2 PROJECT DESCRIPTION

Introduction

2.1 This chapter provides a description of the project and forms the basis for the environmental assessment provided in this Environmental Statement (ES).

2.2 The effects of the project have been assessed throughout the ES based on what is a reasonable worst case. For example, construction information is presented as the 'reasonable worst case'. The reason for assessing a reasonable worst case scenario is to provide as much flexibility as possible in terms of the proposed development given the outline nature of the planning application and is based on end user feedback to provide credibility. Measures that would reduce or avoid adverse environmental effects arising have been included as part of the project design. Details of these measures are provided in this chapter and set out in each topic chapter. This chapter, together with the subsequent topic chapters, provide the data required to identify and assess the main and likely significant effects of the project in accordance with Regulation 17 and Schedule 4 of the EIA Regulations.

2.3 The following sections of this chapter provide a description of the site and the key components of the project, including an overview of the approach to construction.

The Site and Surrounding Area

Site Location

2.4 The town of Pembroke Dock is in the south of Pembrokeshire on the southern side of the Milford Haven Waterway. Pembroke Port is located at the north-western edge of the settlement of Pembroke Dock (grid reference: SM958037, X [Easting]: 195835 and Y [Northing]: 203799).

2.5 To the north of the Port lies the Milford Haven Waterway. To the east lies Front Street and Commercial Row with a residential area and Pembroke Dock town centre beyond. To the south lies Fort Road and Meyrick Owen Way with South Pembrokeshire Hospital and commercial and residential properties beyond. To the west lies a sewage treatment work with the Milford Haven Waterway beyond.

2.6 Pembroke Port itself comprises a broadly rectangular area of approximately 33.25 ha (82.15 acres) enclosed on three sides by the Grade II listed dockyard walls. Since its construction in the 1810s the development within the dockyard has consistently evolved to meet the needs of the marine industry it serves.

2.7 The Port contains a mixture of larger modern industrial and older, generally smaller industrial and ancillary office buildings, several of which are listed due to their architectural or historical (associated with the former Royal Naval Dockyard use of the site) value. Much of the remainder of the Port is covered in hardstanding with some small areas of land covered in grass or scrub vegetation. An Existing Site Plan is included as **Figure 2.1**.

2.8 The Port can broadly be divided into three thirds, the eastern third known as 'Gate 1'. The central third known as Pembroke Dock Ferry Terminal (PDFT) and the western third known as 'Gate 4'.

East: 'Gate 1' Area

2.9 The eastern Gate 1 area contains a multi-purpose quay supported by an expanse of relatively flat hardstanding and large buildings. The principal use of this area is as a cargo handling facility. Land and floorspace is used to compile and store cargo ready for onward transport by land (imports) or by sea (exports).

2.10 The Port serves several regular cargo trades that operate in this area as follows:

- Animal feed stuffs (AFS) – utilising two large sheds and weighbridge facilities located in the Gate 1 area;
- Waste processing / transfer of Refuse derived fuel (RDF) – utilising two buildings in Gate 4 area;
- Aggregates – utilising land close to the quay;
- Intermittent project cargos/heavy lifts – this can use land areas for long periods of time, and then require a single short period of use of the quay to load out a large fabricated component. This is sometimes done in conjunction with use of the existing large sheds where structures may be fabricated.

2.11 Gate 1 is attracting increasing volumes of cargo that is loaded or unloaded at Quay 1. In the main this is retained within the Gate 1 area but there are instances of cargo being moved between the Gate 1 and Gate 4 areas (e.g. the export of waste (RDF) from Pembrokeshire to Sweden). An increase in aggregate import/export is also expected following GD Harries taking over the aggregate operation at Pembroke Port and their recent merger with SigmaRoc. The ongoing import of AFS together with frequent project cargo movements and activities associated with refinery maintenance is also expected to increase. The closure of oil refineries has also presented opportunities at Pembroke Port for use as a staging post for export of the decommissioned refinery components internationally.

2.12 Contact has also been made with firms regarding the use of Pembroke Port as a part of the logistics chain for Hinkley Point C, Valero's Combined Heat and Power project and the HVDC Greenlink Interconnector project between Wales and Republic of Ireland construction. Consequently, the capacity of Gate 1 operations in terms of land and quay space as it stands currently is likely to be exceeded in the near future.

2.13 Growth in regular volume cargos is expected to continue. However, congestion on the single principal berth, Quay 1, within Gate 1 is occasionally being experienced, with instances of one customer's ship having to wait until the berth is cleared of another customer's cargo operation.

2.14 The Port is actively marketing itself in order to encourage sustainable income. For example, in spring 2019 teams from the Port attended conferences and exhibitions in Aberdeen and Hamburg and the Port regularly attends Ocean Energy Europe as part of the Welsh Government stand.

Central: Pembroke Dock Ferry Terminal Area

2.15 Pembroke Dock Ferry Terminal (PDFT) is situated centrally within Pembroke Port between eastern Gate1 and western Gate 4. It is a distinct operation, serving the long-established Irish Ferries roll on, roll off (RoRo) service between Pembroke Dock and Rosslare. The operation is separated from other activities either side for border security and safety reasons, as required by the Department for Transport and the International Ship and Port Security (ISPS) Code.

2.16 The area within the terminal is used efficiently. MHPA is seeking to attract additional ferry services to the Port and this will place additional demands on the area and the single ferry berth. Opportunities for constructing a new ferry berth are limited and costly so improving the efficiency of the PDFT operation through optimising traffic circulation patterns will be a focus in the short term.

West: Gate 4 Area

2.17 Activities in Gate 4 are varied but centre around vessel repair, light engineering industry and the provision of service boats such as harbour tugs, line boats, range boats etc. The area is considered underutilised and its layout inefficient currently, with large areas unused and unusable due to the outmoded layout and significant constraints.

2.18 Mainstay Marine Solutions (Mainstay) has a facility adjacent to, and some activity within, Gate 4 constructing, refitting and maintaining workboats, jetty and harbour infrastructure, and marine energy device fabrication. It is seeking to expand its activities in terms of boat building and marine energy given that the skill sets for both are complementary. Until recently Mainstay used the existing slipways within Gate 4, which are a vital mechanism for transferring boats to and from water, for boat repair. This was less than ideal as the existing slipways are designed for access and egress to the water and while work is undertaken on the slipway it is unable to service a second vessel. However, Mainstay has now installed a hoist so boats can be transferred to hardstanding areas or workshops for repair.

2.19 MHPA has been involved in confidential discussions with vessel operators about a repair and maintenance facility at Pembroke Port. This would require transporting vessels, which are larger than the Mainstay hoist can accommodate, ashore to an area where works can be undertaken. The advantage of this system over a dry dock is that several vessels can be worked on simultaneously inland whilst the slipway is used more intensively for getting vessels and devices into and out of the water. The ship repairer is then no longer in the position of having to turn away work due to slipway unavailability as is the case currently and at dry docks. From a ship operations point of view, it represents a step-change in the philosophy and management of ship repair. It will be possible to book in a ship, take it out of the water and have it returned to service in much shorter time. It will also be practical to do this for relatively minor issues that might otherwise have to wait for a routine docking. Increased slipway area would therefore add a great deal of flexibility to operations, being able to transfer small and large boats, in addition to loading or unloading renewable energy devices and components.

2.20 MHPA has similarly been in confidential discussions with wave energy, offshore wind and floating wind technology developers – promoting the use of Gate 4 to accommodate their needs in actively seeking to develop those technologies at sites within the Irish Sea and off the Pembrokeshire coast.

Pembroke Dock Infrastructure Site

2.21 The application site itself extends to 11.32 ha, is 'L-shaped' broadly, and forms the westernmost third of the Port encompassing most of the Gate 4 area. It contains several larger and smaller modern buildings in addition to six listed buildings (or structures) as follows:

- Grade II* former Graving Dock including bollards and capstans;
- Grade II Building Slip No 1;
- Grade II Building Slip No 2;
- Grade II former Timber Pond (also known as the Pickling Pond);
- Grade II former Foremen's Office (currently in third party ownership but intended to become part of the scheme); and
- Grade II Dockyard Walls.

2.22 The application site also lies within the Pembroke Dock Conservation Area.

2.23 The remainder of the application site is covered in hardstanding and/or scrub vegetation and is underutilised currently.

Geology and Topography

2.24 In terms of geology, weathered bedrock exists underneath the site to an approximate thickness of between 3.6 and 10.4 m. Where the weathered bedrock was fully penetrated by boreholes, strata of the Pembroke Limestone Group was encountered and medium grained metamorphic rock was encountered in two boreholes.

2.25 Made Ground exists across the site with approximate thickness ranging from 0.2 to 7.9 m below ground level. The majority of the surface covering within the site is concrete hardstanding which is in relatively good condition.

2.26 Regarding topography, the site is relatively flat although it slopes marginally towards the west, from 8.1 mAOD along the eastern extent of the site to the lowest point of 6.0 mAOD along the western boundary.

Planning Context

2.27 The Pembrokeshire Local Development Plan (LDP) was in adopted February 2013. The Proposals Map identifies the site as within the settlement boundary of Pembroke Dock (Policy SP 13) and within a Conservation Area (Policy GN.38).

2.28 The site, including the foreshore, is also within an area designated for Port and Energy Related Development (Policy SP 2), Hard Rock Resource (Policy GN.22) and includes a designated Existing Mineral and Quarry Site (Policy GN.23) within the north-eastern perimeter.

2.29 In addition, two Scheduled Ancient Monuments (SAMs) are located at the southern and south-western perimeter of the site (Policy GN.38) together with an area of Amenity Open Space (Policy GN.35) to the south east along Meyrick Owen Way.

2.30 The Milford Haven Waterway, to the north of the site, is designated as a Special Area of Conservation (SAC) (Policy GN.37).

2.31 Further details on the relevant planning policy context are provided in Chapter 5 (Planning Policy Context).

Project Description

Key Components

2.32 The intention of the proposed development is to create a flexible and efficient port-related office, industrial, warehousing and distribution, and ancillary area capable of meeting the needs of the modern blue economy (meaning the sustainable use of ocean resources for economic growth, improved livelihoods and jobs and ocean ecosystem health) that will provide a significant contribution to the £1.3 Bn Swansea Bay City Deal (SBCD). This will involve the intensive use of land side areas for fabrication, repair and servicing of boats, renewable energy devices, transporting cargo and other works requiring marine access, served by an appropriately structured highly flexible enlarged slipway. The Proposed Masterplan is included as **Figure 2.2**.

2.33 To realise the vision of a centre of excellence, several modifications are required to the layout of the Gate 4 area, including:

- Formation of a single ‘mega’ slipway;
- Provision of large areas of hardstanding in proximity to the quayside;
- Areas of flat land for use either as ‘laydown’ or capable of being developed to create buildings in response to time-sensitive business requirements.
- Enhanced interconnectivity between the new Gate 4 facility and the existing Gate 1 facility.

2.34 The proposed development will enable the provision of an enlarged single slipway at Gate 4 to facilitate the efficient transfer of vessels and marine renewable devices between land and sea, together with the formation of large open laydown areas to facilitate working on boats and devices without occupying slipways. The new single slipway will replace two existing smaller slipways and will be designed such that the historic fabric of the outer walls of these two smaller slipways will be retained.

Marine Components of the Project

2.35 Regarding the marine elements of the proposed development, the proposed works will include:

- Capital dredging around the slipways and within the Graving Dock;
- The creation of a single ‘mega’ slipway by combining the two existing westernmost slipways and modification of its gradient into the Milford Haven Waterway;

- The infilling of the Graving Dock; and
- The infilling of the Timber Pond.

Onshore Components of the Project

2.36 In addition to the hardstanding and laydown areas outlined above, large buildings for assembly, manufacturing and repair of vessels and devices will be required. At the southern boundary, areas and buildings for the importation and storage of goods and raw materials by land for fabrication activities on site will be required.

2.37 To achieve this, the following will be necessary:

- Creation of efficient areas of open space laydown in brownfield areas within the curtilage of the dockyard.
- Infilling the former Graving Dock (via the methods outlined in the marine components constructions section below);
- Infilling the former Timber Pond (via the methods outlined in the marine components construction section below); and
- Demolition of some other buildings which are no longer fit for purpose, although the listed former Foremen's Office will be retained.

2.38 The above will allow the creation of six open areas for light assembly, maintenance, external storage, laydown and parking and an extended slipway and transition area. It will also provide space to construct three buildings to be used for fabrication, repair and light assembly purposes.

2.39 The table below sets out the 'worst case' parameters (i.e. largest), for the purposes of the EIA, regarding the buildings to be erected and the extent of the open areas.

Table 2.1: Development Parameters

Building	Use	Maximum Footprint (sq m)	Maximum Width and Breadth (m)	Maximum Height (m)
Building A	Fabrication	11,900	170 x 75	40
Building B	Repair and Fabrication	4,900	75 x 65	40
Building C	Light Assembly	2,500	129 x 20	10
Area C1	Light Assembly and Maintenance External Storage and Parking	5,000	N/A	N/A
Area D	Open Batching Plant and Storage Area	12,937	N/A	N/A
Area E1	Employee Car Park	3,050	N/A	N/A
Area E2	Employee Car Park	4,900	N/A	N/A
Area F1	External Multi Use Laydown and Final Assembly Area	8,100	N/A	N/A
Area F2	External Processing and Multi Use Laydown and Assembly Area	4,850	N/A	N/A
Area J	Extended Slipway and Transition Area	11,838	N/A	N/A

Access and Parking

2.40 There are two points of access to the proposed development:

- Primary access via Whites Farm Way and Meyrick Owen Way (Gate 4); and,
- Secondary accesses via Admiralty Way and Gate 1 off Front Street (Gate 1).

2.41 The primary access will be used by staff and the secondary accesses will be used for the staff overflow car park and deliveries into the Port.

2.42 In addition to the above, a modified widened highway access point will be required to the Gate 4 area from Whites Farm Way. It is also expected that Mainstay's operation will be incorporated into the modified Gate 4 access arrangements rather than having its own access as at present. This will further contribute to the efficiency of the proposed layout.

2.43 The proposed development will provide an appropriate level of on-site parking in accordance with Pembrokeshire County Council (PCC) parking policies. In addition, secure covered cycle parking will be provided to encourage the use of sustainable, active travel as well as a pedestrian/cycle crossing across Meyrick Owen Way, in the vicinity of the primary vehicle access to the site.

2.44 A Travel Plan will be prepared to support sustainable transport to and from the development.

Appearance and Design

2.45 The proposed buildings, out of operational necessity, are relatively large. However, historically, the Port has accommodated several large buildings, especially the numerous historic slipway cover buildings, all of which were located adjacent to Milford Haven Waterway.

2.46 Consequently, the key design principles that have been adopted for the proposed buildings includes curved roofs and mansard side elevations to echo the shape of the historic slipway cover buildings. In addition, in order to mitigate the scale and mass of the proposed buildings, cladding options have been considered, such as horizontal cladding panels grouped by colour, which is a widely used method for reducing the scale of buildings such as distribution warehouses whereby the cladding pattern can be altered to reduce the mass and bulk of the building, or using a combination of opaque and scattered translucent panels, which is the favoured option for the site – echoing the glazing pattern of former slipway covers at the site.

2.47 Regarding the creation of the mega slipway and the infilling of the Graving Dock and Timber Pond, the project design has considered the heritage value of the existing structures affected and seeks to preserve as much of the original fabric as possible. Prior to commencement of works to them, these structures will be recorded in detail and any subsequent infill undertaken in a manner that is reversible, preserving their fabric in situ. Visible re-use of existing features, such as coping stones, capstans, bollards and the caisson gate, will be incorporated within the development.

Drainage and Flood Risk

2.48 The sustainable management of surface water is an essential element of reducing future flood risk to the site and its surroundings.

2.49 As the existing site mainly contains low permeable hardstanding there will be negligible change in the permeability of site surfacing as a result of the proposed development. However, the proposed development includes the infilling of the Timber Pond into which a proportion of the site's surface water run-off discharges via the existing drainage network before discharging via an outfall into the Milford Haven Waterway.

2.50 The proposed surface water management strategy will, therefore, be required to re-route the existing site drainage network through or around the infilled Timber Pond possibly to a new outfall to the Milford Haven Waterway. In addition, the existing culvert connection between the Timber Pond and Graving Dock is to be sealed with inflows diverted accordingly. Overall, the drainage strategy will involve run-off being directed to new outfalls passing through interceptors and/or separators, as appropriate, prior to 'clean' water discharging into Milford Haven Waterway.

2.51 Foul drainage will be routed via the dockyard wall to be picked up by the sewer leading to the adjacent Dwr Cymru Welsh Water (DCWW) treatment works.

2.52 A detailed drainage infrastructure design will be secured via an appropriately worded planning condition and submitted prior to construction for regulator approval.

Lighting

2.53 The operational lighting principles will be set out within a lighting strategy for the proposed development. The strategy will include the following key principles:

- The lighting strategy will comply with the requirements of the Docks Regulations and other health and safety legislation.
- Lighting will be designed to be contained within the site, avoiding spill into adjoining properties, an objective that is aided by the existing high dockyard walls and the shading provided by both existing and proposed buildings.
- The proposed green space at the southern boundary of the site is being designed as a bat flight corridor with very low lux levels (max 1 lux).
- Proposed Building C will be designed to avoid light spill from internal light sources that could affect the bat flight corridor.
- Lighting will be managed such that it does not remain on when not required and so that it can be dimmed to suit certain operational situations.

2.54 The detailed lighting strategy addressing the above principles and the wider operational requirements of the site is anticipated to be the subject of an appropriately worded planning condition and will be submitted to PCC for approval prior to the beneficial operation of the development.

Sustainability

Energy Demand

2.55 More broadly, the proposed development will facilitate the development and advancement of marine renewable energy technologies and devices designed to reduce reliance on fossil fuels, reducing the

emission of greenhouse gases (GHGs) and the carbon density of the UK's electricity mix available through the distribution network in response to the threat of climate change.

2.56 More specifically within this project, the proposed buildings incorporate translucent panels that will enable natural daylight to penetrate the interior, reducing energy demand for artificial electrical lighting during daylight hours. The translucent panels will also potentially light external areas of the site at night, reducing energy demand for external lighting during hours of darkness.

2.57 The buildings are anticipated to have relatively low heating demand due to the nature of activities taking place within them.

2.58 Opportunities to design out energy demand through energy efficiency and introducing low carbon energy supply will be explored more closely at the detailed design stage.

Waste

2.59 The proposed development will not give rise to hazardous waste. The anticipated fabrication and repair activities on site are likely to produce some commercial waste although these are unlikely to be significant and are expected to be adequately dealt with via standard waste management procedures.

Use of Natural Resources

2.60 The proposed development is located on brownfield land within the existing Port and will not require the significant use of land, soil and biodiversity resources. Where possible, materials arising from dredging and demolition works will be recycled for infilling of associated elements of the project and, in some cases, it might be possible to re-use any stonework that is removed to repair damaged sections of masonry elsewhere.

Residues and Emissions

2.61 Relevant details of residues and emissions in relation to water, air (e.g. dust) and noise and vibration are set out in Chapters 6 (Marine Environment), 8 (Noise and Vibration) and 9 (Air Quality) of this ES. Lighting is considered within Chapter 16 (Biodiversity) and 14 (Landscape and Visual) as relevant.

Construction

2.62 The details of construction methods, timing and phasing are necessarily broad at this stage. The limits of the assessment, however, have been set sufficiently wide to allow a robust assessment to be undertaken of a reasonable worst-case scenario.

Marine Components Construction

New Slipway

2.63 The works relating to the new slipway are summarised below and further details are provided in New Mega Slipway Report (Royal Haskoning DHV, 2019) at **Appendix 2.1** as supplemented and amended by Dredging Strategy: Milford Haven Port Authority Slipway (Royal Haskoning DHV, 2020) at **Appendix 2.2** and Pembroke Dock Marine Infrastructure - Marine Rock Dredging (Royal Haskoning DHV, 2020) at **Appendix 2.3**. The new slipway will be created by carefully removing the central section between the two existing slipways, removing the rails, supports and hauling system from Slipway No. 2 and re-grading the whole area to form a new concrete ramp sloping down into the water which will be approximately 65 m wide. The design will ensure that the extent of the underwater construction at

the seaward end will be minimised whilst still maintaining the required water depth for the launch and recovery of a full range of vessels and modules.

2.64 Works will include the careful dismantling of the existing structures between the two existing slipways, the intention being to retain the flank walls closest to the graving dock and Carr Jetty on the east and west slipways respectively.

2.65 The new slipway is likely to comprise a 500 mm thick reinforced concrete slab over 1,000 mm of compacted granular sub-base or a bed comprising single sized rock. It is anticipated to extend to approximately 4.27 m below chart datum and cover an area of approximately 67 by 172 m. These works may necessitate some pre-construction dredging (below MHWS) within the footprint of the new slipway and, should this be required, it is anticipated that approximately 3,551 m^3 of soft silt and clay sediments would be dredged and approximately 5,353 m^3 of coarse sand, gravel, bound mudstone and mudstone would be removed (see Slipway Excavation Volumes Dredge Material Below M.L.W.S. at **Figure 2.3**). Excavation above tide level will be undertaken by backhoe excavator and rock excavation will be by hydraulic breaker or a milling attachment will be used. Alternatively, a larger excavator will be used if the rock is sufficiently weak to be excavated. Below tide level, the backhoe excavator will be positioned on a barge and work from it, if necessary, using a larger machine and/or ripper tooth or teeth bucket to achieve the necessary force.

2.66 The bathymetric survey undertaken shows that approximately 40 m from the quay wall/end of the existing slipways the rock stratum drops away quite quickly. Therefore, to minimise the extent and complexity of the underwater construction at the seaward end of the new slipway it is proposed to increase the gradient from 1 in 17 (at the existing slipways) to 1 in 12 and move the slipway crest landward by approximately 36 m. This approach will avoid having to place a significant thickness of fill and construct an underwater retaining wall at the end of the slipway, or alternatively support this section of the works on piles, thereby minimising the impact on the marine environment.

2.67 As the gradient of the new slipway has been increased and the crest moved landward, the new slab level will be below the foundation level of the existing flank walls. These walls will, therefore, be underpinned. The underpinning will be carefully organised and executed to maintain the integrity of the existing walls and to undertake the work tidally 'in the dry'. It is likely that a new reinforced concrete boundary wall will be constructed below the existing wall. This method would secure the long-term integrity of the flank walls and provides the opportunity for viewing and recording the original construction work.

Graving Dock

2.68 The works to infill the Graving Dock will include the removal of the existing caisson gate and removal of silt and debris from within the dock. It is anticipated that sediments within the Graving Dock are to a depth of approximately 2-3 m with the removal of up to approximately 7,100 m^3 of material in total. The likely method of removal of sediments will be via a temporary cofferdam installed across the entrance to the dock and material removed via sludge pump and excavator in the dry. Once cleared, the preferred option that maximises the preservation of the historic fabric of the dock is for it to be partially infilled with crushed stone over a layer of sand with a mass wall erected at the invert to the seaward end of the dock, which preserves the opening and caisson slot. Further details are provided in **Appendix 2.4**.

Timber Pond

2.69 The infilling of the Timber Pond will require the decommissioning/plugging of the intake and outfall pipes (e.g. by installing sheet piles against the face of the culverts) followed by the dewatering of the pond and either the treatment or removal of the sediment. If the sediment is left in situ it will be covered with a geotextile prior to infilling. If the sediment is removed, then a layer of sand will initially be placed to protect the bed of the pond and side walls prior to infilling with sand and granular material. The infill material will be placed up to the existing ground level. Further details are again provided in **Appendix 2.4** and **2.5**.

Materials Reuse in Graving Dock and Timber Pond

2.70 As set out within Technical Note: Materials Re Use and Timber Picking Pond Backfilling v03 in support of EIA (Arcadis, 2020) at **Appendix 2.5**, the vision is for the majority of materials that arise from marine dredging activities and dismantling of the onshore elements between Slipways 1 and 2 to be re-used as engineering fill within the significant voids within the site that require infill at the former Timber Pickling Pond and Graving Dock. The re-use as infill will be only if "suitable" material. If unsuitable, or uneconomical/impractical to recover for reuse as fill then these will be sent to an onshore licensed disposal site.

Onshore Components Construction

2.71 The hardstanding and laydown areas and the proposed buildings will be constructed using standard construction techniques, as will any demolition of existing onshore structures.

2.72 Hardstanding areas will be stripped and then laid with compacted hardcore and finished in concrete and/or tarmacadam.

2.73 The proposed buildings will, subject to final design, be of structural steel frame construction, under coated standing seam roofing, walls/mansard sides to be 70% composite Kingspan and 30 Rodeca glazed panels fixed to purlins and sheeting rails. The internal fit-out of the buildings will be subject to the occupier's specifications although is likely to include the installation of overhead gantry cranes in addition to switchgear, power and lighting installations and office and welfare facilities.

2.74 The method of constructing foundations for the proposed buildings will depend on ground conditions. It is expected, however, that the building proposed over the Timber Pond will require piled foundations. Where the calculated loads to be imposed on the foundations are large it is likely that piled foundations will have to be used in order to reach the stronger unweathered bedrock. More lightly loaded foundations may still require the use of piles if the top layers of rock are poor quality or at a depth of more than approximately 2 metres. Where the ground is of suitable quality and foundations are lightly loaded then pad foundations will be used. For heavy duty foundations the piles are likely to be bored cast in place piles. More lightly loaded piles are likely to be driven precast or steel piles.

Indicative Phasing of Construction Works

2.75 The timing of the proposed development will be dependent on securing planning permission, the discharge of planning conditions and the approval of reserved matters details.

2.76 The construction of the new slipway is likely to be undertaken in phases to ensure that an operational slipway always remains available. Whilst this will affect the cost of undertaking the works and will

lengthen the overall programme it has the benefit that it allows works to the listed structures to proceed in a very controlled manner.

2.77 At this stage it is anticipated that construction works for the marine components will take approximately 18 months.

2.78 Services infrastructure is anticipated to take around 12 months and the construction of the hardstanding area is also anticipated to take around 12 months.

2.79 Similarly, it is anticipated that each of the buildings would take approximately 12 months to construct.

2.80 The broad sequence of construction activities is likely to be:

- Q2 2021 – Contractor Mobilisation:
  - Set up of construction access routes at Gate 4;
  - Contractor Site Offices, welfare facilities and material compound;
  - Identification of Heritage assets, working areas, services and development of the Construction Phase Plan, Environmental and Waste Management Plans;
  - Demolition of buildings directly affected by the slipway development.
- Q2 2021 to Q4 2022 – Slipway Construction Works;
- Q2 2021 to Q1 2022 – Decommissioning and infilling of the Timber Pond;
- Q3 2021 – Provision of Ecology measures, land remediation and development of laydown areas;
- Q4 2021 to Q3 2022 – Removal of the Caisson Gate and Infilling of the Graving Dock;
- Q2 2022 to Q3 2023 – Demolition of Buildings, Infrastructure works, including construction of internal roads, drainage works and sewage pumping station;
- Q3 2023 – Completion of Infrastructure Development;
- Q4 2023 – Construction of Building substructures (subject to demand for facilities);
- Q3 2024 to Q3 2026 – Erection of superstructures and building finishes, landscaping and planting in accordance with landscape strategy.

2.81 The construction sites would be fenced during construction. It is the intention of the applicant that the site would be registered under the Considerate Constructors Scheme or a similar locally recognised certification scheme.

Construction Working Hours

2.82 In general, working hours would be 07:00 to 19:00 hours Monday to Friday, 07:00 to 13:00 hours on Saturday with no construction on Sundays or on public or bank holidays. These hours would be subject to agreement with PCC. However, some works will be tidally restricted and will, therefore, need to take place outside of these hours. Works required outside of these hours would be agreed in advance with PCC and appropriate measures would be taken to avoid exceeding agreed noise levels.

Environmental Management During Construction

2.83 Construction would be undertaken in accordance with the Outline Code of Construction Practice (OCoCP) provided at **Appendix 2.6** of this ES. The OCoCP sets out the key management measures that contractors would be required to adopt and implement. These measures have been developed based on those identified during the EIA process and set out in the topic chapters of this ES. They include strategies and control measures for managing the potential environmental effects of construction and limiting disturbance from construction activities as far as reasonably practicable.

2.84 The OCoCP would form the basis of more detailed plans and method statements, including a Construction Environmental Management Plan (CEMP), to be prepared during the pre-construction period once a Principal Contractor has been appointed. The final CEMP would be agreed with PCC and is expected to be the subject of a planning condition.

Construction Working Areas

2.85 Construction is expected to be undertaken within the proposed masterplan site boundary. However, should additional land be required for construction compounds this would be provided within the existing operational Port.

2.86 Several temporary facilities would be required during construction including:

- Temporary offices and welfare facilities;
- Storage area for materials, fuels, plant and equipment;
- Waste management areas; and
- Car parking facilities.

Construction Access

2.87 The construction access point will be via the existing Gate 4 entrance to the site. The principal route to the access from the A477 would be via London Road, Western Way, Commercial Row and Meyrick Owen Way (A4139).

2.88 Every effort would be taken to minimise the effects of traffic associated with the construction phase of the proposed development. Materials and resources would be sourced locally where possible and deliveries and construction traffic would endeavour to avoid travel during commuter peaks.

2.89 A Construction Traffic Management Plan (CTMP) will be provided to (and agreed with) PCC prior to the commencement of any construction works.

Construction Vehicles

2.90 The type of construction vehicles would be selected by the contractor prior to and during the construction phase. However, the following vehicles would typically be used during construction:

- Excavators;
- Cranes - for assembly and erection;

- Low loaders - for transport of construction equipment and plant;
- Concrete lorries;
- Tipper lorries; and
- Construction staff vehicles.

2.91 The peak construction period would require up to a maximum of 73 two-way AM and PM vehicle trips by construction staff, plus 9 heavy goods vehicle (HGV) movements per day. Although it is not expected that the construction of the proposed development would generate any abnormal loads, if this was required, the routing and nature of such loads would be agreed with the highway authority prior to work commencing.

2.92 It is anticipated that the peak periods for traffic movements associated with the construction phase would be 07.00-08.00 and 15.00-16.00. Further details of predicted traffic flows associated with the project are provided in Chapter 11 (Transportation) of this ES.

Drainage

2.93 The construction phase would incorporate pollution prevention and flood response measures to ensure that the potential for any temporary effects on water quality or flood risk are reduced as far as practicable.

2.94 Such measures would be implemented through the OCoCP and subsequent CEMP, which are anticipated to include the following:

- Covers for lorries transporting materials to/from site to prevent releases of dust/sediment to watercourses/drains;
- Storage of oils and chemicals away from existing watercourses, including drainage ditches or ponds;
- Concrete to be stored and handled appropriately to prevent release to drains;
- Preparation of a flood response plan in the event of flooding during construction works. This would include a procedure for securing or relocating materials stored in bulk;
- Use of a documented spill procedure and use of spill kits kept near chemical/oil storage;
- Storage of stockpiled materials on an impermeable surface to prevent leaching of contaminants and use of covers when not in use to prevent materials being dispersed and to protect from rain; and
- Stockpiles to be kept to minimum possible size with gaps to allow surface water runoff to pass through.

Construction Waste

2.95 Works to install the new slipway will necessitate some pre-construction dredging and it is anticipated that up to approximately 21,450 m^3 of material would be dredged or removed below MLW. The works to infill the Graving Dock will require the removal of up to approximately 7,100 m^3 of material.

2.96 Accordingly, it is estimated that a total volume of approximately 73,340 m^3 of spoil will be generated from works to remove material from both the footprint of the new slipway and the graving dock. The possibility of beneficial use of this material on site (for infill) will be assessed and implemented if it is practicable to do so in accordance with **Appendix 2.5**. Otherwise, this material will be disposed of at an authorised onshore disposal site.

2.97 All other construction wastes would be recycled wherever possible.

Use of Natural Resources

2.98 The CoCP would require the contractor to identify the main types and quantities of materials required for the project to assess potential for sourcing materials in an environmentally responsible way. The construction specification would place preference, when options are available, on the use of materials with a high recycled content.

2.99 The Considerate Contractors Scheme includes measures relating to the use of resources, including categories in relation to minimising the use of water. All timbers used as primary structural elements would be required to be Forest Stewardship Council (FSC) certified.

2.100 Wherever possible materials will be re-used on site, for example, any concrete taken up will be crushed and re-used as sub-base.

2.101 Where relevant, the construction process would consider the principles of good practice in soil handling and restoration set out in the following documents, wherever possible, to reduce the possibility of damage to soil materials during the construction process:

- MAFF (2000) Soil Handling Guide; and
- DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (including the Toolbox Talks).

Operation and Maintenance

2.102 The proposed development has been designed to allow a more efficient use of the Port for fabrication, repair and servicing of boats, renewable energy devices, transporting cargo and other works requiring marine access, served by an appropriately structured highly flexible enlarged slipway.

2.103 The long-term management strategy for the proposed development will be the responsibility of MHPA, subject to the conditions relating to servicing and management included within any tenancy agreements that MHPA enters with other companies that may operate within the site.

Measures Adopted as Part of the Project

2.104 To avoid or reduce the environmental effects, several measures have been designed into the proposed development. Details of these can be found within each topic chapter of the ES and are summarised in Tables 2.2 and 2.3 below.

Table 2.2: Schedule of Measures to be Adopted as Part of the Project During Construction

	Proposed Measures during Construction
General	• CoCP • Working hours • Site Layout and Appearance • Security • Site Waste Management Plan • Method Statements • Local Community Liaison • Emergency Contacts and Procedures
Design	• Design development examined several options for the site selecting that which preserved the greatest amount of designated historic assets, minimised impact on the environment and recognising the need to visually diminish the impact of new buildings when viewed from significant locations and create a 'sense of place' while accommodating anticipated end user needs • Avoidance of complete demolition or irreversible infill of any designated historic asset • Infill methodologies to include protective layering of infilled designated historic assets • Recovery, conservation and display of caisson gate from the Grade II* listed Graving Dock • Relocation of capstans and bollards associated with Graving Dock • No deep piling within the Graving Dock • Retention of visibility of Graving Dock entrance • Retention of visibility of upper part of western wall of Timber Pond • Outfall in western wall of Timber Pond reconfigured to drain from pond into Haven • No piling within walls of Timber Pond • Underpinning and retention of flank walls of Grade II listed Building Slips Nos 1 and 2 to accommodate modified and enlarged slipway • Design concept of buildings A and B shows comparison of the proposed production facilities at Pembroke Port with their 19th century counterparts in the heyday of ship building and the form of the `mansard` type envelope structures sitting over the `Slip-Docks`
Marine Environment	• Construction Environmental Management Plan (CEMP) • Installation of a cofferdam at the entrance to Graving Dock • Use of backhoe, rock bucket and rock tooth to undertake dredging activities • Piling activities undertaken in daylight hours only • Soft start procedure to be implemented prior to commencement of piling activity
Shipping and Navigation	• Promulgation of information including Notices to Mariners during the construction phase, advising on the location, nature and timing of the works; • Aids to navigation • Marine charting • Recommended advisory clearance distances for vessels undertaking construction activities • Consideration of the use of safety vessels/guard boats during construction activities • Compliance with International Maritime Organisation Conventions including COLREGs and SOLAS • Update to Navigation (Marine) Safety Management System; and • Review of the Port Emergency Plan

Noise and Vibration	• CEMP • Communication with those likely to be affected • Equipment • Worksite • Hoardings • Maintenance • Piling undertaken using the most appropriate technique, with minimal noise and vibration generation in mind
Air Quality	• Dust Management Plan • CEMP • Communication: as for noise and vibration above. • Site Management: record all complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken • Monitoring: regular site inspections • Site Preparation and Maintenance: site layout so that machinery and dust causing activities are located away from receptors, as far as reasonably possible and use screening intelligently where possible • Vehicle/Machinery and Sustainable Travel: Ensure all vehicles switch off engines when stationary and avoid the use of diesel or petrol-powered generators by using mains electricity or battery powered equipment where practicable • Construction Logistics/Traffic Management Plan to manage the sustainable delivery of goods and materials. • Construction Equipment: only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays • Waste Management: avoid bonfires and burning of waste materials, bag and remove debris or damp down such material before demolition
Historic Environment	• A programme of historic building recording to be carried out ahead of any works • Archaeological watching brief • Recovery and conservation of the caisson from the Grade II* listed Graving Dock • Relocation of capstans and bollards associated with Graving Dock • Graving Dock drained and sediment removed before infilling initially with a layer of sand to to protect the structure and ensure reversibility • No deep piling within the Graving Dock • Retention of visibility of Graving Dock entrance • Retention of visibility of upper part of western wall of Timber Pond • Grade II listed Timber Pond drained and sediment removed. Puddling clay retained and pond infilled with layer of sand initially to protect the structure and ensure revesibility • Outfall in western wall of Timber Pond reconfigured to drain from pond into Haven • No piling within walls of Timber Pond • Underpinning and retention of flank walls of Grade II listed Building Slips Nos 1 and 2 to accommodate modified and enlarged slipway
Transportation	• Construction Traffic Management Plan • Delivery hours restrictions • Wheel washing facilities • Dust reducing measures • Any necessary road closures or diversions
Ground Conditions	• Pre-demolition audit of each building would be undertaken, which would include the removal of any hazardous material • Demolition and construction phases would be carried out in accordance with the measures outlined in a Code of Construction Practice (CoCP) and implemented through a Construction Environmental Management Plan (CEMP) • Where significant unforeseen contamination is identified during the course of the demolition or construction work, work would stop and further investigation would be undertaken to establish the level of contamination

	• Stockpiling of any contaminated materials would be avoided where practicable. Where it is necessary, stockpiles would be located on areas of hardstanding or plastic sheeting to prevent contaminants infiltrating into the underlying ground • Where remediation is required, on-site treatment, including bioremediation, would be carried out wherever practicable • Demolition and excavation works would be carried out in such a way to enable effective segregation of clean materials for reuse on site wherever practicable • For demolition activities, potential risks to human health would be reduced as much as is reasonably practicable prior to undertaking the works by undertaking the works in accordance with approved health and safety plan including comprehensive method statements and risk assessments for the proposed activities • Emergency Response Plan to minimise, contain and remediate contamination from the accidental release of contaminating substances • In areas of soft landscaping with potential for contamination a cover system is required, alternatively source removal of the contaminated Made Ground will be undertaken • Basic gas protection measures will be required in all new buildings
Landscape and Visual Impact	• Design development examined several options for the site selecting that which preserved the greatest amount of designated historic assets, minimised impact on the environment and recognising the need to visually diminish the impact of new buildings when viewed from significant locations and create a 'sense of place' while accommodating anticipated end user needs • Design concept of buildings A and B shows comparison of the proposed production facilities at Pembroke Port with their 19th century counterparts in the heyday of ship building and the form of the curved roof and `mansard` type envelope structures sitting over the `Slip-Docks` • Panelisation of the side walls of proposed buildings and use of scatter pattern (colour –– deep blue) translucent panels make suggestion of the slip-docks` and their contrast colour (metallic Pewter) selected for historic and visual purposes to minimise ``volumetric bulk`
Hydrology and Flood Risk	• Surface Water Management Strategy • Temporary drainage mitigation techniques • Construction material and/or spoil within construction compounds will be positioned away from drainage systems and water bodies • Emergency Spillage Management Plan • Flood Management Plan
Biodiversity	• Biosecurity Method Statement or Invasive Non-Native Species (INNS) Management Plan • Construction fencing • Ecological Clerk of Works • Pre-construction surveys • Ecological method statements/mitigation strategies • Licensing

Table 2.3: Schedule of Measures to be Adopted as Part of the Project During Operation

	Proposed Measures during Operation
General	• Compliance with Docks Regulations 1988 • Environmental Management Plan • Lighting Management
Design	• Ongoing avoidance of complete demolition or irreversible infill of any designated histroic asset • At night the proposed buildings a filigree of light from the many small scale translucent panels and visually diminish the mass of the structure
Marine Environment	• Environmental Management Plan • Invasive and Non-Native Species (INNS) Management Plan
Shipping And Navigation	• Continuaton and extension Port Marine Satefy Code duties and guidance to include relevant project operational activities

	• Continuaton and extension of Statutory Harbour Authority duties to include relevant project operational activities • Continuaton and extension of Competent Harbour Authority duties to include relevant project operational activities
Noise and Vibration	• Any concrete batching plant to be enclosed with entry point to north • Retention of 5 m wall or fence along southern boundary of site • Limiting activities within Area D within the more sensitive night-time period • Operational noise monitoring should be provided at the nearest receptors on Martello Road, St. Patrick's Hill, South Pembrokeshire Hospital and Surehaven Pembroke Hospital
Air Quality	• Residual air quality effects during the operational phase are not considered significant and no further mitigation is required
Historic Environment	• Conservation and retention of Graving Dock Caisson near to Graving Dock slot • Digital augmented reality and virtual reality of historic dockyard utlising digital historical recording data abtained during construction mitigation
Transportation	• Travel Plan in order to encourage staff to use more sustainable modes of travel and reduce their reliance on the private car
Ground Conditions	• Groundwater monitoring programme
Landscape and Visual Impact	• At night the structures provide a filigree of light from the many small scale translucent panels and visually diminish the mass of the entire structure
Hydrology and Flood Risk	• Adherence to Surface Water Management Strategy • Drainage Maintenance Plan • Flood Management Plan • Emergency Spillage Management Plan • Water Quality Monitoring Strategy
Biodiversity	• Maintain the sheltered context of the existing bat flight line along the southern boundary • A stand off between operational areas and the off-site mature trees on the southern side of Fort Road • Native shrubs will be subject to aftercare during the establishment period • Replacement of damaged or diseased plants • Periodic monitoring will review the health of the planted shrubs, identifying if shrub management practices need to be modified and where replacement planting is required • Relocated OMH would be subject to annual monitoring for the first five years • Long-term management of native scrub and ruderal vegetation in would be incorporated into the management regime for the Port • The operational lighting scheme will be developed with reference to the recommendations published by the Institution of Lighting Professions and Bat Conservation Trust