NORTH PORTSEA ISLAND COASTAL FLOOD AND EROSION RISK MANAGEMENT SCHEME - Phase 2

Removal of Great Salterns Quay and Milton Common works
Habitat Regulations Assessment

Working together - protecting our coastline

Revision 1.3
October 2015

Portsmouth CITY COUNCIL

EASTERN SOLENT | COASTAL PARTNERSHIP

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EXECUTIVE SUMMARY

This HRA has been prepared to demonstrate that the proposed North Portsea Island Coastal Flood and Erosion Risk Management [CFERM] scheme can be constructed in it's entirety without having a Likely Significant Effect [LSE] on the European environmental designated sites and their interest features.

It provides an overview of the Habitat Regulations, a summary of the proposed CFERM scheme and information on the European sites and their interest features that could be impacted by the scheme.

Using this background information, an impact assessment has been completed to demonstrate whether the overall scheme could impact the European sites and their interest features. Where a potential impact could occur, mitigation measures have been identified to reduce, or remove the impact, thereby allowing a conclusion of whether or not there is any resultant LSE. This impact assessment considers the overall scheme impacts and potential 'In-Combination' impacts in order to conclude whether there will be an overall LSE from construction of the scheme within the wider environment.

Due to the length of the full scheme frontage (8.4km), it was split into smaller frontages to enable delivery in manageable phases over a number of years. Each phase will be taken forward through detailed design, the approvals process and on to construction separately. Phase 1 works at Anchorage Park were approved in 2014 and construction was nearing completion at the time of updating this scheme level HRA in October 2015.

This scheme level HRA was developed at the Outline Design stage for the overall scheme. It is therefore intended to provide confidence that the overall scheme is environmentally acceptable, and sets the issues that need to be considered further at the detailed design stage for each phase, as we finalise designs and apply for approvals and licenses for construction.

An 'Information for HRA' report will be produced and targeted towards each phase of works and included within the Environmental Statement in support of each Planning and Marine License application. Appendix G contains the 'Information for HRA' that supported the Phase 1 works. Appendix F contains the 'Information for HRA' that will support the applications for the Phase 2 works. This scheme level HRA has been updated to include our latest scheme level proposals.

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ACRONYMS

AA	Appropriate Assessment
AEP	Annual Exceedance Probability
AST	Assessment Summary Table
FCERM	Flood and Coastal Erosion Risk Management Strategy
EA	Environment Agency
ESCP	Eastern Solent Coastal Partnership
HRA	Habitat Regulations Assessment
HTL	Hold The Line
IROPI	Imperative Reasons of Overriding Public Interest
LPA	Local Planning Authority
LSE	Likely Significant Effect
MMO	Marine Management Organisation
NE	Natural England
PICSS	Portsea Island Coastal Strategy Study
RHCP	Regional Habitat Creation Programme
SEA	Strategic Environmental Assessment
SMP	Shoreline Management Plan

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CONTENTS

1. INTRODUCTION

1.1 North Portsea Island Coastal Flood and Erosion Risk Management [CFERM] Scheme

The proposed North Portsea Island (Flood Cell 4) CFERM Scheme, to which this Habitat Regulations Assessment [HRA] relates, covers 8.4km of the Portsea Island coastline, Hampshire on the south coast of England. This coastline stretches from the Mountbatten Centre (SU 64523 03189) on the north west of Portsea Island around to Milton Common (SU 67798 00310) on Portsea Island's east coast, as illustrated by Flood Cell 4 on **Figure1.1**.

The frontage extends across the coastline of Langstone Harbour, Portsmouth Harbour and Ports Creek, which separates the island from the mainland and connects the two Harbours. The North Portsea Island scheme frontage is characterised by a range of existing flood risk management assets, land uses, environmental issues, access constraints and differing standards of flood protection.

North Portsea Island is a densely populated urban area and is home to a mixture of residential and commercial properties along with a number of key infrastructure assets. The Portsea Island Coastal Strategy Study [PICSS] identified the assets at risk from flooding in North Portsea Island (based on a 0.5% AEP flood event in year 100) as listed below:

- 4,234 Residential Properties;
- 490 Commercial Properties;
- 2 MoD Properties;
- 2 arterial Road Access routes on to Portsea Island (leaving only one other route operational to and from the city);
- The only rail route onto Portsea Island;
- 2no. Scheduled Monuments;
- 89no. Electrical Sub-Stations;
- 2no. Historic landfill sites (causing potential localised pollution).

The PICSS was approved in 2011, and the strategy confirms the North Solent Shoreline Management Plan 2010 [SMP] policy for Portsea Island of 'Hold the Line' [HTL] and splits Portsea Island into 7 discreet flood cells.

The North Portsea Island flood cell is identified in PICSS as Flood Cell 4 and recommends that the 0.5% AEP is maintained over the next 100 years. It identified that works will be required to raise sea walls and embankment crest heights to and replace existing structures with enhanced defences. Since the adoption of PICSS, a 0.2% AEP has been promoted for the Flood Cell 4 Scheme due to the minimal additional scheme costs of providing a significantly higher Standard of Protection [SoP].

The PICSS identified that Flood Cell 1 and 4 (North Portsea Island) will require Capital Grant works within the first ten years of the Strategy.

Following a thorough assessment of CFERM options along the North Portsea Island Flood Cell 4 coastline, final preferred options have been selected and taken forward to outline design stage to deliver the Strategic policy of HTL. This HRA concludes whether these options could adversely effect the wider environment, including the European Sites along the Flood Cell 4 coastline.

1.2 Habitat Regulations Assessment

This report provides the information required to enable the competent authorities to determine the implications of the full proposed CFERM scheme on the designated European nature conservation interests. It is guided by the Environmental Scoping Report and our Regulator's opinions on this.

On the 20th August 2014, we received a Scoping Opinion for the full proposed scheme, under The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) and Town and Country Planning (Environmental Impact Assessment) Regulations 2011. This was provided by the Local Planning Authority (Portsmouth City Council) and Marine Management Organisation [MMO], and is included as **Appendix H**. The Scoping Opinion was based on the outline designs and Environmental Scoping Report that was developed for the full scheme in 2014. In July 2014, a site meeting was also undertaken with consultees as part of the environmental scoping exercise to look at the full scheme frontage.

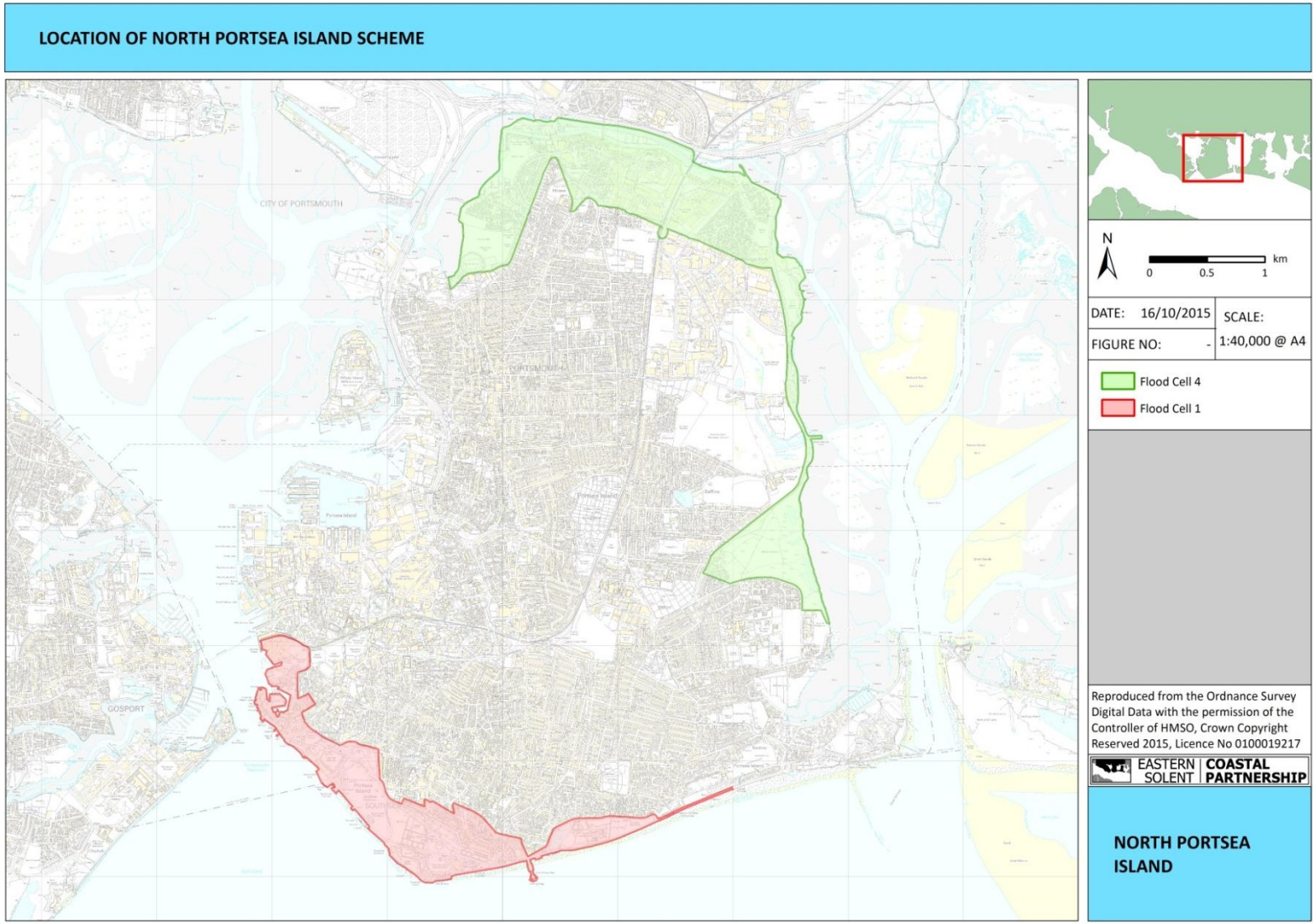
This HRA is structured so as to present a view as to whether the proposed CFERM schemes would (either alone or in-combination with other plans or projects) be likely to have a LSE on the designated European nature conservation interests and the objectives that apply to these interests. The assessment process is explained below but, in summary, the following is provided:

- an overview of the HRA process and methodology for assessment;
- Information on the proposed CFERM Schemes;
- Background information regarding relevant European sites;
- Assessment of Impacts and Likely Significant Effects; and
- In-combination Impacts, Summary and Conclusion.

It is important to highlight that this full HRA was first prepared at the Outline Design Stage of North Portsea Island scheme development, to identify any LSE's from its overall delivery on the European sites. This HRA has been prepared to demonstrate that the scheme is deliverable in its entirety, following assessment of the environmental impacts and the mitigation that is required.

Support of this HRA by the Competent Authority and our Statutory Nature Advisors does not negate the requirement for individual, detailed HRA's to support our ongoing applications for Planning Permission and the issue of Marine Licenses, as phases of the North Portsea Island scheme are taken forward. Therefore whilst this scheme level HRA will identify whether or not there are any major impacts that would prevent the scheme's overall delivery, phase specific HRA's are being prepared as detailed designs are completed to obtain consents and permissions prior to construction. The detailed 'Information for HRA' for the Phase 2 works is included in the ES that supports the Planning and Marine License Applications. It has also been extracted into **Appendix G**.

Figure 1.1: Location of the proposed North Portsea Island CFERM scheme referred to here as 'Flood Cell 4'.



2. OVERVIEW OF THE HABITAT REGULATIONS ASSESSMENT PROCESSES AND METHODOLOGY FOR ASSESSMENT

2.1 Overview of the Habitat Regulations

The 'Habitats Directive' (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) protects habitats and species of European nature conservation importance. Together with Council Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive'), the Habitats Directive establishes a network of internationally important sites designated for their ecological status. Special Areas of Conservation [SACs] and Sites of Community Importance [SCIs] are designated under the Habitats Directive and promote the protection of flora, fauna and habitats. Special Protection Areas [SPAs] are designated under the Birds Directive in order to protect rare, vulnerable and migratory birds. These sites combine to create a Europe-wide 'Natura 2000' network of designated sites; hereafter referred to as 'European sites'.

In the United Kingdom, the Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations') incorporate all SPAs into the definition of European sites and, consequently, the protections afforded to European sites under the Habitats Directive apply to SPAs designated under the Birds Directive.

In addition to sites designated under European nature conservation legislation, United Kingdom Government policy (ODPM Circular 06/2005) states that internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them.

Regulation 61 of the Habitats Regulations defines the procedure for the assessment of the implications of plans or projects on European sites. Under this Regulation, if a proposed development is unconnected with site management and is likely to

significantly affect the designated site, the competent authority must undertake an 'appropriate assessment' (Regulation 61(1)).

2.2 The Habitat Regulations Assessment Process

The North Portsea Island Flood Cell 4 Scheme has and will be assessed in the following way under the Habitat Regulations:

Step 1, Screening: The process to identify the likely impacts of a project upon a European site, either alone or in combination with other plans and projects, and consider whether the impacts are likely to be significant.

Step 2, Habitat Regulations Assessment: The consideration of the impacts on the integrity of the European site, either alone or in combination with other plans and projects, with regard to the site's structure and function and its conservation objectives. Where there are adverse impacts, an assessment of mitigation options is carried out to determine adverse effect on the integrity of the site. If these mitigation options cannot avoid adverse effects then development consent can only be given if stages 3 and 4 are followed. This document comprises the full 'living' HRA for the proposed North Portsea Island CFERM scheme, based on the outline design detail. 'Information for HRA' will also be prepared, specific to each Phase of works following detailed design. This will be included in the Environmental Statement that supports our Planning and Marine License Applications for each phase.

Step 3, Appropriate Assessment / Assessment of Alternative Solutions: Examining alternative ways of achieving the objectives of the project to establish whether there are solutions that would avoid or have a lesser effect on European sites, and identification of compensation opportunities if these are required.

Step 4, Imperative Reasons of Overriding Public Interest [IROPI] (Step 4): This is the assessment where no alternative solution exists and where adverse impacts remain and is the process to assess whether the development is necessary for IROPI and, if so, the potential compensatory measures needed to maintain the overall coherence of the site or integrity of the European site network. This is not considered to be a standard part of the process and will only be carried out in exceptional circumstances.

2.3 North Portsea Island CFERM HRA Process

Step 1 has been completed, as the North Portsea Island CFERM Scheme Environmental Scoping Report was submitted to the MMO and Portsmouth City Council's Planning department in 2014. This was circulated to statutory consultees and wider environmental stakeholders, to confirm the expected implications of the proposed scheme, i.e. consideration of Likely Significant Effects, with information to advise the HRA. The Scoping Opinion was received within 2014, and this advised detailed design and ongoing approvals. This HRA assessment delivers **Step 2**, feeding from the environmental scoping report, the scoping opinions received and the latest level of design detail for the scheme. It will reconsider the potential impacts on the integrity of the European site, alone, and in combination with other plans and projects.

In order to deliver the SMP and PICSS policy of 'Hold the Line' along the North Portsea Island frontage, considerable effort was invested into selecting preferred scheme design options. As will be seen, due to the length of the North Portsea Island scheme frontage (8.4km), and a mix of different issues and limitations along the full frontage, it has been split into smaller, manageable frontage lengths, within which options to deliver the strategic policy have been analysed (see **Figure 2.1**).

To select a preferred scheme construction option for each of the frontages, a long-list of CFERM options to implement the approved strategy for North Portsea Island was first established. The long-list, which was generated in collaboration with key stakeholders and technical experts, was screened by way of a multi-criteria assessment to produce a short list of options for detailed assessment. This ruled out the scheme options that could not be delivered, largely due to their technical, economic and / or environmental issues, making them unviable. The long-list and screening summary is presented in **Appendix A**.

This resulted in short-listed scheme options, which were deliverable on economic, environmental and technical grounds. These short-listed options were then analysed further in order to select a preferred scheme option for each frontage. These short-listed options are listed below:

- **Option A**: Vertical Wall
- **Option B**: Vertical Wall with secondary set-back defence
- **Option C**: Sloping Revetment
- **Option D**: Sloping Revetment with secondary set-back defence
- **Option E**: Tidal Control (Ports Creek – Tipner Lake)

Each of the above options were considered for each frontage length that makes up North Portsea Island Flood Cell 4. Each option within each frontage was analysed to confirm it's environmental, technical and economic feasibility, which are summarised in Assessment Summary Tables [ASTs], which are attached for info as **Appendix B**. Selection of the final preferred option from the above list for each of the frontages was based heavily on the environmental impacts of each, taking advice from our statutory and wider stakeholders and technical experts. Consideration was given to:

- The historic environment;
- Landscape;
- Designated Sites;
- Soils;
- Water;
- Flora / Fauna;
- Construction etc.

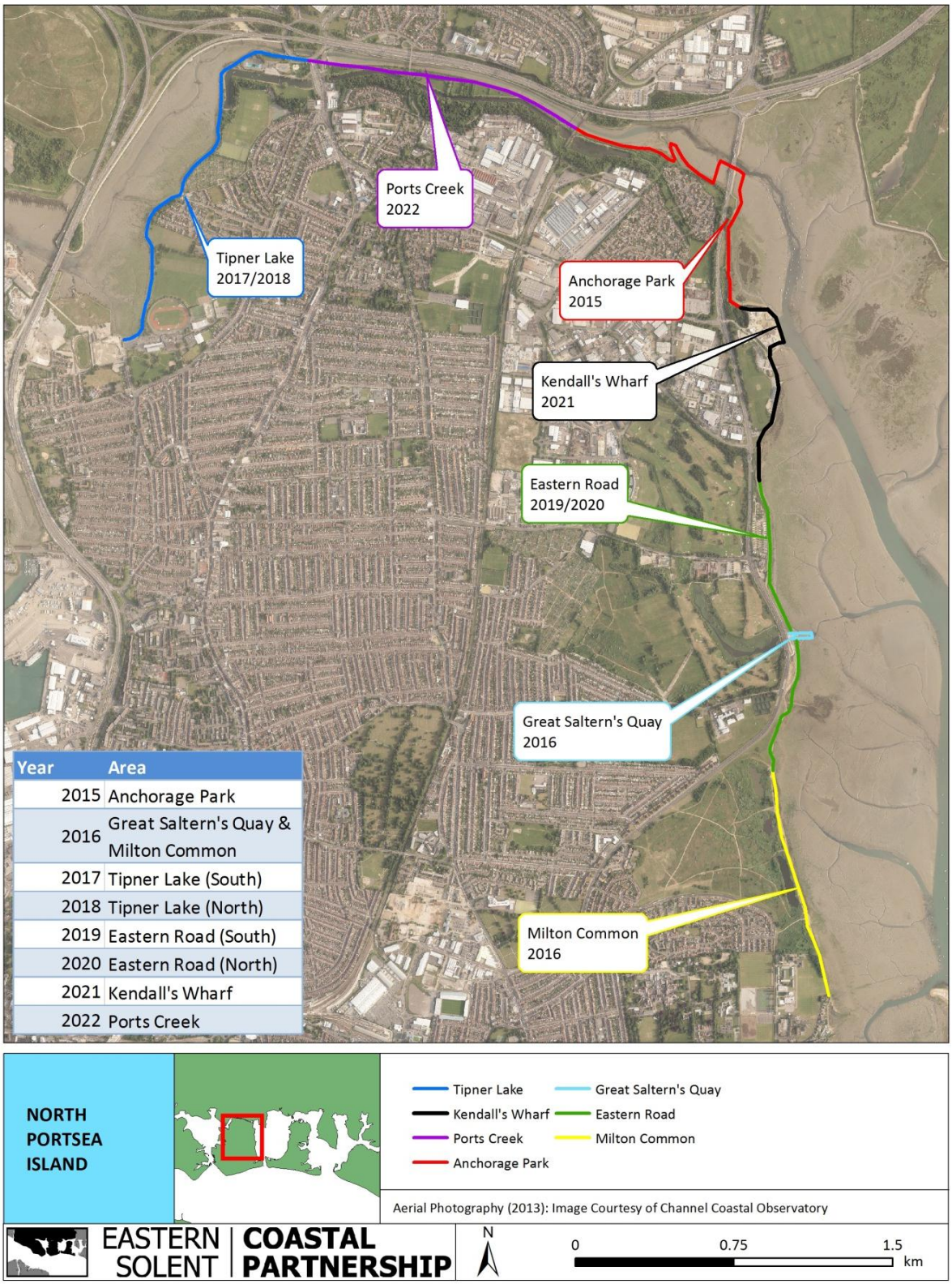
Whilst the final preferred options will result in unavoidable environmental impacts, mitigation and best practice working has been identified to reduce these impacts, as set out within this HRA. The preferred options also contain some significant environmental benefits, as a result of strongly challenging the short-list of options on their environmental impacts. Therefore it is arguable that the option selection process was in itself a key element of **Stage 3** (Appropriate Assessment), but completed in advance of this HRA. We have established viable options for each of the frontages that are considered to have the least impact on the environment and the European Sites. Therefore this HRA will confirm any resultant adverse environmental impacts and the mitigation to reduce / remove these impacts. It is believed that the chosen scheme options will have the least significant effect on the environment, and as set out in this HRA, will avoid adverse effects on the European sites.

This HRA (**Stage 2**) relates to the full Flood Cell 4 North Portsea Island coastline, and is based on the latest level of detail for each frontage - the outline design. As each of the frontages is taken forward for planning permission, detailed design may result in localised changes in detail. Therefore an additional HRA will be prepared as each frontage is progressed to support the planning application and confirm that the scheme wide HRA conclusions on Likely Significant Effect still stand. This will be included as 'Information for HRA' in the Environmental Statement, and included as **Appendix G** to this scheme level HRA.

The intention of this scheme wide HRA is to identify any potential adverse environmental impacts from delivery of the full scheme on the environment, and to

establish any mitigation that will be required over the construction timeframe. This will allow us to carefully plan our programme of works. It also enables us to proactively identify opportunities to enhance the environment at this early stage. Without delivery of the entire scheme, Flood Cell 4 will remain vulnerable to flood risk, so its overall construction must be environmentally acceptable for us to proceed.

Figure 2.1: Map of the North Portsea Island Flood Cell 4 frontage, illustrating the frontages considered during the options selection process



3. BACKGROUND TO THE PROPOSED CFERM SCHEME

3.1 Introduction

This HRA relates to the proposed North Portsea Island CFERM scheme, which will improve the standard of the CFERM defences over an 8.4km stretch of the North Portsea Island coastline. Construction works commenced in May 2015 for the first phase of construction works, with the remainder of the scheme being phased over the next 7-10 years.

The North Portsea Island Flood Cell 4 coastline has been divided into separate frontages; see **Figure 2.1**. This has enabled:

- A targeted appraisal and design process to mitigate specific current coastal flood and erosion risk issues;
- A phased approach to construction, to reduce in-combination effects on the environment and minimise disturbance;
- Time to deliver environmental enhancement opportunities, including mitigation, where this is required.

Due to the length of these frontages, they have been further split into manageable lengths for delivery. A phasing plan is included as **Figure 2.1**, to illustrate how they will be taken through the detailed design, approvals and construction process. The Anchorage Park frontage is currently in construction, with Milton Common and the removal of Great Salterns Quay now being taken through the approvals process. Alterations to this phasing may be necessary following detailed design.

3.2 Strategic background

The Portsea Island Coastal Strategy Study [PICSS] Strategic Environmental Assessment [SEA], Appropriate Assessment [AA] and Post Adoption Statement

were all completed in 2008/2009 to establish the environmental acceptability of the preferred strategic policy options.

The PICSS SEA concluded that the preferred CFERM solution of HTL for North Portsea Island Flood Cell 4 is considered to represent the best solution for the area given the economic, social and environmental constraints. In addition, the North Solent SMP and its associated environmental assessments also confirmed HTL as the preferred policy for North Portsea Island Flood Cell 4. However, these documents confirmed that adoption of this policy would have adverse environmental impacts, including coastal squeeze and a visual impact due to raised defence heights. These impacts are discussed further in **Section 5**.

3.3 CFERM Scheme Background

Section 2 provided a summary of the options appraisal process that was undertaken to confirm a preferred policy option for each of the frontages along the North Portsea Island Flood Cell 4 coastline.

This section contains a summary of the preferred options for each frontage at outline design stage, information which supports our application for funding. See **Figure 2.1** for a visual representation of the frontage lengths.

This scheme level information will be used to confirm any Likely Significant Effects on the European Sites within this HRA.

3.3.1 Tipner Lake (North and South): western North Portsea coastline from the Mountbatten Centre to Ports Bridge and runs along the full extent of Tipner Lake (part of Portsmouth Harbour).

Frontage Summary, with description of current CFERM Structures: The frontage is approximately 1,850m long and currently protected by a concrete seawall along the majority this length. The very northern end of the frontage is currently protected by a sloped block work revetment.

The existing seawall constructed pre WW2 generally has a narrow concrete apron at its toe from its southern limit to Lower Wade Way. Lower Wade Way is a historic concrete slipway that extends from the end of Horsea Lane, located midway along the frontage, for approximately 120m along the toe of the existing seawall before it diverts away from the seawall and runs across the foreshore into deeper water.

The hinterland of Tipner Lake includes areas of dense residential properties, leisure facilities, public open space and a number of scheduled monuments.

Proposed FCERM Structures: The outline design for Tipner Lake is presented on drawing numbers PB1042/1010 (General Arrangement) and PB1042/1015 (Sections) that are contained within **Appendix C**.

The preferred option consists of the construction of a new reinforced concrete seawall along the full length of the frontage. The detail of this option is described below from the southern end of the frontage moving in a northerly direction.

Chainage 0 to 850m (850m length): The existing seawall is in a very poor condition and showing signs of structural movement from its southern limit to Lower Wade Way.

The preferred option along this length, approximately 850m long, consists of a freestanding reinforced concrete seawall with a stepped apron. Steel sheet piles will extend below beach level at the toe of the apron to protect the structure from undermining should foreshore levels drop. Bearing piles have been included at the rear of the structure to provide support. The crest level of the new seawall will be approximately +4.2m ODN.

The seawall will be constructed directly in front of the existing seawall along approximately 550m of this section of the frontage. The existing seawall apron will be removed to enable these works.

The seawall will be constructed along a set-back alignment, behind the existing seawall, along a length of approximately 300m of this frontage. The ground levels in front of the proposed seawall will therefore be lowered to create a larger foreshore in front of the proposed seawall.

Chainage 850m to 1,650m (800m length): The existing seawall, while in a poor condition and with a low crest level, appears structurally stable from Lower Wade Way to where it meets the sloping defence to the northern end of the frontage.

The preferred option consists of a reinforced concrete encasement of the existing seawall. The encasement will extend above the top of the existing seawall and have a crest level of approximately +4.2m ODN. The encasement will extend below beach level to protect against undermining.

Chainage 1,650m to 1,850m (200m length): The existing defence consists of a block work revetment which is in a poor condition and shows signs of undermining. The preferred option along this length, approximately 200m long, consists of a freestanding reinforced concrete seawall with a stepped apron. Steel sheet piles will extend below beach level at the toe of the apron to protect the structure from undermining should foreshore levels drop. Bearing piles have been included at the rear of the structure to provide support. The crest level of the new seawall will be approximately +4.2m ODN.

The defence alignment is set back and will run along the seaward edge of the current footpath / cycle way. The existing revetment will therefore be removed and ground levels in front of the proposed seawall lowered to create a larger foreshore in front of the proposed seawall.

Ancillary works: The existing footpath / cycle way behind the seawall will be reconstructed as part of the works. The footpath / cycle way will be raised in level were the crest level of the new seawall is greater than 1.1m above the existing footpath / cycle way to ensure seaward views are maintained for the public.

There are a number of existing access stairs and two slipways along the frontage. Each of these will be reinstated as part of the works. Flood defence continuity will be maintained either through the use of flood gates or raised accesses over the crest of the new seawall.

Existing outfall pipes through the seawall will be renewed as part of the works.

3.3.2 Ports Creek and Anchorage Park:

from Ports Bridge along the southern coastline of Ports Creek to Kendalls Wharf within Langstone Harbour on the east coast.

Frontage Summary, with description of current CFERM Structures: The hinterland of Ports Creek and Anchorage Park is dominated by the dense residential development of Anchorage Park, numerous industrial and commercial properties and the Hilsea Lines scheduled monument.

The frontage is approximately 2,650m long. The western half of the frontage is currently protected by ad hoc masonry and concrete walls constructed between 1930 and 1980 along the majority of its length. The eastern half of the frontage was historically protected by a sloping precast concrete block revetment. Both frontages have slightly set-back raised earth embankments that have varying crest levels. The eastern half of this frontage, from Ports Creek Railway Bridge, to Kendalls Wharf Aggregate Company was in construction at the time of updating this HRA Assessment, as the Phase 1 works.

Proposed CFERM Structures: The outline design for Ports Creek and Anchorage Park is presented on drawing numbers PB1042/1020 (General Arrangement) and PB1042/1025 (Sections) that are contained within Appendix C. The detailed design drawings for the Phase 1 works are included as **Appendix E**.

The preferred option consists of constructing a sloping revetment with raised earth embankment along the majority of the frontage. This is described below from the western end of the frontage moving in an easterly direction.

3.3.2.1 Ports Creek

Chainage 0m to 70m (70m length): This section sits within the Ports Creek Roundabout which spans Ports Creek at its western end. Ports Creek flows beneath the roundabout and its southern bank is currently protected by a sloping block work revetment. The preferred option along this 70m length is to encase the revetment in concrete / block work. The crest of this revetment is currently low and will therefore be raised to a crest level of approximately +4.1m ODN to prevent the roundabout from flooding during a storm event.

Chainage 70m to 1,350m (1,280m length): The preferred option consists of creating a sloping defence approximately 1,280m in length. The sloping defence will be formed from imported earth fill which will extend out into Ports Creek beyond the current toe line of the existing vertical wall. The slope will extend up above the current walls and embankments to a crest level of approximately +4.1m ODN. The slope will be faced with rock armour stone from the 2100 predicted Mean High Water Springs [MHWS] level down to below the current Ports Creek bed level. Extending below the bed level will ensure the stability of the new defence should bed levels drop in the future.

The embankment slope above this level, and down the rear face, will be covered in topsoil and grass seeded. A soil reinforcement geotextile will be embedded within the seaward face of the upper section of the embankment to give greater resilience to extreme water levels.

Shrub and tree vegetation will need to be removed under much of the footprint of the landward element of the works. Some minor re-planting along the landward slope of the proposed embankment will be required to enable the work to blend in with the existing environment designed in liaison with landscape architects and the planning department.

3.3.2.2 Anchorage Park – Phase 1 of the overall NPI scheme, in construction since May 2015

These works are being completed as Phase 1 of the overall NPI scheme. Works commenced in May 2015 and were still in construction at the time of updating this HRA Assessment.

Chainage 1,350m to 2,050m (700m length):

The works have consisted of creating a sloping defence approximately 700m in length. The sloping defence follows the same seaward profile of the previous precast concrete block revetment at a gradient of between 1 in 2 and 1 in 3. The slope extends up to a crest level of approximately +4.6m AOD. The existing revetment was removed together with some underlying ground to give sufficient room to construct the rock armour stone facing. The excavation arisings have been reused within the works where they satisfy the geotechnical and land quality criteria.

The slope has been faced with rock armour stone from the 2100 predicted MHWS level down to below the current Ports Creek bed level. Extending below the bed level will ensure the stability of the new defence should bed levels drop in the future. Please see **Photo 3.1** for a typical view of the newly constructed revetment along this frontage.

The embankment slope above this level, and down the rear face, will be covered in suitable topsoil, guided by the Landscape and Visual impact Assessment and seeded as per the agreed planting schedule (see **Chapter 11 of the full ES**). The seaward slope will be left to naturally colonise, due to the healthy and rare plant species that surround the site, which are expected benefit from these new surfaces for their establishment.

The upper embankment is set-back behind the rock armour faced lower slope at the eastern end of this section adjacent to Anchorage Park. This has enabled vegetation clearance to be minimised at this location and construction of the raised earth embankment along an area of higher ground, thereby reducing the amount of fill material required for this element of the works.

Shrub and tree vegetation was removed (approx. 19,500m^2) under the footprint of the landward element of the works to the west of Anchorage Park. Re-planting along the landward slope of the new embankment is due to commence upon completion of the works (October 2015). This will enable the work to blend in with the existing environment. This has been designed in liaison with landscape architects and the landowner of this Local Conservation Area (Portsmouth City Council). The replanting will include native, hardy, quick growing species suitable to the specific conditions. This will provide visual and ecological diversity and enhancement.

Photo 3.1: Typical rock revetment construction between Ports Creek Railway Bridge, and the Eastern Road Bridge

Chainage 2,050m:

The A2030 (Eastern Road) crosses Ports Creek at this location joining Portsea Island to the mainland. The southern bridge abutment extends some 100m into Ports Creek, which took the form of an earth embankment, with the highway sitting on top and the sides protected by masonry block work, which extended below beach level. The block work was in a poor condition, with a number of missing units and failing patch repairs. The embankment shoulders were also lower than the required defence level which would allow flood waters to enter Portsea Island should works have not been undertaken to the structure.

The works for this structure involved concrete encasement of the existing embankment slopes. Any loose blockwork was removed, with the underlying structure made suitable for encasement. To avoid the encasement encroaching into the environmentally designated harbour, steel sheet toe piles have been driven into the foreshore. The sheet piles will protect the structure from undermining should there be a fall in foreshore levels. Please see **Photo 3.2** for a typical view of the newly constructed encasements to the Eastern Road Bridge.

Low parapet floodwalls have been incorporated into the upper section of the embankment works to provide protection from extreme water levels. The eastern side of the embankment has been raised to approximately +4.85m AOD and the more sheltered, western side of the embankment has been raised to approximately +4.5m AOD.

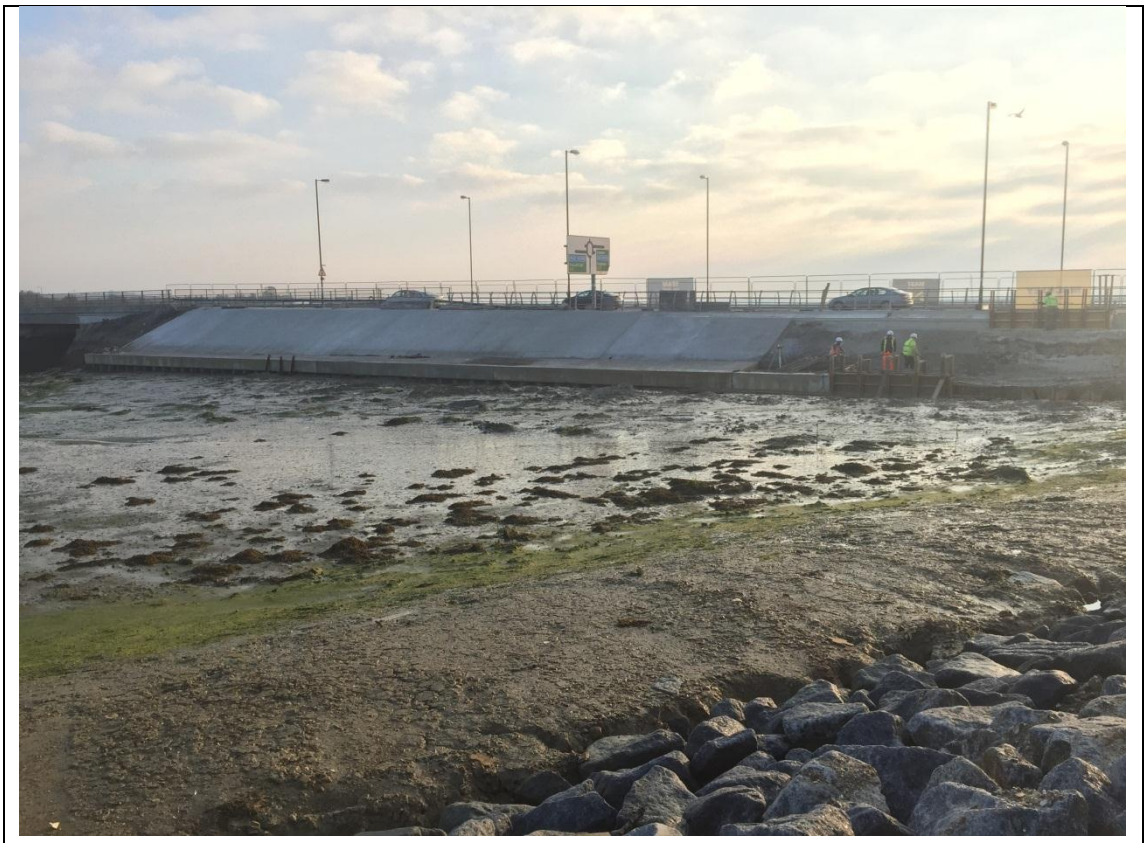


Photo 3.2: Typical Eastern Road Bridge Embankment encasement works

Chainage 2,050m to 2,650m (600m length):

The works along this section have consisted of creating a sloping defence approximately 600m in length. The sloping defence follows the same seaward profile of the previous precast concrete block revetment at an appropriate gradient of 1 in 3. The slope extends up to a crest level of approximately +4.85m AOD. The excavation arisings have been reused within the works, where they have satisfied geotechnical and land quality criteria.

The slope has been faced with rock armour stone from the top of the embankment down to below the current foreshore level. Extending below the foreshore level will ensure the stability of the new defence should foreshore levels drop in future. Gabion

baskets act as a retaining wall to maintain volume in the balancing pond. Please see **Photos 3.3 and 3.4** which illustrate typical views of the rock revetment and gabion retaining wall respectively.

Upon completion of the works (October 2015), the rear slope will be covered in topsoil and seeded in line with the agreed planting schedule. The seaward slope will be left to naturally colonise, due to the healthy and rare plant species that surround the site, which could benefit from these new surfaces for their establishment.

Shrub and tree vegetation was removed (approx. 19,500m^2) under the footprint of the landward element of the works to the west of Anchorage Park. Re-planting along the landward slope of the new embankment is due to commence upon completion of the works (October 2015). This will enable the work to blend in with the existing environment. This has been designed in liaison with landscape architects and the landowner of this Local Conservation Area (Portsmouth City Council). The replanting will include native, hardy, quick growing species suitable to the specific conditions. This will provide visual and ecological diversity and enhancement.

Photo 3.3: Typical rock revetment structure between Eastern Road Bridge and Kendalls Wharf

Photo 3.4: Typical view of gabion retaining wall adjacent to the Eastern Road Balancing Pond

Ancillary works:

A shared use path will be constructed along the length of the frontage upon completion of the works (October 2015) to replace the access track that will be covered by the proposed works.

Public accesses into Ports Creek and to the Langstone Harbour foreshore will be created to provide access and emergency egress from the creek and harbour to the island.

A Network Rail railway bridge crosses the creek and enters the island approximately midway along the frontage. Liaison with Network Rail will continue to ensure that the railway bridge does not form a flow path onto the Island.

Existing outfall pipes along the frontage will be renewed as part of the works.

Throughout the construction period of the Phase 1 works, the line of defence has been challenged where possible, which has resulted in some landward realignment of defences, providing minor intertidal habitat gain. At the time of writing this application, the Phase 1 scheme was still in construction; therefore final intertidal habitat gains will be quantified and reported upon completion of the works.

3.3.3 Kendalls Wharf:

This frontage deals exclusively with the complexities of ensuring continuity of flood risk management measures around Kendalls aggregate wharf.

Frontage Summary, with description of current CFERM Structures: Existing flood risk management is provided by a section of sheet pile quay wall and a series of informal earth bund installations (with no engineering design or analysis). The hinterland of Kendalls Wharf includes dense residential, commercial and industrial properties along with areas of public open space. The frontage is approximately 240m in length.

Proposed CFERM Structures: The outline design for Kendalls Wharf is presented on drawing number PB1042/1030 (General Arrangement) in **Appendix C**.

The preferred option is to provide a set-back flood defence that runs around the rear of the wharf consisting of an earth embankment and reinforced concrete floodwall. Erosion protection is provided to the frontage from the existing wharf perimeter, which is not of a sufficient height to provide the required protection against flooding. Should the wharf fall into disrepair and the defences fail then there is sufficient room so that the proposed set-back defences will not be threatened by the eroding coastline for some time.

The proposed flood defences cross the road entrance into the wharf and it is proposed to raise the road and ramp it up and over the proposed flood defences.

These works are described below from the northern end of the frontage moving in a southerly direction.

Chainage 0m to 120m (120m length): An earth fill embankment will run along a set-back alignment across grassland between two wooded areas. The embankment will be covered with topsoil and grass seeded and a formal footpath will be constructed along the crest. The embankment side slopes will be at a gradient of approximately 1 in 3.

The crest level of the embankment will be approximately +4.1m ODN.

Some vegetation clearance of trees and shrubs will be required to accommodate the embankment footprint.

Chainage 120m: The road will be raised at this location to maintain the continuity of the flood defences. The road will give access from the main highway to Kendall's Wharf, a car park, the nearby sailing club and outdoor centre.

The crest level of the road raising will be approximately +4.1m ODN.

Chainage 120m to 240m (120m length): A freestanding reinforced concrete floodwall will run along a set-back alignment adjacent to the existing footpath. The floodwall will tie-in to the road raising to the north and the Eastern Road works to the south.

The crest level of the floodwall will rise from approximately +4.1m ODN at its northern end to approximately +4.7m ODN at its southern end where it ties into the Eastern Road works and therefore exposed to the Langstone Harbour wave climate.

3.3.4 Eastern Road (North and South):

This frontage covers the majority of the eastern scheme coastline extending from Kendall's Wharf to Milton Common and bounds Langstone Harbour for the full extent of the frontage. Part of the Phase 2 works are within this frontage (removal of Great Salterns Quay).

Frontage Summary, with description of current CFERM Structures: Existing flood risk management is provided by a number of sea wall assets, constructed between the early 1960's and 1982. The frontage is approximately 2,050m in length.

The hinterland of the Eastern Road is dominated by public and private open space with dense residential and commercial properties behind.

Proposed CFERM Structures: The outline design for the Eastern Road is presented on drawing numbers PB1042/1040 (General Arrangement) and PB1042/1045 (Sections) that are contained within **Appendix C**.

The preferred option consists of the construction of a new reinforced concrete seawall along the full length of the frontage. The detail of this option is described below from the northern end of the frontage moving in a southerly direction.

Chainage 0m to 1,400m (1,400m length): The existing seawall, while in a poor condition and with a low crest level, appears structurally stable from start of the frontage to Great Salterns Quay to the south.

The preferred option consists of a reinforced concrete encasement of the existing seawall. The encasement will extend above the top of the existing seawall and have a crest level of approximately +4.7m ODN. The encasement will extend below beach level to protect against undermining.

Chainage 1,400m – Great Salterns Quay (part of the Phase 2 works):

For a detailed description of these proposed works, please refer to the Chapter 4 of the ES.

Great Salterns Quay extends some 100m into Langstone Harbour and is approximately 25m in width. The quay has a steel sheet pile perimeter wall, which is in a very poor condition, and is capped with a concrete deck. There is a beach differential either side of the quay at the inner end. The effect the quay has on beach levels generally stops approximately 20m offshore. A coastal processes study has been completed to ensure that the quay will not have a detrimental impact on the processes within the harbour. This is included as **Appendix P of the ES**.

Great Salterns Quay is to be removed in its entirety during the Phase 2 works in 2016. The concrete slab on top of the quay will be broken up and removed. Excavated material from within the quay will be disposed of or if suitable, used as fill for the new earth bunds at Milton Common (this will align with Contaminated Land Strategy – see Appendix I of the ES. of the Environmental Statement). The existing sheet piles will be removed, along with the remaining fill within the quay. Piling may potentially be required post removal of Great Salterns Quay to stabilise the existing wall behind the quay. If required, this would be a temporary measure until the Eastern Road phase of works is taken forward at a later date. Machinery to be used for the demolition of Great Salterns Quay includes an excavator with concrete breaker and dumper trucks.

There is potential for the inclusion of a high tide roost site within the area of intertidal habitat gained from the removal of the quay. This is not included as part of the Phase 2 works, however this is something that will be given consideration in the future.

The intertidal habitat gained by the removal of Great Salterns Quay will provide the mitigation required for the minimal foreshore losses caused by the encasement option to the north extent of the Eastern Road.

Please see **Appendix I**, which includes the detailed design drawings for the Phase 2 works.

Chainage 1,425m to 2,050m (625m length): The existing seawall is variable in nature along this length. The wall is generally in a very poor condition with failing masonry, cracking, sections of undermining and a low crest level.

The preferred option along this length consists of a freestanding reinforced concrete seawall with a stepped apron. Steel sheet piles will extend below beach level at the toe of the apron to protect the structure from undermining should foreshore levels drop during storm events. Bearing piles have been included at the rear of the structure to provide support. The crest level of the new seawall will be approximately +4.7m ODN.

The seawall will be constructed directly in front of the existing seawall along the majority of this section of the frontage. The existing seawall apron will be removed to enable these works.

The seawall will be constructed along a set-back alignment, behind the existing seawall, along a length of approximately 120m of this frontage. The ground levels in front of the proposed seawall will therefore be lowered to create a larger foreshore in front of the proposed seawall.

Ancillary works: The existing footpath behind the seawall will be reconstructed as part of the works. The footpath will be raised in level were the crest level of the new seawall is greater than 1.1m above the existing footpath to ensure seaward views are maintained for the public.

There are a number of existing access stairs and two slipways along the frontage. Each of these will be reinstated as part of the works. Flood defence continuity will be maintained either through the use of flood gates or raised accesses over the crest of the new seawall.

Existing outfall pipes through the seawall will be renewed as part of the works.

3.3.5 Milton Common (part of the Phase 2 works):

For a detailed description of the proposed works, please refer to **Chapter 4** of the ES.

Covers the full extent of the Milton Common adjacent to Langstone Harbour and represents the most southern section of the North Portsea Island coastline.

Frontage Summary, with description of current CFERM Structures: Milton Common is a historic land fill site. The northern 800m includes lengths of an ad hoc rock and rubble revetment installed to protect the coastal slope from erosion. The 300m remainder of the frontage is protected by a concrete seawall.

The hinterland of Milton Common is dominated by public and private open space with dense residential and commercial properties behind.

Proposed CFERM Structures: The detailed design drawings of the proposed Phase 2 works at Milton Common are included as **Appendix I**.

The works consist of the construction of a rock revetment along the current defence line and two sections of set-back earth embankment. The position of the set-back embankments takes advantage of the local topography and significantly reduces the work and cost required compared to building the defences to the full height on the primary alignment.

The works are described below from the northern end of the frontage moving in a southerly direction.

Chainage 0m to 800m (800m length): The existing ad-hoc rock revetment will be removed and replaced with a more robust rock revetment. The revetment will be installed at a gradient of approximately 1 in 2. Some ground improvement works, i.e. dig and replace with more competent material, may be required behind the new rock revetment to ensure its long term stability at this gradient. The seaward profile of the new revetment will match that of the existing revetment. The new rock revetment will extend below the current beach level to ensure the stability of the revetment should foreshore levels drop in the future. The existing revetment rock will be reused within the proposed rock revetment where possible.

The crest level of the new rock revetment will be approximately +3.3m ODN. New set-back earth flood embankments will be constructed with crest levels typically of +4.7m ODN.

The crest level of the northern flood embankment will tie in at approximately +4.7m ODN where it ties-in with the proposed seawall works to the north along the Eastern Road.

Ancillary works: The existing footpath behind the rock revetment will be reconstructed along the length of the frontage.

Public access to the Langstone Harbour foreshore will be maintained to provide emergency egress from the harbor to the Island. These egress points will not increase the access to the foreshore over and above what already exists (Chapter 9 of the ES considers this further).

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4. BACKGROUND INFORMATION REGARDING RELEVANT EUROPEAN SITES

4.1 European Sites

The proposed coastal defence scheme for North Portsea Island is located both within and adjacent to the boundaries of the Portsmouth Harbour SPA and Ramsar site, Chichester and Langstone Harbours SPA and Ramsar site and Solent Maritime SAC (see **Figure 4.1**). Details of the designated sites and their reasons for designation are outlined in the following section.

4.2 Portsmouth Harbour - SPA and Ramsar

Portsmouth Harbour is a heavily industrialised estuarine basin that comprises one of the four largest expanses of mud-flats and tidal creeks on the south coast of England. The hydrology within Portsmouth Harbour is unusual (the harbour receives comparatively little freshwater) with a narrow mouth which leads into the English Channel via the Solent. The mud-flats within Portsmouth Harbour support large beds of Narrow-leaved Eelgrass *Zostera angustifolia* and Dwarf Eelgrass *Z. noltii*, extensive green algae beds, mainly *Enteromorpha* species, and Sea Lettuce *Ulva lactuca* (JNCC, 2001a). The habitats within the site support important numbers of wintering Dark-bellied Brent goose *Branta bernicla bernicla*.

4.2.1 Portsmouth Harbour SPA

Portsmouth Harbour is of European importance and is designated as an SPA, based on the criteria set out in **Table 4.1**. Its total area is 1248.77ha

Table 4.1 Portsmouth Harbour SPA site qualification information

SPA qualification criteria	Qualifying details
This site qualifies under Article 4.2 of the Birds Directive by supporting over winter populations of European importance of migratory species.	**Migratory Species Over Winter**
	Dark-bellied Brent Goose *Branta bernicla bernicla,* 2,847 individuals representing at least 0.9% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/92 - 1995/96). Dunlin *Calidris alpina alpina*, 5,123 individuals representing at least 1% of the population in Great Britain (5 year peak mean 1991/92 – 1995/96). Black Tailed Godwit *Limosa limosa islandica*, 31 individuals representing at least 0.4% of the population in Great Britain (5 year peak mean 1991/92 – 1995/96). Red Breasted Merganser *Mergus serrator*, 87 individuals representing at least 0.9% of the population in Great Britain (5 year peak mean 1991/92 – 1995/96).

Annex I Birds and regularly occurring migratory birds not listed on Annex I:

4.2.2 Portsmouth Harbour – Ramsar

Portsmouth Harbour is designated as a Ramsar site, under the international Ramsar Convention, based on the criteria set out in **Table 4.2**.

Table 4.2 Portsmouth Harbour Ramsar site qualification information

Ramsar criterion	Qualifying details	
Ramsar Criterion 3	The intertidal mudflat areas possess extensive beds of eelgrass *Zostera angustifolia* and *Zostera noltei* which support the grazing dark-bellied Brent geese populations. The mud-snail *Hydrobia ulvae* is found at extremely high densities, which helps to support the wading bird interest of the site. Common cord-grass *Spartina anglica* dominates large areas of the saltmarsh and there are also extensive areas of green algae and sea lettuce. More locally the saltmarsh is dominated by sea purslane *Halimione portulacoides* which gradates to more varied communities at the higher shore levels. The site also includes a number of saline lagoons hosting nationally important species.	
Ramsar Criterion 6 - Species/populations occurring at levels of international importance.	**Qualifying species / populations (as identified at designation)**	**Number of individuals (5 yr. peak mean 1998/9-2002/3)**
	Species with peak counts in winter:	
	Dark-bellied Brent goose, *Branta bernicla bernicla*	2105 individuals, representing an average of 2.1% of the (GB) population

The Portsmouth Harbour Ramsar site also supports fauna and flora currently occurring at levels of national importance shown in **Table 4.3**.

Table 4.3 Species of national importance present in Portsmouth Harbour Ramsar site

Species currently occurring at levels of national importance	Peak counts (5 year peak mean 1998/9-2002/3)
Spring/autumn	
Little egret *Egretta garzetta*	47 individuals, representing an average of 2.8% of the GB population

Species currently occurring at levels of national importance	Peak counts (5 year peak mean 1998/9-2002/3)
Black-tailed godwit *Limosa limosa islandica*	343 individuals, representing an average of 2.2% of the GB population
Higher Plants, including *Zostera noltei, Zostera angustifolia, Zostera marina* and *Inula crithmoides*	

4.3 Chichester and Langstone Harbours - SPA and Ramsar

The large, sheltered estuarine basins of Chichester and Langstone Harbours comprise extensive sand and mud-flats which are exposed at low tide. The harbour basin contains a wide range of coastal habitats supporting important plant and animal communities. The invertebrate-rich mud-flats support extensive beds of algae (especially *Enteromorpha* species) and eelgrasses. The Chichester and Langstone Harbours site is of particular significance for water birds, especially in migration periods and in winter (JNCC, 2001b). It also supports important colonies of breeding terns *Sterna spp*.

4.3.1 Chichester and Langstone Harbours SPA

Chichester Harbour and Langstone Harbour are of European importance and are designated as an SPA, based on the criteria set out in **Table 4.4**. Its total area is 5810.03ha

Table 4.4 Chichester and Langstone Harbours SPA site qualification information

Site qualification criteria	Qualifying details
This site qualifies under Article 4.1 of the Birds Directive by supporting populations of European importance of species listed on Annex I of the Directive	**During the breeding season the area regularly supports**
	Little tern, *Sterna albifrons* - 100 pairs representing up to 4.2% of the GB breeding population (5 year mean, 1992-1996).
	Common tern, *Sterna hirundo* - 33 pairs representing up to 0.3% of the GB breeding population (5 year mean,

Site qualification criteria	Qualifying details
	1992-1996).
	Sandwich tern, *Sterna sandvicensis* - 31 pairs representing up to 0.2% of the GB breeding population (5 year mean, 1993-1997).
	Over Winter the area regularly supports
	Bar-tailed godwit, Limosa lapponica – 1,692 individuals representing up to 3.2% of the GB breeding population (5 year peak mean, 1991/92-1995/96).
This site also qualifies under Article 4.2 of the Directive (79/409/EEC). Over winter the area regularly supports:	Northern pintail, *Anas acuta* – 330 individuals representing 1.2% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Northern shoveler, *Anas clypeata* – 100 individuals representing 1.% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Eurasian teal, *Anas crecca* – 1,824 individuals representing 0.5% of the North-western Europe population (5 year peak mean 1991/92 – 1995/96).
	Eurasian wigeon, *Anas penelope* – 2,055 individuals representing 0.7% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Ruddy Turnstone, *Arenaria interpres* – 430 individuals representing 0.7% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Dark-bellied Brent Goose, *Branta bernicla bernicla* – 17,119 individuals representing 5.7% of the

Site qualification criteria	Qualifying details
	Western Siberia/Western Europe population (5 year peak mean 1991/92 – 1995/96).
	Sanderling, *Calidris alba* – 236 individuals representing 0.2% of the Eastern Atlantic/Western & Southern Africa - wintering population (5 year peak mean 1991/92 – 1995/96).
	Dunlin, *Calidris alpina alpina* – 44,294 individuals representing 3.2% of the Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/92 – 1995/96).
	Common Ringed Plover, *Charadrius hiaticula* – 846 individuals representing 3% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Red-breasted merganser, *Mergus serrator* – 297 individuals representing 3% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Eurasian Curlew, *Numenius arquata* – 1,861 individuals representing 1.6% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Grey Plover, *Pluvialis squatarola* – 3,825 individuals representing 2.3% of the Eastern Atlantic - wintering population (5 year peak mean 1991/92 – 1995/96).
	Common Shelduck, *Tadorna tadorna* – 2,410 individuals representing

Site qualification criteria	Qualifying details
	3.3% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Common Redshank, *Tringa totanus* – 1,788 individuals representing 3.% of the GB population (5 year peak mean 1991/92 – 1995/96).
The area qualifies under Article 4.2 of the Birds Directive by regularly supporting at least 20,000 waterfowl.	Over winter, the area regularly supports 93,230 individual waterfowl (5 year peak mean 01/04/1998) including: Wigeon *Anas penelope*, Bar-tailed Godwit Limosa lapponica, Dark-bellied Brent Goose *Branta bernicla bernicla,* Common Ringed Plover *charadrius hiaticula*, Grey Plover *Pluvialis squatarola*, Dunlin *Calidris alpina alpina*, Redshank Tringa tetanus, Shelduck *Tadorna tadorna*, Curlew *Numenius arquata*, Teal *Anas crecca*, Pintail *Anas acuta*, Shoveler *Anas clypeata*, Red-breasted Merganser *Mergus serrator*, Ruddy turnstone Arenaria interpres, Sanderling *Calidris alba*.

4.3.2 Chichester and Langstone Harbours Ramsar

Chichester and Langstone Harbour are designated as a Ramsar site, under the international Ramsar Convention, based on the criteria set out in **Table 4.5**.

Table 4.5 Chichester and Langstone Harbours Ramsar site qualification information

Ramsar Criterion	Qualifying details
Ramsar criterion 1 - a representative, rare, or unique example of a	Two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes intertidal mudflats,

Ramsar Criterion	Qualifying details	
natural or near-natural wetland type	saltmarsh, sand and shingle spits and sand dunes.	
Ramsar criterion 5 – regularly supports 20,000 or more water birds	**Assemblages of international importance:**	
	Species with peak counts in winter: 76480 waterfowl (5 year peak mean 1998/99-2002/2003)	
Ramsar criterion 6 – species / populations occurring at levels of international importance	**Qualifying species / populations occurring at levels of international importance**	**Number of individuals (5 yr. peak mean 1998/9-2002/3**
	Peak counts spring/autumn	
	Ringed plover, *Charadrius hiaticula*	853 individuals, representing an average of 1.1% of the population
	Black-tailed godwit, *Limosa limosa islandica*	906 individuals, representing an average of 2.5% of the population
	Common redshank, *Tringa totanus totanus*	2577 individuals, representing an average of 1% of the population
	Peak counts winter	
	Dark-bellied Brent goose, *Branta bernicla bernicla*	12987 individuals, representing an average of 6% of the population
	Common shelduck, *Tringa totanus totanus*	1468 individuals, representing an average of 1.8% of the GB population
	Grey plover, *Pluvialis squatarola*	3043 individuals, representing an average of 1.2% of the population
	Dunlin, *Calidris alpina*	33436 individuals,

Ramsar Criterion	Qualifying details	
	alpina	representing an average of 2.5% of the population
	During the breeding season (species identified for possible future consideration under criterion 6)	
	Little tern, *Sterna albifrons albifrons*	130 apparently occupied nests, representing an average of 1.1% of the breeding population

The Chichester and Langstone Harbours Ramsar site also supports fauna and flora currently occurring at levels of national importance shown in **Table 4.6**.

Table 4.6 Species of national importance present in Portsmouth Harbour Ramsar site

Species currently occurring at levels of national importance	Peak counts (5 year peak mean 1998/9-2002/3)
During the breeding season	
Mediterranean gull *Larus melanocephalus*	47 apparently occupied nests, representing an average of 43.5% of the GB population
Black-headed gull *Larus ridibundus*	3180 apparently occupied nests, representing an average of 2.4% of the GB population
Common tern *Sterna hirundo hirundo*	127 apparently occupied nests, representing an average of 1.2% of the GB population
Spring/autumn	
Little egret	224 individuals, representing an average of 13.5% of the GB population
Eurasian oystercatcher	3403 individuals, representing an average of 1% of the GB population
Whimbrel *Numenius phaeopus,*	192 individuals, representing an average of 6.4% of the GB population
Eurasian curlew *Numenius arquata arquata*	3108 individuals, representing an average of 2.1% of the GB population

Species currently occurring at levels of national importance	Peak counts (5 year peak mean 1998/9-2002/3)
Spotted redshank *Tringa erythropus*	6 individuals, representing an average of 4.4% of the GB population
Common greenshank *Tringa nebularia*	215 individuals, representing an average of 36% of the GB population
Ruddy turnstone ,*Arenaria interpres interpres*	569 individuals, representing an average of 1.1% of the GB population
Winter	
Little grebe	131 individuals, representing an average of 1.6% of the GB population
Black-necked grebe *Podiceps nigricollis nigricollis*	14 individuals, representing an average of 11.6% of the GB population
Great bittern, *Botaurus stellaris stellaris*	1 individuals, representing an average of 1% of the GB population
Eurasian teal	2226 individuals, representing an average of 1.1% of the GB population
Red-breasted merganser *Mergus serrator*	306 individuals, representing an average of 3.1% of the GB population
Water rail *Rallus aquaticus*	12 individuals, representing an average of 2.6% of the GB population
Bar-tailed godwit	1189 individuals, representing an average of 1.9% of the GB population
Higher Plants: Polypogon monspeliensis, Zostera angustifolia, Zostera marina, Zostera noltei.	

4.4 Solent Maritime SAC

The Solent Maritime SAC is designated under the Habitats Directive, due to the presence of the habitats set out in table criteria set out in **Table 4.7**.

Table 4.7 Annex I habitats that are a primary reason for the selection of this site as an SAC

Annex I habitats that are a primary reason for the selection of this site	Habitat details
Estuaries	The Solent and its inlets are unique in Britain and Europe for their hydrographic regime of four tides each day, and for the complexity of the marine and estuarine habitats present within the area.
Spartina sward *Spartinion maritimae*	Solent Maritime is the only site for smooth cord-grass *Spartina alterniflora* in the UK and is one of only two sites where significant amounts of small cord-grass *S. maritima* are found.
Atlantic salt meadow (*Glauco-Puccinellietalia maritimae*)	The Solent contains the second-largest aggregation of Atlantic salt meadows in south and south-west England, notable as being representative of the ungrazed type and supporting a range of communities dominated by sea-purslane *Atriplex portulacoides*, common sea-lavender *Limonium vulgare* and thrift *Armeria maritime*.

The Solent Maritime SAC also contains a number of qualifying features which, whilst valuable, are not primary reasons for the selection of this site as an SAC. These are indicated in **Table 4.8**.

Table 4.8 Annex I habitats and Annex II species present that are not a primary reason for the selection of this site as an SAC

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
Sandbanks which are slightly covered by sea water all the time
Salicornia and other annuals colonizing mud and sand
Mudflats and sandflats not covered by seawater at low tide
Coastal lagoons (a priority feature)
Annual vegetation of drift lines
Perennial vegetation of stony banks

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
"Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")"
Annex II species present as a qualifying feature, but not a primary reason for site selection
Desmoulin`s whorl snail *Vertigo moulinsiana*

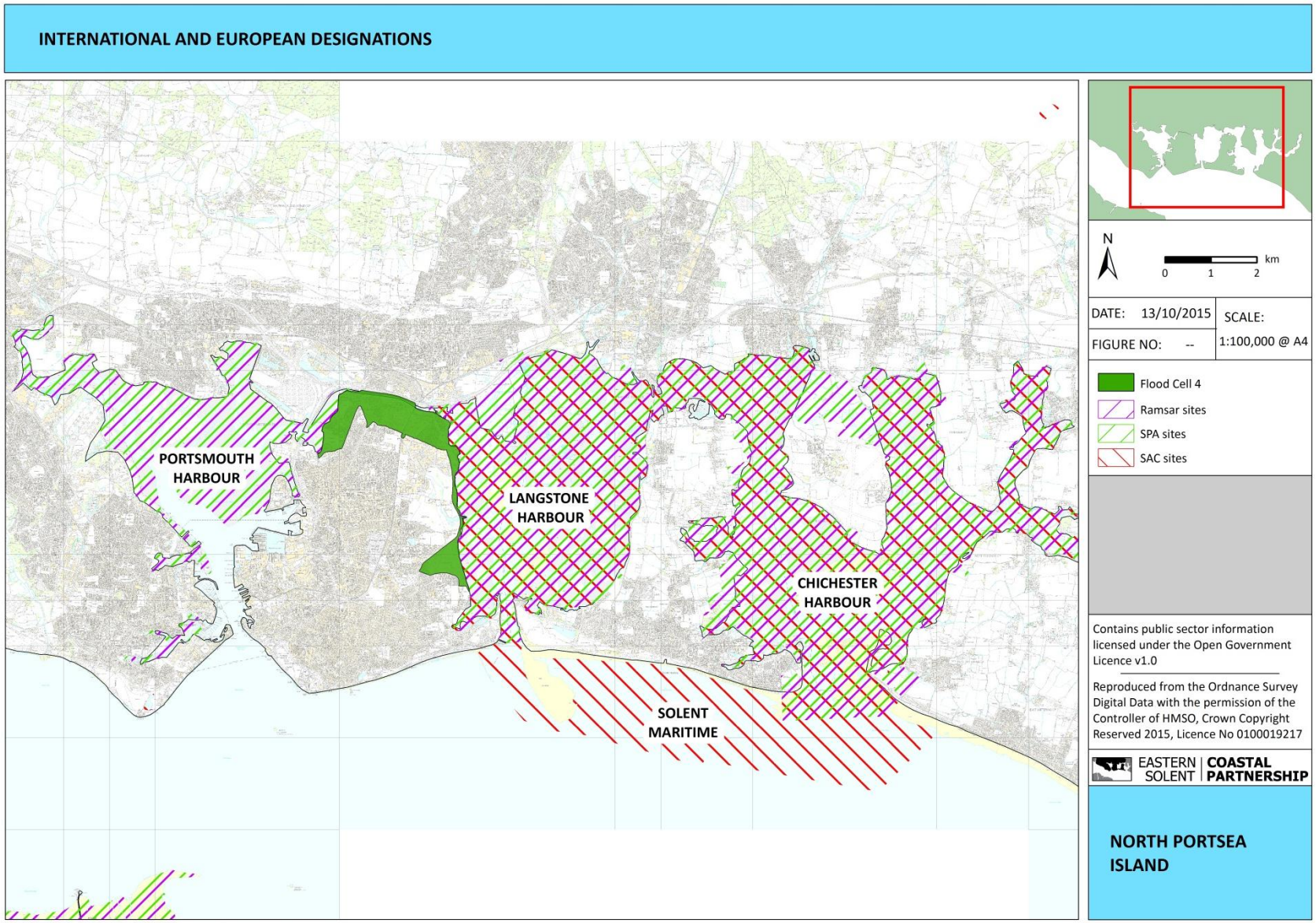

Figure 4.1 International and European protected sites adjacent to the North Portsea Island Flood Cell 4 frontage

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5. ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

5.1 Summary

This section assesses the impacts of the overall proposed scheme on the European sites and their interest features, identifies mitigation measures and summarises whether there is any resultant Likely Significant Effect [LSE] As the scheme is delivered in Phases, Phase specific impacts and mitigation will be confirmed following detailed design, and an 'Information for HRA' chapter will be provided for each phase of work. This will be included in the Environmental Statement that supports the Marine Licence and Planning Applicants.

5.2 Summary of impact assessment process

Section 3 has summarised the proposed North Portsea Island CFERM scheme to the latest level of detail (outline design). Section 4 has summarised the European sites and their interest features that could be impacted by this scheme.

This Section (**Table 5.1**) assesses any impacts that the scheme could have on the European site's interest features. Where impacts have been identified, mitigation has been considered, to demonstrate how the impact would be addressed at the detailed design stage, through the approvals and licensing system and during construction.

Following the identification of mitigation measures, the assessment summarises whether any LSE is expected and whether an additional Appropriate Assessment [AA] / Imperative Reasons of Overriding Public Interest [IROPI] case is required.

The proposed scheme is not directly connected with, or necessary for the management of the site for nature conservation, however failure to maintain the defences could result in uncontrolled pollution incidents from the

potentially contaminated land they protect, and loss of important terrestrial habitats landward of the existing defences.

5.3 Impacts, mitigation and LSE of the proposed North Portsea Island CFERM Scheme

5.3.1 Impacts

Potential impacts of the North Portsea Island scheme on the European sites are recorded in **Table 5.1**, which confirms necessary mitigation and a summary of any LSE.

Table 5.1: Potential Impacts, Mitigation and Likely Significant Effects of the proposed North Portsea Island Scheme to advise the Habitat's Regulation Assessment						
No.	**Potential impacts of scheme on European sites**	**North Portsea Island frontages causing impact**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect [LSE] after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA / IROPI]**
1.	Loss of intertidal habitats due to coastal squeeze caused by sea level rise and delivery of the strategic policy option of 'hold the line' from the nationally adopted PICSS and North Solent SMP. See **Note 1** below this table, which quantifies losses.	All frontage lengths (Tipner Lake, Ports Creek, Anchorage Park, Kendalls Wharf, Eastern Road and Milton Common)	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in **Section 4**.	Mitigation not possible, however impact to be compensated through the Regional Habitat Creation Programme [RHCP].	Yes, this will cause a LSE as no mitigation available. Compensation through the RHCP will maintain the overall integrity of the Natura 2000 network of environmental sites.	No, as IROPI case already made and accepted within PICSS. For further information on this impact see **Note 1** below this table.
2.	Direct loss of European designated habitat due to local changes in CFERM defence footprint. See **Note 2** below this table, which quantifies losses.	Tipner Lake and Eastern Road	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in **Section 4**.	Removal of obsolete structures within the European sites to provide additional intertidal habitat to that being lost. This includes defunct concrete aprons of the existing defences and Great Salterns Quay. See **Note 2** below this table, which quantifies gains. Mitigation habitat has been provided before losses occur. Great Salterns Quay is located directly within the existing European site boundaries, and approx. 2460m² of intertidal habitat will be gained through its removal. This well exceeds the expected losses of habitat through future phases of the North Portsea Island Scheme. In addition, some localised realignment of defences at Milton Common will provide additional intertidal habitat, which is considered an environmental gain, however these are not counted in the 'mitigation'	No LSE, as with additional habitat gains compared to losses and further localised defence realignments, an increased intertidal area is expected to be provided. This will benefit the interest features of the designated sites in the longer term.	No, as the mitigation has appropriately addressed the potential impacts identified, with some environmental gains from the removal of obsolete structures within the designated sites (i.e. Great Salterns Quay). For further information on this impact see **Note 2** below this table.

Table 5.1: Potential Impacts, Mitigation and Likely Significant Effects of the proposed North Portsea Island Scheme to advise the Habitat's Regulation Assessment						
No.	**Potential impacts of scheme on European sites**	**North Portsea Island frontages causing impact**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect [LSE] after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA / IROPI]**
				calculations (see **Note 2**), as the realignment is landward of the existing European site boundaries, which follow the line of defence.		
3.	Impacts on water quality during construction due to pollution incidents from construction machinery.	Tipner Lake, Ports Creek, Anchorage Park, Eastern Road and Milton Common	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in **Section 4**.	Method statements will be prepared and included as part of any construction contract. Any machinery working on, or adjacent to, the foreshore would use biologically degradable hydraulic oils. Any chemicals stored nearby would be appropriately bunded. This potential impact will be further considered within the Water Framework Directive [WFD] Assessment being prepared for this scheme. All re-fuelling to be undertaken away from the foreshore. Methods will be confirmed in the Construction Environmental Management Plan.	No LSE, as measures will be built into the construction contract to ensure best-practice working and minimise risks.	No, as the potential impacts will be controlled with no LSE.
4.	Pollution to water body by opening up new pathways between potentially contaminated land sources and receptors (i.e. remobilisation, dispersal or redistribution of potentially contaminated sediments near water body).	All frontage lengths (Tipner Lake, Ports Creek, Anchorage Park, Kendalls Wharf, Eastern Road and Milton Common)	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in **Section 4**.	At the detailed scheme design stage for each construction phase, and to inform the Environmental Statement, any potentially contaminated land that will be impacted by these works will be investigated on site to identify any contaminants present. Any contaminated fill requiring removal will be disposed of at fully licensed land based sites. Construction method statements will ensure no new pathways are created between contaminated land sources and receptors (such as the water bodies). This potential impact will be further considered within the WFD Assessment being prepared for this scheme. Contaminated land strategies will be prepared where potentially contaminated land occurs within the vicinity of the works. This will be included within the	No LSE, as any works within the vicinity of potentially contaminated land areas will be advised from surveys of the site to determine the presence of any contaminants, with method statements agreed with the local planning authority at the planning approval stage. Through improved defences and the protection of potentially contaminated land sites, the water bodies and wider receptors will be protected from uncontrolled pollution incidents occurring. WFD compliance will control this impact.	No, as the potential impact has been controlled through the mitigation measures identified. Additional protection to the potentially contaminated land sites will benefit the wider environment longer term.

Table 5.1: Potential Impacts, Mitigation and Likely Significant Effects of the proposed North Portsea Island Scheme to advise the Habitat's Regulation Assessment						
No.	**Potential impacts of scheme on European sites**	**North Portsea Island frontages causing impact**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect [LSE] after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA / IROPI]**
				Environmental Statement for each phase of works.		
5.	Increased suspended sediments within the water body during construction.	Tipner Lake, Ports Creek, Anchorage Park, Eastern Road and Milton Common	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features. • Specific impacts could occur to: ➢ Fish Species, as the harbours are nursery grounds for bass, tope shark, plaice, sole, thornback Rays and lemon sole. The harbours also support spawning grounds for cod, sandeel, sole, lemon sole and sprat; ➢ Seagrass Beds, which are present within the wider harbours; ➢ Commercial Molluscan shellfish, including the Native Oyster (*O. edulis)* and hard shell clam (*M.mercenaria)*, which are present within the wider harbours. ➢ Marine mammals and birds that feed on the above.	Construction works will be undertaken at low tide. Therefore limited potential for significant increases of suspended sediments within the water body. Increases will be minimal, localised and temporary and expected to have minimal impact on the overall water body of the harbours when you take into account dilution factors. Phasing of works, method statements and briefing of contractors will help manage any impacts. Due to the presence of eelgrass beds (which have been mapped), mitigation measures will be required to reduce suspended sediments in the wider water body, as a result of the works (i.e. through the use of silt traps) (when working within close proximity to the sea grass beds). This requirement will be confirmed with our environmental partners at the detailed design and planning stage, and will be advised by the proposed construction methods and assessment of LSE. This potential impact will be further considered within the WFD Assessment being prepared for this scheme.	No LSE expected on fish, the sea grass beds or the commercial shellfish, due to the minimal, localised, temporary nature of the works and the control measures that can be implemented. Therefore marine mammals and birds will retain their food sources. WFD compliance will control this impact.	No, as no LSE expected due to mitigation measures adopted.
6.	Indirect impacts on intertidal Benthic communities during construction (through	Tipner Lake, Ports Creek,	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and	Disturbance to the intertidal areas will be temporary and localised. Construction method statements will ensure best practice methods are adopted to reduce these temporary impacts. The seaward working	No LSE expected, as any disturbance to the narrow intertidal working area will be minimal, temporary, and made	No, as no LSE expected due to mitigation measures

Table 5.1: Potential Impacts, Mitigation and Likely Significant Effects of the proposed North Portsea Island Scheme to advise the Habitat's Regulation Assessment						
No.	**Potential impacts of scheme on European sites**	**North Portsea Island frontages causing impact**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect [LSE] after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA / IROPI]**
	disturbance).	Anchorage Park, Eastern Road and Milton Common	Ramsar; Solent Maritime SAC; • Specific impacts could occur to: ➢ Mudflat faunal communities; ➢ Species including *Hydrobia ulvae*; ➢ Bird and fish species that feed on these micro-fauna.	footprint on the intertidal areas (from the toe of the existing defence) will be kept to a minimum and any disturbance made good following works. Temporary access routes for machinery on the foreshore will be investigated at detailed design stage (i.e. matting to prevent disturbance to the foreshore sediments). These areas are close to the heavily accessed footpaths and roads and disturbance is generally high. Therefore this habitat is not as well utilised by birds as the wider harbours, which will remain uninterrupted. As the works are to be undertaken outside of sensitive times for birds (not during overwintering periods), the impact of the works on food availability is further reduced.	good following works. For this reason the area will quickly recover post works with no longer term impacts in these less sensitive bird feeding areas in the immediate footprint and shading of the existing defences. A well informed construction contract and method statements will control impacts.	adopted.
7.	Direct impact on intertidal benthic communities from intertidal habitat loss.	Tipner Lake and Eastern Road	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC. • Specific impacts could occur to: ➢ Mudflat faunal communities; ➢ Species including *Hydrobia ulvae*; ➢ Bird and fish species that feed on these micro-fauna.	Habitat losses will be minimal, and in close proximity to the existing defence structures (less than 400mm encroachment). New habitat is being created through removal of Great Salterns Quay and defunct coastal defence structures to replace these losses. As discussed within impact 6, these areas are close to heavily accessed footpaths and roads and disturbance is generally high. Therefore this habitat is not as well utilised as the wider harbours, which will not be impacted.	No LSE expected, as minimal losses and larger gains through removal of defunct structures. Salterns Quay removal has potential to provide very valuable mudflat habitat, for the colonisation of micro fauna and an enhanced feeding area for protected birds, away from the heavily accessed habitat that will be lost.	No, as mitigation replaces losses and will potentially provide more suitable mudflat habitat for the colonisation of micro fauna and an improved feeding resource for birds.
8.	Impacts on intertidal vegetation during construction. Direct losses of intertidal vegetation from machine access to foreshore and removal	Ports Creek, Anchorage Park, Eastern Road and Milton	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC. • Intertidal vegetation species known to be within the footprint	In order to confirm species that could be affected by the proposed CFERM scheme, a full intertidal vegetation survey will be commissioned to advise each phase of works. This will confirm which species are present within the existing defence structure and the working footprint during construction. It will also confirm their coverage (area / location). This will advise a	We cannot entirely prevent disturbance to intertidal vegetation during construction. Mapping of the intertidal vegetation to be affected and preparation of a mitigation plan will advise our construction	No, mitigation will minimise harm and provides an increased sloping defence footprint, thereby providing an opportunity for additional

Table 5.1: Potential Impacts, Mitigation and Likely Significant Effects of the proposed North Portsea Island Scheme to advise the Habitat's Regulation Assessment						
No.	**Potential impacts of scheme on European sites**	**North Portsea Island frontages causing impact**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect [LSE] after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA / IROPI]**
	of existing defence structures, which contain small colonies of intertidal vegetation.	Common	of works / the existing defence structures include: ➢ *Limonium vulgare* (common sea lavender); ➢ *Halimione portulacoides* (sea purslane); ➢ *Inula crithmoides* (golden samphire); ➢ *Spartina anglica* (common cordgrass).	mitigation plan, first limiting disturbance to the existing intertidal vegetation to the minimal possible amount. We will also continue to work closely with our local stakeholders to agree a methodology. Along Frontage 2 we are also creating a significant additional sloping defence structure, from the railway bridge running west to Ports Bridge. During detailed design we will optimise design of the sloping structure, with the aim of it readily colonising with additional intertidal vegetation. This would be expected to self colonise, however some seeding to promote establishment could be undertaken.	activities, enabling us to make good any local, temporary and phased disturbance. There are potential opportunities through the increased footprint of the sloping coastal defence structures, to establish fresh intertidal vegetation habitat. Ongoing monitoring of post works colonisation will help advise future schemes, and advise whether any additional reseeding would be beneficial. For the above reasons, no LSE is expected.	colonisation by intertidal vegetation than currently exists.
9.	Displacement of marine mammals and fish communities through vibration.	Tipner Lake and Eastern Road mainly due to piling. Ports Creek, Anchorage Park, Kendalls Wharf and Milton Common less	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC. • Specific impacts could occur to: ➢ Fish Species, as the harbours are nursery grounds for bass, tope shark, plaice, sole, thornback Rays and lemon sole. The harbours also support spawning grounds for cod, sandeel, sole, lemon sole and sprat); ➢ Common and Grey Seals	Piling will not be undertaken at high tide (I.e. not within the water body). Therefore, as the sheet piling is not directly coupled with the water, the sound radiated into it would not be expected to be of a significant level. Such works are localised, minimal and temporary. Piling would not take place at times where disturbance could impact overwintering birds or other sensitive receptors, which would be appropriately conditioned at the planning approval stage, as advised by our statutory advisors. The seal 'haul-out' site within Langstone Harbour is a good distance from the working footprint of the scheme, in an area that already has high background noise levels due to the main Eastern Road access onto Portsea Island. However we will control our construction noise to avoid prolonged	No LSE. Any resultant disturbance will be localised and only ever occur in one location at any one time. This may result in temporary local displacement of species, but not a full long – term displacement.	No, as no LSE expected due to construction methods being adopted. Any impacts would be short-term.

Table 5.1: Potential Impacts, Mitigation and Likely Significant Effects of the proposed North Portsea Island Scheme to advise the Habitat's Regulation Assessment						
No.	**Potential impacts of scheme on European sites**	**North Portsea Island frontages causing impact**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect [LSE] after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA / IROPI]**
		effected.	passing through the harbours and from their 'haul-out' site in Langstone Harbour; ➢ Birds and other species that feed on the above.	disturbance above these background levels.		
10.	Noise disturbance to people, birds and terrestrial fauna during construction.	Tipner Lake, Ports Creek, Anchorage Park and Milton Common (Kendalls Wharf to a lesser extent)	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC. • In particular, overwintering bird species listed within the European site's interest features (see **Section 4**).	Construction works will result in additional noise; however the phasing of noisy activities will be controlled to avoid sensitive times, where disturbance of key receptors could occur. For example, piling activities would not be undertaken during overwintering bird period in sensitive areas. This would be controlled via conditions as part of any planning permission and would be agreed in consultation with statutory advisors. Any others works undertaken overwinter that will not result in noise disturbance could be screened to totally prevent any resultant impact. Many of the scheme frontages are in areas where there is already high background noise from main roads, regular access along the coastline (which tends to follow the line of defence) and local businesses (such as dredging wharfs). In addition, due to the proximity to some residential areas, a degree of noise modelling will be undertaken, working closely with the Local Planning Authorities environmental health officers to help advise mitigation for any noise impacts.	Due to the controls that can be put in place, and a good knowledge of sensitive times for disturbance, the construction contract will ensure minimal disturbance to sensitive receptors. Activities are localised and temporary and will take place in phases, therefore leaving vast areas free from disturbance at any one time. It is therefore not expected that there will be any LSE on the interest features present.	No, as no LSE expected due to mitigation / avoidance measures adopted.
11.	Visual disturbance from movement of construction vehicles and staff.	Tipner Lake, Ports Creek, Anchorage Park and Milton	• In particular, overwintering bird species listed within the European site's interest features (see **Section 4**).	Construction works will result in additional visual disturbance, however the phasing of construction activities will be controlled to avoid sensitive times, where disturbance of key receptors could occur, including overwintering bird periods in sensitive areas. This would be controlled via conditions as part of any planning permission (similar to noise) and would be	Due to the controls that can be put in place, and the good knowledge of sensitive times for disturbance, the construction contract will ensure minimal disturbance to sensitive receptors. Activities	No, as no LSE expected due to mitigation / avoidance measures adopted. Potential gain from better screening of birds following

Table 5.1: Potential Impacts, Mitigation and Likely Significant Effects of the proposed North Portsea Island Scheme to advise the Habitat's Regulation Assessment						
No.	**Potential impacts of scheme on European sites**	**North Portsea Island frontages causing impact**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect [LSE] after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA / IROPI]**
		Common (Kendalls Wharf to a lesser extent)		agreed in consultation with statutory advisors. Many of the scheme frontages are in areas where there is already high background disturbance from main roads, regular access along the coastline (which tends to follow the line of defence) and local businesses (such as dredging wharfs). A Landscape and Visual Impact Assessment has been undertaken to support the planning application for the work phases, which also considers visual impacts during construction and any mitigation required. Any others works undertaken overwinter that will not result in noise disturbance could be screened to totally prevent any resultant impact.	are localised, temporary and will take place in phases, therefore leaving vast areas free of disturbance at any one time. It is therefore not expected that there will be any LSE on the interest features present. There is a significant benefit from the works, as the construction of higher seawalls in areas adjacent to the SPA sites will help screen birds from dogs and people accessing the coastline. This may increase bird use of the intertidal habitats.	completion of works.
12.	Loss of bird nesting and other terrestrial habitats during construction	Ports Creek, Anchorage Park and Milton Common directly. Consideration for Tipner Lake, Kendalls Wharf and Eastern Road.	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC and supporting habitats; • Terrestrial species, including protected species – for example: ➢ Nesting birds; ➢ Bats; ➢ Great Crested Newts; ➢ Reptiles.	Landward vegetation removal will be required during construction, in order to improve the standard of the coastal defence. This cannot be avoided. Ports Creek will require significant terrestrial vegetation removal for access purposes and to make room for the increased footprint of the defences, as was undertaken at Anchorage Park (Phase 1 of the full NPI Scheme). Both of these areas are adjacent to a Conservation area, and therefore any vegetation removal needs to be agreed with the Local Planning Authority, who require 6 weeks written notice. A Phase I habitat survey has been completed, which illustrated those frontages where there was the potential for protected species to occur. Specific protected species surveys will be undertaken by appropriately licensed professionals, at a suitable time of year to confirm whether the species and habitats are	There will be no long term impact from removing landward vegetation in the footprint of the defences. Re-planting will take place and will be agreed with the local planning authority as landowner. Vegetation will only be removed where there is no other option for access and construction needs. Vegetation removal will be carried out, outside of bird nesting periods and a mitigation plan will be in place if any protected species are identified through surveys, prior to the construction works	No, as no LSE expected due to mitigation measures adopted.

Table 5.1: Potential Impacts, Mitigation and Likely Significant Effects of the proposed North Portsea Island Scheme to advise the Habitat's Regulation Assessment						
No.	**Potential impacts of scheme on European sites**	**North Portsea Island frontages causing impact**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect [LSE] after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA / IROPI]**
				present. If so, the mitigation required to ensure no harm will be agreed. These surveys and mitigation plans will be required to satisfy planning conditions, which will ensure no harm to protected species and habitats. For the Phase 1 works a full survey of the terrestrial vegetation was undertaken of the areas of vegetation requiring removal. This confirmed whether protected species identified within the Phase I Habitat Survey were present. The same approach has been taken for the Phase 2 works, with a full survey of terrestrial vegetation, as well as a Habitat Suitability Assessment for Great Crested Newts, undertaken prior to vegetation clearance. This approach will be used for future phases of construction works.	commencing. Therefore, there will be no long term LSE on terrestrial species.	
13.	Potential disturbance to Schedule 1 nesting birds (e.g. little tern).	Tipner Lake, Ports Creek, Anchorage Park, Eastern Road and Milton Common.	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC and supporting habitats; • Schedule 1 nesting birds (e.g. little tern).	As part of the Environmental Statement we will confirm the location of key breeding sites for Schedule 1 Birds and their location in relation to the construction works. A significant nesting area for terns is the Hayling Island Oyster Beds, located 3.8km to the east of Kendalls Wharf. Sensitive times for breeding birds and activity that could result in disturbance will be controlled, as discussed under impact 10 (noise). Works will be phased to ensure no impact on these key breeding sites (i.e. no activities that could create enough noise to cause a concern will take place within a distance that could cause disturbance).	Via controls within the construction contract and via Planning Conditions, disturbance will be prevented and there will be no LSE on the Schedule 1 nesting birds.	No, as no LSE expected due to mitigation / avoidance measures adopted.
14.	Impact on coastal processes including erosion of intertidal sediments	Tipner Lake, Ports Creek, Anchorage	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC and supporting habitats;	There is no major change in the profile of the existing defences along Tipner Lake and Milton Common; however the preferred option at Ports Creek and the Eastern Road will result in localised changes to the frontage profile. Vertical structures along Ports Creek	The proposed scheme for each frontage is broadly the same as the existing defence structures, generally reinforced structures to an increased height with no	No, as no LSE expected due to control measures in place, and mitigation measures available.

Table 5.1: Potential Impacts, Mitigation and Likely Significant Effects of the proposed North Portsea Island Scheme to advise the Habitat's Regulation Assessment						
No.	**Potential impacts of scheme on European sites**	**North Portsea Island frontages causing impact**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect [LSE] after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA / IROPI]**
		Park, Eastern Road and Milton Common.	• Specific impacts could occur to: ➢ Benthic communities; ➢ Intertidal vegetation; ➢ Birds and other species that feed on the above.	will be replaced with sloping structures that extend onto the foreshore. This option may better enable a build up of sediments where voids in the rock revetment can help trap sediments within their structure, but could impact flows within the creek. Along the Eastern Road, the removal of Great Salterns Quay (Phase 2 works) is expected to dramatically improve the foreshore environment and natural coastal processes at this location; however it may change the local hydrodynamics. The potential impact of this has been considered further in **Chapter 7 of the Environmental Statement** for the Phase 2 works, which includes mitigation that would be required should there be a negative impact on coastal processes and the European sites and their interest features.	significant changes to the footprint profile, therefore changes to the coastal processes as a result of the proposed project are expected to be minimal. Separate analysis will be undertaken where change has been promoted to ensure no negative impacts within the European sites. No LSE expected, and a potential improvement on the existing structures.	
15	In-combination impacts from other activities within / adjacent to the European designated sites.	All frontage lengths (Tipner Lake, Ports Creek, Anchorage Park, Kendalls Wharf, Eastern Road and Milton Common)	• Portsmouth Harbour SPA and Ramsar; Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC and supporting habitats listed in **Section 4**.	As discussed in the HRA (**Section 5**), other potential activities that could impact the European sites have been identified. As different phases of the scheme are taken forward to development, a full in-combination assessment will be made to ensure that no 'in-combination impacts could arise, that could have a LSE on the European sites. If there is the potential that an 'in-combination' effect could arise, programming of works would require reconsideration, until the activity that causes the in-combination' effect has ceased. The scheme itself has been phased, to ensure any disturbance is localised and short-term, so that if displacement of species occurs, there will always be areas of the wider harbours free of disturbance.	As explained in **Section 5**, many potential in-combination impacts are prevented by programming of works and avoiding sensitive times for key interest features of the European sites. In addition, by adopting appropriate mitigation (i.e. suspended sediments) would ensure that any unforeseen in-combination impacts are quickly identified and can be actioned. Therefore, with the control measures in place no LSE is expected.	No, as no LSE expected due to mitigation / avoidance measures adopted.

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Note 1. Coastal Squeeze losses due to strategic policy of 'Hold The Line'.

The Portsea Island Coastal Strategy Study [PICSS] Strategic Environmental Assessment [SEA], Appropriate Assessment [AA] and Post Adoption Statement were all completed in 2008/09 to establish the environmental acceptability of the preferred strategic policy options.

The PICSS SEA concluded that the preferred CFERM option of HTL for North Portsea Island Flood Cell 4 is considered to represent the best environmental solution for the area given the economic, social and environmental constraints. However, these documents confirmed that adoption of this policy would have adverse environmental impacts due to coastal squeeze.

The SEA quantified the coastal squeeze losses that would occur within each Flood Cell over the life of the Strategy. Along North Portsea Island Flood Cell 4, the total coastal squeeze loss will be 14.59ha over the lifetime of the Strategy. This can be further split to illustrate the total coastal squeeze losses within each internationally designated site. These are summarized in **Table 5.2** below.

Table 5.2: Coastal Squeeze losses within each of the designated European sites, caused by HTL at North Portsea Island (Flood Cell 4) over the next 100 years:

Designated Site	Flood Cell 4 Coastal Squeeze loss calculations
Portsmouth Harbour SPA, Ramsar and SSSI	1.80ha
Chichester and Langstone Harbour SPA, SAC, Ramsar and SSSI	11.69ha
Ports Creek (undesignated)	1.10ha

Due to the calculated coastal squeeze losses, an AA was completed for the Strategy. This concluded that because of the calculated coastal squeeze losses, implementation of the Strategy would have an adverse effect on the environmentally designated sites. The AA also concluded that there is justification for these adverse effects, as there were no alternative policy options to HTL, and an over-riding public need to protect life and property on Portsea Island.

For this reason an Imperative Reasons of Overriding Public Interest [IROPI] statement of case was made, which concluded that environmental compensation for 'holding the line' would be achieved through the Regional Habitat Creation Programme [RHCP]. The RHCP promotes the realignment of defences elsewhere in the Solent (including Medmerry) to create new intertidal habitats and compensate for the coastal squeeze losses identified within the North Solent Shoreline Management Plan [SMP] and Coastal Strategies. The RHCP will help maintain the integrity of the European sites. The IROPI case was signed off by Defra on 5th April 2011, allowing the PICSS Strategy to be adopted and these schemes to be progressed. Letters of support were also provided from the Environment Agency and Natural England in relation to the RHCP. These letters are attached as Appendix D.

Therefore, whilst this policy will result in a Likely Significant Effect on the European sites, this has been assessed and accepted at the strategic level and would only require reassessment if delivery of the policy resulted in additional coastal squeeze losses with the designated sites. The project team have challenged the existing line of the defences to identify opportunities to reduce the calculated strategic coastal squeeze losses, as discussed in note 2 under 'localised changes to footprint of coastal defences.

Note 2. Direct loss of European designated habitat due to local changes in defence footprint

The final scheme outline designs have been produced in line with the adopted PICSS Policy of 'Hold The Line'. These final designs are considered viable options that have the least possible encroachment onto the foreshore of the European designated sites, which deliver this policy. All scheme options were heavily challenged, working closely with stakeholders and technical experts to reduce any encroachment and identify opportunities to reduce the coastal squeeze expected to occur through delivery of the strategic policy.

Schemes for Tipner Lake and Eastern Road do give rise to minimal encroachment onto the foreshore of the European designated sites, through encasement of the existing seawall. This is where the existing seawall will be encased with concrete in order to strengthen the existing structure and allow for an increase in structure height. The encroachment is expected to be no more than 400mm seaward along the frontages affected.

At outline design stage we have identified opportunities to create new habitat within the European designated site boundaries to mitigate for these losses. We have also identified some habitat gain landward of the existing coastal defences but outside of the European designated site boundaries, which are

considered a reasonable environmental gain. All losses and gains of intertidal habitat are in the upper intertidal region, and therefore habitat gains are similar to habitat losses.

Mitigation within the existing European site boundaries will be provided by the removal of obsolete structures, such as concrete seawall aprons and quay structures. This will return historic concrete surfaces within the European site boundary to new intertidal surfaces to establish as new bird feeding areas following colonisation of benthic communities.

Losses and gains of intertidal habitat within each European site have been calculated at this outline design stage and are summarised below by **Figure 5.1** and T**ables 5.3 & 5.4**.

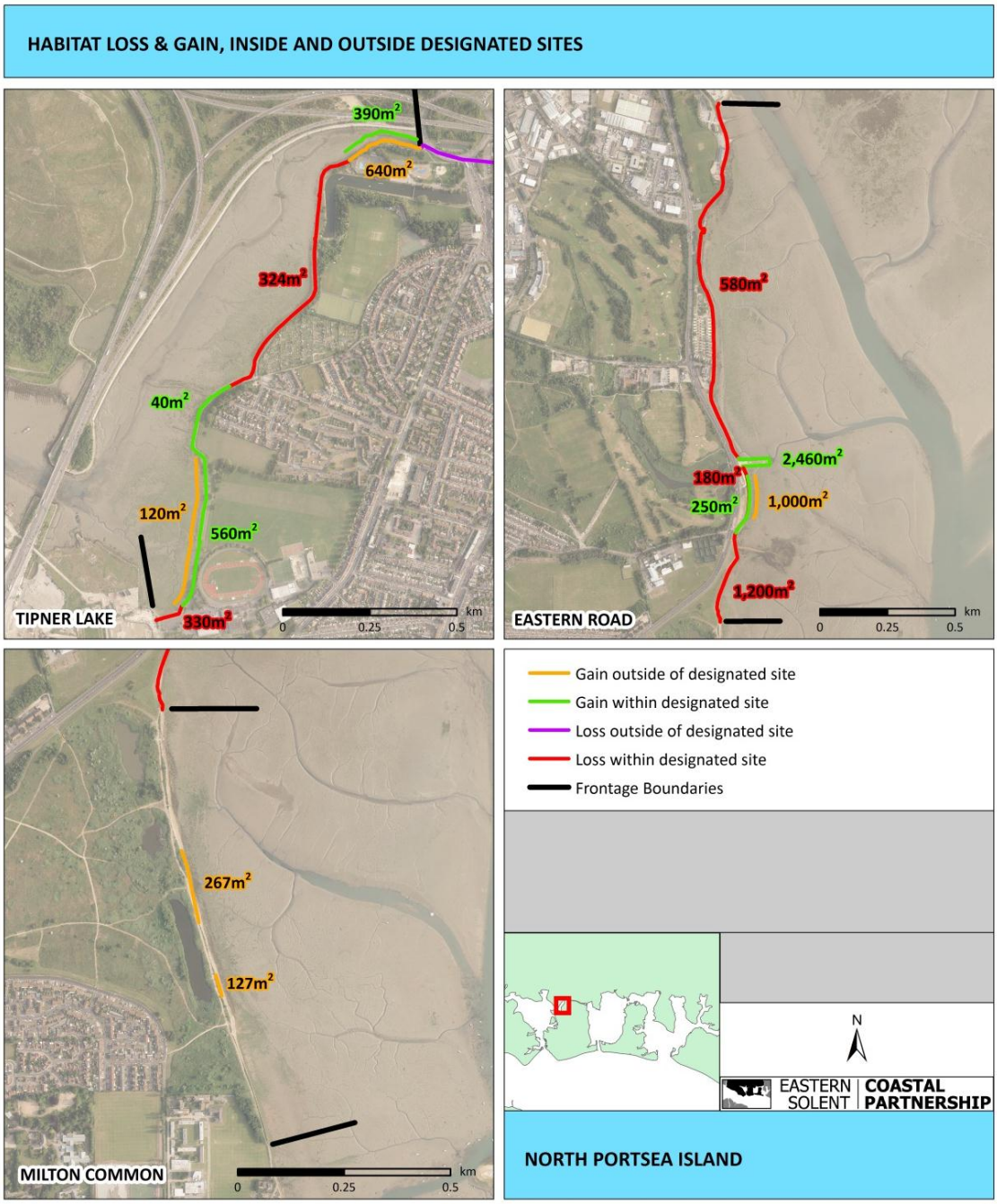

Figure 5.1: Losses and gains of intertidal habitat within and adjacent to Portsmouth Harbour SPA and Ramsar site and Chichester and Langstone Harbour SAC, SPA and Ramsar site.

Table 5.3: Summary of losses and gains of intertidal habitat within and adjacent to Portsmouth Harbour SPA and Ramsar site

Losses of intertidal habitat within the SPA through encasement of defences	- 654m2
Gains of intertidal habitat within the SPA through removal of defunct existing ad-hoc defence structures	+ 990m2
Total SPA balance upon completion of scheme	+ 336m2
Additional intertidal habitat gain outside of the SPA boundary, due to partial realignment of defences	+ 760m2
Total intertidal habitat balance for Tipner Lake	+ 1096m2
* Note that these losses may vary at detailed design stage but are our current best estimate.	

Table 5.4: Summary of losses and gains of intertidal habitat within and adjacent to Chichester and Langstone Harbour SPA and Ramsar site

Losses of intertidal habitat within the SPA / SAC through encasement of defences	- 1,960m2
Gains of intertidal habitat within the SPA / SAC through removal of defunct existing ad-hoc defence structures / Great Salterns Quay	+ 2,710m2
Total SPA / SAC balance upon completion of scheme	+ 750m2
Additional intertidal habitat gain outside of the SPA / SAC boundary, due to partial realignment of defences	+1394m2
Total intertidal habitat balance for Eastern Road and Milton Common	+2,144m2
* Note that these losses may vary at detailed design stage but are our current best estimate.	

There has been some additional intertidal habitat gain outside of the Chichester and Langstone Harbour SPA / SAC along the Anchorage Park frontage (Phase 1 works). Throughout the construction period of the Phase 1 works, the line of defence has been challenged where possible, which has resulted in some landward realignment of defences, providing minor intertidal habitat gain. At the time of writing this application, the Phase 1 scheme was

still in construction; therefore final intertidal habitat gains will be quantified and reported upon completion of the works.

Minor losses due to localised defence encroachment are along heavily accessed existing coastal defence structures, and bird use this close to the existing defence is minimal due to disturbance (see **Photo 5.1** as an example of an existing defence structure where encroachment will occur). There is the potential for temporary, localised disturbance to the intertidal areas during construction, but this is not expected to impact birds using it, as works will be carried out outside of key bird overwintering periods (sensitive times) and disturbance will be kept to a minimum, with any temporary impacts being made good. It is anticipated that a Construction and Environmental Management Plan will be developed to ensure best practice working, and minimal access and impacts on the foreshore during construction.

Photo 5.1: Typical defence structure where encasement will occur, causing encroachment of 400mm onto the foreshore (into the shaded area). This section of seawall is within Langstone Harbour, to the northern end of the Eastern Road frontage.

The defences along Ports Creek will encroach onto intertidal areas, in an area outside of the European sites. This is due to a failing vertical structure being replaced with a sloping structure. The sloping structure is expected to colonise with saltmarsh species, and may be utilised by birds as an additional roost site, such as the Eastern Road Bridge, where birds are known to roost on the rock structures during high tide. This encroachment along Ports Creek is onto unvegetated mudflat that is not considered key feeding habitat for birds, due to its limited time of exposure during low tide, and high levels of disturbance from the motorway (M275) and access along the Hilsea Lines frontage. For this reason, this is one of the few sections of the harbour not counted for the Wetland Bird Survey.

5.3.2 Methods and timings for mitigation.

This shadow HRA has been completed to demonstrate that the proposed CFERM, scheme is deliverable in an environmentally acceptable way. Precise details on delivery of the mitigation will be provided at the detailed design stage in support of the Planning and Marine License Application for each phase of works. This will include details such as access routes, use of sediment traps and necessary monitoring etc. At this level it is important to highlight that we will continue to work closely with our stakeholders and partners to ensure the mitigation is delivered appropriately.

One of the major elements of mitigation is the removal of obsolete man-made structures within the European site boundaries, to create new intertidal habitat to that being lost through the proposed encasement of the existing defences. The removal of Great Salterns Quay is being taken forward as part of the Phase 2 works, and will result in approximately 2460m² of intertidal habitat gain within the European site boundaries. As seen in **Table 5.4**, the total SPA / SAC balance of intertidal habitat upon completion of the scheme outweighs the losses considerably. As the removal of Great Salterns Quay is to be undertaken prior to any encasement north and south of the structure, i.e. works along the Eastern Road, the intertidal habitat gain as a result of this will have time to establish (see **Figure 2.1** for the indicative phasing programme of works).

Geotechnical surveys, and protected species surveys will take place in advance of any works for each phase. These will guide the preferred construction details, help establish least impacting access routes and advise any post scheme environmental reinstatement. The geotechnical surveys will highlight any contaminants to be aware of during construction, enabling method statements to be written up that prevent and potential pollution pathways being established. Upon completion of each phase of work, details

will be provided on the effectiveness of mitigation adopted, and summarise any post construction surveys (i.e. recolonization of vegetation). No phase has yet been completed however for the Phase 1 works, a key element of mitigation was the use of silt traps to make the 10m working area and to control the area of increased suspended sediments. We have received praise from our stakeholders, including Natural England, Langstone Harbour Board and Southampton University on their effectiveness and we therefore propose to use them again for the Phase 2 works (see **Photo 5.2**).

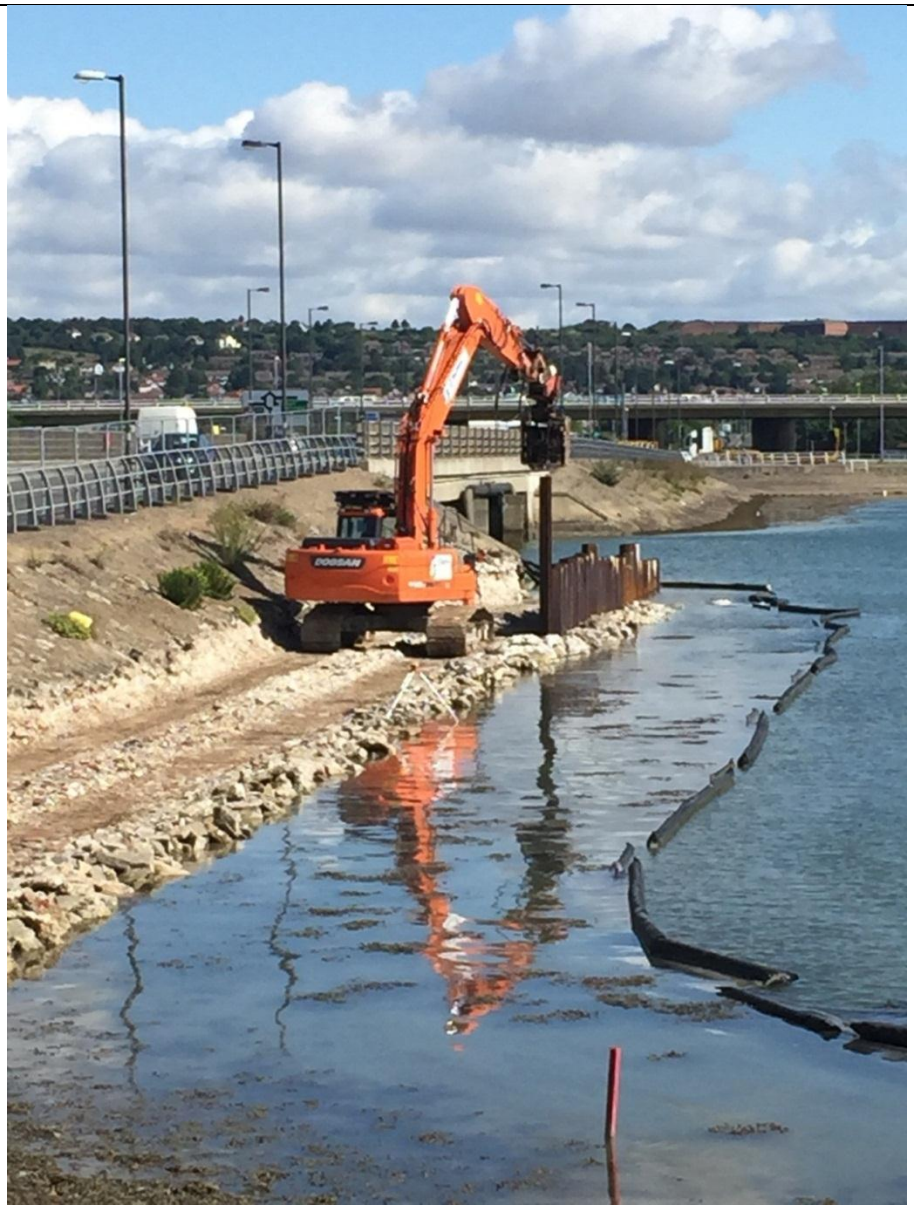

Photo 5.2: Use of sediment traps at North Portsea Island Phase 1

An additional key positive environmental element to note from the Phase 1 works, is the area of environmental impact. The site boundaries were strictly controlled to the location of the new structures. The environment either side of the tight working boundaries has not been impacted. Please note that the banks illustrated by **Photo 5.3** are yet to be re-landscaped/seeded with vegetation.

Photo 5.3: Newly constructed flood banks and revetment along Ports Creek. Note the limited footprint of impact, following tight control measures.

5.4 In-Combination / Cumulative Impacts Assessment

5.4.1 Introduction

The Environmental Statement to be prepared in support of the applications for consent for the proposed scheme includes a Cumulative Impact Assessment [CIA]. (**Please see Chapter 20 of the Environmental Statement**) That is, the assessment of the potential effects of the works when combined with the

potential effects of other relevant plans and projects in the study area (i.e. the area of influence of the works or the area in which receptors potentially affected by the works are present).

In line with agreed practice, this assessment will be limited to plans and projects where there is sufficient information to allow consideration of the potential for a cumulative or in-combination effect to arise. In the absence of publicly available information (usually in the form of a planning application) or a defined 'scheme', it is not possible to undertake a proper consideration of cumulative effects (i.e. if proposals are speculative or where assumptions regarding potential impacts may be contentious).

5.4.2 Projects Identified

There are a number of projects which have been identified to date as having the potential to have an environmental impact in-combination or cumulatively with the proposed scheme. These projects are outlined in **Table 5.5**. Relevant searches will also be undertaken with the Local Planning Authorities and the MMO to identify any other relevant projects.

Table 5.5 Plans and Projects to be considered in the CIA

No.	**Projects to be considered for cumulative impacts** (*Name of developer(s)*)
1	**Southsea CFERMS** (*ESCP and Environment Agency*)
2	**City Deal Portsmouth Sites, including** *(PCC led)*: • **Tipner West and Firing Range;** • **East Tipner Housing Development (TRC and HCA);** • **Tipner Motorway Junction Park & Ride;** • **Horsea Island Land Development and Port Solent Expansion.**
3	**Portchester to Paulsgrove tidal defence improvements**
4	**Kendalls Wharf Extension, Langstone Harbour** (*Kendall Bros Portsmouth*)
5	**Langstone Campus redevelopment**
6	**St James' Hospital, Milton Redevelopment**
7	**Priddy's Hard, Gosport Redevelopment**

8	**HMNB Portsmouth Harbour Dredge**
9	**Adjacent CFERM Strategies**
10	**Other phases of the North Portsea Island FCREM scheme**

5.4.3 Cumulative Impacts Assessment Investigations

European Commission (1999) and IEMA (2004) standard guidance will be used for the CIA, with the first step being to determine the likely spatial and temporal overlaps of the plans and projects screened into the assessment in order to determine where interactions could arise; the next being to determine the effects of the proposed scheme that have the potential to affect receptors in-combination with other proposed activities; and the final step being to determine the significance of any potential interactions/effects identified (as well as relevant mitigation). The CIA will be carried out throughout the EIA process, and full consideration of 'In-combination' impacts will be made as each phase is taken for planning approval, once timings for the phases are confirmed.

5.4.4 Assessment of 'In-combination' Impacts

Table 5.6 summarises the key impacts identified in **Table 5.1** of the scheme above, and explains how other schemes, developments and proposals could result in an in-combination effect. It also sets out what the mitigation could be, which will be fully considered as part of the EIA process, once timings and details of each phase of the North Portsea Island CFERM scheme are known.

Table 5.6: How the scheme impacts identified in Table 5.1 could be influenced by 'in-combination' effects of other proposals within or adjacent to the European sites

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
1	Loss of intertidal habitats due to coastal squeeze caused by sea level rise and delivery of the strategic policy option of 'hold the line' from the nationally adopted PICSS and North Solent SMP.	Yes, Assessed at Strategic and SMP level.	RHCP will replace losses and maintain Natura 2000 'Network' of sites.	Yes, but dealt with at Strategic level.
2	Direct loss of European designated habitat due to local changes in CFERM defence footprint.	Losses of habitat as a result of this scheme will be over mitigated through habitat gains. Other proposals would need to ensure no loss of habitat as a result of their delivery and therefore no potential for additional 'in combination' effect.	No additional mitigation.	No.
3	Impacts on water quality during construction due to pollution	No, any proposal working within or adjacent to water bodies of European sites	No additional mitigation.	No.

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
	incidents from construction machinery.	would be required to follow best practice during construction and have agreed method statements in place.		
4	Pollution to water body by opening up new pathways between potentially contaminated land sources and receptors (i.e. remobilisation, dispersal or redistribution of potentially contaminated sediments near water body).	Scheme level mitigation measures have been identified to prevent this impact. Therefore an 'in-combination' impact has been avoided. Other proposals, such as the Tipner Regeneration are expected to improve coastal defence structures along potentially contaminated land frontages, so overall, within the European sites, potential pollution incidents from uncontrolled release of contaminants are expected to be prevented with an 'in-combination' benefit to the water bodies.	No additional mitigation.	No.

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
5	Increased suspended sediments within the water body during construction.	Scheme level mitigation measures have been identified to prevent this impact (use of sediment traps). Impact dealt with at source.	No additional mitigation.	No, due to mitigation measures identified.
6	Indirect impacts on intertidal Benthic communities during construction (through disturbance).	It has been identified that the scheme will have localised, minimal impacts, and that benthic communities will recover post works. Whilst works are undertaken, birds and other species feeding on the benthic micro fauna may be displaced for feeding into the wider harbour. If other activities are taking place within the wider harbour, there could be an 'in-combination' impact if birds are further constrained to limited 'disturbance free' feeding habitat.	Yes, we will work closely with our licensing partners (MMO, NE and the LPA) to ensure that our works are programmed alongside other activities in a way that can avoid this impact. As most works causing disturbance will be undertaken outside of sensitive 'overwintering' periods, this potential impact is further reduced.	No, due to mitigation measures identified.

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
7	Direct impact on intertidal benthic communities from intertidal habitat loss.	Losses of habitat as a result of this scheme will be over mitigated through habitat gains. Other proposals would need to ensure no loss of habitat as a result of their delivery and therefore no potential for additional 'in combination' effect.	No additional mitigation.	No.
8	Impacts on intertidal vegetation during construction. Direct losses of intertidal vegetation from machine access to foreshore and removal of existing defence structures, which contain small colonies of intertidal vegetation.	Scheme level mitigation for this impact has been identified. If other proposals elsewhere in this harbour result in similar damage to vegetation, at the same time as our temporary, localised impacts, there could be wider harbour impacts. Reduced quantities of vegetation could harm its successive colonisation of the new defence structures, and it's	Yes, we will work closely with our licensing partners (MMO, NE and the LPA) to ensure that our works are programmed alongside other activities in a way that can avoid this 'In-Combination' impact. Due to scheme level mitigation of re-planting, there will be no significant time period where areas are devoid of intertidal vegetation following our works, which reduces the potential for an 'in-	No, due to mitigation measures identified.

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
		availability to fauna that feed / colonise within the vegetation.	combination' impact.	
9	Displacement of marine mammals and fish communities through vibration.	This could result in 'in-combination' impacts, as any other activities taking place in the water body, at the same time as our works could result in further displacement of marine mammals and fish to a point they could cause an impact.	Yes, we will work closely with our licensing partners (MMO, NE and the LPA) to ensure that our works are programmed alongside other activities in a way that can avoid this impact. At the scheme level we will control piling activities and seek additional advice on the least impacting methods.	No, due to avoidance measures identified.
10	Noise disturbance to people, birds and terrestrial fauna during construction.	This could result in 'in-combination' impacts, as any other activities taking place adjacent to the wider harbours (at the same time as our works), could result in further noise. However, scheme level mitigation will ensure we are not undertaking noisy works in key	Yes, we will work closely with our licensing partners (MMO, NE and the LPA) to ensure that our works are programmed alongside other activities in a way that can avoid this impact. As most works causing disturbance will be undertaken outside of sensitive 'overwintering'	No, due to avoidance measures identified.

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
		sensitive times, where overwintering birds are present within the harbours.	periods, this potential impact is further reduced.	
11	Visual disturbance from movement of construction vehicles and staff.	This could result in 'in-combination' impacts, as any other activities taking place adjacent to the wider harbours (at the same time as our works), could result in further visual disturbance. However, scheme level mitigation will ensure we are not causing a significant visual disturbance in key sensitive times, where overwintering birds are present within the harbours, a receptor particularly affected by such disturbance.	Yes, we will work closely with our licensing partners (MMO, NE and the LPA) to ensure that our works are programmed alongside other activities in a way that can avoid this impact. As most works causing disturbance will be undertaken outside of sensitive 'overwintering' periods, this potential impact is further reduced.	No, due to avoidance measures identified.
12	Loss of bird nesting and other terrestrial habitats during construction.	This could result in 'in-combination' impacts, as any other activities taking place adjacent to the	Yes, we will work closely with our licensing partners (MMO, NE and the LPA) to ensure that our works are	No, due to mitigation measures identified.

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
		wider harbours (at the same time as our works), that require the removal of significant terrestrial vegetation could limit the availability of habitats for nesting birds and other terrestrial species.	programmed alongside other activities in a way that can avoid this impact.	
13	Potential disturbance to Schedule 1 nesting birds (e.g. little tern).	Linked to impacts 10 and 11, this could result in 'in-combination' impacts, as any other activities taking place adjacent to the wider harbours (at the same time as our works), could result in further noise and visual disturbance to nesting birds. However, scheme level mitigation will ensure we are not undertaking works that could result in disturbance, at key sensitive times, where nesting birds are present within the	Yes, we will work closely with our licensing partners (MMO, NE and the LPA) to ensure that our works are programmed alongside other activities in a way that can avoid this impact.	No, due to avoidance measures identified.

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
		harbours.		
14	Impact on coastal processes including erosion of intertidal sediments	This could result in 'in-combination' impacts, as any other activities taking place along the harbour coastline could further impact coastal processes.	For this scheme, detailed modelling / analysis will be undertaken where there is any significant change in defence structure / coastline profile. Any wider proposals for works that could affect these elements elsewhere within the harbours would also be required to model for impacts. We will work closely with our licensing partners (MMO, NE and the LPA) to ensure that our works are programmed alongside other activities in a way that can avoid this impact. As the Coastal Partnership we would be expected to comment and advise on any wider proposals that could impact general coastal processes, which	No, due to mitigation measures identified.

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
			would be assessed 'in-combination' with our proposals.	
15	In-combination impacts from other activities within / adjacent to the European designated sites	Yes, as discussed above	Yes, as discussed above, most 'in-combination' impacts can be avoided by working closely with our licensing partners (MMO, NE and the LPA) to ensure that our works are programmed alongside other activities in a way that can avoid 'in-combination' impacts	No, due to mitigation and avoidance measures identified.

6. CONCLUSIONS

6.1 Is the proposal likely to have a significant effect 'alone and / or in-combination' on a European Site

Because of the control measures that will be put in place during construction, and the mitigation opportunities that have been identified, it is not anticipated that there will be a long term Likely Significant Effect on the European sites as a result of the North Portsea Island scheme delivery – alone, or 'in-combination'.

The scheme itself protects numerous potentially contaminated land sites, preventing potential uncontrolled pollution of habitats, should the defences fail. Wider environmental enhancement opportunities have been considered, and will be further considered at detailed design stage. The proposed scheme is supported by the North Solent SMP, the Portsea Island Coastal Strategy Study and is considered to be the most environmentally sound, viable option as a result of a rigid options appraisal process.

Through delivery of the mitigation measures, we expect to provide more habitat gain within the European sites, than would be lost through encroachment. There will be further gains through the creation of intertidal habitat outside of the European sites.

Through the above impact assessment and working closely with regulators, we do not foresee any LSE, and potentially some environmental benefit to the European sites from the delivery of the proposed North Portsea Island CFERM scheme.

Based on this overall scheme conclusion, we do not believe an additional scheme level Appropriate Assessment is required, and a Statement of case for IROPI is also not required. Therefore the full scheme is deliverable to protect North Portsea Island's people, property, infrastructure and the environment from flooding and erosion. Individual HRA's will be submitted to support the approval process as individual scheme phases are taken forward, and these act as the final check at the

detailed design stage to confirm that the works will not have a Likely Significant Effect on the European Sites.

Appendix A:

Long-list Screening Summary

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Long list of Flood and Coastal Erosion Risk Management Options	
Project	North Portsea Flood and Coastal Erosion Risk Management Scheme
Date	08/01/2014
Version	2
Prepared	Matt Balkham
Checked	Jackie Lavender
Reviewed	Alexander Lee / Bret Davies / Marc Bryan

No.	Approach	Option	Description	Comment	Screening	Principal reason for exclusion
1	Do Nothing	Accept deterioration and failure of coastal defences over time.	Baseline scenario required for economic appraisal. Ongoing maintenance ceased with immediate effect and no improvements undertaken. Defences allowed to deteriorate resulting in increasing risk of flooding over time. Some periodic intervention would be necessary in order to minimise Public Health and Safety.	This approach is not in line with the approved strategy and would quickly lead to an unacceptable level of flood risk. This approach is considered only for baseline economic appraisal of scheme options.	Required for Baseline	N/A
2	Do Minimum	Repair and maintain existing coastal defences	Continue ongoing maintenance of existing defences. No new coastal flood and erosion risk management assets to be built. No improvements or enhancements to existing coastal flood and erosion risk management assets.	The standard of flood protection, to a CFERM asset, will reduce with predicted sea level rise. Not in line with approved strategy.	Required for Baseline	N/A
3	Advance the line	New defences seaward of existing alignment	Construct new defences sea of existing alignment.	**Not in line with approved strategy** or local planning policy and therefore excluded from further appraisal. Further clarification provided within the strategy document. Likely to be very expensive (since entire new defence required). Unlikely to secure environmental consent given loss of SPA/SAC/ etc. Could create land for development. Could interfere with existing water based activities and businesses.	Exclude	Policy, Environment
4	Retreat the line	Managed retreat/realignment comprising new defences landward of existing alignment	Construction of new defences landward of existing alignment. Potentially removal of existing defences (or these could be left to deteriorate)	**Not in line with approved strategy** or local planning policy and therefore excluded from further appraisal. Open space, which would normally be suitable for managed realignment, generally contains potential contamination. Further clarification provided within the strategy document. Scheme cost likely to be high because land would need to be decontaminated, an entire new defence constructed and land purchase (compensation) required. Potential to create intertidal habitat seaward of new defence alignment is limited.	Exclude	Policy Cost
5	Hold the line	Vertical primary defence	Repair/replace existing primary defence/revetment with a vertical CFERM asset, such as a sea wall. Improve height of CFERM asset, if necessary, to provide a safe standard of CFERM protection.	Likely to be technically and economically viable. Particularly relevant to locations where land available for improvements is limited. The primary defence could be improved, at a later stage, to make the asset adaptable to climate change.	Include	N/A
6		Sloping primary defence	Repair/replace existing primary defence/revetment with a sloping CFERM asset, such as a revetment or bio-engineered option. Improve height of CFERM asset, if necessary, to provide a safe standard of CFERM protection.	Likely to be technically and economically viable, particularly where land is readily available for construction. The primary defence could be improved, at a later stage, to make the asset adaptable to climate change.	Include	N/A
7		Vertical primary defence and setback secondary defence	Repair/replace existing primary defence with a vertical CFERM asset, such as a sea wall. Construct a new secondary line of defence such as an embankment or wall.	Likely to be technically and economically viable, particularly where an existing defence is in relatively good condition, provides a good standard of protection and/or where space for construction is limited. In these situations the setback defence could, for example, be implemented in year 50 to make provision for climate change.	Include	N/A
8		Sloping primary defence and setback secondary defence	Repair/replace existing primary defence, such as a revetment or bio-engineered option. Construct a new secondary line of defence such as an embankment or wall.	Likely to be technically and economically viable, particularly where an existing defence is in relatively good condition, provides a good standard of defence and/or where space for construction is readily available. In these situations the setback defence could, for example, be implemented in year 50 to make provision for climate change.	Include	N/A
9		Demountables	Maintain existing defences and install demountable defences (either community level or individual property protection)	Demountables to the entire frontage is likely to be uneconomical, given length of the frontage, and require considerable operational effort (resource) to deploy. Significant risk of failure because sections may not be installed in time or correctly. Demountables could form part of any hold the line solution in some localised areas. Demountables are unlikely to provide a comprehensive solution to the entire North Portsea Island frontage.	Exclude	Technical H&S
10		Utilise/improve highways assets and or existing buildings as flood defences	Potential to utilise Eastern Road, Railway embankment or existing buildings/walls as defence.	Topography not ideal for this solution (i.e. existing assets too low). Cost likely to be prohibitive. No existing plans for asset owners to replace/repair assets (which could improve the affordability).	Exclude	Technical
11	Others	Tidal control barrier (Ports Creek & Tipner Lake)	Construct tidal flood barrier under/adjacent to the existing road bridges to prevent sea levels rising above existing defence levels. Tidal barrier would only be activated (closed) in advance of an extreme high tide. Would require replacement/ maintenance of existing defences	**Not in line with the approved strategy.** Construction costs of a tidal barrier has been costed at £40m and is expected to have high maintance and operational whole life costs. Replacement and maintancne of the existing defence structures has been costed at an additional £4.4m. This option will only offer protection to frontages 1 and 2, the remaining frontages would need to be dealt with seperatly at additional cost. It is expected to be difficult to gain environmental consents to impliment this option due to the requirement to artificially control the tidal nature of the designated habitat. Significant risk of failure because the barrier may not be installed in time or correctly. Mechanical and electrical components may break down during use.	Exclude	Cost Environmental
12		Property level flood resistance/resilience	Improvements to flood proof individuals properties to reduce likelihood of flooding or reduce impact of flooding (and ease clean-up post event)	Not in line with approved strategy. Large number of properties to improve. Still poses significant risk to life. Does not reduce risk or mitigate effect of infrastructure flooding. Potentially unfundable through current revenue streams. Resistance measures could form part of any hold the line solution in some localised areas.	Exclude	Policy H&S Cost
13		Accept overtopping and improve drainage	Maintain existing defences (or allow to deteriorate) and improve landward drainage to cope with overtopping and prevent/reduce water reaching housing/infrastructure.	Not inline with strategy. Does not mitigate risk to life. Due to the low lying and flat topography of Portsea Island, this is unable to achieve a long term safe standard of flood protection.	Exclude	H&S Technical Policy
14		Harbour Barrage	Construct a barrage at the entrance to Langstone and Portsmouth Harbours to control levels within the harbours	Likely to have significant cost of construction and maintenance. Significant impact on local economy through restricting harbour operations. Disruption to harbour activities (navigation) and environment (ecology, geomorphology, etc.) likely to be unacceptable. Not in line with policy. Need to address connection between Langstone and Chichester Harbour. Primary defences still required albeit at a lower height.	Exclude	Cost Environmental Amenity Policy
15		Fill, through land reclamation, the length of Ports Creek	Filling, or reclaiming land, along the creek could remove the flood pathway. Removing the flood pathway eliminates the dependency, on the creeks embankments, as the primary flood defence.	Implementing this option would result in significant direct loss of a European designated environmental habitat and loss of a Navigational right of way. This option is unlikely to be implemented.	Exclude	Environmental Policy
16		Beach Management	By creating a shingle/sand beach/dune in front of the existing defences, flood risk as result of wave energy and water level could be reduced.	Principal flood mechanism is via water level (not waves). Environmental designations mean it is highly unlikely to secure approvals for works seaward of foreshore. Costs likely to be prohibitively expensive since material not readily available.	Exclude	Technical Environmental Cost
Notes						
4 – Localised/small scale realignment might be possible as part of the 'hold the line' options and could provide opportunities for habitat enhancement						

Long list to short list selection criteria
Policy
Is the defence option a significant departure from the Shoreline Management Plan and Strategy policy? Yes = reject.
Technical
Is there a high risk that the defence option will not perform from a technical perspective? Yes = reject.
Environment
Is the defence option likely to have a significant detrimental impact on the environment? Yes = reject.
Health and Safety
Does the defence option put the public at an unacceptable level of health and safety risk? Yes = reject.
Cost
Is the defence option unlikely to receive funding including external contributions? Yes = reject.
Amenity
Is the defence option likely to have a significant detrimental impact on the local amenity? Yes = reject.

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Appendix B:

Appraisal Summary Tables

- **Comparison of shortlist options against Do Nothing in range of criteria**

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Negative Impact	
Neutral Impact	
Positive Impact	

Project Name	Southsea and North Portsea Island Frontages Outline Design				
Frontage	North Portsea Frontage 1				
Project Description	The current defences around North Portsea Island Flood Cell 4 are in poor condition and do not provide the required standard of protection identified within the Portsea Island Coastal Strategy Study.				
Option	**Baseline**	**Option A**	**Option B**	**Option C**	**Option D**
Overview / Description	Do Nothing, hypothetical option, is not in line with Strategy recommendations.	Vertical Primary Defence	Vertical Primary Defence with Set-Back Defence	Sloping Primary Defence	Sloping Primary Defence with Set-Back Defence
Technical Issues	-	Services, including high voltage electricity cable are present behind the existing seawall. The seawall to the south will have to be demolished to allow for a retreated line of defence. A retreated line of defence will have to be constructed close to the electricity cables.	Services, including high voltage electricity cable are present behind the existing seawall. The seawall to the south will have to be demolished to allow for a retreated line of defence. A retreated line of defence will have to be constructed close to the electricity cables. The footpath to the northern end of the frontage is relatively narrow which constrains the options available for a secondary defence.	Services, including high voltage electricity cable are present behind the existing seawall. The seawall to the south will have to be demolished to allow for a retreated line of defence. A retreated line of defence is likely to require diversion of the electricity cables.	Services, including high voltage electricity cable are present behind the existing seawall. The seawall to the south will have to be demolished to allow for a retreated line of defence. A retreated line of defence is likely to require diversion of the electricity cables. The footpath to the northern end of the frontage is relatively narrow which constrains the options available for a secondary defence.
Assumptions and Uncertainties	-	It is assumed that the land behind the seawall to the south is contaminated and that any excavated material will be disposed of off site. Any filling that is required will be achieved via import of material. Should the existing ground prove suitable for reuse then it will reduce overall construction costs. The lowest cost concrete wall option is encasement of the existing seawall to the north. It is assumed that the existing seawall is sufficiently robust to support the encasement rather than requiring a more costly standalone seawall. It is assumed that the existing seawall to the south will be replaced by a new structure, rather than a concrete encasement, due to its poor condition. This will be confirmed by site survey.	It is assumed that the land behind the seawall to the south is contaminated and that any excavated material will be disposed of off site. Any filling that is required will be achieved via import of material. Should the existing ground prove suitable for reuse then it will reduce overall construction costs. The lowest cost concrete wall option is encasement of the existing seawall to the north. It is assumed that the existing seawall is sufficiently robust to support the encasement rather than requiring a more costly standalone seawall. The set-back defence type has been chosen as an earth fill embankment unless there is insufficient space. In these cases the set-back defence is a reinforced concrete or steel sheet pile floodwall. It is assumed that the existing seawall to the south will be replaced by a new structure, rather than a concrete encasement, due to its poor condition. This will be confirmed by site survey,	It is assumed that the land behind the seawall to the south is contaminated and that any excavated material will be disposed of off site. Any filling that is required will be achieved via import of material. Should the existing ground prove suitable for reuse then it will reduce overall construction costs.	It is assumed that the land behind the seawall to the south is contaminated and that any excavated material will be disposed of off site. Any filling that is required will be achieved via import of material. Should the existing ground prove suitable for reuse then it will reduce overall construction costs. The set-back defence type has been chosen as an earth fill embankment unless there is insufficient space. In these cases the set-back defence is a reinforced concrete floodwall.
Approaches to Adaption	-	These options are based upon construction of the defence crest level to full height in year 0. Following selection of the preferred option and further development consideration will be given to building to a lower height and raising the defence height in a staged approach, say in year 50, to stay in line with climate change.			
Costs (£K)	Nil	10600 to 11900 £k	12400 to 13800 £k	11700 to 20900 £k	12300 to 24400 £k
Category	**Description and quantification of impacts**	**Description and quantification of impacts**	**Description and quantification of impacts**	**Description and quantification of impacts**	**Description and quantification of impacts**
Economic Impacts					
Properties	Residential and commercial properties at risk of flooding under a 1 in 200yr event.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties from erosion within the 100 year life of scheme.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties from erosion within the 100 year life of scheme.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties from erosion within the 100 year life of scheme.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties from erosion within the 100 year life of scheme.

Emergency Costs	Emergency costs will increase over the years due to the low SoP against flooding. Flood response and clear-up will increase.	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding. NR: By not using set back secondary defence, post event footpath maintenance and clean up costs avoided	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding. NR: By not using set back secondary defence, post event footpath maintenance and clean up costs avoided	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.
Infrastructure	Infrastructure will be at risk due to low SoP. Access to businesses and associated car parks will be limited in extreme events due to road being flooded. Closure and disruption due to flooding will affect emergency services access across Flood Cell 4.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding. To allow revetment in line with current toe, HV cable must be relocated	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding. To allow revetment in line with current toe, HV cable must be relocated
Transport	Cycle and pedestrian access will be flooded more frequently. Key links in and out of city will be blocked by flooding.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links kept open within the 100 year life of scheme.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links kept open within the 100 year life of scheme. Footpath and cycleway will flood under extreme events.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links kept open within the 100 year life of scheme.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links kept open within the 100 year life of scheme. Footpath and cycleway will flood under extreme events.
Agriculture	NA	NA.	NA.	NA.	NA.
Indirect effect on businesses	Businesses within Flood Cell 4 will be at risk of flooding and damage due to flood waters. Potential for access to businesses to be cut off.	Flood risk reduced to local businesses during 100 year life of scheme.	Flood risk reduced to local businesses during 100 year life of scheme.	Flood risk reduced to local businesses during 100 year life of scheme.	Flood risk reduced to local businesses during 100 year life of scheme.
Environmental Impacts					
Historic Environment	Flooding to Hillsea lines to north of frontage will occur.	The Local Planning Authority have a duty to preserve and enhance the historic environment. The Local Planning Authority consider that the vertical defences would not be in keeping with the sloping lines of the Hillsea Lines in the northern section of the frontage. Flood risk to the Hillsea Lines would decrease. Potential physical disturbance to archaeological / geoarchaeological remains (terrestrial, foreshore and intertidal). Potential indirect impacts through scour and change in hydrodynamics. Potential impacts on setting of Hillsea Lines Scheduled Monument.	The Local Planning Authority have a duty to preserve and enhance the historic environment. The Local Planning Authority consider that the vertical defences would not be in keeping with the sloping lines of the Hillsea Lines in the northern section of the frontage. Flood risk to the Hillsea Lines would decrease. Potential physical disturbance to archaeological / geoarchaeological remains (terrestrial, foreshore and intertidal). Potential indirect impacts through scour and change in hydrodynamics. Potential impacts on setting of Hillsea Lines Scheduled Monument.	The Local Planning Authority have a duty to preserve and enhance the historic environment. The sloping defences would be in keeping with the sloping lines of the Hillsea Lines in the northern section of the frontage. Flood risk to the Hillsea Line would decrease. Potential physical disturbance to archaeological / geoarchaeological remains (terrestrial, foreshore and intertidal). Operation: Indirect impacts through scour reduced compared to vertical structure. Potential impacts on setting of Hillsea Lines Scheduled Monument reduced compared to vertical structure.	The Local Planning Authority have a duty to preserve and enhance the historic environment. The sloping defences would be in keeping with the sloping lines of the Hillsea Lines in the northern section of the frontage. Flood risk to the Hillsea Line would decrease. Potential physical disturbance to archaeological / geoarchaeological remains (terrestrial, foreshore and intertidal). Operation: Indirect impacts through scour reduced compared to vertical structure. Potential impacts on setting of Hillsea Lines Scheduled Monument reduced compared to vertical structure.
Landscape	Deterioration to landscape character as defences fail. Regular flooding causing deterioration to landscape and change of character.	The primary defence structure would be similar to the current structure so the impact of this would be minimal. However the higher defence height reducing seaward views from the footpath is generally perceived as a negative impact by the public. Steering Group: Mixed opinions whether continuous linear structure seen as improvement to current mix of structure types	The primary defence structure would be similar to the current structure so the impact of this would be minimal. A locally set-back secondary defence is generally perceived as having a minimal impact by the public. Steering Group: Mixed opinions whether continuous linear structure seen as improvement to current mix of structure types	The primary defence structure would be sloped rather than vertical like the current structure. Feedback from the public indicates that the impact of this change would be positive. The existing footpath could be run along the top of the new, higher defence. The overall impact would therefore be positive. Steering Group: Mixed opinions whether continuous linear structure seen as improvement to current mix of structure types	The primary defence structure would be sloped rather than vertical like the current structure. Feedback from the public indicates that the impact of this change would be positive. A locally set-back secondary defence is generally perceived as having a minimal impact by the public. The overall impact would therefore be positive. Steering Group: Mixed opinions whether continuous linear structure seen as improvement to current mix of structure types

Designated sites	Deterioration of designated sites as defences fail and potentially litter foreshore. Following failure of defence, there is an increase risk of contaminants leaching into designated sites.	Encasement option would involve some minor encroachment into environmentally designated areas (SSSI, SPA and Ramsar). There is scope for mitigation through habitat creation by removing the existing defence apron to the south of the frontage, which is within the designated site boundary. ESCP/NE: Any mitigation should be as close to the losses as possible and within the SPA. ESCP/NE: If mitigation for SPA losses cannot be indentified any resultnat case for IROPI, must set out why no alternative option is viable. ESCP/NE: Vertical structures provide better screening and protection to the habitat than revetments. There is a potential for loacalised realignment of defences via this option, which could result in additonal environmental gain	Encasement option would involve some minor encroachment into environmentally designated areas (SSSI, SPA and Ramsar). There is scope for mitigation through habitat creation by removing the existing defence apron to the south of the frontage, which is within the designated site boundary. ESCP/NE: Any mitigation should be as close to the losses as possible and within the SPA. ESCP/NE: If mitigation for SPA losses cannot be indentified any resultnat case for IROPI, must set out why no alternative option is viable. ESCP/NE: Vertical structures provide better screening and protection to the habitat than revetments. There is a potential for loacalised realignment of defences via this option, which could result in additonal environmental gain	Due to landward space constraints, a revetment would involve significant encroachment into environmentally designated areas (SSSI, SPA, Ramsar). While some mitigation is possible through local habitatcreation, this option would require a successful IROPI case to compensate additional losses outside of the SPA. Some minor habitat enhancement could be incorporated into the face of the sloped defences. Scour would be reduced compared to a vertical structure. ESCP/NE: Any mitigation should be as close to the losses as possible and within the SPA. ESCP/NE: The required IROPI case, would need to set out why no alternative option is viable. Whilst vertical options remain comparable in price to the sloping structure and is socially and technically deliverable, an IROPI case would not be supported by our statutory advisors. Therefore a sloped structure is not deliverable along this frontage. ESCP/NE: Vertical structures provide better screening and protection to the habitat than revetments.	Due to landward space constraints, a revetment would involve significant encroachment into environmentally designated areas (SSSI, SPA, Ramsar). While some mitigation is possible through local habitatcreation, this option would require a successful IROPI case to compensate additional losses outside of the SPA. Some minor habitat enhancement could be incorporated into the face of the sloped defences. Scour would be reduced compared to a vertical structure. ESCP/NE: Any mitigation should be as close to the losses as possible and within the SPA. ESCP/NE: The required IROPI case, would need to set out why no alternative option is viable. Whilst vertical options remain comparable in price to the sloping structure and is socially and technically deliverable, an IROPI case would not be supported by our statutory advisors. Therefore a sloped structure is not deliverable along this frontage. ESCP/NE: Vertical structures provide better screening and protection to the habitat than revetments.
Soils	Contaminated land would remain on-site.	Construction would potentially involve the removal of contaminated land (frontage 1a) and the need to refill with imported material. The overall impact is neutral.	Construction would potentially involve the removal of contaminated land (frontage 1a) and the need to refill with imported material. The overall impact is neutral.	Construction would potentially involve the removal of contaminated land (frontage 1a) and the need to refill with imported material. The overall impact is neutral.	Construction would potentially involve the removal of contaminated land (frontage 1a) and the need to refill with imported material. The overall impact is neutral.
Water	Potential for release of contamination contained within the ground to the rear of the defences as well as sediment load as defences begin to fail.	During the construction there is the potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. The risk of significant release of contaminants and sediment during a failure of the defences will be significantly reduced.	During the construction there is the potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. The risk of significant release of contaminants and sediment during a failure of the defences will be significantly reduced.	During the construction there is the potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. The risk of significant release of contaminants and sediment during a failure of the defences will be significantly reduced.	During the construction there is the potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. The risk of significant release of contaminants and sediment during a failure of the defences will be significantly reduced.
Flora / Fauna	No Impact	Vertical primary defence would provide screening to birds on the open water from dogs/pedestrians using the footpath, an option Natural England favour. However, wall would also screen birds using adjacent fields/parkland from the water. Potential impact to intertidal fauna if defence encroaches.	Wall could screen birds using adjacent parkland/playing fields from open water. Creating an embankment on adjacent playing fields /park could potentially impact on land being used by birds for nesting/resting/feeding. However embankments to be grassed and sloped to allow use by birds to continue. Potential impact to intertidal fauna if defence encroaches.	Some minor habitat enhancement could be incorporated into the face of the sloped defences. Creating an embankment on adjacent playing fields /park could potentially impact on land being used by birds for nesting/resting/feeding. However embankments to be grassed and sloped to allow use by birds to continue. Potential impact to intertidal fauna if defence encroaches. ESCP: Potential impact on habitat as revetment could make access to the foreshore easier for dogs and public, thus disturbing feeding birds. Screening could be incorporated to reduce this impact IROPI case difficult due to encroachment into the harbour of revetted slope	Some minor habitat enhancement could be incorporated into the face of the sloped defences. Creating an embankment on adjacent playing fields /park could potentially impact on land being used by birds for nesting/resting/feeding. However embankments to be grassed and sloped to allow use by birds to continue. Potential impact to intertidal fauna if defence encroaches. ESCP: Potential impact on habitat as revetment could make access to the foreshore easier for dogs and public, thus disturbing feeding birds. Screening could be incorporated to reduce this impact IROPI case difficult due to encroachment into the harbour of revetted slope

Construction	No Impact	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Footprint of works localised compared to other options. Some offsite disposal of materials may be required (frontage 1a).	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Some offsite disposal of materials may be required (frontage 1a).	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Some offsite disposal of materials may be required (frontage 1a). PCFP: Consideration to be given to choice of planting between path and revetment. Consider selecting plants to form a screen or barrier PCFP: Consider low wall between path and revetment to form screen or barrier.	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Some offsite disposal of materials may be required (frontage 1a). PCFP: Consideration to be given to choice of planting between path and revetment. Consider selecting plants to form a screen or barrier PCFP: Consider low wall between path and revetment to form screen or barrier.
Social Impacts					
Way of Life	Loss of key recreation site and access route to and from the City and Mainland. Loss of visits to the city and reduction in tourism.	Flood risk fear significantly reduced. Hinterland protected and enhanced for use. PCFP: Privacy issues with raised walkway overlooking properties at northern end of the frontage.	Flood risk fear significantly reduced. Hinterland protected and enhanced for use.	Flood risk fear significantly reduced. Hinterland protected and enhanced for use. PCFP: Privacy issues with raised walkway overlooking properties.	Flood risk fear significantly reduced. Hinterland protected and enhanced for use.
Public perception	Negative perception. Would be seen as nothing being done. 91% of the public who attended consultation events believe there is a need to reduce flood risk and 85% believe there is a need to improve flood defences.	Feedback from public consultation indicates this is not a preferred option. This option would reduce coastal views and would disconnect the public from the coast. Public feedback from consultation is that open space and sea views are important.	Feedback from public consultation indicates this is an accepted option. Public feedback is that open space and sea views are important. This option would encourage connection to the coastline and would be aesthetically pleasing.	Feedback from public consultation indicates that this is an accepted option. This option would improve coastal views as footpath would be constructed along the crest. Public feedback from consultation is that open space and sea views are important. ESCP: Public interest in choice of planting and landscaping Concern over land take and loss of car parking and amenity space	Feedback from public consultation indicates this is a preferred option. Public feedback from consultation is that open space and sea views are important. This option would encourage connection to the coastline and would be aesthetically pleasing. ESCP: Public interest in choice of planting and landscaping Concern over land take and loss of car parking and amenity space
Recreation	Deterioration on playing fields due to increased flooding.	Overtopping/flooding landward of defence reduced. Recreation usage maintained.	Overtopping/flooding landward of defence reduced. Recreation usage maintained. Footpath and sports field will become inundated for the fully set-back secondary flood defence option under extreme events. However, 77% of public who attended consultation events felt that this would not be a problem. NE: Concern over interaction of cyclists and dogs not on leads	Overtopping/flooding landward of defence reduced. Recreation usage maintained NE: Concern over interaction of cyclists and dogs not on leads	Overtopping/flooding landward of defence reduced. Recreation usage maintained. Footpath and sports field will become inundated for the fully set-back secondary flood defence option under extreme events. However, 77% of public who attended consultation events felt that this would not be a problem. NE: Concern over interaction of cyclists and dogs not on leads
Health and wellbeing	Deterioration on playing fields due to increased flooding. Deterioration to cycle areas and loss of walking areas. Increases stress due to risk of property flooding.	The primary defence will consist of a vertical structure. There is a residual risk to the public from falls from height. PCFP: Assessment of dual use foot and cycle path required Need to incorporate steps into the structure to allow access/egress	The primary defence will consist of a vertical structure. There is a residual risk to the public from falls from height although a handrail would be installed to reduce the risk from that experienced at present. This is a positive impact. PCFP: Assessment of dual use foot and cycle path required PCFP/NE: Need to incorporate steps into the structure to allow access/egress	The primary defence will consist of a sloping structure. There is a residual risk to the public from falls from height although the sloped structure reduces this risk in comparison to that experienced at present and of the vertical structure option. This is a positive impact. PCFP: Assessment of dual use foot and cycle path required PCFP: Concerns over safety of smooth finish concrete - users might slip down the revetment, and users may not be able to climb the structure and become trapped in the creek PCFP/NE: Need to incorporate steps into the structure to allow access/egress	The primary defence will consist of a sloping structure. There is a residual risk to the public from falls from height although the sloped structure reduces this risk in comparison to that experienced at present and of the vertical structure option. This is a positive impact. PCFP: Assessment of dual use foot and cycle path required PCFP: Concerns over safety of smooth finish concrete - users might slip down the revetment, and users may not be able to climb the structure and become trapped in the creek PCFP/NE: Need to incorporate steps into the structure to allow access/egress

		The risk of injury from overtopping will be reduced.	The risk of injury from overtopping will be reduced landward of the set back defence. The risk of injury from overtopping seaward of the set back defence remains unchanged.	The risk of injury from overtopping will be reduced. PCFP: Potential H&S risk to cyclists using route at top of embankment - long way to fall	The risk of injury from overtopping will be reduced landward of the set back defence. The risk of injury from overtopping seaward of the set back defence remains unchanged.
Community	Deterioration of visual character will have negative impact on community. Loss of community due to regular flooding and erosion over 100 years.	Flooding and erosion risk to community reduced. High walls will reduce feeling of coastal community.	Flooding and erosion risk to community reduced. Community will not feel disconnected due to high structures along coastline.	Flooding and erosion risk to community reduced. High embankment will not reduce feeling of coastal community due to footpath being constructed on crest and access remaining compared to vertical structures.	Flooding and erosion risk to community reduced. Community will not feel disconnected due to high structures along coastline.

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Negative Impact	
Neutral Impact	
Positive Impact	

Project Name	Southsea and North Portsea Island Frontages Outline Design				
Frontage	North Portsea Frontage 2				
Project Description	The current defences around North Portsea Island Flood Cell 4 are in poor condition and do not provide the required standard of protection identified within the Portsea Island Coastal Strategy Study.				
Option	**Baseline**	**Option A**	**Option B**	**Option C**	**Option D**
Overview / Description	Do Nothing, hypothetical option, is not in line with Strategy recommendations.	Vertical Primary Defence	Vertical Primary Defence with Set-Back Defence	Sloping Primary Defence	Sloping Primary Defence with Set-Back Defence
Technical Issues		Services are present behind the existing defences, across the bridges linking Portsea with mainland and along the landward side of Eastern Road. There is limited access to the Northern section of this frontage due to the low bridges at either end and poor access by road.	Services are present behind the existing defences, across the bridges linking Portsea with mainland and along the landward side of Eastern Road. There is limited access to the Northern section of this frontage due to the low bridges at either end and poor access by road.	Services are present behind the existing defences, across the bridges linking Portsea with mainland and along the landward side of Eastern Road. There is limited access to the Northern section of this frontage due to the low bridges at either end and poor access by road.	Services are present behind the existing defences, across the bridges linking Portsea with mainland and along the landward side of Eastern Road. There is limited access to the Northern section of this frontage due to the low bridges at either end and poor access by road.
Assumptions and Uncertainties		It is assumed that the land behind the existing defence is contaminated and that any excavation of material will be disposed of off site. Any filling that is required will be achieved via import of material. Should the existing ground prove suitable for reuse then it will reduce overall construction costs. It is assumed that all defences along this section are in poor condition and will be replaced. It is assumed that the Eastern Road bridge flood route into the island will be stopped by raising of parapet floodwalls along the western and eastern sides of the bridge extending to a high point along the road bridge deck.	It is assumed that the land behind the existing defence is contaminated and that any excavation of material will be disposed of off site. Any filling that is required will be achieved via import of material. Should the existing ground prove suitable for reuse then it will reduce overall construction costs. The set-back defence type has been chosen as an earth fill embankment and assumes there is sufficient space to do so. It is assumed that the Eastern Road bridge flood route into the island will be stopped by raising of parapet floodwalls along the western and eastern sides of the bridge extending to a high point along the road bridge deck.	It is assumed that the land behind the existing defence is contaminated and that any excavation of material will be disposed of off site. Any filling that is required will be achieved via import of material. Should the existing ground prove suitable for reuse then it will reduce overall construction costs. It is assumed that all defences along this section are in poor condition and will be replaced. It is assumed that the Eastern Road bridge flood route into the island will be stopped by raising of parapet floodwalls along the western and eastern sides of the bridge extending to a high point along the road bridge deck.	It is assumed that the land behind the existing defence is contaminated and that any excavation of material will be disposed of off site. Any filling that is required will be achieved via import of material. Should the existing ground prove suitable for reuse then it will reduce overall construction costs. The set-back defence type has been chosen as an earth fill embankment and assumes there is sufficient space to do so. It is assumed that the Eastern Road bridge flood route into the island will be stopped by raising of parapet floodwalls along the western and eastern sides of the bridge extending to a high point along the road bridge deck.
Approaches to Adaption		These options are based upon construction of the defence crest level to full height in year 0. Following selection of the preferred option and further development consideration will be given to building to a lower height and raising the defence height in a staged approach, say in year 50, to stay in line with climate change.			
Costs	Nil	14700 to 17900 £k	16900 to 21100 £k	12700 to 17500 £k	13800 to 17100 £k
Category	**Description and quantification of impacts**	**Description and quantification of impacts**	**Description and quantification of impacts**	**Description and quantification of impacts**	**Description and quantification of impacts**
Economic Impacts					
Properties	Residential and commercial properties at risk of flooding under a 1 in 200yr event.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties from erosion within the 100 year life of scheme. Possible disruption to residential estate during construction period only.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties from erosion within the 100 year life of scheme. Possible disruption to residential estate during construction period only.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties from erosion within the 100 year life of scheme. Possible disruption to residential estate during construction period only.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties from erosion within the 100 year life of scheme. Possible disruption to residential estate during construction period only.
Emergency Costs	Emergency costs will increase over the years due to the low SoP against flooding. Flood response and clear-up will increase.	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding. By not using set back secondary defence, post event footpath maintenance and clean up costs are reduced.	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding. By not using set back secondary defence, post event footpath maintenance and clean up costs are reduced.	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.

Infrastructure	Infrastructure will be at risk due to low SoP. Access to businesses and associated car parks will be limited in extreme events due to road being flooded. Closure and disruption due to flooding will affect emergency services access across Flood Cell 4.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.
Transport	Cycle and pedestrian access will be flooded more frequently. Key links in and out of city will be blocked by flooding.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links kept open within the 100 year life of scheme.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links kept open within the 100 year life of scheme. Coastal footpath and will flood under extreme events.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links kept open within the 100 year life of scheme.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links kept open within the 100 year life of scheme. Coastal footpath will flood under extreme events.
Agriculture	NA	NA.	NA.	NA.	NA.
Indirect effect on businesses	Businesses within Flood Cell 4 will be at risk of flooding and damage due to flood waters. Potential for access to businesses to be cut off.	Flood risk reduced to local businesses during 100 year life of scheme.	Flood risk reduced to local businesses during 100 year life of scheme.	Flood risk reduced to local businesses during 100 year life of scheme.	Flood risk reduced to local businesses during 100 year life of scheme.
Environmental Impacts					
Historic Environment	Flooding to Hillsea lines.	The Local Planning Authority have a duty to preserve and enhance the historic environment. The Local Planning Authority consider that the vertical defences would not be in keeping with the sloping lines of the Hillsea Lines. Flood risk to the Hillsea Lines would decrease. Potential physical disturbance to archaeological / geoarchaeological remains (terrestrial, foreshore and intertidal). Potential indirect impacts through scour and change in hydrodynamics. Potential impacts on setting of Hillsea Lines Scheduled Monument. EH/PCFP: Desire to maintain continuity, and 'tell the story' of Hilsea Lines and Portsdown Hill defences.	The Local Planning Authority have a duty to preserve and enhance the historic environment. The Local Planning Authority consider that the vertical defences would not be in keeping with the sloping lines of the Hillsea Lines. Flood risk to the Hillsea Lines would decrease Potential physical disturbance to archaeological / geoarchaeological remains (terrestrial, foreshore and intertidal). Potential indirect impacts through scour and change in hydrodynamics. Potential impacts on setting of Hillsea Lines Scheduled Monument. EH/PCFP: Desire to maintain continuity, and 'tell the story' of Hilsea Lines and Portsdown Hill defences.	The Local Planning Authority have a duty to preserve and enhance the historic environment. The sloping defences would be in keeping with the sloping lines of the Hillsea Lines . Flood risk to the Hillsea Line would decrease. Potential physical disturbance to archaeological / geoarchaeological remains (terrestrial, foreshore and intertidal). Potential indirect impacts through scour and change in hydrodynamics. Potential impacts on setting of Hillsea Lines Scheduled Monument. EH: Structure mirrors that of Hilsea Lines and may tie in with proposals to open up sections of the Lines as a museum EH: Improve access to the Lines EH: Revetment gives clear distinction between Hilsea Lines and defences EH/PCFP: Desire to maintain continuity, and 'tell the story' of Hilsea Lines and Portsdown Hill defences.	The Local Planning Authority have a duty to preserve and enhance the historic environment. The sloping defences would be in keeping with the sloping lines of the Hillsea Lines . Flood risk to the Hillsea Line would decrease. Potential physical disturbance to archaeological / geoarchaeological remains (terrestrial, foreshore and intertidal). Potential indirect impacts through scour and change in hydrodynamics. Potential impacts on setting of Hillsea Lines Scheduled Monument. EH: Structure mirrors that of Hilsea Lines and may tie in with proposals to open up sections of the Lines as a museum EH: Improve access to the Lines EH/PCFP: Desire to maintain continuity, and 'tell the story' of Hilsea Lines and Portsdown Hill defences.

Landscape	Deterioration to landscape character as defences fail. Regular flooding causing deterioration to landscape and change of character.	The primary defence structure would be vertical, which would match what is currently in place along the western section of the frontage. The replacement of the current sloping defences along the eastern end of the frontage to vertical defences would be out of character. Feedback from the Local Planning Authority is that a vertical structure would be less favoured over a sloping as there is a desire to keep this area open and in keeping with the Hillsea Lines Scheduled Monument.	The primary defence structure would be vertical, which would match what is currently in place along the western section of the frontage. The replacement of the current sloping defences along the eastern end of the frontage to vertical defences would be out of character. Feedback from the Local Planning Authority is that a vertical structure would be less favoured over a sloping as there is a desire to keep this area open and in keeping with the Hillsea Lines Scheduled Monument. A locally set-back secondary defence is generally perceived as having a minimal impact by the public as views and access are not lost.	The sloping primary defence is favoured by the Local Planning Authority as it keeps the frontage open and is sympathetic to the Hillsea Lines Scheduled Monument. In addition, feedback from the public indicates that the impacts of this change would be positive. The existing footpath run along the top of the new, higher defence. The overall impact would therefore be positive.	The sloping primary defence is favoured by the Local Planning Authority as it keeps the frontage open and is sympathetic to the Hillsea Lines Scheduled Monument. In addition, feedback from the public indicates that the impacts of this change would be positive. The existing footpath would run landward of the primary defence. A locally set-back secondary defence is generally perceived as having a minimal impact by the public as views and access are not lost. The overall impact would therefore be positive.
Designated sites	Deterioration of designated sites as defences fail and potentially litter foreshore. Following failure of defence, there is an increase risk of contaminants leaching into designated sites.	Option does not involve encroachment into designated habitats (Langstone Harbour SSSI, Solent Maritime SAC and Chichester and Langstone Harbour SPA). ESCP: There is the potential to use or improve the existing spit at the eastern end of the creek as a roosting site by removing access and changing levels	Option does not involve encroachment into designated habitats (Langstone Harbour SSSI, Solent Maritime SAC and Chichester and Langstone Harbour SPA). ESCP: There is the potential to use or improve the existing spit at the eastern end of the creek as a roosting site by removing access and changing levels	Option does not involve encroachment into designated habitats (Langstone Harbour SSSI, Solent Maritime SAC and Chichester and Langstone Harbour SPA). Scour would be reduced compared to a vertical structure. Some minor habitat enhancement could be incorporated into the face of the sloped defences. The overall impact is positive. ESCP: There is the potential to use or improve the existing spit at the eastern end of the creek as a roosting site by removing access and changing levels	Option does not involve encroachment into designated habitats (Langstone Harbour SSSI, Solent Maritime SAC and Chichester and Langstone Harbour SPA). Scour would be reduced compared to a vertical structure. Some minor habitat enhancement could be incorporated into the face of the sloped defences. The overall impact is positive. ESCP: There is the potential to use or improve the existing spit at the eastern end of the creek as a roosting site by removing access and changing levels
Soils	Contaminated land would remain on-site.	Construction would potentially involve the removal of contaminated land (frontage 2b) and the need to refill with imported material. The overall impact is neutral.	Construction would potentially involve the removal of contaminated land (frontage 2b) and the need to refill with imported material. The overall impact is neutral.	Construction would potentially involve the removal of contaminated land (frontage 2b) and the need to refill with imported material. The overall impact is neutral.	Construction would potentially involve the removal of contaminated land (frontage 2b) and the need to refill with imported material. The overall impact is neutral.
Water	Potential for release of contaminated contained within the ground due to failed defences reducing quality of nearshore waters.	During the construction there is the potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. The risk of significant release of contaminants and sediment during a failure of the defences will be significantly reduced.	During the construction there is the potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. The risk of significant release of contaminants and sediment during a failure of the defences will be significantly reduced.	During the construction there is the potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. The risk of significant release of contaminants and sediment during a failure of the defences will be significantly reduced.	During the construction there is the potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. The risk of significant release of contaminants and sediment during a failure of the defences will be significantly reduced.
Flora / Fauna	No Impact	Vertical primary defence would provide screening to birds on the open water from dogs/pedestrians. However, wall would also screen birds using adjacent woodland/field from the water. Potential impact to intertidal fauna if defence encroaches.	Set back defence would encroach on SINC in front of Hillsea Lines. Potential impacts on protected species (e.g. GCN, water voles, birds). Potential for direct impacts to intertidal area. However embankments to be grassed and sloped to allow use by birds to continue.	Raised crest embankment would encroach on SINC in front of Hillsea Lines. Potential impacts on protected species (e.g. GCN, water voles, birds). Potential for direct impacts to intertidal area. However embankments to be grassed and sloped to allow use by birds to continue. Some minor habitat enhancement could be incorporated into the face of the sloped defences. PCC: Potential loss of vegetation. NE: Potential to incorporate vegetation onto structure. EH: Desire to retain woodland.	Set back defence would encroach on SINC in front of Hillsea Lines. Potential impacts on protected species (e.g. GCN, water voles, birds). Potential for direct impacts to intertidal area. However embankments to be grassed and sloped to allow use by birds to continue. Some minor habitat enhancement could be incorporated into the face of the sloped defences. PCC: Potential loss of vegetation. NE: Potential to incorporate vegetation onto structure. EH: Desire to retain woodland.

Construction	No Impact	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Footprint of works localised compared to other options. Some offsite disposal of materials may be required. Steering Group: Mixed opinion whether continuous linear structure seen as an improvement to current mix of structure types ESCP: Need to improve access to site for plant.	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Some offsite disposal of materials may be required. Steering Group: Mixed opinion whether continuous linear structure seen as an improvement to current mix of structure types ESCP: Need to improve access to site for plant.	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Some offsite disposal of materials may be required. Structure would mirror that on other bank of the creek creating continuity. Steering Group: Mixed opinion whether continuous linear structure seen as an improvement to current mix of structure types. ESCP: Need to improve access to site for plant.	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Some offsite disposal of materials may be required. Structure would mirror that on other bank of the creek creating continuity Steering Group: Mixed opinion whether continuous linear structure seen as an improvement to current mix of structure types ESCP: Need to improve access to site for plant.
Social Impacts					
Way of Life	Loss of key recreation site and reduction in quality of key woodland site. Loss of visits to the city and reduction in tourism.	Flood risk fear significantly reduced. Hinterland protected and enhanced for use.	Flood risk fear significantly reduced.	Flood risk fear significantly reduced. Hinterland protected and enhanced for use.	Flood risk fear significantly reduced.
Public perception	Negative perception. Would be seen as nothing being done. 91% of the public who attended consultation events believe there is a need to reduce flood risk and 85% believe there is a need to improve flood defences.	Feedback from public consultation indicates this is not a preferred option. This option would reduce Ports Creek views and would disconnect the public from the channel Public feedback from consultation is that open space and views are important.	Feedback from public consultation indicates this is an accepted option. Public feedback is that open space and sea / coastal views are important. This option would encourage connection to the creek and would be aesthetically pleasing.	Feedback from public consultation indicates this is an accepted option. Public feedback is that open space and sea / coastal views are important. This option would encourage connection to the creek and would be aesthetically pleasing.	Feedback from public consultation indicates this is an accepted option. Public feedback is that open space and sea / coastal views are important. This option would encourage connection to the creek and would be aesthetically pleasing.
Recreation	Deterioration to Hillsea Lines open spaces and woodland areas due to increased flooding.	Overtopping/flooding landward of defence reduced. Recreation usage maintained. NE: Public interest in Improved footpath and access.	Overtopping/flooding landward of defence reduced. Recreation usage maintained. Footpath will become inundated for the set-back secondary flood defence option under extreme events. However, 77% of public who attended consultation events felt that this would not be a problem. NE: Public interest in Improved footpath and access.	Overtopping/flooding landward of defence reduced. Recreation usage maintained. NE: Public interest in Improved footpath and access.	Overtopping/flooding landward of defence reduced. Recreation usage maintained. Footpath will become inundated for the set-back secondary flood defence option under extreme events. However, 77% of public who attended consultation events felt that this would not be a problem. NE: Public interest in Improved footpath and access.
Health and wellbeing	Deterioration on playing fields due to increased flooding. Deterioration to cycle areas and loss of walking areas. Increases stress due to risk of property flooding.	The primary defence will consist of a vertical structure. There is a residual risk to the public from falls from height which will be greater than at present. Need to incorporate steps into the structure to allow access/egress	The primary defence will consist of a vertical structure. There is a residual risk to the public from falls from height although a handrail would be installed to reduce the risk from that experienced at present. This is a positive impact. Need to incorporate steps into the structure to allow access/egress.	The primary defence will consist of a sloping structure. There is a residual risk to the public from falls from height although the sloped structure reduces this risk in comparison to that experienced at present along the western section of frontage. This is a positive impact. Assessment of dual use foot and cycle path required. Concerns over safety of smooth finish concrete - users might slip down the revetment, and users may not be able to climb the structure and become trapped in the creek. Need to incorporate steps into the structure to allow access/egress.	The primary defence will consist of a sloping structure. There is a residual risk to the public from falls from height although the sloped structure reduces this risk in comparison to that experienced at present along the western section of the frontage. This is a positive impact. Assessment of dual use foot and cycle path required Concerns over safety of smooth finish concrete - users might slip down the revetment, and users may not be able to climb the structure and become trapped in the creek Need to incorporate steps into the structure to allow access/egress
		The risk of injury from overtopping will be reduced.	The risk of injury from overtopping will be reduced landward of the set back defence. The risk of injury from overtopping seaward of the set back defence remains unchanged.	The risk of injury from overtopping will be reduced.	The risk of injury from overtopping will be reduced landward of the set back defence. The risk of injury from overtopping seaward of the set back defence remains unchanged.

Community	Deterioration of visual character will have negative impact on community. Loss of community due to regular flooding and erosion over 100 years.	Flooding and erosion risk to community reduced. High walls will reduce feeling of coastal community.	Flooding and erosion risk to community reduced. Community will not feel disconnected due to high structures along coastline.	Flooding and erosion risk to community reduced. High embankment will not reduce feeling of coastal community due to footpath being constructed on crest and access remaining compared to vertical structures.	Flooding and erosion risk to community reduced. Community will not feel disconnected due to high structures along coastline.

Negative Impact
Neutral Impact
Positive Impact

Project Name	Southsea and North Portsea Island Frontages Outline Design		
Frontage	North Portsea Frontage 3		
Project Description	The current defences around North Portsea Island Flood Cell 4 are in poor condition and do not provide the required standard of protection identified within the		
Option	**Baseline**	**Option A**	**Option B**
Overview / Description	Do Nothing, hypothetical option, is not in line with Strategy recommendations.	Set-back defence (wall and embankment)	Fully set-back defence (wall and embankment)
Technical Issues	Would need to pull away from Shoreline Management Plan and Approved Strategy.	Services run along the seaward side of Eastern Road and across the land into Kendalls Wharf. The road entrance to Kendalls Wharf will need to be raised over any set-back defences to maintain access to the wharf or a flood gate installed in the defence.	Services run along the seaward side of Eastern Road and across the land into Kendalls Wharf. The road entrance to Kendalls Wharf will need to be raised over any set-back defences to maintain access to the wharf or a flood gate installed in the defence.
Assumptions and Uncertainties	-	No significant assumptions or uncertainties.	No significant assumptions or uncertainties.
Approaches to Adaption	-	These options are based upon construction of the defence crest level to full height in year 0. Following selection of the preferred option and further development consideration will be given to building to a lower height and	
Costs	Nil	1300 £k	1340 £k
Category	**Description and quantification of impacts**	**Description and quantification of impacts**	**Description and quantification of impacts**
Economic Impacts			
Properties	Residential and commercial properties at risk of flooding under a 1 in 200yr event.	Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties for the next 100 years.	Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties for the next 100 years.
Emergency Costs	Emergency costs will increase over the years due to the low SoP against flooding. Flood response and clear-up will increase.	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.
Infrastructure	Infrastructure will be at risk due to low SoP. Access to businesses and associated car parks will be limited in extreme events due to road being flooded. Closure and disruption due to flooding will affect emergency services access across Flood Cell 4.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.
Transport	Cycle and pedestrian access will be flooded more frequently. Key links in and out of city will be blocked by flooding. Eastern road will become flooded more frequently and cause more road closures cutting of vital links in and out of city.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links kept open within the 100 year life of scheme.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links kept open within the 100 year life of scheme.

Agriculture	NA	NA.	NA.
Indirect effect on businesses	Businesses within Flood Cell 4 will be at risk of flooding and damage due to flood waters, including Kendalls Wharf. Potential for access to businesses to be cut off.	Flood risk reduced to local businesses during 100 year life of scheme. Kendalls Wharf will still be at risk of flooding.	Flood risk reduced to local businesses during 100 year life of scheme. Kendalls Wharf will still be at risk of flooding.
Environmental Impacts			
Historic Environment	No impact	No change.	No change.
Landscape	Deterioration to landscape character as defences fail. Regular flooding causing deterioration to landscape and change of character.	The defence structures would be an addition to what is already along this frontage, however the day to day operations at Kendalls Wharf will not be affected. Therefore, the option is likely to be accepted by Kendalls Wharf.	The defence structures would be an addition to what is already along this frontage, however the day to day operations at Kendalls Wharf will not be affected. Therefore, the option is likely to be accepted by Kendalls Wharf.
Designated sites	No impact	No change.	No change.
Soils	No Impact	Construction would potentially involve the removal of contaminated land being a former landfill site and the need to refill with imported material. The overall impact is neutral.	Construction would potentially involve the removal of contaminated land being a former landfill site and the need to refill with imported material. The overall impact is neutral.
Water	Aggregates from Kendalls Wharf lost seaward during extreme events.	Kendalls Wharf will still flood, although properties to the rear of the defences will be protected.	Kendalls Wharf will still flood, although properties to the rear of the defences will be protected.
Flora / Fauna	No Impact	NE: Grassed area used as roost site. Location of embankment should be carefully considered.	NE: Grassed area used as roost site. Location of embankment should be carefully considered.
Construction	NA	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Some offsite disposal of materials may be required. NR: Earth bank could include hard elements (concrete cap or similar) to prevent accidental removal in the future NR/PCC: Road raising preferred as gates require operation and may be damaged by HGV impacts. SW: "softer" engineering option of embankment preferred to walls.	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Some offsite disposal of materials may be required. NR: Earth bank could include hard elements (concrete cap or similar) to prevent accidental removal in the future NR/PCC: Road raising preferred as gates require operation and may be damaged by HGV impacts. SW: "softer" engineering option of embankment preferred to walls.
Social Impacts			
Way of Life	Loss of key recreation site and access route to and from the City and Mainland. Loss of visits to the city and reduction in tourism.	Flood risk fear significantly reduced. Hinterland protected and enhanced for use.	Flood risk fear significantly reduced. Hinterland protected and enhanced for use.
Public perception	Negative perception. Would be seen as nothing being done. 91% of the public who attended consultation events believe there is a need to reduce flood risk and 85% believe there is a need to improve flood defences.	Feedback from public consultation indicates that this is a preferred option.	Feedback from public consultation indicates that this is a preferred option.

Recreation	No impact	ESCP/NE: Sports pitches currently positioned to rear of defences. Embankment should be positioned accordingly	ESCP/NE: Sports pitches currently positioned to rear of defences. Embankment should be positioned accordingly
Health and wellbeing	Deterioration to cycle areas and loss of walking areas. Increases stress due to risk of property flooding.	The risk of injury from overtopping will be reduced landward of the set back defence. The risk of injury from overtopping seaward of the set back defence remains unchanged.	The risk of injury from overtopping will be reduced landward of the set back defence. The risk of injury from overtopping seaward of the set back defence remains unchanged.
Community	Deterioration of visual character will have negative impact on community. Loss of community due to regular flooding and erosion over 100 years.	Flood risk reduced along Eastern Road so access for the public improved.	Flood risk reduced along Eastern Road so access for the public improved.

Negative Impact
Neutral Impact
Positive Impact

Project Name	Southsea and North Portsea Island Frontages Outline Design				
Frontage	North Portsea Frontage 4				
Project Description	The current defences around North Portsea Island Flood Cell 4 are in poor condition and do not provide the required standard of protection identified within the Portsea Island Coastal Strategy Study.				
Option	**Baseline**	**Option A**	**Option B**	**Option C**	**Option D**
Overview / Description	Do Nothing, hypothetical option, is not in line with Strategy recommendations.	Vertical Primary Defence	Vertical Primary Defence with Set-Back Defence	Sloping Primary Defence	Sloping Primary Defence with Set-Back Defence
Technical Issues	Would need to pull away from Shoreline Management Plan and Approved Strategy.	Services are present directly behind the existing defences along the Eastern Road, across the fields and across defences offshore.	Services are present directly behind the existing defences along the Eastern Road, across the fields and across defences offshore. The land between the Eastern road and existing defence is very narrow in places and therefore limits the amount of options available for a secondary set-back defence.	Services are present directly behind the existing defences along the Eastern Road, across the fields and across defences offshore.	Services are present directly behind the existing defences along the Eastern Road, across the fields and across defences offshore. The land between the Eastern road and existing defence is very narrow in places and therefore limits the amount of options available for a secondary defence.
Assumptions and Uncertainties	-	It is assumed that the land behind the existing defence is contaminated and that any excavation of material will be disposed of off site. Any filling that is required will be achieved via import of material. Should the existing ground prove suitable for reuse then it will reduce overall construction costs. It is assumed at this stage that the wall to the north of Great Salterns Quay is sufficiently structurally robust for a concrete encasement option to be viable. This will be confirmed by on-site survey. It is assumed that the existing seawall to the south of Great Salterns Quay will be replaced by a new structure, rather than a concrete encasement, due to its poor condition. This will be confirmed by site survey,	It is assumed that the land behind the existing defence is contaminated and that any excavation of material will be disposed of off site. Any filling that is required will be achieved via import of material. Should the existing ground prove suitable for reuse then it will reduce overall construction costs. The set-back defence type has been chosen as an earth fill embankment where space allows otherwise a reinforced concrete floodwall is selected as an alternative. It is assumed at this stage that the wall to the north of Great Salterns Quay is sufficiently structurally robust for a concrete encasement option to be viable. This will be confirmed by on-site survey. It is assumed that the existing seawall to the south of Great Salterns Quay will be replaced by a new structure, rather than a concrete encasement, due to its poor condition. This will be confirmed by site survey,	It is assumed that the land behind the existing defence is contaminated and that any excavation of material will be disposed of off site. Any filling that is required will be achieved via import of material. Should the existing ground prove suitable for reuse then it will reduce overall construction costs.	It is assumed that the land behind the existing defence is contaminated and that any excavation of material will be disposed of off site. Any filling that is required will be achieved via import of material. Should the existing ground prove suitable for reuse then it will reduce overall construction costs. The set-back defence type has been chosen as an earth fill embankment where space allows otherwise a reinforced concrete floodwall is selected as an alternative.
Approaches to Adaption	-	These options are based upon construction of the defence crest level to full height in year 0. Following selection of the preferred option and further development consideration will be given to building to a lower height and raising the defence height in a staged approach, say in year 50, to stay in line with climate change.			
Costs	Nil	13100 to 14800 £k	15300 to 15800 £k	18500 to 19500 £k	19400 to 20200 £k
Category	**Description and quantification of impacts**	**Description and quantification of impacts**	**Description and quantification of impacts**	**Description and quantification of impacts**	**Description and quantification of impacts**
Economic Impacts					
Properties	Residential and commercial properties at risk of flooding under a 1 in 200yr event.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties for the next 100 years.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties for the next 100 years.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties for the next 100 years.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties for the next 100 years.

Emergency Costs	Emergency costs will increase over the years due to the low SoP against flooding. Flood response and clear-up will increase.	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding. NR: By not using set back secondary defence, post event footpath maintenance and clean up costs avoided	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding. NR: By not using set back secondary defence, post event footpath maintenance and clean up costs avoided	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.
Infrastructure	Infrastructure will be at risk due to low SoP. Access to businesses and associated car parks will be limited in extreme events due to road being flooded. Closure and disruption due to flooding will affect emergency services access across Flood Cell 4.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Infrastructure will be protected as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.
Transport	Cycle and pedestrian access will be flooded more frequently. Key links in and out of city will be blocked by flooding. Eastern road will become flooded more frequently and cause more road closures cutting of vital links in and out of city.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links including Eastern Road kept open within the 100 year life of scheme. Road closures prevented.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links including Eastern Road kept open within the 100 year life of scheme. Road closures prevented.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links including Eastern Road kept open within the 100 year life of scheme. Road closures prevented.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme. Key transport links including Eastern Road kept open within the 100 year life of scheme. Road closures prevented.
Agriculture	NA	NA.	NA.	NA.	NA.
Indirect effect on businesses	Businesses within Flood Cell 4 will be at risk of flooding and damage due to flood waters. Potential for access to businesses to be cut off.	Flood risk reduced to local businesses during 100 year life of scheme.	Flood risk reduced to local businesses during 100 year life of scheme.	Flood risk reduced to local businesses during 100 year life of scheme.	Flood risk reduced to local businesses during 100 year life of scheme.
Environmental Impacts					
Historic Environment	Flooding to a listed building and land along the frontage.	The Local Planning Authority has a duty to preserve and enhance the historic environment. The structure passes a listed building located between Eastern Road and the defences. The vertical defences would be in keeping with the area as they are similar in form to the existing defences. Flood risk to the listed building would decrease.	The Local Planning Authority has a duty to preserve and enhance the historic environment. The structure passes a listed building located between Eastern Road and the defences. The vertical defences would be in keeping with the area as they are similar in form to the existing defences. Flood risk to the listed building would decrease.	The Local Planning Authority has a duty to preserve and enhance the historic environment. The structure passes a listed building located between Eastern Road and the defences. The sloping defences would not be similar in form to the existing vertical defences but this would not be a detriment to the area. Flood risk to the listed building would decrease.	The Local Planning Authority has a duty to preserve and enhance the historic environment. The structure passes a listed building located between Eastern Road and the defences. The sloping defences would not be similar in form to the existing vertical defences but this would not be a detriment to the area. Flood risk to the listed building would decrease.
Landscape	Deterioration to landscape character as defences fail. Regular flooding causing deterioration to landscape and change of character.	The primary defence structure would be similar to the current structure so the impact of this would be minimal. However the higher defence height reducing seaward views from the footpath is generally perceived as a negative impact by the public and local sailing club. As deterioration of the frontage will not occur at the same rate as in the do-nothing option this option has, on balance, a neutral impact. PCC: Wall raising is not a preferred option PCC/PCFP/EH/NE: Support for masonry walls based upon aesthetics. PCC/PCFP: There are opportunities to raise the footpath level behind the wall	The primary defence structure would be similar to the current structure so the impact of this would be minimal. A locally set-back secondary defence is generally perceived as having a minimal impact by the public, although this would block views from the sailing club along the frontage and they have expressed concerns over this. As deterioration of the frontage will not occur at the same rate as in the do-nothing option this option has, on balance, a neutral impact. PCC: Wall raising is not a preferred option. PCC/PCFP/EH/NE: Support for masonry walls based upon aesthetics	The primary defence structure would be sloped rather than vertical like the current structure. Feedback from the public indicates that the impact of this change would be positive. The existing footpath could be run along the rear of the new, higher defence. However the higher defence height reducing seaward views from the footpath is generally perceived as a negative impact by the public and local sailing club. As deterioration of the frontage will not occur at the same rate as in the do-nothing option this option has, on balance, a neutral impact.	The primary defence structure would be sloped rather than vertical like the current structure. A locally set-back secondary defence is generally perceived as having a minimal impact by the public, although this would block views from the sailing club along the frontage and they have expressed concerns over this. As deterioration of the frontage will not occur at the same rate as in the do-nothing option this option has, on balance, a neutral impact.

Designated sites	Deterioration of designated sites as defences fail and potentially litter foreshore. Following failure of defence, there is an increase risk of contaminants leaching into designated sites.	The encasement option would involve minor encroachment into environmentally designated areas (SSSI, SPA, SAC and Ramsar). However, this can be mitigated by the removal of defunct apron structures and Saltern's Quay, from within the SPA. Local retreat along southern sections of the frontage would provide an additional environmental gain. NE: Salterns Quay could be accepted as a potential habitat creation to provide mitigation for encroachment losses. NE: Preferred option under habitat regulations. An IROPI case would not be required where mitigation covers habitat losses within the designated sites. Vertical structure are in keeping with the existing structures and can reduce access to the foreshore / screen the flora and fauna from dogs, which is considered a benefit.	The encasement option would involve minor encroachment into environmentally designated areas (SSSI, SPA, SAC and Ramsar). However, this can be mitigated by the removal of defunct apron structures and Saltern's Quay, from within the SPA. Local retreat along southern sections of the frontage would provide an additional environmental gain. NE: Salterns Quay could be accepted as a potential habitat creation to provide mitigation for encroachment losses. NE: Preferred option under habitat regulations. An IROPI case would not be required where mitigation covers habitat losses within the designated sites. Vertical structure are in keeping with the existing structures and can reduce access to the foreshore / screen the flora and fauna from dogs, which is considered a benefit.	This option would involve encroachment into environmentally designated areas (SSSI, SPA, SAC and Ramsar). This could be compensated by the local retreat along southern sections of the frontage, however this would require an IROPI case to be made to demonstarte there is no alternative viable option that would prevent this need for compensation. This IROPI case would not be supported, as the vertical structure would not require compensation due to the identified mitigation. Some minor habitat enhancement could be incorporated into the face of the sloped defences. There is significant risk that this could introduce geomorphological changes to the foreshore due to the significant realignment of the defences. A sloped structure could also improve access to the foreshore, resulting in access and disturbance issues. NE: Salterns Quay could be considered as a potential area for habitat creation and provide mitigation for any proposed realignment along this frontage, but would not provide the quantity of mitigation required.	This option would involve encroachment into environmentally designated areas (SSSI, SPA, SAC and Ramsar). This could be compensated by the local retreat along southern sections of the frontage, however this would require an IROPI case to be made to demonstarte there is no alternative viable option that would prevent this need for compensation. This IROPI case would not be supported, as the vertical structure would not require compensation due to the identified mitigation. Some minor habitat enhancement could be incorporated into the face of the sloped defences. There is significant risk that this could introduce geomorphological changes to the foreshore due to the significant realignment of the defences. A sloped structure could also improve access to the foreshore, resulting in access and disturbance issues. NE: Salterns Quay could be considered as a potential area for habitat creation and provide mitigation for any proposed realignment along this frontage, but would not provide the quantity of mitigation required.
Soils	Contaminated land would remain on-site.	Construction would potentially involve the removal of contaminated land (frontage 4b) and the need to refill with imported material. The overall impact is neutral.	Construction would potentially involve the removal of contaminated land (frontage 4b) and the need to refill with imported material. The overall impact is neutral.	Construction would potentially involve the removal of contaminated land (frontage 4b) and the need to refill with imported material. The overall impact is neutral.	Construction would potentially involve the removal of contaminated land (frontage 4b) and the need to refill with imported material. The overall impact is neutral.
Water	Potential for release of contaminated contained within the ground due to failed defences reducing quality of nearshore waters.	During the construction there is the potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. The risk of significant release of contaminants and sediment during a failure of the defences will be significantly reduced.	During the construction there is the potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. The risk of significant release of contaminants and sediment during a failure of the defences will be significantly reduced.	During the construction there is the potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. The risk of significant release of contaminants and sediment during a failure of the defences will be significantly reduced.	During the construction there is the potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. The risk of significant release of contaminants and sediment during a failure of the defences will be significantly reduced.
Flora / Fauna	No Impact	Vertical primary defence would provide screening to birds on the open water from dogs/pedestrians. However, wall would also screen birds using adjacent woodland/field from the water. There is potential for localised disturbance of invertebrates present in the intertidal. Increasing the length of slipways to compensate for raising crest level may require compensatory habitat Reduced encroachment into harbour and least impact on habitat	Wall could screen birds using adjacent parkland/playing fields from open water. Creating an embankment on adjacent grassland could potentially impact on land being used by birds for nesting/resting/feeding. However embankments to be grassed and sloped to allow use by birds to continue. There is potential for localised disturbance of invertebrates present in the intertidal.	Some minor habitat enhancement could be incorporated into the face of the sloped defences. Creating an embankment on adjacent grassland could potentially impact on land being used by birds for nesting/resting/feeding. However embankments to be grassed and sloped to allow use by birds to continue. There is potential for localised disturbance of invertebrates present in the intertidal. ESCP: Potential impact on habitat as revetment could make access to the foreshore easier for dogs and public, thus disturbing feeding birds. Screening could be incorporated to reduce this impact	Some minor habitat enhancement could be incorporated into the face of the sloped defences. Creating an embankment on adjacent grassland could potentially impact on land being used by birds for nesting/resting/feeding. However embankments to be grassed and sloped to allow use by birds to continue. There is potential for localised disturbance of invertebrates present in the intertidal. ESCP: Potential impact on habitat as revetment could make access to the foreshore easier for dogs and public, thus disturbing feeding birds. Screening could be incorporated to reduce this impact

Construction	No Impact	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Footprint of works localised compared to other options.	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Some offside disposal of materials may be required.	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Some offside disposal of materials may be required.	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Some offside disposal of materials may be required.
Social Impacts					
Way of Life	Loss of key recreation site and access route to and from the City and Mainland. Loss of visits to the city and reduction in tourism.	Flood risk fear significantly reduced. Hinterland protected and enhanced for use.	Flood risk fear significantly reduced.	Flood risk fear significantly reduced. Hinterland protected and enhanced for use.	Flood risk fear significantly reduced.
Public perception	Negative perception. Would be seen as nothing being done. 91% of the public who attended consultation events believe there is a need to reduce flood risk and 85% believe there is a need to improve flood defences.	Feedback from public consultation indicates this is not a preferred option. This option would reduce Langstone Harbour views and would disconnect the public from the harbour. Public feedback from consultation is that open space and views are important. Steering group has given their support for this option. PCC: In keeping with current structures.	Feedback from public consultation indicates this is an accepted option. Public feedback is that open space and sea / coastal views are important. This option would encourage connection to the harbour and would be aesthetically pleasing.	Feedback from public consultation indicates this is an accepted option. Public feedback is that open space and sea / coastal views are important. This option would encourage connection to the harbour and would be aesthetically pleasing.	Feedback from public consultation indicates this is an accepted option. Public feedback is that open space and sea / coastal views are important. This option would encourage connection to the harbour and would be aesthetically pleasing.
Recreation	Deterioration on playing fields due to increased flooding.	Overtopping/flooding landward of defence reduced. Recreation usage maintained, although areas to the rear of the defences are rarely used due to their proximity to Eastern Road. ESCP: Slipways need to be considered in design as may steepen or higher flood gates required LHB: Opportunity to increase slipway access and removalof boats	Overtopping/flooding landward of defence reduced. Recreation usage maintained, although areas to the rear of the defences are rarely used due to their proximity to Eastern Road. Footpath will become inundated for the locally set-back secondary flood defence option under extreme events. However, 77% of public who attended consultation events felt that this would not be a problem. ESCP: Slipways need to be considered in design as may steepen or higher flood gates required LHB: Opportunity to increase slipway access and removalof boats	Overtopping/flooding landward of defence reduced. Recreation usage maintained, although areas to the rear of the defences are rarely used due to their proximity to Eastern Road. ESCP: Slipways need to be considered in design as may steepen or higher flood gates required LHB: Opportunity to increase slipway access and removalof boats	Overtopping/flooding landward of defence reduced. Recreation usage maintained, although areas to the rear of the defences are rarely used due to their proximity to Eastern Road. Footpath will become inundated for the locally set-back secondary flood defence option under extreme events. However, 77% of public who attended consultation events felt that this would not be a problem. ESCP: Slipways need to be considered in design as may steepen or higher flood gates required LHB: Opportunity to increase slipway access and removalof boats
Health and wellbeing	Deterioration on playing fields due to increased flooding. Deterioration to cycle areas and loss of walking areas. Increases stress due to risk of property flooding.	The primary defence will consist of a higher vertical structure. There is a residual risk to the public from falls from height.	The primary defence will consist of a vertical structure. There is a residual risk to the public from falls from height although a handrail would be installed to reduce the risk from that experienced at present. This is a positive impact.	The primary defence will consist of a sloping structure. There is a residual risk to the public from falls from height although the sloped structure reduces this risk in comparison to that experienced at present. This is a positive impact.	The primary defence will consist of a sloping structure. There is a residual risk to the public from falls from height although the sloped structure reduces this risk in comparison to that experienced at present. This is a positive impact.
		The risk of injury from overtopping will be reduced.	The risk of injury from overtopping will be reduced landward of the set back defence. The risk of injury from overtopping seaward of the set back defence remains unchanged.	The risk of injury from overtopping will be reduced.	The risk of injury from overtopping will be reduced landward of the set back defence. The risk of injury from overtopping seaward of the set back defence remains unchanged.
Community	Deterioration of visual character will have negative impact on community. Loss of community due to regular flooding and erosion over 100 years.	Sailing club and activity centre protected from flooding to a 1 in 200 year standard of defence. ESCP: Tudor Sailing Club and Watersports Centre concerns to be taken into consideration	Sailing club and activity centre protected from flooding to a 1 in 200 year standard of defence by the locally set back secondary defence. ESCP: Tudor Sailing Club and Watersports Centre concerns to be taken into consideration	Sailing club and activity centre protected from flooding to a 1 in 200 year standard of defence. ESCP: Tudor Sailing Club and Watersports Centre concerns to be taken into consideration	Sailing club and activity centre protected from flooding to a 1 in 200 year standard of defence by the locally set back secondary defence. ESCP: Tudor Sailing Club and Watersports Centre concerns to be taken into consideration

Negative Impact
Neutral Impact
Positive Impact

Project Name	Southsea and North Portsea Island Frontages Outline Design		
Frontage	North Portsea Frontage 5bc		
Project Description	The current defences around North Portsea Island Flood Cell 4 are in poor condition and do not provide the required standard of protection identified within the		
Option	Baseline	Option A	Option C
Overview / Description	Do Nothing, hypothetical option, is not in line with Strategy recommendations.	Vertical Primary Defence	Sloping Primary Defence
Technical Issues	Would need to pull away from Shoreline Management Plan and Approved Strategy.	The existing rock revetment along part of the frontage will be removed as part of the works and replaced.	The existing rock revetment along part of the frontage will be removed and the material reused as part of the works.
Assumptions and Uncertainties	It is understood that Milton Common is formed from land fill and that the ground is therefore contaminated. This is then protected by a chalk bund that runs along the coastal edge and it is this that is becoming exposed from erosion. Further details of the potential contamination and dimensions of the chalk bund are unknown at this stage.	It is understood that Milton Common is formed from land fill and that the ground is therefore contaminated. This is then protected by a chalk bund that runs along the coastal edge and it is this that is becoming exposed from erosion. Overtopping can be tolerated at Milton Common as land levels mean that property and roads are not at risk from flooding from an event up to 1 in 200 years., although areas of the common are.. The risk along this frontage is therefore from coastal erosion which this option provides a solution to.	It is understood that Milton Common is formed from land fill and that the ground is therefore contaminated. This is then protected by a chalk bund that runs along the coastal edge and it is this that is becoming exposed from erosion. Overtopping can be tolerated at Milton Common as land levels mean that property and roads are not at risk from flooding from an event up to 1 in 200 years., although areas of the common are.. The risk along this frontage is therefore from coastal erosion which this option provides a solution to.
Approaches to Adaption		These options are based upon construction of the defence crest level to full height in year 0. Following selection of the preferred option and further development consideration will be given to building to a lower height and	
Costs	Nil	3800 to 4300 £k	2500 to 4700 £k
Category	Description and quantification of impacts	Description and quantification of impacts	Description and quantification of impacts
Economic Impacts			
Properties	Residential and commercial properties at risk of flooding under a 1 in 200yr event.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties for the next 100 years.	Delay to erosion by 100 years. Standard of defence against flood raised to a 1 in 200 year event for the next 100 years. No loss of properties with the 100 year life of scheme.
Emergency Costs	Emergency costs will increase over the years due to the low SoP against flooding. Flood response and clear-up will increase.	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.	Emergency costs will reduce significantly as the defences will have a 100 year life and provide a 1 in 200 year SoP against flooding.
Infrastructure	Limited infrastructure will be affected as the higher ground levels to the rear of the common will restrict flood waters. The coastal path along the common will eventually be lost through erosion.	Milton Common will be protected from erosion for the next 100 years.	Milton Common will be protected from erosion for the next 100 years.
Transport	Cycle and pedestrian access will be flooded more frequently and the coastal path along the common will eventually be lost through erosion.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years.
Agriculture	NA	NA.	NA.
Indirect effect on businesses	None	No change	No Change.
Environmental Impacts			
Historic Environment	None	EH: Ensure unclassified archaeological on foreshore is protected / recorded as necessary.	EH: Ensure unclassified archaeological on foreshore is protected / recorded as necessary.
Landscape	Deterioration to landscape character as defences fail. Regular flooding causing deterioration to landscape and change of character.	The primary defence structure would be different to the current rock structure that exists along this frontage. However, this would not significantly change the character of the area and is in keeping with seawalls to the south of the frontage.	The primary defence structure would be similar to the temporary rock revetment structure that covers most of the frontage so the impact of this would be minimal. NE: Support for informal rock structure

Designated sites	Deterioration of designated sites as defences fail and potentially litter foreshore. Following failure of defence, there is an increase risk of contaminants leaching into designated sites.	If the toe of the new structure is landward of the existing revetment this option would not encroach into environmentally designated areas (SSSI, SAC, SPA, Ramsar). ESCP: Milton Common is a Local Nature Reserve so landward development could have an impact on this locally important site.	This option would not encroach into environmentally designated areas (SSSI, SAC, SPA, Ramsar). Some minor habitat enhancement could be incorporated into the face of the sloped defences. The overall impact is positive. ESCP: Milton Common is a Local Nature Reserve so landward development could have an impact on this locally important site.
Soils	Contaminated land would be dispersed into the harbour due to coastal erosion.	Construction would protect the currently eroding area of potentially contaminated ground to the rear.	Construction would protect the currently eroding area of potentially contaminated ground to the rear.
Water	Potential for release of contaminated contained within the ground due to failed defences reducing quality of nearshore waters.	Potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. However, coastline would be protected from erosion.	Potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. However, coastline would be protected from erosion.
Flora / Fauna	Loss of areas of the common due to erosion, potentially including the three ponds.	The common would be protected from erosion. There is potential for localised disturbance of invertebrates present in the intertidal zone.	Some minor habitat enhancement could be incorporated into the face of the sloped defences. The common would be protected from erosion. There is potential for localised disturbance of invertebrates present in the intertidal zone. Any planting will be carefully considered as seeds will spread throughout protected harbour.
Construction	No Impact	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. RHDHV/PCFP: Consider incorporating steps or using gabions in construction	Potential exposure of construction workers/site users to contaminated soil or water, during construction and during operation. Steering Group support for this option NE: Will support if structure is within existing footprint SW: Waste water services currently run close to edge of Milton Common
Social Impacts			
Way of Life	Loss of key recreation site. Loss of visits to the city and reduction in tourism.	Flood risk fear significantly reduced. Further erosion of the coastal footpath will be halted.	Flood risk fear significantly reduced. Further erosion of the coastal footpath will be halted.
Public perception	Negative perception. Would be seen as nothing being done. 91% of the public who attended consultation events believe there is a need to reduce flood risk and 85% believe there is a need to improve flood defences.	Feedback from public consultation indicates this is a preferred option.	Feedback from public consultation indicates this is a preferred option.
Recreation	Deterioration to common due to erosion.	The works would protect the coastal footpath from further erosion. This is a well used and liked route for the public. PCC: The is an opportunity to widenthe footpath at southern end.	The works would protect the coastal footpath from further erosion. This is a well used and liked route for the public. PCC: The is an opportunity to widenthe footpath at southern end.

Health and wellbeing	Deterioration of common due to erosion. Deterioration to cycle areas and loss of walking areas. Increases stress due to risk of property flooding.	The primary defence will consist of a vertical structure. There is a residual risk to the public from falls from height, although this would improve the currently eroding bank in places. This is a positive impact.	The primary defence will consist of a sloping structure. There is a residual risk to the public from falls from height although the sloped structure reduces this risk in comparison to that experienced at present. This is a positive impact. Potential H&S risks with public climbing over rock structures
Community	Deterioration of visual character will have negative impact on community. Loss of community due to regular flooding and erosion over 100 years.	Milton Common is protected from erosion.	Milton Common is protected from erosion.

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Negative Impact
Neutral Impact
Positive Impact

Project Name	Southsea and North Portsea Island Frontages Outline Design	
Frontage	North Portsea Frontage Tidal Barrier	
Project Description	The current defences around North Portsea Island Flood Cell 4 are in poor condition and do not provide the	
Option	**Baseline**	**Option E**
Overview / Description	Do Nothing, hypothetical option, is not in line with Strategy recommendations.	Tidal Barrier at M275 road bridge and A2030 road bridge. Tidal barrier would be operated during extreme events. Existing seawalls between barriers would be upgraded as they will be required to protect coastline from erosion on a day to day basis.
Technical Issues	Would need to pull away from Shoreline Management Plan and Approved Strategy.	The barrier would require regular maintenance. Failure of the barrier during operation could result in flooding, it is not a passive system.
Assumptions and Uncertainties	-	Existing seawalls between barriers would be upgraded as they will be required to protect coastline from erosion on a day to day basis. We have assumed a 20m barrier width at this stage. Current bridge openings are greater width, although it may be possible to further reduce the width.
Approaches to Adaption	-	These options are based upon construction of the defences in year 0.
Costs	Nil	45,000 £k + cost of enhancing existing erosion protection defences between the barriers.
Category	**Description and quantification of impacts**	**Description and quantification of impacts**
Economic Impacts		
Properties	Residential and commercial properties at risk of flooding under a 1 in 200yr event.	Delay to erosion by 100 years. Standard of defence against flooding raised to a 1 in 200 year event for the next 100 years when gate is in operation. No loss of properties with the 100 year life of scheme.
Emergency Costs	Emergency costs will increase over the years due to the low SoP against flooding	Emergency costs will reduce significantly as the defences will have a 100 year life.
Infrastructure	Infrastructure will not be protected due to low SoP	Impact on traffic and access onto Portsea Island along Bridge during construction. Infrastructure will be protected on the island following completion of the scheme.
Transport	Cycle and pedestrian access will be flooded more frequently. Key links in and out of city will be blocked by flooding. Eastern road will become flooded more frequently and cause more road closures cutting of vital links in and out of city.	Cycle and pedestrian access will be improved along the length of the frontage for the next 100 years. Local roads protected within the 100 year life of scheme.
Agriculture	NA	NA.
Indirect effect on businesses	Businesses within Flood Cell 4 will be at risk of flooding and damage due to flood waters. Potential for access to businesses to be cut off.	Flood risk reduced to local businesses during 100 year life of scheme.
Environmental Impacts		
Historic Environment	Flooding to imported areas such as Hillsea Lines and listed buildings.	Bastions and surrounding heritage aspects would be protected from flooding to a 1:200yr SoP for the next 100 years.

Landscape	Deterioration to landscape character as defences fail. Regular flooding causing deterioration to landscape and change of character.	The primary defence structure between the gates would be sloped rather than vertical like many of the current structures. Feedback from the public indicates that the impact of this change would be positive. The sloping primary defence structure would create a more uniform defence along this frontage and step away from the current adhoc situation.
Designated sites	Deterioration of designated sites as defences fail and potentially litter foreshore. Following failure of defence, there is an increase risk of contaminants leaching into designated sites.	Option would involve encroachment into environmentally designated areas. However, this would be compensated by the local retreat along Frontage 4 and 1. The overall impact is neutral. Some minor habitat enhancement could be incorporated into the face of the sloped defences. The overall impact is positive. Tidal Barrier would also cause loss of intertidal habitat.
Soils	Contaminated land would remain on-site.	Construction would potentially involve the removal of contaminated land (frontage 1a) and the need to refill with imported material. The overall impact is neutral.
Water	Potential for release of contaminated contained within the ground due to failed defences reducing quality of nearshore waters.	Potential for the leaching of contaminants directly into sea. Potential to temporally increase suspended sediment load as a consequence of mobilised sediment on foreshore. However the scheme will halt erosion for the next 100 years.
Flora / Fauna	-	There is potential for localised disturbance of invertebrates present in the intertidal. There would be no screening to birds on the open water from dogs/pedestrians. Potential for direct impacts to intertidal area.
Social Impacts		
Way of Life	Loss of key recreation site and access route to and from the City and Mainland. Loss of visits to the city and reduction in tourism.	Flood risk fear significantly reduced.
Public perception	Negative perception. Would be seen as nothing being done. 91% of the public who attended consultation events believe there is a need to reduce flood risk and 85% believe there is a need to improve flood defences.	Feedback from public consultation indicates this is not a preferred option.
Recreation	Deterioration on playing fields due to increased flooding.	Recreation areas would be protected from flooding.
Health and wellbeing	Deterioration on playing fields and amenity areas due to increased flooding. Deterioration to cycle areas and loss of walking areas. Increases stress due to risk of property flooding.	The primary defence will consist of a sloping structure. There is a residual risk to the public from falls from height although the sloped structure reduces this risk in comparison to that experienced at present. This is a positive impact. The risk of injury from overtopping will be reduced when the tidal barrier is in operation.
Community	Deterioration of visual character will have negative impact on community. Loss of community due to regular flooding and erosion over 100 years.	Flood risk reduced so community would remain largely at present.

Appendix C:

Outline Design Drawings for North Portsea Island CFERM Scheme

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DRAWING No. PB1042/1010

DO NOT SCALE

PROPOSED RAISED VERTICAL WALL CONSTRUCTED DIRECTLY IN FRONT OF EXISTING SEAWALL APPROX 785m LONG (SEE TYPICAL SECTION 1-5)

PROPOSED RAISED WALL CONSTRUCTED LANDWARD OF EXISTING REVETMENT TOE APPROX 180m LONG (SEE TYPICAL SECTION 1-5)

EXTENT OF FRONTAGE 1

PROPOSED RAISED VERTICAL WALL CONSTRUCTED DIRECTLY IN FRONT OF EXISTING SEAWALL APPROX 285m LONG (SEE TYPICAL SECTIONS 1-2 & 1-3)

PROPOSED RAISED VERTICAL WALL APPROX 1850m LONG

PROPOSED RAISED VERTICAL WALL CONSTRUCTED LANDWARD OF EXISTING SEAWALL APPROX 340m LONG (SEE TYPICAL SECTION 1-1)

PROPOSED RAISED VERTICAL WALL CONSTRUCTED DIRECTLY IN FRONT OF EXISTING SEAWALL APPROX 265m LONG (SEE TYPICAL SECTION 1-2)

EXTENT OF FRONTAGE 1

1.1 1015

1.2 1015

1.3 3100

1.4 1015

1.5 1015

NOTES

50m 0 50 100 150m

SCALE IN METRES
1:2500

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APP
D1	30.06.14	FOR COMMENT	AIK	TG	APL

REVISIONS

CLIENT/PARTNERSHIP

Portsmouth City Council

Environment Agency

PROJECT

SOUTHSEA AND NORTH PORTSEA ISLAND FRONTAGES OUTLINE DESIGN

TITLE

NORTH PORTSEA ISLAND FRONTAGE 1 GENERAL ARRANGEMENT

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Royal HaskoningDHV
Enhancing Society Together

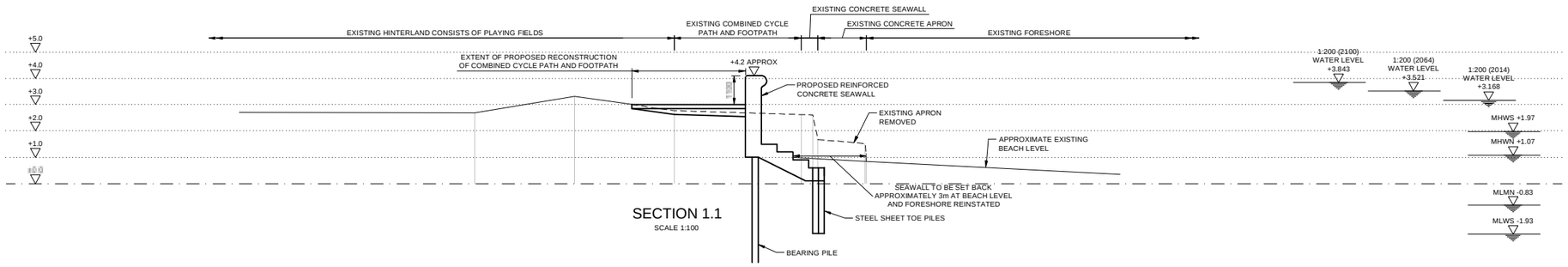
DRAWN	CHECKED	APPROVED
A.I.K		
DATE: Jun. 2014	SCALE AT A1: 1:2500	REF.: PB1042-1010.dwg

DRAWING No. PB1042/1010

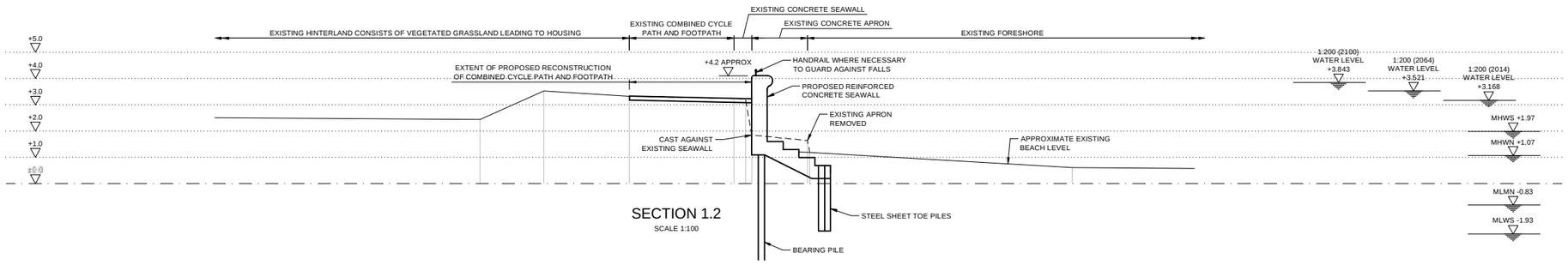
REVISION D1

DRAWING No. PB1042/1015

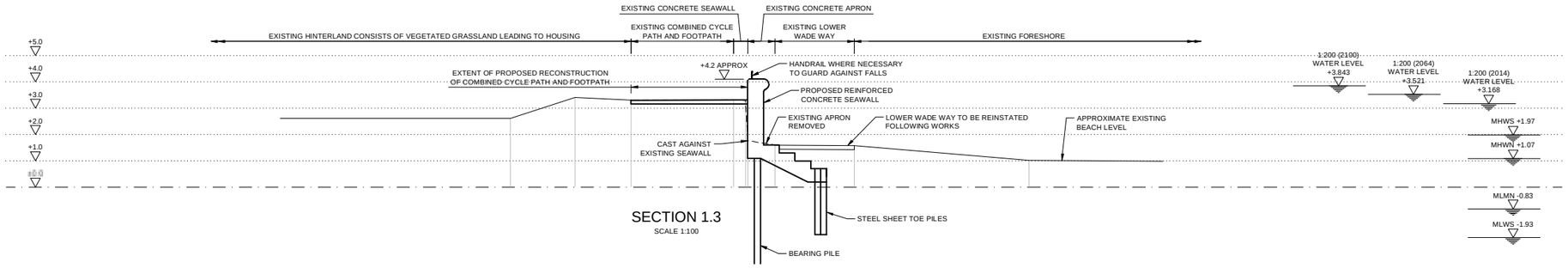
DO NOT SCALE



SECTION 1.1
SCALE 1:100



SECTION 1.2
SCALE 1:100



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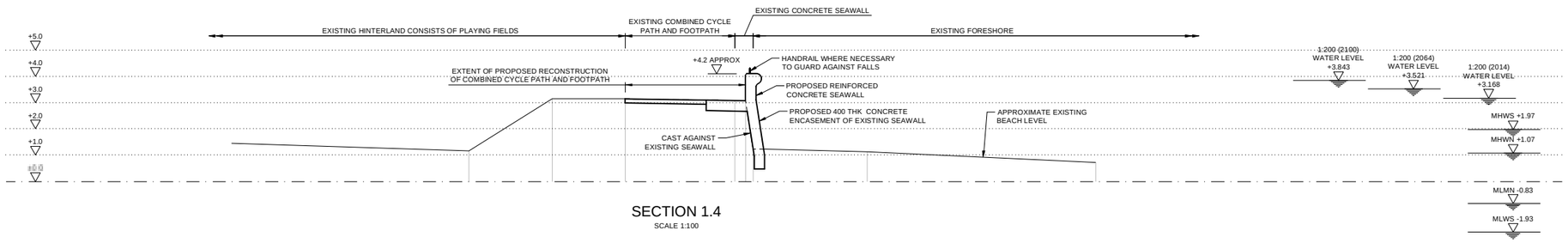
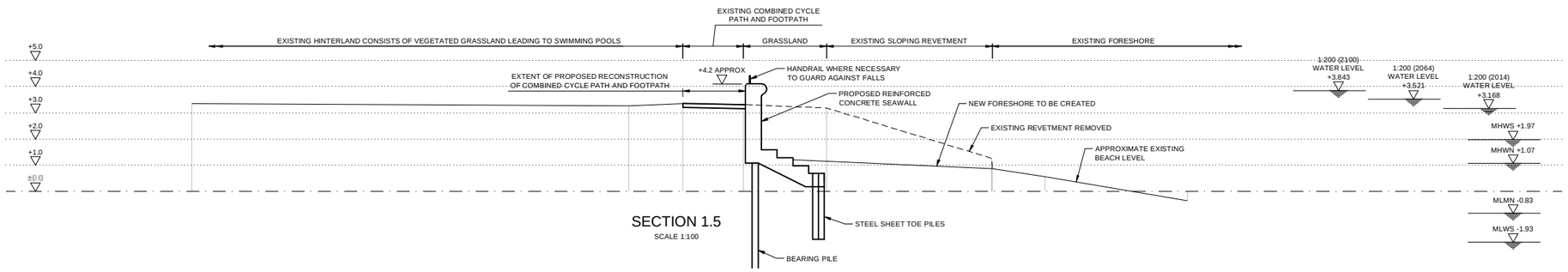
SCALE 1:100



SECTION 1.4
SCALE 1:100



SECTION 1.5
SCALE 1:100

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES, RELATIVE TO ORDNANCE DATUM NEWLYN, UNLESS NOTED OTHERWISE.

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REV	DATE	DESCRIPTION	BY	CHK	APP
D1	30.06.14	FOR COMMENT	AIK	TG	APL

REVISIONS

CLIENT/PARTNERSHIP

Portsmouth City Council

Environment Agency

PROJECT

SOUTHSEA AND NORTH PORTSEA ISLAND FRONTAGES OUTLINE DESIGN

TITLE

NORTH PORTSEA ISLAND FRONTAGE 1 SECTIONS

Burns House, Harlands Road
Haywards Heath, RH16 1PG
Tel +44(0)1444 458855
Email info.haywardsheath@rhdhv.com
Website www.royalhaskoningdhv.com

Royal HaskoningDHV
Enhancing Society Together

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A.I.K		
DATE: Jun. 2014	SCALE AT A1: 1:100	REF.: PB1042-1015.dwg

DRAWING No.	REVISION
PB1042/1015	D1

DRAWING No. PB1042/1020

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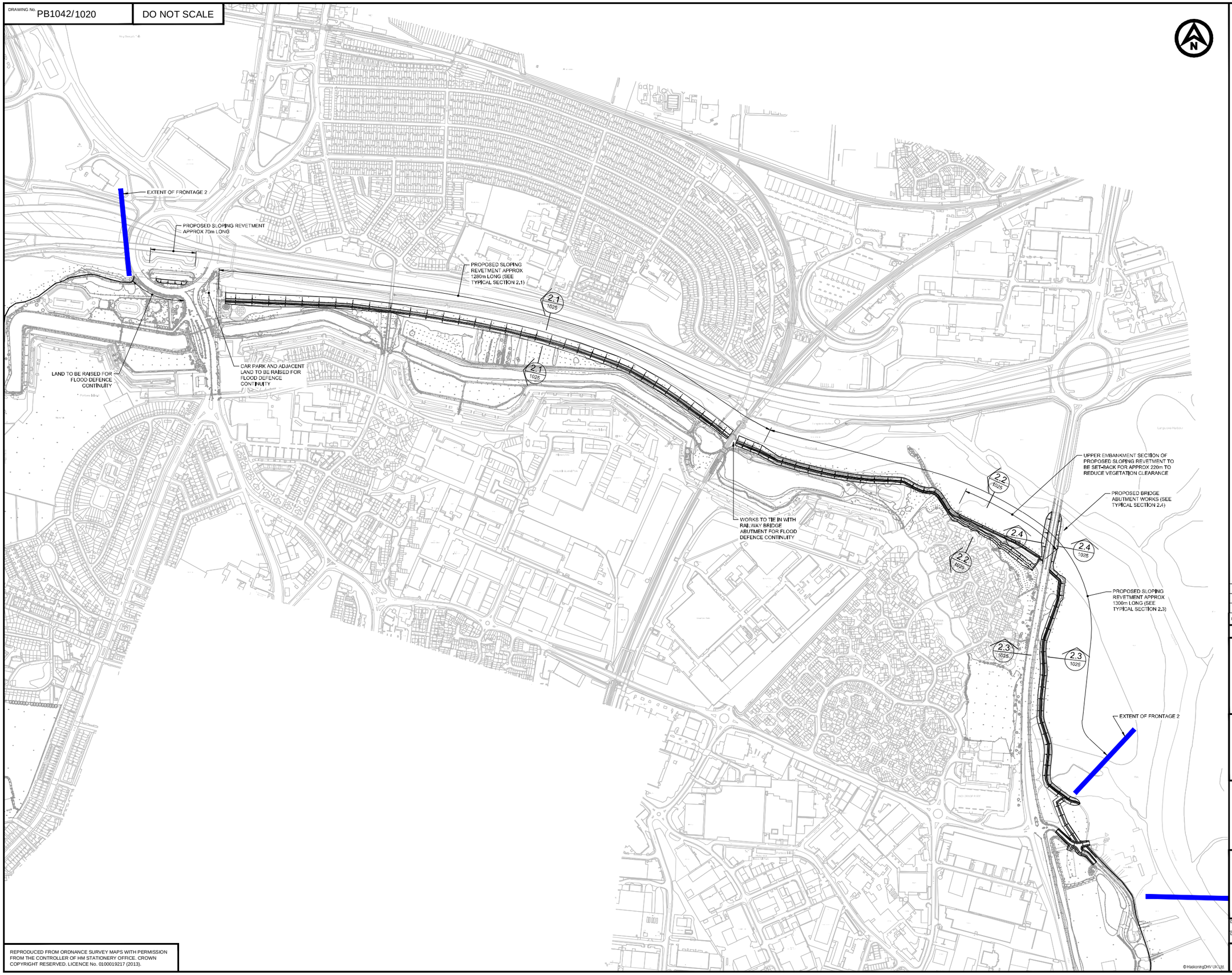

NOTES

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SCALE IN METRES
1:4000

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APP
D3	25.06.14	MINOR AMENDMENTS	AIK	APL	APL
D2	05.06.14	MINOR AMENDMENTS	AIK	TG	APL
D1	09.05.14	FOR COMMENT	AIK	PS	APL

REVISIONS

CLIENT/PARTNERSHIP

Portsmouth City Council

Environment Agency

PROJECT

SOUTHSEA AND NORTH PORTSEA ISLAND FRONTAGES OUTLINE DESIGN

TITLE

NORTH PORTSEA ISLAND FRONTAGE 2 GENERAL ARRANGEMENT

Burns House, Harlands Road
Haywards Heath, RH16 1PG
Tel +44(0)1444 458551
Email info.haywardsheath@rhdhv.com
Website www.royalhaskoningdhv.com

Royal HaskoningDHV
Enhancing Society Together

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A.I.K	PS	APL
DATE	SCALE AT A1	REF.
May 2014	1:4000	PB1042-1020.dwg

DRAWING No. PB1042/1020

REVISION D3

DRAWING No. PB1042/1025

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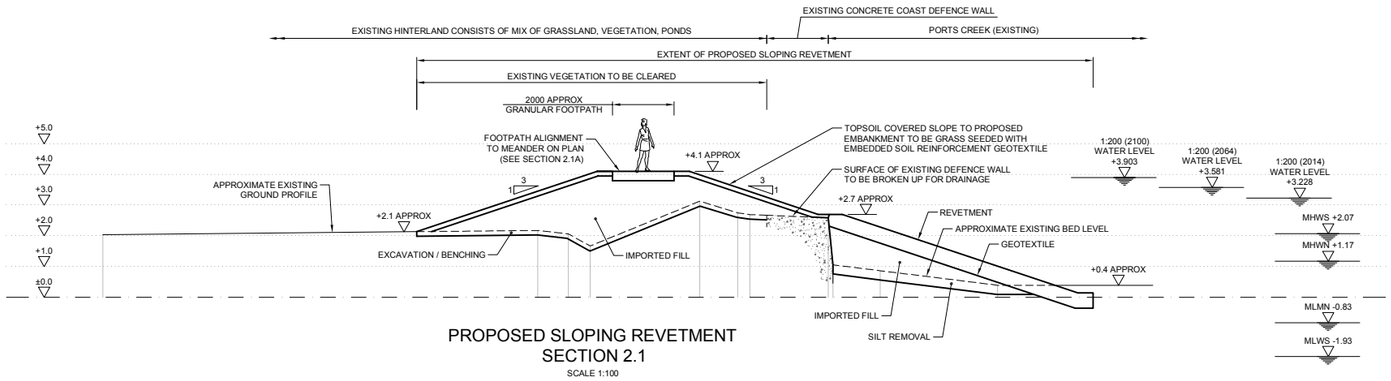
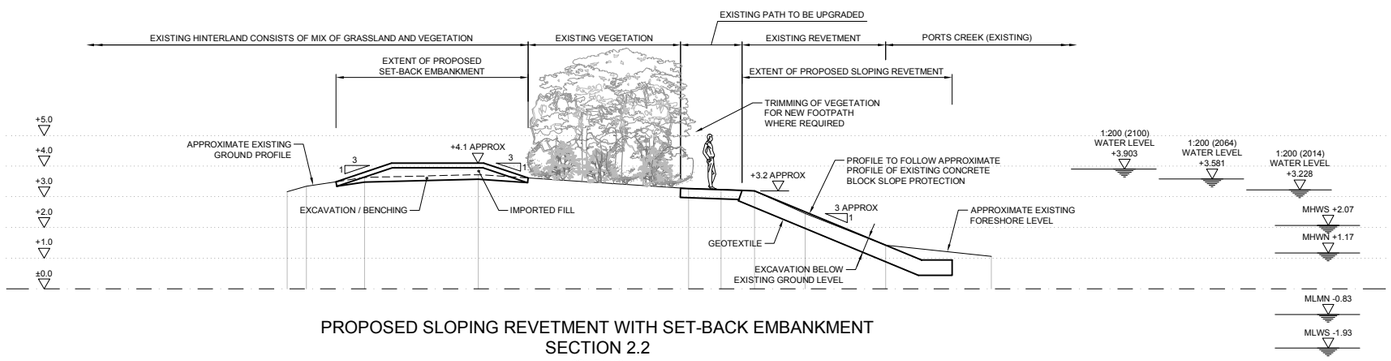
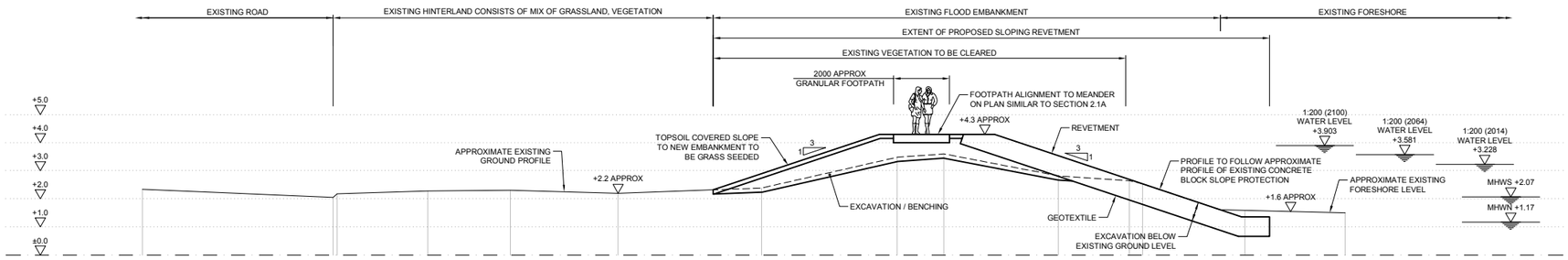


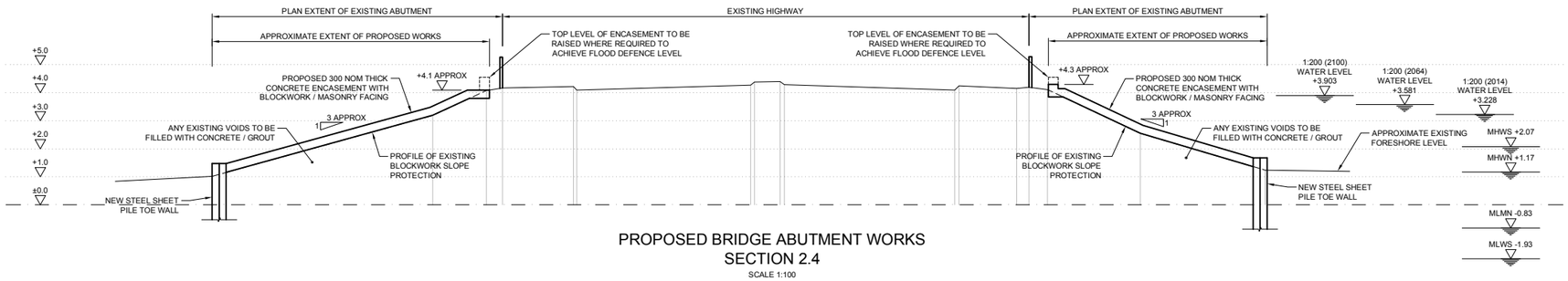
PROPOSED SLOPING REVETMENT
SECTION 2.1
SCALE 1:100



PROPOSED SLOPING REVETMENT WITH SET-BACK EMBANKMENT
SECTION 2.2
SCALE 1:100



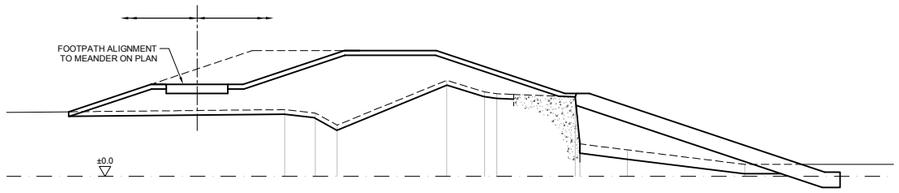
PROPOSED SLOPING REVETMENT
SECTION 2.3
SCALE 1:100



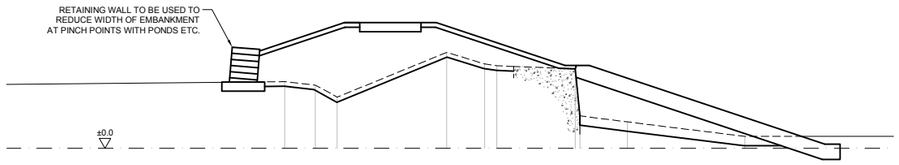
PROPOSED BRIDGE ABUTMENT WORKS
SECTION 2.4
SCALE 1:100

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES, RELATIVE TO ORDNANCE DATUM NEWLYN, UNLESS NOTED OTHERWISE.
3. SLOPE GRADIENTS SHOWN OF PROPOSED STRUCTURES IS APPROXIMATE.
4. TIDE LEVELS SHOWN (MHWS ETC.) ARE FOR 2014.



PROPOSED SLOPING REVETMENT - MEANDERING FOOTPATH
SECTION 2.1A
SCALE 1:100



PROPOSED SLOPING REVETMENT - RETAINING WALL
SECTION 2.1B
SCALE 1:100

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APP
D3	25.06.14	SECTIONS 2.1 AND 2.2 AMENDED	AIK	APL	APL
D2	09.06.14	MINOR AMENDMENTS	AIK	RG	APL
D1	09.05.14	FOR COMMENT	AIK	PS	APL

REVISIONS

CLIENT/PARTNERSHIP

Portsmouth City Council
Environment Agency

PROJECT

SOUTHSEA AND NORTH PORTSEA ISLAND FRONTAGES OUTLINE DESIGN

TITLE

NORTH PORTSEA ISLAND FRONTAGE 2 SECTIONS

Burns House, Harlands Road
Haywards Heath, RH16 1PG
Tel +44(0)1444 458551
Email info.haywardsheath@rhdhv.com
Website www.royalhaskoningdhv.com

Royal HaskoningDHV
Enhancing Society Together

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A.I.K	PS	APL
DATE: May 2014	SCALE: AT A1 1:100	REF.: PB1042-1025.dwg

DRAWING No. PB1042/1025

REVISION D3

DRAWING No. PB1042/1030

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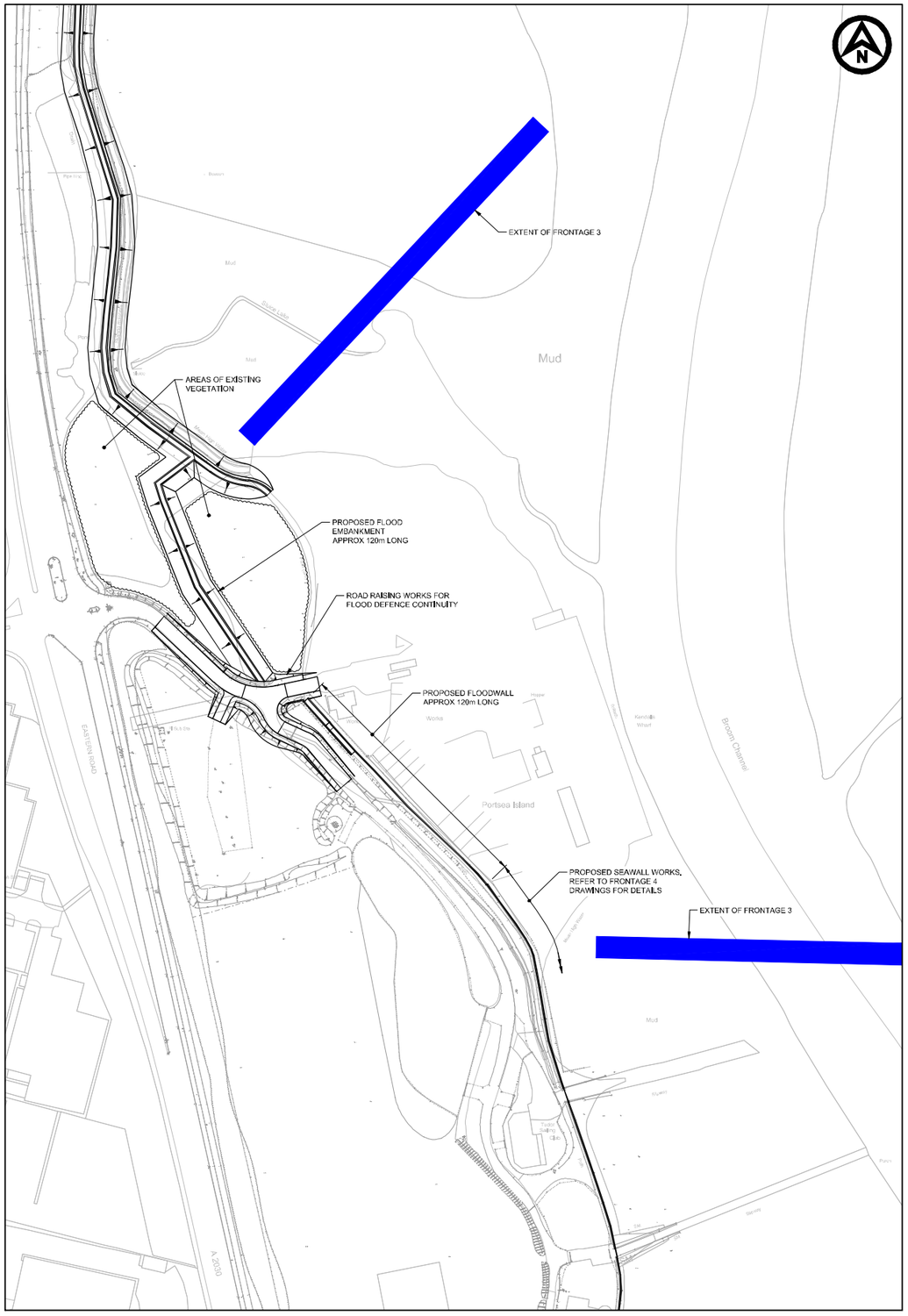

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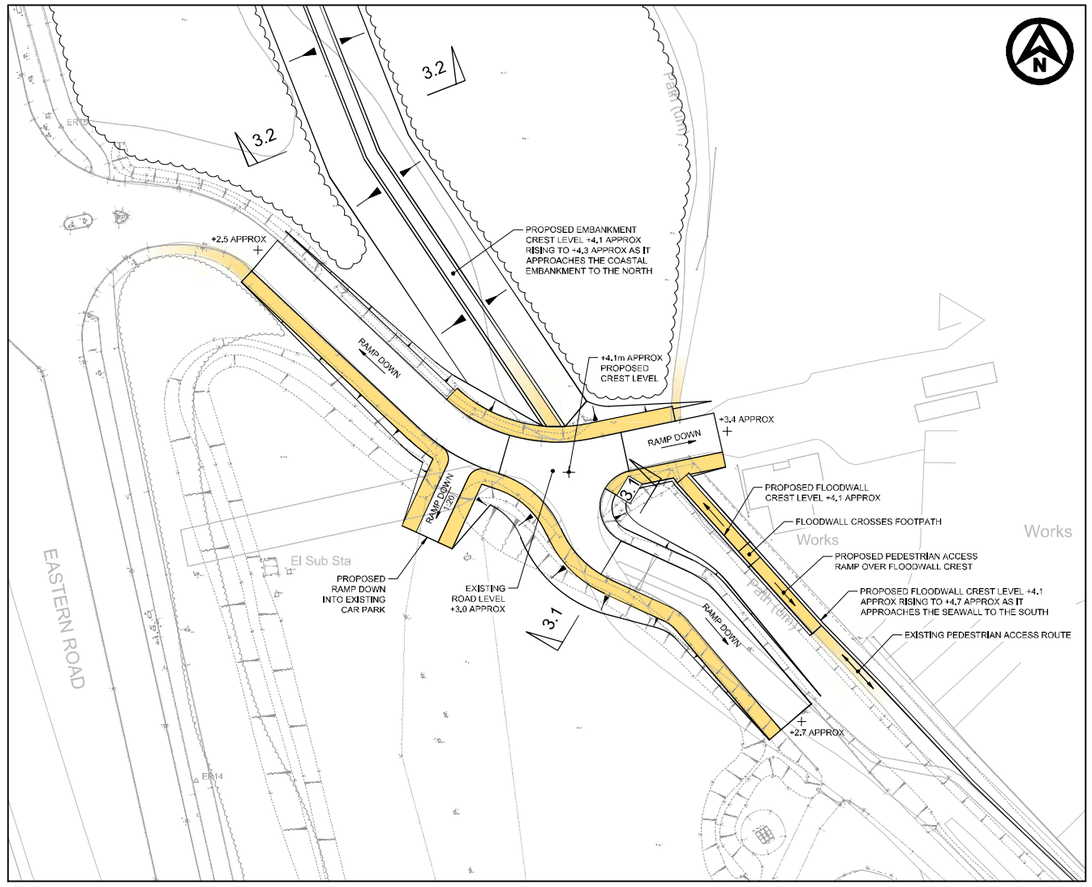
LOCATION PLAN

SCALE 1:1250



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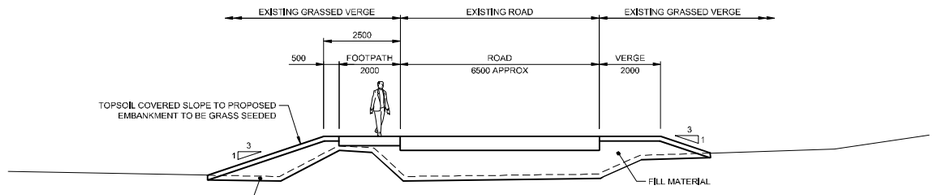
SCALE IN METRES 1:250

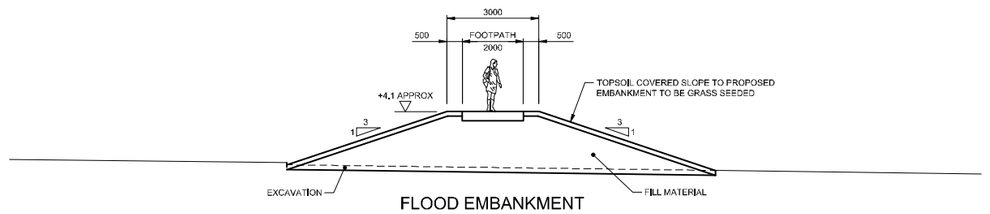
SITE PLAN

SCALE 1:500



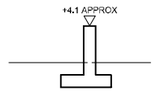
ROAD RAISING SECTION 3.1

SCALE 1:100



FLOOD EMBANKMENT SECTION 3.2

SCALE 1:100



FLOODWALL TYPICAL SECTION

SCALE 1:100

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES, RELATIVE TO ORDNANCE DATUM NEWLYN, UNLESS NOTED OTHERWISE.
3. SLOPE GRADIENTS SHOWN OF PROPOSED STRUCTURES IS APPROXIMATE.
4. TIDE LEVELS SHOWN (MHWS ETC.) ARE FOR 2014.

KEY:

FOOTPATH

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APP
D2	05.06.14	MINOR AMENDMENTS	AIK	TG	APL
D1	09.05.14	FOR COMMENT	AIK	PS	APL

REVISIONS

CLIENT/PARTNERSHIP

Portsmouth City Council

Environment Agency

PROJECT

SOUTHSEA AND NORTH PORTSEA ISLAND FRONTAGES OUTLINE DESIGN

TITLE

NORTH PORTSEA ISLAND FRONTAGE 3 GENERAL ARRANGEMENT

Burns House, Harlands Road
Haywards Heath, RH16 1PG
Tel +44(0)1444 458551
Email info.haywardsheath@rhdhv.com
Website www.royalhaskoningdhv.com

Royal HaskoningDHV
Enhancing Society Together

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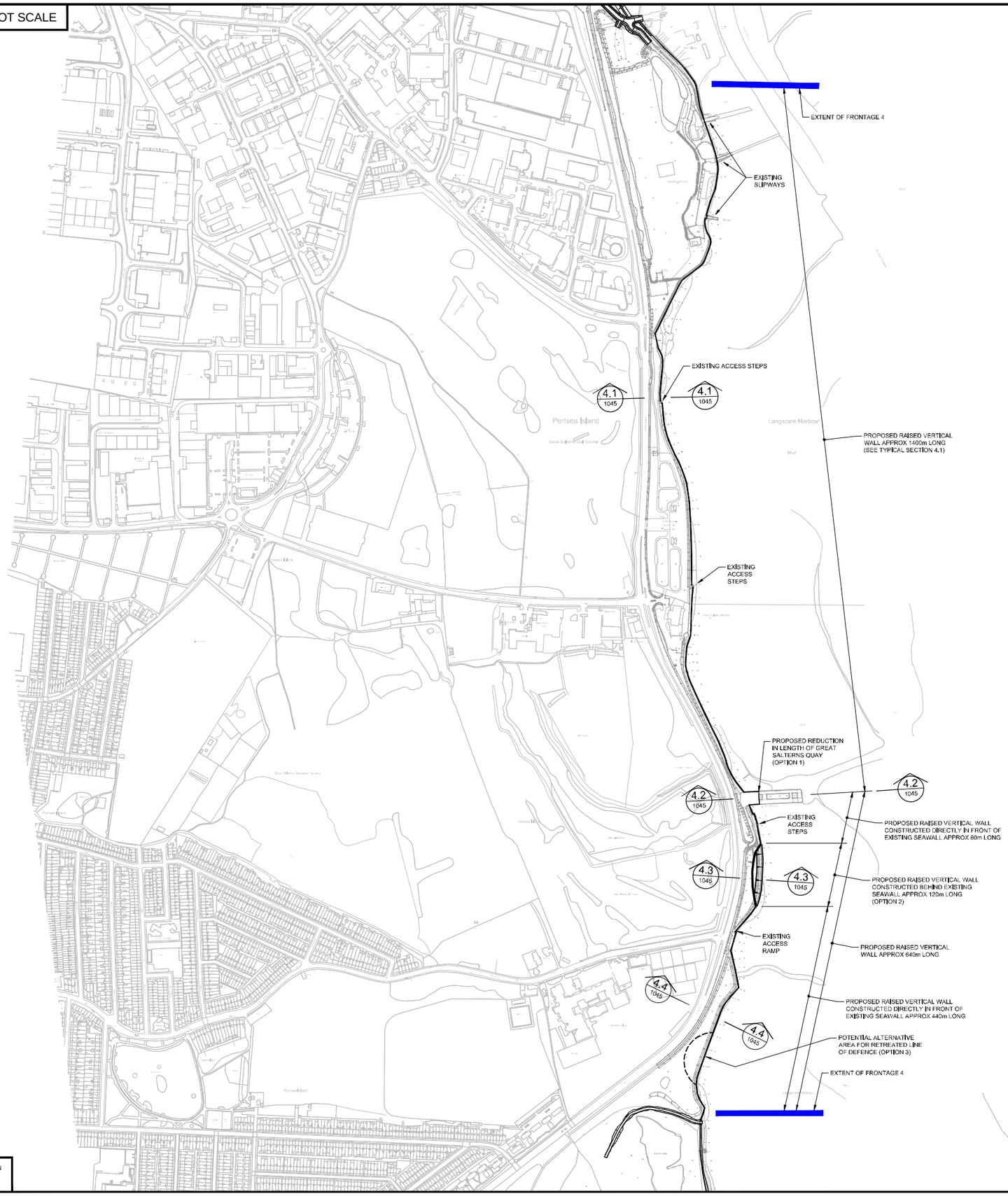
A.I.K	PS	APL
DATE	SCALE AT A1	REF.
May 2014	AS SHOWN	PB1042-1030.dwg

DRAWING No. PB1042/1030

REVISION D2

DRAWING No. PB1042/1040

DO NOT SCALE



NOTES

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SCALE IN METRES
1:4000

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APP
D2	05.06.14	MINOR AMENDMENTS	AIK	TG	APL
D1	13.05.14	FOR COMMENT	AIK	PS	APL

REVISIONS

CLIENT/PARTNERSHIP

Portsmouth City Council

Environment Agency

PROJECT

SOUTHSEA AND NORTH PORTSEA ISLAND FRONTAGES OUTLINE DESIGN

TITLE

NORTH PORTSEA ISLAND FRONTAGE 4 GENERAL ARRANGEMENT

Burns House, Harlands Road
Haywards Heath, RH16 1PG
Tel +44(0)1444 458551
Email info.haywardsheath@rhdhv.com
Website www.royalhaskoningdhv.com

Royal HaskoningDHV
Enhancing Society Together

DRAWN	CHECKED	APPROVED
A.I.K	PS	APL
DATE: May 2014	SCALE AT A1: 1:4000	REF.: PB1042-1040.dwg

DRAWING No. PB1042/1040

REVISION D2

DRAWING No. PB1042/1045

DO NOT SCALE

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
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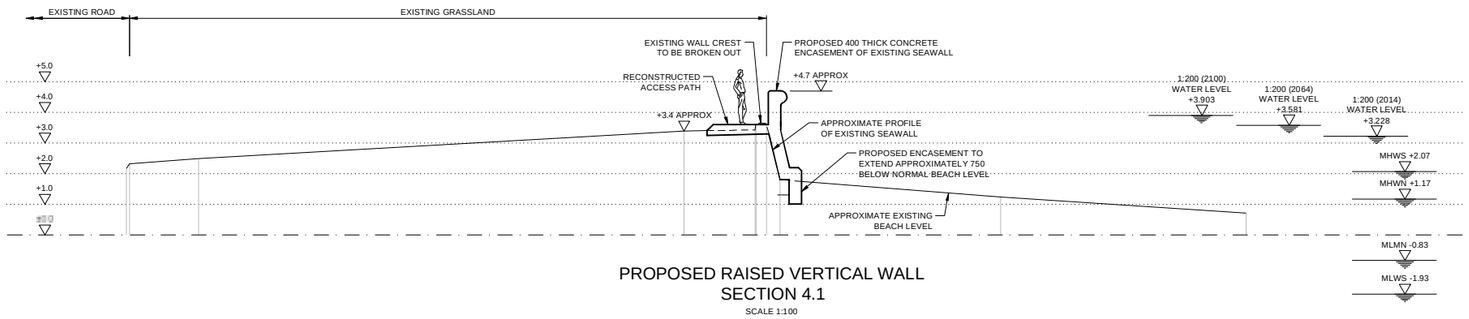
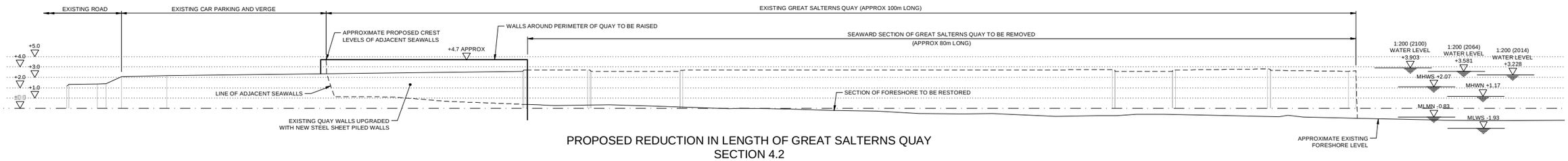
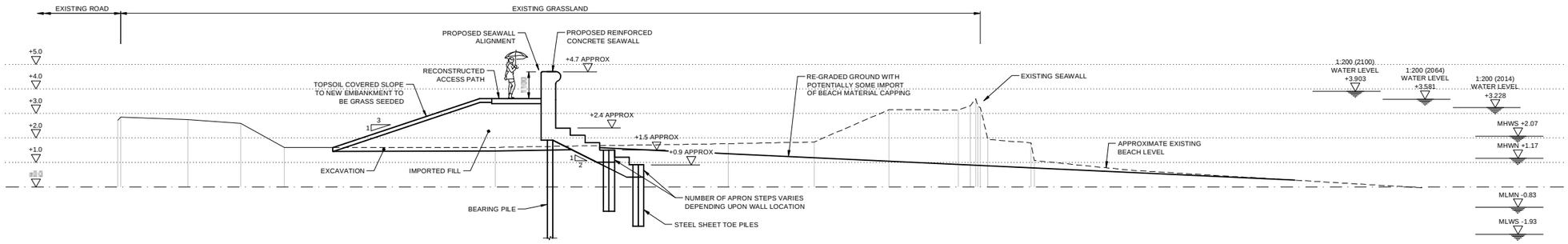
3. SLOPE GRADIENTS SHOWN OF PROPOSED STRUCTURES IS APPROXIMATE.
4. TIDE LEVELS SHOWN (MHWS ETC.) ARE FOR 2014.



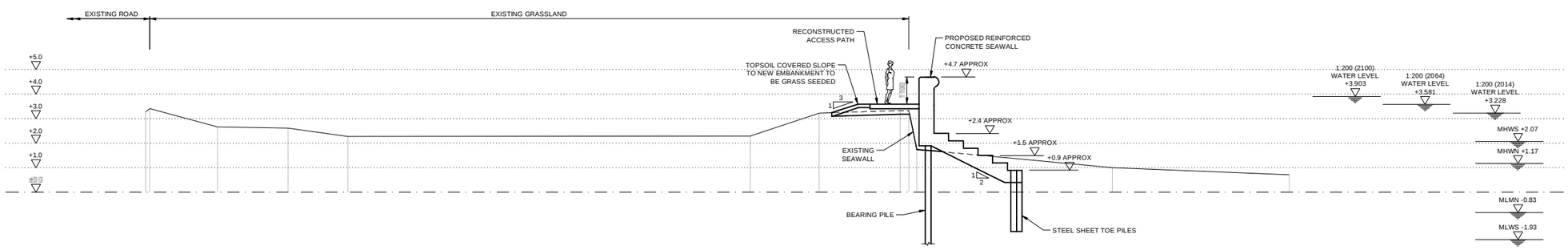
PROPOSED RAISED VERTICAL WALL
SECTION 4.1
SCALE 1:100



PROPOSED REDUCTION IN LENGTH OF GREAT SALTERNS QUAY
SECTION 4.2
SCALE 1:200



PROPOSED RAISED VERTICAL WALL
SECTION 4.3
SCALE 1:100



PROPOSED RAISED VERTICAL WALL
SECTION 4.4
SCALE 1:100

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APP
D2	05.06.14	MINOR AMENDMENTS	AIK	TG	APL
D1	13.05.14	FOR COMMENT	AIK	PS	APL

REVISIONS

CLIENT/PARTNERSHIP

Portsmouth City Council

Environment Agency

PROJECT

SOUTHSEA AND NORTH PORTSEA ISLAND FRONTAGES OUTLINE DESIGN

TITLE

NORTH PORTSEA ISLAND FRONTAGE 4 SECTIONS

Burns House, Harlands Road
Haywards Heath, RH16 1PG
Tel +44(0)1444 458551
Email info.haywardsheath@rhdhv.com
Website www.royalhaskoningdhv.com

Royal HaskoningDHV
Enhancing Society Together

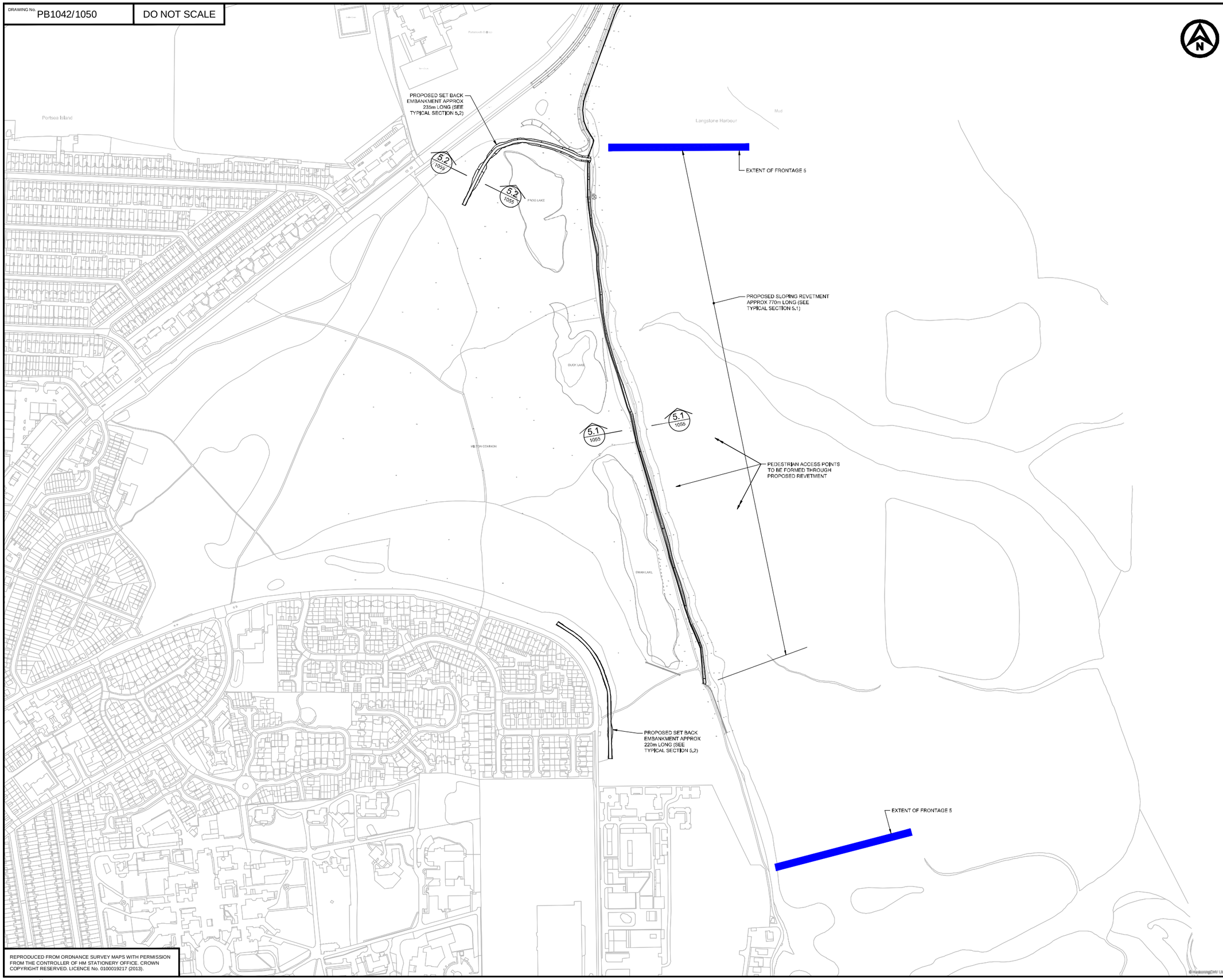
DRAWN	CHECKED	APPROVED
A.I.K	PS	APL
DATE	SCALE AT A1	REF:
May 2014	AS SHOWN	PB1042-1045.dwg

DRAWING No. PB1042/1045

REVISION D2

DRAWING No. PB1042/1050

DO NOT SCALE



NOTES

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SCALE IN METRES
1:2500

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APP
D2	05.06.14	MINOR AMENDMENTS	AIK	TG	APL
D1	09.05.14	FOR COMMENT	AIK	PS	APL

REVISIONS

CLIENT/PARTNERSHIP

Portsmouth City Council

Environment Agency

PROJECT

SOUTHSEA AND NORTH PORTSEA ISLAND FRONTAGES OUTLINE DESIGN

TITLE

NORTH PORTSEA ISLAND FRONTAGE 5 GENERAL ARRANGEMENT

Burns House, Harlands Road
Haywards Heath, RH16 1PG
Tel +44(0)1444 458551
Email info.haywardsheath@rhdhv.com
Website www.royalhaskoningdhv.com

Royal HaskoningDHV
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DATE: May 2014	SCALE AT A1: 1:2500	REF.: PB1042-1050.dwg

DRAWING No. PB1042/1050

REVISION D2

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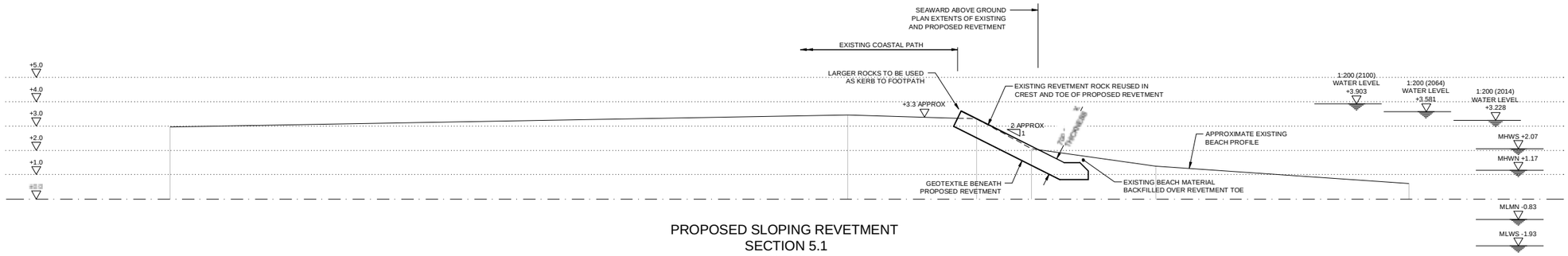

PROPOSED SLOPING REVETMENT
SECTION 5.1
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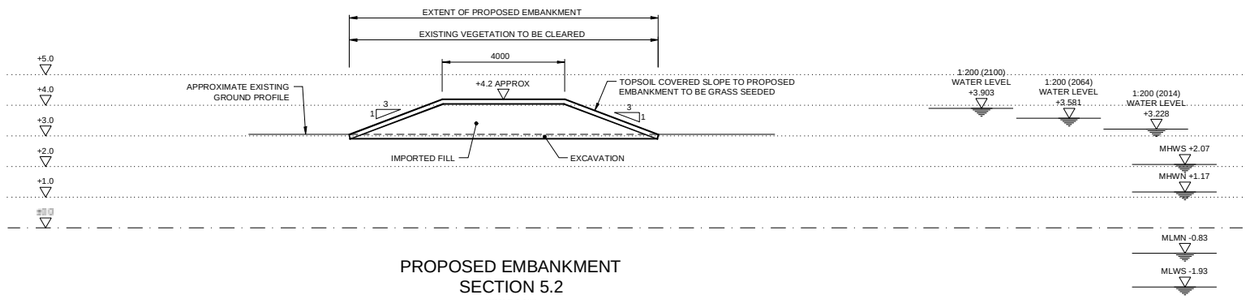

PROPOSED EMBANKMENT
SECTION 5.2
SCALE 1:100

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES, RELATIVE TO ORDNANCE DATUM NEWLYN, UNLESS NOTED OTHERWISE.
3. SLOPE GRADIENTS SHOWN OF PROPOSED STRUCTURES IS APPROXIMATE.
4. TIDE LEVELS SHOWN (MHWS ETC.) ARE FOR 2014.

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APP
D2	05.06.14	MINOR AMENDMENTS	AIK	TG	APL
D1	09.05.14	FOR COMMENT	AIK	PS	APL

REVISIONS

CLIENT/PARTNERSHIP

Portsmouth City Council
Environment Agency

PROJECT

SOUTHSEA AND
NORTH PORTSEA
ISLAND FRONTAGES
OUTLINE DESIGN

TITLE

NORTH PORTSEA ISLAND
FRONTAGE 5
SECTIONS

Burns House, Harlands Road
Haywards Heath, RH16 1PG
Tel +44(0)1444 458551
Email info.haywardsheath@rhdhv.com
Website www.royalhaskoningdhv.com

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DATE	SCALE	REF:
May 2014	AT A1 1:100	PB1042-1055.dwg

DRAWING No. PB1042/1055

REVISION D2

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Appendix D:

Portsea Island Coastal Strategy Study [PICSS] Environmental Letters of Approval (Imperative Reasons of Overriding Public Interest [IRPOI] and Regional Habitat Creation Programme [RHCP])

Marine Management Organisation

Marine Licensing
Lancaster House
Hampshire Court
Newcastle upon Tyne
NE4 7YH

T +44 (0)000 000 0000
F +44 (0)000 000 0000
www.gov.uk/mmo

Gavin Holder
Coastal Project Engineer,
East Solent Coastal Partnership

Ref: MLP/2014/00181

21st August 2014

Dear Gavin,

FCERM North Portsea Island Scheme

We understand that you need to be able to provide some assurance to the Environment Agency that the project is unlikely to require the need for Imperative Reasons of Overriding Public Interest (IROPI) in order to secure funding to progress with your funding application.

The MMO are proposing to act as lead competent authority for the HRA on this project as set out in the DEFRA guidance in Annex I of this letter. Any assessment made as to the requirement for a test of Likely Significant Effect and an Appropriate Assessment will be undertaken once detailed design options for each phase become available. The MMO will work closely with Natural England in doing so.

Unfortunately, the MMO has been unable to undertake a detailed assessment of the report provided (Revision 1.1 of the Habitats Regulation Assessment (HRA) for the wider North Portsea Island Scheme). However, the MMO has undertaken a brief review of the report, and has discussed the issue with Simon Thompson at Natural England.

Based upon the information and guidance provided to date, and assuming that the developer works closely with the advisors in the detailed design of each phase, the proposal is likely to lead to an environmentally acceptable solution. Although it cannot be excluded that the project would not have an Likely Significant Effect upon the interest features of the Portsmouth Harbour SPA and Ramsar, Chichester and Langstone Harbours SPA and Ramsar, and Solent Maritime SAC. It is therefore likely that an Appropriate Assessment under the Conservation of Habitats and Species Regulations 2010 (as amended) will be required.

As discussed previously, the HRA will be assessed in detail as part of the Marine Licence application for the wider scheme, and detailed assessments will be required for each phase as the project progresses. The MMO would be able to offer advice on draft the HRA in pre-app for each of the subsequent proposals.

We stress that this advice is provisional and that this letter does not constitute an approval, consent or guarantee the MMO will undertake an Appropriate Assessment or that a Marine Licence will be granted.

If you have any queries, or would like to discuss this response in more detail, please do not hesitate to contact me.

Kind regards,

Jayne Griffiths
Senior Marine Licensing Manager – Coastal Development

Telephone: (0)191 376 2720
Mobile: 07766 246948
E-Mail: jayne.griffiths@marinemanagement.org.uk

Date: 19 August 2014
Our ref: 129434

Gavin Holder
Eastern Solent Coastal Partnership

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

T 0300 060 3900

BY EMAIL ONLY

Dear Gavin,

PORTSMOUTH SITE OF SPECIAL SCIENTIFIC INTEREST (SSSI)
LANGSTONE HARBOUR SITE OF SPECIAL SCIENTIFIC INTEREST (SSSI)
PORTSMOUTH HARBOUR SPECIAL PROTECTION AREA (SPA)/RAMSAR
CHICHESTER AND LANGSTONE HARBOURS SPECIAL PROTECTION AREA (SPA)/RAMSAR
SOLENT MARITIME SPECIAL AREA OF CONSERVATION (SAC)

North Portsea Island Flood and Coastal Erosion Risk Management Strategy – Scheme Level Habitats Regulations Assessment

Following the information received from the Eastern Solent Coastal Partnership regarding the above, we write to confirm that it is Natural England's view that **the proposal is likely to lead to an environmentally acceptable solution.**

However, whilst the scheme level Habitats Regulations Assessment concludes that the entire scheme can be delivered without any adverse effects, due to the limited information available to date, we cannot rule out that the subsequent individual proposals could have a significant effect on Portsmouth Harbour SPA, Portsmouth Harbour Ramsar, Chichester and Langstone Harbours SPA and Ramsar, and Solent Maritime SAC and therefore, they may require an appropriate assessment under the Conservation of Habitats and Species Regulations 2010 (as amended). We stress that this advice is provisional, and will need to be reviewed under the Regulations when the final design details are available because they are partly within and partly in the vicinity of Portsmouth Harbour SPA, Ramsar and SSSI and Chichester and Langstone Harbours SPA, Ramsar, Langstone Harbour SSSI and Solent Maritime SAC.

We stress that this letter does not constitute Natural England's assent or advice for the purposes of S28H of the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000). When details of the proposed operation become available and before carrying it out, Portsmouth City Council, having considered its general duty under section 28G(2) of the Wildlife and Countryside Act 1981, is required to give notice to Natural England. The Council is required to carry out the operation in accordance with the provisions of section 28H of the Wildlife and Countryside Act 1981 as the proposed operation is partly within and partly adjacent to Portsmouth Harbour SSSI and Langstone Harbour SSSI

This advice is offered based on the information provided to date. It is given without prejudice to any advice that Natural England may offer in accordance with its statutory role under the Conservation of Habitats and Species Regulations 2010 (as amended) or assent that may be required under the Wildlife and Countryside Act 1981 (as amended by the Countryside and

Rights of Way Act 2000). Formal comment on the proposal will be provided following consultation on the Environmental Statement as required under the relevant Regulations. We look forward to receiving further information as the proposal is developed.

Summary of Natural England's advice at the option choice stage	Answer only yes or no
Is the proposal likely to lead to an environmentally acceptable solution?	Yes
Is the proposal likely to require an appropriate assessment under Habitats Regulations?	Yes

Should you have any questions, or require any further information with regard to this response, please do not hesitate to contact me.

Yours sincerely

Simon Thompson
Lead Adviser – New Forest, Hampshire Coast and Isle of Wight
Tel: 0300 060 4625 Email: simon.thompson@naturalengland.org.uk

Appendix E:

Detailed Design Drawings: Phase 1 (Anchorage Park)

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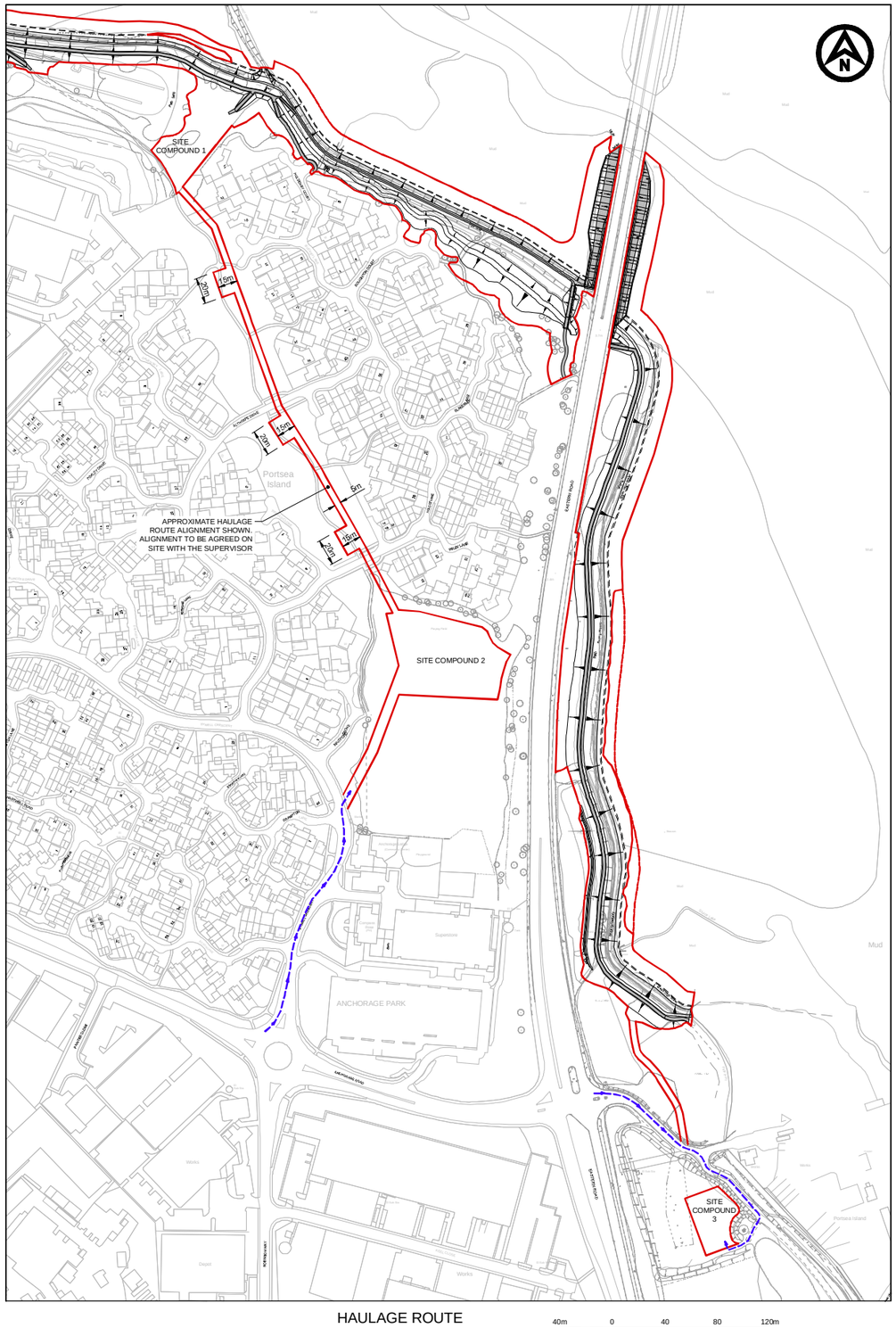
DRAWING No. PB2761/0010

DO NOT SCALE



HAULAGE ROUTE

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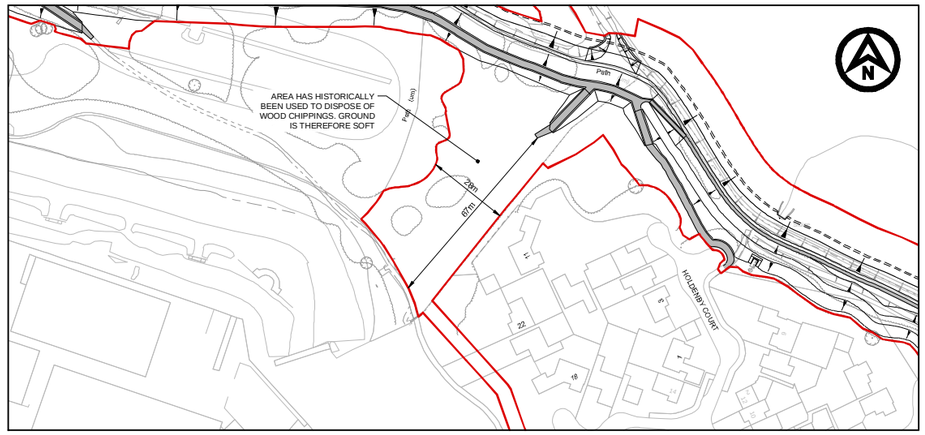

SITE COMPOUND 1

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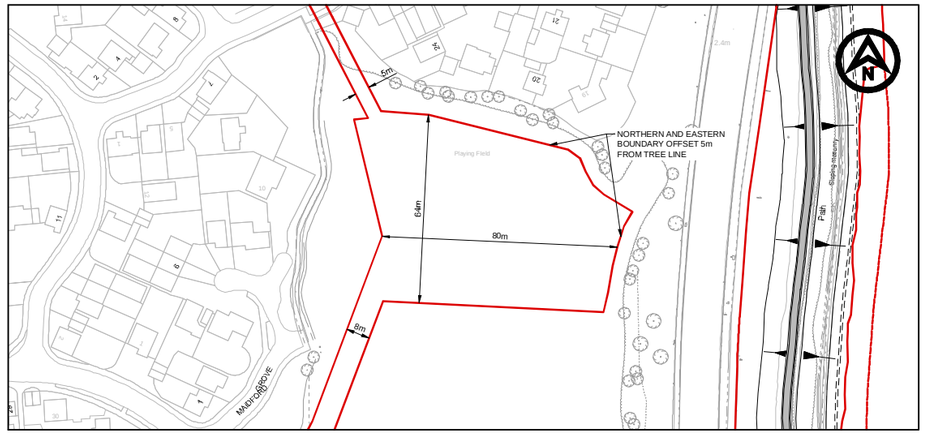

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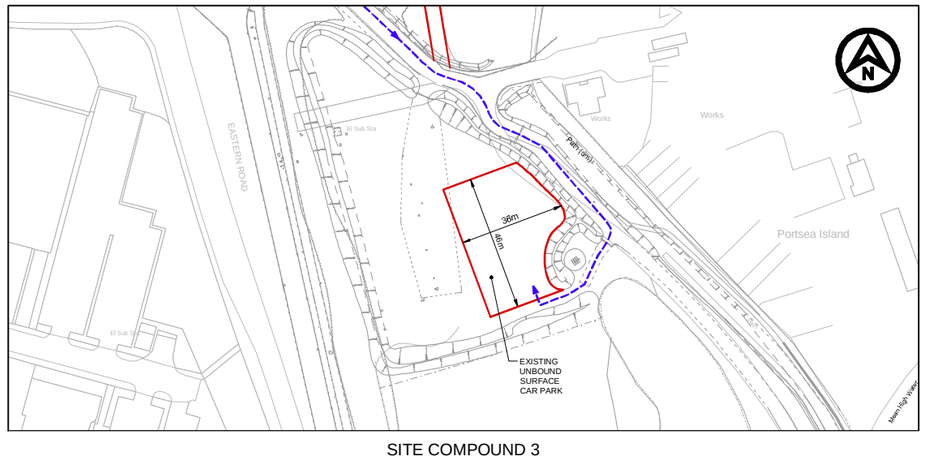

SITE COMPOUND 3

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SCALE IN METRES 1:1000

NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES, RELATIVE TO ORDNANCE DATUM NEWLYN, UNLESS NOTED OTHERWISE.
3. ALL SITE COMPOUND LOCATIONS ARE APPROXIMATE AND SHALL BE AGREED ON SITE WITH THE SITE SUPERVISOR.
4. ALL WORKING AREAS INCLUDING SITE COMPOUNDS SHALL BE REINSTATED UPON COMPLETION TO A CONDITION AT LEAST EQUAL TO THAT FOUND AT THE START OF THE WORKS. REFER TO THE WORKS INFORMATION DOCUMENT FOR FURTHER INFORMATION RELATING TO REINSTATEMENT OF THE SPORTS FIELD AT SITE COMPOUND 2.

KEY

- SITE BOUNDARY
- APPROVED ACCESS ROUTE

SAFETY, HEALTH AND ENVIRONMENT INFORMATION
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS:
CONSTRUCTION • SITE SECURITY (URBAN AREA). • HAUL ROUTES CROSS PUBLIC HIGHWAY.
MAINTENANCE/CLEANING/OPERATION • NONE
DECOMMISSIONING/DEMOLITION • NONE

REV.	DATE	DESCRIPTION	BY	CHK	APP
A	13.04.15	FOR CONSTRUCTION	BJR	AP	AP
T1	18.12.14	TENDER ISSUE	AIK	RWW	APL

REVISIONS

CLIENT/PARTNERSHIP

EASTERN SOLENT COASTAL PARTNERSHIP

Portsmouth City Council

Environment Agency

PROJECT

NORTH PORTSEA ISLAND (PHASE 1) COASTAL FLOOD AND EROSION RISK MANAGEMENT SCHEME

TITLE

SITE BOUNDARY PLAN
SHEET 6 OF 6

Royal HaskoningDHV
Enhancing Society Together

Bums House, Harlands Road
Haywards Heath, RH16 1PG
Tel +44(0)1444 458551
Email info.haywardsheath@rhdhv.com
Website www.royalhaskoningdhv.com

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A.I.K	RWW	APL
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REVISION A

DRAWING No. PB2761/1105

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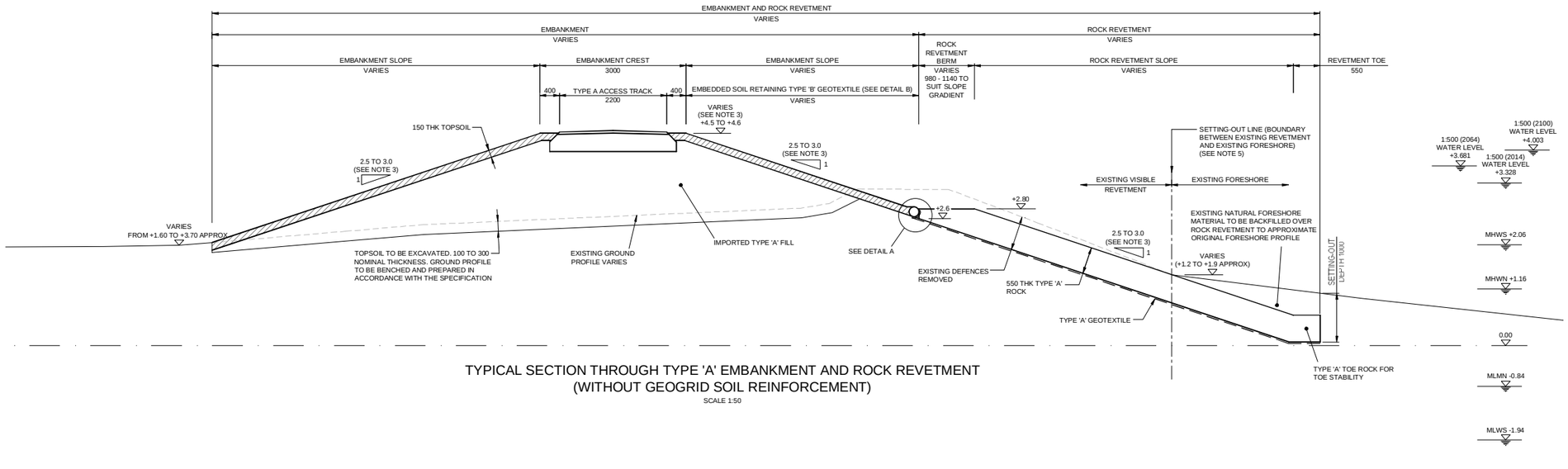
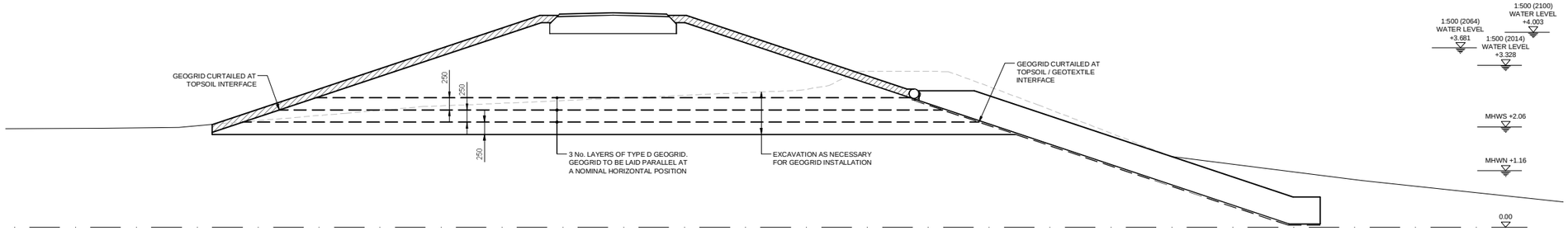


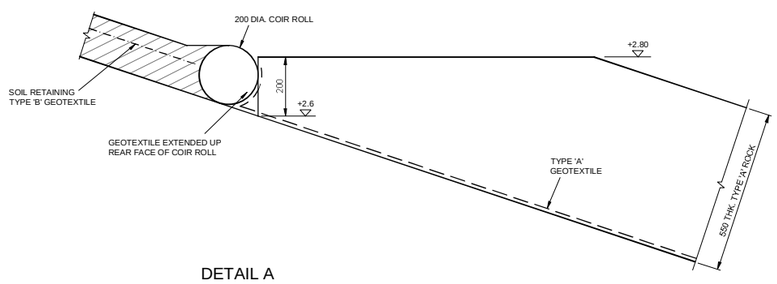
TYPICAL SECTION THROUGH TYPE 'A' EMBANKMENT AND ROCK REVETMENT
(WITHOUT GEOGRID SOIL REINFORCEMENT)

SCALE 1:50



TYPICAL SECTION THROUGH TYPE 'A' EMBANKMENT AND ROCK REVETMENT
(WITH GEOGRID SOIL REINFORCEMENT)
REFER TO SECTION ABOVE FOR ALL OTHER NOTES

SCALE 1:50



DETAIL A

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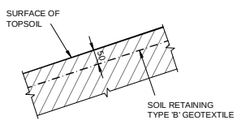

DETAIL B

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SCALE IN METRES
1:10

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SCALE IN METRES
1:50

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES, RELATIVE TO ORDNANCE DATUM NEWLYN, UNLESS NOTED OTHERWISE.
3. SLOPE GRADIENT AND CREST LEVEL OF EMBANKMENT AND REVETMENT IS SHOWN ON GENERAL ARRANGEMENT PLAN DRAWINGS.
4. EXTENT OF WORKS WITH AND WITHOUT GEOGRID SOIL REINFORCEMENT IS SHOWN ON GENERAL ARRANGEMENT PLAN DRAWINGS.
5. SETTING-OUT LINE SHOWN ON THE GENERAL ARRANGEMENT PLAN AND GENERAL ARRANGEMENT CROSS SECTION DRAWINGS.
6. REFER TO LANDSCAPING PLANS FOR GRASS SEEDING AND PLANTING REQUIREMENTS.
7. THE EXISTING GROUND PROFILE AND FORM OF CONSTRUCTION OF EXISTING WORKS VARIES ALONG THE FRONTAGE. REFERENCE SHOULD BE MADE TO THE WORKS INFORMATION AND THE SITE INFORMATION TO UNDERSTAND THIS VARIABILITY.

SAFETY, HEALTH AND ENVIRONMENT INFORMATION
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS:
CONSTRUCTION • UXO RISK IS MODERATE. • WORKING ADJACENT TO NETWORK RAIL ASSETS. • DEMOLITION OF EXISTING STRUCTURES. • THERE IS A RISK OF ENCOUNTERING ASBESTOS WITHIN THE MADE GROUND.
MAINTENANCE/CLEANING/OPERATION • NONE
DECOMMISSIONING/DEMOLITION • UXO RISK IS MODERATE. • WORKING ADJACENT TO NETWORK RAIL ASSETS. • THERE IS A RISK OF ENCOUNTERING ASBESTOS WITHIN THE MADE GROUND.

REV	DATE	DESCRIPTION	BY	CHK	APP
A	13.04.15	FOR CONSTRUCTION	BJR	AP	AP
T1	18.12.14	TENDER ISSUE	AIK	RWW	APL

REVISIONS

CLIENT/PARTNERSHIP

EASTERN SOLENT COASTAL PARTNERSHIP

Portsmouth City Council

Environment Agency

PROJECT

NORTH PORTSEA ISLAND (PHASE 1) COASTAL FLOOD AND EROSION RISK MANAGEMENT SCHEME

TITLE

TYPE 'A' EMBANKMENT AND ROCK REVETMENT TYPICAL SECTION

Royal HaskoningDHV
Enhancing Society Together

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Website www.royalhaskoningdhv.com

DRAWN	CHECKED	APPROVED
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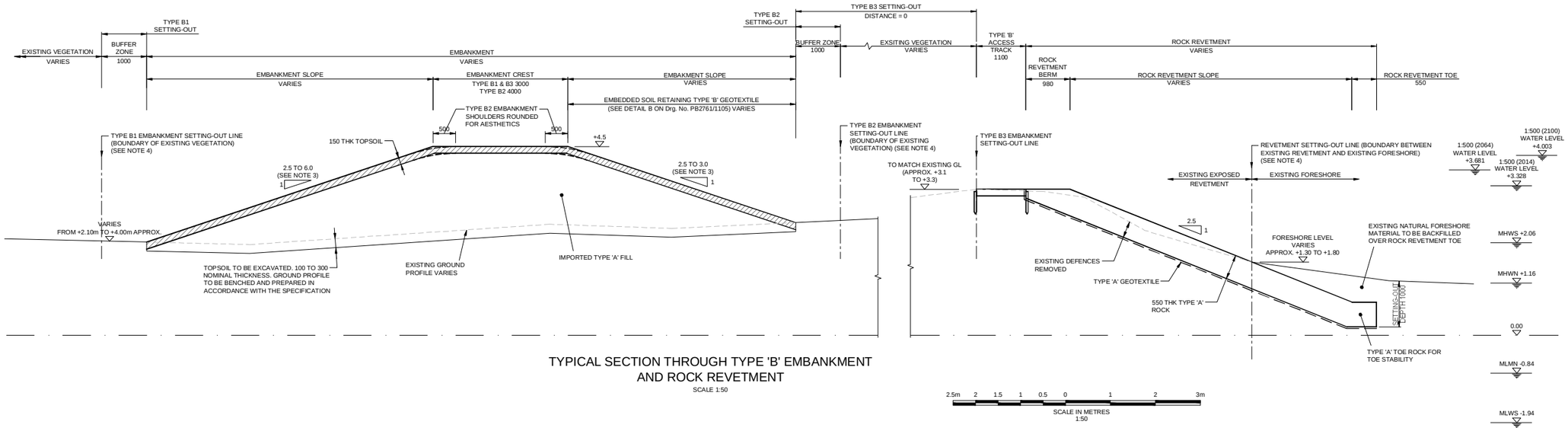
REVISION A

DRAWING No. PB2761/1106

DO NOT SCALE



TYPICAL SECTION THROUGH TYPE 'B' EMBANKMENT AND ROCK REVETMENT

SCALE 1:50

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES, RELATIVE TO ORDNANCE DATUM NEWLYN, UNLESS NOTED OTHERWISE.
3. SLOPE GRADIENT AND CREST LEVEL OF EMBANKMENT AND REVETMENT IS SHOWN ON GENERAL ARRANGEMENT PLAN DRAWINGS.
4. SETTING-OUT LINE SHOWN ON THE GENERAL ARRANGEMENT PLAN AND GENERAL ARRANGEMENT CROSS SECTION DRAWINGS.
5. REFER TO LANDSCAPING PLANS FOR GRASS SEEDING AND PLANTING REQUIREMENTS.
6. THE EXISTING GROUND PROFILE AND FORM OF CONSTRUCTION OF EXISTING WORKS VARIES ALONG THE FRONTAGE. REFERENCE SHOULD BE MADE TO THE WORKS INFORMATION AND THE SITE INFORMATION TO UNDERSTAND THIS VARIABILITY.

SAFETY, HEALTH AND ENVIRONMENT INFORMATION
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS:
CONSTRUCTION • UXO RISK IS MODERATE. • DEMOLITION OF EXISTING STRUCTURES. • CONSTRUCTING EARTH EMBANKMENTS ALONG THE LINE OF HIGH VOLTAGE ELECTRICITY AND TELECOMMUNICATIONS CABLES. • THERE IS A RISK OF ENCOUNTERING ASBESTOS WITHIN THE MADE GROUND.
MAINTENANCE/CLEANING/OPERATION • NONE
DECOMMISSIONING/DEMOLITION • UXO RISK IS MODERATE. • THERE IS A RISK OF ENCOUNTERING ASBESTOS WITHIN THE MADE GROUND.

REV	DATE	DESCRIPTION	BY	CHK	APP
A	13.04.15	FOR CONSTRUCTION	BJR	AP	AP
T1	18.12.14	TENDER ISSUE	AIK	RWW	APL

REVISIONS

CLIENT/PARTNERSHIP

EASTERN SOLENT COASTAL PARTNERSHIP

Portsmouth City Council

Environment Agency

PROJECT

NORTH PORTSEA ISLAND (PHASE 1) COASTAL FLOOD AND EROSION RISK MANAGEMENT SCHEME

TITLE

TYPE 'B' EMBANKMENT AND ROCK REVETMENT TYPICAL SECTION

Bums House, Harlands Road
Haywards Heath, RH16 1PG
Tel +44(0)1444 458551
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Royal HaskoningDHV
Enhancing Society Together

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DATE	SCALE AT A1	REF.
Dec. 2014	AS SHOWN	PB2761-1106.dwg

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REVISION A

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Appendix F:

Information for Habitat Regulations Assessment (HRA) – Phase 2 only

Chapter 8 of the ES summarised the International and European environmental designations that could be impacted by the full North Portsea Island Flood Cell 4 scheme. At the overall scheme level, a HRA has been developed, to demonstrate that 'in combination', the entire scheme is deliverable and compliant with the 'Habitats Directive' and Birds Directive'.

Natural England and the MMO have reviewed the scheme level HRA and concluded that the entire scheme proposal is likely to lead to an environmentally acceptable solution. This conclusion was based on the outline scheme design detail, and therefore with each phase of works, detailed 'Information for HRA' will be provided to confirm that this conclusion stands as permissions and approvals are sought.

The Scheme level HRA is included as Appendix C, and the letters of support for the HRA are included as Appendix K. This 'Information for Habitats Regulations Assessment' sub chapter will only consider the Phase 2 works. Refer to Appendix C for wider scheme impacts.

1 Introduction to the Scheme

As discussed in Chapter 4 of the ES (Section 4.3.5.4 for Great Salterns Quay and Sections 4.3.6 for Milton Common), the urgently required Phase 2 works includes the removal of Great Salterns Quay and construction works extending south at Milton Common, as illustrated by Figure 1.3. They will deliver the adopted strategic policy of 'Hold the Line' for this section of the coastline, as set out in Chapter 2 of the ES. The proposed works will protect significant numbers of people, property and assets from flooding and erosion.

2 Habitats Regulations Assessment

This sub chapter provides the information required to enable the competent authorities to determine the implications of the proposed Phase 2 CFERM works on the designated European nature conservation interests.

The HRA is structured so as to present a view as to whether the proposed Phase 2 CFERM scheme works will, either alone or in-combination with other plans or projects, be likely to have a significant effect on relevant designated European nature conservation interests and the objectives that apply to these interests. The following information is provided to guide the assessment process:

- **A brief overview of the HRA process and methodology for assessment;**

- **Information on the proposed Phase 2 CFERM works;**
- **Background information regarding relevant European sites, interest features and population levels along the scheme frontage;**
- **Assessment of Impacts and Likely Significant Effects; and**
- **In-combination Impacts, Summary and Conclusion.**

3 Overview of the HRA process and methodology for assessment

3.1 Overview of the Habitat Regulations

The 'Habitats Directive' (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) protects habitats and species of European nature conservation importance. Together with Council Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive'), the Habitats Directive establishes a network of internationally important sites designated for their ecological status. Special Areas of Conservation [SACs] and Sites of Community Importance [SCIs] are designated under the Habitats Directive and promote the protection of flora, fauna and habitats. Special Protection Areas [SPAs] are designated under the Birds Directive in order to protect rare, vulnerable and migratory birds. These sites combine to create a Europe-wide 'Natura 2000' network of designated sites; hereafter referred to as 'European sites'.

In the United Kingdom, the Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations') incorporate all SPAs into the definition of European sites and, consequently, the protections afforded to European sites under the Habitats Directive apply to SPAs designated under the Birds Directive.

In addition to sites designated under European nature conservation legislation, United Kingdom Government policy (ODPM Circular 06/2005) states that internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them.

Regulation 61 of the Habitats Regulations defines the procedure for the assessment of the implications of plans or projects on European sites. Under this Regulation, if a proposed development is unconnected with site management and is likely to significantly affect the designated site, the competent authority must undertake an 'appropriate assessment' (Regulation 61(1)).

3.2 The Phase 2 works Habitat Regulations Assessment Process

The proposed Phase 2 works has been assessed in the following way under the Habitat Regulations:

Step 1, Screening: The process to identify the likely impacts of the project upon a European site and it's interest features, either alone or in combination with other plans and projects, and consider whether the impacts are likely to be significant.

This was undertaken between June and August 2014, with a joint scoping opinion received from PCC and the MMO on 20th August 2014, which has guided this ES and the information contained within this chapter.

Step 2, Habitat Regulations Assessment: The consideration of the impacts on the integrity of the European site, either alone or in combination with other plans and projects, with regard to the site's structure and function and its conservation objectives. Where there are adverse impacts, an assessment of mitigation options is carried out to determine adverse effect on the integrity of the site. If these mitigation measures cannot avoid adverse effects then development consent can only be given if an Appropriate Assessment [AA] and Imperative Reasons of Overriding Public Interest [IROPI] stages are followed.

This Chapter of the ES comprises the 'Information for Habitats Regulations Assessment' for the Phase 2 works, to enable the Competent Authority to conclude whether the Phase 2 works will have a 'Likely Significant Effect' on the SAC, SPA and Ramsar sites. Following the mitigation presented, this Chapter will conclude that the Phase 2 works will not have a 'Likely Significant Effect on the SAC, SPA and Ramsar, and that an AA and IROPI stage will not be required.

4 Background to the proposed Phase 2 works

To avoid repetition, please refer to Chapter 4 of the ES, which provides details on the proposed scheme. Sections 4.3.5.4 for Great Salterns Quay and 4.3.6 for Milton Common describes the Phase 2 works in detail, and Section 4.4 confirms details on Phase 2 works access, construction compounds and general delivery information.

5 Background information regarding relevant European Sites

The Phase 2 works are directly adjacent to the following International and European designated sites, the impacts upon which this 'Information for the HRA' is based (refer to Tables 9.1 to 9.5, which contain information on the qualifying features of these designated sites, and Chapter 8):

- **Chichester and Langstone Harbours SPA (Table 9.1);**
- **Chichester and Langstone Harbours Ramsar (Table 9.2 and 9.3);**
- **Solent Maritime SAC (Table 9.4 and 9.5).**

Figure 1.1 illustrates the location of the Phase 2 works in relation to these sites.

As set out in Chapter 8.12 of the ES, focused data collection and site surveys have been undertaken along the Phase 2 scheme frontage, to confirm the presence and population levels of species that could be impacted by this scheme.

These scheme specific surveys have assessed:

- **The species concerned;**
- **The species population levels at the site affected by the proposal.**

This Information for HRA Chapter (Table 9.6 in particular):

- **Assesses the direct and indirect effects of the Phase 2 works on the species present;**
- **Provides full details of any mitigation or compensation required;**
- **Concludes whether the impact is acceptable and / or licensable.**

Table 9.1 Chichester and Langstone Harbours SPA site qualification information

Site qualification criteria	Qualifying details
This site qualifies under Article 4.1 of the Birds Directive by supporting populations of European importance of species listed on Annex I of the Directive	During the breeding season the area regularly supports
	Little tern, *Sterna albifrons* - 100 pairs representing up to 4.2% of the GB breeding population (5 year mean, 1992-1996).
	Common tern, *Sterna hirundo* - 33 pairs representing up to 0.3% of the

Site qualification criteria	Qualifying details
	GB breeding population (5 year mean, 1992-1996).
	Sandwich tern, *Sterna sandvicensis* - 31 pairs representing up to 0.2% of the GB breeding population (5 year mean, 1993-1997).
	Over Winter the area regularly supports
	Bar-tailed godwit, Limosa lapponica – 1,692 individuals representing up to 3.2% of the GB breeding population (5 year peak mean, 1991/92-1995/96).
This site also qualifies under Article 4.2 of the Directive (79/409/EEC). Over winter the area regularly supports:	**Northern pintail, *Anas acuta* – 330 individuals representing 1.2% of the GB population (5 year peak mean 1991/92 – 1995/96).**
	Northern shoveler, *Anas clypeata* – 100 individuals representing 1.% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Eurasian teal, *Anas crecca* – 1,824 individuals representing 0.5% of the North-western Europe population (5 year peak mean 1991/92 – 1995/96).
	Eurasian wigeon, *Anas penelope* – 2,055 individuals representing 0.7% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Ruddy Turnstone, *Arenaria interpres* – 430 individuals representing 0.7% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Dark-bellied Brent Goose, *Branta bernicla bernicla* – 17,119 individuals representing 5.7% of the Western Siberia/Western Europe population (5 year peak mean 1991/92 – 1995/96).
	Sanderling, *Calidris alba* – 236 individuals representing 0.2% of the Eastern Atlantic/Western & Southern

Site qualification criteria	Qualifying details
	Africa - wintering population (5 year peak mean 1991/92 – 1995/96).
	Dunlin, *Calidris alpina alpina* – 44,294 individuals representing 3.2% of the Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/92 – 1995/96).
	Common Ringed Plover, *Charadrius hiaticula* – 846 individuals representing 3% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Red-breasted merganser, *Mergus serrator* – 297 individuals representing 3% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Eurasian Curlew, *Numenius arquata* – 1,861 individuals representing 1.6% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Grey Plover, *Pluvialis squatarola* – 3,825 individuals representing 2.3% of the Eastern Atlantic - wintering population (5 year peak mean 1991/92 – 1995/96).
	Common Shelduck, *Tadorna tadorna* – 2,410 individuals representing 3.3% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Common Redshank, *Tringa totanus* – 1,788 individuals representing 3.% of the GB population (5 year peak mean 1991/92 – 1995/96).

Site qualification criteria	Qualifying details
The area qualifies under Article 4.2 of the Birds Directive by regularly supporting at least 20,000 waterfowl.	Over winter, the area regularly supports 93,230 individual waterfowl (5 year peak mean 01/04/1998) including: Wigeon *Anas penelope*, Bar-tailed Godwit Limosa lapponica, Dark-bellied Brent Goose *Branta bernicla bernicla,* Common Ringed Plover *charadrius hiaticula*, Grey Plover *Pluvialis squatarola*, Dunlin *Calidris alpina alpina*, Redshank Tringa tetanus, Shelduck *Tadorna tadorna*, Curlew *Numenius arquata*, Teal *Anas crecca*, Pintail *Anas acuta*, Shoveler *Anas clypeata*, Red-breasted Merganser *Mergus serrator*, Ruddy turnstone Arenaria interpres, Sanderling *Calidris alba*.

Table 9.2 Chichester and Langstone Harbours Ramsar site qualification information

Ramsar Criterion	Qualifying details	
Ramsar criterion 1 - a representative, rare, or unique example of a natural or near-natural wetland type	Two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes.	
Ramsar criterion 5 – regularly supports 20,000 or more water birds	Assemblages of international importance:	
	Species with peak counts in winter: 76480 waterfowl (5 year peak mean 1998/99-2002/2003)	
Ramsar criterion 6 – species / populations occurring at levels of international importance	Qualifying species / populations occurring at levels of international importance	Number of individuals (5 yr peak mean 1998/9-2002/3
	Peak counts spring/autumn	
	Ringed plover, *Charadrius hiaticula*	853 individuals, representing an average

Ramsar Criterion	Qualifying details	
		of 1.1% of the population
	Black-tailed godwit, *Limosa limosa islandica*	906 individuals, representing an average of 2.5% of the population
	Common redshank, *Tringa totanus totanus*	2577 individuals, representing an average of 1% of the population
	Peak counts winter	
	Dark-bellied Brent goose, *Branta bernicla bernicla*	12987 individuals, representing an average of 6% of the population
	Common shelduck, *Tringa totanus totanus*	1468 individuals, representing an average of 1.8% of the GB population
	Grey plover, *Pluvialis squatarola*	3043 individuals, representing an average of 1.2% of the population
	Dunlin, *Calidris alpina alpina*	33436 individuals, representing an average of 2.5% of the population
	During the breeding season (species identified for possible future consideration under criterion 6)	
	Little tern, *Sterna albifrons albifrons*	130 apparently occupied nests, representing an average of 1.1% of the breeding population

Table 9.3 Species of national importance present in Portsmouth Harbour Ramsar site

Species currently occurring at levels of national importance	Peak counts (5 year peak mean 1998/9- 2002/3)
During the breeding season	
Mediterranean gull *Larus melanocephalus*	47 apparently occupied nests, representing an average of 43.5%

Species currently occurring at levels of national importance	Peak counts (5 year peak mean 1998/9- 2002/3)
	of the GB population
Black-headed gull *Larus ridibundus*	3180 apparently occupied nests, representing an average of 2.4% of the GB population
Common tern *Sterna hirundo hirundo*	127 apparently occupied nests, representing an average of 1.2% of the GB population
Spring/autumn	
Little egret	224 individuals, representing an average of 13.5% of the GB population
Eurasian oystercatcher	3403 individuals, representing an average of 1% of the GB population
Whimbrel *Numenius phaeopus,*	192 individuals, representing an average of 6.4% of the GB population
Eurasian curlew *Numenius arquata arquata*	3108 individuals, representing an average of 2.1% of the GB population
Spotted redshank *Tringa erythropus*	6 individuals, representing an average of 4.4% of the GB population
Common greenshank *Tringa nebularia*	215 individuals, representing an average of 36% of the GB population
Ruddy turnstone ,*Arenaria interpres interpres*	569 individuals, representing an average of 1.1% of the GB population
Winter	
Little grebe	131 individuals, representing an average of 1.6% of the GB population
Black-necked grebe *Podiceps nigricollis nigricollis*	14 individuals, representing an average of 11.6% of the GB population
Great bittern, *Botaurus stellaris*	1 individuals, representing an

Species currently occurring at levels of national importance	Peak counts (5 year peak mean 1998/9- 2002/3)
stellaris	**average of 1% of the GB population**
Eurasian teal	**2226 individuals, representing an average of 1.1% of the GB population**
Red-breasted merganser *Mergus serrator*	**306 individuals, representing an average of 3.1% of the GB population**
Water rail *Rallus aquaticus*	**12 individuals, representing an average of 2.6% of the GB population**
Bar-tailed godwit	**1189 individuals, representing an average of 1.9% of the GB population**
Higher Plants: Polypogon monspeliensis, Zostera angustifolia, Zostera marina, Zostera noltei.	

Table 9.4 Annex I habitats that are a primary reason for the selection of this site as an SAC

Annex I habitats that are a primary reason for the selection of this site	Habitat details
Estuaries	**The Solent and its inlets are unique in Britain and Europe for their hydrographic regime of four tides each day, and for the complexity of the marine and estuarine habitats present within the area.**
Spartina sward *Spartinion maritimae*	**Solent Maritime is the only site for smooth cord-grass *Spartina alterniflora* in the UK and is one of only two sites where significant amounts of small cord-grass *S. maritima* are found.**
Atlantic salt meadow (*Glauco-Puccinellietalia maritimae*)	**The Solent contains the second-largest aggregation of Atlantic salt meadows in south and south-west England, notable as being representative of the ungrazed type and supporting a range of communities dominated by sea-purslane *Atriplex portulacoides*, common sea-lavender**

Annex I habitats that are a primary reason for the selection of this site	Habitat details
	Limonium vulgare **and thrift** ***Armeria maritime*****.**

Table 9.5 Annex I habitats and Annex II species present that are not a primary reason for the selection of this site as an SAC

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
Sandbanks which are slightly covered by sea water all the time
Salicornia and other annuals colonizing mud and sand
Mudflats and sandflats not covered by seawater at low tide
Coastal lagoons (a priority feature)
Annual vegetation of drift lines
Perennial vegetation of stony banks
"Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")"
Annex II species present as a qualifying feature, but not a primary reason for site selection
Desmoulin`s whorl snail *Vertigo moulinsiana*

6 Assessment of Likely Significant Effects

6.1 Summary

This section assesses the impacts of the Phase 2 works on the adjacent SAC, SPA and Ramsar site and their interest features. It then identifies any necessary site-specific mitigation measures, concluding whether there is any resultant Likely Significant Effect [LSE].

6.2 Summary of Impact Assessment process

Section 9.4 has summarised the proposed Phase 2 works (removal of Great Salterns Quay and construction works at Milton Common). Section 9.5 has summarised the European sites and their interest features that could be impacted by the scheme and the species population levels at this site.

This Section (Table 9.6 in particular), assesses any impacts that the works could have on the European site's interest features. Where

impacts have been identified, mitigation has been confirmed, to demonstrate how the impact would be addressed during construction.

Following the identification of mitigation measures, the assessment summarises whether any LSE is expected, as information for the HRA, to advise the Competent Authority.

The Phase 2 works are not directly connected with, or necessary for the management of the site for nature conservation, however failure to maintain the defences could result in uncontrolled pollution incidents from the potentially contaminated land it protects, and loss of important terrestrial habitats landward of the existing defence.

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Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 2 Works – Information for the HRA					
Impact No.	**Potential impact of scheme on SPA, SAC and Ramsar sites.**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect (LSE) after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)**
1.	Coastal Squeeze loss of 11.69ha of intertidal habitat caused by sea level rise and delivery of the strategic policy option of 'Hold the Line' from the nationally adopted PICSS and North Solent SMP. This results from the full Flood Cell 4 scheme, not just Phase 2 works, but the Phase 2 works contributes to this overall figure.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in Section 9.5.	Mitigation not possible, however impact compensated through the EA's Regional Habitat Creation Programme (RHCP). This has enabled delivery of the Medmerry Managed Realignment scheme, providing new intertidal habitat in the North Solent SMP region to compensate the coastal squeeze losses.	Yes, this will cause a LSE on the identified SPA, SAC and Ramsar site, as no mitigation is available. Compensation through the RHCP will maintain the overall integrity of the Natura 2000 network of environmental sites.	No, as IROPI case already made and accepted at the strategic level (PICSS). For further information on this impact see Note 1 below this table.
2.	Impacts on water quality during construction due to pollution incidents from construction machinery.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in Section 9.5.	A Construction and Environmental Management Plan (CEMP) is being prepared for the construction contract, and will form a legally binding contract to ensure best practice working. Machinery working on, or adjacent to the foreshore will use biologically degradable hydraulic oils. All re-fuelling to be undertaken away from the foreshore. Chemicals stored outside the designated site boundaries, in the nearby compounds will be appropriately bunded. These avoidance measures are confirmed within the Water Framework Directive (WFD) Assessment.	No LSE, as avoidance measures are built into the construction contract to ensure best-practice working and minimise risks. These avoidance measures will be legally binding.	No, as the avoidance measures will prevent impacts resulting in no LSE.
3.	Opening up new pathways between potentially contaminated land sources, landward of the proposed defences and environmental receptors.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in Section 9.5.	An intrusive ground investigation has been undertaken at Great Salterns Quay, the results of which are presented in Chapter 16 (Ground Conditions and Land Quality). These results will advise construction activities and final design details for the Phase 2 works. Excavation is required during the removal of Great Salterns Quay. Should the intrusive investigation identify the presence of contaminants that exceed tolerable levels as guided by the regulating authorities, this excavated material will be disposed of at fully licensed land based sites and not reused in the construction of the new defences, or disposed of at sea. If the excavated material is found to be suitable i.e. does not exceed tolerable	No LSE, as the construction contract will be advised by the intrusive ground investigation surveys of the site to ensure that no pathways are established. Methods will be agreed with the Local Planning Authority's Contaminated Land Officer prior to works commencing. The avoidance methods highlighted will prevent this impact. Through improved coastal defences, the water bodies and wider receptors will be protected from uncontrolled pollution incidents that could occur.	No, as the potential impact has been controlled through the avoidance measures identified. Additional protection to the potentially contaminated land sites along this frontage will benefit the SAC, SPA and Ramsar site longer term.

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 2 Works – Information for the HRA					
Impact No.	**Potential impact of scheme on SPA, SAC and Ramsar sites.**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect (LSE) after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)**
			levels as guided by the regulating authorities, this material will be used in the construction of the new earth bunds at Milton Common. **There will be limited excavation during the construction of the new rock revetment at the foreshore of Milton Common, with existing rock to be used within the new structure. Where new material is required to be imported, this will be certified clean material, suitable for the construction of the proposed works. This will cap any existing, undisturbed contaminated land and prevent any contaminant pathways becoming established.** **The intrusive results are included in Chapter 16 of the ES.**		
4.	**Increased suspended sediments within the water body during construction (including potentially contaminated sediments).**	**Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in Section 9.5.** **Specific impacts could occur to:** ➢ **Fish Species, as the harbours are nursery grounds for bass, tope shark, plaice, sole, thornback Rays and lemon sole. The harbours also support spawning grounds for cod, sandeel, sole, lemon sole and sprat;** ➢ **Seagrass Beds, which are present within the wider harbours;** ➢ **Commercial Molluscan shellfish, including the Native Oyster (*O. edulis)* and hard shell clam (*M.mercenaria)*, which are present within the wider harbours.** ➢ **Marine mammals and birds that feed on the above.**	**Construction works will be undertaken at low tide. Therefore there is limited potential for significant increases in suspended sediments within the water body. Increases will be minimal, localised and temporary and expected to have minimal impact on the overall water body of the harbour, due to dilution factors.** **The working footprint within the intertidal area will be strictly controlled via a CEMP and the construction contract to ensure a maximum access footprint of 10m along the Milton Common Frontage, and 20m around Great Salterns Quay. Direct disturbance to the foreshore sediments will be minimal and in discrete locations at any one time, from access of machinery and excavation around the existing toe of the defence.** **Due to the presence of eelgrass beds in the wider harbour, silt curtains will be deployed around the working area, to prevent disturbed sediments (that become suspended at high tide) migrating into the wider harbour and sensitive areas.**	**No LSE expected on fish, the eelgrass beds or the commercial shellfish, due to the minimal, localised and temporary nature of the works and the control measures that will be implemented, which remove the impact. Therefore marine mammals and birds will retain their food sources.**	**No, as no LSE expected due to avoidance measures adopted.**

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 2 Works – Information for the HRA					
Impact No.	**Potential impact of scheme on SPA, SAC and Ramsar sites.**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect (LSE) after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)**
5.	**Indirect impacts on intertidal Benthic communities during construction (through disturbance).**	**Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC;** **Specific impacts could occur to:** ➢ **Mudflat faunal communities;** ➢ **Species including *Hydrobia ulvae*;** ➢ **Bird and fish species that feed on these micro-fauna.**	**The working footprint within the intertidal area will be strictly controlled via a CEMP and the construction contract to ensure a maximum access footprint of 10m along the Milton Common frontage and 20m around Great Salterns Quay. Direct disturbance to the foreshore sediments will be minimal and in discrete locations at any one time, from access of machinery and excavation around the existing toe of the defence.** **These areas are close to the heavily accessed footpaths and roads and disturbance is generally high. Therefore this habitat is not as well utilised by birds as the wider harbours, which will remain uninterrupted. As the works are to be undertaken outside of sensitive times for birds (not during overwintering periods), the impact of the works on food availability is further reduced.** **Along a 125m length of the foreshore, a temporary hard route may be required, however this is within the 10m working area. Any materials used for its construction will be removed on completion of the works. This would impact shingle habitat on the foreshore.**	**No LSE expected, as any disturbance to the narrow intertidal working area will be minimal, temporary, and made good following works. For this reason the area will quickly recover post works with no longer-term impacts in the less sensitive bird feeding areas in the immediate footprint and shading of the existing defences. The CEMP, as a legally binding element of the construction contract will advise the works to prevent this short term localised impact.**	**No, as no LSE expected due to avoidance measures adopted.**
6.	**Impacts on intertidal vegetation during construction. Direct losses of intertidal vegetation from machine access to foreshore and removal of existing defence structures, which contain colonies of intertidal vegetation.**	**Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC.** **Intertidal vegetation species including:** • **Cord-grass salt marsh (although well away from survey area)** • **Very limited small remnant patches of vegetated shingle consisting of: sea sandwort and sea rocket community** • ***Elytrigia atherica* saltmarsh**	**A Phase 2 intertidal vegetation survey has been completed (see Chapter 8) to confirm which species are present within the existing coastal defence structure itself, and the working footprint for the scheme where disturbance will occur. This survey concluded that most of the rare and scarce species of the vegetation are outside of the direct scheme working areas. The survey identified that there is no eelgrass *Zostera spp.* within the survey area.** **During previous intertidal vegetation surveys (September 2007), a single plant of**	**Disturbance to the intertidal areas cannot be avoided entirely, however, the new coastal defence structure presents opportunities for natural recolonisation of species (some of which are nationally scarce), which are currently present adjacent to the works site, so this is considered a benefit, as highlighted within the survey.** **Further annual monitoring of the recolonisation of the new defence structures will be undertaken by**	**No, whilst there will be unavoidable shorter term impacts on localised areas of the vegetation, mitigation will minimise these impacts, and provide opportunities for additional colonisation by intertidal vegetation.**

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 2 Works – Information for the HRA					
Impact No.	**Potential impact of scheme on SPA, SAC and Ramsar sites.**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect (LSE) after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)**
			the Nationally Scarce slender hare's ear was identified at the north-eastern end of Milton Common. This species was not recorded during the survey carried out by HBIC in September 2015, but the habitat in this location is suitable. **Very limited patches of cord-grass *Spartina anglica* saltmarsh area present offshore, although well away from the existing defence structure and not within the 20m area surveyed. Due to the distance of this vegetation from the area of works, and the firm nature of the substrate (mostly shingle and sand), impacts are considered to be negligible.** **There are very small remnant patches of vegetated shingle present along the eastern side of Milton Common SINC. This vegetation is considered to be similar to sea sandwort *Honkenya peploides* – sea rocket *Cakile maritime* community, consisting almost exclusively of *Atriplex prostrata, Atriplex littoralis and Beta vulgaris* ssp. *Maritime. Elytrigia atherica* saltmarsh is present alongside the existing defence, as well as on the landward side and is considered to be the vegetation community most likely to develop post works.** **We will work with our contractors in attempt to ensure that imported materials are Japanese Knotweed free where possible, to avoid the on-going cost and problems which stem from accidental introduction of this problematic species.**	**experienced ecologists, to confirm its success. This will recommend whether any reseeding is required longer term (although this is considered unlikely). These surveys will continue until satisfied that recolonisation has been a success. Such information will guide future phases of the scheme.**	
7.	**Impacts on Protected Species**	• **Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC and surrounding terrestrial habitats;** • **In particular, bats, badgers, breeding birds, reptiles and**	**An extended Phase 1 habitat Survey and Phase 2 reptile survey have been undertaken (See chapter 8) in the areas affected by the proposed works, to identify any impacts on protected species. It identified the following potential impacts:**	**The proposed mitigation is in line with the recommendations of the Extended Phase 1 Habitat Survey and Phase 2 Reptile Survey (discussed in Chapter 8 of the ES). As a result, upon completion of the**	**No, as no LSE expected due to mitigation measures adopted.**

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 2 Works – Information for the HRA					
Impact No.	**Potential impact of scheme on SPA, SAC and Ramsar sites.**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect (LSE) after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)**
		invertebrates.	Breeding birds: the proposed removal of scrub vegetation has high potential to destroy and disturb bird's nests if undertaken during the breeding bird season. This habitat is present throughout the landward extent of Milton Common. Mitigation: Clearance will be undertaken outside the bird nesting season (prior to March '16). Clearance for the Phase 2 works commenced in early October 2015. If further vegetation clearance is required in the breeding bird season (March 2016 onwards) the area requiring removal will be carefully examined by an ecologist, however if nests are found, clearance would not be permitted. Reptiles and amphibians: Slow worms and common lizards are present directly landward of the works (and within the working footprint). The three waterbodies are considered to be unsuitable for amphibians due to the brackish nature of them; however Habitat Suitability Index [HSI] assessments were undertaken for each to establish the suitability of the ponds for Great Crested Newts. All three waterbodies were assessed as being of poor suitability. Mitigation: Mitigation will be completed in line with the recommendations of the Phase 2 Reptile Survey (See Chapter 8 of ES). Due to the relatively limited area of direct impact, and a full translocation of species is not necessary. Any reptiles encountered throughout the works will be removed by hand and placed into retained habitat. Features to be removed include scrub, brambles and grassland habitats located landward. Invertebrates: the survey area contains no records of rare / notable species although impact to invertebrates at the very local	mitigation measures, no LSE is expected.	

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 2 Works – Information for the HRA					
Impact No.	**Potential impact of scheme on SPA, SAC and Ramsar sites.**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect (LSE) after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)**
			scale is inevitable. It is considered that the long term impacts to invertebrate populations (which are generally resilient to frequent disturbance) will be negligible. Mitigation: No detailed invertebrate surveys are considered necessary. Replanting of semi-natural vegetation post works is considered to be the most effective approach to invertebrate conservation. Amphibians:		
8.	Noise / vibration disturbance to overwintering birds, marine mammals and terrestrial fauna during construction.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC. ➢ In particular, overwintering bird species listed within the European site's interest features (listed in Section 9.5). ➢ Marine mammals (in particular Grey and Common Seals, with a haul out site within Langstone Harbour.	Construction works will result in additional noise above background levels, as set out in Chapter 14 of the ES. The construction programme for the Phase 2 works runs from May '16 – October '16, which avoids the overwintering bird period (the most sensitive time for birds where disturbance would be a significant issue). Whilst common and grey seals frequent Langstone Harbour, their haul out site is a significant distance from this frontage, south towards Great Salterns Quay. Disturbance at this distance is unlikely. There is the potential that piling may be required during this phase of works to stabilise the existing wall behind Great Salterns Quay (this will become known post demolition of the Quay). However, piling (if required) will be minimal and undertaken at low tide to prevent impacts within the water body. To commence construction works in May, some terrestrial vegetation has required clearance, to remove its potential suitability for nesting birds in advance of the main works. This commenced in October 2015, before the over wintering bird period, therefore avoiding the sensitive bird period. Only small hand operated machinery has	Due to the avoidance measures identified (avoiding the sensitive bird overwintering periods), the construction contract will prevent disturbance to sensitive receptors. Activities are localised and temporary and will take place in phases, therefore leaving vast areas free from disturbance at any one time. It is therefore not expected that there will be any LSE on the interest features present.	No, as no LSE expected due to avoidance measures adopted.

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 2 Works – Information for the HRA					
Impact No.	**Potential impact of scheme on SPA, SAC and Ramsar sites.**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect (LSE) after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)**
			been used to clear vegetation along the coastal strip. Clearance landward of the coastal strip i.e. behind the Milton Ponds away from the SPA has been completed using a flail machine due to the density of the vegetation present and distance from sensitive receptors. The noise assessment that has been completed for this scheme (Chapter 14 of the ES) considered the impacts of vegetation clearance. This assessment concluded that impacts on birds from the proposed vegetation clearance will be minimal, as response by birds, due to this noise is unlikely.		
9.	Generation of dust during construction and from stock piled materials.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC. In particular, overwintering bird species listed within the European site's interest features and intertidal vegetation (listed in Section 9.5).	The works along this frontage involve the import of material, which will initially be stored in one of the site compounds. To prevent issues with dust, sprinklers may be used during prolonged dry periods to ensure that when it's worked on site, dust will not become an issue. Similar sprinkler systems may be required where excavating on site, as advised by the client and site supervisor.	Due to the avoidance measures that can be implemented, no LSE will occur.	No, as no LSE expected due to avoidance measures adopted.
10.	Visual disturbance from movement of construction vehicles and staff / improved access to the foreshore / displacement of recreational users during construction resulting in indirect habitat losses.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC. In particular, overwintering bird species listed within the European site's interest features (see Section 4).	Construction works will result in additional visual disturbance above background levels. The construction programme for the Phase 2 works runs from May '16 to October '16, which avoids the overwintering bird period (the most sensitive time for birds where disturbance would be a significant issue). To commence construction works in May '16, some terrestrial vegetation will require clearance, to remove its potential suitability for nesting birds in advance of the main works. It is anticipated the clearance will be undertaken during October 2015, before the over wintering bird period, therefore avoiding the most sensitive time for birds.	Due to the avoidance measures identified (avoiding the sensitive bird overwintering periods), the construction contract will prevent disturbance to sensitive receptors. Activities are localised and temporary and will take place in phases, therefore leaving vast areas free from disturbance at any one time. It is therefore not expected that there will be any LSE on the interest features present. The egress steps are not expected to increase access/disturbance over and above the existing situation. Two days were spent on site week	No, as no LSE expected due to avoidance measures adopted.

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 2 Works – Information for the HRA					
Impact No.	**Potential impact of scheme on SPA, SAC and Ramsar sites.**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect (LSE) after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)**
			Vegetation adjacent to the SPA, SAC and Ramsar will be removed using hand tools only, and not large machinery, so any visual impact is considered minor. **Access for the Phase 2 works (adjacent to the SPA, SAC and Ramsar will remain similar to the existing access. Currently there are two main access points along the Milton Common frontage. In addition, informal access is available along the complete frontage. Access will be significantly reduces along the majority of the frontage, however two egress steps have been designed for health and safety purposes. It is not considered that these egress steps will enhance access over what's already available.** **Access along this frontage (adjacent to the SPA, SAC and Ramsar site will remain similar to the existing access, and therefore no additional disturbance is expected over and above the existing situation. As the works are to be completed outside of the sensitive overwintering period, and significant displacement of recreation users is unlikely, additional impacts from displacement are not expected.**	**commencing the 5th October, to understand site use, and this demonstrated that although users of the Common currently have good access to the foreshore, very few users actually venture onto the foreshore, therefore reducing overall access area is not expected to lead to more people using the foreshore. See Chapter 18, which contains a summary of the user surveys.**	
11.	**In-combination impacts from other activities within / adjacent to the European designated sites.**	**Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC and supporting habitats listed in Section 4.**	**As discussed in Chapter 19 of the ES, and the scheme level HRA (ES Appendix D), other potential activities that could impact the European sites have been identified.** **The scheme itself has been phased, to ensure any disturbance is localised and short-term, so that if displacement of species occurs, there will be areas of the wider harbours free of disturbance.** **Scheme level impacts, as set out within this HRA are minimal, due to the mitigation that will be adopted. Therefore there is no LSE of the scheme that could have an 'in-**	**For the reasons provided no LSE of 'in combination impacts' is expected.**	**No, as no LSE expected due to mitigation / avoidance measures adopted.**

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 2 Works – Information for the HRA					
Impact No.	**Potential impact of scheme on SPA, SAC and Ramsar sites.**	**European sites / interest features impacted**	**Mitigation / avoidance methods**	**Likely Significant Effect (LSE) after mitigation**	**Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)**
			combination' impact with wider activities in the harbour, as the impacts have been dealt with satisfactorily at the scheme level.		
12	Creation of new intertidal mud flat habitat through removal of the Great Salterns Quay structure and through localised realignment of defences.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features.	This provides mitigation habitat for future phases of the full North Portsea Island scheme, however it will result in an overall net gain of habitat which will be quantified in full as later phases of the scheme progress.	This mitigation prevents LSE's of future phases of the scheme and will provide additional habitat over what's existing.	No, as no LSE expected.

Note 1: Due to the calculated coastal squeeze losses, an AA was completed for the Strategy. This concluded that because of the calculated coastal squeeze losses, implementation of the Strategy would have an adverse effect on the environmentally designated sites. The AA also concluded that there is justification for these adverse effects, as there were no alternative policy options to HTL, and an over-riding public need to protect life and property on Portsea Island.

For this reason an Imperative Reasons of Overriding Public Interest [IROPI] statement of case was made, which concluded that environmental compensation for 'holding the line' would be achieved through the Regional Habitat Creation Programme [RHCP]. The RHCP promotes the realignment of defences elsewhere in the Solent (including Medmerry) to create new intertidal habitats and compensate for the coastal squeeze losses identified within the North Solent Shoreline Management Plan [SMP] and Coastal Strategies. The RHCP will help maintain the integrity of the European sites. The IROPI case was signed off by Defra on 5th April 2011, allowing the PICSS Strategy to be adopted and these schemes to be progressed. Letters of support were also provided from the Environment Agency and Natural England in relation to the RHCP. These letters are attached to the ES as Appendix D. Therefore, whilst this policy will result in a Likely Significant Effect on the European sites, this has been assessed and accepted at the strategic level.

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7 Conclusions

Are the Phase 2 works proposals likely to have a significant effect 'alone or in-combination' on the Chichester and Langstone Harbour SPA and Ramsar site, and the Solent Maritime SAC?

Due to the avoidance and control measures that will be adopted during construction, and the mitigation opportunities that have been identified, it is not anticipated that there will be a long term Likely Significant Effect on the European sites as a result of the Phase 2 works delivery at North Portsea Island – alone, or 'in-combination'.

The proposed scheme is supported by the North Solent SMP, the Portsea Island Coastal Strategy Study and is considered to be the most environmentally sound, viable option as a result of a rigid options appraisal process.

Through the above impact assessment (Table 9.6) and working closely with regulators, we do not foresee any LSE, and potentially some environmental benefit to the European sites from the delivery of Phase 2 of the North Portsea Island CFERM scheme.

Based on this overall scheme conclusion, we do not believe an additional scheme level Appropriate Assessment, or IROPI Statement of case is required, above the Strategic level case. Therefore the Phase 2 scheme can be delivered to protect people, property, infrastructure and the environment from flooding and erosion.

Figure 1.1 Location of the Phase 2 scheme in relation to the SAC, SPA, Ramsar and SSSI sites

Portsmouth CITY COUNCIL

Appendix G:

Information for Habitat Regulations Assessment (HRA) – Phase 1 only

Chapter 8 of the ES (Phase 1) summarised the International and European environmental designations that could be impacted by the full North Portsea Island Flood Cell 4 scheme. At the overall scheme level, a HRA has been developed, to demonstrate that 'in combination', the entire scheme is deliverable and compliant with the 'Habitats Directive' and Birds Directive'.

Natural England and the MMO have reviewed the scheme level HRA and concluded that the entire scheme proposal is likely to lead to an environmentally acceptable solution. This conclusion was based on the outline scheme design detail, and therefore with each phase of works, detailed 'Information for HRA' will be provided to confirm that this conclusion stands as permissions and approvals are sought.

The Scheme level HRA is included as Appendix D, and the letters of support for the HRA are included as Appendix J. This 'Information for Habitats Regulations Assessment' sub chapter **will only consider the Phase 1 Scheme**. Refer to Appendix D for wider scheme impacts.

1 Introduction to the Scheme

As discussed in Chapter 4 of the ES (Sections 4.3.2.5 to 4.3.2.9), the urgently required Phase 1 works extend east from the Ports Creek Railway Bridge to Kendall's Wharf Northern Boundary, as illustrated by Figure 1.4. They will deliver the adopted strategic policy of 'Hold the Line' for this section of the coastline, as set out in Chapter 2 of the ES. The proposed works will protect significant numbers of people, property and assets from flooding and erosion.

2 Habitats Regulations Assessment

This sub chapter provides the information required to enable the competent authorities to determine the implications of the proposed Phase 1 CFERM scheme on the designated European nature conservation interests.

The HRA is structured so as to present a view as to whether the proposed Phase 1 CFERM scheme will, either alone or in-combination with other plans or projects, be likely to have a significant effect on relevant designated European nature conservation interests and the objectives that apply to these interests. The following information is provided to guide the assessment process:

- A brief overview of the HRA process and methodology for assessment;
- Information on the proposed Phase 1 CFERM Scheme;
- Background information regarding relevant European sites, interest features and population levels along the scheme frontage;

- Assessment of Impacts and Likely Significant Effects; and
- In-combination Impacts, Summary and Conclusion.

3 Overview of the HRA process and methodology for assessment

3.1 Overview of the Habitat Regulations

The 'Habitats Directive' (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) protects habitats and species of European nature conservation importance. Together with Council Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive'), the Habitats Directive establishes a network of internationally important sites designated for their ecological status. Special Areas of Conservation (SACs) and Sites of Community Importance (SCIs) are designated under the Habitats Directive and promote the protection of flora, fauna and habitats. Special Protection Areas (SPAs) are designated under the Birds Directive in order to protect rare, vulnerable and migratory birds. These sites combine to create a Europe-wide 'Natura 2000' network of designated sites; hereafter referred to as 'European sites'.

In the United Kingdom, the Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations') incorporate all SPAs into the definition of European sites and, consequently, the protections afforded to European sites under the Habitats Directive apply to SPAs designated under the Birds Directive.

In addition to sites designated under European nature conservation legislation, United Kingdom Government policy (ODPM Circular 06/2005) states that internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them.

Regulation 61 of the Habitats Regulations defines the procedure for the assessment of the implications of plans or projects on European sites. Under this Regulation, if a proposed development is unconnected with site management and is likely to significantly affect the designated site, the competent authority must undertake an 'appropriate assessment' (Regulation 61(1)).

3.2 The Phase 1 Scheme Habitat Regulations Assessment Process

The proposed Phase 1 Scheme has been assessed in the following way under the Habitat Regulations:

Step 1, Screening: The process to identify the likely impacts of the project upon a European site and it's interest features, either alone or in combination with other plans and projects, and consider whether the impacts are likely to be significant.

This was undertaken between June and August 2014, with a joint scoping opinion received from PCC and the MMO on 20th August 2014, which has guided this ES and the information contained within this chapter.

Step 2, Habitat Regulations Assessment: The consideration of the impacts on the integrity of the European site, either alone or in combination with other plans and projects, with regard to the site's structure and function and its conservation objectives. Where there are adverse impacts, an assessment of mitigation options is carried out to determine adverse effect on the integrity of the site. If these mitigation measures cannot avoid adverse effects then development consent can only be given if an Appropriate Assessment (AA) and Imperative Reasons of Overriding Public Interest (IROPI) stages are followed.

This Chapter of the ES comprises the 'information for Habitats Regulations Assessment' for the Phase 1 scheme, to enable the Competent Authority to conclude whether the Phase 1 scheme will have a 'Likely Significant Effect' on the SAC, SPA and Ramsar sites. Following the mitigation presented, this Chapter will conclude that the Phase 1 scheme will not have a 'Likely Significant Effect on the SAC, SPA and Ramsar, and that an AA and IROPI stage will not be required.

4 Background to the proposed Phase 1 Scheme

To avoid repetition, please refer to Chapter 4 of the ES, which provides details on the proposed scheme. Sections 4.3.2.5 to 4.3.2.9 describe the Phase 1 scheme in detail, and Section 4.4.1 to 4.6 confirm details on Phase 1 scheme's access, construction compounds and general delivery information.

5 Background information regarding relevant European Sites.

The Phase 1 scheme is directly adjacent to the following International and European designated sites, the impacts upon which this 'Information for the HRA' is based (refer to Tables 9.1 to 9.5, which contain information on the qualifying features of these designated sites, and Chapter 8):

- Chichester and Langstone Harbours SPA (Table 9.1);
- Chichester and Langstone Harbours Ramsar (Table 9.2 and 9.3);

- Solent Maritime SAC (Table 9.4 and 9.5).

Figure 1.1 illustrates the location of the Phase 1 scheme in relation to these sites.

As set out in Chapter 8.12 of the ES, focused data collection and site surveys have been undertaken along the Phase 1 scheme frontage, to confirm the presence and population levels of species that could be impacted by this scheme.

These scheme specific surveys have assessed:
- The species concerned;
- The species population levels at the site affected by the proposal.

This Information for HRA Chapter (Table 9.6 in particular):
- Assesses the direct and indirect effects of the Phase 1 scheme on the species present;
- Provides full details of any mitigation or compensation required;
- Concludes whether the impact is acceptable and / or licensable.

Table 9.1 Chichester and Langstone Harbours SPA site qualification information

Site qualification criteria	Qualifying details
This site qualifies under Article 4.1 of the Birds Directive by supporting populations of European importance of species listed on Annex I of the Directive	**During the breeding season the area regularly supports**
	Little tern, *Sterna albifrons* - 100 pairs representing up to 4.2% of the GB breeding population (5 year mean, 1992-1996).
	Common tern, *Sterna hirundo* - 33 pairs representing up to 0.3% of the GB breeding population (5 year mean, 1992-1996).
	Sandwich tern, *Sterna sandvicensis* - 31 pairs representing up to 0.2% of the GB breeding population (5 year mean, 1993-1997).
	Over Winter the area regularly supports
	Bar-tailed godwit, Limosa lapponica – 1,692 individuals representing up to 3.2% of the GB breeding population (5 year peak mean, 1991/92-1995/96).

Site qualification criteria	Qualifying details
This site also qualifies under Article 4.2 of the Directive (79/409/EEC). Over winter the area regularly supports:	Northern pintail, *Anas acuta* – 330 individuals representing 1.2% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Northern shoveler, *Anas clypeata* – 100 individuals representing 1.% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Eurasian teal, *Anas crecca* – 1,824 individuals representing 0.5% of the North-western Europe population (5 year peak mean 1991/92 – 1995/96).
	Eurasian wigeon, *Anas penelope* – 2,055 individuals representing 0.7% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Ruddy Turnstone, *Arenaria interpres* – 430 individuals representing 0.7% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Dark-bellied Brent Goose, *Branta bernicla bernicla* – 17,119 individuals representing 5.7% of the Western Siberia/Western Europe population (5 year peak mean 1991/92 – 1995/96).
	Sanderling, *Calidris alba* – 236 individuals representing 0.2% of the Eastern Atlantic/Western & Southern Africa - wintering population (5 year peak mean 1991/92 – 1995/96).
	Dunlin, *Calidris alpina alpina* – 44,294 individuals representing 3.2% of the Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/92 – 1995/96).
	Common Ringed Plover, *Charadrius hiaticula* – 846 individuals representing 3% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Red-breasted merganser, *Mergus serrator* – 297 individuals representing 3% of the GB population (5 year peak mean 1991/92 – 1995/96).

Site qualification criteria	Qualifying details
	Eurasian Curlew, *Numenius arquata* – 1,861 individuals representing 1.6% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Grey Plover, *Pluvialis squatarola* – 3,825 individuals representing 2.3% of the Eastern Atlantic - wintering population (5 year peak mean 1991/92 – 1995/96).
	Common Shelduck, *Tadorna tadorna* – 2,410 individuals representing 3.3% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Common Redshank, *Tringa totanus* – 1,788 individuals representing 3.% of the GB population (5 year peak mean 1991/92 – 1995/96).
The area qualifies under Article 4.2 of the Birds Directive by regularly supporting at least 20,000 waterfowl.	Over winter, the area regularly supports 93,230 individual waterfowl (5 year peak mean 01/04/1998) including: Wigeon *Anas penelope*, Bar-tailed Godwit Limosa lapponica, Dark-bellied Brent Goose *Branta bernicla bernicla,* Common Ringed Plover *charadrius hiaticula*, Grey Plover *Pluvialis squatarola*, Dunlin *Calidris alpina alpina*, Redshank Tringa tetanus, Shelduck *Tadorna tadorna*, Curlew *Numenius arquata*, Teal *Anas crecca*, Pintail *Anas acuta*, Shoveler *Anas clypeata*, Red-breasted Merganser *Mergus serrator*, Ruddy turnstone Arenaria interpres, Sanderling *Calidris alba*.

Table 9.2 Chichester and Langstone Harbours Ramsar site qualification information

Ramsar Criterion	Qualifying details
Ramsar criterion 1 - a representative, rare, or unique example of a natural or near-	Two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes.

Ramsar Criterion	Qualifying details	
natural wetland type		
Ramsar criterion 5 – regularly supports 20,000 or more water birds	**Assemblages of international importance:**	
	Species with peak counts in winter: 76480 waterfowl (5 year peak mean 1998/99-2002/2003)	
Ramsar criterion 6 – species / populations occurring at levels of international importance	**Qualifying species / populations occurring at levels of international importance**	**Number of individuals (5 yr peak mean 1998/9-2002/3**
	Peak counts spring/autumn	
	Ringed plover, *Charadrius hiaticula*	853 individuals, representing an average of 1.1% of the population
	Black-tailed godwit, *Limosa limosa islandica*	906 individuals, representing an average of 2.5% of the population
	Common redshank, *Tringa totanus totanus*	2577 individuals, representing an average of 1% of the population
	Peak counts winter	
	Dark-bellied Brent goose, *Branta bernicla bernicla*	12987 individuals, representing an average of 6% of the population
	Common shelduck, *Tringa totanus totanus*	1468 individuals, representing an average of 1.8% of the GB population
	Grey plover, *Pluvialis squatarola*	3043 individuals, representing an average of 1.2% of the population
	Dunlin, *Calidris alpina alpina*	33436 individuals, representing an average of 2.5% of the population
	During the breeding season (species identified for possible future consideration under criterion 6)	
	Little tern, *Sterna albifrons albifrons*	130 apparently occupied nests, representing an average of 1.1% of the breeding population

Table 9.3 Species of national importance present in Portsmouth Harbour Ramsar site

Species currently occurring at levels of national importance	Peak counts (5 year peak mean 1998/9- 2002/3)
During the breeding season	
Mediterranean gull *Larus melanocephalus*	47 apparently occupied nests, representing an average of 43.5% of the GB population
Black-headed gull *Larus ridibundus*	3180 apparently occupied nests, representing an average of 2.4% of the GB population
Common tern *Sterna hirundo hirundo*	127 apparently occupied nests, representing an average of 1.2% of the GB population
Spring/autumn	
Little egret	224 individuals, representing an average of 13.5% of the GB population
Eurasian oystercatcher	3403 individuals, representing an average of 1% of the GB population
Whimbrel *Numenius phaeopus,*	192 individuals, representing an average of 6.4% of the GB population
Eurasian curlew *Numenius arquata arquata*	3108 individuals, representing an average of 2.1% of the GB population
Spotted redshank *Tringa erythropus*	6 individuals, representing an average of 4.4% of the GB population
Common greenshank *Tringa nebularia*	215 individuals, representing an average of 36% of the GB population
Ruddy turnstone ,*Arenaria interpres interpres*	569 individuals, representing an average of 1.1% of the GB population
Winter	
Little grebe	131 individuals, representing an average of 1.6% of the GB population
Black-necked grebe *Podiceps nigricollis nigricollis*	14 individuals, representing an average of 11.6% of the GB

Species currently occurring at levels of national importance	Peak counts (5 year peak mean 1998/9- 2002/3)
	population
Great bittern, *Botaurus stellaris stellaris*	1 individuals, representing an average of 1% of the GB population
Eurasian teal	2226 individuals, representing an average of 1.1% of the GB population
Red-breasted merganser *Mergus serrator*	306 individuals, representing an average of 3.1% of the GB population
Water rail *Rallus aquaticus*	12 individuals, representing an average of 2.6% of the GB population
Bar-tailed godwit	1189 individuals, representing an average of 1.9% of the GB population
Higher Plants: Polypogon monspeliensis, Zostera angustifolia, Zostera marina, Zostera noltei.	

Table 9.4 Annex I habitats that are a primary reason for the selection of this site as an SAC

Annex I habitats that are a primary reason for the selection of this site	Habitat details
Estuaries	The Solent and its inlets are unique in Britain and Europe for their hydrographic regime of four tides each day, and for the complexity of the marine and estuarine habitats present within the area.
Spartina sward *Spartinion maritimae*	Solent Maritime is the only site for smooth cord-grass *Spartina alterniflora* in the UK and is one of only two sites where significant amounts of small cord-grass *S. maritima* are found.
Atlantic salt meadow (*Glauco-Puccinellietalia maritimae*)	The Solent contains the second-largest aggregation of Atlantic salt meadows in south and south-west England, notable as being representative of the ungrazed type and supporting a range of communities dominated by sea-purslane *Atriplex*

Annex I habitats that are a primary reason for the selection of this site	Habitat details
	portulacoides, common sea-lavender *Limonium vulgare* and thrift *Armeria maritime*.

Table 9.5 Annex I habitats and Annex II species present that are not a primary reason for the selection of this site as an SAC

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
Sandbanks which are slightly covered by sea water all the time
Salicornia and other annuals colonizing mud and sand
Mudflats and sandflats not covered by seawater at low tide
Coastal lagoons (a priority feature)
Annual vegetation of drift lines
Perennial vegetation of stony banks
"Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")"
Annex II species present as a qualifying feature, but not a primary reason for site selection
Desmoulin`s whorl snail *Vertigo moulinsiana*

6 Assessment of Likely Significant Effects

6.1 Summary

This section assesses the impacts of the Phase 1 scheme on the adjacent SAC, SPA and Ramsar site and their interest features. It then identifies any necessary site-specific mitigation measures, concluding whether there is any resultant Likely Significant Effect (LSE).

6.2 Summary of Impact Assessment process

Section 9.4 has summarised the proposed Phase 1 scheme. Section 9.5 has summarised the European sites and their interest features that could be impacted by the scheme and the species population levels at this site.

This Section (Table 9.6 in particular), assesses any impacts that the scheme could have on the European site's interest features. Where impacts have been identified, mitigation has been confirmed, to demonstrate how the impact would be addressed during construction.

Following the identification of mitigation measures, the assessment summarises whether any LSE is expected, as information for the HRA, to advise the Competent Authority.

The Phase 1 scheme is not directly connected with, or necessary for the management of the site for nature conservation, however failure to maintain the defences could result in uncontrolled pollution incidents from the potentially contaminated land it protects, and loss of important terrestrial habitats landward of the existing defence.

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 1 Scheme – Information for the HRA					
Impact No.	Potential impact of scheme on SPA, SAC and Ramsar sites.	European sites / interest features impacted	Mitigation / avoidance methods	Likely Significant Effect (LSE) after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)
1.	Coastal Squeeze loss of 11.69ha of intertidal habitat caused by sea level rise and delivery of the strategic policy option of 'Hold the Line' from the nationally adopted PICSS and North Solent SMP. This results from the full Flood Cell 4 scheme, not just Phase 1, but Phase 1 contributes to this overall figure.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in Section 9.5.	Mitigation not possible, however impact compensated through the EA's Regional Habitat Creation Programme (RHCP). This has enabled delivery of the Medmerry Managed Realignment scheme, providing new intertidal habitat in the North Solent SMP region to compensate the coastal squeeze losses.	Yes, this will cause a LSE on the identified SPA, SAC and Ramsar site, as no mitigation is available. Compensation through the RHCP will maintain the overall integrity of the Natura 2000 network of environmental sites	No, as IROPI case already made and accepted at the strategic level (PICSS). For further information on this impact see Note 1 below this table.
2.	Impacts on water quality during construction due to pollution incidents from construction machinery.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in Section 9.5.	A Construction and Environmental Management Plan (CEMP) is being prepared for the construction contract, and will form a legally binding contract to ensure best practice working. Machinery working on, or adjacent to the foreshore will use biologically degradable hydraulic oils. All re-fuelling to be undertaken away from the foreshore. Chemicals stored outside the designated site boundaries, in the nearby compounds will be appropriately bunded. These avoidance measures are confirmed within the Water Framework Directive (WFD) Assessment.	No LSE, as avoidance measures are built into the construction contract to ensure best-practice working and minimise risks. These avoidance measures will be legally binding.	No, as the avoidance measures will prevent impacts resulting in no LSE.
3.	Opening up new pathways between potentially contaminated land sources, landward of the proposed defences and environmental receptors.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in Section 9.5.	An intrusive ground investigation has been undertaken along the Phase 1 frontage, the results of which are presented in Chapter 16 of the ES (Ground Conditions and Land Quality). These results will advise construction activities and final design details for this scheme. There will be limited excavation during the construction of the new defences, as earth banks are being increased in height, with the import of certified clean material, suitable for the construction of the proposed banks. This will cap any existing, undisturbed contaminated land and prevent any contaminant pathways becoming established. Where excavation is required, should the intrusive investigation identify the presence of contaminants that exceed tolerable levels as guided by the regulating authorities, this excavated material will be disposed of at fully licensed land based sites and not reused in the construction of the	No LSE, as the construction contract will be advised by the intrusive ground investigation surveys of the site to ensure that no pathways are established. Methods will be agreed with the Local Planning Authority's Contaminated Land Officer prior to works commencing. The avoidance methods highlighted will prevent this impact. Through improved coastal defences, the water bodies and wider receptors will be protected from uncontrolled pollution incidents that could occur.	No, as the potential impact has been controlled through the avoidance measures identified. Additional protection to the potentially contaminated land sites along this frontage will benefit the SAC, SPA and Ramsar site longer term.

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 1 Scheme – Information for the HRA					
Impact No.	Potential impact of scheme on SPA, SAC and Ramsar sites.	European sites / interest features impacted	Mitigation / avoidance methods	Likely Significant Effect (LSE) after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)
			new defences, or disposed of at sea. The intrusive investigation results are included in Chapter 16 of the ES.		
4.	Localised pollution of the water body, through the remobilisation, dispersal or redistribution of potentially contaminated sediments at the toe of the existing defences.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in Section 9.5. Specific impacts could occur to: ➢ Fish Species, as the harbours are nursery grounds for bass, tope shark, plaice, sole, thornback Rays and lemon sole. The harbours also support spawning grounds for cod, sandeel, sole, lemon sole and sprat; ➢ Seagrass Beds, which are present within the wider harbours; ➢ Commercial Molluscan shellfish, including the Native Oyster (*O. edulis)* and hard shell clam (*M.mercenaria)*, which are present within the wider harbours. ➢ Marine mammals and birds that feed on the above.	Intertidal sediment sampling has been undertaken, where localised disturbance of the marine sediments will occur during construction, directly at the toe of the existing defence line. This sampling was undertaken at the time of the intrusive ground investigation discussed in Action 3. The sediment sampling results are presented in Chapter 16 of the ES. As can be seen within Chapter 16, the sediment contaminants detected are considered to be within a manageable range. For numerous reasons, disturbance to the intertidal sediments will be minor, and extremely localised. The sediments will only be interfered with where there is no other option, and the absolute maximum working footprint for access reasons is 10m seaward of the toe of the new defence line, which is a requirement of the construction contract and recorded in the CEMP. Due to the presence of Eelgrass Beds, seaward of this phase of works, silt curtains will be deployed to prevent any suspended sediments migrating seaward and interfering with this important habitat (see impact 5). This will also prevent any sediment particles carrying potential contaminants migrating beyond the localised area of works where they originated. Given the extent of the wider water body, any localised, uncontrollable dispersal of sediment will be rapidly diluted. Planned works require no intertidal sediments will be added or removed from the foreshore, just temporarily worked during construction. All works will take place at low tide and therefore direct suspension of sediment particles will be minimal as a result of these works.	No LSE, as the construction contract will be advised by the intertidal sediment sampling surveys of the site, minimising disturbance through the avoidance methods highlighted. Methods will be agreed with the Local Planning Authority's Contaminated Land Officer prior to works commencing.	No, as the potential impact has been controlled through the avoidance measures identified.
5.	Increased suspended	Chichester and Langstone Harbour	Construction works will be undertaken at low	No LSE expected on fish, the eelgrass	No, as no LSE expected due to

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 1 Scheme – Information for the HRA					
Impact No.	Potential impact of scheme on SPA, SAC and Ramsar sites.	European sites / interest features impacted	Mitigation / avoidance methods	Likely Significant Effect (LSE) after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)
	sediments within the water body during construction.	SPA and Ramsar; Solent Maritime SAC, with their associated interest features, listed in Section 9.5. Specific impacts could occur to: ➢ Fish Species, as the harbours are nursery grounds for bass, tope shark, plaice, sole, thornback Rays and lemon sole. The harbours also support spawning grounds for cod, sandeel, sole, lemon sole and sprat; ➢ Seagrass Beds, which are present within the wider harbours; ➢ Commercial Molluscan shellfish, including the Native Oyster (*O. edulis)* and hard shell clam (*M.mercenaria)*, which are present within the wider harbours. ➢ Marine mammals and birds that feed on the above.	tide. Therefore there is limited potential for significant increases in suspended sediments within the water body. Increases will be minimal, localised and temporary and expected to have minimal impact on the overall water body of the harbour, due to dilution factors. The working footprint within the intertidal area will be strictly controlled via a CEMP and the construction contract to ensure a maximum access footprint of 15m. Direct disturbance to the foreshore sediments will be minimal and in discrete locations at any one time, from access of machinery and excavation around the existing toe of the defence. Due to the presence of eelgrass beds in the wider harbour, silt curtains will be deployed around the working area, to prevent disturbed sediments (that become suspended at high tide) migrating into the wider harbour and sensitive areas.	beds or the commercial shellfish, due to the minimal, localised and temporary nature of the works and the control measures that will be implemented, which remove the impact. Therefore marine mammals and birds will retain their food sources.	avoidance measures adopted.
6.	Indirect impacts on intertidal Benthic communities during construction (through disturbance).	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC; Specific impacts could occur to: ➢ Mudflat faunal communities; ➢ Species including *Hydrobia ulvae*; ➢ Bird and fish species that feed on these micro-fauna.	The working footprint within the intertidal area will be strictly controlled via a CEMP and the construction contract to ensure a maximum access footprint of 15m. Direct disturbance to the foreshore sediments will be minimal and in discrete locations at any one time, from access of machinery and excavation around the existing toe of the defence. These areas are close to the heavily accessed footpaths and roads and disturbance is generally high. Therefore this habitat is not as well utilised by birds as the wider harbours, which will remain uninterrupted. As the works are to be undertaken outside of sensitive times for birds (not during overwintering periods), the impact of the works on food availability is further reduced.	No LSE expected, as any disturbance to the narrow intertidal working area will be minimal, temporary, and made good following works. For this reason the area will quickly recover post works with no longer-term impacts in these less sensitive bird feeding areas in the immediate footprint and shading of the existing defences. The CEMP, as a legally binding element of the construction contract will advise the works to prevent this short term localised impact.	No, as no LSE expected due to avoidance measures adopted.
7.	Impacts on intertidal vegetation during construction. Direct losses of	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime	A phase 2 intertidal vegetation survey has been completed (see chapter 8) to confirm which species are present within the existing	We cannot entirely prevent disturbance to the intertidal vegetation during construction, however the phase 2	No, whilst there will be unavoidable shorter term impacts on localised areas of

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 1 Scheme – Information for the HRA					
Impact No.	Potential impact of scheme on SPA, SAC and Ramsar sites.	European sites / interest features impacted	Mitigation / avoidance methods	Likely Significant Effect (LSE) after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)
	intertidal vegetation from machine access to foreshore and removal of existing defence structures, which contain colonies of intertidal vegetation.	SAC. Intertidal vegetation species including: • *Inula crithmoides* (golden samphire); • Sea-purslane dominated salt-marsh; • Common Cord-grass and Sea-purslane dominated salt-marsh.	coastal defence structure itself, and the working footprint for the scheme where disturbance will occur. This survey identified that most of the rare and scarce species of vegetation are outside of the direct scheme working areas. Some of the rare species adjacent to the works could benefit from the scheme, where species such as Slender hare's ear and Sea wormwood could later colonise the new coastal defence surfaces created. A significant population of nationally scarce (but locally abundant) Golden Samphire will be lost during the works, however it is expected that this will re-establish on the new defence structures, quickly spreading back from nearby populations on the north side of the channel and along the spit. For one rare species, Spiny restharrow, relocation will take place, because it is considered unlikely to recolonise the sea defences after the works are complete. This will be achieved under the guidance of an experienced ecologist, where the existing population will be temporarily relocated and then returned to an appropriate position, once works have been completed. There is the potential for a significant impact on two localised areas of intertidal vegetation at the base of the existing defence structures: • Sea-purslane dominated salt-marsh on the northern shore of Hilsea Lines; • Common Cord-grass and Sea-purslane dominated salt-marsh on the seaward side of the north-western shore of Langstone Harbour. It will be possible to protect the majority of the Common cord-grass and sea-purslane dominated saltmarsh where it occurs, as the substrate is firm shingle and sand. Often there are gaps between the base of the defences	survey has identified sensitive areas and pointed towards mitigation that will reduce these impacts. The new coastal defence structure presents opportunities for natural recolonisation of species (some of which are nationally scarce), which are currently present adjacent to the works site, so this is considered a benefit, as highlighted within the survey. Further annual monitoring of the recolonisation of the new defence structures will be undertaken by experienced ecologists, to confirm its success. This will recommend whether any reseeding is required longer term (although this is considered unlikely). These surveys will continue until satisfied that recolonisation has been a success. Such information will guide future phases of the scheme.	the vegetation, mitigation will minimise these impacts, and provide opportunities for additional colonisation by intertidal vegetation.

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 1 Scheme – Information for the HRA					
Impact No.	Potential impact of scheme on SPA, SAC and Ramsar sites.	European sites / interest features impacted	Mitigation / avoidance methods	Likely Significant Effect (LSE) after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)
			and the saltmarsh, so the impact is manageable by placing strict controls on access routes on the foreshore during construction (these constraints will be included in the CEMP, guided by the Phase 2 vegetation survey results). There may be some unavoidable loss of this habitat during construction however, where it occurs on softer sediments. These losses will be minor, and are expected to recover following works. We will work with our contractors in attempt to ensure that imported materials are Japanese Knotweed free where possible, to avoid the on-going cost and problems which stem from accidental introduction of this problematic species.		
8.	Impacts on Protected Species	• Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC and surrounding terrestrial habitats; • In particular, bats, badgers, breeding birds, reptiles and invertebrates.	An extended Phase 1 habitat Survey and Phase 2 reptile survey have been undertaken (See chapter 8) in the areas affected by the proposed works, to identify any impacts on protected species. It identified the following potential impacts: Breeding birds: The proposed removal of scrub vegetation has high potential to destroy and disturb bird nests if undertaken during the breeding bird season. This habitat is present throughout the landward extent of the sea defence. Mitigation: Clearance will be undertaken outside the bird nesting season (prior to March '15). If this window is missed, the area requiring removal will be carefully examined by an ecologist, however if nests are found, clearance would not be permitted. Reptiles: Slow worms and common lizards are present directly landward of the scheme (and within the working footprint. Mitigation: Given the low numbers of slow-worms and common lizards recorded, persuasion of the reptiles into adjacent habitats through the removal of suitable features within the footprint of the works will be undertaken. Features to be removed include scrub and grassland habitats located landward. Mitigation will be completed	The proposed mitigation is in line with the recommendations of the Extended Phase 1 Habitat Survey and Phase 2 Reptile Survey (discussed in Chapter 8 of the ES). As a result, upon completion of the mitigation measures, no LSE is expected.	No, as no LSE expected due to mitigation measures adopted.

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 1 Scheme – Information for the HRA					
Impact No.	Potential impact of scheme on SPA, SAC and Ramsar sites.	European sites / interest features impacted	Mitigation / avoidance methods	Likely Significant Effect (LSE) after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)
			in line with the recommendations of Phase 2 Reptile Survey (See Chapter 8 of ES). Invertebrates: the protected species, 'white letter hairstreak', is present on the elm cultivars located within the footprint of the proposed works Mitigation: In order to avoid impacts on BAP priority species white letter hairstreak, the elm cultivars located within the footprint of the proposed works will be transplanted, where appropriate to other locations within the SINC. As part of the final detailed design process, we will actively seek opportunities to reduce the need for removal.		
9.	Noise / vibration disturbance to overwintering birds, marine mammals and terrestrial fauna during construction.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC. ➢ In particular, overwintering bird species listed within the European site's interest features (listed in Section 9.5). ➢ Marine mammals (in particular Grey and Common Seals, with a haul out site within Langstone Harbour.	Construction works will result in additional noise above background levels, as set out in Chapter 14 of the ES. The construction programme for this Phase 1 scheme runs from March '15 to October '15, which avoids the overwintering bird period (the most sensitive time for birds where disturbance would be a significant issue). Whilst common and grey seals frequent Langstone Harbour, their haul out site is a significant distance from this frontage, south towards Great Saltern's Quay. Disturbance at this distance is unlikely, as this phase involves minimal piling (excepting the Eastern Road Bridge abutments, which would be piled at low tide to prevent impacts within the water body). To commence construction works in March, some terrestrial vegetation will require clearance, to remove it's potential suitability for nesting birds in advance of the main scheme. Whilst this is within the sensitive period for overwintering birds, we will only small hand operated machinary to remove this vegetation, and install noise absorbing screening if the hand equipment generates noise levels that would be 69db or higher at the location of the receptor (overwintering birds). This advice has been provided by Natural England.	Due to the avoidance measures identified (avoiding the sensitive bird overwintering periods), the construction contract will prevent disturbance to sensitive receptors. Activities are localised and temporary and will take place in phases, therefore leaving vast areas free from disturbance at any one time. It is therefore not expected that there will be any LSE on the interest features present.	No, as no LSE expected due to avoidance measures adopted.

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 1 Scheme – Information for the HRA					
Impact No.	Potential impact of scheme on SPA, SAC and Ramsar sites.	European sites / interest features impacted	Mitigation / avoidance methods	Likely Significant Effect (LSE) after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)
			The noise assessment that has been completed for this scheme (Chapter 14 of the ES) considers this impact further, with mitigation recommendation. This assessment concluded that impacts on birds from the proposed vegetation clearance will be minimal, as response by birds, due to this noise is unlikely.		
10.	Generation of dust during construction and from stock piled materials.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC. In particular, overwintering bird species listed within the European site's interest features and intertidal vegetation (listed in Section 9.5).	The works along this frontage involve the import of material, which will initially be stored in one of the site compounds. To prevent issues with dust, sprinklers may be used during prolonged dry periods to ensure that when it's worked on site, dust will not become an issue. Similar sprinkler systems may be required where excavating on site, as advised by the client and site supervisor.	Due to the avoidance measures that can be implemented, no LSE will occur.	No, as no LSE expected due to avoidance measures adopted.
11.	Visual disturbance from movement of construction vehicles and staff / improved access to the foreshore / displacement of recreational users during construction resulting in indirect habitat losses.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC. In particular, overwintering bird species listed within the European site's interest features (see Section 4).	Construction works will result in additional visual disturbance above background levels. The construction programme for this Phase 1 scheme runs from March '15 to October '15, which avoids the overwintering bird period (the most sensitive time for birds where disturbance would be a significant issue). To commence construction works in March, some terrestrial vegetation will require clearance, to remove it's potential suitability for nesting birds. Whilst this is within the sensitive period for overwintering birds, only hand tools will be used for it's removal not large machinery, so any visual impact is considered minor. Access along this frontage (adjacent to the SPA, SAC and Ramsar site will remain similar to the existing access, and therefore no additional disturbance is expected over and above the existing situation. As the works are to be completed outside of the sensitive overwintering period, and significant displacement of recreation users is unlikely, additional impacts from displacement are not expected.	Due to the avoidance measures identified (avoiding the sensitive bird overwintering periods), the construction contract will prevent disturbance to sensitive receptors. Activities are localised and temporary and will take place in phases, therefore leaving vast areas free from disturbance at any one time. It is therefore not expected that there will be any LSE on the interest features present.	No, as no LSE expected due to avoidance measures adopted.

Table 9.6 Potential Impacts, Mitigation and Likely Significant Effects of the Proposed Phase 1 Scheme – Information for the HRA					
Impact No.	Potential impact of scheme on SPA, SAC and Ramsar sites.	European sites / interest features impacted	Mitigation / avoidance methods	Likely Significant Effect (LSE) after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest (AA / IROPI)
12.	In-combination impacts from other activities within / adjacent to the European designated sites.	Chichester and Langstone Harbour SPA and Ramsar; Solent Maritime SAC and supporting habitats listed in Section 4.	As discussed in Chapter 19 of the ES, and the scheme level HRA (ES Appendix D), other potential activities that could impact the European sites have been identified. The scheme itself has been phased, to ensure any disturbance is localised and short-term, so that if displacement of species occurs, there will be areas of the wider harbours free of disturbance. Scheme level impacts, as set out within this HRA are minimal, due to the mitigation that will be adopted. Therefore there is no LSE of the scheme that could have an 'in-combination' impact with wider activities in the harbour, as the impacts have been dealt with satisfactorily at the scheme level. As discussed in Impact 7, there will be a localised impact on intertidal vegetation, which will take time post works to recolonize the new defence structures and the working footprint. This relies on natural recolonisation from the vegetation either side of the scheme footprint. Should this adjacent intertidal vegetation require removal from any other project or activity, there could be an 'in combination' impact, however the project team are not aware of any such proposed activity. The on-going monitoring and surveys of this vegetation will identify any future issues, which could lead to re-seeding of the new defence structures.	For the reasons provided no LSE of 'in combination impacts' is expected.	No, as no LSE expected due to mitigation / avoidance measures adopted.

Note 1: Due to the calculated coastal squeeze losses, an AA was completed for the Strategy. This concluded that because of the calculated coastal squeeze losses, implementation of the Strategy would have an adverse effect on the environmentally designated sites. The AA also concluded that there is justification for these adverse effects, as there were no alternative policy options to HTL, and an over-riding public need to protect life and property on Portsea Island.

For this reason an Imperative Reasons of Overriding Public Interest (IROPI) statement of case was made, which concluded that environmental compensation for 'holding the line' would be achieved through the Regional Habitat Creation Programme (RHCP). The RHCP promotes the realignment of defences elsewhere in the Solent (including Medmerry) to create new intertidal habitats and compensate for the coastal squeeze losses identified within the North Solent Shoreline Management Plan (SMP) and Coastal Strategies. The RHCP will help maintain the integrity of the European sites. The IROPI case was signed off by Defra on 5th April 2011, allowing the PICSS Strategy to be adopted and these schemes to be progressed. Letters of support were also provided from the Environment Agency and Natural England in relation to the RHCP. These letters are attached to the ES as Appendix E. Therefore, whilst this policy will result in a Likely Significant Effect on the European sites, this has been assessed and accepted at the strategic level.

7 Conclusions

Is the Phase 1 scheme proposal likely to have a significant effect 'alone or in-combination' on the Chichester and Langstone Harbour SPA and Ramsar site, and the Solent Maritime SAC?

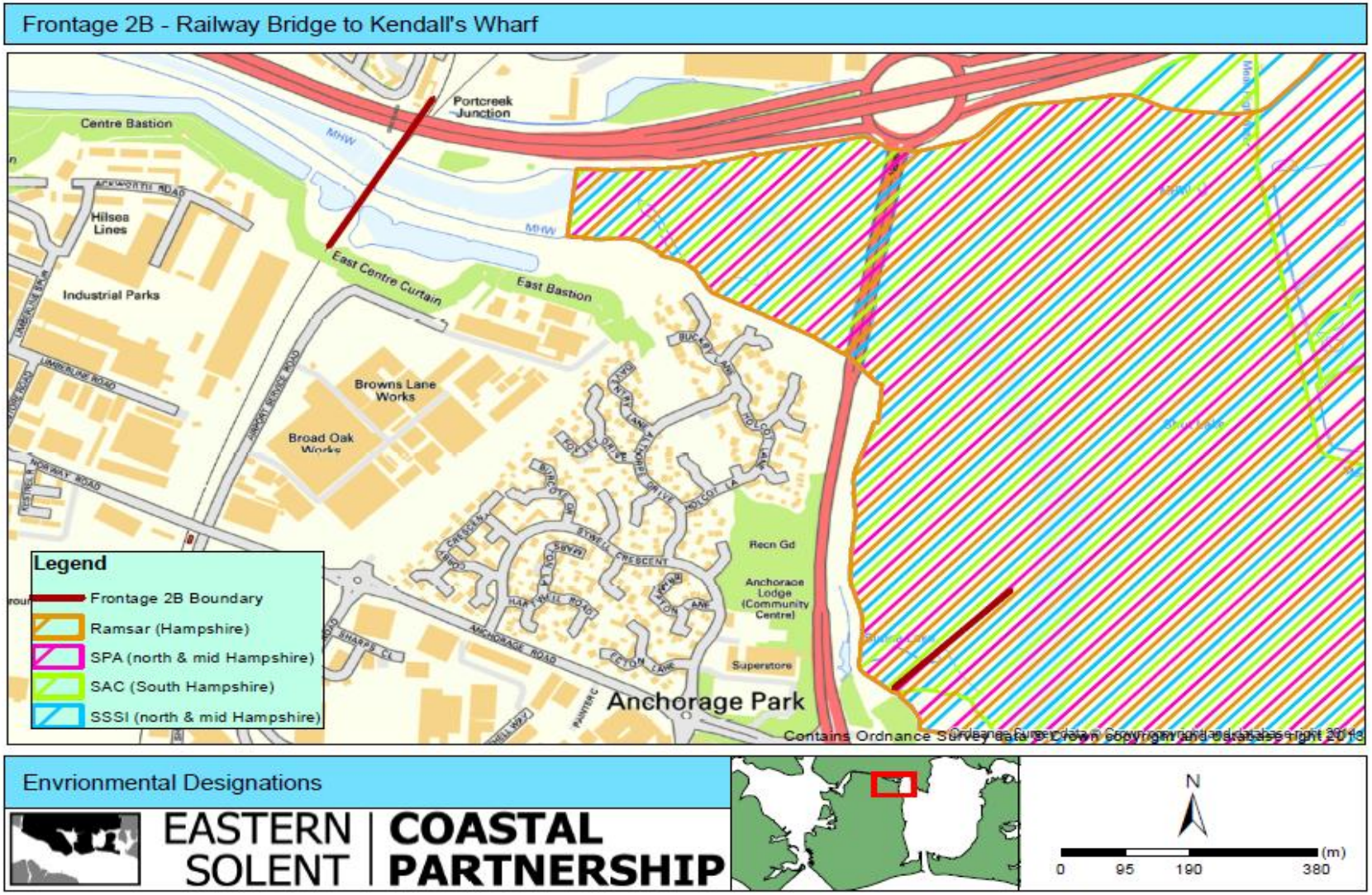
Due to the avoidance and control measures that will be adopted during construction, and the mitigation opportunities that have been identified, it is not anticipated that there will be a long term Likely Significant Effect on the European sites as a result of the Phase 1 Scheme delivery at North Portsea Island – alone, or 'in-combination'.

The proposed scheme is supported by the North Solent SMP, the Portsea Island Coastal Strategy Study and is considered to be the most environmentally sound, viable option as a result of a rigid options appraisal process.

Through the above impact assessment (Table 9.6) and working closely with regulators, we do not foresee any LSE, and potentially some environmental benefit to the European sites from the delivery of Phase 1 of the North Portsea Island CFERM scheme.

Based on this overall scheme conclusion, we do not believe an additional scheme level Appropriate Assessment, or IROPI Statement of case is required, above the Strategic level case. Therefore the Phase 1 scheme can be delivered to protect people, property, infrastructure and the environment from flooding and erosion.

Figure 1.1 Location of the Phase 1 scheme in relation to the SAC, SPA, Ramsar and SSSI sites



Appendix H:

The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) and Town and Country Planning (Environmental Impact Assessment) Regulations 2011: Scoping Opinion

The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) and

Town and Country Planning (Environmental Impact Assessment) Regulations 2011: Scoping Opinion

MMO Ref: MLP/2014/00181

PCC Ref: 14/00514/EIASCO

Date: 20th August 2014

Title: North Portsea Island Coastal Flood and Erosion Risk Management Scheme

Applicant: Eastern Solent Coastal Partnership

Address of applicant: Coastal Team, Havant Borough Council, Southmoor Depot & Offices, 2 Penner Road, Havant, PO9 1QH

Contents

1. Summary

The proposed coastal defence scheme at North Portsea is required urgently in order to ensure that people, properties, businesses, potentially contaminated land and other key assets behind the existing coastal defence are protected from extreme tidal flood events and coastal erosion.

2. Location

Portsea Island is located on the south coast of England, within Hampshire, lying between Portsmouth and Langstone Harbours. The Island is separated from the mainland by Ports Creek, and is crossed by a railway and several road / pedestrian bridges.

3. Background

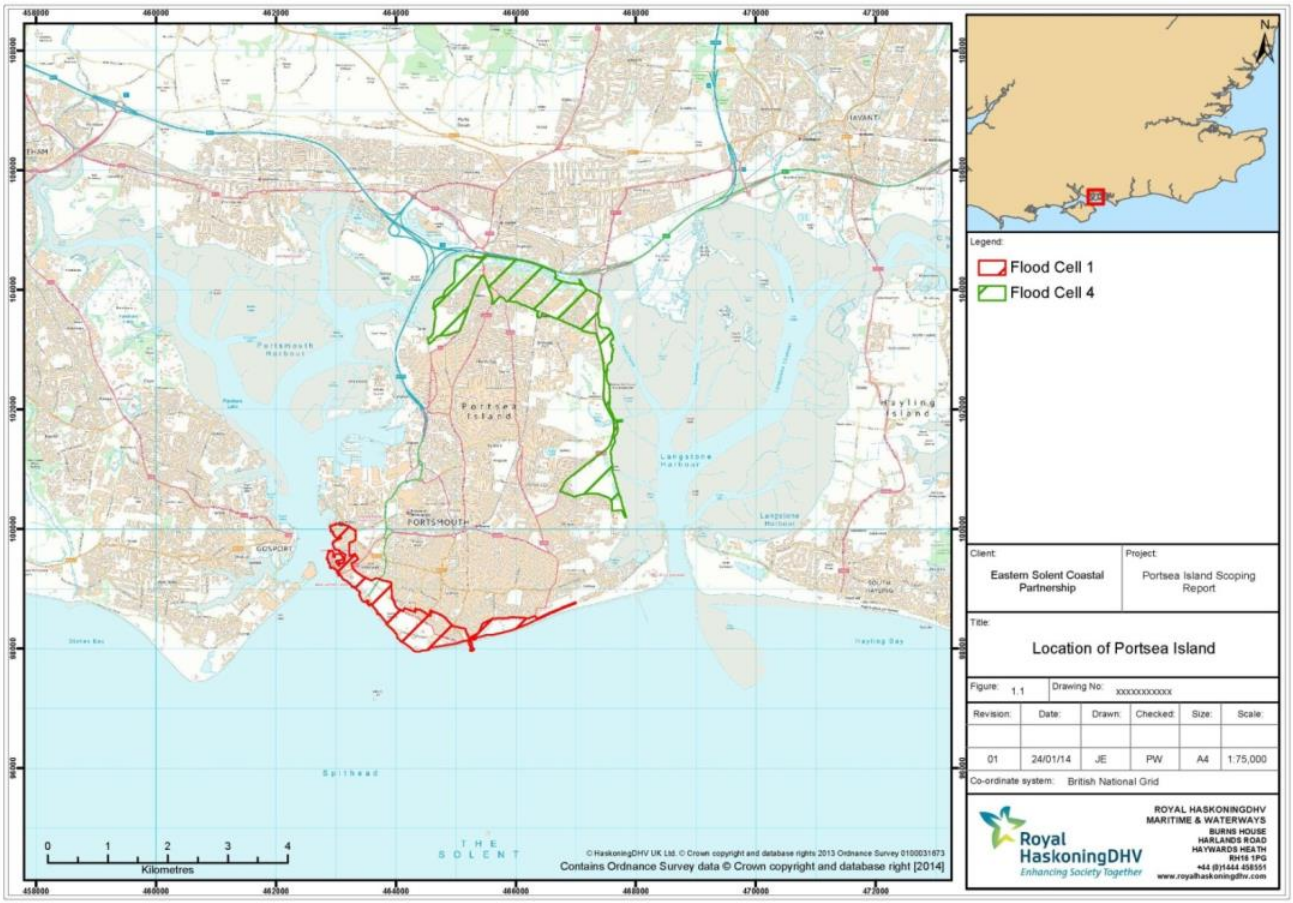
In May 2012, Defra approved the Portsea Island Coastal Strategy Study (ESCP, 2008) which identified that the City of Portsmouth is at significant risk of flooding and that coastal defence schemes in the following flood cells should be undertaken within the next 10 years. The project aims to help secure the future and heritage of the City of Portsmouth for the next 100 years and beyond by identifying, appraising and designing preferred Coastal Flood and Erosion Risk Management (CFERM) scheme options to protect the city from coastal flooding and erosion. The project is split into two separate Flood Cell's encompassing (**Figure 1**):

- Flood Cell 1: Southsea (Long Curtain Moat to the Royal Marine Museum);
- Flood Cell 4: North Portsea (The Mountbatten Centre to, and including Milton Common).

The outline designs for Flood Cell 1 and Flood Cell 4 are being progressed in parallel as part of a single overall project; however Flood Cell 4 is being progressed under an accelerated programme to ensure priority works can commence in 2015.

This document consists of the Marine Management Organisation (MMO, as Appropriate Authority) and Portsmouth City Council (PCC, as Local Planning Authority) joint Screening and Scoping Opinion for **Flood Cell 4** of the North Portsea Island CFERM Scheme.

Figure 1: The separate flood cells of Portsea Island



4. Proposal

The construction activities will be phased and programmed over a ten year period, due to the scale of the frontage (8.2km). The proposed coastal defence works would involve the refurbishment, consolidation or removal of existing structures and associated works. In some instances, redundant structures may also be removed, to re-establish mudflats for the benefit of the wider environment.

A number of different design options have been identified for **Flood Cell 4** these coordinate with the separate frontages (and phasing programme) shown in **Figures 2 & 3;** the main options considered include:

- Construction of the sea walls to a higher level;
- Building a flood embankment;
- Raising the crest level of the embankments;
- Raising the crest level of the sea walls;
- Replacing the existing sheet pile walls;

- Building splash walls;
- Construction of wave return walls;
- Re-profiling of the embankment;
- Construction of new sea walls, and
- A hybrid option of the above.

Figure 2: Flood cell 4 and the separate frontages

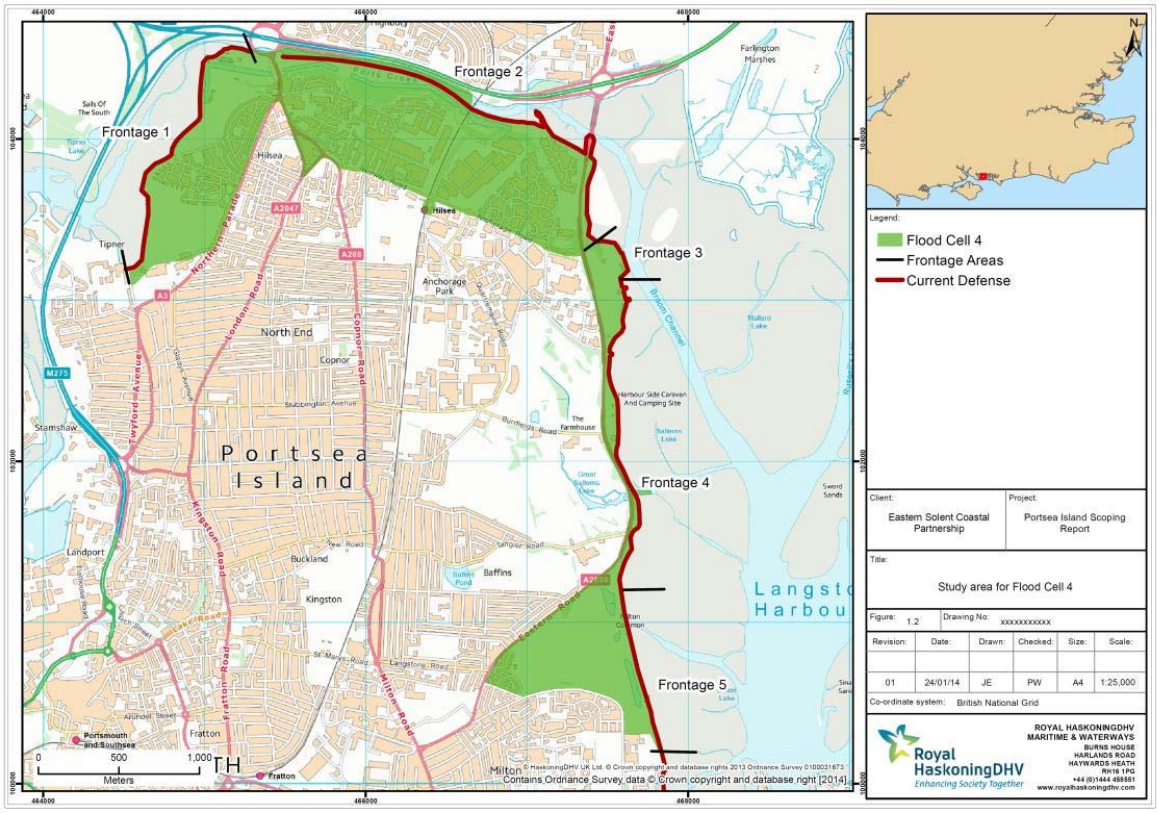
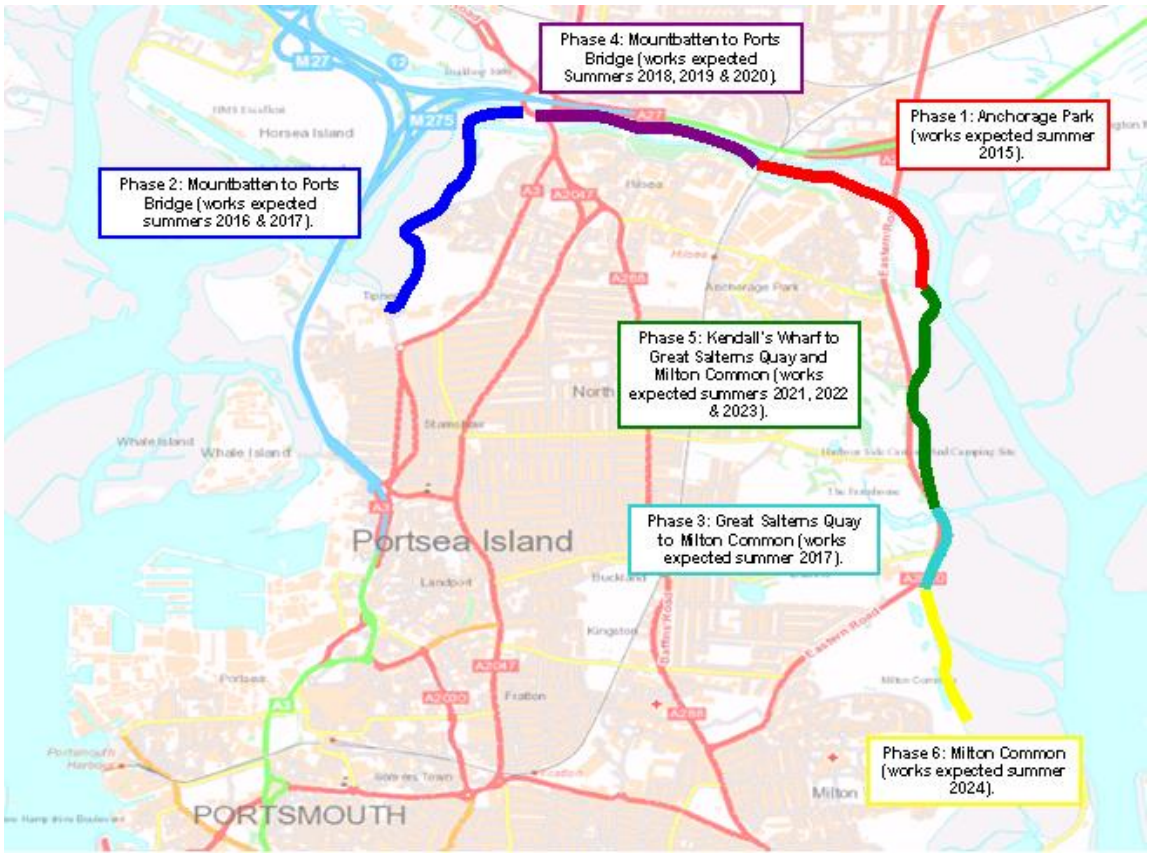


Figure 3: Proposed phasing of works at North Portsea Island



5. Screening

The MMO have concluded that the proposed development constitutes a project that falls under Annex II 10 (k) of the Marine Works (EIA) Regulations 2007 (as amended): *'Coastal work to combat erosion and maritime works capable of altering the coast through the construction, for example, of dykes, moles, jetties and other sea defence works, excluding the maintenance and reconstruction of such works'* of Council Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.

Annex III Section [2(iv)] refers to the proximity of the project relative to nature reserves; the site is located within the Solent and Southampton Water SPA and Ramsar Site, and the Lee-on-Solent to Itchen SSSI.

In addition, PCC have concluded that the proposed development constitutes a project that falls under Schedule 2, Infrastructure Project, 10 (m) of the Town & Country Planning (Environmental Impact Assessment) Regulations 2011: *'Coastal work to combat erosion and maritime works capable of altering the coast through the construction, for example, of dykes, moles, jetties and other sea defence works, excluding the maintenance and reconstruction of such works'.*

The MMO and PCC have determined that a statutory Environmental Impact Assessment (EIA) under the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) and the Town & Country Planning (Environmental Impact Assessment) Regulations 2011 is required for the proposed project.

6. Scoping

The following document was submitted in support of the request for a scoping opinion:

- North Portsea Island Coastal Flood and Erosion Risk Management (CFERM) Scheme: Environmental Scoping Report. Eastern Solent Coastal Partnership, June 2014.

The following sections respond to the chapters set out in that report and represent the joint response from the MMO and PCC.

7. EIA deferral

The MMO has the power to defer its authority under Section 10(b) of the Marine Works (Environmental Impact Assessment) Regulations 2007. For the MMO to discharge this provision, it must be satisfied that the marine impacts of the proposal have been fully considered. The MMO reserves the right to rescreen the project at any stage during the process if it determines that this has not been undertaken to an adequate extent.

8. Consultation

In considering the documents supplied, the MMO and PCC consulted with internal advisors and those bodies considered appropriate due to their environmental responsibilities; those that responded were:

- Environment Agency;
- Langstone Harbour Board;
- Queens Harbour Master (Portsmouth);
- Marine and Coastguard Agency;

- Natural England;
- English Heritage;
- Royal Yachting Association, and
- Trinity House.

9. Planning policy context

Due to the location of the proposed works (and further to the planning policy context set out in the scoping report), the Environmental Statement (ES) also needs to have regard to the South Inshore Marine Plan Area. This is third area in England to be selected for marine planning. The MMO expects to release a consultation draft of the marine plan for formal representation in the winter 2015-16. Until the plan is formally adopted, the ES must also have regards to the Marine Policy Statement.

10. Nature conservation designations

The proposed works are located within 2km of (see **Figure 4**):

- Portsmouth Harbour - Ramsar and Special Protection Areas (SPAs);
- Chichester and Langstone Harbours - Ramsar and SPA;
- Solent Maritime Special Area of Conservation (SAC);
- Langstone Harbour – Sites of Special Scientific Interest (SSSIs);
- Portsmouth Harbour – SSSI;
- Portsdown Hill – SSSI, and
- Sinah Common, Hayling Island – SSSI.

The ES should include a full assessment of the direct and indirect effects of the development on the features of special interest within these sites.

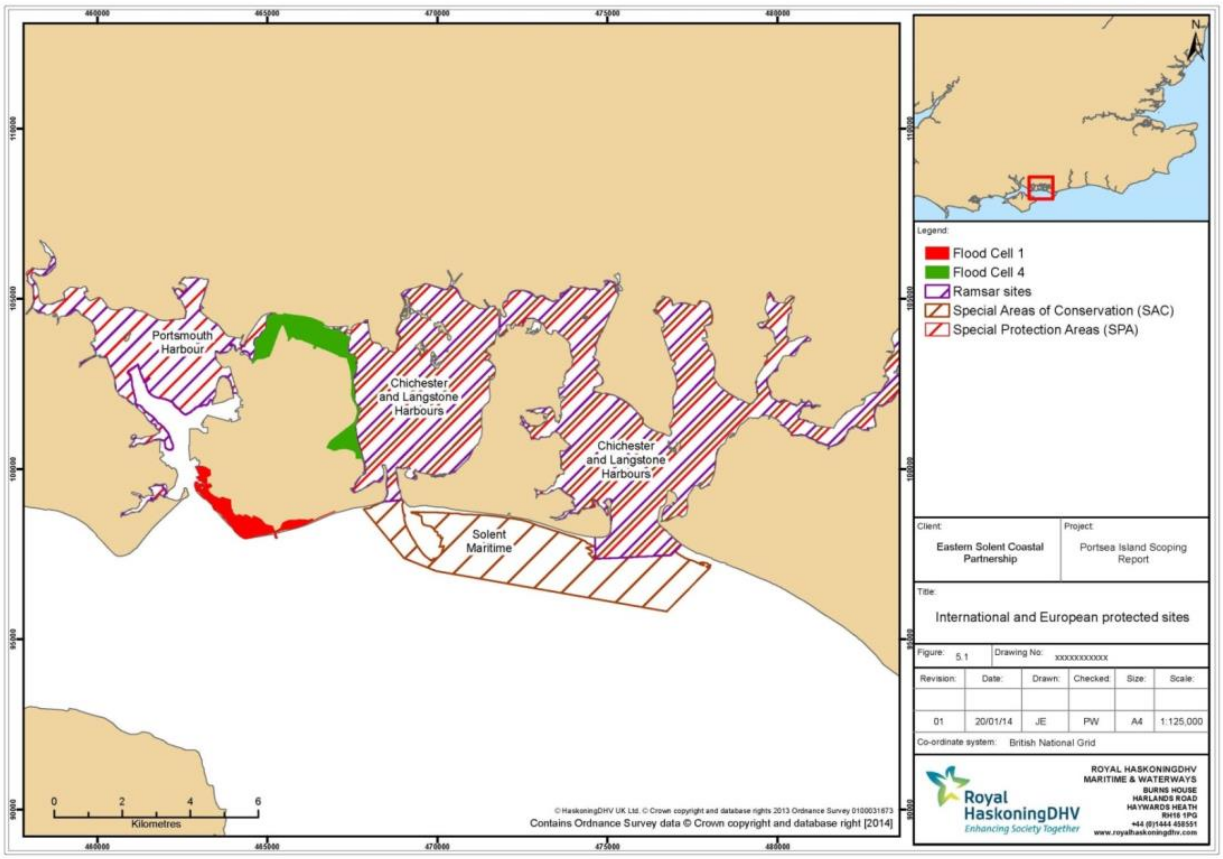
10.1 Protected habitats and species

The ES will also need to consider the potential impacts upon habitats or species listed within the UK's and Hampshire's Biodiversity Action Plan and suggest suitable mitigation should a negative impact arise. It is also recommended that the ES include an assessment of the environmental effects of those species and habitats on the OSPAR List of Threatened and Declining Species and Habitats.

An assessment of the potential impact upon species within the application area protected by the Wildlife and Countryside Act 1981 (as amended) or the Conservation of Habitats and Species Regulations 2010 should include:

- The species concerned;
- The population level at the site affected by the proposal;
- The direct and indirect effects of the development upon that species;
- Full details of any mitigation or compensation that might be required, and
- Whether the impact is acceptable and / or licensable.

Figure 4: International and European Protected Areas



11. Coastal process

The MMO and PCC have no comments to make upon the proposed approach at this time.

12. Marine water and sediment quality

The scoping report states some coastal areas of Flood Cell 4 are adjacent to potentially contaminated land, for example Frontage 5 includes large areas of reclaimed land / landfill. The presence of contamination at Frontage 1, Frontage 2, Frontage 3 and Frontage 4 has not been assessed to date, but if present, construction works could result in the potential to remobilise, disperse and / or redistribute contaminated material and this should be assessed in the ES.

The ES needs to include details of the contaminant levels, compared to Cefas Action Level limits, for each identified determinant. The ES should include details / evidence to support the statement in the scoping report that with good practice, the potential impacts with regard to contaminated land and sediment quality are anticipated to be of minor significance during the construction phase. In addition, where the scheme is likely to result in 'benefits' then an assessment of those benefits needs to be included in the ES. This is because the ES should address all the likely significant effects, both positive and negative (please note this applies to all the chapters).

It is presumed the licenced disposal site referred to in Table 7.2 will be on land. Should the disposal of material from any phase of the project require disposal at sea, sampling will be required to assess its suitability and the ES should consider this in line with the waste hierarchy (Waste Framework Directive [2008/98/EC]). Disposal at sea is a last resort and alternatives must be considered.

13. Water framework directive and compliance assessment

It is requested that an assessment is carried out under the EU Water Framework Directive (2000/60/EC) and submitted with the application for a marine licence.

14. Benthic ecology and marine mammals

The proposed scheme has the potential to impact upon the intertidal benthic ecology of the area directly (due to habitat loss) and indirectly (through disturbance). The aim to minimise access to and impact upon intertidal areas during the works, and to actively seek opportunities to improve the environment, is welcomed.

Where negative impacts upon the Atlantic Saltmarsh, Seagrass and Intertidal Foreshore are unavoidable; opportunities for mitigation and enhancement should be given further consideration and included in the subsequent ES.

15. Fish and shellfish ecology

The proposed scheme is within a broad area used as nursery grounds by Bass (*Dicentrarchus labrax)*, Tope Shark (*Galeorhinus galeus*), Plaice (*Pleuronectes platessa)*, Sole (*Solea solea)*, Thornback Ray (*Raja clavata)*, Undulate Ray (*Raja undulata*) and Lemon Sole (*Microstomus kitt)*; the proposed scheme is also within a broad area used as spawning grounds by Cod (*Gadus morhua*), sandeel (*Ammodytes tobianus*), sole, lemon sole and sprat (*Sprattus sprattus)*.

The baseline data for migratory fish species refers to surveys undertaken within the Test and Itchen catchments, it is suggested that data from catchments closer to the scheme location are also used. The Environment Agency hold freshwater fish data for the River Wallington and River Meon; both rivers are known to support Salmon (*Salmo salar*), Sea trout (*Salmo trutta*), Sea Lamprey (*Petromyzon marinus)* and European eel (*Anguilla anguilla)*. The information can be found in the annual Solent and South Downs Fish Monitoring Report; this report also contains information on the transitional and coastal water body (TRAC) fish surveys. Small fish survey data is also available via Langstone and Chichester Harbour Authorities. The methodology used to collect this data is consistent with the TRAC fish survey data collected by the Environment Agency.

Table 10.3 is missing the downstream movement for Sea trout which tends to be mid-March to mid-May. Some of the text is a little confusing / unclear switching between Sea Trout and Salmon. Given the location of the proposed piling, we consider it unlikely that there will be significant risk to migratory fish. However, we do not feel this should be scoped out of the assessment until the piling methodology is available. The pile dimensions, how the piles are installed and when they are installed will all influence the scale of impact.

The proposed scheme is within the Langstone Harbour native oyster (*O.edulis*) and the Portsmouth Harbour native oyster and hard shell clam (*M.mercenaria*) commercial molluscan shellfishery areas. The proposed scheme is also within approximately 1.6 km of the Langstone Harbour hard shell clam and approximately 4.5 km of the Chichester Harbour native oyster commercial molluscan shellfishery areas. The proposed works have the potential to impact commercial molluscan shellfishery areas due to increases in suspended sediment. However, the conclusion of the report is agreed, that any effects are expected to be minimal, localised and temporary.

16. Ornithology

The MMO and PCC have no additional comments to make upon the proposed approach at this time.

17. Terrestrial ecology

The MMO and PCC have no additional comments to make upon the proposed approach at this time.

18. Land quality and hydrology

The MMO and PCC have no additional comments to make upon the proposed approach at this time and refer to the comments made under section 12 - Marine water and sediment quality.

19. Landscape and visual environment

The MMO and PCC have no additional comments to make upon the proposed approach at this time.

20. Navigational and commercial fisheries

It is recommended any potential impacts upon navigation to and from Portsmouth Naval Base are included within the scope of the ES. In addition, the applicant should consider any impacts on other water users, both leisure and commercial. It is recommended that the applicant consult the local Inshore Fisheries Conservation Authority (IFCA) about any fisheries (commercial or leisure) and incorporate this information within the finalised ES.

21. Traffic and access

The ES (and planning application) has to be explicit about the traffic and access impacts (including routes) during the construction phase. This will be particularly relevant for Phase 1 (due to its frontage to Anchorage Park) given the close proximity to residential properties and access constraints and the likely disturbance during the construction phase.

22. Air quality

The MMO and PCC have no additional comments to make upon the proposed approach at this time.

23. Noise and vibration

Whilst it is agreed that there are high levels of background noise throughout the flood cell, this is generally the steady traffic noise from the M27, A27 and Eastern Road. This is quite different to the more intermittent noise that results from construction and piling in particular. As such, noise should not be ruled out as a possible impact pathway solely because of existing background noise without

further investigation or mitigation. In addition, it is agreed that if sheet piling is carried out as stated in the scoping, any potential impact upon migratory fish species is likely to be mitigated. Although, it is recommended that the impacts from underwater noise on local or migratory fish resources should still be included in the ES.

Please also see comments on Section 21 - Traffic and access as there are likely to be noise disturbance to the sensitive receptors in this location.

24. Archaeology and historic environment

This issue needs to recognise the two separate areas, archaeology **and** heritage. In both areas, we are of the view that neither can be 'scoped out' of the EIA at this stage (Table 19.2 suggests that no further detailed work is undertaken as part of the EIA process) and further detailed investigations / assessments are required particularly as Frontage 2 contains Scheduled Ancient Monument(s) and is a Conservation Area (Conservation Area No: 27 - Hilsea Lines).

In terms of Archaeology, it is explicit in the scoping report that there is not yet enough detail to fully distinguish between the impact of different options, and some refinement will by necessity follow. However, the scheme has an impact on nationally important archaeological remains, in particular the Hilsea Lines. It is important that the impact of the development on these Scheduled Ancient Monuments is understood, clarified and presented in a balanced manner as soon as possible as such a consideration must have the opportunity to influence the design option selected. It is recommended that the nationally important archaeological sites are more explicitly given their due weight in the considerations.

Within paragraph 19.3.2 it is clear that there are ‘gaps’ in the knowledge required to fully scope the options, impacts, mitigation and opportunities and it is intended addressed these at the next stage. Whilst in paragraph 19.5 it is clear that that need and scope of archaeological works will be agreed with the local archaeological advisors from the local authority and English Heritage, the potential complexity of the archaeological issues cannot be underestimated. The archaeological potential will vary from place to place and according to past development and coastal erosion, the impact of development will very according to the design and implementation selected, and the mitigation including preliminary survey (and potentially archaeological observation of early stage geo technical works) will vary in complexity and how onerous it is. We would not recommend the use of a 'watching brief' as is set currently out in Table 19.2.

As discussed with Hannah Flunk and Ben Jervis (and as set out in the email from Hannah on 11th June), they set out the process which needs to be followed and the creation of an overall archaeological management plan and mitigation strategy (which will recognise the overall scheme but acknowledges that details will come forward at different stages). This process needs to be picked up in the ES.

As with archaeology, the report needs to be more explicit on the potential impacts on the built 'heritage' assets (the Scheduled Ancient Monuments, Listed Buildings and Conservation Area). At this stage we cannot agree that there will not be a significant impact (both positive and negative) so therefore can be 'scoped out' of the EIA process (as implied by Table 19.2). The scoping report needs to state that there will be an assessment of the likely significant effects of the proposed development with respect to the historic environment, including built heritage and the historic landscape during the construction and operational phases. The ES should also follow English Heritage's guidance on assessing the impacts on the settings of heritage assets, which can be viewed here - http://www.english-heritage.org.uk/publications/setting-heritage-assets/.

25. Amenity and recreation

The MMO and PCC have no additional comments to make upon the proposed approach at this time.

26. Socio-economics

The MMO and PCC have no additional comments to make upon the proposed approach at this time.

27. Coastal and flood defence

It is recommended that the scope of the Flood Risk Assessment is discussed with the Environment Agency to ensure it meets the required standards.

28. Information for Habitats Regulations Assessment

As this proposal is not directly connected with or necessary to the conservation management of the site, the Portsmouth Harbour Ramsar / SPA, Chichester and Langstone Harbours Ramsar / SPA and Solent Maritime SAC require assessment under the Conservation of Habitats and Species Regulations 2010. This process is commonly referred to as a Habitats Regulations assessment ("HRA").

Given the limited detailed information available on the final design and proposed construction methodologies for the scheme, it is the opinion of the MMO (as the lead competent authority) in partnership with PCC, that the project cannot be excluded from having a *'Likely Significant Effect*' on the SAC, SPA and Ramsar sites.

This is because there is a risk that it will affect the following features of the designated site(s):

- Over-wintering, migratory and breeding birds, and
- Intertidal habitats.

It is recommended that there should be a separate section of the ES to address impacts upon European and Ramsar sites entitled '*Information for Habitats Regulations Assessment*'. The HRA document[1] provided to the MMO and PCC on the 5th August provides a high-level review of the CFERM; this was not considered as part of this Scoping Opinion and we would recommend this is used as the basis for future applications.

There are also a few impact pathways that haven't been considered in Table 23.9. Permanent increase from indirect habitat loss - there is likely to be a coastal path created around and on top of the new bund at Anchorage Park. This is obviously fantastic from a recreational perspective. However, as part of it would be along European site frontage, then there could be a significant effect due to a changed pattern in recreation adversely affecting the efficiency of the habitat for SPA species. In other areas (Tipner, Trafalgar Wharf), low level screening has been used to shield bird sightlines of dogs, bike wheels etc. This could potentially be achieved through landscaping and vegetation here.

Temporary effect from pollution and contamination, caused by the construction of the new defences does not seem to have been considered as an HRA issue. Obviously it has been elsewhere in the scoping and this just needs to be referred to and in some areas of the flood cell (Milton Common in particular), great care will be needed regarding this issue.

Temporary effect due to dust from construction does not seem to have been considered. This can have an adverse effect on the vegetation in the harbours, leading to an effect in some bird populations.

[1] North Portsea Island Coastal Flood and Erosion Risk Management Scheme, Habitats Regulation Assessment. August 2014. Royal Haskoning

Finally, with regards to overwintering birds, given that the works are taking place close to (and possibly affecting) an existing coastal path, it may be sensible to also consider any potential for the works to cause existing recreational users to be temporarily displaced to other areas of the coast, which may potentially result in increases in recreational disturbance in other sensitive areas some way from the project area. If the phasing of each frontage is such that the works will not take place in the winter season then this possible recreation displacement is unlikely to be a concern, but if this cannot be confirmed, further investigation may be necessary.

For your information, the Langstone Harbour Board (LHB) also own two data sets which may be of interest during compilation of the HRA. Data on the number of seals hauled out adjacent to frontage 4 is available from 2008 – present, and includes instances of Grey Seals being hauled out (as well as the Harbour Seals mentioned in the scoping study). Additionally, LHB conducts a survey of the small fish community in Langstone Harbour. A small fee may apply to this small fish data.

Further information about the interest features of the SAC, SPA and Ramsar sites is also available within Natural England's Regulation 33 advice on the Solent European Marine Site. This advice package is available for download from the following website at http://publications.naturalengland.org.uk/publication/3194402.

29. Mitigation and monitoring

The ES should identify areas where mitigation and monitoring are required and for details of such to be included (including proposals for undertaking such mitigation and monitoring).

30. Cumulative impacts

We welcome the recommendation that standard guidance will be used for the Cumulative Impact Assessment (CIA) and that the scope of the CIA will be discussed and agreed through consultation to be carried out throughout the EIA process. The cumulative impacts should not only include the construction projects / activities but it should also include dredge and disposal projects / activities where potential impacts could overlap.

Following the initial consultation, it is recommended that potential cumulative impacts from the following developments are considered in the ES:

- Tipner (West, including the Firing Range);
- Trafalgar Wharf redevelopment;
- St James' Hospital, Milton redevelopment;

- Langstone Campus redevelopment;
- Kendall's Wharf Extension, Langstone Harbour;
- Priddy's Hard, Gosport redevelopment;
- HMNB Portsmouth Harbour dredge; and
- Emerging Flood and Coastal Erosion Risk Management (FCERM) Strategies including the Portchester to Emsworth FCERM strategy and the Emsworth to East Head FCERM Strategy.

31. Conclusion

The topics highlighted in this scoping opinion should be assessed during the EIA process and the outcome of these assessments should be documented in the ES in support of the marine licence application and the planning application(s). This statement, however, should not necessarily be seen as a definitive list of all EIA requirements. Given the scale and programme of these planned works (and as further information about the project becomes available), other work may prove necessary.

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Appendix I:

Detailed Design Drawings: Phase 2 (Great Salterns Quay and Milton Common)

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GREAT SALTERNS QUAY REMOVED
AND FORESHORE REINSTATED

EXISTING SEA WALL MAY
NEED TEMPORARY REPAIRS
AFTER QUAY REMOVAL

SITE
BOUNDARY

PORTSEA ISLAND

N

0 50 100 150 200 250 300
Metres

EASTERN
ROAD

FROG LAKE BUND

FROG LAKE BUND
TYPICAL SECTION

STEP SECTION

EGRESS STEPS

LANGSTONE HARBOUR

BUND
FOOTPATH

ROCK REVETMENT
TYPICAL SECTION
WITH PLANT SCREENING

FROG
LAKE

ROCK REVETMENT

DUCK LAKE

BUND
FOOTPATH

EGRESS STEPS

ROCK REVETMENT
TYPICAL SECTION
WITHOUT PLANT SCREENING

SITE
BOUNDARY

HAUL
ROUTE

BARRIER
FENCE

SWAN LAKE

SITE
BOUNDARY

MOORINGS
WAY

MOORINGS
WAY BUND

ROCK REVETMENT

MOORINGS
WAY BUND
TYPICAL
SECTION

1:12 ACCESS
RAMP

SOLENT STUDENT
VILLAGE BUND
TYPICAL SECTION

MOORINGS WAY
BUND LOW
SECTION

COASTAL PATH TO
BE RAISED WHERE
REQUIRED

PORTSMOUTH
UNIVERSITY

REV	DESCRIPTION	DATE	NAME	CHECK

EASTERN SOLENT | COASTAL PARTNERSHIP

TITLE
NORTH PORTSEA ISLAND FRONTAGES
OUTLINE DESIGN - PHASE 2 DRAWING
GENERAL ARRANGEMENT
FRONTAGE 5 AND GREAT SALTERNS QUAY

DRAWN BY	CHECKED BY	APPROVED BY	DRG No.
BR/RW	CE	MB	SE13/1234

DATE	DIR NAME
OCT 2015	2'\H\C\CE\412\1\Non'Reg'Mom\Hlsea'Lines

SCALE	CAD NAME
1: 2000 @ A1	Milton'Common'Revet'Des'P'

FROG LAKE BUND
TYPICAL SECTION

EGRESS STEPS

STEP SECTION

FROG LAKE BUND

EASTERN
ROAD

0 50 100 150 200 250

Metres

ROCK REVETMENT

BUND
FOOTPATH

FROG
LAKE

ROCK REVETMENT
TYPICAL SECTION
WITH PLANT SCREENING

PORTSEA ISLAND

LANGSTONE HARBOUR

DUCK LAKE

EGRESS STEPS

SITE
BOUNDARY

SITE BOUNDARY

ROCK REVETMENT
TYPICAL SECTION
WITHOUT PLANT SCREENING

HAUL
ROUTE

BARRIER
FENCE

SWAN LAKE

MOORINGS
WAY

MOORINGS
WAY BUND

ROCK REVETMENT

SITE BOUNDARY

MOORINGS WAY
BUND TYPICAL SECTION

1:12 RAMP

SITE
COMPOUND
AREA

MOORINGS WAY
LOW BUND
SECTION

PORTSMOUTH
UNIVERSITY

REV	DESCRIPTION	DATE	NAME	CHECK

EASTERN SOLENT COASTAL PARTNERSHIP

TITLE
NORTH PORTSEA ISLAND FRONTAGES
OUTLINE DESIGN - PHASE 2 DRAWING
GENERAL ARRANGEMENT
FRONTAGE 5 MILTON COMMON

DRAWN BY	CHECKED BY	APPROVED BY	DRG No.
BR/RW	CE	MB	SE13/1237

DATE	DIR NAME
OCT 2015	J:\HC\CIE\4\21\1\Non'Reg'Mom\Hilsea'Lines

SCALE	CAD NAME
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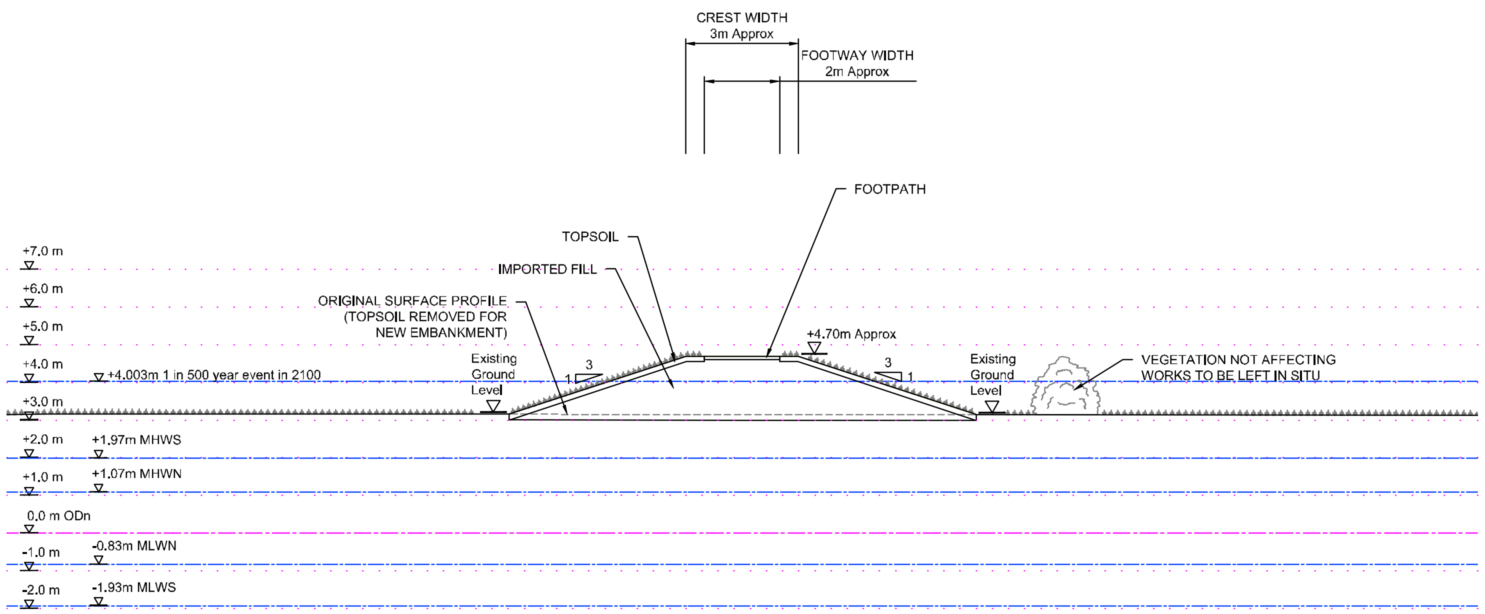
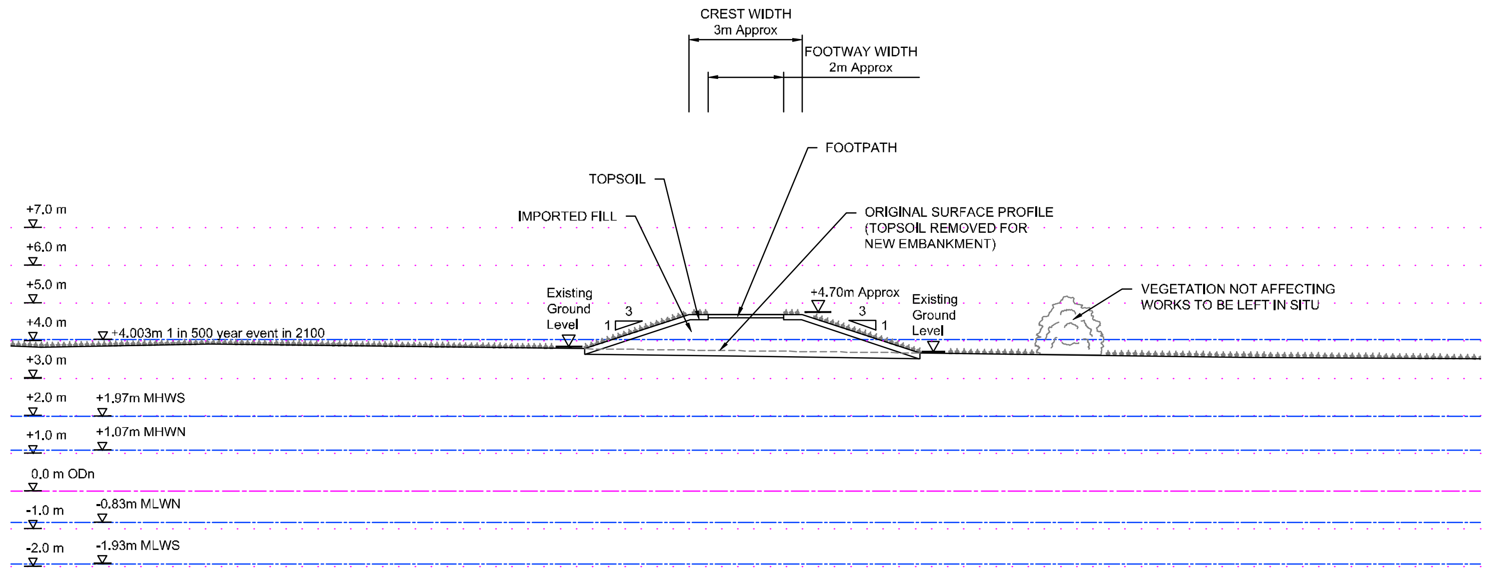
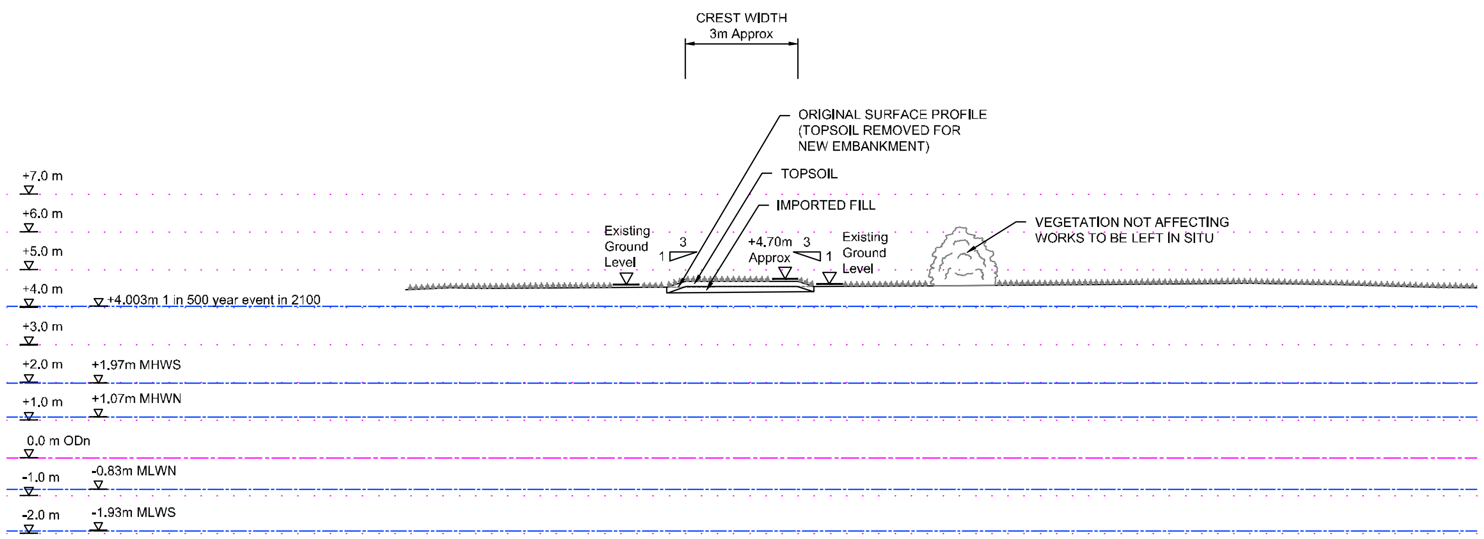


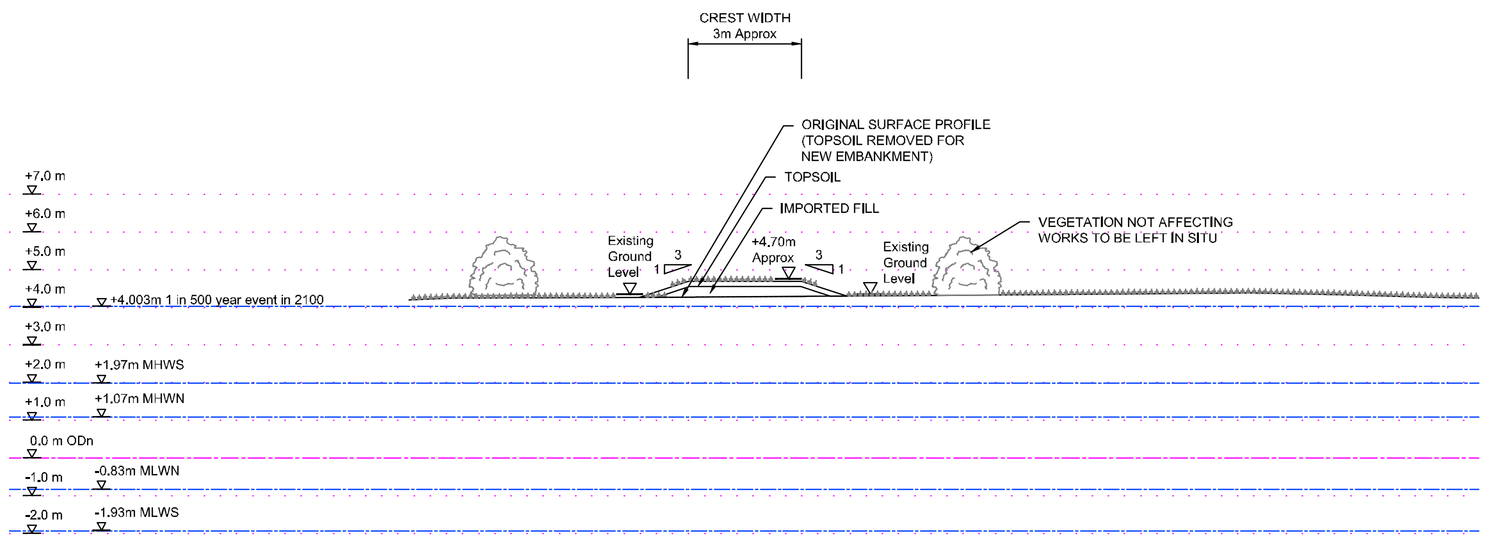
FROG LAKE BUND TYPICAL SECTION



MOORINGS WAY BUND TYPICAL SECTION



MOORINGS WAY BUND LOW SECTION



SOLENT STUDENT VILLAGE BUND TYPICAL SECTION

EASTERN SOLENT | COASTAL PARTNERSHIP

0 1.0 2.0 3.0 4.0 5.0 6.0
Metres

TITLE
NORTH PORTSEA ISLAND FRONTAGES OUTLINE DESIGN - PHASE 2 DRAWING TYPICAL BUND CROSS SECTIONS

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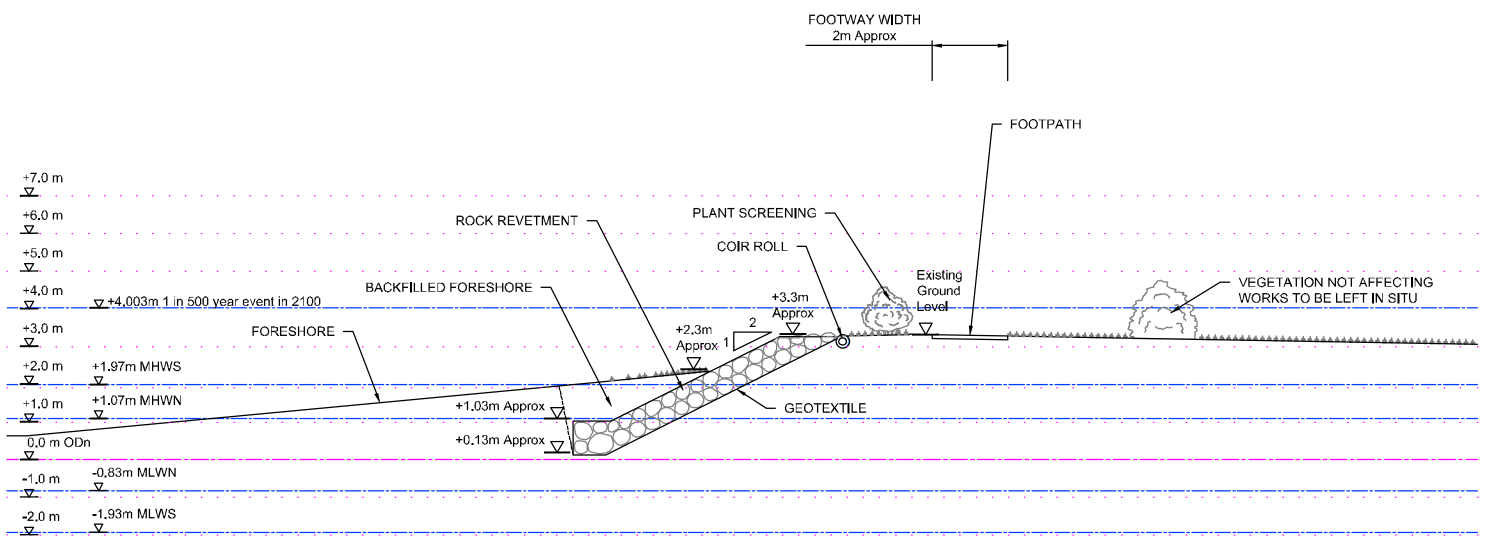
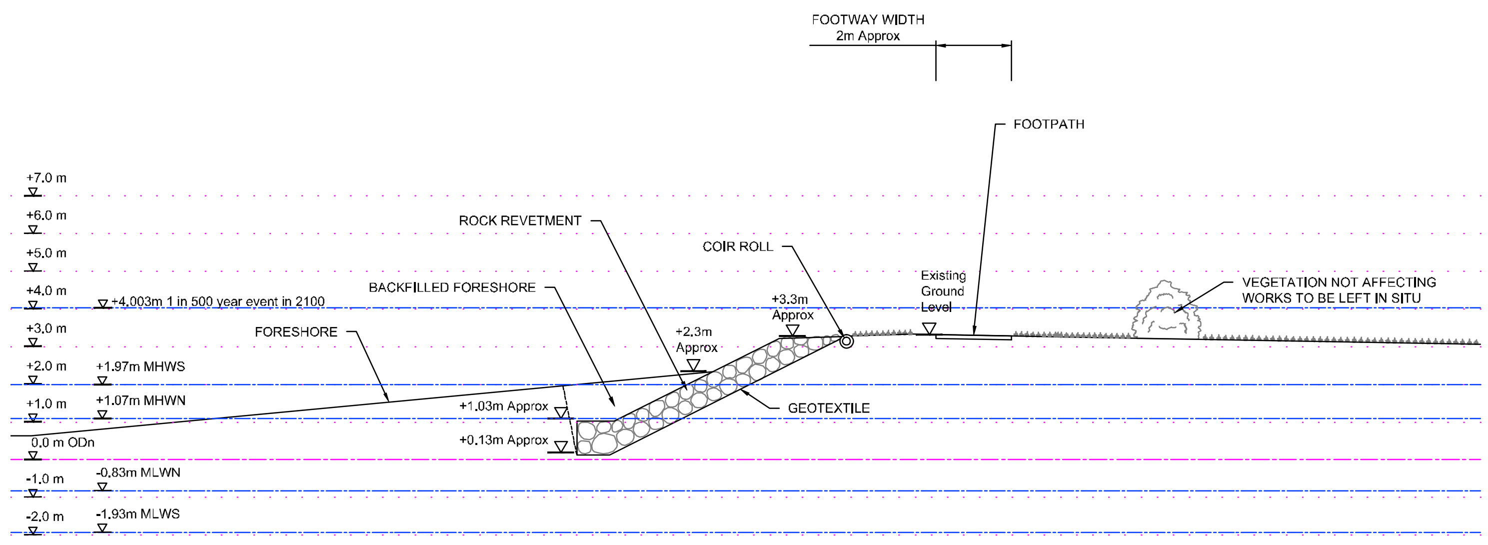
BR/RW	CE	MB	SE13/1236
DATE OCT 2015			DIR NAME J:\H.OOE\3\1\C\2049\Ph\2\Typ\Cross\Sect\
SCALE 1 : 100 @ A1			CAD NAME Milton'Common'Revet'Des'P'

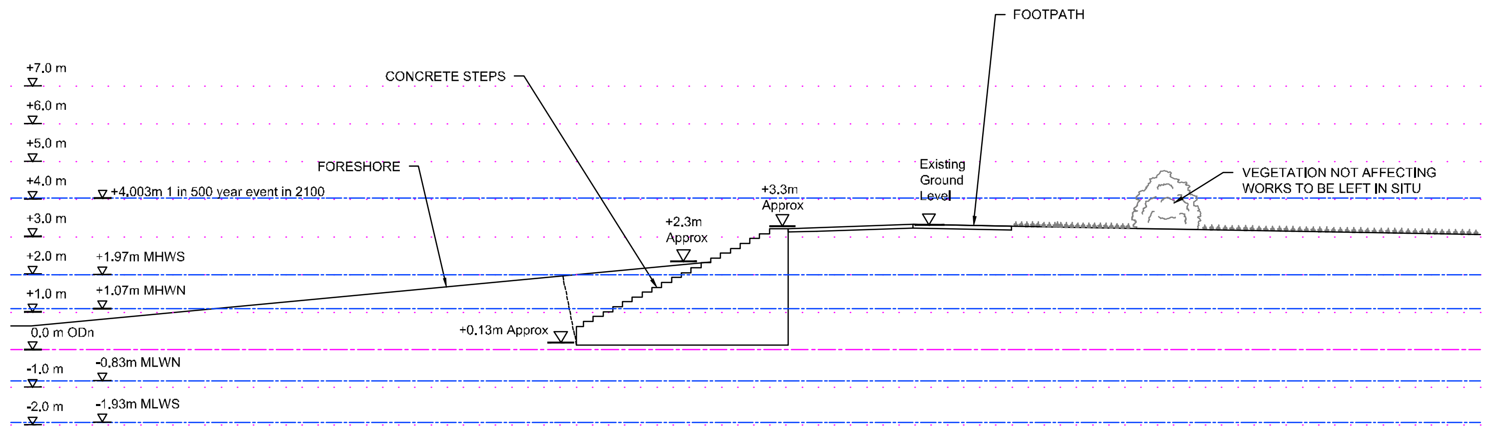
REV	DESCRIPTION	DATE	NAME	CHECK



ROCK REVETMENT TYPICAL SECTION - WITH PLANT SCREENING



ROCK REVETMENT TYPICAL SECTION - WITHOUT PLANT SCREENING



STEP SECTION

EASTERN SOLENT | COASTAL PARTNERSHIP

0 1.0 2.0 3.0 4.0 5.0 6.0
Metres

REV	DESCRIPTION	DATE	NAME	CHECK

TITLE
NORTH PORTSEA ISLAND FRONTAGES
OUTLINE DESIGN - PHASE 2 DRAWING
TYPICAL ROCK REVETMENT
CROSS SECTIONS

DRAWN BY	CHECKED BY	APPROVED BY	DRG No.
BR/RW	CE	MB	SE13/1235

DATE: OCT 2015
SCALE: 1 : 100 @ A1
Milton'Common'Revet'Des'P'