REPORT

Holyhead Breakwater Refurbishment Scheme

Outline Biosecurity Risk Assessment

Client: Stena Line Ports Ltd

Reference: PB9014-RHD-ZZ-XX-RP-C-0225

Status: Final/01

Date: 08 April 2022

Royal HaskoningDHV

Enhancing Society Together

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Status: 01/Final
Date: 08 April 2022
Project name: Holyhead Breakwater Refurbishment Scheme
Project number: PB9014
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Date: 31 January 2022

Approved by: Jamie Gardiner

Date: 07/03/2022

Classification
Project related

Royal HaskoningDHV

Table of Contents

Table of Tables

Table of Figures

1 Introduction

1.1 Background

Constructed between 1848 and 1873, Holyhead Breakwater ("the Breakwater") provides an area of sheltered water for the Port of Holyhead and Holyhead New Harbour, and provides protection to the surrounding coastline from coastal erosion and flooding (**Figure 1-1**). The Breakwater is a Grade II* listed Victorian structure and, at a total length of 2.4km, is the longest breakwater in the UK. At the end of the Breakwater (the roundhead) sits the Grade II-listed Holyhead Breakwater Lighthouse. The Breakwater is formed by a wide rubble mound with a crest around the waterline and a vertical blockwork-walled superstructure on top.

Considerable wave action has led to the displacement and erosion of the rock that makes up the rubble mound and, consequently, has led to a loss of integrity of the rubble mound itself. This has resulted in regular and expensive maintenance and repair work. A permanent solution to the constant erosion of the foundations of the Breakwater and damage of the blockwork-walled superstructure itself is therefore required.

The proposed scheme comprises the refurbishment of the seaward and leeward sides of the Breakwater and has been divided into three elements:

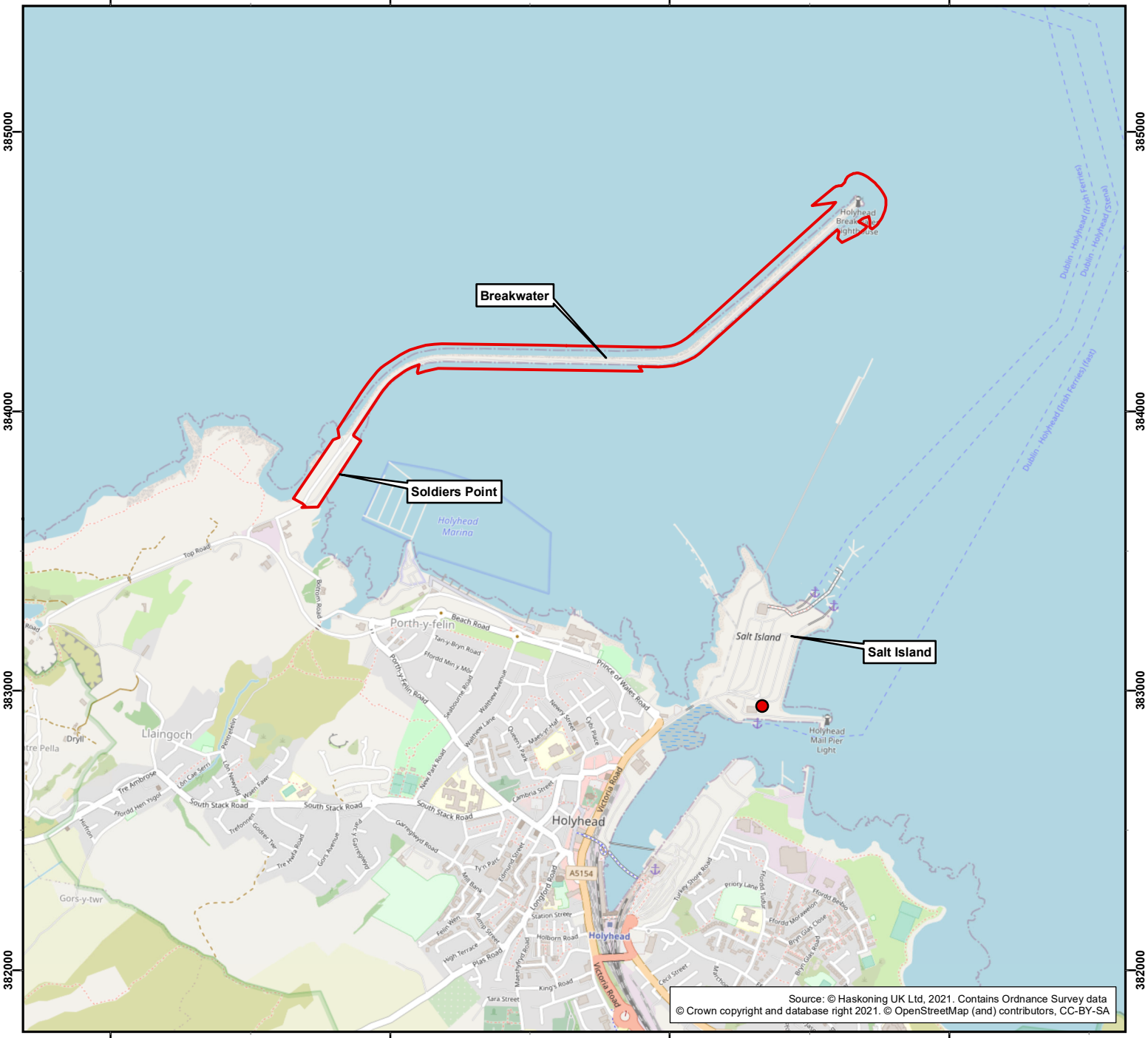
- **Seaward side** – installation of concrete armour onto the existing rubble mound along the length of the Breakwater, in the form of 18.1m^3 Tetrapod units and reinforcing 120-tonne Z-shaped concrete units to prevent displacement;
- **Breakwater roundhead** (i.e., the terminal section of the Breakwater on which the lighthouse stands) – rock placement to widen the existing rubble mound, with installation of Tetrapod units and reinforcing Z-shaped blocks; and,
- **Leeward side** – restoration of the existing rubble mound along sections of the Breakwater through the installation of an Articulated Concrete Block Mattress (ACBM), and rock revetment where the existing rubble mound is too steep to accommodate the ACBM.

An application for a marine licence, required for all works below the Mean High Water Spring (MHWS) mark, was made in August 2021, which was supported by an Environmental Impact Assessment (EIA) (Royal HaskoningDHV, 2021). Comments on the application made by Natural Resources Wales (NRW) included the requirement to provide an outline Biosecurity Risk Assessment (oBRA) as part of the application.

1.2 Purpose of this document

This document presents the oBRA, carried out to ensure that the proposed scheme does not introduce and/or spread invasive non-native species (INNS) at the Breakwater and Holyhead Bay, and connected water bodies. It has been produced in accordance with best practice guidance, including Marine Biodiversity Planning (Cook *et al.*, 2015).

The chosen contractor will confirm the construction methodology and equipment to be used; therefore, this oBRA has been based upon the expected construction methodology produced during the planning stage, as described in the EIA Report (Royal HaskoningDHV, 2021). A detailed BRA will be produced by the chosen contractor and submitted to NRW for approval prior to construction.



Legend:

- Holyhead Breakwater
- Potential Location of Concrete Batching Plant

Client: Isle of Anglesey County Council	Project: Holyhead Breakwater Refurbishment Scheme

Title: Location Plan

Figure: 1.1 | Drawing No: PB9014-200-014

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	24/02/2021	AB	KD	A4	1:20,000

Co-ordinate system: British National Grid

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1.3 Relevant legislation

The biosecurity risk assessment will support compliance with the following UK legislation:

- EU Regulation on Invasive Alien Species.
- The Water Framework Directive (WFD) (2000/60/EC).
- Marine Strategy Framework Directive (2208/56/EC).
- Wildlife and Countryside Act 1981, as amended.
- The Conservation of Habitats and Species Regulations 2017, as amended.

1.3.1 EU Regulation on Invasive Alien Species 2015

The EU Invasive Alien Species regulation outlines rules to prevent, minimise and mitigate the adverse effects of invasive alien species on biodiversity and related ecosystem services, and on human health and safety as well as to reduce their social and economic impact. The regulation outlines species of union concern and requires action plans to control the introduction and spread of INNS.

1.3.2 Water Framework Directive

The Water Framework Directive (WFD) came into force in 2000 and is transposed into UK law through The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The WFD aims "*to establish a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater*".

It aims to ensure that all aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands meet good status or potential. The Directive considers the presence of INNS, which can reduce the ecological and overall status of a water body.

1.3.3 Marine Strategy Framework Directive

The Marine Strategy Framework Directive (2008/56/EC) was adopted in 2008. The goal of the Directive is to achieve '*Good Environmental Status*' by 2020 across Europe's marine environment. The Directive provides an overarching framework for other key directives and legislation including the WFD. Descriptor 2 requires that "*non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystem*".

The Directive includes targets to reduce the risk of introduction and spread of non-native species through improved management of high-risk pathways and vectors and to develop action plans for key high risk marine nonindigenous species by 2020.

1.3.4 Wildlife and Countryside Act

It is an offence under this Act to release, or allow to escape into the wild any animal or plant species which is not ordinarily resident in the UK and is not a regular visitor to the UK in a wild state or is listed in Schedule 9 to the Act.

1.3.5 The Conservation of Habitats and Species Regulations

The Conservation of Species and Habitats Regulations 2017 as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, which implement the Habitats Directive (92/43/EEC) in England and Wales (the Habitats Regulations).

The Habitats Regulations also transport elements of the Wild Birds Directive (2009/147/EC) in England and Wales. Within the Habitats Directive (92/43/EEC) it states that "*provision should be made for supplementary measures governing the reintroduction of certain native species of fauna and flora and the possible introduction of non-native species*".

2 Project Description

A full description of the proposed scheme is provided in the EIA Report (Royal HaskoningDHV, 2021).

2.1 Site Location

The Breakwater is situated at the northwest end of Holyhead on the island of Anglesey in North Wales (**Figure 1-1**).

2.2 Description of Construction Activities

2.2.1 Delivery of storage materials

There are two options under consideration for the delivery of refurbishment materials and plant:

- Delivery of refurbishment materials and plant to Holyhead Port by sea or road; and,
- Delivery of refurbishment materials and plant to Soldier's Point by sea.

Under both options, the material would be stockpiled and then transported to the refurbishment site by barge. At any given moment during the construction phase, up to three barges may be in use for the transportation of material from stockpiles to the refurbishment site.

2.2.2 Fabrication of concrete armour units

Two options have been proposed for the fabrication of the concrete armour units, as follows:

- Temporary concrete batching plant at Salt Island, Holyhead Port; or,
- A precast concrete yard elsewhere.

Should a temporary concrete batching plant be set up on Salt Island, materials would be delivered to the plant by sea or road.

2.2.3 Placement of refurbishment material

Marine-based plant would be used for the placement of the armour units (i.e. Tetrapods, Z-shaped concrete armour units, rock and articulated concrete block mattress (ACBM)). A jack-up or floating barge with spud legs, or an alternative form of anchoring system, would provide a platform for a crane and a long-reach excavator.

Whilst a suitable method of anchoring the barge is yet to be confirmed, one option is that a series of concrete anchor blocks placed seaward of the rubble mound may be used to hold the barge in place. Up to two barges would be used to transport the armour units to the jack-up / floating barge. From the jack-up / floating barge, armour units would be lowered into place on the existing rubble mound by crane.

At the roundhead, there may be a need to place rock outside the footprint of the existing rubble mound. This would be placed directly onto the seabed over an area that formed part of the footprint of the original breakwater.

2.2.4 Regrading works

The level of the existing rubble mound undulates along its length. Where undulations are such that they would prohibit the armour units from sitting in a stable orientation, it may be necessary to regrade such areas. Regrading works would be carried out by spreading the rubble using a long-reach excavator from

the jack-up / floating barge. It is anticipated that very little regrading works would be required, and there would be no requirement for the removal of rubble from the site.

2.2.5 Construction programme

The proposed scheme will be undertaken over the course of a single construction phase of approximately two years, or potentially over three phases, each lasting approximately nine months with two-year intervals.

2.3 Description of Operational Activities

Once the refurbishment of the Breakwater is complete, further maintenance of the rubble mound would be minimal and far less than the current maintenance activities. Wave overtopping of the superstructure would be reduced by around 90% and as such any repointing and repair of the superstructure would also be reduced. The structure would continue to be monitored annually and repairs undertaken if damage occurs.

3 Biosecurity Management Plan

3.1 Understanding the Site

The Breakwater extends approximately 2.4km into Holyhead Bay. The seaward side is exposed to considerable wave action from the southern Irish Sea, whilst the leeward side is sheltered due to the effects of the Breakwater itself. The Breakwater protects numerous businesses and waterfront facilities including the Port of Holyhead, a marina, sailing club, coastguard station, Royal National Lifeboat Institute (RNLI) lifeboat station.

The environment surrounding the Breakwater is important for nature conservation as shown by the following designations:

- Anglesey Terns / Morwenoliaid Ynys Môn Special Protection Area (SPA);
- North Anglesey Marine / Gogledd Môn Forol Special Area of Conservation (SAC); and,
- Holy Island Coast / Glannau Ynys Gybi SPA, SAC and Site of Special Scientific Interest (SSSI).

3.2 Potential Presence of INNS

The INNS recorded within and around Holyhead are described in **Table 3.1**. This data was obtained from the National Biodiversity Network dataset[1]. The table categorises marine species as either non-native (i.e., those that have reached the UK by accidental human transport, deliberate human introduction or which have arrived by natural dispersion from a non-native population in Europe), or cryptogenic (i.e., those of unknown origin and are not demonstrably native or introduced).

Table 3-1 INNS recorded within and around Holyhead (source: National Biodiversity Network dataset)

Species Name	Status	Common Name	Origin	Found Location
Marine species				
Didemnum vexillum	Non-native	Carpet sea squirt	North-western Pacific Ocean and the coast around Japan	Holyhead Marina
Spartina townsendii var. anglica	Cryptogenic	Common cord grass	Derived from a north American and European species	East of Trearddur and West of Llanfachraeth
Asterocarpa humilis	Non-native	Compass sea squirt	New Zealand	Holyhead Marina

[1] National Biodiversity Network (nbn.org.uk)

Species Name	Status	Common Name	Origin	Found Location
Sargassum muticum	Non-native	Japanese wireweed	Japan	Near Holyhead Maritime Museum, Penrhos Beach, Near Four Mile Bridge and Trearddur Bay
Undaria pinnatifida	Non-native	Wakame, Asian kelp	Northwest Pacific Ocean	Holyhead Marina
Crassostrea gigas	Non-native	Pacific oyster	Pacific coast of Asia	Holyhead Mariner, Penrhos Bay and Cymyran Strait
Caprella mutica	Non-native	Japanese skeleton shrimp	Sea of Japan in north western Asia	Holyhead Marina.
Bonnemaisonia hamifera	Non-native	Bonnemaison's hook weed	Northwest Pacific Ocean	Trearddur Beach.
Schizoporella japonica	Non-native	A bryozoan	Northwest Pacific Ocean	Holyhead Marina.
Styela clava	Non-native	Leathery seasquirt	Northwest Pacific Ocean	Holyhead Marina and near Holyhead Maritime Museum
Terrestrial plant species				
Smyrnium olusatrum	Non-native	Alexanders	Continental Europe	Near Holyhead Maritime Museum and Marina
Fallopia japonica	Cryptogenic	Japanese Knotweed	East Asia, Japan, China and Korea	Near Holyhead Maritime Museum and Marina
Rhododendron ponticum	Non-native	Common Rhododendron	Southwest Europe	Near Holyhead Maritime Museum and Marina
Pentaglottis sempervirens	Non-native	Green Alkanet	Western Europe	Near Holyhead Maritime Museum and Marina
Spiraea salicifolia x alba = S. x rosalba	Non-native	Bridewort	Continental Europe	Near Holyhead Maritime Museum and Marina
Impatiens glandulifera	Non-native	Himalayan balsam	Himalayas	Near Holyhead Maritime Museum and Marina
Quercus ilex	Non-native	Evergreen oak	Greece	Near Holyhead Maritime Museum and Marina

Carpet sea squirt is known to be present in Holyhead Harbour. A survey undertaken along the Breakwater in 2019 did not record carpet sea squirt or any other INNS. In addition, Japanese knotweed was recorded within the proposed scheme's boundary (Royal HaskoningDHV,2021).

3.3 Identification of site activities which could introduce or spread INNS

3.3.1 Construction Phase

The construction activities that could present a risk of introducing or spreading terrestrial and marine INNS are presented in **Table 3-2.**

Table 3-2 Construction activities which present a risk of introducing or spreading INNS

Activity and brief description	Details of the activity risk to introducing or spreading INNS	Potential Risk: Low, Medium, High
Use of vessels and marine plant from outside of the local area to support the refurbishment works	There is a risk that vessels and marine plant could transport INNS arriving to the site should they have been used elsewhere and not be clean.	High
Landside activities that involve the use of construction equipment, vehicles and staff arriving to site from elsewhere	There is a risk that equipment and vehicles arriving to the site may have been used elsewhere and not be clean and could introduce INNS to the site. Specifically, the wheels of the trucks may not have been cleaned and the long reach excavator could lead to transport of INNS. Project staff arriving and leaving site may unknowingly be carrying INNS on their personal protective equipment (PPE) from other construction sites.	High
Placement of refurbishment material	Concrete armour units will have been recently made either at the Port or imported from an existing site. As such the risk of these units introducing INNS is considered to be very low. Rock used in the works would be sourced from local quarries. As this will be used in the marine environment, it is considered that the risk of introducing INNS to be very low.	Low
Regrading of rubble mound	The proposed regrading of the rubble mound has the potential to spread INNS; however, the INNS survey did not record any INNS. In addition, it is anticipated that very little regrading works would be required, and there would be no requirement for the removal of rubble from the site.	Low
Maintenance activities	Once the refurbishment of the Breakwater is complete, further maintenance of the rubble mound would be minimal and far less than the current maintenance activities. Any maintenance works would be carried in accordance with the Port of Holyhead's existing Biosecurity Plan.	Low

3.3.2 Operational Phase

The operational phase activities that could present a risk of introducing or spreading marine INNS are presented in **Table 3-3**.

Table 3-3 Operational activities which present a risk of introducing or spreading INNS

Activity and brief description	Details of the activity risk to introducing or spreading INNS	Potential Risk: Low, Medium, High
Presence of refurbishment material	There is a risk that presence of concrete armour could increase the potential for invasive species to colonise and become established on the newly available hard surface, spreading to surrounding area.	Medium
Maintenance activities	Once the refurbishment of the Breakwater is complete, further maintenance of the rubble mound would be minimal and far less than the current maintenance activities. Any maintenance works would be carried in accordance with the Port of Holyhead's existing Biosecurity Plan.	Low

Those activities which carry a significant risk of introducing or spreading INNS will require control measures to reduce the risk. These measures are outlined in **Section 3.4** below.

3.4 Biosecurity control measures

Table 3-3 details the biosecurity control measures to be adopted to reduce the risk of introducing or spreading INNS. Specific details will be provided in the detailed BRA to be produced by the chosen contractor.

Table 3-4 biosecurity control measures to be adopted to reduce the risk of introducing or spreading INNS.

Activity Type	Biosecurity Measure
Use of vessels and marine plant to undertake construction activities	• Biosecurity information from visiting vessels will be gathered; including port of origin and when anti-fouling was last applied to hull. • Biosecurity information will be provided to allow boat owners to 'self-assess' their risk. • All vessels to be cleaned prior to and when leaving site. • A rapid visual hull inspection will be carried out on 'high risk' vessels. • Boat owners will not be permitted to dispose of any water contained on the vessel (e.g., bilge water, anchor lockers) into the water at the site. • The prevention of introducing or spreading INNS through the transfer of ballast will be governed by the Ballast Water Management Convention 2017.
Landside activities that involve the use of construction equipment, vehicles and staff arriving to site from elsewhere	• A pre-construction survey should be carried out to confirm the location of Japanese knotweed on Solder's Point. An appropriate management plan should be agreed to ensure the construction activities do not result in the spread of this species. • At the start and end of each working day on site, staff must adhere to the Check, Clean, Dry procedure[2] to ensure their PPE is thoroughly cleaned. All vehicles to be inspected and cleaned at the designated wash down facility on arrival and departure from the site. • All equipment used should be washed down at the end of each day and kept on site to avoid spread of any potential invasive species. This is to take place at the designated wash down facility to avoid spread of any invasive species across the site. • The wheels of each truck to be washed down on arrival and departure from site.
Presence of refurbishment material	• Post-construction monitoring for habitat recovery and INNS colonisation should be carried out post completion of the refurbishment works. Monitoring, reporting and remedial methods should be agreed NRW prior to the monitoring being carried out.

[2] *https://secure.fera.defra.gov.uk/nonnativespecies/checkcleandry/documents/check-clean-dry-england.pdf*

4 Site surveillance and reporting procedures

Table 4.1 presents the mandatory actions required in order to ensure any terrestrial and marine INNS are correctly identified on site and the appropriate reporting procedures are carried out before work can resume.

Table 4-1 Site surveillance and reporting actions before and during construction activities.

Action	Responsibility	When
All site staff to have been trained on the importance of INNS awareness, identification and the reporting procedure.	Site construction manager	Prior to works commencing
All staff to be made aware of the Check, Clean, Dry protocol and its importance throughout the period of construction.	Site construction manager	Prior to works commencing
All site staff to be provided with INNS identification material prior to commencement of construction activities.	Site manager or dedicated biosecurity officer	Prior to works commencing
All site staff are instructed to report any potential INNS found.	All site construction workers	Throughout works
Ensure all material imported is inspected. Delivery drivers must confirm the origin and type of material being delivered on arrival to the site.	Site manager or dedicated biosecurity officer	Throughout works
Oversee implementation of contingency plan should INNS be suspected.	Site manager or dedicated biosecurity officer	Throughout works

5 Contingency Plan

If the identified biosecurity control measures fail to be successful and INNS are suspected, contingency procedures must be implemented. The required actions and the relevant staff responsibility are presented in **Table 5.1**.

Table 5-1 Contingency plan if INNS are identified during construction activities.

Action	Responsibility
Stage One - Suspected arrival of high alert species	
Stop works, collect sample, take photograph and place in plastic bag.	All site construction workers
Conduct a survey to establish the extent and distribution of the INNS.	Site manager or dedicated biosecurity officer
Confirm identification of 'suspect' species and make note of the species, location and distribution in a biosecurity logbook.	Site manager or dedicated biosecurity officer
Inform neighbouring users of INNS and mark out the area.	Site manager or dedicated biosecurity officer
Stage Two - Presence of high alert species confirmed	
Seek advice on the species and appropriate management.	Site manager or dedicated biosecurity officer
Initiate immediate containment measures.	Site manager or dedicated biosecurity officer
Carry out wider surveys of structures, vehicles and equipment throughout the site.	Site manager or dedicated biosecurity officer
Stage Three – Eradication/long-term control measures in place	
Seek advice from NRW on the most appropriate eradication measures and long-term control measures.	Site manager or dedicated biosecurity officer

6 References

Cook, E.J., Macleod, A. Payne, R.D., and Brown, S. (2014) edited by Natural England and Natural Resources Wales (2015). Marine Biosecurity Planning – Guidance for producing site and operation-based plans for preventing the introduction and spread of non-native species in England and Wales.

Royal HaskoningDHV (2021). Environmental Impact Assessment Report: Holyhead Breakwater Refurbishment Scheme. 25th May 2021.