



Outline Construction Environmental Management Plan

Langstone FCERM Scheme

December 2025

Document information

Project	Langstone FCERM Scheme
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1 Introduction

This Construction Environmental Management Plan (CEMP) describes the environmental management to be implemented during the Langstone Flood and Coastal Erosion Risk Management (FCERM) Scheme construction works. It will serve the following purposes:

- It will be briefed to the Site Management Team to ensure that they are aware of the environmental constraints and requirements of the project.
- It will inform the induction and Tool Box Talks (TBT) for all site operatives to ensure that they are aware of the key environmental risks and controls expected for their tasks.
- It will inform task specific Risk Assessment and Method Statements (RAMS) throughout the project. These will be briefed to all operatives prior to the commencement of tasks.
- It will be reviewed at each Progress Meeting and updated as the project progresses, keeping it a live document. At all times it will continue to comply with the approved Environmental Impact Assessment (EIA) mitigation plan.

The scope and requirements of this CEMP covers the activities and operations undertaken by the whole project team. This includes the Coastal Partners (CP) on behalf of Havant Borough Council (HBC), the principal contractor and any sub-contractors during the works. All of these parties will collectively be referred to in this document as the 'Project Team'.

Construction method statements for the Langstone FCERM Scheme works will be included in **Appendix A** as part of the final CEMP, which will be submitted for discharge of pre-commencement conditions on any consent issued for the scheme. This method statement will be developed with the principal contractor once they have been appointed to undertake the works.

1.1 Detailed Risk Assessment

The risk and controls outlined in this document have been assessed based on the Environmental Statement and its associated reports. Detailed risk assessments for each task (site set up, concrete placement etc.) will be carried out during the production of each RAMS, which will include an assessment of environmental risk and control measures.

1.2 Monitoring

The environmental controls will be reviewed as the project progresses, both in progress meetings on site and through regular inspections.

2 Site Location and Project Description

The proposed coastal defences consist of a mix of earth bunds, reinforced concrete sea walls and sheet pile walls, as described below.

- **Frontage 1A: Billy Line North.** The flood defence comprises of a raised earth embankment and follows the line of the existing Billy Line cycleway (a National Cycle Route 2 cycleway). The existing cycle path is to be upgraded to a new 3 metre wide shared path for pedestrians and cyclists which sits on top of the flood embankment.

- **Frontage 2: Billy Line South.** The design for Frontage 2 consists of a sheet-piled wall. Raised earth embankments are included where the defence alignment needs to cross existing utility pipes. The existing cycle path is to be upgraded to a new 3 metre wide shared path for pedestrians and cyclists which sits adjacent to the sheet-piled wall. Frontage 2 ties in with Frontage 1A and the existing higher levels on the A3023 road.
- **Frontage 3: A3023 road to 9 Coastguard Cottages (The Look Out).** Frontage 3 consists of a continuous flood defence that largely comprises of four flood defence structures. These structures include the A3023 flood wall, Ship Inn car park raised earth bund, Ship Inn flood wall and Ship Inn Annex flood wall. A flood gate is also to be provided between the Ship Inn and the Ship Inn Annex flood walls.
- **Frontage 4: The Look Out to No. 24 Langstone High Street (the Winklemarket).** Frontage 4 consists of new reinforced concrete flood walls in front of the existing garden walls that run along the frontage. The existing footpath is to be upgraded to a new 1.5 metre wide footpath through the construction of a new quay wall, to improve user accessibility of the route. One flood gate (at Green Cottage) and one demountable flood barrier (at the pedestrian access adjacent to the Watch Tower) will be provided to ensure robust continuity of the defence.
- **Frontage 5: Langstone High Street to the field north of the Royal Oak.** Frontage 5 consists of a continuous flood defence that largely comprises of five structures. These structures include the High Street flood gates, the Royal Oak flood wall, the allotment flood wall, the Footpath flood wall that runs west of the Mill Pond, and an earth embankment in the field north of the Royal Oak. Demountable flood barriers will be provided between the section transitions and flood gates will be provided at No.21 High Street.

An overview of the important environmental information relevant to the Langstone FCERM Scheme works is illustrated on **Figure 2.1** and discussed in further detail in the sections below.

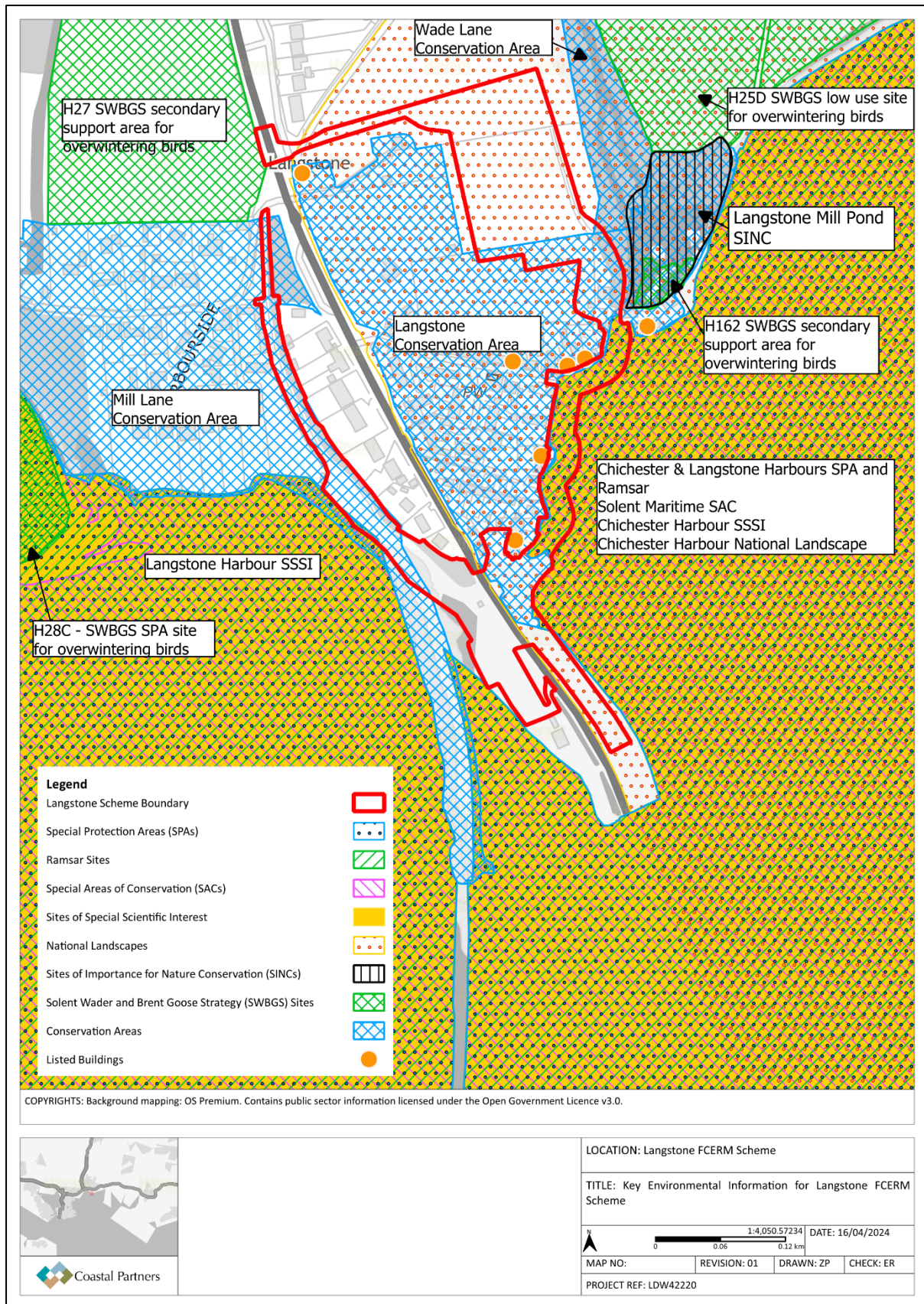


Figure 2.1: Key Environmental Information for Langstone FCERM Scheme Construction Works (indicative red line).

2.1 Timings

The construction works for the Langstone FCERM scheme are currently scheduled to be undertaken between Spring 2026 and Autumn 2027. Enabling works for construction of the Langstone FCERM scheme is currently planned to commence in Summer 2025 at the earliest. This will include setting up the main site compound, installation of the access route and site offices, welfare facilities, connection of services and potentially vegetation clearance and reptile translocation. **Table 2.1** below specifies the permitted timescales for activities associated with the scheme.

Table 2.1: Permitted timings for activities

Specified Work Timescales	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Construction works in Frontage 2, 3, 4 and between chainage 0-110 in Frontage 5 are not permitted during over-wintering bird period (October to March inclusive).												
Piling work and trench sheet installation between chainage 110-185 in Frontage 5 are not permitted during the overwintering bird period (October to March inclusive).												
Use of a wacker plate or compacting plant with a similar noise profile are not permitted between chainage 120-188 in Frontage 1A during the overwintering bird period (October to March inclusive).												
Vegetation clearance in Frontage 5 is not permitted during the breeding bird season (March-August inclusive) to avoid disturbance of the egret/heron nesting colony. In addition no night working in vicinity of egret/heron roost and watching brief required.												
Vegetation clearance in Frontages 1A, 2, 3 and 4 during the breeding bird season (March-August inclusive) will require an ecologist to be present.												
Landscaping works.												

Key

	Specified works prohibited
	Specified works permitted with qualified ecologist present
	Specified works permitted

2.2 Working Hours

Normal Working Hours: Monday - Friday (0700 - 1900).

Due to the tidal nature of the works within Frontages 3, 4 and 5, it may be necessary for some works to be undertaken outside of these hours eg. during evening/nighttime periods or over a weekend. However, a final CEMP and Section 61 application will be submitted to the Local Planning Authority (LPA) for approval, which will include a communication strategy for residents, the planned works and methods, the phasing and working hours of the site, and measures to mitigate the potential noise and vibration impact by best practical means. This will be inclusive of a percussive piling method statement should the need for percussive piling arise. residents would be kept fully informed.

2.3 Communication

A Stakeholder Management Plan will be implemented to keep all property owners informed of the construction works.

2.4 Emergency Contacts

Emergency Incident Contacts
• In an emergency - follow the 'Emergency Incident Plan (EIP)'. The EIP will be located in the main site office (to be produced by the contractor) and briefed to all staff during site inductions. • Any fuel, oil or chemical spill within the marine environment will be reported immediately to: - The Environment Agency (incident hotline Tel. 0800 807060); - Marine Management Organisation (Tel. 0300 200 2024 - within office hours; 07770 977825 - outside office hours; 0345 051 8486 and dispersants@marinemanagement.org.uk - if the previous two numbers are unavailable); - The Site Supervisor and Project Manager.

3 Site Set Up

3.1 Vegetation Clearance

Areas of vegetation will need removing prior to the start of the works. All vegetation clearance will be undertaken in accordance the landscaping plans. The following steps will need to be taken.

- The draft Reptile Mitigation Strategy (**Appendix B**) outlines the principles and methods of a 'vegetation management, hand capture and reptile relocation programme', prior to the construction works. The final Reptile Mitigation Strategy will be strictly followed during the in situ reptile translocation and vegetation clearance within the site boundary. Reptile fencing and/or close-cropped strips will be located to stop recolonisation of de-risked areas

from adjacent suitable habitat that will act as reptile safe areas throughout the works (**Figure 3.1**). These receptor sites will not be impacted by the construction works. See **Section 4.10.8** for further details regarding reptiles.

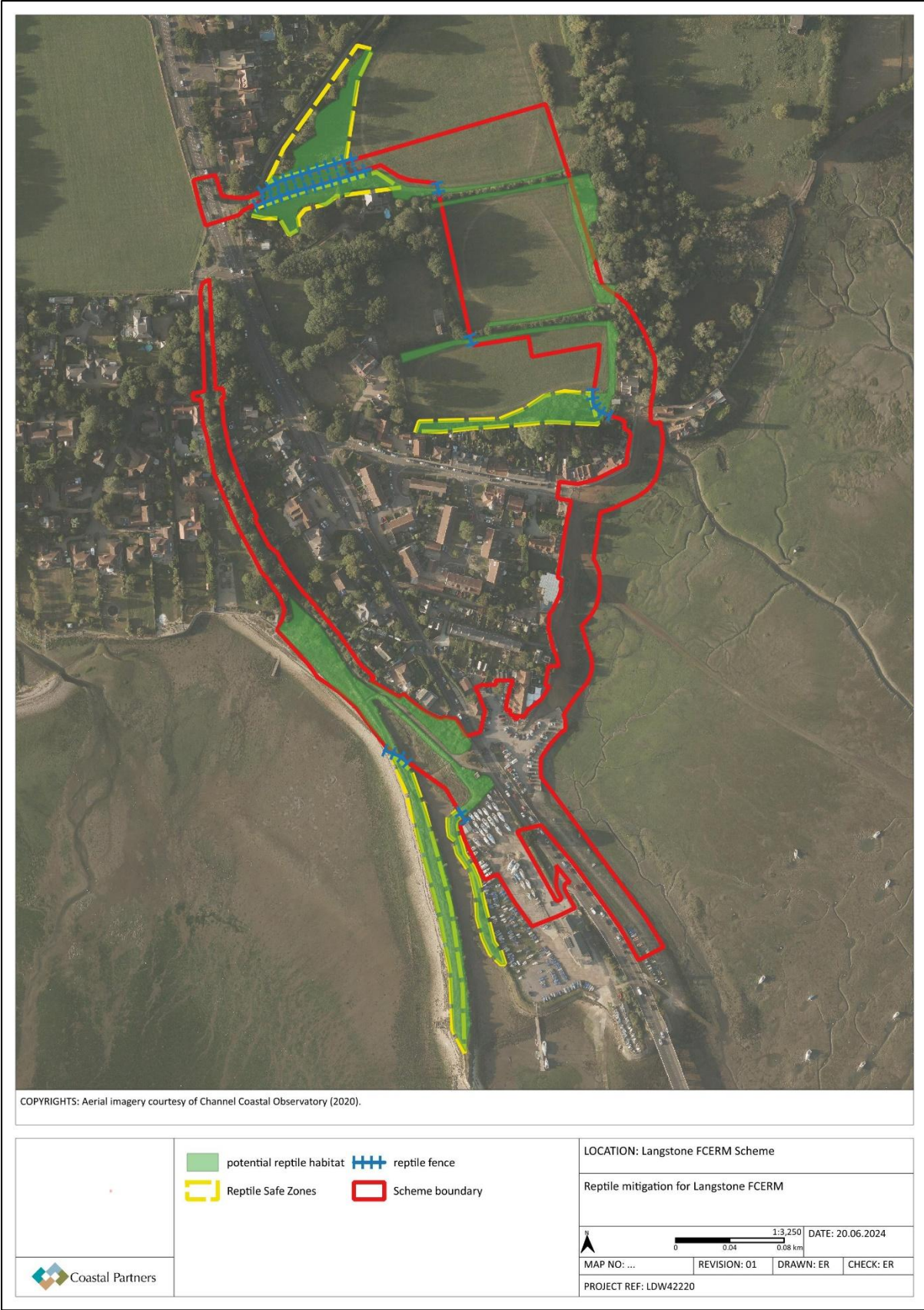


Figure 3.1: Langstone FCERM Scheme Reptile Mitigation Areas (scheme boundary indicative).

- Translocate the Golden Samphire plants from the old revetment at Frontage 3 to areas with suitable conditions and/or create areas with suitable conditions for assisted colonisation. See **Section 4.10.1** for further details regarding other notable plant species and priority habitats.
- Bat surveys must be conducted on trees due to be felled or pruned if there is any possibility of bats using them as roosts. See **Section 4.10.2** for further details regarding bats.
- Vegetation clearance in Frontage 5 is not permitted during the breeding bird season (March-August inclusive) to avoid disturbance of the egret/heron nesting colony. See **Section 4.10.3** for further details regarding breeding birds.
- Vegetation should be removed prior to the start of works and outside of the bird nesting season (March to August inclusive) where possible. If this is not possible, all potential habitat that needs to be removed will be carefully examined by a suitably experienced and qualified ecologist. If nests are found, work in that area will stop, and a 5m buffer will be placed around the nest. Clearance would only be undertaken once the nest becomes unoccupied of its own accord. See **Section 4.10.3** for further details regarding breeding birds.
- Any dense vegetation clearance (e.g. hedgerows / along the Hayling Billy trail) should initially be checked for hedgehogs prior to removal. See **Section 4.10.6** for further details regarding hedgehogs.
- The area to be cleared in Frontage 1A and 2 should be checked for any stag beetle larvae and / or adults by a suitably qualified and experienced ecologist. Any stag beetles or larvae found should be carefully translocated to a suitable natural or purpose-built habitat close by. See **Section 4.10.9** for further details regarding stag beetles.

3.2 Compounds

Three compounds are currently proposed for the Langstone works (**Figure 3.2**). A main site compound will be set up that will remain in situ throughout the construction works, located in the fields to the north of the Royal Oak (Langstone Meadows). The main compound will be located in the middle field and will likely include modular cabins comprising of the site office, meeting rooms and welfare facilities, a car park and material storage area, which could also be used for the prefabrication of reinforcement and preparation of timber shutters. The compound would include an area of hard standing for approximately 30 workforce vehicles and five bikes. Charging points would be available for electric/hybrid cars and a store container where personal bikes may be stored. Upon completion of the construction works, the drainage, geotextile and stone will be removed, and topsoil reinstated. Additional agricultural treatment is likely to be required, this could involve rotavating the subsoil (due to compaction), importing further topsoil and seeding.

Two satellite compounds are also proposed if the contractor requires them and any necessary landowner consents are gained – one located in the Ship Inn car park (which will be required to store plant, non-bulk materials and a temporary visitors information centre for the works) and one at the southern extent of Frontage 2 with access via the Langstone Sailing Club boat storage area (subject to landowner consent). The satellite compounds will have limited welfare facilities, as employees would be expected to return to the main compound at the start and end of shifts and for any significant breaks or briefings.

Within all site compounds and working areas, a site speed restriction of 10mph will be implemented, which will be communicated through appropriate signage. Fully segregated pedestrian access routes will be provided where possible. Access to all site compounds will be managed to ensure that only authorised personnel are able to gain access to the site. A log of incoming and outgoing staff, plant and vehicles will be kept ensuring that during the construction phase, whereabouts of all personnel working on the project is known in the event of an emergency.

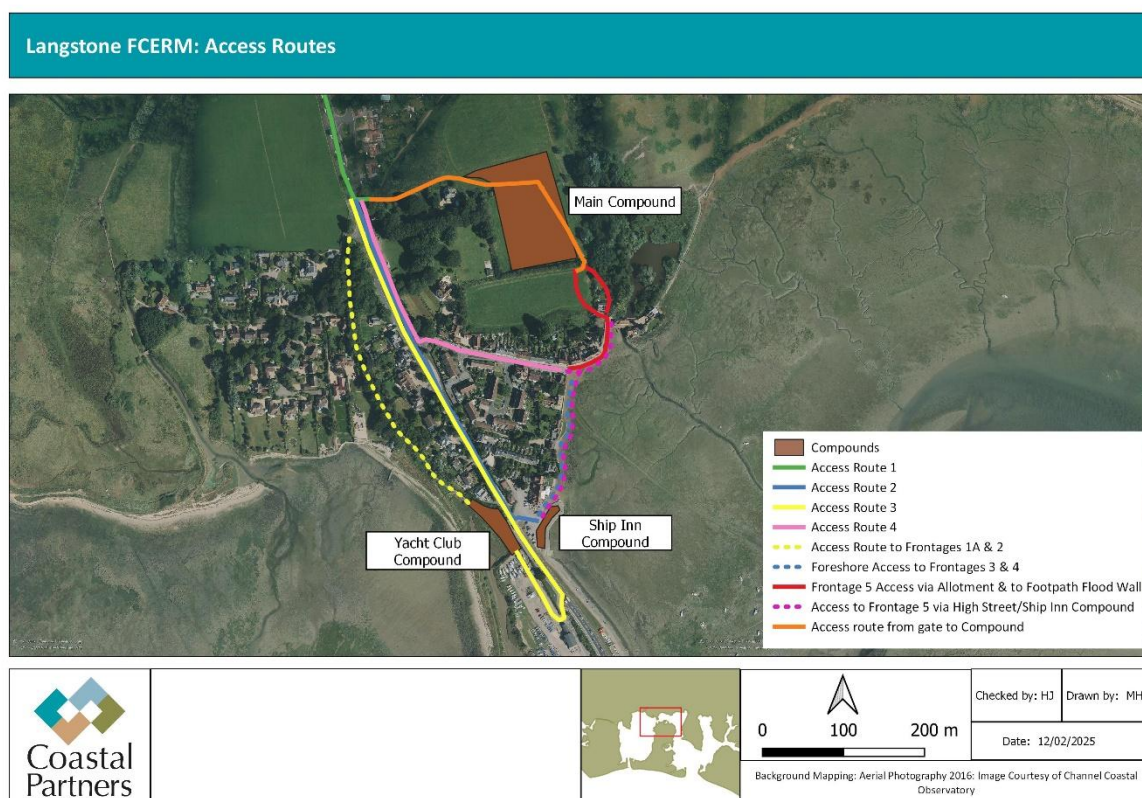


Figure Location of Compounds and Haul Routes to Access the Site

3.3 Haul Routes and Access

The haul routes and site access points are illustrated on **Figure 3.2**. Access to the main compound will be via a newly created junction from the A3023 (Langstone Road) and would utilise the existing gate entrance off the Langstone Avenue turning circle. A single vehicle width access track (formed from stone) with passing places will be formed from the gate off Langstone Avenue to the main compound. Topsoil will be stripped and set aside in a bund for reinstatement on completion. Geotextile will be laid on the subsoil. As the ground is soft, temporary plastic surface water drains will be installed under the track, perpendicular to it at regular intervals. Crushed concrete will then be laid followed by a running surface of graded stone such as MOT type 1. A similar construction will be required for the material storage areas, car park and office/welfare set up.

Stock proof fencing will be erected to keep livestock off the access track and out of the compound. A tractor access gate could be formed to maintain farmer access if required, with

shared access along the western section of the access track (past the overgrown shrubs) from the gate off Langstone Avenue, which could be opened using a multiple padlock system.

Upon completion of the construction works, the drainage, geotextile and stone will be removed and topsoil reinstated. Additional agricultural treatment is likely to be required, this could involve rotavating the subsoil (due to compaction), importing further topsoil and seeding.

Access to the secondary satellite compounds (if required) at the Ship Inn car park and Langstone Sailing Club boat storage area will be via the A3023 (Langstone Road), subject to landowner consents.

Haulage routes throughout the construction period will run on both the landward and seaward side of the coastal defence structures. On Frontages 1A and 2, machinery will utilise the Billy Line for access. On Frontages 3, 4 and 5, machinery will use the Ship Inn car park, the High Street and the allotment for access to the construction areas (subject to any required landowner consent). A 20 metre wide access corridor and working area along the foreshore will also be used for construction machinery.

4 Construction Phase

Before the commencement of the works, all crew shall be advised of any risks and/or hazards that are involved with the works by undertaking a site-specific induction and discussing the relevant Risk Assessment and Method Statement (RAMS) for the intended works. All environmental considerations shall be included and highlighted to staff as part of site-based inductions and risk assessments, to be reviewed and signed by all personnel involved with the works.

4.1 Use of Machinery / Fuelling / Fuel Spillage

- The Emergency Incident Plan (EIP) will be followed in case of an emergency or accidental spillage and/or pollution incident.
- Machinery used during construction will be required to adhere to standard best practice measures including pollution control strategies and spillage response.
- Regular and effective maintenance by trained personnel will be undertaken to keep plant and equipment working to manufacturers specifications.
- Plant to be used properly with respect to minimising noise emissions. Exhaust silence systems or acoustic engine covers will be used as appropriate.
- Unnecessary revving of engines will be avoided, and equipment will be switched off when not in use.
- Plant and vehicles will be sequentially started up rather than altogether.
- Appropriate plant and equipment will be used to reduce the noise and vibration levels and shall comply with EU emission limits and any stated requirements of the Local Authority.
- Equipment will be cleaned before delivery to site.
- Machinery (working on or adjacent to the foreshore) will use biologically degradable hydraulic oils.
- Equipment that leaks any fuel, lubricant or hydraulic fluid shall not be used to complete the works and will be removed from site or stored in the compound until repaired.
- Plant will be serviced in designated areas in the compound, away from water courses / drains.
- Fuels, chemicals and other potentially hazardous liquids to be stored outside the designated site areas, at least 10m away from sensitive habitats (such as hedgerows,

wet woodland, mixed deciduous woodland, reedbed, vegetated shingle, saltmarsh), and away from water bodies and surface water drains in nearby compounds and to be fully bunded to 110% of the maximum storage capacity and maintained in a secure and clear manner. Delivery and vent pipes shall terminate within the bund. Bio-degradable lubricants to be used.

- All fuelling operations, servicing of equipment and fuel storage to take place away from the foreshore, and at least 10m away from sensitive habitats, in accordance with agreed refuelling risk assessment and method statement.
- Refuelling shall be supervised and shall be carried out by pumping through a trigger type delivery nozzle.
- All plant to be equipped with suitable spill kits and operatives trained in use. Spill kits (including booms for potential leaks into the marine environment) should be kept on site at all times during operation and be available at all fuelling locations.
- Any spillage shall be immediately contained, removed from site and disposed to a licensed tip.
- Potentially hazardous liquids on the application site such as fuels and chemicals will be managed and stored in accordance with best practice guidance, such as the UK Government pollution prevention guidelines (<https://www.gov.uk/guidance/pollution-prevention-for-businesses>). Storage tank and container facilities will be appropriately bunded within designated storage areas and located away from surface water drains.
- Where necessary, surface drainage will pass via settlement and/or oil interception facilities.

4.2 Foreshore Working

The TBT on environmental sensitivities, foreshore risk assessment and method statement are to be followed at all times.

- All materials used in the Scheme will be suitable for use in the marine environment.
- All operations to be carried out from the landward side wherever possible, however where there is no viable landward option, works will be permitted from the foreshore.
- Where foreshore working is required, the intertidal works area will be restricted to a maximum of 20 metres seawards of the existing defences. The 20m maximum boundary will be marked by the silt curtain.
- A silt curtain will be installed prior to the commencement of any work on the intertidal area to fully contain the current working area and kept in a good working condition (**Figure**) during the whole duration of the foreshore construction works. This will prevent any suspended sediments migrating into the wider adjoining harbours, prevent any significant impacts on water quality in the harbours. Any failures in the silt curtain (e.g. **Figure**) will be reported to the sub-contractor and repaired as soon as possible.



Figure 4.1: Silt curtain in good working condition.

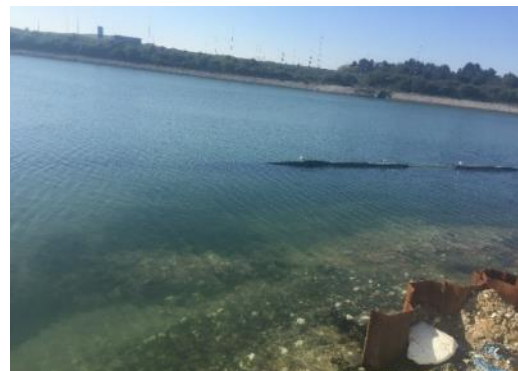


Figure 4.2: Silt curtain failure – the floating booms have sunk in places and needs to be repaired.

- The silt curtain and temporary working area boundary will be set out to ensure that areas of *Spartina* swards are protected and excluded from the haul route / working areas to ensure this habitat is not damaged during the works.
- Foreshore works will only be undertaken over the low tide period when the surface of intertidal sediment is above the current tidal water level (i.e. not covered with seawater), to minimise resuspension of any contaminants into the water column and to minimise impacts on foraging terns / seabirds, migratory fish and marine mammals.
- A temporary cofferdam, formed from sheet piles, may be used during the construction at Frontages 3, 4, 5, but this will be set within the 20m temporary working area boundary and must avoid the *Spartina* swards. The cofferdam would be removed on completion of the foreshore quay wall works.
- Foreshore access is **not** permitted for construction of the A3023 flood wall in Frontage 3. Only access for the construction of the Ship Inn sea wall is permitted in Frontage 3.
- Where access is required on the foreshore, removable temporary haul routes (e.g. matting) will be installed for tracking plant / machinery (e.g. excavator) on all substrates.
- Temporary haul routes on the foreshore will be created so that they are removable (e.g. geotextile with sheet piles laid flat or aggregate on top) to minimise disturbance to the intertidal habitat and accelerate recovery upon reinstatement. This will be carefully removed as soon as access is no longer required.
- The intertidal habitat excavated for construction of the buried apron of the new sea walls in Frontages 3, 4 and 5 will be reinstated to the same topography as existing levels following completion of the new sea wall using material retained from the excavation and stockpiled adjacent to the working area within the silt curtain. The foreshore material will be placed back over the new sea wall apron in the reverse order to that in which it was excavated to ensure that the sediment layers are returned in the order they were prior to the works.
- A Marine Biosecurity Plan will be followed to minimise the introduction / spread of marine invasive non-native species (see **Appendix C**).

4.3 Excavation and Piling Activities

A TBT will be given to site operatives involved in excavations. All excavations will be undertaken in accordance with the Materials Management Plan and the Contaminated Land Method Statement.

A TBT will also be given to site operatives on noise and vibration control. The Piling Risk Assessment and Method Statement is to be followed. All works will be in accordance with the approved Section 61 application in relation to noise and vibration.

- A silt curtain will be in place for all excavation and piling activities on the foreshore and kept in a good working condition.
- Excavation and piling on the foreshore will only be undertaken over the low tide period (when the surface of substrate / foreshore is above the current tide level). This will minimise sediment going into the water column and avoid the transmission of sound into the water body (that may impact foraging terns, migratory fish and marine mammals).
- Site safety fencing will be erected around any excavations, during low tides. These will be made safe before leaving site each night and weekend.
- If required, excavation work on the foreshore will be supervised by an archaeological watching brief as outlined in the Archaeological Mitigation Strategy / Heritage Statement and confirmed within the Written Scheme of Investigation.

- Installation of piles will be undertaken using vibro piling techniques as standard. Percussive piling will only be used when necessary to achieve the required design depth. If percussive piling is required, it should be undertaken ideally between August to September (to avoid impacts to breeding and overwintering birds) and a soft start procedure will be implemented for a minimum of 20 minutes to encourage any marine species to move away from the area. Should piling cease for a period greater than 10 minutes, then the soft start procedure will be repeated once piling is recommenced. Piling methods will be agreed and included as part of the final CEMP once a contractor has been appointed.
- Piling activities will be restricted to daytime hours only (07:00 to 19:00).

4.4 Noise and Vibration Control

- A specific briefing / TBT on noise and vibration control will be provided for all site operatives.
- Best practice methods will be employed to reduce noise emissions to a minimum. Works on site to be carried out in accordance with BS5228-1 2009 (code of practice for noise and vibration control on construction and open sites), where necessary.
- A communication strategy will be in place to ensure residents are kept up to date with Scheme progress and informed of any upcoming noisy work.
- As far as reasonably practicable, sources of significant noise will be enclosed.
- Plant will always be used in accordance with manufacturers instructions. Care will be taken to use site equipment away from noise sensitive areas e.g., in close proximity to residential properties. Where this is not possible due to the nature of the works, advance warning will be given. Where possible, loading and unloading will also be carried out away from sensitive areas.
- Rubber linings in, for example, chutes and dumpers will be used to reduce impact noise.
- Screening e.g., noise barriers and blinds will be used as appropriate.
- If practicable, a hydraulic press piling method will be considered to limit the potential impact of vibration at sensitive receptors. This method (if acceptable ground conditions are present) would apply where piling works are taking place within less than 10 m to the following properties: 50a Langstone Road (The Boat House), The Ship Inn, 24 Langstone High Street (The Winkle Market), The Royal Oak.
- A vibration risk assessment will be carried out in relation to vibratory (movax) and percussive piling, should these piling methods be required in close proximity to the following properties: 50a Langstone Road (The Boat House), The Ship Inn, 24 Langstone High Street (The Winkle Market), The Royal Oak. A pre-works survey will be undertaken of adjacent buildings, to inspect for any pre-existing damage.
- Where practicable, noisy works should be interspersed between quieter works to provide periods of respite and the works should be phased to ensure that the noisiest operations are performed during the least sensitive times.
- To avoid the transmission of noise into the water column, piling on the foreshore will only be undertaken over the low tide period when the surface of the substrate is above the current tide level.

4.5 Lighting and Visual Control

- Ensure the perimeter fencing is secure, screen bunds are in place where needed and the construction site remains tidy.
- The majority of construction works will be undertaken in daylight hours, however where works do take place in the dark, any lights used on the foreshore (within the proposed 20m working area from the toe of the new defences), would be placed so that they face landwards towards the sea wall (and removed each tide prior to the tide coming into the

10m working area). Any lighting from land would be angled down to reduce impacts on the foreshore working area.

- No night working and no artificial lighting will be used between chainage 112-221 in Frontage 5 to minimise disturbance to egret and heron roost (see **Section 4.10.3**).
- Lighting will only be used when tasks cannot be undertaken in good daylight.

4.6 Materials Management

- The contractor will develop and follow an approved Materials Management Plan (to guide material excavation, storage and placement) and a Contaminated Land Method Statement (to manage potentially contaminated material (see **Section 4.8**)).
- All materials used in the Scheme will be suitable for use in the marine environment.
- Drop heights of materials will be minimised.
- A material storage area will be established alongside the main site office and set back inland away from the foreshore.
- Stock piles will be limited on site and will be covered or dampened down during periods of dry weather.
- Strict site management will be employed to minimise extensive damage and to monitor over-run, excavation and containment of bank profiles and soils.
- No works or storage of materials will take place outside the site boundary. Upon completion of the works, any areas not forming part of the permanent works will be reinstated to at least their pre-works condition. This includes sub-surface reinstatement where required.
- Any materials to be re-used within the works will be managed in accordance with an approved materials management plan (to be produced once a contractor has been appointed) and the Contaminated Land Method Statement.
- Any materials to be imported for the works will be tested to ensure they are clean and suitable for the proposed use prior to importation and placement within the works.
- Any materials to be removed from the site will be suitably classified and taken to an appropriate off-site disposal facility or treatment site.

4.6.1 Soils

- Follow steps in Soil Management Plan, Surface Water Drainage Plan and Contaminated Land Method Statement.
- Strict site management will be employed to ensure safe handling and storage of soils.
- Soils will not be stored in heaps greater than 1.5m in height and 8m in width.
- Strict construction site management will be employed to minimise excessive damage to the grassland areas and within the open spaces to monitor over-run, excavation and compaction of topsoil adjacent to the site compound and access routes. Any drainage problems caused by over-compaction will be addressed as part of the works
- All imported subsoil and topsoil will be contaminant free. Samples will be assessed against the same criteria as used for the GI and any batch that is found to have levels of contaminants exceeding thresholds will be rejected in full.
- All new soils will be clean, contaminant-free, and all mounded/banked areas of new soil will soon be softened by establishing vegetation allowing the works to blend in with the existing landscape and provide greater diversity to the existing environment.
- Provide drainage improvements where any problems arise, using hardcore/soils to suit where needed.

- Site access will be reviewed regularly and the protection of vulnerable soils by temporary overlay surfaces will be implemented where necessary.

4.6.2 Concrete

- Concrete shuttering shall be designed to prevent escape of cementitious material into watercourses.
- Concrete washout will be in suitably lined skips in the main compound. These will be at least 10m away from the nearest watercourse / surface water drain.
- Ensure coatings and treatments are suitable for the marine environment and used in accordance with environmental best practice.

4.6.3 Other Materials

- Any materials to be imported for the works will be tested to ensure they are clean and suitable for the proposed use prior to importation and placement within the works.
- Timber used for temporary and permanent works shall be from a temperate, sustainable source.

4.7 Dust Control and Air Quality

- A supply of water and means of dispensing it will be available on site to dampen down dust, haul routes and material stockpiles.
- Regular inspections will be carried out to monitor dust levels and the effectiveness of any suppression in use.
- All vehicles carrying loose or potentially dusty material to or from the site are to be fully sheeted.
- Vehicle speed will be limited on site to a maximum of 10 mph.
- No idling vehicles; all engines to be switched off.
- Any plant, machinery or tools that have the potential to create dust should utilise dust suppressant methods and accessories, where possible and practicable.

4.8 Land-based Contamination

- Works to be undertaken as guided by the Contaminated Land Method Statement and the Materials Management Plan (see also **Section 4.6**).
- Where excavation is required, excavated material confirmed to be present with contaminants in concentrations greater than permitted within the Contaminated Land Method Statement will be disposed of at fully licensed land-based sites and not reused in the construction of the new defences.
- If any land-based contaminants are excavated, it will be stored on land and kept separate from areas that would drain into the harbours.
- All excavations during the construction works will be undertaken in accordance with the CEMP and Contaminated Land Method Statement.
- Any materials to be re-used within the works will be managed in accordance with an approved Materials Management Plan (to be produced once a contractor has been appointed) and the Contaminated Land Method Statement.
- Any materials to be imported for the works will be tested to ensure they are clean and suitable for the proposed use prior to importation and placement within the works.

- Any materials to be removed from the site will be suitably classified and taken to an appropriate off-site disposal facility or treatment site.

4.9 Waste

A TBT will be given to site operatives on waste management control and the Site Waste Management Plan is to be followed.

- All works to be undertaken in accordance with the Site Waste Management Plan.
- Waste to be stored in designated areas that are isolated from surface water drains and open water and any other sensitive receptors.
- Hazardous waste will be stored separately from inert and non-hazardous waste. Any differing hazardous waste will not be mixed.
- All waste containers will be signed to show the accepted waste stream.
- All skips used for the storage of waste shall be kept covered as far as is reasonable.
- Waste will be segregated for ease for off-site recycling.
- Site material will be re-used where possible.
- Waste and/or debris associated with the works will be removed within 6 weeks of each sectional completion of the works.
- All waste to be accompanied by completed Waste Transfer Notes.
- All waste transfer notes / hazardous waste consignment notes are to be checked before signatures applied to ensure all required information is recorded before the waste is removed.
- Carrier licences will be obtained and checked for all companies who remove waste from site.
- Full environmental permits, exemptions or other evidence will be obtained and checked to ensure that disposal locations can accept the waste type to be sent there, and in the quantity required.
- Where possible, excavated natural material will be used in accordance with CL:AIRE The Definition of Waste: Development Industry Code of Practice. This will ensure that these materials do not get classified as waste and are used in a sustainable manner.

4.10 Ecology (Species Mitigation and Precautions Required)

4.10.1 Notable Plant Species and Priority habitats

- The vegetated shingle habitat within Frontage 2 will be avoided and will not be impacted during construction works as the new sheet pile wall will be installed working from the landward side.
- Translocate the Golden Samphire plants from the old revetment at Frontage 3 to areas with suitable conditions and/or create areas with suitable conditions for assisted colonisation.
- Areas of vegetation that will not be removed but contain notable species (e.g. Golden Samphire in Frontage 2) should be mapped, demarcated and protected throughout the works to avoid any harm.
- Any wet woodland understorey habitat removed will be replaced with a native wetland mix of shrubs as outlined in the landscaping plans and planting schedule.

- 27m of species rich hedgerow will be planted in same location to replace the hedgerow removed during vegetation clearance and additional areas will be planted with a hedgerow seed mix as outlined in the landscaping plans and planting schedule.

4.10.2 Bats

All bat species and bat roosts are legally protected in the UK under Conservation of Habitats and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to:

- *Deliberately kill, injure or capture bats;*
 - *Deliberately disturb bats in such a way as to be likely to significantly affect i) the ability of any significant group of bats to survive, breed or rear or nurture their young, or ii) the local distribution or abundance of bats;*
 - *Intentionally or recklessly disturb any bat whilst it is occupying a roost;*
 - *Damage or destroy bat roosts;*
 - *Intentionally or recklessly obstruct access to a bat roost.*
- Any trees to be felled or pruned will be assessed from the ground level for the potential bat roost features, as even unoccupied bat roosts are protected by law. Emergence/re-entry surveys will be conducted at a suitable time of year on any additional tree due to be felled or pruned where medium/high/confirmed potential bat roosting features are identified.
 - Where possible all work on trees will be carried out in Spring (mid-March to end of April) before young are born, or Autumn (September to late October) after the young are weaned and independent before hibernation. However, these times are climate dependent and can vary from year to year.
 - Soft felling will be used as a precautionary method to remove trees / branches, including the five identified trees with negligible potential roosting features located around the proposed access junction between Langstone Road and the compound entrance. Soft felling requires the trees to be cut down in sections, with each section carefully lowered to the ground. Once lowered, the sections must be left in situ for 24 hours, to give any temporary roosting bats time to move away to another roost site.
 - To minimise risk of affecting foraging bats, avoid night working using artificial lighting. If essential, lights should be directed and shrouded to avoid light illuminating potential foraging areas e.g. tree lines.
 - Bat boxes will be installed as outlined in the landscape plans.

4.10.3 Breeding Birds

Under the Wildlife and Countryside Act, it is an offence to destroy or damage the nest of birds of any species.

- An appropriate ornithological watching brief by a suitably qualified and experienced ecologist will be undertaken to assess any impacts to nesting Little Egret (*Egretta garzetta*), Cattle Egret (*Bubulcus ibis*), Grey Heron (*Ardea cinerea*) and Cetti's warbler (*Cettia cetti*) at Langstone Millpond during the nesting period (March to August inclusive). Significant disturbance will be determined by expert opinion and, if required, consultation with relevant bodies, but could be reached by unacceptable daily effects or cumulatively, e.g. a pattern of effect amounting to an adverse impact. Appropriate management measures will be put in place immediately to address it. Such measures could range from the installation of acoustic barriers, implementation of timing restrictions to cessation of construction activities if other measures are not sufficient to avoid significant disturbance on nesting birds in this colony. These would be implemented, until nesting attempts have been completed. Details of this watching brief will be set out within the final CEMP.
- To minimise risk of disturbance to the egret and heron roost, no night working, and particularly no artificial lighting, should be used between CH112-221.

- All vegetation clearance in Frontage 5 should be undertaken outside of the bird nesting season (March-August inclusive) to avoid disturbance of the egret/heron nesting colony.
- No site personnel to enter the woodland area around the egret/heron nesting colony during the bird breeding season March-August inclusive.
- All suitable bird nesting habitat within working areas to be cleared outside of the bird nesting period (no bird nesting habitat to be cleared between March to August inclusive). If this is not possible all potential habitat to be checked by a suitably experienced and qualified ecologist prior to commencement. If nests are found, work in that area will stop, and a 5m buffer will be placed around the nest. Work can only continue when the nest becomes unoccupied of its own accord.
- A range of nest boxes suitable for species present will be erected in adjacent habitats prior to commencement of site clearance.

4.10.4 SPA Breeding Seabirds

- A silt curtain will be installed and kept in a good working condition throughout the whole duration of the foreshore construction works. This will prevent any suspended sediments migrating into the wider adjoining harbours. Any failures in the silt curtain will be reported to the sub-contractor and repaired as soon as possible.
- Works on the foreshore will be undertaken over the low tide period to minimise resuspension of any contaminants into the water column.

4.10.5 Non-breeding SPA Birds / Overwintering Birds

- The following seasonal timing restrictions will be incorporated for sensitive overwintering bird locations:
 - In Frontage 1A, a wacker plate or compacting plant with a similar noise profile will not be used between CH120-188 during the overwintering bird period October to March inclusive.
 - In Frontage 2, no construction work to be undertaken during the overwintering bird period October-March inclusive.
 - In Frontage 3, no construction work to be undertaken during the overwintering bird period October-March inclusive.
 - In Frontage 4, no construction work to be undertaken during the overwintering bird period October-March inclusive.
 - In Frontage 5, no construction work to be undertaken on the harbourside stretch of this frontage (CH0-110) or piling / trench sheet installation work between CH110-185 during the overwintering bird period October to March inclusive.
- For any work proposed within the over-wintering bird period (October- March inclusive), an appropriate ornithological watching brief by a suitably qualified and experienced ecologist will be undertaken to assess any impacts. Significant disturbance will be determined by expert opinion and, if required, consultation with relevant bodies, but could be reached by unacceptable daily effects or cumulatively, e.g. a pattern of effect amounting to an adverse impact. Appropriate management measures will be put in place immediately to address it. Such measures could range from the installation of acoustic barriers, implementation of timing restrictions to cessation of construction activities, if other measures are not sufficient to avoid significant disturbance to the over-wintering birds. Details of this watching brief will be provided within the final CEMP, which will be submitted for approval by the LPA / Natural England prior to the commencement of construction activities.
- In the event of severe weather, defined as frozen ground conditions reported by over half of the meteorological stations in England/Wales, after 7 consecutive days (allowing for

short (24-48 hours) periods of thaw) an expert review will be undertaken by the project ecologist and if necessary work may be restricted or halted. After 14 consecutive days of frozen ground conditions and if a statutory suspension is announced all works will cease during the suspension period. Details of this process will be laid out within the final CEMP.

4.10.6 West European Hedgehog

West European hedgehogs are listed under the NERC Act 2006.

- Any dense vegetation clearance (e.g. hedgerows / along the Hayling Billy trail) should initially be checked for hedgehogs prior to removal.
- Any piles of leaf litter and similar material should initially be cleared by hand, to avoid harm to sleeping or hibernating hedgehogs.
- No excavations should be left open overnight, they should be covered and / or provide a means of escape (e.g. scaffold plank laid at 45 degrees).

4.10.7 Badger and Common Toad

Badgers and their setts are legally protected under the Protection of Badgers Act 1992 in England and Wales. Common toads are listed under the NERC Act 2006.

- No excavations should be left open overnight, they should be covered and / or provide a means of escape (e.g. scaffold plank laid at 45 degrees).

4.10.8 Reptiles

It is illegal to intentionally or recklessly kill or injure a common reptile. The following mitigation measures will be applied to minimise the risk of the proposed works on impacting protected reptile species (see also **Appendix B - Reptile Mitigation Strategy**).

Frontage 5

Due to the low reptile population and the good connectivity of areas of reptile habitat in this frontage, the main method of mitigation will be vegetation management undertaken to encourage reptiles to move into adjacent habitats. Reptile fencing and/or close-cropped strips will be located to stop recolonisation of de-risked areas from adjacent suitable habitat that will act as reptile safe areas throughout the works. These reptile safe sites will not be impacted by the construction works. The following measures will be taken during the vegetation management and reptile de-risking:

- During the active season (March to October - subject to suitable weather conditions), vegetation management (staged cutting down to ground level) will be used to encourage reptiles to move into safe zones.
- The cutting programme will aim to work in a directional manner cutting progressively toward the nearest reptile safe area.
- Once it is considered that all reptiles will have moved into safe zones, all safe zones will be constrained by close crop mowing along the zone boundaries and/or reptile fenced to best practice standards.
- Following vegetation management hand capture under Alternative Cover Objects (ACO) will be undertaken, to demonstrate that the area is clear of reptiles. Any captured animals will be translocated into the nearest reptile safe area. Capture will be undertaken five days a week, once per day in suitable weather conditions. Capture operations will continue for a minimum of 15 days and then until no animals have been seen or captured for five consecutive days with suitable weather conditions.
- As most of the habitat is alongside habitats that will be retained and/or are with tree protection zones no destructive search will be carried out following vegetation management.
- Close cropping will continue around the Frontage boundaries and reptile fencing will be placed around the Frontage boundaries where necessary (attached to the heras fencing)

to ensure reptiles do not return to the site during the construction works. Vegetation will be kept short within the Frontage boundaries to further deter reptiles during the construction works. The reptile fencing will be checked regularly to ensure it is in good working order.

Frontage 2

Vegetation management and in situ reptile translocation within the Frontage boundaries is planned for Frontage 2. Reptile fencing and/or close-cropped strips will be located to stop recolonisation of de-risked areas from adjacent suitable habitat that will act as reptile safe areas throughout the works. These reptile safe sites will not be impacted by the construction works. The following measures will be taken during the vegetation management and reptile de-risking:

- During the active season (March to October - subject to suitable weather conditions), vegetation management (staged cutting down to ground level) will be used to encourage reptiles to move into safe zones and/or where that is not feasible into focus areas.
- The cutting programme will aim to work in a directional manner cutting progressively toward the nearest reptile safe area.
- Once it is considered that all reptiles will have moved into safe zones, all safe zones will be constrained by close crop mowing along the zone boundaries and/or reptile fenced to best practice standards.
- Following vegetation management hand capture under Alternative Cover Objects (ACO) will be undertaken, to demonstrate that the area is clear of reptiles. Any captured animals will be translocated into the nearest reptile safe area. Capture will be undertaken five days a week, once per day in suitable weather conditions. Capture operations will continue for a minimum of 30 days and then until no animals have been seen or captured for five consecutive days with suitable weather conditions.
- If considered necessary, e.g. in areas where capture is difficult, a destructive search will be carried out. This will follow best practice procedures presented and use two suitably qualified and experienced ecologists observing/checking and capturing any reptiles and covering both the excavation and the deposition areas.
- Close cropping will continue around the Frontage boundaries and reptile fencing will be placed around the Frontage boundaries where necessary to ensure reptiles do not return to the site during the construction works. Vegetation will be kept short within the Frontage boundaries to further deter reptiles from recolonisation during the construction works. The reptile fencing will be checked regularly to ensure it is in good working order.
- A full Reptile Mitigation Strategy will be prepared and submitted for approval prior to commencement.
- All works will be carried out in accordance with the approved Reptile Mitigation Strategy.
- In the unlikely event that reptiles are discovered during works (including pre-works clearance), work should stop immediately, and a suitably qualified and experienced ecologist contacted for advice.

4.10.9 Invertebrates: Stag Beetle

The stag beetle is a Habitats Directive Annex II listed species.

- The area to be cleared in Frontage 1A and 2 should be checked for any stag beetle larvae and / or adults by a suitably qualified and experienced ecologist. Any stag beetles or larvae found should be carefully translocated to a suitable natural or purpose-built habitat close by.
- Create areas with loggeries / log piles / log pyramid features within the landscaping plans along the Hayling Billy trail footpath in Frontages 1A and 2, to encourage female stag beetles to lay their eggs within / near the rotting wood features.

4.10.10 Marine Mammals (Harbour and Grey Seals)

The harbour and grey seal are both listed on Annex V of the European Habitats Directive 2017.

- See **Section 4.3** for mitigation measures regarding excavation and piling on harbour and grey seals.
- A silt curtain will be used to prevent suspended sediments entering the wider area during construction (see **Section 4.2**).

4.10.11 Migratory Fish

- See **Section 4.3** for mitigation measures regarding excavation and piling works on migratory fish.
- A silt curtain will be used to prevent suspended sediments entering the wider area during construction (see **Section 4.2**).

4.10.12 Marine Invasive Non-native Species

- A Marine Biosecurity Plan will be followed to minimise the introduction / spread of marine invasive non-native species (see **Appendix C**).

4.10.13 Schedule 9 Plants: Japanese Rose and Three-cornered Garlic

Two plants listed under Schedule 9 part 2 of the Wildlife and Countryside Act 1981 (as amended), are present within the Scheme boundary located close to the Billy Trail footpath. Japanese Rose is present within Frontage 2 and Three-cornered Garlic is present within Frontages 1A and 2. It is illegal to plant or cause a Schedule 9 invasive non-native plant species to grow.

- A pre-commencement survey will be undertaken and a 7m buffer zone will be marked around any Japanese Rose and/or Three-cornered Garlic plants found.
- A Schedule 9 Plant Management Plan will be implemented and adhered to for plants/material retained on site, or appropriately disposed of on site.
- All material within the 7m buffer zones removed from site will be clearly identified to the waste carriers as potentially containing Japanese Rose and/or Three-cornered Garlic and taken to a suitably licensed disposal site.
- Ensure that imported materials are free from Japanese Rose, Three-cornered Garlic and other invasive species where possible.

4.10.14 Trees

All works will be undertaken in accordance with the Arboricultural Method Statement.

- All of the recommended tree works should be undertaken by an approved and experienced tree contractor as outlined in the Arboricultural Method Statement prior to any construction contractors commencing works on site.
- Erect the protective fencing as specified and shown on the Tree Protection Plan BJH03/04 at appendix BH3 in the Arboricultural Method Statement. Barriers are to be 'Fit for Purpose' to exclude construction activity and must be maintained to ensure that they remain rigid and complete and in the original setting out positions. These checks will need to be incorporated into a schedule of site monitoring visits to be agreed with the contractor subject to phased development operations and subsequently copies of these site visit reports will need to be copied to the LPA.

- A copy of the Tree Protection Plan is to be pinned up in the offices on site for all site staff to see. The area within the fenced off construction exclusion zone is to be regarded as sacrosanct and the fencing shall not be taken down or relocated at any time without the prior written approval of the monitoring arboriculturist or local authority tree officer, unless this has already been agreed as part of the planning application consent process and is detailed in writing and shown on a plan.
- The following prohibitions shall apply within the area enclosed by the Tree Protection Fencing [Construction Exclusion Zone]:
 - No mechanical digging or scraping once the initial ground cover vegetation has been cleared and the site fenced off.
 - No storage of plant, equipment or materials
 - No vehicular or plant access
 - No fire lighting
 - No handling, discharge or spillage of any chemical substance, including cement washings
 - No action likely to cause localised water-logging
 - No change in ground levels
- All site works storage areas and compounds/welfare units/toilet blocks and any mixing areas are to be located outside of and well clear of retained tree RPA's.
- All Utility Service connections are to be located outside of tree RPA's.

Arboricultural Expert Monitored 'Hand Digging' works [for works within tree Root Protection Zones (RPZ)'s]:

- Break out hard surfacing with appropriate drills and hand held tools stopping as soon as bare earth is reached - which may include the use of a mini digger with a pneumatic 'pecker' attachment or for large plant working entirely from the foreshore and outside of tree RPZ's.
- Clear away the debris and arisings from the work face.
- An Arboricultural Expert is to be called in to monitor the 'Hand Digging' works with forks [or air spades or similar acceptable low impact technology] ONLY initially and shovels and spades at a later date at the discretion and direction of the Arboricultural Expert.
- If roots are encountered then they are to be carefully worked around and if they are 25mm or less in diameter and not found 'en masse' then the Arboricultural Expert will sever them at the trench edge with clean and sharp bypass secateurs to allow works to continue. In the event that the roots are over 25mm in diameter then the priority must be to retain them and find a 'work around' solution (e.g. packing around them with sharp washed sand and then wrapping in hessian to protect them).

Ground Protection Measures:

- Whilst there is no anticipated specific need for these works it may be found that to access an area to work on it (i.e. the Mill Lane footpath link) then ground protection must be laid to give access to hand operated machinery as per BS5837:2012 Section 6.2.3.3 Recommendations.
- The Tree Protection Plan will be monitored as outlined in the Arboricultural Method Statement.

Tree Removals:

- Where specific trees are shown for removal to facilitate the layout of the Scheme (on the Tree Protection Plans: LANG-ACM-TPP-F1A_DR_ZZ_011030, LANG-ACM-TPP-F2_DR_ZZ_011031, LANG-ACM-TPP-F3_DR_ZZ_011032, LANG-ACM-TPP-F4_DR_ZZ_011033, LANG-ACM-TPP-F5_DR_ZZ_011034, LANG-ACM-TPP-F5_DR_ZZ_011035, LANG-ACM-TPP-F5_DR_ZZ_011036, LANG-ACM-TPP-

F5_DR_ZZ_011037, LANG-ACM-TPP-F5_DR_ZZ_011038), they are to be cut down in a controlled manner to avoid damage to other trees and their surroundings. The stumps are to be ground out by machine except where they are shown to be coppiced and these will be cut down to ground level and allowed to re-shoot and contribute to the general shrubbery and low canopy cover in the future (as detailed in the Arboricultural Method Statement).

- All of the recommended tree works should be undertaken by an approved and experienced tree contractor prior to any construction contractors commencing works on site.
- Any trees and scrub removed will be replaced with an equal or greater number of appropriate species, sizes and quality.

4.11 Archaeology and Heritage

Works to be undertaken in accordance with the Heritage Statement and Archaeological Mitigation Strategy.

- An Archaeological Mitigation Strategy will be produced, which sets out an appropriate approach to be adopted during construction.
- Site induction and specific tool box talks will highlight the potential for buried archaeology and the correct response procedure should any items be uncovered during works.
- The construction works will have a retained archaeologist present that will brief the construction team at commencement of works and undertake a watching brief in some capacity during certain stages of construction, if required.
- Construction site management will ensure care is taken to not disturb the ground deeper than is required for surface clearance.
- In the event of archaeological material being discovered, works will stop immediately in that area until the County Archaeologist and Historic England have approved works to continue. Any finds will be recorded and managed in accordance with the Archaeological Mitigation Strategy.
- Sensitively designed hoardings will be used within the Conservation Area and near Grade II Listed Buildings and the Contractors will be required to follow the Code of Considerate Practice during the works.

4.12 Planting and Landscaping Works

- Once works are complete, vegetation will be replanted with native, hardy and quick growing species suited to the environment, where possible. Replanting will be undertaken as advised by the Landscape Plans and Planting Schedule and shall be carried out no later than the first planting and seeding season following the completion of the development.
- Any trees or plants which, within a period of 5 years from the date of planting die, are removed or become seriously damaged or diseased shall be replaced in the next planting season with others of similar size and species.

4.13 Reinstatement of Site

- Temporary structures will be reinstated within 4 weeks of work completion.
- Any damage to the open spaces used (e.g. from vehicular use and location of compounds) will be repaired and the grass reinstated upon completion of the construction works.

4.14 Traffic and Transport

Adhere to the Construction Traffic Management Plan (CTMP). *This will be finalised by the contractor once appointed and expect this will be secured via planning conditions.*

4.14.1 Roads/Haul Routes/Deliveries

- Pre-work survey carried out to assess condition of local roads and ensure assets are returned to pre-works condition or better after completion.
- Utility service providers will be contacted to locate their services, suitable protection will be agreed.
- A gated entrance will be located on the site entrances. The entrances will be manned and marshalled at all times when the site is in operation to ensure public safety and safe vehicle management. The entrance will be padlocked shut when not in use.
- Deliveries and on-site traffic will be controlled through a Construction Traffic Management Plan.
- Site traffic will be restricted to 10mph.
- A designated wash down area with a mobile jet wash will be provided to clean site vehicles before leaving site and going on the highway.
- All deliveries to site will enter immediately upon arrival where possible and will not be kept on public highways. Vehicles entering site will have priority over vehicles leaving site.
- Vehicle Marshalls will be at each delivery entrance to control all vehicle movements.
- General public and public vehicles will have priority over site traffic at all times. There is sufficient room within the site boundaries to stack up all vehicles expected throughout the works.
- All drivers delivering to the site will be briefed regarding site rules and sensitivities prior to their initial visit.
- Segregation will be maintained at all times between site traffic and the public via site fencing and gatemen at all access points on to the site. All site roads will be fenced with either Heras panels or Ready hoarding to segregate site from general public.
- Pedestrian fences will be erected within compound areas to separate site operatives from site vehicles wherever possible to maintain public safety.
- All haul routes within the site boundary will be well maintained throughout the works.

4.14.2 Footpath / Cycle Path

- Appropriate notices and signage will be displayed throughout the construction period to update the public on progress and the need for the works.
- All footpath closures will be suitably signed with a diversion route plan at the start and end of the diversion along with intermediate joining points, to warn the public of construction works.
- Any closed footpaths and cycle routes will be replaced with signposted temporary alternative routes during the works.

4.14.3 Access to Residential Properties / Local Facilities

- Sensitively designed hoardings will be used and the Code of Considerate Practice will be followed by the contractor to reduce the visual and noise impacts to local residents and users of the local facilities.
- Access to the Ship Inn car park and the stone paved seating area along the path will be maintained and only suspended temporarily during the construction works to the Ship Inn flood wall (Frontage 3).
- Existing access and egress points will be maintained as part of the works.

- Slipway access will be maintained and only suspended temporarily during the construction works to the Ship Inn flood wall (Frontage 3).
- Parking restrictions will be in place at the end of Langstone Avenue will be required to enable HGV access. Such restrictions will be limited where possible such as restricting some parking during working hours, taking into account delivery restrictions.
- Finger boards will be used to direct cars to designated parking areas.

5 Management of Flood Risk during Construction

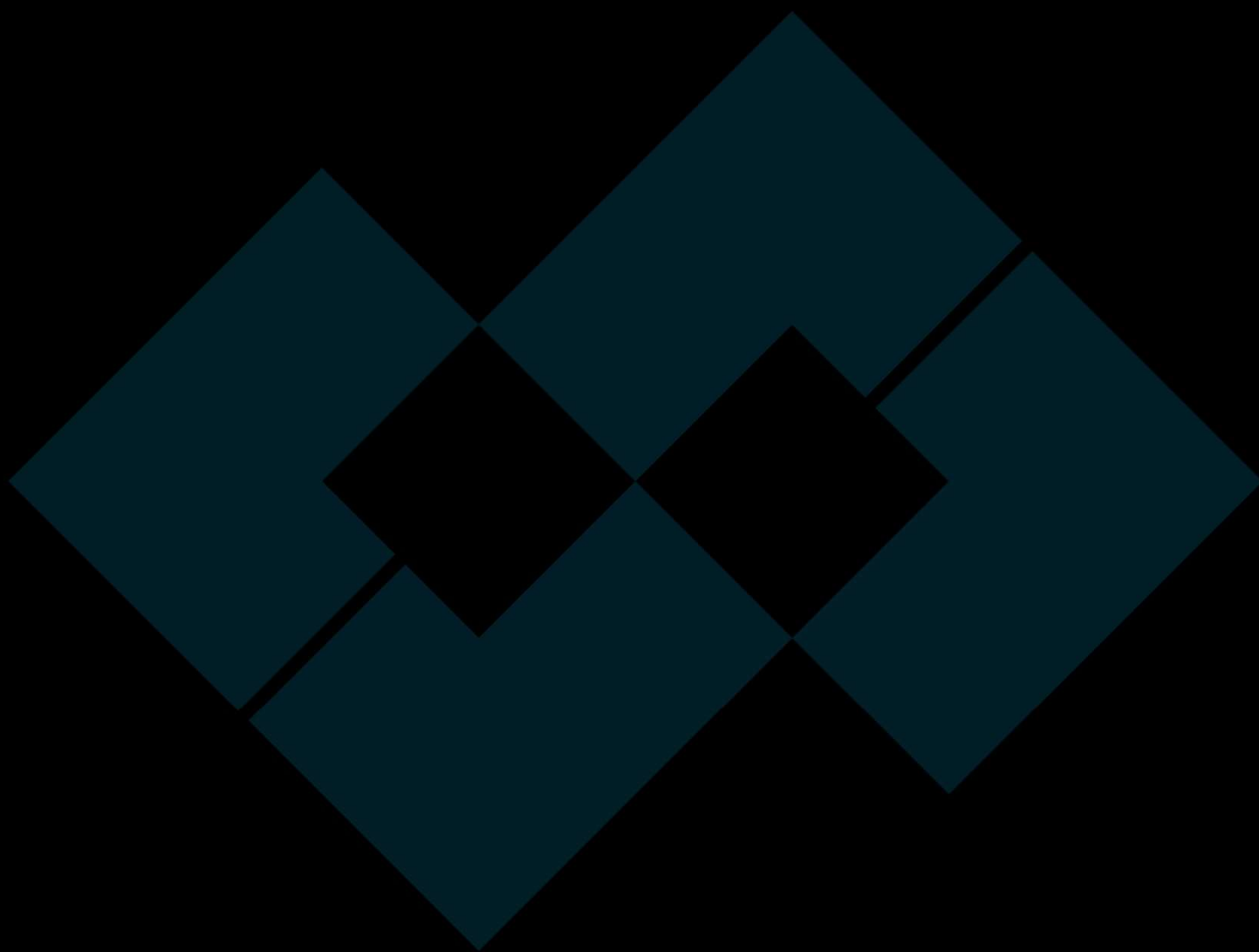
Existing flood defence levels and watercourses within the site working area will be maintained and monitored to ensure no increased risk of flooding during construction activities.

The Principal Contractor will retain the integratory of the coastal defence and manage flood risk during construction through the final CEMP, which will be submitted for discharge on conditions once a contractor has been appointed.

Appendix A – Langstone FCERM Scheme Construction Method Statement

To be completed with the contractor (when appointed) and included in the final version of the CEMP, which will be submitted for discharge of pre-commencement conditions.

Appendix B – Reptile Mitigation Strategy



Appendix B - Langstone FCERM Scheme Draft Reptile Mitigation Strategy

Project	Langstone FCERM Scheme
Title	Reptile Mitigation Strategy
Reference	

Document History

Date	Revision	Prepared	Approved	Authorised	Notes
04/03/2024	0.1	Zoe Palmer	Ed Rowsell		Draft
19/06/2024	0.2	Ed Rowsell	Gavin Holder		Final



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1 Introduction

A Reptile Mitigation Strategy has been produced by Coastal Partners (CP) for the Langstone Flood and Coastal Erosion Risk Management (FCERM) Scheme (**Figure 1.1**). The Reptile Mitigation strategy is required as part of the planning application to demonstrate measures taken for work within potential reptile habitat during the construction of the proposed Langstone FCERM Scheme, to avoid harm to protected reptile species. This document will establish the principles and methods of a 'vegetation management, hand capture and reptile relocation programme', prior to the construction works. Any contractors engaged to undertake the construction work will be required to adhere to this strategy. (This is a live document and could change according to conditions on the ground; contractors should consult with CP on any deviation).

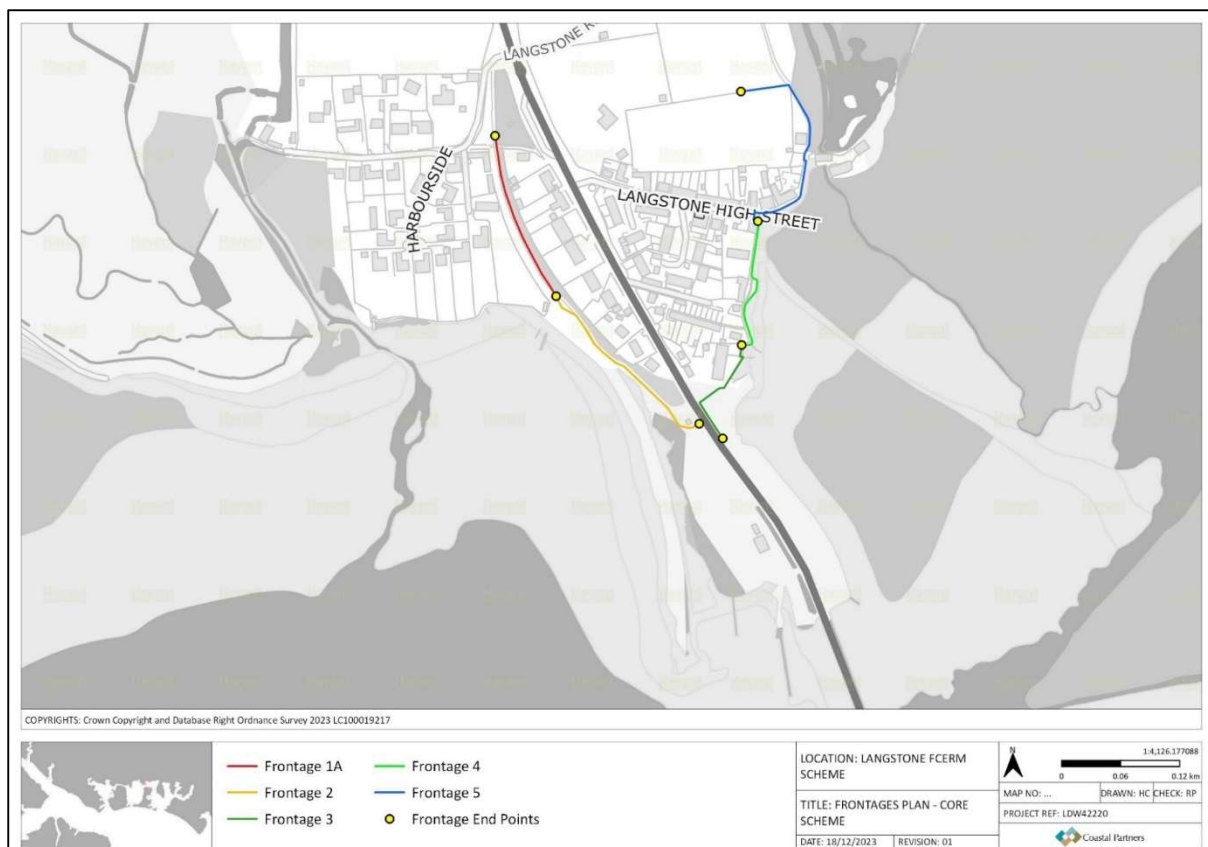


Figure 1.1 – Langstone FCERM Scheme Frontages plan.

2 Site Background

The site comprises a mixture of broadleaved and wet woodland, scrub, hedgerow, grassland and reedbed habitats. Saltmarsh and vegetated shingle habitats are located at the coastal margins and the harbour itself comprises of intertidal mudflat, littoral coarse sediment and shingle. There are areas of suitable reptile habitat within Frontage 2 (approximately 0.21ha), particularly within the scrub and improved grassland adjacent to the Billy Trail footpath which runs parallel to Langstone Road. Suitable reptile habitat (approximately 0.77ha) is also present within Frontage 5 (including the main compound area), particularly within the improved grassland, scrub and hedgerows within the Langstone Meadows.

2.1 Proposed Works

The proposed coastal defences consist of a mix of earth bunds, reinforced concrete sea walls and sheet pile walls, as described below.

- **Frontage 1A: Billy Line North.** The flood defence comprises of a raised earth embankment and follows the line of the existing Billy Line cycleway (a National Cycle Route 2 cycleway). The existing cycle path is to be upgraded to a new 3 metre wide shared path for pedestrians and cyclists which sits on top of the flood embankment.
- **Frontage 2: Billy Line South.** The design for Frontage 2 consists of a sheet-piled wall. Raised earth embankments are included where the defence alignment needs to cross existing utility pipes. The existing cycle path is to be upgraded to a new 3 metre wide shared path for pedestrians and cyclists which sits adjacent to the sheet-piled wall. Frontage 2 ties in with Frontage 1A and the existing higher levels on the A3023 road.
- **Frontage 3: A3023 road to 9 Coastguard Cottages (The Look Out).** Frontage 3 consists of a continuous flood defence that largely comprises of four flood defence structures. These structures include the A3023 flood wall, Ship Inn car park raised earth bund, Ship Inn flood wall and Ship Inn Annex flood wall. A flood gate is also to be provided between the Ship Inn and the Ship Inn Annex flood walls.
- **Frontage 4: The Look Out to No. 24 Langstone High Street (the Winklemarket).** Frontage 4 consists of new reinforced concrete flood walls in front of the existing garden walls that run along the frontage. The existing footpath is to be upgraded to a new 1.5 metre wide footpath through the construction of a new quay wall, to improve user accessibility of the route. One flood gate (at Green Cottage) and one demountable flood barrier (at the pedestrian access adjacent to the Watch Tower) will be provided to ensure robust continuity of the defence.
- **Frontage 5: Langstone High Street to the field north of the Royal Oak.** Frontage 5 consists of a continuous flood defence that largely comprises of five structures. These structures include the High Street flood gates, the Royal Oak flood wall, the allotment flood wall, the Footpath flood wall that runs west of the Mill Pond, and an earth embankment in the field north of the Royal Oak. Demountable flood barriers will be provided between the section transitions and flood gates will be provided at No.21 High Street.

A main site compound will be set up that will remain in situ throughout the construction works, located in the fields to the north of the Royal Oak (Langstone Meadows). Two satellite compounds may also be required – one located in the Ship Inn car park and one north of the Langstone Sailing Club.

In Frontage 2 approximately 0.28ha of grassland, scrub, and woodland will need to be removed under the footprint of and adjacent to the raised earth embankment. In Frontage 5 approximately 1.6 ha of grassland, hedgerow, scrub and woodland habitat will be removed under the footprint and adjacent to the flood wall and earth embankment, and within the main compound location and associated haul route (**Figure 2.1**). Re-planting along the new embankments is proposed to enable the work to blend in with the existing environment and to support a range of species including reptiles.

The construction works are expected to commence in Spring 2027 (subject to approvals) and will take approximately two years to complete.



Figure 2.1: Proposed vegetation clearance areas for Frontage 2 and Frontage 5 of the Langstone FCERM Scheme (site boundary indicative).

2.2 Reptile Survey Results

A presence / likely absence survey was undertaken in accordance with the Herpetofauna Groups of Britain and Ireland (HGBI) (1998) guidelines and Natural England's 'Reptiles: surveys and mitigation for development projects' guidance (Natural England, 2015). Five transects (A-E) (**Figure 2.2**) were established through areas of potentially suitable reptile habitat within the Frontage 2 site. The transects were surveyed with a total of 53 Artificial Cover Objects (ACOs), consisting of 500mm x 500mm bitumen felt squares. The ACOs were placed approximately every 10 - 20m along the transects and were left to settle in for two weeks following placement. Each transect received nine site visits during suitable conditions between 16th April and 8th June 2021; and records of any reptiles basking on top or sheltering underneath the ACOs were made. In addition, during survey transects, a methodical visual search of natural basking locations was undertaken to gain further observations of reptiles.

A second survey was undertaken in 2022 to account for an additional haul route and compound location within the Frontage 5 area. Three transects (A-C) (**Figure 2.3**) were established through areas of potentially suitable reptile habitat. The transects were surveyed with a total of 41 ACOs that were placed approximately every 10 - 20m along the transects and left to settle in for two weeks following placement. Each transect received seven site visits during suitable conditions between 5th and 26th of April 2022; and records of any reptiles basking on top or sheltering underneath the ACOs were made. The population size was calculated based on the maximum number of adults seen during each survey visit as detailed in the Froglife Advice sheet 10 (Froglife, 1999).

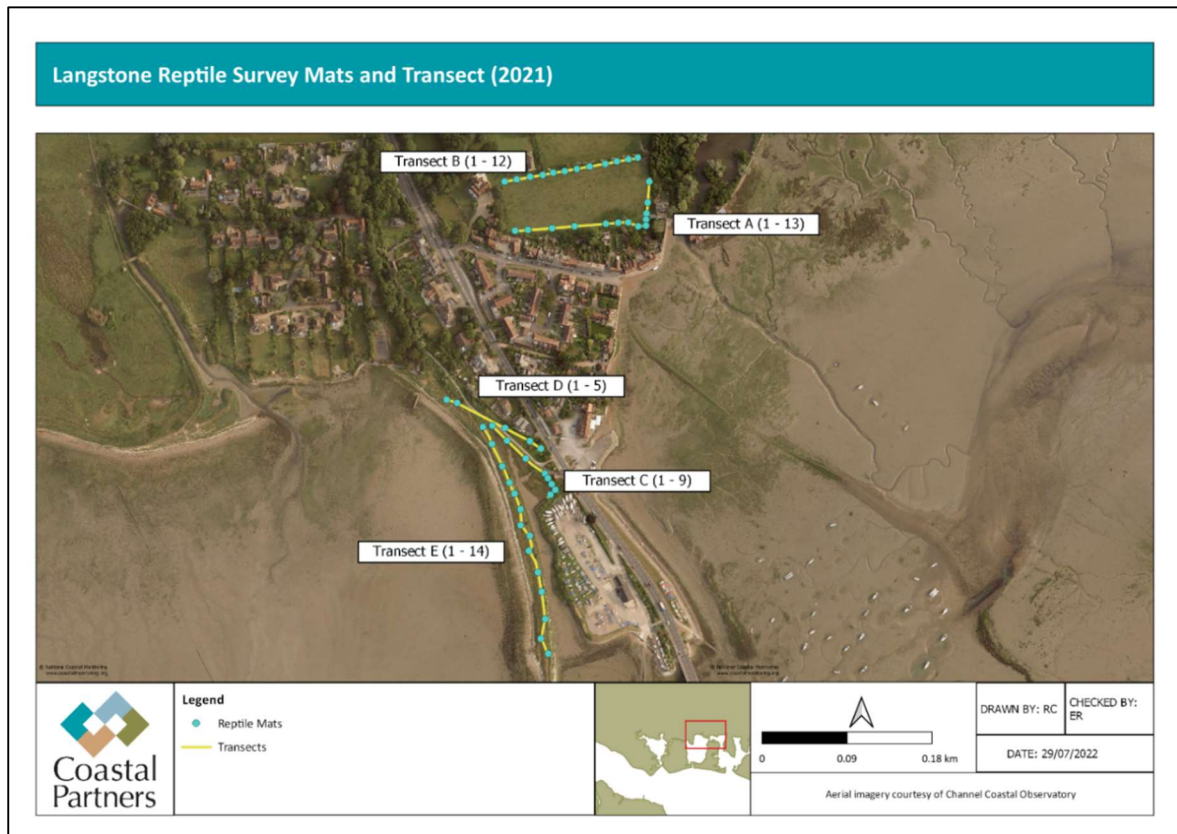


Figure 2.2 Langstone reptile survey (2021) transects A-E showing position of ACOs.

Additional Langstone Reptile Survey Transects and Mat Locations (2022)

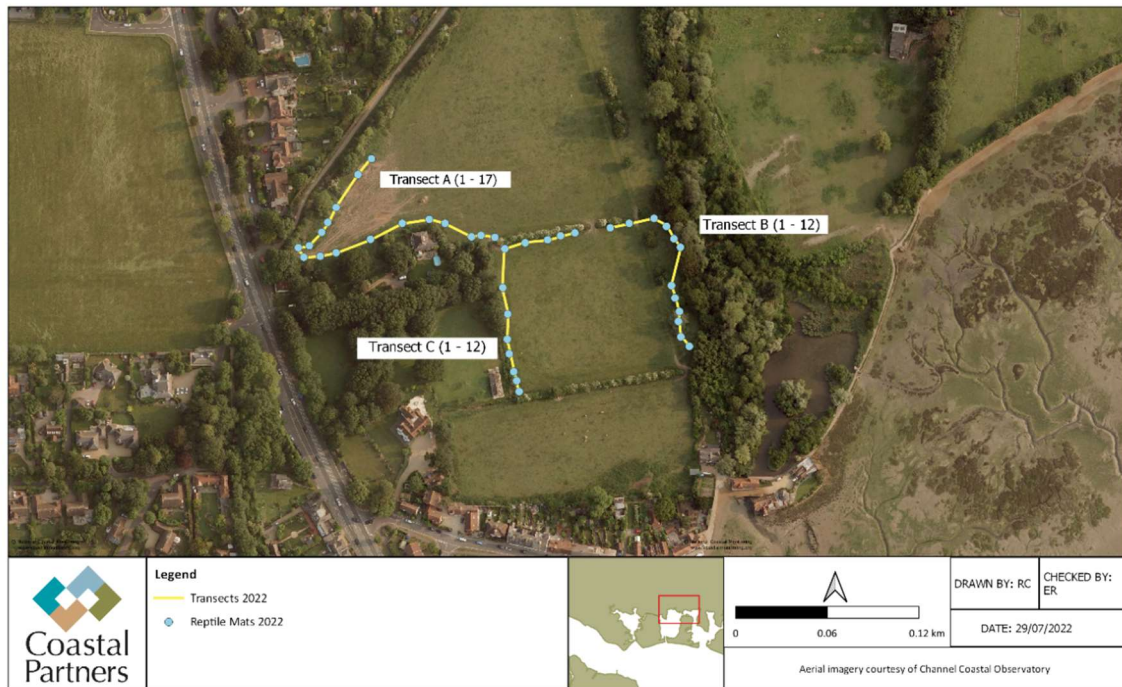


Figure 2.3 Langstone reptile survey (2022) transects A-E showing position of ACOs.

During the surveys, two reptile species, common lizard (*Zootoca vivipara*) and slow worm (*Anguis fragilis*) were recorded along transects B-E (2021) and transect A (2022) (**Figure 2.4**). Peak adult survey counts were one common lizard (on 16.04.21, 23.04.21 and 27.04.21) and thirteen slow worms (on 27.05.21) for both areas. Using the Froglife Advice sheet 10 (Froglife, 1999) criteria, these results indicate that the location has a 'good' population of slow worm and a 'low' population of common lizard overall.

When looking at the two frontages separately where suitable reptile habitat is found, the survey results are as follows.

- Frontage 2 had a peak survey count of eleven adult slow worms and one adult common lizard, indicating that Frontage 2 has a medium population of slow worms and a low population of common lizards.
- Frontage 5 had a peak survey count of two adult slow worms, indicating that Frontage 5 has a low population of slow worms.

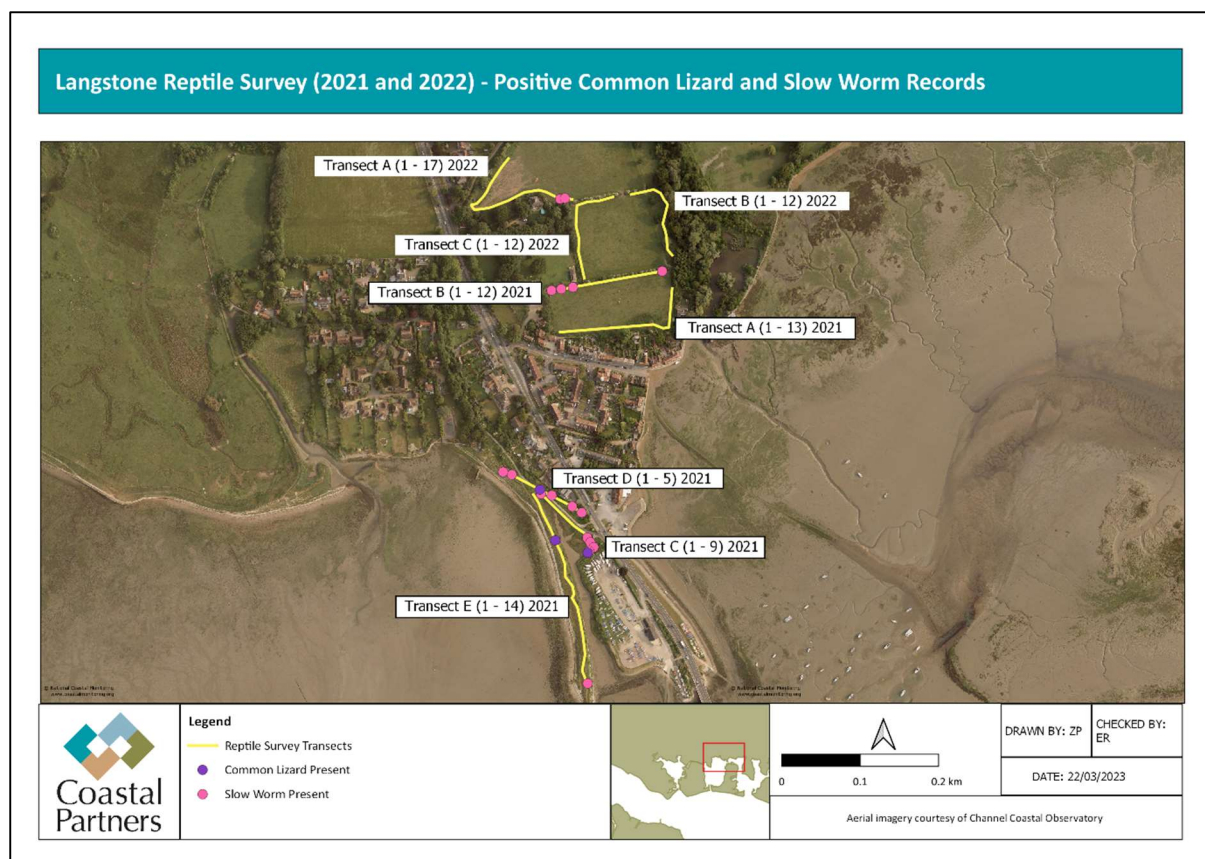


Figure 2.4 Positive records of slow worm (*Anguis fragilis*) and common lizard (*Zootoca vivipara*) on all transect routes during 2021 and 2022 reptile surveys.

2.3 Legislation

All reptiles are protected under the Wildlife and Countryside Act 1981 (as amended), making it illegal to intentionally or recklessly kill or injure a common reptile. Rare reptiles, which include Smooth Snake (*Coronella austriaca*) and Sand Lizard (*Lacerta agilis*) also receive legal protection under the Conservation of Habitats and Species Regulations 2017 (as amended). It would be an offence to deliberately injure, kill, capture or disturb a rare reptile, or to damage or obstruct any place used for shelter or protection. Rare reptiles may only be disturbed by licensed ecologists.

All reptile species are species of principle importance under the Natural Environment Rural Communities (NERC) Act 2006, and local authorities and other public bodies have a legal duty to take their conservation into account. Because of this they are a material consideration in the planning process.

2. Proposed Mitigation

Vegetation clearance, construction activities and operations (particularly involving plant and other machinery) have the potential to impact reptiles within Frontage 2 and Frontage 5. The following mitigation measures will be applied to minimise the risk of the proposed works on killing or injuring protected reptile species.

A composite and phased approach will be undertaken on site in order to achieve programme objectives whilst complying with current guidelines, best practice and UK legislation. A range of techniques will be used to de-risk all suitable habitat for reptiles within the Frontage boundaries and reptiles found will be captured and translocated to the designated safe receptor areas. The receptor areas (**Figure 3.1**) contain approximately 0.85ha of mixed grassland / meadow / light scrub habitat. It is estimated that there is around 1.6ha of potential reptile habitat in the vicinity, of which 0.6ha is within the scheme boundary.

The entire process will be undertaken or supervised by suitably qualified and experienced ecologists. The optimal time to carry out the translocation is during the reptile active season (March to September). Due to the low population located in Frontage 5 and the connectivity of the habitat a different approach is suggested for this area as opposed to frontage 2.

2.4 Frontage 5 – Langstone FCERM Scheme

Due to the low reptile population and the good connectivity of areas of reptile habitat in this frontage, the main method of mitigation will be vegetation management, undertaken to encourage reptiles to move into adjacent habitats. Reptile fencing and/or close-cropped strips will be located to stop recolonisation of de-risked areas from adjacent suitable habitat that will act as reptile safe areas throughout the works see (**Figure 3.1**). These reptile safe sites will not be impacted by the construction works. The following measures will be taken during the vegetation management and reptile de-risking:

- During the active season (March to October - subject to suitable weather conditions), vegetation management (staged cutting down to ground level) will be used to encourage reptiles to move into safe zones.
- The cutting programme will aim to work in a directional manner cutting progressively toward the nearest reptile safe area.
- Once it is considered that all reptiles will have moved into safe zones, all safe zones will be constrained by close crop mowing along the zone boundaries and/or reptile fenced to best practice standards.
- Following vegetation management hand capture under Alternative Cover Objects (ACO) will be undertaken, to demonstrate that the area is clear of reptiles. Any captured animals will be translocated into the nearest reptile safe area. Capture will be undertaken five days a week, once per day in suitable weather conditions. Capture operations will continue for a minimum of 15 days and then until no animals have been seen or captured for five consecutive days with suitable weather conditions.

- As most of the habitat is alongside habitats that will be retained and/or are with tree protection zones, no destructive search will be carried out following vegetation management.
- Close cropping will continue around the Frontage boundaries and reptile fencing will be placed around the Frontage boundaries where necessary (attached to the heras fencing) to ensure reptiles do not return to the site during the construction works. Vegetation will be kept short within the Frontage boundaries to further deter reptiles during the construction works. The reptile fencing will be checked regularly to ensure it is in good working order.

For further details on methodologies for these stages see **section 3.3.1**.

2.5 Frontage 2 – Langstone FCERM Scheme

Vegetation management and in situ reptile translocation within the Frontage boundaries is planned for Frontage 2. Reptile fencing and/or close-cropped strips will be located to stop recolonisation of de-risked areas from adjacent suitable habitat that will act as reptile safe areas throughout the works see (**Figure 3.1**). These reptile safe sites will not be impacted by the construction works. The following measures will be taken during the vegetation management and reptile de-risking:

- During the active season (March to October - subject to suitable weather conditions), vegetation management (staged cutting down to ground level) will be used to encourage reptiles to move into safe zones and/or where that is not feasible, into focus areas.
- The cutting programme will aim to work in a directional manner cutting progressively toward the nearest reptile safe area.
- Once it is considered that all reptiles will have moved into safe zones, all safe zones will be constrained by close crop mowing along the zone boundaries and/or reptile fenced to best practice standards.
- Following vegetation management, hand capture under Alternative Cover Objects (ACO) will be undertaken, to demonstrate that the area is clear of reptiles. Any captured animals will be translocated into the nearest reptile safe area. Capture will be undertaken five days a week, once per day in suitable weather conditions. Capture operations will continue for a minimum of 30 days and then until no animals have been seen or captured for five consecutive days with suitable weather conditions.
- If considered necessary, e.g. in areas where capture is difficult, a destructive search will be carried out. This will follow best practice procedures presented and use two suitably qualified and experienced ecologists observing/checking and capturing any reptiles and covering both the excavation and the deposition areas.
- Close cropping will continue around the Frontage boundaries and reptile fencing will be placed around the Frontage boundaries where necessary to ensure reptiles do not return to the site during the construction works. Vegetation will be kept short within the Frontage boundaries to further deter reptiles from recolonisation during the construction works. The reptile fencing will be checked regularly to ensure it is in good working order.

For further details on methodologies for these stages see **section 3.3.1** and destructive search at **section 3.3.2**.

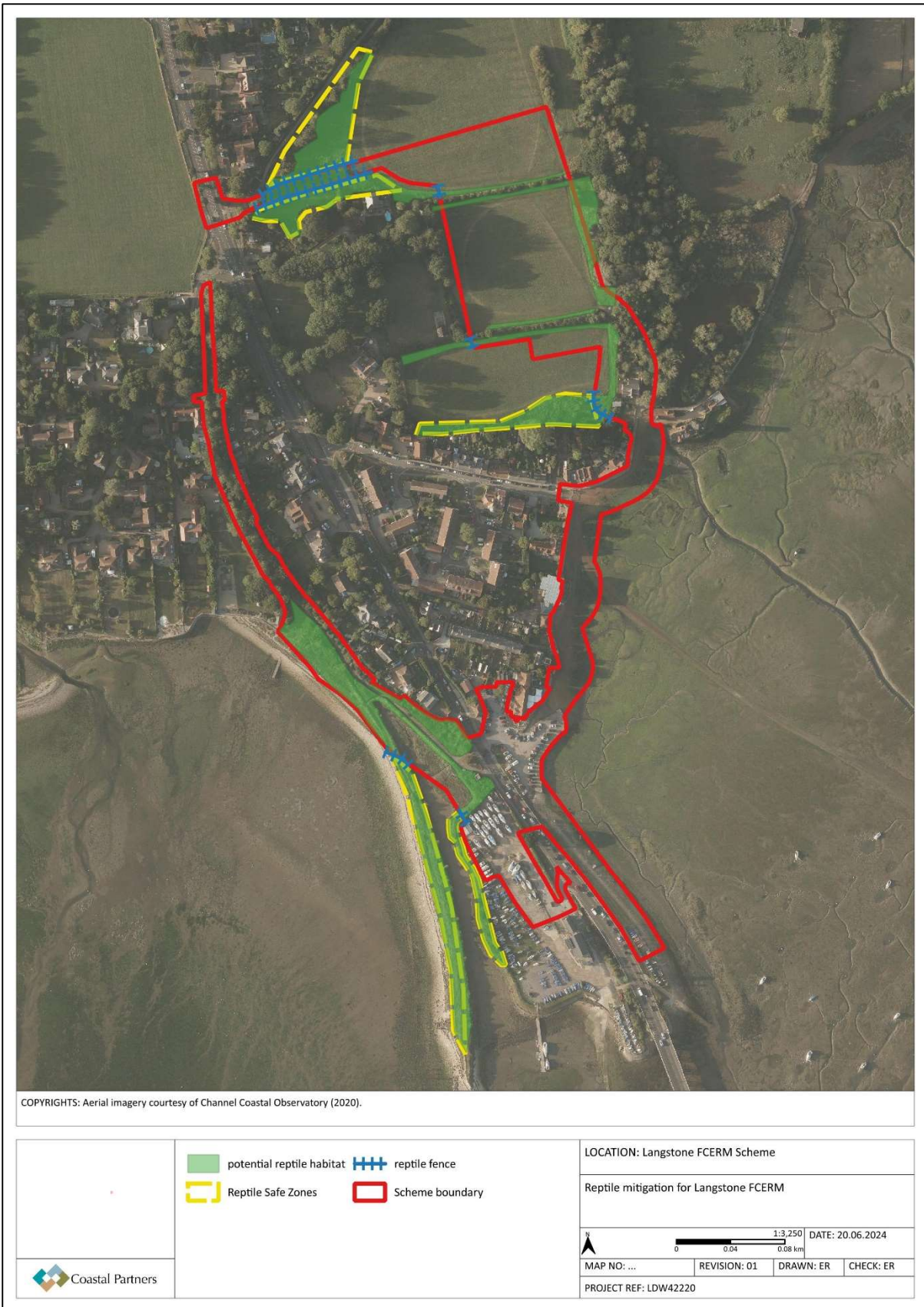


Figure 3.1: Langstone FCERM Scheme reptile mitigation areas (scheme boundary indicative).

2.6 Methods

2.6.1 Vegetation Management and Hand Capture

Step 1 - Vegetation management, to encourage reptiles into safe zones and to support hand capture effort into easy to capture focus areas.

- Focus areas (frontage 2 only) will be identified and demarcated before vegetation clearance commences.
- The ecologist will give a tool box talk to the vegetation clearance operator / contractor, including:
 - A brief introduction to the reptile species which potentially may be discovered on the site.
 - Working methods to be employed and permitted equipment types.
- Soft and low woody vegetation will be cleared to a minimum height of 20cm from ground level by skilled operators supervised by a suitably qualified and experienced ecologist using; tractor mounted side arm flail, brushcutters, chainsaws or similar machinery. At no time will tracked or wheeled vehicles track across areas of suitable habitat. All arisings to be removed from site.
- After 24 hours. Soft and low woody vegetation will be cleared to a minimum height of 10cm from ground level by skilled operators supervised by a suitably qualified and experienced ecologists using; tractor mounted side arm flail, brushcutters, chainsaws or similar machinery. At no time will tracked or wheeled vehicles track across areas of suitable habitat. All arisings to be removed from site.
- After a further 24 hours. Soft and low woody vegetation will be cut to the lowest height possible by skilled operators and maintained at this height throughout the active season.
- A hand search by ecologists will be undertaken of the cleared areas, looking under rocks and cut vegetation in search of reptiles.
- This process will be supervised by ecologists and hand capture visits will be continued throughout this period.

Step 2 - Once ecologists are satisfied that all reptiles that will move, have moved into safe zones and focus areas, the cleared areas will be close cropped mowed and/or reptile fenced to contain and protect reptile safe areas and avoid re-colonisation of work areas by reptiles.

- Close cropping will continue around the safe zone boundaries and reptile fencing conforming to good practice guidance will be erected completely surrounding the safe zones and if required, around any boundaries of the working area adjacent or near any suitable reptile habitat (see **figure 3.1**)
- Fencing will be checked daily and will be repaired immediately if found to be damaged.
- Hand capture will continue under ACO's and if considered suitable bottle traps. Suitably qualified and experienced ecologists will visit once per day five days per week initially for 15 days (in Frontage 5) and 30 days (in Frontage 2).
- Any reptiles encountered will be captured by hand and either placed into a large container filled with soft vegetation or a soft cloth bag, before being transported to the designated demarcated safe zones within the site boundary.
- All captures or observations will be recorded in a log, with species and if possible, age class and sex.
- Hand capture will continue if there have been observations in the final five days of this minimum period, until there has been no captures or observations of reptiles for five

consecutive visits in suitable weather conditions. Once this scenario is reached it will be considered that the site has been successfully cleared of reptiles.

Step 3 - Review and look at options if site cannot be considered successfully cleared of reptiles.

- If the site has not been successfully cleared consider options below;
 - Continue hand capture if suitable weather and it is felt the hand capture is likely to achieve clearance.
 - Consider undertaking destructive search (not feasible for frontage 5), if it is considered reptile numbers are now very low and suitable weather conditions are forecast over the following weeks, this option will be favoured.
 - Consider delaying works to enable continued translocation the following Spring for Frontage 5 or the following Autumn for Frontage 2; if reptiles are still being regularly encountered and/or weather conditions are considered likely to cause reptiles to enter hibernation, then this option will be favoured.

2.6.2 Destructive Search Method (if required)

Should a destructive search be required to confirm successful clearance;

- Once all other steps above undertaken. A skilled operator using a 360° excavator with a large toothed bucket will remove any remaining vegetation and the topsoil to a depth of approximately 100mm, under an ecological watching brief. (A large toothed bucket should be used on the excavator as it is less likely to cause injury to reptiles compared to a smaller toothed or untoothed bucket, and will be more effective at clearing large areas).
- No areas of suitable habitat will be entered, tracked over, spoil placed on or excavated until getting confirmed clearance by the ecologists undertaking the watching brief.
- The removed topsoil and debris will be checked for reptiles by an ecologist.
- Any reptiles found will be recorded and either placed into a large container filled with vegetation or a soft cloth bag, before being transported to the designated reptile safe area (see **figure 3.1**).
- All captures or observations will be recorded in a log, with species and if possible, age class and sex.

3 Conclusion

The composite approach involving vegetation management, hand capture and reptile fencing, will allow for the safe reptile de-risking from Frontage 2 and Frontage 5 of the Langstone FCERM Scheme. In addition, management and planting regimes to be undertaken on site and detailed within the Construction Environmental Management Plan and the Biodiversity Net Gain Plan will compensate for the loss of the small area of habitat, providing net enhancement to support a range of reptile species. On completion of the Langstone FCERM Scheme construction and landscaping works, the reptile fencing will be removed from Frontage 2 and Frontage 5 and reptiles will be allowed to recolonise the area.

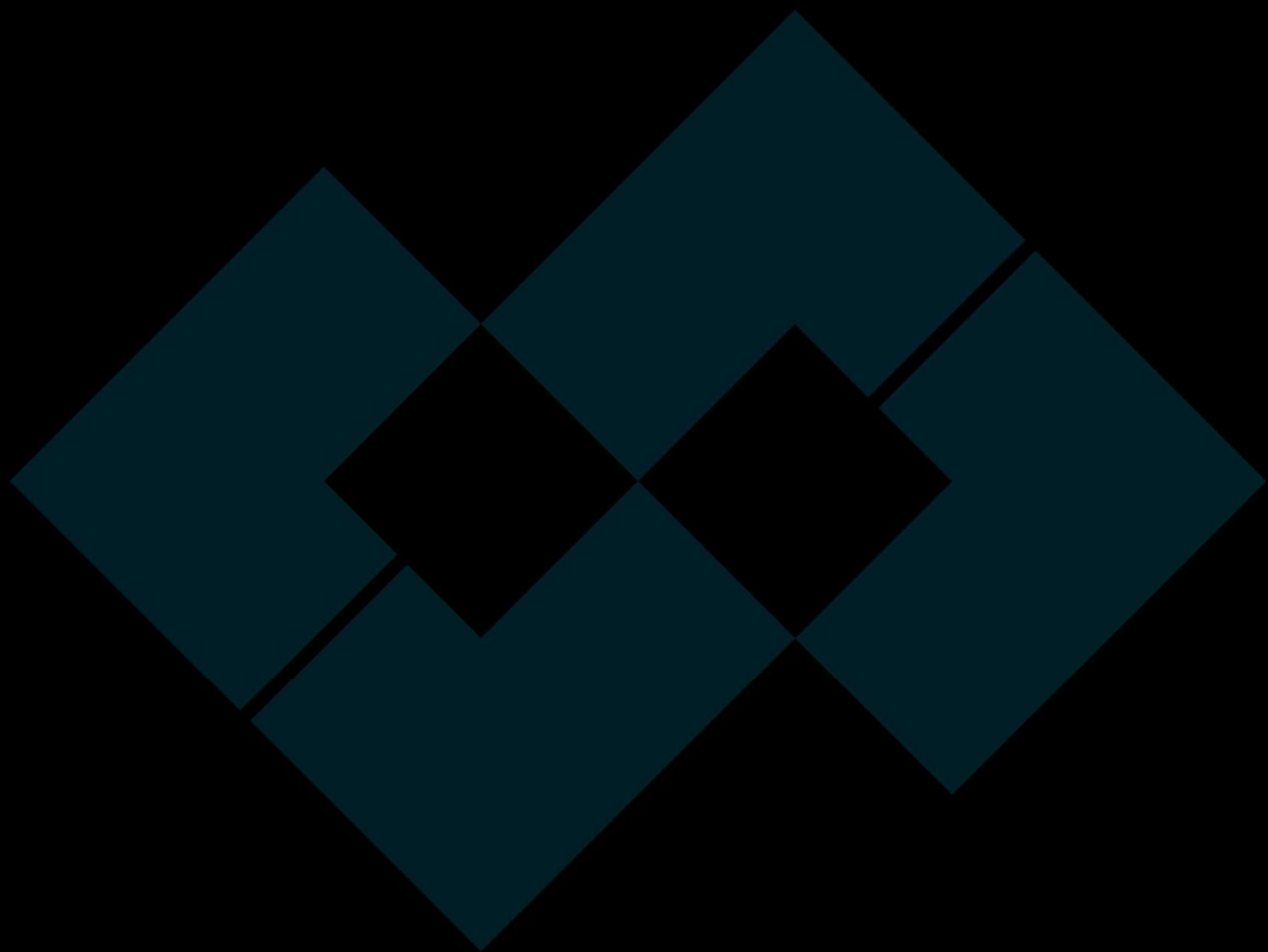
4 References

Froglife. (1999). *Froglife Advice Sheet 10 Reptile Survey: An Introduction to Planning, Conducting and Interpreting Surveys for Snake and Lizard Conservation*. Peterborough: Froglife.

Herpetofauna Groups of Britain and Ireland (HGBI) (1998). *Evaluating Local Mitigation / Translocation Programmes: Maintaining Best Practice and Lawful Standards*. HGBI Advisory Notes for Amphibian and Reptile Groups (ARGs). HGBI, c/o Froglife, Halesworth. Unpubl.

Natural England (2015). Reptiles: surveys and mitigation for development projects. Available at: <https://www.gov.uk/guidance/reptiles-protection-surveys-and-licences> (Accessed on 15.01.20).

Appendix C – Marine Biosecurity Plan



Langstone FCERM Scheme
Marine Biosecurity Plan

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Langstone FCERM Scheme Marine Biosecurity Plan

1 Introduction

Non-native species have been introduced to the UK by human activity either deliberately (for cultural or economic benefits) or accidentally to an area outside of their natural range. There is a growing risk of the introduction and spread of non-native species through an increase in global shipping, recreational tourism, climate change and marine industries such as aquaculture. When non-native species grow rapidly, threaten native species and habitats, impact man-made structures or marine industries they become known as invasive non-native species (INNS). INNS have the potential to damage marine environments, the economy, our health and the way we live.

Within the Solent, high volumes of shipping, ferries and recreational boating have contributed to the spread of marine INNS and artificial structures within the area have helped a number of marine INNS to become established. Within the Solent, marine INNS are a threat to native biodiversity, recreation, fishing industries and have contributed to growing business operational costs through increased maintenance and cleaning of vessels and man-made structures.

Once established, INNS can be difficult to eradicate, control and manage. Biosecurity measures will ensure good practices are in place and outline steps to take to minimise the risk of introducing or spreading INNS in the marine environment.

2 Location

The Langstone FCERM Scheme is located within and adjacent to Langstone Harbour (Frontage 2) and Chichester Harbour (Frontages 2, 3, 4 and 5), which hold the following nature conservation designations (see **Figure 1**):

- Langstone and Chichester Harbours Special Protection Area (SPA) and Ramsar
- Solent Maritime Special Area of Conservation (SAC)
- Chichester Harbour Site of Scientific interest (SSSI)
- Langstone Harbour SSSI.

The intertidal habitat located within these two interconnecting harbours includes coarse sediment/shingle, mudflats and saltmarsh. Both Langstone and Chichester Harbours are connected to the Solent (**Figure 1**) which is a key entry point and hotspot for INNS in the UK, due to its high volumes of international shipping and recreational boating.

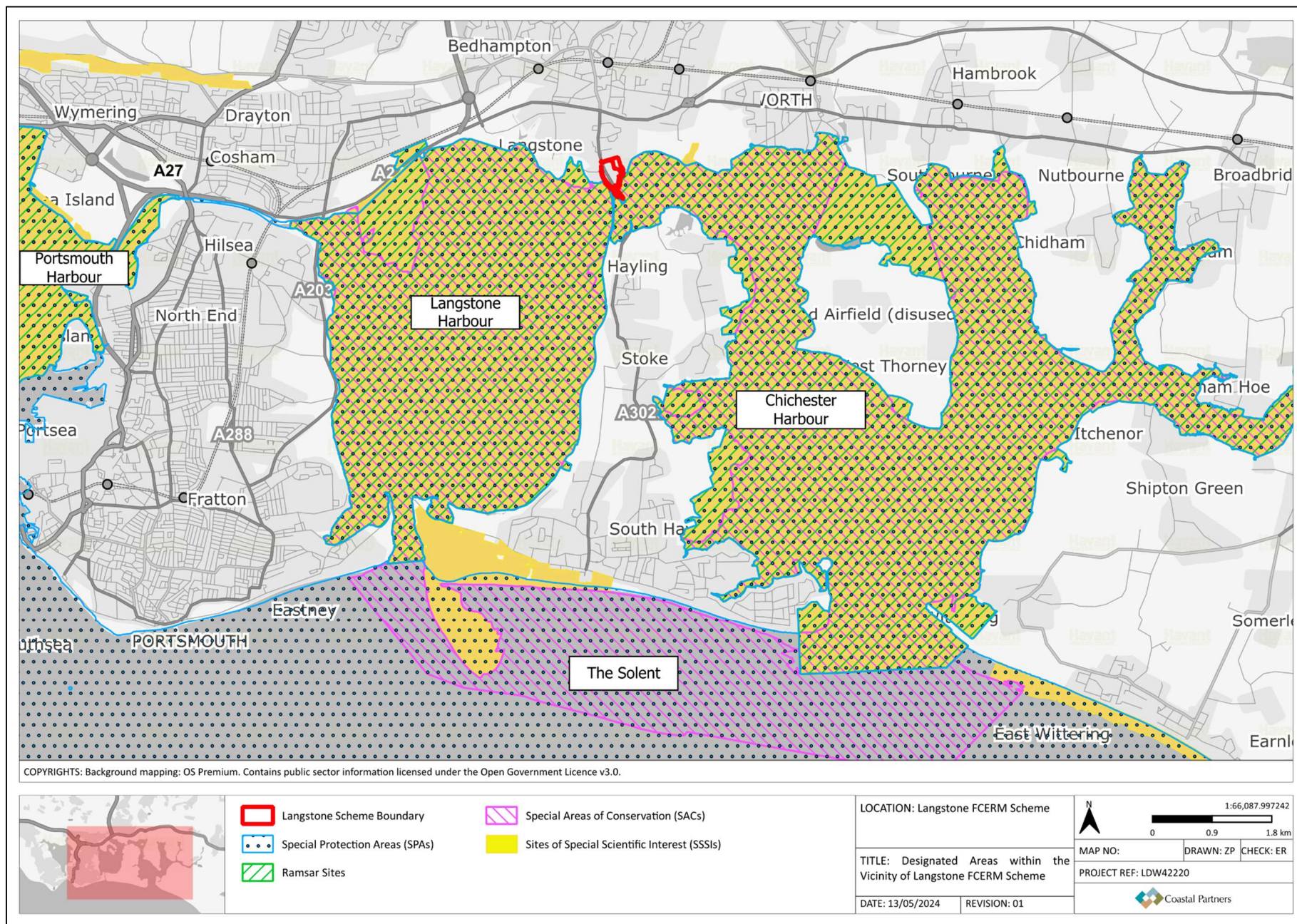


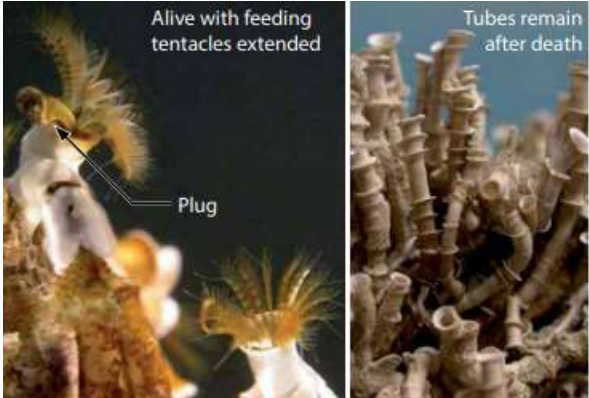
Figure 1: Designated Areas within the Vicinity of the Langstone FCERM Scheme Works.

3 Marine Invasive Non-native Species within the Vicinity of the Langstone FCERM Scheme

INNS	Description
	Pacific oyster (<i>Magallana gigas</i>): is a mollusc native to Japan and SE Asia. It is found on the lower shore in sheltered coastal waters and fixed onto artificial structures in harbours and marinas in the south of England. This species was found within the vicinity of the Scheme along the historic Wadeway causeway. They are present year-round and spawn in the warmer months. Pacific oysters have thick, hinged shells up to 18cm long, with the lower half attached to a solid surface, and have a wavy or saw-toothed shell margin. The Pacific oyster can displace native species (e.g. native oyster (<i>Ostrea edulis</i>)), alter habitats and ecosystems through forming reefs and their sharp shells become a hazard to humans and structures.
	Slipper limpet (<i>Crepidula fornicata</i>): is a mollusc native to North America. It is found attached to solid surfaces, rocks and shells within shallow coastal and lower intertidal waters in southern England and Wales. This species has been recorded in Langstone and Chichester Harbours and is widespread in the Solent. They are present year-round, have domed oval or kidney shaped shells (5cm long) and an internal flat shelf. The slipper limpet lives in stacks of up to 12 individuals, with the largest at the base. The slipper limpet can smother other seabed species, alter seabed habitats and compete with other filter feeding species (e.g. mussels, oysters) for food and space.
	Australasian or Darwin's barnacle (<i>Austrominius modestus</i>): is a crustacean native to Australasia. It is found on hard surfaces such as rocks, shells, other crustaceans, artificial structures, intertidally on rocky shores and within estuaries. This species has been recorded in Langstone and Chichester Harbours. Adults are found year-round and live to 3-4 years. They reproduce year-round, but mainly in summer and early autumn. This barnacle is small (up to 10mm in diameter), white in colour, has four outer shell plates and a diamond shaped opening. The Darwin's barnacle can dominate hard surfaces, outcompeting and displacing native barnacle species.

INNS	Description
	Tufty-buff bryozoan (<i>Tricellaria inopinata</i>): is native to the Pacific. It is found attached to solid surfaces in shallow water in harbours, marinas and natural shores. This species has been recorded on the shores of Hayling Island's north coast. The tufty-buff bryozoan is present year-round. It is pale brown or pinkish-brown in colour. It is a flexible, densely branched colony growing as a 1-4cm high tuft. It is a fast growing fouling species and can compete with native bryozoan species for food and space.
	Ruby Bryozoan (<i>Bugula neritina</i>): is found attached to hard surfaces in shallow waters such as harbours and marinas. This species has been recorded on the shores and in the marina on the north coast of Hayling Island. This bryozoan will mostly die back in Winter and re-grow in Spring. It has a bushy red brown, golden brown or violet flexible growth up to 8cm and looks like a red seaweed. This wide spread sub-tidal fouling species can affect native biodiversity.
	Carpet sea squirt (<i>Didemnum vexillum</i>): is native to NW Pacific. It is found mostly in shallow waters (e.g. harbours, marinas) and in the intertidal zone in north Kent, Solent and Ireland. This species has been recorded on the shores of Hayling Island's north coast. The carpet sea squirt produces larvae in summer and autumn and dies back in harsh winters. They are pale orange, cream or off-white in colour and have a firm, leathery texture. They form extensive thin sheets and sometimes long pendulous outgrowths. The carpet sea squirt can cover extensive areas of the seabed and smother other species such as mussels and oysters as well as fouling marine infrastructure.
	Orange cloak sea squirt (<i>Botrylloides violaceus</i>): is native to NW Pacific. It is found in shallow waters in harbours and marinas, and intertidally on seaweeds and sheltered shores. This species has been recorded on the shores and in the marina on the north coast of Hayling Island. The orange cloak sea squirt produces larvae in summer and autumn and dies back in winter. Colonies form in jelly like sheets or cushions with individuals arranged in ovals or small rows, in a single colour of bright orange, violet, brick red, pink or yellow. Colonies can overgrow and smother other species. They take up a large amount of space, outcompeting and displacing native species.

INNS	Description
	San Diego sea squirt (<i>Botrylloides diegensis</i>): is native to North America. It is found in shallow waters such as harbours, marinas and sheltered shores. This species has been recorded on the shores and in the marina on the north coast of Hayling Island. The San Diego sea squirt produces larvae in summer and autumn and dies back in winter. Colonies form jelly like sheets and individuals grow in meandering rows within it. The colonies are often orange in colour but can also be yellow and white. This sea squirt can smother and displace other native species.
	Leathery Sea Squirt (<i>Styela clava</i>): is native to NW Pacific. It is found attached to solid surfaces in shallow water, in harbours and marinas. This species has been recorded on the shores and in the marina on the north coast of Hayling Island. The brown leathery sea squirt attaches to solid surfaces by a narrow stalk, grows to 20cm tall and has two feeding siphons close together. It is present year-round and spawns in autumn. This sea squirt can dominate and displace other species through competing for food and space. It is also a fouling species and is known to impact aquaculture.
	Orange-tipped Sea Squirt (<i>Corella eumyota</i>): is native to the southern hemisphere. It is found attached to solid surfaces on sheltered shores, harbours and marinas. This species has been recorded on the shores and in the marina on the north coast of Hayling Island. The orange-tipped sea squirt is smooth, slightly translucent with orange-tinged siphons and grows up to 8cm. They are present year-round and reproduces in the summer. This sea squirt can overgrow and smother other species, outcompeting and displacing native species.
	Twin-keel tube worm (<i>Hydroides ezoensis</i>): is thought to be native to NW pacific. It is found in ports, harbours and on rocks on the seabed. This species has been recorded on the shores and in the marina on the north coast of Hayling Island. The twin-keel tube worm has a white chalky tube up to 4mm wide and 45mm long with two parallel ridges and breeds in the summer. This tube worm is a fouling species and can outcompete native species.

INNS	Description
	Hydroides dianthus tube worm: is found in ports, harbours as well as coastal waters. This species has been recorded on the shores and in the marina on the north coast of Hayling Island. It has a white chalky tube up to 1.5mm wide and 40mm in length. It is found attached to hard substrate in large aggregations. This tube worm can alter ecosystems and harm native species such as oysters.
	Trumpet tube worm (<i>Ficopomatus enigmaticus</i>): is found in sheltered, shallow coastal areas, ports, harbours, marinas, channels and lagoons. This species has been recorded in the marina on the north coast of Hayling Island. It has clumps of upright white chalky intertwined tubes (1-3mm diameter) with flared collars at intervals. Worms have banded, feathery feeding tentacles within the crown, which can withdraw into the tube. The tubes from this worm can alter local ecosystems and be a fouling nuisance.
	Wireweed (<i>Sargassum muticum</i>): is native to Japan and NW pacific. It is found on hard surfaces and rock pools in shallow water. This species has been recorded on the shores and in the marina on the north coast of Hayling Island. It is a olive-brown seaweed with alternating branches along a frond over 1m long. It looks like a 'washing line' when out of water (see image). This seaweed can overtop and shade other native seaweed and seagrass species.

Source: Marine Biological Association (2020). Identification Guide for Selected Marine Non-native Species: [ID Guide for Marine INNS.pdf \(solentforum.org\)](https://www.solentforum.org/ID_Guide_for_Marine_INNS.pdf).

The following species are also present but in smaller numbers and considered to be 'rare' on the shores and/or in the marina on the north coast of Hayling Island (see [Mapping Invasive Alien Species in intertidal habitats within Natura 2000 sites in the Solent - JP042 \(naturalengland.org.uk\)](#) for further details):

<i>Aplidium cf. glabrum</i>	Japanese sea spider (<i>Ammothoa hilgendorfi</i>)
Creeping sea squirt (<i>Perophora japonica</i>)	Manila clam (<i>Ruditapes philippinarum</i>)
Red ripple bryozoan (<i>Watersipora subatra</i>)	<i>Solieriaceae</i>
<i>Bugulina fulva</i>	Wakame (<i>Undaria pinnatifida</i>)
<i>Bugulina simplex</i>	Devil's tongue weed (<i>Grateloupia turuturu</i>)
<i>Bugulina stolonifera</i>	Oyster thief (<i>Colpomenia peregrina</i>)
Orange-striped Anemone (<i>Diadumene lineata</i>)	

4 Biosecurity Pathways

No vessels will be used during the construction and operation of the Langstone FCERM Scheme works. However, the following activities have the potential to introduce, disturb or spread marine INNS during the Langstone FCERM Scheme construction works:

- Importing materials could introduce new INNS to the area.
- Using plant / equipment from outside of the water body could introduce new INNS to the area.
- Moving plant / equipment on and off the foreshore could disturb and spread INNS.
- The removal of the old seawall / structures and the construction of the new coastal defences could disturb and spread INNS.
- The disposal of the old seawall / structures may spread INNS to other areas.

5 Biosecurity Measures

The following biosecurity measures (which will be incorporated into the contractor's method statements and final CEMP) will ensure the Langstone FCERM Scheme minimises the risk of introducing and/or spreading marine INNS:

- No vessels will be used during construction.
- Ensure that any construction materials from a marine source or that has been stored in water have undergone biosecurity protocols with the supplier and have been checked for marine INNS at source.
- Ensure all equipment, materials, machinery and personal protective equipment (PPE) used are in a clean condition prior to their arrival on site to minimise risk of introducing INNS into the marine environment.
- The 'Clean, Check and Dry' approach will be implemented on site for construction equipment, hand tools and workers' PPE.



Check all plant, equipment, tools and PPE which has been used on and removed from the foreshore / marine environment for mud, aquatic animals or plants. Remove anything you find and leave it at the site.

Clean everything thoroughly as soon as you can.

Dry completely and for as long as you can before using again (as some marine INNS can survive for over two weeks in damp conditions, but most cannot survive long term desiccation / drying out).

See [Check Clean Dry » NNSS \(nonnativespecies.org\)](https://www.naturalengland.org.uk/nature/conservation/biodiversity/nonnative-species/) for further details.

- Report any 'suspect' marine plant or animal to the Coastal Partners Environmental Lead, who will report the INNS on <https://irecord.org.uk/> and/or email finding details to: marineinvasivespecies@naturalengland.org.uk

- Best practise guidelines (Natural England and Natural Resources Wales Marine Biosecurity Planning guidance) will be followed to minimise the introduction / spread of invasive non-native species.
- Any materials to be removed from the site will be suitably classified and taken to an appropriate off-site disposal facility or treatment site.

6 Further information:

Solent Forum 'Solent Marine Invasive Species': [Solent Forum - Solent Marine Invasive Species](#)

Marine Biological Association (2020) 'Identification Guide for Selected Marine Non-native Species': [ID Guide for Marine INNS.pdf \(solentforum.org\)](#)

Natural England (2022) Taylor, J.G; Wood, C.A., Bishop, J.D.D. Mapping Invasive Alien Species in intertidal habitats within Natura 2000 sites in the Solent. Natural England and The Marine Biological Association Joint Publication JP042. [Mapping Invasive Alien Species in intertidal habitats within Natura 2000 sites in the Solent - JP042 \(naturalengland.org.uk\)](#)

Solent Forum 'Biosecurity Planning': [Solent Forum - Solent Biosecurity Planning](#)

GB Non Native Species Secretariat 'INNS Management Toolkits': [INNS management toolkits » NNSS \(nonnativespecies.org\)](#)