Liverpool Cruise Terminal

Framework Construction Environmental Management Plan (CEMP)

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Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS OHSAS 18001:2007)

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Eleventh	December 2019	Lara Russo Consultant	Gavin Spowage Associate Director	Gavin Spowage Associate Director
Comments		Addressing further NE consutation response – severe winter weather restrictions		

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1. Introduction

1.1 General Overview

This framework Construction and Environmental Management Plan (CEMP) has been prepared by Waterman Infrastructure & Environment Limited (hereafter referred to as 'Waterman'), on behalf of Liverpool City Council to support the construction of the new Liverpool Cruise Terminal and associated infrastructure including the demolition phase (hereafter referred to as the 'Development') on land at Princes Parade, Liverpool (the 'Site'). The general location of the Site is shown in **Figure 1** included within **Appendix A.**

The new Liverpool Cruise Terminal was granted planning permission on 3rd April 2018 (planning reference 17O/3230) and a number of planning conditions were attached. In particular, Planning Condition 8 of the Decision Notice states that:

"No development within any phase shall commence until a Construction Environmental Management Plan (CEMP) and Ecological Conservation Management Plan (ECMP) has been submitted to and approved in writing by the Local Planning Authority, in liaison with Merseyside Environmental Advisory Service and Natural England. The CEMP and ECMP must describe how construction will be managed to avoid, minimise and mitigate any adverse construction effects on the environment and provide the following details in accordance with the provisions set the Environmental Statement and HRA Screening Report Addendum - version 10-3-3:

I. measures to control and prevent dust, debris, emissions and water run-off from entering the River Mersey during construction;

II. how certain activities will be limited in time, location or noise level to minimise the risk of disturbance to SPA birds and to minimise impacts to supporting habitat;

III. measures to provide resting/roosting opportunities for cormorant;

IV. measures for reducing impact of lighting;

V. details for the waste minimisation, recycling and disposal of waste resulting from demolition and construction works;

VI. details of provisions to utilise renewable energy in the cruise terminal building.

The Plan shall be implemented in accordance with the agreed provisions over the course of construction of the development"

This framework CEMP was therefore prepared to provide the appointed Contractor with an outline of the relevant measures to be implemented during the construction of the Development to avoid, minimise or mitigate effects on the local environment and community surrounding Site. The CEMP is designed to ensure compliance within the requirements of relevant environmental legislation and Planning Condition 8. This framework CEMP is therefore aimed to guide the Contractor with the production of an operational CEMP (which is a 'live' document that is reviewed and updated by the Contractor at regular intervals throughout the project life cycle). The Contractor will have overall responsibility for the CEMP and the construction works at the Site.

The Cormorant Ecological Conservation Management Plan forms part of the CEMP and is included as a Technical Note in **Appendix B.**

1.2 Environmental Statement and ES Addendum

An Environmental Impact Assessment (EIA) was undertaken by Waterman in 2017 to support the Planning Application. The assessments were summarised within the following documents:

- Environmental Statement (ES) (Ref: WIE12464-100-R-1-1-1ES, dated October 2017), hereafter referred to as '2017 ES';
- ES Addendum (Ref: WIE12464-103-R-ES Addendum 12-3-8, dated June 2018), which was subsequently compiled in 2018 to address the additional requirements set out in the Marine Works (Environmental Impact Assessment) Regulations 2007, as amended, (to apply for a Marine Works Licence) and Schedule 3 of the Harbours Act 1964 (to apply for a Harbour Revision Order);
- ES Addendum (Ref: WIE12464-103-R-ES-Addendum-12-6-1, dated January 2019), which superseded the June 2018 ES Addendum and took account of, amongst other things, subsequent changes to the proposed construction methodology for the proposed Development;
- ES Addendum (Ref: WIE12464-103-R-ES-Addendum-12-7-2, March 2019), which superseded the January 2019 ES Addendum and was compiled to address subsequent additional comments received from the MMO; and
- ES Addendum (Ref: WIE12464-103-R-ES-Addendum-12-8-1, October 2019) – the 'fourth issue', which superseded the March 2019 ES Addendum and addresses subsequent comments received from MMO and other regulatory bodies including Natural England.

The baseline information, the relevant outcome of the assessment of the impacts and the mitigation measures identified within the 2017 ES and associated ES Addendum have been used to inform this framework CEMP. Therefore, reference to these documents and associated supporting studies will be made within the relevant section of the document.

1.3 Site Description

The Site falls within the administrative boundary of LCC and is centred at easting and northing coordinates 333670, 390670. The site and occupies an area of approximately 5.77 hectares (ha) (refer to **Figures 1 and 2**) and is bound by the Mersey Estuary to the west, the residential Alexandra Tower and the Princes Half Tide Dock to the north, Princes Dock and office buildings to the east and the Royal Liver Building and Water Street to the south. The current temporary 'Upper' Cruise Terminal is located adjacent to the south-east of the Site.

The northern part of the Site currently includes the derelict Princes Jetty and an area of surface car parking known as Plot 11. The Jetty and Plot 11 are separated by Princes Parade which connects to Waterloo Road in the north and St Nicholas Place in the south. A series of floating pontoons (Pontoons A to D) are located in the west and south-west of the Site. The existing 'Lower' Cruise Terminal building is located on Pontoon A (refer to **Figure 3**). The southern part of the Site contains the Isle of Man ferry terminal and a marshalling area associated with the cruise ship and ferry terminals. The Titanic Memorial is excluded from the Site boundary.

A detailed description of the key area of Site is provided within the sections below.

1.3.1 Plot 11

For information Plot 11 is as defined in the Outline Planning Application and includes Development Parcels 1g and 1h as identified on Parameter Plan 004 and Plots A-07 and A-08 of the Neighbourhood Masterplan and within Parameter Plan 005. The Plot 11 site is located in the north of the proposed Cruise Terminal Site (as defined by the redline planning boundary) and comprises a hard-standing surface car

park, currently used for short term parking. The hard-standing comprises a mixture of tarmac and cobbles with some gravel areas. A disused railway line runs through this part of the Site.

1.3.2 Princes Jetty

The derelict Princes Jetty and an area of open water occupy the north-west corner of the Site. Princes Jetty is formed of a concrete deck supported by approximately 140 timber uprights and is surrounded by security fencing and, as such, is not publicly accessible.

Two mooring dolphins are located within the open water area to the south of the jetty.

1.3.3 Pontoons

A series of four floating pontoons are located in the south-west of the Site, forming the current Liverpool Landing Stage that facilitates the berthing and servicing of cruise ships. There are a number of buildings and structures on the pontoons including a small building, located at the north end of Pontoon D, currently utilised as a Pilot launch facility.

The lower Cruise Terminal Building is located on the southern pontoon (Pontoon A). These pontoons are connected to Princes Parade in Princes Dock by number of link bridges to provide pedestrian and vehicular access.

1.3.4 Southern Area

The south part of the Site contains a marshalling area and the Isle of Man ferry terminal along with a small surface car park. An area of soft landscaping and the Grade II Listed Titanic Memorial is in this area but is specifically excluded from the Site boundary. A subterranean section of the Liverpool Canal Link runs beneath the car park.

1.3.5 Access Roads

Access to the site is provided from St Nicholas Place in the south-east. St Nicholas Place runs westwards through the south of the Site before turning north to become Princes Parade. Princes Parade forms the eastern boundary of the Site as it runs northwards before it bisects Princes Jetty and Plot 11. It then turns to the east in the north of the Site, eventually linking with Bath Street at the north-east corner of the Site.

Link bridges provide vehicular access from Princes Parade to the pontoons for service vehicles to access the cruise ships.

1.4 Development Proposal

1.4.1 Description of the Development

The Applicant has been granted with the construct a new cruise ship terminal facility and supporting infrastructure to replace the existing temporary cruise ship terminal. The main elements of the proposed Development comprise:

- Demolition of buildings and structures, including the controlled removal of Princes Jetty;
- Construction of a cruise liner terminal building;
- Construction of a new landing stage and suspended concrete deck;
- Removal of existing mooring dolphins and construction of two new mooring dolphins;

- Modification of the existing cruise liner terminal building to accommodate cruise related ancillary uses, including staff facilities and storage, on completion of the new cruise liner terminal; and
- Erection of a vehicular and pedestrian linkspan bridge (linking the new terminal building and the existing pontoons).

The physical characteristics of the proposed Development are set out in a series of Parameter Plans which set out, amongst other things, the location and maximum buildable envelope of the proposed built elements within the Site. The details of the proposed Development's appearance, including fixed building heights and footprints, will be established in due course, during the detailed design stage. The detailed design will need to accord with the relevant Parameter Plans.

Figure 3 shows the Proposed Site Layout; whilst **Figure 4 and 5** the Development elevations and sections respectively.

The primary use of the proposed Development would be the berthing of cruise ships, generally from March through to November, to accommodate the predicted growth in passenger numbers in this sector. Additionally, at appropriate times throughout the year and particularly during the off-season, it is proposed to use the new terminal building as conferencing and exhibition space.

1.4.2 Demolition of buildings and structures

The buildings and structures to be demolished comprise:

- Princes Jetty: To facilitate the construction of the new terminal building, the existing Princes Jetty
- structure must be removed. The jetty is currently in a state of disrepair and is unsuitable for safe
- berthing of vessels;
- The pilot launch buildings on Pontoon D; and
- The two mooring dolphins between Princes Jetty and Pontoon D.

The indicative location of building and structures to be demolished is illustrated on **Figure 6**. Further details drawings would be developed at detailed planning stage and should be taken into account for the production of the CEMP.

1.4.3 Cruise Liner Terminal Building

The Cruise Liner Terminal Building would be built on a new suspended deck. It would be a two-storey building comprising:

- Baggage x-ray area;
- Baggage hall;
- Customs area;
- Ground floor entrance atrium and departure lounge; and
- Café at 1st floor level.

No renewable energy systems are proposed as part of the Cruise Liner Terminal Building.

1.4.4 Vehicle Linkspans and Pedestrian Walkways

A vehicular link bridge (a 'linkspan') would connect the new suspended deck with the retained floating pontoons to the south. The linkspan would float to adjust for tidal variations and would be supported by a

dedicated support pontoon at the southern end. The northern end of the vehicular linkspan would be supported from the new suspended deck.

To segregate pedestrians from the vehicle access area and ensure a smooth transition of passengers to the varying deck levels of the cruise ships, a pedestrian walkway would be provided as part of the vehicular linkspan.

A hinged walkway bridge would connect the cruise terminal building to a fixed walkway which would provide access to the cruise ships. The high-level walkway would have a minimum headroom clearance of 5.3m above pontoon deck level to allow safe passage of vehicles beneath.

At this stage, it is anticipated that the form of construction for the link-bridge and walkways would be structural steel warren trusses with glassed side walls on each side and a solid roof.

1.4.5 Mooring and Berthing Infrastructure

Following the removal of the two existing mooring piles between the existing timber jetty and Pontoon D, it is considered likely that there would be one replacement mooring pile, and the potential for two additional berthing piles. These piles would be located in the same approximate location as the two existing mooring piles.

1.4.6 Existing Terminal Building

Once the new terminal building is in operation, the existing 'lower' terminal building on Pontoon A would be modified for cruise-related ancillary uses including storage and operational staff facilities.

1.4.7 Parking Provisions

On-site parking provisions would include coach bays as chevron bays along the frontage of the terminal building on Princes Parade and within the passenger pickup/drop-off area. This area would also include spaces for drop-off and pick-ups by private vehicles and for taxis. There would also be bays for shuttle buses linking with the off-site long-term designated car park(s).

1.4.8 Landscape, Open Space and Public Realm

The proposed Development would be at approximately the same level as existing (typically 7.55m AOD). The public realm would be designed in order to provide street level access from the passenger pick-up / drop-off area. The design principles of the landscape, open space and public realm would accord with the Princes Dock Neighbourhood Masterplan as approved in May 2018, reusing materials currently existing on-site, particularly those with a historical link to the dock, and having natural stone as the dominant surface material (granite and sandstone), simply and neatly detailed, incorporating discrete drainage and other street furniture.

1.4.9 Drainage Infrastructure

Surface Water

It is anticipated that surface water from the all areas other than highways areas would be discharged directly to the River Mersey, via interceptors and pollution abatement controls as appropriate. The most sustainable way to drain surface water runoff is through the use of Sustainable Drainage Systems (SuDS). Due to the nature of the proposed jetty deck structure, there is limited space and depth for many of the SuDS devices potentially available. Treatment could be achieved through the incorporation of

permeable asphalt used in conjunction with a shallow permavoid system fitted with a biomat filtration system (or similar treatment device).

The various options are discussed in more detail in the standalone Flood Risk Assessment report submitted in support of the planning application. The final strategy would be confirmed at the detailed design stage.

Foul Water

It is expected that foul water drainage would be connected to the existing private foul network which runs adjacent to the Site in Princes Parade. It is not anticipated that foul water from vessels would be discharged in to the landward sewerage system.

1.5 Sensitive Receptors

A review of the land uses surrounding the Site has been undertaken to ensure that appropriate mitigation measures are implemented to minimise disruption to potentially sensitive receptors. **Figure7** illustrates the surrounding land uses, whilst **Table 1** below provides a summary of the identified potential sensitive receptors around the Site. A definitive list of the schemes which have been reviewed was included within the Environmental Statement which accompanied the original outline application, these can be found in Table 16.1 of Chapter 15.

Table 1: Potential Sensitive Receptors

Category	Sensitive Receptor	Description
Residential and Commercial	Existing Residents	A number of residential properties are located in the local area, such as the Alexandra Tower adjacent to the north and the residential 1 Princes Dock ('City Lofts') adjacent to the north-east. Residential buildings on William Jessop Row are currently under construction and are expected to be complete and occupied prior to the Development coming into operation.
	Existing Businesses	A number of commercial activities are located in the proximity of the Site and include the Malmaison hotel approximately 125m to the east and the commercial Princes Dock Offices at 12 Princes Parade adjacent to the east.
Leisure / Amenity	Existing Users	Users of the 'Liverpool Canal Link'
Heritage Assets	Built Heritage	The southern section of the Site is located within the 'Liverpool Maritime Mercantile City' World Heritage Site (WHS) and the rest of the Site is within the WHS's buffer zone. The southern portion of the Site, along part of Princes Parade and St Nicholas Place, is located within the Castle Street Conservation Area. The north-east portion of the Site is adjacent to the Stanley Dock Conservation Area. The Memorial to Heroes of the Marine Engine Room (Grade II* Listed) is located within the southern section of the Site, but is excluded from the Site boundary. The derelict Princes Jetty is located within the Site boundary. This feature is a non-designated heritage asset, however, consultation with LCC in March 2018 with regards to the Development, confirmed that the jetty is considered a listed structure due to its

Category	Sensitive Receptor	Description
		physical connection to the Grade II listed Entrance to Princes Dock to the north. The 'Prince's Half Tide Dock' (Grade II Listed) is located immediately to the north, beyond Prince Parade, and includes the retaining walls of the dock. The Site falls within the setting of a group of nationally significant listed buildings, collectively known as the Three Graces: • The Royal Liver Building (Grade I Listed), approximately 50m south of the Site; • The Cunard Building (Grade II* listed), approximately 125m south; and • The Port of Liverpool Building (Grade II* Listed), approximately 200m south. A group of listed monumental statues are located to the west of the Three Graces, including: • Monument to Sir Alfred Lewis Jones (Grade II Listed); • Monument of Edward VII (Grade II Listed); • War Memorial in front of Cunard Building (Grade II Listed); and • Merchant Navy War Memorial (Grade II Listed).
	Archaeology	The Site has the potential to contain palaeo-environmental and riverine deposits from Prehistoric to the present day. The extant structure of the Princes Jetty is the only surviving element of the original Liverpool Landing Stage, where many people embarked for emigration to North America.
Ground Conditions and Contamination	Construction workers, Site users and off-site receptors.	The Site is immediately underlain by Made Ground, which is present in all areas except in the west extent of the Site. Superficial deposits include Tidal Flat Deposits (clay, silty, sandy) and Glacial Till (Stiff brown Clay with lenses of sand) which overlay the Chester Pebble Beds Formation (sandstone, pebbly, gravelly). Historically, the Site has been in use as docks from at least the 1850s where historical mapping indicates substantial modification to the banks of the Mersey Estuary that the Site is located on. Historical uses of the Site are primarily associated with the docks and include warehouses and a railway. Two dock basins, located in the southern section of the Site, appear to have been infilled in the 1890s. By the 1990s all building on Site had been demolished. The historical uses of the Site represent potential sources of contamination the underlying soils and groundwater. An assessment of UXO has been prepared previously by BAE Systems for the Liverpool Waters Masterplan area (within which the Site is located) with the assessment stating that *"the probability of encountering UXO during the project is relatively high… however…the probability of initiating the device and causing an explosion is substantially lower"*.
Ecology	Designated Sites	The Site is located within the Liverpool Bay Special Protection Area (SPA), which was fully classified as an SPA on 31 October 2017, with an extension in area and with additional interest features to the original SPA. Its bird interest features are red-throated diver (non breeding, winter), little gull (passage/non breeding), common tern (breeding), little tern (breeding) and common scoter (non

Category	Sensitive Receptor	Description
		breeding/winter). It is also recognised for its internationally important assemblage of birds, which are made up mostly of the same non breeding/winter/passage species above plus an additional two species: red-breasted merganser *Mergus serrator* and great cormorant *Phalacrocorax carbo*. Other designated ecological sites within 10km of the Site include: • The Mersey Narrows SSSI, approximately 800m to the west of the Site; • The New Ferry SSSI, approximately 3.3km to the south; • The Mersey Estuary Ramsar Site and SPA approximately 3.3km to the south and the Mersey Estuary SSSI approximately 4.3km to the south-east; • The North Wirral Foreshore SSSI, approximately 4.2km to the northwest; • The Dee Estuary Special Area for Conservation (SAC), approximately 4.2km north-west; • The Sefton Coast SAC and SSSI, approximately 6.3km north; and • The Ribble and Alt Estuaries Ramsar site and SPA, approximately 6.4km north.
	Terrestrial Habitats	On-site terrestrial habitats are considered to be of generally low ecological value. The Site offers very few opportunities for terrestrial bird species with regards to nesting sites or suitable food resources for foraging. With the exception of great cormorant, none of the mobile species (e.g. foraging common tern, little gull) relevant to European sites occur on the Development site, although they may forage along the adjacent River Mersey.
	Marine Habitats	There is a very small section of intertidal sediment (approx. 3000m^2) at the mouth of Prince's Half Tide Dock, immediately to the north of the Site red line boundary. There are also intertidal habitats within the Site on man-made structures including the existing jetty and dock walls. The subtidal sampling within the Site indicated that the sediments were quite heterogenous. However, the subtidal assemblage was relatively impoverished. The subtidal macroinvertebrate assemblage was dominated by juvenile blue mussel *M. edulis* and the cryptogenic acorn barnacle *A. improvisus*. Several non-native species were recorded. Three individuals of the starlet sea anemone *N. vectensis* were recorded at stations north of the Site red line boundary. There are at least 46 fish species within the Mersey Estuary of which eleven are species of conservation importance. These include the migratory (diadromous) species: Atlantic salmon; river lamprey; sea lamprey; and European eel which are protected under Annex II of the Habitats Directive as well as seven species that are protected under Section 41 of the NERC Act: sea trout (also a migratory species); sea trout, European smelt; Atlantic cod; herring; plaice; common sole; and whiting. Several species of fish use the Mersey Estuary as a spawning or nursery area. The number of marine mammals recorded within the Estuary is low; however, there are occasional sightings of harbour porpoise and bottlenose dolphin, and the pinnipeds grey and harbour seal.

Category	Sensitive Receptor	Description
Controlled Waters	Groundwater	The Site is underlain by Unproductive Strata associated with the Tidal Flat Deposits and a Principal Aquifer associated with Chester Pebble Beds Formation. The aquifer represents a potentially sensitive receptor. However, it is noted the Site is not located within a Groundwater Source Protection Zone.
	Sensitive Surface Water Features	The nearest surface water feature is the River Mersey, located directly to the west the and Princes Dock directly to the east. The Liverpool Canal Link also runs under the southern carpark area. The Princes Half-Tide Dock is located immediately to the north, beyond Princes parade. The River Mersey is considered has a heavily modified transitional water and EA water quality data indicates the river has an overall 'Moderate' status under the Water Framework Directive Classification Scheme.
Transport	Pedestrians, Cyclists, Vehicle Users	Existing vehicle, pedestrians, cyclists and other road users surrounding the Site.
	Transport Infrastructure	Nearby transport infrastructure includes Princes Parade, which forms the eastern boundary of the Site as it runs northwards, providing connection with Bath Street at the north-east corner of the Site.
Air Quality	Existing Local Residents	The Site is located within the LCC Air Quality Management Area.
Noise	Existing Local Residents	Existing residents surrounding the Site.

1.6 Applicable Codes and Standards

1.6.1 Considerate Constructors Scheme

The Contractor will work under the guidelines of the Considerate Constructors Scheme (CCS). The aim of the CCS is to improve the image of construction by encouraging good communications with site neighbours and the general public, improved welfare facilities and greater environmental awareness. The Contractor is required to achieve a CCS Code of Considerate Practice overall score of at least 40 points with a score of no less than seven in each of the five sections in the final CCS visit.

1.6.2 Contractor Management System

The Contractor shall have an Environmental Management System in place that is accredited to ISO 14001, Eco-Management and Audit Scheme (EMAS), or the International equivalent standard for such systems. Once appointed, the Contractor's own policies, procedures, targets and objectives shall be considered, and the Contractor's CEMP may need to be updated accordingly. The Contractor will also comply with all relevant legislation.

2. Works Activities and Responsibilities

2.1 Key Activities

The proposed construction works would take place from April 2019 until February 2021 and would have a programme duration of 100 weeks. Works would include a number of activities summarised in **Table 2**.

Table 2: Construction Activities

Activity	Action
Pre-commencement Surveys	• Building and structure recording surveys of Princes Jetty and Princes Dock prior to commencement of intrusive site works • Structural surveys • Detailed utilities and services survey including penetrating radar, where required
Service Diversions	• Termination/isolation of existing redundant services entering the Site, where necessary • Diversion of existing utilities and other services, where necessary
Enabling Works	• Engagement with all stakeholders to discuss the detailed sequence of Works, prior to setup of the Site • Installation of a perimeter hoarding and of the temporary Site office and compounds • Establishment of wheel wash facilities
Demolition and Dismantling	• Deconstruction and removal of the existing concrete-decked Princes Jetty. Due to the condition of the existing structure it is anticipated that these works would predominantly take place from within the Mersey Estuary using barges. Once the Jetty has been removed it is anticipated that the existing timber piles shall be removed from the river bed (where practicable). • Demolition of the exiting Pilot Launch Building on Pontoon D • Removal of the two mooring dolphins between Princes Jetty and Pontoon D
Pilling and New Jetty Construction	Works would include the construction of a new suspended deck, which would comprise reinforced concrete slabs supported on a grid of precast reinforced concrete beams that would in-turn be supported on steel tubular piles. Therefore, the main operations would include: - Piling works - Installation of precast beams and slabs - Casting of the in-situ concrete deck • Piling Works - Landside Piling: Works would commence with the installation of the landside piles to the rear of the river wall. This would be conducted using a Casagrande B300 rotary bored piling rig (or similar) and an attending crawler crane. The piling ring rig would install the casing first, then the pile rebar and finally the concrete. The rig would work sequentially starting at the southern end of the site working towards the north as shown on **Figure 8a**. - Marine Piling (new deck piles): Works would commence once Landward piles have progressed far enough ahead. These works would be carried out using marine plant consisting of a jack up barge with 180t crawler crane and Casagrande B300 rotary bored piling rig (or similar). The works would commence at the southern end of the site and work towards the northern end, as shown of **Figure 8b.** The marine piling would be undertaken with the aid of a jack up rig and the gate would be set-up for 3 No. piles. Prefabricated piles would be delivered to the jackup by a service barge and lifted by the crane. The piles would then be screwed into the seabed and penetrate the rock head

Activity	Action
	by the piling rig. Following the setup of 3 No. piles, the sockets would be drilled. The material arising from this operation would be placed into a skip, which would be located on a service barge to be taken away for disposal. Once the sockets have been drilled, then the pile cages will be installed and placement of concrete would be undertaken. The jetty piles are expected to be specified as 965mm diameter open ended steel tubes concreted into an augered rock socket; and - Marine Piling (mooring piles): these are also 965mm diameter open-ended steel tubular piles driven into the rock. • Installation of precast beams and slabs for the new deck would commence once the piles have progressed far enough and would be done using land-based plant consisting of a 350t crawler crane. • Casting of the insitu concrete deck would commence once the precast concrete members have been progressed to the first 3 bents of the structure**. Figure 8c** and **8d** show the different phases of the deck construction.
Building and Structures	• Construction of the building would commence, on the insitu concrete works have progressed far enough • The new terminal building is likely to be constructed as a two-storey steel framed building with a full height atrium at the northern end. • The terminal building steel frame would be constructed in a phased manner, progressing from south to north. • The first floor would be concrete possibly constructed as a composite floor with in-situ concrete on profiled steel decking. Steel decking would be installed to the first floor and possibly to areas of the roof. This would provide safe access until the in-situ concrete is poured on top of the decking to construct the floor slabs. • It is currently envisaged that the roof would generally be constructed from lightweight insulated panels. The roof cladding would be installed followed by the wall cladding and glazing to provide a watertight building to enable the fit out of the building to proceed.
External Works	• Construction of hard and soft landscaping
Water Discharges During Demolition and Construction	• Surface water from the landward areas would be treated before draining to Peel Ports' private sewer • Surface water from the new jetty would be treated and drained to the river

2.2 Key Responsibilities

To ensure that environmental standards are maintained, it is necessary that every person working on the Site is aware of their responsibilities. Responsibilities have been set out in Table 2 below but, in general, the Contractor will have overall responsibility for implementation of the CEMP. The Contractor will also detail roles and responsibilities in Method Statements & Risk Assessments (RAMS) and Plans of Work for each activity. It should be noted that individuals or companies can be responsible for more than one role.

Table 3: Key Responsibilities

Person / Organisation	Responsibility
The Employer and / or developer for each phase	• The developer is LCC, who would undertake formal communication with neighbours and relevant Regulators in relation to key stages of the works

Person / Organisation	Responsibility
Project Manager	• Key person involved in the management of the project on behalf of the Employer and / or developer, issuing instructions to the Contractor as necessary • Policing non-conformances reported during independent verification audits • It is understood that the Project Manager is [……]
Principal Contractor (Contractor)	• Develop a CEMP that would adhere to the requirements of this draft CEMP at all times • Liaising with the LCC and local residents where necessary • Attend meetings at the request of the LCC with representatives of local residents' groups where necessary and addressing complaints / queries as soon as practicable • Ensuring that all Site staff and subcontractors undertake their activities in accordance with best practice outlined within this draft CEMP and subsequent operational CEMP • Ensuring that the appropriate monitoring is being undertaken by the nominated Environmental Monitoring Consultant / Co-ordinator • Ensuring that the Site activities do not create unacceptable levels of environmental pollution or nuisance (including fuel spillages, odour, noise, dust or vibration). This includes ensuring that: - Statutory environmental requirements are met; - Environmental best practice and control is used; - Relevant procedures are followed; - Resources (personnel and financial) are available to meet the environmental management requirements; - Corrective actions are implemented; and - Records and other relevant documentation are maintained
Transport Co-ordinator (nominated by, and reporting to, the Contractor)	• Production of a Construction Traffic Management Plan (including a Site Delivery Plan) • Co-ordinating deliveries and controlling vehicles accessing and leaving the Site, along routes to be agreed with the LCC
Environmental Consultant / Co-ordinator (nominated by, and reporting to, the Contractor)	• Monitoring air, noise, vibration on and immediately adjacent to the Site and ensuring that complaints regarding air, noise or vibration are appropriately investigated and responded to • Monitoring of any water discharges, in order to assess compliance with temporary water discharge consents • Monitor the quality of imported and site-won material in line with the site reuse criteria
Liaison Manager (nominated by, and reporting to, the Contractor)	• Liaison with neighbours and the LCC regarding site-specific issues • Producing a regular newsletter to inform stakeholders of progress, issues and upcoming work • Keeping the site notice board(s) up to date, including with appropriate contact information

Person / Organisation	Responsibility
Subcontractor Site Managers	• Ensuring that all staff adhere to the rules detailed in the Site induction • Ensuring that statutory adhere to the environmental requirements and the CEMP • Ensuring that resources (personnel and financial) are available to meet the environmental management requirements. • Reporting incidents to the Contractor • Ensuring that corrective actions are implemented. • Ensuring that records and other relevant documentation are maintained and reported to the Contractor, including energy use and water consumption
Site personnel	• All Site staff are responsible for adhering to the requirements of the procedures outlined in the CEMP, ensuring that legislative requirements and good environmental practice are met within their job function • As part of the Site induction, all Site staff will be made aware of the importance of maintaining good relations with the local community and neighbours

2.3 Relevant Permits

A number of permit and/or licences will be required to undertake the construction works and will include, but not limited to:

- Access Permit – Peel Land and Property;
- Access Permit – Peel Ports;
- River Wall Permit – Peel Ports;
- Planning Permission – Liverpool City Council;
- Harbour Revision Order (HRO) – Parliament;
- Notice to Mariners – Harbour Master (Peel Ports);
- Heritage Conditions – English Heritage;
- Listed Building Application – Liverpool City Council;
- Marine Licence – Marine Management Organisation (MMO);
- Discharge Permits - Peel Ports / Environment Agency.

If not already in place, the Contractor should apply for all relevant permits and licences. A copy of all Licences, Environmental Permits etc. will be held on Site in a designated file(s).

3. General Site Management

3.1 Introduction

This procedure addresses the general Site management practices that should be employed to ensure the safe and compliant operation of the Site. In addition, it provides control to reduce the impacts for general operations on receptors in the surrounding.

3.2 Procedure

3.2.1 Site Working Hours

It is anticipated that general hours of work would be between 07:00 and 19:00, for 7 days per week, with some tidal works occurring outside these hours.

It is also anticipated that low noise works would be required outside these hours, in preparation for piling works, precast and in-situ works to be undertaken on the following day; although the Contractor will endeavour to minimise the frequency and duration these works. Such activities may include:

- Moving of barge to required location and jack-up;
- Setup of temporary pile gates;
- Placement of reinforcement cages; and
- Moving of service barges for disposal of arisings and material supply.

The above mentioned working hours would be agreed with LCC and the Marine Management Organization (MMO), as relevant, prior to commencements of the works.

3.2.2 Site Security

During working hours, access to the Site will be kept closed except when vehicles are entering or leaving. The Site access / egress points will operate a security pass system, and access to the Site will only be granted after a site induction has been undertaken. The Site will be clearly marked with fixed warning signs at the entrance / exit and around work perimeters detailing the potential hazards of the area.

All staff will be required to sign in and out of the Site.

Out of working hours, the Contractor should ensure that Site access points are securely locked and appropriate security provisions set in motion to prevent unauthorised access. Any security events will be logged and the logs will be kept on-site and made available to Council officers on request.

Construction hoarding will be provided in accordance with HSE standards and the Conditions of Licence issued by LCC, and will be maintained by the Contractor during the works. Hoardings will be fitted with bulkhead lights and will be well lit during hours of darkness. In addition, the Contractor will ensure that all hoardings are painted. Pedestrians will be redirected safely to alternative pedestrian routes.

3.2.3 Site Facilities

It is envisaged that the Principal Contractor would be afforded a section of the application site for welfare facilities and offices, as shown on **Figure 9**. This would be for the site personnel only with management residing in an office let from Peel in Building 12. Due to the limited space it is envisaged that a satellite compound would be required elsewhere with operatives bused from there to site. These details would be negotiated and confirmed before the construction.

On-site changing and canteen facilities for Site employees will be provided by the Contractor. A Site office will be installed for the Contractor Site Manager who will hold the all documentation required.

Employees should not congregate on the pavement outside the Site boundary, unless required to do so as part of their work. A Site dress code will be specified in the induction and details of inappropriate behaviour, including the use of radios, will be highlighted during the Site induction. The Site shall run a staggered break system to prevent large groups of site employees visiting local shops together.

Food waste will be disposed of regularly, to minimise the potential for vermin. Adequate waste and rubbish disposal facilities will be provided to minimise littering.

Designated smoking areas will be provided at the Site, with no smoking allowed to occur outside this area.

All site facilities will be contained within the designated welfare area.

3.2.4 Site Floodlighting

Floodlighting in areas adjacent to sensitive receptors shall generally be limited to the working hours identified in **Section 3.2.1**, and when seasonal changes in natural daylight require it. Where light glare may cause a nuisance, light shielding will be considered. Site lighting will be kept to a minimum, whenever possible, taking into account the needs for site Health and Safety and security. Hoarding will be lit during the hours of darkness.

Where required, lighting shall be sensitively placed, taking due account of nearby residential properties and ecologically sensitive areas. Where possible, lighting shall be directed away from the residential properties to the west of the site.

No site floodlighting will be undertaken out of hours without prior agreement with LCC and the Marine Management Organization (MMO), as relevant.

4. Neighbour and Local Community Liaison and Management of Complaints

4.1 Introduction

This procedure addresses neighbour and community liaison during the works including liaison with commercial and charter fishing operations which use the River Mersey close to the Site. The Contractor is responsible for ensuring compliance with the procedure. In addition, all staff are responsible for adhering to its requirements.

4.2 Relevant Legislation

- Clean Neighbourhoods and Environment Act 2005;
- Environmental Protection Act 1990, Part III: Statutory Nuisance; and
- Control of Pollution Act 1974.

4.3 Procedure

4.3.1 Liaison

Prior to each phase of the construction, all neighbouring occupiers will be contacted in writing by the Contractor to explain:

- The activities to be undertaken;
- The duration of the works; and
- The working hours.

Telephone numbers for key contacts, email addresses and helpline details will also be provided by the Main Contractor. The Contractor will maintain a full-time Site contact for the public and LCC in order for them to be able to obtain information, register a complaint or request action.

The Contractor will provide a Fisheries Liaison Officer (FLO) during the construction works to keep fishermen informed. The FLO would be responsible for timely communication of construction plans in order to help skippers plan fishing locations etc during the construction works.

The Contractor will also liaise with LCC (and the MMO, where relevant), to discuss working methods and measures to be used to minimise disruption.

During the works, communication with the neighbours will be maintained via a dedicated phone line for complaints, notice boards on hoardings (displaying contact details for key Site personnel) and a regular newsletter with updates on the progress of the Development and details of key upcoming activities and changes to any previously disseminated information. Neighbours will also be specifically informed about any abnormal work or road closures proposed.

All relevant licenses issued must be displayed prominently on hoardings, scaffolds, gantries or fences.

As part of the stakeholder engagement, a meeting will be arranged with the Harbour Master to advise Peel Ports of the extent of the works and to present and agree the relevant Method Statement. Following this meeting information will then be disseminated to the relevant stakeholders on the Mersey and the wider Maritime community via a Notice to Mariners.

4.3.2 Complaints

In the event of a complaint from a neighbour, a member of the public or other interested party in relation to any site activities, it will be recorded in a designated logbook, stating the nature of the complaint, the cause and, where appropriate, the remedial action taken. Sub-contractors will immediately notify the Main Contractor should they receive any complaints.

Should complaints be received, they will be addressed directly by the Contractor to enable the situation at the time of the complaint to be reviewed, and where appropriate immediate actions employed to rectify the problem. The FLO would be responsible for dealing with any complaints from fishing vessels.

All complainants will be contacted by the Contractor or their representative for further discussion and to identify a mutually acceptable resolution if the problem persists. Where a valid grievance is raised, measures will be put in place where practicable to avoid recurrence of the complaint.

The Contractor will provide regular updates to the Project Manager with regard to complaints received and subsequent resolutions.

4.4 Documentation

All complaints will be recorded in a complaints log with details of remedial action taken. The log will be available for inspection at any time during working hours.

5. Waste Minimisation and Management

5.1 Introduction

This procedure applies to the minimisation, storage and disposal of all waste generated during the construction works. It is also concerned with the establishment of procedures for complying with statutory and good practice requirements for waste management. The Contractor is responsible for ensuring that the relevant documentation is completed and held on Site. In addition, all staff are responsible for adhering to the requirements of the procedure.

The anticipated waste generated during the demolition and construction works is expected to comprise demolition waste (largely concrete timber and metals), typical construction waste (e.g. plastics, concrete, scrap metal, tarmac) and general waste generated by site workers.

This section represents an outline Waste Management Strategy (WMS). Whilst not a legal requirement, a detailed Site Waste Management Plan (SWMP) will be prepared by the Contractor before work before construction begins.

5.2 Potential Effects

The improper management of construction waste may result in potential health risks to the public and adverse environmental effects such as air, water and land pollution as well as in deterioration of the historic heritage and visual impacts of the local area.

5.3 Relevant Legislation and Guidance

- Environmental Protection Act 1990, Part II;
- Waste (England and Wales) Regulations 2011 (as amended);
- List of Wastes (England) Regulations 2005;
- Hazardous Waste (England and Wales) Regulations 2005, as amended;
- Landfill (England and Wales) Regulations 2002, as amended;
- Guidance on Applying the Waste Hierarchy (DEFRA, 2011);
- Environmental Permitting (England and Wales) Regulations 2016;
- Guidance on the classification and assessment of waste - Technical Guidance WM3, 2015;
- British Standard BS EN 14899:2005 - Characterisation of Waste, 2005;
- Clean Neighbourhoods and Environment Act 2005;
- Waste Management: The Duty of Care, A Code of Practice (HMSO, 2016);
- Definition of Waste: Development Industry Code of Practice (CLAIRE, 2008);
- Control of Asbestos Regulations 2012; and
- Asbestos: The Survey Guide (HSE, 2012).

To assist in achieving best practice, the Principal Contractor will consider the following initiatives:

- Waste Change, an online notice board where local recyclers advertise the availability of various types of waste and companies can search for required materials; and
- Building Research Establishment (BRE) and Construction Industry Research and Information Association (CIRIA) current initiatives and publications relating to construction; and

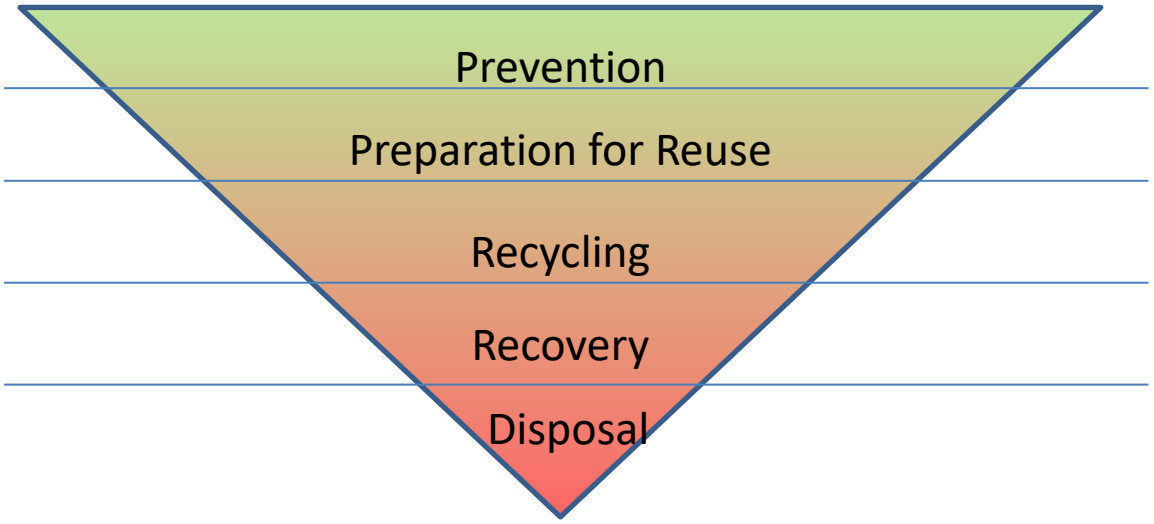
- National Industrial Symbiosis Programme.

5.4 Procedure

In line with the Waste (England and Wales) Regulations 2011, the Contractor has the duty to take all such measures available, as are reasonable in the circumstances, to apply the waste hierarchy.

In To this aim, the Contractor should rank waste management options according giving top priority to preventing waste in the first place. When waste is created, priority should be given to preparing it for re-use, recycling, recovery and finally disposal (e.g. landfill). In particular:

- Prevention includes all the measures to minimise the quantity and the quality of the waste generated, such as measures aimed at using less material in design and manufacture, keeping products for longer, using less hazardous materials;
- Preparation for reuse involves checking, cleaning, repairing, refurbishing, whole items or spare parts, in order to make the material suitable for reuse;
- Recycling is aimed at turning waste into a new substance or product. Includes composting if it meets quality protocols;
- Recovery includes treatment options such as anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste; some backfilling; and
- Disposal, represents the ultimate options, and includes landfill and incineration (without energy recovery).



The procedures to be implemented in order to achieve an effective management of the materials and a reduction the waste generated during the construction of the works will be described in the SWMP. This document will detail how the re-use and recycling of materials will be maximised and will provide an estimate of the qualities of each type of waste likely to be produced, along with the proportion of waste that will be re-used or recycled on site, or removed from the site for off-site re-use, recycling, recovery or disposal.

5.4.1 Waste Prevention

The Contractor shall implement measures to minimise the production of waste during the construction phase. Measures should include, and not be limited to:

- Use standard sizes and quantities of materials, and plan ahead to reduce off cuts;
- Avoid over-ordering;
- Buying materials in bulk bags rather than loose, where possible to reduce wastage;
- Arrange deliveries to match work stages;
- Avoid materials being stored on site longer than necessary and under poor conditions; and
- Minimise rework from errors and poor workmanship.

Site induction and regular toolbox talks should be undertaken to raise awareness of good waste management. The Constructor may consider the use of computer software to estimate required quantities accurately.

5.4.2 Waste Classification

As part the waste duty of care, the Contractor must classify the waste:

- Before it is collected, disposed of or recovered;
- To identify the controls that apply to the movement of the waste;
- To identify the European Waste Catalogue code;
- To complete waste documents and records;
- To identify suitably authorised waste management options; and
- To prevent harm to people and the environment.

Waste classification should be undertaken based on the document 'Guidance on the classification and assessment of waste - Technical Guidance WM3 (1st edition 2015) and British Standard BS EN 14899:2005 'Characterisation of waste'. As a result of the classification, the Waste will be provided with a six figure European Waste Catalogue code as described by the List of Wastes Regulations (England) 2005 and would be classified as 'Hazardous' or 'Non-Hazardous', depending on if it displays or not hazardous properties.

The Contractor is responsible for commissioning the appropriate waste classification chemical testing, which will be undertaken by a NAMAS / UKAS accredited testing facility.

5.4.3 General Handling Procedures

Non-Hazardous Waste

Once the waste has been produced, the Contractor has the general duty to:

- Sort and store waste safely and securely;
- Check if the waste carrier is registered to dispose of waste;
- Complete a Waste Transfer Note for each load of waste that leaves the Site; and
- Retention of completed Waste Transfer Notes for 2 years.

Information on each waste carrier and waste treatment / disposal facility (e.g. environmental permit) should be included within the SWMP. Any anomaly with regards to the waste contractors' licenses should be reported to the Crimestoppers.

Hazardous Waste

Hazardous Waste requires additional handling, storage and disposal precautions, which include:

- Use of appropriate storage measures suitable for its hazardous properties;
- Use of businesses authorised to collect, recycle or dispose of hazardous waste;
- Preparation of EA Waste Consignment Notes; and
- Completion of Part E returns;
- Retention of completed Waste Consignment Notes for 3 years.

Hazardous waste must be clearly labelled and segregated before being treated (e.g contaminated soil) under an appropriate waste management licence or removed by a specialist, licensed waste contractor. As per the Non- Hazardous waste, information on waste contractors must be detailed within the SWMP.

Any asbestos would be removed by a licensed contractor in accordance with the Control of Asbestos Regulations 2012 and the appropriate HSE guidance in Asbestos: The Survey Guide.

In the event that potentially hazardous contaminated soils, the Works would cease in this area until the contamination has been investigated and an appropriate strategy implemented for its management.

In accordance with relevant health and safety legislation, all construction staff would be provided with appropriate Personal Protective Equipment (PPE). Welfare facilities would be provided on the Site for washing and changing. Toolbox talks should be undertaken to raise awareness about potential hazardous materials that may arise from Site and management procedures.

5.4.4 Waste Storage

The Contractor has the responsibility to provide adequate measures to store the waste before any re-use, recycling, recovery or disposal operations.

Waste material will be segregated into individual waste streams retained in clearly labelled stockpiles, skips or drums in designated areas. The detailed SWMP will include information on the types and volumes of wastes anticipated to be produced, details of any dedicated refuse / recycling enclosures, along with specific plans for how each waste stream will be stored and disposed of.

The Site will be left in a clean and tidy condition at the end of each day. Welfare facilities and skips will be clean and tidy, and food waste will be collected regularly to avoid attracting vermin to the Site.

All roads, pavements, construction equipment, temporary structures, materials and machines will be kept clean and tidy at all times with litter and rubbish removed promptly.

When leaving the Site, appropriate measures will be taken to prevent waste escaping onto the public highways, for example containers must be secured and open skips must be covered by sheeting.

Stockpiling of potentially contaminated material will be avoided. Where stockpiling is unavoidable, the material will be located on hardstanding and covered with sheeting. Stockpiles will be physically separated to avoid cross contamination and temporary road access provided for placement and loading. Any stockpiles will be positioned on impervious surfaces to collected drainage and prevent loss of entrained water and leachate to ground.

5.4.5 On-Site Reuse

In line with the Informative 9 of the Planning Decision, including the Environment Agency Model Procedures and good practice advice for applicant, the CLAIRE Definition of Waste: Code of Practice (CoP), will be considered for the reuse of site-won materials (e.g. excavations operations and/or removal of existing sub-structures).

The CLAIRE CoP is a voluntary tool based on a 'suitable for use' and 'risk based approach' which provides operators with a framework for determining whether or not excavated material arising from site during remediation and /or land development works are waste or have ceased to be waste.

The CLAIRE CoP applies to both uncontaminated and contaminated material from anthropogenic and natural sources, including:

- Soil, both top soil and sub-soil, parent material and underlying geology;
- Soil and mineral based dredgings;
- Ground based infrastructure that is capable of reuse within earthworks projects, e.g. road base, concrete floors;
- Made ground;
- Source segregated aggregate material arising from construction activities, such as crushed brick and concrete, to be reused on the site of production within earthworks projects or as sub-base or drainage materials; and
- Stockpiled excavated materials that include the above.

In order to comply with the CoP and demonstrate that the material reused has ceased to be a waste, a Materials Management Plan (MMP) will be prepared by the Environmental Management Coordinator / Consultant. The MMP will be reviewed by a CLAIRE CoP Qualified Person who will provide a Declaration to the EA prior to the use of materials.

The MMP will provide detailed procedures covering the treatment of the waste and the reuse of materials. The document would be based specific reuse criteria in order to ensure reuse of the materials would not cause harm to human health or pollution of the environment. Site reuse criteria will be derived from a human health and controlled waters risk assessment and will also include geotechnical specifications.

The MMP will include procedures to characterise the materials and assess their compliance with the site reuse criteria. Should the waste require to be treated, in order to be suitable for use, the treatment of the would be undertaken under a valid Environmental Permit or a registered Waste Exemption.

The Contractor will ensure that all materials subject to excavation, disposal, treatment and/or reuse are tracked throughout, and evidence generated to provide an auditable trail.

All evidence will be included in the Verification Report, which will be produced following the completion of the works to provide an audit trail to show that materials and wastes have gone to the correct destination.

The contractor Developers should ensure that all contaminated materials are adequately characterised both chemically and physically and that the permitting status off any proposed operations are clear.

5.4.6 Recycling

Waste management priorities and practical actions that can be undertaken on Site should follow the principles of the waste hierarchy, as outlined below.

Prior to the construction works of a specific area of the Site, the Contractor shall undertake an audit of the Site to identify materials and opportunities for maximising salvage, reuse and recycling rates of building structures and materials prior to disposal. This will be guided by the BRE's SMARTwaste toolkit and the Waste and Resources Action Programme (WRAP) Facilities Management Procurement toolkit.

Opportunities to recycle in the local area will also be investigated before any materials are disposed. The Contractor will contact LCC to notify them of any materials requiring disposal or raise the presence of such materials at working groups. Contacting other developers in the area to collect such materials (thus reducing vehicle trips and mileage) will be encouraged.

5.4.7 Off Site Treatment/ Disposal

Waste requiring off-site recycling/recovery or disposal would be adequately sampled and characterised both chemically and physically in line with the Technical Guidance WM3 on the classification and assessment of waste, as detailed within Section 5.3.2.

Should the waste be addressed to landfill disposal, it will be also classified in accordance with the Landfill (England and Wales) (Amendment) Regulations 2005, the Hazardous Waste Regulations 2005.

The Contractor will carry out pre-treatment of the waste material to a methodology that is agreed with the receiving landfill operator and in accordance with Environment Agency guidance.

As waste producer, the Contractor is responsible for describing the waste in detail. To this aim, the Contractor will provide a 'Basic Characterisation' of the waste, which must include:

- Waste source and origin;
- The code applicable to the waste under the European Waste Catalogue (EWC);
- Determination if the waste has any hazardous properties;
- The process producing the waste (including a description of the process, its SIC code and characteristics of its raw materials and products which may affect its behaviour under landfill conditions);
- The waste treatment applied, or a statement of why treatment is not considered necessary;
- The appearance of the waste (including smell, colour, consistency and physical form);
- Confirmation that the waste is not prohibited from disposal to landfill (for example liquid waste and whole used tyres); and
- The class of landfill the waste can be disposed at.

Copies of all relevant licences for the waste disposal / treatment site will be provided prior to the waste being disposed off-site.

5.5 Documentation

The following documentation must be completed and held on Site by the Contractor:

- Details of any targets for waste minimisation and recycling;
- Details regarding the quantities of waste produced, reused, recycled and sent to landfill;
- Waste Transfer Notes (Controlled Waste);
- Hazardous Waste Consignment Notes;
- Waste carrier's registration licences; and
- Environmental Permits and licences for disposal sites.

Transfer notes for controlled waste and consignment notes for hazardous waste must include an accurate description of the type, quantity and containment of waste; the European Waste Catalogue Number; and details of the waste carrier, who must be licensed. Sufficient information must be provided to ensure that the waste disposal operator is aware of the potential hazards of the substance. All documentation must be retained for a minimum of two years for transfer notes and three years for consignment notes and be available for inspection.

It should be noted that from 1 April 2016, premises in England are no longer required to register as hazardous waste producers. In the place of the former six-digit premises code the first six letters of the organisation's name are to be included on consignment notes.

6. Transport Management

6.1 Introduction

This procedure applies to the management of vehicles accessing the Site during the works and vehicle circulation within the Site. The Contractor is responsible for managing traffic and ensuring that drivers adhere to both onsite and offsite transport protocols. All staff are responsible for complying with this procedure.

It is anticipated that access to site would be created via Princes Parade, and consideration has been given to divert a section of Princes Parade to the rear of the works to create a working space and lay down area. This would also allow better access to the landside of the River Wall. The proposed diversion route is illustrated on **Figure 10**, along with the proposed construction traffic management option.

A Construction Traffic Management Plan (CTMP) will be prepared by the Contractor to provide a framework for understanding and managing construction vehicle activity in and out of the Site in co-ordination with other requirements such as the Considerate Construction Codes of Practice and Site Waste Management Plans. Furthermore, the plan will identify a range of tools, actions and interventions aimed at reducing and retiming waste removals / deliveries, maximising the use of more sustainable modes and ensuring procurement activities also account for vehicle movement and emissions. In particular, a Site Delivery Plan will form part of the CTMP.

In addition, individual construction contracts will include appropriate safeguards to ensure that the Contractor's methods and plant are controlled on site.

It is recommended that the Contractor should consider registration with the Fleet Operator Recognition Scheme (FORS) to demonstrate the Development's commitment to safe working practices and should reasonably endeavour that all sub-contractors used throughout the works are also registered with FORS. This will be checked by the preferred construction contractor in the first instance.

6.2 Potential Impacts

The potential impacts as a result of construction traffic are:

- Congestion on the local road network resulting from vehicle routing and / or queuing to access the Site;
- Pollution as a result of queuing vehicles;
- Pedestrian and cyclist safety; and
- Dust, noise and vibration of vehicles visiting and operating on Site.

6.3 Relevant Legislation and Guidance

- The Highways Act 1980;
- Environmental Protection Act 1990;
- Road Vehicles (Construction and Use) Regulations 1986, as amended;
- The Non-Road Mobile Machinery (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018;
- Road Vehicles (Construction and Use) Regulations 1986;
- The Road Traffic (Vehicle Emissions) (Fixed Penalty) (England) Regulations 2002;
- EC Directive 98/69/EC;

- Traffic Management Act 2004;
- Sulphur Content of Liquid Fuels (England and Wales) Regulations 2007, as amended;
- LCC Unitary Development Plan (UDP) 2002; and
- Merseyside Local Transport Plan 3 (LTP3).

6.4 Procedure

6.4.1 Liaison with LCC

For all temporary closures of roads and footpaths surrounding the Site required as part of the construction works, the Contractor will carry out an initial consultation with LCC. No obstruction of the public footway or public carriageway should occur during construction without prior agreement in writing by LCC. Agreement with LCC will be required on the proposed commencement date of such works, the area of the carriageway or footway to be occupied and duration, and the proposed methods of construction in order to minimise inconvenience to the public. Agreement with LCC would also be required concerning the posting of notices informing local residents, businesses and organisations.

An up-to-date Construction Traffic Management Plan will be prepared ahead of the commencement of Site works. The plan will be agreed with LCC and implemented on commencement of such works.

6.4.2 Public Safety

CEMP should also include measures to address public safety issues. To this end, the construction site will be secured by the installation of a perimeter hoarding equipped with vehicle access gates for deliveries and workforce. On-site and security measures will be in place to prevent entrance by the public or unauthorised persons. These measures would be maintained and kept in good order for the full duration of the construction phase.

CEMP should also include measures to reduce the perception of severance during construction activities, as well as the sensible routing of HGVs to avoid sensitive areas. Measures may include taking steps to phase the arrival and departure of HGVs, in order to avoid large numbers of HGVs accessing the local road network at the same time. Consideration may also be given to using river transport for removal of material and deliveries if considered feasible by the appointed Contractor.

The CEMP should also encourage Contractors to use construction vehicles fitted with cycle specific safety equipment, including side-bars, blind spot mirrors and detection equipment to help reduce the risk of collisions on the local roads.

All HGV drivers will have attended HGV Cycle Awareness sessions to ensure they are aware of and understand (and look-out for) cyclists on the roads.

All access to and egress from the Site will be made in a forward direction.

Public safety measures may also include the need for short-term partial or full closure of footways close to the Site during construction. Where temporary full or partial road and/or footway closures are required these would be agreed with LCC, as discussed in Section 7.4.1.

6.4.3 Site Access

It is anticipated that general access to site would be created via Princes Parade, as shown on **Figure 9.** This would involve a partial closure of a section of Princes Parade, which would be diverted as indicated in **Figure 10**. Access to the site for the marine piling works will be via the River Mersey.

Road closures and construction traffic routes will be subject to formal agreement with LCC and safe alternative walkways would be provided.

6.4.4 Deliveries

It is anticipated that delivery of piling rigs, supply of piles and the transport of pile arisings off site during the marine piling works such will be via the River Mersey.

Deliveries of concrete, precast concrete units, structural steel and all other materials would be by road, this will be via Princes Parade. This would need to be agreed with the relevant stakeholders, including Peel Ports, Peel Land and Property and Liverpool City Council in association with Wates Construction who will be working to the landside constructing the new hotel for Liverpool City Council, immediately adjacent the site (subject to approval).

Through the liaison noted above a full and comprehensive site delivery protocol will be developed and agreed. This may mean that a satellite storage site may be required and deliveries then taken to site from there.

All deliveries will be limited to working hours, and where possible will be planned to avoid peak times and unnecessary nuisance. Deliveries will be phased and controlled on a 'just in time' basis to limit travel time around the Site, stockpiling of materials and any associated noise and dust impacts.

A vehicle booking and management system will be enacted in order to minimise peaks and increase opportunities for consolidated deliveries. As necessary, peak hour restrictions will be applied and enforced.

Banksmen will be present at all times to ensure the safe movement of any vehicles arriving at and leaving the Site and to ensure material and equipment are delivered and removed with as little disruption to local road users and traffic in the immediate vicinity of the Site.

Wheel washing and road cleaning facilities will be provided at a sufficient level to ensure the surrounding road network is kept clear of spoil and debris.

All the delivery operations would be detailed within a Site Delivery Plan, which would form part of the CTMP.

The hours that deliveries (i.e. construction materials arriving / leaving in articulated lorries) related to the works will be allowed to access the Site will be 07:00 and 19:00 Monday to Sunday (subject to approval).

6.4.5 Navigation Traffic

It is not expected that the works themselves will have an impact on the current navigation on the Mersey. With the works progressing using the top down methodology, then the impact on Mersey traffic will be minimised. However, should there be a requirement for any small vessels to access the works then this will be agreed in advance and managed in line with the Safety Guidance For Small Boat Passage Of The River Mersey (Version 3 April 2010), with the Mersey VTS to be contacted for all movements on VHF Channel 12.

6.4.6 Vehicle Maintenance and Emissions

All vehicles should be regularly maintained in accordance with the manufacturer's specifications and must meet the relevant European Emission Standards pursuant to EC Directive 98/69/EC (commonly known as Euro standards), depending on the year the vehicle has been manufactured.

Similarly, heavy duty vehicles must comply with emission standards set in EC directive 98/69/EC non-road mobile vehicles with compression ignition engines used within the Site must comply with emission standards set in EC directive 98/69/EC. Vehicles must meet Stage III limits from commencements of works.

Non-road mobile machinery (NRMM) of net power between 37KW and 560KW used on site are required to meet specific standards. This applies to NRMM engines for both Nitrogen Oxides (NOx) and Particulate Matter (PM) emissions. These standards are based upon engine emissions standards set in Regulation (EU) 2016/1628.

Exemptions to the standards set out above for road and non-road vehicles may be granted for specialist equipment with alternative emission reduction equipment or run on alternative fuels. Such exemptions shall be applied for in writing to Local Planning Authority in advance of use.

Vehicles or equipment not complying with these standards must not be used on the Site without prior written approval from the Local Planning Authority.

Any diesel-powered machines used on Site must be run on low sulphur diesel, which is a fuel meeting the specification within BS EN 90.

6.5 Documentation

- Copies of vehicle maintenance records;
- Construction Traffic Management Plan (CTMP);
- Travel Route and Contractor Welfare / Parking Location Plans;
- Employee Work Travel Plans; and
- A log of correspondence with LCC regarding non-conformance.

7. Control of Emissions to Air

7.1 Introduction

The major influences on air quality throughout the construction works are likely to be dust-generating activities and vehicle emissions from plant and vehicles both on and accessing the Site. Potentially, nuisance can be caused by the deposition of construction dust.

Typical emissions arising from plant operating during the construction works and from vehicles going to and from the Site would have the potential to contribute to local levels of air pollution, particularly Nitrogen Dioxide (NO_2), Carbon Dioxide (CO_2) and particulate measuring 10µm or less (PM_{10}). Dust nuisance occurs more readily during prolonged dry weather and especially in strong winds. Dust becomes more difficult to suppress once it is made airborne, consequently, good site management must include the ability to respond quickly to such conditions.

The whole of Liverpool City area has been designated as an air quality management area (AQMA) for exceedances of nitrogen dioxide (NO_2).

The nearest high sensitivity human receptors to air pollution are residential properties located within 20m of the Site boundary on Princes Parade to the north and William Jessop Way to the east. The nearest ecological receptor is the River Mersey, (included in the Liverpool Bay Special Protection Area (SPA) for foraging common tern *Sterna hirundo*), a high sensitivity receptor located within part of the Site.

An Air Quality assessment was prepared by Waterman as part of the 2017 ES submitted to LCC and the MMO in relation to the planning permission for the Development. The chapter presented an assessment of the likely significant effects of the proposed Development on local air quality, and particular consideration was given to the effects of potential emissions from site-wide construction activities.

The procedures outlined below apply to the management of emissions to the atmosphere during the works. All staff are responsible for complying with the requirements of the procedure.

7.2 Potential Impacts

The construction works in relation to the Development have the potential to effect local air quality conditions, as follows:

- Dust deposition onto surfaces such as clothes, cars or windows; and
- Impact on human health from dust inhalation and air emissions; and
- Impacts on ecological receptors due to dust deposition and air emissions.

Dust generation is usually associated with the demolition, earthworks, construction and trackout activities. The Air Quality assessment prepared by Waterman indicated that the sensitivity of the surrounding area to dust nuisance was high during all the relevant phases construction works in terms of dust soiling effects and human health inhalation and was low in terms of ecological effects. Based on the emissions magnitude and sensitivity of the area, the assessment indicates that the risk of having dust soiling and health effects on the is high during the earthwork and construction and medium for the demolition phase and trackout activities. Whilst the risk of having ecological effects was assessed as being generally low, with the exception of the demolition phase, where this was considered negligible. Therefore, Site specific mitigation measures would be required to ensure that there are no adverse effects from demolition and construction.

Plant operating on the Site and demolition and construction related vehicles entering and egressing the Site from / to the local road network would have the potential to increase local air pollutant concentrations, particularly in respect of NO_2 and particulate matter (both PM_{10} and $PM_{2.5}$). The likely effect of construction

vehicles entering and egressing the Site to air quality would, in the worst-case, give rise to a temporary, short-term, local effect of moderate adverse significance during the peak construction period.

7.3 Relevant Legislation and Guidance

- Environmental Protection Act 1990; Part III Statutory Nuisance;
- Control of Substances Hazardous to Health Regulations 2002;
- Control of Pollution Act 1974;
- Clean Air Act 1993;
- The Health and Safety at Work Act 1974;
- Clean Neighbourhoods and Environment Act 1995;
- Air Quality Regulations 2010;
- UK Air Quality Strategy 2007;
- Environmental Permitting (England and Wales) Regulations 2016, as amended;
- British Research Institute (BRE) "Controlling particles, vapour and noise pollution from construction sites" 2003;
- Environmental Permitting (England and Wales) Regulations 2016, as amended;
- Institute of Air Quality Management: Guidance on the Assessment of Dust from Demolition and Construction 2014;
- Local Air Quality Management Technical Guidance LAQM. TG(16), Defra 2016;
- Environmental Protection UK & Institute of Air Quality Management Guidance; Land-Use Planning & Development Control: Planning for Air Quality, 2017; and
- LCC Air Quality Action Plan 2008; and
- Air Quality Annual Status Report for Liverpool City Council, LCC 2016.

7.4 Baseline Air Quality

LCC currently undertakes monitoring of NO_2 at one location in Liverpool City Centre. The urban roadside automatic monitor on Queens Drive, Walton is located, approximately 5km to the north-east of the Site (OS Grid Reference 336164, 394906). The urban background automatic monitor in Speke monitors NO_2 and PM_{10} and is located approximately 12km to the south-east of the Site (OS Grid Reference 343884, 383601). The most recent monitored concentrations at these monitors are presented in **Table 4** below from 2013 to 2016. The monitoring results in indicate that the NO_2 and PM_{10} objectives were met in each year measured.

NO_2 was also measured at locations using 73 diffusion tubes in Liverpool. However, the results for the ten NO_2 roadside diffusion tubes closest to the centre of the Site (presented in **Table 5)** indicate that the annual mean NO_2 objective of 40µg/m^3 was exceeded at all the 10 diffusion tubes in 2015 and at seven diffusion tubes in 2016.

Table 4: Annual Mean Monitored Concentrations at the LCC automatic monitors (µg/m^3)

Monitor	Pollutant	Averaging Period	AQS Objective	2013	2014	2015	2016
Queens Drive, Walton	NO_2	Annual Mean (µg/m^3)	40µg/m^3	34.0	34.6	34.3	-
		1-Hour Mean (No. of Hours)	200µg/m^3 not to be exceeded more than 18 times a year	0	0	0	-
Speke	NO_2	Annual Mean (µg/m^3)	40µg/m^3	23.0	24.7	22.4	23
		1-Hour Mean (No. of Hours)	200µg/m^3 not to be exceeded more than 18 times a year	0	0	0	0
	PM_{10}	Annual Mean (µg/m^3)	40µg/m^3	14.0	14.0	13.9	15
		24-Hour Mean (No. of Days)	50µg/m^3 not to be exceeded more than 35 times a year	6	2	1	0
	PM2.5	Annual Mean (µg/m^3)	25µg/m^3	11.6	10.8	9.2	10.0

Notes: Data obtained from 2016 Air Quality Annual Status Report for Liverpool City Council and www.airqualityengland.co.uk

Table 5: Annual Mean Monitored Concentrations at the LCC automatic monitors (µg/m^3)

Site ID	Location	Distance to Site centre (km)	2015	2016
T29	Leeds Street/Pall Mall Road Sign	0.8	**43**	39
T30	Leeds Street/Pall Mall Road Sign	0.8	**41**	40
T31	Leeds Street/Pall Mall Road Sign	0.8	**43**	38
T38	Covent Garden/Dale Street Lamp Post	0.3	**48**	**44**
T39	Strand Street/Water Street Junction – Road sign L2	0.5	**67**	**67**
T40	Strand Street/Water Street Junction Road sign L2	0.5	**64**	**60**
T41	Strand Street/Water Street Junction Road sign L2	0.5	**67**	**63**
T32	Crosshall Street Downpipe 2nd Along from Dale St.	0.8	**70**	**63**
T33	Crosshall Street Downpipe 2nd Along from Dale St.	0.9	**73**	**65**
T34	Crosshall Street Downpipe 2nd Along from Dale St.	0.9	**80**	**66**

7.5 Procedures

7.5.1 Liaison with LCC

Prior to the commencement of construction works, the Contractor will liaise with LCC to confirm:

- PM_{10} Action Levels;
- Monitoring regime, sampling locations and frequency; and
- Proposed mitigation measures.

7.5.2 General Mitigation Measures

Guidance from the BRE states that the most effective mitigation technique for dust control is to prevent dust from becoming airborne, since it is difficult to suppress after this stage. As such, good site management would include the ability to respond quickly to such conditions.

The following mitigation measures will be adopted by the Contractor to reduce and manage dust and other emissions from Site activities and minimise disruption or nuisance to neighbouring occupiers.

- A) Pre-project planning
  - Method statements including the demolition method statement required as a condition of planning will include processes for controlling dust;
  - Where applicable hold regular liaison meetings with other construction sites within 500m of the Site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised;
  - Setting of speed limits; and
  - Discussions with LCC to determine what monitoring is required to meet local and national aims
- B) Site works
  - Visual assessment of dust levels will be undertaken by all Site personnel at all times to identify where excess dust levels are being generated;
  - Erection of appropriate hoarding and / or fencing to reduce dust dispersion and restrict public access;
  - Damping down of areas subject to ground breaking / excavation activities and any demolished materials;
  - Damping down of materials during the site infilling operations;
  - Setting an onsite speed limit of 10mph; and
  - Keeping fencing, barriers, scaffolding and screening clean and in good repair with any damage repaired by the Contractor without delay.
- C) Haulage routes, vehicles and plant
  - Unnecessary vehicle movements and manoeuvring will be avoided;
  - Locate plant and vehicles away from sensitive areas, or housed in closed environments where possible;
  - Use of vehicles and plant with low emission levels;
  - Restriction of drop heights onto lorries;
  - Regular maintenance of engines, plant, maintenance of pumps and bowser jets;
  - Use of wheel-washes at site egress points to ensure vehicles are clear of mud and similar debris prior to leaving the Site boundary;
  - Use of enclosed and sheeted vehicles;
  - Prevention of unnecessary engine idling;
  - Provide regular road sweeping activities;
  - Avoid heating with open flame burners;
  - Using water sprays, sand or Hessian to reduce vapour emissions; and
  - Use of particle control measures on all machinery which can generate dust.
- B) Materials handling, storage, stockpiles, spillage and disposal
  - Provision of screening during dust generating activities near to residential properties adjoining the Site;
  - Keeping handling areas clean and free of dust;

- Employ best available dust suppression techniques to control particle emissions;
- Damping down with water when loading materials onto vehicles, onto conveyors and skips;
- Storage of fine dry materials in enclosures or given adequate protection from wind, by sheeting;
- Ensure that skips are securely covered;
- Ensure methods and equipment are in place for immediate clean-up of accidental spillages of dusty or potentially dusty materials, using wet handling methods where appropriate; and
- No burning of waste wood or other materials on Site.

A specific Construction Traffic Management Plan (CTMP) will be prepared by the Contractor and will identify the route management strategy for HGVs. During construction, the Contractor should aim to establish and maintain an area for turning vehicles on-site so that all vehicles can enter and leave in a forward gear for as much of the construction programme as possible. An area for site workers to park at the Site would be established, although use of public transport to access the Site would be encouraged.

The Contractor must ensure that all plant and vehicles are in good state of repair and conform to the manufacturers' specification or legislative / British Standard Emission Standards. Plant maintenance and defect reports shall be held on Site in a designated file. Wherever possible, plant shall not be left running for long periods when not directly in use. Where appropriate, electrically-powered plants shall be used in place of petrol or diesel.

Care should be taken that damping down and wheel washing activities do not create excess mud that could cause excessive run-off into water courses and drainage.

Close liaison with surrounding sensitive properties should be undertaken during periods that may generate dust because of the combination of activities or particular wind conditions (speed and direction).

In addition, recording of any exceptional incidents that cause dust and air quality pollutant emissions, either on or off-Site, and appropriate action taken to resolve the situation.

7.5.3 Monitoring

Monitoring shall be the responsibility of the Contractor. Final details of dust monitoring are to be agreed with LCC. The Contractor will determine the prevailing wind direction across the Site using data from a nearby weather station and identify which sensitive location(s) need to be monitored. Details of the monitoring programme (parameters, equipment, frequency) as well as monitoring locations need to be agreed with LCC. In line with IAQM guidance (*Guidance on Monitoring in the Vicinity of Demolition and Construction Sites, October 2018 (version 1.1)*, a minimum of two monitoring locations will be established, ideally one upwind and one downwind.

Action Levels will be agreed with LCC. The recommended action level for PM_{10} / dust concentrations is 190µg/m^3 averaged over a 1-hour period.

It is recommended that an alarm level, lower than the Action Level, is identified by the Contractor's system, to allow issues surrounding elevated dust levels to be dealt with prior to the Action Level being reached.

Where the results of monitoring exercises indicate that the Action Levels have been exceeded, work should stop immediately, and the following steps will be undertaken by the Contractor:

- Identify the activity or activities causing the Action Level to be exceeded;
- Investigate whether the activities could be easily changed or other simple actions taken to substantially reduce dust levels;

- If simple and effective remedial measures are not identified, adopt alternative techniques and / or additional mitigation measures, until the problem is rectified;
- In all cases where Action Levels are likely to be exceeded, undertake liaison with neighbours and LCC to the degree that is appropriate for the levels likely to be reached and their estimated duration; and
- Log the incidents of exceedances along with the identified source and the action taken to mitigate the issue. This log should be available for review by LCC at all times.

The local community will be informed in writing of proposed Site operations and potentially disturbing operations will be programmed for times that would minimise any impacts.

On-going visual inspection of the Site will be undertaken at all times by the Contractor. If dust clouds are observed, action should be taken immediately, notwithstanding dust monitoring measurements.

Daily on and off-Site inspections, with particular regard to the dust deposition, should be undertaken.

The above measures will be set out in a Dust Management Plan to be provided by the Contractor in due course.

7.6 Documentation

The following documentation must be held on file onsite:

- A Dust Management Plan, including dust monitoring sheets;
- Records of targets and progress against these targets for onsite energy use;
- A log of exceedances / complaints with source and details of corrective action taken;
- Method Statements;
- Risk Assessments;
- Plant maintenance and defect reports; and
- Complaints procedure.

8. Terrestrial Noise and Vibration

8.1 Introduction

This procedure applies to the management of noise and vibration during the construction works. All staff are responsible for complying with the requirements of the procedure.

A Noise and Vibration assessment was prepared by Waterman as part of the Environmental Statement submitted to LCC in relation to the planning permission for the Development. The chapter presented an assessment of the likely effects of the proposed Development on the surrounding area in terms of noise and vibration, both during the construction phase and operational phase of the Development. It also outlined the relevant baseline acoustic conditions on the Site and immediate surrounding area.

An updated assessment of demolition and construction noise was completed in November 2018 which took account of updated proposed construction methodology, particularly in relation to the use of less noisy and vibration-inducing piling techniques.

The area surrounding the Site is urban in nature, being a combination of residential and business / commercial use. The closest sensitive receptors (SRs) for noise and vibrations during demolition and construction would be as follows:

- Alexandra Tower (Residential);
- Liverpool City Lofts (Residential); and
- Malmaison Hotel (Residential).
- Baseline noise surveys were undertaken by Waterman in March 2017.

Ambient noise levels around the Site ranged between $L_{Aeq,T}$ 51dB and 64dB dependent on location, time of day and time of week. The dominant noise source at all locations was noted to be road traffic noise. Noise levels during the night-time period were typically lower than those experienced during the day and evening time as a result of reduced traffic flows and human activity during this period.

Generally, the noise climate around the Site were reportedly dominated by constant distant vehicular traffic on the New Quay (A5052) and influenced by intermittent vehicular traffic on the access road running through Princes Dock; however at Alexandra Tower and Number 12 Princes Dock Offices high tidal noise from the waves hitting the banks of the river were discernible, during the night, when road traffic was at a lull.

8.2 Potential Impacts

The highest noise and vibration noise levels during the Works tend to be generally associated with piling, excavation, and construction of the substructure and superstructure. During the fit-out, construction noise would be generally lower.

At both Alexandra Tower and No.12 Princes Dock Offices major, short-term, temporary, local adverse effects are predicted for all phases when works are undertaken at the closest distance to identified receptors during both the day and evening (including Sunday daytime) periods. At night-time during ‘low noise’ works negligible effects are predicted to occur at both Liverpool City Lofts and Malmaison due to distance attenuation. At Alexandra Tower local, short-term temporary effects of major adverse significance are predicted when works are undertaken within 20m, reducing to moderate adverse at 50m from receptors.

It should be noted that, in reality, construction works would be transient in nature, with works for the most part taking place at locations significantly removed from the SRs. Nonetheless, given that some major adverse effects have been predicted, mitigation measures would be required to reduce noise levels from the all the construction phases of the proposed Development.

The construction of the Development, namely the suspended deck, would necessitate the use of rotary bored piling into the river bed. Given the distance at which perceptible vibration may occur, there is the potential for temporary, short-term, local minor to moderate adverse effects at Alexandra Tower and No. 12 Princes Parade Dock Office depending on the proximity and method of piling works to these properties. With regard to all other receptors, negligible effects are anticipated due to the distance separation from the works. Piling and construction activities more than 50m from Alexandra Tower are predicted to result in negligible noise effects.

Vibration arising from activities other than piling are not anticipated to give rise to perceptible vibration at the SRs due to the type of activities and distance separation.

Without mitigation, there is the potential for temporary, short-term, localised minor adverse effects at the SRs adjacent to the construction traffic route.

8.3 Relevant Legislation and Guidance

- Environmental Protection Act 1990 Part III Statutory Nuisance;
- Control of Pollution Act 1974 Part IV (Sections 60 and 61);
- The Control of Noise (Codes of Practice for Construction and Open Sites) (England) Order 2002 as amended;
- Noise Emission in the Environment by Equipment for Use Outdoors Regulations 2001;
- The Noise and Statutory Nuisance Act 1993;
- The Noise Act 1996, as amended;
- Control of Noise at Work Regulations 2005, as amended;
- Environmental Noise (England) Regulations 2006;
- The Environmental Noise (Identification of Noise Sources) (England) Regulations 2007, as amended;
- BS 5228: 2009+A1:2014 Control of Noise on Construction and Open Sites, Parts 1 and 2;
- BS 7385: Part 2 Guide to Damage Levels from Ground Borne Vibration;
- BS 6472: Guide to Evaluation of Human Exposure to Vibration in Buildings;
- BS EN 61672-1:2013: Electroacoustics, Sound level meters, Specifications December 2013; and
- BRE “Controlling particles, vapour and noise pollution from construction sites” 2003.

8.4 Procedures

8.4.1 Liaison with LCC

Discussions will take place with LCC prior to and / or (as the case may require) during works on relevant areas of the Site regarding the following:

- Noise & Vibration monitoring locations;
- Noise & Vibration Action Levels;
- Noise & Vibration monitoring regime; and

- Proposed mitigation measures.

Discussion shall relate to the specific works and operations on such relevant plots or parts of the Site and the relevant context in which such works and operations shall be carried out.

In this regard, it should be noted that Condition 23 of the Liverpool Cruise Terminal Decision Notice (planning reference: 17O/3230) states that:

23. Noise levels at any occupied residential property due to construction or demolition or Site Engineering and Preparation Works shall not exceed 75dB LA eq (10 hour) measured at 1m from the façade of the nearest occupied property, between the hours of 08.00 to 18.00, Monday to Friday, and 75dB LA eq (5 hour) during the hours of 08.00 to 13.00 on Saturday, as controlled through the CEMP, unless such works have the prior approval of the Local Authority, under S61 of the Control of Pollution Act 1974.

In addition, the Local Planning Authority Advice for Applicant No.11 indicates that *During the site works the contractor shall pay full regard to the best practicable means available in respect of the control of noise and dust from the site. In addition, no operations which are audible at the site boundary shall be carried out: (i) outside the hours of 0800 to 1800 weekdays; (ii) outside the hours of 0800 to 1300 Saturdays, and (iii) at any time on Sundays or Bank Holidays.*

However, it is understood that works are tide dependent and therefore works outside those specified in Condition 45 are being sought; namely 0700-1900 Monday to Saturday but also with the flexibility to include Sunday.

Based on current planning and programming, there is the potential for 'low noise' works to be undertaken outside the requested operational hours of 0700-1900 7-days a week. This is to allow preparation for piling works, precast and in-situ works that would be undertaken the following day. Such activities may include:

- Moving of barge to required location and jack-up
- Setup of temporary pile gates
- Placement of reinforcement cages
- Moving of service barges for disposal of arisings and material supply.

As stated in BS 5228-2, and as generally accepted, the threshold of vibration perception for humans in residential environments is typically in the PPV range 0.15 to 0.3 mm/s at frequencies between 8 Hertz (Hz) and 80Hz with complaints likely at 1 mm/s. With regard to potential damage to utilities and listed buildings/structures, provided vibration is ≤7.5mm/s (derived from BS5228-2 advice) the potential effect is likely to be insignificant. For all other buildings, a vibration level of ≤10mm/s is likely to be insignificant with regard to building damage.

8.4.2 General Mitigation Measures

Noise and vibration shall be managed according to best practicable means. The following mitigation measures should be implemented by contractors at all times to minimise noise and vibration generated from construction activities and disruption to any sensitive receptors. Particular attention will be paid to implementing the measures outlined below when operations are undertaken in close proximity to occupied properties.

Mitigation measures should include but not limited to:

- Use of hoarding to the required height and density appropriate to the noise sensitivity of the along boundaries with sensitive receptors;

- Any damage to the hoarding surrounding the Site to be immediately repaired by the Contractor;
- Use of modern, quiet and well-maintained machinery such as electric powered plant, where possible and hoists should use the Variable Frequency Converter drive system;
- Use of screens around static plant, and other temporary acoustic barriers where appropriate;
- Switching off plant which is not in use;
- Vehicles and mechanical plant used for the Works to be fitted with exhaust silencers;
- Plant should be operated in such a manner as to minimise noise emissions in accordance with the relevant EU / UK noise limits applicable to that equipment;
- Plant should be properly maintained and operated in accordance with manufacturers' recommendations. Electrically powered plant would be preferred, where practicable, to mechanically powered alternatives;
- Establish noise and vibration target levels (a Section 61 agreement under the Control of Pollution Act 1974(COPA)) to reduce noise and vibration to a minimum in accordance with best practicable means, as defined in Section 72 of COPA;
- Where high levels of noise and vibration are predicted, monitoring of noise and vibration levels;
- Changing, where possible, methods and processes to keep noise and vibration levels low;
- Positioning plant as far away from residential property as physically possible and switching off when not in use;
- Works would be limited to restricted working hours, as detailed in **Section 3.2.1**;
- Where possible, adopt low vibration working methods or alternative working methods, use of cut off trenches, reduction of energy input per blow and reducing resistance to penetration e.g. pre-boring for driven piles; and
- Regular communications held between contractors, Local Authority officers and neighbours;
- Occupants of adjacent properties most likely to be affected by noise or vibration from activities on the Site should be informed of the nature of the works, proposed hours of work and anticipated duration prior to the commencement of activities.
- Adopting quiet periods during the day to enable the occupants of surrounding commercial premises to carry out their work normally;
- Where noise Trigger Levels are exceeded, appropriate action should be taken to prevent exceedance of threshold levels (see Section 8.4.3); and
- Reviewing techniques, especially in response to exceedances of the Action Level and / or complaints.

The Construction Traffic Management Plan (CTMP) prepared by the Contactor will assist in the control of traffic during construction of the site. The CTMP will ensure the construction vehicle movements would be adequately scheduled to avoid concentration of movements during sensitive hours. The CTMP will also include a construction traffic routing plan, which would further contribute to minimise the temporary and intermittent adverse impacts associated to the construction traffic. Consideration should also be given to the avoidance (or limited use) of roads during peak hours, where practicable. The CTMP will be agreed between LCC, the Contractor and the Applicant.

The implementation of mitigation measures set out above should be based on the attenuation levels set out within the Table B1 'Methods of reducing noise levels from construction plant' of BS5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites' and, as such should provide a 10dB(A) reduction.

For additional noise mitigation to address the impact of noise on birds, please refer to **Section 13.4**.

8.4.3 Noise and Vibration Monitoring

Monitoring shall be the responsibility of the Contractor. The requirement for noise and vibration monitoring, and the monitoring locations and frequency, will be agreed with LCC. This will be determined by the nature of the construction works being undertaken at the Site at a particular time. During phases that have the potential to generate excessive noise and / or vibration, continuous monitoring is likely to be required. Monitoring frequency and locations will be defined following liaison with LCC.

Noise and vibration monitoring record sheets, as presented in **Appendix C (**or similar), will be completed as necessary.

The results of monitoring will be recorded and retained on Site. Should monitoring identify any exceedance of the noise or vibration Action Levels or should any complaints regarding noise and vibration be received, additional sample noise and vibration monitoring should be undertaken by the Environmental Monitoring Co-ordinator nominated by the Contractor.

Where the results of the monitoring exercises indicate that the Action Levels have been exceeded, the following actions should be undertaken:

- The activity or activities causing an exceedance of the Action Levels will be identified through discussions with the Environmental Monitoring Co-ordinator;
- Investigations will be made to determine whether the activities could be easily changed, or other simple actions taken to substantially reduce noise or vibration levels;
- If simple and effective remedial measures are not identified, consideration will be given to the implementation of alternative techniques and/or additional mitigation measures;
- Log the incidents of exceedances along with the identified source and the action taken to mitigate the issue. This log shall be available for review by LCC at all times; and
- In all cases where Action Levels are likely to be exceeded, neighbours shall be advised in writing to the degree that is appropriate for the levels likely to be reached and their estimated duration.

8.4.4 Equipment

Noise monitors will comply with BS EN 61672-1:2013 and conform to a Class 1 integrating sound level meter that simultaneously records L_{Aeq}, L_{MAX}, L_{90} and L_{10} noise levels. The vibration monitors must continuously sample the vibration levels and record the maximum vertical Peak Particle Velocity (PPV) every second for sample vibration monitoring and every 15-minute period for continuous vibration monitoring. The vibration monitors will be capable of measuring 3-dimensional levels of vibration. Data recorded by the monitors will be downloaded on a weekly basis and reported to the relevant members of the project team.

8.5 Documentation

The following documentation must be held on file onsite:

- Noise and vibration monitoring data;
- Details of all complaints received;
- Details of corrective action taken if complaints are received or excessive noise is identified; and
- Information regarding maintenance of monitors and Site plant / vehicles.

9. Townscape and Visual Effects

9.1 Introduction

This procedure applies to the management of the townscape and visual effect during the site enabling and construction. All staff shall be responsible for complying with the requirements of the procedure.

As mentioned in Section 1.2, the southern part of the Site is within the WHS. The location of the proposed cruise terminal building is within the WHS Buffer Zone. Castle Street Conservation Area forms part of the WHS and also overlaps the southern part of the Site.

9.2 Potential Impacts

General anticipated potential effects associated with demolition and construction would include:

- The visual impact of HGV movement, barges and general construction works;
- The visual impact of site lighting around construction areas;
- The visual and landscape impacts of remodelling ground levels/cut and fill operations;
- The landscape impacts of incorporating services and utilities;
- The landscape and visual impacts of temporary parking, on-site accommodation and work areas;
- The visual impacts of temporary screening measure and protective fencing;
- The landscape and visual impact of material stockpiles.

As is commonplace with major building works, the scale of the activities involved in the construction of the planned Cruise Liner Terminal and its associated infrastructure, including local demolitions, dock wall reconstruction and jetty construction, would potentially be visible from many locations including the opposite side of the Mersey. These would have the potential to give rise to a range of visual effects that cannot practicably be mitigated that would vary over the construction period depending on the scale and intensity of the Works. However, the effects would be predominantly visual and it is not anticipated that there would be any significant townscape effects during demolition and construction.

9.3 Relevant Legislation and Guidance

- National Planning Policy Framework (NPPF), 2019;
- Planning (Listed Buildings and Conservation Areas) Act 1990;
- Town and Country Planning Act 1990;
- Unitary Development Plan (UDP), LCC, 2002;
- Regional Spatial Strategy, LCC 2008; and
- Liverpool World Heritage Site Management Plan, 2017.

9.4 Procedure

In order to mitigate against potential adverse visual effects, the dedicated measures shall be incorporated in the CEMP, ensuring that temporary deterioration to landscape resources, character and visual amenity would be kept to a practicable minimum.

Minimum measures to be included are as follows:

- Establish and enact good site management, maintenance and housekeeping;
- Use of hoardings where appropriate to screen works from surrounding visual receptors;

- Security fencing during construction being of a type and colour chosen to be sympathetic to the surroundings;
- Consideration of the location, type, height and colour of site compounds buildings / portacabins;
- Use of directional lighting and limiting hours of operation to minimise effects on receptors; and
- Limiting height of stockpiles on site (e.g. to height of surrounding hoarding / fencing).

10. Built Heritage

10.1 Introduction

This procedure applies to the management of built heritage assets during the Site construction works. All staff shall be responsible for complying with the requirements of the procedure.

The following existing reports and information on built heritage are available:

- International Council on Monuments and Sites (ICOMOS) Statement prepared by Waterman in October 2017; and
- Built Heritage assessment prepared by Waterman, which formed one of the chapters of the 2017ES submitted to LCC in relation to the planning permission for the Development.

The Liverpool Maritime Mercantile City World Heritage Site was inscribed by UNESCO in July 2004 under the 1972 World Heritage Convention. The southern section of the site falls respectively within the Liverpool Maritime Mercantile World Heritage Site (WHS) and its Buffer Zone (BZ). Part of the proposed site lies within the Castle Street Conservation Area. The site surrounds the Titanic Memorial (Grade II Listed Building), although this is excluded from the scheme and outside planning application site boundary. The Site also lies within the wider setting of, and is visible from, the Grade II Listed Waterloo Warehouse and the various Grade I and II* Listed Buildings at the Pier Head. For these reasons the site is considered a sensitive location in heritage terms.

The derelict Princes Jetty is located within the Site boundary. As per the Informative 12 provided as part of the Planning Decision Notice, the jetty is considered a listed structure due to its physical connection to the Grade II Listed Entrance to Princes Dock to the north.

As detailed in **Section 1.5**, the Site within the setting of a group of nationally significant listed buildings, collectively known as the Three Graces and a group of listed monumental statues are located to the west of these buildings.

10.2 Potential Effects

Potential effects on the built heritage asset associated with the construction works can be classed as ‘direct’ and ‘indirect’. Direct effects are expected to include the material alteration to the built heritage asset, such as its extension, alteration to fabric or design or its demolition. Indirect effects are related to the potential for noise, dust and additional traffic vibration to have a detrimental effect on the heritage assets identified.

The 2017 ES Built Heritage assessment indicated that during the construction phase:

- There would be no such primary direct effect to any heritage assets of high heritage significance, namely the listed buildings which fall outside of the Site boundary; and
- Indirect Effects are expected to be temporary adverse upon both the heritage assets located within the Site and located within the surrounding of the Site.

It was subsequently confirmed that since Princes Jetty is connected to the listed Entrance to Princes Half Tide Dock, listed building consent is required to demolish Princes Jetty. The Applicant has applied for listed building consent.

[Note: To be updated as and when consent granted]

10.3 Relevant Legislation and Guidance

- Planning (Listed Buildings and Conservation Areas) Act 1990;
- Town and Country Planning Act 1990 (as amended);
- National Planning Policy Framework (NPPF) 'Conserving and Enhancing the Historic Environment' (Section 16);
- English Heritage (2008) Conservation Principles, Policies and Guidance;
- Liverpool Unitary Development Plan (2002); and
- Liverpool Maritime Mercantile City World Heritage Site Supplementary Planning Document (2009).

10.4 Procedure

Any mitigation measures to be Included within the CEMP on matters related to heritage should be discussed with Historic England and LCC prior to during works on relevant areas of the Site.

The following mitigation measures shall be incorporated within the CEMP in order to limit the adverse effects on the built heritage during the enabling works and construction programme:

- As per Condition 8 of the Planning Decision Notice, demolition shall not be implemented until the Listed Building Consent has been granted; In particular, as per Informative 12 of the Planning Decision Notice " *…listed building consent will be required for the demolition that part of the Princes Jetty which is fixed to the listed dock and for the construction of any part of the proposed Cruise Terminal Structure that is fixed to the listed dock wall".*
- Care should be taken during the demolition and construction works to limit the extent of vibration and dust, reducing the significance of adverse effects upon the following heritage assets:
  - Liverpool Maritime Mercantile City WHS;
  - Memorial to Heroes of the Marine Engine Room;
  - Royal Liver Building;
  - Cunard Building;
  - Port of Liverpool Building:
  - Tower Building;
  - Church of Our Lady and St Nicholas;
  - Dock Wall and Dock Wall Gates;
  - Listed Statues in and Around Pier Head;
  - Princes Half Tide Dock, Entrance to Princes Half Tide Dock and Waterloo Warehouse;
  - Castle Street Conservation Area;
  - Stanley Dock Conservation Area; and
  - West Africa House and Wellington Buildings.
- Monitor listed structures for movement or damage if activities are being undertaken in proximity to the structures (none currently proposed); and
- Any artefacts including signage, plaques, date stones, objects associated with historic uses, and written or illustrative materials, if discovered during demolition shall be stored for inspection by the Heritage Consultant prior to its destruction or onward salvage. Potentially sensitive material shall be handled through appropriate channels.

11. Archaeology

11.1 Introduction

This procedure applies to control of potential adverse effect on the Archaeology, associated with the Site construction activities. All staff are responsible for adhering with the requirements of the procedure.

The following existing reports and information on archaeology are available for consultation:

- Archaeology assessment prepared by Waterman, included as Chapter 11 within the 2017 ES submitted to LCC in relation to the planning permission for the Development; and
- International Council on Monuments and Sites (ICOMOS) Statement prepared by Waterman in October 2017.

All but a small portion of the Site falls within the buffer zone of the adjacent World Heritage Site (WHS) and the very southern-most part of the Site falls within the WHS, but no development is proposed in this area. The rest of the Site has been specifically excluded from the WHS itself.

The Site has the potential to contain palaeo-environmental and riverine deposits from Prehistoric to the present day. These would be of value in a regional context and would be of medium significance.

The extant structure of the Princes Jetty is the only surviving element of the original Liverpool Landing Stage, where many people embarked and disembarked for emigration to North America.

In addition, several sets of railway tracks were observed, along with the footprints of previous buildings and stone block surfaces, both within and outside the Site. Both tracks and buildings are marked on historic OS maps. The tracks are part of the early twentieth century Riverside Railway. The railway and the buildings were part of the infrastructure of the Liverpool Docks, and therefore part of a major international port. These features are likely to be more relevant to the construction of the proposed Liverpool Cruise Liner Hotel, adjacent to the Liverpool Cruise Terminal but within the wider Liverpool Cruise Terminal Site.

11.2 Potential Effects

An archaeological assessment was prepared by Waterman as part of the 2017 ES submitted to LCC in relation to the planning permission for the Development, in order to identify likely effects resulting from the Development, including demolition and construction works.

The assessment indicated that the likely impact from the Development would result from activities such as: demolition of Princes Jetty; piling; new services and utilities, or diversion of existing ones; and hard and soft landscaping.

In particular, the Development would entail the demolition of Princes Jetty, giving rise to a substantial magnitude of change. Also, the proposed resurfacing of the Dock and the direct physical impact to the structure of the Dock, to form a connection with the new jetty, would represent a substantial magnitude of change. In addition, demolition and construction activities could, locally, potentially truncate (or further truncate) palaeo-environmental and riverine deposits.

11.3 Relevant Policy and Guidance

- National Plan Policy Framework Section 12: Conserving and enhancing the historic environment 2012;
- English Heritage: Conservation Principles, Policies and Guidance for the sustainable management of the historic environment, April 2008;

- Historic England (formerly English Heritage): The Battersea Channel Project, Nine Elms: exploration of the buried prehistoric landscape 2014;
- Liverpool Unitary Development Plan, 2002; and
- Liverpool's World Heritage Site - Supplementary Planning Document, 2009.

11.4 Procedure

The any mitigation measures to be included within the CEMP on matters related to heritage and archaeology should be discussed with Historic England and LCC prior to and during works on relevant areas of the Site.

In order to limit the adverse effects on the archaeology and in line with Condition 24 of the Planning Decision Notice, the following mitigation measures shall be incorporated within the CEMP:

- A written scheme of archaeological investigation, including provisions for recording of the existing jetty structure and associated infrastructure to Level 3 as set out in Historic England's Understanding Historic Buildings A Guide to Good Recording Practice (2016), and details for an archaeological watching brief to be submitted to and approved by LCC before commencement of the works; and
- A scheme of investigation to be implemented and reported in accordance with the approved programme.

12. Management of Soil Contamination

12.1 Introduction

This section identifies procedures to control the potential issues associated with the management of contaminated soils that may arise during the construction works. All staff are responsible for complying with the requirements of the procedure.

The following existing reports and information on ground conditions are available:

- Preliminary Environmental Risk Assessment (PERA) prepared by Waterman in October 2017; and
- Ground conditions and contamination assessment prepared by Waterman, which formed one of the chapters of the 2017 ES (as amended by the March 2019 ES Addendum) submitted to LCC in relation to the planning permission for the Development.

On-site potentially contaminative land uses were identified on site and associated with the use of the southern section of the Site as a car park. In addition, potentially contaminative historical land uses were recorded on-site and comprised significant infilling / reclamation and various dockyard activities, including railways and associated infrastructure and warehousing. Therefore, there is a potential that these land uses could have impacted upon the surrounding soils and Controlled Waters receptors. The recorded infilling also represents a potentially significant source of ground gas.

Potentially contaminative off-site land uses include former landfill sites, significant areas of infilling /reclamation, warehouses, railways and associated infrastructure, sawmills, tobacco works, lead works, coal yard, bus station and a grave yard. Therefore, potential for on-site migration of contamination and ground gas from these sources cannot be discounted.

Liverpool was subject to significant bomb damage during World War 2 and Unexploded Ordnance (UXO) is considered to be a high risk at the Site.

12.2 Potential Effects

Due to the potential for contamination within the underlying soils and/or groundwater, a number of potential effects have been identified during the demolition and construction works, and include:

- Effects on Human Health from Ground Contamination and Ground Gas;
- Effects on Human Health from Unexploded Ordnance;
- Effects on Soils and Controlled Waters;
- Effects on Ecological receptors; and
- Disposal of Excavated Material.

12.2.1 Effects on Human Health from Ground Contamination and Ground Gas

Construction and demolition activities, particularly the breaking up of existing hardstanding surfacing, piling, earthworks associated with the construction of new structures, roads and parking facilities and the excavation of drainage routes has the potential to disturb and expose future construction workers and Site visitors to any contamination (including asbestos) present within the underlying soils and groundwater which would have been previously contained and effectively isolated by hardstanding, building footprint and other structures. There is also a potential that construction workers could be exposed to asbestos containing materials (ACMs) (if present) within the existing Lower Cruise Terminal building which is proposed for modification and reconfiguration. In addition, ground gas associated with

the extensive infill, organic soils and off-site features (including former landfills) could potentially migrate via granular deposits into poorly ventilated spaces (such as excavations), thereby posing a potential risk to future construction workers.

12.2.2 Effects on Human Health from Unexploded Ordnance

Construction and demolition activities may give rise to the effect of temporary, local and of major adverse significance on human health in the event of encountering UXO at the Site.

12.2.3 Effects on Soils and Controlled Waters

During demolition and construction, areas of existing hardstanding would be broken out to accommodate the Development, allowing increased rainwater and surface run-off to infiltrate the subsurface. This could potentially mobilise previously contained residual contamination which could feasibly migrate into the underlying aquifers or the Mersey Estuary giving rise to adverse effects. In addition, to facilitate demolition and construction, it is anticipated that potentially polluting substances and activities would be introduced to the Site. These may include concrete pouring, storage of fuels and chemicals and leaks/ spills of fuel and oil from demolition and construction vehicles. In the event of an accidental pollution incident, and in the absence of mitigation, this can have potential adverse effect on Controlled Waters.

In addition, piling would have the potential to create new pathways for contamination into the underlying Principal bedrock aquifer.

12.2.4 Effects on Ecological Receptors

The demolition and construction of the proposed development would introduce potentially polluting substances and activities to the Site. Whilst unlikely, there is a potential that accidental released, leaks or spills could occur, leading to migration via surface water beyond the boundary of the demolition and construction area resulting in effects on animal and ecological receptors of the Mersey Narrows & North Wirral Foreshore which is a designated SSSI, SPA and Ramsar site.

Consequently, in the absence of mitigation, there may be potential effects on sensitive land uses in the surrounding area as a result of demolition and construction works.

12.2.5 Disposal of Excavated Material

Due to the potentially contaminative land use excavation works may result in the handling and managing of contaminated excavated materials.

12.3 Relevant Legislation and Guidance

- Environmental Protection Act 1990 Part IIA;
- Environmental Damage (Prevention and Remediation) Regulations 2009, as amended;
- Contaminated Land (England) Regulations 2006, as amended;
- Contaminated Land Statutory Guidance 2012;
- Building Regulations 2000;
- Environmental Permitting (England and Wales) Regulations 2016, as amended;
- Control of Substances Hazardous to Health Regulations 2002;
- Health and Safety Executive (HSE) Guidance Note EH40/2005 Workplace Exposure Limits, as amended;

- Health and Safety Executive (HSE), 'Protection of Workers and the General Public during the Development of Contaminated Land, 1991;
- CIRIA Report 132 'A Guide for Safe Working on Contaminated Sites, 1996;
- National Planning Policy Framework 2012;
- The Construction (Design and Management) Regulations 2015;
- The Control of Asbestos Regulations 2012;
- Environmental Permitting (England and Wales) Regulations 2016;
- Hazardous Waste (England and Wales) Regulations 2005; and
- Waste (England and Wales) Regulations 2011.

12.4 Procedure

A number of procedures will be set within the final CEMP, in order to avoid or minimise effects associated with the soil contamination during constructions works.

12.4.1 Human Health from Ground Contamination and Ground Gas

Contractor to adhere to COSHH Regulations 2002 the CDM Regulations 2015 and the Control of Asbestos Regulations 201, to ensure worker safety throughout the construction period.

Construction workers should be made aware of the possibility of encountering contaminated soils and asbestos in made ground through the Site Induction, Method Statements and Toolbox Talks. Vigilance should also be maintained throughout the works for any signs of unanticipated contamination.

All Site personnel and visitors will be required to use appropriate PPE commensurate with the contaminants present and the activities being undertaken, thereby minimising the risk of exposure to contaminated soils, dust and perched groundwater. Where appropriate, workers are required to wear respiratory protective equipment (RPE) commensurate with the activities being undertaken and the contaminants present. All personnel to be provided with asbestos awareness training.

The potential for exposure to ground gas would be monitored where construction workers enter confined spaces such as excavations. Safe procedures for entry into excavations would be developed in line with HSE and CIRIA guidance and, where necessary, adequate RPE and ventilation would be provided.

Adoption of dust suppression methods as required, such as water spraying, wheel washing facilities for vehicles leaving the Site and covering of stockpiled materials and materials being transported to and from the Site. In addition, regular cleaning of Site roads, access roads and the public highway will be implemented.

Further mitigation includes the use of good personal hygiene, washing and changing procedures.

12.4.2 Unexploded Ordnance

A specialist des- based assessment of unexploded ordnance risk (UXO) would also need to be undertaken ahead of any intrusive works to consider the risk of encountering UXO on the site.

Potential effects of inadvertent detonation of UXO during intrusive works (such as excavation, construction and piling) must be mitigated through adherence to the mandatory health and safety requirements and the Site-specific mitigation measures outlined in the 1st Line Defence Detailed UXO Risk Assessment report. These include:

- Site-Specific UXO awareness briefing to all personnel conducting intrusive works (all works);
- UXO specialist presence on Site to support shallow intrusive works (trial pits, excavations, shallow foundations, etc.); and
- Intrusive Magnetometer Survey of all boreholes and pile locations down to a maximum bomb penetrations depth (deep intrusive works).

12.4.3 Soils, Controlled Waters and Ecological Receptors

The Contractor should identify measures for the minimisation of potential contamination of underlying soils and Controlled Water receptors.

In line with Condition 15 of the Planning Decision Notice (Foundation/Piling Works Method Statement), piling or any other foundation designs using penetrative methods will not be undertaken other than with the express written consent of the local planning authority. The development will be carried out in accordance with the approved details.

In line with Conditions 16 and 17 of the Planning Decision Notice (Contamination),

No part or phase of the development hereby permitted shall commence until;

- An investigation and assessment methodology, including analysis suite and risk assessment methodologies will be developed and submitted to the Planning Authority prior to any site investigations;
- Any site investigation will be undertaken only following approval in writing from the Planning Authority;
- The site investigation and assessment will be undertaken by competent persons to determine the status of contamination including chemical, radiochemical, flammable or toxic gas, asbestos, biological and physical hazards at the site and submitted to the LPA.
- The investigations and assessments will be in accordance with current Government and Environment Agency recommendations and guidance and will identify the nature and extent of any contaminants present, whether or not they originate on the site, their potential for migration and risks associated with them.
- The assessment will take into account potential risks to: human health, controlled waters, property (existing or proposed) including buildings, crops, livestock, pets, woodland and service lines and pipes, adjoining land, ecological systems, and archaeological sites and ancient monuments.
- If required, a detailed remediation scheme (if required), will be submitted to and agreed in writing with the LPA;
- Following completion of the approved remediation scheme (if required) a verification report will be prepared and submitted to and approved in writing by the Planning Authority; similarly, this applies also to a phased approach; and
- Should any potentially contaminated (unusual/suspect) material or flammable/toxic gas not previously identified is discovered, this will be reported in writing to the Planning Authority and a further assessment and a revised remediation scheme will be required.

Additional mitigation measures will also include, but be limited to:

- Implementation of procedures for the safe management of fuels and other potentially hazardous materials, spillage clean-up, use of best practice construction methods and monitoring;
- The use of appropriate tanked and bunded areas for fuels, oils and other chemicals;

- Locating stockpiles of materials identified as containing leachable contaminants on hardstanding surfaces to prevent mobile contaminants infiltrating the underlying soils;
- Generation of stockpiles of excavated material to be minimised as far as reasonably practical;
- Testing of any ground proposed for re-use within the Site for contamination (including leachable contamination) to ensure that soils are not placed in areas where they will potentially present a risk to groundwater and surface water receptors;
- Provision of a clean capping layer comprising imported subsoil and topsoil as a growing medium, where ground investigation identifies phytotoxic contamination within proposed areas of soft landscaping. The thickness of the capping required would be informed through consultation with LCC and the landscape architect.
- Use of dust suppression techniques, including water spraying in dry weather, wheel washing facilities for vehicles leaving the Site and covering stockpiled material;
- Measures to avoid surface water ponding and collection and disposal of all on-Site run-off; and

Establishment of pollution incident control procedures, as per **Section 17.**

It is anticipated that the expected piling depths would extend into the bedrock which is designated by the EA as a Principal Aquifer, EA's 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention' describes various methods and scenarios for piling through contaminated land. This guidance recommends that a Foundation Works Risk Assessment be prepared to support the selection of appropriate piling methodology.

12.4.4 Off Site Treatment or Disposal of Excavated/ Stockpiled Material

All wastes requiring off-site management (Treatment or Disposal) needs to be transported to a licensed waste treatment facility of licensed landfill site in accordance with the Duty of Care Regulations 1991 and, as applicable, in accordance with the Environmental Permitting (England and Wales) Regulations 2016, the Hazardous Waste (England and Wales) Regulations 2005 and the Waste (England and Wales) Regulations 2011. Licensed waste carriers should be used for the haulage activities.

12.5 Documentation

The following documentation shall be held on the Site:

- A log of environmental incidents and remedial actions;
- Relevant approvals from LCC;
- Copies of waste transfer and consignment notes of any contaminated soil that is removed from the Site;
- Copy of relevant written consents from the regulatory austerity;
- Copy of the Foundation Works Risk Assessment; and
- Materials test records (chemical and geotechnical).

13. Minimisation of Disturbance to Ecology

13.1 Introduction

This section identifies procedures to control the potential adverse effects of the demolition and construction of the Development on Terrestrial Ecology, Ornithology and Marine Ecology.

All staff are responsible for complying with the requirements of the procedure.

The following existing reports and information are available on ecology:

- Marine Ecology, Ornithology and Terrestrial Ecology assessment prepared by APEM and Waterman, which formed one of the chapters of the 2017 ES and of the subsequent ES Addendum completed in March 2019;
- Information to inform a Habitat Regulations Assessment (HRA) Appropriate Assessment, completed by Waterman in (Ref: WIE12464-100-11-2-3-AA, January 2019);
- Cormorant Ecological Conservation Management Plan, prepared by Waterman and presented as a Technical Note in **Appendix B;** and
- An Adaptive Management Plan for the cormorant mitigation – refer to **Appendix E**.

13.1.1 Designated Sites

As mentioned in Section 1.5, the Site is located within the Liverpool Bay Special Protection Area (SPA), which was fully classified as a SPA on 31 October 2017, with an extension in area and with additional interest features to the original SPA. The birds interest features include red-throated diver, common scoter, little gull, common tern, little tern and a non-breeding waterbird assemblage including as its main components red-throated diver, common scoter, redbreasted merganser and cormorant.

Other designated ecological sites within 10km of the Site include:

- The Mersey Narrows and North Wirral Foreshore Ramsar site and SPA, approximately 800m to the west of the Site (on the opposite side of the Mersey);
- The Mersey Narrows SSSI, approximately 800m to the west of the Site;
- The New Ferry SSSI, approximately 3.3km to the south;
- The Mersey Estuary Ramsar Site and SPA approximately 3.3km to the south and the Mersey Estuary SSSI approximately 4.3km to the south-east;
- The North Wirral Foreshore SSSI, approximately 4.2km to the northwest;
- The Dee Estuary Special Area for Conservation (SAC), approximately 4.2km north-west;
- The Sefton Coast SAC and SSSI, approximately 6.3km north; and
- The Ribble and Alt Estuaries Ramsar site and SPA, approximately 6.4km north.

13.1.2 Terrestrial Ecology and Ornithology

The Site offers very few opportunities for terrestrial bird species with regards to nesting sites or suitable food resources for foraging and doesn't have opportunities for any of the bird species associated with the protected sites listed above. A small number of common bird species, such as blackbirds and robins, may occur on the Site but not in any significant numbers. In addition to common species, two protected bird species are known to have bred close to the Site; peregrine falcon and black redstart, which were included within the desk study to inform the baseline. Due to a lack of old warehouses and nesting ledges mean that the habitat is not preferable for black redstart for breeding, but as it is a species that is

notoriously difficult to locate unless singing, it could be frequenting the Site to forage. With the exception of great cormorant, none of the mobile species (e.g. foraging common tern, little gull) relevant to European sites occur on the Development site, although they may forage along the adjacent River Mersey.

13.1.3 Marine Ecology

Phytoplankton and zooplankton assemblages are present within the Site and are expected to be typical of the Mersey Estuary and Liverpool Bay area. It is anticipated that taxa present at the Site would be well adapted to the extremely turbid environment and fluctuating tide levels of the Mersey Estuary. A small section of intertidal sediment (approx. 3000m2) is located at the mouth of Prince's Half Tide Dock, immediately the north of the Site red line boundary. Intertidal habitats are also present within the Site on man-made structures including the existing jetty and dock walls. These structures were colonised by species including the non-native barnacle *Austrominius modestus*, macroalgae and small numbers of periwinkle.

The subtidal sampling within the Site indicated that the sediments were quite heterogenous. However, the subtidal assemblage was relatively impoverished. The subtidal macroinvertebrate assemblage was dominated by juvenile blue mussel M. edulis and the cryptogenic acorn barnacle *A. improvisus*. Several non-native species were recorded. Three individuals of the starlet sea anemone *N. vectensis* were recorded at stations north of the Site red line boundary.

There are at least 46 fish species within the Mersey Estuary of which eleven are species of conservation importance. These include the migratory (diadromous) species: Atlantic salmon; river lamprey; sea lamprey; and European eel which are protected under Annex II of the Habitats Directive as well as seven species that are protected under Section 41 of the NERC Act: sea trout (also a migratory species); sea trout, European smelt; Atlantic cod; herring; plaice; common sole; and whiting.

The number of marine mammals recorded within the Estuary is low; however, there are occasional sightings of harbour porpoise and bottlenose dolphin, and the pinnipeds grey and harbour seal.

During the construction phase of the proposed Development, it will be ensured that appropriate environmental controls are implemented to avoid the contravention of legislation.

13.2 Potential Impacts

The potential impacts from the construction activities to the ecological receptors are associated with:

- Loss of habitat;
- Physical disturbance and displacement (disturbance of bottom sediments);
- Physical disturbance and displacement (visual);
- Airborne noise and vibration;
- Underwater noise and vibration;
- Changes to water quality (suspended solids and release of contaminants from sediments);
- Pollution (direct e.g. oil);
- Collision risk due to vessel movements;
- Spread of non-native species; and
- Physical disturbance and displacement (indirect i.e. through the food chain).

The demolition and removal of the existing jetty will result in the loss of supporting habitats.

Visual disturbance could occur as a result of movements of vehicles and machinery at or within close proximity to the Site and construction workers walking on or close to the Site. Within the aquatic environment visual disturbance could be associated with the presence of barges during construction. There is also potential for visual disturbance due to any artificial light used during the construction works.

Source of noise and vibration during the construction activities are associated with enabling works; excavation; piling works; building and structures foundation and the movement and operation of plant vehicles, machinery and construction workers.

Changes to water quality may occur as a result of activities disturbing the estuary bed, such as piling works which could lead to an increase in turbidity and resuspension of bottom substrates could potentially result in the release of chemicals locked in the sediments to the water column

Pollution may result from the improper discharge of surface water, stockpiling of contaminated materials, improper handling of hazardous material.

Loss of Habitat

During demolition and removal of the existing jetty, intertidal habitats and species encrusting the existing wooden jetty structure and the supporting habitat would be permanently removed. The wooden pile habitat would be replaced via the installation of metal piles for the new Cruise Liner Terminal; however, it is noted that however, that the dominant encrusting organisms on the current structures which would be expected to colonise the new structures would include the non-native barnacle *Austrominius modestus*.

Removal of the jetty structures would also result in the loss of subtidal invertebrates and algae that have colonised them, but these species are widespread on other structures in the vicinity of the Works including the walls at the waterfront and these taxa would be expected to colonise new jetty structures introduced for the Development.

Some loss of habitat would also be experienced as a consequence of the installation of piles (which are currently planned to avoid the locations of the current pile footings). However, the area of the estuary bed due to the installation of new piles is small (footprint of approximately 102m^2) which also represents a small proportion of the available subtidal habitat within the Site.

It is expected that dismantling and construction would have effects on great cormorant *Phalacrocorax carbo*, a component species of the bird assemblage feature of Liverpool Bay SPA. This would classify as loss of habitat for this species and would determine a displacement of birds from resting/roosting locations due to loss of land under the footprint of the construction works.

No impacts are considered to affect great cormorants from the remaining listed indirect and direct effects, including changes to water quality from suspended solids and release of sediment chemicals: such changes would be temporary and localised and the magnitude of effect negligible given the extent of the River Mersey.

Black redstarts are not known to forage on the Site and the demolition plans do not involve the destruction or removal of any known nesting locations.

Physical Disturbance and Displacement (Disturbance of Bottom Sediments)

Disturbance of Bottom Sediments may result in potential mortality of individuals within the footprint of new piles as well as in a displacement of subtidal invertebrates or fish within areas immediately outside the pile footprints due to physical disturbance of sediment in the area. This could include the smothering of

individuals by sediment settling out of solution. However, predicted effects would be limited to approximately 1km from the existing jetty.

The area of subtidal sediment potentially affected by this disturbance would be larger than the area within the pile footprints but would still be very small in relation to the availability of similar habitats within the Site boundary and wider Estuary. Any disturbed/displaced benthic invertebrates would only be displaced a short distance and would be expected to survive such disturbance.

With specific regards to fish, it should be noted that they highly mobile species and any fish physically disturbed by the work due to sediment movement/changes in habitat would be able to avoid the area during periods of disturbance and return to the area if required once disturbance has ceased. It should be noted that the type of habitat potentially disturbed is widespread within the Site boundary and wider Estuary so fish would not have to move far to find similar habitat.

Physical Disturbance and Displacement (Visual)

Receptors potentially affected by this effect are fish, marine mammals and birds. Visual disturbance generally results in a temporary avoidance of the area due to the works.

With regards to birds, physical disturbance as a consequence of machinery, vehicles / vessels and workmen at the Site or travelling to and from it could potentially cause temporary or permanent displacement of bird species feeding and / or roosting within a preferred area.

Airborne Noise and Vibration

The sources of noise and vibration from the mobilisation activities associated with this Development include the movement and operation of plant vehicles, vessels and machinery on the Site and adjacent to it on the water. The biggest potential source of noise is from piling works.

It is anticipated that effects of airborne noise on receptors would be negligible or neutral. However, there may also be direct impact from noise and vibration causing displacement of great cormorant from resting/roosting locations.

Underwater Noise and Vibration

The deconstruction and removal of the existing Princes Jetty would generate some underwater noise due to the breaking and removal of wooden piers and other structures. Noise could be also generated by the barges and other boats utilised to remove the Princes Jetty structure. However, the biggest potential source of noise is from piling works for the new Cruise Liner Terminal.

The receptors potentially affected by this effect are fish and marine mammals.

Fish species have different sensitivity to underwater noise and effects may include:

- Behavioural effects (e.g. changes in swimming behaviour and orientation, communication between conspecifics and detection of predators/prey);
- Masking effects (i.e. the reduction in the detectability of a given sound as a result of the simultaneous occurrence of another sound);
- Temporary threshold shift in hearing (short- or long-term changes in hearing sensitivity that may or may not reduce fitness);
- Recoverable tissue injury (injuries, including hair cell damage, minor internal or external hematoma etc. None of these injuries are likely to result in mortality); and
- Mortality and potential mortal injury (immediate or delayed death).

Underwater noise can have physical and behavioural effects on marine mammals. Physical injury can include permanent threshold shift (i.e. permanent hearing damage caused by very intensive noise or by prolonged exposure to noise) or a temporary threshold shift, and behavioural effects can include avoidance of an area subject to noise disturbance. Overall, any effects are considered likely to be of minor adverse significance.

Changes to Water Quality and Pollution

Receptors potentially affected by this effect are plankton, intertidal and subtidal habitats and species, fish, marine mammals and birds.

Effects of minor adverse significance are anticipated on Intertidal and Subtidal Habitats and Species, Fish and mammals. However, it should be noted that many bird species being highly sensitive to oil pollution incidents, if individuals come into direct contact with pollutants.

Spread of Non-Native Species

Demolition and removal of the existing Princes Jetty would be conducted by barge. These barges are expected to remain within the Mersey Estuary for the entire demolition phase. Vessel movements (fouling of hulls and ballast water) have been identified as the highest potential risk routes for the introduction of non-native species. The main non-native species recorded during the site-specific benthic survey were the invasive barnacle *A. modestus*, the starlet sea anemone *N. vectensis* and the American piddock *P. pholadiformis*.

13.3 Relevant Legislation

Specific habitats and species of relevance to the Site receive legal protection in the UK under various European and domestic legislative provisions, including:

- Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC) (the 'Habitats Directive');
- Birds Directive - Council Directive 2009/147/EC on the Conservation of Wild Birds;
- Water Framework Directive (WFD) (2000/60/EC);
- Marine Strategy Framework Directive (MSFD) (2008/56/EC);
- EU Alien Invasive Species Regulation (Regulation No 1143/2014);
- Convention for the Protection of the Marine Environment of the North-East Atlantic (the 'OSPAR Convention'), 1992;
- Ramsar Convention on Wetlands of International Importance (1972);
- Council Regulation (EC) No 1100/2007;
- Convention on Biological Diversity 1992;
- Marine and Coastal Access Act 2009;
- Wildlife and Countryside Act 1981, as amended;
- National Environment and Rural Communities (NERC) Act 2006;
- Eels (England and Wales) Regulations 2009;
- The Conservation of Habitats and Species Regulations 2017;
- Conservation of Seals Act 1970;
- UK Marine Policy Statement (MPS);

- National Planning Policy Framework;
- UK Post-2010 Biodiversity Framework;
- Marine Plans;
- Draft Liverpool Local Plan 2016;
- North Merseyside Biodiversity Action Plans;
- Mersey Estuary Management Plan 2007; and
- Mersey Waterfront Regional Park Strategic Framework 2007.

The Contractor is required to ensure that all relevant UK and EU legislation relating to the protection and enhancement of ecology has been complied with during the construction process.

13.4 Procedure

The following mitigation measures will be included in the CEMP:

- All works to be undertaken in line with the Cormorant Ecological Conservation Management Plan, following its submission and approval in writing by the Local Planning Authority, in liaison with Merseyside Environmental Advisory Service and Natural England;
- Installation of a permanent floating pontoon in Princes Half Tide Dock for the cormorants to rest/roost upon prior to the wooden jetty being dismantled, in order to mitigate against the displacement of cormorants due noise, vibration and visual disturbance associated with construction works (refer to **Appendix B**). The effectiveness of the pontoons would be established by adherence to an Adaptive Management Plan (AMP). The AMP is provided in **Appendix E**.
- Incorporation of horizontal suspended deck braces which would be suitable for great cormorant to rest/roost upon once the Development is operational and when vessels are not docked to these areas;
- A soft-start piling approach will be implemented in order to reduce potential adverse effects to fish and marine mammals. This involves gradually increasing the force of piling, thereby steadily increasing the sound power levels generated over a period of time. This would alert individuals within the area, without exposing them to more intense sound power levels, and provide an opportunity for them to move away from the noise source. This technique is recommended as best practice by the Joint Nature Conservation Committee for pile driving operations and is considered appropriate for the proposed development;
- Management of waste water, including surface water, should be undertaken in a manner which prevents sediment laden / contaminated run-off entering watercourses, using construction control measures given within Pollution Prevention Guidelines from the Environment Agency (withdrawn from use but still providing good guidance). This may also be subject to appropriate licensing by the EA;
- Construction of the drainage system to be designed and managed to comply with BS 6031:2009 ‘The British Standard Code of Practice for Earthworks’, which details methods that should be considered for the general control of drainage on construction sites. Discharge rates and volumes of water discharged would be agreed with the EA and/or local wastewater network provider. Where appropriate, cut-off drainage would be provided around the Site during demolition and construction when there is no on-site drainage network in place. Surface drainage system to be equipped with settlement and oil interception facilities, where required, and discharge to be agreed with the EA and/or local wastewater network provider and compliant with the discharge consent;

- Stockpiling of contaminated materials to be avoided, wherever possible. Stockpiles should be located on areas of hard standing or on plastic sheeting to prevent mobile contaminants infiltrating into the underlying ground;
- Potentially hazardous liquids on the Site such as fuels and chemicals to be managed and stored in accordance with best practice guidance, such as that published by the Environment Agency. Storage tank and container facilities to be appropriately bunded within designated areas and located away from surface water drains, docks and the Mersey Estuary;
- An Emergency Incident Plan to be in place to deal with any spillages and/or pollution incidents. This would include the provision of on-Site equipment for containing spillages, such as emergency booms and chemicals to soak up spillages. Any pollution incidents would be reported immediately and regulatory bodies such as the Environment Agency immediately informed;
- All marine works need to be undertaken in line with Marine Works Licence. In addition, the Contractor must ensure that the marine operations are carried out in line with the Navigation Risk Assessment (NRA);
- Works to be carried out in line with a project-specific Biosecurity Risk Assessment, which will outline numerous inherent mitigation design measures to limit the risk of introduction of invasive non-native species (INNS). The contractor should undertake works in line with the best practice guidelines and standard INNS protocol. Biosecurity assessments will be undertaken for all vessels measures and will take account of the following aspects: management of vehicles and vessels, Ports and Harbour protocols, conformity to the guidelines and best practice set out in the Natural England and Natural Resources Wales Biosecurity Planning guidance.
- In order to limit the potential effects of demolition and construction works on qualifying bird species, daily air temperature recording will be undertaken during site works. In the case of severe winter weather restrictions, a suitably qualified ecologist will visit the site in order to assess the requirements for further actions. In the unlikely event that significant numbers of waterbirds remain on immediately adjacent docks during severe winter weather periods, consideration would be given to halting or reducing demolition/construction work to prevent undue disturbance. Any actions taken as a result of below freezing conditions will be agreed with LCC / MEAS.
- All high disturbance works (i.e. piling) will be temporarily suspended if local temperatures (as recorded by nearest Met Office data and/or available site specific measurements) are below zero degrees centigrade for a period of 7 consecutive days, and remain suspended until temperatures reach above zero degrees centigrade for a period of 3 consecutive days. The relevant nature conservation bodies should be informed of when works are suspended and re-commenced.
- The Contractor shall ensure that all those working on the Site are aware of their obligations in relation to ecological legislation;
- The Contractor shall nominate a Biodiversity Champion to influence Site activities and ensure that detrimental impacts on Site biodiversity are minimised in line with the recommendations of the project ecologist;
- As part of the site induction process, all staff working on the marine elements of demolition and construction will be made aware, through toolbox talks by suitable qualified personnel, of the potential presence of starlet sea anemone and that this species is protected under the Wildlife and Countryside Act;
- When drilling is conducted, a soft-start approach will be deployed whereby the drill string will be incrementally lowered from deck level until it lightly touches the silty seabed (mudline). The drill will then be started extremely slowly to dislodge/disperse any *N. vectensis* a short distance away from the

immediate point at which drilling will occur (due to the robust nature of *N. vectensis* they would be expected to readily survive such movement across a short distance within any dislodged sediments). The speed of the drill will then increase very slowly until it reaches full capacity;

- As a good practice, during demolition and construction works artificial lighting will be angled towards the working areas and platform to limit spillage; and
- Should nesting birds be encountered, method statements for the establishment of appropriate exclusion zone(s) shall be drafted by a suitably qualified ecologist and kept on site.

13.5 Documentation

- A copy of the Marine Licence issued by the MMO;
- Relevant documentation such method statement(s) for exclusion zone(s) around any identified active breeding bird nests shall be kept on the Site;
- Cormorant Ecological Conservation Management Plan (refer to **Appendix B**);
- Adaptive Management Plan (AMP). Refer to the AMP in **Appendix E**.
- Emergency Incident Plan;
- An Environmental Incident Logbook for use in the event of a pollution incident (and to include also log of associated log remedial actions); and
- Relevant approvals from LCC.

14. Management of Costal Processes, Sediment Transport and Contamination

14.1 Introduction

This procedure applies to the operations that are likely to cause disturbance or alter the quality of the sediments during marine works (e.g. piling, walls works and water discharges) and aims to avoid and/or minimise potential adverse effects on the sensitive receptors. All staff are responsible for complying with the requirements of the procedure.

The following existing reports and information on sediments conditions are available:

- Coastal Processes, Sediment Transport and Sediment Contamination assessment prepared by Waterman, which formed one of the chapters of the 2017 ES and of the subsequent ES Addendum completed in June 2018;
- Marine Ecology Survey Report, prepared by APEM in October 2017;
- Hydrodynamic and Costal Processes Studies, prepared by HR Wallingford in October 2017; and
- Water Framework Directive Scoping Report, prepared by Waterman in October 2017.

A survey was undertaken in the Mersey Estuary by APEM in June 2017, to recover sediment samples for analysis. The analysis of the sediment samples provided information on the status of the baseline environment at the Site and in the Mersey Estuary. The sediment samples were analysed for physicochemical parameters. Based on the results of the above analysis, it is considered that the sediments across the Site can be classified into two categories:

- Group 1: This group comprises stations G02, G06, G09 and G10. These stations have low levels of fine (<63µm) material, (between 3.2 and 4.2%) and are predominantly composed of sand. The stations were located on the margins of the main estuary channel and are expected to be under the influence of tidal flows. The analytical results from these stations are indicative of a relatively uncontaminated environment. The variations in heavy metal and hydrocarbon concentrations at these sites could be considered indicative of natural variation in the sediment.
- Group 2: This group comprises stations G01, G03, G05, G07 and G08. The sediments at these stations presented a varying proportion of fine material, between 11.5% and 74.1%. The stations were all located in the immediate vicinity of either the structures and retaining walls at the side of the estuary that experience reduced tidal flow velocities (G01) or in a sheltered area outside of the area of main tidal flows (G05, G05, G07 and G08) with minimal tidal currents. The results of the sediment analysis from these stations showed that there were levels of heavy metals over the Cefas CAL1 thresholds, but below the Cefas CAL2 limits. The hydrocarbon concentrations in the sediment were typically above either the CCME TEL or OSPAR ERL levels, indicating that there is a potential risk to marine organisms. The levels of heavy metals and hydrocarbons in the sediments in the Group 2 stations are indicative of a low level of contamination. This is most likely due to a combination of the historical industrial activity along the banks of the estuary, and the limited flows within the Group 2 station locations allowing the accumulation of fine-grained sediment.

Under the Water Framework Directive, the Mersey Estuary is considered to be heavily modified for navigation, ports and harbours, as per the current Development. The estuary is currently failing to achieve Good Status with respect to ‘lead and its compounds’.

14.2 Potential Effects

Potential effects of demolition and construction works on costal processes, sediment transport and contamination would be as follows:

- Effects on Tidal Flow;
- Effect on the waves at the Site;
- Transport of Estuarine Sediments; and
- Disturbance of Potentially Contaminated Sediments

14.2.1 Tidal Flow

The Development has the potential to affect the Mersey Estuary with respect to either increasing or decreasing tidal flows in the vicinity of the Site as a result of the planned demolition of the existing jetty structure. This is due to the drag effect of the existing piled structure on the tidal flows being removed. Any effect on tidal flows would be limited to the duration of demolition and construction operations.

14.2.2 Wave Effects

The current jetty structure does not have a substantial effect on the baseline wave regime. Therefore, the removal of this structure is not expected to cause a substantial change in the wave regime.

14.2.3 Transport of Estuarine Sediments

The overall effect of removing the existing jetty reduces the potential for fine sediment accretion particularly in the area north of the structure, around the Princes Half Tide Dock approaches, with an estimated reduction in accretion of 0.3 to 0.4m of sediment. The reduction in accretion in these areas results in some areas experiencing a small increase in the potential for fine sediment accumulation as material which would have settled further towards the channel is now able to settle nearer the bank line

14.2.4 Disturbance of Potentially Contaminated Sediments

During demolition and construction activities at the Site a certain level of sediment disturbance is unavoidable. The rate of sediment release during the demolition and construction is anticipated to be insignificant compared to the ambient sediment flux in the Mersey Estuary. The movement of potentially contaminated sediment may lead to a localised deterioration in sediment (and water quality) around the Site and in the immediate vicinity. The level of potential contamination is relatively low; however it may provide a cumulative effect to the concentrations of potential contaminants in other areas of the estuary.

14.3 Relevant Legislation and Guidance

- National Planning Policy Framework (NPPF);
- The Water Framework Directive (WFD) 2000/60/EC;
- EU Bathing Water Directive (2006/7/EC);
- Countryside and Rights of Way Act 2000;
- Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora;
- WFD Guidance: Clearing the Waters for All (2016);
- CIRIA C744 - Coastal and marine environmental site guide. 2nd edition (2015);
- CIRIA C741 - Environmental good practice on site guide. 4th edition (2015);

- Canadian Council of Ministers of the Environment (CCME) Freshwater sediment quality guidelines (2001);
- Marine Licensing: sediment analysis and sample plans (CEFAS Action Levels) (2016); and
- OSPAR Levels and trends in marine contaminants and their biological effects – CEMP Assessment report (2012).

14.4 Procedures

Measures should be implemented to minimise impacts associated with the management of the dredged sediments as well as procedures to protect the quality of the undisturbed river bed. To this end:

- All marine works should be undertaken in accordance with the Licence for Marine Works issued by the MMO;
- All mitigation measures to control adverse effects associated with all marine works (including dredging) would need to be agreed with the MMO and other relevant authorities;
- Pollution preventions measures should be put in place to prevent release on contaminants the could compromise the quality of the undisturbed sediment.

14.5 Documentation

The following documents will be held on Site:

- A copy of the Marine Licence issued by the MMO;
- An Environmental Incident Logbook for use in the event of a pollution incident;
- A log of environmental incidents and remedial actions;
- Relevant approvals from LCC.

15. Water Management and Pollution Control

15.1 Introduction

This procedure applies to discharges of trade effluent and other waters from the Site, as well as the control of ground and surface water pollution during the on shore and marine works. All staff are responsible for complying with the requirements of the procedure.

The following documents are available for information:

- Water Framework Directive Scoping Assessment, prepared by Waterman in October 2017;
- Preliminary Environmental Risk Assessment (PERA) prepared by Waterman in October 2017; and
- Ground conditions and contamination assessment prepared by Waterman, which formed one of the chapters of the 2017 ES submitted to LCC in relation to the planning permission for the Development.

The Site is underlain by Unproductive Strata associated with the Tidal Flat Deposits and a Principal Aquifer associated with Chester Pebble Beds Formation. The Site is not located within a Groundwater Source Protection Zone.

The nearest watercourse to the Site is the adjacent River Mersey, which is tidal at this location and forms some of the western part of the Site. The Mersey Estuary is designated under the Water Framework Directive (WFD) as a heavily modified transitional water body and its overall status is classed as 'Moderate' (with Moderate Ecological status and 'Failing' Chemical Status).

According to the EA's indicative flooding data, the Site is located in an area of fluvial or tidal flooding. However, flood defences are recorded in the area. The EA's indicative flooding data also indicates that parts of the Site located in an area at high and medium risk of surface water flooding.

There are nine recorded groundwater abstractions within a 1km radius of the Site, the closest of which is located 220m east of the Site at Georges Dock Pumping Station for a groundwater heat pump (other industrial/commercial/public services). No drinking water abstractions have been identified in the surrounding area. There are no pollution incidents to groundwater within a 1km radius of the Site.

Overall, therefore, data suggests that the underlying ground water quality is likely to be of medium quality. Due to the location of the Site on and close to the Mersey Estuary the ground water is likely to be saline.

15.2 Potential Effects

During the construction phase effects impacts on water quality could occur if good practice construction practices are not followed and mitigation measures are not implemented on the proposed Site. The potential effects of the new ferry terminal construction on water quality could include:

- Incorrect disposal of Site effluent;
- Pollution of groundwater or surface water runoff through chemical, oil and fuel spills;
- Introduction of other pollutants (e.g. drilling runoff) into the surface water drainage system;
- Pollution of the groundwater or surface water run-off due to unforeseen contamination; and
- Increased vertical contamination percolation following removal of hardstanding;

In particular, the site activities may have an adverse effect on surface water quality in terms of:

- Impacts on water quality due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals;
- Impacts on water quality due to the mobilisation of fine sediments that may contain contaminants into the water column or through uncontrolled site run-off;

- Impacts on water quality from dewatering operations (where required);
- Temporary, localised effects on sea bed morphology within the Mersey Estuary; and
- Temporary effects on the navigation of vessels in the Mersey Estuary.

15.3 Relevant Legislation and Guidance

- Environmental Protection Act 1990;
- Water Industry Act 1991, as amended;
- The Water Framework Directive (WFD) 2000/60/EC;
- Directive 2009/147/EC on the Conservation of Wild Birds;
- Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora;
- Environmental Permitting (England and Wales) Regulations 2016;
- Control of Pollution (Oil Storage) (England) Regulations 2001, as amended;
- Environment Agency Pollution Prevention Guidelines – General Guidance to the Prevention of Water Pollution (PPG01) 2013;
- Clearing the Waters for All, Environment Agency, June 2017;
- BS 6031:2009 Code of Practice for Earthworks; and
- Environmental Damage (Prevention and Remediation) Regulations 2009.

15.4 Procedure

15.4.1 Management of Shallow Groundwater

If encountered, shallow groundwater should be managed in a controlled manner, and the Contractor will have due regard for underlying aquifers and adhere to the Environment Agency's Groundwater Protection Policy.

There will be no infiltration of anything other than clean, uncontaminated rainwater into the ground other than with the express written consent of the Environment Agency, which may be given for those parts of the Site where it has been demonstrated that there is no resultant unacceptable risk to controlled waters.

15.4.2 Site Drainage

The Contractor will hold a foul and surface water drainage plan on Site showing the location of all known drains and outfalls and will implement working practices to ensure that contaminated water does not impact upon controlled waters. The Contractor will make relevant staff aware of the existing drainage network.

Site drainage will be managed to prevent sediment laden or contaminated runoff from entering watercourses or drains without consent. Under no circumstances will excavation waste, arisings, spoil, chemicals, fuels, silt or sediments be discharged to the drainage system, surface water or groundwater. In the event of a blockage, a specialist trade contractor will clear out the drains and the waste material will be disposed of accordingly.

Trade effluent from the Site shall not be discharged to surface or foul water drains without obtaining consent from the Environment Agency or Thames Water respectively.

Construction of the drainage system should be designed and managed to comply with British Standards (BS) 6031:2009 'The British Standard Code of Practice for Earthworks', which details methods that should be considered for the general control of drainage on construction sites. Discharge rates and volumes of water discharged would be agreed with the EA and United Utilities. Where appropriate, cut-off drainage would be provided around the Site during the Works when there is no on-Site drainage network in place.

Water use will be monitored through meters or similar monitoring equipment, and reported against targets set out by the Contractor, which will be agreed with LCC.

15.4.3 Hazardous Substances

Significant quantities of hazardous substances are not anticipated to be used during the construction works. However, some fuels and oils may be required to be present on the Site.

Hazardous substance stores (including fuel and chemical stores) and stockpiles at risk of spillage / leakage of polluting materials will be provided with above ground secondary containment. Bunded compounds will have an impervious base, which can hold at least 110% of the capacity of the tank or drum it contains to minimise the risk of hazardous substances entering the drainage system or the underlying soils and / or groundwater.

All pipelines and fuelling points will be protected from vandalism and unauthorised interference and will be turned off and locked when not in use. Drip trays will be used when filling smaller containers from tanks or drums to avoid drips and spills from entering the ground or drainage system.

Labels will be used to clearly indicate the contents of containers. There should be no storage of hazardous substances near open drains. All fuel storage and associated pipework will be above ground and located on hardstanding.

Deliveries will be supervised, and a suitable number of spill kits will be available in areas where hazardous materials are used or stored. Areas used for vehicle washing and / or parked vehicles shall include oil interceptors.

On Site vehicle routing will take into consideration the location of any storage areas to ensure that accidental impact does not occur; and

In case of accidental spillage, the pollution incident control procedure set out in Section 13 & Section 18 of this CEMP will be followed.

Temporary stockpiling of materials would be located away from the River Mersey and drains. Drums and barrels would be stored in designated bunded safe areas within the Site compound to reduce the risk of silt and pollutants entering the surface water drainage system;

Surface water from the landward areas would be treated before draining to Peel Ports' private sewer, and surface water from the new jetty would be treated and drained to the river, subject to an approved discharge consent.

15.5 Documentation

The following documents will be held on Site:

- Copies of Environmental Permits / discharge consents and records of any effluent monitoring, which will be held in a designated file by Contractor and will be available for inspection at any time;
- Copies of effluent monitoring records (if required by any discharge consent or Permit);

- A drainage plan for the Site, kept up to date as work on Site progresses;
- An Environmental Incident Logbook for use in the event of a pollution incident; and
- Copies of liaison with the Regulator in the event of an incident.

16. Pollution Incident Control Procedure

16.1 General

This procedure applies to public safety, emergency and other unplanned activities during the construction works. All staff are responsible for complying with the requirements of the procedure.

As a best practice measure, the Contractor shall implement pollution prevention policies and procedures on Site in accordance with the measure and principles set up within this Framework CEMP.

16.2 Potential Effects

Construction site activities such as deliveries, oil and chemical storage and emergencies may result in unplanned pollution incidents that would have adverse effects on the environment, human health and properties.

Considering the nature of the site, additional risks include the interaction of the construction works with the existing navigational routes.

16.3 Relevant Legislation and Guidance

- Environmental Protection Act 1990;
- Environmental Permitting (England and Wales) Regulations 2016, as amended;
- Water Industry Act 1991, as amended;
- Environmental Damage (Prevention and Remediation) Regulations 2009: Guidance for England and Wales, as amended; and
- Pollution Prevention Guidance 61 (PPG61): Working at construction and construction sites (it is noted PPGs are no longer maintained by the EA).

16.4 Procedure

The Contractor will establish a spill control procedure as part of their operating procedures, which will be adhered to in the event of a spill.

Incidents that shall be reported to the Contractor include:

- Spills of chemicals, oils, fuels, unplanned or non-consented discharges;
- Release of fumes and gases; and
- Any incident that could lead to enforcement action from LCC or any other regulatory body, public complaint or media attention.

In the event of a spillage or other pollution incident, the Contractor will be notified immediately and will take immediate steps to prevent environmental pollution, for example:

- Protection of drains following a spillage of oil or other chemical;
- Use of spill kits following a spillage of oil or other chemical; and
- Turning off equipment or other source of fumes, noise or dust.

A suitable number of spill kits will be kept on Site in the vicinity of the work in progress and areas of hazardous material storage, which as a minimum should contain absorbent granules, sand bags and drain covers. Where possible, absorbent pads and booms shall be used instead of granules and sand bags. Used spill kits must be disposed of appropriately, for example as hazardous waste, where relevant.

If it is considered that a fugitive release to air, water or ground may have occurred, the following action will be taken:

- Ensure that it is safe to remain in the area;
- Locate and switch any isolation switches, valves or pumps if possible;
- Contact the following bodies where appropriate and follow their instructions:
  - Environment Agency (Tel: 0800 80 70 60);
  - Liverpool City Council (Tel: 0151 233 3000);
  - Fire Brigade - 999 (emergencies) 0151 296 4000 (non-emergencies); and
  - MMO Marine Pollution incidents line (0300 2002024).

Where possible, damage control measures should be undertaken to prevent dispersion of gases or pollution from entering drains or water courses. For example, create containment sumps, pump liquid to temporary storage areas (such as lined skips) and block or clear drains as appropriate.

Liaison must be undertaken with Mersey Docks Harbour Company (MDHC) as Harbour Authority to ensure suitable management / control mechanisms during the construction works in line with the Port Marine Safety Code (PMSC) of a Safety Management System (SMS).

Construction activities and associated risk management and emergency response must be undertaken in lined with the most updated Navigation Risk Assessment (NRA).

16.5 Documentation

- A log of environmental incidents and remedial actions taken will be maintained on the Site and held by the Contractor; and
- Site Review Record Sheet as presented in **Appendix D (**or similar), to be maintained and completed as necessary.

17. Site Environmental Auditing and Verification Monitoring

17.1 Introduction

Regular independent environmental audits should be undertaken to ensure that the requirements of this CEMP are being met. The frequency of the audits will be dependent upon the potential for the works being carried out to give rise to environmental impacts but are generally every once every two to four weeks during the main phases of demolition or construction.

The audits will include a Site inspection and a review of documentation and will be recorded on the Site Record Sheet presented in **Appendix D**, or similar. This will include a review of the in-house auditing.

Non-conformances will be reported to the Contractor's environmental manager with a deadline for remedial action, where necessary.

Independent dust, vibration and noise monitoring will also be undertaken, in addition to that outlined in **Sections 7 and 8** above.

17.2 Environmental Reviews

Environmental issues will be included as an item on the agenda at Progress Meetings, attended by the Contractor, Sub Contractors, relevant Trade Contractors and other members of the Project Team where appropriate. Where relevant, the following should be discussed:

- Results of the monitoring;
- Complaints, including cause and remedial action;
- Neighbourhood liaison;
- Communications with LCC and other statutory bodies; and
- Incidents that have taken place.

17.3 Documentation

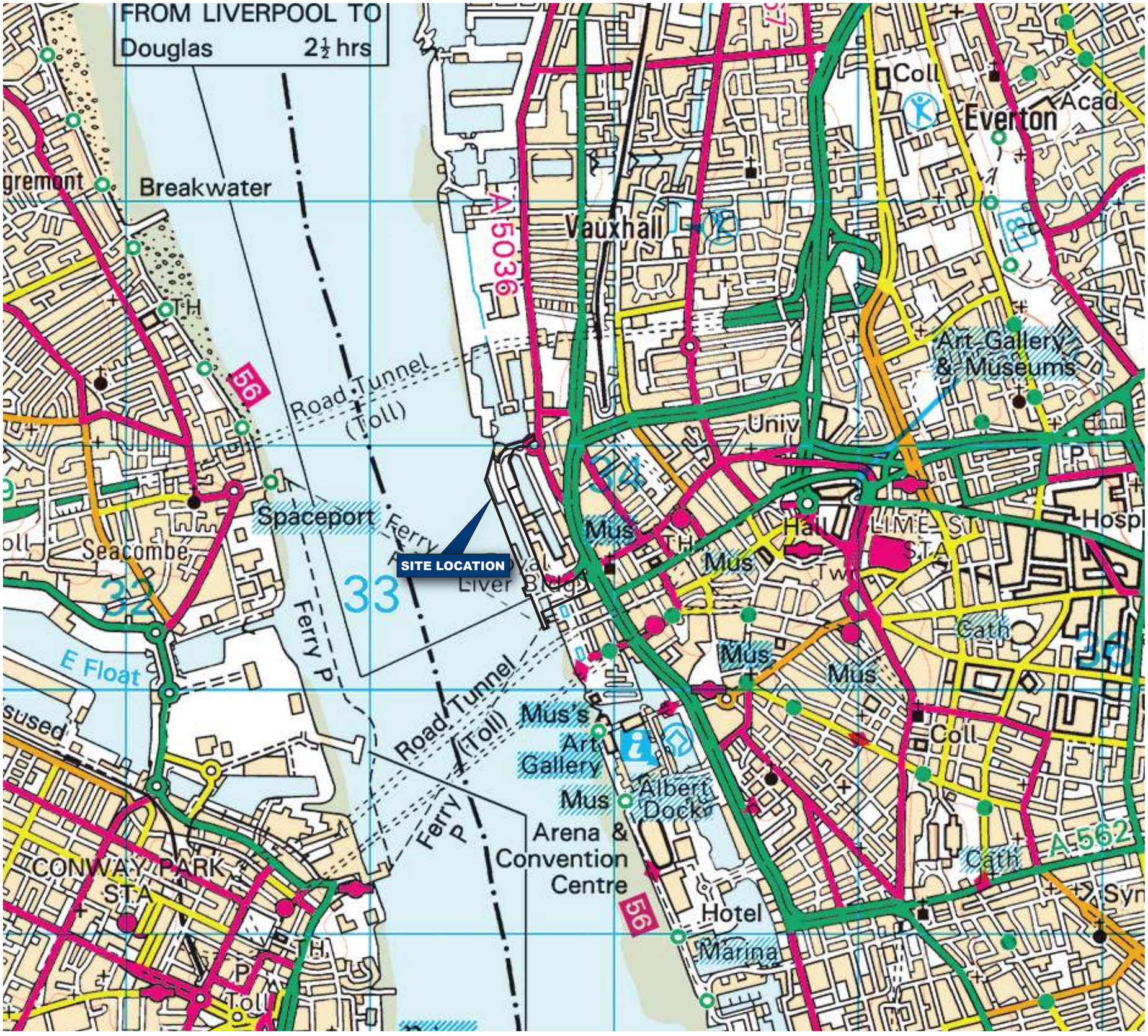
The following documentation must be retained on Site for inspection as indicated in the previous sections of the EMP:

- Complaints log book with details of the response made to complaints received;
- Noise and vibration monitoring record sheets with details of corrective actions taken where the action levels are exceeded;
- Dust monitoring records;
- Plant maintenance and defect records;
- Details of waste recycling targets and records;
- Records of quantities of waste produced, reused, recycled and disposed of to landfill;
- Waste transfer notes, hazardous waste consignment notes and waste carrier's registration;
- Copies of Environmental Permits, discharge consents and licenses;
- Results of discharge water quality testing; and

Environmental incident logbook containing details of environmental incidents and corrective action taken.

APPENDICES

A. Figures



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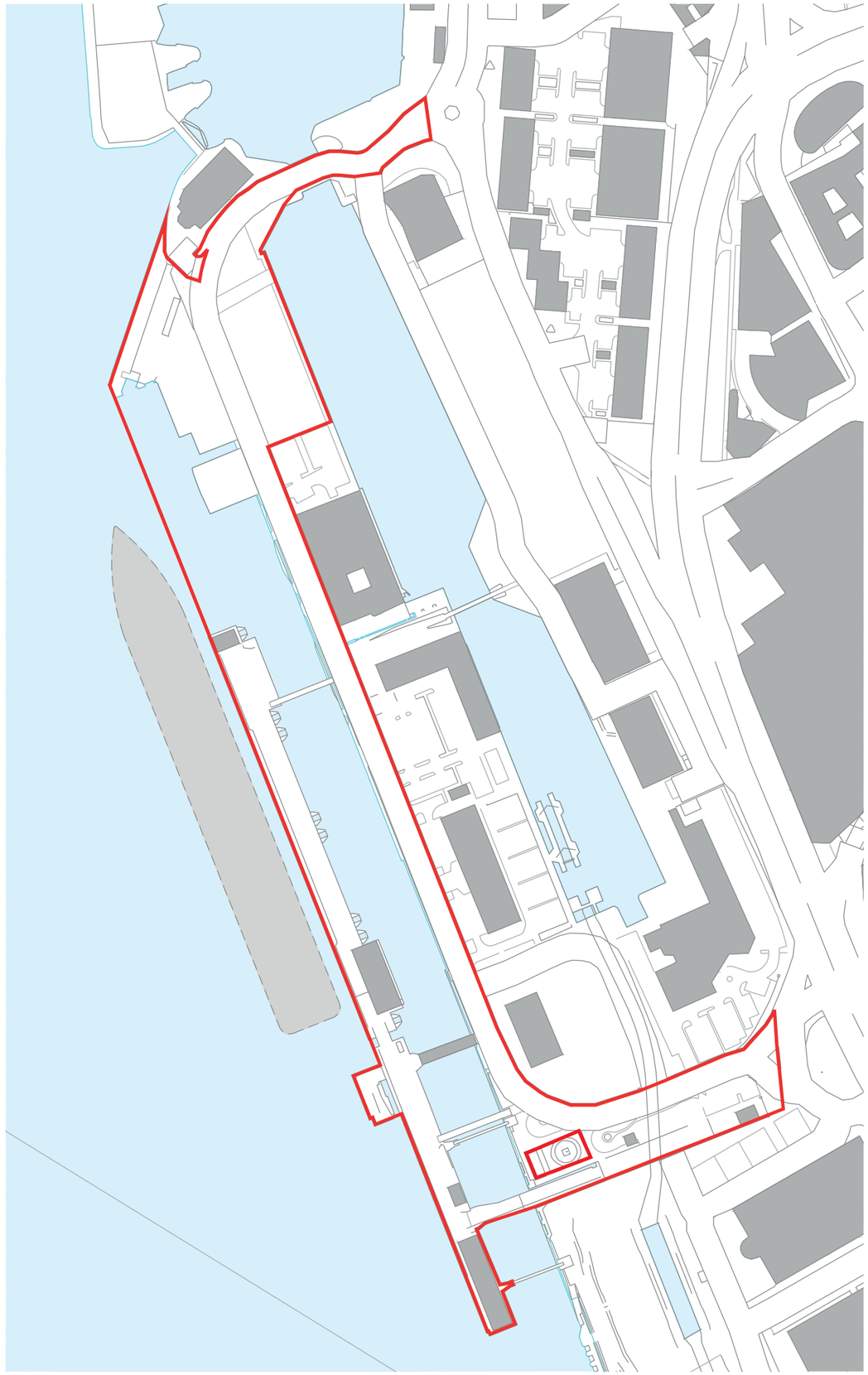

Site Boundary

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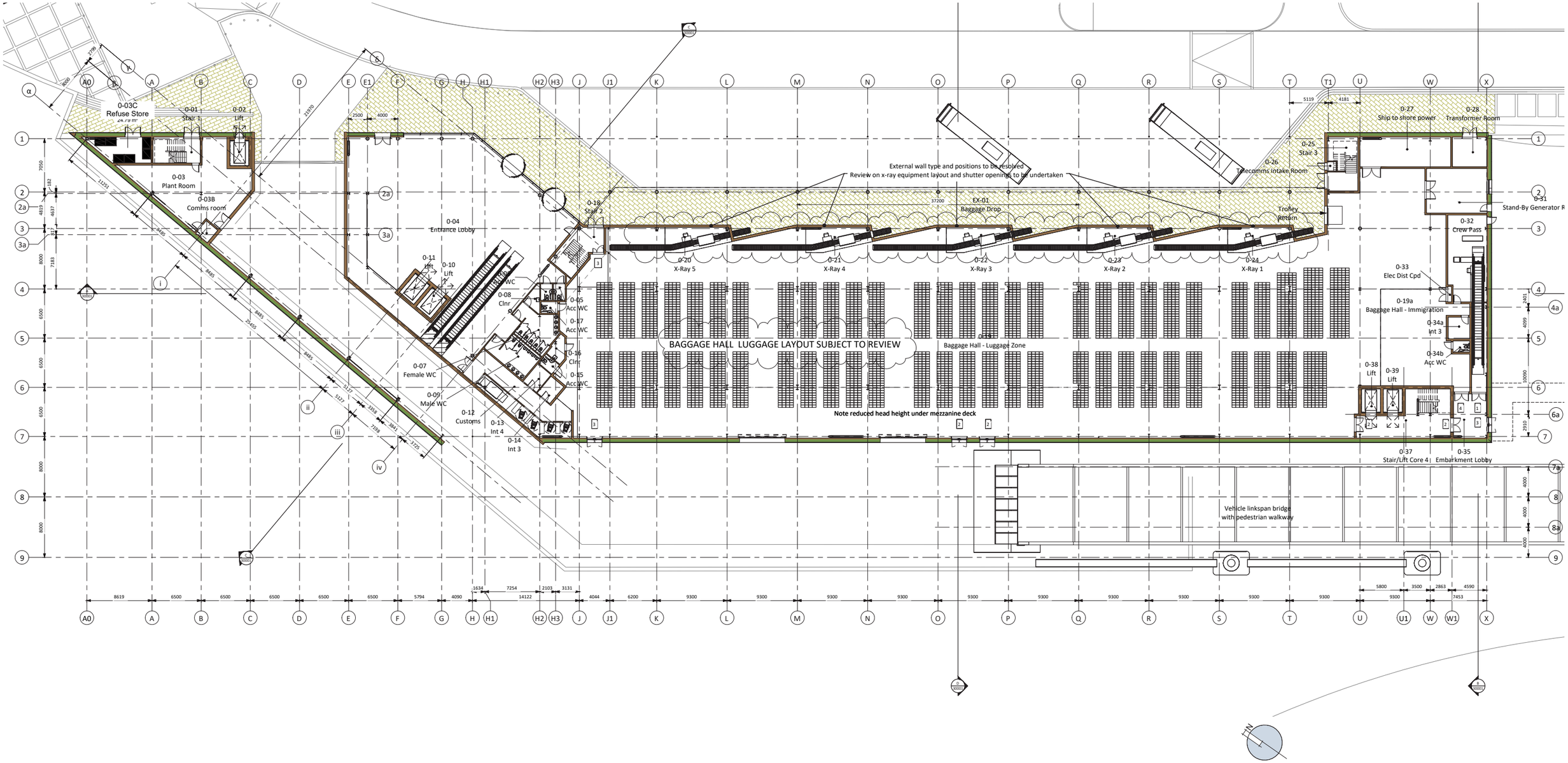

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Figure Ref	WIE12464-100_GR_CEMP_3A
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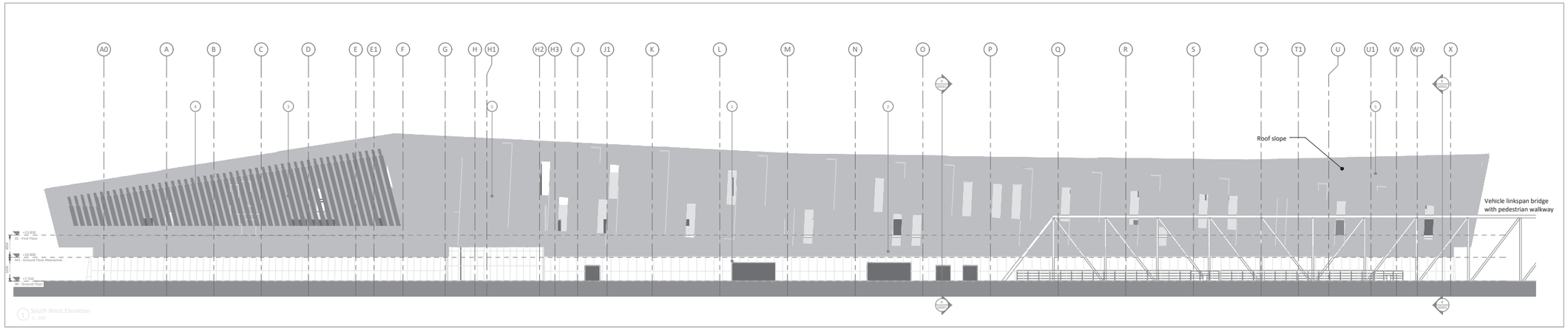

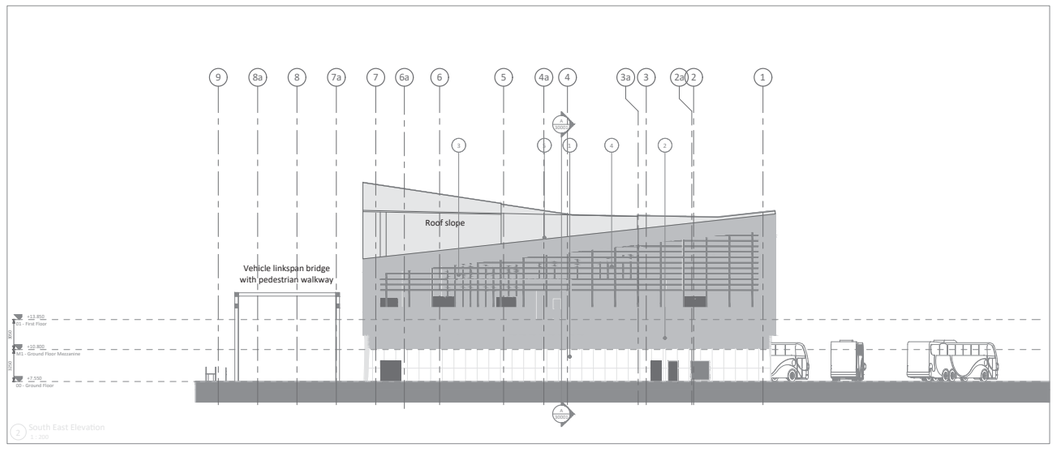

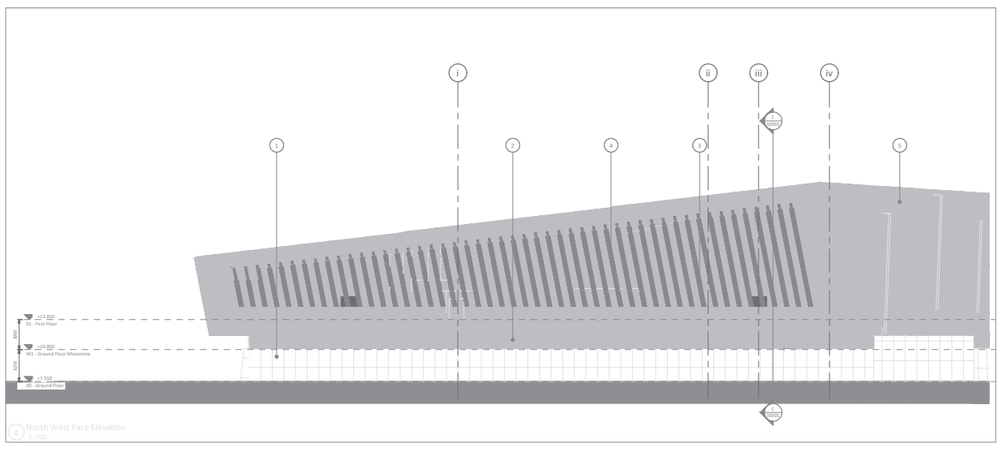

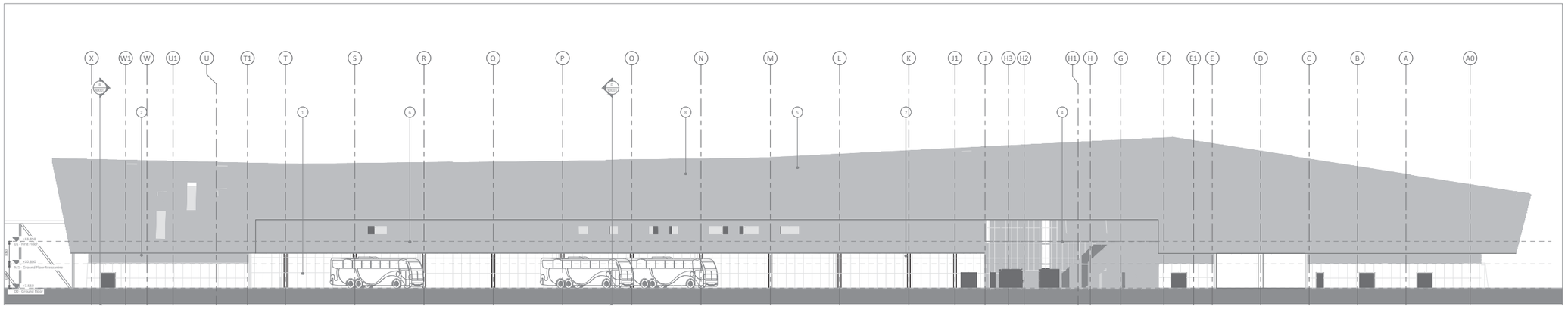

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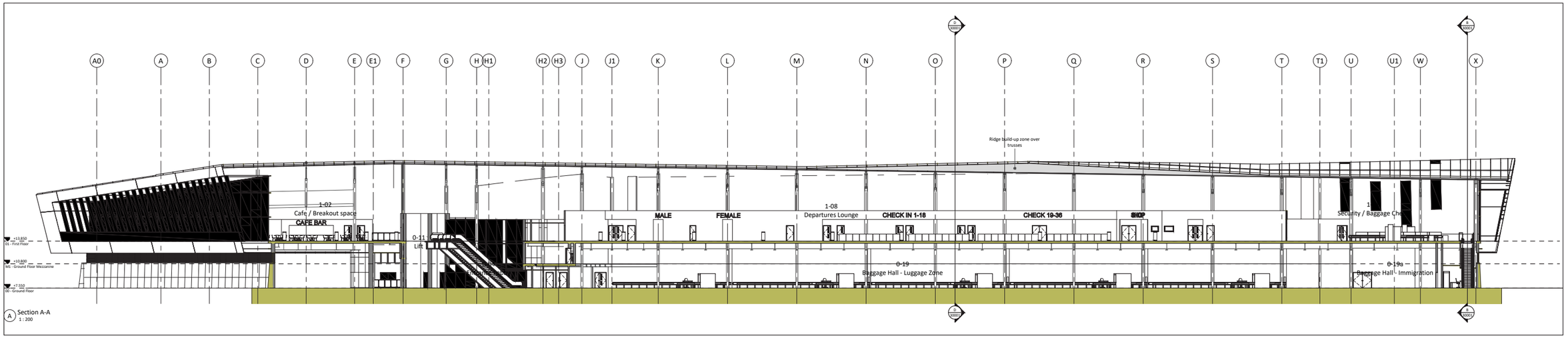

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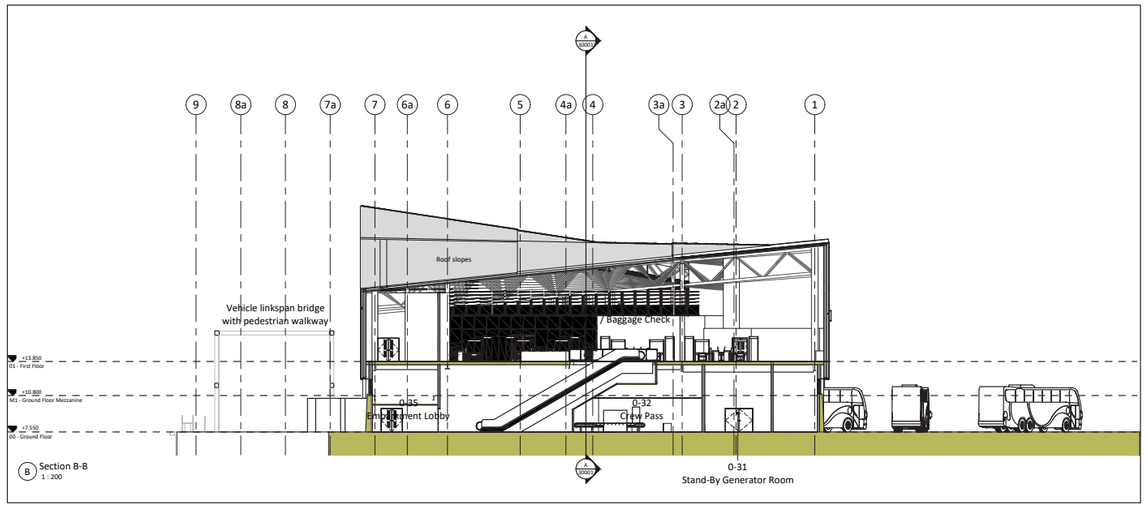

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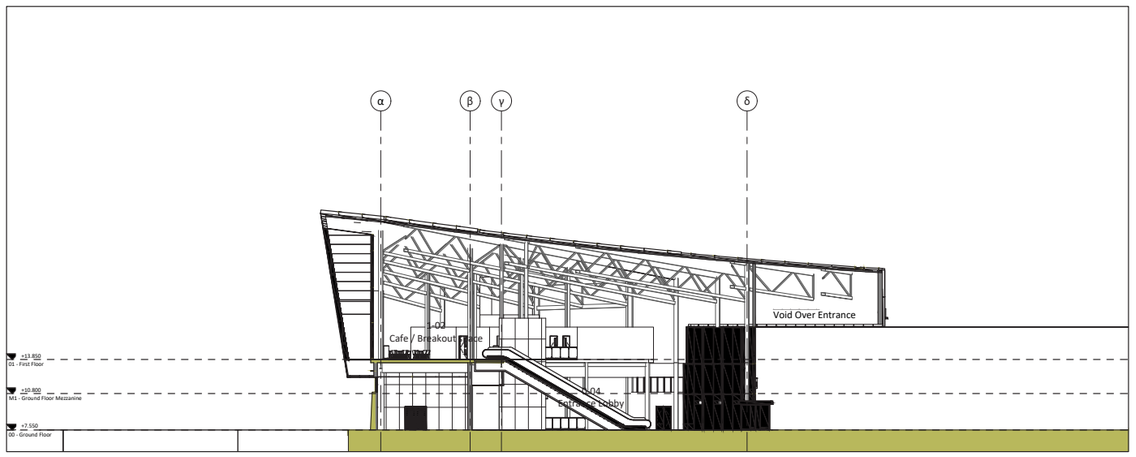

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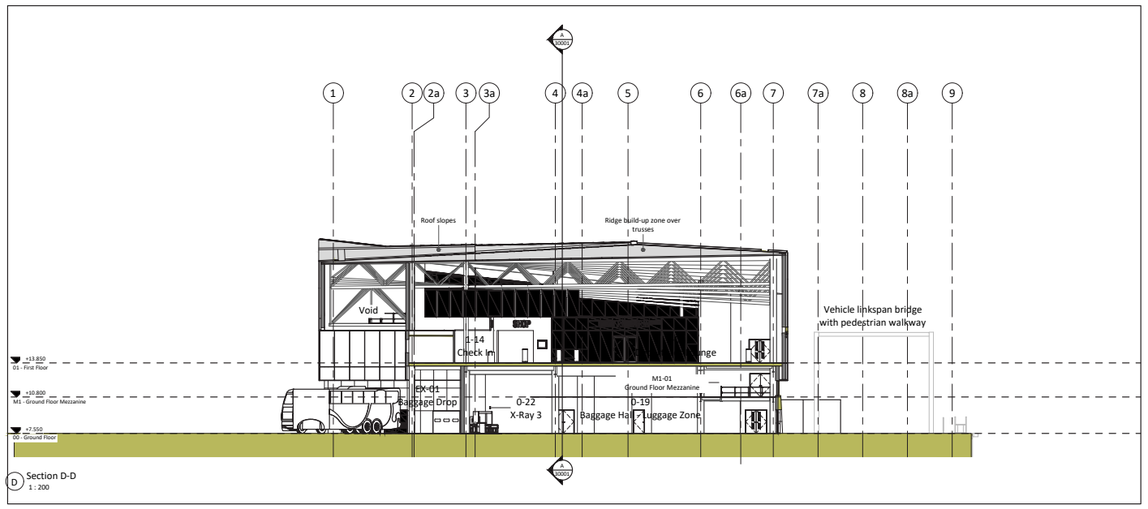

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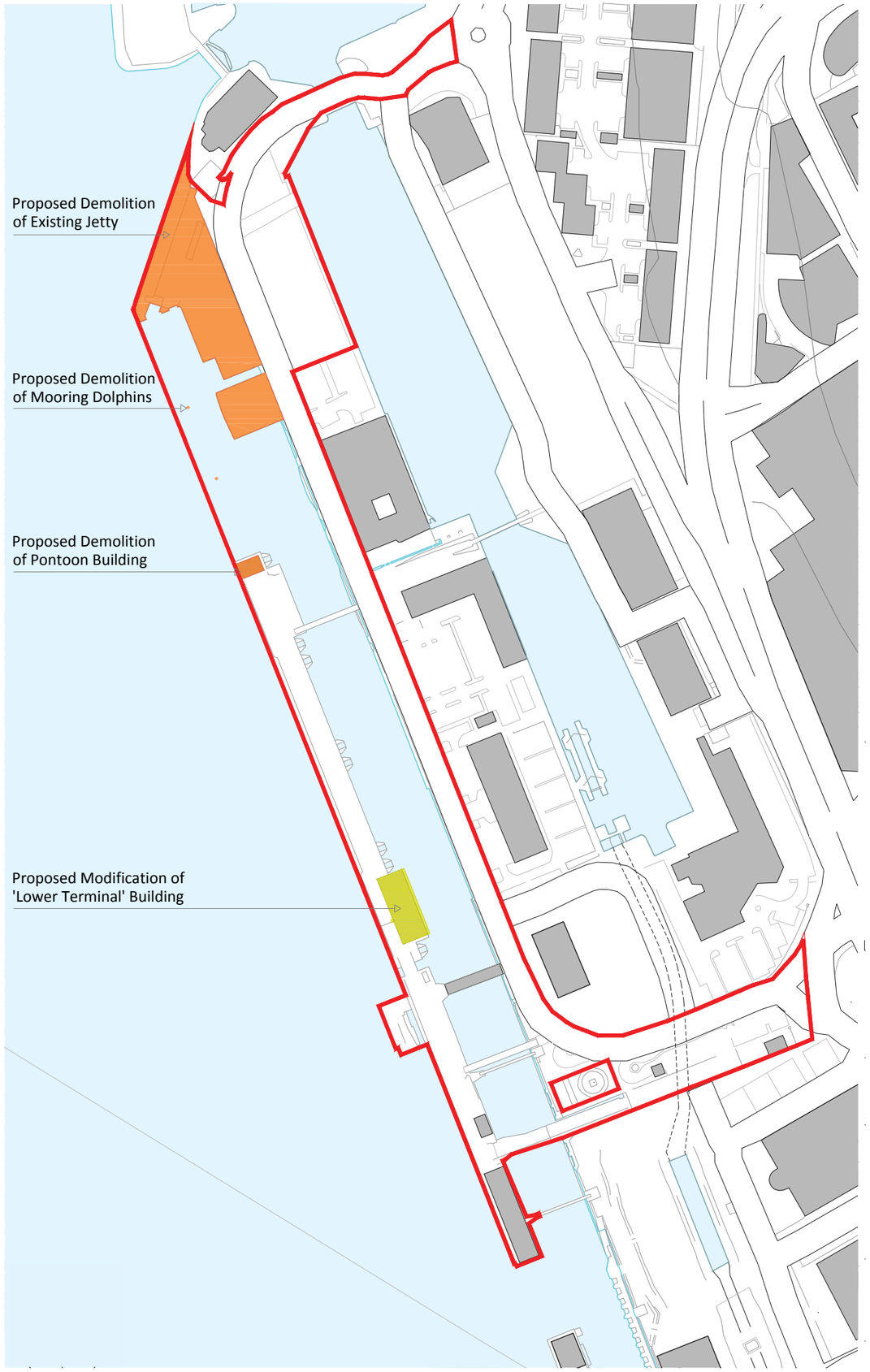
Figure Title	Figure 5: Proposed Building Sections
Figure Ref	WIE12464-100_GR_CEMP_5A
Date	2018
File Location	\\s-lncs\wiel\projects\wie12464\100\graphics\cemp\issued figures



waterman

Site Boundary

Proposed Demolition Works

Proposed Building Modification

N

Project Details	WIE12464-100: Liverpool Cruise Terminal
Figure Title	Figure 6: Parameter Plan 2 - Demolition Plan
Figure Ref	WIE12464-100_GR_CEMP_6A
Date	2018
File Location	\\s-lncs\wiel\projects\wie12464\100\graphics\cemp\issued figures

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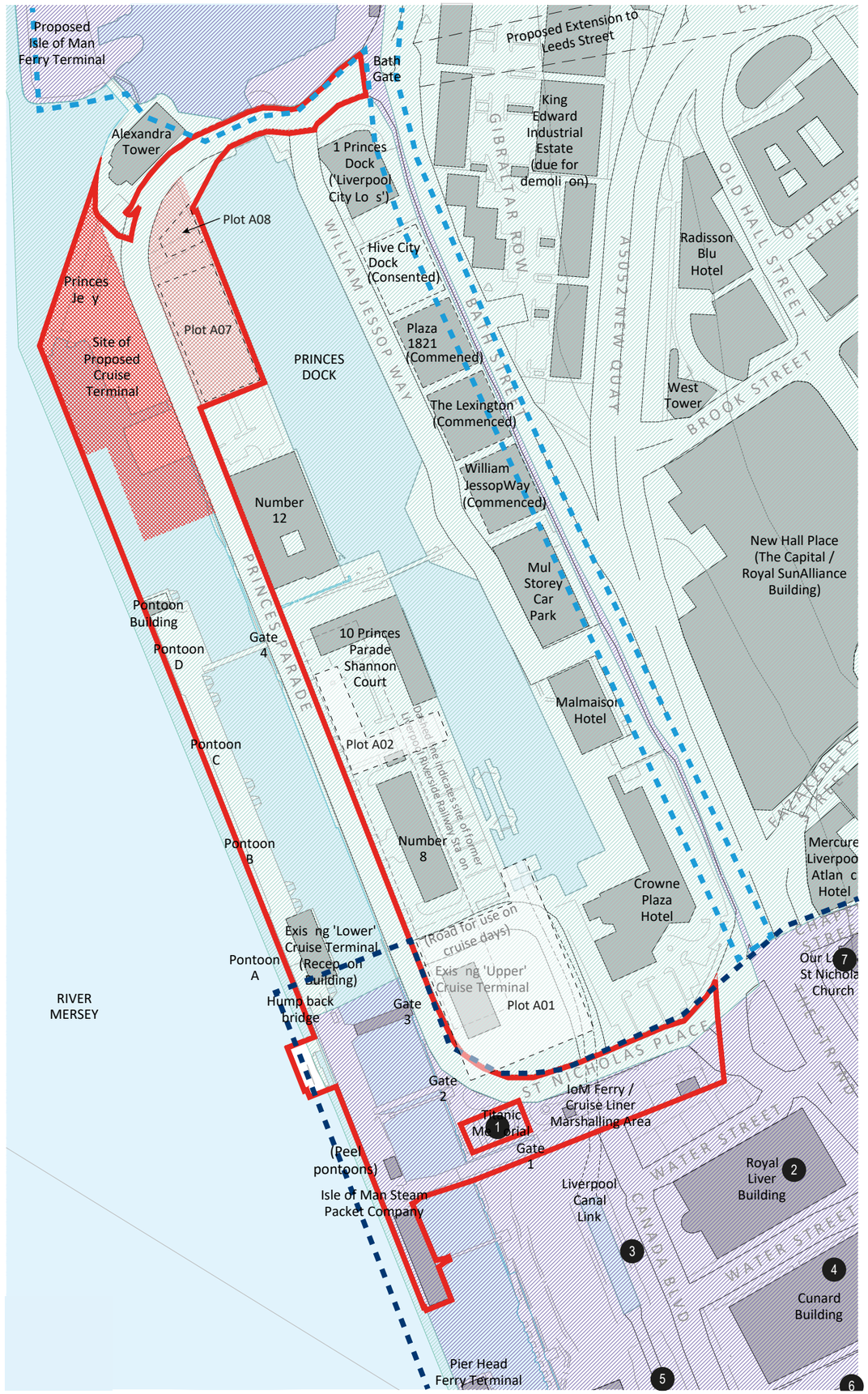
Source: Stride Treglown



Source: Stride Treglown

waterman

- Site Boundary
- World Heritage Site
- World Heritage Site Buffer
- Stanley Dock Conservation Area
- Castle Street Conservation Area
- Proposed Passenger Pick-up / Drop-off Area

Listed Buidlings

1. Memorial to Heroes of the Marine Engine Room (Grade II Listed)
2. Royal Liver Building (Grade I Listed)
3. Monument to Sir Alfred Lewis Jones (Grade II Listed)
4. Cunard Building (Grade II Listed)
5. Monument to Edward VII (Grade II Listed)
6. Port of Liverpool Building (Grade II Listed)
7. Church of Our Lady and St. Nicholas (Grade II Listed)

N

Project Details	WIE12464-100: Liverpool Cruise Terminal
Figure Title	Figure 7: Existing Land Use
Figure Ref	WIE12464-100_GR_CEMP_7B
Date	2019
File Location	\\s-lncs\wiel\projects\wie12464\100\graphics\cemp\issued figures

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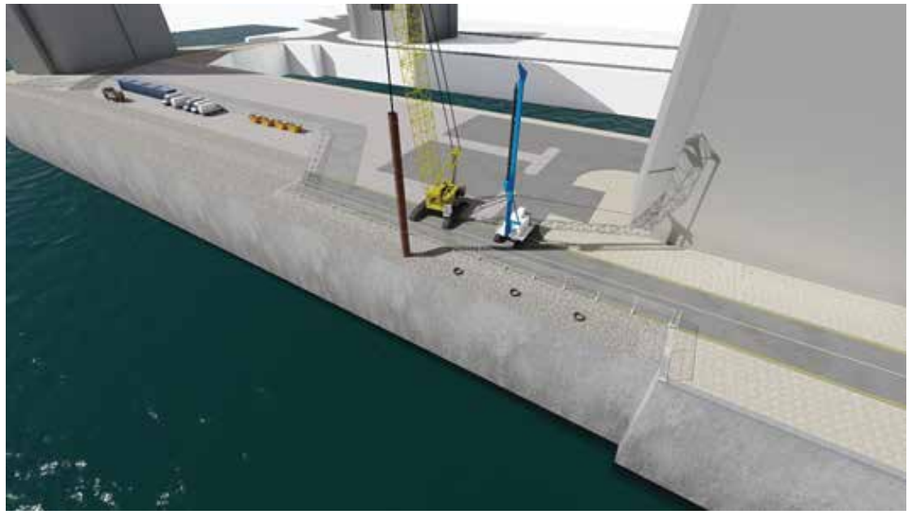
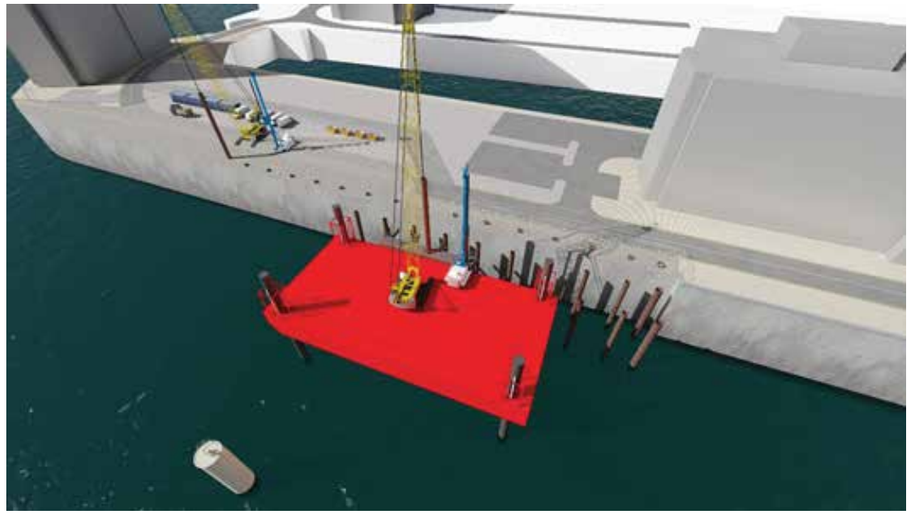
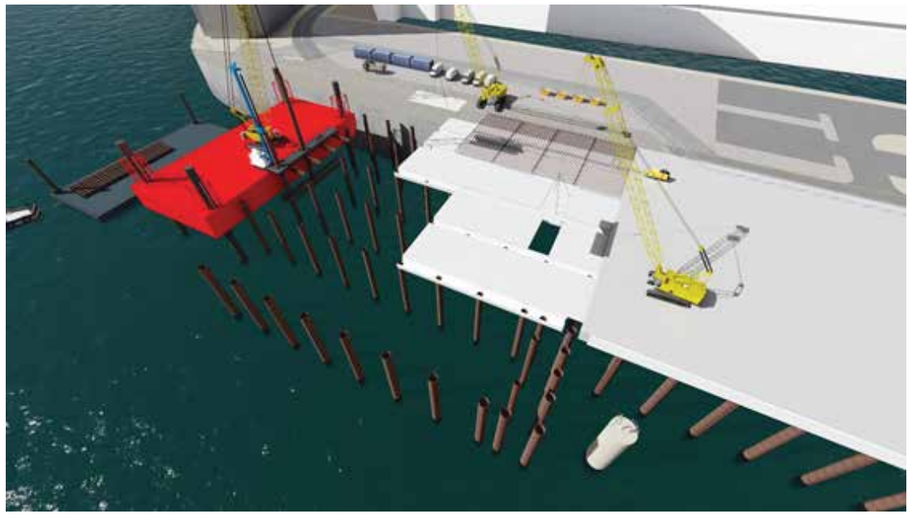


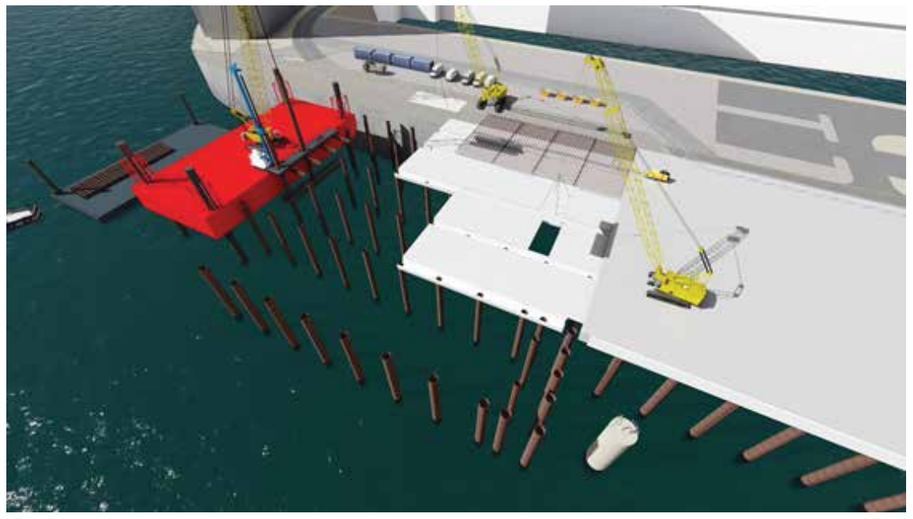
Installation of the landside piles



Piling using marine plant



Status of the project with piling and deck construction



Piling Complete and precast and insitu works reaching the northern end of the site

Southern end of the deck completed to allow works on the building to commence (note the deck will never look as open as this as the building frame will have commenced at this stage

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Figure Title	Figure 8: Deck construction operations
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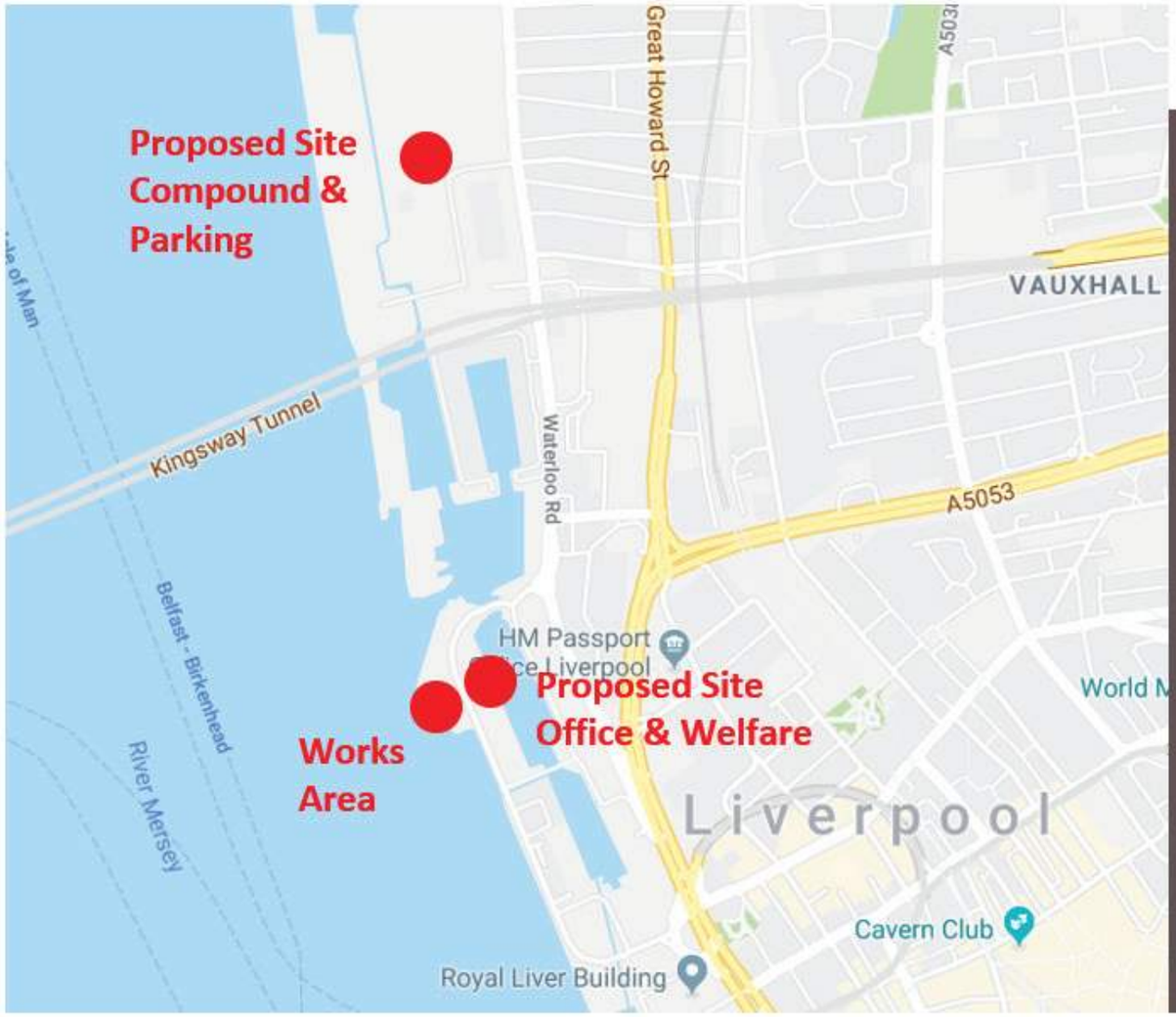

Project Details	WIE12464-100: Liverpool Cruise Terminal
Figure Title	Figure 9: Site Setup
Figure Ref	WIE12464-100_GR_CEMP_9A
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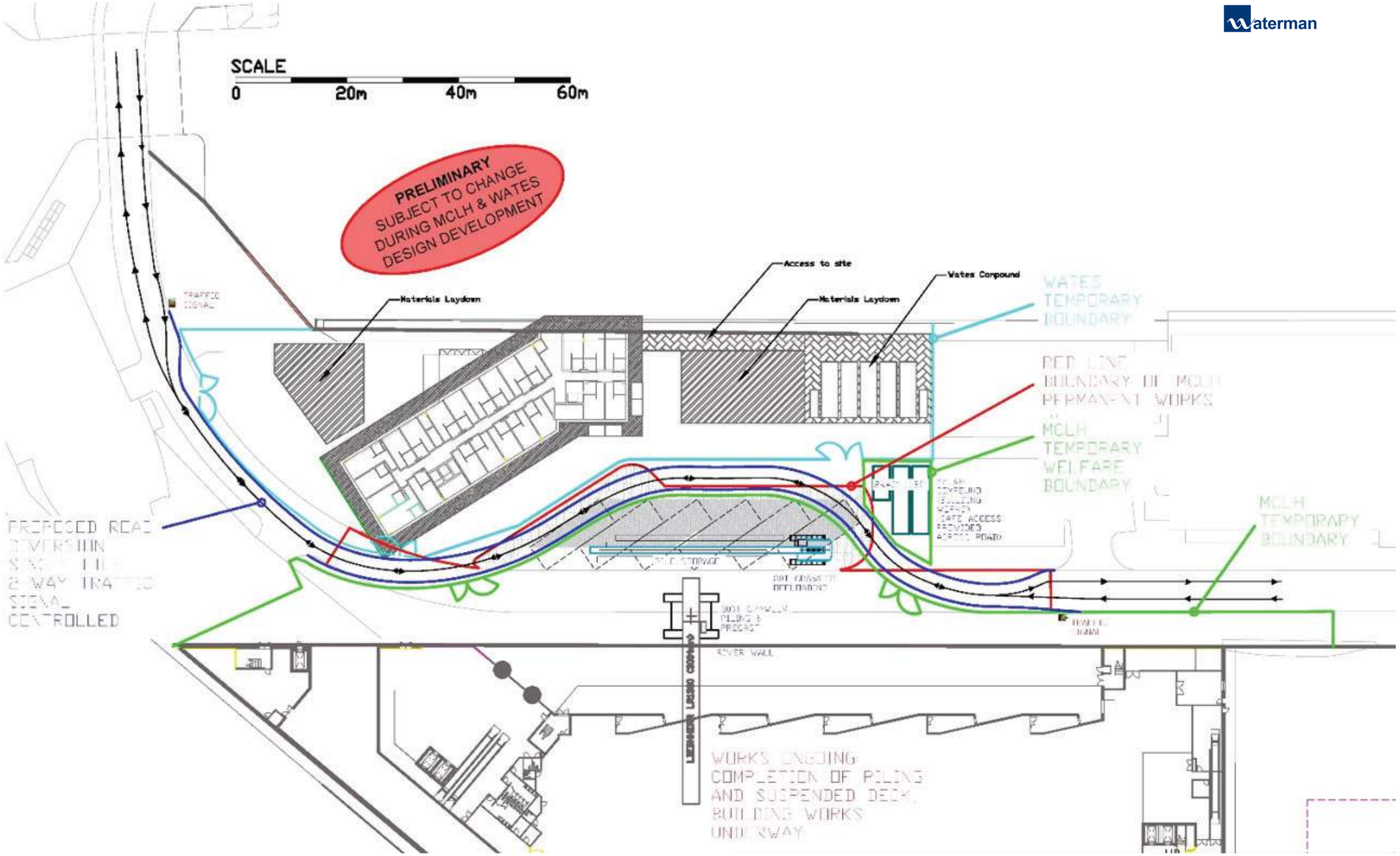

Project Details	WIE12464-100: Liverpool Cruise Terminal
Figure Title	Figure 10: Proposed Traffic Management Plan and Site Setup
Figure Ref	WIE12464-100_GR_CEMP_10A
Date	2018
File Location	\\s-lncs\wiel\projects\wie12464\100\graphics\cemp\issued figures

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B. Cormorant Ecological Conservation Management Plan

Waterman Infrastructure & Environment Limited
Merchants House, Wapping Road, Bristol, BS1 4RW
www.watermangroup.com

Liverpool Cruise Terminal

Technical Note – Cormorant Mitigation

Date: Date: October 2019

Client Name: Liverpool City Council

Document Reference: WIE12464-100-TN-14-2-2

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS OHSAS 18001:2007)

Issue	Prepared by	Checked & Approved by
	Niall Machin	Gavin Spowage
Second Issue	Associate Director	Associate Director

1. Introduction

1.1. The shadow Habitat Regulations Assessment (HRA ref WIE12464-100-11-2-3-AA, Waterman January 2019) for the Liverpool Cruise Terminal proposed ecological mitigation for cormorant *Phalacrocorax carbo* in the form of a floating pontoon structure. MEAS and Natural England have advised that the floating pontoon should be a permanent structure. This is secured by a planning condition.

1.2. Small numbers of cormorant (up to 12) were recorded using on-site dockside structures in 2017 winter ornithological surveys. As the scheme will result in the loss of structures, particularly Princes Jetty, used by roosting/resting cormorant during construction, a floating pontoon for roosting/resting cormorant will be installed. To ensure the loss of the jetty is fully mitigated, the floating pontoon will be a permanent installation. The new jetty will also provide cormorant resting/roosting locations.

1.3. This Note sets out further detail on the design and location of the floating pontoon and sits as part of the strategic approach to cormorant mitigation in the wider Liverpool Waters vicinity of which the Cruise Terminal is part.

1.4. A strategic approach to cormorant mitigation within the overall Liverpool Waters area is being coordinated by Arup on behalf of Peel Land & Property (Ports) Ltd. The provisions within this Technical Note are covered by and conform with the overarching strategic approach.

1.5. This Technical Note constitutes an Ecological Conservation Management Plan (ECMP) for cormorants for the Liverpool Cruise Terminal development.

2. Pontoon design and location

Design

2.1. Floating platforms are used by wintering and other bird species, including cormorant, as night time roosts and daytime resting areas. Cormorants utilising such structures have become a feature of many of the UK's urban areas where large bodies of water occur.

2.2. A schematic design is shown as **Figure 1**. This is designed to enable a single 3m by 3m pontoon to be initially delivered by the neighbouring Isle of Man Ferry Terminal scheme in October 2019, with additional pontoons being added to form a larger structure as other nearby developments, including the Liverpool Cruise Terminal come forward.

Individual 3m by 3m pontoon design

2.3. Refer to **Annex A** for proposed pontoon design.

Larger joint pontoon design

2.4. It is known that a larger pontoon resource is required to jointly deliver cormorant mitigation for the Isle of Man Ferry Terminal, Liverpool Cruise Terminal, Northern Relief Road and, potentially, the C02 project. **Figure 1** therefore shows how four 3m by 3m blocks can form one single larger pontoon unit. The final design may instead be a square 6m by 6m arrangement.

2.5. Whilst each individual scheme is expected to deliver appropriate mitigation for roosting/resting cormorant displacement, there is a degree of 'double counting' of the birds involved. In particular, the Isle of Man Ferry Terminal, Northern Relief Road and C02 developments will impact more or less the same group of cormorants that currently rest/roost around West Waterloo Dock/Princes Dock and the dockside structures. The cormorants using land impacted by Liverpool Cruise Terminal just to the south would also interact with the West Waterloo/Princes Dock birds.

2.6. Therefore, it is appropriate for the individual developers to deliver a structure which could support around 15-20 roosting/resting cormorant. The design in **Figure 1** would accommodate upwards of 20 cormorants. It has been agreed that the relevant developers (Liverpool City Council, Isle of Man Government Department of Infrastructure, and Peel Land & Property (Ports) Ltd) will jointly provide this four-pontoon solution. However, a single 3m by 3m pontoon described in **Annex A** has been installed by the Isle of Man Government under marine licence L/2019/00239/1, to meet the requirements of condition 5.2.9 of that licence in advance of the other three pontoons (which can then be attached to the single pontoon when they are installed), as the project timescales for the Isle of Man scheme required the pontoon to be installed and in situ by 17th October 2019 at the latest. That pontoon was installed on 16th October 2019. The date of installation of the second 3m x 3m pontoon for the Liverpool Cruise Terminal is currently unknown.

Maintenance and Monitoring

2.7. The design will have an estimated life of at least 12 years with minimal maintenance. Minimal management is required – just removal of bird droppings once per year (off site, not into the Dock).

2.8. The current pontoon and all subsequent pontoons, including the pontoon installed for the Liverpool Cruise Terminal development, will be subject to an Adaptive Management Plan and annual winter bird surveys. An Adaptive Management Plan has been drafted by Waterman (ref: WIE12464-100-17-2-3) and forms an Appendix to the Liverpool Cruise Terminal CEMP document. The effectiveness of the mitigation (i.e. the pontoon) will be reviewed annually and action taken to ensure appropriate habitat for cormorant is maintained.

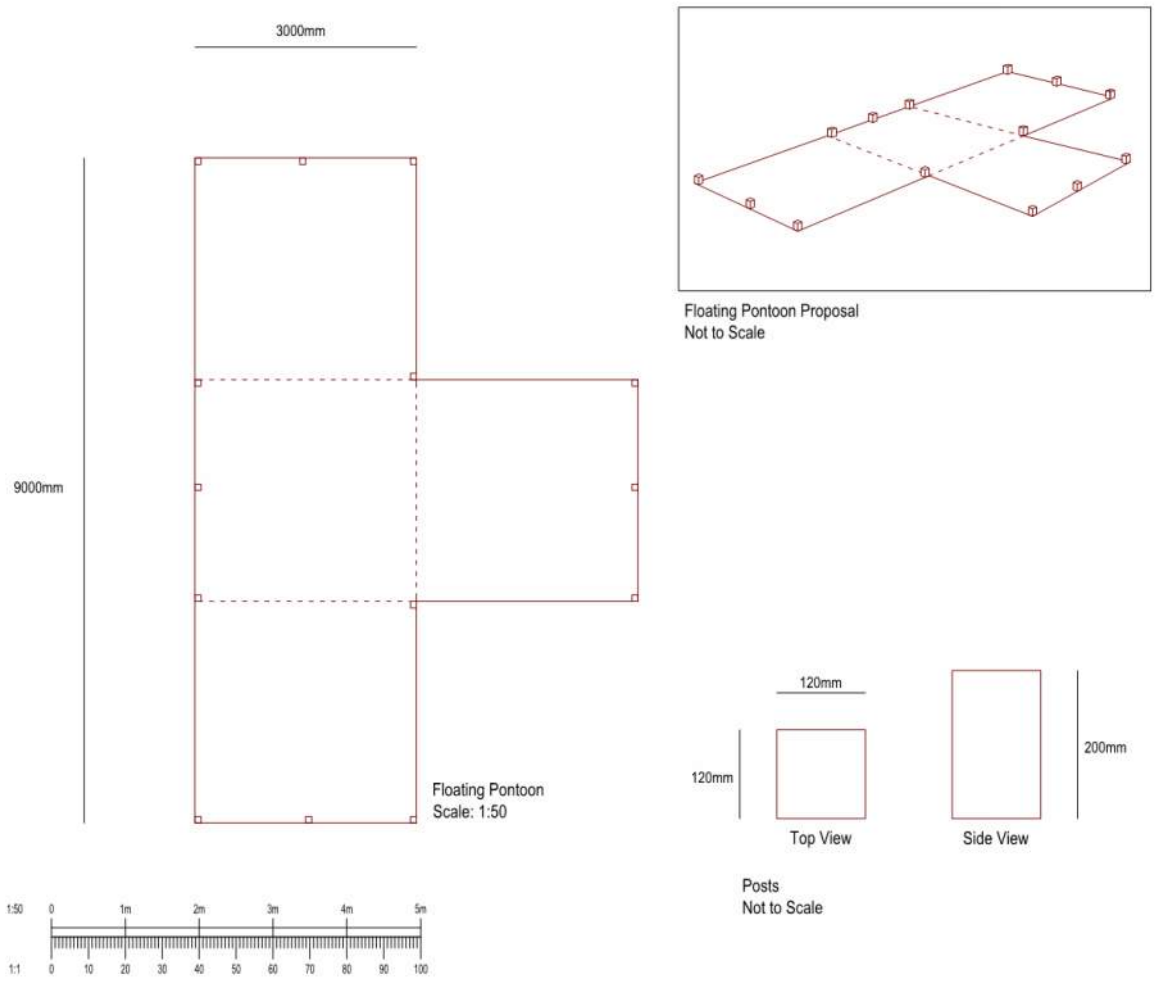

Figure 1: Proposed Cormorant Pontoon Design

Location

2.9. The floating pontoon(s) would be located in the eastern part of Princes Half Tide Dock, see **Figure 2**.

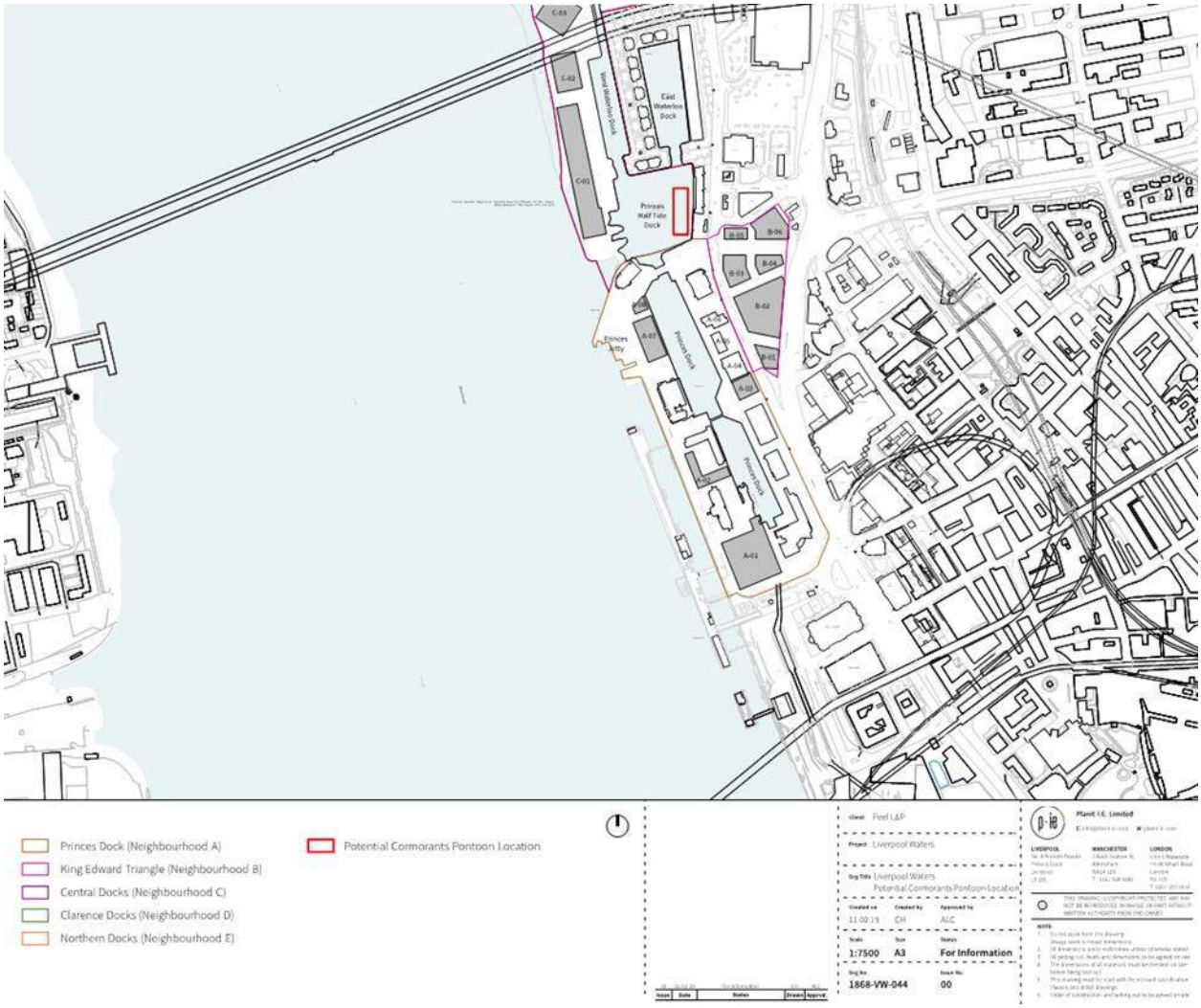

Figure 2: Proposed Cormorant Pontoon Location

3. Strategic approach

3.1. In their comments dated 18th March 2019 relating to the shadow HRA report submitted in support of the planning application for the nearby Isle of Man Ferry Terminal proposed development (ref: 18F/3231), Natural England (NE) stated:

We are highly encouraged that development teams from a number of projects in the area are working together to provide a combined mitigation pontoon. We have advised that a strategic approach to mitigation would be the most beneficial approach to ensure impacts arising from the number of developments is considered, therefore allowing for more certainty on deliverability of mitigation within a holistic manner. We advise that a strategic mitigation strategy should be provided and ideally in advance of projects coming forward so that the strategy can be agreed and in place, therefore allowing a smooth process through the planning stages.

3.2. In response to NE's advice, Peel, the site owners and holders of the outline permission for the Liverpool Waters Masterplan have agreed to co-ordinate a strategic approach to cormorant mitigation for Liverpool Cruise Terminal (LCT), Isle of Man Ferry Terminal (IoM), Northern Link Road (NLR)

and C02. Peel have identified a new permanent pontoon facility to be provided in Princes Half Tide Dock – see **Figure 2** above.

3.3. The final large joint pontoon structure would comprise 4 interlocking units forming a single structure of sufficient size and design to deliver the mitigation for the IoM, LCT, NLR and C02 schemes, i.e. catering for at least 20 cormorants.

3.4. Peel, in association with the individual developers, will oversee the Annual Monitoring of the pontoon facility in terms of winter bird monitoring surveys. The facility will be subject to an Adaptive Management Plan (AMP) which sets out any additional actions required for successful mitigation, e.g. responding to the monitoring in terms of adaptations that may be required to the structure to make it more suitable for cormorant. The AMP will also address management or maintenance requirements and respond to further additions/additional structural elements/habitats should other schemes come forward in the vicinity that require ecological mitigation of this sort.

3.5. The strategic approach to cormorant mitigation within the overall Liverpool Waters area, including the AMP for the cormorant pontoons, is being coordinated by Arup on behalf of Peel Land & Property (Ports) Ltd. The provisions within this Technical Note are covered by and conform with the overarching strategic approach.

ANNEX A

Cormorant Pontoon – Design Basis Statement and Method Statement

REPORT

IOM Ferry Terminal – Bird Pontoon

Design Basis Statement

Client: Sisk

Reference: PB8850-RHD-ZZ-XX-RP-Z-0001

Status: Draft/P02

Date: 30 July 2019

Royal HaskoningDHV

Enhancing Society Together

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Document title:	IOM Ferry Terminal – Bird Pontoon
Document short title:	Design Basis Statement
Reference:	PB8850-RHD-ZZ-XX-RP-Z-0001
Status:	P02/Draft
Date:	30 July 2019
Project name:	IOM Ferry Terminal
Project number:	PB8550
Author(s):	Stephen Salmon
Drafted by:	Stephen Salmon
Checked by:	Mike Primrose
Date / initials:	26/07/2019
Approved by:	Alistair Reid
Date / initials:	26/07/2019

Classification
Project Related

Disclaimer

Table of Contents

1 Introduction

The scope of the design comprises 1 No. 3 x 3m pontoon for bird roosting including Cormorants for a 12-year design life. The pontoon will be located in Princes Half-Tide Dock, Liverpool.

The overall design is based on an adaptation of an existing RSPB design, as outlined in the RSPB Design and Management of Rafts notes, by forming the lower section in steel with upper section remaining as per the standard design. The RSPB design notes are included in Appendix A.

2 Key Parameters

2.1 Geometry

The habitat pontoon will be made of 1 No. 3 x 3m unit. The design includes a capability for the addition of further pontoons, linked by shackles.

The freeboard will be approximately 250 to 300mm excluding wind induced heeling effects and maintenance personnel.

The pontoon will be moored in position using chains to anchor blocks installed on the dock bed. This anchoring system will allow movement under wind loading. Given the open water nature of the dock this is not anticipated to present any significant issues.

2.2 Wind

Wind velocities have been extracted from another project undertaken in the area and are listed in Table 1.

Return Period	10minute at +10m	Wind speed at sea level so 30sec gust
1 in 1yrs	20.8	22.8
1 in 10yrs	24.7	27.1
1 in 50yrs	28.5	31.2

Table 1 – Design wind velocities

The loads reported are based on a 250mm freeboard.

2.3 Water Levels

Normal dock water level is around +9.8mCD, the published seabed level in the dock is +0.2mCD giving a water depth of 9.6m.

The existing seabed level is understood to be significantly higher than the above published level, prior to construction the seabed level will be confirmed by hydrographic survey. The anchor assemblies e.g. length and diameter of chains, expected movements, etc. will then be adjusted to suit the seabed level.

The existing seabed level in the dock is not known. Should this be different to that assumed above the chain lengths and reported movements will require recalculating.

2.4 Seabed Composition

The seabed material in the dock is assumed to comprise soft, cohesive material i.e. deposited mud and silt. This is considered suitable for the use of anchor blocks.

2.5 Wave climate

There is no significant wave loading assumed as the dock is enclosed with a limited fetch for locally generated wind waves.

2.6 Live loads

A uniformly distributed load of 0.40kPA and point load of 1.00kN has been assumed. This matches the recommend guidance provided in BS EN 1991-1 Table 6.10 for a Category H roof i.e. not accessible except for normal maintenance and repair.

Ad additional load case of 3 No. persons (equivalent to 0.75kN each) on one side has also been assumed. This allows for 3 maintenance personnel or other unauthorised access.

Cormorants have been proposed as the primary users of the pontoon accessing it by flying. These birds have typical body masses of up to 5.0kg. Consequently, they are not anticipated to have any significant impact on the freeboard or stability of the pontoon. By inspection their live loading is lower than that assumed in the design.

3 Results

To achieve an initial 250-300mm freeboard with all the timber and gravel in-situ 762mm diameter tubes filled with polystyrene is required. The polystyrene will reduce the risk of the pontoon sinking should the tubes be perforated.

These tanks are to act as support for the decking with additional angles to support the planking. The tubes will be sealed with square end plates that will allow welding to the square frame that holds the deck in place.

Diagonal bracing will be attached to the end plates to secure the floatation tanks.

The freeboard and trim of the pontoon is adjustable via the addition and positioning of steel plates on the deck (these will be gravel covered). Freeboard corrections will be achieved by adding the plates at the centre of the pontoon. Trim corrections will be made by adding plates to the edges of the pontoon.

It should be noted that any reductions in freeboard beyond the assumed 250-300mm will have a disproportionate effect on reserve buoyancy due to the tube shape.

3.1 Stability

Full live load
Max total load =0,40kN/m^2 x 3m x 3m = 3.60kN

With this load the freeboard will reduce by 30mm.

With the UDL loading on one side only the heel will be in the region of 1.0° Therefore the unit is deemed stable for the expected use.

Additional point loads
Max total load = 3 x 0.75kN = 2.25kN

With this load the freeboard will reduce by 20mm.

With this loading on one side only the heel will be in the region of 1.2° Therefore the unit is deemed stable for the expected use.

3.2 Anchorage

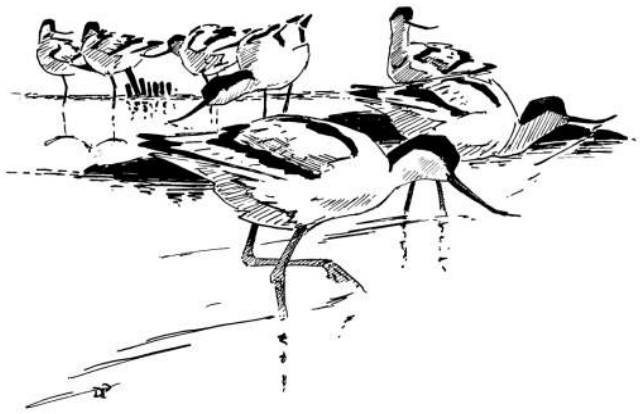
The anchor assemblies comprise catenary chains attached to sinkers positioned on the seabed. Using a 12.0m length 25kg/m catenary chain the anchor sinkers need to have a submerged weight of 250kg. This is equivalent to a dry concrete mass of 420kg or 280kg of steel.

4 Designers Risk Assessment

No.	Risk	Impact	Mitigation	Residual Risk
1	Floating structure that, though designed for wild life, will occasionally be accessed by people	Instability could result in operative having an unplanned entry to the water.	• Structure designed to have good stability will little tilt when unevenly loaded. • Operatives to wear life jackets when accessing the pontoons. • Operatives to be given adequate training/instruction as to safe working practice. • Hand railing will not be installed as that would negatively impact the purpose of the structure.	Typical risks of working near water. Suitable procedures need to be in place.
2	Floating structure is within an active area	Significant movement of the pontoons could risk other structures within the basin	• Movement kept below reasonable limit for design winds from 1:50year event • Supports on each side to take full wind load therefore there will be share capacity in the perpendicular anchors that will give appropriate safety factor.	Under extreme conditions the anchor blocks could be dragged a short distance on the seabed and may require repositioning
3	Corrosion of floatation tanks	Corrosion could eventually result in a hole in a take that would result in its loss of buoyancy	• Tanks filled with expanding foam such as even with a hole water will not be able to fill the tanks.	Significant areas of corrosion could allow the foam to be damaged and lost. An appropriate inspection regime is recommended
4	Lifting	The pontoon will have to be transferred into the water by lifting on slings.	• Structure kept to minimum weight • Tanks integral part of structure so slings under tanks during lifting not anticipated to put undue stresses into pontoon.	Typical risks of lifting large object into water. Suitable method statements would need to be produced

Appendix A – RSPB Design and Management of Rafts Note

a million voices for nature



Design of management of rafts

Rafts are a useful way of providing island habitat in areas of deep or fluctuating water levels. Their purpose is to improve breeding success by providing areas safe from flooding, disturbance or predation. Rafts are unlikely to attract terrestrial predators and so are useful where islands would be too close to shore for safety. They also provide wildfowl with loafing spots and are often used as resting places by various bird species during the winter.

Main factors to consider when making a raft

There are many conflicting requirements when constructing a nesting raft.

- The ability to float, preferably with the deck just above the water line.
- The ability to rise and fall easily with the water over the maximum flood range.
- Stability, so that the raft is not tipped or spun by current, waves or wind.
- A dry, sheltered nest site, which does not attract the attention of crows or other avian predators. The nest area must be high enough not to be swamped by storm waves.
- Means of access and some protection from waves and current for young birds.
- Harmonious blending with the surroundings if possible.
- Practical factors e.g. water not excessively deep, lake shore accessible by vehicle, for bringing in boat, raft and materials, and for regular maintenance checks.
- On SSSIs, formal consent may be required from NE, SNH or CCW.

Construction

Although rafts vary in character and design, some basic considerations apply to each.

1. Timber rafts tend to absorb water and sink, although pine or other light wood floats better than heavy timber. In most cases, additional floats must be used if the raft is to last for more than one season.

2. **Flotation blocks**: Small rafts can be floated with plastic 4.5 litre containers. Slightly larger rafts will stay afloat with 22 litre plastic drums. Rafts in the range of 1.2 - 1.8 m in dimension require closed cell polystyrene blocks, polystyrene scraps, airtight metal drums (including old oil drums). Polystyrene is easily held in place and can be adjusted to achieve right buoyancy. It should be packed into strong polythene to prevent it from breaking up and littering the environment. Metal drums need to be weighted so that they do not float too high. The flotation blocks must be thoroughly cleaned before they are brought to the site to prevent pollution. Annual checks and maintenance is important to ensure that the raft remains secure and firm, and that the flotation devices are not disintegrating or leaking.

The RSPB
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Tel: 01767 693690

The RSPB
Northern Ireland Headquarters
Belvoir Park Forest
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Tel: 028 9049 1547

The RSPB
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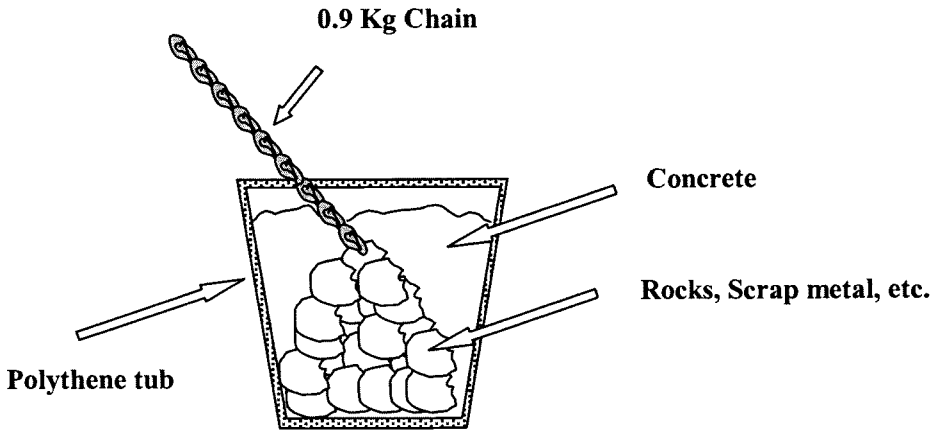
Dunedin House
25 Ravelston Terrace
Edinburgh EH4 3TP
Tel: 0131 311 6500

The RSPB
Wales Headquarters
Sutherland House
Castlebridge
Cowbridge Road East
Cardiff CF11 9AB
Tel: 029 2035 3000

3. **Anchors:** Two anchors are better than one and should be attached to opposite corners of the raft to keep it from swinging in the wind. Anchor to the bottom, not to the shore, to prevent vandalism and to keep rats or weasels from getting to the raft.
    a. Anchors can be made from breeze blocks, concrete blocks etc. The wire anchor rope should be tied to a short section of chain or to an eye bolt; for large rafts use 19 mm circumference flexible steel wire rope with a 4 ton breaking strain to ensure that the mooring is secure. An anchor weighing about 50 kg is suitable for most rafts. It can be made in a large polythene garden tub half filled with scrap metal or rocks. Wrap one end of an appropriate length of chain around the scrap and fill the tub with concrete. Once the concrete has set, the anchor can be turned out of the mould and the chain bolted to the raft. Three thickness of heavy gauge (24mm) polypropylene rope can be used instead to save money, especially if the raft is in deep water. Where strong winds or currents are likely, several 50kg anchors may be needed to securely hold a 3m x 2m turned raft.



    b. Where one large anchor is too cumbersome to manage, a smaller (e.g. 9 litre) container can be used as a mould and concrete sinkers can be cast with holes through their centres. One sinker can be fastened to the end of the wire and others can be threaded on and allowed to slide to the bottom before fixing the other end of the wire to the raft.

4. Where more than three rafts are to be moored in a string there should be some additional anchor points from the middle rafts to keep the string from sagging before a strong wind and dragging the main moorings.

5. Various nest boxes and duckling ramps can be added to the raft superstructure depending on the species of birds that the raft is intended for. Duck baskets should be at least 1.2 m apart and facing away from each other. They should be tilted slightly upwards at the front and lined with dead grass or some wood shavings. Baskets should be positioned in early January and left until early September, when they should be taken up, cleaned of nesting material and stored under cover.

Species specifications:

1. Wader and tern nesting rafts, in most cases, should be bare of vegetation and covered with a material attractive to the intended nesting species.
2. Wildfowl rafts require more vegetation. Rushes, reeds or small willows are suitable, planted either around the edges or over the deck of the raft leaving pathways to the nest box or central clearing. Plants survive best on raft designs with an open mesh or slatted platform just above the water

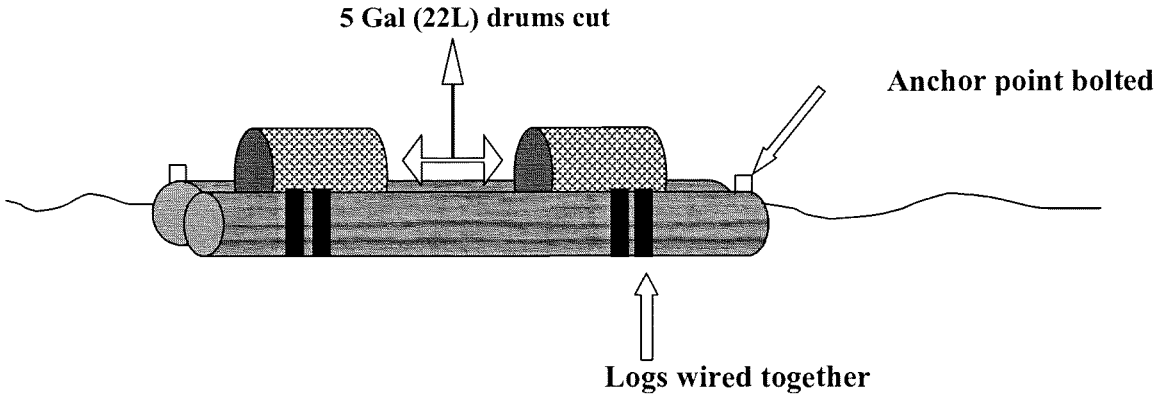
line, covered with moisture-holding mulch in which the plants can root and through which they can reach the water.

Some raft models

The area and water characteristics determine the best design for a raft. Some of the designs used on RSPB reserves are described below as a guide.

Simple log or telegraph pole rafts

Logs from nearby felling operations or used GPO poles are often available free and can be used to provide the basis both for simple rafts and more elaborate designs. Without any additional support, the timbers eventually sink low in the water and sprout a floating garden, which should prove to be attractive to nesting wildfowl if the raft is sited in a calm area.



The standard raft

This raft is made of pressure treated (do not use CCA treated) softwood and is 3 meters square. Design includes chick shelters, a re-entry ramp and an optional security fence. Buoyancy is provided by two high-density polystyrene blocks. Raft is anchored to concrete blocks by a chain attached to a marker buoy. It is covered with gravel and rocks, and any plant growth is removed each winter.

Raft platform:
Mainframe: 100x200mm timber, bolted together in each corner through overlapping ends (two upper, two lower), one top inset 150mm to allow for re-entry ramp. Deck 25x150mm planking, laid on and nailed (75mm galvanized nails) to lower mainframe timbers. Sub frame 50x75mm runners to support flotation and strengthen deck, nailed (150mm nails); main flotation holders/deck support 50x100mm runners; sides 25x150mm planking, nailed flush with top of upper mainframe timbers along the lower sides to hold in gravel etc, and flush with the bottom of the mainframe timbers along the upper sides to hold the flotation devices in place.

Buoyancy:
Blocks of 380x600x2700mm high density polystyrene foam, painted (optional) with BP Aquaseal 44 bituminous paint (as suitable for use inside cold water tanks) to water seal and strengthen the polystyrene; two optional straps per float block, 1,420mm strips of polystyrene webbing (or 50mm chair webbing as a temporary measure, eg during launching) with eyelet holes for nailing to frame. Once in the water, the weight of the raft is sufficient to hold the polystyrene in place without any additional fixings, even in extreme conditions.

Mooring:
Mooring ring bolted through center of mainframe timber (bolt fixed with two nuts so that it can swivel freely), connected preferably to a chain or a 20mm diameter hawser-lay polypropylene rope (which will not rot, but can be chafed), with hard eyes and shackles each end. Tether a 30-inch circumference marker buoy to the raft end of the chain or rope with a length of polypropylene rope to allow the raft to be detached, without having to pull up or lose the anchor.

Anchor:
Multiple small weights (up to $1m^3$ concrete as a total) for ease of transport. Four buckets 250mm high by 300mm diameter of concrete, eyebolt set in centre; weights connected in pairs by shackles to 300mm lengths of chain; fixed to mooring by placing two pairs of weights together with the connecting chains forming a cross, and attaching the mooring rope shackle to the point where the chains cross. Exposed sites where wind and waves are strong may require more anchor weights.

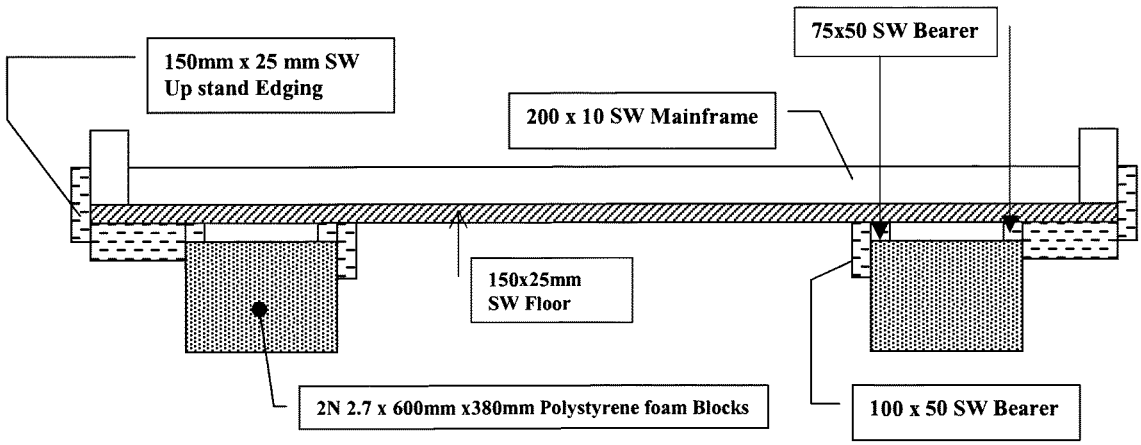
Shelters (to protect from rain):
These comprise 1m long 25x150mm planks located in opposite corners, nailed flat onto end of upper mainframe timber, side plank and 50x75mm end block.

Gravel covering:
Preferably of 15mm-25mm gravel with larger pieces and rocks to provide shelter, and give sufficient weight to push running board down to water level.

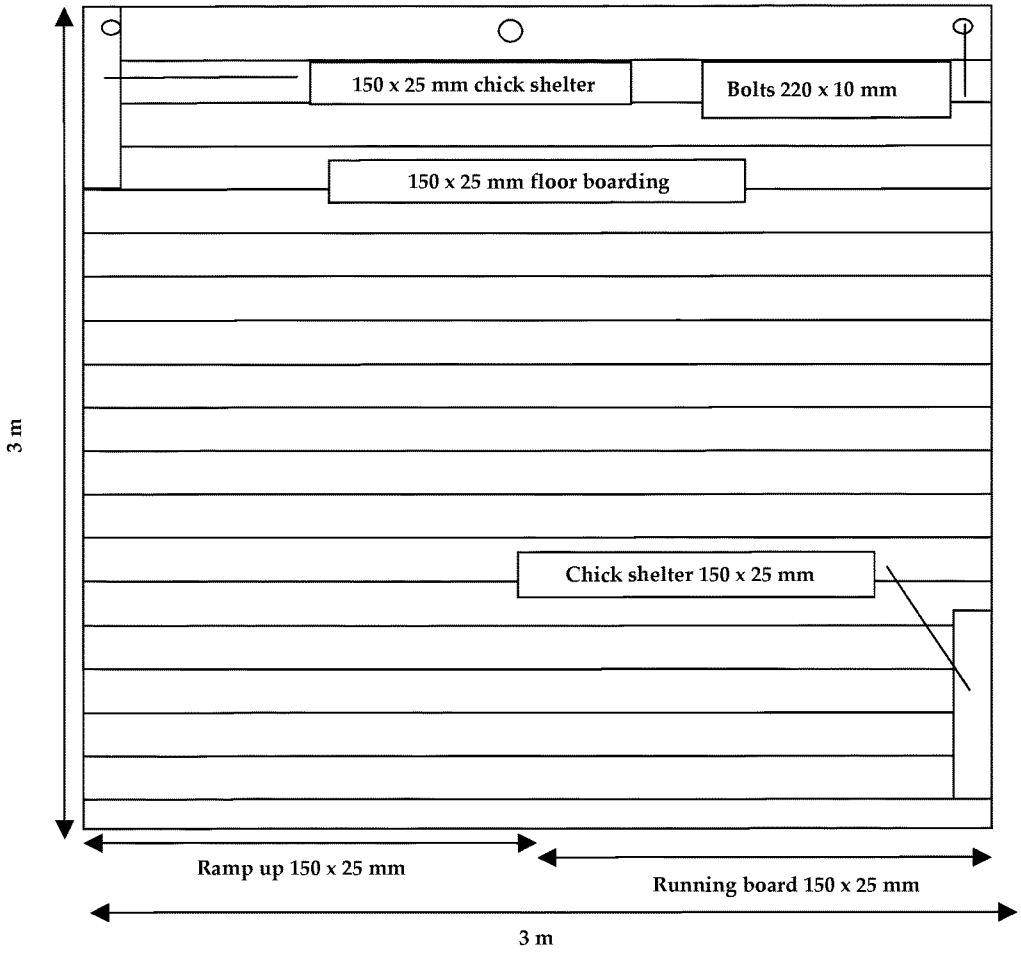
Re- entry system (for chicks falling overboard):
These are located on opposite (lee) side of raft to the mooring ring: running board 3m, 25x150mm plank nailed to bottom of the two lower mainframes. Ramp (1.5m, 25x150mm plank) sloping up to top corner of mainframe, supported by up stand, nailed. Block gap under raft behind ramp with 25x150mm skirt plank.

Optional removable security fence:
These comprise four frames 230mm by 0.3m, made from 50x50mm planks covered with 25mm chicken wire, bolted along each side and fixed at top corners.

Side view



View from above

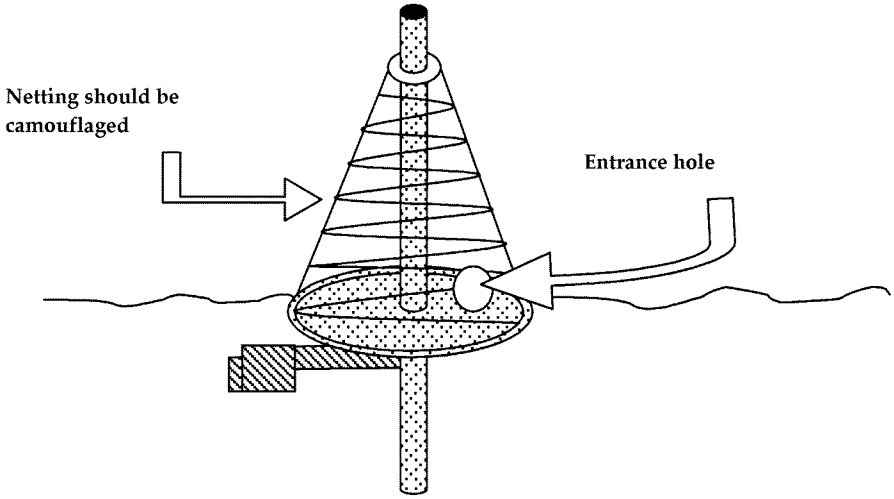


A floating wildfowl nest for use on rivers

This design, successfully used on the Ray, near Oxford, is intended to overcome the problems posed by strong currents, which make it difficult for wildfowl to nest successfully on rivers. Chick survival is best where the floating nest is sited on a quiet backwater with gently sloping banks so that, when a chick leaves the nest, it can get to the shore and climb out despite the current.

1. Drive a suitable length of 50mm diameter steel pipe into the riverbed to provide an anchor pole on which the floating nest can rise and fall with changes in water level.
2. Cut out a circular platform from marine plywood and cut a hole in its centre so that it fits over the anchor pipe.
3. Screw three boards to the circular plywood piece, so that they form an equilateral triangle to make a frame underneath the platform for the floats.
4. Strap three 4.5 litre plastic or metal tins to the triangular frame, one each side. If metal tins are used, they should be well painted with bitumen paint and coated inside with a spoonful of old engine oil before capping.
5. Attach three metal struts, evenly spaced, to the edge of the platform, joined at the upper end to a ring that fits over the anchor pipe. This upper ring, with the hole in the platform, forms the bearing on which the nest rises and falls on the pipe.

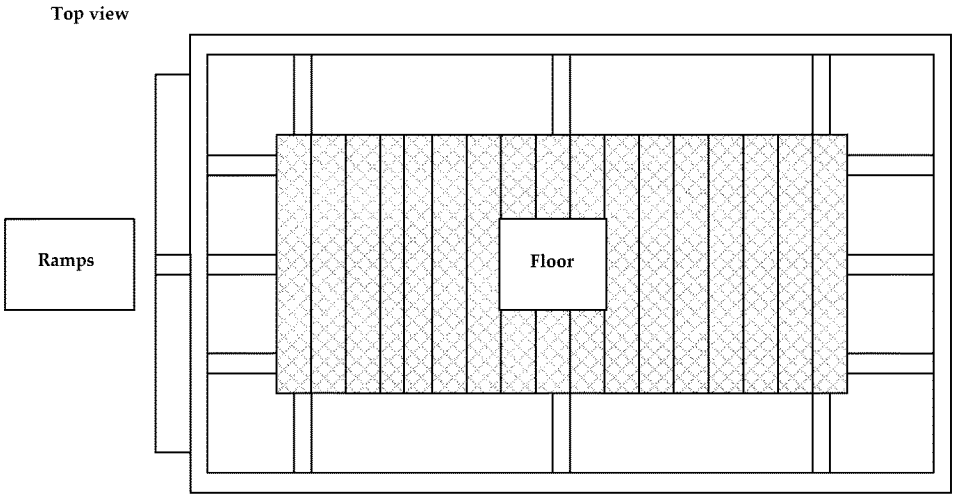
6. Fasten a conical covering of light but firm netting around the outside of the strut assembly, and use vegetation to provide some shelter. Leave a 150 mm diameter entrance on one side.
7. Slide the platform down over the pipe. If it tends to spin in the current, attach a rudder to the floats to keep it properly orientated. The entrance hole should be arranged to face the nearest bank.



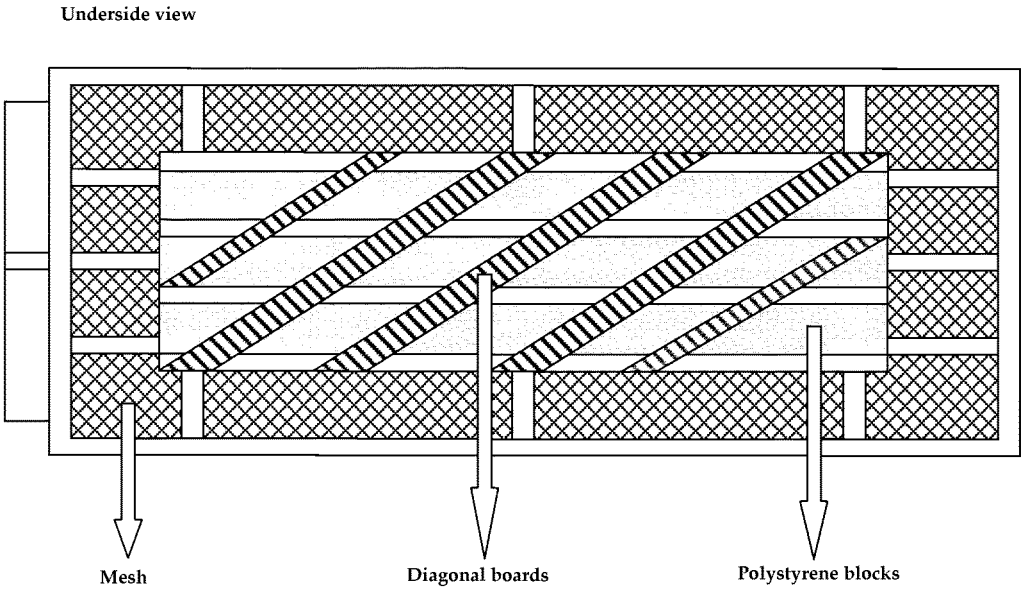
A square raft

This design is popular and has proved to be highly effective and weatherproof. Similar structures are in use in many reserves.

a. Construct a framework of 25 x 150mm boards or similar. Nail the flooring across the top of the frame leaving the margins open to take vegetation and nail duckling ramps to one end of the raft. Use galvanized nails since they do not rust.



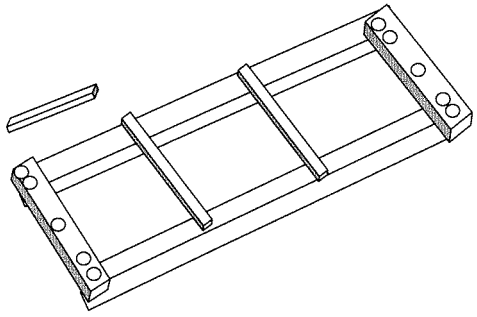
b. Turn the raft over. Staple close-mesh galvanized wire netting across the bottom of the raft, leaving the central part free to hold the flotation blocks.
c. Place 150mm thick polystyrene blocks in the uncovered centre of the frame. Hold the polystyrene in place with diagonal boards nailed across the frame.



d. Turn the raft right way up. Cut out blocks of rush, willow etc. to fit into the margins of the frame. Fit anchor bolts to two opposite corners. Fix a nesting box or basket if required. You can cover the raft with some gravel. Finally, tow the raft into the position and anchor it firmly.

A heavier variation:

The raft described below is very successful when attracting terns to nest. Bare shingle is required for the nesting, but a completely exposed raft results in high chick mortality. At about one week old, tern chicks leap overboard at the slightest disturbance. This can be prevented by providing them with small shelters to hide underneath.



1. Drill the sleepers as indicated in the diagram, using a brace and a bit, and bolt them together with eight 250mm coach bolts. Drill and fix anchor bolts in the end sleepers.
2. Drill and bolt the cross members to the side sleepers. These are required to make a rigid structure and to resist the upward pressure of the floats.
3. Nail the side battens into position; these help hold the shingle in place.
4. There are two ways to floor the raft. One is to trap plastic-coated chain link fencing, covered in heavy-duty polythene, under the cross braces. Staple the fencing firmly to the sleepers. Alternatively, nail old garage doors or other suitable sturdy timber to the cross members and spread the flooring with a layer of concrete to help keep the shingle in place.
5. Float the raft. Unless you have mechanical help, placing approximately 0.8 cubic metres of polystyrene blocks under the raft for flotation will require a number of water-hardy volunteers.
6. The amount of polystyrene needed varies with the weight of the raft so trials are necessary. Provide some extra flotation to compensate for the shingle, which is added afterwards. The polystyrene stays in place between the sleepers due to its buoyancy and should not need fastening.
7. Spread a layer of shingle over the flooring.
8. Fix ramps or walls to the rafts sides, place a shelter on it, tow it into position and anchor it by means of bolts in the end sleepers.

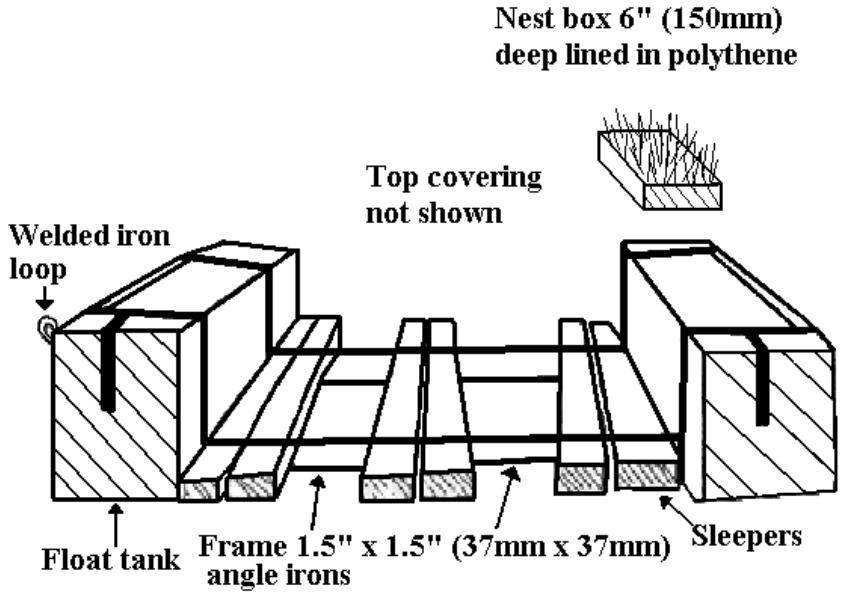
Welded Rafts

These two models were designed for the specific needs of a particular area. They require a great deal of skills and therefore are only suitable if none of the previous ones can be used. The designs shown have proved to have an estimated life of at least 12 years with minimal maintenance. These types depend on availability of suitable welding equipment and skills, and sheet-metal float tanks used by gravel companies for ferrying electrical equipment around wet pits.

Type A
Weld together three float tanks and attach a rim of logs with welded metal straps. To moor the raft, fix a wire anchor rope to a 50 kg scrap iron or concrete anchor. This simple but strong raft gives a surface area of 6.7 square metres. It successfully attracts ducks and geese, but has two disadvantages. It is so buoyant that the nest floats at least a foot above the water so that, unless a ramp is attached to help them, once the chicks leave the raft they cannot return. Soil ultimately dries out or is dislodged and must be replaced at intervals along with fresh vegetation.

Type B
This rather elaborate design features a semi-flexible welded frame, which makes the raft very durable in exposed conditions. The float tanks are the same size as in the previous design; the sleepers are topped with a grid that holds nesting cover.

Construction:
- Weld the frame together and to the float tanks. Weld two anchor bolts to opposite corners.
- Manoeuvre the completed frame into the water.
- Slide the sleepers into position. Leave gaps between the pairs of sleepers so that plant roots can reach the water.
- Cover the top of the frame's central section with narrow-mesh galvanized metal.
- Fix the nesting boxes on top of the floats
- Cover the mesh with mulch or soil and suitable plants. Plant up the nesting boxes.
- Tow the raft into position and anchor from the anchor bolts.



REPORT

IOM Ferry Terminal – Bird Pontoon

Method Statement

Client: Sisk

Reference: PB8850-RHD-ZZ-XX-RP-Z-0002

Status: Draft/P02

Date: 30 July 2019

Royal HaskoningDHV

Enhancing Society Together

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Document title:	IOM Ferry Terminal – Bird Pontoon
Document short title:	Method Statement
Reference:	PB8850-RHD-ZZ-XX-RP-Z-0002
Status:	P02/Draft
Date:	30 July 2019
Project name:	IOM Ferry Terminal
Project number:	PB8850
Author(s):	Mike Primrose
Drafted by:	Mike Primrose
Checked by:	Ben Hughes
Date / initials:	25/07/2019
Approved by:	Alistair Reid
Date / initials:	26/07/2019

Classification
Project Related

Disclaimer

Table of Contents

1 Introduction

This method statement relates to the installation of 1 No. floating pontoon in Princes Half-Tide Dock. The pontoon will form part of the Isle of Man Ferry Terminal scheme and wider Liverpool Waters Strategic Ecological Mitigation Plan.

1.1 Site Location

The site is located on the East side of Princes Half-Tide Dock is shown in Photo 1.

Photo 1 – Princes Half-Tide Dock site

The pontoon is to be moored clear of the navigation channel for the Liverpool Canal Link that extends across the West side of the dock. There is therefore no risk to navigation.

2 Pontoon and Anchor Assemblies

The pontoon will comprise a below water level welded steel frame with an above water timber covering (pressure but not CCA treated softwood timber). The design is an adaptation of ‘the standard raft’ described in RSPB document Design and Management of Rafts.

The anchor assemblies comprise steel sinkers and standard anchor chains.

All the above components will be fabricated off-site.

The topside of the pontoon will be covered in a layer of washed gravel.

3 Installation

3.1 Off-Site Fabrication

The pontoon and anchor assemblies will be fabricated off-site and transported to Princes Half Tide Dock by road.

3.2 Survey

A hydrographic survey of the dock will be undertaken to confirm the seabed level which will then allow the final mooring locations to be confirmed. In particular the water depth will allow the sinker positions and weights to be confirmed.

3.3 Lifting into the Dock

The pontoon will be lifted into the dock by a small mobile crane or HIAB, located alongside one of the quay walls.

3.4 Means of Access

A safe means of access between the pontoon and quay will be set up. Operatives working on the pontoon will also wear correct Personal Protective Equipment (PPE) which will include self-inflating life preservers at all times.

3.5 Gravel Placement

The gravel covering to the pontoon topside will be placed by hand and raked level. All gravel will be pre-washed to minimise dust.

3.6 Anchor Assembly Installation

The anchor assemblies will be attached to floatation bags and then be lifted into the dock by the mobile crane or HIAB.

A small craft will then tow each of the anchor assemblies to the anchor locations and release the sinkers. The floatation bags will remain attached to the free end of the mooring chains.

3.7 Mooring into Final Location

The completed pontoon ill then be towed to the final location by a small craft. Each of the free anchor chains will then be attached to the pontoon and the floatation bags removed and retained.

4 Maintenance

The annual maintenance of the pontoon topside is envisaged to be undertaken in-situ. Access to the pontoon will be via a small boat. The pontoon design allows for the maintenance access in terms of flotation and stability.

The anchor assemblies are not envisaged to require maintenance in the 12-year design life.

5 Decommissioning

The decommissioning of the pontoon is envisaged to be undertaken after a period of 12 years.

The pontoon will be disconnected, temporarily positioned against a quay wall and a safe means of access installed using the previously described procedure.

The gravel covering of the topside will be removed by hand and disposed of off-site.

The pontoon will then be disconnected from any further pontoons, if installed, prior to being lifted from the dock by small mobile crane or HIAB.

The pontoon will be then be disposed of off-site with transportation by road.

There are two possibilities envisaged with regards to removal of the anchor assemblies.

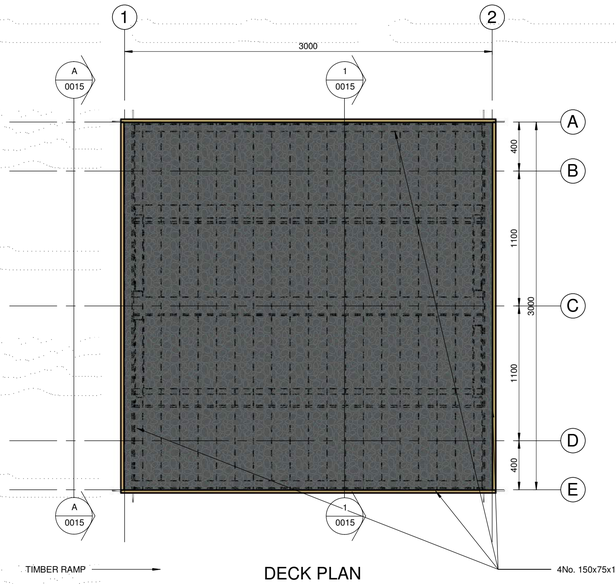
1. The sinkers on the seabed may have embedded into what is assumed to be a soft mud / silt material. If this is the case it is proposed to cut the chains at seabed level. This would leave the sinkers in place as they pose no risk to navigation or to the environment. This will also mitigate the need for any air-lifting or dredging works that would otherwise be required to extract the sinkers.

2. In the event the sinkers remain on the seabed or to a shallow embedment, it is proposed they will be lifted by floatation bag, be towed to near one of the quay walls and be lifted by small mobile crane or HIAB.

In either option the removed elements of the anchor assemblies will be then disposed be of off-site with transportation by road.

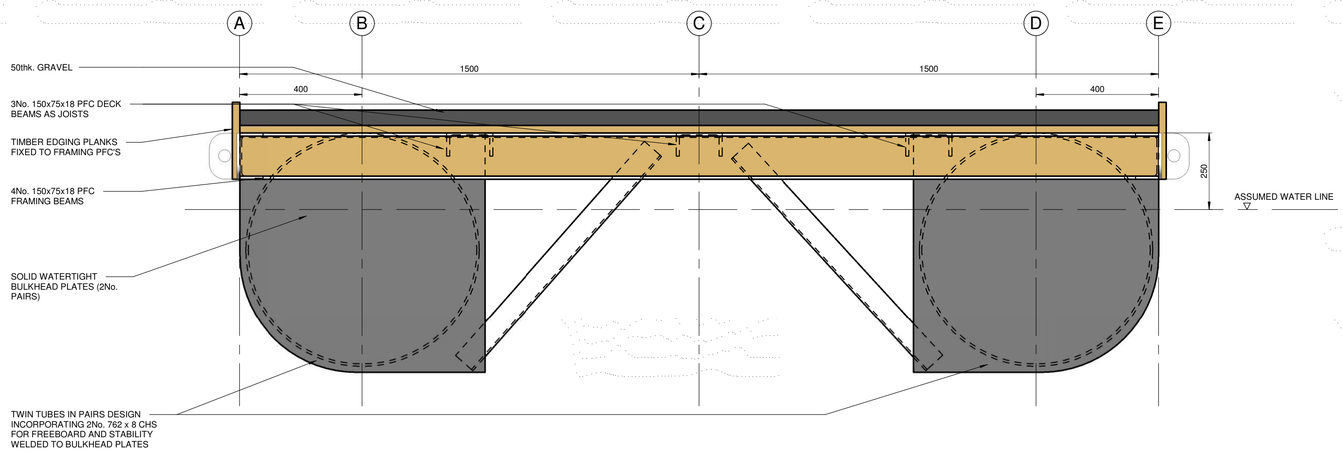
The works in the dock will be undertaken using a diving contractor operating from a quay side.

PB8850-RHD-XX-XX-DR-C-0015



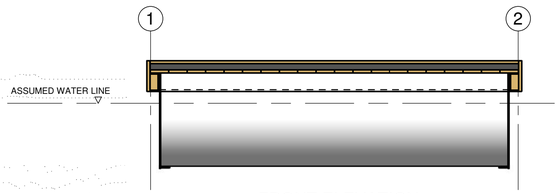
DECK PLAN

1 : 25



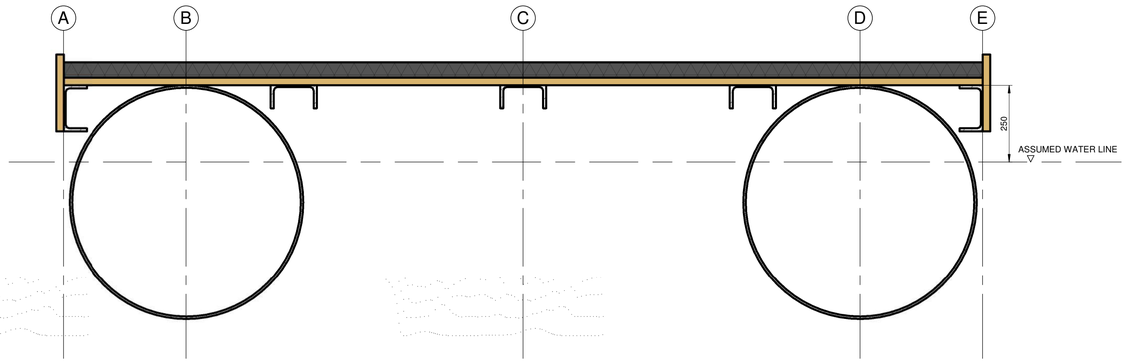
VIEW ON A

1 : 10



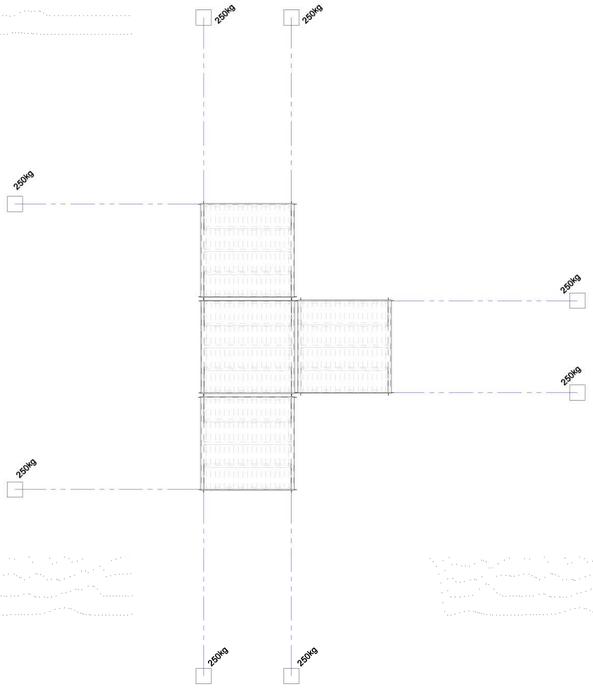
FRONT ELEVATION

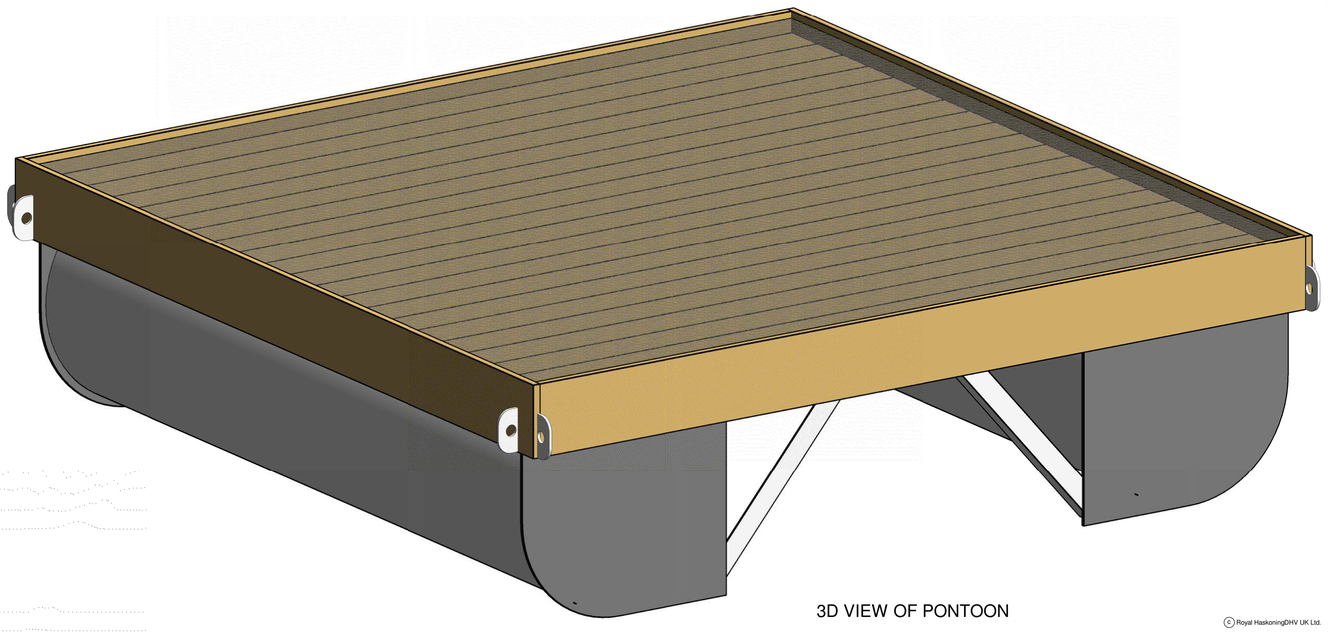
1 : 25



SECTION B-B

1 : 10





3D VIEW OF PONTOON

NOTES

1. THIS DRAWING SHOWS A CONCEPTUAL GENERAL ARRANGEMENT FOR THE PROPOSED COMPENSATORY HABITAT PONTOON.
2. ALL DIMENSION IN MILLIMETERS
3. STEEL S2 75 WITH C5-M DURABILITY HIGH COATING TO BS EN 12944.
4. TUBES TO BE FILLED WITH CUT POLYSTYRENE BLOCKS
5. 8No. ANCHOR BLOCKS AND CHAINS TBC BASED ON FINAL WATER DEPTH.
6. ALL WELDS TO BE 6mm FILLET WELDS.
7. GRAVEL TO BE NOMINALLY 50THK. 20mm SINGLE SIZED PRE-WASHED.

REV	DATE	DESCRIPTION	DRW	CHK	APR
P1.0	12.07.2019	FIRST ISSUE	DD	MP	AR

REVISIONS

CLIENT

BUILDERS SISK CONTRACTORS Established 1859

PROJECT

ISLE OF MAN FERRY TERMINAL

TITLE

PONTOON GENERAL ARRANGEMENT

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Liverpool L3 9NG
Tel: +44 (0)151 236 2944
Email: info@rhdhv.com
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Royal HaskoningDHV
Enhancing Society Together

DRAWN	CHECKED	APPROVED
DD	MP	AR

DATE	SCALE AT A1	REF.
07/10/19	As indicated	

DRAWING No.	SUITABILITY	REVISION
PB8850-RHD-XX-XX-DR-C-0015	S3	P1.0

C. Dust, Noise and Vibration Monitoring Sheets

DUST MONITORING RECORD SHEET

Date of monitoring:

Weather:

Name of person undertaking monitoring:

Monitoring position	PM_{10} level recorded			TSP level recorded			Start Time	Thresholds exceeded?	Source and/or Activities
	Min	Peak	Av. (15 min)	Min	Peak	Av. (15 min)			
1.									
2.									

EVALUATION (to be completed during every monitoring visit)	
Have any complaints been received? Comments:	Y / N
Is action needed to mitigate dust? If not why not? Comments:	Y / N

REMEDIAL ACTION (to be completed if action is required)	
Discussion Details of action to be undertaken:	
Has action been satisfactorily implemented? Comments:	Y / N

NOISE MONITORING RECORD SHEET

Date of monitoring:

Name of person undertaking monitoring:

Monitoring position	Noise level recorded, dB	Time	Action Level	Level exceeded?	Source / Observations
1.					
2.					

EVALUATION (to be completed during every monitoring visit)	
Have any complaints been received? Comments:	Y / N
Is action needed to mitigate noise? If not why not? Comments on action required:	Y / N

REMEDIAL ACTION (to be completed if action is required)	
Discussion Details of action to be undertaken:	
Has action been satisfactorily implemented? Comments:	Y / N

VIBRATION MONITORING RECORD SHEET

Date of monitoring:
Name of person undertaking monitoring:

Monitoring position	Vibration level recorded, ppv	Time	Action level exceeded?	Source / Observations
1.				
2.				

Note: Action Level is 1-3 mm/s.

EVALUATION (to be completed during every monitoring visit)	
Have any complaints been received? Comments:	Y / N
Is action needed to mitigate vibration? If not why not? Comments on action required:	Y / N

REMEDIAL ACTION (to be completed if action is required)	
Discussion Details of action to be undertaken:	
Has action been satisfactorily implemented? Comments:	Y / N

D. Site Review Record Sheet

FORM A: SITE REVIEW RECORD SHEET

(To be completed in conjunction with Form B)

Date of site visit: **Time:** **Name of person undertaking visit:**

Checklist:

Issue	Observation	Required Action (numbered)
General		
What activities are currently being undertaken at the site?		
Does the site appear clean and tidy from the outside? Including hoarding, viewing apertures, entry points, pedestrian signs, pavement ramps etc.		
Can all road signs/names be seen?		
Is the reception clearly signed and does the receptionist know how to deal with unexpected visitors? Were you escorted to the person you are visiting?		
Is the site clean and tidy internally?		

Issue	Observation	Required Action (numbered)
Are all site facilities within the site boundary?		
Are site operatives using the correct rest facilities (ie not congregating in public areas?)		
Are site operatives aware of the Site Environmental Policy and how it relates to them?		
Are site operatives appropriately dressed and is the radio ban being enforced?		
Does the main contractor operate an Environmental Management System?		
Has the site registered with the Considerate Constructors Scheme? If yes, has a minimum score of 24 been achieved?		
Does the main contractor have an environmental materials policy, used for sourcing of construction materials to be utilised on site.		

Issue	Observation	Required Action (numbered)
Is floodlighting limited to working hours and shielding in place where light may cause a nuisance?		
Energy / CO_2		
Are there any energy saving measures in place on the site?		
Is onsite energy use / CO2 produced from onsite energy use being monitored, recorded and reported monthly. Who is the named individual responsible for this?		
Is the distance travelled by transport to and from the site being monitored to enable CO2 emissions to be calculated? Is this recorded and reported monthly?		
Public Relations and Community Liaison		
Have any complaints been received from the public or neighbours? If so, give details.		
Are gates kept closed and entry points manned?		

Issue	Observation	Required Action (numbered)
Are pedestrian walkways signed and clear of obstructions and allow access for mobility impaired people or people with sight/hearing difficulties?		
Is the vehicle routing both on and off site being followed?		
Are vehicles queuing to access the site and are vehicles waiting to enter or leave the site switched off?		
Is wheel washing and street sweeping being undertaken and is it effective at reducing mud on the roads?		
Water and Wastewater Management		
Is a drainage plan held on site and methods of preventing silt and oils from entering the drainage system in use?		
Are there any unauthorised discharges?		
Is water use being minimised and monthly water consumption figures being recorded?		
Bulk Chemical / Fuel Storage		

Issue	Observation	Required Action (numbered)
Are liquids stored appropriately i.e. bunded and labelled?		
Is there any evidence of spillages? Are spill kits available?		
Are drip trays being used to fill small containers?		
Are deliveries of fuel and oil supervised and fuelling points protected from vandalism?		
Are there stockpiles of material on the site? If so, where and are they appropriately stored to prevent damage/theft etc?		
Waste Management		
What types and quantities of waste are collected on site?		
Are records being kept to show the amount of waste collected and how much is being reused or recycled?		

Issue	Observation	Required Action (numbered)
Are waste certificates and other documents in order (Hazardous Waste Consignment Notes / Waste Transfer Notes)?		
Air Quality		
Are lorries sheeted when leaving the site?		
Are any dust clouds observed? If so, where?		
Have dust action levels been exceeded? If so, give details.		
Noise and Vibration		
Can noise be heard as the site is approached? If so, where is it coming from?		
Is a sign displayed prominently detailing the Contractor, contact details for complaints etc?		
Have noise action levels been exceeded? If so, give details		
Have vibration action levels been exceeded?		

Issue	Observation	Required Action (numbered)
If so, give details		
Have any statutory bodies visited the site? Council (EHO), Environment Agency etc.		
Are there any incidents recorded in the environmental incidents logbook?		
Other		
Other observations:		

FORM B: ENVIRONMENTAL ACTIONS SHEET
(To be completed in conjunction with Form A)

For the attention of **(Name of Contractor)**

All **actions** arising from the site visit on are numbered below and should be rectified immediately. Confirmation should be forwarded to the Project Manager **within the time specified** using this form

Required Action number	**Description of how Action has been rectified**	**To be auctioned within the following timescale**

Signed: Print name:

Date:

Please forward to the Project Manager

E. Adaptive Management Plan

Liverpool Cruise Terminal

Ecology Adaptive Management Plan (Cormorants)

December 2019

Waterman Infrastructure & Environment Limited
Second Floor, South Central, 11 Peter Street, Manchester, M2 5QR, United Kingdom
www.watermangroup.com

Client Name: Liverpool City Council
Document Reference: WIE12464-100-17-3-1
Project Number: WIE12464-100

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS OHSAS 18001:2007)

Issue	Date	Prepared by	Checked by	Approved by
First	July 2019	Niall Machin Associate Director	Gavin Spowage Associate Director	Gavin Spowage Associate Director
Comments		Incorporates conclusions of meeting with Peel, Arup and LCC on 2nd July to agree strategic approach to cormorant mitigation.		
Second	August 2019	Gavin Spowage Associate Director	John Hughes Regional Director	John Hughes Regional Director
Comments		Incorporates monitoring methodology from Arup		
Third	October 2019	Gavin Spowage Associate Director	John Hughes Regional Director	John Hughes Regional Director
Comments		Incorporates Natural England's consultation comments		
Fourth	December 2019	Gavin Spowage Associate Director	Niall Machin Associate Director	Niall Machin Associate Director
Comments		Incorporates Natural England's further consultation comments		

Disclaimer

This report has been prepared by Waterman Infrastructure & Environment Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

Contents

1. Introduction

1.1. This Adaptive Management Plan has been produced in response to Natural England's responses to recent planning, marine licence and harbour revision order applications affecting Liverpool Docks, notably the new **Liverpool Cruise Terminal** and the **Isle of Man Ferry Terminal**.

1.2. Waterman Infrastructure & Environment Ltd (Waterman) was commissioned by Liverpool City Council (LCC) and the Isle of Man Government Department of Infrastructure to prepare ecological advice in relation to both the construction of the new Liverpool Cruise Terminal and the Isle of Man Ferry Terminal.

1.3. For the Liverpool Cruise Terminal, this Plan supports the discharge of planning condition 8 (planning application ref: 17O/3230) in relation to minimising the adverse impacts on the population of cormorants *Phalacrocorax carbo* a component species of the bird assemblage feature of Liverpool Bay Special Protection Area (SPA). In relation to Planning Condition 8 and the cormorant Ecological Conservation Management Plan (ECMP), Natural England (NE) have recommended (letter dated 30th May 2019, ref 19DIS/0919) that an Adaptive Management Plan (AMP) is provided:

> *" to set out how monitoring will be undertaken, what additional actions may be required in order to deliver successful mitigation (e.g. movement of the pontoon), and also to consider the long term validity of the mitigation"*

1.4. NE reiterated this advice in their consultation response to the subsequent applications for a Marine Licence and Harbour Revision Order (letter dated 10th June 2019, ref 280851 & 280784)

1.5. For the Isle of Man Ferry Terminal, the provision of an Adaptive Management Plan (AMP) has been requested to discharge Planning Condition 26 (planning application Ref: 18F/3231) and the Marine Licence condition 5.2.10 (Marine Licence application Ref: L/2019/00239/1):

> Planning Condition 26 - "*No development shall commence until an Ecological Conservation Management Plan (ECMP) has been submitted to and approved in writing by the Local Planning Authority. The ECMP (…) should (…) include the following details: (..) ii) The provision of an Adaptive Management Plan (AMP) setting out the arrangements for monitoring the usage and effectiveness of the proposed mitigation and arrangements for ensuring any adaptations reasonably necessary to improve the success of the mitigation measures with respect to cormorants will be provided;*
>
> Marine Licence condition 5.2.10 - *"An Adaptive Management Plan (AMP) relating to the Cormorant Mitigation Plan (CMP) must be submitted to MMO prior to the commencement of any activity included with this licence. The AMP must ensure that appropriate monitoring, review and adaptation of the mitigation measures described in the CMP will be provided. This must be submitted at least 6 weeks before the scheduled installation of the pontoon detailed in condition 5.2.9. Monitoring reports must be provided to MMO at the intervals as determined within any agreed AMP.*

1.6. Earlier this year, Waterman produced plans for a permanent floating pontoon to provide roosting/resting opportunity for cormorant. It would be located in Princes Half Tide Dock and be sufficiently large as to provide mitigation for a number of schemes in the docks including Liverpool Cruise Terminal, Isle of Man Ferry Terminal, the Northern Link Road and, potentially, the C02 proposals.

1.7. The design and location details for the floating pontoon were set out in the respective Technical

Notes for each of the schemes (WIE12464-100-TN-14-2-2 for Liverpool Cruise Terminal and WIE13897-100-TN-10-2-1 for the Isle of Man Ferry Terminal).

1.8. The first pontoon was installed in Princes Half-Tide Dock in October 2019 as part of the mitigation measures required for the Isle of Man Ferry Terminal development. A second pontoon is proposed to be installed next to the first prior to the commencement of demolition and construction works for the Liverpool Cruise Terminal development.

1.9. A strategic approach to cormorant mitigation within the overall Liverpool Waters area is being coordinated by Arup on behalf of Peel Land & Property (Ports) Ltd, although at the time of writing this strategic approach has not been finalised. Nevertheless, the provisions within this Adaptive Management Plan are covered by and conform with the emerging overarching strategic approach.

1.10. Adaptive Management Plans are tools for improving resource management by learning from outcomes ('learning by doing'), usually through a partnership of stakeholders. This Plan is supported by the following organisations:

- Liverpool City Council
- Natural England
- Merseyside Environmental Advisory Service (MEAS)
- Peel Land & Property (Ports) Ltd
- Isle of Man Government Department of Infrastructure

1.11. The objective of this AMP is to ensure that the proposed cormorant specific mitigation remains valid, appropriate and compliant with the Habitat Regulations throughout the lifetime of the development. The AMP enables co-ordinated, appropriate and timely actions to be implemented in response to potential issues that may arise from other relevant, adjacent developments. This AMP will form part of a strategic and more collective approach to mitigation in the wider area that will be adopted in the long term, as part of other developments that may impact upon the designated sites and their interest features in the vicinity.

2. Cormorant Monitoring Approach

2.1. The pontoons are considered suitable to provide roosting habitat for cormorant in the non-breeding season. Other species, such as herring, lesser-black-backed and black-headed gulls and oystercatcher will use a wide range of roosts and the pontoons also provide suitable habitat for these species.

2.2. In addition, in future, monitoring will be extended to cover the operational Liverpool Cruise Terminal: this will assess the extent to which cormorants are using features of the operational terminal (e.g. deck bracing, mooring dolphins etc) as set out in the Habitat Regulations Assessment (HRA)[1].

2.3. In order to determine if and how cormorants are using the new pontoon facilities a 5 year programme of annual monitoring is being undertaken. This commenced shortly after the first pontoon was installed in October 2019. All surveys are being undertaken by an experienced ornithologist and will eventually be coordinated by Arup on behalf of Peel Land & Property (Ports) Ltd. The surveys will be completed as part of Arup / Peel's programme of ecological monitoring of the wider Liverpool Waters site. **However, for the first year[2], the monitoring is specific to the mitigation pontoons themselves (with any additional data and evidence from the wider survey work used to support the monitoring).**

2.4. The monitoring is being undertaken by Waterman, initially solely on behalf of the Isle of Man Government. Once the second pontoon is installed, Waterman will continue to monitor the pontoons on behalf of both the Isle of Man Government and Liverpool City Council.

2.5. To assess the success of the Liverpool Cruise Terminal mitigation, previous bird survey data collected for the Liverpool Cruise Terminal site will be used as a baseline to identify if numbers have declined and if any there have been any negative impacts on the populations using the site.

2.6. The monitoring methodology will include four visits per month between September 2019 and March 2020 inclusive, two during high tide and two during low tide to monitor bird numbers using the rafts and the site. A suitable vantage point will be selected which is safe for the surveyor due to active construction being undertaken on the site, but also allows for a clear sight on the rafts and the wider site area. Both high and low tide surveys will start two and a quarter hours before high/low tide and end a quarter of an hour after high/low tide (i.e. duration of 2.5 hours). Paired visits (high and low tide) will be undertaken on the same day where possible (or if not, consecutive days) during daylight hours.

2.7. **Table 1** details the peak numbers (peak number of individuals recorded at one time, seen together) of cormorants using the site over four months (a total of 18 surveys) during autumn/winter. This shows that only low numbers of individuals are using the area, with a peak count of 12 birds on the 31st October high tide count.

Table 1: Peak cormorant numbers recorded at the Liverpool Cruise Terminal site during winter and passage 2017-2018[3]

Date	Oct 17	Nov 17	Dec 17	Jan 18
No. of cormorant	12	8	10	5

[1] Waterman 2019. Information to inform a Habitat Regulations Assessment (HRA) Appropriate Assessment, ref WIE12464-100-11-3-2-AA
[2] For LCT, the first year would be winter 2020/21 as the LCT pontoon is not being installed until spring 2020
[3] Liverpool Cruise Terminal. Wintering Bird Surveys. APEM January 2018 Ref P00001343

2.8. The trigger point for the rafts to be revised or relocated will be where the bird monitoring shows that there is a decrease in numbers utilising the rafts or surrounding area. Peak monthly counts for the Site noted an average of just under 9 individuals using the Site. The lowest peak count in any month was five individuals recorded using the Site (in January).

2.9. The high and low tide counts covering 18 visits recorded zero cormorants on-site on two occasions (both high tide), and only 1 bird on another occasion (at low tide). The lowest sequence was three consecutive visits when six cormorant used the Site (occurred twice).

2.10. The trigger point for initial action of further investigation will be if **no cormorants are using the pontoon in any one month**. This is a simple and clear trigger and has been endorsed by Natural England.

2.11. In terms of initial action following the trigger point, the ecologists will make an assessment of likely contributory factors, which would involve (but not be restricted to);

- Studying weather patterns (e.g. has adverse or unseasonable weather impacted numbers?);
- Making a visual inspection of surrounding land and land uses (and making inquiries of relevant authorities) to ascertain if any activities are occurring, or have recently occurred, that may have displaced cormorant (e.g. canoeing, boating, fireworks, dock repair works, building development etc); and
- Consulting the local ornithological groups to ascertain if additional information is available on cormorant numbers locally on the River Mersey (increasing or decreasing).

2.12. Where the trigger point occurs, monthly monitoring for the following month will be increased to 6 visits per month to help better understand trends and the causes of the reduction and what further action, if any, may be required.

2.13. Depending on the outcome of action set out in paragraphs 2.11-2.12 above, the project ecologists may also notify LCC where they consider that changes to the rafts may be required (e.g. size, design, location) and also subsequently input into a specification to procure a contractor to make such changes.

2.14. Success of the monitoring programme will be identified where the monthly peak count averages six or more cormorants using the rafts and site during September to March period: this will be assessed by the project ecologists, acting on behalf of the Isle of Man Government Department of Infrastructure and Liverpool City Council, at the end of the first year of monitoring results to assess the success of the pontoon mitigation (see also 2.22 below). As part of the first year review, we will also undertake a review of annual peak means against the baseline to check there is no downward trend, e.g. if the birds are present but in dwindling numbers.

2.15. Where rafts require relocation as part of the AMP this will be implemented and maintained by Liverpool City Council in collaboration with other interested parties (e.g. Peel; Isle of Man Government Department of Infrastructure), and an amended monitoring period will re-start from when the rafts are moved. Other measures of success would include: target species using the pontoons and not being disturbed e.g. by boat traffic or other human activity; no non-target species recorded to be using the pontoons (e.g. Canada geese); and structural success in terms of the pontoons remaining in place and not having failed e.g. sinking etc.

2.16. Where pontoons or posts are deemed to have failed or require additional maintenance, repair or replacement will be carried out preferably during late winter or early spring before birds start to nest

and wintering bird activity is low. Where deemed necessary through monitoring, additional mitigation may be installed, or locations may need to be changed to maximise the effectiveness.

2.17. The results of the 5-year monitoring programme would be written up in an annual report for the client and shared with Natural England and other relevant stakeholders. The annual report would make recommendations about the success of the pontoon in terms of its intended cormorant mitigation role.

2.18. Monitoring of the physical condition of the pontoons will also be undertaken, most likely at the same time as the ornithological surveys. The floating pontoon design is expected to have a minimum estimated life of 12 years with minimal maintenance. As per RSPB guidance, yearly maintenance of the floating pontoons will be carried out. Resurfacing of the floating islands will be necessary if they are to remain attractive for birds every year. It will also be vital to remove the excess of droppings which can build up over the course of the year.

2.19. Where pontoons are deemed to have failed or require additional maintenance, repair or replacement will be carried out preferably during late winter or early spring before birds start to nest and wintering bird activity is low. Where deemed necessary through monitoring, additional mitigation may be installed, or locations may need to be changed to maximise the effectiveness.

2.20. Further adaptive measures may also be required to minimise disturbance, for example through control of boat traffic.

Programme

2.21. Arup have proposed within their Liverpool Waters Strategic Ecological Mitigation Plan (LW SEMP) Interim Note that the monitoring of the cormorant mitigation pontoons will be included within the annual surveys being undertaken across the entire LW scheme (as included within the LW Neighbourhood Ecological and Biodiversity Strategies (NEBS)). This will include monitoring for wintering/passage birds including high water and low water surveys and also monitoring for breeding birds (e.g. ringed plover, little ringed plover, lapwing) and foraging common tern. The NEBS produced for Central Docks (where the cormorant pontoons will be / are located) in July 2019 (provided in **Appendix A**) and for Princes Docks (where the Liverpool Cruise Terminal site is) in May 2018 (provided in **Appendix B**) outline the surveys that will be completed including, duration, timing and methodology.

2.22. However, as stated in para 2.3 above, specific monitoring of the cormorant mitigation pontoon itself would be carried out in Year 1. At the end of Year 1, the monitoring approach and data would be reviewed in terms of the approach to Years 2-5 and how this fits with the wider strategic monitoring and action detailed within the future LW SEMP.

2.23. Section 2 of the Central Docks NEBS sets out specific methodologies for the following surveys:

- Section 2.2: Breeding birds, including specifically little ringed plover and black redstart;
- Section 2.3: Wintering and passage bird surveys, including cormorant; and
- Section 2.4: Common tern surveys.

2.24. Section 2 of the Princes Docks NEBS sets out specific methodologies for the following surveys:

- Section 2.1: Breeding birds, including specifically peregrine and black redstart;
- Section 2.2: Wintering and passage bird surveys, including cormorant; and
- Section 2.3: Common tern surveys.

3. Review of Projects

3.1. In tandem with the annual bird surveys, a review of planning applications which may impact upon the docks and cormorant ecology would be undertaken.

3.2. This would include reviewing scheme mitigation plans and reviewing whether the cormorant mitigation installed to date requires any alteration.

4. Adapting the Mitigation

4.1. The Adaptive Management Plan table of issues and responses, set out below, would be maintained. Data from the annual bird surveys and the planning application reviews would be fed into this table and appropriate remedial measures identified and implemented.

4.2. Implementation measures may involve a range of clients/stakeholders, including those signed up to this Plan.

Table 1: Adaptive Management Plan

Issue	Evidence	Remedial action	Timetable	Responsibility
Describe issue, e.g. damaged pontoon side	*Describe evidence, cite source, e.g. winter bird survey (date)*	*e.g. repairs required*	*Date*	*E.g. Liverpool City Council*

4.3. The Adaptive Management Plan will be issued to Natural England on an annual basis for review and approval.

Appendices

Appendix A: Central Docks Neighbourhood Ecological and Biodiversity Strategy

Peel Land & Property (Ports) Ltd.

Central Docks Condition 16

Neighbourhood Ecological and Biodiversity Strategy

0-15-08

Issue | 23 July 2019

Job number 266384-00

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ARUP

Document verification

ARUP

Job title		Central Docks Condition 16			**Job number** 266384-00
Document title		Neighbourhood Ecological and Biodiversity Strategy			**File reference**
Document ref		0-15-08			
Revision	**Date**	**Filename**	Central Docks NEBS.docx		
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			Prepared by	Checked by	Approved by
		Name	Amy Martin/Joseph Shepherdson	Rory Canavan	Rory Canavan
		Signature			
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			Prepared by	Checked by	Approved by
		Name	Amy Martin	N/A	N/A
		Signature			
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			Prepared by	Checked by	Approved by
		Name	Amy Martin	N/A	N/A
		Signature			
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			Prepared by	Checked by	Approved by
		Name	Amy Martin	N/A	N/A
		Signature			
				Issue Document verification with document	✓

Contents

Executive Summary

Outline consent for the Liverpool Waters Scheme was granted in June 2013, subject to a total of 77 planning conditions. Condition 16 of the Liverpool Waters Outline Consent (10O/2424) states:

"*Prior to the submission of the first application for any reserved matters approval in each respective neighbourhood, an Ecological & Biodiversity Strategy based on the Principal Application Documents and Detailed Neighbourhood Masterplan that relates to that particular neighbourhood and has regard to the wider application site shall be submitted to and approved in writing by the Local Planning Authority. The strategy shall summarise the means of safeguarding all protected species of relevance and supporting habitats during construction and operation within the respective neighbourhood including consideration of pathways to protected European sites by the following measures:*

i. *The means, method and timeframe for carrying out updated bird surveys and impact assessments for bats and migratory and/or over wintering birds;*
ii. *The methodology and timeframe for carrying out (seasonal) monitoring of fish and other water species within the dock system;*
iii. *Working practices to address phasing of construction, construction vehicles, routing and speed limits during removal of existing buildings, vegetation and other suitable breeding habitats;*
iv. *Details of habitat creation;*
v. *Design of buildings and spaces in terms of layout, design, materials and lighting to avoid creating barriers to bird migration and aviation and reduce risk of bird strikes particularly in relation to tall buildings;*
vi. *Means and methodology for the monitoring and management of water quality within the dock system which shall inform mitigation to safeguard fish and other water species, including the aeration of dock water spaces;*
vii. *Methods for controlling leisure boat activity within the dock system;*
viii. *Methods for controlling gulls and pigeons roosting on buildings;*
ix. *Mechanisms for monitoring and reviewing the effectiveness of agreed ecological and biodiversity mitigation against identified targets and means for enhancing mitigation where those targets are not met; and*

Mechanisms to ensure protection of Sefton Coast SAC (Seaforth Docks to Formby Point) from recreational disturbance overseen by the Liverpool Waters Coordination Panel in accordance with Schedule 6 of this permission."

This document presents the Neighbourhood Ecological and Biodiversity Strategy for the Central Docks Neighbourhood (Neighbourhood C). The strategy relates to the Central Docks Neighbourhood and has regard to the wider Liverpool Waters application site. The strategy summarises the means of safeguarding all protected species of relevance and supporting habitats during construction and operation

within the respective neighbourhood. This includes consideration of impact pathways to European designated sites.

The strategy is intended to provide guidance in relation to ecology and biodiversity for all reserved matters applications within the neighbourhood and addresses Condition 16.

1 Introduction

1.1 Background

This strategy has been produced to discharge a planning condition under Part C of the Liverpool Waters (LW) scheme (Planning Application reference: 10O/2424). The LW scheme, which secured outline consent on the 19th of June 2013, covers an area of 60 hectares of former dockland located along Liverpool's Waterfront. The project will provide a mixed-use development of up to 1,691,100 sqm. The outline planning consent is split into multiple parts:

- **Part A-** Overall Development Quantum and Parameters
- **Part B-** Time Limits
- **Part C-** Information to be submitted prior to the submission of applications for reserved matters approval
- **Part D-** Details to be provided with Reserved Matters Applications
- **Part E-** Compliance Conditions

Across parts A to E there are a total of 76 conditions within the outline consent (originally 77, see s96a section for further details). 16 of these are pre-commencement conditions which therefore require discharging prior to any submission of detailed reserved matters applications (i.e. a specific development plot). These conditions are listed within Part C of the outline consent.

In June 2018, these 16 conditions were discharged for Princes Dock (Neighbourhood A) to allow for reserved matters applications to come forward for development in this neighbourhood alone. Each condition required a strategy to be produced which provided high level information on how specific requirements would be met.

To progress development within Central Docks (Neighbourhood C), Peel Land and Property are seeking to discharge these 16 pre-reserved matters conditions for this neighbourhood. The following strategy sets out the information required to discharge a pre-reserved matters condition for Central Docks, Liverpool Waters.

1.2 Consultees

Where relevant, advisory or statutory consultees have been engaged with during the production of the strategy. Additionally, liaison has taken place across all conditions between other sub-consultants to ensure each condition conforms to all other relevant conditions.

1.3 Standalone Applications

There have been several consents for developments within Central Docks. These developments have come forward as standalone applications and although measures have been considered to ensure general conformity with the outline

consent, they have not directly followed the LW process. Due to the definition of "committed development" only the standalone applications which have commenced on site can be considered and referenced within the condition strategy. For clarity these are:

- C04 – C06 (17F/1628)
- Northern Link Road (17F/2628)

Developments which have been determined but have not commenced:

- Isle of Man (18F/3231)

Developments which are currently being determined for planning are:

- C02 (18F/3247)
- District Heating Network, Phase 1 Part 2 (19F/0079)

As these applications have not been granted consent, they only hold limited weight and are not classed as committed development. Where relevant, these have been considered within the strategy but reference to the original outline consented plots for these emerging developments is still made where needed.

1.4 Part D Conditions

The following strategy has been produced to discharge Part C conditions, as such, it sets a high-level strategy for the Central Docks Neighbourhood. Further detail will be provided through the discharge of Part D conditions '*Details to be provided with Reserved Matters Applications*'. Therefore, Part C conditions will establish the strategy, and Part D conditions will provide further details when reserved matters applications come forward.

1.5 S96a Amendment Application (18NM/2766)

In November 2018, a non-material amendment was consented for the Liverpool Waters Outline Consent. The amendments included:

1. Liverpool Waters Parameter Plan Report (November 2011) to Liverpool Waters Parameter Plan Report (October 2018), where changes within the document include:
    - PP003 Phasing Plan
    - PP004 Development Parcels
    - PP005 Development Plots
    - PP006 Building Heights
    - Illustrative Masterplan
2. **The wording of Condition 3:**

The development hereby approved shall only be implemented in general conformity with the following submitted application documents (The Principal Application Documents):

- Updated Planning Application form (November 2011);
- Statement of Key Development Principles (November 2011);
- LW Parameter Plan Report (incorporating Parameter Plans) (October 2018)
- Design and Access Statement (November 2011);
- Building Characterisation & Precedent Study (November 2011) ("BCPS");
- Public Realm Characterisation & Precedent Study (November 2011) "(PRCPS)";
- Conservation Management Plan for the Protection, Conservation and
- Preservation of Heritage Assets (November 2011);
- Liverpool Waters Indicative Masterplan (October 2011)

Received by the Local Planning Authority on the 8th & 16th December 2011 & October 2018.

3. The wording of condition 71:

No more than 27.24% (460,000sqm) of the entire total consented development floorspace set within the LWOPP shall be erected within Neighbourhoods A, B and C, and no development shall commence in Neighbourhoods D and E, until the Transport Assessment (November 2011) submitted and hereby approved with the application has been reviewed, updated and agreed by the Local Planning Authority in writing and identified measures have been secured to undertake the highway works and public transport enhancements identified as necessary within that updated Transport Assessment in a phased manner in relation to the development as a whole and in accordance with the Highway and Public Transport Enhancement Strategy referred to in Condition 19 and the monitoring and review and enhancement arrangements referred to in Schedule 3 of this permission.

4. The removal of condition 75 of the LW Outline Planning permission

5. The wording of Schedule 3:

The Highway & Public Transport Enhancement Strategy monitoring and review mechanisms referred to in Condition 10 and required in advance of any development in neighbourhoods D and E and anymore development floorspace greater than 27.2% (460,000sqm) of the entire total consented development floorspace within Neighbourhoods A, B and C (or 2021, whichever the earlier) shall identify the range, methodology, format and timetable of travel monitoring. The results of the monitoring shall be submitted annually to the Local Planning Authority commencing concurrently with submission to the Local Planning

Authority of the first Detailed Neighbourhood Masterplan for neighbourhood B, C D or E required by Condition 11.

6. **The wording of Schedule 5:**

- The Pontoon and Princes Jetty shall be provided in conjunction with the development plots set out in the approved Princes Dock Neighbourhood Masterplan (May 2018).
- Central Park shall be commenced at the same time as the start of any construction work to provide buildings in any of development Parcels 3a, 3b, 3c, 3d and 3f.
- Bath Gate will be commenced and completed in conjunction with plot A05 (Plaza 1821).

Where relevant, the strategy will refer to the above amendments.

1.6 Section 96a Amendment Application (April 2019)

An additional non-material amendment has been submitted to Liverpool City Council (application currently pending decision). The amendments include:

1. Liverpool Waters Parameter Plan Report (October 2018) to Liverpool Waters Parameter Plan Report (April 2019), where changes within the document include:
    - PP005 Development Plots
    - PP006 Building Heights
    - PP007 Access and Movement
    - Illustrative Masterplan
2. **The wording of Condition 3:**

The development hereby approved shall only be implemented in general conformity with the following submitted application documents (The Principal Application Documents):

- Updated Planning Application form (November 2011);
- Statement of Key Development Principles (November 2011);
- LW Parameter Plan Report (incorporating Parameter Plans) (April 2019)
- Design and Access Statement (November 2011);
- Building Characterisation & Precedent Study (November 2011) ("BCPS");
- Public Realm Characterisation & Precedent Study (November 2011) "(PRCPS)";
- Conservation Management Plan for the Protection, Conservation and

- Preservation of Heritage Assets (November 2011);
- Liverpool Waters Indicative Masterplan (October 2011)

Received by the Local Planning Authority on the 8th & 16th December 2011, October 2018 and April 2019.

1.7 Site and Scheme Description

1.7.1 Liverpool Waters

Liverpool Waters is a major project involving the regeneration of 60ha of redundant docks in the heart of the city of Liverpool on the eastern bank of the River Mersey. The development is over 2km in length; extending from Princes Dock in the south to Bramley Moore Dock in the north. Virtually the entire Liverpool Waters site comprises reclaimed land which was created to form docks commencing in the late 18th century. Over a third of the Liverpool Waters site consists of docks with open water. By the early 21st century all of the docks were redundant by virtue of the changing nature of the shipping industry.

The Liverpool Waters joint vision (Peel and Liverpool City Council) involves regenerating the historic dockland site to create a world-class, high-quality, mixed-use waterfront quarter in central Liverpool that will allow for substantial growth of the city's economy. The aspirational scheme will create a unique sense of place, taking advantage of the site's cultural heritage and integrating it with exciting and sustainable new development.

The principal proposed land uses at Liverpool Waters will be commercial offices and other business uses, residential development and tourism-related uses. More specifically this includes:

- Residential (about 9000 dwellings)
- Business space, mainly offices.
- Hotel and conference facilities.
- Buildings for assembly and leisure.
- Restaurants, cafes, pubs and wine bars.
- Comparison (non-food) shops serving local needs.
- Community institutions (clinics, health centres, nurseries, schools and places of worship).
- Offices and services in local shopping centres.
- Convenience (food) shops.
- Parking.
- A cruise-liner terminal and an energy centre.
- Servicing.

1.7.2 Central Docks

The Central Docks Neighbourhood will provide a new dynamic urban focus around public open space and the Leeds-Liverpool Canal extension. It is intended to be the business, entertainment and leisure fulcrum of the Liverpool Waters

scheme. There will be significant changes in the south of the neighbourhood including the new Isle of Man Ferry Terminal and cultural buildings. Central Docks is the location of the secondary tall buildings cluster and will also have a new public open space – Central Park. The plots identified for development within the masterplan for the Central Docks Neighbourhood are shown on Figure 1.1.

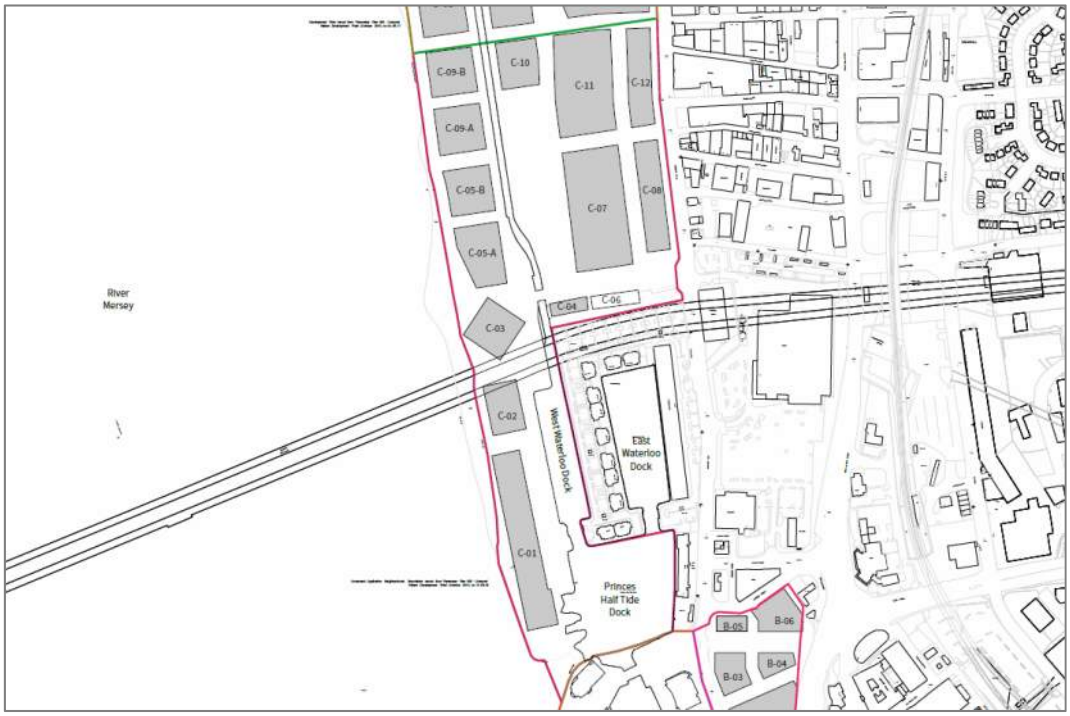

Figure 1.1: Central Docks Development Plots (C-01 to C-12). Image taken from Parameter Plan 005 Liverpool Waters Development Plots. Drg. No. 1868-VW-005 (Planit I.E. Limited, 2018).

Development within Central Docks (Neighbourhood C; Phase 2 of Liverpool Waters) is anticipated to take place over a period of 16 years between 2020 and 2036.[1] The amount of each proposed land use within the Central Docks Neighbourhood was designed to reflect firstly, the character and location of the neighbourhood, secondly the balance considered reasonable between the primary land uses (residential/business/tourism) and finally a reasonable balance of shops, services and other supporting land uses (Table 1.1).

Table 1.1: Proposed land uses at Central Docks.

Proposed Land Use	**Central Docks Neighbourhood**
Residential	2,900 units
Office/Business	165,900 m^2
Hotel/Conference	35,300 m^2
Assembly/Leisure	30,700 m^2
Restaurants/Cafes	11,900 m^2

[1] Planit I. E. Limited (2018) Parameter Plan 003 Liverpool Waters Phasing Plan. Drg No. 1868-VW-013.

Proposed Land Use	Central Docks Neighbourhood
Pubs/Bars	12,600 m^2
Local Shops – Non-food	8,700 m^2
Community	600 m^2
Local Services	2,600 m^2
Local Shops – Food	4,200 m^2
Parking	180,400 m^2
Servicing	17,500 m^2
Cruise Terminal/Other	16,600 m^2

1.8 Part C - Condition 16

Condition 16 of the Liverpool Waters Outline Consent (10O/2424) states that prior to the submission of the first application for any reserved matters approval in each respective neighbourhood, an Ecological & Biodiversity Strategy based on the Principal Application Documents and Detailed Neighbourhood Masterplan that relates to that particular neighbourhood and has regard to the wider application site shall be submitted to and approved in writing by the Local Planning Authority. The strategy shall summarise the means of safeguarding all protected species of relevance and supporting habitats during construction and operation within the respective neighbourhood including consideration of pathways to protected European sites.

Ove Arup & Partners Ltd. (Arup) have been commissioned by Peel Land and Property (Ports) to address Condition 16 by producing the Neighbourhood Ecological and Biodiversity Strategy (NEBS) for Neighbourhood C (Central Dock). Condition 16 consists of ten points which are addressed within the NEBS (Table 1.2).

Table 1.2: Relevant section of the NEBS which address the ten points of Condition 16 of the Liverpool Waters Outline Consent.

Condition 16		Relevant section within NEBS
i.	The means, method and timeframe for carrying out updated bird surveys and impact assessments for bats and migratory and/or over wintering birds.	2.1 to 2.5
ii.	The methodology and timeframe for carrying out (seasonal) monitoring of fish and other water species within the dock system.	2.6
iii.	Working practices to address phasing of construction, construction vehicles, routing and speed limits during removal of existing buildings, vegetation and other suitable breeding habitats.	4.1
iv.	Details of habitat creation.	5
v.	Design of buildings and spaces in terms of layout, design, materials and lighting to avoid creating barriers to bird migration	3.1

Condition 16		Relevant section within NEBS
	and aviation and reduce risk of bird strikes particularly in relation to tall buildings.	
vi.	Means and methodology for the monitoring and management of water quality within the dock system which shall inform mitigation to safeguard fish and other water species, including the aeration of dock water spaces.	2.7
vii.	Methods for controlling leisure boat activity within the dock system.	3.3
viii.	Methods for controlling gulls and pigeons roosting on buildings.	3.2
ix.	Mechanisms for monitoring and reviewing the effectiveness of agreed ecological and biodiversity mitigation against identified targets and means for enhancing mitigation where those targets are not met.	6
x.	Mechanisms to ensure protection of Sefton Coast SAC (Seaforth Docks to Formby Point) from recreational disturbance overseen by the Liverpool Waters Coordination Panel in accordance with Schedule 6 of this permission.	3.4

The NEBS will set out a strategy for the Central Docks Neighbourhood based on the results and mitigation measures included in the Liverpool Waters Environmental Statement (ES) produced for the Outline Consent (WYG, 2011a).[2] It was intended that the mitigation measures would apply to the overall Liverpool Waters development area and therefore are split across each of the neighbourhoods:

- Neighbourhood A – Princes Dock.
- Neighbourhood B – King Edward Triangle.
- Neighbourhood C – Central Docks.
- Neighbourhood D – Clarence Docks.
- Neighbourhood E – Northern Docks.

This Central Docks NEBS will therefore outline methodologies for carrying out updated surveys and the mitigation measures that should be included with the Neighbourhood. A NEBS has already been produced for Princes Dock (Neighbourhood A) (WYG, 2018).[3] This sets out measures for the Princes Dock Neighbourhood however for efficiencies and practicality, also includes measures (e.g. biennial passage/wintering bird surveys) which should be undertaken across the entire Liverpool Waters site as opposed to in isolation at the different neighbourhoods. The Central Docks NEBS therefore incorporates these measures to align with the Princes Dock NEBS, in addition to specific measures for Neighbourhood C. By adopting this joined up methodology there is an opportunity for a strategic approach to be adopted in which the mitigation measures and biodiversity enhancements for the Central Docks Neighbourhood

[2] WYG (2011a) Liverpool Waters Environmental Statement.
[3] WYG (2018) Princes Dock Condition 16 Neighbourhood Ecological and Biodiversity Strategy.

can be considered strategically in respect of ensuring maximum biodiversity benefits across the whole Liverpool Waters scheme.

Part D of the Outline Consent (details to be provided with reserved matters applications) includes Condition 34 – Ecological & Biodiversity Statement (EBS). This states that prior to the commencement of development within any neighbourhood, the approval in writing of the Local Planning Authority (LPA) must be obtained to a detailed EBS based on the NEBS explaining how the specific scheme in that neighbourhood or part neighbourhood will provide for the protection and enhancement of protected species and supporting habitats, including the provision of new and replacement habitats by means of the following:

i. provision of detailed and quantitative surveys to be able to assess in detail any potential impacts of the development upon bats and migratory and/or over-wintering birds;
ii. mitigation to safeguard fish and other water species;
iii. details of habitat creation;
iv. siting and design of replacement roosting sites within Nelson Dock for displaced winter water birds (specifically cormorants);
v. provision and management of new/compensatory habitats;
vi. the design of buildings and spaces based on the Detailed Neighbourhood Masterplan for the land;
vii. for development involving the Hydraulic Engine House, Victoria Clock Tower or the office and workshop buildings south of Collingwood Dock, detailed internal bat surveys;
viii. measures to control leisure boat activity and behaviour within the dock system to minimise disturbance of wildlife within the docks;
ix. measures to discourage gulls and pigeons from nesting/roosting on buildings; and
x. mitigation for any areas affected by invasive, non-native plants and noxious weeds.

The Central Docks NEBS will therefore outline the methodologies, measures and options to allow for the production of detailed plot-specific EBSs for each reserved matters application in order for Condition 34 of the outline consent to be discharged.

1.9 Liverpool Waters Sustainability Principles

Peel Land and Property (Ports) Ltd. (Peel L&P) support the United Nations Sustainable Development Goals (SDGs) and their vision is to encourage the creation of highly sustainable, future-proofed developments (Peel L&P, 2019).[4] Peel L&P have prioritised the four SDGs that are most relevant to their business activities:

- SDG 8 – decent work and economic growth.

[4] Peel Land & Property (Ports) Ltd. (2019). Sustainability 5 Year Business Plan.

- SDG 11 – sustainable cities and communities.
- SDG 12 – responsible consumption and production.
- SDG 15 – life on land.

Based on these SDGs, seven sustainability principles have been developed by Peel L&P. Three of these principles are considered most relevant to this NEBS:

- Principle 3: *Develop highly sustainable and smart built environments* – minimum standards will be BREEAM Very good for commercial buildings and Home Quality Mark for residential buildings. All building development shall achieve a BREEAM Communities rating of excellent.
- Principle 5: *Put more back into the natural environment than is taken out* – ensuring that the development delivers a net gain for biodiversity and natural capital, protects existing habitats and provides benefits for people and wildlife.
- Principle 6: *Support the health and wellbeing of communities by creating beautiful, functional and well-used green public realm* – green infrastructure will be used to cool the microclimate and benefit local air quality, biodiversity and water management as well as to provide character and connectivity for people throughout the neighbourhoods.

2 Update Surveys and Impact Assessments

2.1 Preliminary Ecological Appraisal

Due to the time elapsed between the original ecological surveys and production of the ES for Liverpool Waters, each plot-specific reserved matters application should include a Preliminary Ecological Appraisal (PEA). The PEA should identify key ecological constraints, design options, requirements for further surveys and mitigation measures within each plot. These should subsequently be detailed within the plot-specific EBS.

The PEA should be undertaken in accordance with CIEEM guidelines (CIEEM, 2017).[5] With regards to habitats and vegetation, a PEA should follow the Phase 1 Habitat survey guidelines as set out by the Joint Nature Conservation Committee (JNCC, 2010).[6] The PEA should also conform to the mandatory British Standard BS42020:2013 Biodiversity Code of Practice for Planning & Development.

2.2 Breeding Birds

Thirty-nine breeding bird species were recorded during the initial survey work completed in 2009 for the Liverpool Waters Outline Application.[7] Of these 39 species, 16 were considered to be holding territory on site and nine species were confirmed to have successfully bred within the site boundary. The key species recorded to be holding territory within Liverpool Waters were black redstart *Phoenicurus ochruros*, lapwing *Vanellus vanellus*, skylark *Alauda arvensis*, starling *Sturnus vulgaris*, linnet *Linaria cannabina*, mallard *Anas platyrhynchos*, ringed plover *Charadrius hiaticula*, and swallow *Hirundo rustica*. Species recorded within the Central Docks Neighbourhood in 2009 included lapwing, skylark, linnet and ringed plover. A singing male black redstart was recorded approximately 150m to the north east of Central Docks. Little ringed plover *Charadrius dubius* were not recorded during the breeding bird surveys undertaken in 2009; however they had previously been recorded breeding within the Liverpool Waters site and the habitat remains suitable.

Species specific breeding bird surveys should therefore be undertaken in the Central Docks Neighbourhood. The focus of the surveys should be on Schedule 1 species which are considered to be likely breeding on site. It will be possible to assess all breeding species on site (including those listed above) by undertaking five visits (mid-April – end of June) following the Common Bird Census methodology. In addition to recording the Schedule 1 species, this method would also record species such as skylark, lapwing, linnet, ringed plover and meadow pipit *Anthus pratensis*. For efficiency, and in line with a strategic approach,

[5] CIEEM (2017). Guidelines for Preliminary Ecological Appraisal, 2nd edition. Winchester: Chartered Institute of Ecology and Environmental Management.
[6] JNCC (2010). Handbook for Phase 1 Habitat survey - a technique for environmental audit. Peterborough: Joint Nature Conservancy Council.
[7] WYG (2009). *Liverpool Waters Breeding Bird Survey Report*. Appendix 7.6 of the Liverpool Waters ES (2011).

surveys for breeding bird species should be undertaken across the entire Liverpool Waters site, thereby providing data for applications within all neighbourhoods.

2.2.1 Little Ringed Plover

Annual surveys should be undertaken in the year prior to construction and during the subsequent four years of development at the Central Docks Neighbourhood. The surveys will look to identify whether little ringed plover *Charadrius dubius,* have colonised the vacant plots for nesting and foraging. Ringed plover have previously been recorded breeding within the site; the surveys for little ringed plover should therefore also target ringed plover. The survey data should inform the construction mitigation strategies of the development in Central Docks with the aim of preventing disturbance to little ringed plover and ringed plover nest sites.

The surveys should be undertaken by a suitably qualified ecologist and follow the methodology described below. Following the first five years of monitoring, the requirement for continued breeding plover surveys should be reviewed. If appropriate, the frequency of surveys should be reduced to biennial surveys throughout the development of the Liverpool Waters site.

Methodology

The methodology for the little ringed plover survey should be based on the 2007 British Trust for Ornithology (BTO) Breeding Plover Survey (Burton & Conway, 2008).[8] The survey should comprise a transect survey along a pre-defined route around the Central Docks Neighbourhood. The survey should be undertaken between 08:30 and 18:00 and note any little ringed plover (and ringed plover) heard singing, calling, and those identified visually. In addition, any nests observed should be recorded to estimate the number of breeding pairs. Three survey visits should be undertaken between 15 April and 15 July. To reduce bias on the survey data, the transect route should be walked in the alternative direction for each survey. Appropriate field maps should be annotated to show the location of any little ringed plover that are heard or seen; the standard two letter BTO species and activity codes should be used on all surveys (BTO, 2019).[9]

Timing/Weather Conditions

- The survey should consist of at least three visits with one visit between 15 April to 15 May, one visit between 15 May to 15 June, and the third visit between 15 June and 15 July.
- Surveys should be undertaken between 08:30 and 18:00 and last for the duration of time it takes to comprehensively complete the transect route.
- Surveys will avoid poor weather.

[8] Burton, N. H. K. and Conway, G. J. (2008). *Assessing population of breeding ringed plovers in the UK between 1984 and 2007.* Report to the Joint Nature Conservation Committee. BTO Research Report No. 503. Thetford: British Trust for Ornithology (BTO).
[9] BTO (2019). Standard naming and coding of species and subspecies regularly found in Britain and Ireland. Available at https://www.bto.org/about-birds/birdfacts/british-list

Impact Assessment

A breeding plover impact assessment should be undertaken for each new reserved matters application in the Central Dock Neighbourhood, using data collected on the surveys. The impact assessment should be included in the plot specific EBS for submission to the LPA.

The breeding plover impact assessment should follow the same assessment methodology prescribed in the Liverpool Waters ES,[2] and should cover remediation, construction and operational phases of the development. Should the assessment identify that significant impacts on little ringed plover are likely for a particular development, appropriate mitigation measures should be identified. Mitigation measures may include the incorporation of working windows or buffer zones to restrict the impact of potentially disturbing activities on little ringed plover (and ringed plover). In addition, there may be a requirement to provide alternative nesting habitat, where possible.

2.2.2 Black Redstart

As per the NEBS for Princes Dock, annual surveys for black redstart, should be undertaken in the year prior to construction and during the subsequent four years of development at the Central Docks Neighbourhood. The surveys should set out to identify whether black redstart have colonised the existing buildings and/or are using any of the vacant plots for foraging. The survey data should inform the construction mitigation strategies for the new buildings with the aim of preventing disturbance to new black redstart nest sites. The surveys should be undertaken by a suitably qualified ecologist. The methodology for undertaking the survey should closely follow that outlined in Bird Monitoring Methods (Gilbert *et al*., 1998);[10] this may need to be modified slightly to ensure it is site specific. Following the first five years of monitoring, the requirement for continued black redstart surveys should be reviewed. If appropriate, the frequency of surveys should be reduced to biennial surveys throughout the development of the Liverpool Waters site.

Methodology

As identified in the NEBS for Princes Dock, the survey should comprise a transect survey along a pre-defined route around the Central Docks Neighbourhood. Surveys should be undertaken at dawn, and will note any black redstart heard singing, calling, and those identified visually. Five survey visits should be undertaken between mid-April and the end of June. To reduce the bias on the survey data, the transect route should be walked in the alternative direction for each survey. Appropriate field maps should be annotated to show the location of any black redstart that are heard or seen; the standard two letter BTO species and activity codes should be used on all surveys.[9]

[10] Gilbert, G., Gibbons, D. W., and Evans, J. (1998). *Bird Monitoring Methods – a Manual of Techniques for Key UK Species*. RSPB.

Timing/Weather Conditions

- The surveys should consist of a least five fortnightly visits from mid-April to the end of June.
- Surveys should commence early morning (in the hours after sunrise) and last for the duration of time it takes to comprehensively complete the transect route.
- Surveys will avoid cold, wet and windy conditions.

Impact Assessment

As per the NEBS for Princes Dock,[3] a black redstart impact assessment should be undertaken for each new reserved matters application in the Central Docks Neighbourhood, using data collected on the surveys. The impact assessment should be included in the plot-specific EBS for submission to the LPA.

In line with the NEBS for Princes Dock, the black redstart impact assessment should follow the same assessment methodology as set out in the Liverpool Waters ES,[2] and should cover remediation, construction and operational phases of the development. Should the assessment identify that significant impacts on black redstart are likely for a particular development, appropriate mitigation measures should be identified. Mitigation measures may include the incorporation of working windows or buffer zones to restrict the impact of potentially disturbing activities on black redstart. In addition, there may be a requirement to provide alternative nesting habitat.

2.3 Passage/Wintering Birds

2.3.1 Wintering Bird Surveys

Wintering bird surveys should be undertaken in the year prior to construction and during the subsequent four years of development within the Central Docks Neighbourhood; this data will highlight if there is a need to revise mitigation strategies in relation to disturbance of wintering bird roosts. For efficiency and in line with a strategic approach, surveys for passage/wintering species should be undertaken across the entire Liverpool Waters site, thereby providing data for applications within all neighbourhoods. The surveys should be undertaken by suitably qualified ecologists following the methodology described below.

Following the first five years of monitoring, the requirement for continued annual wintering bird and passage surveys should be reviewed; a decision as to the required survey effort should be made based on the results. If appropriate, wintering and passage bird surveys should be reduced to biennial; data from biennial surveys should inform reserved matters application in the docks that are yet to be developed. Based on the review, fully developed neighbourhoods may be excluded from future survey efforts; therefore, reducing the scope of surveys as the neighbourhoods are developed.

Methodology

The survey methodology proposed is based on the BTO's Wetland Bird Survey (WeBS) (BTO, 2017[11]) however utilises a transect rather than dividing the site into blocks. Surveys should consist of a transect with predefined vantage points in each waterfront neighbourhood. The transects should be undertaken by two suitably qualified ecologists. Appropriate field maps should be annotated to show the bird species, high band, flight line and direction; the standard two letter BTO species and activity codes should be used on all surveys.

Target species for wintering bird and passage surveys should comprise waders, wildfowl, gulls & terns, cormorant, grey heron and raptors. All other species, including BoCC Red and Amber list passerines (song birds) should be recorded as incidental species. Surveys should be written up as a factual report; highlighting flight lines, key roosting locations, and any potential breeding activity of target species (early March onwards) within the Liverpool Waters scheme.

Timing/Weather Conditions

- High water surveys should be undertaken between September and March (inclusive) and comprise a minimum four-hour watch period per survey.
- In line with the NEBS produced for Princes Dock, high water surveys should be undertaken during the four hours preceding high tide.
- Low water surveys should be undertaken between September and March (inclusive) and comprise of a minimum four-hour period per survey.
- Low water surveys should be undertaken during the two hours preceding low water and two hours after.
- Surveys should be undertaken in a range of weather conditions, although times of restricted visibility and particularly harsh weather will be avoided.

Impact Assessment

The Liverpool Waters ES identified the presence of a small roost for oystercatcher *Haematopus ostralegus*, and redshank *Tringa totanus*, in Waterloo Dock.[2] Redshank and oystercatcher are components of the water bird assemblage (non-breeding) of the Mersey Narrows and North Wirral Foreshore Special Protection Area (SPA). The potential loss of this roost should be assessed in the context of the European site to determine whether this would result in a likely significant impact.

In line with the NEBS for Princes Dock, an impact assessment for water birds should be undertaken for each new reserved matters application in the Central Dock Neighbourhood, using data collected on the surveys. The impact assessment should be included in the plot specific EBS for submission to the LPA.

In accordance with the NEBS for Princes Dock, the water bird impact assessment should cover remediation, construction and operational phases of the development. It should follow the same assessment methodology as set out in the

[11] BTO (2017). *Wetland Bird Survey – Survey Methods, Analysis & Interpretation*. Thetford: BTO.

Liverpool Waters Ecology and Nature Conservation ES chapter and should include a Habitats Regulations Assessment (HRA) of Likely Significant Effect (LSE) for each of the Natura 2000 sites that may be affected by the development. Assessments should include all of the following sites, in addition to any proposed, new or extensions to current sites which may be designated subsequently:

- Liverpool Bay SPA;
- The Mersey Narrows and North Wirral Foreshore SPA/Ramsar;
- Mersey Estuary SPA/Ramsar;
- Ribble & Alt Estuaries SPA/Ramsar;
- Sefton Coast Special Area of Conservation (SAC);
- The Dee Estuary Ramsar;
- Dee Estuary SPA;
- Dee Estuary SAC; and
- Martin Mere SPA and Ramsar.

As with the NEBS for Princes Dock, the impact assessment should reference the most recent surveys, the baseline bird report for Liverpool Waters, the subsequent monthly update reports produced by WYG between October 2013 and April 2014, and the TEP assessment of the docks for qualifying features of Natura 2000 sites (TEP, 2015).[12] Impact assessments should also utilise any additional data and evidence available from standalone applications. Should the assessment identify that significant impacts on water birds are likely for a particular development, appropriate mitigation measures should be identified. Mitigation measures may include the incorporation of working windows or buffer zones to restrict the impact of potentially disturbing activities on water birds. In addition, there may be a requirement to provide alternative roosting habitat. Any mitigation proposed should be in accordance with the Liverpool Waters Strategic Ecological Mitigation Plan (SEMP) which is currently being developed at the time of writing this NEBS.[13]

2.4 Foraging Common Tern

2.4.1 Common Tern Survey

Surveys for foraging common tern *Sterna hirundo,* should take place in the Central Docks Neighbourhood in the year prior to construction and during the subsequent four years following development of the neighbourhood. The surveys should be undertaken by a suitably qualified ecologist and should follow the methodology described below. Following the first five years of monitoring, the requirement for continued surveys should be reviewed on the basis of the survey results and, if appropriate, the frequency of the surveys reduced.

[12] TEP (2015). Assessment of Supporting Habitat (Docks) for Use by Qualifying Features of Natura 2000 Sites in the Liverpool City Region. Available at http://www.meas.org.uk/media/5279/4157005-assessment-of-supporting-habitat-liverpool-docks-excl-drawings-aug-2015.pdf

[13] Arup (2019) Liverpool Waters Strategic Ecological Mitigation Plan – Interim Note.

Methodology

There is no standard methodology available for foraging common tern within Bird Monitoring Methods.[10] Similar to the Princes Dock NEBS,[3] the following shore-based survey approach is proposed to assess foraging common tern. This approach was outlined in Parson *et al.* (2015)[14] and was designed for little tern *Sternula albifrons*. Surveys for common tern foraging should be carried out by four surveyors, one located in each of the waterfront neighbourhoods. Surveys should be carried out from a vantage point which allows observation of the docks and coastal strip along the Mersey. Appropriate field maps should be annotated to show the flight lines of observed common terns, including their height, direction and foraging activity. The survey should also record breeding behaviour as observed.

Survey results should be written up as a factual report, highlighting flight lines, key foraging locations and any breeding locations for common tern within the Liverpool Waters Scheme and adjacent coastal strip.

Timing/Weather Conditions

- A total of 30 hours of survey effort should be completed between April and August (inclusive).
- Survey effort should be evenly spread across the five-month survey period and comprise approximately two-hour watches, with three watches completed in each month.
- The surveys should be undertaken under a variety of tidal states and times of day to reduce sampling bias.
- The surveys should be undertaken in a range of weather conditions, although times of restricted visibility and particularly harsh weather will be avoided.

Impact Assessment

An impact assessment for common tern should be undertaken for each new reserved matters application in the Central Dock Neighbourhood; the reserved matters applications should incorporate the data recorded within the surveys and any other data collected from standalone applications. The impact assessment should be included in the plot specific EBS for submission to the LPA.

The impact assessment for common tern should cover remediation, construction and operational phases of the development and should include a HRA for Liverpool Bay SPA and Mersey Narrows and North Wirral Foreshore SPA. Impact assessments should reference the baseline reports for Liverpool Waters, in addition to the monthly update reports produced by WYG between October 2013 and April 2014. The impact assessments should also reference the TEP study

[14] Parsons, M., Lawson, J., Lewis, M., Lawrence, R. & Kuepfer, A. (2015). Quantifying foraging areas of little tern around its breeding colony SPA during chick-rearing – JNCC Report No. 548. Available at http://jncc.defra.gov.uk/pdf/Report_548_web.pdf

assessment of supporting Habitat (Docks) for Use by Qualifying Features of Natura 2000 Sites in the Liverpool City Region.[12]

2.5 Bats

Bat activity transect surveys were undertaken at Liverpool Waters by WYG in 2009.[15] Observed levels of bat activity were considered to be low with only 1-2 common pipistrelle bats recorded during each of the three visits undertaken. No bats were recorded within Central Docks and no buildings within Central Docks were recorded to have suitability for roosting bats. The waterfront dock basins were noted to be particularly exposed to the prevailing winds along the River Mersey and the habitats sparse of vegetation. It was concluded that the habitat was of poor suitability for foraging bats.

2.5.1 Preliminary Bat Roost Assessment

Very few buildings remain within Central Docks however there are some industrial units located to the west of Waterloo Road (approximate grid reference SJ33609151). Where a reserved matters application proposes demolition of any existing structures, a bat roost suitability assessment should be undertaken to determine presence/likely absence of roosting bats and to assess the potential of the structure to be used for roosting. This should be carried out by a suitably qualified ecologist in line with current guidance (Collins, 2016).[16] Structures should be searched for signs of bat presence including:

- bat droppings;
- scratch and grease marks;
- live or dead bats; and
- noises of bats calling from within the roost.

In addition, features searched for on structures should include:

- missing mortar; and
- any cracks or gaps at least 10mm in size.

Following this inspection, the structure should be assigned a level of suitability to support roosting bats at different times of year: high, moderate, low or negligible. If the structure is identified to have suitability for roosting bats, further surveys may be required.

Timing/Weather Conditions

Bat roost suitability assessments may be undertaken at any time of year under any weather conditions, providing the weather conditions do not affect the ecologist's

[15] WYG (2009). *Liverpool Waters Bat Survey Report*. Appendix 7.5 of the Liverpool Waters ES (2011).
[16] Collins, J. (ed) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust: London.

ability to carry out the survey effectively and safely e.g. not during heavy rain or high winds.

2.5.2 Bat Activity Surveys

Structures confirmed as roosts during the preliminary bat roost assessment, or those assessed as having low, moderate or high bat roost suitability may require further activity surveys to determine the presence/likely absence of bats and characterise roosts (identify species, numbers, access points, timing of use etc.). Surveys should take the form of dusk emergence/dawn re-entry surveys and should be undertaken following current guidance.[16]

Dusk emergence/dawn re-entry surveys involve ecologists visiting at dusk or dawn to listen/record and watch for bats emerging or returning to roosts. The number and timing of visits required depends on the suitability of the structure being surveyed:

- Confirmed/High – three separate survey visits required between May and September with at least two visits in May to August. At least one dusk emergence and one dawn re-entry survey, the third visit may be either dusk or dawn.
- Moderate – two separate surveys (one dusk emergence and one dawn re-entry) required between May and September with at least two visits in May to August.
- Low – One dusk emergence or dawn re-entry survey required between May and August.

Timing/Weather Conditions

Surveys should be taken between May and August/September (see above). The sunset temperature must be above 10°C and no rain or strong winds.

2.5.3 Bat Impact Assessment

Any reserved matters applications which affect structures with potential to be used by roosting bats should include an impact assessment within the plot-specific Ecological and Biodiversity Statement. If any significant impacts during remediation, construction or operation are considered likely, then appropriate mitigation should be identified. This may include application for a bat mitigation licence from Natural England if any roosts and to be disturbed or destroyed.

2.6 Aquatic Species

Surveys for aquatic species were not undertaken within the dock system as part of the survey work undertaken to inform the ES (WYG, 2011).[2] As stated in the Princes Dock NEBS,[3] an initial baseline assessment should therefore be undertaken within the Central Dock system prior to the start of construction. An ongoing programme of monitoring should then be undertaken annually throughout

the development. The surveys should follow the same methodology as included within the Princes Dock NEBS (Table 2.1).

Table 2.1: Methodology for carrying out monitoring of fish and other water species within the dock system.

Survey	Methodology
Baseline	
Phytoplankton survey	Appropriate UKAS accredited methodology.
Fish survey – hydroacoustic and netting	Duncan, A. and Kubecka, J. (1993). *Hydroacoustic methods of fish surveys*. National Rivers Authority R&D Note 196. Fyke net surveys.
Benthic macroinvertebrate survey of dock floor	Samples to be collected using a suitable grab. Samples to be taken from Princes Half Tide Dock, West Waterloo Dock, and the linear waterway to the north of West Waterloo Dock. Minimum of 18 sampling sites. Also, baited traps to be used at a minimum of nine locations to quantitatively sample mobile species. Samples to be processed following Worsfold & Hall (2010).[17]
Benthic invertebrate survey of dock walls	Wall scrape samples to be taken following Worsfold (1998).[18]
Monitoring	
Annual surveys to monitor benthic invertebrates, algae, phytoplankton and zooplankton species.	As above for baseline surveys, unless subsequent improvement to accepted methodologies during development lifespan.
Annual fish survey if low fish population is identified during baseline to monitor improvements. Otherwise no further monitoring except in exceptional circumstances e.g. pollution incident.	As above for baseline surveys, unless subsequent improvement to accepted methodologies during development lifespan.

2.6.1 Invasive Non-Native Species

Marine Invasive Non-Native Species (INNS) such as the tunicate *Styela clava*, are known to be present within the docks in Liverpool (Davis et al., 2007).[19] There is high potential for other marine non-native species to be present in the docks, spread both by natural vectors or via vessels and their ballast/bilge water. If any INNS are recorded within Central Docks during the initial baseline or any subsequent monitoring, an appropriate method statement or management plan

[17] Worsfold, T.M. & Hall, D.J. (2010) *Guidelines for processing marine microbenthic invertebrate samples: a Processing Requirements Protocol: Version 1.0, June 2010.* Unicomarine Report. Available at http://www.nmbaqcs.org/media/1175/nmbaqc-inv-prp-v10-june2010.pdf
[18] Worsfold, T.M. (1998). *Sampling of cryptofauna from natural turfs (flora or fauna) on hard substrata. Version 1 of 26 March 1998*. In: Biological monitoring of marine Special Areas of Conservation: a handbook of methods for detecting change. Part 2. Procedural guidelines, ed. By K. Hiscock. Peterborough: Joint Nature Conservation Committee.
[19] Davis, Martin H., Lützen, Jørgen and Davis, Mary E (2007). *The spread of Styela clava Herdman, 1882 (Tunicata, Ascidiacea) in European waters.* Aquatic Invasions (2007) Volume 2, Issue 4: 378-390

should be implemented during construction to avoid promoting the spread of these species. Method statements or management plans should also be considered in relation to operational requirements, for example should there be a change in usage or activities within Central Docks waters post-development.

2.7 Water Quality

2.7.1 Monitoring

Part vi. Of Condition 16 requires details of the means and methodology for the monitoring and management of water quality within the dock system. This should inform mitigation to safeguard fish and other water species, including the aeration of dock water spaces. The surveys should follow the same methodology as included within the Princes Dock NEBS (Table 2.1).

An initial baseline characterisation survey of the dock system should be undertaken prior to the start of construction. This should include:

- Water quality sampling at several locations within Princes Half Tide Dock, West Waterloo Dock and the waterway to the north of West Waterloo Dock. Parameters to include dissolved oxygen, pH, conductivity, salinity, biochemical oxygen demand, ammonia, nutrients, heavy metals and organics likely to include poly-aromatic hydrocarbons and TBT.
- Sediment quality sampling for sediment oxygen demand, metals, pH and redox potential.
- Bathymetric survey for sediment depth.

An ongoing monitoring programme should be implemented during construction to monitor the above parameters including biochemical oxygen demand, ammonia and nutrients. This should be completed monthly in the first instance however the frequency may reduce over time, depending on the results.

Reports on water quality monitoring should be provided to the Environment Agency, MEAS and The Canal & River Trust. The Principal Contractor should rectify any issues identified during monitoring and implement measures to prevent further impacts arising.

2.7.2 Management Plan

As included in the NEBS for Princes Dock (WYG, 2018[3]), an appropriate water quality management plan should be developed and implemented by the Principal Contractor during the development of Central Docks. This should be produced following the results of the initial baseline assessment and will likely include measures such drainage system investigation to identify pollution risk and/or aeration of dock spaces.

3 Mitigation Through Scheme Design

3.1 Bird Strike Mitigation

Central Docks is the location of the secondary tall buildings cluster with five high-rise (>45m) buildings to be developed. Despite this, previous surveys within Liverpool Waters have found that the majority of birds follow either the River Mersey or the dock system rather than the land which has been allocated for development.[12,20] Nevertheless, the development of the tall buildings cluster within Central Docks has the potential to increase the risk of bird strike.

Measures to reduce the risk of bird strike should be designed into all tall buildings within Central Docks, particularly those with large areas of reflective glass on the northern and southern aspects. This should incorporate day and night time mitigation measures and should be incorporated into the plot-specific EBS required for each reserved matters application under Part D, Condition 34 of the Liverpool Waters outline consent. As is included in the Princes Dock NEBS (WYG, 2018[3]), all reserved matters applications for buildings over five storeys high, or where there are low existing light levels, should consider the requirement for a lighting plan. The design of any ancillary structures of high-risk buildings should also consider the requirement of similar mitigation.

Potential mitigation measures to reduce bird strike which may be included at Central Docks include (US Fish and Wildlife Service, 2016[21]):

- Reducing strikes with glass:
    - Patterning
    - Fritting
    - UV Patterned Glass
    - Screens
    - Netting (mesh size <1.3cm)
    - Architectural features e.g. overhangs, awnings and louvres
- Lighting plan to reduce lighting during bird migration periods (mid-August to mid-November and March to mid-May):
    - Avoid unnecessary lighting including perimeter lighting.
    - Operating lights to be designed so that light levels (brightness) are as low as possible.

[20] Vantage point surveys undertaken by WYG in 2009/2010, 2013/2014.
[21] US Fish and Wildlife Service (2016). *Reducing bird collisions with buildings and building glass best practices*. Falls Church, Virginia: Division of Migratory Bird Management. Available at https://www.fws.gov/migratorybirds/pdf/management/reducingbirdcollisionswithbuildings.pdf

  - Consider use of motion sensors in public areas (where health & safety considerations allow).
  - No upward lighting – lights to be fitted with hoods or louvres to avoid lighting skywards.
  - Height of lighting columns to be reduced/limited to reduce spillage.
  - Building occupants to be made aware of measures to reduce risk of bird strike e.g. use of shades/blinds and turning off lights when not in use.

- Landscaping design should:
  - avoid creating linear features which may funnel birds towards glass features;
  - consider pedestrian and vehicle approaches to buildings to avoid potential for flushing of birds e.g. from trees or shrubs towards glass buildings; and
  - avoid placement of interior planting in close proximity to windows to avoid creating the impression of continuing vegetation.

3.2 Control of Gulls and Pigeons

All buildings within the Central Docks Neighbourhood should incorporate measures to dissuade nesting and roosting of gulls and feral pigeons, appropriate to the design and function of the building. Each reserved matters application should include details of consideration with designed-in measures to be prioritised over additional measures such as spikes, wires or netting. Applicants should consider the implications of installing such measures in also reducing the availability of habitat for other key bird species including cormorant *Phalacrocorax carbo*. Any measures installed must also have regard to appropriate licensing requirements in respect to the protection of breeding birds under the Wildlife and Countryside Act 1981 (as amended).

Suitable designed-in measures include:

- Minimise flat roofs or replace with pitched roofs (over 25 degrees).
- Where flat roofs are required consider incorporation of roof gardens so human disturbance may deter nesting. Additional dissuasion measures may be required in certain locations.
- Avoid interruptions in the roof plane, e.g. skylights, or utilise additional dissuasion measures.
- Avoid roof overhangs with ledges below or incorporate a minimum ledge slope of 45 degrees or additional dissuasion measures.

Additional dissuasion measures which may be considered include:

- Spikes – can be effective on ledges if spaced appropriately however if used on roofs requires complete covering and therefore there is an associated visual impact.
- Wires – may be aligned in parallel rows on flat roofs or ledges to dissuade roosting (ineffective against nesting). Preferable over netting as avoids snagging of other bird species and may be less visually intrusive).
- Netting – requires careful consideration due to potential negative visual impact; difficulty to correctly install and maintain; and potential for individuals to become snagged due to inappropriate mesh size.
- Effective management of litter and waste – avoid accumulations and consider nuisance bird species in design of street furniture, e.g. litter bins.

It is not recommended that measures such as plastic bird of prey decoys, noise emitting devices or wind-driven moving structures are utilised as they are less effective and may have a negative impact on local nesting species, in particular peregrine *Falco peregrinus*.

Additional mitigation measures may be required for priority bird species which will also be deterred by the methods outlined above. All reserved matters applications should consider appropriate inclusion of integrated roosting features for species such as cormorant.

3.3 Control of Leisure Boat Activity

Due to the location of the Central Docks Neighbourhood within close proximity to sites designated for significant water bird populations, the impact of increased boat traffic should be considered within the environmental assessment and Habitats Regulations Assessment accompanying each reserved matters application. The assessments should incorporate survey/monitoring data of SPA species in order to ensure the appropriateness of mitigation measures.

Boats currently access Princes Half Tide Dock, West Waterloo Dock and the waterway to the north of West Waterloo Dock via the Liverpool Canal Dock link. This is accessed from the north from the Liverpool to Bootle stretch of the canal via Stanley Dock.

Impacts from increased boat traffic will require appropriate mitigation to ensure impacts on SPA qualifying species utilising the docks (e.g. cormorant) are avoided. In addition increased boat traffic has the potential to undermine the effectiveness of mitigation measures such as floating pontoons.

Measures to limit boat activity may include restricting traffic in certain seasons or to certain times of the day or year. Additionally, the implementation of a lane or one-way system may help to control traffic.

3.4 Recreational Disturbance

Point x. of Condition 16 requires '*mechanisms to ensure protection of Sefton Coast SAC (Seaforth Docks to Formby Point) from recreational disturbance*

overseen by the Liverpool Waters Coordination Panel in accordance with Schedule 6 of this permission'.

It is proposed that 2,900 residential units will be created within the Central Docks Neighbourhood. There is the potential that residents may travel to Sefton Coast SAC (approximately 5.9km to the north), Ribble and Alt Estuaries SPA/Ramsar (approximately 5.3km to the north) and Mersey Narrows and North Wirral Foreshore SPA/Ramsar (0.9km to the west across the River Mersey) for recreational purposes. This may affect the designated sites either alone, or in-combination with other developments.

A public open space will be created within the Central Docks Neighbourhood – Central Park. It is envisaged that this will be used for recreation which may reduce visits to the European sites. Recreational disturbance effects at Sefton Coast SAC were screened out within the Liverpool Waters HRA (WYG, 2011b)[22] as *"the primary movements of end users will be contained within the footprint of the development and its immediate surrounds."* However, since the Liverpool Waters outline consent was granted, a number of statutory designations have changed (e.g. Mersey Narrows and North Wirral Foreshore SPA and Liverpool Bay SPA). There is also further evidence and understanding of the impacts of visitor pressure on the designated sites (Natural England, 2015).[23]

Recreational pressure, including vehicular access and dog-fouling, is recognised in the formal statutory European Site Conservation Advice Packages for Sefton Coast SAC (Natural England, 2019[24]) which can be assessed as a Medium-High risk to qualifying features of the European site. Recreational pressure is also highlighted in the draft Liverpool Local Plans HRA as a Likely Significant Effect (LSE) (AECOM, 2017).[25] Public access/disturbance is confirmed as an issue in the Site Improvement Plans for Ribble and Alt Estuaries SPA, Sefton Coast SAC and Mersey Narrows and North Wirral Foreshore SPA.

All reserved matters applications for plots within Central Docks should include consideration of recreational pressure within HRA for Sefton Coast SAC, Ribble and Alt Estuaries SPA, Mersey Narrows and North Wirral Foreshore SPA. All future applications should ensure that they provide sufficient information to satisfy further tests of the Habitat Regulations (as required).

All developments should include a commitment to adhering to the objectives of the Visitor Management Strategy (VMS) which is currently being considered to provide a strategic approach to mitigation across the Liverpool City Region (LCR). The Liverpool City Region has commissioned a wider strategic approach to visitor and recreation pressure management; this is to be referred to as the 'Liverpool City Region European Sites Recreational Mitigation and Avoidance

[22] WYG (2011b). Liverpool Waters Habitats Regulations Assessment Screening Report for Proposed Liverpool Waters Scheme. Liverpool: WYG.
[23] Natural England (2015). *Mersey Narrows and North Wirral Foreshore Sites of Special Scientific Interest - Investigation into the impacts of Recreational Disturbance on Bird Declines*. Natural England Commissioned Report NECR201.
[24] Natural England (2019). *European Site Conservation Objectives: Draft Supplementary advice on conserving and restoring site features. Sefton Coast Special Area of Conservation (SAC) Site Code: UK0013076.* York: Natural England.
[25] AECOM (2017). *Liverpool Local Plan Habitats Regulations Assessment*. Liverpool: AECOM.

Strategy'. This work may help inform the delivery of visitor and recreation mitigation to protect European Sites within the City Region. This work is currently ongoing and no firm proposals have been proposed or agreed.

As stated in the NEBS for Princes Dock (WYG, 2018), reserved matters applications which come forward prior to the adoption of the LCR Mitigation and Avoidance Strategy should consider how recreational pressure will be assessed (and potentially mitigated for) as a result of the development. Condition 34 of Part D of the outline consent will ensure that the developer provides sufficient information to assess potential impacts through further surveys and HRA. More certainty over what mitigation (if any) would be required will be able to be provided at this stage. Applicants should include additional mitigation/preventative measures capable of being incorporated into the proposals and/or scheme design that will avoid and/or mitigate recreational pressures on the European sites and any functionally linked habitat. There should be a clear distinction within the reserved matters application documents (e.g. EBS) between those parts of the development which are essential features/characteristics, and those which are proposed as mitigation/preventative measures designed to protect European sites.

Examples of mitigation/preventative measures that may be included (as appropriate to the development of plots):

xi. Design and management of additional public open space outside the proposed development boundary to encourage use away from the European sites (e.g. Central Park).

xii. Restrictions on the number of apartments allowed to keep dogs.

xiii. Provision of information in sales packs, informing residents of the presence and importance of the European sites, and how they can help protect them including an outline 'responsible user code.'

xiv. Contributions to develop a visitor/householder 'responsible coast user code' including encouragement of visits to non-sensitive locations.

xv. Contributions to improving and/or managing access to and/or within the internationally important nature sites including financial contributions.

xvi. Contributions to increase recreation management including location-specific interventions e.g. wardening, signage, path management and habitat management, including financial contributions.

xvii. Contributions to non-sensitive locations in order improve sites to provide greater visitor enjoyment in order to reduce visits to European sites.

Any mitigation proposed should be in accordance with the Liverpool Waters SEMP.[26]

[26] Arup (2019) Liverpool Waters Strategic Ecological Mitigation Plan – Interim Note.

4 Construction Phase Mitigation

4.1 Construction Working Practices

4.1.1 Removal of Existing Buildings and Vegetation

The existing buildings, structures, hardstanding and ephemeral vegetation within the Central Docks Neighbourhood offer suitable nesting habitat for birds. Consequently, projects should demonstrate that breeding birds have been considered in their planning application. To limit disturbance to nesting birds, it is recommended that intrusive works such as vegetation clearance and demolition works are undertaken outside of the bird nesting season (March-August), where possible.

Where it is not possible to undertake intrusive works outside of the nesting season, a suitably qualified Ecological Clerk of Works (ECoW) should undertake a nesting bird check prior to the commencement of works on site. Should an active nest be identified, the ECoW should advise on a suitable species-specific working method and exclusion zone to limit disturbance and avoid damaging nests. The recommended working method may vary depending on the species and the nature of planned works.

4.1.2 Construction Vehicles, Routes and Speed Limits

As a precautionary measure, construction should be undertaken outside of the bird nesting season (March – August inclusive). Where this is not possible, an ECoW will be required to undertake a nesting bird check to ensure nests will not be damaged as vehicles move across the site. As per the NEBS for Princes Dock, vehicle routes and speed limits may need to account for nests.[3] The EcOW should advise the appropriate distance for vehicle traffic to keep from nests.

Wintering bird surveys were undertaken across the entire Liverpool Waters site during the 2018-2019 season (October to March). The reporting of the surveys was not yet published at the time of writing this NEBS, however cormorant, shelduck *Tadorna tadorna*, ringed plover *Charadrius hiaticula*, and oystercatcher have been recorded on site, among other common species. The numbers of cormorant recorded on site is considered to represent a significant proportion of the SPA population (i.e. >1%). Construction vehicle routes and speed limits should therefore be developed based on the data collected during the 2018/2019 surveys along with data collected previously across Liverpool Waters and for standalone applications. Any mitigation should be outlined in detail in the Construction Environmental Management Plan (CEMP) for the individual reserved matters through Condition 39 of the Liverpool Waters outline consent. Any mitigation proposed should be in accordance with the Liverpool Waters SEMP.[26]

The Liverpool Waters ES identified the presence of a small roost for oystercatcher and redshank in West Waterloo Dock. A restricted speed limit should therefore be stipulated for construction vehicles moving around this dock and should be

included within the CEMP. The ECoW may also recommend a speed limit during the nesting bird season (March – August inclusive).

4.1.3 Protection of Roost Sites of Wintering/Passage Birds

In 2011, WYG identified no significant aggregations of water birds associated with the Central Docks Neighbourhood; although, surveys by Arup in the 2018/2019 wintering season, have recorded SPA qualifying species such as cormorant on site.

Consequently, any developments in the Central Docks Neighbourhood, and elsewhere in the Liverpool Waters Scheme, which have the potential to result in increased water bird disturbance should consider, within its supporting environmental assessment and associated HRA, the impact of disturbance on features of all designated sites.

Disturbance pathways through the development of plots within the Central Docks Neighbourhood are likely to be associated with increased noise and visual effects and disturbance to available habitat for roosting and foraging. Impacts resulting from disturbance and interruption of flight paths and shading from buildings should also be considered. Mitigation should be identified through the updated impact assessment and/or the HRA. Any mitigation deemed necessary should be in accordance with the Liverpool Waters SEMP.[26] It should be outlined in detail in the CEMP for the individual reserved matters through Condition 39 of the Liverpool Waters outline consent.

Noise Disturbance Mitigation

Individual developments in the Central Docks Neighbourhood will require piling; this activity has the potential to extend the noise disturbance outside of the Central Docks Neighbourhood and may have potential effects on water birds using other docks within the vicinity. Therefore, effects on water bird roosting and foraging will be extended outside of the Central Docks Neighbourhood and will cover the entirety of the Liverpool Waters Scheme. For each development where piling is required, mitigation should be identified and implemented where appropriate. Any mitigation proposed should be in accordance Liverpool Waters SEMP.[26]

Noise disturbance mitigation measures should be included within the CEMP to reduce the effect of noise disturbance on birds. For Central Docks, these may include the following:

- Adherence to the guidelines set out in The Code of Practice for Noise and Vibration Control on Construction and Open Sites, 2009 and subsequent updates.
- The use of rotary piling method.
- Selection of quietest working equipment available.
- Positioning equipment behind physical carriers, i.e. temporary hoarding.
- Provision of lined and sealed acoustic covers for noisy equipment.
- Directing noise emissions away from plant, including exhausts or engines away from sensitive locations.

- Ensuring that regularly maintained and appropriately silenced equipment is used.
- Maintaining a no idling policy.

It is therefore recommended that the above guidance is followed for each development requiring piling; however, a noise impact assessment should still be undertaken for reserved matters applications through Condition 47 of the Liverpool Waters outline consent to determine whether additional mitigation, such as restrictions on the time of year i.e. a working window, is required.

An in-combination assessment should be undertaken within any HRA coming forward for reserved matters applications. This should consider the impacts of noise disturbance (amongst other impacts) from additional developments within the site, therefore looking at the cumulative and in-combination impacts, which may require additional or adapted mitigation.

Visual Disturbance Mitigation

Developments around West Waterloo Dock and Princes Half Tide Dock will require screening in relation to water birds. In both docks, screening should only be placed at ground level, this will block sight lines to the busiest area of the construction sites (i.e. where most operative and vehicle movements are likely to be concentrated). The developments should also be screened to prevent windblown litter entering the docks.

5 Habitat Creation

5.1 Bird Nesting/Roosting Features and Foraging Habitat

In accordance with the Sustainability Principles described in Section 1.9, developments should be striving towards biodiversity enhancement and net gain. Wherever possible, any opportunity to develop ecological connectivity within the neighbourhood and the wider Liverpool Waters scheme should be considered. To enhance the ecological value of the Central Docks Neighbourhood, buildings within the neighbourhood should incorporate features for the following bird species.

5.1.1 Black Redstart

During the breeding bird surveys undertaken in 2009 one singing black redstart was recorded singing south of Stanley Dock (WYG, 2009).[27] In 2015 and 2016, WYG undertook peregrine surveys close to Stanley Dock (north of Central Docks) and also recorded black redstart. To create a cohesive enhancement plan across the Liverpool Waters Scheme, as per the NEBS for Princes Dock, it is recommended buildings within the Central Docks Neighbourhood consider the inclusion of a green roof specifically designed for black redstart, where appropriate and viable.

Green Roof

Although the term green roof is used throughout this NEBS, roof habitat designed specifically for black redstart should contain a high proportion of sparsely vegetated areas which is more typical of brown roofs.

Green roofs should incorporate the following specification:

- relatively small areas of very sparsely vegetated rubble or rocky terrain incorporating hibernacula for invertebrates;
- still or slow-moving water; and
- nearby nest boxes.

An ornithologist should be involved in the design process to ensure specific ecological requirements for black redstart are met through the design process. Developments should also consider the compatibility of green roofs with the need to exclude gulls and pigeons as outlined in Section 3.2.

Detailed guidance on green roofs is provided by the greater London Authority (GLA) publication, Living Roofs and Roofs (GLA, 2008).[28] Guidance on creating

[27] WYG (2009). *Liverpool Waters Breeding Bird Survey Report*. Liverpool: WYG. Included as Appendix 7.6 of the Liverpool Waters ES.
[28] Greater London Authority (2008). Living Roofs and Walls Technical Report: Supporting London Plan Policy. GLA, London.

habitat specifically for black redstart is also detailed in the guidance produced by the Greater Manchester Biodiversity Project (GMBP, 2008).[29]

Nest Boxes

In addition to providing green roofs, nest boxes specifically designed for black redstart are also recommended. Suitable next boxes include:

- Schwegler 2HW (externally fixed); and
- Schwegler 1HE (integrated).

Due to the presence of peregrine falcon within the area, consideration should be required as to which plots will be most suitable for black redstart nest boxes. A suitably qualified ecologist should advise on the installation of nest boxes within each plot during production of the EBS.

5.1.2 Peregrine

Peregrine falcon thrive in urban environments due to their capacity to hunt a diverse range of species. It is not considered appropriate to incorporate nest boxes for black redstart (prey) and peregrine falcon (predator) in the same area. Consequently, consideration may be required as to which plots will be most suitable for peregrine nest boxes. A suitably qualified ecologist should advise on the installation of nest boxes within each plot during production of the EBS. Dixon & Drewitt (2012) provides further guidance on the provision of artificial nest sites for peregrine on built structures.[30]

5.1.3 Swallows and Swifts

The Central Docks Neighbourhood should also consider the inclusion of swallow and/or swift boxes in buildings to the north of the Kingsway Tunnel. Where provided, it is recommended that a minimum of three boxes should be considered to be installed per building, to replicate a colonial nesting situation. Any boxes installed should be sited at least 5m above ground, with clear adjacent airspace so birds can access them in high-speed direct flight. A suitably qualified ecologist should advise on the installation of nest boxes. It may be necessary to utilise a lure whereby calls of nesting swifts may be played to attract individuals and increase the likelihood of establishing a colony.

5.1.4 Replacement Roosting Habitat for Water Birds

As per the NEBS for Princes Dock, it is acknowledged that Condition 34 of the planning decision notice for the Liverpool Waters development specifies that replacement roosting sites are only required for Nelson Dock; due to the relatively high number of roosting cormorants, recorded by WYG in the Liverpool Waters

[29] Greater Manchester Biodiversity Project (GMBP) (2008). *Make Room for Black Redstarts: A species action plan for Greater Manchester*. GMBP: UK.
[30] Dixon, N and Drewitt, E. (2012). *A 15-year study of the diet of urban-nesting Peregrines.* Devon Birds.

Wintering and Passage Bird Report (WYG, 2011c).[31] Replacement habitat for roosting water birds was not proposed for the docks in the Central Docks Neighbourhood. However, due to the findings of more recent surveys which have recorded significant numbers of cormorant,[12] and the extension of Liverpool Bay SPA which now includes cormorant as a qualifying species, the requirement for mitigation will need to be revised.

The specification for suitable water bird habitat should be based on the results of the first annual passage and wintering bird survey and foraging common tern survey. Based on the information collected during the 2018/2019 wintering bird surveys, SPA species such as cormorant have been recorded within the site. Appropriate mitigation such as floating pontoons will therefore be required. The results of the surveys will be used alongside other data to produce a Liverpool Waters Strategic Ecological Mitigation Plan (SEMP) which will examine data in the context of extant and likely reserved matters applications across the entire Liverpool Waters Scheme, and identify areas where mitigation is needed.[26] The SEMP will be submitted to the LPA for approval. In line with the NEBS for Princes Dock, it is proposed that all of the mitigation features specified are delivered in areas managed by the landowner.

A cohesive approach across all neighbourhoods is required for this type of mitigation; reserved matters applications elsewhere within the Liverpool Waters scheme may result in significant impacts on water bird habitats, which cannot be mitigated for locally, therefore, mitigation may need to be implemented within adjacent neighbourhoods to maximise the overall effectiveness. However, mitigation measures should also be submitted as part of reserved matters applications and approved and discharged through Condition 34 of the outline consent for each detailed plot when additional surveys are undertaken to provide further information. Any mitigation proposed should be in accordance with Liverpool Waters SEMP.[26]

5.2 Bat Roosting Features

Although no bat roosts or buildings with bat roost suitability were identified within Central Docks during the surveys undertaken (WYG, 2009),[15] there is an opportunity to enhance the site for bats through the installation of artificial roosting features. Central Docks may be considered to be the neighbourhood with the most potential to be utilised by bats in the future due to the proposed Central Park which should provide suitable foraging habitat.

A total of nine bat boxes should therefore be installed on buildings in proximity to Central Park. Two bat boxes should be installed onto the southern facing aspect of the building on Plot C-10, where possible. It is recommended that the boxes are positioned on the southern face of the building, above 4m height. It is recommended that bat boxes are to be considered to be integrated into the walls for longevity, however they may also be fixed to the external walls.

[31] WYG (2011c). *Liverpool Waters Wintering and Spring Passage Bird Survey Report*. Liverpool: WYG.

The additional bat boxes should be positioned on the buildings on Plots C-05-A, C-05-B, C-09-A, C-09-B, C-07 and/or C-11, where possible. The boxes should be positioned south-west through to south-east where possible, however the western aspects of the buildings along the River Mersey should be avoided due to exposure to the prevailing weather.

The details of locations and types of boxes should be included within the plot-specific EBS to be provided as part of the reserved matters applications.

5.3 Landscape Planting

Public open space is proposed at Central Park along with additional areas of planting within the majority of development plots. Landscaping design should be detailed within the plot-specific reserved matters applications. Landscaping should include native species which attract invertebrates and therefore provide a food resource for bats. This includes native nectaring species; alternatively, suitable high nectaring non-native species may be considered to augment native species planting.

5.3.1 Tree Planting

Tree planting in areas of public open space should aim to create potential green corridors through the neighbourhood for bats and breeding birds, whilst avoiding funnelling birds towards reflective glass surfaces (Section 3.1). The landscaping within individual plots should tie in to corridors created in the public open space and develop a green network of potential wildlife corridors throughout the development. The habitats developed within each neighbourhood should also seek to link into adjacent neighbourhoods to maximise corridors and increase permeability throughout the entire Liverpool Waters scheme.

Where possible the planting interval for trees should be such that the canopies of adjacent trees are within at least 5m of one another when mature or the spaces between the trees should be bridged by suitable planting for bats. As stated in Princes Dock NEBS (WYG, 2018), it is recommended that the priority (broad) habitat ‘Broadleaved mixed and yew woodland’’ which is listed in the Natural Character Area (NCA) profile for Merseyside Conurbation (Natural England, 2013) is referenced as the basis of tree planting schemes. Suitable species include wild cherry *Prunus avium*, alder *Alnus glutinosa*, Blackthorn *Prunus spinosa*, elder *Sambucus nigra*, goat willow *Salix caprea*, hawthorn *Crataegus monogyna*, oak *Quercus* sp., field maple *Acer campestre*, silver birch *Betula pendula*, hazel *Coryllus avellana* and rowan *Sorbus aucuparia.*

5.3.2 Additional Shrub and Herbaceous Planting

The planting mix should attract a range of invertebrate species and provide an important foraging resource for breeding birds and bats. The formulated planting mix should encompass a range of sequential flowering and fruiting species which provide foraging resources for site fauna at different times of year.

Landscaping of public open space and within individual plots should include additional areas of shrub and herbaceous planting, including both annuals and herbaceous perennials. The planting mix should aim to attract a range of invertebrate species and support pollinator species.

Although native species are preferred, non-native plants, provided they are not invasive, can assist in providing nectar sources throughout the year. Examples of such species are listed in the Royal Horticultural Society (RHS) publication Plants for Pollinators – Garden Plants (RHS, 2011).[32]

[32] RHS (2011). Plants for Pollinators – Garden Plants. Available at https://www.rhs.org.uk/science/pdf/conservation-and-biodiversity/wildlife/plants-for-pollinators-garden-plants.pdf

6 Post-Construction Monitoring and Management

Details of post-construction monitoring and management should be specified within the EBS for each plot and submitted with the reserved matters application. An outline of what should be included within the Central Docks Neighbourhood is provided below.

6.1 Aquatic Monitoring

The results of the construction phase monitoring detailed in Sections 2.6 and 2.7 should be used by the applicant/developer to inform the monitoring programme required during the operational phase for aquatic species (including invasive non-native species) and water quality. The requirements of the ongoing monitoring should be discussed and agreed with Natural England, MEAS, the Environment Agency and Canal and Rivers Trust prior to completion of construction.

6.2 Ecological Mitigation

6.2.1 Bird Strike Mitigation

Routine Management

The bird strike prevention measures should be part of the fabric/fixtures/fittings of the building therefore should require little management outside of that covered by routine building maintenance. Management of any installed features should follow the manufacturer's recommendations.

Monitoring

Bird strike monitoring should be carried out in the first year after construction by owners/occupants of any buildings over five storeys high. This should take the form of monitoring surveys and occupant reports.

Monitoring of bird strike fatalities involves a systematic search for carcasses of birds which have collided with the building. Most bird strike collisions occur in the morning between 7am and 11am although they can happen at any time. Scavengers such as gulls, crows, cats and foxes learn where collisions happen frequently therefore it is important to survey regularly and as close as possible to peak collision time. It is proposed in the Princes Dock NEBS (WYG, 2018)[3] that monitoring surveys should be undertaken based on the methodology set out in the American Bird Conservancy (ABC) advice note (2015).[33] This is also proposed for Central Docks as set out below:

- Representatives should be chosen from each building to carry out the monitoring, for example a member of maintenance staff.

[33] ABC (2015). *Monitoring buildings for bird collisions*. Virginia: American Bird Conservancy.

- The monitoring period should be 12 months, where possible, to include one winter and one spring migration.
- Monitoring should take place on three days per week, between 8am and 10am.

Monitoring staff should initially be trained in conducting searches by a suitably qualified ecologist who may also be on hand to assist with subsequent identification of carcasses, e.g. by emailed photographs. The monitoring route should be devised during the training and should include every façade with windows, including along green roofs, and if possible, setbacks and other roof terraces. A map of the monitoring route should be created for reference, and the route should be subdivided into segments, with each change in façade structure and orientation assigned a segment number.

At the designated times, monitoring staff should conduct a careful search, looking within 10m of the building, with a special emphasis on landscape planting and other objects such as street furniture, as injured birds may seek shelter near those objects. After each segment, staff should record the date, time, number of birds found, their species and their status (dead, alive, or injured). If possible, photographs and specimens should be collected. It is important to record the search, even if no birds are found as this may be used as evidence for the effectiveness of installed mitigation.

All building occupants should be informed of the monitoring, so that their own efforts do no complicate the data e.g. maintenance staff should be instructed not to sweep up any carcasses when they are not engaged in monitoring.

The monitoring strategy and data collected should be continually reviewed in consultation with the ecologist to determine whether any adjustments to the methodology or mitigation are required. This should take place initially after 3 months and then quarterly until the end of the 12-month monitoring period. A monitoring report should be produced by the ecologist at the end of the monitoring period to summarise the findings and include any further enhancements of mitigation and monitoring, as required.

A system should also be set up whereby building occupants are encouraged to report any bird strikes. This should be included in the Welcome Pack for owners/tenants and supported by posters displayed on information boards to alert occupants to the risk of bird strike and the routine monitoring programme. Any occupant reports should be reviewed and included within the results of the monitoring report.

Remedial Management

The monitoring report should examine the locations of bird strikes in relation to mitigation features. Where relevant, areas of the building which may be more prone to bird strike should be highlighted and if appropriate further mitigation should be recommended. The monitoring report should be discussed with the building owner and additional monitoring undertaken if required. If additional mitigation is installed, then a further 12-month round of monitoring should take place to assess its effectiveness.

6.3 Control of Gulls and Pigeons

Routine Management

Ideally, issues with gulls/pigeons should be designed out without the need for additional control/dissuasion measures. However, if installed appropriately, little management should be required on control/dissuasion measures outside of that covered by routine building maintenance. Management of any installed features should follow the manufacturer's recommendations.

Monitoring

Monitoring for breeding is proposed where control/dissuasion measures are installed on buildings. A representative from the building should be chosen to carry out the monitoring following training by a suitably qualified ecologist. Searches should be undertaken at least twice per year, during May and June for the lifetime of the building. All potential nesting surfaces, such as ledges, flat roofs and roof terraces, should be inspected from the ground, with binoculars, and from within the buildings, where access allows. The locations of any gull or pigeon nests should be recorded on a map.

Remedial Management

Where significant numbers of nesting gulls and pigeons (more than two gull or five pigeon nests) are recorded, then the building owner should consult an appropriate contractor to identify suitable additional measures to dissuade/exclude birds during the following breeding season. Any additional exclusion measures should be installed by a suitably qualified contractor.

6.4 Habitat Creation

Where appropriate, buildings within the Central Docks Neighbourhood, should consider the incorporation of the following habitat creation measures:

- green roofs and black redstart nest boxes;
- swallow boxes;
- peregrine boxes;
- bat boxes; and
- landscape planting for bats and invertebrates.

As per the NEBS for Princes Dock,[3] routine management, appropriate monitoring and provisions for remedial management are set out below. Where mitigation for water birds is provided on the basis of the passage and wintering bird surveys, these should also be included within the monitoring programme. Monitoring and remedial management measures will be dependent on the type(s) of mitigation features implemented. Further details on the requirements of monitoring of mitigation measures should be provided with reserved matters applications and should be provided to the LPA for approval prior to installation. An Adaptive Management Plan should be produced with any SPA bird mitigation package developed. This is to ensure appropriate monitoring is undertaken and the mitigation is adapted if required to ensure the best success possible for SPA birds.

Any mitigation, management and monitoring proposed should be in accordance with the Liverpool Waters SEMP.[26]

6.4.1 Green/Brown Roofs and Black Redstart Boxes

Routine Management

Once fully established, green roofs designed specifically for black redstart require limited management. Occasional weeding may be required, should robust species establish.

Monitoring

Green roofs should be inspected twice per year to ensure they continue to meet the original specification. Inspections should be made by a suitably qualified landscape contractor and/or an ecologist. It should be ensured the roofs remain sparsely vegetated with an exposed substrate, e.g. rubble or rocky terrain.

The black redstart nest boxes should be inspected annually to ensure they remain fit for purpose. Inspections should be made from the ground using binoculars outside of the bird nesting season (September – February); where unable to ascertain the condition of nesting boxes, a closer inspection should be undertaken using an appropriate access system (September – February).

Following the completion of a green roof, two black redstart surveys should be undertaken in accordance with the survey methodology outlined in Section 2.2.2, in addition, a roof level survey should be undertaken (following the below methodology). To make efficiencies by avoiding the duplication of survey effort, the data collected during the biennial black redstart surveys should be used for monitoring; this is only possible where a full breeding season has passed between completion of the green roof and the survey. The second survey should be carried out five years after the completion of the green roof.

The roof level survey should comprise a two-hour vantage point survey, with the aim of observing whether black redstart are utilising the green roof for foraging and/or nesting. The roof level survey should be completed following the ground-level survey or independently, depending on whether data from the biennial surveys are used for the ground-level element.

Remedial Management

As per the NEBS for Princes Dock, remedial management of any created green roof features would be dependent on the system chosen; management would likely be limited to re-establishing flora which has failed. If required, maintenance of the green roof would be undertaken by a suitably experienced contractor. Any nest boxes which are deemed to have failed should be replaced between September and February (inclusive).

6.4.2 Swallow Boxes

Routine Management

Once erected, swallow boxes should not require any routine management.

Monitoring

The condition of swallow nest boxes should be inspected from the ground using binoculars, approximately every five years.

Remedial Management

Any nest boxes which are deemed to have failed structurally, should be replaced between September and February, using an appropriate access system.

6.4.3 Bat Boxes

Routine Management

Once erected, bat boxes should not require any routine management.

Monitoring

Bat boxes should be monitored by a suitably licensed bat worker in years two, five and ten post-installation. The monitoring survey may be done from a Mobile Elevation Work Platform (MEWP) or similar, where possible, in order to inspect the boxes for signs of use. Where this is not possible activity surveys (dusk emergence/dawn re-entry) may be required to assess presence/likely absence of bats.

Remedial Management

If any bat boxes are recorded to have failed, or require maintenance/cleaning, this should be undertaken under the supervision of a licensed bat worker between November and February (inclusive).

6.4.4 Landscape Planting

Routine Management

A Landscape Management Plan (LMP) should be produced for each plot-specific reserved matters application and should cross-reference the plot-specific EBS. Routine management will likely comprise weeding, pruning and replanting as appropriate to the species mix and layout/design.

Monitoring

Landscape planting should be assessed annually during maintenance visits to determine the success/establishment of planting and whether it meets the original specification.

Remedial Management

The overall aim should be as set out in Section 5.3, to provide a scheme that is beneficial to bats and invertebrates. The initial requirement for remedial management should be determined by the Landscape Architect and set out in the LMP. This should be reviewed by the landscape contractor during their annual inspections. If significant remedial management is required, an ecologist should be consulted to ensure that proposed replacement is appropriate.

7 Summary

7.1 Pre-Construction/Construction Phase Surveys and Impact Assessment – Condition 16: Parts i, ii and vi

7.1.1 Birds

- Annual surveys for breeding little ringed plover, breeding black redstart, passage/wintering birds and foraging common tern should be undertaken in the year prior to construction and during the subsequent four years of development at the Central Dock Neighbourhood. Following the first five years of monitoring, the requirement for continued surveys should be reviewed.
- The results of the bird surveys should be used to produce updated impact assessments for each reserved matters application, to be submitted to the LPA through an Ecological and Biodiversity Statement.

7.1.2 Bats

- Where a reserved matters application proposes demolition of any existing structures, a bat roost suitability assessment should be undertaken.
- Structures confirmed as roosts during the preliminary bat roost assessment, or those assessed as having low, moderate or high bat roost suitability may require further activity surveys to determine the presence/likely absence of bats and characterise roosts.
- Any reserved matters applications which affect structures with potential to be used by roosting bats should include an impact assessment within the plot-specific EBS. If any significant construction or operational impacts are considered likely, then appropriate mitigation should be developed.

7.1.3 Aquatic Species

- Initial baseline characterisation surveys should be undertaken for phytoplankton, fish, benthic macro-invertebrates and benthic invertebrates.
- Annual surveys (spring and autumn) should be undertaken to monitor benthic invertebrates, plus surveys for algae, phytoplankton and zooplankton species.
- If the baseline survey indicates a low fish population is present, surveys should be undertaken to monitor improvements.
- If the surveys identify marine INNS, methodologies should be developed to avoid them being spread because of works within the docks.

7.1.4 Water Quality

- Initial baseline characterisation survey of the dock system is to be undertaken prior to the start of construction to include water quality

sampling, sediment quality sampling and bathymetric survey for sediment depth.
- Ongoing monitoring to be undertaken during construction to monitor the above parameters including biochemical oxygen demand, ammonia and nutrients.
- Appropriate water quality management plan to be developed and implemented by the Principal Contractor during development.

7.2 Mitigation Through Scheme Design – Condition 16: Parts v, vii, viii & x

7.2.1 Bird Strike Mitigation

- The design of tall buildings within the Central Docks Neighbourhood, particularly those with significant quantities of reflective glass, should incorporate measures to mitigate the risk of bird strike.
- Plot-specific details of measures to reduce bird strike should be included within the EBS for each reserved matters application.

7.2.2 Control of Gulls and Pigeons

- All buildings must incorporate measures to dissuade nesting and roosting of gulls and feral pigeons, appropriate to the design and function of the building.
- Each reserved matters application should include details of consideration with designed-in measures to be prioritised over additional measures such as spikes, wires or netting. This should be detailed within the plot-specific EBS.

7.2.3 Control of Leisure Boat Activity

- Any development which has potential to result in increased boat traffic should consider the impact of the increased boat traffic on features of designated sites.
- Bird populations at Central Docks should be monitored on an annual basis. The surveys should be used to develop a leisure boat activity mitigation strategy, where required.

7.2.4 Recreational Distrubance

- All reserved matters applications should include HRA information for all Natura 2000 sites which may be impacted by the proposed scheme, including through recreational disturbance.
- All developments should include a commitment to adhere to the objectives of relevant Visitor Management Strategies (VMS).
- Reserved matters applications which come forward prior to the adoption of the VMS should consider how recreational pressure will be assessed (and potentially mitigated for) for the development.

7.3 Construction Phase Mitigation – Condition 16: Part iii

7.3.1 Removal of Existing Buildings and Vegetation

- The removal of existing buildings, structures, hardstanding and ephemeral vegetation should be undertaken outside of the breeding bird season, where practicable.
- Where this is not practicable, a suitably qualified ECoW should conduct a check for nesting birds prior to commencement of works.

7.3.2 Construction Vehicles, Routes and Speed Limits

- Construction vehicle routing and speed limits should take account of nesting birds (advised by ECoW) and SPA birds.
- A speed limit should be implemented on vehicles travelling adjacent to West Waterloo Dock due to the potential for roosting redshank and oystercatcher.

7.3.3 Roost Sites of Wintering Birds and Passage

- Any development which has the potential to result in increased disturbance of water bird roosting sites should consider the impacts on features of all designated sites.
- Bird populations should be monitored on an annual basis; a scheme-wide mitigation strategy should be developed.
- For each development where piling is required, appropriate mitigation should be identified and implemented, where appropriate.
- Measures to reduce the impacts of noise disturbance during construction should be included within a CEMP.
- Visual disturbance mitigation should be installed for the developments around West Waterloo and Half Princes Dock.

7.4 Habitat Creation – Condition 16: Part iv

7.4.1 Black Redstart

- Buildings within Central Docks should consider the inclusion of a green roof designed for black redstart.
- Where green roofs are provided, black redstart nest boxes should also be included on the same building.
- Additional mitigation options for black redstart should also be considered to include brown walls and a mosaic of green/brown roofs and walls.

7.4.2 Peregrine

- Due to the potential for conflict between black redstart and peregrine, consideration may be required as to which plots will be most suitable for peregrine nest boxes.

7.4.3 Swallows and Swifts

- The inclusion of swallow and/or swift nest boxes should be considered on buildings, where appropriate. Where provided, a minimum of three boxes should be installed per building.

7.4.4 Replacement Roosting Habitat for Water Birds

- Due to the findings of more recent surveys which recorded 12 cormorant in Princes Half Tide Dock and the extension of Liverpool Bay SPA which now includes cormorant as a qualifying species, the requirement for mitigation may need to be revised within Central Docks.
- The specification for suitable water bird habitat should be based on the results of all surveys undertaken to date across Liverpool waters including standalone applications.
- The results of the surveys will be used alongside other data to produce a Liverpool Waters Strategic Ecological Mitigation Plan (SEMP). A cohesive approach across all neighbourhoods is required for this type of mitigation.

7.4.5 Bat Roosting Features

- A total of nine bat boxes are to be installed on buildings in proximity to Central Park. Two bat boxes should be installed on the southern-facing aspect of the building on Plot C-10.
- The additional bat boxes should be positioned on the buildings on Plots C-05-A, C-05-B, C-09-A, C-09-B, C-07 and/or C-11.
- The specific details of locations and types of boxes should be included within the plot-specific EBS to be provided as part of the reserved matters applications.

7.4.6 Landscape Planting

- Landscaping design should be detailed within the plot-specific reserved matters applications.
- Landscaping should include native species which attract invertebrates and therefore provide a foraging resource for bats. This includes native nectaring species; alternatively, suitable non-native species may be considered to augment native species planting.
- Tree planting in areas of public open space should aim to create potential green corridors through the neighbourhood for bats and breeding birds, whilst avoiding funnelling birds towards reflective glass surfaces.

- Habitats to be developed within individual plots should link to the wider neighbourhood which in turn should seek to link into the other neighbourhoods of Liverpool Waters.

7.5 Post-Construction Monitoring and Management – Condition 16: Part ix

7.5.1 Aquatic Monitoring

- The results of the construction phase monitoring should inform the monitoring programme required during the operational phase.

7.5.2 Bird Strike Mitigation

- Bird strike prevention measures should be integrated into buildings where possible, consequently this should form part of routine building maintenance.
- Bird strike monitoring should be carried out in the first year after construction by owners/occupants of any buildings over five storeys high. This should take the form of monitoring surveys and occupant reports.
- The monitoring strategy and data collected should be continually reviewed in consultation with the ecologist to determine whether any adjustments to the methodology or mitigation are required.

7.5.3 Control of Gulls and Pigeons

- Issues with gulls/pigeons should ideally be designed out without the need for additional control/dissuasion measures. However, if installed appropriately, little management should be required outside of routine building maintenance.
- Monitoring is proposed where control/dissuasion measures are installed: at least twice per year during the lifetime of the building.
- Any additional exclusion measures required as a result of the monitoring should be installed by a suitably qualified contractor.

7.5.4 Green/Brown Roofs and Black Redstart Boxes

- Where provided, green roofs should be inspected at least twice per year to determine whether they continue to meet their original specification.
- Black redstart nest boxes should be inspected annually between September and February (inclusive). Any nest boxes that have failed structurally should be replaced.
- Two black redstart surveys should be undertaken on the completion of the green roof. The surveys should comprise a ground level survey and a roof level survey.
- In order to maximise efficiencies by avoiding the duplication of survey effort, the data collected during the biennial black redstart surveys should

be used for monitoring. However this is only possible where a full breeding season has passed between completion of the green roof and the survey. The second survey should be carried out five years after the completion of the green roof.

7.5.5 Swallow and Swift Boxes

- Where provided, swallow and swift boxes should be inspected every five years.
- Any nest boxes that have failed structurally should be replaced between September and February.

7.5.6 Bat Boxes

- No routine management should be required.
- Bat boxes should be monitored by a suitably licensed bat worker in years two, five and ten post-installation.
- If any bat boxes are recorded to have failed, or require maintenance/cleaning, this should be undertaken under the supervision of a licensed bat worker between November and February.

7.5.7 Landscape Planting

- Landscape Management Plan (LMP) to be produced for each reserved matters application, cross-referencing to the plot-specific EBS.
- Landscape planting should be assessed annually during maintenance visits.
- If significant remedial management is required, an ecologist should be consulted to ensure that proposed replacement is appropriate.

This document provides guidance to be used in relation to ecology and biodiversity for all reserved matters applications within the Central Docks Neighbourhood. The document addresses all parts of Condition 16 and therefore should discharge this condition.

Appendix B: Princes Docks Neighbourhood Ecological and Biodiversity Strategy

FEBRUARY 2018

PRINCES DOCK

CONDITION

16

NEIGHBOURHOOD ECOLOGICAL AND BIODIVERSITY STRATEGY

WYG

LIVERPOOL
WATERS

Liverpool Waters, Princes Dock

Neighbourhood Ecological and Biodiversity Strategy

Peel Land and Property (Ports) Ltd

18th May 2018

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Issue 1	2nd February 2018	DRAFT FOR COMMENT
Prepared by:		Alistair Blackshaw MCIEEM **Senior Ecologist**
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2	18/05/18	Alistair Blackshaw	Gavin Ward	Update following comments on Rev 1 from Merseyside Environmental Advisory Service (MEAS) and Natural England

Contents

Executive Summary

Planning permission for the Liverpool Waters Scheme was granted in June 2013, subject to a total of 77 planning conditions. Condition 16 covers the Neighbourhood Ecological and Biodiversity Strategy (NEBS), which must be submitted to and approved in writing by the Local Planning Authority prior to the submission of the first application for any reserved matters approval in each respective neighbourhood. This document presents the NEBS for the first phase of the Liverpool Waters Scheme, Princes Dock (Neighbourhood A). The NEBS is intended to provide guidance in relation to ecology and biodiversity for all reserved matters applications within the neighbourhood and addresses the following broad areas:

- Pre-construction and construction phase surveys for protected species, fish and water quality;
- Mitigation for bird strike in relation to tall ball buildings;
- Measures to prevent gull and pigeon breeding on new buildings within the neighbourhood;
- Guidance on checks and mitigation for breeding birds and wintering birds during the construction phase;
- Creation of new nesting/roosting features and habitats for black redstart, peregrine falcon, swallow and bats
- Routine management, monitoring and remedial management of mitigation features, new nesting/roosting features and habitats.

The Princes Dock NEBS covers the anticipated construction period for the neighbourhood (2019 – 2023) although some of the specified monitoring measures will last for the operational lifetime of the development.

Glossary

ABC	American Bird Conservancy
ALSE	Assessment of Likely Significant Effect
BCT	Bat Conservation Trust
BoCC	Bird(s) of Conservation Concern
BTO	British Trust for Ornithology
CEnv	Chartered Environmentalist
CIEEM	Chartered Institute of Ecology & Environmental Management
CRoW Act	Countryside and Rights of Way Act 2000
ECoW	Ecological Clerk of Works
EPS	European Protected Species
EPSL	European Protected Species Licence
ES	Environmental Statement
GLA	Greater London Authority
GMBP	Greater Manchester Biodiversity Project
HRA	Habitats Regulations Assessment
IUCN	International Union for Conservation of Nature
JNCC	Join Nature Conservancy Council
LPA	Local Planning Authority
MCIEEM	Member of Chartered Institute of Ecology & Environmental Management
MEAS	Merseyside Environmental Advisory Service
NEBS	Neighbourhood Ecological and Biodiversity Strategy
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SPA	Special Protection Area
USFWS	United States Fish and Wildlife Service
VMS	Visitor Management Strategy
W&CA	Wildlife & Countryside Act 1981 (as amended)

1.0 Introduction

1.1 Background

To address Condition 16 of the planning permission for the Liverpool Waters scheme, WYG was commissioned by Peel Land and Property (Ports) Ltd in December 2017 to produce a Neighbourhood Ecological and Biodiversity Strategy (NEBS) for the Princes Dock neighbourhood (Phase 1). This neighbourhood lies at the southern end of the scheme and includes Princes Dock itself and the dockside land between St. Nicholas Place to the south and Bath Street to the east (Figure 1).

This report has been prepared by WYG Senior Ecologist, Alistair Blackshaw MCIEEM.

1.2 Scope of the NEBS

Planning permission for the Liverpool Waters Scheme was granted in June 2013, subject to a total of 77 planning conditions. Part C of the permission includes conditions 9 – 24, which identify the additional information that must be submitted to and approved by the Local Planning Authority prior to the submission of applications for reserved matters approval. Condition 16 relates to the NEBS, which must be submitted to and approved in writing by the Local Planning Authority prior to the submission of the first application for any reserved matters approval in each respective neighbourhood. The condition states that each NEBS:

> *Shall summarise the means of safeguarding all protected species of relevance and supporting habitats during construction and operation within the respective neighbourhood including consideration of pathways to protected European sites.*

Table 1 presents the 10 points of Condition 16 and shows where they are addressed in this document. Appendix B provides a summary of the wildlife legislation relevant to the NEBS.

Table 1: Liverpool Waters Planning Condition 16

Point	Description	Document Section
i.	*The means, method and timeframe for carrying out updated bird surveys and impact assessments for bats and migratory and/or over wintering birds*	**2.0**
ii.	*The methodology and timeframe for carrying out (seasonal) monitoring of fish and other water species within the dock system*	**2.0**
iii.	*Working practices to address phasing of construction, construction vehicles, routing and speed limits during removal of existing buildings, vegetation and other suitable breeding habitats*	**4.0**
iv.	*Details of habitat creation*	**5.0**
v.	*Design of buildings and spaces in terms of layout, design, materials and lighting to avoid creating barriers to bird migration and aviation and reduce risk of bird strikes particularly in relation to tall buildings*	**3.0**

Point	Description	Document Section
vi.	*Means and methodology for the monitoring and management of water quality within the dock system which shall inform mitigation to safeguard fish and other water species, including the aeration of dock water spaces*	**2.0**
vii.	*Methods for controlling leisure boat activity within the dock system*	**3.0**
viii.	*Methods for controlling gulls and pigeons roosting on buildings*	**3.0**
ix.	*Mechanisms for monitoring and reviewing the effectiveness of agreed ecological and biodiversity mitigation against identified targets and means for enhancing mitigation where those targets are not met*	**6.0**
x	*Mechanisms to ensure protection of Sefton Coast SAC (Seaforth Docks to Formby Point) from recreational disturbance overseen by the Liverpool Waters Coordination Panel in accordance with Schedule 6 of this permission*	**3.0**

Additionally, Condition 34 of the Liverpool Waters planning permission requires each reserved matters application to be accompanied by an Ecological and Biodiversity Statement based on the NEBS, explaining how the specific scheme in that neighbourhood or part neighbourhood will provide for the protection and enhancement of protected species and supporting habitats, including the provision of new and replacement habitats by means of the following:

i. Provision of detailed and quantitative surveys to be able to assess in detail any potential impacts of the development upon bats and migratory and/or over-wintering birds;
ii. Mitigation to safeguard fish and other water species;
iii. Details of habitat creation;
iv. Siting and design of replacement roosting sites within Nelson Dock for displaced winter water birds (specifically cormorants);
v. Provision and management of new / compensatory habitats;
vi. The design of buildings and spaces based on the Detailed Neighbourhood Masterplan for the land;
vii. For development involving the Hydraulic Engine House, Victoria Clock Tower or the office and workshop buildings south of Collingwood Dock, detailed internal bat surveys;
viii. Measures to control leisure boat activity and behaviour within the dock system to minimise disturbance of wildlife within the docks;
ix. Measures to discourage gulls and pigeons from nesting/roosting on buildings; and
x. Mitigation for any areas affected by invasive, non-native plants and noxious weeds.

It is intended that each NEBS will identify the methodologies and options for providing the above surveys and mitigation measures within their own footprint. The Princes Dock neighbourhood is partially built-out under other consents and several reserved matters applications are also currently pending (Table 2). Therefore the scope of the ecological mitigation features which can be

accommodated within this phase of the Liverpool Waters development may be limited. However, the mitigation measures set out in the Environmental Statement (November 2011), and summarised in Schedule 6 of the planning permission, were intended apply to the overall development area and were intended to simply split pro-rata across all of the neighbourhoods.

To address these requirements, each subsequent NEBS will state how much of the total mitigation package has been delivered to date by previous Neighbourhoods – and the mitigation measures it is delivering itself, so that the delivery of these commitments can be tracked, so that all of the mitigation features will demonstrably be in place on completion of the whole Liverpool Waters development.

Note that the Princes Dock NEBS covers the anticipated construction period for the neighbourhood (2019 – 2023) although some of the specified monitoring measures will last for the operational lifetime of the development, where appropriate.

1.3 The Existing Liverpool Waters Scheme

1.3.1 Existing Site

A description of the existing site is provided in the Environmental Statement (WYG, 2011) and other documents submitted as part of the planning application. The extent of the site is shown in Figure 1 and a summary is provided below.

The site of Liverpool Waters occupies approximately 60 hectares to the north of Liverpool's Pier Head, and extends from Princes Dock in the south to Bramley Moore dock in the north. The site extends 2km along the waterfront and also includes the King Edward Industrial Estate. It extends eastwards as far as the dock boundary wall that runs along Bath Street and Waterloo Road. The eastern boundary of the site is defined by the north-south axis of the A5036 carriageway, and the River Mersey defines the site's western boundary. A small portion of the A5046 (at St Nicholas Place) abuts the site to its south, whilst the dock system continues to the site's north towards the boundary with Sefton Metropolitan Borough Council.

Over one third of the site consists of open water docks, in addition to former dock areas that have been subject to earlier in-filling, and are now part of the canal system. Previous in-filling of other docks within the site had been extensive, for example to make way for a power station (the last remnants of which were removed in 1994). The site has remained redundant since then.

The majority of the site consists of land reclaimed from the River Mersey, and historically has been used for industrial purposes. The remaining structures on site include the quaysides, dock boundary walls and open dock spaces. Whilst the site is largely unutilised, Princes Dock to the south has been recently developed to create high-rise residential apartments, office blocks, hotel development, a multi-storey car park and other commercial and ancillary uses. In addition to this, low-rise residential accommodation is located to the east of the site (East Waterloo Dock), and a small industrial estate is situated in the south-eastern corner of the site.

1.3.2 Overview of the Development Scheme

A description of the development scheme is provided in the Environmental Statement (WYG, 2011) and other documents included in the planning submission. A summary is provided below and an illustrative site masterplan is included in Appendix A.

The Liverpool Waters scheme has been divided into five neighbourhoods, or character areas, that focus on the historic names of the docks that sit within these neighbourhoods or have an association with the locality. The five neighbourhoods are:

- **Princes Dock (Neighbourhood A)**;
- King Edward Triangle (Neighbourhood B);
- Central Docks (Neighbourhood C);
- Clarence Docks (Neighbourhood D); and
- Northern Docks (Neighbourhood E).

The amount of floorspace generated for various uses within each neighbourhood varies from approximately 124,000m^2 to 551,500m^2, with the overall total being approximately 1,320,000 m^2. The different land uses of the area once the development is finished will include:

- Commercial office space;
- Residential dwellings;
- Hotel and conference facilities;
- Shops providing mainly for local daily needs;
- Banks and building societies;
- Cafes, bars and restaurants;
- Culture and leisure facilities;
- Education, health and religious and community uses;
- Cruise liner terminal;
- Car and cycle parking;
- Servicing areas; and,
- Roads, paths, central park and other landscaped areas.

Due to the scale of the project, the development will be based on a 30 year construction programme. Due to the long timescales involved in the project, no element of the project has been designed in full detail, with only certain specific elements of the design being 'fixed', such as part of the access. The neighbourhoods will be developed in five phases, in order from neighbourhood A to E.

Before construction starts on each phase (or neighbourhood) of development, clearance and levelling will need to take place, including the demolition of some existing buildings/structures on site.

1.3.3 Princes Dock (Neighbourhood A)

- **Characteristics:** low, medium and high-rise hotel, office and residential buildings around the existing dock basin.
- **Use/Function:** hotel, leisure, office, residential and restaurants.

The development in this neighbourhood will see the remaining vacant plots at Princes Dock brought forward and new commercial buildings delivered along the eastern and western edges of the dock. Cafes and local retail uses will be focused at the ground floor and around openings in the Dock Boundary Wall focusing activity around pedestrian links back to the city centre and to the River Mersey. A 55 storey tower known as 'Shanghai Tower' is proposed to house commercial office space, hotel and residential and will further reinforce the existing City Centre Commercial Core Cluster of tall buildings. The proposal will further activate this neighbourhood with additional residential, hotels,

cafes and restaurants together with new pontoon spaces. Neighbourhood A will deliver up to 198,500 sq.m of development[1], comprising up to:

- A1 Shops (convenience) = 100 sq.m
- A3 Restaurants & Cafes = 7,600 sq.m
- B1 Business = 57,100 sq.m
- C1 Hotels = 14,900 sq.m
- C3 Dwelling Houses = 88,500 sq.m
- D2 Assembly & Leisure = 800 sq.m
- Sui Generis Servicing = 4,700 sq.m
- Sui Generis Parking = 25,200 sq.m

Table 2 shows the planning applications that have already been submitted within the Princes Dock neighbourhood at the time of writing of the NEBS.

Table 2: Princes Dock Planning Applications Submitted up to and Including January 2018

Scheme Name	Plot Reference	LCC Planning Application Reference	Consented Date
Plaza 1821	A05	17F/0913	November 2017
The Lexington	A04	16F/1370	Not yet consented
William Jessop House	A03	15F/0560	Not yet consented
Hive City Docks	A06	17F/0456	January 2018
Liverpool Cruise Terminal	Princes Jetty and Liverpool Ferry Terminal	17O/3230	Not yet consented
Dock Boundary Wall	-	17F/3518	Not yet consented

1.3.4 Changes to Designated Sites Since Planning Permission was Granted

The most significant change to the designated sites within the vicinity of the Liverpool Waters scheme is the extension of Liverpool Bay SPA into the River Mersey estuary. The extended SPA now includes the River Mersey from Bootle, in the north, to past Brunswick Dock, in the south. The Liverpool Waters site, therefore now lies directly adjacent to Liverpool Bay SPA.

The extension of Liverpool Bay SPA also added the following new species to its citation:

- Little gull;
- Cormorant; and
- Red breasted merganser.

[1] Rounded to the nearest 100m

Of these, cormorant are particularly relevant to the Liverpool Waters site, as they may use dockland features, such as jetties and railings as perches or preening areas – as well as the docks themselves for fishing. The numbers of cormorants identified during the survey work which supported the original planning application would now be considered to represent a significant proportion of the birds designated through Liverpool Bay SPA.

In addition, the amended SPA boundary extends the boundary of the pervious marine SPA further inshore to offer protection to foraging common tern. As a result, common tern must now be considered in more detail as they may forage close to the Liverpool Waters Scheme (i.e. within the SPA) or potentially in the docks themselves.

The environmental assessments for all developments coming forward under the Liverpool Waters Scheme will therefore consider the impact of each proposal on the updated features of all the designated sites, including the extended Liverpool Bay SPA, and identify any mitigation measures required, as appropriate.

1.4 Sustainability Targets

The Neighbourhood Sustainability Strategy for the neighbourhood masterplan links the sustainability principles through to the design/construction/management of the site. This strategy has been produced to discharge condition 17. The sustainability commitments for the Liverpool Waters site include:

- To achieve BREEAM Communities Excellent (at Liverpool Waters scale);
- To achieve BREEAM New Construction Excellent for the non-domestic buildings on site; and
- To achieve Home Quality Mark 5* rating for all homes (which represents an updated target from the original Code for Sustainable Homes Level 6 target in the planning decision).

This NEBS links to sustainability targets by fulfilling the mandatory requirement for an ecology strategy under Category LE01 of the BREEAM Communities scheme. The NEBS, in conjunction with the site masterplan also provides detail on how the credits under category LE04 of scheme (Enhancement of ecological value) can be achieved for the Princes Dock neighbourhood.

Compliance with the BREEAM New Construction and Home Quality Mark schemes will be specific to the design/function of the individual buildings within the Princes Dock neighbourhood and should therefore be addressed under each reserved matters application.

2.0 Pre-Construction/Construction Phase Survey and Impact Assessment

2.1 Breeding Birds – Condition 16: Part i.

2.1.1 Peregrine Falcon

Annual surveys for breeding peregrine falcon should be undertaken, in the year prior to construction and during the subsequent four years of development of the Princes Dock neighbourhood (Liverpool planning application reference 10O/2424). The surveys should aim to assess whether any peregrine have colonised the existing buildings for breeding and thus should inform the updated construction phase mitigation strategies for the new buildings. The surveys should be undertaken by suitably qualified ecologists and the survey methodology should follow the guidance set out in *Bird Monitoring Methods* (Gilbert *et al* 1998) adapted for the site (see below). At the end of the first five years' monitoring, the requirement for annual peregrine surveys will be reviewed on the basis of the survey results and, if appropriate, the frequency of the surveys will be reduced. Peregrine surveys will then continue throughout the development of the Liverpool Waters site, at the frequency determined by this review.

Methodology

The survey should comprise a walkover of the site in late March to observe all potential nest sites within the Princes Dock neighbourhood (i.e. the existing buildings) and adjacent buildings for peregrine occupancy/activity. If peregrines are found during the initial visit, then a further two visits should be completed in June/July to assess breeding success. Appropriate field maps should be annotated to show the locations of occupied peregrine nest sites within the survey area. Flight lines of any birds foraging within the area should also be recorded. The survey(s) should be written up into a brief report, which highlights occupied peregrine breeding locations within and adjacent to the neighbourhood.

Timing/Weather Conditions

- The initial survey should take place at the end of March, with a further visit at the end of April, if no peregrine activity is recorded at potential breeding sites.
- If occupied nest sites are found during the initial survey, then two follow up visits should be completed in June/July.
- The survey(s) can be undertaken at any time of day.
- The surveys(s) should take place in fine weather.

Impact Assessment

A peregrine impact assessment should be undertaken for each new reserved matters application in the Princes Dock Neighbourhood, using the data collected by the surveys. The impact assessment should be included in the Ecological and Biodiversity Statement for the development, which should be submitted to the LPA.

The peregrine impact assessment should follow the same assessment methodology as set out in the Liverpool Waters ES chapter (WYG 2011a) and cover the construction and operational phases of the development. If the assessment identifies that significant impacts on peregrines are likely for a particular development, then appropriate mitigation measures should be identified. These may

include measures such as buffer zones or the implementation of 'work windows' to restrict potentially disturbing works to certain times of year.

2.1.2 Black Redstart

Annual surveys for breeding black redstarts should be undertaken in the year prior to construction and during the subsequent four years of development of the Princes Dock neighbourhood. The surveys should aim to assess whether black redstart have colonised the existing buildings and/or are using any of the vacant plots for foraging. The survey should inform the construction mitigation strategies for the new buildings, in relation to preventing the disturbance of any new black redstart nest sites. The surveys should be undertaken by suitably qualified ecologists and the survey methodology should follow the guidance set out in *Bird Monitoring Methods* adapted for the site (see below). At the end of the first five years' monitoring, the requirement for annual black redstart surveys will be reviewed on the basis of the survey results and, if appropriate, the frequency of the surveys will be reduced. Black redstart surveys will then continue throughout the development of the Liverpool Waters site, at the frequency determined by this review.

Methodology

The survey should comprise a walkover survey of the area around the Princes Dock neighbourhood, following a pre-determined route, at dawn to record any black redstarts heard singing or observed visually. The survey should comprise five visits between mid-April and the end of June. The same route followed during each visit with the direction alternating each time. The locations of any black redstarts seen or heard should be marked on a map of the site.

Timing/Weather Conditions

- The survey should consist of at least five fortnightly visits from mid-April to the end of June.
- Surveys should commence around dawn and last for the time it takes to complete the survey route.
- The surveys should take place in fine weather.

Impact Assessment

A black redstart impact assessment should be undertaken for each new reserved matters application in the Princes Dock Neighbourhood, using the data collected by the surveys. The impact assessment should be included in the Ecological and Biodiversity Statement for the development, which should be submitted to the LPA.

The black redstart impact assessment should follow the same assessment methodology as set out in the Liverpool Waters ES chapter (WYG 2011a) and cover the construction and operational phases of the development. If the assessment identifies that significant impacts on black redstarts are likely for a particular development, then appropriate mitigation measures should be identified. These may include measures such as buffer zones or the implementation of 'work windows' to restrict potentially disturbing works to certain times of year.

2.2 Passage/Wintering Birds – Condition 16: Part i.

2.2.1 Passage/Wintering Bird Surveys

Passage and wintering bird surveys should take place in the year prior to construction and during the subsequent four years of development of the Liverpool Waters site, to inform/revise the mitigation

strategy in relation to disturbance of wintering bird roosts. The surveys should be undertaken by suitably qualified ecologists and follow the methodology described below, which will then be comparable to those undertaken in 2011 to support the planning application for the site (WYG 2011b). At the end of the first five years' monitoring, the requirement for annual passage/wintering bird surveys will be reviewed on the basis of the survey results and, if appropriate, the frequency of the surveys will be reduced. Passage/wintering bird surveys will then continue throughout the development of the Liverpool Waters site, at the frequency determined by this review. On the basis of the review, and depending on whether they provide any mitigation features for passage/wintering birds (see Section 5.1.4), it may be possible to exclude some fully built-out neighbourhoods from the future survey efforts.

Methodology

These should comprise vantage points survey carried out by eight surveyors, two located in each of the waterfront neighbourhoods. Appropriate field maps should be annotated to show the bird species present and their flight lines, including their height and direction, using standard BTO two letter species codes and activity codes (Gilbert et al., 2002). The survey should also record breeding behaviour if it occurs during the survey period.

Target species should comprise waders, wildfowl, gulls & terns, cormorant, grey heron and raptors. All other species, including BoCC Red and Amber list passerines (song birds) should be recorded as incidental species. The surveys should be written up as a factual report, highlighting flightlines, key roosting locations and any breeding locations of target species within the Liverpool Waters scheme. All bird species referred to within the report should be referred to using both common and scientific names.

Timing/Weather Conditions

- A total of 36 hours of survey effort should be completed between September and March (inclusive).
- Survey effort should be evenly spread across the seven month survey period and comprise a minimum four hour watch period per survey.
- The surveys should be undertaken during the four hours preceding high tide, to take into account the limitations acknowledged by WYG 2011b[2] and two hours prior to and two hours after low tide.
- The surveys should be undertaken in a range of weather conditions, although times of restricted visibility and particularly harsh weather should be avoided.

Impact Assessment

An impact assessment for water birds should be undertaken for each new reserved matters application in the Princes Dock Neighbourhood, using the data collected by the surveys. The impact

[2] Timing the surveys to fall two hours prior and two hours after high tide resulted in recording only minimal numbers of waders. This was believed to be a result of their feeding areas (principally on the Wirral Egremont shore) having already been submerged before the maximum tide height was reached, due to the large tidal range on the Mersey. In order to ascertain where waders were flying to from their foraging grounds, the timings of the surveys were altered so they instead covered the four hours prior to high tide.

assessment should be included in the Ecological and Biodiversity Statement for the development, which should be submitted to the LPA.

The water bird impact assessment should cover the construction and operational phases of the development and follow the same assessment methodology as set out in the Liverpool Waters Ecology and Nature Conservation ES chapter (WYG 2011a) and should include a Habitats Regulations (HRA) Assessment of Likely Significant Effect (ALSE) for each of the Natura 2000 sites that may be affected by the development. Assessments must include all of the following sites, together with any relevant new sites or extensions which may be designated subsequently:

- Liverpool Bay SPA;
- The Mersey Narrows and North Wirral Foreshore SPA/Ramsar;
- Mersey Estuary SPA/Ramsar;
- Ribble & Alt Estuaries SPA/Ramsar;
- Sefton Coast SAC;
- The Dee Estuary SPA;
- The Dee Estuary Ramsar;
- Dee Estuary SAC; and
- Martin Mere SPA and Ramsar.

The impact assessment should reference the baseline bird report for Liverpool Waters, the subsequent monthly update reports, produced by WYG between October 2013 and April 2014 and the TEP study *Assessment of Supporting Habitat (Docks) for Use by Qualifying Features of Natura 2000 Sites in the Liverpool City Region* (TEP 2015). If the assessment identifies that significant impacts on water birds are likely for a particular development, then appropriate mitigation measures should be identified. These may include measures such as buffer zones or the implementation of 'work windows' to restrict potentially disturbing works to certain times of year or the provision of alternative roosting habitat.

2.3 Common Tern Survey

2.3.1 Common Tern Survey

Surveys for foraging common tern should take place in in the year prior to construction and during the subsequent four years of development of the Liverpool Waters site, to inform an evolving mitigation strategy in relation to common tern foraging areas. The surveys should be undertaken by suitably qualified ecologists and follow the methodology described below. At the end of the first five years' monitoring, the requirement for annual common tern surveys will be reviewed, on the basis of the survey results and, if appropriate, the frequency of the surveys will be reduced. Common tern surveys will then continue throughout the development of the Liverpool Waters site, at the frequency determined by this review.

Methodology

No standard methodology is available for monitoring common tern foraging, but shore-based surveys have been carried out to assess use of foraging areas by little tern (Parsons *et al.,* 2015). Surveys for common tern foraging should be carried out by four surveyors, one located in each of the waterfront neighbourhoods. Surveys should be carried out from a vantage point which allows observation of the docks and coastal strip along the Mersey. Appropriate field maps should be annotated to show the

flight lines of any common terns observed, including their height, direction and foraging activity. The survey should also record breeding behaviour if it occurs during the survey period.

The surveys should be written up as a factual report, highlighting flightlines, key foraging locations and any breeding locations of common terns within the Liverpool Waters scheme and adjacent coastal strip.

Timing/Weather Conditions

- A total of 24 hours of survey effort should be completed between March and June (inclusive).
- Survey effort should be evenly spread across the four month survey period and comprise approximately two hour watches, with three watches completed in each month.
- The surveys should be undertaken under a variety of tidal states and times of day, to reduce sampling bias.
- The surveys should be undertaken in a range of weather conditions, although times of restricted visibility and particularly harsh weather should be avoided.

Impact Assessment

An impact assessment for common terns will be undertaken for each new reserved matters application in the Princes Dock Neighbourhood, using the data collected by these surveys. The impact assessment will be included in the Ecological and Biodiversity Statement for the development, which will be submitted to the LPA.

The common tern impact assessment will cover the construction and operational phases of the development and will include an HRA ALSE for Liverpool Bay SPA. The impact assessment will reference the baseline bird report for Liverpool Waters, the subsequent monthly update reports, produced by WYG between October 2013 and April 2014 and the TEP study *Assessment of Supporting Habitat (Docks) for Use by Qualifying Features of Natura 2000 Sites in the Liverpool City Region* (TEP 2015). If the assessment identifies that significant impacts on common terns are likely for a particular development, then appropriate mitigation measures should be identified. These may include measures such as buffer zones or the implementation of 'work windows' to restrict potentially disturbing works to certain times of year.

2.4 Bats – Condition 16: Part i.

2.4.1 Roosting Bats – External/Internal inspections

Where a reserved matters application proposes demolition or re-modelling of existing built structures, for example the dock boundary wall or buildings associated with the temporary cruise terminal, these should be inspected by a suitably qualified ecologist, for signs of, and potential for use by roosting bats. Depending on structure type, inspections should comprise external and internal assessments which must be completed prior to determination of the reserved matters application.

Methodology

Inspections of structures for bats should be carried out in accordance with *Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd Edition* (Bat Conservation Trust, 2016), hereafter referred to as the 'BCT Guidelines', to determine presence or likely absence of bats, as well as the likelihood of the structure being used by bats.

Each structure should be systematically inspected during daylight, using binoculars, high powered torches and an endoscope where necessary, and any features suitable for bats noted, such, gaps in brickwork, cracks or crevices. Any potential bat access points should be identified and inspected for signs of bats such as:

- Bat droppings on the ground or stuck to the wall;
- Suitable entry and exit points around gaps in mortar;
- Live bats, bat corpses or skeletons; and,
- Oily marks (from fur) or localised clean spots around possible access points and roost areas.

On the basis of the inspection, each structure should be assigned to one of four roost suitability categories, following the BCT Guidelines: Negligible, Low, Moderate or High. The roost suitability category of the structure should determine the requirement and level of effort of additional nocturnal surveys and appropriate mitigation.

The assessment should also determine the suitability of each structure for nesting birds.

Timing/Weather Conditions

- External inspections of structures for bats can be carried out at any time of year.
- The surveys should take place in fine weather.

2.4.2 Roosting Bats – Nocturnal Surveys

If a structure is assigned a roost suitability category of Low, Moderate, High or even as a confirmed roost, it will require further nocturnal surveys to determine the presence or likely absence of bats and/or the number and species of bat present prior to determination of the reserved matters application. The level of survey effort that should be undertaken for each suitability category is presented below:

- **Low** – One survey visit between May and August (inclusive). One dusk emergence or dawn re-entry survey.
- **Moderate** – Two separate survey visits between May and September (inclusive). One dusk emergence and a separate dawn re-entry survey, with at least one of the surveys between May and August (inclusive).
- **High/Confirmed roost** - Three separate survey visits between May and September (inclusive). At least one dusk emergence and a separate dawn re-entry survey. The third visit could be either dusk or dawn. At least two of the surveys must be between May and August (inclusive).

Timing/Weather Conditions

- Nocturnal bat surveys must take place between May and September (refer to the list above for more specific timings related to building/structure category).
- Surveys must take place in suitable weather conditions: Sunset temperature greater than 10°C and no rain or strong winds.

2.4.3 Impact Assessment

An impact assessment for bats should be undertaken for any reserved matters application that includes demolition/modification of structures, using the data collected by any bat surveys that are

carried out. The impact assessment should be included in the Ecological and Biodiversity Statement for the development, which should be submitted to the LPA. Should a delay of more than 12 months occur between consent for the reserved matters application being given and the development works commencing, updated bat surveys may be required.

The bat impact assessment should cover the construction and operational phases of the development and follow the same assessment methodology as set out in the Liverpool Waters ES chapter (WYG 2011a). If the assessment identifies that significant impacts on bats are likely, then appropriate mitigation measures should be identified. If a bat roost is found, a European Protected Species Licence (EPSL) application to Natural England will be needed. The EPSL is required to permit the destruction, damage or modification of a bat roost. A mitigation strategy will be required as part of the licence method statement and this should be developed once all surveys are completed and detailed proposals are available.

2.5 Fish and Other Water Species – Condition 16: Part ii.

2.5.1 Fish and Other Water Species Monitoring During Construction

Monitoring should include:

A one-off initial baseline characterisation survey carried out at a time between May and September covering:

- Phytoplankton survey[3]
- Fish survey using hydroacoustic[4] and netting methods[5]
- Benthic macroinvertebrate survey of dock floor[6]
- Survey of the dock walls to identify benthic invertebrates[7]

Ongoing programme of surveillance surveys covering:

- Annual surveys (spring and autumn) to monitor benthic invertebrates, plus surveys for algae, phytoplankton and zooplankton species[8]. Note that this frequency could potentially reduce over time dependent on results.

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[3] Following an appropriate UKAS accredited methodology.
[4] Following Duncan, A., and Kubecka, J. (1993). *Hydroacoustic methods of fish surveys.* National Rivers Authority R&D note 196 163pp.
[5] To include fyke net surveys using at least four pairs of nets.
[6] Benthic invertebrate samples to be collected from at least 12 sampling sites within the dock using a suitable grab. Also, baited traps to be used at six or more locations to quantitatively sample mobile benthic invertebrates. Samples to be processed following Worsfold, T.M., Hall, D.J. & O'Reilly, M. (Ed.) 2010. Guidelines for processing marine macrobenthic invertebrate samples: a Processing Requirements Protocol: Version 1.0, June 2010. Unicomarine Report NMBAQCMbPRP to the NMBAQC Committee. 33pp. Available online.
[7] Wall scrape samples to be taken following Worsfold, T.M., 1998. Sampling of cryptofauna from natural turfs (flora or fauna) on hard substrata. Version 1 of 26 March 1998. In: Biological monitoring of marine Special Areas of Conservation: a handbook of methods for detecting change. Part 2. Procedural guidelines, ed. By K. Hiscock, 4 pp. Peterborough, Joint Nature Conservation Committee.
[8] Methodologies to follow those used in the initial baseline characterisation survey, other than where improvements have been identified.

- An annual fish survey if the baseline survey indicates a low fish population is present, to monitor improvements[9]. Otherwise further fish surveys are not required unless unusual circumstances arise, such as a pollution event that results in a fish kill.

Based on surveys carried out in nearby docks it is likely that marine invasive non-native species will be identified as present. If they are recorded, methodologies should be developed to avoid their spread as a result of works within the dock. The precise measures required will depend on the species identified, but are likely to consist of controls on the disposal of material removed from the dock. The amount of material is likely to be limited, as only limited works are proposed within the dock.

2.6 Water Quality – Condition 16: Part vi.

2.6.1 Water Quality Monitoring During Construction

The applicant should conduct an initial baseline characterisation survey covering:

- Water quality sampling at several locations in each basin for physical and chemical parameters, to include dissolved oxygen, pH, conductivity, salinity, biochemical oxygen demand, ammonia, nutrients, heavy metals (cadmium, mercury, arsenic, copper, chromium, zinc, nickel, lead and iron) and organics likely to include poly aromatic hydrocarbons and TBT.
- Sediment quality sampling for sediment oxygen demand, metals, pH and redox potential.
- Bathymetric survey for sediment depth.

Ongoing programme of surveillance surveys covering:

- Monthly monitoring for physical and chemical parameters as shown above including biochemical oxygen demand, ammonia and nutrients. Frequency could potentially reduce over time dependent on monitoring results.

Results to be reported in the form of electronic reports that summarise the data and identify key issues, with the full data set included as appendices. Copies to be provided to the Environment Agency, MEAS and the Canal & River Trust. Should the reports identify issues with water quality arising as a result of the development the Principal Contractor should undertake measures to prevent further impacts arising and if necessary to clean up any contamination.

Principal contractor to develop and implement a management plan for water quality within the dock system during construction. Details to be developed once the initial baseline characterisation surveys have been completed, but management measures may include for example:

- Investigations of the drainage system to identify pollution risk.
- Reaeration.

[9] Methodologies to follow those used in the initial baseline characterisation survey, other than where improvements have been identified.

3.0 Mitigation Through Scheme Design

3.1 Bird Strike Mitigation – Condition 16: Part v.

Vantage point bird surveys of the Liverpool Waters site by WYG in 2009/10 and 2013/2014 and by TEP in 2013 and 2014 found that the majority of birds flying through the site (i.e. travelling at height and at speed, rather than short-distance commuting between the docks) did so following either the River Mersey or the dock system, rather than the land allocated for development. Therefore, even though development of the Princes Dock neighbourhood will include 14 buildings greater than five storeys in height, the risk of bird strike is considered to be relatively low. Nevertheless, the development of tall buildings along the river has the potential to increase the risk of bird strike over the baseline situation, where relatively few tall buildings were present.

It is thought that bird strike with buildings is due to birds' inability to detect the difference between clear air and glass. During the daytime, they see the reflections of the surrounding landscape or are able to see through the glass altogether. At night, birds can be attracted to lit structures, causing collisions, although it is thought that this phenomenon is more associated where isolated lighted structures occur in otherwise dark environments, or during conditions of poor visibility.

The designs of all tall buildings constructed in the Princes Dock neighbourhood, particularly those with significant areas of reflective glass to their northern and southern facades, should incorporate measures to mitigate the risk of day time and night time bird strike, appropriate to the building design and function. Developers must show the risk of bird strike has been considered in their planning application documents and provide specific details of any mitigation measures adopted in the Ecological and Biodiversity Statement for each reserved matters application, which must be submitted to the LPA in accordance with Condition 34 of the Liverpool Waters Consent.

The US Fish and Wildlife Service (USFWS) has produced a document *Reducing Bird Collisions with Buildings and Building Glass* (USFWS 2016) which identifies various potential mitigation options. Those that are most suitable for commercial buildings are summarised below:

3.1.1 Reducing Bird Strike with Glass

Not all windows are equally hazardous to birds, it is considered that those which reflect bird habitats, such as open sky or vegetation are the most dangerous. In the context of the likely direction of waterfowl flights through the neighbourhood (i.e. following the line of the River Mersey), north facing and south facing windows which reflect these features are likely to be most hazardous. To mitigate this, non-reflective glass can be used or glass can potentially be treated in the following ways;

Patterning

The principle of patterning is to create the impression of a space that is too small for the target bird to pass through. Much of the research into bird strike has found that passerines (i.e. song birds such as thrushes) are most at risk and therefore USFWS recommend horizontal lines with a spacing of 5cm or vertical lines with a spacing of 10cm. Other patterns can also be used, for example diagonal lines or dots. The patterning can be applied to the glass as tape, film or adhesive stickers.

Fritting

Fritting is the use of ceramic dots or lines on the outside facing or interior panes of a window to break up large expanses of highly reflective glass. This technique is applicable to commercial buildings as it is permanent and can be used to create a variety of patterns, which aesthetic as well as practical functions.

Ultraviolet Patterned Glass

Birds see in the ultraviolet (UV) spectrum, so using glass that reflects UV light in a pattern can reduce bird collisions. While this glass is typically more expensive than other treatments, it is comparable in price to other energy-efficient glass This option may be desired, over alternatives such as fritted glass, when seeking a product that is generally not visible to humans, but provides some benefit to birds.

Screens and Netting

Installing external screens or netting on windows is an effective and relatively inexpensive treatment. Screens reduce reflection and injury by providing a cushion between the bird and the window. This treatment can be installed on individual panes or attached to a façade. To be effective, the netting must be placed far enough in front of the window that a bird hitting it will not collide into the glass behind. The netting should have openings no larger than 1.3 cm, to prevent birds becoming entangled.

Architectural Features

Structural additions such as overhangs, awnings and louvres can be used to shade reflective features and thus reduce the risk of bird strike. Louvres can also have the same shading effect and also can be designed to fulfil a similar function to 'patterning' to create the impression of a space that is too small for target bird species to fly through. Such features also often have additional benefits in that they can reduce overheating and glare in buildings with large areas of glass.

3.1.2 Lighting

Lighting Design

As described above, lighting can also play a significant role in bird strike collisions with buildings. Therefore all reserved matters applications for all buildings over five storeys high or located within an area of limited development, where there are low light levels in comparison to other areas across the Liverpool City frontage, will consider the requirement for a lighting plan to reduce bird strike, in accordance with the building's position in the development, construction materials etc. Where a lighting plant is developed, this should explore opportunities for reducing lighting of the building during bird migration periods e.g. mid-August to mid-November and March to mid-May. The following lighting design principles should be followed:

- Unnecessary lighting (i.e. lighting which does not perform a practical function), including perimeter lighting, should be avoided.
- Motion sensors should be installed in interior and exterior public spaces to activate lights only when people are present.
- Exterior lighting should be fully shielded so that light is prevented from being directed skyward. "Fully shielded" light fixtures are defined as those with an opaque shield so that all light is emitted below the lowest light emitting part of the fixture.

- Building occupants should be made aware of the risk of bird strike via a welcome pack, when they take up occupation of the building, which will provide instruction in simple techniques to reduce the risks (e.g. closing shades, turning off lights in unoccupied rooms/offices.)

3.1.3 Landscape Design

Exterior

The design of landscaping around new buildings, particularly those with extensive glass surfaces, should be carefully considered to avoid creating funnelling effects whereby linear features (e.g. lines of trees, walkways, passageways and walls) direct birds towards windows. Approaches to the buildings for vehicles and pedestrians should also be carefully considered to avoid flushing birds from landscaping features towards windows.

Where ancillary structures are required, such as bus shelters, guard rails and glass walls, consideration should be given to avoiding the use of glass or treating it with the methods outlined for building glass above.

Interior

Indoor plants and trees should be located sufficiently far away from windows, or placed next to treated windows, to avoid creating the impression of continuing natural vegetation behind the glass.

3.2 Dissuasion of Breeding Gulls and Pigeons – Condition 16: Part viii.

Rooftops and ledges of urban buildings provide ideal nesting/roosting sites for gulls and feral pigeons because they are free from predators and are often within easy reach of food sources, e.g. landfill sites. It is important to incorporate measures to discourage nesting birds from buildings to prevent the establishment of colonies, to which individual birds are likely to be faithful once they have bred and which can attract additional birds from the surrounding area.

Given the proximity of Liverpool Waters to large gull and feral pigeon populations, all buildings constructed in the Princes Dock neighbourhood should aim to incorporate measures to discourage these species, appropriate to building design and function. Developers must show how such measures have been considered in their planning application documents; the focus should be on designed-in measures such as minimising the area of flat roof, minimising ledges or using sloping ledges in preference to relying on systems such as netting. Suitable dissuasion measures are summarised below.

3.2.1 Designed-in Measures

Roof Pitch

The size of flat roofs should be minimised where possible, or replaced with pitched roofs. Pitches of over 25 degrees are considered steep enough to prevent nesting, without any additional dissuasion methods. Even small interruptions in the roof plane, for example a skylight, can provide enough purchase for a gull nest so these should be avoided where possible, or equipped with dissuasion measures.

Ledges and Overhangs

Roof overhangs provide potential shelter for roosting birds, especially when a ledge is located below and should therefore be avoided where possible. Where ledges are necessary to building design/function, or they have been included to mitigate bird strike (see Section 3.1) they should incorporate a minimum slope of 45 degrees to make them unsuitable for nest building or should be equipped with suitable dissuasion measures, such as spikes where practicable.

Roof Gardens

Where flat roofs are critical to building design, they can be purposed as roof gardens, where practical and feasible, which, if used frequently, should result in a sufficient level of human disturbance to dissuade gulls. Roof gardens can also offer other social, insulating and rainwater attenuation benefits or can function as green/brown roofs for black redstarts. Publicly accessible gardens may not always be compatible with habitat creation measures proposed for black redstarts, although, if required, netting of a suitable gauge can be installed to dissuade gulls and pigeons, but allow black redstarts to use the feature (see Section 6).

3.2.2 Additional Dissuasion Measures

Spikes

These are typically a series of upturned spikes that deter gulls from roosting or, in certain circumstances, from nesting. Spikes can be effective on ledges where, if used in sufficient quantity, they will deter birds. If used on roofs, spikes should be positioned at a density suitable to dissuade the target species and completely cover the roof. If used on ledges, they must be placed at sufficiently close spacing to be effective. They are generally ineffectual if placed only around parapet walls or installed at low densities.

Wires

Wires can be stretched across a flat roof or across the ridge of a pitched roof; they do not prevent nesting birds but can be used to prevent roosting. These are aligned in parallel rows at a distance that will dissuade a gull from landing. They have the advantage that other birds do not get snagged in them, and they can be less visually intrusive than nets. Wires can also be used on ledges.

Netting

Netting is a common form of bird dissuasion because it can be retrofitted to most buildings. However, netting may have a negative visual impact and therefore designed-in measures should be prioritised. Where netting is considered to be necessary, an appropriate shade should be chosen to integrate with the materials of the building. Also, locating the netting further back on the roof and using a combination of methods such as wires or spikes, should help to minimise visual impact from the street.

Netting systems need to be properly installed and maintained to be successful. If installed poorly or the incorrect mesh size is used, gulls may still be able to enter the area or become snagged in the nets; an appropriate mesh size for gull management is 75mm, whilst 50mm is suitable for dissuading pigeons.

Litter and waste

Accumulations of litter and other waste can attract opportunist birds such as gulls, pigeons and corvids. All reserved matters applications should therefore demonstrate how waste will be managed to ensure that it is not accessible to foraging birds. Management of litter within the public realm should also take nuisance bird species into account and should employ designs for street furniture, such as litter bins that are not accessible to gulls in particular.

Other measures

A variety of other dissuasion measures are available including plastic bird of prey decoys, noise (e.g. distress calls) emitting devices and wind-driven moving structures, however these are considered to be significantly less effective than the dissuasion measures described above, and are therefore not recommended. The use of plastic decoys should be avoided altogether, as they may have a negative effect on peregrines nesting locally.

The use of birds of prey is considered an impractical deterrent measure, as they must be flown daily, over a large part of the breeding season, to deter nesting birds. As with plastic decoys, the flying of captive birds of prey should be avoided, as they may have a negative effect on peregrines nesting locally.

3.2.3 Potential Conflicts with Waterbird Mitigation

Features such as ledges and platforms, when appropriately located, can provide roosting sites for priority bird species, including cormorants. All individual reserved matters applications within Princes dock should consider the provision of integrated roosting features for species such as cormorant, provided that they can be located or designed in such a way to have minimal levels of anthropogenic disturbance and reduce the likelihood of their use by gulls and pigeons.

3.3 Methods for Controlling Leisure Boat Activity – Condition 16: Part vii.

Leisure boats can currently access Princes Dock via the Liverpool Canal Dock link, which is accessed from the Liverpool to Bootle stretch of the canal via Stanley Dock. It is likely that development of the dock will result in an increase in boat traffic, over current levels.

In 2011 WYG identified no significant aggregations of water birds associated with Princes Dock although small numbers of the SPA species cormorant and shelduck were recorded using the docks themselves. In 2013/14 TEP recorded small numbers of the following SPA species using Princes Dock black-headed gull, cormorant, lesser black-backed gull and oystercatcher. Following the addition of cormorant as a designated feature of Liverpool Bay SPA, it is considered that the numbers previously recorded within Princes Dock may represent a significant proportion of the SPA population. Therefore, any development coming forward within Princes Dock, and indeed elsewhere within the Liverpool Waters scheme, which has the potential to result in increased boat traffic should consider, within its supporting environmental assessment and associated Habitats Regulations Assessment, the impact of the increased boat traffic on features of all designated sites (including the recently extended Liverpool Bay SPA).

It is important to prevent any increase in boats causing a direct or indirect impact to SPA birds, such as cormorants, utilising the docks as functionally linked habitat, nor undermine the effectiveness of

any mitigation measures (e.g. floating pontoons) put in place. Where impacts from increased boat are considered likely then appropriate mitigation measures must be identified, for example restricting traffic at certain times of year or certain times of day and/or the creation of lane or one-way systems.

To allow for change in waterbird populations, the annual water bird surveys will monitor the dock and the survey report should analyse the data to monitor whether the area continues to be used as functionally linked habitat by significant numbers of SPA qualifying species and identify any changes to the mitigation strategy re: boat traffic, if appropriate.

3.4 Protection of Sefton Coast SAC –– Condition 16: Part x.

Point x of condition 16 states that *Mechanisms to ensure protection of Sefton Coast SAC (Seaforth Docks to Formby Point) from recreational disturbance overseen by the Liverpool Waters Coordination Panel in accordance with Schedule 6 of this permission.*

Prince's dock lies 6.7km from Sefton Coast SAC. Recreational disturbance effects on this Natura 2000 site were screened out within the Liverpool Waters HRA (WYG 2011c) for the following reasons:

> *The construction works and primary movements of the end users will be contained within the footprint of the development and it's immediate surrounds. In addition, none of the qualifying species have been recorded on or near the site*.

Nevertheless, all reserved matters applications within the Princes Dock neighbourhood should include a Habitats Regulations ALSE covering all of the Natura 2000 sites that may be affected by recreational disturbance as a result of the development. All developments should include a commitment to adhere to the objectives of the Sefton Coast SAC and Ribble and Alt Estuaries SPA VMS. The VMS is being produced within and across all European sites within the Liverpool City Region.

Reserved matter applications which come forward on a plot by plot basis and are received prior to the adoption of the VMS should consider how recreational pressure will be assessed (and potentially mitigated for) as a result of the additional development. Condition 34 of the outline consent (1O/2424) will ensure that the developer provides additional information through further ecological surveys. Each development that is brought forward in more detail will allow for more certainity over what mitigation (if any) would be required.

4.0 Construction Phase Mitigation

4.1 Construction Working Practices – Condition 16: Part iii.

4.1.1 Removal of Existing Buildings and Vegetation

Existing vegetation, hardstanding and structures within the Princes Dock neighbourhood have some potential to support breeding birds. Developers must therefore show how breeding birds have been considered in their planning application documents. It is recommended that vegetation clearance and demolition works should therefore be timed to take place outside the bird breeding season where possible, provided this would be lawful in the context of the results of the pre-construction surveys for bats outlined in Section 2.0.

- The bird breeding season is normally regarded as March to August (inclusive)

Where restricting works outside the bird nesting season is not possible, a suitably qualified Ecological Clerk of Works (ECoW) should conduct a check for nesting birds within the site in advance of any works commencing. If a nesting bird was identified, the ECoW would advise on suitable working methods and exclusion zones to avoid damage to the nest. The measures recommended would depend on the nature of the works in the area close to the nest, as well the nesting bird species, and could result in delays to undertaking works within specific areas of the site until all chicks had fledged.

4.1.2 Construction Vehicles, Routes and Speed Limits

If construction is undertaken outside the bird breeding season, then routing of construction traffic will not need to take account of breeding birds. Should construction take place during the breeding season and a nesting bird be identified during the ECoW's check (see 4.1.1), then vehicle routes and speed limits may need to account of the nest. The distance that construction traffic would need to keep from the nest would depend on the nesting bird species and would therefore be advised by the ECoW following the check.

In 2011 WYG identified small numbers of cormorant and shelduck using Princes Dock in winter. In 2013/14 recorded small numbers of the following SPA species using Princes Dock black-headed gull, cormorant, lesser black-backed gull and oystercatcher, however, the aggregations present were not considered represent significant proportions of their respective SPA populations. As the docks are currently subject to disturbance by vehicles using William Jessop Way and Princes Parade, and alternative routes into the site are likely to be unfeasible, no specific routing of construction traffic is proposed to protect wintering birds.

Specification of a general speed limit for construction vehicles in this document is not considered to be appropriate, as no specific bird breeding locations or wintering roost locations are considered likely to be affected by construction traffic.

4.1.3 Protection of Roost Sites of Wintering/Passage Birds

In 2011 WYG identified no significant aggregations of water birds associated with Princes Dock although small numbers of the SPA species cormorant and shelduck were recorded using the docks themselves. In 2013/14 TEP recorded small numbers of the following SPA species using Princes Dock black-headed gull, cormorant, lesser black-backed gull and oystercatcher. Following the addition of

cormorant as a designated feature of Liverpool Bay SPA, it is considered that the numbers previously recorded within Princes Dock may represent a significant proportion of the SPA population. Therefore, any development coming forward within Princes Dock, and indeed elsewhere within the Liverpool Waters scheme, which has the potential to result in increased waterbird disturbance should consider, within its supporting environmental assessment and associated Habitats Regulations Assessment, the impact of disturbance on features of all designated sites (including the recently extended Liverpool Bay SPA).

Disturbance pathways associated with the development of plots within the Princes Dock neighbourhood are likely to be visual and noise effects mainly during construction. Mitigation against these effects should be identified through the updated impact assessment (described in 2.2.1) and/or the HRA and any mitigation deemed necessary should be outlined in detail in the Construction Environmental Management Plan (CEMP) for the individual development.

Visual Disturbance Mitigation

Based on current baseline information (e.g. WYG 2011b and TEP 2015), no specific screening is proposed for development west of William Jessop Way as the developable land is located east of the road and the area immediately adjacent to the docks is regularly used by inhabitants of the existing buildings and members of the general public.

Development east of Princes Parade should be screened from Princes Dock by heras fencing equipped with dark green debris netting, to screen the site and prevent any windblown litter entering the docks. Development west of Princes Parade (e.g. at the northern end of the neighbourhood) should be screened on the western side of the site (facing the River Mersey) by heras fencing equipped with dark green debris netting, to screen the site and prevent any windblown litter entering the docks.

In both areas, screening should only be placed at ground level, to block sight lines to the busiest area of the construction sites (i.e. where most operative and vehicle movements are likely to be concentrated).

Noise Disturbance Mitigation

Some of the development in the Princes Dock neighbourhood will require piling, which has the potential to extend the noise disturbance envelope outside of Princes Dock, with potential associated effects on water birds using other docks within the vicinity. Therefore, effects on water birds roosting/foraging outside Princes Dock should be assessed for each development where piling is required and mitigation identified as appropriate.

MEAS demonstrated, in their comments on the Plaza 1821 development, based on the use of rotary piling, as specified in the Liverpool Waters outline application and Statement of Conformity, the noise disturbance envelope would extend to 550m beyond the plot[10]. However, the comments concluded there would be no disturbance to non-breeding birds within the envelope, from piling operations at this plot, if the following were included in the CEMP:

[10] An envelope of 550m around Princes Dock includes Canning Dock and Canning Half Tide Dock, to the south and Princes Half Tide Dock and East and West Waterloo Docks, to the north. In 2013/14, TEP found these docks supported qualifying/assemblage species for nearby Natura 2000 sites SPAs.

- Adherence to the guidelines set out in *The Code of Practice for Noise and Vibration Control on Construction and Open Sites, 2009* and subsequent updates;
- The use of rotary piling methods;
- Selection of quietest working equipment available;
- Positioning equipment behind physical barriers i.e. hoarding;
- Provision of lined and sealed acoustic covers for noisy equipment;
- Directing noise emissions away from plant including exhausts or engines away from sensitive locations;
- Ensuring that regularly maintained and appropriately silenced equipment is used; and
- Maintaining a no idling policy.

It is therefore recommended that the above guidance is followed for each development requiring piling although a noise impact assessment should still be undertaken to determine whether additional mitigation, such as the restriction of piling to 'working windows' is required.

5.0 Habitat Creation

5.1 Bird Nesting/Roosting Features and Foraging Habitat – Condition 16: Part iv.

Buildings constructed in the Princes Dock neighbourhood should incorporate features for the following bird species, to enhance the ecological value of the site.

5.1.1 Black Redstart

Breeding bird surveys carried out in 2009 to support the Liverpool Waters Planning Application (WYG 2009) recorded one singing black redstart south of Stanley Dock. Peregrine surveys carried out by WYG in 2015 and 2016 for a site close to Stanley Dock also recorded black redstarts. To enhance the site for this species, buildings within the neighbourhood should, if practicable, consider the inclusion of a green roof[11], specifically designed for black redstarts. Outline specifications for the green roof and black redstart nest boxes are provided below.

Green Roof

Incorporating the following ecological requirements into green roof design can make a significant contribution to the replacement of lost brownfield habitat and benefit black redstarts:

- Relatively small areas of very sparsely vegetated rubble or rocky terrain incorporating hibernacula for invertebrates;
- Still or slow moving water; and
- Nearby nest boxes.

The area of habitat creation for black redstart does not need to be extensive, small roof areas of 25m^2 will readily be used, although the roof should be at least partially south facing to create suitable thermal conditions for a diverse range of invertebrates. Green roofs can be created at a range of heights, but it is recommended that, where practical and feasible, within the Princes Dock neighbourhood the maximum height of any green roof(s) is 50m above ground level, to reduce exposure to high winds and precipitation. Green roofs should also be accessible for maintenance, but ideally not regularly disturbed by the public; larger areas of roof habitat may be able to function as public spaces in combination with black redstart foraging habitat, particularly if access is restricted at certain times of day. Green roofs for black redstarts have also successfully been combined with solar panels, with the foraging habitat provided between the solar arrays.

The aim is to create an environment with sparse vegetation and abundant microhabitats for invertebrates. This is achieved by using low nutrient substrate, such as crushed brick, fine aggregate or expanded clay pellets with topsoil or peat-free compost if necessary.

Detailed guidance on green roofs is provided by the Greater London Authority (GLA) publication *Living Roofs and Walls* (GLA 2008). The following specification for green roofs is taken from the Greater Manchester Biodiversity Project (GMBP) publication *Make Room for Black Redstarts* (GMBP

[11] Although the more generic term 'green roof' is used throughout, roof habitats for black redstarts are more often termed 'brown roofs' in reference to the generally higher proportion of sparsely vegetated habitat than a typical 'green' sedum roof or roof garden.

2008), which provides photographs to illustrate the target habitat. A similar specification is also provided at:

- https://www.blackredstarts.org.uk/pages/greenroof.html

The substrate should be based on a mix of aggregate, (e.g. Leca), and this should then be overlaid with rock and/or stone chippings and contoured in height from zero up to 50cm, for the largest invertebrate hibernacula. In designing the hibernacula, a central mound area of sand or soil is compacted to form a sandcastle effect that angled at 30 degrees with the broadest area south facing. The mound is then covered with boulders around 10 – 15 cm in size, that are loosely placed to allow entry by invertebrates into the central area.

Vegetation can be introduced onto a new green roof although the roof can also be left to colonize naturally. However, it is important that the majority of a green roof designed specifically for black redstarts should consist of bare or sparsely vegetated areas. If the roof is to be seeded or plug-planted this should be done with species typical of drought stressed and nutrient poor conditions (see Table 3). If sedum matting is to be used, it should only cover a small amount of the total roof area and should be planted into the aggregate mix, to encourage colonization by other plant species. If matting is the only viable option due to structural (i.e. load bearing) considerations, then a system which incorporates a range of hardy plants should be used.

Table 3: Suggested Species for Planting to Create Green Roofs for Black Redstarts

Species Name
Perforate St John's Wort *Hypericum perforatum*
Yellow-wort *Blackstonia perfoliata*
Common Centuary *Centaurium erythaea*
Kidney Vetch *Anthyllis vulneraria*
Common Bird's-foot-trefoil *Lotus corniculatus*
Black Medick *Medicago lupulina*
Dove's-foot Crane's-bill *Geranium molle*
Common Eyebright *Euphrasia nemorosa*
Betony *Stachys officinalis*
Devil's – bit Scabious *Succisa pratensis*
Ribwort Plantain *Plantago lanceolata*
Selfheal *Prunella vulgaris*

Nest Boxes

If a green roof for black redstarts is provided, then nest boxes for this species should be installed on the same building. Various suitable nest boxes for black redstarts are available; these can either be fixed to an exterior wall, or integrated into the fabric of a building. Examples of these two types of nest box are provided below:

- Schwegler 2HW (externally fixed) or equivalent.
- Schwegler 1HE (integrated) or equivalent

Where provided, the boxes will be securely installed on the buildings at a variety of heights, between 3m and 50m, in locations that are unlikely to be disturbed by the public, in a sheltered position i.e. under overhangs or balconies on a north or east-facing wall, or in a similar sheltered location in close proximity to the green roof.

Additional Mitigation Options

Mitigation for black redstarts could, where practicable, be improved by expanding the habitat creation to include the following.

Brown Walls

If, due to building design restrictions, only a small area of green roof habitat can be provided, black redstart habitat could be extended by designing brown walls into the new buildings. Brown walls (e.g. https://www.blackredstarts.org.uk/pages/brownwall.html) incorporate ledges at different heights filled with suitably sized aggregate and sparse planting to provide linear strips of habitat similar to that targeted by the green roof described above.

Green/brown Roof and Wall Mosaic

Further benefits could be delivered for black redstarts if additional green/brown roofs and walls were incorporated into other buildings within the Princes Dock neighbourhood, to provide a mosaic of elevated habitats that would benefit this species. Different buildings could potentially target slightly different habitats, for example sparsely vegetated crushed brick/aggregate, flower-rich grassland and aquatic features or each roof could include a combination of these. Nest boxes could be distributed across the buildings, in association with the mosaic of habitats, to provide black redstarts with a network of potential nest sites.

5.1.2 Peregrine

Peregrine falcons prey on other bird species and will hunt a diverse range of species, even in urban environments. Therefore, it is not considered appropriate to combine the provision of black redstart habitat and peregrine nest boxes in the same location. Black redstart was the highest conservation priority bird species recorded in the Liverpool Waters area by WYG (2009). Princes Dock neighbourhood is the first phase of the Liverpool Waters development and therefore offers the opportunity to provide a benefit to this species at the earliest opportunity in the lifespan of the development.

5.1.3 Swallows and Swifts

Buildings within Princes Dock should consider the inclusion of swallow and/or swift nest boxes where possible. Where provided, it is recommended that a minimum of 3 boxes are installed per building to create colonial nesting habitat. The boxes should be fixed to the exterior of the buildings at a minimum of 1m intervals under suitable canopies or overhanging ledges, at a maximum of second storey height, with a distance of at least 6cm between the top of the nest and the ceiling of the canopy or ledge. Suitable nest boxes include:

- No. 10 Schwegler swallow nest (or equivalent).
- No. 18 Schwegler swift box (or equivalent).

5.1.4 Replacement Roosting Habitat for Water Birds

Condition 34 of the planning decision notice for the Liverpool Waters development specifies that replacement roosting sites are only required for Nelson Dock, due to the relatively high number of roosting cormorants recorded by WYG 2011b. No replacement water bird roosting sites were proposed for Princes Dock. However, due to the extension of Liverpool Bay SPA, which now includes cormorant as a designated feature, the requirement for mitigation may need to be revised. The final specification for replacement water bird habitat will be based on the results of the first annual passage/wintering bird survey and common tern survey. If the numbers of birds identified by this future study represent a significant proportion of their SPA populations, then mitigation features (e.g. floating pontoons for cormorants) may be required.

The results of the first annual passage/wintering bird survey and common tern surveys will be used alongside other data where relevant to draft a strategic water bird mitigation plan, which examines the bird survey data in the context of extant and likely reserved matters application across the Liverpool Waters scheme and identifies areas where mitigation is needed. The plan will be submitted to the local planning authority for approval. It is proposed that all of the mitigation features specified are delivered in areas managed by Peel Holdings and will be provided within two years of the mitigation plan being approved.

A strategic approach to providing this type of mitigation is required, as reserved matters applications elsewhere within the Liverpool Waters scheme may result in significant impacts on water bird habitat, which can't be mitigated locally to the development and therefore mitigation features may need to be provided within other neighbourhoods to maximise the overall effectiveness of the mitigation package proposed. However, mitigation measures will also be submitted as part of reserved matters applications and approved and discharged through condition 34 of the outline consent for each detailed plot when additional surveys are undertaken to provide more information.

5.2 Bat Roosting Features – Condition 16: Part iv.

5.2.1 Bat Boxes

To enhance the value of the Princes Dock neighbourhood for roosting bats, a total of 3 bat boxes should be provided on the new building proposed for Plot A-03 . This is the most appropriate part of the neighbourhood for bat boxes due to its location close to potential bat foraging habitat associated with The King Edward Estate and Great Howard Street. Buildings in this location are also likely to be more sheltered than those on the western side of Princes Dock, which are closer to the River Mersey.

The bat boxes will be placed at 4m height on the south, south-east and east faces of the buildings. The north and west faces should be avoided due to being too shaded and exposed to the prevailing weather. The bat boxes can either be fixed to the external walls of the buildings or integrated into the walls:

- Externally fixed boxes should be Schwegler 2FE or equivalent.
- Integrated boxes should be Schwegler 1FR or equivalent.

5.3 Landscape Planting – Condition 16: Part iv.

5.3.1 Planting for Bats and Invertebrates

Landscaping within the Princes Dock neighbourhood should seek to incorporate features to enhance its value for bats and their invertebrate prey. Public open space including tree/shrub and herbaceous planting is proposed for The Northern Crossing, The Jetty, The City Link and The Southern Gateway

(Planit 2018). Each reserved matters application will also have its own landscaping proposals for the environment local to the new buildings.

Tree Planting

Tree planting in areas of public open space should aim to create potential foraging corridors for bats and green linkages through the neighbourhood for breeding birds where possible. To maximise the potential for green corridors through the development, landscaping for the individual reserved matters should seek to link into the corridors created in the public open space and develop a network of potential wildlife corridors throughout the development.

The planting interval should be such that the canopies of adjacent trees are within at least 5m of one another when mature or the spaces between the trees should be bridged by suitable 'bat-friendly' planting (see Appendix C). To maximise invertebrate populations within landscaped areas, locally native tree and shrub species should be planted. It is recommended that the priority (broad) habitat '*Broadleaved mixed and yew woodland*' which is listed in the Natural Character Area (NCA) profile for Merseyside Conurbation (Natural England 2013) is referenced as the basis of tree planting schemes; suitable species are listed in Table 4. Planting should be carefully planned to avoid funnelling birds, which may use the trees for foraging and/or song posts towards reflective glass surfaces (see section 3.1.3).

Table 4: Suitable Tree and Shrub Species for Linear Planting

Species Name
Wild cherry *Prunus avium*
Alder *Alnus glutinosa*
Blackthorn *Prunus spinosa*
Elder *Sambucus nigra*
Goat willow *Salix caprea*
Hawthorn *Crataegus monogyna*
Hazel *Corylus avellana*
Rowan *Sorbus aucuparia*

Additional Shrub and Herbaceous Planting

Landscaping of public open space and the public realm of the individual developments can be further enhanced by the inclusion of additional shrub and herbaceous species, with the aim of having flowers in bloom throughout the year, including both annuals and herbaceous perennials. Although native species are often preferred by ecologists, non-native plants, provided they are not invasive (see Appendix B), can assist in providing nectar sources more or less year round. Examples of such species are provided in Appendix C. Additional plant species are listed in the Royal Horticultural Society (RHS) publication *Perfect for Pollinators – Garden Plants* (RHS n.d.)

- https://www.rhs.org.uk/science/pdf/conservation-and-biodiversity/wildlife/rhs-perfect-for-pollinators-garden-plants.pdf

6.0 Post-construction Monitoring and Management

6.1 Ongoing Aquatic Ecology Monitoring – Condition 16: Part ii.

Monitoring programmes for the following should be developed by the applicant/developer subject to the results of the construction phase monitoring outlined in Section 2.0:

- Fish and other water species; and
- Water Quality.

The requirements for ongoing monitoring of both of these features in the operational phase should be discussed and agreed with MEAS, the Environment Agency and Canal and Rivers Trust before completion of the construction phase. The design of any ongoing monitoring programmes should take into account the results of the construction phase monitoring, in particular whether or not they indicate any issues with water quality and/or aquatic ecology in the dock.

6.2 Ecological Mitigation – Condition 16: Part ix.

The following permanent ecological mitigation measures should be incorporated into the Princes Dock neighbourhood where possible:

- Measures to reduce bird strike;
- Measures to dissuade breeding gulls and pigeons.

Routine management, monitoring and provisions for remedial management of these measures are set out below.

6.2.1 Measures to Reduce Bird Strike

Routine Management

Bird strike prevention measures should require little management outside of that covered by routine building maintenance as they would be part of the fabric and or fixtures and fittings of the building. Management of any installed features should follow the manufacturer's recommendations.

Monitoring

Owners/occupants of buildings over five storeys high should aim to carry out bird strike monitoring in the first year after construction. Monitoring can be conducted through two methods:

- Regular walk arounds of the buildings; and
- Building occupant reports.

Building Walk-arounds

Monitoring of bird strike fatalities requires systematic searches for the carcasses of birds which have collided with a building. This can be problematic, because predators such as foxes, crows and gulls will rapidly habituate to searching areas where collisions regularly occur and may remove carcasses before they are found. Monitoring therefore has to be frequent to be effective.

The following monitoring strategy, based on the American Bird Conservancy (ABC) advice note *Monitoring Buildings for Bird Collisions* (ABC n.d.), is proposed:

- A representative, for example a member of the maintenance staff, should be chosen from each building to carry out monitoring.
- The monitoring period should be 12 months, to include one winter and one spring migration.
- Monitoring should take place on three days a week, between 8am and 10am.

Monitors should be trained initially by a suitably qualified ecologist appointed by the building owner. The ecologist should be available to check the identification of carcasses found by the monitor once the initial training is completed. Verification of carcass identification could be completed by emailed carcass photos rather than site visits, to minimise the cost of monitoring. During training, the monitoring route should be agreed and finalised. The route should include every façade with windows, including along green roofs, and if possible, setbacks and other roof terraces. A map of the monitoring route should be created for reference, and the route subdivided into segments, with each change in façade structure and orientation assigned a segment number. Monitors should follow this route consistently during monitoring.

Monitors should conduct a careful search, looking within 30 feet of the building, with a special emphasis on landscape planting and street furniture, as injured birds may seek shelter near those objects. The primary activity should be the search effort, though it is permissible for searchers to do other things while they are searching (e.g. picking up litter). After each segment, the monitor should record the date, time, number of birds found, their species and their status (dead, alive, or injured), if possible photographs and specimens should be collected. The search should be recorded, even if no birds were found, as zero counts can help to evidence that any installed mitigation measures are working.

Prior to the monitoring programme commencing, a local wildlife hospital or veterinary service, who can accept any injured birds that may be found, should be identified. Injured birds should be captured using a long-handled net and placed in a suitably sized container with air holes, for transport to the wildlife hospital. Injured birds should be kept away from extreme cold and heat during transport and their containers secured in as quiet an environment as possible.

The monitoring strategy should be reviewed in consultation with a suitably qualified ecologist after 3 months, to determine whether any adjustments need to be made. The data collected should be reviewed at 6 months. Following the end of the 12 month monitoring period, the data collected during the building walk arounds should be reviewed by a suitably qualified ecologist and a brief monitoring report produced, including recommendations for enhancing mitigation, where required.

Building Occupant Reports

Building occupants should be encouraged to report any bird strikes they witness while inside/outside the building, via a dedicated email address. This information should be included in the Welcome Pack for owners/tenants. Posters on each building floor could alert occupants to risk of bird strike and the monitoring programme that has been put in place. The occupant reports should be collated by the bird strike monitor and reviewed by the ecologist during production of the monitoring report.

Remedial Management

The monitoring report should examine the locations where bird strikes were reported in relation to existing mitigation features and, where relevant, highlight areas of the building which are prone to bird strike and, if appropriate make recommendations for further mitigation. The monitoring report should be discussed with the building owner and additional monitoring undertaken if required. If additional mitigation is installed, then a further 12 month round of monitoring should take place to assess its effectiveness.

6.2.2 Measures to Dissuade Gulls and Pigeons

Routine Management

Measures to dissuade/exclude gulls and pigeons will be dependent on building design but should require little management outside of that covered by routine building maintenance. Management of any installed features should follow the manufacturer's recommendations.

Monitoring

The following monitoring programme for gull and pigeon breeding is proposed for buildings where dissuasion measures are installed:

- A representative, for example a member of the maintenance staff, should be chosen from each building to carry out monitoring.
- Searches for breeding birds should take place at least twice annually, during May and June, for the lifetime of the building.

All potential nesting surfaces, such as ledges and roof terraces should be inspected, either from the ground, with binoculars, and from within the building, where access is possible. The locations of any pigeon/gull nests recorded on a map of the building.

Remedial Management

Where significant numbers of nesting gulls and pigeons (e.g. more than 2 gull nests or 5 pigeon nests) are present on a building, then the building owner should consult a suitably experienced contractor to identify suitable measures to dissuade/exclude birds during the following breeding season. Any additional exclusion measures should be installed by a suitably qualified contractor.

6.3 Habitat Creation – Condition 16: Part ix.

Where possible buildings within the Princes Dock neighbourhood will seek to include the following ecological habitat creation measures:

- Green/brown roof(s) and black redstart boxes;
- Swallow boxes;
- Bat boxes; and
- Landscape planting for bats and invertebrates.

Routine management, monitoring and provisions for remedial management of these measures are set out below. Where mitigation features for waterbirds are proposed on the basis of the passage/winter bird surveys, these should also be included within the monitoring programme. Monitoring and

remedial management measures will be dependent on the type(s) of mitigation features provided and should be provided to the LPA for approval prior to installation.

6.3.1 Green Roof(s) and Black Redstart Boxes

Routine Management

Once established, the green/brown roof(s) created for black redstarts would need little maintenance other than occasional weeding, if robust species do establish. The very low nutrient status and drought conditions should keep any vegetation that does establish sparse and low growing.

Monitoring

Where provided green roofs should be monitored as part of ongoing landscape maintenance programme and inspected at least twice a year by a suitably experienced landscape contractor or ecologist, to determine whether they continue to meet their original specification.

The condition of black redstart nest boxes should be inspected annually between September and February, from the ground using binoculars, to determine their condition. If a closer inspection is required, this should be undertaken between September and February (inclusive) using an appropriate access system.

Two black redstart surveys should be carried out post completion of a building with a green roof. The surveys should comprise two elements; a ground level survey (following the methodology outlined in 2.1.2) and a roof level survey (following the methodology below). To avoid duplication of survey effort, the data collected during the biennial black redstart surveys (see 2.1.2) should be used for monitoring where possible, provided a full breeding season has passed between completion of the green roof and the survey. The second survey should be carried out five years after completion of the green roof.

The roof level survey should comprise a two hour vantage point watch, to observe whether any black redstarts are utilising the green roof(s) for foraging and/or nesting. This should either be completed following the ground-level survey or independently, depending on whether data from the biennial surveys is used for the ground-level element.

Remedial Management

Remedial management of any created green roof features would be dependent on the system chosen, but would likely to be limited to re-establishment of any failed planting should this be identified by monitoring. If required, maintenance of the green roof would be undertaken by a suitably experienced contractor. Any nest boxes which are deemed to have failed structurally should be replaced between September and February (inclusive).

6.3.2 Swallow Boxes

Routine Management

Swallow boxes should need no maintenance and should be left undisturbed.

Monitoring

Where provided, the condition of swallow nest boxes should be inspected, every five years, from the ground using binoculars to determine their condition.

Remedial Management

Any nest boxes which are deemed to have failed structurally should be replaced between September and February (inclusive) using an appropriate access system.

6.3.3 Bat Boxes

Routine Management

Once installed, bat boxes will require no routine management.

Monitoring

Where provided bat boxes should be monitored in years 2, 5 and 10 post-installation. Monitoring should be undertaken from a mobile work platform or similar by a suitably licenced bat worker. The boxes should be examined for droppings and urine-staining and for 'chattering' bats. The boxes should also be inspected with an endoscope where appropriate and accessible, to assess occupation by bats and whether any of the boxes needs cleaning.

Remedial Management

Any bat boxes which are deemed to have failed structurally should be replaced under the supervision of a suitably licenced bat worker between November and February (inclusive). Where monitoring has deemed that a frequently occupied box needs cleaning, this should also be carried out under the supervision of a licenced bat worker, between November and February (inclusive).

6.3.4 Landscape Planting for Bats

Routine Management

Any landscape planting for bats should be managed by a suitably experienced contractor. Routine management should likely comprise weeding, pruning and replanting (e.g. annual plants), as appropriate to the plant species mix chosen and the planting layout.

Monitoring

Landscape planting should be assessed at least annually, between May and August (inclusive), by a suitably experienced contractor, to determine whether the planting continues to meet its original specification.

Remedial Management

All planted trees which fail to establish or die during the lifetime of the development should be replaced with an equivalent tree within 12 months. Remedial management of other aspects of the landscape scheme will be dependent on the plant species mix, for example some plants may fail due to the local soil conditions and need to be replaced. It is recommended that a requirement for remedial management is decided by the landscape contractor, as a result of their annual inspections, however the overall aim should be to provide a scheme which delivers on the original specification to provide a benefit to bats and invertebrates. If significant remedial management required, a suitably qualified ecologist should be consulted to ensure that the proposed replacement planting is appropriate.

7.0 Summary

7.1 Pre-Construction/Construction Phase Surveys and Impact Assessments – Condition 16: Parts i, ii & vi

Birds

- Annual surveys for breeding peregrine falcon should be undertaken, in the year prior to construction and during the subsequent four years of development of the Princes Dock neighbourhood. After the initial five years of survey work, the results will be reviewed and the interval between surveys reviewed.
- Annual surveys for black redstarts should be undertaken, in the year prior to construction and during the subsequent four years of development of the Princes Dock neighbourhood. After the initial three years of survey work, the results will be reviewed and the interval between surveys reviewed.
- Annual surveys for passage/wintering birds, covering the entire Liverpool Waters scheme, should be undertaken, in the year prior to construction and during the subsequent four years of development of the Princes Dock neighbourhood. After the initial five years of survey work, the results will be reviewed and the interval between surveys reviewed.
- Annual surveys for common terns, covering the entire Liverpool Waters scheme, should be undertaken, in the year prior to construction and during the subsequent four years of development of the Princes Dock neighbourhood. After the initial five years of survey work, the results will be reviewed and the interval between surveys reviewed.
- The results of the bird surveys should be used to produce updated impact assessments for peregrine, black redstart, passage/wintering birds and common tern for each reserved matters application, to be submitted to the LPA through an Ecological and Biodiversity Statement.
- The frequency of each of the above survey efforts will continue throughout the remainder of the construction phase of the Liverpool Waters site, as determined by each of their subsequent reviews.

Bats

- Where a reserved matters application proposes demolition or re-modelling of existing built structures, these should be inspected by a suitably qualified ecologist, for signs of, and potential for use by roosting bats. Depending on structure type, inspections should comprise external and internal assessments which must be completed prior to determination of the reserved matters application.
- If a structure is assigned a roost suitability category of Low, Moderate, High or even as a confirmed roost, further nocturnal surveys, to determine the presence or likely absence of bats and/or the number and species of bat present, must be completed prior to determination of the reserved matters application.
- The results of any bat surveys undertaken to inform proposals including the demolition of structures should be used to produce an updated impact assessment for bats for the reserved matters application, to be submitted to the LPA through an Ecological and Biodiversity Statement.

Fish

- Initial baseline surveys characterisation surveys should be undertaken for: phytoplankton, fish, benthic macro-invertebrates and benthic invertebrates on the dock walls.
- Annual surveys (spring and autumn) should be undertaken to monitor benthic invertebrates, plus surveys for algae, phytoplankton and zooplankton species.
- If the baseline survey indicates a low fish population is present to monitor improvements.
- If the surveys identify marine invasive non-native species, methodologies should be developed to avoid their being spread as a result of works within the dock

Water Quality

- Initial baseline characterisation surveys should be undertaken for physico-chemical parameters, sediment quality and sediment depth.
- Monthly monitoring of physico-chemical parameters, including biochemical oxygen demand, ammonia and nutrients, should be undertaken.
- Results of the monitoring are to be reported in the form of electronic to be provided to the Environment Agency, MEAS and the Canal & River Trust. Should the reports identify issues with water quality arising as a result of the development the Principal Contractor should undertake measures to prevent further impacts arising and if necessary to clean up any contamination.
- A management plan should be developed for water quality within the dock system on the basis of the baseline characterisation surveys, to potentially include investigations of the drainage system to identify pollution risk and reaeration.

7.2 Mitigation Through Scheme Design – Condition 16: Parts v, vii, viii & x

Bird Strike Mitigation

- The designs of all tall buildings constructed in the Princes Dock neighbourhood, particularly those with significant areas of reflective glass to their northern and southern facades, should seek to incorporate measures to mitigate the risk of day time and night time bird strike, appropriate to the building design and function.
- Specific details of measures to reduce bird strike should be included in the Ecological and Biodiversity Statement for each reserved matters application, which should be submitted to the LPA.

Exclusion of Breeding Gulls and Pigeons

- All buildings constructed in the Princes Dock neighbourhood should seek to incorporate measures to exclude breeding gulls and pigeons, appropriate to building design and function. The focus should be on designed-in measures such as minimising the area of flat roof, minimising ledges or using sloping ledges in preference to relying on retro-fitted systems.
- All developments should demonstrate how waste will be managed to ensure that it is not accessible to foraging birds. Management of litter within the public realm should be regular and employ innovative solutions to ensure that gulls in particular do not become a nuisance.
- Management of gulls and pigeons should not conflict with provision of replacement habitat for priority waterbird species. Provided that they can be located or designed in such a way

as to reduce their use by gulls and pigeons, all individual reserved matters applications within Princes dock should consider the provision of integrated roosting features for species such as cormorant.

- Specific details of measures to reduce bird strike should be included in the Ecological and Biodiversity Statement for each reserved matters application, which should be submitted to the LPA.

Methods for Controlling Leisure Boat Activity

- Any development coming forward within Princes Dock, and elsewhere within the Liverpool Waters scheme, which has the potential to result in increased boat traffic should consider the impact of the increased boat traffic on features of all designated sites, including the recently extended Liverpool Bay SPA.
- Bird populations within Princes Dock will be monitored on an annual basis. A mitigation strategy should be developed in respect of leisure boat activity on the basis of the results of these surveys.

Protection of Sefton Coast SAC

- All reserved matters applications within the Princes Dock neighbourhood should include a Habitats Regulations ALSE for each of the Natura 2000 sites that may be affected by recreational disturbance as a result of the development. All developments should include a commitment to adhere to the objectives of the Sefton Coast SAC and Ribble and Alt Estuaries SPA VMS

7.3 Construction Phase Mitigation – Condition 16: Part iii

Removal of Existing Buildings and Vegetation

- Vegetation clearance and demolition works should be timed to take place outside the bird breeding season (March to August inclusive) where possible, provided this would be lawful in the context of the results of the pre-construction surveys for bats outlined in Section 2.0.
- Where restricting works outside the bird nesting season is not possible, a suitably qualified ECoW should conduct a check for nesting birds within the site in advance of any works commencing.

Construction Vehicles, Routes and Speed Limits

- Construction vehicle routing should take account of nesting birds if nests are present on site.
- The distance that construction traffic would need to keep from the nest would depend on the nesting bird species and would be advised by the ECoW.
- No general speed limit for construction vehicles is specified as no specific bird breeding locations or wintering roost locations are considered likely to be affected by construction traffic in the Princes Dock neighbourhood.

Protection of Roost Sites of Wintering/Passage Birds

- Any development coming forward within Princes Dock, and elsewhere within the Liverpool Waters scheme, which has the potential to result in increased disturbance of waterbird roosting sites should consider, the impact of disturbance on features of all designated sites, including the recently extended Liverpool Bay SPA.

- Bird populations within the Liverpool Waters Scheme will be monitored on an annual basis. If significant populations of SPA or Ramsar site qualifying species are recorded utilising Princes Dock, an overarching mitigation strategy should be developed on the basis of the results of these surveys.
- Visual disturbance mitigation should be installed for the developments to the east and west of Princes Parade and comprise heras fencing equipped with dark green debris netting, to screen the site and prevent any windblown litter entering the docks.
- The measures outlined in 4.1.3 to reduce the noise disturbance associated with piling should be followed.

Additional Mitigation Requirements

- Any additional mitigation identified by the updated impact assessments for peregrine, black redstart and water birds should be incorporated in the CEMP as required.

7.4 Habitat Creation – Condition 16: Part iv

Black Redstart

- Building within the neighbourhood should, if practicable, incorporate consider the inclusion of a green roof , specifically designed for black redstarts.
- If a green roof for black redstarts is provided, then nest boxes for this species should be installed on the same building.
- Additional mitigation options for black redstart should also be considered including brown walls and a mosaic of green/brown roofs and walls distributed between different buildings.

Peregrine

- Nesting habitat for peregrine should not be provided in the Princes Dock neighbourhood, due to the potential negative interaction between this species and black redstarts.

Swallows and Swifts

- Buildings within Princes Dock should consider the inclusion of swallow and/or swift nest boxes where possible. Where provided, it is recommended that a minimum of 3 boxes are installed per building.

Replacement Roosting Habitat for Water Birds

- The final requirement for replacement water bird habitat should be based on the results of the proposed passage/wintering bird surveys.
- The results of the first annual passage/wintering bird survey and common tern surveys will be used to draft a strategic water bird mitigation plan which will be submitted to the local planning authority for approval. All of the mitigation features specified will be delivered in areas managed by Peel Holdings and will be provided within two years of the mitigation plan being approved.

Bats

- A total of 3 bat boxes should be provided on the new building proposed for Plot A-03.

Landscape Planting

- Linear planting of locally native trees should be incorporated in the landscape scheme for the areas of public open space within Princes Dock neighbourhood. Where tree planting is proposed within the public realm of the individual development plots, it should seek to integrate with adjacent plots/public open space, to create a coherent ecological network within the neighbourhood.
- Planting should be carefully planned to avoid funnelling birds, which may use the trees for foraging and/or song posts towards reflective glass surfaces.
- Opportunities for further enhancing landscaping within the neighbourhood should be taken where possible, through the incorporation of additional 'bat friendly' plants within the scheme.

7.5 Post-construction Monitoring and Management – Condition 16: Part ix.

Green Roofs and Black Redstart Boxes

- Where provided green roofs should be inspected at least twice a year by a suitably experienced landscape contractor, to determine whether they continue to meet their original specification.
- The condition of black redstart nest boxes should be inspected annually between September and February, from the ground using binoculars, to determine their condition.
- Two black redstart surveys should be carried out post completion of a building with a green roof. The surveys should comprise two elements; a ground level survey and a roof level survey.
- To avoid duplication of survey effort, the data collected during the biennial black redstart surveys (see 2.1.2) should be used for monitoring where possible, provided a full breeding season has passed between completion of the green roof and the survey. The second survey should be carried out five years after completion of the green roof.
- The roof level survey should be completed either following the ground-level survey or independently, depending on whether data from the biennial surveys is used for the ground-level element.
- If monitoring of green roofs finds that remedial management is required, this should be undertaken by a suitably experienced contractor.
- Any nest boxes which are deemed to have failed structurally should be replaced between September and February (inclusive).

Swallow and Swift Boxes

- Where provided, the condition of the swallow and/or swift nest boxes should be inspected, every five years, from the ground using binoculars to determine their condition.
- Any nest boxes which are deemed to have failed structurally should be replaced between September and February (inclusive) using an appropriate access system.

Bat Boxes

- Where provided, bat boxes should be monitored in years 2, 5, and 10 post installation, by a licenced bat worker from a mobile work platform or similar.

- Any bat boxes which are deemed to have failed structurally should be replaced under the supervision of a licenced bat worker between November and February (inclusive).
- Where monitoring has deemed that a frequently occupied box needs cleaning, this should also be carried out under the supervision of a licenced bat worker, between November and February (inclusive).

Landscape Planting

- Routine management of any landscape planting for bats should be undertaken by a suitably experienced contractor.
- The landscape planting should be assessed at least annually, between May and August, by a suitably experienced contractor, to determine whether it continues to meet its original specification.
- All planted trees which fail to establish or die during the lifetime of the development should be replaced with an equivalent tree within 12 months.
- The requirement for remedial management of the landscape planting should be decided on the basis of the landscape contractor's annual assessment, with the overall target that the scheme should continue to meet the original specification for the lifespan of the development.
- If significant remedial management required, a suitably qualified ecologist should be consulted to ensure that the proposed replacement planting is appropriate.

8.0 References

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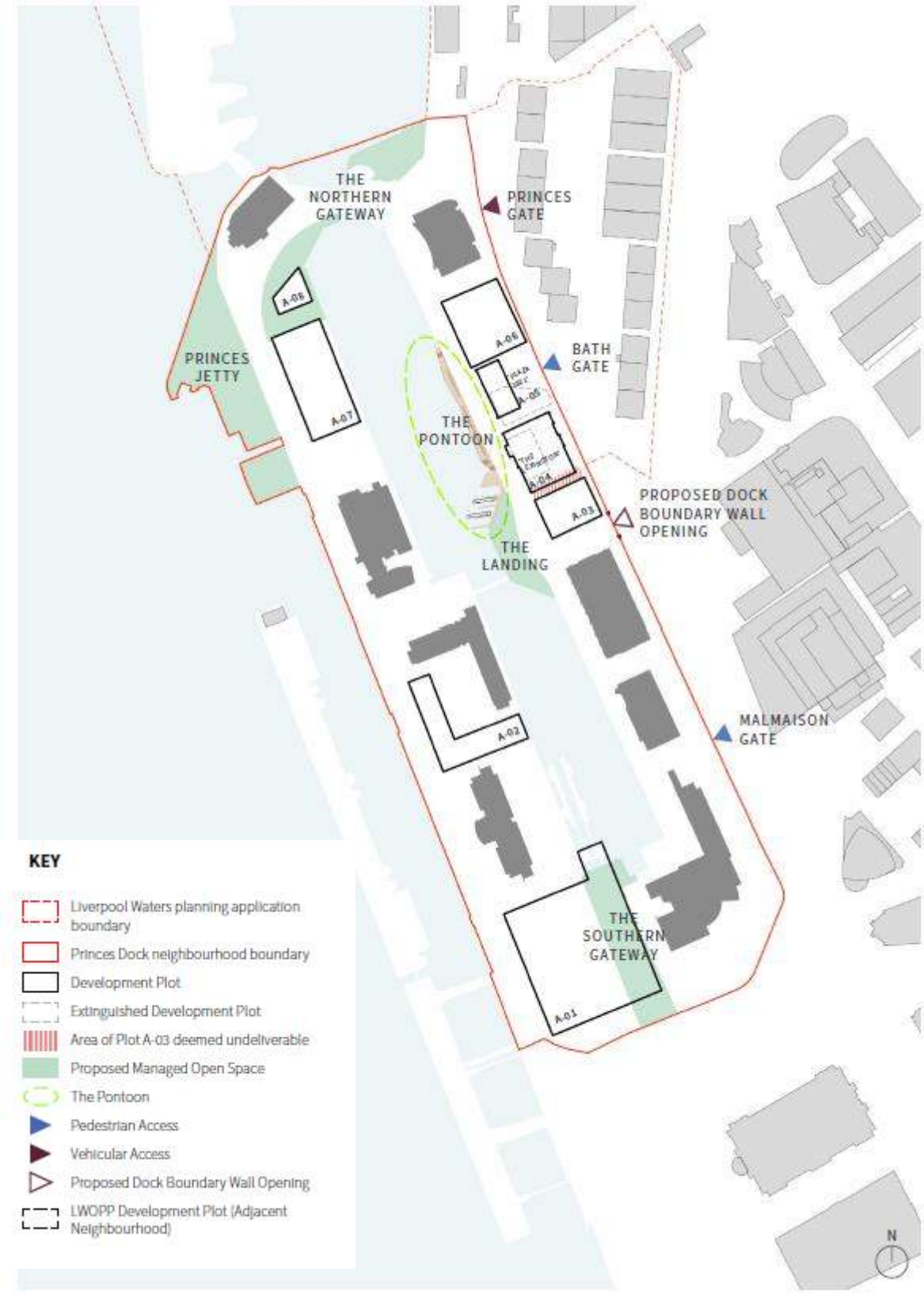
Appendix A – Figures

Figure 1 Plots Identified for Development within the Princes Dock Masterplan



Appendix B – Wildlife Legislation

Bern Convention

The *Convention on the Conservation of European Wildlife and Natural Habitats* (the *Bern Convention*) was adopted in Bern, Switzerland in 1979, and was ratified in 1982. Its aims are to protect wild plants and animals and their habitats listed in Appendices 1 and 2 of the of the Convention, and regulate the exploitation of species listed in Appendix 3. The regulation imposes legal obligations on participating countires to protect over 500 plant species and more than 1000 animals.

To meet its obligations imposed by the Convention, the European Community adopted the *EC Birds Directive* (1979) and the *EC Habitats Directive* (1992 – see below). Since the Lisbon Treaty, in force since 1st December 2009, European legislation has been adopted by the European Union.

Bonn Convention

The Convention on the Conservation of Migratory Species of Wild Animals or 'Bonn Convention' was adopted in Bonn, Germany in 1979 and came into force in 1985. Participating states agree to work together to preserve migratory species and their habitats by providing strict protection to species listed in Appendix I of the Convention. It also establishes agreements for the conservation and management of migratory species listed in Appendix II.

In the UK, the requirements of the convention are implemented via the Wildlife & Countryside Act 1981 (as amended), Wildlife (Northern Ireland) Order 1985 (as amended), Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 and the Countryside and Rights of Way Act 2000 (CRoW).

Habitats Directive

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Fora, or the 'Habitats Directive', is a European Union directive adopted in 1992 in response to the Bern Convention. Its aims are to protect approximately 220 habitats and 1,000 species listed in its several Annexes.

In the UK, the Habitats Directive is transposed into national law via the Conservation of Habitats and Species Regulations 2010 (as amended) in England and Wales, and via the Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended) in Northern Ireland.

Birds Directive

The EC Directive on the Conservation of Wild Birds (791409/EEC) or 'Birds Directive' was introduced to achieve favourable conservation status of all wild bird species across their distribution range. In this context, the most important provision is the identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex 1 of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance.

Conservation of Habitats and Species Regulations 2017 (as amended)

Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species (listed in Annexes I or II of the Habitats Directive respectively) to the European Commission. These sites, if ratified by the European Commission, are then designated as Special Protection Areas (SPAs) within six years. Public bodies must also help preserve, maintain and re-establish habitats for wild birds.

The Regulations also make it an offence to deliberately capture, kill, disturb or trade in the animals listed in Schedule 2, or pick, uproot, destroy, or trade in the plants listed in Schedule 5 - see below:

Schedule 2 – European Protected Species of Animals	**Schedule 5 – European Protected Species of Plants**
Horseshoe bats *Rhinolophidae* - all species	Shore dock *Rumex rupestris*
Common bats *Vespertilionidae* - all species	Killarney fern *Trichomanes speciosum*
Large Blue Butterfly *Maculinea arion*	Early gentian *Gentianella anglica*
Wild cat *Felis silvestris*	Lady's-slipper *Cypripedium calceolus*
Dolphins, porpoises and whales *Cetacea* – all sp.	Creeping marshwort *Apium repens*
Dormouse *Muscardinus avellanarius*	Slender naiad *Najas flexilis*
Pool frog *Rana lessonae*	Fen orchid *Liparis loeselii*
Sand lizard *Lacerta agilis*	Floating-leaved water plantain *Luronium natans*
Fisher's estuarine moth *Gortyna borelii lunata*	Yellow marsh saxifrage *Saxifraga hirculus*
Great crested newt *Triturus cristatus*	
Otter *Lutra lutra*	
Lesser whirlpool ram's-horn snail *Anisus vorticulus*	
Smooth snake *Coronella austriaca*	
Sturgeon *Acipenser sturio*	
Natterjack toad *Epidalea calamita*	
Marine turtles *Caretta caretta, Chelonia mydas, Lepidochelys kempii, Eretmochelys imbricata, Dermochelys coriacea*	

Wildlife & Countryside Act 1981 (as amended)

This is the principal mechanism for the legislative protection of wildlife in the UK. This legislation is the chief means by which the 'Bern Convention' and the Birds Directive are implemented in the UK. Since it was first introduced, the Act has been amended several times.

The Act makes it an offence to (with exception to species listed in Schedule 2) intentionally:

- kill, injure, or take any wild bird;
- take, damage or destroy the nest of any wild bird while that nest is in use; or
- take or destroy an egg of any wild bird.

Or to intentionally do the following to a wild bird listed in Schedule 1:

- disturbs any wild bird while it is building a nest or is in, on or near a nest containing eggs or young; or
- disturbs dependent young of such a bird.

In addition, the Act makes it an offence (subject to exceptions) to:

- intentionally or recklessly kill, injure or take any wild animal listed on Schedule 5;

- interfere with places used for shelter or protection, or intentionally disturbing animals occupying such places; and
- The Act also prohibits certain methods of killing, injuring, or taking wild animals.

Finally, the Act also makes it an offence (subject to exceptions) to:

- intentionally pick, uproot or destroy any wild plant listed in Schedule 8, or any seed or spore attached to any such wild plant;
- unless an authorised person, intentionally uproot any wild plant not included in Schedule 8; or
- sell, offer or expose for sale, or possess (for the purposes of trade), any live or dead wild plant included in Schedule 8, or any part of, or anything derived from, such a plant.

Following all amendments to the Act, Schedule 5 'Animals which are Protected' contains a total of 154 species of animal, including several mammals, reptiles, amphibians, fish and invertebrates. Schedule 8 'Plants which are Protected' of the Act, contains 185 species, including higher plants, bryophytes and fungi and lichens. A comprehensive and up-to-date list of these species can be obtained from the JNCC website.

Part 14 of the Act makes unlawful to plant or otherwise case to grow in the wild any plant which is listed in Part II of Schedule 9.

It is recommended that plant material of these species is disposed of as bio-hazardous waste, and these plants should not be used in planting schemes.

Schedule 1 - Birds which are protected by special penalties			
Avocet	*Recurvirostra avosetta*	Osprey	*Pandion haliaetus*
Bee-eater	*Merops apiaster*	Owl, Barn	*Tyto alba*
Bittern	*Botaurus stellaris*	Owl, Snowy	*Nyctea scandiaca*
Bittern, Little	*Ixobrychus minutus*	Peregrine	*Falco peregrinus*
Bluethroat	*Luscinia svecica*	Petrel, Leach's	*Oceanodroma leucorhoa*
Brambling	*Fringilla montifringilla*	Phalarope, Red-necked	*Phalaropus lobatus*
Bunting, Cirl	*Emberiza cirlus*	Plover, Kentish	*Charadrius alexandrinus*
Bunting, Lapland	*Calcarius lapponicus*	Plover, Little Ringed	*Charadrius dubius*
Bunting, Snow	*Plectrophenax nivalis*	Quail, Common	*Coturnix coturnix*
Buzzard, Honey	*Pernis apivorus*	Redstart, Black	*Phoenicurus ochruros*
Capercaillie	*Tetrao urogallus*	Redwing	*Turdus iliacus*
Chough	*Pyrrhocorax pyrrhocorax*	Rosefinch, Scarlet	*Carpodacus erythrinus*
Corncrake	*Crex crex*	Ruff	*Philomachus pugnax*
Crake, Spotted	*Porzana porzana*	Sandpiper, Green	*Tringa ochropus*
Crossbills (all species)	*Loxia*	Sandpiper, Purple	*Calidris maritima*
Curlew, Stone	*Burhinus oedicnemus*	Sandpiper, Wood	*Tringa glareola*
Divers (all species)	*Gavia*	Scaup	*Aythya marila*
Dotterel	*Charadrius morinellus*	Scoter, Common	*Melanitta nigra*
Duck, Long-tailed	*Clangula hyemalis*	Scoter, Velvet	*Melanitta fusca*
Eagle, Golden	*Aquila chrysaetos*	Serin	*Serinus serinus*
Eagle, White-tailed	*Haliaetus albicilla*	Shorelark	*Eremophila alpestris*
Falcon, Gyr	*Falco rusticolus*	Shrike, Red-backed	*Lanius collurio*
Fieldfare	*Turdus pilaris*	Spoonbill	*Platalea leucorodia*
Firecrest	*Regulus ignicapillus*	Stilt, Black-winged	*Himantopus himantopus*
Garganey	*Anas querquedula*	Stint, Temminck's	*Calidris temminckii*
Godwit, Black-tailed	*Limosa limosa*	Swan, Bewick's	*Cygnus bewickii*

Goshawk	*Accipiter gentilis*	Swan, Whooper	*Cygnus cygnus*
Grebe, Black-necked	*Podiceps nigricollis*	Tern, Black	*Chlidonias niger*
Grebe, Slavonian	*Podiceps auritus*	Tern, Little	*Sterna albifrons*
Greenshank	*Tringa nebularia*	Tern, Roseate	*Sterna dougallii*
Gull, Little	*Larus minutus*	Tit, Bearded	*Panurus biarmicus*
Gull, Mediterranean	*Larus melanocephalus*	Tit, Crested	*Parus cristatus*
Harriers (all species)	*Circus*	Treecreeper, Short-toed	*Certhia brachydactyla*
Heron, Purple	*Ardea purpurea*	Warbler, Cetti's	*Cettia cetti*
Hobby	*Falco subbuteo*	Warbler, Dartford	*Sylvia undata*
Hoopoe	*Upupa epops*	Warbler, Marsh	*Acrocephalus palustris*
Kingfisher	*Alcedo atthis*	Warbler, Savi's	*Locustella luscinioides*
Kite, Red	*Milvus milvus*	Whimbrel	*Numenius phaeopus*
Merlin	*Falco columbarius*	Woodlark	*Lullula arborea*
Oriole, Golden	*Oriolus oriolus*	Wryneck	*Jynx torquilla*
Invasive plant species listed in Schedule 9			
Australian swamp stonecrop or New Zealand pygmyweed	*Crassula helmsii*	Japanese rose	*Rosa rugosa*
Californian red seaweed	*Pikea californica*	Japanese seaweed	*Sargassum muticum*
Curly waterweed	*Lagarosiphon major*	Laver seaweeds (except native species)	*Porphyra* spp
Duck potato	*Sagittaria latifolia*	Parrot's-feather	*Myriophyllum aquaticum*
Entire-leaved cotoneaster	*Cotoneaster integrifolius*	Perfoliate alexanders	*Smyrnium perfoliatum*
False Virginia creeper	*Parthenocissus inserta*	Pontic rhododendron	*Rhododendron ponticum*
Fanwort or Carolina water-shield	*Cabomba caroliniana*	Purple dewplant	*Disphyma crassifolium*
Few-flowered garlic	*Allium paradoxum*	Red algae	*Grateloupia luxurians*
Floating pennywort	*Hydrocotyle ranunculoides*	Rhododendron	*Rhododendron ponticum* × *Rhododendron maximum*
Floating water primrose	*Ludwigia peploides*	Small-leaved cotoneaster	*Cotoneaster microphyllus*
Giant hogweed	*Heracleum mantegazzianum*	Three-cornered garlic	*Allium triquetrum*
Giant kelp	*Macrocystis* spp.	Variegated yellow archangel	*Lamiastrum galeobdolon* subsp. *argentatum*
Giant knotweed	*Fallopia sachalinensis*	Virginia creeper	*Parthenocissus quinquefolia*
Giant rhubarb	*Gunnera tinctoria*	Wakame	*Undaria pinnatifida*
Giant salvinia	*Salvinia molesta*	Wall cotoneaster	*Cotoneaster horizontalis*
Green seafingers	*Codium fragile*	Water fern	*Azolla filiculoides*
Himalayan cotoneaster	*Cotoneaster simonsii*	Water hyacinth	*Eichhornia crassipes*
Hollyberry cotoneaster	*Cotoneaster bullatus*	Water lettuce	*Pistia stratiotes*
Hooked asparagus seaweed	*Asparagopsis armata*	Water primrose	*Ludwigia grandiflora*
Hottentot fig	*Carpobrotus edulis*	Water primrose	*Ludwigia uruguayensis*
Hybrid knotweed	*Fallopia japonica* × *Fallopia sachalinensis*	Waterweeds	*Elodea* spp.
Indian (Himalayan) balsam	*Impatiens glandulifera*	Yellow azalea	*Rhododendron luteum*
Japanese knotweed	*Fallopia japonica*		

Natural Environment and Rural Communities Act 2006

Section 41 (S41) of this Act requires the Secretary of State to publish a list (in consultation with Natural England) of Habitats and Species which are of Principal Importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as public bodies including local and regional authorities, in implementing their duty under Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal (e.g. planning) functions. The S41 list includes 65 Habitats of Principal Importance and 1,150 Species of Principal Importance.

Birds of Conservation Concern

This is a review of the status of all birds occurring regularly in the United Kingdom. It is regularly updated and is prepared by leading bird conservation organisations, including the British Trust for Ornithology (BTO), Joint Nature Conservation Committee (JNCC) and The Royal Society for the Protection of Birds (RSPB).

The latest report was produced in 2015 (Eaton *et al*, 2015) and identified 67 red list species, 96 amber species, and 81 green species. The criteria are complex, but generally:

- **Red list** species are those that have shown a decline of the breeding population, non-breeding population or breeding range of more than 50% in the last 25 years.
- **Amber list** species are those that have shown a decline of the breeding population, non-breeding population or breeding range of between 25% and 50% in the last 25 years. Species that have a UK breeding population of less than 300 or a non-breeding population of less than 900 individuals are also included, together with those whose 50% of the population is localised in 10 sites or fewer and those whose 20% of the European population is found in the UK.
- **Green list** species are all regularly occurring species that do not qualify under any of the red or amber criteria are green listed

Global IUCN Red List

The International Union for Conservation of Nature (IUCN) Threatened Species was devised to provide a list of those species that are most at risk of becoming extinct globally. It provides taxonomic, conservation status and distribution information about threatened taxa around the globe.

The system catalogues threatened species into groups of varying levels of threat, which are: Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CE), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD), Not Evaluated (NE). Criteria for designation into each of the categories is complex, and consider several principles.

Local Biodiversity Action Plan (LBAP)

Local Biodiversity Action Plans (LBAP) identify habitat and species conservation priorities at a local level (typically at the County level), and are usually drawn up by a consortium of local Government organisations and conservation charities.

Some LBAP's may also include Habitat Action Plans (HAP) and/or Species Action Plans (SAP), which are used to guide and inform the local decision making process.

Appendix C – Planting for Bats and Invertebrates

Table B1 Gardening for bats

Below are some suggestions, but this is not an exhaustive list – see also:

- https://www.rhs.org.uk/science/pdf/conservation-and-biodiversity/wildlife/rhs-perfect-for-pollinators-garden-plants.pdf

Flowering times are approximate, varying dependent on region. Regular dead-heading extends flowering period in many flowers. A=annual, HA= hardy, annual, HHA=half-hardy annual, P=perennial, W=wild flower.

Flowers for borders			
St. John's Wort	*Hypericum*	P	March
Marigolds	*Calendula*	H/A	March-October
Aubrietia	*Aubrietia deltoidea*	P	March-June
Honesty	*Lunaria rediviva*	HB	March
Forget-me-not	*Myosotis* sp.	A/P	March-May
Elephant ears	*Bergenia*	P	April
Wallflowers	*Erysimum*	B	April-June
Cranesbills	*Geranium spp.*	P	May-September
Yarrow	*Achillea*	P	May-
Poppies	*Papaver spp.*	A	May- July
Dames violet	*Hesperis matronalis*	P	May-August
Red Valerian	*Centranthus rubber*	P	May-Sept
Poached egg plant	*Limnanthes*	HA	June-August
Knapweed	*Centaurea nigra*	P	June-September
Phacelia	*Phacelia spp.*	HA	June-September
Ox-eye daisy	*Leucanthemum vulgare*	P	June-August
Evening primrose	*Oenothera biennis*	B	June-September
Candytuft	*Iberis umbellate*	HA	June-September
Sweet William	*Dianthus barbatus*	B	June-July
Blanket flowers	*Gaillardia*	P	June -
Verbena	*Verbena bonariensis*	HHA	June-October
Scabious	*Knautia arvensis*	P	July-August
Night-scented stock	*Mattiola bicornia*	HA	July-August
Pincushion flower	*Scabious spp.*	A/P	July-September
Cherry pie	*Heliotrope*	HHA	July-October
Mexican aster	*Cosmos sp.*	A/P	July-October
Cone flower	*Rudbeckia spp.*	A/P	August-November
Mallow	*Lavateria spp.*	P	August-October
Michaelmas daisy	*Aster spp.*	P	August-September
Ice plant 'Pink lady'	*Sedum spectabile*	P	September
Herbs – both leaves and flowers are fragrant			
Fennel	*Foeniculum vulgare*		July-September
Bergamont	*Monarda didyma*		June-September

Sweet Cicely	*Myrrhis odorata*		April-June
Hyssop	*Hyssopus officinalis*		July-September
Feverfew	*Tanacetum parthenium*		June-September
Borage	*Borago officinalis*		May-September
Rosemary	*Rosmarinus officinalis*		March-May
Lemon balm	*Melissa officinalis*		
Coriander	*Coprianrum sativum*		June-August
Lavenders	*Lavendula spp*		
Marjoram	*Origanum spp*		
Trees, shrubs and climbers important to insects			
Common alder	*Alnus glutinosa*		Suitable for coppicing
Hazel	*Corylus avellana*		Suitable for coppicing
Elder	*Sambucus nigra*		Small
Goat willow	*Salix caprea*		Suitable for coppicing
Hawthorn	*Crataegus monogyna*		Suitable for coppicing
Honeysuckle	*Lonicera spp*		Grow a variety for succession
Dog rose	*Rosa canina*		Climber
Bramble	*Rubus fruticosus*		Climber
Ivy	*Hedera helix*		Climber
Guelder rose	*Vibernum opulus*		Shrub
Gorse	*Ulex spp.*		Shrub
Plants for pond edges and marshy areas			
Purple loosestrife	*Lytrhum salicaria*	W	June-August
Meadow sweet	*Filipendula ulmaria*	W	June-September
Lady's smock	*Cardamine pratensis*	W	April-June
Water mint	*Mentha aquatica*	W	July-September
Angelica	*Angelica sylvestris*	W	July-September
Hemp agrimony	*Eupatorium cannabinum*	W	March-May
Marsh marigold	*Caltha palustris*	W	June-September
Creeping Jenny	*Lysimachia nummularium*	W	May-August
Fringed water lily	*Nymphoides peltata*	W	June-September
Water forget-me-not	*Myosotis scorpioides*	W	June-September

Appendix D – Report Conditions

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The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.

Appendix C: Approval Correspondence

To be added once NE approve this Framework AMP document.

UK and Ireland Office Locations