions are to be concealed behind a raised building parapet as far as is reasonably practicable. Roof parapets are to be of a generally consistent design and detail across site structures except for particularly prominent parapets, which may require a bespoke design.



**6.16 Material strategy**

- 6.16.1 The buildings on site are required to achieve a minimum design life of 70 years to accommodate the construction period and the planned operational life of the power station. Building designs should minimise disruption resulting from façade replacement and building maintenance. The marine environment at Sizewell requires durable materials and high-quality methods of construction to withstand demanding climatic conditions and high levels of salinity. Therefore, all materials must be specified to provide a durable finish and be resistant to deterioration / degradation in the marine environment, due to the requirement for a long lifespan.
- 6.16.2 In terms of the overarching material strategy the development is grouped into three material groups as illustrated in **Figure 6.20**. These groups are formed of buildings with similar performance requirements as well as a similar contribution to the overall site concept. This not only supports ease of maintenance requirements, but also provides a sense of uniformity and coherence across the site.
- 6.16.3 The turbine halls and operational service centre buildings are treated as focal structures within the site, forming the compositional set-piece as described earlier in the chapter. A palette of carefully detailed anodised aluminium cladding panels would provide visible variation for upper levels whilst a robust glass fibre reinforced concrete (GRC) or similar approved base would ground the buildings within the lower level recessive support structures of the Sizewell C platform.
- 6.16.4 The ancillary and plant buildings with less onerous safety requirements are generally steel framed and clad with profiled sheet metal cladding. Ancillary buildings are to have a consistent façade treatment, comprising a visually recessive colour as far as is reasonably practicable. A darker appearance to these structures would help to ground the structures within the operational platform.

**DETAILED BUILT DEVELOPMENT PRINCIPLES WITHIN MAIN PLATFORM 61.**

There will be a unifying design approach to provide architectural continuity between each of the three material groups. The three main material groups will be:

- Nuclear island, cooling water pumphouse and associated buildings - concrete structures;
- Conventional island primary structures (turbine halls and operational service centre) - Anodised aluminium cladding panels and glass reinforced concrete plinth or similar; and
- ancillary and plant buildings – majority of which are profiled sheet metal cladding or similar, subject to operational requirements.

- 6.16.5 The design approach to the industrial buildings within the nuclear islands and cooling water pumphouse and associated buildings expresses the large bold forms based on their engineering requirements. Their external material is therefore pre-defined by the UK EPR™ generic design as robust reinforced concrete structures.
- 6.16.6 The purpose of the external concrete is to protect the plant. The ONR has confirmed it would be necessary to inspect the concrete on a regular basis to ensure its integrity is maintained. In these circumstances it is not practicable to erect cladding directly onto the concrete as this would prevent inspection. It should be noted that inspection of the outer surface of the Sizewell B secondary containment dome concrete is not required for the safety case, and hence the Sizewell B dome was able to be clad. Concrete specifications are complex requiring laboratory level testing to prove feasibility before full scale testing within the production batching plant. Even small mix variations can have a significant impact on the compliance of the concrete make up.
- 6.16.7 Exposed concrete is to have a consistent pale grey finish as far as reasonably practicable. Careful on-site attention should be given to the change in batch of aggregates and setting-out of day joints to ensure a consistent even finish can be achieved, subject to operational requirements. **Figure 6.21** indicates the approximate colour range of the concrete façades of the industrial buildings, whilst **Figure 6.22** indicates the anodised aluminium colour options proposed for the turbine halls and operational service centre buildings.

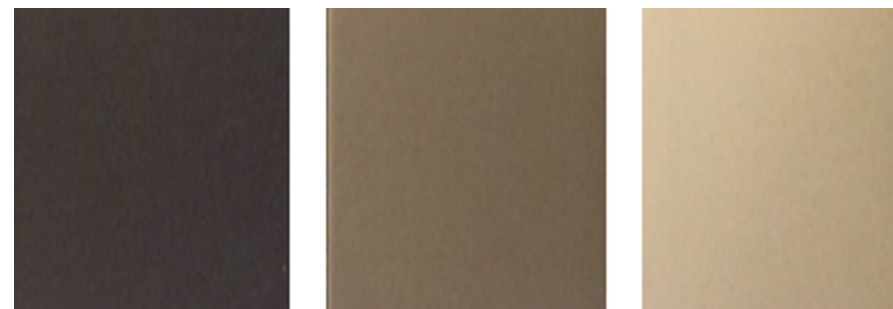


Figure 6.22: Anodised aluminium cladding panels - indicative finish

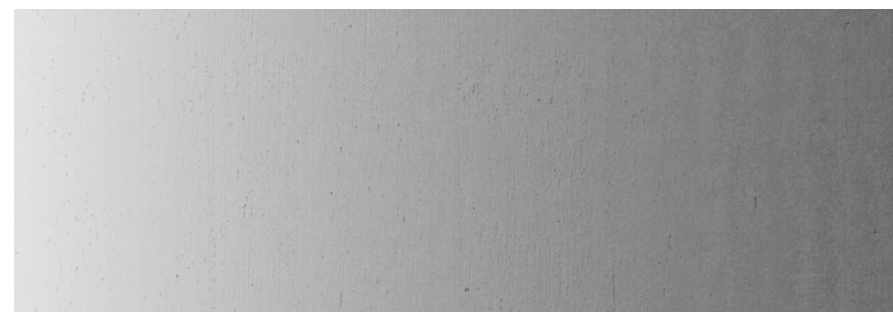


Figure 6.21: In-situ exposed concrete facades - indicative finish

**OVERARCHING DESIGN PRINCIPLE 23.**

Building finishes will be durable, low maintenance and suitable for a marine environment.



Figure 6.20: Sizewell C material strategy plan

**Legend**

- Anodised aluminium cladding panels
- Concrete
- Aluminium / profiled metal cladding



## 6.17 Cladding colour assessment

6.17.1 In 2015 the Sizewell C design team undertook a colour study to describe the character and behaviour of colours in views towards the proposed Sizewell C development and explore the range of possible colour finishes that could be suitable for the turbine hall cladding within the Sizewell context. The focus of the colour studies was predicated on the flexibility of the turbine hall building envelope treatment and their relative prominence which was identified as part of our project strategy. This colour study was aligned to the Environmental Colour Assessment (ECA), which is a process that aids in making landscape-led decisions, ensuring that an appropriate colour is chosen that acknowledges the important balance of visual integration and accentuation, in order to prevent visual conflict.

6.17.2 A palette of colour swatches was developed through an analysis of existing site photography, refer **Figure 6.23**. The colour palette informed a series of studies which explored the introduction of colour to the structures. Colour options were tested that both deliberately contrasted to, or harmonised with the surrounding environment, refer **Figures 6.24-26**. This study formed the basis of a turbine halls cladding assessment which was consulted on with the local authorities.

6.17.3 Feedback from the local authorities and the Suffolk Coast and Heaths AONB 'Guidance on the selection and use of colour in development', published in 2018 has informed ongoing design development and led to SZC Co. commissioning an independent cladding colour assessment. This study analysed the performance of cladding colour and finishes under different Sizewell specific light and day conditions, to review and narrow the shortlist of colour options for the prominent structures of the turbine halls and the operational service centre.

6.17.4 Key considerations in relation to the study include; the buildings would always be seen within the wider colour palette of the Sizewell context, and that the perception of their colour finish would be influenced by the lighting, climatic conditions and view position in relation to the coloured surface.

6.17.5 The assessment was undertaken over a two-day period, under varying weather and lighting conditions, from rain and cloud to bright low angle sun. The range of anodised aluminium cladding samples selected for the study was guided by previous studies, consultation feedback and guidance, whilst meeting durability requirements and established performance criteria for the buildings.

6.17.6 The study assessed alterations to the tonality and colour of cladding sample panels in varying conditions, with light striking the panel from high to low angle sunlight to ambient flat light. It also documented the effect of altering view position towards the surface of the panels, which would comparably scale up to larger façade areas viewed from a greater distance; and allowed a more intimate assessment of the samples in relation to the existing colour ranges of the receiving landscape.

6.17.7 Fourteen possible colour variants for the cladding panels were tested, with an on-site definition of seven shortlisted options to be taken forward for the natural colour system analysis (see **Figure 6.27**). The results of this analysis identify correlation with the receiving landscape, locating the tonal values and hue range of each sample. Subject to operational requirements, the built forms of Sizewell C would be treated with an external colour palette which is responsive to and would aim to form an integrated part of the natural landscape they sit within.

6.17.8 The conclusions provided a measure of appropriateness for each of the shortlisted samples within the existing Sizewell context, the materials illustrated within this Design and Access Statement scored in the upper range of the test results.

6.17.9 SZC Co. included the consideration of colour as part of the Design Council design review process. It is proposed to identify a range of colours and hues for the turbine halls within their receiving landscape, as part of this DCO submission.



Wider context (horizontal field of view 200°)



Figure 6.23: Initial colour study exploring possible colour palettes by Sizewell design team





Figure 6.24: Initial study of a light bronze cladding for the Hinkley Point C turbine hall design



Figure 6.25: Initial red cladding exploration for the Hinkley Point C turbine hall design



Figure 6.26: Initial blue study for the Hinkley Point C turbine hall design



Figure 6.28: The dominant hues and tonality found in the Sizewell landscape

**OVERARCHING DESIGN PRINCIPLE 24.**

Subject to project requirements, visibility from public viewpoints and good masterplanning, where possible, the built forms of Sizewell C will generally be treated with an external colour palette that is responsive to and will aim to form an integrated part of the natural landscape they sit within.



Figure 6.27: Testing cladding panel finishes in relation to the existing natural and built form colour palettes surrounding Sizewell



## OVERARCHING DESIGN PRINCIPLES 26.

New buildings located outside the main Sizewell C platform will be responsive to their individual local context whilst maintaining a coordinated high-quality approach to the whole development.

### 6.18 Peripheral buildings within the Sizewell C estate

- 6.18.1 The buildings which are on the periphery, but still fall within the main development site boundary, are to be treated with sensitivity and proposed elements outside of the main platform would be designed to suit their respective character area and minimised where possible. These buildings are shown on **Figure 6.29**. A comprehensive masterplan has been and will continue to be developed for the area which integrates current works with proposed mitigation measures. For further detail please refer to **Chapter 8** of this statement.
- 6.18.2 Peripheral buildings which fall outside of the main platform would be small in scale and treated with an understated external aesthetic which serves to root them in their environment. The material palette for the peripheral buildings would make use of colour tones appropriate to the surrounding landscape and in keeping with the Sizewell C main development site proposals.
- 6.18.3 These buildings which comprise the off-site delivery checkpoint and the ancillary substation, are small in scale and provide complementary simplicity to their receiving landscape setting. All external cladding treatments would be durable and be easily accessed and maintained to reduce the impact of weathering over time.
- 6.18.4 The approach to reduce the sprawl of the Sizewell C development as far as reasonably practicable has driven design moves such as the consolidation of workforce facilities within the central operational service centre, this includes the removal of the training centre, formerly proposed to be located on Goose Hill. The buildings that are required to be outside the main platform would be designed in response to their specific local context whilst adhering to the design principles set out in **Chapter 5** of this statement to apply a consistency of architectural language to the peripheral buildings.

### Peripheral buildings

- 59 National Grid substation
- 60 Off-site delivery checkpoint
- 63 Ancillary sub-station

### Legend





	Peripheral buildings within the SZC Co. estate		Sea defences and platform bank
	SSSI Boundary		Suffolk coast and heaths AONB

Figure 6.29: Peripheral buildings within the SZC Co. development site boundary (SZB relocated facilities Option 2 layout)





UPPER  
ABBAY FARM

SIZEWELL C  
Co ESTATE

GOOSE HILL

SIZEWELL  
MARSHES  
SSSI

CORONATION  
WOOD

SIZEWELL  
BEACH

LEISTON

PILLBOX  
FIELD

63

60

59