Eden Project North, Morecambe

Environmental Impact Assessment
Scoping Report

wsp | indigo.

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1. Introduction

1.1. WSP | Indigo has been instructed by Eden Project International Limited to prepare and submit a full planning application pertaining to development of land north and south of Marine Road Central, Morecambe (known as "*the site*" at **Appendix 1.1**).

1.2. Eden Project International Limited is part of the Eden Trust (Registered Charity number 1093070). It is an educational charity with a mission to connect people with each other and the living world.

1.3. The proposed development has a working title of "*Eden Project North*".

1.4. The planning application will be accompanied by a single Environmental Statement (ES) which will set out how the proposals can be accommodated in environmental terms and the benefits which are likely to arise as a consequence of the development.

1.5. This document presents an environmental scoping report which has been prepared in the context of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (SI 2017/571) and the Planning Practice Guidance (PPG) (last updated March 2019). Part 4 (15) of the Regulations enables anyone minded to make an EIA application to ask the relevant local planning authority to state in writing their opinion as to the information to be provided in the environmental statement (a "*scoping opinion*").

1.6. The following sections of this report identify the proposed development; the need for an EIA to be undertaken; and, the scope of the proposed ES including reference to specific subject areas to inform the council's scoping opinion.

2. Proposed developments

Site description

Site and surrounds

2.1. The 'Area of Interest' comprises land situated to the north and west of Morecambe Town Centre and broadly falls within the following areas:

- The main development site bound by the promenade to the north and east, Marine Road Central to the south and the Grade II listed Midland Hotel to the west;
- The promenade to the north, east and west of the main development site, including the sea wall to the north and stone jetty to the north west; and
- Adopted highways, footways and public realm to the south of the site.

2.2. A site location plan showing the extent of the 'Area of Interest' is shown at **Appendix 1.1.** In total, the site area extends to circa 14.8 hectares.

2.3. The main development site is identified by Lancaster City Council as a Development Opportunity Area. The site is known as the former Bubbles complex. The site boundary also incorporates the promenade immediately north and east of the site, the sea wall and part of the bay to the north, the stone jetty to the north west and aspects of Morecambe Town Centre and the public realm to the south. The site falls within the Morecambe Conservation Area and close to a number of designated heritage assets as outlined below.

2.4. The main development site is bound to the north, east and west by the promenade which extends east-west along the Bay of Morecambe. The RNLI lifeboat station lies immediately north of the site adjoining the promenade. The stone jetty extends out from the promenade to the north west of the site.

2.5. Immediately to the south west lies the Grade II* listed Midland Hotel and the Bay of Morecambe.

2.6. The site is bound to the south by Marine Road Central beyond which lies the Grade II* listed Winter Gardens, amusement arcades, shops, public realm and car parks serving Morecambe Town Centre.

2.7. Other designated heritage assets within the site boundary include the Grade II listed station building and lighthouse at the northern tip of the stone jetty, the Grade II listed wall and entrance piers enclosing the car park and the Grade II listed war memorial in the main site.

Existing uses

2.8. The land within the red line boundary is predominantly brownfield. Areas of greenfield land are limited to landscaping as part of previous public realm works.

2.9. The existing land uses are as follows:

- The main development site is a large brownfield site formerly in use as the Bubbles complex. The former Bubbles complex comprised a swimming pool, slides and other recreational activities. Following the closure of the former Bubbles complex, the site remains largely accessible by pedestrians via the adjacent promenade and footpaths. Vehicular access is also achievable via the promenade. Whilst the site is accessible by

the public – indeed part of the is identified as Key Public Space - the site as a whole provides limited opportunities for recreation and enjoyment.

- The promenade, sea wall and stone jetty extending out to the north form part of the public realm which are accessible as open space for recreation and enjoyment.

- Adopted highways, footways and junctions are included in the red line as it is envisaged that some highways and public realm works will be required to support the main development site.

The proposed development

2.10. Full planning permission will be sought for the following development:

> *Demolition of existing buildings and proposed construction of major mixed leisure development in association with Eden Project (including use classes A1, A3, A4, B1, D1, D2 and Sui Generis), public realm, landscaping, car parking and associated engineering works*

2.11. The maximum development parameters are shown in the plan / schedule contained at **Appendix 2.1**. In summary, the proposed development will comprise a maximum of:

- Maximum building height of 37.3m AOD;

- Maximum building footprint of 16,838sqm (GEA);

- Maximum visitor numbers of 1 million per annum with an estimated average of 760,000 per annum. There will be timed ticketing to control visitor flows. The proposed development has been designed to accommodate a maximum of 4,000 visitors per day. Feasibility studies indicate an estimated average of 100 days per annum of up to 3,000 visitors; 200 days per annum of up to 2,000 visitors; and 60 days per annum of up to 1,000 visitors. There will be a maximum of 500 visitors per hour accessing the site.

- Maximum core hours of operation (main site):

  - Daily: 09:00 – 21:00

- Maximum hours of operation (main site – summer time):

  - Daily: 09:00 – 00:00

- Maximum 4,000-person capacity outdoor arena to host late evening events during the following hours:

  - Daily: 18:00 – 00:00 (music finishing at 23:00)

- On-site parking limited to visitors with mobility issues;

2.12. Within these maximum parameters, the proposed development will comprise development within Use Class A1, A3, A4, B1, D1, D2 and Sui Generis.

2.13. The full extent of the apportionment of the floorspace per Use Class is not yet known. This will be crystallised once the scheme design has developed further.

2.14. The proposed layout of the development will be in accordance with the proposed parameters of development.

2.15. An indicative opening year for the development has been given as spring 2023; with pre-opening operations from late 2022. The site is anticipated to be built over a 2-year period.

2.16. The full planning application will be accompanied by a comprehensive ES which will define how the proposed development can be accommodated in an environmentally acceptable manner and what benefits can be obtained as a consequence of the development.

2.17. The ES will consider the potential environmental impacts and their significance of the development of the site, and when taken together (i.e. cumulatively), alongside other committed developments in the defined assessment area.

2.18. In carrying out the Environmental Impact Assessment (EIA) and in developing the detailed design of the schemes, the ES consultants will have regard to the comments made through the consultation process involving both statutory and non-statutory consultees and all other interested parties.

3. Requirement for an Environmental Assessment (Screening)

3.1. The proposed development is not considered to fall within any category in Schedule 1 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

3.2. It is however, considered to fall within the scope of Schedule 2 of these Regulations, specifically Part 10 (b) 'Urban development projects, including the construction of shopping centres and car parks, sports stadiums, leisure centres and multiplex cinemas'.

3.3. The site would exceed the thresholds and criteria set out in column two of Schedule 2 as follows:

- 'the development includes more than 1 hectare of urban development which is not dwellinghouse development'; and
- Part of the site is within a 'sensitive area' as defined at 2(1) of the Regulations. The site boundary at the northern edge of the Stone Jetty falls within the Morecambe Bay and Duddon Estuary SPA and the Morecambe Bay Ramsar, SAC and SSSI. The proposed Ecology Zone to the north of the Bubbles Complex comprises a breakwater structure and intertidal mudflats known as Shell Bed Flat. This area also falls within the SPA, Ramsar, SAC and SSSI. The Ecology Zone also includes a breakwater coastal defence structure, covered in boulders, which extends into Shell Bed Flat, known to provide roosting habitat for waterbirds.

3.4. Schedule 2 development requires an EIA if it is likely to have significant environmental effects (positive or negative), taking into account the selection criteria in Schedule 3.

3.5. The applicant considers that an EIA is required to support the planning application and does not propose to submit a request for an EIA Screening Opinion.

3.6. The applicant requests the Local Planning Authority agrees that an EIA is required.

4. Structure of the ES

ES approach

4.1. The overall proposed structure of the ES with regards the consideration of specific environmental impacts is set out below.

- Step 1: (Baseline assessment): Assessment of the baseline conditions of the site (including any associated zones of influence beyond the site boundaries);
- Step 2: (Impact assessment): Consideration of the impacts of the development proposals, against the baseline conditions identified. This assessment will take into account the potential cumulative effects with existing or approved developments within the local area.

4.2. The approach to each technical topic will involve:

- a description and analysis of the existing baseline conditions of the site, ie the environment as it is currently and could be expected to evolve if the proposed development were not to proceed, based on site surveys, desk studies etc.;
- an assessment of the predicted environmental effects on the environment likely to result from the proposed developments of the site against the baseline conditions. This includes an explanation of the assessment methodology of impacts in both the construction and operation phases. This assessment takes into account the potential cumulative effects with existing or approved developments within the local area;
- an assessment of the potential cumulative effects of the proposed development having regard to any existing or approved developments within the local area;
- identification of appropriate measures for the mitigation of predicted effects for both the construction and operation of the development, including amendments to the proposals assessed; and
- identification of any residual effects remaining after any mitigation measures have been implemented.

4.3. The ES assesses the worst-case scenario in all environmental disciplines.

4.4. One particular aspect of an EIA, which the 2017 Regulations specifically identify (at Regulation 4(e)), is the need to consider the interaction between the environmental factors likely to be significantly affected. The preparation of the ES has been undertaken through a process of regular reporting by, and meeting of, the team of consultants appointed to ensure these interrelationships are identified and taken into account in considering the impacts and mitigation proposals for each issue. The ES will consider the interactions between the environmental effects identified.

4.5. The format and structure of the ES will be in accordance with Schedule 4 of the 2017 Regulations and the Planning Practice Guidance.

4.6. The ES will comprise four volumes:

- Non-Technical Summary (Volume I);
- Main Text (Volume II);

- Illustrations (Volume III); and,
- Technical Appendices (Volume IV).

4.7. The Main Report (Volume II):

- introduces the development proposals, describes the approach to the assessment, provides details of the consultation undertaken and outlines the report structure of the statement;
- describes the scoping process and impact assessment methodology;
- describes the proposed development, considers the relevant planning and design context, construction phasing and benefits of the development;
- outlines alternatives to the proposed development and their respective environmental implications;
- addresses the key environmental issues individually and describes (for each issue) the existing environment (baseline); any difficulties encountered in compiling the required information; the likely positive and negative significant impacts of each proposed development both during construction and operation; any appropriate mitigation measures; and residual impacts of significance; and
- concludes on the mitigation and controls necessary relating to each environmental issue and assesses the significance of the issues identified during construction and operation of the developments.

4.8. In accordance with the requirements of the Regulations and best practice guidance, a Non-Technical Summary (NTS) of Volume 2 will be prepared and provided at Volume I.

4.9. Plans and illustrations for the ES will be presented in Volume III, whilst technical background information will be included at Volume IV.

5. Environmental Statement Subject Areas

5.1. The ES will detail the assessment of a number of key subject areas, identifying the existing baseline position for the site, the potential impacts of the proposed development against the baseline conditions alongside the cumulative effects of the development with any committed development in the area, and identify any mitigation measures which are required to overcome or reduce identified environmental impacts.

5.2. The subject areas to be addressed within the proposed ES are outlined below, with further information provided in respect of each discipline at **Sections 7 to 18** of this Report.

- Section 7 – Consideration of alternatives
- Section 8 - Landscape, seascape, townscape and visual amenity
- Section 9 - Cultural heritage
- Section 10 - Nature conservation and biodiversity
- Section 11 - Ground conditions and geology
- Section 12 - Hydrology, drainage and flood risk
- Section 13 - Traffic, transport and access
- Section 14 - Noise and vibration
- Section 15 - Air quality
- Section 16 - Wind, daylight and sunlight microclimate
- Section 17 - Socio-economics
- Section 18 - Population and human health

5.3. Each chapter of the ES will follow a common structure relating to each of the subject areas as follows:

- Introduction and approach (which will include methodology)
- Baseline assessment
- Impacts (construction and operational)
- Mitigation (construction and operational)
- Residual impacts (construction and operational)
- Conclusions

Combining the assessment of baseline conditions with the proposed working method, an assessment of the effect of the proposed developments, the potential impacts of the developments and cumulative effects and mitigating measures to overcome or reduce any impact, will be made. If impacts are substantial and cannot be acceptably mitigated, amendments to the proposed schemes will be made.

6. Policy Considerations

6.1. The ES will examine the proposals in relation to relevant policies in the development plan, taking account of emerging policy guidance and proposals.

6.2. The proposals will also be assessed against relevant national planning policy guidance.

6.3. Government policy guidance will include:

- National Planning Policy Framework (2019); and
- Planning Practice Guidance.

7. Schedule of Consultees

7.1. Consultees for the environmental assessment exercise will include:

- Lancaster City Council;
- Natural England;
- RSPB;
- Environment Agency;
- Local Highway Authority;
- Highways England;
- Lancashire County Strategic Planning;
- Historic England;
- Lead Local Flood Authority;
- United Utilities;
- Morecambe Town Council;
- Lancashire Public Rights of Way Officer;
- Network Rail;
- Neighbouring Local Planning Authorities.

7.2. The comments of the above bodies will, where appropriate, be included in the baseline information of the ES.

8. Alternatives

8.1. Schedule 4(2) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 requires the developer to describe the reasonable alternatives (for example in terms of development design, technology, location, size and scale) considered by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

8.2. The ES will consider reasonable alternatives to the current proposals. It will include reference to the following:

- the 'do-nothing' scenario;
- alternative developments previously proposed on the site; and
- alternative approaches and mitigation to deliver the scheme objectives.

8.3. The ES will explain the background and merits of the proposed scheme and how reasonable alternative approaches to its development have been considered in working up the proposed scheme in the context of an overall framework for development in this area.

9. Landscape, seascape, townscape and visual amenity

Introduction

9.1. This chapter of the Environmental Statement (ES) Scoping Report has been produced by TEP and sets out the approach to the assessment of the likely significant environmental effects on townscape, seascape and landscape character and on visual amenity during the construction and operational phases of the proposed development as part of the EIA.

9.2. In the following paragraphs, the acronym TSVIA (Townscape, Seascape and Visual Impact Assessment) is used, but in this context, it also encompasses landscape aspects of assessment, beyond settlements including Morecambe and Lancaster.

9.3. The TSVIA will be undertaken by Chartered Landscape Architects and the approach to TSVIA will be proportionate to the likely effects of the proposed development being assessed, as set out in the Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3).

9.4. The TSVIA will identify the features that define the character of the townscape and will assess the effect of the proposed development on these. The effects on townscape character areas will also be assessed. The TSVIA will assess the effects of the development on visual receptors and views they experience.

9.5. Landscape is defined in GLVIA3 as: 'an area, as perceived by people, the character of which is the result of the action and interaction of natural and/or human factors.' Landscape character is defined in GLVIA3 as: 'a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.'

9.6. GLVIA3 defines townscape as: 'the character and composition of the built environment including the buildings and the relationships between them, the different types of urban open space, including green spaces, and the relationship between buildings and open spaces.'

9.7. GLVIA3 defines seascape as: 'landscapes with views of the coast or seas, and coasts and adjacent marine environments with cultural, historical and archaeological links with each other.' An Approach to Seascape Character Assessment (Natural England, 2012) uses the definition: 'an area of sea, coastline and land, as perceived by people, whose character results from the activities and interactions of land with sea, by natural and/or human factors.'

9.8. The results of the assessments will be presented in the ES as a combined townscape and visual chapter.

Study Area

9.9. The TSVIA will assess the potential effects of the proposed development on townscape, seascape and landscape character, and on visual receptors within a study area extending up to 10km from the site, whilst noting that viewpoints in Arnside and Silverdale Area of Outstanding Natural Beauty (AONB) beyond 10km will be considered where appropriate, and approximately half of the study area encompasses sea or inter-tidal Morecambe Bay typically crossed only by organised parties accompanied by a guide.

9.10. This study area has been identified as providing sufficient context within which an assessment of the townscape, seascape, and landscape, and an assessment of the visual effects of the proposed development can be framed. It is based on a consideration of the type of development proposed and the local topography on the edge of Morecambe Bay

which is relatively flat. Baseline and site assessment work will refine the scope of the TSVIA further and identify where the focus of the assessment should lie.

9.11. The ZTV shown at **Appendix 9.1 and 9.2** indicates that screening by existing buildings and vegetation restricts theoretical visibility of the proposed development to the coastline of Morecambe Bay and areas of open sea in Morecambe Bay. Furthermore, there is a fragmented pattern of theoretical visibility to the south and east of the proposed development. The ZTV indicates theoretical visibility from the southern fringes of Arnside and Silverdale AONB with very small areas of theoretical visibility from the western edge of the Forest of Bowland AONB. Viewpoint selection has been informed by the pattern of theoretical visibility relative to sensitive receptors in the study area.

Planning Policy Context

9.12. The assessment will take account of the National Planning Policy Framework (NPPF) 2019, and National Planning Practice Guidance. The assessment will also consider local planning policy where relevant to the TSVIA as summarised below.

Local Planning Policy

Lancaster City Council Core Strategy (2003-2021) and Saved Policies

9.13. The assessment will be informed by the following policies of the Lancaster Core Strategy (adopted July 2008);

- Policy SC1 Sustainable Development;
- Policy SC5 Achieving Quality in Design;
- Policy SC8 Recreation and Open Space; and
- Policy E1 Environmental Capital.

9.14. The Lancaster Core Strategy superseded the Lancaster District Local Plan (adopted April 2004). The following Saved Policies will inform the assessment;

- Policy E13 Trees and Woodland;
- Policy E30 Green Corridors;
- Policy E31 Key Urban Landscape;
- Policy E35 Conservation Areas and their Surroundings; and
- Policy E38 New Building in Conservation Areas.

9.15. Lancaster City Council is in the process of developing a new Local Plan covering the period from 2011-2031. The Plan is expected to be adopted in October 2019. Examination hearings were held in April and May 2019.

Morecambe Area Action Plan

9.16. The Morecambe Area Action Plan was adopted on 17 December 2014 as a Development Plan Document. The Plan creates a framework for economic development and conservation of environmental and heritage assets in the town. The TSVIA will be informed by policies within the document.

Baseline Conditions

9.17. The following paragraphs provide an overview of the townscape, seascape, landscape and visual baseline within the 10km study area illustrated at **Appendix 9.3**.

9.18. The application site lies on the edge of Morecambe Bay. It comprises land that was reclaimed from the sea between Marine Road Central and the shoreline. The land has traditionally provided space for public recreation for residents and visitors alike over time. It is an important interface between the town and open views towards the bay and the Lake District beyond.

9.19. The Study Area comprises land situated to the north and west of Morecambe Town Centre and broadly falls within the following areas:

- The main development site bound by the promenade to the north and east, Marine Road Central to the south and Grade II listed Midland Hotel to the west;
- The promenade to the north, east and west of the main development site, including the sea wall and part of the bay to the north and stone jetty to the north west; and
- Adopted highways, car parks, footways and public realm to the south of the site. It is noted that National Cycle Routes 69 and 700 run through the site.

9.20. The main site is the former Morecambe Leisure Park. The site was previously occupied by a public swimming stadium (closed in 1975) and replaced by an outdoor swimming pool complex known as Bubbles (opened in 1976 and closed in 1999) and is contained by the A589 Marine Road Central to the south and by built development along this road. There is a War Memorial within the southern part of the Leisure Park, and the Grade II* listed Midland Hotel is to the immediate south-west. The Lancashire Coastal Way long distance recreational route and National Cycle Route 700 run through this open space.

9.21. The site is within the western part of the Morecambe Conservation Area and is approximately 0.5km north-east of the West End, Morecambe Conservation Area. There are numerous Listed Buildings within the Site's immediate context.

9.22. Land within the Arnside and Silverdale Area of Outstanding Natural Beauty (AONB) is approximately 9km to the north-east of the Site, beyond the eastern part of Morecambe Bay. The Forest of Bowland AONB is approximately 7.5km to the east beyond Morecambe, Lancaster and the M6 motorway. Consideration will be given to the Arnside and Silverdale AONB and its setting.

Potential Townscape and Seascape Receptors

9.23. Potential townscape receptors that could change as result of the proposed development fall into two broad categories:

- Townscape and seascape features and elements; and
- Townscape and seascape character.

9.24. The proposed development would have an effect on identified townscape elements as construction activities would require the removal of some townscape features and the sensitive management of others.

9.25. Potential effects on townscape character, during operation of the proposed development, would result from the introduction of new built form, public realm and planting. This would change the character of townscape and views in the locality and influence pedestrian and

vehicular movement to and from the proposed development.

Potential Visual Receptors and Viewpoints

9.26. The visual assessment will use up to fifteen viewpoints to support the assessment of effects, including viewpoints on the Lancashire Coastal Way and on National Cycle Route 700 along the promenade and viewpoints in the Arnside and Silverdale AONB which are shown on **Appendix 9.1 and 9.2**.

9.27. Several potential representative viewpoints have been identified following liaison with WSP | Indigo's Cultural Heritage Team and consultation with Lancaster City Council. Preliminary assessment including analysis of ZTV has also informed viewpoint selection. Photographs from most of these viewpoints are described below, and included at **Appendix 9.5**.

9.28. The visual assessment will include an analysis of the degree of change likely to be experienced at each viewpoint location.

9.29. The assessment of effects on visual amenity will be informed by fieldwork undertaken in the study area and by visiting points in the study area that represent the character of views experienced by people in the study area. These points in the study area will be illustrated by photographs and will include the viewpoints listed below. The location of each viewpoint is shown on **Appendix 9.1, 9.2 and 9.5**.

- Viewpoint 1: View from the Stone Jetty, (in the vicinity of the Grade II Listed Former Station Building and Lighthouse), looking south-east.
- Viewpoint 2: View from near the Rotunda Bar at the Grade II* Listed Midland Hotel, looking north-west towards and along the Stone Jetty, and north and north-east across part of the main development site.
- Viewpoint 3: View from the entrance to the Visitor Centre looking north and north-east towards the main development site beyond Marine Road Central and the Grade II* Listed Midland Hotel.
- Viewpoint 4: View from the junction between Northumberland Street and Marine Road Central looking west to north.
- Viewpoint 5: View from the Lancashire Coastal Way and NCR 700 on the promenade, in the vicinity of the Eric Morecambe statue, looking westwards to the main development site, with the Midland Hotel beyond.
- Viewpoint 6: View from the Lancashire Coastal Way and NCR 700 on the promenade, in the vicinity of the mountain range sculpture and the Grade II Listed Clock Tower, looking south-west to north-west towards the main development site, with the Midland Hotel and Stone Jetty beyond.
- Viewpoint 7: View from the slipway car park, north of Sandylands, looking north-east towards the main development site. Higher ground within the Arnside and Silverdale AONB is visible in the distance.
- Viewpoint 8: View from a PRoW to the west of the Grade I Listed Chapel of St Patrick, on Chapel Hill at Heysham (National Trust Site), looking north-east towards the Stone Jetty, and the main development site in the distance, obscured by intervening development.
- Viewpoint 9: View from the Lancashire Coastal Way and NCR 700 on the promenade, alongside the Coastal Road and opposite the car park adjacent to Morecambe Golf Club, looking south-west.
- Viewpoint 10: View from the Lancashire Coastal Way near the Hest Bank railway level

crossing and café looking south-west.

- Viewpoint 11: View from the Lancashire Coastal Way near the Morecambe Lodge Caravan Park (west of Bolton Town End), looking south-west.
- Viewpoint 12: View from the PRoW between Park Point and Far Arnside, within the Arnside and Silverdale AONB, looking south across Morecambe Bay.

9.30. In addition to those viewpoints for which photographs are provided the following viewpoints are also considered pertinent:

- Viewpoint 13: View from Warton Crag looking south across Morecambe Bay.
- Viewpoint 14: View from PRoW to the east of Heysham and to the west of Downlands Farm.
- Viewpoint 15: View from PRoW to the north of Langthwaite Reservoir and immediately to the west of the Forest of Bowland AONB.

9.31. Consultation with the Arnside and Silverdale AONB Unit in early May 2019 identified a number of viewpoints for consideration, including viewpoints 12 and 13 listed above. These viewpoints are distant, to the north-north-east of the Site, and are listed below:

- Jenny Brown's Point, Jack Scout and the Lancashire Coastal Way (view from the shore);
- Arnside Knott (elevated view); and
- King William's Hill and Eavers Wood (elevated view).

9.32. Verified views will be provided for 5 viewpoints agreed with consultees to support the TSVIA.

Assessment Methodology

9.33. The assessments will identify and describe, as far as is reasonably practical, the effects on townscape and seascape character, and on views that will arise from the proposed development (during construction and operation) to assess the significance of anticipated effects and to make appropriate recommendations for the mitigation of any resulting effects.

9.34. Townscape refers to the landscape within the built up area and includes buildings, the relationship between them, the different types of urban open spaces, including green spaces and the relationship between buildings and open space. The assessment of effects on townscape will consider the following factors described in paragraph 5.5 of GLVIA3:

- The context or setting of the urban area and its relationship to the wider landscape;
- Topography and its relationship to built form;
- The grain of the built form and its relationship to historic patterns;
- The layout and scale of buildings, density of development and building types, including architectural qualities, period and materials;
- The patterns of land use both past and present;
- The contribution to the landscape of water bodies, water courses and other water features;
- The nature and location of vegetation, including different types of green space and tree cover and their relationships to buildings and streets;

- The types of open space and the character and qualities of public realm; and
- Access and connectivity, including streets and footways and pavements.

9.35. The TSVIA will be undertaken in accordance with Guidelines for Landscape and Visual Impact Assessment Third Edition (2013) – produced by the Landscape Institute (LI) and the Institute of Environmental Management and Assessment (IEMA).

9.36. There are five stages to the method of assessment of landscape and visual effects as detailed in GLVIA3, of which Chapters 5 and 6 are relevant to this TSVIA. These are:

- Scope;
- Establishing the landscape and visual baseline;
- Predicting and describing landscape and visual effects;
- Assessing the significance of landscape and visual effects; and
- Judging the overall significance of landscape and visual effects.

Assessing Significance of Effect

9.37. The method for the assessment of the likely significant effects of the proposed development on the townscape will be in accordance with the guidelines at paragraphs 5.38 to 5.52 of GLVIA3 (LI and IEMA, 2013, p.88-91). The key terms used within assessments are:

- Sensitivity - a combination of susceptibility to change and value;
- Magnitude of effect - a combination of size or scale, geographical extent, duration and reversibility and nature of effects (adverse or beneficial); and
- Significance of Effect – a judgement of the level of significance of effect when Sensitivity and Magnitude are combined.

<u>Sensitivity</u>

Townscape and Seascape Sensitivity

9.38. The sensitivity of the townscape and seascape will be considered in accordance with paragraph 5.39 of GLVIA3. Townscape and seascape sensitivity considers susceptibility to change to the development proposed, as stated at paragraph 5.42 of GLVIA3 (LI and IEMA, 2013, p.89), and the value attached to the townscape and seascape potentially affected.

9.39. Townscape and seascape value is "*the relative value that is attached to different landscapes by society*" (GLVIA3, page 157). Box 5.1 (GLVIA3, page 84) sets out factors that can help in the identification of valued landscapes. These factors can include townscape and seascape quality, scenic quality, rarity, representativeness, conservation interest, recreation value and perceptual aspects. Townscape and seascape value criteria will be described in detail in the TVIA methodology which will accompany the TVIA ES Chapter.

9.40. The susceptibility of a townscape and seascape to change is dependent on the characteristics of the receiving environment and the type and nature of the development proposed. In accordance with paragraph 5.42 of GLVIA3, the assessment of susceptibility is tailored to the development proposed, and is considered as part of the assessment of effects, and is not recorded as part of the townscape and seascape baseline. Susceptibility criteria will be described in detail in the TVIA methodology which will accompany the TVIA ES Chapter.

9.41. The assessment of sensitivity combines judgements on susceptibility to change and value. Sensitivity criteria will be described in detail in the TVIA methodology which will accompany the TVIA ES Chapter.

Visual Sensitivity

9.42. The sensitivity of visual receptors depends on the susceptibility of the view to change, and the value attached to the view experienced. The susceptibility of different visual receptors to potential changes in views and visual amenity is mainly a function of:

- The occupation or activity of people experiencing the view at particular locations; and
- The extent to which their attention or interest may therefore be focussed on the views and the visual amenity they experience at particular locations.

9.43. In accordance with paragraph 6.35 of GLVIA3 "*each project needs to consider the nature of the groups of people who will be affected and the extent to which their attention is likely to be focused on views and visual amenity. Judgements about the susceptibility of visual receptors to change should be recorded on a scale (for example high, medium or low) but the basis for this must be clear, and linked back to evidence from the baseline study*".

9.44. For this assessment susceptibility to change generally will be assigned to visual receptors as shown in **Table 9.1** below.

Table 9.1: Susceptibility to Change

Receptor	**Susceptibility to Change**
Residential Properties	High
Users of PRoW and other recreation routes	High
Public Open Space/visitor attractions where surroundings are important to the experience	High
Workers in their work places where setting not important to quality of working life	Low
Motorists and passengers on main roads	Low
Motorists and passengers on rural lanes and tourist routes	Medium

9.45. Judgements about the values attached to the views experienced will be considered in the context of alternatives available and the relative scenic quality of a view. The judgement of the value of a view is subjective and, in accordance with paragraph 6.37 of GLVIA3, takes account of recognition of the value attached to particular views, for example in relation to heritage assets or through planning designations. In this assessment views have been ascribed a value using the scale set and typical examples set out in **Table 9.2**.

Table 9.2: Value of Views

Value of View	Typical Example
International	Views experienced from a World Heritage Site, in recognition of the value likely to be placed on views, including by tourists.
National	Views experienced from a National Park or AONB, in recognition of the scenic quality of views and the value likely to be placed on views, including by tourists, within a nationally designated townscape.
Regional	The views from national footpaths and cycle routes, in recognition of their wider recreational use (at a national level) and the value likely to be attached to views by visitors.
Local	Views from walks, cycle routes or public open spaces publicised at a county or regional level, in recognition of their wider recreational use and the value likely to be attached to views by visitors from the county or wider region.
Community	Views from walks, cycle routes, or public open spaces publicised at a local or borough level, in recognition of their recreational use and the value likely to be attached to views experienced by visitors from the local area.

9.46. Receptor sensitivity will be assigned to visual receptors taking into consideration their susceptibility to change and value of the view, and in accordance with the typical criteria in **Table 9.3**.

Table 9.3: Typical Criteria for the Assessment of Visual Receptor Sensitivity

Receptor Sensitivity	Typical Criteria
High	The receptor view has a high susceptibility to change and has national, regional or local value; or
Medium	The receptor view has a medium susceptibility to change and has national value.
Low	The receptor view has a high susceptibility to change and has community or local value; or

Magnitude

Magnitude of Townscape and Seascape Effect

9.47. The magnitude of townscape and seascape effect will be considered in accordance with paragraphs 5.48 to 5.52 of GLVIA3. The magnitude of effect combines the judgements on the scale of change (ie whether it is high, moderate, low or negligible); its nature (adverse, beneficial or neutral) and its duration (short, medium or long term) and its reversibility. **Table 9.4** describes the magnitude criteria for the townscape and seascape assessment, which can be adverse or beneficial.

Table 9.4: Typical Criteria for the Assessment of Magnitude of Effect on Townscape and Seascape Character

Magnitude of Effect	Typical Criteria
High	Major alteration to key features or characteristics in the existing townscape and seascape and or the introduction of elements considered totally uncharacteristic.
Moderate	Typically this would be where there would be a great scale of change to the character of the townscape and seascape for the long or medium-term.
Low	Partial alteration to key features or characteristics of the existing townscape and seascape and or the introduction of prominent elements.
Negligible	Typically this would be where there would be a perceivable scale of change to the character of the townscape and seascape for the medium and long- term; or where there would be a great scale of change on the townscape for the short-term.

Magnitude of Visual Effect

9.48. The magnitude of visual effects will be considered in accordance with paragraphs 6.38 to 6.41 of GLVIA3. The magnitude of effect evaluates the visual effects identified in terms of the size or scale of each component of a development; the geographical extent of the area influenced; and its duration and reversibility. The assessment of magnitude also refers to the nature of the effect (adverse or beneficial). More weight usually is given to effects that are greater in scale and long-term in duration. In assessing the duration of the effect, consideration is given to the effectiveness of mitigation, particularly where planting is proposed as part of the works which would change the scale of visual effect. **Table 9.5** describes the magnitude criteria for visual assessment.

Table 9.5: Typical Criteria for the Assessment of the Magnitude of Effect on Visual Amenity

Magnitude of Effect	Typical Criteria
High	Major alteration to the existing view and or the introduction of elements considered totally uncharacteristic in the view.
Moderate	Typically this would be where a development would be seen in close proximity with a large proportion of the view affected with little or no filtering and there would be a great scale of change from the present situation for the long or medium-term.
Low	Partial alteration to the existing view and or the introduction of prominent elements in the view.
Negligible	Typically this would be where a development would be seen in views for the long or medium-term where a moderate proportion of the view is affected. There may be some screening, which would minimise the scale of change from the present situation.

Significance of Effect

9.49. The significance of effect on townscape character is determined through the sequential combination of judgements on the townscape sensitivity and magnitude of effect in accordance with GLVIA3, paragraph 5.53. Significance of effect on townscape character can be beneficial (enhance the townscape) or adverse (at odds with or harmful to the townscape's key features or character) considering the typical criteria presented in **Table 9.6**.

Table 9.6: Typical Criteria for the Assessment of the Significance of Effect on Townscape and Seascape Character

Significance	Typical Criteria
Major Beneficial	An effect of major beneficial significance is generally recorded where a high beneficial magnitude of effect occurs to a high or medium sensitivity townscape receptor. For example, when the proposed development would: • Enhance and redefine the townscape and seascape character in a beneficial manner; • Repair or restore townscape and seascape badly damaged or degraded through previous or existing land uses.
Moderate Beneficial	An effect of moderate beneficial significance is generally recorded where a moderate beneficial magnitude of effect occurs to a townscape receptor of high or medium sensitivity. For example, when the proposed development would: • Fit well with the existing scale, landform and pattern of the townscape and seascape; • Improve the quality of the townscape and seascape through removal of damage caused by previous or existing land uses.
Minor Beneficial	An effect of minor beneficial significance generally relates to a low beneficial magnitude of effect on townscape and seascape. For example, when the proposed development would: • Fit with the scale, landform and pattern of the townscape and seascape; • Enable the restoration of valued characteristic features partially lost through other land uses to improve the townscape and seascape quality and character.
Negligible	An effect of negligible significance is recorded where a negligible magnitude of effect occurs. For example, when the proposed development would: • Be in keeping with the scale, landform and pattern of the existing townscape and seascape; • Maintain the existing townscape and seascape quality.

Significance	Typical Criteria
Minor Adverse	An effect of minor adverse significance generally relates to a low adverse magnitude of effect on townscape and seascape. For example, when the proposed development would: • Result in short-term townscape and seascape effects; • Not quite fit into the landform, scale and pattern of the townscape and seascape; • Have an adverse effect on an area of recognised townscape and seascape character.
Moderate Adverse	An effect of moderate adverse significance is generally recorded where a moderate adverse magnitude of effect occurs to a townscape and seascape receptor of high or medium sensitivity. For example, when the proposed development would: • Be at considerable variance with the landform, scale and pattern of the townscape and seascape; • Would degrade, diminish or destroy the integrity of some characteristic features and/or their setting; • Would cause damage to the character of a valued townscape and seascape.
Major Adverse	An effect of major adverse significance is generally recorded where a high adverse magnitude of effect occurs to a high or medium sensitivity townscape receptor. For example, when the proposed development would: • Be at complete variance with the landform, scale and pattern of the townscape and seascape; • Would permanently degrade, diminish or destroy the integrity of valued characteristic features and/or their setting; • Would substantially damage a high quality, highly valued townscape and seascape.

9.50. The assessment of the potential significant visual effects of the proposed development will be carried out in accordance with GLVIA3 paragraphs 6.30 to 6.45. The significance of effect on views will be been determined through the sequential combination of judgements on visual receptor sensitivity and the magnitude of effect. The significance of visual effects can be either adverse or beneficial or be recorded as 'no effect'. The significance of visual effects considers the typical criteria shown in **Table 9.7**.

Table 9.7: Typical Criteria for the Assessment of the Significance of Effect on Visual Amenity

Significance	Typical Criteria
Major	An effect of major significance generally is recorded where a high magnitude of effect occurs to a high or medium sensitivity receptor. For example where an unobstructed view of development would represent a large part of the view from a recreational footpath where views are presently open and of high scenic quality.
Moderate	An effect of moderate significance generally is recorded where a moderate magnitude of effect is experienced by a receptor of high or medium sensitivity. For example where part of a development is visible in a view from a private property for the long or medium-term, but where it does not comprise the whole view; or where an unobstructed view of development is visible for the short-term.
Minor	An effect of minor significance generally relates to a low magnitude of effect and often relates to a change in a view for the short-term; to a change in a distant view or a change in only a small part of a view, possibly because the view is already screened to a large extent.
Negligible	An effect of negligible significance is where the change to a view will be barely perceptible from the view presently experienced.

9.51. Residual townscape or visual effects (those occurring after 15 years) above moderate (ie Major or Moderate to Major) are considered to be significant; all other effects are considered not significant.

Inter-Relationship and Cumulative Effects

9.52. The TSVIA will consider the inter-relationship of effects from the proposed development between different aspects of the environment. For example, proposals to establish or modify habitats to mitigate effects on biodiversity may have effects on the townscape. Landform changes and planting to mitigate effects on the townscape and seascape and on views may have effects on biodiversity and on the historic environment. These inter-relationships will be considered in the ES.

9.53. The TSVIA will also consider the potential cumulative effects of the proposed development and other existing or approved developments of a similar scale or nature where effects may interact. The projects to be included in the cumulative assessment will be agreed in advance with Lancaster City Council and other statutory consultees.

Mitigation

9.54. Mitigation will comprise three categories:

- Primary measures, developed through the iterative design process, which will be embedded into the Scheme design;
- Standards of construction and operational management practices for avoiding and reducing environmental effects; and
- Secondary measures designed to address any residual adverse effects remaining after primary measures and standard construction practices have been incorporated into the design of the Scheme.

Residual Effects

9.55. The TSVIA will consider the effect of proposed mitigation on completion and after 15 years in order to assess the likely residual effects of the proposed development.

Reporting

9.56. The TSVIA will be presented as a single Townscape, Seascape and Visual Amenity chapter within the main volume of the ES. It will be accompanied by figures illustrating the townscape and seascape baseline and context to the site.

10. Cultural heritage

Introduction

10.1. This chapter of the Environmental Statement (ES) Scoping Report has been produced by WSP | Indigo and sets out the approach to the assessment of the proposed development's impact on Cultural Heritage. The purpose of the assessment will be to identify and characterise any relevant heritage resources, to consider the nature and scale of the potential impacts arising from the proposed development, and to assess the significance of any likely effects.

10.2. The cultural heritage assessment will draw on information presented in the Townscape, Seascape and Visual Impact Assessment (Chapter 9) such as the Zone of Theoretical Visibility (ZTV) and identified viewpoints.

10.3. The application site lies on the edge of Morecambe Bay. It comprises land that was reclaimed from the sea between Marine Road Central and the shoreline. The land has traditionally provided space for public recreation for residents and visitors alike over time. It is an important interface between the town and open views towards the bay and the Lake District beyond. The wider public realm included in the site boundary includes the promenade to the north, east and west of the main development site, including the sea wall to the north and stone jetty to the north west, and the adopted highways, footways and public realm to the south of the site.

10.4. The proposed development lies within Morecambe Conservation Area and includes within its boundary the Grade II listed war memorial (NHLE 1292855) and Grade II listed former station building and lighthouse on the stone jetty (NHLE 1207223) and the Grade II listed The Clock Tower (NHLE 1279837). The proposed development lies adjacent to the Midland Hotel (NHLE 1208988) and the Winter Gardens (NHLE 1025280), both Grade II* listed buildings, the Grade II entrance piers and walls of the Midland Hotel (NHLE 1292883) and Grade II listed 217, 219 and 221 Marine Road Central as well as others.

Study Area

10.5. A study area for built heritage assets will extend to a distance of 500m will be initially selected from the proposed site boundary. A flexible approach will be taken to the identification of assets of the highest significance on which there may be an impact upon setting up to 1km beyond the proposed site boundary and other than may be identified during site visits or through consultation with consultees.

10.6. This will be guided by the proposed development's Zone of Theoretical Visibility (ZTV) but will also consider physical and historical connectivity and relationships between heritage assets.

10.7. Whilst the study area will be used to inform those assets that could be affected by the proposed development it is anticipated that many of the heritage assets with little or no visual relationship with the site will not be affected.

Desk based sources

10.8. Sources of information that will be consulted include, but not limited to:

- The National Heritage List for England (NHLE);
- Lancaster County Council Historic Environment Record (HER);
- Cartographic sources;

- Relevant primary and secondary sources.

Planning Policy Context

10.9. Legislation and planning policy relating to heritage and pertinent to this project comprise:

Legislation

- Planning (Listed Buildings and Conservation Areas) Act 1990

Adopted Development Plan Policy

Lancaster Core Strategy and Saved Policies

- Development Management DPD Policy DM31 (Development affecting Conservation Areas);
- Development Management DPD Policy DM32 (The Setting of Designated Heritage Assets).

Morecambe Area Action Plan

- Policy DO2 (Strategic Leisure - Seafront Headland, Central Promenade);
- Spatial Policy SP1 (key pedestrian routes and spaces);
- Spatial Policy SP3 (Morecambe Main Seafront and Promenade).

National Planning Policy

10.10. National Planning Policy Framework (NPPF) 2019 – with particular reference to Section 12: Achieving well-designed places and Section 16: Conserving and enhancing the historic environment.

National Guidance

- National Planning Practice Guidance, DCLG

Historic England Guidance

- Historic Environment Good Practice Advice in Planning Note 2 (GPA2) Managing Significance in Decision Taking in the Historic Environment. Historic England (Ref 47),
- Historic Environment Good Practice Advice in Planning Note 3, second edition (GPA3) The Setting of Heritage Assets. Historic England 2017.

Baseline Conditions

10.11. The following section provides an overview of the cultural heritage baseline within the study area. Identified heritage assets within the study area are contained at **Appendix 10.1**.

10.12. There are no World Heritage Sites, Scheduled Monuments, Registered Parks and Gardens within the study area or within the proposed development site.

Listed Buildings

10.13. There are three Grade II listed buildings within the proposed development site boundary. These are:

- The war memorial (NHLE 1292855);
- The former station building and lighthouse on the stone jetty (NHLE 1207223); and
- The Clock Tower (NHLE 1279837).

10.14. There are two Grade II* listed buildings, the Midland Hotel and the Winter Gardens.

10.15. The Midland Hotel is a Grade II* listed building. It was built in 1933 to the designs of Oliver Hill. It is built in a Streamline Moderne style and it is constructed of concrete and rendered brickwork, painted white. It is curved in plan with the convex side facing west towards the sea to take full advantage of the sea views.

10.16. The Midland Hotel stands as the only substantial building forward of Marine Road Central with uninterrupted views of the Bay and the Lake District beyond. This defines its setting. The promenade area made up of reclaimed land is an important interface between the Midland Hotel, views of the bay and the rest of the built-up area of the town. Despite several attempts to reuse the area it is characterised by several redundant structures from previous endeavours, legacies of Morecambe's bygone history. There are elements of landscaping that bring certain formality to the area. The lack of built structures within this space provide the Midland Hotel to be free visual clutter and it is largely experienced within a backdrop of sky and sea.

10.17. The Winter Gardens is a Grade II* listed theatre. It was built in 1896 by Mangnall and Littlewood as the Victorian Pavillion Theatre and was originally an extension to the Winter Gardens complex. It sits prominently on the sea front with a principal elevation of ornate red terracotta. The symmetrical composition includes two three-storey corner towers linked by a glazed first floor arcade with balustrade and central projection. It is a prominent and noticeable building on the sea front and distinctly different from any other building within Morecambe.

10.18. In addition, there are 24 Grade II listed buildings within the study area but outside the site boundary:

- Barclays Bank (NHLE 1279833);
- Morecambe railway station main building (NHLE 1207224);
- 217, 219 and 221, Marine Road Central (NHLE 1207218);
- 4, Poulton Square (NHLE 1390683);
- Abbotsford, Eastleigh (NHLE 1207221);
- Parish Church of The Holy Trinity (NHLE 1207210);
- 342, Marine Road Central (NHLE 1207222);
- Wall enclosing churchyard at Parish Church of the Holy Trinity (NHLE 1292918);
- 336, Marine Road Central (NHLE 1025254);
- 333, 334 and 335, Marine Road Central (NHLE 1207219);
- 338, Marine Road Central (NHLE 1025258);
- Fylde court (NHLE 1207220);
- Wall and 2 pairs of entrance piers enclosing south east side of car park of Midland Hotel (NHLE 1292883);
- Church of St Lawrence (NHLE 1292956);
- The Morecambe public house (NHLE 1279834);
- Cumbria (NHLE 1355047);
- Central Methodist Church (NHLE 1208920);
- Town Hall (NHLE 1389539);
- Queen's Hotel (NHLE 1025289);
- Park Farmhouse (NHLE 1209485);
- 341, Marine Road Central (NHLE 1025264);
- Mona House (NHLE 1279832);
- Poulton Hall archway (NHLE 1209004); and
- Art and Technical School (NHLE 1391508).

10.19. Many of the Grade II listed buildings are associated with the development of Morecambe as a seaside resort during the 19th century. Others are associated with the small fishing village of Poulton and its early 17th century origins such as 4 Poulton Square (NHLE 1390683).

Conservation Area

10.20. The proposed development lies within the Morecambe Conservation Area.

10.21. Morecambe's Conservation Area was designated in June 2003. The conservation area comprises a wide range of historic structures, road layouts and varied streetscapes which tell the story of Morecambe's growth from its origins as a fishing village into a popular seaside resort of the 19th and early 20th century. The mid-19th century was an important time in the development of Morecambe. In 1846 the North Western Railway elected to build a port in Morecambe to serve the Northern Ireland routes and to transport Iron ore from the Furness foundries and Clyde costs. Trains terminated at the old stone jetty for passengers to the Isle of Man. The first Midland Hotel was built in 1848 to serve the passengers of the railway. This brought an increased movement of people and goods and Morecambe established itself as a coastal resort attracting visitors from the large industrial town in the west and Yorkshire to holiday on the coast. Several attractions opened during this period including the West End Pier and the Winter Gardens. In 1889, the villages of Bare, Poulton-le-Sands and Torrisholme became collectively known as Morecambe.

10.22. The early 20th century saw further development of Morecambe's visitor attractions. Morecambe's role as a port to Northern Ireland and Isle of Man came to an end in 1904 when Heysham Harbour was opened. The old port became a ship-breakers yard which also became a visitor attraction as people would pay to look around the old cruise liners and ships prior to them being broken up. At this time Morecambe had an industrial feel to it until the 1930s when the Morecambe Corporation started its 'Brighten the Promenade' Campaign and led to the old harbour and ship-breaking yard being cleared away to make way for new attractions on reclaimed land. A new phase in Morecambe's history began.

10.23. The Midland Hotel was built in 1933 and was an ambitious building the curved lines following the line of the coast. The 'Super Swimming Stadium' was constructed adjacent to it that provided Europe's largest outdoor swimming stadium. During the summer an average 250,000 visitors used the swimming facilities. The Art Deco buildings on the former Woolworths and Hitchens building were built at a similar time. Unfortunately, the later 20th century saw a decline in Morecambe's popularity. The Swimming Stadium was demolished and replaced with the bubbles complex. By the late 1990s Morecambe water world and pleasure beach had closed. The restoration of the Midland Hotel by Urban Splash has hailed a period of regeneration and new popularity.

10.24. The Bay is part of the special character and setting of the conservation area and the heritage assets contained within it. The Bay has driven the economy of Morecambe from its origins as a fishing village through to its role as a harbour and latterly as a visitor designation with the backdrop of the Lake District beyond. The setting has influenced the architecture of the conservation area with buildings associated with the 19th and 20th century built to look out to sea and take advantage of the spectacular views. The Midland Hotel built on the shoreline, designed to appear as a visiting ocean liner, and the Winter Gardens are key buildings within the conservation area that have remained as key architectural elements but have also had a key role to play in the development of the area.

10.25. Morecambe's promenade area including the expanse of reclaimed land between Marine Road Central and the shoreline has traditionally provided a space for public recreation for residents and visitors alike. It is an important interface between the town and open views towards the bay and the Lake District beyond.

Non-designated heritage assets

10.26. There are a number of buildings that could be considered non-designated heritage assets within the study area. However, for the purposes of the ES chapter only two will be considered in any detail. These are: the former Woolworths building and the former Littlewoods building on Marine Road Central. These are both Art Deco buildings that lie opposite the proposed development site and have strong group value with the Midland

Hotel.

10.27. The Grade II listed war memorial is situated within a garden purported to be designed by Thomas Mawson. Thomas Mawson was a British garden designer, architect and town planner. A number of Mawson's designed gardens have been recently added to the list of Registered Parks and Gardens held by Historic England. The war memorial garden will be assessed to understand its heritage significance and how proposals might affect it.

10.28. An assessment will be made as to whether there are any features on the existing site that have any heritage significance. In particular, the existing structures will be assessed as to whether they are remnants of the 1936 Super Swimming Stadium that once occupied the site.

Archaeology

10.29. A previous application for Urban Splash (ref: 07/01810/OUT) of the development site provided an archaeological report by North Pennines Archaeology. The archaeological report concluded that the proposals would affect the existing townscape, as well as the potential for remains of a prehistoric date to survive at some depth on the site. Three boreholes were excavated to ascertain the potential for former drowned prehistoric landscapes. The borehole data revealed that the site does not, or is very unlikely to, contain evidence for such former landscapes. Consequently, no further investigation of the archaeological resource was considered necessary. The archaeological advisor at the time considered that the background research undertaken as part of the previous application was a sufficient record of the archaeological interest of the site. The sites identified as part of that previous report was considered to have no more than local significance and that it was Lancaster Council Council's opinion that the surviving evidence would be truncated to such as extent that it would be of little archaeological value. Lancaster County Council therefore concluded that no further archaeologically recording of the site was necessary.

10.30. Archaeology is therefore scoped out of the Environmental Statement as there would be no significant effects on the archaeological interest of the site. Built heritage, however, is scoped in.

Assessment Methodology

Scope and Level of Assessment

10.31. The above discussion establishes that the proposed development is situated within Morecambe Conservation Area and within the setting of two heritage assets of the highest significance namely the Midland Hotel and the Winter Gardens, both Grade II* listed buildings. It also lies within the setting of other listed buildings. As such there are a number of heritage assets within the study area and a few select assets beyond which may be affected by the proposed developments. Such effects could consist of:

- Physical effects on heritage assets; and
- Effects upon the setting of heritage assets.

10.32. There is a potential for significant effects on heritage (both beneficial and adverse) from the construction and operation of the proposed development.

10.33. Given the importance of the heritage assets potentially affected by the proposed development, there is a requirement for a detailed assessment of built heritage as part of EIA. Archaeology is scoped out of the EIA. Built heritage is scoped into the EIA.

10.34. In addition to the detailed impacts as required, there will be a separate heritage baseline. The heritage baseline will be included as an appendix to the Environmental Statement and the results will be incorporated into the ES discussion and conclusions.

Assessment standards

10.35. The detailed assessment will be prepared in line with national and local planning policy, national guidance from Historic England.

Assessment of Significance (or Value)

10.36. As assessment of significance and the contribution made by setting of the heritage assets will be undertaken. It will be prepared in accordance with principles set out in the National Planning Policy Framework 2019 (NPPF) and advice provided in National Planning Practice Guidance and Historic England's good practice advice (GPA) guide GPA2: Managing Significance in Decision Taking and GPA3: Setting of Heritage Assets.

10.37. Significance (or value) is defined within the NPPF as the sum of the heritage interests that a heritage asset holds. The assessment of the significance (or value) of heritage assets will include a consideration of their archaeological, historic, architectural and artistic interests and the extent to which that significance relates to different elements of the asset and to what extent the setting of a heritage asset contributes to its significance.

10.38. The contribution of setting to the significance of heritage assets is often expressed by reference to views. To facilitate the assessment of those heritage assets that might be affected by the proposed development, the ZTV model will be used as a guide. The potential impact of the proposed development on the setting of heritage assets that are identified as potentially being affected will be guided by the identification of key viewpoints to be agreed with the landscape and visual impact team as well as the consultees.

Level of Significance

10.39. For the purposes of this cultural heritage chapter significance will be articulated in terms that directly relate to key policy, principally NPPF.

10.40. Four levels of significance may be identified:

- Designated heritage assets of the highest significance, as identified in paragraph 194 of NPPF 2019 comprising Grade I and II* Listed buildings; Grade I and II* Registered Parks and Gardens; Scheduled Monuments; Protected Wreck Sites and Registered Battlefields (and also including some Conservation Areas);
- Designated heritage assets of less than the highest significance, as identified in paragraph 194 of NPPF, comprising Grade II Listed buildings and Grade II Registered Parks and Gardens (and also some Conservation Areas);
- Non-designated heritage assets of local historic value; and
- Sites, buildings or areas which have little or no heritage significance and thus do not constitute heritage assets.

10.41. Paragraph 194 footnote 63 clarifies that non-designated heritage assets of archaeological interest, which are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets.

Assessment of significance of effect of development

10.42. The assessment of the significance of effect of development will be articulated in qualitative terms that directly relate to key policy, principally NPPF and the PPG. The following levels of harm may potentially be identified:

- Substantial harm or total loss. Substantial harm is a high test that will consider whether the adverse impact seriously affects a key element of a heritage asset's significance. It is the degree of harm to the asset's significance rather than the scale of the development that is to be assessed;
- Less than substantial harm. Harm of a lesser level that that defined above; and

- No harm (preservation). A High Court Judgement of 2014 is relevant to this, in which it was held that with regard to preserving the setting of Listed building or preserving the character and appearance of a Conservation Area, 'preserving' means 'doing no harm'.

10.43. The identification of significant effects in EIA terms will be based on professional judgement. Substantial harm to a designated heritage asset will be deemed to be a significant effect. Less than substantial harm to a designated heritage asset, or substantial harm to a non-designated heritage asset may also represent a significant effect, determined on the basis of professional judgement. Less than substantial harm to a non-designated heritage asset does not usually represent a significant effect in EIA terms. Beneficial effects will also be reported.

10.44. Consultation will be undertaken with Lancaster City Council Conservation Officers and Historic England regarding the likely impacts on heritage assets from the construction and operation of the Scheme. Mitigation measures will be agreed as necessary and appropriate.

Potential Impacts

10.45. The proposed development is located within the Morecambe Conservation Area and within the setting of several listed buildings. The proposed development will affect the character and appearance of the conservation area and the setting of the listed buildings both positively and negatively, with some assets subject to beneficial and adverse impacts.

10.46. The principal beneficial effect of the proposed development relates to the opportunities to enhance the character and appearance of the conservation area. It has the potential to re-establish the proposed development site as an area for and a focus for recreational activity that will regenerate and better reveal the significance of Morecambe as a tourist destination and its association and setting of the Bay. The proposed development has potential to provide an impetus for the regeneration of Morecambe and to help the viability of many heritage assets including the Midland Hotel and the Winter Gardens.

10.47. Construction of the proposed development has the potential to affect heritage assets in the following ways:

- Both beneficial and adverse effects on the setting of heritage assets including changes to visual intrusion, noise, access and amenity as a result of the proposed development; and

- Operation of the proposed development has the potential to result in impacts on the setting of heritage assets. In most cases, these would be long-term in nature. These impacts would commence during construction of the scheme and continue during operation. Such impacts could include:

a. Both beneficial and adverse changes to the surroundings or certain heritage assets or the general character of their setting; and
b. Changes to the viability of certain heritage assets.

Cumulative Effects

10.48. The cultural heritage chapter will also consider the potential cumulative effects of the proposed development and other existing or approved developments of a similar scale or nature where effects may interact. The projects to be included in the cumulative assessment will be agreed in advance with Lancaster City Council and other statutory consultees.

Mitigation

10.49. Mitigation will be inbuilt to the design of the proposed development to minimise impacts of heritage assets and their setting as far as possible. This will be agreed with Historic England and Lancaster City Council. The design response will seek to avoid significant adverse effects through careful planning, siting, height, massing, layout, access and scale.

Residual Effects

10.50. The Cultural heritage chapter will consider the effect of proposed mitigation on completion to assess the likely residual effects of the proposed development.

Reporting

10.51. Following detailed assessment, the potential impacts of the proposed development on the significance and setting of the identified heritage assets will be assessed and reported within the ES. It will be accompanied by figures illustrating the cultural heritage baseline and context to the site.

11. Nature conservation and biodiversity

Introduction

11.1. This chapter of the Environmental Statement (ES) Scoping Report has been produced by TEP and sets out the approach to the assessment of the proposed development's impact on nature conservation and biodiversity interests. The assessment will identify, describe and evaluate all ecological features, including those within the development boundary and others which might be indirectly affected by construction or operation of the development. Important Ecological Features (IEF) will be highlighted for full assessment.

11.2. The assessment will consider the nature and scale of the potential effects arising from the proposed development, and describe avoidance, mitigation, compensation and enhancement measures to be incorporated into the development. The assessment will describe the significance of any likely residual effects, taking account of the above measures.

11.3. The terrestrial elements of the proposed development will be built on brownfield land, hard standing, amenity grassland and ornamental plantings. None of these areas are subject to any ecological designation, but they lie adjacent to Morecambe Bay which is subject to multiple designations, as described below.

11.4. The proposed development boundary also includes boulders used for marine defences, along with intertidal sand and mudflats, adjacent to and within Morecambe Bay, an area of 37,405 hectares of estuary internationally designated as a Special Protection Area (SPA) and Ramsar site for the estuarine habitats it contains and the waterbird and seabird populations it supports. This area is also internationally designated as a Special Area of Conservation (SAC) for the estuarine habitats it supports. The SPA, Ramsar and SAC designations are broadly co-located with the Morecambe Bay Site of Special Scientific Interest, which is also designated for its range of estuarine and marine habitats, birds, plants and invertebrate fauna.

11.5. Aspects of the proposed development within the designated area of Morecambe Bay include habitat enhancement works and ancillary structures associated with the development. At the time of writing this Scoping Report, the precise nature of these structures and activities is not determined and will be subject to consultation with Natural England, the City Council and non-governmental conservation bodies.

11.6. Taking account of the location and significance of the site, the assessment will fully assess impacts of the proposals on the site itself, but also to assess potential direct and indirect impacts on the adjacent protected sites, both during construction and operation. For example, the proposed development may attract one million visitors per annum, so the effects of increases in recreational disturbance will be assessed, both for coastal birds and habitats.

11.7. An assessment of the potential impacts on the internationally designated sites will also be carried out to enable the City Council to make a Habitats Regulations Assessment (HRA). The HRA process will sit alongside the EIA and will require a systematic approach using the "*Source – Pathway – Receptor*" model applied at each stage of the HRA. Natural England will be consulted on the scope of, and approach to, HRA, and the applicant will provide sufficient information to enable the City Council to fulfil its obligations under the Conservation of Habitats and Species Regulations (2017).

Study Area

11.8. The study area reflects the habitats present in the locality and the ecology of the site itself as well as that of both the adjacent urban habitats and the extensive protected coastal habitats bordering the north, taking into consideration the nature and extent of potential effects. Accordingly, the study area has multiple tiers.

11.9. The study area for gathering information on internationally designated sites extends 10km from the site boundary, although within this, more targeted bird information relating to these designated sites has been gathered within 1km of the site. The desk study area for collation of statutory designated sites, notable habitats and licensed European Protected Species (EPS) mitigation projects (publicly available through the Government Multi-Agency Geographic Information System (MAGIC) Map database, extends 5km from the central grid reference of the Project site. Collation of protected and notable species records extends 2km from the same locale. The field surveys focus on the footprint of the proposed development and immediately adjacent habitats.

Planning Policy Context

11.10. As part of the assessment a review of legislation and planning policy relating to biodiversity will be undertaken. The ES will include an explanation of how these provisions have been considered and addressed. The review will include reference to the following:

- The National Planning Policy Framework (2019);
- The Conservation of Habitats and Species Regulations 2017 [The Habitat Regulations];
- Wildlife and Countryside Act 1981 (as amended) [WCA];
- The Countryside and Rights of Way Act 2000 (as amended) [CRoW Act];
- Section 41 (S41) of the Natural Environment and Rural Communities Act 2006 [NERC];
- Circular 06/2005: Biodiversity and Geological Conservation – Statutory Obligations and their Effects on the Planning System;
- Local planning policy (Lancaster City Council), and:
- Supplementary Planning Document (Nature Conservation and Biodiversity).

11.11. At the time of writing this Scoping Report, the UK Government has indicated that "*biodiversity net gain*" (BNG) will be mandated within the next year for most development. Eden Project North is committed to delivering Biodiversity Net Gain in accordance with its own charitable objectives and with UK Government aspirations expressed in the 25YEP. During the detailed design stages, EPN will agree with the City Council and Natural England about the appropriate metric to use in relation to this specific project, and will implement biodiverse planting within the red-line boundary and, if necessary, elsewhere in the local area in conjunction with local partners who share the project's objectives. A BNG statement will be provided with the final planning application and will be referred to in the ES.

11.12. A BNG statement will be provided with the final planning application and will be referred to in the Environmental Statement.

Baseline Conditions

11.13. Baseline data has been collected in accordance with standard best practice methods published by Natural England, Chartered Institute of Ecology and Environmental Management (CIEEM) and other recognised bodies, as appropriate.

Designated Wildlife Sites

11.14. The desktop study involved a buffer of 2km from the site boundary for locally designated wildlife sites, which was extended up to 5km for nationally designated sites and 10km for internationally designated sites. Records were gathered from Lancashire Environment Record Network (LeRN) and using Natural England's interactive, web-based MAGIC (Multi-Agency Geographic Information for the Countryside) database.

11.15. One locally designated site was found within 2km of the site. This was Oxcliffe Road Lake Biological Heritage Site (BHS), located 1.8km south of the site. This BHS is designated for its open water and marginal vegetation habitats as well as the invertebrates these support.

11.16. Three Sites of Scientific Interest (SSSI) are located within 5km. These include Morecambe Bay SSSI (within which part of the site lies), Heysham Moss SSSI (3.2km south of the site) and Lune Estuary SSSI (3.4km south east of the site).

11.17. There are three internationally designated wildlife sites within 10km. These include Morecambe Bay and Duddon Estuary SPA, Morecambe Bay Ramsar and Morecambe Bay SAC, all located adjacent to the site. These sites are illustrated at **Appendix 11.1**.

Habitats

11.18. An extended Phase 1 habitat assessment was undertaken on 3 May 2019 and 17 May 2019. The survey was undertaken by an experienced botanist (qualified as Level 4 under the Field Identification Skills Certificate scheme). The methods employed were in line with the Phase 1 habitat assessment methods (JNCC 2010) and Guidelines for Preliminary Ecological Appraisal (CIEEM 2017). The survey included habitat assessments for protected and S41 priority species. The extended Phase 1 Habitat Survey report is provided in **Appendix 11.2**, within which drawing ref: G7596.003 illustrates the site.

11.19. The majority of the site is dominated by hard standing and short mown amenity grassland, with many small areas of introduced shrub present throughout. A few areas of grassland on banks within the former Bubbles complex have been left unmown and have developed a more rich ground flora, albeit not of S41 priority.

11.20. There are many areas of introduced shrub comprising ornamental species such as *Escallonia* sp. Two taller areas of introduced shrub with scattered broadleaved and coniferous trees are present, one of which separates the Midland Hotel complex from the site and the other is located at the northern edge of the former Bubbles complex. These areas provide nesting habitat for a range of bird species.

11.21. Coastal sea defences comprising stone boulders, surround the Stone Jetty in the north west of the site and also border the north of the former Bubbles complex area and the promenade. These large boulders have become colonised by some stunted tree and shrub species and ephemeral species in places where they are not regularly inundated by the tide.

11.22. The site boundary at the northern edge of the Stone Jetty falls within the Morecambe Bay and Duddon Estuary SPA and the Morecambe Bay Ramsar, SAC and SSSI. This area contains hard standing associated with a viewpoint surrounded by boulder sea defences, concrete access ramps and small areas of intertidal mudflats. Intertidal mudflats is a S41 habitat of principal importance and is also a qualifying habitat for the SAC.

11.23. The proposed Ecology Zone to the north of the Bubbles Complex comprises a breakwater structure and intertidal mudflats known as Shell Bed Flat. This area also falls within the SPA, Ramsar, SAC and SSSI. The Ecology Zone also includes a breakwater coastal defence structure, covered in boulders, which extends into Shell Bed Flat, known to provide roosting habitat for waterbirds.

11.24. A number of buildings are present within the site including three disused structures

associated with the previous Bubbles Complex, the lighthouse building at the north of the Stone Jetty, a shop/public toilets building and nearby brick clock tower on the promenade, and a bus shelter corrugated metal structure within the car parking area to the south of the A589.

11.25. One invasive plant species was recorded within the site – Japanese rose (*Rosa rugosa*). This species is listed on Schedule 9 of the Wildlife and Countryside Act 1981.

11.26. These habitats will be measured and evaluated in the EIA, with an assessment of the residual effects of the proposed development and mitigation on the habitat types of importance, also considering their ability to support protected and priority species. Particular emphasis will be placed on assessment of S41 habitats and/or those that contribute to the integrity of the designated sites.

Protected Species/Species of Conservation Concern

Previous surveys

11.27. Previous surveys undertaken at this site as part of a residential application (Urban Splash, 2008), included a nocturnal bat survey (May 2008), a breeding bird survey (Two visits in May 2008) and a winter and migrant bird survey (two visits in February and one visit in May 2008). These studies are available for public viewing, but given their relative age and the fact they were commissioned by a third party, will not be used for assessment.

Non-Breeding birds

11.28. Two Wetland Bird Survey (WeBS) core count sectors are located within proximity to the site; 'Morecambe Promenade' (located between the Stone Jetty at the northwest corner of the proposed site and Scalestones Point, located approximately 2.8km north east of the site) and 'Stone Jetty' (located between the jetty at the western edge of the site and Heysham Port, located 5.6km south west).

11.29. Core count data was obtained from WeBS for both of these sectors for the period 2012/13 – 2016/17. Species for which the 5 year peak mean was greater than 1% of the qualifying counts for either the Morecambe Bay and Duddon Estuary SPA or Morecambe Bay Ramsar site include the following:

- Little egret;
- Oystercatcher;
- Ringed plover;
- Knot;
- Black-tailed godwit;
- Redshank;
- Turnstone;
- Cormorant;
- Great crested grebe; and
- Red-breasted merganser.

11.30. Due to the size of the WeBS core count areas, it is highly likely that the numbers of birds within the Zone of Influence (ZOI) for the development will be significantly lower than this.

The large WeBS areas are likely to be strongly skewed by the very large roost sites within the wider area (eg at Heysham). From three winter bird survey visits to a smaller area of Morecambe Sea Front undertaken from a survey location at the base of the breakwater at the edge of the site as part of the Morecambe Bay Bird Disturbance and Access Management Report (Liley et al, 2015), much lower numbers of birds were seen within the area of interest, including maximum counts of 10 black-tailed godwit, 5 curlew, 60 knot, 88 oystercatcher, 74 redshank, 3 turnstone, 20 shelduck and a single red-breasted merganser and cormorant. Only the count of redshank approached 1% of the SPA or Ramsar qualifying population (0.7% SPA, 0.8% Ramsar).

11.31. Recent correspondence with local WeBS co-ordinator Pete Marsh highlighted that the groynes and rock armour breakwaters along the Morecambe front are of particular interest for birds in this area, being commonly used by roosting waders, wildfowl and gulls. These include the adjacent rock armour breakwater at Shell Bed Flat that adjoins the north east of the site, which is a known roost site for a number of species of waders. The species that most commonly roost in this location include redshank and turnstone, with the area also occasionally used by dunlin, knot and oystercatcher. The adjacent shell bed and mud flats to the site are used by feeding waders and wildfowl at low tide. The intertidal area to the west of the Stone Jetty is of less importance for feeding waders due to the more sandy, compacted substrate which provides less feeding resources and allows more disturbance from dogs and dog walkers.

11.32. Out of twenty two groynes along the east side of Morecambe Bay, the breakwater at Shell Bed Flat is one of the three most important for waterbirds, and is used by a good variety but small number of roosting birds, with mergansers and grebes at high tide on the water in the lee of the breakwater (Liley et al., 2015). At low tide, the shell beds and mud flats off the Central Promenade are less important for waders as feeding grounds, although knot are occasionally present in significant numbers.

11.33. During previous surveys undertaken as part of the Urban Splash application (2008) wintering waders, wildfowl and gulls were observed roosting on the adjacent breakwater at high tide, and feeding on the shell beds and mud flats at low tide. Birds did not appear to be concerned or disturbed by large number of people in the area.

11.34. The Morecambe Bay Bird Disturbance and Access Management Report found that the key species supported by Morecambe Sea Front included oystercatcher, knot, redshank and ringed plover. Of all the locations at Morecambe Bay monitored, Morecambe Sea Front had by far the highest level of human activity, with relatively low levels of disturbance recorded. The main disturbance problem for roosting birds was reported to occur when people clamber out onto the breakwaters, usually anglers or children. Otherwise roosting birds are generally undisturbed by the regular use of adjoining promenades, roads, car parks and open spaces by people and dogs.

11.35. At mid and low tide, walkers and dog walkers tend to keep to the sandy parts of the beaches and do not stray into the intertidal area due to the deep, sticky mud, limiting any potential disturbance effects on nearby feeding birds further (Marsh, P. pers comm, 2019.).

Breeding birds

11.36. Prior records found 9 nesting bird species, three of which are of Birds of Conservation Concern (BoCC) species on S41 of the NERC Act, 2006: dunnock *Prunella modularis*, house sparrow *Passer domesticus* and song thrush *Turdus philomelos*). During the 2019 Phase 1 habitat survey, BoCC species recorded within or over the site included dunnock, house sparrow, starling *Sturnus vulgaris*, swallow, lesser black-backed gull *Larus fuscus*, greater black-backed gull *Larus marinus* and black-headed gull *Chroicocephalus ridibundus*. Of these species it is possible that dunnock and house sparrow breed within the site.

11.37. No tern nesting sites are known within 1km of the site. During the phase 1 habitat survey, a herring gull was observed nesting on the roof of an adjacent building to the proposed car

parking area (Festival Market). No other gull nesting sites are known within 1km of the development.

Bats

11.38. A number of records of pipistrelle bats were provided by the South Lancashire Bat Group. LeRN provided multiple records of pipistrelle bats, with other bat species occasionally recorded in the last 20 years including Daubenton's bat, noctule, soprano pipistrelle and brown long-eared bat. Records of a number of bat roosts were provided, the closest of these being 600m south of the site.

11.39. During the extended Phase 1 habitat survey undertaken on 3 May 2019, the seven buildings present within the site were assessed externally from ground level to determine if they had suitability for roosting bats. Each of the buildings was assessed as holding low potential for roosting bats, however a further daytime inspection of these structures will be necessary by a licenced bat ecologist using an endoscope to determine if these features do indeed hold potential to be used as roosting features. If these features are found to hold roosting bat potential, nocturnal survey work may be required under BCT guidelines (BCT, 2016).

Other Species

11.40. Other ecology records of interest for the search area include the following:

- Round headed leek Sch8 WCA1981 - recorded in 2011 within the wider search area; and
- Otter – European protected species & Sch8 WCA1981 - recorded in 2015 in the south of Morecambe, approximately 1km south of the site.

11.41. No evidence of either of these species was recorded within the site during the Phase 1 habitat survey undertaken in 2019, neither is suitable habitat present for these species.

Further Surveys and Analyses

11.42. The following protected species surveys will be undertaken in summer 2019, during the optimal survey window:

- Internal and external inspections for roosting bats of all buildings affected by the proposed development.

11.43. It is not currently proposed to undertake further bird survey work at this site to inform the EIA. This is due to the wealth of existing bird data for this area, which is for a sufficient time period and of sufficient detail to enable a full assessment of potential impacts on birds associated with nearby protected sites including the Morecambe Bay and Duddon Estuary SPA and the Morecambe Bay Ramsar and SSSI. This approach has been agreed with Natural England (Knowles, E. pers comm, May 2019).

11.44. In addition to the information currently available to make the baseline assessment, the following information is also currently being obtained and will inform the EIA:

- RSPB – 10 years of detailed WeBS counts undertaken twice a month throughout the year for the Stone Jetty, Lancaster Sand and Shell Bed Flat extending up to 500m to the east of the site boundary;
- Pete Marsh (Local Bird Recorder) – 10 years of detailed WeBS counts undertaken twice a month for the area south west of the Stone Jetty, extending up to 500m to the west of the site boundary; and
- ABP Marine Environmental Research Ltd. – Records of usage of Morecambe Seafront by birds at low tide during 1990's and 2000's, including Shell Bed Flat.

Assessment Methodology

Key Issues and Requirement for Assessment

11.45. Ecological impacts can occur at all stages of a development process. Short-term impacts may result from preliminary ground investigation work, demolition and site clearance, drainage works and the construction activities themselves. Impacts associated with such activities are likely to be temporary and of a less significant nature than the longer-term impacts of the development. They may include risks such as disturbance to birds and other fauna using the site or the estuary, or may come from pollution incidents or similar. Temporary habitats may also be created during this stage of development.

11.46. Long-term and permanent impacts are associated with the loss, fragmentation or modification of habitats present on or around a development site. Individual species of flora and fauna could be impacted to differing degrees and in various ways by the loss or alteration of habitat. Finally, potentially permanent impacts on wildlife adjacent to a development may occur due to human interference in one form or another. Such disturbance may lead to habitat deterioration and the disturbance of individual animals using adjacent habitats.

11.47. In relation to habitats and plants, potential impacts would include the permanent loss of habitat as well as other possible impacts, for example, partial loss or reduction in species diversity. The significance of such impacts would be associated with the relative conservation importance of the specific habitat and associated species. Just as impacts could be adverse, a development such as this provides significant opportunities for beneficial impacts through appropriate habitat creation and design.

11.48. With regard to protected species and qualifying features for the internationally designated sites, the key impact would be actual habitat loss or effective loss of habitat due to disturbance. The significance of such impacts would be associated with the relative conservation importance of the specific habitat and associated species. However, the project presents opportunities to provide significant long-term ecological benefits.

11.49. The key potential effects of the proposed development on local ecological features include:

- Potential direct and/or indirect effects on qualifying species of nationally and internationally designated sites, including pollution impacts to habitats and a range of potential impacts to qualifying waterbird features such as habitat loss, construction and operational noise disturbance, visual disturbance, lighting impacts and possible increased bird collision risk;
- Potential direct and/or indirect effects on qualifying habitats of nationally and internationally designated sites, including pollution impacts to habitats and direct habitat loss;
- Potential direct and/or indirect construction effects on locally designated SBI's;
- Disturbance to, injury or killing of protected species during site clearance and construction works;
- Permanent habitat loss, including building demolition, severance and fragmentation impacts;
- Permanent loss and temporary damage to vegetation and plant communities during the construction period, including effects arising from uncontrolled spread of existing invasive species;
- Loss of breeding bird habitat and temporary potential disturbance to nesting sites during construction;

- Impacts on foraging habitats for bats; and
- Pollution as a result of sediments, chemicals, fuel or oil run off.

11.50. The Ecological Impact Assessment (EcIA) of the proposals upon identified ecological features will be undertaken with reference to the Ecological Impact Assessment Guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018). The EcIA will seek to:

- establish a robust and accurate ecological baseline for the site;
- identify and evaluate the nature conservation/biodiversity interest present;
- identify any potential effects arising from the proposed development (construction and operational stages);
- establish the character and significance of those identified effects;
- identify mitigation measures to address the significant effects;
- assess any residual effects and the need for any compensation; and,
- assess cumulative effects from other surrounding developments.

Sensitivity, Value or Importance

11.51. The CIEEM EcIA guidance (2018) confirms that detailed assessment of ecological features that are 'widespread, unthreatened and resilient to project impacts' is not necessary. It is therefore necessary to determine which ecological features are sufficiently important (and potentially affected by the Scheme). Decisions on relative importance will be outlined in the assessment and consider quality, extent, rarity (including local rarity) and threats or declines of a feature. Relevant statutory and non-statutory designations, legislation and policies will be taken account of, although not all populations of legally protected species show the same rarity, so contextual information is vital. Importance could also relate to the supportive function of the feature (ie providing a buffer, connections or opportunities for expansion/ climate change resilience of a neighbouring feature).

11.52. The importance of a feature will be identified within a defined geographical context, and will likely use the following frame of reference:

- International and European;
- National;
- Regional;
- County;
- Estuarine system/Coastal cell; and
- Local.

11.53. These criteria provide a starting point for the assessment but specific site conditions together with information on the local and wider context may result in different criteria being applied.

Characterisation of Impact

11.54. Although not necessary, it is good practice to describe potential impacts without and with mitigation. The proposals may result in multiple potential impacts on an important ecological

feature, but the CIEEM approach requires that only those that are likely to occur and have significant impacts need be assessed, although a precautionary approach to scoping potential impacts is recommended. The following characteristics are used to describe impacts (not all may be relevant in all cases):

- Direct or indirect;
- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

11.55. Once an impact has been described it is necessary to determine if the effect is 'significant'. In the context of CIEEM EcIA guidance a significant effect is one that either 'supports or undermines nature conservation objectives for 'important ecological features'. These may be specific objectives (eg for a designated site) or broad objectives (eg national/local nature conservation policy). The decision on significance is made irrespective of the geographical scale of importance of the feature; if an effect is found not to be significant at the level at which the receptor has been valued, it may be significant at a more local level. A significant negative effect is not necessarily one that would make the proposals unacceptable.

Likelihood of Effect

11.56. The following four-point scale will be used to express the degree of confidence in the prediction of impact significance. For residual impacts, this scale will also indicate the reliability of mitigation proposals:

- Certain/near certain;
- Probable;
- Possible; and
- Extremely unlikely.

Climate Change

11.57. European guidance (EC, 2013) requires that EIA considers the effects of projects on climate change and on biodiversity. The EC guidance indicates that impacts which are only likely to be experienced in the next 20 years should be based on current weather patterns or near-future projections if available and relevant. Beyond 20 years, potential impacts (those associated with operation of the development) may need to be modified in the light of the projected climate change. This will be taken into account in the assessment of operational effects.

Cumulative Effects

11.58. An assessment of the intra-relationship of effects with other topic areas will be undertaken. Those likely to be of relevance to ecology include hydrology, flood risk and drainage and landscape and visual effects.

11.59. The EcIA will include an assessment of the likely significant cumulative effects arising from other existing or approved developments in the area. The scope of projects to be considered in the cumulative assessment will be agreed in advance with statutory consultees.

Mitigation

11.60. Where it is not possible to avoid negative impacts, recommendations will be made to mitigate any significant detrimental impacts associated with the construction and operation of the proposed development on any identified Important Ecological Feature (IEF). Any other mitigation that is not related to an IEF, but is nonetheless considered necessary would also be set out.

Residual Effects

11.61. Once the appropriate mitigation measures have been proposed, the impacts remaining once they are taken into account will be identified. Any compensation required to offset these residual effects will then also be identified. Any compensation provided would be focused on the same type of ecological features as those affected and equivalent in terms of ecological 'functionality'. Should any biodiversity offsetting be required to achieve biodiversity net gain (BNG) at mandatory levels, a contemporary metric approved by Natural England would be applied to assess existing and proposed habitats.

Reporting

11.62. The ecological assessment will be presented in the Ecology chapter within the main volume of the ES. Technical appendices will be used to support the assessment presented in the main chapter.

12. Ground conditions and geology

Introduction

12.1. This Chapter considers the implications of the Scheme on ground conditions and geology during the construction and operational phases and any potential significant effects. It sets out the proposed methodology for assessing impacts to ground conditions and geology and identifies those impacts that can be scoped out of the Environmental Impact Assessment (EIA).

Study Area

12.2. The study area for the ground conditions and geology chapter will incorporate the site area shown at **Appendix 1.1** plus a buffer of 250 m beyond the redline boundary. It is considered that this is the only area that would be affected in terms of ground conditions and geology based on potential sources of contamination and the sensitivity of environmental receptors.

Planning Policy Context

12.3. Legislation relevant to the Scheme will be presented in the Environmental Statement (ES) and will consist of the following aspects:

- European policy;
- National policy; and
- Local planning policy

12.4. The following legislation will underpin the assessment and will be described in detail in the assessment:

- Part 2A of the Environmental Protection Act, 1990;
- Environment Act, 1995;
- Control of Substances Hazardous to Human Health Regulations, 2002 (as amended);
- The Water Environment (Water Framework Directive) (England and Wales) Regulations, 2003 (2000/60/EC);
- Dangerous Substances Directive (Amendment), 2006 controls the amount of dangerous substances that are discharged into inland, coastal and territorial waters;
- Environmental Damage and Liability (Prevention and Remediation) Regulations, 2009;
- The Environmental Permitting (England and Wales) Regulations, 2010;
- Control of Asbestos Regulations, 2012;
- Contaminated Land (England) (Amendment) Regulations, 2012; and
- Construction (Design & Management) (CDM) Regulations, 2015.

12.5. The following policy and guidance will underpin the assessment and will be described in detail in the assessment:

- National Planning Policy Framework, 2019.

12.6. Policy and plans relevant to the Scheme forming part of the ES will consist of the following aspects:

- A schedule of the relevant national, regional, county and local policies; and
- A commentary setting out the significance of the impact of the Scheme on each policy objective.

Baseline Conditions

12.7. The following data sources have been consulted to inform the baseline review:

- WSP (2019), Eden Project North, Morecambe – Geo-Environmental Preliminary Risk Assessment Report (currently in production);
- Cranfield Soil and Agrifood Soilscapes Database;
- Natural England MAGIC Database; and
- Agricultural Land Classification (ALC) 1:250,000 Scale Series.

Geology

Topsoil/Subsoil

12.8. Topsoil/subsoil is anticipated to be present within landscaped areas. With reference to the Cranfield Soil and Agrifood Institute Soilscapes database, the soils are classified as Soilscape 23 which are loamy and sandy soils with naturally high groundwater and a peaty surface.

Made Ground

12.9. Made Ground is anticipated at the site due to a large portion of the site being reclaimed from Morecambe Bay, construction of the promenade, the potential for infilled paddling pools/ swimming pools and the former railway associated with the historical Morecambe Harbour.

Superficial Deposits

12.10. The British Geological Survey (BGS) Online Viewer indicates that there are a variety of superficial deposits present within the site area.

12.11. The published geological maps indicate that superficial deposits are absent in the main/ central site area to the north of Marine Road Central with the exception of a small area of Bank Deposits immediately north of the promenade. This area was reclaimed and is indicated by available online data to comprise artificial ground.

12.12. Raised Tidal Flat Deposits are present to the south of Marine Road Central, in the western part of the site.

12.13. Storm Beach Deposits and Glacial Till are present underlying the main promenade in the east with Tidal Flat Deposits at the eastern-most extent of the site.

Bedrock Geology

12.14. The underlying bedrock geology comprises mudstone, siltstone and sandstone of the Millstone Grit Group.

Mining/Mineral Resources

12.15. The site is not located within a coal mining area and there are not considered to be any potential mineral resources within the study area.

Radon

12.16. The site is located in an area with elevated radon potential where 5-10% of properties are above the action level. Basic radon protection measures are required in new dwellings.

Hydrogeology

12.17. The Raised Tidal Flat Deposits are classified as unproductive strata, The Storm Beach Deposits and Bank Deposits are Secondary B aquifers. The Tidal Flat Deposits and Glacial Till are Secondary Undifferentiated aquifers.

12.18. The Millstone Grit bedrock is classified as a Secondary A aquifer.

12.19. The site is not located within a source protection zone (SPZ) and there are no groundwater abstractions within 250m of the site.

12.20. The site is located within the Lune and Wyre Carboniferous Aquifer groundwater body (reference GB41202G102700) which was classified under the Water Framework Directive (WFD) as having good overall status in 2016.

Hydrology

12.21. The site includes an area located along the promenade, extending out into Morecambe Bay.

12.22. There are no surface watercourses present within 250 m of the site.

Unexploded Ordnance

12.23. The site is located in an area that is considered to be at a low risk from unexploded ordnance.

Designated Sites

12.24. There are no designated regional geologically or geomorphologically important sites (RIGS) located within 250 m of the site.

12.25. The site extends into Morecambe Bay which is classified as a Ramsar site, Special Protection Area (SPA), Special Area of Conservation (SAC) and a Site of Special Scientific Interest (SSSI).

Agricultural Land Classification

12.26. The site is located in an area classified as Urban, under the Agricultural Land Classification of England and Wales.

Potential Sources of Contamination

12.27. Based on a review of publicly available desk-based information and the information provided within the Preliminary Risk Assessment, the following potential sources of contamination within the study area have been identified:

- Infilled ground associated with reclamation of part of the site from Morecambe Bay, infilling of the former paddling pool and swimming pools and the jetty;

- Former railway land associated with the historical Morecambe Harbour; and
- Offsite potential sources of contamination within 250 m of the site include railway land, garages, gasworks, laundry, unspecified works and a sawmill.

Potential Contaminant Pathways

12.28. Potential contaminant pathways include:

Human Health

- Direct contact, soil ingestion and inhalation; and
- Migration and accumulation of ground gas/vapours followed by inhalation / asphyxiation.

Controlled Waters

- Infiltration of rainwater and leaching of contamination into shallow perched water/ underlying groundwater aquifer and through the retaining walls into Morecambe Bay; and
- Surface runoff of contaminants and sediments into Morecambe Bay.

Infrastructure

- Direct contact.

Potential Environmental Receptors

12.29. Potential environmental receptors include:

Human Health

- Construction/maintenance workers;
- Future site users; and
- Neighbouring site users during construction.

Controlled Waters

- Underlying superficial and bedrock aquifer; and
- Adjacent Morecambe Bay coastal waters (SAC, SPA, Ramsar site, SSSI).

Infrastructure

- Services such as water mains; and
- Foundations and other underground structures.

Assessment Methodology

Topics and Elements of Topics to be Scoped in and out

12.30. The following elements have been **scoped out** of the EIA:

- The effect on statutory and non-statutory sites of geological importance, as no sites have been identified within the study area or surrounding area;

- Impacts on agricultural land;
- Impacts on soil quality;
- Impacts on potential mineral resources; and
- Impacts associated with historical mining activity.

12.31. The following elements have been **scoped in** to the EIA:

- Impacts associated with construction phase activities such as the establishment of temporary construction compounds, use and maintenance of heavy machinery, fuel/oil and chemical storage, potential spills and stockpiling of materials; and
- Impacts associated with the potential for encountering potentially contaminated Made Ground during the construction phase.

12.32. A **Detailed Level** of assessment will be undertaken as defined by DMRB Volume 11, Section 3 Part 11 Soils and Geology, DMRB Volume 11 and DMRB Volume 11, Section 2 Part 5 HA 205/08 Assessment and Management of Environmental Effects (Ref 12.13). The methodology will include:

- Review baseline soil, geological and environmental information for the study area, including historical mapping to enable an assessment of potential constraints associated with land contamination;
- List and assess potential impacts;
- Assess the sensitivity of the attributes; and
- List and assess the likely significance of the effects.

12.33. The potential impacts will take into consideration both the construction and operational phases of the Scheme. Contaminated land issues will be assessed in accordance with Model procedures for the Management of Contaminated Land (CLR11). The document advocates the use of a Conceptual Site Model (CSM) to establish the links between a potentially hazardous source and a sensitive receptor via an exposure pathway. The concept behind this approach is that, without each of the three fundamental elements (source, pathway and receptor), there can be no risk from contamination. Thus, the mere presence of a contamination hazard at a particular site does not necessarily imply the existence of associated risks.

Assessment Criteria

12.34. The likely significant environmental effects are assessed based on consideration of the sensitivity of receptors and the predicted magnitude of the potential effects. The magnitude of the impact on the identified receptor/receiving environment is assessed as major, moderate, minor or negligible. The significance of the effect on identified receptors/receiving environments is assigned a significance category on a scale ranging from very large to neutral. Professional judgement in consideration of the guidance provided in DMRB Volume 2 Part 5 HA 205/08 will be used to assess the magnitude of impact and significance of the effect.

Cumulative Effects

12.35. There are not considered to be any significant cumulative effects from this project relating to ground conditions and geology.

Mitigation

12.36. The likely mitigation measures to be applied to the proposed development to avoid, prevent or reduce significant effects to ground conditions and geology related environmental receptors, during both the construction and operational phase are outlined below.

Construction

- Implementation of a Construction Environmental Management Plan (CEMP) to mitigate risks associated with the construction phase including measures to mitigate physical and chemical surface water contamination and to limit chemical spillages.
- Earthworks to be completed in accordance with a CL:AIRE compliant Materials Management Plan (MMP) to ensure that re-used material does not pose a risk to human health or the environment.
- Soil management operations to generally be in accordance with DEFRA's Good Practice Guide for Handling Soils.
- Construction works to be completed in accordance with relevant guidance and best practice guidance documents to limit environmental impact during construction.
- Ensuring construction workers wear appropriate personal protective equipment (PPE) and use monitoring equipment where appropriate. The preparation of Risk Assessments and Method Statements (RAMS) will ensure the appropriate use of PPE such as respiratory protective equipment (RPE) where required.
- The preparation of RAMS to ensure mitigation measures such as temporary shoring is incorporated should there be a risk of loose or unstable ground.

Operation

12.37. The completion of earthworks in accordance with a MMP to mitigate potential longer term impacts to human health and controlled waters following completion of the Scheme.

Residual Effects

12.38. A potential adverse effect on human health (future site users, construction/maintenance workers and neighbouring site users during construction) could arise due to potential direct contact, ingestion and inhalation of contaminants and to surrounding controlled waters associated with the mobilisation and discharge of physical and chemical contamination. However, this is unlikely to be considered significant.

Reporting

12.39. The EIA for Ground Conditions and Geology will be presented as a chapter within the ES.

13. Hydrology, drainage and flood risk

Introduction

13.1. This chapter of the Environmental Statement (ES) Scoping Report has been produced by WSP and will consider the likely significant effects of the proposed development on the surrounding area with regards to flood risk, surface water and groundwater quality and quantity arising from the construction and operational phases.

13.2. Hydrology, drainage and flood risk will be scoped in to the EIA.

13.3. The following sections detail the study area, the understanding of the baseline environment, the assessment criteria and methodology, the potential environmental impacts and effects, and the envisaged mitigation which will be considered within the ES.

Study Area

13.4. The area of study for the assessment of hydrology, drainage and flood risk shall encompass sensitive water receptors within the influence of the proposed development, up to and including 500m from the Site. Outside of this distance, it is unlikely that any direct impacts upon the water environmental will be attributable to the Proposed Development.

13.5. The temporal scope for the ES Hydrology, drainage and flood risk chapter will cover the construction and occupation phases (assumed to be 50 to 60 years in line with NPPF guidance) for the proposed development.

Planning Policy Context

13.6. The applicable planning policy and guidance for assessing the impacts of the proposed development on the hydrology at the Site are listed below and summarised in **Appendix 13.1**.

National Planning Policy

13.7. A summary of the national planning policy relevant to hydrology, drainage and flood risk is provided below:

- National Planning Policy Framework (NPPF) - ISBN 978-1-5286-1033-9, 2019;
- Planning Practice Guidance (PPG) – Flood Risk and Coastal Change (March 2014); and
- Non-Statutory Sustainable Drainage Technical Standards (March 2015).

Local Planning Policy

13.8. A summary of relevant current local planning policy is provided below:

- Lancaster City Council Core Strategy 2003 – 2021 (July 2008);
- Lancaster City Council Development Management Development Plan Document (December 2014); and
- Lancaster City Council Morecambe Area Action Plan (December 2014).

Guidance/ Best Practice

13.9. A summary of the guidance/ best practice documents relevant to this chapter is provided below:

- Lancaster City Council Level 1 Strategic Flood Risk Assessment (October 2017);
- Lancashire and Blackpool Local Flood Risk Management Strategy (October 2013);
- Lancaster City Council Surface Water Drainage, Flood Risk Management and Watercourse Planning Advisory Note (May 2015);
- North West England and North Wales Shoreline Management Plan (February 2011);
- North West River Basin Management Plan (December 2009); and
- Kent Leven Catchment Flood Management Plan (December 2009).

Baseline Conditions

13.10. LiDAR, obtained from the Environment Agency, indicates that the Site is relatively flat with levels between 7.5m and 8m Above Ordnance Datum (AOD). There is a large low spot at the centre of the site, relating to the former Bubbles complex, with levels at approximately 4m AOD.

13.11. The Environment Agency's Flood Map for Planning shows the Site lies in Flood Zone 1, 2 and 3. The annual probability of flooding from rivers/seas to land in Flood Zone 1 is less than 0.1%. For Flood Zone 2, the annual probability of flooding is between 0.1% and 1% from rivers and between 0.1% and 0.5% for seas. The annual probability of flooding from rivers/seas to land in Flood Zone 3 is greater than 3.3%. Subsequently, the current risk of fluvial/tidal flooding to the Site is considered to be **'high'**.

13.12. The Environment Agency's Risk of Flooding from Surface Water mapping shows that the majority of the Site has a 'very low risk' of surface water flooding, with an annual probability of less than 0.1%. Several areas are shown to have a low (annual probability between 0.1% and 1%) to medium risk (annual probability between 1% and 3.3%) of flooding. However, these areas are localised and likely to be associated with low spots on the Site. Subsequently, the current risk of surface water flooding to the Site overall is considered to be **'low'**.

13.13. British Geological Survey (BGS) published maps indicate that the Site is underlain by a bedrock of Millstone Grit Group – Mudstone, Siltstone and Sandstone. For the majority of the Site, there are no recorded superficial deposits. However, a small area of Bank Deposits – Sediment, Shell (Shells) is identified at the north of the Site, Storm Beach Deposits – Gravel can be found along the south-east boundary of the Site and there are Raised Tidal Flat Deposits – Clay and Silt identified within the Site, south of the A589.

13.14. The bedrock is designated as a 'Secondary A' aquifer, as shown on DEFRA's Magic Mapping. Secondary A aquifers are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. The Storm Beach superficial deposits are also designated as a 'Secondary A' aquifer. The Bank superficial deposits are designated as a 'Secondary B' aquifer. Secondary B aquifers are defined as predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

13.15. The Magic mapping indicates that the Site does not lie within a Groundwater Source Protection Zone.

Assessment Methodology

13.16. The EA hydrology, drainage and flood risk chapter will provide a high-level qualitative assessment of the proposed developments effect on hydrology, including impacts to the water environment (water quality, drainage regime and water resource availability). The proposed assessment methodology has been adapted from the tables in the 'Design Manual for Roads and Bridges (DMRB) 'Volume 11.3.10: Road Drainage and the Water Environment'.

13.17. The significance level attributed to each effect will be assessed based on the magnitude of change due to the proposed development and the sensitivity of the affected receptor. The sensitivity of the affected receptor is assessed on a scale of very high; high; medium or low and the magnitude of change is assessed on a scale of high; medium; low or negligible (both adverse and beneficial).

13.18. The criteria used to determine the sensitivity of water receptors is shown in **Table 13.13.1**.

Table 13.1 - Sensitivity of Water Environment Receptors

Sensitivity	Criteria	Example
Very High	Receptor has a high quality and rarity on regional or national scale.	**Surface Water:** WFD Class 'High'; Site protected / designated under EC or UK habitat legislation (SAC, SPA, SSSI, WPZ, Ramsar site, salmonid water); species protected by EC legislation. **Groundwater:** Principal aquifer providing a regionally important resource or supporting site protected under EC and UK habitat legislation; SPZ1 **Flood Risk:** Essential infrastructure or highly vulnerable development.
High	Receptor has a high quality and rarity on local scale.	**Surface Water:** WFD Class 'Good'; species protected under EC or UK habitat legislation. **Groundwater:** Principal aquifer providing locally important resource or supporting river ecosystem; SPZ2. **Flood Risk:** More vulnerable development
Medium	Receptor has a medium quality and rarity on local scale.	**Surface Water:** WFD Class 'Moderate'. **Groundwater:** Aquifer providing water for agricultural or industrial use with limited connection to surface water; SPZ3. **Flood Risk:** Less vulnerable development.
Low	Receptor has a low quality and rarity on local scale.	**Surface Water:** WFD Class 'Poor'. **Groundwater:** Unproductive strata. **Flood Risk:** Water-compatible development.

13.19. The likely magnitude or extent of an impact (or change) on a receptor is established by assessing the degree of the impact relative to the nature and extent of the proposed development (see **Table 13.2**). Potential effects can be both adverse and beneficial. The derivation of magnitude is carried out independently of the sensitivity of the water resource.

Table 13.2 - Magnitude of an Impact on a Receptor

Sensitivity	Criteria	Example
High (adverse)	Results in loss of receptor and / or quality and integrity of the attribute.	**Surface Water:** Calculated risk of pollution from a spillage >2% annually; loss or extensive change to a fishery; loss or extensive change to a designated Nature Conservation Site. **Groundwater:** Loss of or extensive change to an aquifer; potential high risk of pollution to groundwater from routine runoff; calculated risk of pollution from spillages >2% annually; loss of or extensive change to groundwater supported designated wetlands. **Flood Risk:** Increase in peak flood level (1% annual probability) >100 mm.
Medium (adverse)	Results in effect on integrity of receptor, or loss of part of receptor.	**Surface Water:** Calculated risk of pollution from spillages >1% annually and <2% annually; partial loss in productivity of a fishery. **Groundwater:** Partial loss or change to an aquifer; potential medium risk of pollution to groundwater from routine runoff; calculated risk of pollution from spillages >1% annually and <2% annually; partial loss of the integrity of groundwater supported designated wetlands. **Flood Risk:** Increase in peak flood level (1% annual probability) >50 mm.
Low (adverse)	Results in some measurable change in receptors quality or vulnerability.	**Surface Water:** Calculated risk of pollution from spillages >0.5% annually and <1% annually. **Groundwater:** Potential low risk of pollution to groundwater from routine runoff; calculated risk of pollution from spillages >0.5% annually and <1% annually; minor effects on groundwater supported wetlands. **Flood Risk:** Increase in peak flood level (1% annual probability) >10mm.
Negligible	Results in effect on receptor, but of insufficient magnitude to affect the use or integrity.	**Surface Water:** Risk of pollution from spillages <0.5% annually. **Groundwater:** No measurable impact upon an aquifer; risk of pollution from spillages <0.5%. **Flood Risk:** Negligible change in peak flood level (1% annual probability) <+/- 10 mm.
Low	Results in some beneficial effect	**Surface Water:**

(beneficial)	on receptor or a reduced risk of negative effect occurring.	Calculated reduction in existing spillage risk by 50% or more (when existing spillage risk is <1% annually). **Groundwater:** Calculated reduction in existing spillage risk by 50% or more to an aquifer (when existing spillage risk <1% annually). **Flood Risk:** Reduction in peak flood level (1% annual probability) >10 mm.
Medium (beneficial)	Results in moderate improvement of receptor quality.	**Surface Water:** Calculated reduction in existing spillage by 50% or more (when existing spillage risk >1% annually). **Groundwater:** Calculated reduction in existing spillage risk by 50% or more (when existing spillage risk is >1% annually). **Flood Risk:** Reduction in peak flood level (1% annual probability) >50 mm.
High (beneficial)	Results in major improvement of receptor quality.	**Surface Water:** Removal of existing polluting discharge or removing the likelihood of polluting discharges occurring to a watercourse. **Groundwater:** Removal of existing polluting discharge to an aquifer or removing the likelihood of polluting discharges occurring; recharge of an aquifer. **Flood Risk:** Reduction in peak flood level (1% annual probability) >100 mm.

13.20. Once the sensitivity of the receptor and the magnitude of impact/ change are both established, the potential effect can then be derived by combining the two assessments in a simple matrix as set out in **Table 13.3**.

Table 13.3 - Significance of Potential Effects

Importance of Receptor	**Magnitude of Impact**			
	Negligible	Low	Medium	High
Very High	Neutral	Moderate/ Major	Major	Major
High	Neutral	Minor/ Moderate	Moderate/ Major	Major
Medium	Neutral	Minor	Moderate	Major
Low	Neutral	Neutral	Minor	Minor/ Moderate

13.21. The following terms will be used to define the significance of the effects identified:

- **Major effect**: where the proposed development could be expected to have a considerable effect (either positive or negative) on receptors (on flooding, drainage, water quality and/ water resources and associated sensitive receptors);

- **Moderate effect**: where the proposed development could be expected to have a noticeable effect (either positive or negative) on receptors (on flooding, drainage, water quality and/ or water resources and associated sensitive receptors);

- **Minor effect**: where the proposed development could be expected to result in a small, barely noticeable effect (either positive or negative) on receptors (on flooding, drainage, water quality and/ or water resources and associated sensitive receptors); and

- **Neutral**: where no discernible effect is expected as a result of the proposed development on receptors (ie the effect is insignificant).

Cumulative Effects

13.22. The following potential significant cumulative effects will be assessed for both the construction and occupation phases of the project.

Construction Impacts and Effects

- Potential increase in flood risk due to earthworks or drainage improvements on hydrology and surface water flows on- site;

- Short term alterations to groundwater flow and quality;

- Potential contamination of water resources through leaks and spills; and

- Potential increase in physical contamination (ie sedimentation) entering surface waterbodies and drainage features due to ground disturbance.

Occupation Impacts and Effects

- Potential increase in on and off-sire flood risk due to an increase in impermeable surface areas and the disturbance of groundwater flow paths; and,

- Potential increase in physical contamination (ie sedimentation) or surface waterbodies.

Mitigation

13.23. A Flood Risk Assessment (FRA) will be prepared to assess the risk to the Site from all (Coastal, Overland and Drainage) flood sources over its lifetime, accounting for the impacts of climate change, and to demonstrate that an acceptable drainage strategy exists for the Site. The FRA will be undertaken in accordance with the requirements of the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance for Flood Risk and Coastal Change, and other relevant national and local policy and guidance.

13.24. Consultation will be carried out with the Environment Agency, Lancaster City Council and Lancashire County Council, as the Lead Local Flood Authority (LLFA), to agree the scope of the FRA. Where potential risks to the proposed development or neighbouring land uses as a result of the proposed development are identified, the FRA will present details of the mitigation measures to be incorporated into the development to manage unacceptable risks.

13.25. The FRA will include a preliminary Drainage Strategy (DS) for the Site. The DS will include a description of the existing drainage system, including any existing off-site connections. Any likely changes to the existing surface water drainage regime will be identified and any potentially significant impacts, both on-site and off-site, assessed. A discussion regarding mitigation measures and the incorporation of SuDS will be included. The DS will also include an appropriate water quality treatment plan for the proposed development, as necessary, to mitigate any potential environmental impacts.

13.26. The result of a Site Investigation (including soakage testing and groundwater monitoring) will

be required to inform the DS, in order to confirm the potential for infiltrating SuDS at the Site.

13.27. The FRA and DS will be appended to the hydrology, drainage and flood risk chapter of the ES.

13.28. If required (subject to confirmation with the Environment Agency), a Water Framework Directive (WFD) assessment will be undertaken and appended to the ES chapter.

Residual Effects

13.29. At this stage, we do not foresee any residual effects following the implementation of the mitigation measures identified above. However, we will continually review the potential for residual effects throughout the production of the hydrology, drainage and flood risk ES chapter and these will be included within the document as required.

Reporting

13.30. A desk study of baseline (ie existing) hydrology, drainage, flood risk and the effects of climate change will be undertaken to determine the likely significant effects caused by the proposed development. This will be done through a combination of:

- Review topographic survey to inform the assessment of flood risk and the development of the surface water drainage strategy (a preliminary review of available LiDAR has been undertaken in the Baseline section);
- Consultation with stakeholders and regulators (including Lancaster City Council, Lancashire County Council, the Environment Agency and United Utilities) to obtain baseline data on the water environment (groundwater levels, sewer records, history of flooding, presence of flood defences, policy requirements etc.);
- Review online Environment Agency flood risk mapping including the Flood Map for Planning and the Flood Map for Surface Water (a preliminary review has been undertaken in the Baseline section);
- Review online British Geological Society (BGS) borehole records and geological mapping (a preliminary review has been undertaken in the Baseline section); and
- Review soakage testing and groundwater monitoring results to determine the potential for infiltration on the Site.

13.31. A Flood Risk Assessment (FRA) will be prepared to assess the risk to the Site from all flood sources over its lifetime, accounting for the impacts of climate change, and to demonstrate that an acceptable drainage strategy exists for the Site. The FRA will include a preliminary Drainage Strategy (DS) for the Site. The DS will include a description of the existing drainage system, including any existing off-site connections.

13.32. The FRA and DS will be appended to the hydrology, drainage and flood risk chapter of the ES.

13.33. If required (subject to confirmation with the Environment Agency), a Water Framework Directive (WFD) assessment will be undertaken and appended to the ES chapter.

14. Traffic, transport and access

Introduction

14.1. This chapter of the Environmental Statement (ES) Scoping Report has been produced by WSP. The transport strategy for the Eden Project North (EPN) site is being developed to reflect EPN's transport vision for the development. This transport vision aims to position EPN as a leading example for progressive and healthy transport methods in the UK. It aims to provide a clean, smooth, accessible, fun and active alternatives to the traditional transport strategies of reliance upon the private car.

14.2. The EPN transport vision is attached at **Appendix 14.1**.

14.3. The traffic, transport and access ES chapter will assess the likely environmental impacts of the proposed development from a transport perspective. It will build upon the findings of a formal Transport Assessment (TA) prepared in line with good practice advice set out in national policies, and reflecting the aims and objectives of the transport vision. The TA will form an appendix to the EIA.

14.4. The TA process is yet to begin although we have held a very positive initial meeting with Lancashire County Council (LCC) highways officers which has informed this scoping note. The notes of this meeting are attached at **Appendix 14.2**. In particular LCC noted that the general principles of the EPN transport vision were in accordance with their own transport and highways aspirations and they were supportive of the vision.

14.5. The purpose of the EIA assessment is to identify sensitive receptors, users. roads and access points likely to be affected by the proposed development. The transport EIA chapter will then consider the likely environmental effects on the transport network.

14.6. The EIA assessment will also make reference to details of the measures proposed within a Travel Plan (TP) designed to reduce the demand for travel by private car, again in line with the EPN transport vision.

14.7. A description of the proposed development is provided in Chapter 2.

Study Area

14.8. The application site lies on the edge of Morecambe Bay. It comprises land that was reclaimed from the sea between Marine Road Central and the shoreline. The land has traditionally provided space for public recreation for residents and visitors alike over time. It is an important interface between the town and open views towards the bay and the Lake District beyond.

14.9. The Study Area comprises land situated to the north and west of Morecambe Town Centre and broadly falls within the following areas:

- The main development site bound by the promenade to the north and east, Marine Road Central to the south and Grade II listed Midland Hotel to the west;
- The promenade to the north, east and west of the main development site, including the sea wall and part of the bay to the north and stone jetty to the north west; and
- Adopted highways, car parks, footways and public realm to the south of the site. It is noted that National Cycle Routes 69 and 700 run through the site, and from initial discussions with Lancaster City Council it is anticipated minor diversions of these may be

required.

14.10. A site location plan showing the extent of the 'Area of Interest' is shown at **Appendix 1.1**. In total, the site area extends to circa 14.84ha.

14.11. In addition to areas within the defined site area, we have considered the wider transport impact of the development within this scoping chapter, in particular possible off-site cycle links and off-site highway impact through use of the Caton Road Park and Ride off the M6 J34.

Planning Policy Context

14.12. The following section sets out the key national, regional and local traffic and transport policies that are relevant to the proposed development and that will be used to inform the Transport Assessment.

National Planning Policy Framework, 2019

14.13. The National Planning Policy Framework (NPPF) has a core focus on streamlining the overall development process. It maintains that plans and decisions should apply a presumption in favour of sustainable development.

14.14. The NPPF states that development:

> *"should only be prevented or refused on transport grounds if there would an unacceptable impact on highway safety, or the residual cumulative impacts of development are severe (para 109)."*

14.15. The NPPF states (para 110) that applications for new development should:

> *"a) Give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;*
>
> *b) Address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*
>
> *c) Create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*
>
> *d) Allow for the efficient delivery of goods, and access by service and emergency vehicles; and*
>
> *e) Be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations."*

14.16. In the assessment of development proposals, it should be ensured that:

> *"a) Appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;*
>
> *b) Safe and suitable access to the site can be achieved for all users; and*
>
> *c) Any significant impacts from the development on the transport network*

(in terms of capacity and congestion), or in highway safety, can be cost effectively mitigated to an acceptable degree."

14.17. Furthermore, the NPPF states:

> *"All developments that will generate significant amounts of movement should be required to provide a Travel Plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed." (para 111)*

Planning Practice Guidance

14.18. The Government's Planning Practice Guidance (PPG) supplements the NPPF. There is a section clarifying the over-arching principles on Travel Plans, Transport Assessments and Transport Statements.

14.19. There are also sections advising further on each of these three documents. The guidance on Transport Assessments and Statements re-iterates the circumstances in which either document would usually be required.

14.20. It is clear that a development of the size and nature of EPN requires a full Transport Assessment and Travel Plan in addition to the ES chapter.

Lancashire Local Transport Plan 2011 – 2021 (2011)

14.21. The Lancashire Local Transport Plan 2011 – 2021 takes a ten-year view of transport in Lancashire. It states the seven priorities developed to deliver tangible improvements over the life of the strategy:

- Improving access into areas of economic growth and regeneration;
- Providing better access to education and employment;
- Improving people's quality of life and wellbeing;
- Improving safety of our streets for our most vulnerable users;
- Providing safe, reliable, convenient and affordable transport alternatives to the car;
- Maintaining our assets; and
- Reducing carbon emissions and its effects.

Lancaster Local Plan

14.22. The Local Plan for Lancaster District 2011 – 2031 provides a new planning framework for the area adopted in July 2008.

14.23. Policy NPPF1: Presumption in Favour of Sustainable Development states that:

> *"the council will take a positive approach that reflects the presumption in favour of sustainable development contained within the NPPF. It will always work proactively with applicants to jointly find solutions which means that proposals can be approved wherever possible, and secure development that improves the economic, social and environmental conditions in the area."*

14.24. Policy DM3: Public Realm and Civic Space note that:

> *"The council will expect development proposals within urban areas to make a positive contribution to their surroundings, through the good use of design, layout and use of materials, to create positive, safe and attractive streetscapes which contribute to the visual amenity of their locality and encourage good accessibility and connectivity between buildings and urban spaces."*

14.25. Proposals for major leisure facilities or attractions that involve more than 1,000sqm of floorspace or 1 hectare or more of land will be permitted where (Policy DM12: Leisure Facilities and Attractions):

> *"The site is within the identified town centre boundary of Lancaster and Morecambe, preferably in a brown field location within Morecambe which can provide a catalyst for regeneration within the locality, or is supported by a specific site allocation in the Land Allocations DPD"*

14.26. In transport terms, Policy DM20: Enhancing Accessibility and Transport Linkages states that "*The council will seek to ensure that development proposals, particularly those which will generate significant footfall and motorised vehicle journeys, are located where sustainable travel patterns can be achieved*". Besides, proposals should minimise the need to travel, particularly by private car and maximise the opportunities for the use of walking, cycling and public transport.

14.27. Policy DM21: Walking and Cycling intends to protect, maintain and improve the pedestrian environment whilst building on the previous success of Lancaster's designation as a 'Cycling Demonstration Town'.

Morecambe Area Action Plan

14.28. The Morecambe Area Action Plan (MAAP) is a spatial plan for central Morecambe, the priority area for regeneration within Lancaster District. Adopted in 2014 as a Development Plan Document, part of the new Local Plan for Lancaster District. The MAAP provides a framework for the investment, development and change required to regenerate the central Morecambe.

14.29. Spatial Policy 3 (SP3). Morecambe Main Seafront and Promenade identifies this area as open space for peoples' informal recreation and enjoyment. The Council will protect this main seafront and promenade from development other than that which will demonstrably enhance the open character or is reasonably required to provide or improve opportunities for appropriate informal recreation and enjoyment and will not otherwise harm the open character.

14.30. Development Opportunity Policy DO2. Strategic Leisure – Seafront Headland, Central Promenade identifies the proposed site for the Eden Project North as a strategic opportunity for leisure investment and development. The Council will support development proposals for a visitor/education centre. Besides, the Council will further require that any development:

> *"Contributes to improving public realm within the Main Seafront and Promenade; and*
>
> *Provides for vehicle access, servicing and parking in ways not adverse to public amenity and pedestrian circulation on the Main Seafront, and improves public amenity and safety for pedestrian crossings and reduce the perceived and real severance effect of the highway with the town landward."*

14.31. In relation to Marine Road Central, Action Set 5 of the MAAP mentions the Central Seafront and Main Beach and the intention to "*Introduce shared surfaces on Marine Road Central via phased works over time."* The focus is on improving connectivity between the Seafront and

the town centre, with safe and convenient crossings of Marine Road Central.

Baseline Conditions

14.32. The land within the red line boundary is predominantly brownfield. Areas of greenfield land are limited to landscaping as part of previous public realm works.

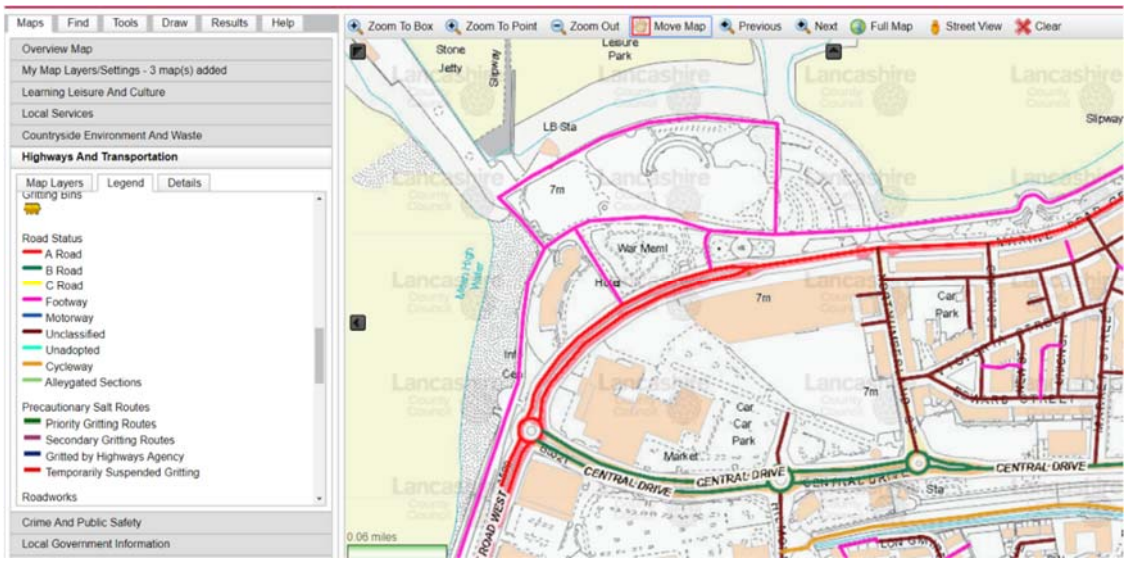
14.33. The existing land uses are as follows:

- The main development site is a large brownfield site formerly in use as the Bubbles complex. The former Bubbles complex comprised a swimming pool, slides and other recreational activities. Following the closure of the former Bubbles complex, the site remains largely accessible by pedestrians via the adjacent promenade and footpaths. Vehicular access is also achievable via the promenade. The site is currently accessible by the public but provides limited opportunities for recreation and enjoyment;

- The promenade, sea wall and stone jetty extending out to the north form part of the public realm which are accessible as open space for recreation and enjoyment; and

- Adopted highways (plan), footways and junctions are included in the red line, as it is envisaged that some highways and public realm works will be required to support the main development site. The adopted highways in the vicinity of the site are at **Figure 14.1** below.

Figure 14.1: Adopted highways in the vicinity of the site



Walking

14.34. The Morecambe promenade is a well-patronised pedestrian corridor that runs from Heysham in the south to Hest Bank in the north.

14.35. Morecambe town centre has multiple walk routes and pedestrian crossing points as would be expected in a town centre, and has a high level of footfall.

14.36. The TA and associated ES transport chapter will include a full site audit (with photographs) of the existing walk routes in the vicinity of the site, together with explanation and diagrams of how the EPN proposals will complement and enhance the existing walking routes and public realm.

Cycling

14.37. The National Cycling Route 69 (Way of the Roses) runs from Morecambe on the west coast to Bridlington on the east coast. The section between Lancaster and Morecambe is a 5.7 miles long segregated traffic free route along the River Lune. The cycling route is just 100 metres away from the Caton Road Park and Ride facility described below.

14.38. National Cycle Route 700 (The Bay Cycle Way) also runs in the vicinity of the site.

14.39. As with walking routes, the TA and ES transport chapter will audit the existing cycle routes and explain how the EPN proposals will complement and enhance the existing cycle routes in and around the site and the wider town, to encourage cycling both as a means of accessing the site and more generally as a means of travel to and from the town centre.

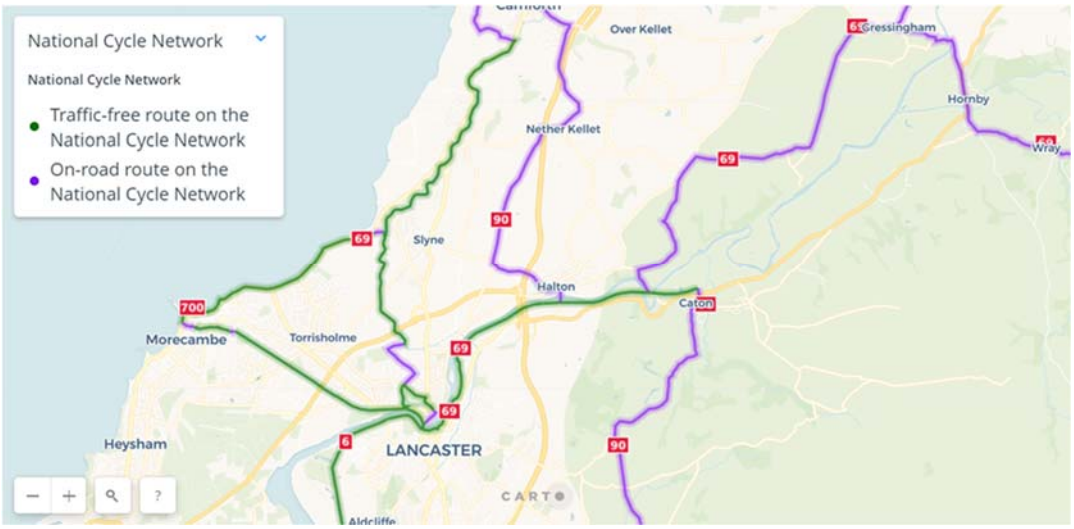
14.40. From initial discussions with Lancaster City Council, it has become apparent that minor diversions of one or both of NCN 69 and 700 may be required to facilitate the development proposals. This will be discussed in detail with Lancashire County Council, Sustrans and other relevant stakeholders as the development proposals progress towards a planning application.

14.41. The cycling network in the local area is shown at **Figure 14.2** and **Figure 14.3** below.

Figure 14.2: Cycling network in local area



Figure 14.3: Cycling network in local area (cont'd)



Public Transport

14.42. Morecambe Bus Station is located next to the Railway Station adjacent to the proposed development site, forming a transport hub in the town centre. Services connect Morecambe with Kendal, Lancaster, Preston and multiple local and regional points.

14.43. Morecambe Railway Station is co-located with the Bus Station, adjacent to the proposed location of the development. It connects Morecambe with Lancaster, Heysham Port and Leeds. Services run approximately every 40 minutes to Lancaster during the weekday daytime, with some services extended beyond Lancaster to other destinations.

14.44. The rail line between Morecambe and Lancaster is not currently electrified and there are understood to be no immediate plans to do so. There are certain capacity issues including use of the Morecambe – Lancaster line by trains to Heysham Power Station, and wider capacity issues on the West Coast Main Line at Lancaster and beyond. Lancaster City Council have held an initial meeting with Northern Rail who were interested in the opportunities relating to likely increased levels of use arising from EPN.

14.45. Lancaster Railway Station is 9 minutes away by train and 36 minutes away by bus from Morecambe town centre. It has regular connections with Edinburgh, Glasgow, Carlisle, Leeds, Manchester and London.

Caton Road Park and Ride

14.46. The 650-space new Park and Ride (P&R) in Lancaster is located at the junction of Caton Road with the M6 J34 slip road. A bus service connects the P&R with Lancaster city centre every 30 minutes Monday to Saturday.

14.47. The location does not just cater for park and ride users, it is also possible to meet up for car sharing and as a starting point for walking and cycling in the local area including along the River Lune.

14.48. It is understood that the site currently operates under capacity, and as it has now been open since late 2016 it is likely that usage has reached steady state levels. There is the potential to expand with a further circa 600 spaces if necessary using land owned by Lancashire County Council, this could be done through surface car parking without the need for a decked car park.

14.49. Eden Project International and WSP will investigate the feasibility of using the J34 P&R as an intermodal transport hub where visitors could park their private vehicles and use alternative sustainable transport modes for the last part of their journey to the development site. This is linked to the sustainable transport vision attached at **Appendix 14.1.**

Highway Network

14.50. The M6 is a three-lane dual-carriageway motorway managed by Highways England (HE) as part of the Strategic Route Network. The Junction 34 is the most direct access point to Lancaster and Morecambe. Junction 34 has been upgraded in the last five years by Highways England to provide additional capacity to co-ordinate with the A683 Heysham link road upgrade.

14.51. The A683 two-lane dual carriageway is the most direct road to access Morecambe from the Junction 34. It is formed by a two-lane dual carriageway. This route was recently upgraded to dual carriageway status, completed in late 2016.

14.52. Morecambe Road is the main local road to access the proposed development via either the A589 Broadway or the Lancaster Road.

14.53. The Marine Road Central is a two-way carriageway with on-street parking facilities at

Morecambe seafront. It is the central section of the Marine Road, connecting the Marine Road West with Marine Road East.

Parking in Morecambe Town Centre

14.54. Off-street parking in the town centre is split into long-stay (circa 902 spaces) and short stay (circa 424 spaces). It is understood that space is typically available in many of these car parks even at peak times. Charges vary according to duration of stay, but a five hour stay in the long-stay car parks is available for £4.20 at present.

14.55. There are a further circa 500 spaces in the vicinity of Morrisons Supermarket, with a maximum stay of three hours.

14.56. Limited on-street parking is also available in the town centre, albeit with a time limitation of typically two hours.

Traffic Flows

14.57. Up to date traffic flow data can be obtained through new traffic surveys if required as part of the Transport Assessment process. This will be determined through scoping with the highway authority. It is understood the Morecambe traffic model has recently been updated and can be used to assess traffic impact across the town.

Assessment Methodology

14.58. The aim of the ES chapter will be to identify, as far as reasonably possible, the nature of the transport changes within the area of the proposed development, to assess significance and to make appropriate recommendations. The assessment will include consideration of traffic impacts during construction as well as impacts during the operation of the proposed development.

14.59. A Scoping Study for the TA will be produced and agreed with Lancashire County Council and Lancaster City Council, plus Highways England, to formally agree the content of the assessment. Any comments from the highways authorities will be incorporated as part of the TA work.

14.60. The assessment will be informed by a comprehensive site audit, the aim of which will be to gather baseline information, assess local walk and cycle network and other transport network constraints, observe traffic movements at critical local junctions and verify modelling outputs.

14.61. Multi-modal trip rates will be agreed with Lancashire County Council as highway authority, and also with Highways England, and will be based upon potential visitor numbers to the site and likely mode share.

14.62. The Transport Assessment will consider the highways impacts of HGV movements during the construction process, both in terms of quantum and also the potential routing.

14.63. The junctions required to be assessed within the TA will be agreed with LCC and Highways England during the pre-application process. These junctions will then be assessed for future operation and capacity. The results of these assessments will inform the need for any off-site highway mitigation measures.

14.64. The assessment would include an evaluation of the traffic generated by all pertinent consented or committed developments in the vicinity of the site. This would ensure that the EIA appropriately evaluates the cumulative impacts of EPN in conjunction with other potential developments.

14.65. The approach for this assessment will be in accordance with the Institute of Environmental

Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Road Traffic. The purpose of the guidelines is to provide a systematic, consistent and comprehensive approach to the assessment of the environmental impacts of traffic associated with major new development projects.

14.66. For the purposes of the EIA chapter, the EIA Guidelines recommend that the environmental effects listed in Table 2.1 of the guidance be considered important when considering traffic from an individual development. These effects include:

- Noise; Vibration; Visual Impact; Severance; Driver Delay; Pedestrian Delay; Pedestrian Amenity; Accidents and Safety; Hazardous Loads; Air Pollution; Dust and Dirt; and Heritage and Conservation.

14.67. Of these effects, several are considered in chapters elsewhere within the EIA due to the specialist skills required; namely noise, vibration, visual impact, air pollution, dust and dirt, and heritage and conservation. With regards to the remaining effects the guidance states that the following rules should be used as a screening process to delimit the scale and extent of the assessment:

- Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and

- Include any other specifically sensitive areas where traffic flows have increased by 10% or more.

14.68. The IEMA guidelines go on to state that any increases in traffic flows of less than 10% are generally accepted as having no discernible environmental impact as daily variance in traffic flows can be of equal magnitude.

14.69. The 30% threshold relates to the level at which humans may perceive change and there may therefore be an effect. Impacts above this level therefore do not suggest that there is a significant impact, only that further consideration is required to assess the significance.

14.70. Once the assessment of potential effects has been made, appropriate measures to offset the effects will be proposed, which will include the Travel Plan strategy and overall transport vision which aims to minimise the use of the private car and in particular minimise vehicle trips to Morecambe town centre.

14.71. The IEMA guidelines refer to the Department for Transport's Manual of Environmental Appraisal, which suggests that changes in traffic flow of 30%, 60% and 90% would be likely to produce 'slight, moderate and substantial' changes respectively. Potential and residual impacts are therefore described as:

- Beneficial – Meaning that they produce environmental benefits in transportation terms, ie where overall traffic flows or percentage HGV decrease, or there are improved facilities for pedestrians, cyclists or public transport users;

- Negligible – Meaning that changes are too small to meaningfully measure where changes in flows are typically less than 10%; and

- Adverse – Meaning that they produce environmental dis-benefits in transportation terms, ie where overall traffic flows or percentage HGV increase, or there are reductions in facilities for pedestrians, cyclists or public transport users.

14.72. Beneficial and adverse effects are further characterised as:

- Negligible – Where the development would cause no noticeable improvement or deterioration to the receptor;

- Slight – Very short or highly localised changes of no significance and/or where changes in traffic flows/patterns are between 10% and 30%;

- Moderate – Limited change by extent, duration or magnitude which may be considered significant and/or where changes in traffic flows/patterns are between 30% and 60%; and

- Substantial – Considerable change by extent, duration or magnitude of more than local significance or in breach of recognised acceptability, legislation, policy or standards, and/or where changes in traffic flows/patterns are greater than 60%.

14.73. The effects are either long or short term, typically with the effects of construction traffic deemed short term and those associated with the operational stages of the proposed development as long term.

14.74. The EIA chapter will reflect the findings of the Transport Assessment, whilst assigning levels of significance to the perceived effects. The chapter will set out the requisite mitigation measures and the residual effects once these are incorporate into the proposals.

Effect on Pedestrians and Cyclists

14.75. The effect of the development on pedestrians and cyclists (ie non-motorised users) of the transport network will be assessed in line with the following potential impacts.

14.76. Severance – Is defined as the perceived division that can occur within a community when it becomes separated by a major traffic artery and describes a series of factors that separate people from places and other people. Such division may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself.

14.77. Pedestrian Delay – The IEMA Guidelines note that changes in the volume, composition and or speed of traffic may affect the ability of people to cross the roads. Typically, increases in traffic levels result in increased pedestrian delay, although increased pedestrian activity also contributes. The guidelines do not set any thresholds, recommending instead that assessors use their judgement to determine the significance of effect.

14.78. Pedestrian Amenity – Is defined as the relative pleasantness of a journey, which as with pedestrian delay is affected by traffic volumes and composition along with pavement width and pedestrian activity. The guidelines suggest tentative thresholds of significance would be where the traffic flows are halved or doubled.

14.79. Fear and Intimidation – The IEMA Guidelines note that a further effect traffic may have on pedestrians is fear and intimidation, the impact of which is dependent on volume of heavy vehicle traffic, its proximity to people or a lack of protection caused by such factors as narrow pavements.

Effect on Road Users

14.80. The effect of the development on road users will be assessed in line with the following potential impacts.

14.81. Driver Delay – The IEMA Guidelines note that driver delay to non-development traffic can occur at several points on the network, although the effects are only likely to be significant when the traffic on the highway network is predicted to be at or close to the capacity of the system; typically, during commuter periods. Values for delay are determined by the use of the DfT's computerised junction assessment packages which estimate vehicle time and delays through junctions.

14.82. Accidents and Safety – The IEMA Guidelines do not include any definition in relation to accidents and safety, suggesting that professional judgment would be needed to assess the implications of local circumstances, or factors which may increase or decrease the risk of

accidents.

Cumulative Effects

14.83. Cumulative effects will be assessed during the construction and operational phases in line with the definition of cumulative effects set out in Chapter 4. Existing or approved development sites for inclusion in the transport assessment will be agreed with LCC and HE as part of the TA scoping process.

Construction Effects

14.84. An indicative opening year for the development has been given as spring 2023; with pre-opening operations from late 2022. The site is anticipated to be built over a 2-year period. However, at this early stage of the planning process, details of the precise planned build-out of the development and associated phasing are undefined, preventing a detailed assessment of the construction related traffic impacts. Nevertheless, consideration has been given to the potential for environmental impacts during this stage of the development in accordance with the IEMA guidance.

14.85. The proposed development will be subject to a Construction Traffic Management Plan (CTMP). This document will identify a range of mitigation measures to be adhered to at the construction stage in order to minimise the impacts on surrounding sensitive receptors. The measures will be agreed with the local planning authority and will include specific routing of construction traffic to the site and the appropriate hours of construction activities taking place. Such measures will reduce the effects of construction traffic on the local highway network. As a general rule the approved construction traffic routes will seek to avoid sensitive areas such as residential areas and schools.

14.86. There will be some increases to the volume of construction traffic on the local highway network within Morecambe, particularly around town centre and the promenade, during the construction process. The volume of construction of HGV's will depend on the construction period, on the construction programme and phasing of the Project.

Operational Effects

14.87. Initial estimates by EPN indicate that approximately one million annual visitors are expected at the development. A peak capacity (ie the busiest day of the year) is anticipated to be 4,000 visitors per day.

14.88. It is important to note that timed ticketing will be used to control peak time visitor numbers and encourage visitors to spread throughout the day and the week. Visitors will be strongly encouraged to book in advance, and variable pricing will be used to encourage visiting during the off-peak periods.

14.89. Based on the above, and their experience at their Cornwall site, Eden Project are currently predicting approximately 100 days annually with visitor numbers of 3,000 people, 200 days of 2,000 people and 60 of 1,000 people. On a typical busy day (3,000 people) it is anticipated there would be a maximum of 500 visitors an hour accessing the site, an average of 8 visitors per minute.

14.90. As part of the TA a detailed multi-modal trip generation calculation will be undertaken. However, as a worst case, even if all 500 visitors per hour choose to travel to the overall area by car, this would potentially only equate to approximately 170 vehicle arrivals per hour, based on a figure of 3 visitors per car.

14.91. These figures are an overestimate as a proportion of visitors will arrive by bus or rail, including school groups and tour groups. Some visitors from the local area will also arrive by walking or cycling.

14.92. As already explained within the transport vision it is anticipated that only visitors with mobility issues will be allowed to park on site in Morecambe town centre. Therefore, the large majority of vehicles will arrive at an off-site location. From this point there will be options for onward travel to the site including cycle / electric cycle via the Way of the Roses cycle route, or a high-quality bus / coach service which could form part of the overall visitor experience. The attached vision document at **Appendix 14.1** highlights the vision and key themes.

14.93. It is possible that staff parking will be permitted on the site, however the aspiration is that the majority of staff will be drawn from the local area, thus making walking, cycling or use of public transport an attractive option for their journey to work. This will be further reinforced and incentivised through the Travel Plan.

14.94. The opening hours are likely to be approximately 9am to 9pm, although these may vary on occasion. It is therefore likely there will be relatively little traffic impact in the traditional AM peak hour, and the majority of traffic impact will be on the PM peak hour.

Mitigation

14.95. Eden Project North aims to be the leading example for progressive and healthy transport methods in the UK. EPN aims to provide a clean, smooth, accessible, fun and active alternative to arriving at a destination that further endorses these values.

14.96. EPN recognises that the experience starts long before the visitor crosses the entrance gates, and that EPN decisions and commitments to sustainability and human health extended far beyond the duration of visitors' stay. This is why EPN remains dedicated to establishing a forward-thinking and innovative strategy that can bring new and positive things to the town, the people and the natural environment of Morecambe.

14.97. For that reason, a range of measures to mitigate the potential effects associated with the proposed development are proposed as set out in the transport vision.

Transport strategy

14.98. The focus of EPN is upon developing a Transport Strategy that reduces car borne trips both to the wider area and in particular to Morecambe town centre, thus reducing impact upon the highway network and the wider environment. The Core Principles as set out in the transport vision are:

1. Eden Project North aims to work with the existing transport infrastructure where possible;
2. Eden Project North aims to support future transport developments where multiple schemes can create an argument for larger scale improvements;
3. Eden Project North's Transport Strategy aims to positively circulation routes in and around the town of Morecambe, encouraging pedestrianisation and inspiring people to spend more time in different areas;
4. Public transport is the priority method;
5. The baseline for the planning horizon is 2025+, with a vision towards 2030;
6. Last two miles – no fossil fuel vehicles around the site;
7. Pedestrianisation of the Prom;
8. The journey should be joyful;
9. Visitors that make a special effort to travel to the destination sustainably will be

rewarded by reduced entry prices and other incentives; and

10. Eden Project North's transport vision extends as far as the perimeter of the project site, but aims to be flexible enough to allow for collaboration in parallel with neighbouring infrastructure.

14.99. The practical focus of the transport strategy will be upon minimising vehicle traffic to the immediate environs of the site, and as a principle the only vehicle traffic to the site will be for mobility impaired visitors and for servicing/deliveries/refuse vehicles. It is currently envisaged the majority of visitors will arrive via public transport (rail or bus) or via park and ride (with a cycle and bus link from the P&R).

Hard Measures

14.100. Different hard mitigation measures are considered at this stage, including:

- Extension of the Caton Road Park and Ride to accommodate the additional demand associated with the development;
- Improved walking and cycling access route between the P&R site and Morecambe;
- Improved bus services and/or private coach services between the P&R site and Morecambe; and
- Improved public realm around the Morecambe railway and bus stations and the wider town centre.

14.101. In addition, it is likely that additional off-site improvements to the wider town centre may be required, including potential improvements to the public realm in and around the promenade and Marine Road Central.

14.102. In relation to parking, there is a challenge relating to the significant availability of relatively cheap parking in the town centre. It is possible that financial incentives to use the P&R may be needed, similar to those offered at the Eden Project in Cornwall. The journey from the P&R will also be marketed as a key part of the visitor experience and could include measures such as electric bicycles, and/or high-quality bus journeys with visitor facilities.

14.103. Rail services are a key opportunity going forward, although infrastructure improvements represent a challenge given the constraints outlined earlier in this chapter. It is however a key existing resource and one that EPN are keen to capitalise on and enhance as part of the development.

14.104. Marine Road Central and its relationship with the development will be considered carefully, in particular in the context of maximising linkages between the development/promenade area and the wider town centre/rail and bus stations.

Residual Effects

14.105. Without undertaking the above analysis and the wider TA process the residual effects are difficult to specify. However, we have listed the likely residual effects in qualitative terms below.

Construction effects

14.106. The residual construction effects are likely to include the following:

- Additional HGV traffic in the local area;
- Additional construction staff travel in and around the local area.

Operational effects

- Amendments to the public realm and walk and cycle routes in the site vicinity and wider town centre;
- Additional bus and coach services to and from the town centre/P&R site;
- Expansion of and additional traffic to the P&R site; and
- Localised traffic changes to accommodate walk and cycle routes and service vehicle movements to the site.

Reporting

14.107. WSP has met with LCC Transport Planning and Public Transport teams to discuss and inform the EIA scoping work. We will meet further with LCC, Lancaster City Council, Highways England and other key stakeholders as the project progresses, in particular to agree the scope of the TA and TP.

14.108. A Transport Assessment and Travel Plan will be developed based upon this scope, which will fully set out the transport effects of the development and set out the transport strategy which is intended to meet the overall aims of EPN's transport vision.

14.109. This TA and TP will then inform the transport chapter which will form part of the overall EIA for the development.

15. Noise and vibration

Introduction

15.1. This chapter will assess the likely significant effects of the construction and operational phases of the proposed development on existing sensitive receptors in the vicinity of the site.

15.2. The noise and vibration impacts will be assessed by WSP UK Ltd.

15.3. The assessment will consider relevant national and local planning policies, and will draw upon current guidance documents and best practice where applicable.

Study Area

15.4. The following sensitive receptors will be assessed within the ES:

- Existing residential and hotel receptors located on the south and south-east side of Marine Road Central;
- Existing residential receptors at the south end of Northumberland Street, to the east of the red line boundary;
- The Midland hotel to the west of the red line boundary; and
- Existing residential receptors adjacent to the surrounding local road network adopted for staff and visitor movements to and from the proposed development.

Planning Policy Context

15.5. Legislation and planning policy relating to noise and vibration relevant to this project comprise the following.

National Policy

- National Planning Policy Framework (NPPF) 2019 – with particular reference to paragraphs 170 and 180; and
- Noise Policy Statement for England (NPSE).

Adopted Development Plan Policy

<u>Lancaster Core Strategy and saved policies</u>

- Development Management DPD Policy DM5: The Evening and Night-time Economy;
- Development Management DPD Policy DM20: Enhancing Accessibility and Transport Linkages; and
- Development Management DPD Policy DM35: Key Design Principles.

Baseline Conditions

15.6. An environmental noise survey will be undertaken to determine the existing ambient and

background sound levels at positions representative of the existing noise-sensitive receptors. Precise measurement locations and survey durations would be agreed during further discussions with the Environmental Health Department of Lancaster City Council and would be subject to access.

15.7. From prior knowledge of the site, it is anticipated that road traffic noise along Marine Road Central will dominate the baseline environmental noise climate at most noise-sensitive receptors.

Assessment Methodology

Insignificant Effects

15.8. Given the nature of the proposed development, it is not expected that levels of vibration during the operational phase are likely to be significant at the identified sensitive receptors. Therefore, operational vibration will not be considered within the ES.

15.9. Based on a review of the local road network surrounding the site and likely to provide access for construction, the temporary changes in daily traffic flows as a result of construction traffic is anticipated to be are anticipated to be minimal in context of the existing traffic flows. Notwithstanding the potential increase in the composition of HGVs on the surrounding local road network, the potential changes in existing road traffic noise at noise sensitive receptors from construction phase development generated traffic noise, if any, are expected to be insignificant and will not be assessed within the ES.

Effects Considered Elsewhere

15.10. Effects in relation to noise on ecological receptors (including designated ecological sites, habitats and protected/notable species) will be considered within the Ecology chapter.

Likely Significant Effects

Construction Phase

- Disturbance to sensitive receptors from noise generated by on-site (non-traffic) construction activities; and
- Disturbance to sensitive receptors from vibration generated by on-site construction activities.

Operational Phase

- Disturbance to sensitive receptors from noise generated by fixed plant and operational activities within the proposed development;
- Disturbance to sensitive receptors from noise produced by live music events held at the proposed development; and
- Potential disturbance to sensitive receptors from road traffic generated by staff and visitor movements to and from the proposed development on the surrounding local road network (to be scoped in at the commencement of the EIA process, as described below).

Method of Assessment

Construction Phase

15.11. The levels of construction noise that are likely to be experienced at each of the identified sensitive receptors and for each phase of the construction works will be predicted using the methodology set out in British Standard 5228-1: 2009 +A1: 2014 *Noise and Vibration Control*

on Construction and Open Sites - Part 1: Noise (BS 5228-1). Suitable assessment criteria will be derived in accordance with the ABC Method contained within BS 5228-1. The magnitude of impact will be determined through a comparison of the predicted levels of construction noise with the adopted criteria. Advice regarding best practice methods to minimise construction noise would be provided, including limits on the hours of working, where necessary.

15.12. Vibration generated from construction activities also has the potential to cause disturbance to existing receptors in the immediate vicinity of the Site. A qualitative assessment of vibration would be undertaken drawing on the historic ground-borne vibration data presented within British Standard 5228-2: 2009: +A1:2014 *Noise and Vibration Control on Construction and Open Sites - Part 2: Vibration* (BS 5228-2) and the acceptable guidance criteria also presented in this document for human exposure and building damage.

Operational Phase

15.13. Operational noise levels resulting from the fixed plant aspects of the proposed development will be predicted based on the plant and equipment proposed, where available. It is anticipated that at the stage of the application being submitted, precise details of fixed plant associated with the proposed development will not be available. Plant noise limits would therefore be determined based on the measured background sound levels and the guidance contained in British Standard 4142:2014 *Methods for rating and assessing industrial and commercial sound* (BS 4142) and the planning requirements of Lancaster City Council.

15.14. Noise due to events held at the proposed development would be assessed in accordance with relevant guidance to be agreed during further consultation with Environmental Health of Lancaster City Council. Guidance may include the Noise Councils *Code of Practice on Environmental Noise Control at Concerts* (1995), the Institute of Acoustics "*Good practice guide to the control of noise from pubs and clubs*" (2003) and "*Good practice guide on the control of noise from pubs and clubs (draft) - Annex 2: Working draft on criteria, measurement guidelines and other relevant information*" (2002). It is anticipated that the intended use and design of the venue will not be sufficiently developed at the stage of the planning application to enable a full assessment to be undertaken. As such, we will seek to agree appropriate noise limits with LCC, which will be summarised in the ES chapter. It is anticipated that a planning condition will be included in the consent, which would be discharged by detailed design work carried out once the design has been sufficiently progressed.

15.15. The scheme aims to strongly encourage sustainable transport, to not only avoid increasing traffic generation but also to promote sustainable forms of transport in Morecambe. As such, it is anticipated that traffic flows will not increase due to the scheme. To verify this, traffic flow data will be analysed to determine whether potential changes in road traffic noise need to be assessed. In accordance with the *Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3 Part 7 Noise and Vibration*, an assessment will be deemed necessary if there is a change in traffic equivalent to a change in noise level of 1 dB $L_{A10,\ 18\ hour}$, ie flows increase by more than 25 % or decrease by more than 20 %. If the noise assessment is required, changes in noise due to traffic generated by the proposed development will be calculated using the methodology set out in the *Calculation of Road Traffic Noise* (CRTN) for 'with' and 'without' development scenarios in the year of opening and design year. The noise level changes will be assessed in accordance with the principles of DMRB.

Cumulative Effects

15.16. Consideration will be given to other existing or approved development in the Morecambe area, so that cumulative effects can be identified.

Mitigation

15.17. Where significant adverse impacts are identified, mitigation measures will be proposed, for assessment against the project's other constraints. These may include:

- Adopting best practice measures during construction to minimise noise and vibration effects;
- Plant noise attenuation measures such as attenuators, noise barriers and acoustic louvres, to reduce the impact of fixed plant noise during the operational phase; and
- Management of noise from live music events (eg times and frequency of occurrence), and design options such as the location and orientation of the performance space and directional loudspeaker systems.

15.18. Where the assessment indicates a likelihood of positive effects, measures to enhance and exploit benefits of the proposed development would be explored. These are most likely to be related to either reductions in road traffic noise associated with the use of the Intermodal Transportation Hub or fixed plant noise serving existing parts of the site.

Residual Effects

15.19. Residual effects will be identified and reported along with their anticipated significance in terms of magnitude and duration, for consideration against the other benefits and effects of the scheme.

Reporting

15.20. The noise and vibration impact assessment will be reported in the form of an ES chapter, with supporting figures and appendices. The ES Chapter would include the survey protocols, equipment used, the measurement sound levels, the noise and vibration impact assessments, mitigation measures and residual impacts/conclusions.

16. Air quality

Introduction

16.1. This chapter of the ES Scoping Report has been produced by WSP. It contains a baseline assessment of the air quality surrounding the site and considers the potential effects of the construction and operational stages of the project. It also provides a summary relevant legislation and policy to be considered in the assessment, an overview of the proposed assessment methodology and information sensitive locations adjacent to the site. In addition, where appropriate, likely mitigation measures required to prevent, minimise or control likely negative effects are presented.

16.2. Impacts on air quality are assessed in relation to changes in concentrations of certain pollutants in the air and at sensitive human and ecological receptor locations. Vehicle derived emissions are a main contributor to the concentrations of oxides of nitrogen (NO_x), nitrogen dioxide (NO_2) and fine particulate matter (PM_{10} and $PM_{2.5}$) in the UK. As the proposed development will result in changes to traffic composition, flow and volume, this has the potential to impact on air quality.

Study Area

16.3. The application site lies on the edge of Morecambe Bay. It comprises land that was reclaimed from the sea between Marine Road Central and the shoreline. The land has traditionally provided space for public recreation for residents and visitors.

16.4. The Study Area comprises land situated to the north and west of Morecambe Town Centre and broadly falls within the following areas:

- The main development site bound by the promenade to the north and east, Marine Road Central to the south and Grade II listed Midland Hotel to the west;
- The promenade to the north, east and west of the main development site, including the sea wall to the north and stone jetty to the north west; and
- Adopted highways, car parks, footways and public realm to the south of the site.

Construction Phase

16.5. The potential effects of construction dust will be assessed in accordance with the Institute of Air Quality Management (IAQM) guidance on the assessment of dust from demolition and construction[1]. The IAQM guidance defines the study area with respect to the area where mitigation may be required. This is defined as an area up to 350 m from the construction site boundary, and a 50 m corridor up to 500 m from site access points.

Operational Phase

16.6. The study area will be defined by the changes in traffic flows on the local road network. The criteria outlined in the IAQM guidance on land-use planning and development control[2] will be

[1] Institute of Air Quality Management (Version 1.1 Updated June 2016). Guidance on the Assessment of Dust from Demolition and Construction.

[2] Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017). Land Use Planning & Development Control: Planning for Air Quality.

used to identify those roads likely to be affected, the relevant criteria include:

- Daily traffic flows that will change by 100 Annual Average Daily Traffic (AADT) or more within or adjacent to an Air Quality Management Area (AQMA) (See Baseline Conditions); or more than 500 AADT elsewhere;
- Heavy Duty Vehicle (HDV) flows that will change by 25 AADT or more within or adjacent to an AQMA; or more than 100 AADT elsewhere; and
- Where a road is realigned by 5 m or more and the road is within an AQMA.

16.7. Changes in traffic flows on the local road network and the alignment will be ascertained by comparing the Do-Something (DS) traffic scenario to conditions without the proposed scheme ie Do-Minimum (DM) scenario. The study area will incorporate a 200m buffer surrounding the identified affected roads.

16.8. Review of the Defra's MAGIC[3] mapping portal has identified some designated sites in the vicinity of the Application Site. These include Morecambe Bay and the Heysham Moss Site of Specific Scientific Interest (SSSI). When assessing ecological sites the Design Manual for Roads and Bridges (DMRB) guidance is applied[4]. This states that designated ecological sites within 200 m of the affected road network need to be assessed.

Planning Policy Context

European and National Legislation

16.9. **Table 16.1** summarises the Air Quality Objectives with relevance to this study.

Table 16.1: Relevant Air Quality Strategy Objectives

NATIONAL AIR QUALITY OBJECTIVES FOR THE PROTECTION OF HUMAN HEALTHERROR! BOOKMARK NOT DEFINED.

Pollutant	Applies to	Objective	Measured as	Dates to be achieved by
Nitrogen dioxide (NO_2)	UK	200µg/m^3 not to be exceeded more than 18 times a year	1 hour mean	31.12.2005
	UK	40µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	UK (except Scotland)	40µg/m^3	Annual mean	31.12.2004
	UK (except Scotland)	50µg/m^3 not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
Particulate Matter ($PM_{2.5}$)	UK (except Scotland)	25µg/m^3	Annual mean	2020
NATIONAL AIR QUALITY OBJECTIVE FOR THE PROTECTION OF VEGETATION AND ECOSYSTEMS				
Nitrogen oxides (NO_x)	UK	30µg/m^3	Annual mean	31.12.2000

[3] MAGIC Geographical Information Portal (http://magic.defra.gov.uk)
[4] DMRB Volume 11 Section 3 Part 1 – HA207/07

16.10. LAQM.TG16[5] advises that exceedances of the 1-hour mean NO_2 Objective are unlikely to occur where annual mean concentrations are below 60µg/m^3, and it provides guidance on the approach that should be taken if either measured or predicted annual mean NO_2 concentrations are 60µg/m^3 or above.

16.11. The IAQM[2] and Defra[5] guidance provides an approach to assessing the relationship between annual mean and 24-hour mean concentrations of PM_{10}. Potential exceedances of the 24-hour Objective are more likely where the annual mean concentration is over 32µg/m^3.

UK Air Quality Strategy

16.12. The AQS[6] also sets standards and objectives for nine key air pollutants to protect health, vegetation and ecosystems. These are benzene (C6H6), 1,3 butadiene (C4H6), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), sulphur dioxide (SO_2), ozone (O_3), and polycyclic aromatic hydrocarbons (PAHs).

16.13. The air quality standards are levels recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO) with regards to current scientific knowledge about the effects of each pollutant on health and the environment.

16.14. The air quality objectives are medium-term policy based targets set by the Government, which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, ie a limited number of permitted exceedances of the standard over a given period.

16.15. For the pollutants considered in this assessment, there are both long-term (annual mean) and short-term standards. In the case of NO_2, the short-term standard is for a 1-hour averaging period, whereas for PM_{10} it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants, for example temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road.

16.16. The AQS contains a framework for considering the effects of a finer group of particles known as '$PM_{2.5}$' as there is increasing evidence that this size of particles can be more closely associated with observed adverse health effects than PM_{10}. Local Authorities are required to work towards reducing emissions/concentrations of particulate matter within their administrative area.

16.17. A new Clean Air Strategy[7] for England was published in February 2019 which includes a series of policy intentions including actions to reduce transport emissions and deposition of pollutants to sensitive habitats.

Air Quality Regulations

16.18. Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000[8] and the Air Quality (England) (Amendment) Regulations 2002[9]

[5] Defra (2018) Part IV The Environment Act 1995 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG16.
[6] Department for Environment, Food and Rural Affairs (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland Volumes 1 and 2. Defra: London.
[7] Department for Environment, Food and Rural Affairs (Defra) – Clean Air Strategy 2019
[8] The Air Quality (England) Regulations 2000. 2000 SI 2000/928. London: HMSO
[9] The Air Quality (England) (Amendment) Regulations 2002. 2002 SI 2002/3043 London: HMSO.

for the purpose of Local Air Quality Management (LAQM).

16.19. These Regulations require that likely exceedances of the AQS objectives are assessed in relation to:

> *"…the quality of air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present…"*

16.20. The Air Quality Standards (Amendment) Regulations 2016[10] transpose the European Union Ambient Air Quality Directive (2008/50/EC) into law in England. This Directive sets legally binding limit values for concentrations in outdoor air of major air pollutants that impact public health such as PM_{10}, $PM_{2.5}$ and NO_2. The limit values for NO_2 and PM_{10} are the same concentration levels as the relevant. AQS objectives and the limit value for $PM_{2.5}$ is a concentration of 25µg/m^3.

Environmental Protection Act 1990 - Control of dust and particulates associated with construction

16.21. Section 79 of the Environmental Protection Act 1990 gives the following definitions of statutory nuisance relevant to dust and particles:

> *"Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance";*
>
> *"Any accumulation or deposit which is prejudicial to health or a nuisance"*

16.22. Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

16.23. There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist. Nuisance is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred.

Environment Act 1995

16.24. Under Part IV of the Environment Act 1995, local authorities must review and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the air quality objectives defined in the Regulations. Where the objectives are not likely to be achieved, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it intends to work towards achieving air quality standards in the future.

Policy

16.25. A summary of the national, regional and local planning policy relevant to the project and air quality is provided below.

<u>National Planning Policy</u>

16.26. The Government's overall planning policies for England are described in the National

[10] The Air Quality Standards (Amendment) Regulations 2016. 2016 SI 2016/1184 London: HMSO.

Planning Policy Framework[11]. The core underpinning principle of the Framework is the presumption in favour of sustainable development, defined as:

> *'…meeting the needs of the present without compromising the ability of future generations to meet their own needs'*

16.27. One of the three overarching objectives of the NPPF is that planning should '…contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy…'

16.28. The environment impact of the project development will be a material consideration during the planning process. In relation to air quality, the NPPF states:

> *"Paragraph 54 '…Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.'*
>
> *Paragraph 103 '…Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health…';*
>
> *Paragraph 170 '…Planning policies and decisions should contribute to and enhance the natural and local environment by: …e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans…';*
>
> *Paragraph 180 '…Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development...';*
>
> *Paragraph 181 '…Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications.*

[11] Ministry of Housing, Communities and Local Government (2019) *National Planning Policy Framework* [online] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779764/NPPF_Feb_2019_web.pdf

Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan...';

Paragraph 183 '…The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.'

Local Planning Policy

Lancaster Local Plan

16.29. The Lancaster District Local Plan was adopted on 16 April 2004. Lancaster City Council's Core Strategy was adopted in July 2008, replacing many of the policies in the Local Plan. Following this a 'strike through edition of the Local Plan'[12] was published in September 2008. It shows the policies that have been fully or partially replaced by the Core Strategy. In relation to air quality, this 'strike through edition' contains the following information:

Air quality is important for sustaining health. It is also an indicator of environmental quality. Poor air quality can damage flora, fauna and buildings and can have a significant effect on soil and water. Pollutants such as CO_2 and other greenhouse gases can also contribute to wider global environmental problems

The City Council can assist in maintaining and improving air quality be directing development to locations which minimize the need to travel and by encouraging the use of alternative means of travel to the private car.

The City Council will seek to maintain or improve air quality wherever possible by resisting development which would result in unnecessary journeys.

16.30. Work is underway on an updated local plan which will shape the future of the Lancaster District. This updated local plan will guide development in the Lancaster District for the next 15 years.

Development Management Development Plan Document (DPD)

16.31. Development Plan Documents (DPDs) are planning policy documents which make up the Local Plan. They help to guide development within a local planning authority area by setting out the detailed planning policies, which planning officers use to make their decisions on planning applications. Lancaster City Council adopted the Development Management Development Plan Document (DPD)[13] on 17 December 2014. This sets out a series of generic planning policies which will be used by us to determine planning applications, the DPD contains policies relating to economic, environmental and social matters. In relation to air quality, the following information is provided:

'Policy DM35: Key Design Principles – Minimise impacts on air quality (including odour), noise pollution and excessive lighting

[12] Lancaster District Local Plan Strike-Through Edition – Lancaster City Council (September 2008)
[13] Development Management DPD – Lancaster City Council Local Plan 2011-2031 (December 2014)

Policy DM37: Air Quality Management and Pollution – Air Quality Assessments (AQA) must be submitted for any development proposal within or adjacent to an Air Quality Management Area (AQMA). New development located within or adjacent to an AQMA must ensure that users are not significantly adversely affected by the air quality within that AQMA and include mitigation measures where appropriate.'

Morecambe Area Action Plan (MAAP)

16.32. The Morecambe Area Action Plan (MAAP)[14] is a spatial plan for central Morecambe, the priority area for regeneration within Lancaster District. The council adopted the MAAP on 17 December 2014 as a Development Plan Document (DPD), part of the new Local Plan for the Lancaster District. The MAAP provides a framework for the investment, development and change required to regenerate Central Morecambe. The plan area takes in all the main central and commercial parts of the town and including the extensive seafront to these.

16.33. There is no specific mention of air quality in this document, however some key elements of the MAAP that are relevant include plans to:

'Integrate the seafront with the town much better with improved connections for pedestrians between the seafront and the town;

Direct footfall into the town centre by a range of actions to create much more of a "buzz";

Restructure landward with new development fitting to a key network that makes it easy for pedestrians to find their way around the town;

The city and county councils to prepare a joint transportation plan to include for the location, management and pricing of public car parking (on and off street) to better support activity and trading within central Morecambe'

Guidance/Best Practice

16.34. A summary of the publications that will be referred to in the undertaking of this assessment is provided below.

Local Air Quality Management Review and Assessment Technical Guidance

16.35. The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities in their review and assessment work[5]. This guidance, referred to in this document as LAQM.TG16, has been used where appropriate in the assessment presented herein.

Land-Use Planning & Development Control: Planning for Air Quality

16.36. Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance[2] that offers comprehensive advice on: when an air quality assessment may be required; what should be included in an assessment; how to determine the significance of any air quality impacts associated with a development; and, the possible mitigation measures that may be implemented to minimise these impacts.

Guidance on the Assessment of Dust from Demolition and Construction

16.37. This document[1] published by the IAQM was produced to provide guidance to developers,

[14] Morecambe Area Action Plan (MAAP) (to 2021) – Lancaster City Council (December 2014)

consultants and environmental health officers on how to assess the impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM_{10} impacts on public exposure and impact upon sensitive ecological receptors) and to identify mitigation measures appropriate to the level of risk identified.

National Planning Practice Guidance – Air Quality

16.38. This guidance[15] provides a number of guiding principles on how the planning process can take into account the impact of new development on air quality, and explains how much detail air quality assessments need to include for projects, and how impacts on air quality can be mitigated. It also provides information on how air quality is taken into account by Local Authorities in both the wider planning context of Local Plans and neighbourhood planning, and in individual cases where air quality is a consideration in a planning decision.

Baseline Conditions

Local Air Quality Management

16.39. In common with many areas in the UK the main source of pollution is road transportation, with NO_2 the pollutant of greatest concern. Exceedance of nitrogen dioxide levels has resulted in the designation of three Air Quality Management Areas (AQMA's) by LCC, located around the gyratory system in Lancaster City and at the main cross road junctions in Carnforth (junction 35 of M6 and Galgate (junction 33 of M6). The AQS annual mean objective is 40µg/m^3

Site Specific Monitoring

16.40. A 12-month, application specific air quality monitoring survey is being prepared which will focus on NO_2. This will use diffusion tubes to obtain data which will be used to determine the baseline conditions in proximity to the site, and facilitate verification of any future air quality models. The locations of the monitors will be determined in conjunction with the EHO at LCC to ensure the sites complement the three existing sites currently in Morecambe.

Council Monitoring

16.41. The Annual Status Report (ASR) for 2018[16,] developed by LCC, provides a detailed overview of air quality in the local area during 2017. The ASR states that, '*Monitoring results in 2017 for the first time indicate compliance with air quality objectives in both the Carnforth and Galgate AQMA's. Results in the Lancaster AQMA were mostly lower than previous years but still indicate exceedance of the annual mean/hourly mean nitrogen dioxide objectives. Overall monitoring results in 2017 indicated that 2017 was generally a better air quality year with results overall being reduced on levels monitored in 2016 by between 1 and 4 ug/m^3 and continue to indicate a declining trend. For Lancaster centre there is however some way to go before pollution levels meet air quality objectives in all locations.*'

16.42. **Table 16.2** provides details of current local authority monitoring within 5 km of the site.

[15] Department of Communities and Local Government (DCLG) (March 2014). National Planning Practice Guidance.
[16] Air Quality Annual Status Report (ASR) – Lancaster City Council (October 2018)

Table 16.2: Local Authority Air Quality Monitoring Data (µg/m^3)

SITE ID	SITE NAME	DISTANCE TO SITE (M)	SITE TYPE	ANNUAL MEAN CONCENTRATION (µg/m^3)				
				2013	2014	2015	2016	2017
T1	Torrisholme T1	2.8	Roadside	33	38	34	32	29
H1	Heysham 1	1.5	Roadside	24	28	25	25	21

Exceedance of the annual mean AQS objective of 40µg/m^3 in **bold**

16.43. Annual mean NO_2 concentrations have not approached or exceeded the AQ objective of 40ug/m^3 at either of these sites. The monitoring sites in Table 16.2 are the only monitoring locations designated by LCC within Morecambe.

16.44. A new monitoring site was established in 2019 at The Shrimp Roundabout by LCC. However, no results are available to report at this time.

National Background Mapping

16.45. Background NO_2, NO_x, PM_{10} and $PM_{2.5}$ concentrations to be used in the assessment will be taken from the national maps provided on the Defra website[17], where background concentrations of those pollutants included within the AQS have been mapped at a grid resolution of 1x1km for the whole of the UK. Estimated concentrations are available for all years between 2015 and 2030.

16.46. Background pollutant concentrations at the site and nearby monitoring sites are well within the air quality objectives as presented in **Table 16.3**. All of the annual mean background concentrations are well below the relevant objectives.

Table 16.3: Background Concentrations (µg/m^3)

Grid Square (Centre on O.S. Grid Reference)	NO_2	NO_x	PM_{10}	$PM_{2.5}$
342500, 464500	7.0	9.0	10.0	7.0
345500, 463500	11.1	14.8	12.9	8.9
341500, 463500	6.2	8.0	9.6	6.7

EU Limit Value Compliance

16.47. The latest national modelling undertaken to assess compliance with EU limit values[18]

[17] Department for Environment, Food and Rural Affairs, 2018. Background Maps. Available at https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html.
[18] Department for Environment, Food and Rural Affairs, 2018. 2017 NO2 Projections (2015 Reference Year). Available at https://uk-air.defra.gov.uk/library/no2ten/2017-no2-projections-from-2015-data.

includes a number of roads (but not all) in the vicinity of the project. Table 16.4 shows the 2017 baseline concentrations at the nearest links.

Table 16.4: Modelled annual mean NO_2 concentrations (µg/m^3)

Road	2017
A5105 (30592-31057)	22.6
A589 (30602-31056)	18.3 – 31.4
A683 (30627-31962)	20.1 – 31.5

Objective = 40µg/m3. Exceedances of the objective are show in **bold**.

16.48. The highest concentrations, as shown in Table 16.4, are modelled on the A683. However, there are no modelled concentrations in exceedance of the limit values in 2017. Concentrations are expected to fall in future year scenarios.

Sensitive Receptors

16.49. Residential receptors are likely to be located adjacent to road links that will be impacted by the project during the operational phase and any within 200 m of affected road links will be incorporated into the assessment. There is also the potential for local receptors to be impacted during the construction phase.

16.50. Review of the Defra's MAGIC[19] mapping portal has identified some designated sites in the vicinity of the Application Site. These include Morecambe Bay and the Heysham Moss Site of Specific Scientific Interest (SSSI) which are immediately to the east and 3km to the south-east of the site.

Summary

16.51. Air quality on and in the immediate vicinity of the project is likely to be good, with concentrations within the air quality objectives and EU limit values for the protection of human health. There are ongoing exceedances of objectives along major roads as outlined in the ASR, especially along routes in and around the busy centre of Lancaster, however the more open and coastal Morecambe is not expected to suffer the same level of exceedances, if any.

16.52. The monitoring site T1 recorded the highest NO_2 concentration of all those identified within Morecambe, as seen in Table 16.2. However, a value of 29 µg/m^3 is still well within the AQS objective. H1 is the closest monitoring site to the project. It provides a good indication of the likely NO_2 concentration at the site, as similarly to the site it is located along Morecambe coastline. A value of 21 µg/m^3 is well within the AQS objective. The background pollutant concentrations at the project and monitoring sites are well below the AQ objectives, as can be seen in Table 16.3.

16.53. This section gives an overview of the baseline conditions in Morecambe for air quality, however, until we are in receipt of the full traffic model from the project transport consultants we will be unable to know the full extent of our study area. This may therefore be expanded to Lancaster and other surrounding areas, in which case the assessment of baseline conditions in the ES chapter will be extended to include these locations.

[19] MAGIC Geographical Information Portal (http://magic.defra.gov.uk)

Assessment Methodology

Scoping

16.54. The proposed scope of the assessment has been determined in the following way:

- Consultation with the Environmental Health Officer (EHO) at Lancaster City Council (LCC) to agree the scope of the assessment and the methodology to be applied;
- Review of LCC's latest review and assessment reports and air quality data for the area surrounding the Application Site, including data from LCC and Defra;
- Desk study to confirm the location of nearby existing receptors that may be sensitive to changes in local air quality and a review of the masterplan for the project to establish the location of new sensitive receptors; and
- Preliminary discussions with the Transport planners concerning the likely access routes to the application site.

16.55. The scope of the assessment includes consideration of the potential impacts on local air quality resulting from changes in:

- Dust and particulate matter generated by on-site activities during the construction phase;
- Ambient pollutant concentrations as a result of exhaust emissions arising from construction traffic and plant;
- Ambient pollutant concentrations as a result of exhaust emissions arising from traffic generated by the project once operational; and
- Ambient pollutant concentrations as a result of on-site power generation.

16.56. In addition, the potential exposure of future residents of the project to poor air quality will also be considered.

Construction Phase

16.57. Dust comprises particles typically in the size range 1-75 micrometres (μm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials. The large dust particles fall out of the atmosphere quickly after initial release and therefore tend to be deposited in close proximity to the source of emissions. Dust therefore is unlikely to cause long-term or widespread change to local air quality; however, its deposition on property and cars can cause 'soiling' and discolouration. This may result in complaints of nuisance through amenity loss or perceived damage caused, which is usually temporary.

16.58. The smaller particles of dust (less than 10μm in aerodynamic diameter) are known as particulate matter (PM_{10}) and represent only a small proportion of total dust released; this includes a finer fraction, known as $PM_{2.5}$ (with an aerodynamic diameter less than 2.5μm). As these particles are at the smaller end of the size range of dust particles they remain suspended in the atmosphere for a longer period of time than the larger dust particles, and can therefore be transported by wind over a wider area. PM_{10} and $PM_{2.5}$ are small enough to be drawn into the lungs during breathing, which could have a potential impact on human health.

16.59. An assessment of the likely significant impacts on local air quality due to the generation and dispersion of dust and PM_{10} during the construction phase will be undertaken using the Guidance on the Assessment of Dust from Demolition and Construction published by the IAQM; the available information for this phase of the project provided by the Project Team; and, professional judgement.

16.60. The IAQM guidance methodology assesses the risk of potential dust and PM_{10} impacts from the following four sources: demolition; earthworks; general construction activities and track-out. It takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM_{10} levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust impacts. Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined.

16.61. In addition to impacts on local air quality due to on-site construction activities, exhaust emissions from construction vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the site and in the vicinity of the site itself. A qualitative assessment of their impact on local air quality will be undertaken using professional judgement and by considering the following:

- The number of type of construction traffic and plant likely to be generated by this phase of the project;
- The number and proximity of sensitive receptors to the Application Site and along the likely routes to be used by construction vehicles; and
- The likely duration of the construction phase and the nature of the construction activities undertaken.

Operational Phase

Road Traffic

16.62. Of the pollutants included in the AQS, concentrations of NO_2 and particulate matter (PM_{10} and $PM_{2.5}$) will be considered in this assessment as road traffic is a major source of these pollutants and their concentrations tend to be close to, or in exceedance of, the objectives in urban locations.

Qualitative Assessment

16.63. It is anticipated that generated road traffic during the operation of the project will be minimised by the use of a Park & Ride at Junction 34 of the M6 and the limitation of on-site parking. Therefore, anticipated traffic generation will be scoped using the IAQM guidance on land-use planning and development control to determine the need for detailed assessment. If the screening criteria are not met, then road traffic emissions will be assessed qualitatively.

Quantitative Assessment

16.64. Where the IAQM guidance criteria are met, detailed assessment will be completed. For the prediction of impacts due to emissions arising from road traffic, the dispersion model ADMS Roads (version 4.1.1.0) will be used. This model uses detailed information regarding traffic flows on the local road network, surface roughness, and local meteorological conditions to predict pollutant concentrations at specific receptor locations, as determined by the user.

16.65. Meteorological data, such as wind speed and direction, is used by the model to determine pollutant transportation and levels of dilution by the wind. Meteorological data will be used in the model and is obtained from the observation station at Walney Island meteorological station. This station is considered to provide representative data for the assessment.

16.66. For the assessment, three scenarios will be modelled, as follows:

- Model Verification, in line with the latest monitoring data available from LCC;
- Opening Year without Development (inclusive of all committed development within the assessment extents; and

- Opening Year with Development.

16.67. The most recent year for which monitoring data and meteorological data are available will be utilised to enable verification of the model results, therefore this year will be used as the baseline year for this assessment. The monitoring data used for verification will come from the scheme specific monitoring survey.

On-Site Power Generation

16.68. At this stage of the project design, it is unknown if power will be sourced from renewable sources, the national grid our via on-site fossil fuel combustion. It is assumed that energy will not be generated by on-site fuel combustion and so on-site power generation will be assessed qualitatively.

Selection of Sensitive Receptors

16.69. Sensitive locations are places where the public or sensitive ecological habitats may be exposed to pollutants resulting from activities associated with the project. These will include locations sensitive to:

- An increase in dust deposition and PM_{10} exposure as a result of on-site construction activities;
- Locations sensitive to exposure to gaseous and deposited pollutants emitted from the exhausts of construction and operational traffic associated with the project; and
- Sensitive receptors will be identified using AddressBase datasets available from the Ordnance Survey.

Construction Phase

16.70. The IAQM assessment is undertaken where there are: 'human receptors' within 350m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or 'ecological receptors' within 50m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s). It is within these distances that the impacts of dust soiling and increased particulate matter in the ambient air will have the greatest impact on local air quality at sensitive receptors.

Operational Phase

16.71. In terms of locations that are sensitive to pollutants emitted from engine exhausts, these will include places where members of the public are likely to be regularly present over the period of time prescribed in the AQS. For instance, on a footpath where exposure will be transient (for the duration of passage along that path) comparison with a short-term standard (ie 15-minute mean or 1 hour mean) may be relevant. At a school or adjacent to a private dwelling, where exposure may be for longer periods, comparison with a long-term standard (such as 24-hour mean or annual mean) may be more appropriate. Box 1.1 of LAQM.TG16 provides examples of the locations where the air quality objectives should/should not apply.

16.72. To complete the assessment of operational phase impacts, a number of 'receptors' representative of locations of relevant public exposure will be identified at which pollution concentrations will be predicted. Receptors are located adjacent to the roads that are likely to experience the greatest change in traffic flows or composition, and therefore NO_2 and particulate matter concentrations, as a result of the project.

16.73. Any nature conservation sites (Designated Sites) should also be identified as potential ecological receptors. The Designated Sites that should be considered for this assessment are those for which designated features are sensitive to air pollutants, either directly or

indirectly, and which could be adversely affected by the effect of local air quality on vegetation within the following nature conservation sites: SACs (SCIs or cSACs), SPAs, pSPAs, SSSIs and Ramsar sites. Sites designated for geological purposes need not be assessed. Only properties and Designated Sites within 200 m of roads affected by the project need be considered. If any designated sites meet this criterion, NO_x concentrations and nitrogen deposition rates should be calculated within the Designated Site to assess the effect of the project. This will be done using guidance outlined by the DMRB[4]

Significance criteria

Construction Phase

16.74. The IAQM assessment methodology recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

16.75. For the assessment of the impact of exhaust emissions from plant used on-site and construction vehicles accessing and leaving the site on local concentrations of NO_2 and particulate matter, the significance of residual effects will be determined using professional judgement and the principles outlined in the EPUK/IAQM guidance, which are described below.

Operational Phase

16.76. The approach provided in the EPUK/IAQM guidance will be used within this assessment to assist in describing the air quality effects of additional emissions from traffic generated by the project once operational.

16.77. This guidance recommends that the degree of an impact is described by expressing the magnitude of incremental change in pollution concentration as a proportion of the relevant assessment level and examining this change in the context of the new total concentration and its relationship with the assessment criterion, as summarised in **Table 16.5**.

Table 16.5: Impact Descriptors for Individual Receptors

Long Term Average Concentration At Receptors In Assessment Year	**% Change In Concentration Relative to Air Quality Assessment Level (AQAL)**			
	1	**2-5**	**6-10**	**>10**
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Notes
AQAL = air quality assessment Level, which for this assessment related to the UK Air Quality Strategy objectives.
Where the %change in concentrations is <0.5%, the change is described as 'Negligible' regardless of the concentration.
When defining the concentration as a percentage of the AQAL, 'without scheme' concentration should be used where there is a decrease in pollutant concentration and the 'with scheme;' concentration where there is an increase.
Where concentrations increase, the impact is described as adverse, and where it decreases as beneficial.

16.78. The EPUK/IAQM guidance notes that the criteria in Table 16.5 should be used to describe impacts at individual receptors and should be considered as a starting point to make a judgement on significance of effects, as other influences may need to be accounted for. The EPUK/IAQM guidance states that the assessment of overall significance should be based on professional judgement, taking into account several factors, including:

- *The existing and future air quality in the absence of the development;*
- *The extent of current and future population exposure to the impacts; and*
- *The influence and validity of any assumptions adopted when undertaking the prediction of impacts.*

16.79. The EPUK/IAQM guidance states that for most road transport related emissions, long-term average concentrations are the most useful for evaluating the impacts. The guidance does not include criteria for determining the significance of the effect on hourly mean NO_2 concentrations or daily mean PM_{10} concentrations. The significance of effects of hourly mean NO_2 and daily mean PM_{10} concentrations arising from the operational phase will therefore be determined qualitatively using professional judgement and the principles described above.

16.80. The EPUK/IAQM guidance says that '*Where the air quality is such that an air quality objective at the building facade is not met, the effect on residents or occupants will be judged as significant, unless provision is made to reduce their exposure by some means. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.*'

Limitations

16.81. There are uncertainties associated with both measured and predicted concentrations. The model (ADMS Roads) that will be used in this assessment relies on input data (including predicted traffic flows), which also has uncertainties associated with them. The model itself simplifies complex physical systems into a range of algorithms. In addition, local micro-climatic conditions may affect the concentrations of pollutants that the ADMS Roads model will not consider.

16.82. To reduce the uncertainty associated with predicted concentrations, model verification will be carried out following guidance set out in LAQM.TG16. As the model will be verified against local monitoring data and adjusted accordingly, there can be reasonable confidence in the predicted concentrations.

16.83. It is assumed in the absence of detailed design information at this stage of the project that there will be no on-site power generation.

Cumulative Effects

16.84. The traffic data provided by the projects transport consultant will take into account flows from existing or approved development in the vicinity of the site. These data will be used in the assessment of the overall operational phase impacts; therefore any potential cumulative operational impacts will be assessed.

Mitigation

16.85. Appropriate recommendations will be made for mitigation measures that should be applied during both the construction and operational phases to reduce any adverse effects and residual effects identified.

16.86. Consideration will be given to the likely significant direct, indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects resulting from the project and a description of the measures envisaged to prevent, reduce, and where possible offset any significant adverse effects on the proposed users of the site and the environment.

Construction

16.87. During the construction phase of the project, a number of activities will have the potential to generate and/or re-suspend dust and particulate matter (PM_{10} and $PM_{2.5}$), including site clearance, earthworks and, in particular, the movement of vehicles and construction plant on site and at the access points to the project. Impacts from construction dust are generally limited to a few hundred metres from construction activities, with the greatest risk within 50m of works or haulage routes.

16.88. The project will require a Dust Management Plan (DMP) and Construction Traffic Management Strategy as part of the Construction Environmental Management Plan (CEMP). The DMP should take account of potential exposure of existing receptors and future receptors during phased opening.

16.89. There is increasing focus on the impact of emissions from non-road mobile machinery (NRMM) on air quality. The project has the opportunity to go beyond current best practice in setting emission limits for NRMM (for NO_2 and PM_{10}) and selecting low emission plant.

16.90. Potential mitigation could include:

- Dust generating activities (eg, cutting, grinding and sawing) will be minimised and weather conditions considered prior to conducting potentially dust emitting activities;
- Fine material will not be stockpiled to an excessive height in order to prevent exposure to wind and/or dust nuisance;
- Roads and accesses will be kept clean;
- Where possible, plant will be located away from site boundaries that are close to residential areas;
- Water will be used as a dust suppressant, where applicable;
- Drop heights of material will be kept to a minimum;
- Distances from crushing plant to stockpiles will be kept to the minimum practicable to control dust generation associated with the fall of materials;
- Skips will be securely covered;

- Soiling, seeding, planting or sealing of completed earthworks will be completed as soon as reasonably practicable following completion of earthworks;
- Dust suppression and the maintenance of the surface of access routes will be appropriate to avoid dust as far as practicable, taking into account the intended level of trafficking;
- Wheel Wash facilities at major site exits to minimise trackout of dust;
- Material will not be burnt on site; and
- Engines will be switched off when not in operation.

Operation

16.91. Notwithstanding the likely not significant effects, the project will include elements designed to minimise emissions to air. These include:

- Travel Plan and Infrastructure – a sustainable travel plan which will ensure that traffic generation is minimized and the project will provide excellent routes and connectivity for cycling and walking;
- Promotion of awareness of local air quality and actions that can be taken to reduce emissions; and
- The potential incorporation of on-site electric vehicle charging points into the design.

Residual Effects

Construction

16.92. The residual impacts of the construction activities are likely to lead to a temporarily and insignificant deterioration in air quality at receptors within proximity of the works. With the application of best practice mitigation measures residual impacts from construction activities are not anticipated to be significant.

Operation

16.93. It is unlikely that mitigation of operational phase effects will be required and as such there will be no post-mitigation residual effects.

Reporting

16.94. The air quality impact assessment will be reported in the form of an ES chapter, with supporting figures and appendices. The ES chapter will include a further baseline assessment of the air quality surrounding the site that will consider any updated information and will be completed in accordance with the latest relevant legislation. The air quality impact assessment results will be used to inform the proposed mitigation measures.

17. Wind, daylight and sunlight microclimate

Introduction

17.1. This section sets out the approach that will be taken for the assessment of the proposed development in relation to wind, daylight and sunlight microclimate.

17.2. The purpose of the wind assessment is to determine the effect of the proposed development on the local pedestrian wind environment and on the surrounding areas. The site is highly exposed to prevailing winds off the Irish Sea, and the proposed development is significantly taller than the neighbouring built environment. As a result, a wind assessment is required.

17.3. The purpose of the daylight and sunlight assessment is to determine the effect of the proposed development on the natural light levels of properties surrounding the development and on the solar access of amenity spaces. 'Daylight' refers to natural light, where the source is the sky in overcast condition, while 'Sunlight refers exclusively to the light coming directly from the sun.

Study Area

17.4. Appropriate study areas will be adopted specific to the requirements of the wind and daylight and sunlight assessments. Specifically, the wind assessment will, following latest industry standards, cover the following spaces:

- ground-level pedestrian areas within the proposed development;
- ground-level pedestrian areas around the adjacent buildings;
- ground-level pedestrian areas within one building height distance; and
- balconies and rooftop terraces within the proposed development.

17.5. The daylight and sunlight assessment, addressed through a Daylight, Sunlight and Overshaddowing (DSO) assessment, will cover the amenity spaces within and outside the site boundary and residential properties and hotel outside the site boundary.

Planning Policy Context

17.6. Legislation and planning documents of relevance to this assessment include the following:

- The National Planning Policy Framework (2019);
- Planning Practice Guidance (2014); and
- Lancaster Core Strategies and Saved Polices.

Legislation

17.7. There is no current legislative framework which specifically governs or addresses wind, daylight and sunlight microclimate.

National Planning Policy

17.8. National planning policies do not impose specific limits on the microclimate wind environment around a new development, but there is a requirement to inform the planning process, so that specific site conditions and functions can be assessed, and to show that other users around the development will not be unreasonably affected by the wind

microclimate.

17.9. The National Planning Policy Framework (NPPF) does not specifically reference wind or microclimate; however, the NPPF emphasises the benefits of high quality built environment, for example:

- Paragraph 89.b) - "*This should include assessment of [...] the impact of the proposal on town centre vitality and viability*."
- Paragraph 124 - "*Good design […] creates better places in which to live and work and helps make development acceptable to communities."*
- Paragraph 127.f - "*Planning policies and decisions should ensure that developments create places that are safe, inclusive and accessible [...] with a high standard of amenity for existing and future users*."

17.10. The NPPF does, however, make specific reference to daylight and sunlight consideration in Paragraph 123 – Achieving appropriate densities, which states that:

> *"Local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site."*

17.11. Planning Practice Guidance, provided by the Department of Communities and Local Government includes further guidance on the application of the NPPF in the planning process. Paragraphs 25 and 26 of the Design guidance, addressing how buildings and the spaces in between them should be considered, identifies the potential for a development's size and shape to affect the wind microclimate. In particular, paragraphs 25 (Reference ID 26-025-20140306) and 26 (Reference ID 26-026-20140306) state:

- Paragraph 25 – 'Consider Form: Some forms pose specific design challenges, for example how taller buildings meet the ground and how they affect local wind … patterns should be carefully considered'; and,
- Paragraph 26 – 'Consider Scale: Account should be taken of local climatic conditions, including … wind'.

<u>Local Planning Policy</u>

17.12. A review of both the existing and draft local plans for Lancaster District found no policies specifically addressing wind conditions. However, Policy E1: Environmental Capital states:

> *"The Council will safeguard and enhance the District's Environmental Capital by applying national and regional planning policies and … using all practicable means to make places more pleasant and liveable with safer, … streets and spaces."*

17.13. With regards to daylight, sunlight and overshadowing assessment, Policy DM35: Key Design Principles of the Lancaster Development Management Development Plan Document states that:

> *'New development should make a positive contribution to the surrounding landscape or townscape. The council will expect development (new build, conversions, alterations or extensions) to [...] ensure no signifcant detrimental impact to amenity in relation to overshadowing, visual amenity, privacy, overlooking, massing and pollution.'*

National Guidance

Lawson Criteria

17.14. In the absence of specific policy-required criteria it is proposed to assess effects based on UK industry standards, assessing the pedestrian level wind microclimate against the Lawson Criteria for pedestrian comfort and distress. These criteria were developed by Professor Tom Lawson at the University of Bristol, and define acceptable frequencies of specific wind velocities for different activities such as sitting, walking and standing.

Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice, BRE

17.15. The BRE Guide provides criteria and methods that are detailed below for calculating the effect of the proposed development on the daylight and sunlight availability to surrounding properties. These guidelines were first published in 1991, and superseded the document 'Sunlight and Daylight Planning Criteria and Design of Buildings' (Department of the Environment, 1971). The second and latest edition of the BRE Guide was released in 2011.

17.16. The BRE Guide includes advice on how to achieve good daylighting and sunlighting both within buildings and open spaces in new developments. It also covers guidance to safeguard daylight and sunlight of existing buildings nearby and the protection of daylighting of adjoining land for future development.

17.17. Whilst the BRE Guide provides numerical guidelines for daylight, sunlight and overshadowing, these criteria should not be seen as absolute targets since, as the document states, the intention of the Guide is to help rather than constrain the designer. The Guide is not an instrument of planning policy, therefore, whilst the methods given are technically robust, some level of flexibility should be applied given the context and constraints of the site.

Baseline Conditions

Wind

17.18. Prevailing winds for Morecambe originate from the west and southwest, and are typically strongest in the winter. The site of the proposed development is on the seafront, and is directly exposed to the prevailing winds. The site is mostly flat with little or no obstacles to affect the wind conditions, and is likely to be acceptable only for business walking. The panoramic nature of the site would mitigate this as being acceptable for leisure walking, which appears to be what much of the area is currently used for. More details of the baseline conditions will be available from the quantitative CFD wind assessment, to be undertaken for the Environmental Statement.

Daylight & Sunlight and Overshadowing

17.19. Residential properties south of the site boundary on Marine Road Central are likely to receive high levels of daylight, as they are mainly facing the open sea and no major existing obstruction has been observed within the site boundary. Sunlight levels of the aforementioned properties are likely to be low due to the north orientation of the windows.

17.20. In terms of Overshadowing the existing promenade receives adequate levels of solar access as there are no relevant existing buildings overshadowing the area.

Assessment Methodology

17.21. This section sets out the methodology by which we will assess the proposed development with regards to wind and daylight, sunlight and overshadowing.

Wind

17.22. A quantitative CFD wind model will be constructed for each of the following three scenarios:

- The existing buildings and topography for the site, to a 500m radius;
- The proposed buildings and topography for the site; and
- The proposed buildings and topography for the site, including cumulative developments.

17.23. The model will include ground topography to a sufficient radius such that local wind effects are considered to be represented. Minor geometrical details (such as street furniture, foliage, rooftop plant, etc.) will not be included in the CFD model. These are typically either negligible or beneficial, and therefore this would be a mildly conservative approximation.

17.24. The model produced will enable a quantitative analysis of flow characteristics in the microclimate around the site.

17.25. The model will extend across an area wider than the assessment area, including the built environment up to ten times the proposed building height from the proposed building footprint. The assessment will represent the local wind profile by accounting for the roughness of the buildings and landscape beyond this.

17.26. The investigation will be performed using a CFD model constructed using ANSYS FLUENT. Simulations will be performed at a representative high velocity from 36 wind directions, at 10° intervals around the compass from north.

17.27. The results of the CFD simulations will be combined with meteorological statistics. Pedestrian comfort conditions will be assessed against the industry standard Lawson Criteria for pedestrian comfort and distress. The resulting predicted comfort and distress will be compared against the intended pedestrian uses of the site. The predicted acceptability of the assessment area will be compared between the proposed scenario and both the existing and cumulative scenarios.

17.28. No technical assessment will be made of the wind microclimate during construction stage. Effects during this period will be local and short-term. In addition, the aerodynamic effect of a partially constructed or partially demolished building is likely to fall on a spectrum between the existing and proposed conditions.

17.29. No industry standard has yet emerged for the assessment of significance of the Lawson Criteria. Significance will be assessed by comparing the difference between the simulated acceptability category and the intended acceptability category. This has the benefit of being more easily grasped by those without expertise in wind assessments.

Expected Wind Comfort Conditions	Significance of Impact
Simulated Conditions are similar to (or better than) intended	Negligible
Simulated Conditions are 1 level windier than intended	Minor Adverse
Simulated Conditions are 2 levels windier than intended	Moderate Adverse
Simulated Conditions are 3 levels windier than desired	Major Adverse

Expected Wind Distress Conditions	Significance of Impact
Not Distressful	Negligible
Distressful, but not a major route. Alternative route exists.	Minor Adverse
Distressful for frail person or cyclist	Moderate Adverse
Distressful for general users	Major Adverse

Where an "*adverse significance*" is pre-existing (ie neither the wind conditions nor the intended use category have changed), the significance will also be classed as negligible.

Daylight, Sunlight and Overshadowing

17.30. A quantitative daylight 3d model will be constructed for each of the following three scenarios:

- The existing buildings and topography for the site, including relevant surrounding buildings;
- The proposed buildings and topography for the site within the existing surrounding context; and
- The proposed buildings and topography for the site within the future surrounding context.

17.31. The 3d model will include the relevant geometry that might obstruct the natural light. For the purpose of this assessment, street furniture, trees and landscaping and minor architectural details will be excluded from the model as they will have a either negligible and or temporary effect. The 3d software Rhinocheros is used to build the geometry and Autodesk Ecotect is used to run the daylight calculations.

17.32. The assessment will determine the effect of the proposed development on the natural light levels of properties on Marine Road Central facing the development and on the solar access of amenity spaces. Since there are no sensitive receptors to sunlight, as no windows are facing 90° due south towards the Site, the effect of the proposed development on the sunlight levels of the existing adjacent properties is negligible. For this reason, the assessment of the effect of the proposed development onto sunlight levels of existing receptors is scoped out.

17.33. The methodology adopted for the study follows that set out in BRE Guide, which gives criteria and methods for calculating daylight and sunlight. The BRE Guide uses a set of parameters to quantify the potential light loss level: Vertical Sky Component (VSC) for surrounding buildings. The Guide uses sun hours on the 21st March to quantify the sunlight levels in open spaces.

17.34. A comparison between the baseline and proposed development scenarios will determine the likely effects of the proposed development.

17.35. The study quantifies the likely daylight and sunlight availability to the receptors identified and derives the resulting ratio of impact. The potential effects are:

- Noticeable reductions in daylight that are likely to make the rooms identified to appear gloomier, and electric lighting will be needed more often. This may result in a minor to major negative effect depending on the sensitivity of the receptor;
- Noticeable increase in daylight thus improving the visual comfort qualities of rooms identified. This would result in a moderate to major beneficial effect depending on the sensitivity of the receptor; and
- Noticeable increase in sunlight to the windows identified that will make the rooms benefit from direct solar gains for longer, thus making the rooms appear warmer and more pleasant. This would result in a moderate to major beneficial effect depending on the sensitivity of the receptor.

17.36. No quantitative assessment will be made of the natural light during construction stage. Effects in this period will be local and short-term. In addition, the obstruction caused by a partially constructed or a partially demolished building is likely to fall on a spectrum between the existing and proposed conditions.

Cumulative Effects

17.37. Consideration will be given to the potential for the development to give rise to cumulative effects alongside other existing and approved development. For both the wind and daylight and sunlight assessments, consideration will be given to the effect, cumulatively with these additional developments, on pedestrian comfort and the loss of natural light.

Mitigation

17.38. The need for mitigation measures will be identified through the wind and daylight and sunlight assessment processes, with appropriate design and mitigation measures considered to reduce any significant effects.

17.39. Where exceedances of the wind pedestrian comfort or distress criteria are marginal and can be readily addressed by means of standard mitigation measures (such as soft/hard landscaping, localised shelter, and recessed entrances), it is not proposed to quantitatively assess the proposals. Instead professional judgement and expertise will be applied in qualitatively assessing the likely effect of the mitigation measures.

Residual Effects

17.40. Residual effects of the proposed development after the inclusion of possible mitigation measures will be assessed qualitatively, based on consultants' experience.

Reporting

Wind

17.41. A summary technical report will be prepared and included as an appendix in the Environmental Statement (volume IV). This document will summarise the models constructed, the simulation methodology, assumptions made and the boundary conditions applied.

17.42. The wind assessment technical report will include result summaries, presented in the form of contour plots of pedestrian comfort and distress at 1.5m above floor level. The technical report will also include a brief discussion of possible causes of adverse effects and possible measures to counteract these. The document will include appropriate conclusions and recommendations.

17.43. The results of the assessment will be summarised in Chapter 17 of the Environmental Statement (volume II), as described above in section 4.7.

Daylight, Sunlight and Overshadowing

17.44. Chapter 17 will provide a detailed summary of the magnitude of impact of the proposed development on each receptor and the relative significance of effect.

17.45. The Detailed results of the analysis will be provided and included as an appendix in the Environmental Statement (volume IV). This document will provide full details of the Daylight and Overshadowing calculations for each scenario accessed and ratios of impact for each comparison.

18. Socio-economics

Introduction

18.1. This section of the report sets out the approach to the assessment of the socio-economic effects arising from the proposed development.

18.2. The purpose of the assessment will be to identify and characterise any relevant effects, to consider the nature and scale of the potential impacts, and to assess the significance of any likely effects. For any socio-economic effects which have the potential to be adverse, it will be necessary to consider mitigation measures.

Study Area

18.3. The application site lies on the edge of Morecambe Bay. It comprises land that was reclaimed from the sea between Marine Road Central and the shoreline. The land has traditionally provided space for public recreation for residents and visitors alike over time. It is an important interface between the town and open views towards the bay and the Lake District beyond. The wider public realm included in the site boundary includes the promenade to the north, east and west of the main development site, including the sea wall to the north and stone jetty to the north west, and the adopted highways, footways and public realm to the south of the site.

18.4. The assessment will evaluate the impact of socio-economic receptors at a range of spatial scales or impact areas. These will be as follows:

- Local: The 2011 ward of Poulton (within which the Site is located);
- District: The administrative boundary of Lancaster; and
- Regional: The North West region.

Planning Policy Context

18.5. Key regeneration, economic development and related planning policies and strategies relevant to this project include:

Regional Planning Policy

- Lancaster Core Strategy (2008);
- Lancaster Development Management DPD (2014) and specifically Development Management DPD Policy DM7 (Economic Development in Rural Areas) and Development Management DPD Policy DM12 (Leisure and Visitor Economies); and
- Morecambe Area Action Plan (2014).

National Planning Policy

- National Planning Policy Framework (NPPF) 2019 – with particular reference to Section 6: Building a strong, competitive economy.

Baseline Conditions

18.6. In order to assess the socio-economic effects of the Development, the baseline information

on a variety of socio-economic indicators will be identified and interpreted. The indicators will be grouped into several subject areas. Taken together, these subject areas provide a robust indication of the socio-economic strengths and weaknesses of the local area.

18.7. The baseline assessment will be prepared through a desktop analysis of economic and social conditions. The main thematic areas considered within the baseline assessment will be as follows:

- Population and demographic change;
- Economic activity;
- Education and skills;
- Health conditions;
- Deprivation and poverty; and
- Crime.

18.8. The baseline will assess the economic and social conditions at a range of spatial scales (impact areas), as highlighted in paragraph 18.4.

18.9. Data on baseline socio-economic conditions will be obtained from a variety of sources, including the 2011 Census, the National Online Manpower Information Service (NOMIS) and the Indices of Multiple Deprivation for 2015 which allow consideration of socio-economic conditions at very small local areas known as Lower Layer Super Output Areas (LSOAs). The most current data available will be used for each socio-economic indicator.

18.10. A social infrastructure audit will not be undertaken, given that the proposals do not increase the residential population and will not therefore increase the demand for education or health infrastructure.

Assessment Methodology

18.11. Identification and assessment of the likely socio-economic effects of the proposed development will follow well-established models and standard procedures used in EIA, supplemented by professional judgment.

18.12. We will identify and, where possible, quantify the socio-economic effects of the proposed development. We will consider a range of **permanent socio-economic effects** which will include:

- **Employment effects** – including direct jobs created on site and associated indirect/induced employment created through multiplier effects;
- **Economic effects** – gross value added to the local economy by the employment created;
- **Population effects** – including the additional tourist and visitor expenditure generated by the proposed development; and
- **Revenue effects** – including Business rates revenue.

18.13. We will also assess the **temporary socio-economic effects** which will include:

- Temporary employment created during the construction phase of the redevelopment;
- Gross value added to the local economy by the temporary construction employment;

- Additional worker expenditure during the construction phase of the redevelopment; and
- Construction training opportunities.

Significance of socio-economic effects

18.14. The socio-economic effects identified will be categorised as beneficial, adverse or negligible depending on their expected effect. The significance of the identified effects will then be evaluated, drawing on the evaluation criteria typically used in environmental impact assessment.

Mitigation

18.15. For any socio-economic effects which have the potential to be adverse, it will be necessary to consider mitigation measures. Mitigation measures will require consultation with the client to confirm approval eg for Section 106 agreements.

Residual Effects

18.16. We will identify any residual socio-economic effects of the proposed development. These effects will be those which are likely to remain after any mitigation measures have been deployed.

Cumulative Effects

18.17. We will undertake a cumulative assessment addressing both Type 1 and Type 2 cumulative effects of the proposed development in the light of other existing and approved development. At this stage we do not know how many schemes will be included in the assessment of cumulative effects.

18.18. The cumulative assessment will draw on the same methodology as used in the main body of the report.

Reporting

18.19. We will prepare a chapter on socio-economic effects for inclusion in the ES. This will also include a Non-Technical Summary.

19. Population and human health

Introduction

19.1. This section of the report sets out the approach to the assessment of the significant effects on population and human health arising from the proposed development. There is no available national guidance on the approach to assessing significant effects on population and human health. However, The Department of Health has published 'Health Impact Assessment Tools'[20], which provide simple tools for assessing health impacts arising from new development.

19.2. The purpose of the assessment will be to identify and characterise any relevant impacts, to consider the nature and scale of the potential impacts, and to assess the significance of any likely effects. For any health impacts which have the potential to be adverse, it will be necessary to consider mitigation measures.

Study Area

19.3. The application site lies on the edge of Morecambe Bay. It comprises land that was reclaimed from the sea between Marine Road Central and the shoreline. The land has traditionally provided space for public recreation for residents and visitors alike over time. It is an important interface between the town and open views towards the bay and the Lake District beyond. The wider public realm included in the site boundary includes the promenade to the north, east and west of the main development site, including the sea wall to the north and stone jetty to the north west, and the adopted highways, footways and public realm to the south of the site.

19.4. The assessment will evaluate the baseline health conditions experienced by Lancaster residents and by those communities living closest to the development site. In assessing baseline health conditions, WSP | Indigo will use the following impact areas:

- **Local impact area** – as defined by the Poulton ward boundary; and
- **Wider impact area** – as defined by the Lancaster City Council boundary.

Planning Policy Context

19.5. The following relevant local planning policies related to health have been identified:

Local Planning Policy

- Lancaster Core Strategy (2008); and
- Lancaster Development Management DPD (2014).

National Planning Policy

- National Planning Policy Framework (NPPF) 2019 – with particular reference to Section 8: Promoting healthy and safe communities.

[20] Healthy Urban Planning Checklist; HUDU Planning for Health; London Healthy Urban Development Unit; NHS (2017).

Baseline Conditions

19.6. In order to assess the health impacts of the proposed development, the baseline information on a variety of health-related indicators will be identified and interpreted. The indicators will be grouped into several subject areas. Taken together, these subject areas provide a robust indication of the health conditions in the local area.

19.7. The baseline assessment will be prepared through a desktop analysis of health conditions in Morecambe, as well as for the local area surrounding the application site.

19.8. Data on baseline health conditions will be obtained from a variety of sources, including the 2011 Census, the National Online Manpower Information Service (NOMIS), Public health England and the Indices of Multiple Deprivation for 2015 which allow consideration of health conditions at very small local areas known as Lower Layer Super Output Areas (LSOAs). The most current data available will be used for each health indicator.

19.9. A social infrastructure audit will not be undertaken, given that the proposals do not increase the residential population of Morecombe.

Assessment Methodology

19.10. Identification and assessment of the likely health effects of the proposed development will follow well-established models and standard procedures used in EIA, supplemented by professional judgment.

19.11. To ensure that health is fully and comprehensively considered, the EIA will provide sufficient information to allow the potential impact of the development on public health to be fully assessed. The chapter on population and human health will incorporate the key technical findings from other relevant ES chapters, including noise, air quality and socio-economics.

19.12. We will identify and, where possible, quantify the health effects of the proposed development. We will consider a range of **permanent health effects** which will include:

- Healthy housing;
- Active travel;
- Air quality;
- Noise;
- Open space;
- Play space;
- Biodiversity;
- Local food growing;
- Overheating; and
- Flood Risk.

19.13. Given that the proposed development does not propose any residential floorspace, effects on social infrastructure will not be assessed.

19.14. We will also assess the **temporary health effects** which will include:

- Construction impacts; and

- Local employment and healthy workplaces.

Mitigation

19.15. For any health effects which have the potential to be adverse, it will be necessary to consider mitigation measures. Mitigation measures will require consultation with the client to confirm approval eg for Section 106 agreements.

Residual Effects

19.16. We will identify any residual health effects of the proposed development. These effects will be those which are likely to remain after any mitigation measures have been deployed.

Reporting

19.17. We will prepare a chapter on population and human health for inclusion in the ES. This will also include a Non-Technical Summary.

Appendix 1.1



Note: All dimensions to be verified by site measurement prior to ordering and installation. Location of desks must be coordinated with position of final floor boxes. Layouts to be checked by a fire engineer to ensure sufficient access (free of obstacles) is available to both stairs at all times.

Grimshaw Architects

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SITE BOUNDARY

Total Area = 148,357 m²

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NORTH

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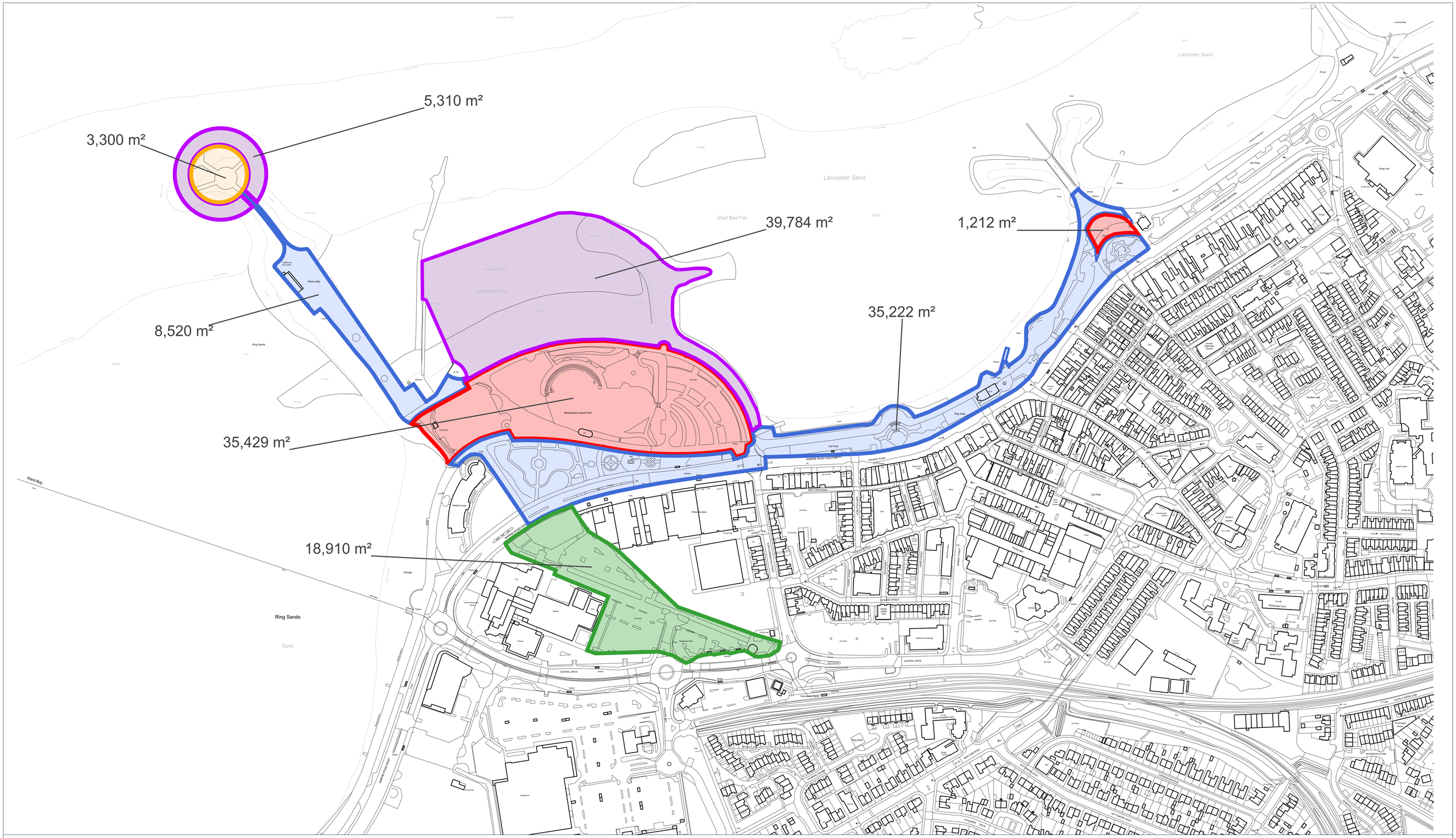
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DRAWING
SITE BOUNDARY PLAN
WITH AREAS

DRAWN	CHECKED	AUTHORISED
OM	AU	AU

DRAWING NUMBER	REVISION
17162_XX_00	04

Appendix 2.1



Note: All dimensions to be verified by site measurement prior to ordering and installation. Location of desks must be coordinated with position of final floor boxes. Layouts to be checked by a fire engineer to ensure sufficient access (free of obstacles) is available to both stairs at all times.

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ECOLOGY ZONE WITH ANCILLARY STRUCTURES

37.3m (AOD)
MAX DEVELOPMENT ZONE

12.6m (AOD)
MAX DEVELOPMENT ZONE

Total Area = 148,357 m²

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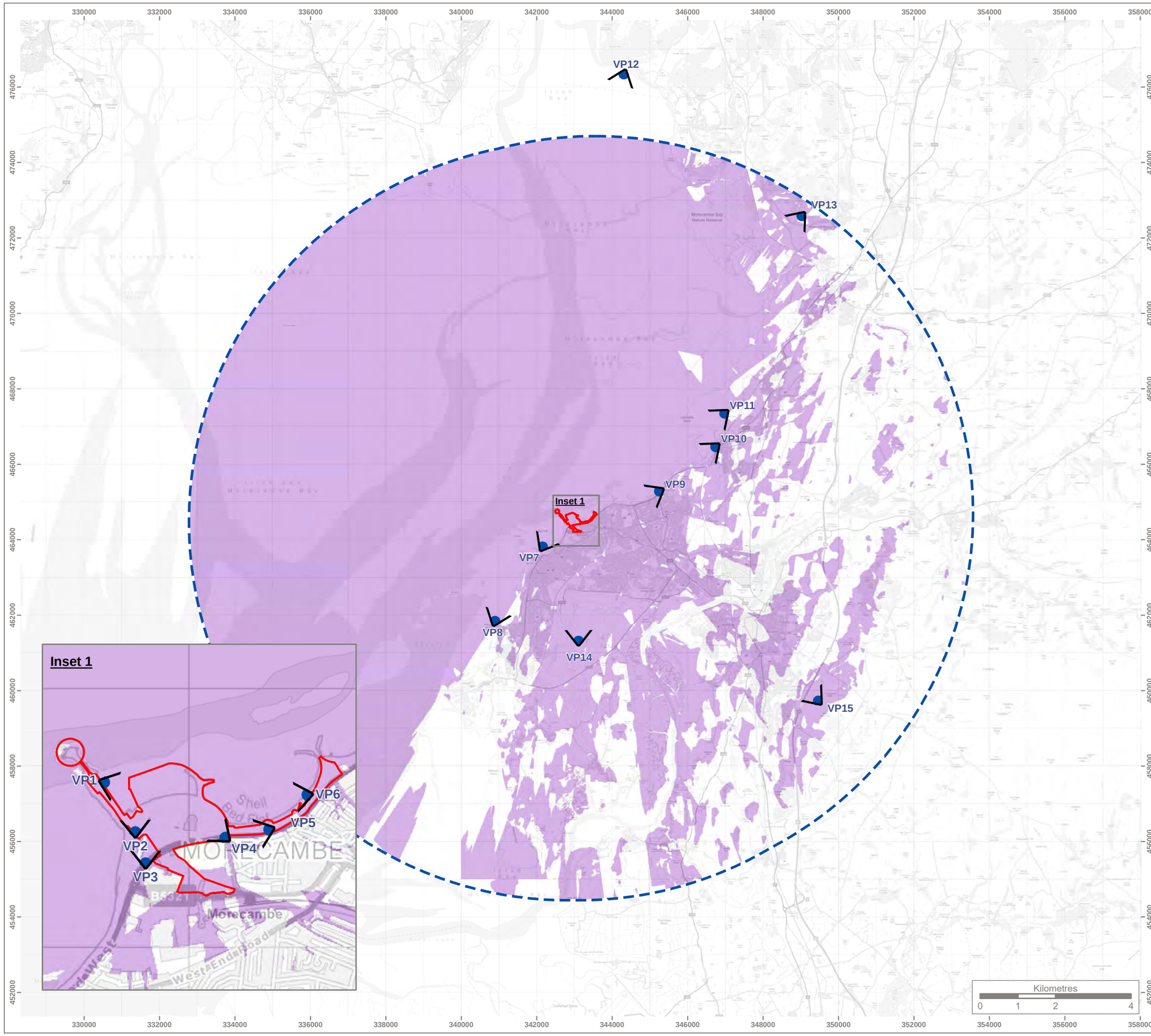
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DRAWING
DEVELOPMENT PARAMETER PLAN WITH AREAS

DRAWN	CHECKED	AUTHORISED
OM	AU	AU

DRAWING NUMBER	REVISION
17162_XX_01	04

Appendix 9.1



KEY

- Site boundary
- 10km offset from Site boundary
- Proposed Viewpoint Location (1)

Zone of Theoretical Visibility (ZTV) - Bare Earth

- Land from which the proposed development would be theoretically visible

Note

This Zone of Theoretical Visibility (ZTV) has been generated using Esri ArcGIS Spatial Analyst extension. The digital terrain model (DTM) has been derived from OS Terrain 5 dataset with an accuracy in the order of ± 2.0m. Earth curvature has been included in the ZTV calculation and refraction of light has been applied using ESRI default settings. The ZTV has been generated from a viewing height of 2m above ground level. This falls within recommendations by "Visual Representation of Windfarms" prepared for Scottish Natural Heritage (SNH) July 2014 - Version 2

The use of Zone of Theoretical Visibility (ZTV) mapping at this stage is limited and the following assumptions should be noted:

• The ZTV has been generated from points at 10m intervals across the Site where the proposed development is likely to occur. The ZTV assumes a maximum development height of 37.3m Above Ordnance Datum (AOD). This is based on information provided on the 20/05/2019 by Grimshaw Architects (drawing number 17162_XX_01 revision 03 Development Parameter Plan with Areas).

• The ZTV is generated from a bare earth terrain and does not account for the screening effect of features within the landscape such as settlements and woodland blocks. It does not indicate potential visual effects or show the likely significance of effects. It shows potential theoretical visibility only. The ZTV has been produced for the purpose of informing scoping and 'on the ground' visual assessment.

• Where visibility is recorded, it is important to note that it does not indicate the number of points visible within the site and could be comprised of any part and number of points across the site.

• The ZTV has been generated up to 10km from the Site boundary.

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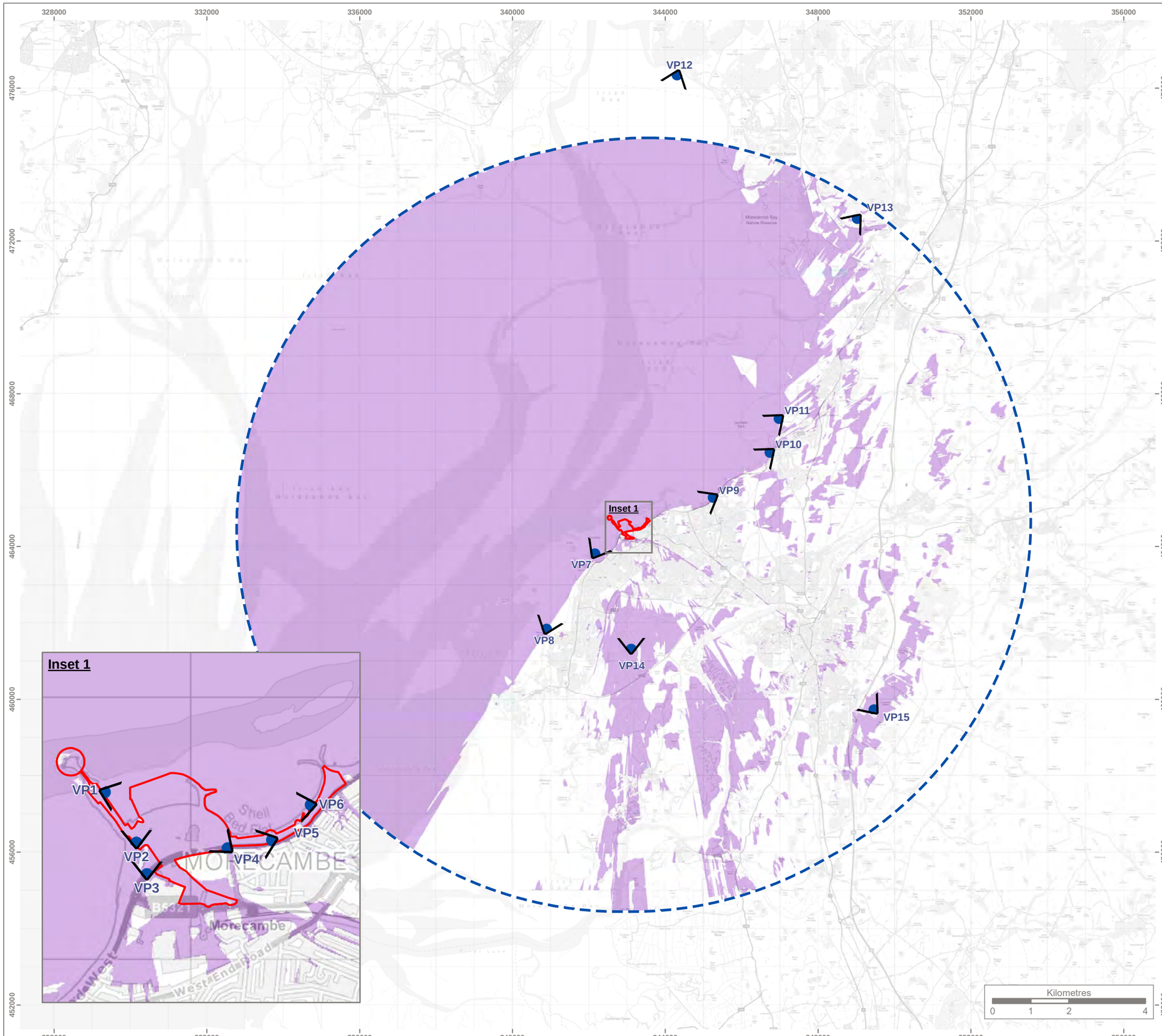
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Title
Figure 3.1 - ZTV Bare Earth

Drawing Number
G7596.006

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Appendix 9.2



KEY

Site boundary

10km offset from Site boundary

Proposed Viewpoint Location

1

Zone of Theoretical Visibility (ZTV) - Screened

Land from which the proposed development would be theoretically visible

Note

This Zone of Theoretical Visibility (ZTV) has been generated using Esri ArcGIS Spatial Analyst extension. The digital terrain model (DTM) has been derived from OS Terrain 5 dataset with an accuracy in the order of ± 2.0m. Earth curvature has been included in the ZVI calculation and refraction of light has been applied using ESRI default settings. The ZTV has been generated from a viewing height of 2m above ground level. This falls within recommendations by "Visual Representation of Windfarms" prepared for Scottish Natural Heritage (SNH) July 2014 - Version 2

The use of Zone of Theoretical Visibility (ZTV) mapping at this stage is limited and the following assumptions should be noted:

•The ZTV has been generated from points at 10m intervals across the Site where the proposed development is likely to occur. The ZTV assumes a maximum development height of 37.3m Above Ordnance Datum (AOD). This is based on information provided on the 20/05/2019 by Grimshaw Architects (drawing number 17162_XX_01 revision 03 Development Parameter Plan with Areas).

• The ZTV accounts for the screening effect of settlements and woodland blocks using a height value of 8m for buildings and 10m for woodland based on OS Open Map Local data (February 2018). Building heights within Morecambe were adjusted to reflect actual heights using LIDAR 1m tiles. The ZTV does not account for the localised screening effects of vegetation (i.e. hedgerows, individual trees, small tree groups or scrub) beyond or immediately adjacent to the Site.

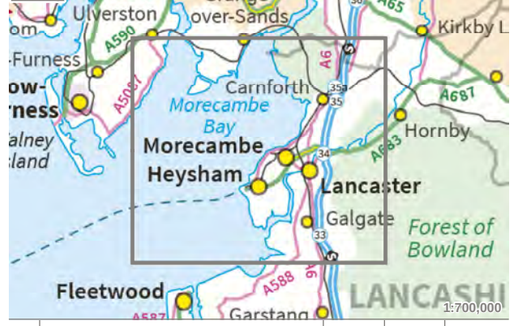
• It does not indicate potential visual effects or show the likely significance of effects. It shows potential theoretical visibility only. The ZTV has been produced for the purpose of informing 'on the ground' visual assessment.

• Where visibility is recorded, it is important to note that it does not indicate the number of points visible within the site and could be comprised of any part and number of points across the Site.

• The ZTV has been generated up to and beyond 10km from the Site boundary.

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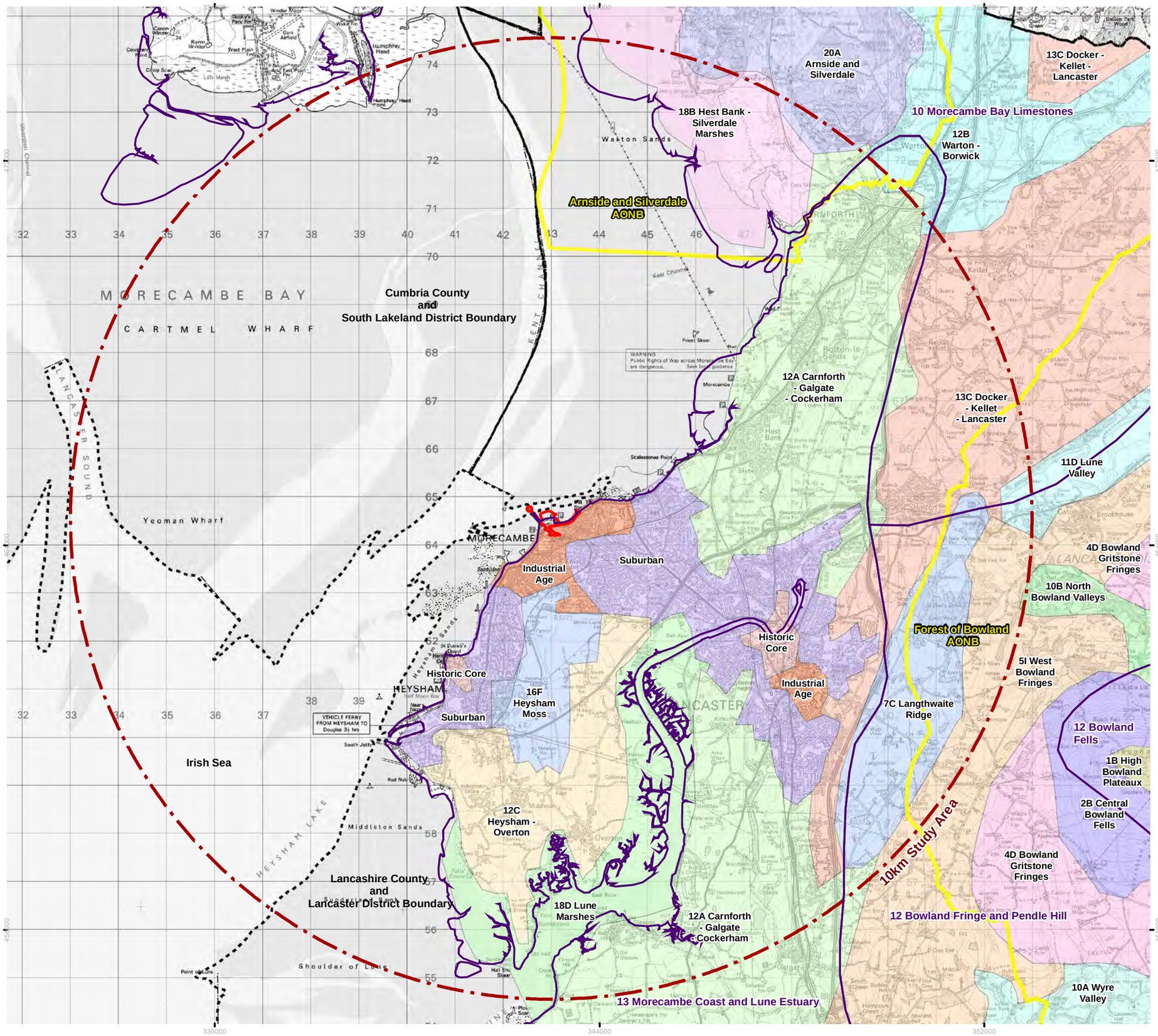
Project
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Title
Figure 3.2 - ZTV Screened

Drawing Number
G7596.007

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Appendix 9.3



KEY

- Site boundary
- 10km study area
- Council boundaries
- Area of Outstanding Natural Beauty (AONB)
- 7a Landscape Character Types (LCA)
- National Character Areas (NCA)

Note

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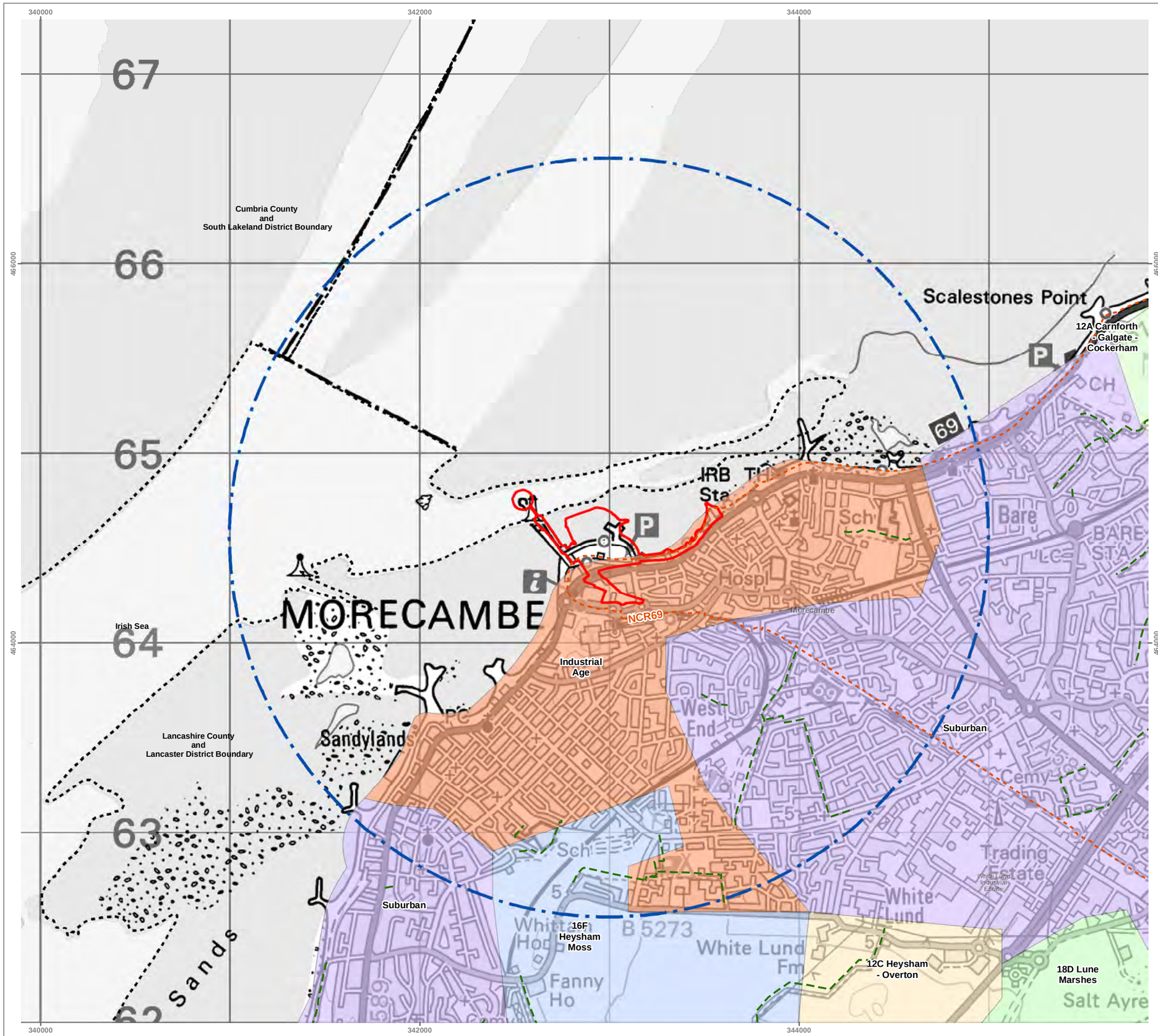
Project
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Title
Figure 1 - Landscape Designations and Landscape Character

Drawing Number
G7596.001

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CR	RE	RA	1:80,000 @ A3	21/05/2019

Appendix 9.4



KEY

- Site boundary
- 2km offset from site
- Council boundaries
- 7a Lancashire Landscape Character Areas (LCT)
- Sustrans National Cycle Route (NCR)
- Public Right of Way (PRoW)

Note

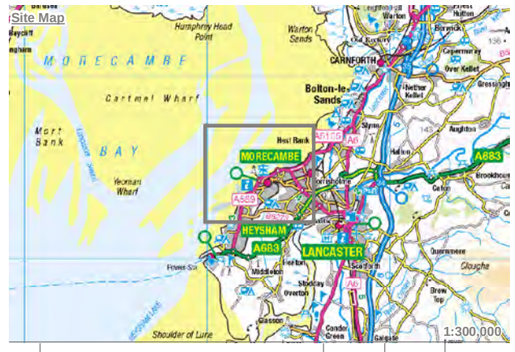
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Site Map



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Title
Figure 2 - Visual Receptors

Drawing Number
G7596.002

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Appendix 9.5



Viewpoint 1 - View from the Stone Jetty, (in the vicinity of the Grade II Listed Former Station Building and Lighthouse), looking south-east towards the main development site (the former Bubbles complex).



Viewpoint 2 - View from near the Rotunda Bar at the Grade II Listed Midland Hotel, looking north-west towards and along the Stone Jetty, and north and north-east across part of the main development site.



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Project
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Title
Figure 4.1: Viewpoints 1 and 2

Drawing Number
IN7596.01

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LDH	LH	RA



Viewpoint 3 - View from the entrance to the Visitor Centre looking north and north-east towards the main development site beyond Marine Road Central and the Grade II Listed Midland Hotel.



Viewpoint 4 - View from the junction between Northumberland Street and Marine Road Central looking west to north towards the main development site.



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Project
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Title
Figure 4.2: Viewpoints 3 and 4

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Viewpoint 5 - View from the Lancashire Coastal Way and NCR 700 on the promenade, in the vicinity of the Eric Morecambe statue, looking westwards to the main development site, with the Midland Hotel beyond.



Viewpoint 6 - View from the Lancashire Coastal Way and NCR 700 on the promenade, in the vicinity of the mountain range sculpture and the Grade II Listed Clock Tower, looking south-west to north-west towards the main development site, with the Midland Hotel and Stone Jetty beyond.



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Project
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Title
Figure 4.3: Viewpoints 5 and 6

Drawing Number
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Viewpoint 7 - View from the slipway car park, north of Sandylands, looking north-east towards the main development site alongside and beyond the Midland Hotel, and towards the Stone Jetty. Higher ground within the Arnside and Silverdale AONB is visible in the distance.



Viewpoint 8 - View from a PRoW to the west of the Grade I Listed Chapel of St Patrick, on Chapel Hill at Heysham (National Trust Site), looking north-east towards the Stone Jetty, and the main development site in the distance, obscured by intervening development.



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Project
Eden Project North, Morecambe

Title
Figure 4.4: Viewpoints 7 and 8

Drawing Number
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Viewpoint 9 - View from the Lancashire Coastal Way and NCR 700 on the promenade, alongside the Coastal Road and opposite the car park adjacent to Morecambe Golf Club, looking south-west towards the main development site and the Stone Jetty in the distance.



Viewpoint 10 - View from the Lancashire Coastal Way near the Hest Bank railway level crossing and café looking south-west towards the main development site and the Stone Jetty in the distance.

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Title
Figure 4.5: Viewpoints 9 and 10

Drawing Number
IN7596.05

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Viewpoint 11 - View from the Lancashire Coastal Way near the Morecambe Lodge Caravan Park (west of Bolton Town End), looking south-west towards the main development site and the Stone Jetty in the distance.



Viewpoint 12 - View from the PRoW between Park Point and Far Arnside, within the Arnside and Silverdale AONB, looking south across Morecambe Bay, towards the main development site in the far distance.



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Title
Figure 4.6: Viewpoints 11 and 12

Drawing Number
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Appendix 10.1

Planning Context
Conservation Area & Listed Buildings

Conservation Area Boundary

Listed Buildings:

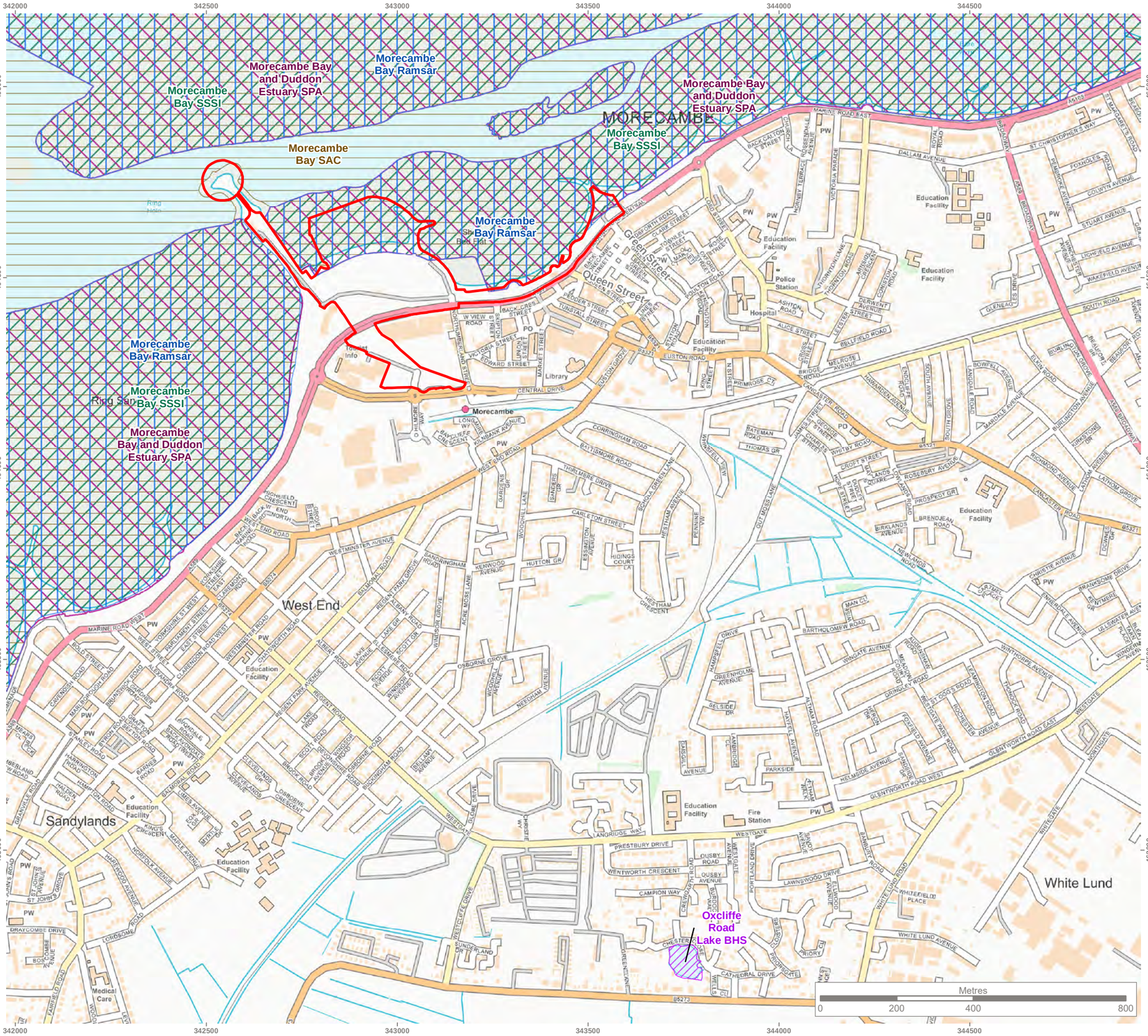
1 Midland Hotel
2 Morecambe Promenade Railway Station
3 War Memorial
4 Station & Lighthouse
5 The Winter Gardens
6 217, 219, 221 Marine Road
7 Church of St Laurence
8 Barclays Bank
9 The Clock Tower
10 Queens Hotel, 274 Marine Road
11 1 Deansgate (Mona House)
12 Morecambe Central Methodist Church
13 333-343 Marine Road
14 The Morecambe Hotel
15 Morecambe Town Hall
16 Telephone Exchange (Recently listed)

(Refer to Morecambe Conservation Area 2008 for full list)



GRIMSHAW

Appendix 11.1



KEY

Site boundary

Designations

- Ramsar
- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- Sites of Special Scientific Interest (SSSI)
- Biological Heritage Site (BHS)

Note

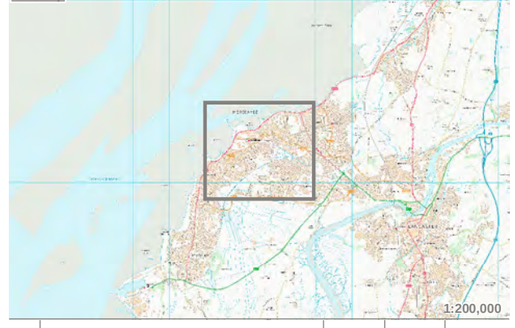
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Site Map



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Title
Designations

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Appendix 11.2

THE ENVIRONMENT PARTNERSHIP



EDEN PROJECT NORTH, MORECAMBE

EXTENDED PHASE 1 HABITAT SURVEY

TECHNICAL REPORT

MAY 2019

TEP
Genesis Centre
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WA3 7BH

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Document Title	Technical Report
Prepared for	Eden Project North
Prepared by	TEP - Warrington
Document Ref	7596.003

Author	John Abernethy
Date	May 2019
Checked	Mike Walker
Approved	Francis Hesketh

Amendment History					
Version	Date	Modified by	Check / Approved by	Reason(s) issue	Status

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3.0 Summary 28

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DRAWINGS

Phase 1 Habitat Map (G7596.003)

1.0 Introduction

1.1 TEP was commissioned by the Eden Project North to prepare an Extended Phase 1 Habitat Survey in respect of land at the Central Promenade, Morecambe for the proposed Eden Project North development.

1.2 The central grid reference for the site is SD 42905 64522 and the site boundary (14.8 hectares) is shown below in Figure 1.

1.3 The application site is located on the central promenade of Morecambe adjacent to the A589 Marine Road Central, just to the north of the town centre. The site is located to the east of the Midland Hotel. In terms of the proposed development, the site comprises five distinct Sections:

- Section 1: Eden Pavilions – this section comprises the now disused 'Bubbles complex'. This Section is proposed to contain the main visitor spaces.
- Section 2 and Section 2A: Promenade – This section contains the memorial gardens to the east of the Midland Hotel and extends east to the Breakwater opposite Green Street. Proposals for Section 2 include a number of micro observatories and proposals for Section 2A include the Bay View Tower.
- Section 3 and Section 3A: Stone Jetty – This contains the jetty structure at the western edge of the site. Proposals for this section include retaining public access along the jetty and the Lunar Observatory Area at the northern end.
- Section 4: Car parking area – this area comprises an existing car park to the south of Marine Road Central, adjacent to the Festival Market Hall. This section is proposed to provide car parking for the site with some landscape enhancement.
- Section 5: Ecology Zone – this comprises a breakwater structure, boulder flood defences and an intertidal area to the north of the site. Habitat enhancements are proposed for this section as well as some ancillary structures associated with the development.



Figure 1 Aerial map showing the site, and various site sections (S1 – S5).

Assessment Scope

1.4 An Extended Phase 1 habitat survey of the site was carried out by TEP Principal Ecologist Mike Walker (Field Identification Skills Certificate (FISC) Level 4) and TEP Assistant Ecologist John Abernethy on the 3rd May and 17th May 2019. Phase 1 habitat survey is a standardised method of recording habitat types and characteristic vegetation, as set out in the Handbook for Phase 1 Habitat Survey - a technique for Environmental Audit (JNCC, 2010). The survey method was extended through the additional recording of specific features indicating the presence, or likely presence, of protected species or other species of nature conservation significance, including invasive species, in accordance with Guidelines for Preliminary Baseline Ecological Appraisal (CIEEM 2017).

1.5 This survey provides an overview of key habitats within the site and identifies any features of ecological value, as well as the presence, or potential presence, of any protected or notable species. Particular note was made of any statutorily protected species or habitats such as Section 41 (S41) species/habitats of principal importance, as prioritised by the Natural Environment and Rural Communities (NERC) Act, 2006.

1.6 The survey was undertaken during the recommended period for Phase 1 habitat assessments (between mid-April to mid-October inclusive). The weather on both survey days was dry and sunny with some light wind.

2.0 Habitat Survey Results

2.1 The overall application site is approximately 14.8 hectares in size and is comprised predominantly of amenity grassland, hard standing and introduced shrubs.

2.2 Only one S41 NERC (2006) habitat of principal importance is present within the site. This habitat is “intertidal mudflats”, present at the edge of Section 3A at the northern edge of the Stone Jetty and present within Section 5 (Ecology Zone). “Mudflats and sandflats not covered by water at low tide” is also a qualifying habitat for the Morecambe Bay Special Area of Conservation (SAC).

Section 1 - Proposed Eden Pavilions

2.3 This Section comprises areas of hard standing used for car parking within the east of the area, interspersed with small patches of introduced shrubs. The central area of the site contains a large area of hardstanding, surrounded by open areas of short mown amenity grassland and some less regularly mown areas of grassland on surrounding banks. The less regularly mown areas have developed a more diverse ground flora and now contain modified neutral grassland.

2.4 A patch of dense introduced shrub is present at the top of the bank with some native scrub species (elder) and pine trees. Three disused buildings are present within this area (B1 – B3), all of which hold low potential for roosting bats.

Section 2 - Promenade (proposed public realm enhancements with ancillary structures) and Section 2A

2.5 This Section contains a stretch of Morecambe promenade. The War Memorial Gardens at the western end, largely comprise amenity grassland, ornamental flower beds and patches of introduced shrubs. This Section is separated from the Midland Hotel grounds to the west by a tall hedgerow containing a mixture of introduced shrubs and coniferous trees.

2.6 Further east there are further areas of hardstanding used as car parking, children’s play areas and walkways. There are also many small areas of amenity grassland and introduced shrubs. Two areas of blown sand are present that have been colonised by some short ephemeral vegetation.

2.7 Two buildings, including a shop and public toilets building (B5) and a clock tower (B6) are present within this area. These buildings have low potential for roosting bats.

2.8 Section 2A lies at the eastern end of this Section and proposals include the Bay View Tower (30m max height development zone). The habitats present are amenity grassland adjacent to an area of hardstanding.

Section 3 – Stone Jetty (proposed public realm enhancements with ancillary structures) and Section 3A

2.9 This Section is dominated by hardstanding and is used as a walkway to the lighthouse building towards the northern end, as well as the viewpoint at the tip of the jetty. The stone jetty is surrounded by boulder sea defences.

2.10 Section 3A is the northern tip of the site and includes the proposed 5m max height development zone. This area contains hardstanding areas used as viewpoints, two access ramps, and surrounding boulder sea defences. The site boundary also includes small areas of estuarine mud between the flood defence areas at the northern tip of the jetty.

Section 4 – Proposed accessible parking and public realm enhancements with ancillary structures

2.11 Section 4 comprises a large area of hardstanding, with a few small area of amenity grassland and introduced shrubs breaking up the area. Scattered trees are also present throughout this Section and a tree line is located along the south eastern edge.

2.12 A small bus shelter building (B7) is present at the southern edge of this Section. This building has low potential for roosting bats.

Section 5 – Proposed Ecology Zone with ancillary structures

2.13 The Ecology Zone contains boulder sea defences at the southern end, with a sandy beach present to the north of this. The sand then gives way to estuarine mud which covers the majority of this intertidal area.

2.14 The rock breakwaters have been colonised by small scatterings of scrub and ephemeral species including elder Sambucus nigra, rowan Sorbus aucuparia, sea buckthorn Hippophae rhamnoides and herb-robert Geranium robertianum.

2.15 This Section falls under multiple ecology protected site designations, including the Morecambe Bay and Duddon Estuary Special Protection Area (SPA), and the Morecambe Bay Ramsar, Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI).

Habitat Descriptions

2.16 The habitats listed in Table 1 are present. The specific locations of the target notes within the site are presented on the Phase 1 habitat plan G7596.003.

Table 1 Habitat types present on site

Habitat Type	Protection/ Status	Target Note No	Brief Description
Introduced Shrub	n/a	TN1 – TN3	Introduced shrub is present throughout each of the Sections. Much of it contains Escallonia species planted as short ornamental hedges. A wide thick hedge comprised of various introduced shrub species and scattered trees serves as the boundary between the ornamental gardens to the south of the site and the Midland Hotel. Another tall area of introduced shrub is present at the top of the grassy bank in Section 1, which also contains a few native scrub species such as elder.
Flower beds	n/a		There are a number of planted flower beds in the ornamental gardens and war memorial to the south of the site comprised of plantings of ornamental non-native flower species.
Boulders			Along the northern boundary of the site there are rock breakwaters which are being colonised by areas of ephemeral/ short perennial species and scattered scrub species including Hippophae rhamnoides and Sambucus nigra
Tall Ruderal	n/a		Tall ruderal vegetation is present in small patches on the edges of the amenity grassland where it meets walls. It is dominated by nettle Urtica dioica.
Scattered Scrub	n/a	TN4	Small patches colonising the rock breakwaters and a small patch on the east side of the substation (B1) at the south side of the large area of hard standing. Patches on the rocks are mostly occasional sea buckthorn, ash and elder. The southern patch is made up of elder, buddleia and Japanese rose.

Habitat Type	Protection/ Status	Target Note No	Brief Description
Amenity Grassland	n/a	TN5	The dominant habitat of the site. Much of the centre of the site is comprised of patches of regularly mown amenity grassland surrounded by hard standing and concrete walls
Modified neutral grassland	n/a	TN6	Two banks bordering the central area of amenity grassland have transitioned into modified neutral grassland through lack of mowing and supports a larger floral diversity than the adjacent amenity grassland. .
Ephemeral /Short Perennial	n/a	TN7	Ephemeral/ short perennial species were found growing in the cracks and crevices between the paving slabs and concrete within the car park to the east of the site.
Buildings	n/a	B1-B7	Seven buildings are present on site (B1 – B7). These include three disused buildings in section1, a lighthouse building in section 2 on the stone jetty, a shop/public toilets building in section 3 and a bus shelter in section 4.
Scattered Broad-leaved Trees	n/a		Occasional within the introduced shrub area at the edge of the Midland Hotel complex. Broad-leaved trees are scattered throughout Section 4, with a range of tree species present (sycamore Acer pseudoplatanus, whitebeam Sorbus sp., ash Fraxinus excelsior).
Scattered Coniferous Trees	n/a		Occasional within the hedge of introduced shrub (TN3)
Intertidal Mudflats	S41		Present at northern tip of Stone Jetty (Section 3A) and covers much of Section 5.
Invasive species	Schedule 9		Japanese rose (Rosa rugosa)

2.17 Species present within the habitats noted on site were assigned codes according to their level of presence within the site using the DAFOR scale where D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare[1].

Introduced Shrub

2.18 Introduced shrub areas are present throughout the site, many of which comprise short ornamental hedgerows dominated by Escallonia species.



Figure 2 Escallonia planted throughout site.

2.19 There are a few taller, more mature areas of introduced shrub, which also contain a number of trees. One of these is located in Section 1 on top of a grassy bank in the north of the site. Trees include pine species, with taller shrubs including laurel and New Zealand holly. Understorey species include nettle, cleavers, cow parsley and hedge garlic.

[1] Hill, D., Fasham, M., Tucker, G., Shewry, M. and Shaw, P. (2005) *Handbook of Biodiversity Methods - Survey, Evaluation and Monitoring*. Cambridge: Cambridge University Press.



Figure 3 Tall introduced shrub and scattered trees on top of grass bank in Section 1

Table 2 Target Note 1. Tall introduced shrub area at top of grassy bank in Section 1

Latin Name	Common Name	DAFOR Scale
Hippophae rhamnoides	Sea buckthorn	F
Alliaria petiolata	Hedge garlic	F
Urtica dioica	Nettle	F
Galium aparine	Cleavers	F
Poa annua	Annual meadow grass	F
Prunus laurocerasus	Cherry laurel	O
Olearia macrodonta	New Zealand Holly	O
Rubus fruticosus agg.	Bramble	O
Anthriscus sylvestris	Cow parsley	O
Sambucus nigra	Elder	O
Plantago lanceolata	Ribwort plantain	O
Escallonia sp.	Escallonia	O
Dactylis glomerata	Cocksfoot	O
Pinus sp.	Pine sp.	R

2.20 At the western end, the species composition changes, becoming more dominated by sea buckthorn.

Table 3 Target Note 2. Tall introduced shrub area at top of grassy bank in Section 1, dominated by sea buckthorn

Latin Name	Common Name	DAFOR Scale
Hippophae rhamnoides	Sea buckthorn	D
Olearia macrodonta	New Zealand holly	F
Sambucus nigra	Elder	O
Fraxinus excelsior	Ash	O
Rubus fruticosus agg.	Bramble	O
Rumex obtusifolius	Broad-leaved dock	O
Anthriscus sylvestris	Cow Parsley	O
Rosa canina	Dog rose	R

Within Section 2, a wide hedge with a mix of native and introduced ornamental species formed the border of the site in its southwest corner separating it from the Midland Hotel. The hedge is interspersed with scattered coniferous and broadleaf trees.



Figure 4: Tall and wide strip of introduced shrub with scattered trees at the edge of the Midland Hotel complex in Section 2

2.21 These areas of habitat offer potential habitat for nesting birds and also shelter for mammal species, although no mammal signs were recorded. Bird species recorded in these areas included dunnock, greenfinch, goldfinch and house sparrow.

Table 4 Target Note 3. Strip of introduced shrub with scattered trees adjacent to Midland Hote

Latin Name	Common Name	DAFOR Scale
Acer campestre	Field Maple	O
Hedera helix	Ivy	O
Lamium purpureum	Red Deadnettle	O
Pinus sp.	Pine species	O
Rubus fruticosus agg.	Bramble	O
Sambucus nigra	Elder	O
Phormium tenax	New Zealand Flax	O
Daphne laureola	Spurge Laurel	R
Hyacinthoides hispanica	Spanish Bluebell	R
Lonicera sp.	Honeysuckle species	R
Rosa rugosa	Japanese Rose	R
Ulex sp.	Gorse sp.	R

Tall Ruderal

2.22 Tall ruderal vegetation is present in small patches around the site, particularly along the margins of the amenity grassland where it meets walls.

2.23 The tall ruderal vegetation is dominated by nettle, with frequent cow parsley and hedge garlic.

2.24 This habitat is also present below the taller, less managed area of introduced shrub and trees in Section 1.

Scattered Scrub

2.25 Small patches of scattered scrub are present in some areas around the north of the site in small scattered patches amongst the rock/boulder breakwaters in Section 5 and on the eastern side of the building at the south of Section 1 (B1).

2.26 The areas of scattered scrub located along the rock breakwaters are generally dominated by bramble with occasional elder, ash, rowan and sea buckthorn. Patches of buddleia are also present.

2.27 The sections of scattered scrub in the rock breakwaters in Section 5 contain a number of tree species, however, these are very small (<1m) and due to the poor conditions are unlikely to grow any larger than this so cannot be considered as scattered trees though they are tree species.



Figure 5 Scattered scrub along the rock breakwater and ephemeral species in Section 5



Figure 6 Patch of scrub and Japanese rose at the south of the site

2.28 The patch of scattered scrub next to the building at the south of Section 1 is made up of bushes of buddleia, Japanese rose and elder with ground flora of bramble and ivy. Japanese rose is an invasive species listed under Schedule 9 of the Wildlife and Countryside Act 1981 and as such it is an offence to plant it or allow it to grow in the wild so this needs to be controlled and removed.

2.29 The scattered scrub on site provides foraging resources for a variety of invertebrates, birds and small mammals.

Table 5 Target Note 4. Scattered scrub, containing a number of stunted tree species within boulder sea defences within Section 5

Latin Name	Common Name	DAFOR Scale
Rubus fruticosus agg	Bramble	D
Fraxinus excelsior	Ash	O
Hippophae rhamnoides	Sea buckthorn	O
Sonchus arvensis	Sowthistle	O
Taraxacum officinale agg.	Dandelion	O
Corylus avelllana	Hazel	O
Olearia macrodonta	New Zealand Holly	O
Buddleja davidii	Buddleia	O
Sambucus nigra	Elder	O
Hedera helix	Ivy	O
Beta vulgaris	Sea beet	O
Blechnum spicant	Hard fern	R
Rosa rugosa	Japanese rose	R

Amenity Grassland

2.30 Much of the site is covered in large sections of amenity grassland. These grasslands are highly managed and regularly mown and as a result the sward is short. The three arc shaped sections of amenity grassland within Section 1 are utilised for functions with a fun fair present in that area during the survey.

2.31 The areas of amenity grassland within the memorial gardens in Section 2 are interspersed with planted flower beds and paved paths. The amenity grassland contains a low floral diversity as a result of its management and use.



Figure 7 Amenity grassland at western edge of Section 1.

Table 6 Target Note 5. Amenity grassland

Latin Name	Common Name	DAFOR Scale
Poa annua	Annual meadow grass	D
Lolium perenne	Perennial Ryegrass	O
Bellis perennis	Daisy	O
Festuca rubra	Red fescue	O
Hypochaeris radicata	Common catsear	O
Plantago lanceolata	Ribwort Plantain	O
Plantago major	Greater Plantain	O
Ranunculus repens	Creeping Buttercup	O
Taraxacum officinale agg.	Dandelion	O
Trifolium repens	White Clover	O

Modified Neutral Grassland

2.32 Through a less intensive mowing regime, areas of modified neutral grassland have formed on the banks surrounding the amenity grassland in the centre of section 1. The lack of mowing and management and sheltered position away from the sea has allowed a more diverse assemblage of plant species to develop than the adjacent mown amenity areas. This more diverse grassland will provide habitat for a range of invertebrates including pollinator species.

2.33 The neutral grassland categories detailed within the Phase 1 Habitat Survey Handbook are concentrated on grassland associated with rural situations (pastures and meadows), as such it was agreed with JNCC in 2005 (P. Gateley, pers. comm.) that neutral grassland habitats that don't easily fit within these categories, usually within urban or industrial areas, can be referred to as modified neutral grassland -

'Modified neutral grassland is not derived from agricultural grassland and the terms semi-improved and improved do not apply. Some modified neutral grassland may be species-rich but many swards are dense, coarse and species-poor. Modified neutral grassland naturally regenerates on disturbed ground and is unmanaged. It most commonly occurs in urban areas and on post-industrial land'

2.34 There are a number of small planters within the central area of hard standing that have reverted to modified neutral grassland through a lack of management and colonisation by grassland species.

2.35 One of the planters has also been colonised by Japanese rose; a Schedule 9 invasive species.



Figure 8 Modified neutral grassland on the bank below area of tall introduced shrub



Figure 9 Planter which has reverted to modified neutral grassland

Table 7 Target Note 6. Modified neutral grassland on grass banks within Section 1

Latin Name	Common Name	DAFOR Scale
Festuca rubra	Red Fescue	A
Plantago lanceolata	Ribwort Plantain	A
Achillea millefolium	Yarrow	F
Alopecurus pratensis	Meadow Foxtail	F
Plantago major	Greater Plantain	F
Taraxacum officinale agg.	Dandelion	F
Calystegia sp.	Bindweed species	O
Cirsium arvense	Creeping Thistle	O
Lolium perenne	Perennial Ryegrass	O
Lotus corniculatus	Bird's-foot Trefoil	O
Poa pratensis	Smooth Meadow-grass	O
Poa trivialis	Rough Meadow-grass	O
Ranunculus repens	Creeping Buttercup	O
Potentilla erecta	Tormentil	O
Trifolium pratense	Red Clover	O
Trifolium repens	White Clover	O
Vicia sativa	Common Vetch	O
Cerastium fontanum	Common Mouse-ear	R
Geranium dissectum	Cut-leaved Cranesbill	R
Rubus fruticosus agg.	Bramble	R
Rumex crispus	Curled Dock	R
Rumex obtusifolius	Broad-leaved Dock	R
Sisymbrium officinale	Hedge Mustard	R

Anthoxanthum odoratum	Sweet Vernal-grass	R
Cardamine pratensis	Cuckooflower	R
Cirsium vulgare	Spear Thistle	R
Lamium album	White Dead-nettle	R
Leucanthemum vulgare	Oxeye daisy	R
Myosotis sp.	Forget-me-not species	R
Senecio jacobaea	Common Ragwort	R
Silene dioica	Red Campion	R
Veronica serpyllifolia	Thyme-leaved Speedwell	R
Fumaria officinalis	Common fumitory	R
Ranunculus ficaria	Lesser celandine	R

Ephemeral / Short Perennial

2.36 Small areas of ephemeral/short perennial species were found both colonising the rock breakwaters and the cracks in the paving slabs surrounding the car park to the east of the site.

2.37 The ephemeral species in the rock breakwaters were scattered and frequently bordered areas of scattered scrub or were mixed within them.



Figure 10 Ephemeral/Short perennial species colonising the rock breakwater

Table 8 Target Note 7. Short ephemeral/perennial species

Latin Name	Common Name	DAFOR Scale
Geranium robertianum	Herb-Robert	O
Cymbalaria muralis	Ivy-leaved toadflax	O
Epilobium sp.	Willowherb species	O
Matricaria discoidea	Pineapple-weed	O
Poa annua	Annual Meadow-grass	O
Sedum acre	Biting Stonecrop	O
Senecio vulgaris	Groundsel	O

Planted Flower Beds

2.38 The majority of the areas of amenity grassland within Section 2 also contain beds of planted herbaceous flower species. These are small and open and offer little in the way of habitat to species but are useful as a resource for pollinator species.



Figure 11 Planted flower beds within the war memorials ornamental gardens

Boulders

2.39 Wide sections of sea defences made up of large boulders are present along the sea edges of much of the site. These habitats fall within the site boundary in Section 3A and Section 5. Above the high tide line scattered scrub and ephemeral/tall perennial species have begun to colonise between the boulders. Below the high tide line the boulders are coated in algal and lichen species and further down they are colonised by marine algal species.

2.40 These boulder habitats, particularly on the groyne within Section 5, are likely to provide both roosting and foraging habitat for a range of waterbirds such as oystercatcher, redshank and turnstone. Low numbers of oystercatcher were observed during the Phase 1 habitat survey.



Figure 12 Boulder sea defences with succession of tidal species within Section 3A. Estuarine mud can be seen in background

Buildings B1-B7

2.41 Hardstanding is prevalent throughout Sections 1 – 4, with tarmac access roads, car parks, pavements and concrete areas present.

2.42 There are seven buildings on-site including two small structures made of breezeblocks with secure metal doors and the old disused bandstand within Section 1, the boarded up lighthouse within Section 3, a shop and an adjacent clocktower in Section 2 and a bus shelter in Section 4.

2.43 B1 is a breeze block built, curved building with large metal doors which have gaps where they meet the floor. There are also a number of gaps present between the breeze blocks which may offer internal access. There are also visible gaps under the roof felt which could be utilised by bats. Furthermore much of the front side of the building is heavily clad in ivy which could obscure other potential cracks and crevices. There is also an open vent on the west side of the structure which provides access to the internal structure.



Figure 13 B1 with the ivy on the right side of the building, ivy obscuring the broken vent offering ingress to the internal structure and the roof felt coming away from the main structure

2.44 B2 is a small circular, breeze block building with a flat recessed roof. There were signs that people had gained access to the roof due to rubbish being found on the roof. There were small holes in the side of the building which used to offer access for cables. The building has a metal door which has open slots at the top which could also offer access for bats.



Figure 14 B2; small circular structure with recessed flat roof. Small holes for cable access and slots above door

2.45 B3 Is the old bandstand, made of bricks with a flat, felt covered roof. There were a number of visible gaps in the brickwork and the roof felt was peeling away from the structure. Lastly there were holes in the boarded up window which could further offer access by bats to the internal structure.



Figure 15 B3; the disused bandstand. Images show the roof felt coming away from the roof, large cracks for ingress and holes in boarded up window/vent



Figure 16 Lighthouse on the Stone Jetty in Section 3 (B4)

2.46 Near the end of the stone jetty is the disused lighthouse (B4). This building is boarded up but has a number of loose roof slates, soffit box and cracks in the walls which could offer access for bats. However, this building is isolated and far from any linear features or foraging habitat which reduces its suitability for bats.

2.47 On the promenade (Section 2) is a building (B5) currently used as a shop and public toilets. It is currently thought that this buildings has low potential for roosting bats.

2.48 Adjacent to building B5 is a brick built clocktower (B6). This building was assessed to hold low potential for roosting bats.



Figure 17 Shop and public toilets (B5) within Section 2.



Figure 18 : Clock tower (B6) within Section 2

2.49 At the eastern end of Section 4 is a bus shelter (B7). This building is made of corrugated metal and was assessed as holding low potential to support roosting bats.



Figure 19 Bus shelter within Section 4.

2.50 It is recommended that further inspection by a licenced bat ecologist is carried out at each of these buildings, including internal inspection if possible, if they are to be impacted by proposed works, to fully determine their potential to support roosting bats.

2.51 A number of bird species were also observed on or near to the buildings, including house sparrow and starling, which could potentially nest in these structures.

Scattered Broad-Leaved Trees

2.52 A number of scattered broad-leaved trees are present within the wide hedge of introduced scrub, including field maple *Acer campestris*.

2.53 Broad-leaved trees are present within areas of introduced shrub throughout the car park in Section 4. Species present include Whitebeam (*Sorbus sp.*), ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*), willow (*Salix sp.*) and poplar species (*Populus sp.*). A line of these trees is present along the northern edge of this area.



Figure 20 Line of trees along northern edge of Section 4.

Scattered Coniferous Trees

2.54 A number of pine trees (*Pinus sp.*) are present within the tall band of introduced shrub adjacent to the Midland Hotel in Section 2, as well as within the tall band of introduced shrub at the top of the grassy bank in Section 1.

Intertidal Mudflats

2.55 At the base of the sea defence boulders within Section 5 is an area of mudflat, known as Shell Bed Flat. This area contains a number of deep channels and provides a feeding resource for wading birds associated with the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar at mid and low tide.

2.56 The northern tip of the Stone Jetty (Section 3A) contains estuarine mud adjacent to the stone boulders surrounding the jetty (See Figure 21).

2.57 Intertidal mud is a S41 habitat, and the specific habitat type 'Mudflats and sandflats not covered by water at low tide' is a qualifying habitat for the Morecambe Bay SAC.



Figure 21 Boulder sea defences giving way to mud flats within Section 5. Adjoining breakwater structure in background.

Invasive Species

2.58 One Schedule 9 invasive species was present onsite - Japanese Rose (Rosa rugosa). This species was found in a few areas of introduced shrub within Section 1 and was prevalent within Section 4. This is an invasive species listed on Schedule 9 of the Wildlife and Countryside Act, 1981 and as such it is an offence to plant it or allow it to grow in the wild. This species should therefore be controlled and ideally removed from the site.

3.0 Summary

3.1 The majority of the application site (excluding Section 3A and Section 5) has few habitats which support a diverse range of native plant and animal species. The habitats of relatively higher ecological value within Sections 1, 2, 2A, 3B and 4 are the modified neutral grassland, and the taller areas of introduced shrub and scattered trees (TN6 and TN3 respectively). These are not S41 habitats and given their limited extent and botanical diversity, they do not have any nature conservation status.

3.2 Section 3A (northern tip of Stone Jetty) and Section 5 (Ecology Zone) both lie within the Morecambe Bay and Duddon Estuary SPA, and the Morecambe Bay Ramsar, SAC and SSSI, designated for a number of waterbirds and seabirds during winter, passage and breeding periods as well as for a range of estuarine habitats.

3.3 These Sections contain the intertidal area to the north of the site and associated boulder sea defences which provide habitat for a number of waterbird species associated with the designated sites. The breakwater structure at the north of the site is known to be roosting habitat for bird species such as redshank, turnstone and oystercatcher, all qualifying features of the SPA and Ramsar site. The habitats present in these areas also include qualifying habitat for the SAC – mudflats and sandflats not covered by water at low tide. Any potential impacts on these protected habitats and species will require careful consideration and mitigation through the process of Habitats Regulations Assessment.

3.4 No evidence of protected species was observed within the site during the Extended Phase 1 habitat survey. External inspection of the buildings on site suggest some offer potential for bat roosts and will require further daytime assessments by a licensed bat ecologist to determine their potential to support roosting bats. This will be necessary for any buildings to be removed or substantially refurbished for the development.

3.5 The introduced shrub areas and trees within the site provide potential breeding habitat for a number of bird species including birds of conservation concern species house sparrow and dunnock. There is also potential for species such as starling and house sparrow to nest within the buildings present.

3.6 The invasive Japanese rose was present in one of the planters in a few locations within Section 1 and is prevalent throughout planting in Section 4. It is an offence under the Wildlife and Countryside Act 1981 to allow this species to grow in the wild, therefore this species should be controlled and ideally eradicated from the site.

DRAWINGS

Phase 1 Habitat Map (G7596.003)

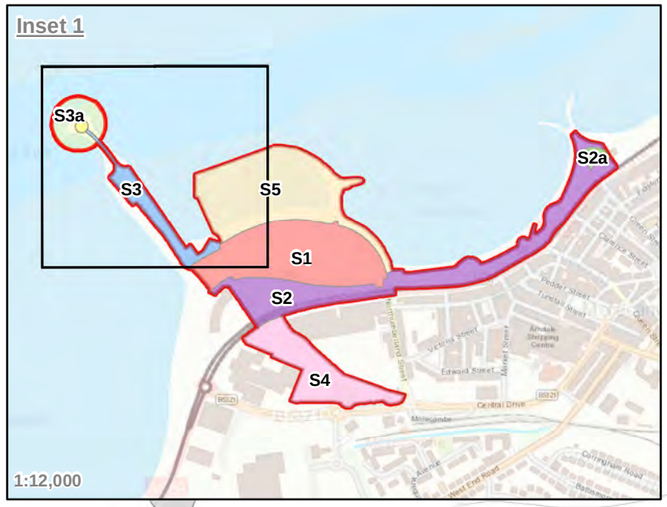
342600

342800

464800

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Inset 1



Stone Jetty

B4

RNLI Lifeboat Ramp

RNLI Morecambe Hovercraft Station

TN4

Metres
0 25 50 100

KEY

- Site boundary
- Target note
- Scattered scrub
- Wall
- Modified neutral grassland
- Boulders
- Amenity grassland
- Hardstanding with ephemeral/short perennial
- Introduced shrub
- Mud
- Building
- Hardstanding

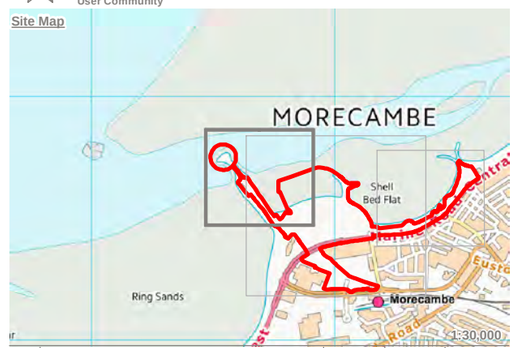
Note:
Inset 1 depicts the development perimeter plan. The plan reflects a drawing received on 20/05/2019 from Grimshaw Architects titled '17162_XX_01 Development Perimeter Plan'.

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Site Map



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THE ENVIRONMENT PARTNERSHIP
Genesis Centre, Birchwood Science Park, Warrington WA3 7BH
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project
Eden Project North, Morecambe

Title
Phase 1 Habitat Survey

Drawing Number
G7596.003.1

Sheet 1 of 3

Drawn	Checked	Approved	Scale	Date
CR	JO	MW	1:1,500 @ A3	22/05/2019

342800 343000 343200

464800 464600 464400 464200

Inset 1

S3a S3 S5 S1 S2 S2a S4

1:12,000

RNLI Lifeboat Ramp

Stone Jetty

B4

RNLI Morecambe Hovercraft Station

TN1 TN2 TN3 TN4 TN5 TN6 TN7

B1 B2 B3 B7

Midland Hotel

A589 Marine Road Central

B5321 Central Drive

Festival Market Hall

Sand

A MG

Metres
0 25 50 100

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MORECAMBE

1:40,000

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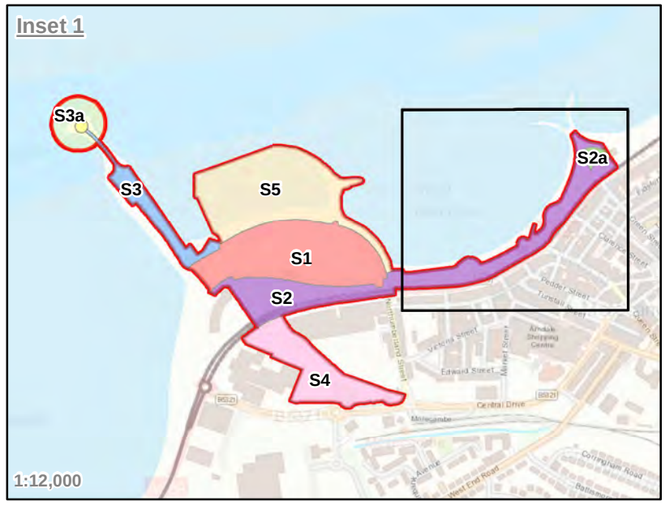
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Sheet 2 of 3

Drawn	Checked	Approved	Scale	Date
CR	JO	MW	1:2,500 @ A3	22/05/2019

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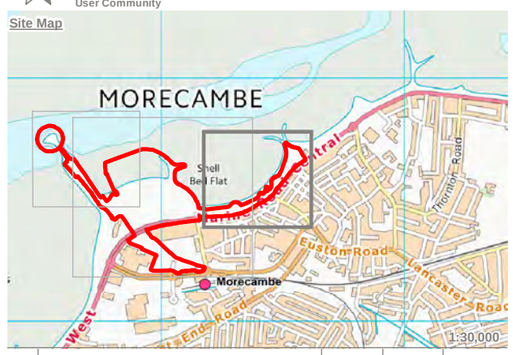
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G7596.003.3

Sheet 3 of 3

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THE ENVIRONMENT PARTNERSHIP

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Cornwall
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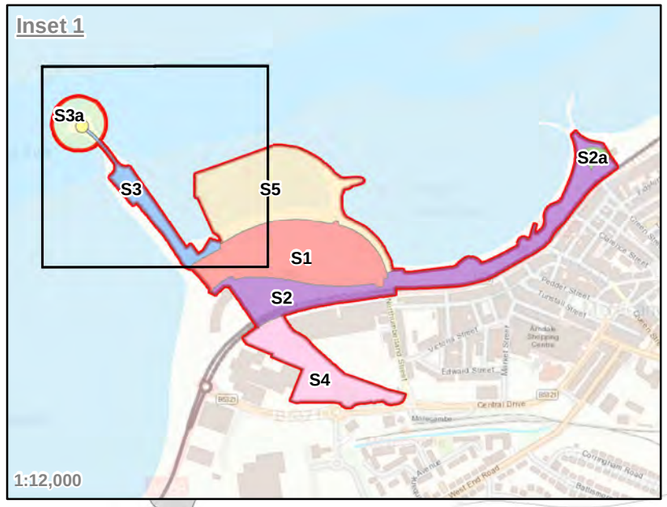
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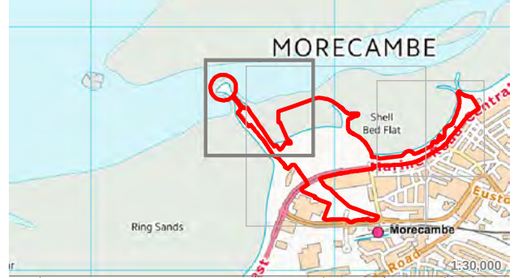
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Sheet 1 of 3

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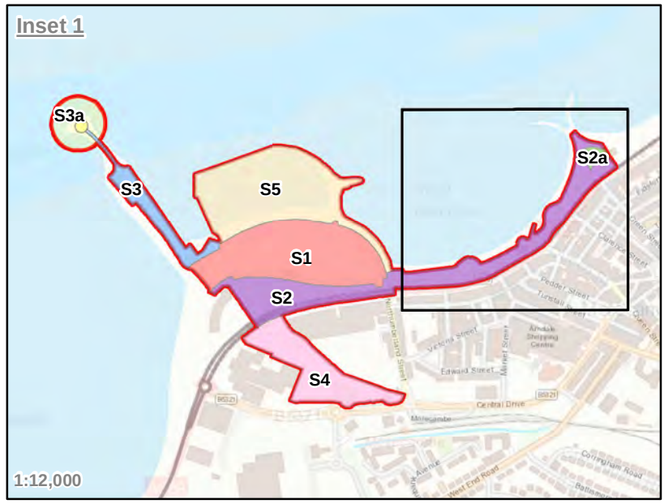
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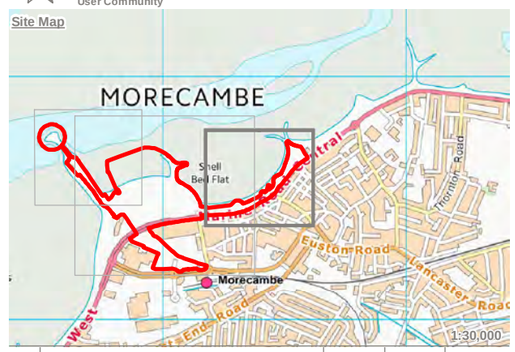
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Sheet 3 of 3

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Appendix 13.1

APPENDIX 13.1: LEGISLATIVE FRAMEWORK, PLANNING POLICY AND GUIDANCE

Legislative Framework

THE WATER RESOURCES ACT (1991):

The Water Resources Act regulates water resources, pollution, water quality and flood defence. The Act aims to prevent and minimise pollution of water. Currently, the Environment Agency is responsible for the policing of this Act. Under the Act, it is an offence to cause or knowingly permit any poisonous, noxious or polluting material, or any solid waste to enter any controlled water.

The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 allow the enforcement of powers to protect and remediate deleterious effects on water bodies. These effects can be caused by either damage to hydro-morphological elements which affect water control, such as river erosion, or general pollution.

LAND DRAINAGE ACT (1994):

The Land Drainage Act adds new environmental duties to the Land Drainage Act 1991. It requires the Internal Drainage Board (IDB) and Local Authorities to further the conservation and enhancement of natural beauty, and to conserve flora, fauna and geological or physiographical features of special interest, as well as taking account of any effects which the proposals may have on the beauty or amenity of any rural or urban area, or on any such flora, fauna or features.

THE ENVIRONMENT ACT (1995):

The Environment Act sets out the responsibilities of the Environment Agency in relation to water pollution, resource management, flood defence and fisheries.

ANTI-POLLUTION WORKS REGULATIONS (1999):

Under Section 161A of the Anti-Pollution Works Regulations 1999, the Environment Agency can serve a works notice requiring any business which has caused pollution or is at risk of causing pollution to a watercourse to carry out preventative works and operations in order to minimise the risk and future risk. Failure to do so can lead to prosecution.

WATER FRAMEWORK DIRECTIVE (2000):

The Water Framework Directive aims to improve and integrate the way waterbodies are managed throughout Europe. In order to address the requirements of the Directive, the Environment Agency has produced river basin management plans, which develop new ways of protecting and improving the water environment.

THE WATER ACT (2003):

The broad aims of the Water Act 2003 are: the sustainable use of water resources; strengthening the voice of the consumer; a measured increase in competition and finally the promotion of water conservation. The Act made it a statutory obligation on water companies to produce a Water Resources Plan.

GROUNDWATER DAUGHTER DIRECTIVE (2006/188/EC) (2006):

The Groundwater Daughter Directive establishes specific measures to prevent and control groundwater pollution. In particular; (a) criteria for the assessment of good groundwater chemical status; and (b) criteria for the identification

and reversal of significant and sustained upward trends and for the definition of starting points for trend reversals. The Directive also aims to prevent the deterioration of the status of all bodies of groundwater.

THE FLOOD RISK REGULATIONS (2009):

The Flood Risk Regulations transpose the EU Floods Directive into law in England and Wales. Under the Regulations, the Environment Agency and Lead Local Flood Authorities (LLFAs) had to prepare Preliminary Flood Risk Assessments (PFRAs).

THE GROUNDWATER (ENGLAND AND WALES) REGULATIONS (2009):

The Groundwater (England and Wales) Regulations are an environmental protection measure which provide enhanced protection for groundwater by preventing the input of ‘hazardous’ substances into groundwater and limiting the input of ‘non-hazardous’ pollutants into groundwater.

FLOOD AND WATER MANAGEMENT ACT (2010):

The Flood and Water Management Act revises and consolidates legislation relating to flooding, land drainage, coastal erosion and reservoir safety. The Act gave new responsibilities to unitary and county councils to manage local flood risk. The Act also includes provisions regarding flood risk management assets, sustainable drainage, powers to undertake environmental works, reservoir safety and a number of alterations to water and sewerage provision.

THE WATER ACT (2014):

The Water Act covers four main areas: making water supplies more resilient to natural hazards such as droughts and floods; creation of a national water supply network to make it easier for water companies to buy and sell water from each other; ensuring access to affordable flood insurance from 2015 via a new industry backed levy; and increasing competition in the water industry by allowing all businesses, charities and public sector customers in England to switch their water and sewage supplier.

THE ENVIRONMENTAL DAMAGE (PREVENTION AND REMEDIATION) (ENGLAND) REGULATIONS (2015):

The Environmental Damage (Prevention and Remediation) (England) Regulations provide guidance for imminent threats of ‘environmental damage’ or actual ‘environmental damage’, related to surface water and groundwater. Guidance is provided to ensure appropriate mitigation measures, such as easements when working near water, is allowed for. In addition, it recommends remediation measures, should there be significant effects to cause a change in surface water and groundwater.

THE ENVIRONMENTAL PERMITTING REGULATIONS (2016):

The intended effects are to make the scheme approach risk based, so that regulators are able to concentrate on high risk applications, and to make applications for flood consents easier and quicker for businesses. It regulates “flood risk activities” within the Environmental Permitting framework, replacing the previous flood defence consent scheme.

THE WATER ENVIRONMENT (WATER FRAMEWORK DIRECTIVE) (ENGLAND AND WALES) REGULATIONS (2017):

The Water Environment (Water Framework Directive) (England and Wales) Regulations outline the duties of regulators in relation to environmental permitting, abstraction and impoundment of water. Specifically, Regulation 3 enforces the duty on the Secretary of State, and the Environment Agency to act in compliance with various water directives when considering permits and licenses affecting water quality, and to coordinate their actions relating to these Directives.

Planning Policy

NATIONAL PLANNING POLICY FRAMEWORK:

The 'National Planning Policy Framework' (NPPF) requires that a 'Flood Risk Assessment' (FRA) should be undertaken:

- *For all developments greater than one hectare (ha) in size in Flood Zone 1.*
- *For all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has a critical drainage problem.*
- *Where proposed development or a change of use (e.g. from commercial to residential) to a more vulnerable class may be subject to other sources of flooding (e.g. surface water drains, reservoirs).*

The Site covers an area of approximately 14.8 hectares (ha). The 'Environment Agency Flood Maps for Planning' indicate that parts of the Site are located within Flood Zones 1, 2 and 3.

Consequently, an FRA is required to support a planning application for the Proposed Development in order to 'demonstrate that the Proposed Development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall'.

The NPPF also requires development to be allocated towards areas at lowest risk of flooding (The 'Sequential Test'), and if necessary the development proposals would be subject to satisfying the requirements of the 'Exception Test'.

NON-STATUTORY SUSTAINABLE DRAINAGE TECHNICAL STANDARDS:

The 'Non-Statutory Sustainable Drainage Technical Standards' (March 2015) document sets out the technical standards for sustainable drainage systems.

The Site is classified as Brownfield Site. The standards state that for Brownfield developments the peak runoff rate from the development to any highway drain, sewer or surface water body for the 100% Annual Exceedance Probability (AEP) rainfall event and 1% AEP rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

For Brownfield developments, where reasonably practicable, the runoff volume from the development to any highway drain, sewer or surface water body must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event. If this is not practical, the runoff volume should never exceed the runoff volume from the development site prior to redevelopment for that event. If this is not practical, the runoff volume must be discharged at a rate that does not increase flood risk.

The drainage system must be designed so that unless an area is designated to hold and/ or convey water as part of the design, flooding does not occur on any part of the site for events up to and including rainfall events with a 3.3% AEP, and flooding does not occur during rainfall events with a 1% AEP in any part of a building or utility plant susceptible to water. The design of the site must ensure that where reasonably practicable flows resulting from rainfall in excess of a 1% AEP rainfall event are managed in exceedance routes that minimise risks to people and property.

Components must be designed to ensure structural integrity of the drainage system, and any adjacent structures, for the design lifetime of the development, and the materials which are specified by the designer must be of a suitable nature for their intended use.

Pumping should only be used to facilitate drainage for those parts of the site where it is not reasonably practicable to drain water by gravity.

The mode of construction of any communication with an existing sewer or drainage system must be such that the making of the communication would not be prejudicial to the structural integrity and functionality of the system. Any damage which does occur must be minimised and rectified before the drainage system is classed as complete.

LANCASTER CITY COUNCIL CORE STRATEGY 2003 - 2021 (JULY 2008):

The 'Lancaster City Council Core Strategy' document sets out the strategy and policies for the use, development or protection of land and buildings in the area for the period of 2003 to 2021. Central Morecombe is identified as a Regeneration Priority Area which will be re-invented as a visitor destination, with the restoration of the Victoria Pavilion (Winter Gardens).

A number of policies within this document are relevant to the Proposed Development:

Policy 'SC1: Sustainable Development' states that any development should:

- *'Have an acceptable impact on drainage systems and use Sustainable Drainage Systems (SuDS) where appropriate'*

Policy 'SC7: Development and the Risk of Flooding' states that:

- *'Development proposals and allocations will be assessed in line with the search sequence set out in Planning Policy Statement 25 on Development and Flood Risk'; and,*
- *'Proposals and Development Control Policies relating to flood defence and flood management should ensure beneficial outcomes for the natural environment. Morecombe Bay is an internationally important wildlife site and proposals should meet the strict tests set out in Regulation 49 and 49 of the Habitat Regulations. Any proposal or policy that cannot demonstrate that it would not have an adverse effect on the European Site will not be supported.'*

Policy 'E1: Environmental Capital' states that the Local Authority will '*resist development in places where environmental risks including from flooding cannot be properly managed'*.

- *A site-specific flood risk assessment demonstrates that the development, including access, will be safe without increasing flooding elsewhere, and where possible, will reduce flood risk overall;*
- *The scheme incorporates flood protection, flood resilience and resistance measures appropriate to the character and biodiversity of the area and the specific requirements of the site;*
- *Appropriate flood warning and evacuation plans are in place; and,*
- *New site drainage systems are designed taking account of events which exceed the normal design standard.*

LANCASTER CITY COUNCIL DEVELOPMENT MANAGEMENT DEVELOPMENT PLAN DOCUMENT (DPD) (DECEMBER 2014)

Lancaster City Council adopted the DPD in December 2014. It sets out a series of generic planning policies that will be used to determine Planning Applications. This document now forms a key part of the new Local Plan for the Lancaster District 2011 – 2031 (which is still being developed by the Local Authority). A number of policies within this document are relevant to the Proposed Development.

Policy 'DM35: Key Design Principles' states that the Proposed Development should '*incorporate surface water drainage through appropriate management techniques maximising where possible their opportunity to deliver amenity and biodiversity enhancements*'.

Policy 'DM38: Development and Flood Risk' states that Proposed Development within defined areas of flood risk must ensure the following:

- *'That the proposed use meets the Sequential and Exception Tests are appropriate...;*
- *The suitable and appropriate flood prevention and mitigation measures are agreed, implemented and maintain to ensure that the development Is appropriately flood resilient and resistant;*
- *There will be no net increase of flooding to properties within the locality as a result of the development ... unless suitable and appropriate compensation or mitigation measures exist or can be agreed, implemented and maintained;*
- *That on-site surface water run-off through the use of SuDS and the use of permeable surfaces are used where appropriate in accordance with Policy DM39; and,*
- *There is no adverse impact on, or unacceptable risks to, the quantity or quality of water resources in accordance with Policy DM40'.*

Policy 'DM39: Surface Water Run-Off and Sustainable Drainage' states that:

- *Relevant proposals will be expected to investigate the suitability of the following attenuation measures:*
  - *Store surface water for later use;*
  - *Use infiltration techniques, such as porous surfaces in non-clay areas;*
  - *Attenuate surface water in ponds or open features for gradual release into a watercourse; and,*
  - *Attenuate surface water by storing in tanks or sealed water features for gradual release into a watercourse.*
- *New development should seek to demonstrate that there is no increase in on-site or off-site surface water run-off rates upon completion and, where practical and feasible to do so, that reductions in surface water run-off are achieved to the relevant standards.*

Policy 'DM40: Protecting Water Resources and Infrastructure' states that new development must:

- *'Not threaten surface water and groundwater quantity and quality caused by water run-off into nearby waterways;*
- *Consider effective and efficient disposal of wastewater; and,*
- *Seek to increase water availability and protect and improve the quality of rivers or groundwater where possible.'*

LANCASTER CITY COUNCIL MORECOMBE AREA ACTION PLAN (DECEMBER 2014)

The Core Strategy prepared by Lancaster City Council identifies Morecombe as the main regeneration priority area within the district. As a result, the Local Authority prepared an area action plan for Morecombe. The Morecombe Area Action Plan (MAAP) forms part of the Local Plan for the Lancaster District.

MAAP Spatial Policy 3 (SP3) relates to the main seafront and promenade at Morecombe. The Proposed Development falls within this spatial area. It states that '*essential works of coastal defence must be complementary with the open character, and contribute to people's use and enjoyment of the seafront and shore'.* Furthermore, the Local Authority will not *'permit any proposals that result in a significant adverse impact on the Bay environment and its interest features as a European Site. Specifically, it will require that development proposals make proper consideration of any effects that might arise for this environment, both direct and indirect and including in how any potential adverse effects can be mitigated through appropriate management measures that the Morecambe Bay Partnership and any successor organisations might propose'.*

Guidance

LANCASTER CITY COUNCIL LEVEL 1 STRATEGIC FLOOD RISK ASSESSMENT (OCTOBER 2017)

The Level 1 Strategic Flood Risk Assessment (SFRA) collates all known sources of flooding within the District that may affect existing or future development, delineates areas of 'low', 'medium' and 'high' probability of flooding, and recommends appropriate land uses within flood affected areas. Where flood risk has been identified as a potential constraint to future development, the SFRA recommends possible flood mitigation solutions to minimise the risk to property and life should a flood event occur.

The predominant source of flood risk to Morecambe is from the sea (due to extreme tides/ storm surges); the Environment Agency's Historic Flood Map contains details of tidal flooding within the town. Surface water flooding is prevalent across the District, particularly around Morecambe, due to the terrain beginning to flatten off, allowing surface water to accumulate.

Climate change poses a significant risk to the sub-region. As a result, a precautionary approach to account for climate change should be considered by assuming that Flood Zone 2 will become Flood Zone 3a in 100 years' time and Flood Zone 3a could become Flood Zone 3b.

The Site is not mentioned specifically within the PUSH SFRA.

LANCASHIRE AND BLACKPOOL LOCAL FLOOD RISK MANAGEMENT STRATEGY (OCTOBER 2013)

The 'Local Flood Risk Management Strategy' (LFRMS) is an over-arching strategy which is seen as the first step in understanding the flood risk in Lancashire and Blackpool. The aim of the document is to help understand the broad nature and extent of flood risk in the area.

The overall aim of the LFRMS is to produce a plan to reduce and manage flood risk in a way that will benefit people, property and the environment. The LFRMS highlights the wards with the highest risk of flooding.

The Site is not mentioned specifically in the LFRMS.

LANCASTER CITY COUNCIL SURFACE WATER DRAINAGE, FLOOD RISK MANAGEMENT AND WATERCOURSES PLANNING ADVISORY NOTE (MAY 2015)

Lancaster City Council has developed a surface water drainage, flood risk management and watercourse Planning Advisory Note. The purpose of the note is to set out how the Local Authority expects developers to manage surface water and flood risk on site.

Lancaster City Council will recommend the implementation of the following methods of managing water on site:

- *'Permeable paving and surfacing on paths, pavements and roads in the development where the expected traffic volumes will not damage this surfacing;*
- *Install water butts/ rainwater collections to new premises;*
- *Contour all roads and other impermeable/ hard surfacing towards planted areas/ gravel trenches, and other SuDS features;*
- *Plant reeds along flow routes of surface water from surfaces used by vehicles, to filter out pollutants, and improve downstream water quality;*
- *Plant as many shrubs and trees as possible around the development;*
- *Grass verges and planted areas should be lower than the adjacent hard surfacing;*
- *Use amenity areas and open spaces as flood storage areas during significant events;*
- *Use gravel on paths to ensure than runoff is reduced and will reduce the developments impermeable areas;*
- *Keep existing hedges and planting in place, to reduce runoff and minimise impacts; and,*
- *Raise all finished floor levels to at least 150mm above the surrounding ground levels.'*

Additionally, attenuation features should be designed such that:

- *'For soakage structures, the percolation rate must be applied to the sides of the infiltration structure only and the rate for the base must be zero;*
- *The infiltration structure should also drain 50% of its total volume in 24 hours or less for both the 1 in 10 and 1 in 100 years (plus climate change storm events; and,*
- *Any infiltration drainage design must include adequate winter groundwater monitoring data to determine the highest winter groundwater table.'*

The Advisory Note also states that discharge to surface waterbodies (including the sea) should be restricted to the estimated mean Greenfield runoff rate (QBAR). It also states that new outfall structures are limited to one if it is proposed to penetrate a flood defence.

NORTH WEST ENGLAND AND NORTH WALES SHORELINE MANAGEMENT PLAN (SMP2) (FEBRUARY 2011)

Halcrow Group Ltd prepared the final 'North West England North Wales Shoreline Management Plan' (SMP). The SMP provides a large-scale assessment of the risks associated with shoreline evolution, coastal flooding and erosion. It presents a policy framework to address these risks to people and the developed historic and natural environment in a sustainable manner.

The coastline is divided up into sub-cells. The Site falls within 'Sub-Cell 11c – Rossall Point to Hodbarrow (including the Wyre, Lune, Kent, Leven and Duddon Estuaries)'.

Sub-cell 11c is characterised by extensive sandflats, which are exposed at low tide. The shorelines of Morecambe Bay are made up of large areas of saltmarsh in more sheltered areas fronting rocky outcrops, low cliffs and low-lying land. The intertidal zone of Morecambe Bay and the estuaries are internationally important environmentally designated areas.

The SMP states a policy of 'hold the line' (until year 2110) This means that defences should be maintained or upgraded to improve the standard of protection provided by the existing defence line. The groynes and breakwaters that also make up Morecambe's defences are helping to manage foreshore levels and control channel movements now. Habitat gains and losses are expected to be balanced in the medium term but there is uncertainty over sediment supply from the outer bay in the long-term. As a result, there will be some coastal squeeze in the long-term of the inter-tidal habitat (between 2060 – 2110).

NORTH WEST RIVER BASIN MANAGEMENT PLAN (DECEMBER 2009)

The North West River Basin Management Plan (RBMB) was produced by the Environment Agency and provides a framework for protecting and enhancing the benefits provided by the water environment. To achieve this, and because water and land resources are closely linked, it also informs decision on land-use planning.

One of the main purposes of the plan is to prevent waterbodies deteriorating by highlighting areas of land and bodies of water that have specific uses that need special protection and setting out legally binding objectives for each quality element in every waterbody.

The Proposed Development falls within the Kent Leven catchment which flows out into Morecambe Bay. Morecambe Bay has the largest continuous intertidal area in the whole of the UK

KENT LEVEN CATCHMENT FLOOD MANAGEMENT PLAN (DECEMBER 2009)

The Kent Leven Catchment Flood Management Plan (CFMP) was produced by the Environment Agency to help understand the scale and extent of flooding now and in the future, and set policies for managing flood risk within the catchment. CFMPs aim to promote more sustainable approaches to managing flood risk.

The Application Site falls within the 'Lowland Rural Areas' sub-group for which the policy is Policy Option 3 – Areas of low, moderate or high flood risk where we are generally managing flood risk effectively. The proposed actions (relevant to the Application Site) to implement the preferred policy are as follows:

- Investigate the feasibility of providing a flood warning service to the risk areas…Also, encourage the use of flood resilience and flood-proofing;
- Review current flood risk management works, including gravel extraction. The level of works should maintain the current protection in urban areas, but maybe reduced in rural areas. Consider small scale schemes to relieve localised flooding due to poor conveyance in areas.
- Ensure that the Local Development Framework includes policies which work towards the long-term protection and re-creation of river corridors through sustainable land use and management. Also work with the planning authorities to limit development in flood plains and reduce runoff using SuDS or controlled discharges where possible.

Appendix 14.1

Eden Project North - Transport Vision

Eden Project North aims to be the leading example for progressive and healthy transport methods in the UK. We want to subvert typical transport expectations (that a journey requires petrol, that it's boring, that it requires lots of planning and forethought) to provide a clean, smooth, accessible, fun and active alternative to arriving at a destination that further endorses these values.

Eden Project North recognises that the experience starts long before the visitor crosses the entrance gates, and that our decisions and commitments to sustainability and human health extend far beyond the duration of their stay. This is why we remain dedicated to establishing a forward-thinking and innovative strategy that can bring new and positive things to the town, the people and the natural environment of Morecambe.

The purpose of this statement is for us to explain to Lancashire County Council and Lancaster City Council our transport vision for Eden Project North.

As a vision it is innovative, forward looking and thought provoking. Its objective is to stimulate discussion and set the principles which will guide the transport strategy and engagement with key consultees. It is the first stage in establishing the detailed transport strategy for the project, which will be developed over the coming months in collaboration with Eden Project North, its highways and planning consultants and the City and County Councils.

Eden's core principles

1. **Eden Project North aims to work with the existing transport infrastructure where possible.**

   We believe the most sustainable and effective method of accessing Eden Project North and integrating a new transport strategy is to use the resources and infrastructure that are already available. We will investigate how we can best use existing infrastructure such as the Park and Ride at M6 Junction 34, the existing local train line from Lancaster to Morecambe, the bus network, footpaths and the existing Way of the Roses cycle path.

2. **Eden Project North aims to support future transport developments where multiple schemes can create an argument for larger-scale improvements.**
   We support many of the principles established in the Lancashire City Council Highways and Transport Masterplan 2016 to help deliver a wide-reaching network of sustainable travel options. We will work with the City and County Councils to try and weave the principles into our transport strategy to help make the Morecambe Area Action Plan a reality. We will consider a range of measures to improve gateways into Morecambe Town Centre and aim to fully integrate the seafront with the town to make it more attractive to spend time in a Morecambe less dominated by cars.

3. **Eden Project North's Transport Strategy aims to positively influence circulation routes in and around the town of Morecambe, encouraging pedestrianisation and inspiring people to spend more time in different areas.**

"At the moment, though the seafront and some of the shopping areas are often busy, this footfall doesn't actually benefit the town centre as much as it might, because many people who come to Morecambe don't spend much time actually in the centre." Highways and Transport Masterplan 2016[1].

We aim to support businesses in the town centre by drawing people through the town and encouraging dwell/stay times through creating attractive routes and public realm. This should assist with people spending leisure time at cafes and in shops or galleries, to assist in economic regeneration of the commercial centre.

4. **Public transport is the priority method.**

Public transport is integral to Eden Project North's Transport Vision, as it not only mitigates fossil fuel emissions per head, but also can encourage interaction through social spaces around waiting rooms, shared carriages and friendly service operators. Encouraging public transport use will also enhance services for residents, workers and all visitors.

5. **The baseline for the planning horizon is 2025+, with a vision towards 2030.**

The vision for transport with Eden North looks as far as possible into the future. The potential for new solutions and technologies to emerge towards 2030 will be taken into consideration, and room for these to be incorporated will be made available in the 2025+ plan. Such technologies could range from advances and improvements to existing vehicles, such as electric methods of transport, to new infrastructures such as a Hyperloop, to new ways of imagining the public's interaction with the built environment, such as kinetic pavements and energy harvesting.

Permeable paving and enhanced rainwater collection methods may also be relevant to the Eden Project North site, as resilience to unreliable weather patterns becomes ever more important.

6. **Last two miles – no fossil fuel vehicles around the site.**

Diesel and petrol vehicles release particulate matter under 2.5microns in diameter (PM2.5). This type of particulate matter is the most directly harmful for human health, as it is absorbed into the respiratory and circulatory systems. Eden Project North's Transport Vision aims to factor in the health benefits of reducing fossil fuel vehicles from not only a physical exercise and social interaction perspective, but also by focusing on the invisible chemical and biological impacts of pollution on both human health and the surrounding environment. This is why a 'last two miles' rule will be in place for most vehicles, meaning the air quality and layout of the town centre will be improved.

The Transport Strategy will, of course, take into consideration and make exceptions for emergency vehicle access and blue badge parking options, with the potential for these spaces to be reserved in advance, and the site will be entirely accessible for those with additional mobility requirements. Eden Project North aims to be wholly inclusive in all aspects of the experience, and especially in its Transport Strategy which will make people feel welcome and supported from the very first stage of their Eden journey.

DEFRA information on PM2.5 https://laqm.defra.gov.uk/public-health/pm25.html

[1] https://www.lancashire.gov.uk/media/899614/final-lancaster-highways-and-transport-master-plan.pdf

7. **Pedestrianisation of the Prom.**
   Pedestrianisation is fundamental to Eden Project North's transport plan, as it results in cleaner air, increased physical activity, more time spent outside and reduced noise pollution. Optimising the use of car parks in the town centre, public transport and walking/cycling means the beautiful landscapes of Morecambe will be able to be much better appreciated by locals and tourists alike, as the heavy traffic on Marine Road Central will be significantly reduced. This means the town will not be cut off from the promenade, and people will have better opportunities to walk and cycle. It also will increase safety from a traffic perspective, as well as safety in terms of 'eyes on the street'.

8. **The journey should be joyful.**
   Eden Project North endeavours to make transport part of the overall experience. This means eliminating and reducing queues, over-crowding, over-priced tickets and introducing a sense of fun into the journey.

   The could mean that the inside and outside of trains, buses and waiting areas are decorated in unexpected ways, and that the method of transport encourages users to engage with Eden Project North's core ideas from before the point of arrival.

9. **Visitors that make a special effort to travel to the destination sustainably will be rewarded by reduced entry prices and other incentives.**
   Eden Project North believes that effort on the public's part should be recognised and rewarded by the venue. Eden Project in Cornwall operates a Green Travel Plan £5 off scheme for visitors arriving either by public transport or on foot or by bike, which has proved popular and effective. https://www.edenproject.com/visit/before-you-visit/directions/by-bus-or-train#greentravel

   An emphasis on sustainability and natural choices will also be applied to the site directly, by transforming the redundant grey spaces (such as disused road) into lawns and wildflower areas.

10. **Eden Project North's transport vision extends as far as the perimeter of the project site, but aims to be flexible enough to allow for collaboration in parallel with neighbouring infrastructure.**

Appendix 14.2

AGENDA & MEETING NOTES

PROJECT NUMBER	Project number	**MEETING DATE**	13 May 2019
PROJECT NAME	Eden Project North	**VENUE**	County Hall Preston
CLIENT	Eden Project North	**RECORDED BY**	KR
MEETING SUBJECT	Transport Initial WSP / Lancashire County Council Discussion		

PRESENT	Kevin Riley (WSP) Dave Colbert (LCC Transport Planning) Michelle Holroyd (LCC TP Team Leader) Andrew Varley (LCC public transport manager)
APOLOGIES	Emma Critchley (Eden Project North), Jim Outterside (WSP)
DISTRIBUTION	As above plus: Daniel Jackson (Indigo Planning)
CONFIDENTIALITY	**Confidential**

ITEM	SUBJECT	ACTION	DUE
1	KR opened discussion by highlighting that the aim of the meeting was to inform the EIA scoping work that WSP have been appointed to provide transport (and other disciplines) input into. No formal agenda had been put together as the principle aim of today is to establish contact and discuss key points following previous meetings between LCC and the Eden Project team.		
2	DC highlighted that communication had been positive to date, having met circa 6 weeks ago in Lancaster.		
3	The general principles of Eden are in accord with the Highways and Transport Masterplan being developed and LCC are keen to help make this happen.		
4	LCC highlighted a key element of the masterplan was related to the HIF bid for Bailrigg Garden Village, which includes consideration of changes to the gyratory in the centre of Lancaster and provision therefore of cycle and bus priority measures. These would fit well with better links to and from Morecambe for these modes. Announcements on HIF due in Autumn.		
5	J34 Park and Ride is a major opportunity, including land owned by LCC. The capacity of the site would need to be looked at in terms of expansion going forward but this is extremely well placed to intercept		

	travellers to Eden North. There could be room for circa 600 extra spaces without decking and the site is currently under-capacity.		
6	J34 P&R is a potential opportunity for a remote 'entry' to Eden and LCC are keen to work with us to explore opportunities – could also include cycle routes (including potential segregation the whole way to Morecambe along former railway lines)		
7	KR asked about parking study being undertaken by Lancaster City Council. All agreed understanding this would be key. KR knew about this and seafront work from previous studies. Lancs CC had no updates on progress on these from Lancaster CC. Agreed KR to chase Julian/Kate at Lancaster CC.	WSP to contact Lancaster CC	
8	Discussion over potential re-routing of main routes along seafront outside Eden Site – use of Northumberland Street etc to be considered going forward. LCC view was that this could be feasible. KR highlighted previous work he had looked at in the area and that this could be a consideration going forward.		
9	Care needed over how we promote use of cycleway between Morecambe and Lancaster as other bodies may be interested in promoting alternative modes (Trams etc). KR had dealt with in past and understood realism matters that would arise with such.		
10	DC summised that three key areas would be key points going forward; - Rail access - J34 / use of Park and Ride - Managing the highway network (incl parking) in Morecambe		
11	On rail a key challenge is other use of line including WCML elements (discussed matters such as use of rail line by nuclear trains to Heysham and capacity of WCML). Also ongoing use of fossil fuel would be a challenge as line unlikely to be electrified quickly. LCC had met Northern Rail who were extremely interested in opportunities related to the likely levels of use (Chris Jackson Regional Director) LEP has rail as an aspiration but no analysis has been undertaken. Timescales likely to be too long in relation to Eden.	WSP to contact Northern at appropriate time	
12	Consideration of how Eden links with wider tourism offers (Lake District) would be important. Discussion occurred on similar attractions. Blackpool Pleasure Beach, Chester Zoo appear to have similar potential trip making patterns (day trips/families etc). International benchmarks would also be useful to use to understand innovation and sustainable options. KR highlighted that going forward analysis would need to start by looking at matters such as volume of		

	trips, nature of catchment, journey opportunities against likely trip making, how we can influence and therefore measures to do so – similar to recent work on stadiums he'd undertaken. All agreed this kind of approach would be relevant.		
13	Coaches would need to be another consideration – discussion around 2-3 hour day/overnight trip from core catchments of Central Scotland, North East, Yorkshire, North West and Midlands. Understanding of school trips etc needed too. KR highlighted that WSP would work with Eden to understand trip making profiles and modal splits/opportunities – some similarities may occur with Eden, Cornwall but at the same time this site would have very different characteristics and therefore needs bespoke thinking.		
14	Another key opportunity is that of cycling. Using the P&R site for such activity would be useful – both to link to Eden but also to wider destinations such as the 'Way of the Roses' to the East.		
15	Traffic Model for Morecambe has been updated recently and likely to be use-able for this project..		
16	Agreed to keep discussion going on regular basis as project developments. Next step beyond initial EIA scoping would be for WSP to work with Eden to understand potential trip generation scenarios and work through different related opportunities, understanding and influencing trip making towards the sustainable modes and in line with principles both are aligned with.		

NEXT MEETING

None set