



**Environmental Statement**  
**CHAPTER 3 – Proposed Scheme**

Langstone FCERM Scheme

January 2026

# Langstone FCERM Scheme Environmental Statement

## Chapter 3

### Proposed Scheme

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## 3. Proposed Scheme

### 3.1 Introduction

The proposed Langstone FCERM Scheme will improve the standard of flood defences and coastal erosion protection over an approximately 1 km length of coastline to provide improved protection against tidal flooding to the A3023 road link to Hayling Island and the village of Langstone.

As discussed in **Chapter 1 (Introduction)**, the Langstone coastline was divided into seven frontages for the development of the detailed design, making up the Core Scheme (Frontages 1A, 2, 3, 4 and 5) and the Additional Scheme (Frontage 1B and 6). However, at the current time, funding has only been secured for the Core scheme of works comprising Frontages 1A, 2, 3, 4 and 5. **Therefore, this ES and the associated consent applications that it supports, are for the Core Scheme works only, as shown in Figure 3.1 below.**

The proposed new defences will provide a present-day Standard of Protection (SoP) of 0.5% Annual Exceedance Probability (AEP), (a 1 in 200-year return period event) from tidal flooding for Langstone. The proposed design provides a design crest level of +3.5m Ordnance Datum Newlyn (ODN) based on extreme water levels from the modelling undertaken to inform the detailed design. A freeboard allowance of 0.3m (+3.8m ODN) has been incorporated into the design for structures on the water's edge, and this freeboard allowance reduces to 0.1m (+3.6m ODN) for structures not on the water's edge. This SoP exceeds the minimum recommendation by the Portchester to Emsworth Strategy (1.3% AEP) in the present day, however the SoP will decline over time as a function of sea level rise. . Providing a present-day 0.5% AEP (1:200 year) SoP against still water level flooding is the key objective of the scheme and it has been recognised that there is no appetite from the community in Langstone to further increase the flood defence level due to landscape and visual impacts. Further details are provided in the preferred option report<sup>1</sup>.

This chapter provides a description of the proposed scheme. **Chapters 7 – 17** provide the detailed environmental assessments, confirming potential impacts of the proposed scheme and the mitigation that is proposed to remove / reduce these impacts on the environment and to our community.

### 3.2 Description of the Proposed Scheme

The location and extent of the proposed scheme is shown on the Location Plan (drawing number LANG-ACM-ZZ-ZZ-DR-ZZ-011001). The proposed coastal defences consist of a mix of earth bunds, reinforced concrete sea walls and sheet pile walls. A summary description of each frontage is provided below, with more detailed frontage design information provided in **Sections 3.2.1 to 3.2.5**:

- **Frontage 1A: Billy Line Upper Section.** 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-

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<sup>1</sup> Available at <https://coastalpartners.org.uk/static/media/resources/langstone-preferred-option-report.pdf>

wide shared path for pedestrians and cyclists which sits on top of the flood embankment.

- **Frontage 2: Billy Line Lower Section.** 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. Two flood gates (at Green Cottage and the Winklemarket) and one demountable flood barrier (at the pedestrian access adjacent to the Watch Tower) are proposed 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. In addition, flood gates will be provided at the Allotment and No.21 High Street.

The proposed design for each frontage is described in the sections below and further detail can be found **Appendix F (Materials Report)**. The general arrangement, cross sections, elevations and landscaping plans should also be viewed in conjunction with the following sections.

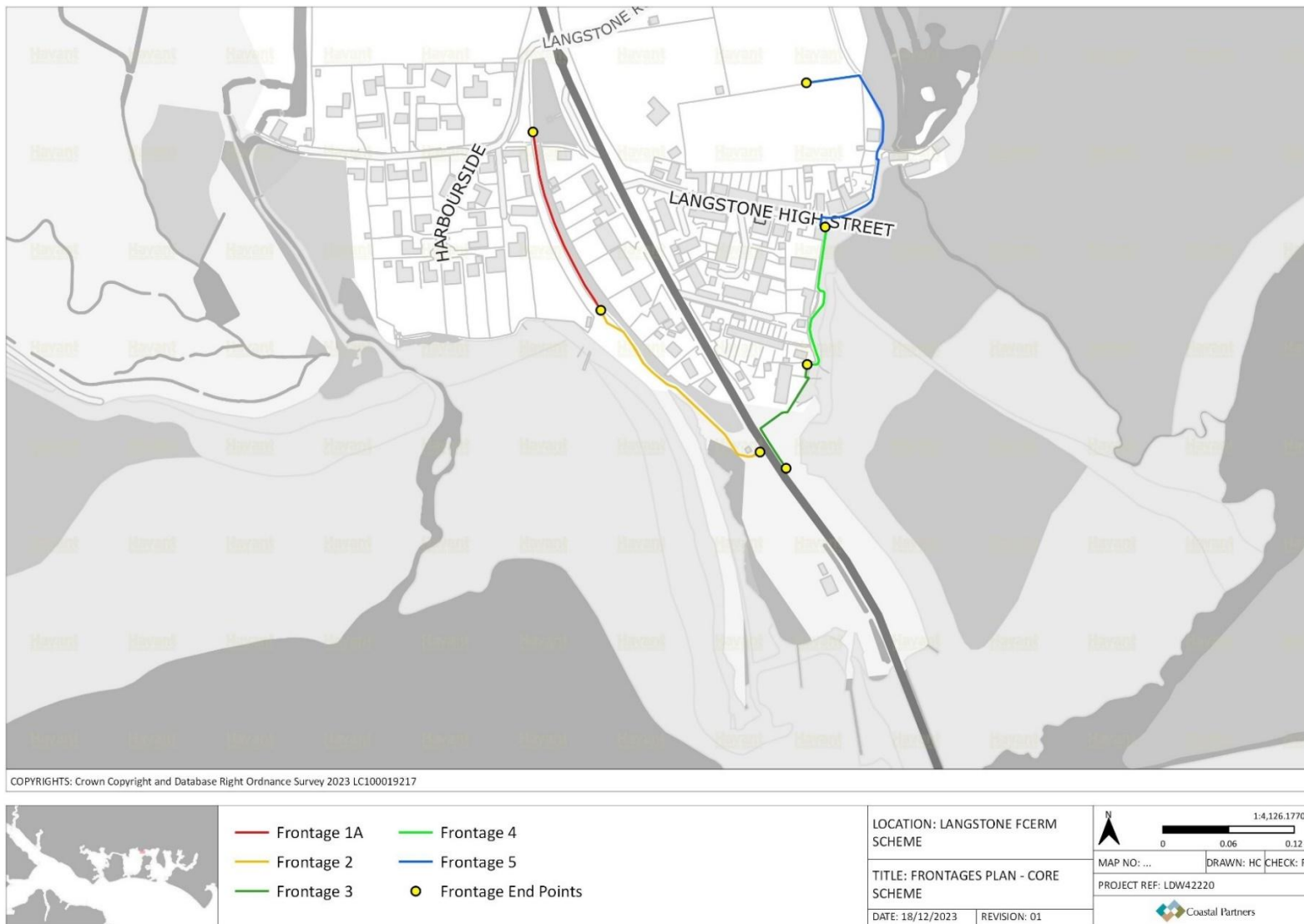


**Figure 3.1: Langstone FCERM Scheme – Frontages Plan**

### 3.2.1 Frontage 1A: Billy Line Upper End

Frontage 1A is 188 metres long and consists of a new flood embankment with an upgraded shared use path on top of the embankment.

The proposed design is shown on:

- LANG-ACM-ZZ-F1A-DR-ZZ-011101 (General Arrangement drawing) and
- LANG-ACM-LS-F1A-DR-LA-011020 (Landscaping drawing)

The start of the new flood embankment and 3-metre-wide shared use path ties in with existing ground at the northern end and transitions into Frontage 2 at the southern end.

The typical cross section for the proposed flood embankment and shared use path is shown in **Figure 3.2** below, with more detail shown on drawings:

- LANG-ACM-ZZ-F1A-DR-ZZ-031102 (Frontage 1A Model Sections and Existing Utilities) and
- LANG-ACM-ZZ-F1A-DR-ZZ-051103 (Frontage 1A Typical Details).

The existing shared use path will be widened to 3 metres from the current centreline. A photomontage of the proposed works for Frontage 1A is shown in **Figure 3.3** below.

The Frontage 1A embankment is a low embankment with Type 1 Granular Fill shoulders and Class 2A wet cohesive fill or Class 2C stony cohesive fill material used to replace the topsoil strip over the footprint of the embankment and form the embankment subgrade. The Class 2A and Class 2C materials may be won from material excavated on site as part of the works or imported to site from an approved off-site source. It is not anticipated that site-won material will be suitable for use as Class 1A fill material and it is expected that this will need to be imported to site from an approved off-site source.

The surface of the upgraded cycleway is proposed to be asphalt concrete and the sides of the embankment seeded with hedgerow seed mix (refer to the Planting Schedule LANG-ACM-LS-ZZ-DR-LA-061028 for details of seed mixes). There will be no planting of shrubs or trees within 2 metres of the shared use path and a 1.5 metre strip will be mown and maintained either side to keep the cycleway clear of vegetation. Beyond the 2-metre seeded strip, areas cleared for the construction of the new embankment are proposed to be reinstated with mixed native shrub and tree species as shown on:

- LANG-ACM-LS-F1A-DR-LA-011020 (Landscaping drawing).

Bat boxes are proposed to be installed on existing retained trees along this frontage, and two benches and an interpretation board will also be installed.

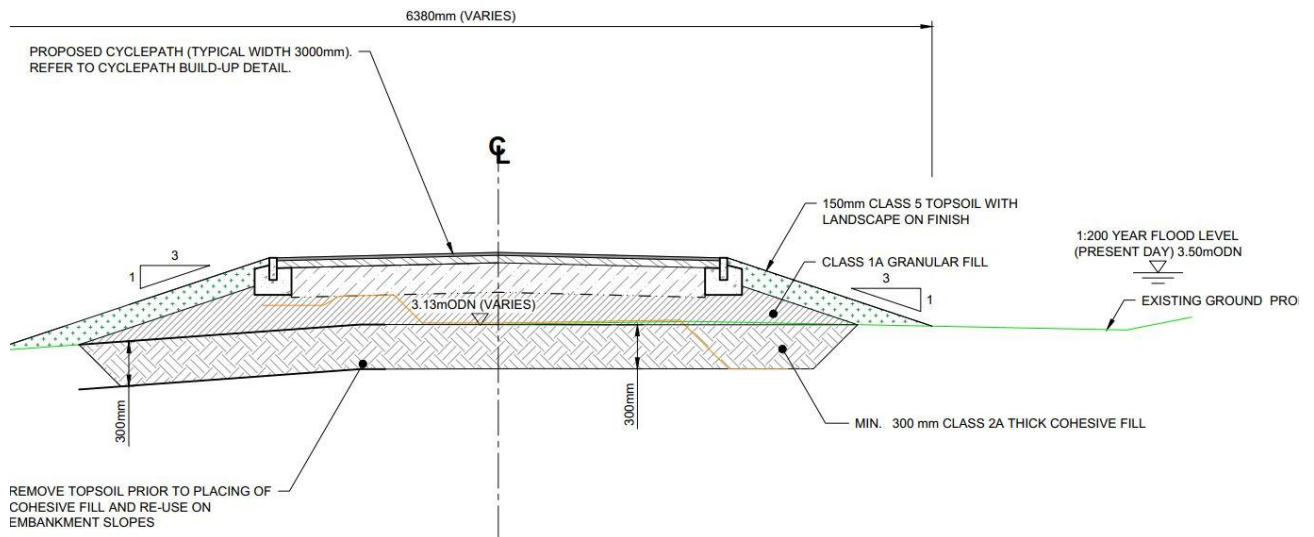


**Figure 3.2: Typical cross section for Frontage 1A flood embankment and shared use path [LANG-ACM-ZZ-F1A-DR-ZZ-051103].**



**Figure 3.3: Photomontage of the proposed defences in Frontage 1A.**

### 3.2.2 Frontage 2: Billy Line Lower End

The proposed flood defences in Frontage 2 include sheet piled walls and raised earth embankments where the defence crosses existing services (namely the Portsmouth Water main). The design for Frontage 2 also includes an upgrade to the existing shared use path. The proposed design is shown on:

- LANG-ACM-ZZ-F2-DR-ZZ-011201 (General Arrangement)
- LANG-ACM-LS-F2-DR-LA-011021 (Landscaping)

The proposed flood defences in Frontage 2 can be described in three sections as follows:

- Section 1: The northern sheet piled wall runs along the seaward side of the footpath / cycleway from Chainage 0 to 93, with a tie in earth embankment crossing over the

Southern Water asset at Chainage 10 to 25. At Chainage 90 there is a cross over embankment.

- Section 2: Between Chainage 88 and 150 the sheet piled wall runs along the landward side of the shared use path. At Chainage 155 there is a cross over embankment.
- Section 3: Between Chainage 160 and 201 the sheet piled wall runs along the seaward side of the shared use path and the Venturi House to tie in with existing ground levels adjacent to the A3023 road.

In the northern section (section 1), the sheet piled wall will be buried within a landscaped bund. In the middle section (section 2), the sheet piled wall will be clad with Accoya timber on the seaward side only, and in the southern section (section 3) the sheet pile wall will be clad with Accoya timber on both sides. Accoya wood is a modified timber manufactured using a non-toxic treatment and sourced from sustainable forests. It has a long life and low maintenance requirements compared to conventional timber.

The shared use path in Frontage 2 transitions from Frontage 1A in the north and ties in with the existing pavement levels on the A3023 road at the southern end. The shared use path will be widened to 3 metres. In the middle and southern sections between Chainage 100 and 201, the new 3 metre shared use path will be realigned landwards to create space to allow expansion and roll back of saltmarsh habitat within the adjacent creek. At the southern end of the frontage, a 2-metre-wide section of shared use path will run behind the existing bus stop to tie in with existing pavement levels, to ensure separation of cyclists and pedestrians waiting at the bus stop.

The surface of the upgraded cycleway is proposed to be asphalt concrete and the edges will be seeded with hedgerow seed mix (in the northern section) and coastal meadow mix (in the middle and southern sections). There will be no planting of shrubs or trees within 2 metres of the pathway and a 1.5 metre strip will be mown and maintained either side to keep the cycleway clear of vegetation. Beyond the 2-metre seeded strip, areas cleared for the construction of the new embankment will be reinstated with mixed native shrub (in the northern and middle sections) and coastal meadow mix (in the southern sections) as shown on the landscaping plan LANG-ACM-LS-F2-DR-LA-011021. Native tree species will be planted, including some fruit trees. Bee posts will be installed, as well as three benches and an interpretation board. A photomontage of the proposed works for Frontage 2 is shown in Figure 3.4



Figure 3.4 below.

The typical cross sections for the proposed sheet piled wall and upgraded shared use path are shown in **Figure 3.5** and **Figure 3.6** below, with full details shown on drawings:

- LANG-ACM-ZZ-F2-DR-ZZ-031202 and LANG-ACM-ZZ-F2-DR-ZZ-031203 (Frontage 2 Model Sections and Existing Utilities)
- LANG-ACM-ZZ-F2-DR-ZZ-051204, LANG-ACM-ZZ-F2-DR-ZZ-051205 and LANG-ACM-ZZ-F2-DR-ZZ-051206 (Frontage 2 Typical Details).



**Figure 3.4: Photomontage of the proposed defences in Frontage 2, showing the shared use path in the southern, realigned landward of its existing route.**

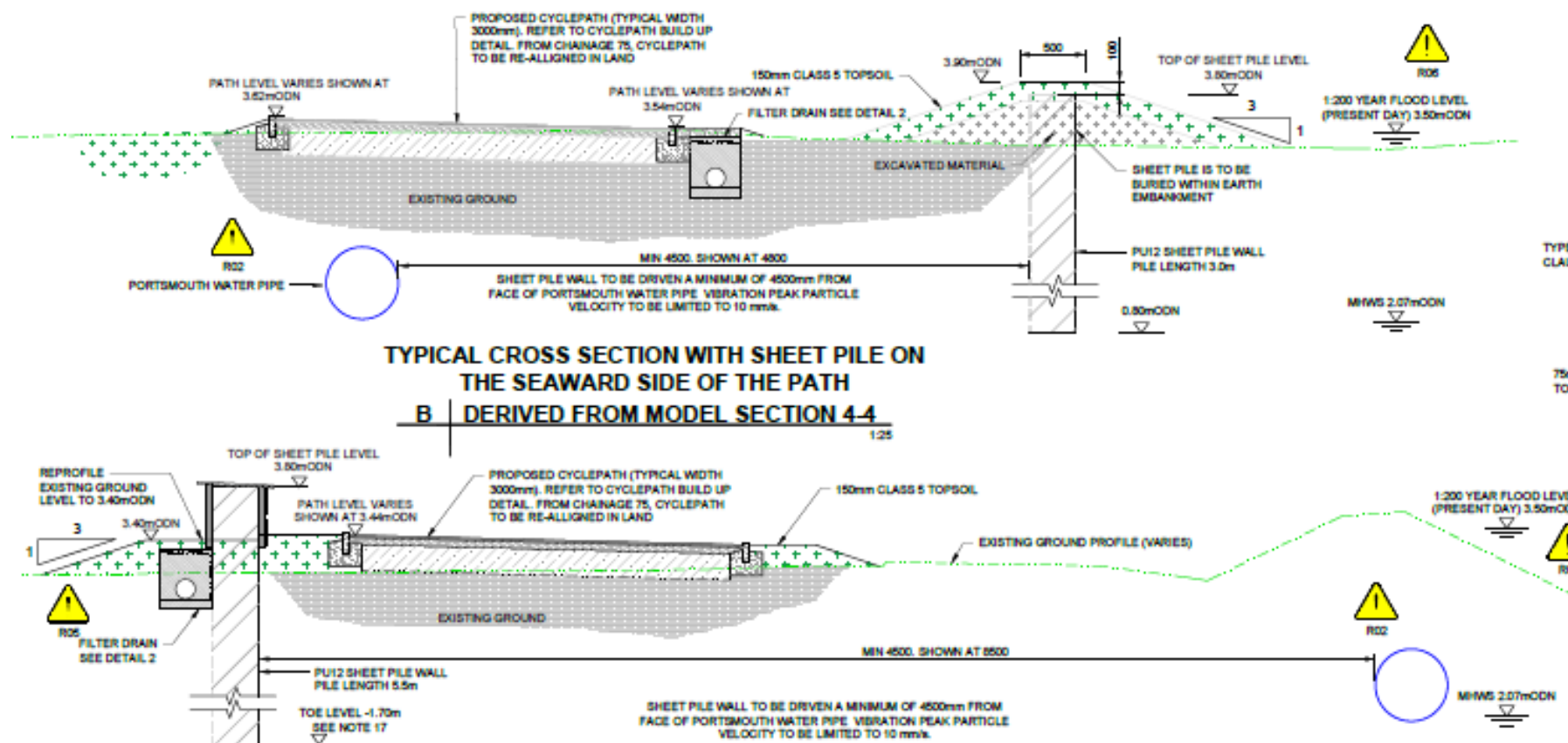


Figure 3.5: Typical cross sections for Frontage 2 sheet piled wall and shared use path – northern section (top) and middle section (lower) [LANG-ACM-ZZ-F2-DR-ZZ-051204].

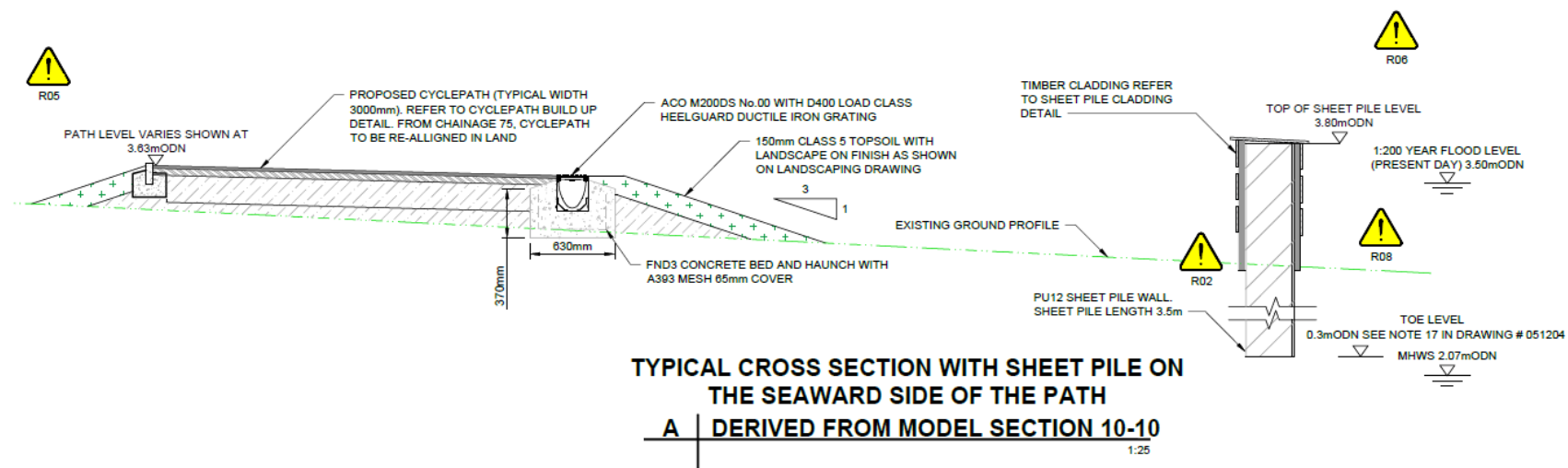


Figure 3.6: Typical cross section for Frontage 2 sheet piled wall and shared usepath – southern section [LANG-ACM-ZZ-F2-DR-ZZ-051206].

### 3.2.3 Frontage 3: A3023 to The Look Out

The flood defences in Frontage 3 comprise various structures including a sheet piled wall along the A3023, a raised bund in the Ship Inn car park that incorporates a pedestrian ramped walkway, a retaining wall and steps to the Ship Inn Courtyard, a glass topped flood wall (in front of the Ship Inn patio), a clad flood wall and a flood gate between the Ship Inn and Ship Inn Annex. The proposed design is shown on the most up-to-date versions of the following plans:

- LANG-ACM-ZZ-F3-DR-ZZ-011301 (General Arrangement),
- LANG-ACM-ZZ-F3-DR-ZZ-031302 and LANG-ACM-ZZ-F3-DR-ZZ-031303 (Model Sections and Existing Utilities drawings)
- LANG-ACM-ZZ-F3-DR-ZZ-051304, LANG-ACM-ZZ-F3-DR-ZZ-051305 and LANG-ACM-ZZ-F3-DR-ZZ-051306 (Typical Details)
- LANG-ACM-LS-F3-DR-LA-011022 (Landscape)

The A3023 sheet piled flood wall runs between Chainage 0 and 66 within Frontage 3 and comprises L8 interlocking trench sheets with a reinforced concrete capping beam, as shown in **Figure 3.7**. The existing fence along the A3023 will be reinstated on completion of the works and will be extended to the Ship Inn car park entrance, and the grass will be reinstated with wildflower turf. A cycle rack is proposed to be provided near to the car park entrance, as shown on the landscaping plan LANG-ACM-LS-F3-DR-LA-011022.

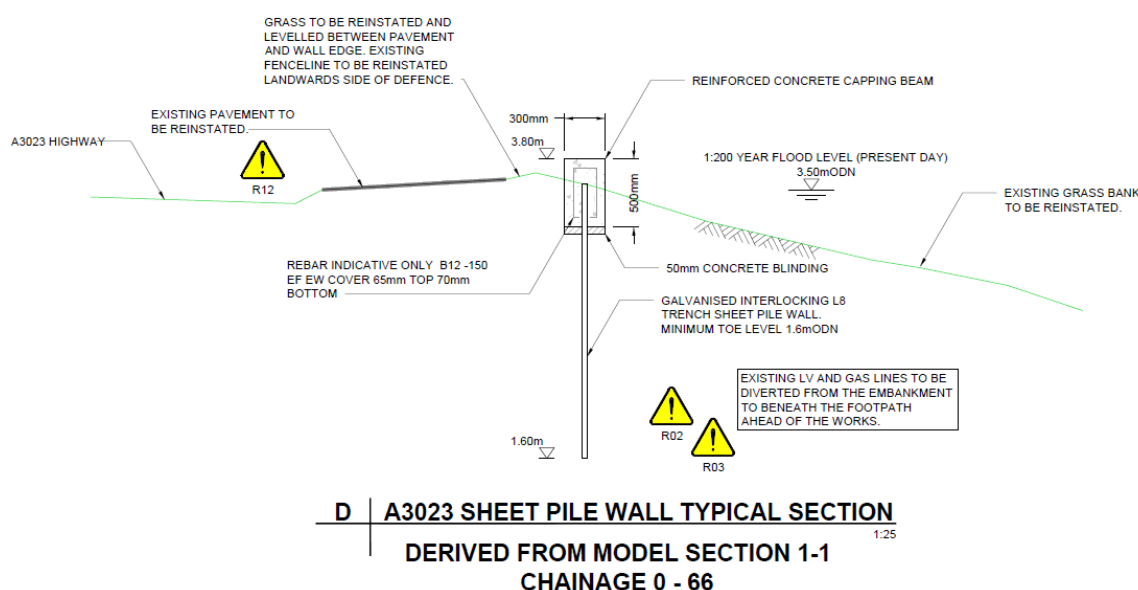


**Figure 3.7: Typical cross section for the A3023 sheet piled flood wall in Frontage 3 [LANG-ACM-ZZ-F3-DR-ZZ-051305].**

The A3023 wall will tie in with the crest of the bund in the Ship Inn car park, which in turn will tie in with the Ship Inn courtyard retaining wall, access steps and the existing slipway. The Ship Inn car park bund is proposed to be comprised of Type 1 Granular Fill and will be surfaced with asphalt concrete. A photomontage of the proposed A3023 wall and the bund in the car park is shown in **Figure 3.8**. The slopes of the bund are proposed to be 1:12 as shown in **Figure 3.10** below.

The existing quay wall at the Ship Inn car park will be retained, with vertipools or something similar anticipated to be attached to the northern end of the quay wall. Vegetated shingle planters will be provided within the seating area on top of the quay wall, and the existing interpretation board will be upgraded, as shown on the landscaping plan LANG-ACM-LS-F3-DR-LA-011022.



**Figure 3.8: Photomontage of the proposed defences in Frontage 3, showing the A3023 wall and bund in the Ship Inn car park.**

The Ship Inn courtyard retaining wall is an L-shaped reinforced concrete retaining wall as shown in **Figure 3.11**. Access steps and an access ramp lined with granite setts would be provided to the Ship Inn courtyard. On completion of the works, the existing paving slabs will be reinstated within the Ship Inn courtyard and black Broxap Weaver Post handrails are proposed.

The Ship Inn courtyard retaining wall will tie into the Ship Inn flood wall, which is a sheet piled wall with a reinforced concrete cap, to replace the existing breeze block wall (as shown in **Figure 3.12**). The Ship Inn flood wall is proposed to be topped with flood glass to preserve views from the Ship Inn beer garden and would be clad on the seaward side with Ketley Staffordshire Red Class A engineering brick, as shown in **Figure 3.9**.



**Figure 3.9: A photomontage of the proposed bund in the Ship Inn car park and the Ship Inn flood wall.**

The Ship Inn flood wall will tie into the Ship Inn Annex flood wall, which is an in-situ cast L-shaped flood wall with a sheet pile wall toe, as shown in **Figure 3.13**. The back face of the new flood wall will be positioned along the alignment of the existing fence line and the front face of the new flood wall proposed to be clad with Weinerberger Olde Heritage Blend brick.

The new quay wall face is proposed to be clad with Ketley Staffordshire Red Class A engineering brick.

At the end of the Ship Inn flood wall, the existing steps to the foreshore will be removed and ramped access from the Ship Inn courtyard to the tie in with Frontage 4 will be provided via a new reinforced concrete footpath with an exposed aggregate finish and black Broxap Weaver Post handrails. A steel flood gate is proposed between the Ship Inn and the Ship Inn Annex flood walls.

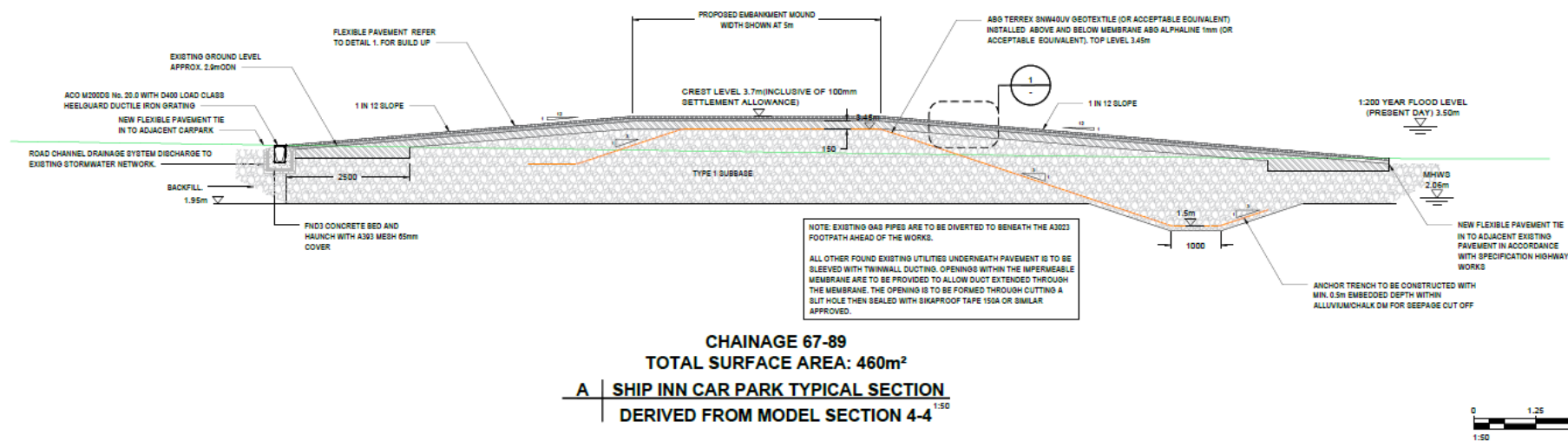


Figure 3.10: Typical cross section of the Ship Inn car park bund in Frontage 3 [ LANG-ACM-ZZ-F3-DR-ZZ-051304].





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New foreshore access steps will be constructed at chainage 0 to 5, with the bottom steps to be buried to reinstate the current foreshore levels, as shown on drawing LANG-ACM-ZZ-F4-DR-ZZ-051404. At chainage 25, demountable (drop in) aluminium flood boards will be installed across the pedestrian access, as shown on drawing LANG-ACM-ZZ-F4-DR-ZZ-051404.

At chainage 50, a new double span flood gate is proposed to be installed to provide access for Green Cottage, as shown on drawing LANG-ACM-ZZ-F4-DR-ZZ-051407. The flood gate



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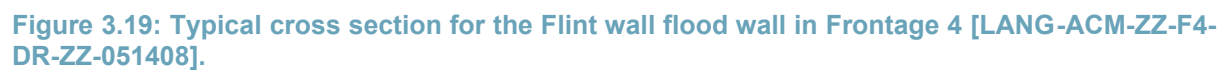
**Figure 3.18: A photomontage of the proposed flood wall and new quay wall at Green Cottage in Frontage 4.**

The Flint Wall flood wall runs between chainage 88 and 131 in Frontage 4 and comprises a Stepoc block concrete flood wall with flint cladding, constructed directly in front of the existing garden wall, as shown in **Figure 3.19**.

A new reinforced concrete quay wall will be constructed seaward of the existing quay wall, with the sheet pile and concrete apron supporting the new quay wall and flood wall buried at least 300mm below the foreshore level. The new quay wall will be clad with Ketley Staffordshire Red Class A engineering brick.

The Winklemarket flood wall runs from chainage 131 to 150 in Frontage 4 and comprises a Stepoc block concrete flood wall, constructed in front of the existing Winklemarket building wall below the level of the windows (see **Figure 3.20** and **Figure 3.21**). On the seaward side of the Winklemarket building the flood wall will be clad with flint and on the High Street side the flood wall will be clad with Weinerberger Olde Heritage Blend brick, as shown in **Figure 3.21**. A new reinforced concrete quay wall will be constructed seaward of the existing quay wall, with the sheet pile and concrete apron supporting the new quay wall buried at least 300mm below the foreshore level. The new quay wall is anticipated to be clad with Ketley Staffordshire Red Class A engineering brick.

Along the whole of Frontage 4, an upgraded 1.5-metre-wide reinforced concrete footpath with an exposed aggregate finish will be provided. This is anticipated to include black Broxap Weaver Post handrails, but all materials are to be agreed with the local planning authority.





### 3.2.5 Frontage 5: High Street to Field North of Royal Oak

The flood defences in Frontage 5 comprise various structures including the High Street flood gates, the Royal Oak flood wall, the Royal Oak flood gate, the Allotment flood wall and demountable flood barrier, a vehicle flood gate at No. 21 High Street, the Footpath flood wall and an earth embankment to tie into higher levels in the field north of the Royal Oak. The proposed design is shown on:

- LANG-ACM-ZZ-F5-DR-ZZ-011501 (General Arrangement).
- LANG-ACM-ZZ-F5-DR-ZZ-031502 and LANG-ACM-ZZ-F5-DR-ZZ-031503 (Model Sections and Existing Utilities drawings).
- LANG-ACM-ZZ-F5-DR-ZZ-051504, LANG-ACM-ZZ-F5-DR-ZZ-051505 and LANG-ACM-ZZ-F5-DR-ZZ-051506 (Typical Details).
- LANG-ACM-LS-F5-DR-LA-011024 (Landscaping).

The High Street flood gates consist of a pedestrian gate and a vehicle gate, which will be fixed open (seaward) the majority of the time (during non-flood conditions) and will be clad in timber, as shown in the photomontage in **Figure 3.21** above. **Figure 3.22** below shows the view looking down the High Street of the proposed flood gates in the open position. A photomontage of the proposed High Street gates in the closed (deployed) position is shown in **Figure 3.23**.

The existing slipway at the end of the High Street will be refurbished as a new reinforced concrete slipway with a sheet pile toe, as shown in **Figure 3.24**.



**Figure 3.22: Photomontage of the proposed High Street flood gates, as viewed looking down the High Street.**



The Allotment flood wall runs between chainage 96 and 109 in Frontage 5 and consists of a new L-shaped reinforced concrete flood wall constructed behind (landwards) of the existing allotment wall with L8 interlocking trench sheets to provide seepage cut off, as shown in **Figure 3.27**. Three courses of Weinerberger Olde Heritage Blend brick will be added to the existing allotment wall to raise the height to the flood defence level and a timber clad flood gate will be installed within the Allotment flood wall (as shown in **Figure 3.26**).

At chainage 109 to 112, a vehicle flood gate will be installed across the driveway of No. 21 High Street, which will be clad with timber, and L8 interlocking trench sheets will provide a seepage cut off as shown on the Typical Details drawing LANG-ACM-ZZ-F5-DR-ZZ-051505.

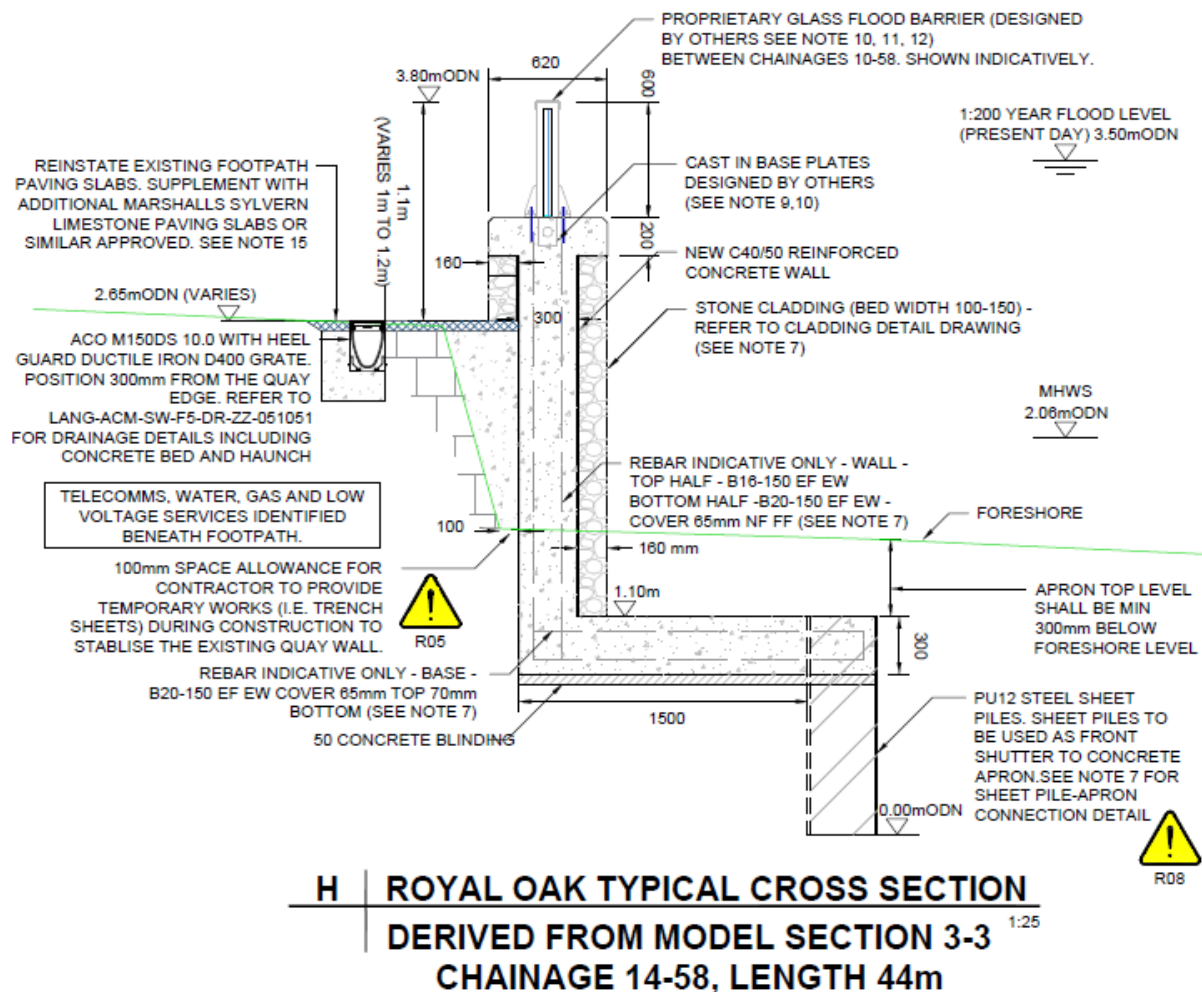


Figure 3.25: Typical cross section of the Royal Oak flood wall in Frontage 5 [LANG-ACM-ZZ-F5-DR-ZZ-051504 for details).



Figure 3.26: Photomontage of the proposed Royal Oak flood wall (full height reinforced concrete with stone cladding), emergency egress steps and the Allotment flood wall and flood gate in Frontage 5.

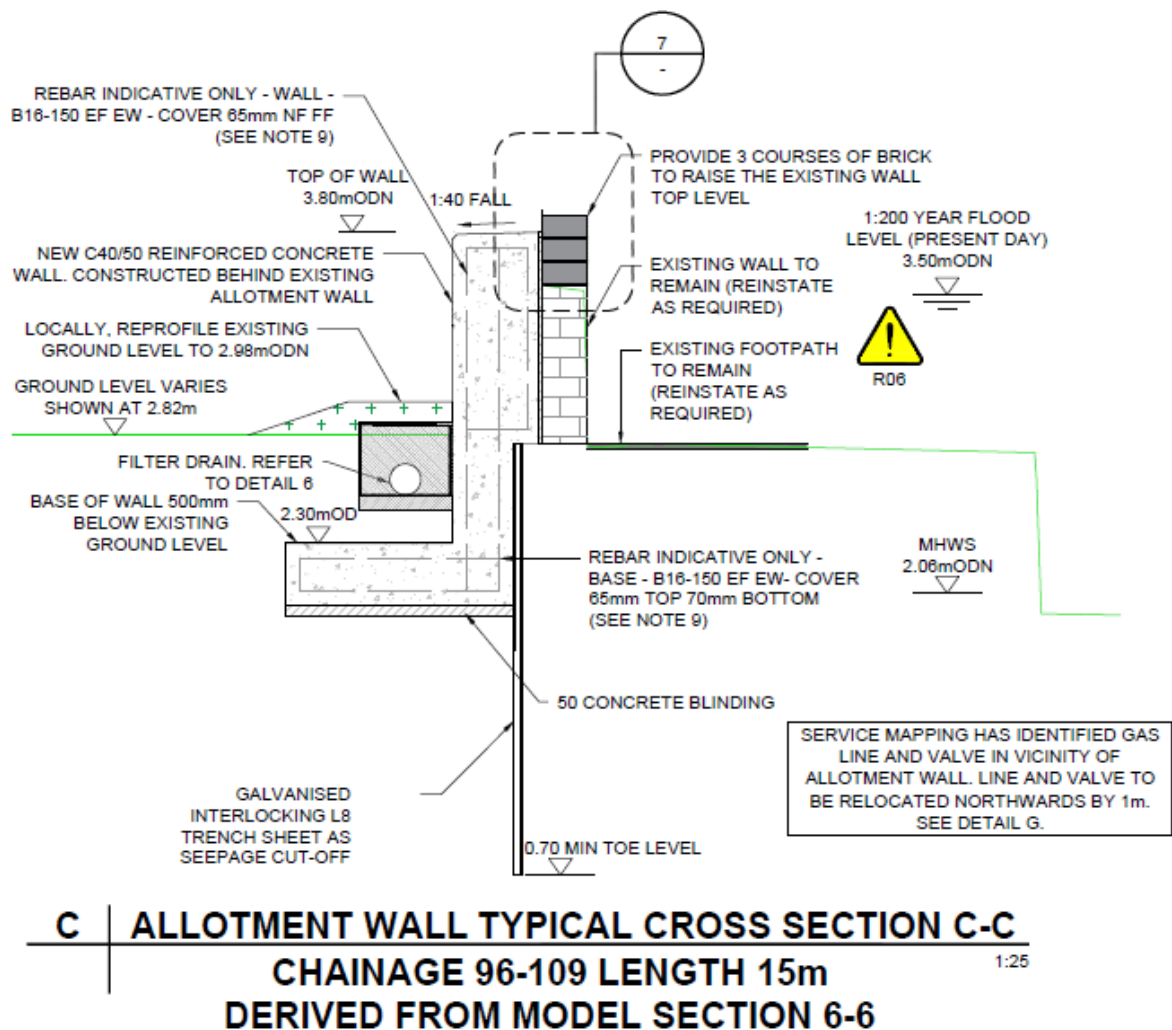


Figure 3.27: Typical cross section of the Allotment flood wall in Frontage 5 [LANG-ACM-ZZ-F5-DR-ZZ-051505].

The Footpath flood wall runs from chainage 112 to 185 in Frontage 5 and consists of an L-shaped reinforced concrete wall, to replace the existing breeze block wall (as shown in **Figure 3.28** below). L8 interlocking trench sheets will provide a seepage cut off. The footpath will be reinstated with Bodpave filled with clean aggregate gravel. Where there is an existing closed board fence, this will be replaced like-for-like on top of the new flood wall. Vegetation clearance required for the construction works along the footpath will be reinstated with mixed native wetland planting and native tree species, as shown on the Landscape Plan (LANG-ACM-LS-F5-DR-LA-011024) and the Planting Schedule (LANG-ACM-LS-ZZ-DR-LA-061028).

From chainage 185 to 221, an earth embankment is proposed, which will tie into higher ground levels in the field north of the Royal Oak. The embankment comprises a clay core and granular fill shoulders, as shown in **Figure 3.29**. The existing field access gate is to be relocated to the west of the earth embankment, as shown on the Landscape Plan (LANG-ACM-LS-F5-DR-LA-011024) and the photomontage in **Figure 3.30**. The embankment will be seeded with a meadow mix on the southern side and a hedgerow seed mix on the northern side. The existing field entrance will be planted up with native hedge species, as described in the Planting Schedule (LANG-ACM-LS-ZZ-DR-LA-061028).

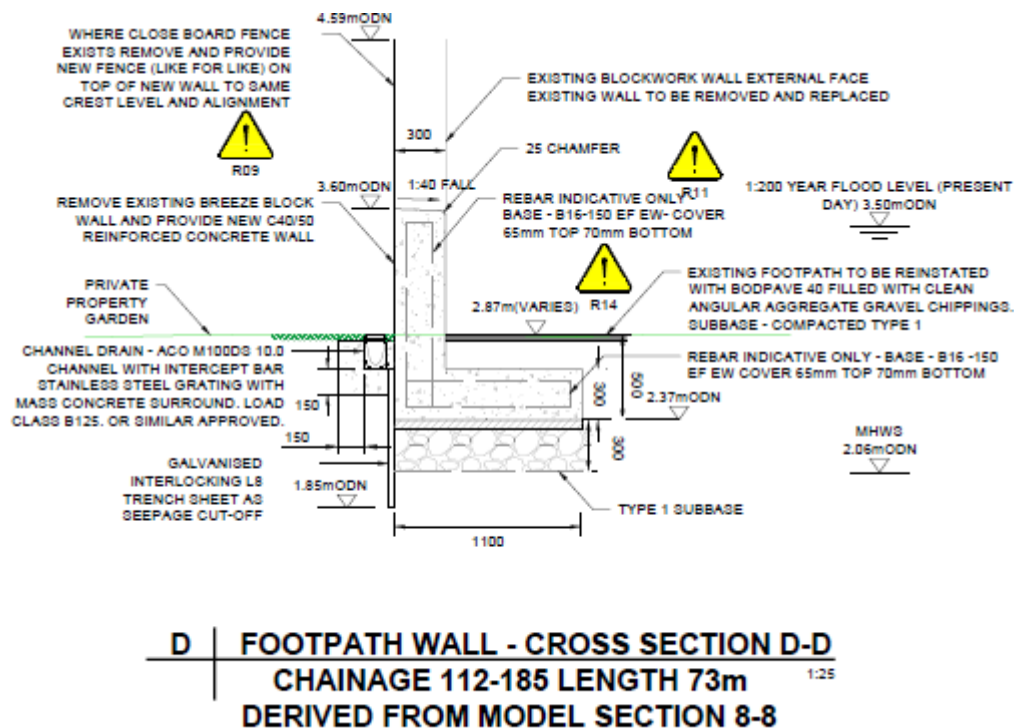


Figure 3.28: Typical cross section of the Footpath flood wall in Frontage 5 [LANG-ACM-ZZ-F5-DR-ZZ-051505].

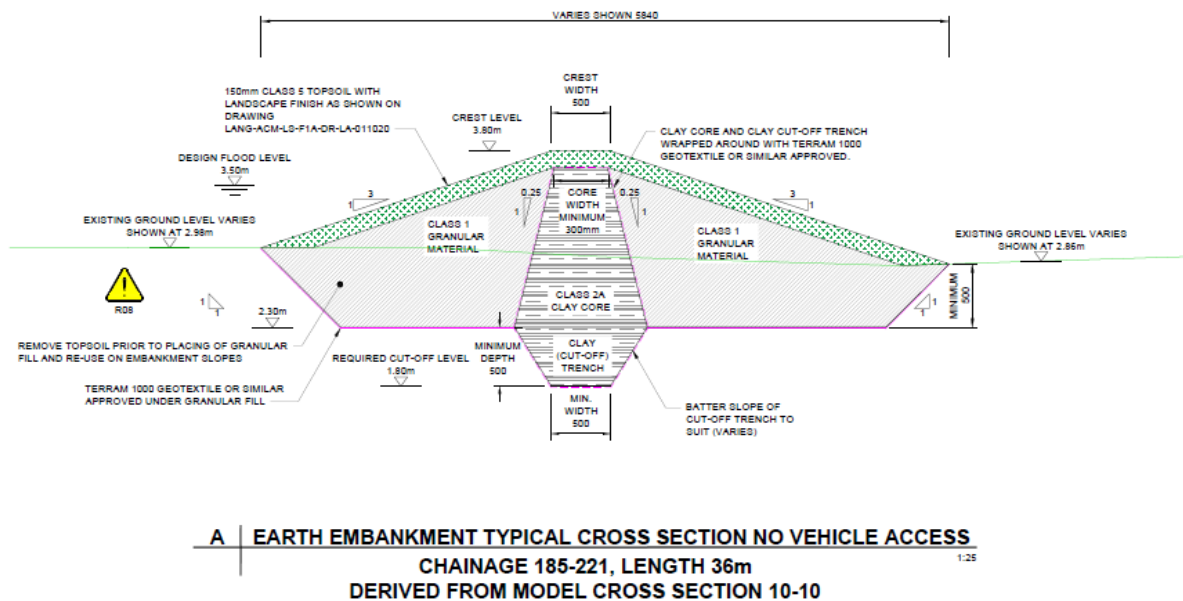


Figure 3.29: Typical cross section of the earth embankment in Frontage 5 [LANG-ACM-ZZ-F5-DR-ZZ-051506].



Figure 3.30: Photomontage of the proposed earth embankment in the field north of the Royal Oak in Frontage 5.

### 3.2.6 Drainage

The proposed flood defences will restrict the drainage of rainwater and wave overtopping water from land areas that previously freely discharged into the harbours. Therefore, surface water drainage is proposed to be installed in conjunction with the defences in Frontages 2, 3, 4 and 5. No formalised drainage is proposed to be installed in Frontage 1A as surface water will drain to either side of the raised embankment, similar to the existing drainage pathways in this frontage.

In summary, new drainage has been proposed to accommodate the scheme design which previously enabled drainage to flow freely into the harbour. However, the catchment remains the same overall, with some additional drainage has proposed to reduce ponding following storm events.

The **Drainage Strategy Report (AECOM, 2024<sup>2</sup>)** also **Appendix G** to this ES describes in detail the proposed drainage with a summary included here:

- **Frontage 2:** Along the northern and middle sections of the sheet pile wall, a filter drain will collect runoff from the path and will discharge through an outlet pipe and SUDS swale at the head of the creek, as shown on drawings LANG-ACM-SW-F2-DR-ZZ-011041 and LANG-ACM-SW-F2-DR-ZZ-051044. Along the southern section of the sheet pile wall, a channel drain will be installed to collect runoff from the path, which will discharge through an outlet pipe and SUDS swale on the eastern side of the creek as shown on drawing LANG-ACM-SW-F2-DR-ZZ-011041. Drainage long sections for the proposed drainage in Frontage 2 are shown on drawings LANG-ACM-SW-F2-DR-ZZ-021042 and LANG-ACM-SW-F2-DR-ZZ-021043.

**Frontage 3:** The construction of the bund in the Ship Inn car park and the raising of the existing walls fronting the Ship Inn will impede the free drainage of water. Therefore, a mix of channel drains, gullies and surface water sewers and outfalls will be installed as shown on drawing LANG-ACM-SW-F3-DR-ZZ-011045. Surface water drainage will discharge via two outfalls through the Ship Inn flood wall, which will be fitted with non-return flap valves, with the outfall levels set above Mean High Water Springs (MHWS) level, as shown on drawings LANG-ACM-SW-F3-DR-ZZ-051048 and LANG-ACM-SW-F3-DR-ZZ-051064. A long section of the proposed drainage in Frontage 3 is shown on drawing LANG-ACM-SW-F3-DR-ZZ-021046.

The requirement for an oil interceptor in the Ship Inn car park has been reviewed however, since the scheme is not changing the size of the catchment or the current use for the area (it is to remain a small car parking facility), and the area is not used for the loading or unloading of fuel, the risk of oil contamination is considered low. Drainage is provided on the northern side of the proposed bund and a trapped gully pot has been included in the design for this area. No drainage is proposed on the southern side, as the surface run off is able to flow naturally into the harbour as it currently does.

- **Frontage 4:** The existing drainage outlets will be extended through the new quay wall and fitted with a non-return flap valve on the seaward end. Along the majority of this frontage, the existing surface drainage runoff remains unchanged from the existing situation where surface water on the footpath runs off seaward over the edge of the quay wall. A crossfall of 1 in 40 (2.5%) will be provided on the upgraded footpath. At Green Cottage, where the new flood wall and footpath are being realigned around the outside of the Green, a filter drain will be installed on the landward side of the new flood wall, as shown on drawing LANG-ACM-SW-F4-DR-ZZ-011049. The filter drain will discharge through the new quay wall via an outfall to be fitted with a non-return flap valve. A long section and typical details of the proposed drainage in Frontage 4 are shown on drawing LANG-ACM-SW-F4-DR-ZZ-021050.

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<sup>2</sup> **AECOM (2024c)** Langstone FCERM Scheme: Drainage Strategy. March 2024. 56pp.

- **Frontage 5:** Channel drains and gullies will be installed on the landward side of the Royal Oak flood wall, as shown on drawings LANG-ACM-SW-F5-DR-ZZ-011051 and LANG-ACM-SW-F5-DR-ZZ-051054. The channel drain will discharge via four outfalls to be fitted with a non-return flap valves. Existing drainage outlets will be extended through the new flood wall and fitted with a non-return flap valve on the seaward end. A channel drain will also be installed along the landward (western) side of the Footpath flood wall, which will connect to a filter drain on the landward side of the Allotment flood wall, as shown on drawing LANG-ACM-SW-F5-DR-ZZ-011051. An inspection chamber will be installed at the southern end of the Allotment wall, and the drainage will discharge via an outfall from the inspection chamber, as shown on drawings LANG-ACM-SW-F5-DR-ZZ-011051 and LANG-ACM-SW-F5-DR-ZZ-051054. A long section of the proposed drainage in Frontage 5 is shown on drawing LANG-ACM-SW-F5-DR-ZZ-021052.

### 3.2.7 Environmental Improvements

In addition to the environmental mitigation, as identified within the subsequent chapter of this environmental statement, a number of environmental improvements are proposed as part of the scheme to help increase biodiversity. This includes the installation of nine posts and bee bricks. A 'Community created Vertipool' units are also proposed to be incorporated into the works.

## 3.3 Construction Compounds and Access

The primary site compound is proposed to be situated in the HCC owned fields to the north of the Royal Oak (Langstone Meadows) as shown on the Site Location Plan (drawing LANG-ACM-ZZ-ZZ-DR-ZZ-011001). Locating the main compound in the fields behind the Royal Oak minimises disruption to local residents, in particular those on Langstone High Street. It is anticipated that the compound would be located here for the duration of the construction period.

The main compound is proposed to be located in the middle field and likely to include single storey modular cabins comprising 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. The provision of site bikes is also being considered. **Chapter 14 (Traffic and Access)** and the outline Construction Traffic Management Plan (CTMP) (submitted separately with the planning application and marine licence submissions) demonstrate that parking demand for the site offices can be readily accommodated within the main compound area.

Access to the primary compound is proposed to be via Langstone Road and across into Langstone Avenue through amendments to the cycle crossing as detailed in the **Chapter 14 (Traffic and Access)**. Several trees will require trimming / siding at the entrance to the field to enable lorry access to deliver the site offices / welfare and to import stone for construction of an access track with passing bays. It is also likely that the gaps in the hedgerows between the top and middle field and the middle and southern field will need to be widened.

The vehicle access from Langstone Avenue into the field will cross several underground services, including a 16-inch gas main, electric cable and virgin media cables. Consultation with the utility companies will be required. It is likely that a suitable protection mat or reinforced concrete slab will be required to span/spread the load over the services. This would involve some local alterations to the kerbs and chamfering to the adjoining road, cycle path and pavement.

A single vehicle width access track with passing places will be formed from the gate off Langstone Avenue to the main compound. As it is envisaged the main compound will be in place for approximately two years and the access track will be formed from stone. 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.

A public footpath runs north to south through the fields joining up with the footpath adjacent to No. 21 High Street and the Mill Pond. The footpath is anticipated to remain open for the majority of the construction works with the exception of works to construct the earth embankment and the Footpath flood wall adjacent to No. 21 High Street in Frontage 5. A pedestrian gate will be formed in the stockproof fencing to maintain access for the public.

If necessary, to reduce traffic movements on the A3023, an additional access route to the foreshore could be created through the allotment at Frontage 5. This would involve the careful dis-assembly of the existing allotment wall by hand, with the bricks being retained and stored to be used in the reinstatement of the wall towards the end of the works.

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 may be required as illustrated on the Site Location Plan (drawing LANG-ACM-ZZ-ZZ-DR-ZZ-011001) – one located in the Ship Inn car park and one at the southern extent of Frontage 2 within access via the Langstone Sailing Club boat storage area. Access to the secondary satellite compounds will be via Langstone Road, as shown on the Site Location Plan (drawing LANG-ACM-ZZ-ZZ-DR-ZZ-011001).

The Ship Inn compound is required to store plant, such as excavators and dumpers for the construction works. It also is required to store non bulk materials for the works. It is proposed that it also has some welfare and a temporary visitors information centre for the works. Access will be maintained to both slipways, except during works to the Ship Inn flood wall. Access will also be maintained to the stone paved seating area from both the south and north. The remaining car park would be available for public use except for during construction of the flood defence in the car park.

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. The final details regarding the compounds will be set out in a final Construction Environmental Mitigation Plan, anticipated to be submitted and approved under planning conditions. At that stage in the project there will be a contractor on board and all final construction details will be known.

In accordance with the Arboricultural Impact Assessment (AIA) (**Appendix L8**), tree protection zones will be required to ensure that no remaining trees are adversely impacted by construction traffic. See **Chapter 10 (Terrestrial Ecology)** for further information.

Cycleway and footpath closures will be required throughout the construction phases. See **Chapter 14 (Traffic and Access)** and the outline **Construction Traffic Management Plan (CTMP)** which sets out the indicative closure points and diversion routes per sub-frontage.

### 3.4 Haulage Routes / Delivery of Plant and Materials

Haulage routes throughout the construction period will run on both the landward and seaward side of the proposed 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 potential Allotment (if landowners permission is obtained) for access to the construction areas. A 20-metre-wide access corridor and working area along the foreshore will also be used for construction machinery. Coastal Partners will be working closely with the contractor to maintain access for residents at all times.

Materials will be transported to site by road only – there will be no deliveries by sea / barge. Plant and materials will be delivered using both Heavy Goods Vehicles (HGVs) and Light Goods Vehicles (LGVs). See **Chapter 14 (Traffic and Access)** and the outline **Construction Traffic Management Plan (CTMP)** for estimations on numbers of vehicle movements.

### 3.5 Construction Methodology

Detailed construction methods will be confirmed once a contractor has been appointed to undertake the works, however the outline approach to construction for each frontage is described below from information provided by the Early Contractor Involvement (ECI) during the design development and considers worst case.

#### 3.5.1 Frontage 1A

Clearance works will be undertaken as detailed on the clearance plan (LANG-ACM-SC-F1A-DR-ZZ-011030). Construction of the new works is anticipated to involve excavation to formation of the embankment using a 5-tonne excavator, laying of the geotextile layer over subsoil and import of clay using a 9-tonne dumper. The clay will be compacted in layers using a sheep's foot roller. The new path would be constructed by placing the concrete edging and then placing and compacting the Type 1 sub-base material. The binder course and surface

course will then be laid. The embankment sides will be reinstated with topsoil and planting and installation of furniture will be undertaken as shown on the landscaping plan (LANG-ACM-LS-F1A-DR-LA-011020).

### 3.5.2 Frontage 2

Clearance works will be undertaken as detailed on the clearance plan (LANG-ACM-SC-F2-DR-ZZ-011031). Construction of the new works will involve installation of the sheet pile wall using a Movax vibrating piling system, that is anticipated to be attached to a 35tonne excavator. Once all the piles have been installed, the cladding will be fitted to the middle and southern sections of the sheet pile wall, and the northern section of the sheet pile wall will be buried. The new footpath will then be constructed by placing the concrete edging and then placing and compacting the Type 1 sub-base material. The binder course and surface course will then be laid. The area will then be reinstated with topsoil and planting and furniture as shown on the landscaping plan (LANG-ACM-LS-F2-DR-LA-011021).

### 3.5.3 Frontage 3

Clearance works will be undertaken as detailed on the clearance plan (LANG-ACM-SC-F3-DR-ZZ-011032). Construction of the new works will involve:

- *Ship Inn sea wall* - demolition of the existing wall and excavation, using an 8-tonne excavator working from the foreshore, to remove the existing footing and form the lead trench for installation of the sheet piles. Foreshore material is proposed to be stored in 1-tonne bags for reinstatement. Worst case, the sheet piles are likely to be installed using a Movax vibrating piling hammer attached to a 35-tonne excavator working from the foreshore. The new concrete wall will be poured and the cladding and handrailing installed, before the pub seating area is backfilled to formation level and the existing paving slabs will be re-laid. The foreshore material will be backfilled, ensuring the layers are returned in the order that they were excavated where possible (i.e., surface sediments to go back on the surface).
- *Ship Inn Annex wall* – the existing mass concrete revetment will be broken out to the new apron formation level. The base and kicker for the new reinforced concrete flood wall will be constructed. A lead trench for the sheet piles will be excavated using an 8-tonne excavator working from the foreshore. Foreshore material is proposed to be stored in 1-tonne bags for reinstatement. Worst case, the sheet piles are likely to be installed using a Movax vibrating piling hammer attached to a 35-tonne excavator working from the foreshore, though it is anticipated that a thorough pre-condition survey would be complete prior to works starting, and that vibration and building monitoring will be active throughout the works with agreed trigger levels and response. The new concrete footpath will be constructed, and then the foreshore material will be backfilled, ensuring the layers are returned in the order that they were excavated. The new concrete flood wall will be constructed, and the garden will then be reinstated.
- *A3023 flood wall* – the existing fencing will be removed and stored safely for reinstatement. A lead trench for the trench sheets will be excavated using an 8-tonne excavator. The trench sheets are proposed to be installed using a 13-tonne excavator fitted with a mounted vibrator, to install the interlocking trench sheets. The concrete

capping will be installed, and the area will be backfilled and reinstated with wildflower turf as shown on the Landscape plan (LANG-ACM-LS-F3-DR-LA-011022).

- *Car park embankment and pub retaining wall* – demolition of the existing wall and excavation to formation level. The new concrete L-shaped wall and concrete steps will then be constructed, before backfilling and reinstating the Ship Inn patio. The existing patio paving slabs are likely to be re-laid and the new hand railing will be installed. For the construction of the embankment in the car park, the existing surfacing will be broken out using a 13-tonne excavator fitted with a breaker (or the existing surface will be planed off) and the area will be excavated to formation level. The new drainage will be installed and then the Type 1 sub-base material will be placed and compacted using a Bomag roller. The area around the new retaining wall will be compacted locally with a smaller roller and wacker plate. The base course will be laid, followed by the binder course and the surface course and the area will be reinstated with furniture as shown on the landscaping plan (LANG-ACM-LS-F3-DR-LA-011022).

### 3.5.4 Frontage 4

Clearance works will be undertaken as detailed on the clearance plan (LANG-ACM-SC-F4-DR-ZZ-011033). Construction of the new works will involve excavation of a lead trench for the sheet piles using an 8-tonne excavator working from the foreshore. Worst case, the sheet piles are likely to be installed using a Movax vibrating piling hammer attached to a 35-tonne excavator, working from the foreshore, though it is anticipated that a thorough pre-condition survey would be complete prior to works starting, and that vibration and building monitoring will be active throughout the works with agreed trigger levels and response. The foreshore behind the sheet pile line will be excavated to formation level for the construction of the new L-shaped concrete apron. The new concrete quay wall will then be constructed, encasing the existing quay wall. The existing footpath will be broken out and the new concrete footpath will be constructed, followed by construction of the new Stepoc block or reinforced concrete flood wall in front of the existing garden walls. The cladding, coping, flood gates and handrails will then be installed as shown on the landscaping plan (LANG-ACM-LS-F4-DR-LA-011023).

### 3.5.5 Frontage 5

Clearance works will be undertaken as detailed on the clearance plan (LANG-ACM-SC-F5-DR-ZZ-011034). Construction of the new works will involve:

- *High Street* - the existing slipway will be broken out using an 8-tonne excavator fitted with a hydraulic breaker and sheet piles will be installed using a Movax vibrating piling hammer attached to a 35-tonne excavator. The area landward of the sheet piles will be excavated to formation level for the construction of the new reinforced concrete apron. The Type 1 sub-base will be laid, followed by construction of the new concrete apron and gate support piers. The new pedestrian and vehicle flood gates will then be installed.
- *Royal Oak* – the existing paving slabs on the Royal Oak footpath will be carefully lifted and stored safely for reinstatement. A lead trench for the sheet piles will be excavated using an 8-tonne excavator working from the foreshore. The sheet piles will be installed using a Movax vibrating piling hammer attached to a 35-tonne excavator

working from the foreshore. The foreshore behind the sheet pile line will be excavated to formation level for the construction of the new L-shaped concrete apron. The new reinforced concrete sea wall will then be constructed, encasing the existing quay wall. The new drainage will be installed behind the new sea wall and the area behind the new wall backfilled. The paving slabs will be reinstated to form the footpath, and the masonry cladding and flood glass will be installed.

- *Allotment and Footpath wall* – the existing timber fence along the footpath will be removed and the existing block wall demolished using a 2-tonne excavator. A 2-tonne excavator will also be used to excavate to formation level for the construction of the new reinforced concrete L-shaped flood wall. The trench sheets will be installed using a 13-tonne excavator with a mounted vibrator. There is a potential that the existing wall might be required to be removed to enable the trench sheets to be installed. If this is the case, the wall would be carefully dis-assembled by hand and hand tools, with the bricks being retained and stored to be used in the reinstatement of the wall towards the end of the works. Type 1 sub-base will be laid, and the new concrete wall will be poured. On the garden side of the new wall, the drainage will be installed and the garden backfilled and reinstated with topsoil and seeding. A new small flood gate is proposed to be installed in the location of the existing allotment access. Another flood gate is proposed to be installed at the driveway entrance to No.21 Langstone High Street. On the footpath side of the new wall, Type 1 material will be laid using a 3-tonne excavator and 3-tonne swivel dumper and compacted using a vibrating plate compactor and the Bodpave surface installed. New fence panels will be installed on top of the new flood wall along the garden, and replanting within the clearance area will be undertaken as shown on the landscaping plan (LANG-ACM-LS-F5-DR-LA-011024).
- *Earth Embankment* – the topsoil will be stripped and the area excavated to formation level for the embankment using a 22-tonne excavator. The geotextile will be laid over the subsoil and the clay material imported using a 9-tonne dumper. The clay material will be placed and levelled and compacted in layers and compacted using a 5-tonne sheepfoot vibrating roller. The Type 1 granular material will be imported and placed and compacted in layers. Once the embankment has been shaped to the required profile, it will be finished with topsoil and seeded as shown on the landscaping plan (LANG-ACM-LS-F5-DR-LA-011024). The existing gateway will be planted with native species instant hedging and a new entrance to the field will be created to the west of the embankment.

For each topic area assessed within this ES, the construction methodology that presents the worst-case scenario has been used to inform the impact assessment.

### 3.6 Programme for the Works

The programme will be confirmed by the contractor once appointment and is dependent on all necessary approvals and funding in place. 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.

Construction of the new flood defences in Frontages 3, 4 and 5 is planned to be undertaken between April 2026 and October 2026, with some lower impact activities (subject to agreement from Natural England) not requiring heavy machinery or equipment with high level noise propagation (such as installation of cladding, coping, handrails and flood gates) being undertaken in October and November 2026.

It is possible that the new defences in Frontage 5 will need to be constructed in two phases over 2026 and 2027 due to the sensitivity of the breeding egret and heronry colony at the Mill Pond and the over-wintering bird period in the harbours, meaning that timings for construction in this frontage are very heavily constrained. Details on proposed mitigation for over-wintering birds and nesting egrets within certain chainages is covered in greater detail in **Section 10.6**.

Construction of the new flood defences in Frontage 1A and Frontage 2 are anticipated to be undertaken between April 2027 and September 2027, and the Frontage 2 satellite compound will be demobilised in September 2027 following completion of the Billy Line works.

The main site compound is currently planned to be demobilised at the end of the construction period, in Autumn 2027.

Prior to each phase of works, any terrestrial vegetation that requires removal will be cleared from within the footprint of the works and access routes, before the nesting bird period (March-August inclusive) commences and in accordance with any reptile mitigation requirements. In exceptional circumstances areas of suitable bird nesting habitat to be removed will be checked by a suitably qualified and experienced ecologist prior to clearance.

Following completion of each phase of works, a tree planting schedule will take place during the winter tree planting season, in accordance with the landscaping plans and Planting Schedule (LANG-ACM-LS-ZZ-DR-LA-061028).

### 3.7 Working Hours

Normal working hours for construction are anticipated to be Monday to Friday from 07:00 to 19:00, except for marine works. 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.