

REPORT

Environmental Scoping Report

Holyhead Breakwater Refurbishment Scheme

Client: Isle of Anglesey County Council

Reference: PB9014-RHD-BW-XX-RP-C-0142

Status: S0/P01.01

Date: 03 April 2020

HASKONINGDHV UK LTD.

Honeycomb
Edmund Street
Liverpool
L3 9NG
Industry & Buildings
VAT registration number: 792428892

+44 151 2362944 **T**
+44 151 2272561 **F**
info.liv@gb.rhdhv.com **E**
royalhaskoningdhv.com **W**

Document title: Environmental Scoping Report

Document short title:

Reference: PB9014-RHD-BW-XX-RP-C-0142
Status: P01.01/S0
Date: 03 April 2020
Project name: Holyhead Breakwater Refurbishment Scheme
Project number: PB9014
Author(s): Anna Sweeney, Melissa Roe-Ely

Drafted by: Anna Sweeney

Checked by: Jamie Gardiner

Date / initials: 31/03/2020 JVG

Approved by: Jamie Gardiner

Date / initials: 03/04/2020 JVG

Classification

Project related



Disclaimer

No part of these specifications/printed matter may be reproduced and/or published by print, photocopy, microfilm or by any other means, without the prior written permission of HaskoningDHV UK Ltd.; nor may they be used, without such permission, for any purposes other than that for which they were produced. HaskoningDHV UK Ltd. accepts no responsibility or liability for these specifications/printed matter to any party other than the persons by whom it was commissioned and as concluded under that Appointment. The integrated QHSE management system of HaskoningDHV UK Ltd. has been certified in accordance with ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018.

Table of Contents

1	Introduction	1
1.1	Background	1
1.2	Need for the Scheme	4
1.3	The Study Area	5
1.4	Purpose of this Report	5
1.5	Report Structure	6
2	Description of the Proposed Scheme	8
2.1	Description of the Construction Phase	8
2.2	Description of the Operational Phase	10
2.3	Alternatives	13
2.4	Decommissioning	15
3	Requirement for EIA	16
3.1	EIA Screening Exercise	16
3.2	Changes to the Proposed Scheme Following Screening	16
4	Legislative and Consenting Requirements	18
4.1	Enabling Legislation	18
4.2	Other Relevant Legislation	18
4.3	Other Relevant Plans and Policies	23
5	Consultation	25
5.1	Public Consultation	25
5.2	Stakeholder Consultation	26
5.3	Further Consultation	27
6	Nature Conservation Designations	28
6.1	European Designated Sites	28
6.2	National Designations	30
6.3	Local Designations	30
7	Topics Scoped out of the EIA	31
7.1	Coastal Processes and Geomorphology	31
7.2	Marine Water and Sediment Quality	32
7.3	Marine Mammals	32
7.4	Terrestrial Ecology	32
7.5	Commercial and Recreational Navigation	33

7.6	Fish and Shellfish Resource and Commercial Fisheries	33
7.7	Traffic and Transport	34
7.8	Accidents and Natural Disasters	34
7.9	Climate Change	35
7.10	Population and Human Health	36
7.11	Tourism and Recreation	36
7.12	Existing Infrastructure and Other Users	36
7.13	Waste	37
7.14	Socio-economics	37
8	Scoping of Environmental Effects	38
8.1	Marine and Coastal Ecology	38
8.2	Ornithology	39
8.3	Air Quality	40
8.4	Noise	42
8.5	Landscape/Seascape and Visual Setting	43
8.6	Cultural Heritage	45
9	Cumulative Impact Assessment	48
9.1	Initial List of Potential Plans and Projects	48
10	Habitats Regulations Assessment	49
10.1	Introduction	49
10.2	The HRA Process	49
10.3	European Sites	50
11	Water Framework Directive	51
11.1	Introduction	51
11.2	The WFD Process	51
12	Proposed Approach to the EIA	53
12.1	EIA Methodology	53
12.2	Consideration of Alternatives	56
12.3	Consultation Process	56
12.4	Preparation of the Environmental Statement	56

13 References 58

Table of Tables

Table 4.1 SMPs for Holyhead and Penrhos and Newlands and Afon Alaw	23
Table 6.1 Summary of qualifying ornithological interest in Anglesey Terns SPA	28
Table 7.2 Initial List of Accidents and Disasters and Determination of Further Consideration.	34
Table 7.3 Refined List of Accidents and Disasters.	35
Table 8.1 2019 NO ₂ , PM ₁₀ and PM _{2.5} concentrations for the 1km by 1km grid square covering the study area (annual means)	41
Table 8.2 Summary of lowest background noise levels at NSR sites in closest proximity to the proposed scheme (Conygar Holyhead, 2020)	42
Table 12-1 Stages of the EIA process	53
Table 12-2 Topics scoped out of the EIA	53
Table 12-3 The sensitivity of receptor	54
Table 12-4 The magnitude of effect	55
Table 12-5 Impact matrix used for the assessment of impacts	55

Table of Figures

Figure 1-1 Location Plan	2
Figure 1-2 Holyhead Breakwater Structure	3
Figure 2-1 Layout of the proposed scheme	9
Figure 6-1 Designated sites for Nature Conservation	29
Figure 11-1 WFD waterbodies	52

Table of Plates

Plate 1.1 Cross-section of the Breakwater structure showing erosion of the rubble mound	4
Plate 2.1 Diagram of seaward side refurbishment scheme	11
Plate 2.2 Diagram showing the three rock tiers around the roundhead	12
Plate 2.3 Diagram of leeward side refurbishment scheme	12
Plate 4.1 Waste hierarchy	20
Plate 5.1 Summary of interests in the Breakwater	25
Plate 5.2 Summary of concerns relating to the refurbishment	25
Plate 7.1 Photograph of Solders Point, looking towards the Breakwater	33
Plate 8.1 Salt Island breeding bird survey area (Source: RPS, 2016)	40
Plate 8.2 Viewpoint looking south west from the head of Holyhead Breakwater towards Holyhead Mountain	44

Appendices

Appendix A Screening Responses

- A1 NRW Screening Response
- A2 IoACC's Screening Opinion
- A3 Further Information for the IoACC to Inform a Second EIA Screening Request
- A4 IoACC's Second Screening Opinion

Appendix B Consultation Records

- B1 Public Consultation Responses
- B2 GAPS Consultation Response
- B3 NRW Consultation Response
- B4 Proposed Scope of the Visual and Heritage Setting Assessments
- B5 Refurbishment Options and Impacts to Heritage Significance Note

Appendix C Level 4 Building Study of Holyhead Breakwater

Acronyms

Acronym	Acronym description
AA	Appropriate Assessment
ACBM	Articulated Concrete Block Mattress
AONB	Areas of Outstanding Natural Beauty
AQMA	Air Quality Management Area
bCD	Below Chart Datum
CEMP	Construction Environmental Management Plan
CIfA	Chartered Institute for Archaeology
CIRIA	Construction Industry Research and Information Association
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CROW	Countryside and Rights of Way Act
cSAC	candidate Special Area of Conservation
DfT	Department for Transport
EC	European Commission
ECI	Early Contractor Involvement
EIA	Environmental Impact Assessment
EU	European Union
FSA	Food Standards Agency
GAPS	Gwynedd Archaeological Planning Service
GAT	Gwynedd Archaeological Trust
GHG	Greenhouse Gas
HER	Historic Environment Record
HRA	Habitats Regulations Assessment
IAQM	Institute of Air Quality Management
IFRC	International Federation of Red Cross and Red Crescent Societies
INNS	Invasive Non-Native Species
IoACC	Isle of Anglesey County Council
IROPI	Imperative Reasons of Overriding Public Interest
ISO	International Standard Organisation
JLDP	Joint Local Development Plan
JNCC	Joint Nature Conservation Committee
LBC	Listed Building Consent
LSE	Likely Significant Effect
LWS	Local Wildlife Site
MCA	Marine Character Area

MCAA	Marine and Coastal Access Act
MCZ	Marine Conservation Zones
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
MPA	Marine Protected Area
MPS	Marine Policy Statement
MSP	Marine Spatial Plan
NMRW	National Monuments Record of Wales
NO	Nitrogen Oxide
NO ₂	Nitrogen Dioxide
NRW	Natural Resources Wales
OBC	Outline Business Case
PD	Permitted Development
PM	Particulate Matter
PPW	Planning Policy Wales
pSPA	proposed Special Protection Areas
RCAHMW	Royal Commission on the Ancient and Historical Monuments of Wales
RNLI	Royal National Lifeboat Institution
ROV	Remotely Operated Vehicle
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SCI	Sites of Community Interest
SHA	Statutory Harbour Master
SMP	Shoreline Management Plan
SO ₂	Sulphur Dioxide
SPA	Special Protection Areas
SSSI	Site of Special Scientific Interest
SWMP	Site Waste Management Plan
VHF	Very High Frequency
WBP	Wales Biodiversity Partnership
WeBS	Wetland Bird Survey
WFD	Water Framework Directive
WGF	Welsh Government Fisheries
WNMP	Welsh National Marine Plan

1 Introduction

1.1 Background

Constructed between 1848 and 1873, the Holyhead Breakwater provides an area of sheltered water for the Port of Holyhead and the New Harbour, and provides protection to the surrounding coastline from coastal erosion and flooding (**Figure 1-1**). The structure is Grade II* listed and reaches a total length of 2.4km, for which there is no parallel in Wales (Gwynedd Archaeological Trust (GAT), 2017). The Breakwater is formed by a wide rubble mound with a crest around the waterline, with a vertical blockwork-walled superstructure on top (**Figure 1-2**).

Holyhead Port is a strategically important international ferry port, providing the main link between Ireland and mainland UK. The Breakwater forms part of the essential infrastructure for the operation of the Port, providing shelter from a more extreme wave climate to the berthing ferries and other vessels. Without the Breakwater it is likely that the wave conditions would increase to the point that the operation of the ferries is no longer viable, resulting in the closure of the Port and the loss of the international link to Ireland for Wales and England.

The Breakwater allows the marina, sailing club, coastguard station, Royal National Lifeboat Institution (RNLI) lifeboat station, maritime museum and Port to thrive, supporting a significant number of jobs. The Breakwater supports the economy of Holyhead and the wider Anglesey and North Wales economies through its role in protecting the Port and the New Harbour, supporting opportunities for regeneration and development, and preventing flooding from wave overtopping.

Since its construction, the Breakwater has been subject to considerable wave action which has led to the movement of the rock blocks that make up the rubble mound and erosion of the rubble mound itself (**Plate 1.1**). As a result, the rubble mound has been subject to regular, expensive, maintenance through the partial replacement of lost material. The vertical blockwork wall structure is also subject to periodic damage which is repaired on an ongoing basis.

To identify a cost-effective long-term sustainable solution to the erosion of the rubble mound, the Isle of Anglesey County Council (IoACC) commissioned an Outline Business Case (OBC) in 2017 (Royal HaskoningDHV, 2017). The aim of the OBC was to identify a cost-effective, long-term sustainable solution to the erosion of the Holyhead breakwater rubble mound so that it continues to provide a stable foundation for the superstructure. In addition, it aimed to contribute towards the objectives from the West of Wales Shoreline Management Plan 2 (SMP2) (Royal HaskoningDHV, 2012) for Holyhead by:

- Maintaining Holyhead as a viable commercial centre and support opportunities for regeneration; and,
- Maintaining Holyhead as a functioning port.

The preferred options for the seaward and leeward sides were selected considering the appraisal categories considered within the OBC (economic, technical, environmental, and alignment with the Well-Being Act and Critical Success Factors), were as follows:

- Seaward side – Armoured slope to seaward face of superstructure to reduce wave impact forces and wave overtopping; and,
- Leeward side – Restore rubble mound to original levels using concrete mattress.



Source: © Haskoning UK Ltd. Contains Ordnance Survey data
© Crown copyright and database right 2020. © OpenStreetMap (and) contributors, CC-BY-SA



Legend:

— Holyhead Breakwater

Client:
Isle of Anglesey
County Council

Project:
Holyhead Breakwater
Refurbishment Scheme

Title:
Location Plan

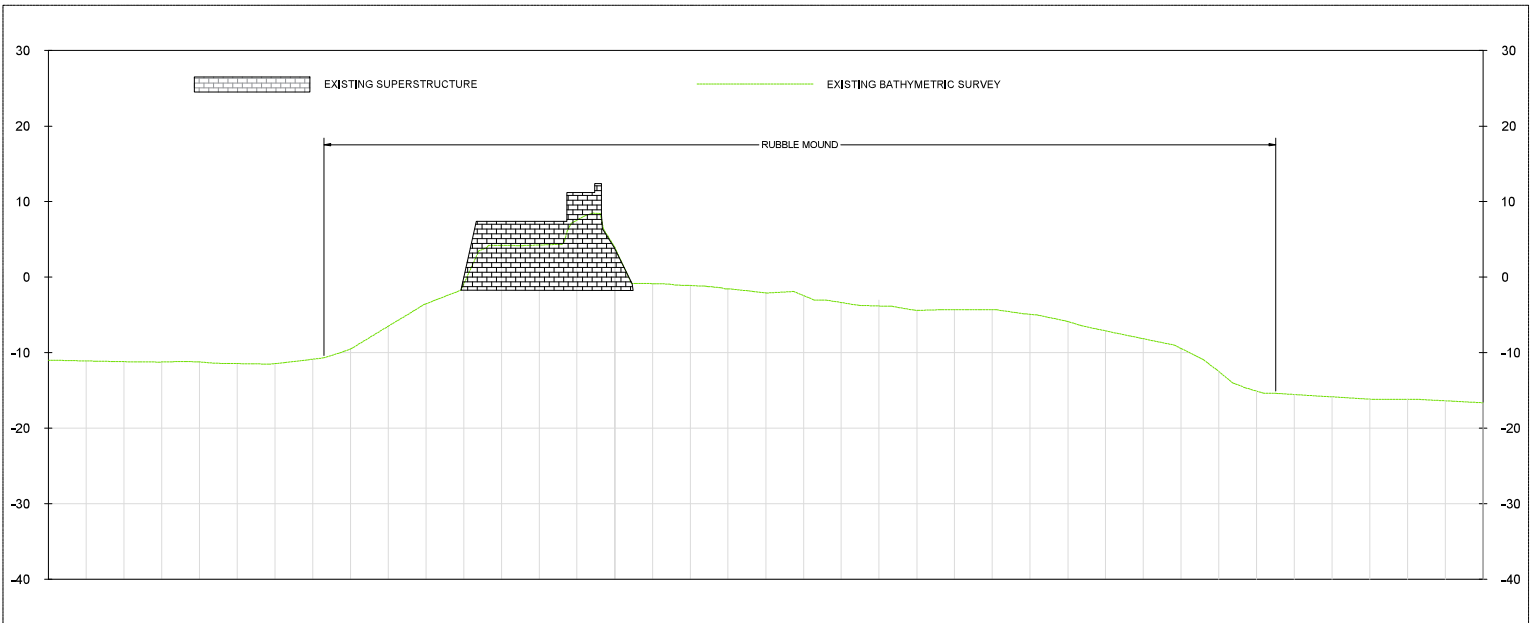
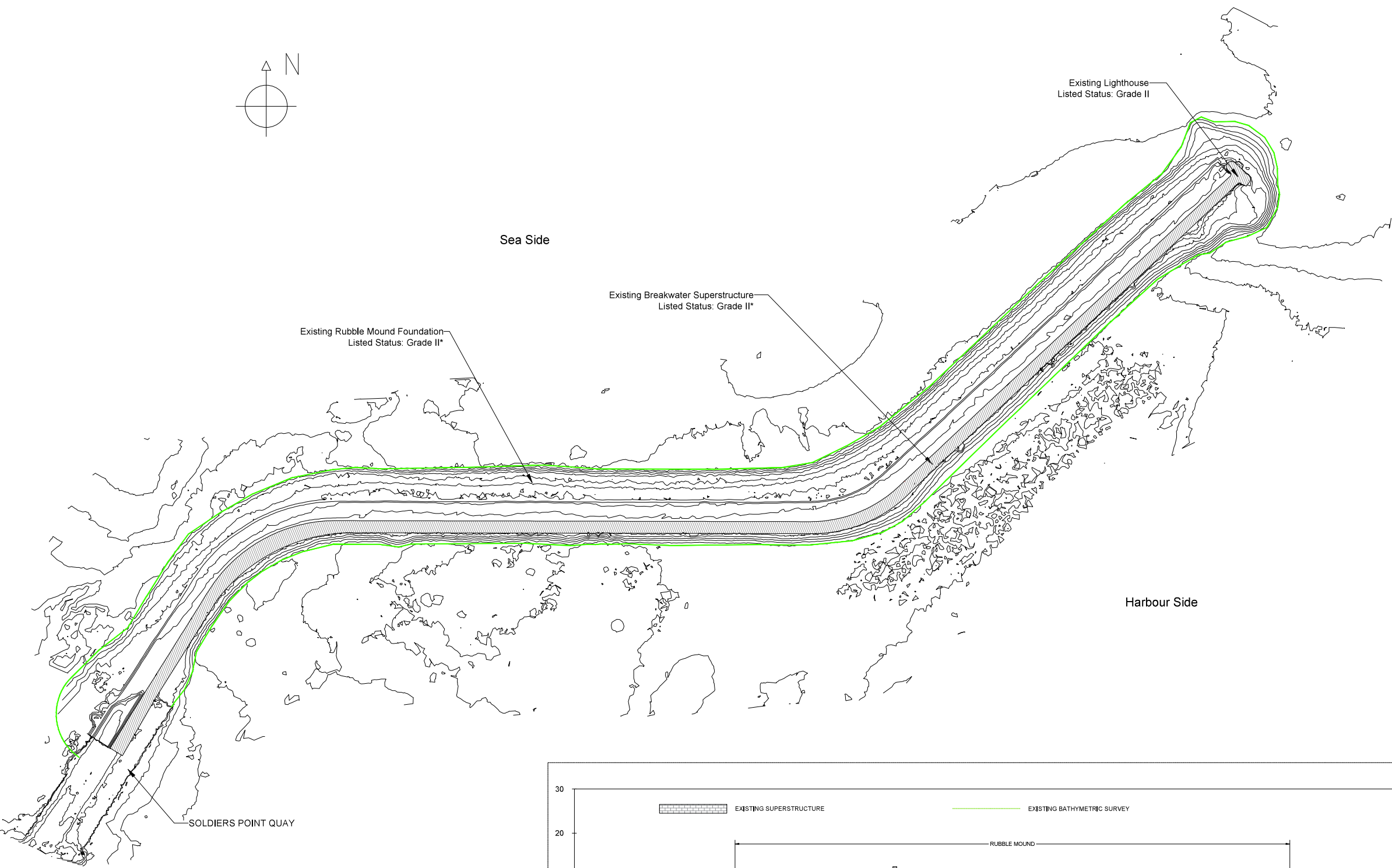
Figure: 1.1 Drawing No: PB9014-101-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	02/04/2020	AB	MRE	A4	1:25,000
01	31/05/2019	GC	SM	A4	1:25,000

Co-ordinate system: WGS 1984 UTM Zone 30N

 **Royal HaskoningDHV**
Enhancing Society Together

**ROYAL HASKONINGDHV
INDUSTRY AND BUILDINGS**
2 ABBEY GARDENS
GREAT COLLEGE STREET
WESTMINSTER
LONDON
SW1P 3NL
+44 (0)20 7222 2115
www.royalhaskoning.co.uk



TYPICAL SECTION THROUGH BREAKWATER

NOTES

KEY

- FOOTPRINT OF THE EXISTING RUBBLE MOUND
- CONTOURS AT 1m INTERVALS

REVISIONS

NO.	DATE	DESCRIPTION
P1.0	16.07.19	SUITABLE FOR COSTING

CLIENT

CYNGOR SIR YNYS MON
ISLE OF ANGLESEY
COUNTY COUNCIL

PROJECT

HOLYHEAD BREAKWATER
REFURBISHMENT

TITLE

HOLYHEAD BREAKWATER
STRUCTURE


Enhancing Society Together

DRAWN	GB	CHECKED	PS	APPROVED	NC
DATE	JULY 2019	SCALE	1:5000	REF.	Figure 1.2
DRAWING NO.	PB9014-RHD-BW-XX-DR-YE-0063			SUITABILITY	REVISION
				D1	P01

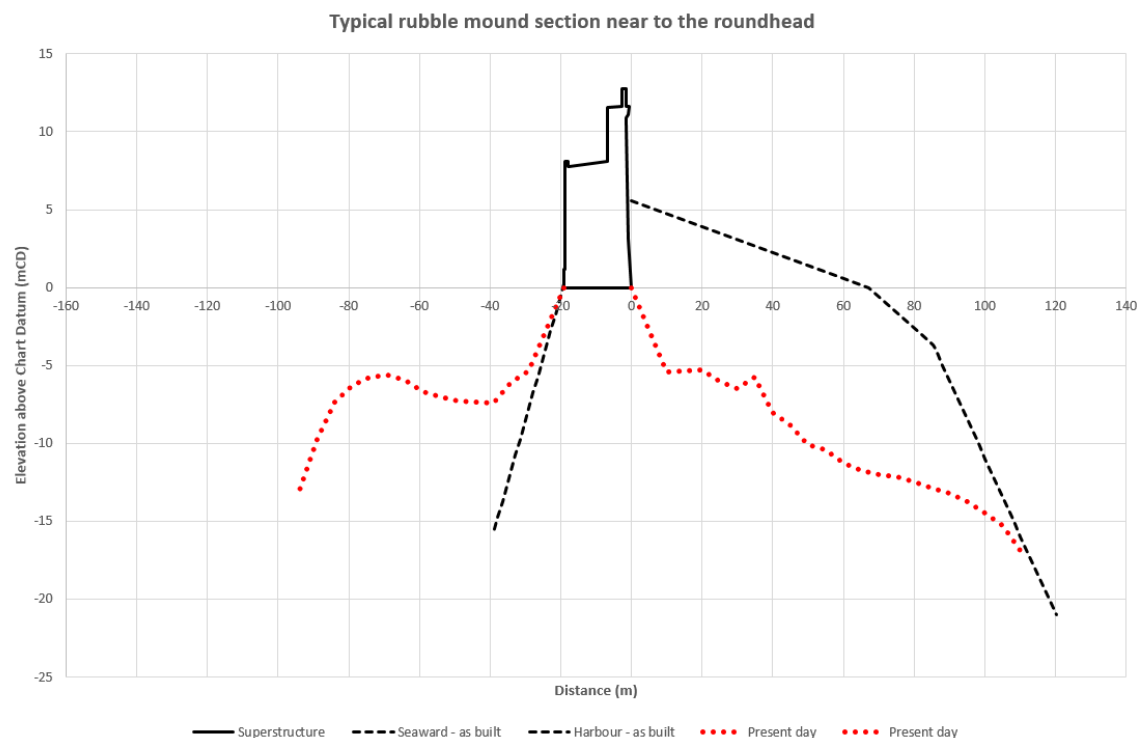


Plate 1.1 Cross-section of the Breakwater structure showing erosion of the rubble mound

Subsequent to the OBC carried out in 2017 (Royal HaskoningDHV, 2017), further work has been undertaken to refine the preferred options to provide a suitable solution for the refurbishment of the Breakwater. The size of rock required to restore the seaward side of the Breakwater would mean sourcing and transporting rock material from Norway. Consequently, this option has been discounted due to it being economically unfeasible. As such, a concrete armour solution is preferred to restore the rubble mound and provide wave protection to the superstructure. The leeward side of the Breakwater would be restored using Articulated Concrete Block Mattresses (ACBM) and rock, where the existing rubble mound is too steep and narrow to enable the ACBMs to be installed.

1.2 Need for the Scheme

The Breakwater represents a key infrastructure for supporting the aspirations for growth in these strategic plans. The project complies with and delivers aspects of the West of Wales SMP2 (Royal HaskoningDHV, 2012). The SMP2 policy for Holyhead is to 'Hold the Line' over the long term and recognises the importance of the Breakwater to achieving this.

Since its completion in 1873, the rubble mound has gradually been eroded by wave action increasing the wave impacts on the superstructure. Without maintenance the loss of the rubble mound would eventually result in the superstructure being undermined and breaches in the breakwater forming, which would expand along the length of the Breakwater cumulating in total failure.

Due to its design, the Breakwater has always required regular maintenance to maintain the condition of the superstructure and replenish the rubble mound. Whilst the current maintenance provides a temporary solution to the problem, the likelihood of a failure of the Breakwater during more frequent and severe storm events increases with time. This maintenance regime has become increasingly expensive and is no longer matching the rate of erosion of the rubble mound; therefore, a more viable long-term solution to ensure the

stability of the breakwater is required. The most recent serious damage to the Breakwater occurred in February 1983 when a length of approximately 300m was damaged seaward from Soldier's Point, leading to a breach in the Breakwater.

If the Breakwater were to fail, then the wave climate in the New Harbour and at the Port of Holyhead would increase significantly, resulting in the following impacts:

- The loss of the Grade II* listed Breakwater and access to the Grade II listed lighthouse;
- The loss of a reliable ferry and freight service to Ireland resulting in the port eventually becoming unviable with the associated losses of income and employment to the town;
- The loss of refuge provided by the outer harbour, one of the main reasons for the construction of the Breakwater;
- More frequent flooding events due to wave overtopping in the Beach Road and Prince of Wales Road areas of the town, affecting 19 properties including the RNLI lifeboat station, HM Coastguard Station, and Holyhead Maritime Museum;
- Closure of the marina and sailing club due to increased wave climate;
- Forced relocation of the RNLI Lifeboat station; and,
- Loss of confidence of investors in several major proposed regeneration and development projects.

A permanent solution to the constant erosion of the foundations of the Breakwater and damage of the blockwork-walled superstructure itself is required before the next breach occurs, which is predicted to occur within the next 15 years (Royal HaskoningDHV, 2017).

1.3 The Study Area

The study area for the environmental assessment is the area over which the direct and indirect effects of the proposed scheme may be detected during the construction and operational phases. Given the localised nature of the proposed works, with limited effects predicted on coastal processes (see **Section 7.1**), a conservative study area of 2km has been used when considering potential impacts to the marine environment.

With regards to the potential for impacts on the terrestrial environment, the study area for the proposed scheme extends approximately 1.5km as determined by the potential impacts to the visual setting (see **Section 8.5**).

1.4 Purpose of this Report

A Marine Licence granted under the requirements of Part 4 of the Marine and Coastal Access Act 2009 (as amended)¹ (MCAA, 2009), will be required for works below the Mean High Water Spring (MHWS) mark. In addition, and as the IoACC has determined the proposed scheme to be an Environmental Impact Assessment (EIA) Development (see **Section 3**), Planning Permission is required under the Town and Country Planning Act 1990.

¹ as amended by The Marine and Coastal Access Act 2009 (Amendment) Regulations 2011

Therefore, this report has been issued to Natural Resources Wales (NRW) and the IoACC to request Scoping Opinions under the Marine Works (EIA) Regulations 2007 (as amended)² and the Town and Country Planning (EIA) Regulations 2017, respectively.

Given that NRW's Screening Opinion concluded that the proposed scheme is not an EIA Development (see **Section 3**), it is requested that NRW considers deferring their EIA Consent Decision to the IoACC under Regulation 10(1)(b) of the Marine Works (EIA) Regulations 2007 (as amended).

This report identifies those areas where there is potential for significant environmental impacts from the construction and operation of the proposed scheme and makes recommendations for further studies considered necessary in support of the EIA process.

The specific objectives of this report are to:

- Define and describe the study area (i.e. physical, biological, human and built environment), the proposed scheme and alternatives considered;
- Identify potential significant environmental impacts;
- Define the approach to the environmental assessment, particularly relating to the assessment of impacts of potential significance;
- Define other projects and plans that may need to be considered as part of an assessment of cumulative impacts; and,
- Identify where data gaps exist and what further data collection is considered necessary to inform the impact assessment (i.e. field surveys or modelling).

1.5 Report Structure

This Environmental Scoping Report is divided into 13 Sections. This section provides an introduction to the proposed scheme and the need for it, as well as a description of the study area. The subsequent sections of this report are structured as follows:

- **Section 2** provides a description of the proposed scheme, including the alternatives that have been considered;
- **Section 3** provides a description of the requirements for EIA
- **Section 4** provides a description of the relevant legislative framework and outlines the potential consenting requirements for the proposed scheme;
- **Section 5** summarises the consultation that has been undertaken to date;
- **Section 6** describes the nature conservation designations in the study area;
- **Section 7** describes where topics are proposed to be scoped out of further assessment, evidence and rationale.
- **Section 8** provides the main detail of the scoping assessment and identifies the nature and level of investigations proposed for each topic during the environmental assessment process. For each parameter the following information is provided:
 - A description of the baseline conditions based on existing data sources;
 - Consideration of the potential impacts of the proposed scheme; and,

² as amended by the Marine Works (EIA) (Amendment) Regulations 2009, the Marine Works (EIA) (Amendment) Regulations 2011 and the Marine Works (EIA) (Amendment) Regulations 2015 and the Marine Works (EIA) (Amendment) Regulations 2017

- Details of any investigations that will need to be undertaken through the assessment process in order to fully determine the significance of any impacts and identify proposed mitigation measures, where appropriate.
- **Section 9** considers the cumulative impact assessment;
- **Section 10** considers the requirements of the Habitats Directive;
- **Section 11** considers the requirements of the Water Framework Directive;
- **Section 12** presents the proposed approach to the EIA; and,
- **Section 13** presents the references used in this report.

2 Description of the Proposed Scheme

The proposed approach to the refurbishment of the seaward and leeward sides of the Breakwater is presented below. It should be noted that the vast majority of the proposed works are located within the footprint of the Breakwater, i.e. on the existing rubble mound; however, depending on the final design of the proposed works, there is a small area at the roundhead or “T head” of the Breakwater that could extend past the rubble mound (see **Figure 2.1**).

2.1 Description of the Construction Phase

2.1.1 Delivery and storage of materials

There are two options for the delivery of construction materials for the proposed refurbishment scheme:

1. Marine delivery of materials and construction plant to Holyhead Port; or,
2. Marine delivery of materials and construction plant to Soldiers Point.

For both options the material would be stockpiled and then transported to the construction site by barge.

2.1.2 Fabrication of concrete armour

There are three options being considered for the fabrication of the concrete armour units. The first two would require a temporary concrete batching plant to be established close to the Breakwater whilst the third option would use an existing facility somewhere else. The options are:

1. Holyhead Port (Salt Island);
2. Soldiers Point; or,
3. A precast concrete yard somewhere else.

The concrete armour units would be transported to the construction site by barge.

2.1.3 Placement of refurbishment material

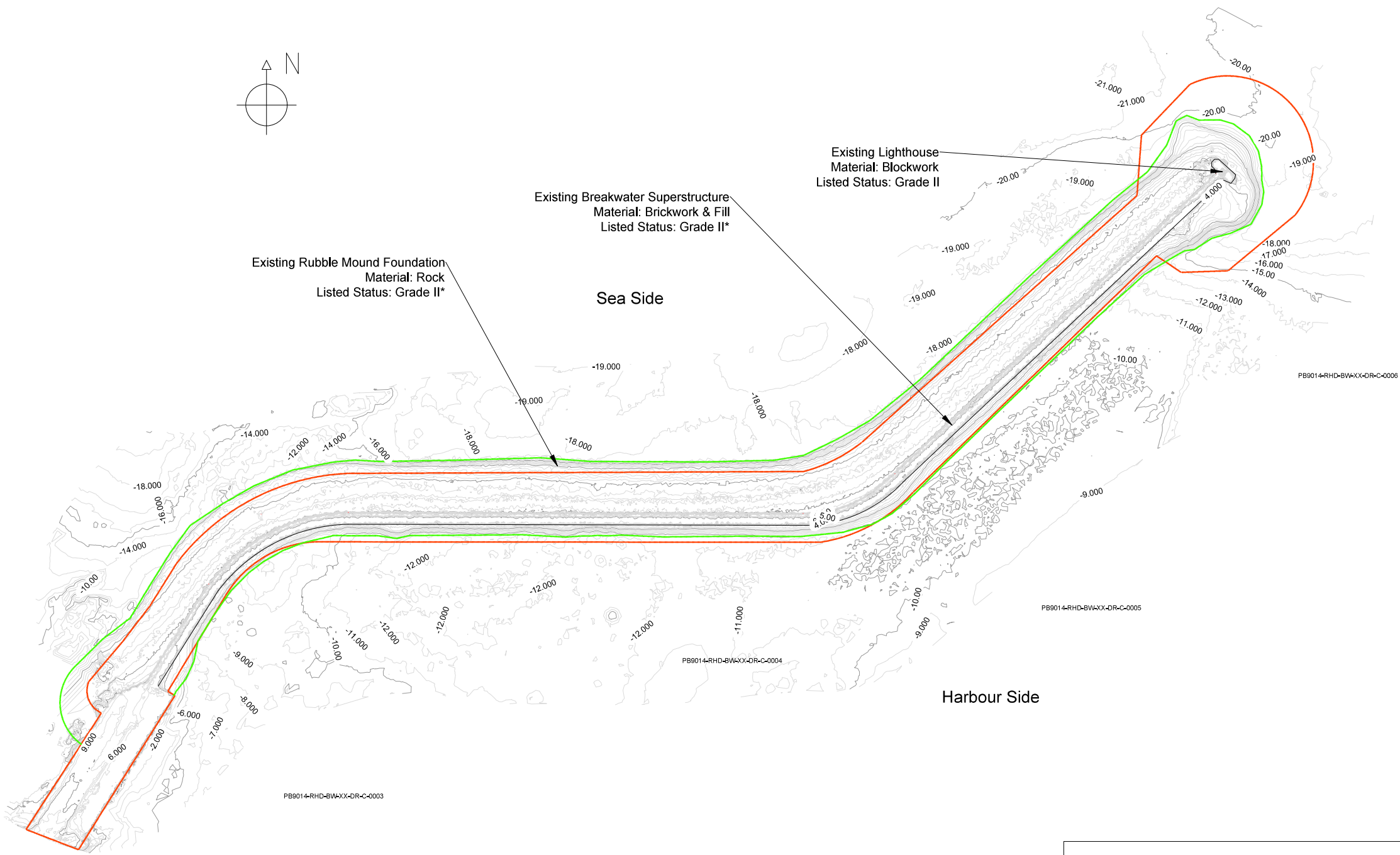
The placement of the concrete armour, rock and ACBMs would be undertaken using marine-based plant. A jack-up or floating barge with spud legs, or an alternative form of anchoring system, would be required as a platform for a long-reach excavator.

Whilst a suitable method of anchoring the barge has yet to be confirmed, it could involve a series of concrete anchor blocks placed seaward of the rubble mound which can be used to hold the barge in place. A vessel would be used to transport the concrete armour, rock and ACBM to the jack-up/floating barge, which would then take the material and place it onto the existing rubble mound.

At the roundhead, there may be a need to place rock outside of the footprint of the existing rubble mound. This would be placed onto the seabed, covering an area similar to that of the original breakwater constructed in the 1800's.

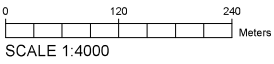
NOTES

1. ALL LEVELS IN METERS RELATIVE TO CHART DATUM.



KEY

- FOOTPRINT OF THE EXISTING RUBBLE MOUND
- EXTENT OF THE PROPOSED REFURBISHMENT
- CONTOURS AT 1m INTERVALS



P02	22.05.19	SUITABLE FOR INFORMATION			
P01.01	05.04.19	SUITABLE FOR INFORMATION			
REV	DATE	DESCRIPTION	BY	CHK	APP

REVISIONS

CLIENT



PROJECT

HOLYHEAD BREAKWATER
REFURBISHMENT

TITLE

Figure 2-1
REFURBISHMENT FOOTPRINT
PLAN VIEW



DRAWN	P.S.	CHECKED	APPROVED
DATE	04.11.2019	SCALE	1:4000
REF.			

DRAWING No.	SUITABILITY	REVISION
PB9014-RHD-BW-XX-DR-C-0001	S2	P03

2.1.4 Regrading works

The level of the existing rubble mound fluctuates along its length due to the effects of environmental conditions (tides, wind, waves etc.). Where fluctuations are such that the concrete armour units are not able to sit in a relatively flat and stable position, it might be necessary to regrade these areas. Regrading works would be carried out using the long-reach excavator from the floating barge or jack-up. It is considered that very little reggrading works would be required.

2.1.5 Construction programme

There are two programme options being considered for the proposed scheme:

1. Undertake and complete the works in one phase; and,
2. Undertake the works in three phases.

It should be noted that the actual construction programme is dependent upon the availability of funding and could differ, both in number of phases and time between phases; however, the proposed three phased construction programme is considered to represent a worst case situation, in terms of the shortest period between each phase.

2.1.5.1 Option 1 – One construction phase

This option involves the refurbishment of the Breakwater in one phase over an estimated two-year period, commencing in March 2021 until January 2023.

2.1.5.2 Option 2 – Three construction phases

This option involves the refurbishment of the Breakwater in three phases. Each phase would take approximately nine months to complete, excluding mobilisation and demobilisation, and each phase would be separated by an approximately two-year interval, as follows:

- Phase 1: March 2022 - October 2022
- Phase 2: March 2025 - October 2025
- Phase 3: March 2027 - October 2027

For this option, the outer third (i.e. lighthouse end) of the Breakwater would be refurbished first, with the corner sections completed in the second phase and the remainder of the Breakwater in the third phase.

2.2 Description of the Operational Phase

2.2.1 Seaward side

The refurbishment of the seaward side of the Breakwater comprises two layers of 18.1m³ Tetrapod concrete armour units (**Plate 2.1**), weighing between 40t and 45t each, and an outer, double layer of interlocking 60t Chevron concrete armour units. The Tetrapods would extend approximately 30m seaward from the superstructure and would have a crest elevation of +6.7mCD. The Chevron units would be placed at the toe of the Tetrapods to prevent these being moved by breaking waves.

At the landward end, close to Soldiers Point, the Tetrapod's would cease and an area of 10-15t rock would be placed to form a transition from the Tetrapods to the vertical wall forming the seaward side of Soldiers Point.

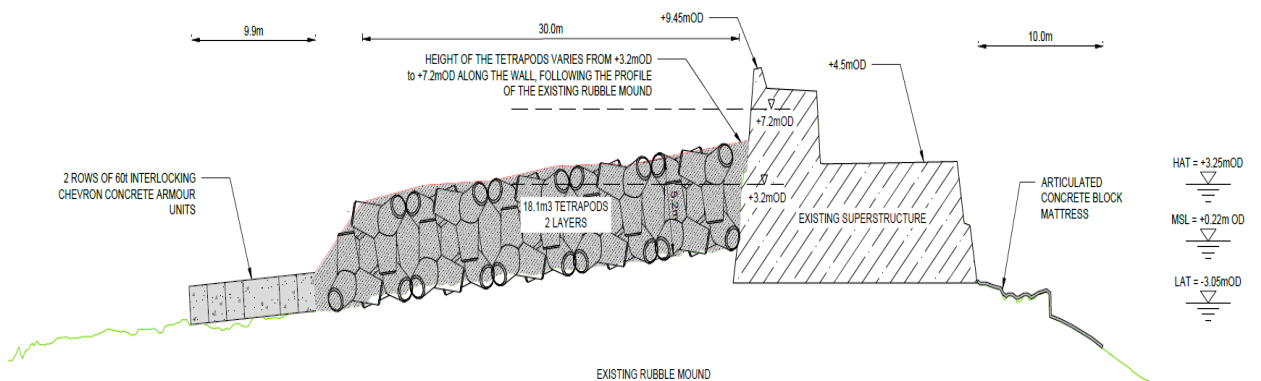


Plate 2.1 Diagram of seaward side refurbishment scheme

The proposed scheme has a design life of 50-years and has been designed to resist a 100-year extreme event, taking into account 1 in 100-year wave height combined with a 1 in 100-year storm surge and 50 years of sea level rise. In order to meet these standards, the design height of the seaward option is required to be 1.1m above MHWS level and would be visible throughout the tidal cycle.

The reconstruction of the seaward side of the Breakwater would stabilise the rubble mound at the toe of the superstructure and restore the level of protection by dissipating wave energy. This would reduce the risk of emergency works whilst also reducing the risk of overtopping, thus minimising the need for future repairs to the superstructure of the Breakwater.

Numerical modelling has shown that refurbishment of the seaward side of the Breakwater would reduce the volume of overtopping by around 30%. In order to confirm these results, and prior to the detailed design phase, 2D and 3D physical modelling will be undertaken on the design of the seaward option.

2.2.2 Roundhead

At the roundhead of the Breakwater, the rubble mound has suffered considerable erosion and narrowing due to the strong tidal and wave forces that exist there; therefore, the current rubble mound profile may have to be widened back to its original width to enable the Tetrapods to be installed. To achieve this, a number of different rock berms or tiers would need to be constructed from the seabed up to a level of around 0mCD (see **Plate 2.2**).

The first tier would be constructed from the existing seabed up to a level of -10mCD and would be formed from core material with a grading of 1-1,000kg. The second tier would extend up to -5mCD and would be formed from slightly larger rock with a grading of 1,000-3,000kg. The final tier would extend up to 0mCD and would be formed from 3000-6000kg rock. The maximum width of the rubble mound widening is anticipated to be 45-50m at the seabed.

These tiers would be formed by either dropping rock from a barge or alternatively a clamp shell bucket could be attached to either a long reach excavator or a crawler crane, and the rock material placed into its final position. It may also be possible to place the smaller material (1-1,000kg rock) using a fall pipe³.

³ A fall pipe is a large diameter pipe that is lowered to the seabed through which rock material is placed down to the seabed, thus minimising the potential environmental impacts of just tipping or pushing the material directly off a barge.

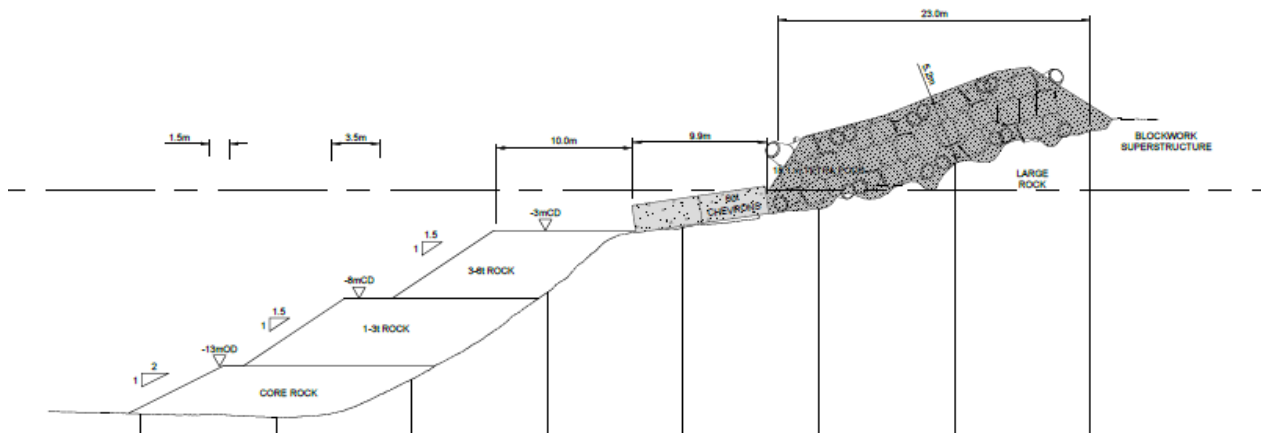


Plate 2.2 Diagram showing the three rock tiers around the roundhead

Once the three tiers have been constructed, the proposed Tetrapod and chevron armour units can be installed.

2.2.3 Leeward side

On the leeward side of the superstructure, ACBMs would be placed over a distance of approximately 10-15m to prevent further erosion of the rubble mound (**Plate 2.3**).

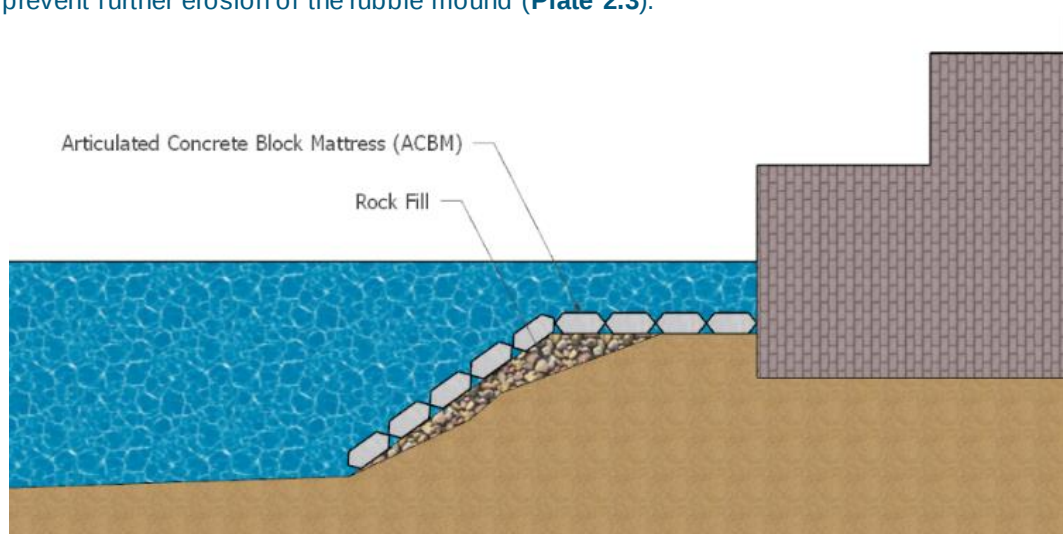


Plate 2.3 Diagram of leeward side refurbishment scheme

Additional rock may be required to raise any low sections of the existing rubble mound before the ACBMs are installed. Any high sections of the mound would be regraded, as required. The leeward scheme would provide a good level of protection to the existing lee wall against waves generated within the harbour and waves diffracted around the head of the Breakwater, whilst also replenishing existing low levels along the toe to offer greater protection against undermining through physical processes.

In addition to the ACBMs, there is a 1km section where the existing mound is too low and/or too steep to accommodate the ACBMs. In these areas, a low-level rock revetment would be installed to stabilise the existing mound in its current position.

The finished height of the ACBMs and rock revetment would be lower than Mean Low Water Springs (MLWS) and as such would not be visible at any point during the tidal cycle.

2.2.4 Maintenance requirements

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 30% 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.

2.2.5 Measures to manage environmental risks

As with any construction project such as the proposed scheme, there is the potential for spillages or leakages of oils, fuels or construction materials which would directly or indirectly impact upon the environment. The potential also exists for the spillage or leakage of fuels or oils used during the operational phase. The risk of this occurring will however be managed through the implementation of best practice measures during construction through the production of a Construction Environmental Management Plan (CEMP).

Stena Line have plans and procedures in place to manage environmental risk during the regular operation of the port. This includes an Oil Spill Contingency Plan (Stena Line Ports Limited, 2017) which was produced in consultation with the IoACC, NRW, Welsh Government Fisheries (WGF) and the Marine Management Organisation (MMO) for use in the event of a spill. Stena Line have also produced a Biosecurity Plan in consultation with NRW in order to prevent or reduce the spread of invasive non-native species (INNS) within Holyhead Port limits, which would be adhered to throughout the construction of the refurbishment and any subsequent maintenance activities.

2.3 Alternatives

A number of alternative options were considered by the OBC (Royal HaskoningDHV, 2017). A summary of these options is presented below.

2.3.1 Do nothing

This option assumes that all attempts to maintain or repair the Breakwater are abandoned and nothing is done to protect the structure. If this approach were to be adopted, a breach of the Breakwater could be expected in the near future, although the exact timing of the breach is difficult to predict. Single or multiple breaches would lead to progressive collapse along the length of the Breakwater.

The breach scenario assumed for the OBC predicted the first breach to occur in Year 15 (2033) at the southern elbow with the breach width increasing by 15m per annum, and the second “breach” resulting from the loss of the furthest end of the wall in Year 20 (2038) and the damage extending south at a rate of 15m per annum. On this basis the landward breach would reach the root of the Breakwater in Year 60 (2078) and the two breaches would join up in Year 97 (2115), resulting in the total failure of the Breakwater.

2.3.2 Do minimum

Under the ‘do minimum’ scenario the current maintenance of the existing superstructure and rubble mound would continue. This would include spring/early summer inspections to identify areas of greatest need followed by repairs to the masonry superstructure. Maintenance tasks may include the replacement of dislodged masonry to reinstate the front wall and the infill of large cracks or voids.

This option provided the cheapest option for maintaining a serviceable Breakwater in the short term. It was anticipated that repairs to damaged sections of the masonry wall would increase in frequency as damage to the rubble mound continues over time, until a breach occurs, at which point the effects would be the same as the Do Nothing option above.

2.3.3 Do something

2.3.3.1 Seaward side

Alternatives to the preferred option to refurbish the seaward side of the Breakwater are described below.

Strengthen the existing superstructure

This option would involve the installation of a new concrete blockwork facing wall to the masonry sea wall. A small rock mound would be installed at the toe of the blockwork to provide scour protection. The construction of the blockwork wall would be difficult in the marine environment and due to the greater heritage impact on the Breakwater this option was considered unlikely to be acceptable from a planning or environmental perspective. Consequently, this option was rejected at the OBC stage.

Detached breakwaters

This option considered the addition of a series of detached island breakwaters, or reefs, approximately 20m in front of the existing Breakwater. These would form protective salient shaped outcrops that would reduce the wave climate approaching the Breakwater and significantly reduce wave overtopping. No direct modifications would be required to the Grade II* listed structure; however, the breakwaters may be considered unsightly and present a risk to navigation. This option was considered to be technically feasible; however, was rejected due to technical uncertainties and potential impacts on the marine environment.

Restore rubble mound

This option would involve reinstating the rubble mound with a crest level similar to that of the original construction in 1875, protecting the wall against wave forces and providing protection to minimise the risk of undermining. Replenishment work to the new mound would need to be carried out as and when required. The revetment would dissipate energy and reduce overtopping minimising need for regular repair to the top of the superstructure. This option was considered to be technically feasible; however, was ruled out due to environmental impacts arising from the regular need to replace the rock and high ongoing costs required to maintain the rubble mound following restoration.

Periodic replenishment of the rubble mound

The rubble mound would be periodically replenished to replace stone lost from the seaward slope, with the wall repaired as necessary. Emergency repairs following storm events would also be required. An initial top up of the mound would be required to bring the structure up to a standard that is not susceptible to major damage. This option was considered to be technically feasible; however, due to low technical performance, ongoing environmental impacts and high costs this option was rejected.

2.3.3.2 Leeward side

Alternative options to the preferred option to refurbish the leeward side of the Breakwater are described below.

Construct rock groynes

Approximately ten rock groynes would be installed along the leeward side of the Breakwater to control the natural movement of material and provide energy dissipation properties. Replenishment work may be required periodically. This would provide a good level of protection against wave forces. Over time sediment will naturally accumulate between the groynes, which would restrict the movement of the existing rubble

mound along the Breakwater under wave induced longshore currents. This option was considered to be technically feasible; however, it was ruled out due to potential impacts on the environment and uncertainties associated with how it would interact with the existing Breakwater and coastal processes, and the potential impacts on navigational safety.

Periodic replenishment of the rubble mound

The rubble mound would be periodically replenished to replace stone lost from the landward slope, with the superstructure repaired as necessary. An initial top up would be required to bring the structure up to a standard that is not susceptible to major damage. This option was considered to be technically feasible; however, it was ruled out due to potential impacts on the environment and high ongoing costs.

2.4 Decommissioning

There are no plans to decommission the Breakwater, given its listed status and role in the protection of Holyhead and the port. Further consideration of the decommissioning phase is therefore not required.

3 Requirement for EIA

3.1 EIA Screening Exercise

An EIA Screening Report along with requests for Screening Opinions were submitted to NRW and the IoACC on the 13th August 2019 (Royal HaskoningDHV, 2019), with Screening Opinions received on 1st October and 18th October 2019 respectively.

NRW confirmed that the proposed scheme does not require a statutory EIA (ref: SC1903, **Appendix A1**), with the following advice provided by the NRW Advisory Team:

- Noise Disturbance / Marine Mammals - No likely significant effects on any marine mammal features as a result of underwater noise is anticipated.
- Coastal Processes - Agree that numerical modelling is not required. It is recommended that an overview of the potential local and regional scale changes to coastal processes be presented in the final application.
- Archaeology - The scope of work relating to archaeology and cultural heritage reflects previous pre-application discussions with the Welsh Archaeological Trust and is still considered to be appropriate.
- Habitats Regulations Assessment (HRA) - At this stage it is not possible to state whether an appropriate assessment will be required. Given mitigation cannot be used when determining Likely Significant Effect, it is likely that an HRA would have to go to appropriate assessment. This does not mean that any potential impact pathways from the proposed scheme cannot be mitigated.
- Navigational Safety – The Marine and Coastguard Agency would expect the safety of navigation to be considered, with any predicted impact on shipping and navigation to be suitably mitigated.

The IoACC confirmed that the proposed scheme does require an EIA (ref: SCR/2019/50) (**Appendix A2**). Given the Screening Opinion did not contain any detail as to why the proposed scheme was considered an EIA Development, discussions with the IoACC identified that this was due to uncertainty with regards to the potential environmental impacts that could arise from the proposed concrete batching plant, specifically if it was to be located at Soldiers Point.

A case was made that further information could be provided that was considered to address these uncertainties and it was agreed this could be provided for the IoACC to reconsider their Screening Opinion. This was submitted to the IoACC on the 27th November 2019 (**Appendix A3**) in order to provide more evidence to reassure the council that the proposed scheme would not have significant environmental effects and therefore would not require an EIA. The IoACC provided a second Screening Opinion on the 17th February 2020 (**Appendix A4**) that also considered the proposed scheme to be EIA Development and again no detail was provided as to the reasons for this decision.

3.2 Changes to the Proposed Scheme Following Screening

Since the initial screening request was made to the IoACC and NRW, there have been a number of minor changes to the proposed scheme as the design has evolved and the outcome of the Early Contractor Involvement (ECI) workshop (held on the 19/20 February 2020), including:

- Placement of concrete anchor blocks onto the seabed;
- Removal of the 'modern' turning point on the leeward side of the breakwater;
- Inclusion of rock material into the scheme design; and,

- Potential for tipping of rock onto the rubble mound at the landward end of the Breakwater, between Solders Point and the start of the Tetrapods and at the roundhead.

It should be noted that none of the above changes are considered to have a material effect on the information provided with the original Screening requests.

4 Legislative and Consenting Requirements

The principal consents and licences likely required are summarised in the following sections, along with a description of the relevant environmental legislation with which the proposed scheme will need to comply.

4.1 Enabling Legislation

4.1.1 Town and Country Planning Act 1990

The Town and Country Planning Act 1990 regulates the development of land in England and Wales and provides Local Planning Authorities (LPAs) the power to approve planning proposals, preserve buildings of architectural or historical interest (Listed Buildings) and redevelop land, amongst others. The Town and Country Planning Act 1990 extends to the Mean Low Water Mark (MLWM).

As the proposed scheme is considered an EIA Development, Stena Line Ports' Permitted Development (PD) Rights do not apply. As such, Planning Permission is required to permit the proposed scheme from the IoACC.

4.1.2 Marine and Coastal Access Act 2009 (as amended)

Part 4 of the MCAA 2009 (as amended)⁴ provides the framework for the current marine licensing system for works below the level of the MHWS mark. As there are works below the MHWS mark, a Marine Licence is required to permit the proposed scheme from NRW.

4.2 Other Relevant Legislation

4.2.1 Planning (Listed Buildings and Conservation Areas) (Wales) Act 2012 (as amended)

Listed Building Consent (LBC) under the Planning (Listed Buildings and Conservation Areas) (Wales) Act 2012, as amended⁵, is required for all works of demolition, alteration or extension to a listed building that affects its character as a building of special architectural or historic interest. The requirement applies to all works and to all parts of those buildings covered by the listing protected (possibly including attached and curtilage buildings or other structures), provided the works affect the character of the building.

The 2017 Regulations⁵ require that an application for LBC must be accompanied by a heritage impact statement. The Holyhead Breakwater is Grade II* listed, whilst the Lighthouse at the end of the Breakwater is Grade II listed. Given this, the proposed works will require LBC and a heritage impact statement will be produced to inform the EIA and support the LBC application.

4.2.2 The Conservation of Species and Habitats Regulations 2017 (as amended)

The Conservation of Species and Habitats Regulations 2017, as amended⁶ (the Habitats Regulations) implements European Commission (EC) Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna (the Habitats Directive) in the UK.

The HRA process is required where new plans or projects have the potential to affect the designated interest features of 'European Sites'. European sites are defined in Regulation 8 of the Habitats Regulations and

⁴ The Marine and Coastal Access Act 2009 (Amendment) Regulations 2011

⁵ Planning (Listed Buildings and Conservation Areas) (Wales) (Amendment No. 2) Regulations 2017

⁶ Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019

include Special Protection Areas (SPA), as designated under the Wild Birds Directive, or a Special Area of Conservation (SAC), as designated under the Habitats Directive. A HRA is also required as a matter of government policy for proposed SPAs (pSPAs), candidate SACs (cSACs) and listed Ramsar sites⁷ for the purpose of considering development proposals affecting them (Welsh Government, 2009).

Should the works, either alone or in combination with other plans or projects, be deemed to have a Likely Significant Effect (LSE) on any European site (or it cannot be determined that there would not be a significant effect), then, in accordance with Section 63 of the Habitats Regulations, an 'Appropriate Assessment' (AA) is required for any plan or project, not connected with the management of the European site.

The proposed scheme is located within the following European designated sites (see **Figure 6-1**):

- North Anglesey Marine/Gogledd Mon Forol SAC; and,
- Anglesey Terns/Morwenoliaid Ynys Mon SPA.

The proposed scheme is located adjacent to the following European designated sites (see **Figure 6-1**):

- Holy Island Coast/Glannau Ynys Gybi SPA and SAC.

4.2.3 Wildlife and Countryside Act 1981 (as amended)

Under the terms of Section 28H of the Wildlife and Countryside Act 1981, as amended by Schedule 9 to the Countryside and Rights of Way Act (CROW) 2000, any operations within, or adjacent to, a Site of Special Scientific Interest (SSSI) require assent from NRW. Assent under Section 28 of the Wildlife and Countryside Act 1981 (as amended by the CROW 2000) is normally included in NRW's overall advice regarding the requirement (or otherwise) for HRA under the Habitats Regulations, where SSSIs are covered by European sites.

The proposed scheme is located adjacent to the following SSSI (see **Figure 6-1**):

- Holy Island Coast/Glannau Ynys Gybi SSSI.

4.2.4 Water Framework Directive

The Water Framework Directive (WFD) (2000/60/EC) is transposed into national law by means of the Water Environment (WFD)(England and Wales) Regulations 2017. These regulations provide for the implementation process of the WFD from designation of all surface waters (rivers, lakes, transitional (estuarine) and coastal waters and groundwater) as waterbodies through to achieving good ecological status or good ecological potential by 2021. NRW is the responsible authority for WFD compliance in Wales. The WFD applies to all waterbodies, including those that are man-made. The consideration of the proposed scheme under the WFD will therefore need to be applied to all WFD waterbodies that could be impacted by the proposals.

The WFD specifies the factors, referred to as quality elements, which must be used in determining the ecological status or ecological potential and the surface water chemical status of a surface waterbody. **Section 11** assesses the requirements for compliance under the WFD. The proposed scheme is located within the following waterbodies (see **Figure 11-1**):

- Holyhead Bay Coastal Water Body (GB681010360000); and,
- Caernarfon Bay North Coastal Water Body (GB621010380000).

⁷ Internationally important wetlands designated under the Ramsar Convention 1971.

4.2.5 Protected Areas (Shellfish waters)

The Shellfish Waters Directive (2006/113/EC) has been subsumed by the WFD. All previously designated shellfish waters have been placed on the Protected Areas register under the WFD. Following the repeal of the Directive at the end of 2013, there is an ongoing requirement to manage designated shellfish waters to ensure there is no deterioration in water quality and the levels of protection are not relaxed. Therefore, existing shellfish waters must at least maintain their current Food Standards Agency (FSA) classification and the environmental objective under the WFD for the wider water body in which they are located. There are no shellfish waters within 2km of the proposed scheme.

4.2.6 Bathing Water Directive

The Bathing Water Directive preserves, protects and improves the quality of the environment and protects human health. The Directive seeks to improve management practices at all bathing waters and to standardise the information available to bather across Europe. The Bathing Water Directive (2006/7/EC) is implemented in England and Wales through the Bathing Water Regulations 2013, for which NRW is the competent authority in Wales. There are no Bathing Waters within 2km of the proposed scheme.

4.2.7 Waste Framework Directive

The Waste Framework Directive (2008/98/EC) consolidates earlier legislation regulating waste. The Directive sets out the general rules applying to all categories of waste. A key objective of which is to provide measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use.

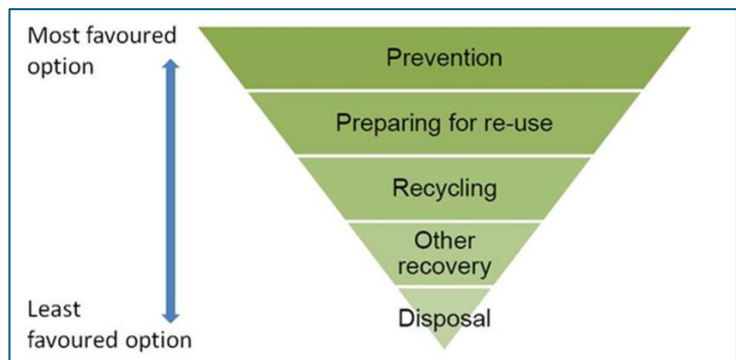


Plate 4.1 Waste hierarchy

Article 3(1) of the Directive defines waste as:

“...any substance or object...which the holder discards or intends or is required to discard”.

More generally, the Directive provides a general duty to ensure that waste is dealt with in an environmentally friendly way. The key to this is the ‘waste hierarchy’, which emphasises prevention (in the first instance) and then re-use, recycling and recovery of waste (see **Plate 4.1**). EU Member States must have regard to the waste hierarchy when dealing with waste. Disposal to landfill or at sea is the least favourable option.

Holyhead Breakwater is owned by Stena Line. Within the current extent of the Port of Holyhead, Stena Line has achieved a zero-landfill target. All waste generated by the Port and visiting ships is 100% recycled with nothing sent to landfill. The Port currently handles approximately 55 tonnes of waste per month.

The only waste generated during the proposed construction works is considered to arise from the fabrication of the concrete armour and general site activities. There would be no need to remove any material from the marine environment. No unusual wastes would arise in terms of types of waste or quantity.

4.2.8 Well-being of Future Generations (Wales) Act 2015

The Well-being of Future Generations (Wales) Act 2015 places a duty on public bodies (including local authorities) to carry out sustainable development. The Act establishes seven well-being goals to ensure that public bodies work towards one vision of a sustainable Wales:

- A globally responsible Wales;
- A prosperous Wales;
- A resilient Wales;
- A healthier Wales;
- A more equal Wales;
- A Wales of cohesive communities; and,
- A Wales of vibrant culture and thriving Welsh language.

In carrying out the Act's duty to carry out sustainable development, the Act requires for all public bodies to:

- Set and publish well-being objectives designed to maximise a public body's contribution to achieve each of the well-being goals; and,
- Take reasonable steps, whilst undertaking its functions, to meet the well-being objectives.

It is considered that the proposed scheme would strongly support all of the Well-being goals, particularly 'A Wales of vibrant culture' by ensuring the longevity of the Grade II* listed Breakwater and Grade II listed lighthouse.

4.2.9 Planning Policy Wales

Planning Policy Wales (PPW) (Welsh Government, 2018) ensures that planning decisions in Wales take into account the goals set in the Well-being of Future Generations (Wales) Act 2015. Section 6.1 of PPW provides the national planning policy framework for the consideration of the historic environment, ensuring that it is conserved and enhanced. Section 6.5 ensures that coastal areas are protected, requiring the consideration of how onshore and offshore developments can affect the coastal environment. Section 6.6 recognises the environmental qualities of places, particularly relation to flood risk. Paragraph 6.6.28 requires that SMPs and potential environmental effects both onshore and offshore are taken into account. Flood defence works can provide opportunities to achieve wider social, economic and environmental and PPW requires that these should be maximised where possible.

The proposed scheme adheres to the SMP2 policy of Hold the Line for Holyhead. It will also restore and protect listed buildings and ensure the continued protection of Holyhead and the port.

4.2.10 The Environment (Wales) Act 2016

The Environment (Wales) Act puts in place the legislation needed to plan and manage Wales' natural resources in a more proactive, sustainable and joined-up way. This positions Wales as a low carbon, green economy, ready to adapt to the impacts of climate change. The act provides significant economic, social and environmental benefits for Wales. It has been carefully designed to support and complement work to help secure Wales' long-term well-being, so that current and future generations benefit from a prosperous economy, a healthy and resilient environment and vibrant, cohesive communities.

4.2.11 Marine Conservation Zones

The MCAA (2009) created a new type of Marine Protected Area (MPA), known as Marine Conservation Zones (MCZs) which will protect nationally important marine wildlife, habitats, geology and geomorphology. Section 126 of the MCAA places specific duties on NRW relating to MCZs and marine licence decision-making. There are no MCZs within 2km of the proposed scheme.

4.2.12 Maritime Spatial Planning Directive

In July 2014, the European Parliament and the Council adopted Directive 2014/89/EU to create a common framework for maritime spatial planning in the European Union (EU). In broad terms, the Directive places a legal requirement on Member States to develop and implement Maritime Spatial Plans (MSP) by 2021 at the latest. Ultimately, the Directive aims to establish *'a framework for maritime spatial planning aimed at promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources.'*

4.2.13 UK Marine Policy Statement

The MCAA and Marine Works Regulations are supported by policy presented in the UK Marine Policy Statement (MPS) (HM Government, 2011), which provides the framework for preparing marine plans and taking decisions affecting the marine environment. The MPS is intended to contribute to the achievement of sustainable development in UK marine area. The MPS enables an appropriate and consistent approach to marine planning across UK waters, and ensures the sustainable use of marine resources and strategic management of marine activities from renewable energy to nature conservation, fishing, recreation and tourism.

Ports and shipping play an important role in the activities taking place within the marine environment and both are an essential part of the UK economy. The MPS recognises the importance of having infrastructure in place to support and promote safe, profitable and efficient marine businesses.

4.2.14 Welsh National Marine Plan

The Welsh National Marine Plan (WNMP) published in November (Welsh Government, 2019) is for inshore and offshore Welsh waters, prepared and adopted for the purposes of Section 51 of the MCAA 2009 in accordance with Schedule 6 of the MCAA and in conformity with the UK MPS. This is the first marine plan for Wales and its purpose is to guide sustainable development of the marine area.

The WNMP recognises the importance of supporting proposals that contribute to the well-being of coastal communities and demonstrate their resilience to coastal changes, climate change and flooding. The enhancement of historic assets is also encouraged.

4.2.15 Shoreline Management Plan 2

SMPs aim to identify the best ways to manage flood and erosion risk to people and the developed, historic and natural environment, and to identify opportunities where shoreline managers can work with others to make improvements. They do not set policy for anything other than coastal defence management. The proposed scheme lies within the West Wales SMP2 (Royal Haskoning, 2012). The long-term management policies for the sections of coastline of relevance are presented in **Table 4.1**.

Table 4.1 SMPs for Holyhead and Penrhos and Newlands and Afon Alaw

Policy Number	Policy Unit	Policy Plan		
		2025	2055	2105
17.15	Holyhead	HTL	HTL	HTL
17.16	Penrhos Bay	MR	MR	MR
17.17	Penrhos Headland	NAI	NAI	NAI
17.18	Stanley Embankment	HTL	HTL	HTL
17.21	Newlands	MR	MR	MR
17.22	Afon Alaw	MR	MR	MR
17.23	Traeth Gribin to Twyn Cliperau	MR	MR	MR

The proposed scheme would restore a coastal defence structure to its original state, ensuring the ongoing and future protection of Holyhead and the port, supporting the SMP2's of Hold The Line policy for Holyhead.

4.2.16 Countryside and Rights of Way Act 2000

The CRoW Act adds further and more recent legislation to the National Parks and Access to the Countryside Act 1949. It provides for better management of Areas of Outstanding Natural Beauty (AONB). AONB's are protected by law because of their special landscape qualities, wildlife, geology and geography. In terms of landscape and scenery, they are equal to National Parks. The proposed scheme is approximately 1km from the Anglesey AONB (see **Figure 6.1**).

4.3 Other Relevant Plans and Policies

4.3.1 Anglesey and Gwynedd Joint Local Development Plan

The Anglesey and Gwynedd Joint Local Development Plan (JLDP) (Isle of Anglesey County Council and Gwynedd Council, 2017) covers the local authorities of the Isle of Anglesey County Council and Gwynedd Council. Following its adoption in July 2017, the JLDP replaced the Gwynedd Structure Plan and the Ynys Môn Local Plan and now forms the basis for land use planning in these areas. The plan covers the period 2011 to 2026.

Policy CYF8: Holyhead Regeneration Area sets out the aims for transformational change by encouraging Holyhead to become a more attractive location to live, work, visit and enjoy (Strategic Objective SO13). The Plan also sets out how Holyhead as an international gateway should be promoted and maximised (Strategic Objective SO4). It is considered that the restoration of the Breakwater will significantly contribute to both of these objectives by protecting Holyhead, Holyhead Port and its hinterland.

4.3.2 Wales Spatial Plan – People, Places and Future

Holyhead is the centre of a Secondary Hub within the Wales Spatial Plan (Welsh Assembly Government, 2008) and the focus of much of the planned future investment in the area. Therefore, maintaining the flood defence provided by the Breakwater is seen as vital to sustaining this regional intent. Holyhead is a recognised key growth settlement with the focus on providing services and employment and building on established strengths to support and spread prosperity to the wider rural hinterland. The focus of investment centres around the port where there are opportunities for exploiting the benefits accruing from links with Ireland and the potential to capture the cruise ship sector. The National Development Framework is currently being developed and will replace the current Wales Spatial Plan in September 2020.

4.3.3 North Wales Growth Plan

The North Wales Growth Plan was developed in partnership between the six North Wales councils, business partners, colleges and universities and was submitted to the UK and Welsh Governments in 2017. The proposals will enable investment of £1.3 billion in the North Wales economy, providing jobs, new businesses and housing (North Wales Growth Board, 2017). The founding principles of the Plan are:

- Smart: supporting innovation in high value sectors to advance economic performance;
- Resilient: retaining young people, raising employment levels and improving skills to achieve inclusive growth; and,
- Connected: improving transport and digital infrastructure to improve connectivity to and within the region.

The proposed scheme is essential to ensure that the founding principles of the North Wales Growth Plan are achieved by ensuring that the town of Holyhead and the Port are protected from climate change and future predictions of sea level rise and wave heights and therefore can continue to support the local, and wider north Wales, communities.

4.3.4 Wales Biodiversity Partnership

The Wales Biodiversity Partnership (WBP) brings together key players from the public, private and voluntary sectors to promote and monitor biodiversity and ecosystem action in Wales. WBP provides a leadership role and an expert steer on priorities for action on biodiversity and ecosystems in Wales. The Wales Biodiversity Partnership contributes to the delivery of Global, European and national targets for biodiversity and ecosystems. The role of the Wales Biodiversity Partnership focuses on:

- Prioritising and promoting activity to ensure biodiversity conservation (protection, enhancement and restoration) and associated benefits for ecosystem structure and function are planned and delivered at the appropriate scale.
- Developing and communicating the understanding of the dynamic relationship within species, between species and their abiotic environment in order to conserve ecosystem structure and function.
- Providing expertise on the conservation and sustainable use of natural resources.
- Working with local and regional partners to ensure management of the environment, and of human activity which impacts on the environment, at the appropriate level incorporating local knowledge, innovations and practices.

Identify evidence requirements and build consensus on priorities to inform the development and delivery of biodiversity conservation and the Ecosystem Approach.

5 Consultation

5.1 Public Consultation

A public consultation event for the proposed scheme was held on the 29th of March 2019 in Holyhead Town Hall. The event introduced the scheme to the local residents and business owners and sought their opinions on the plans. A log of the consultation responses received is presented in **Appendix B1**.

The majority of residents were interested in the heritage value of the Breakwater and used the Breakwater for recreation such as fishing or walking. These residents were most concerned about maintaining public access to the structure for recreational use. Residents with an interest in yachting were concerned about the ongoing protection for the marina and harbour provided by the Breakwater. A summary of the responses is provided in **Plate 5.1** and **Plate 5.2**.

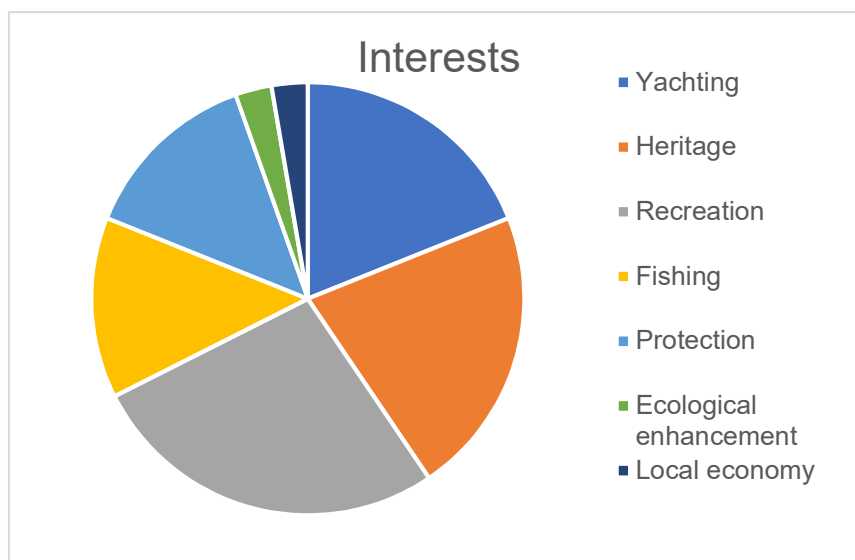


Plate 5.1 Summary of interests in the Breakwater

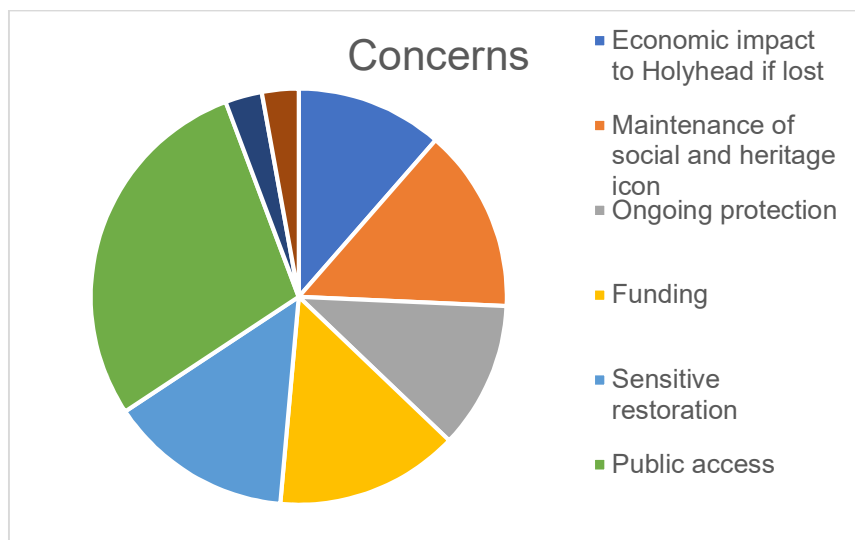


Plate 5.2 Summary of concerns relating to the refurbishment

5.2 Stakeholder Consultation

5.2.1 Stakeholder workshop

A stakeholder pre-application meeting was held on the 24th of April 2019. Attendees included:

- The IoACC Conservation Team;
- Welsh Government;
- Stena Line;
- NRW North Planning Team; and,
- Gwynedd Archaeological Planning Service (GAPS).

The objectives of the workshop were to:

- Present the proposed scheme;
- Confirm the consenting route;
- Identify key potential constraints and opportunities as a result of the proposed scheme; and,
- Identify likely studies and investigations required to support consent applications.

Consultation responses were received from GAPS and NRW which are presented in **Appendix B2** and **B3** respectively.

5.2.2 Visual impact and heritage assessments

On the 20th September 2019 consultation with GAPS, Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW), the IoACC and NRW was undertaken to agree the scope of the visual and heritage setting assessments (see **Appendix B4**) for the proposed scheme. It was agreed that the following viewpoints should be considered:

- View 1 – looking south west along the seaward side of the breakwater from the lighthouse. This would consider views from the Grade II listed lighthouse;
- View 2 – the nearest view from the coastal path and within the Anglesey AONB looking north east along the seaward side of the breakwater;
- View 3 – an elevated view of the breakwater looking north east from Holyhead Mountain and the AONB; and,
- View 4 – From a midpoint along the Breakwater towards the lighthouse.

Further consultation for the proposed scheme was undertaken on the 25th March 2020 with the IoACC, Cadw, GAPS and RCAHMW to present the draft findings of the heritage impact assessment and in particular the draft photomontages of how the scheme would look from the above viewpoints (see **Section 8.5**).

A note was issued prior to the meeting (see **Appendix B5**) and a series of the photomontages were presented during the meeting. A summary of responses received from the consultees is presented below:

- A general acceptance of the proposed scheme and its requirements;

- Questions were raised regarding the colour and texture of the Tetrapods to see if they could blend in better to the existing environment;
- The potential for further visual montages for a second round of public consultation showing possible aging and algal growth and higher tide levels;
- On the basis of the information presented during consultation Cadw agreed that the impacts on the designated historical assets will be limited to the breakwater and lighthouse; and,
- RCAHMW offered access to records of wrecks and other sites in the wider study area to inform the placement of any anchor blocks on the seabed.

5.2.3 Marine and coastal ecology survey specification

Consultation was undertaken with the Marine Area Advice and Management department of NRW to confirm the scope of the required marine ecology surveys, required to characterise the intertidal and subtidal marine ecology. It was agreed with NRW that the following would be implemented:

- Eight transects will be conducted on both the seaward and leeward sides of the breakwater;
- Seaward transects will be at least 200m in length and Leeward transects at least 60m;
- Surveys will be undertaken with a Remotely Operated Vehicle (ROV) using a high resolution camera to record 4k quality video to allow detailed analysis; and,
- The invasive species *Didemnum vexillum* will be targeted when undertaking and reviewing the video footage of the transects. Should potential *D. vexillum* be identified, the location will be noted, and samples collected where possible for identification purposes.

5.3 Further Consultation

Consultation will continue to be undertaken with the public and stakeholders as required, including the IoACC, NRW, the Welsh Government, Stena Line, Cadw, GAPS, the Royal Society for the Protection of Birds (RSPB) Cymru and the RCAHMW.

6 Nature Conservation Designations

This section considers sites designated for nature conservation. The study area considered for this section includes Holyhead Breakwater and a 1km buffer for terrestrial sites and a 2km buffer for coastal/marine sites. The location of all the designated sites described below can be found on **Figure 6-1**.

6.1 European Designated Sites

Effects upon the sites set out in this section would be assessed as part of the HRA which has been set out in **Section 10**.

6.1.1 Morwenoliaid Ynys Mon/Anglesey Terns SPA

The proposed scheme is located within the boundary of the Anglesey Terns/Morwenoliaid Ynys Môn SPA (**Figure 6-1**). The site is designated for its population importance for four species of tern (common tern *Sterna hirundo*, arctic tern *Sterna paradisaea*, roseate tern *Sterna dougalli* and Sandwich tern *Sterna sandvicensis*) (**Table 6.1**).

The Anglesey Terns SPA incorporates and extends three existing SPAs for terns: Ynys Feurig, Cemlyn Bay and The Skerries SPAs. The purpose of combining and extending the sites is to include the surrounding marine areas used by foraging terns during the breeding season as well as the breeding areas themselves. The Ynys Feurig site is made up of a series of small islets that join the west coast of Anglesey at mid to low tide, while the site of Cemlyn Bay consists of a saline lagoon separated from the sea by a shingle ridge. The Skerries are formed by a group of sparsely vegetated rock formations off the North-West coast of Anglesey (NRW, 2015).

Table 6.1 Summary of qualifying ornithological interest in Anglesey Terns SPA

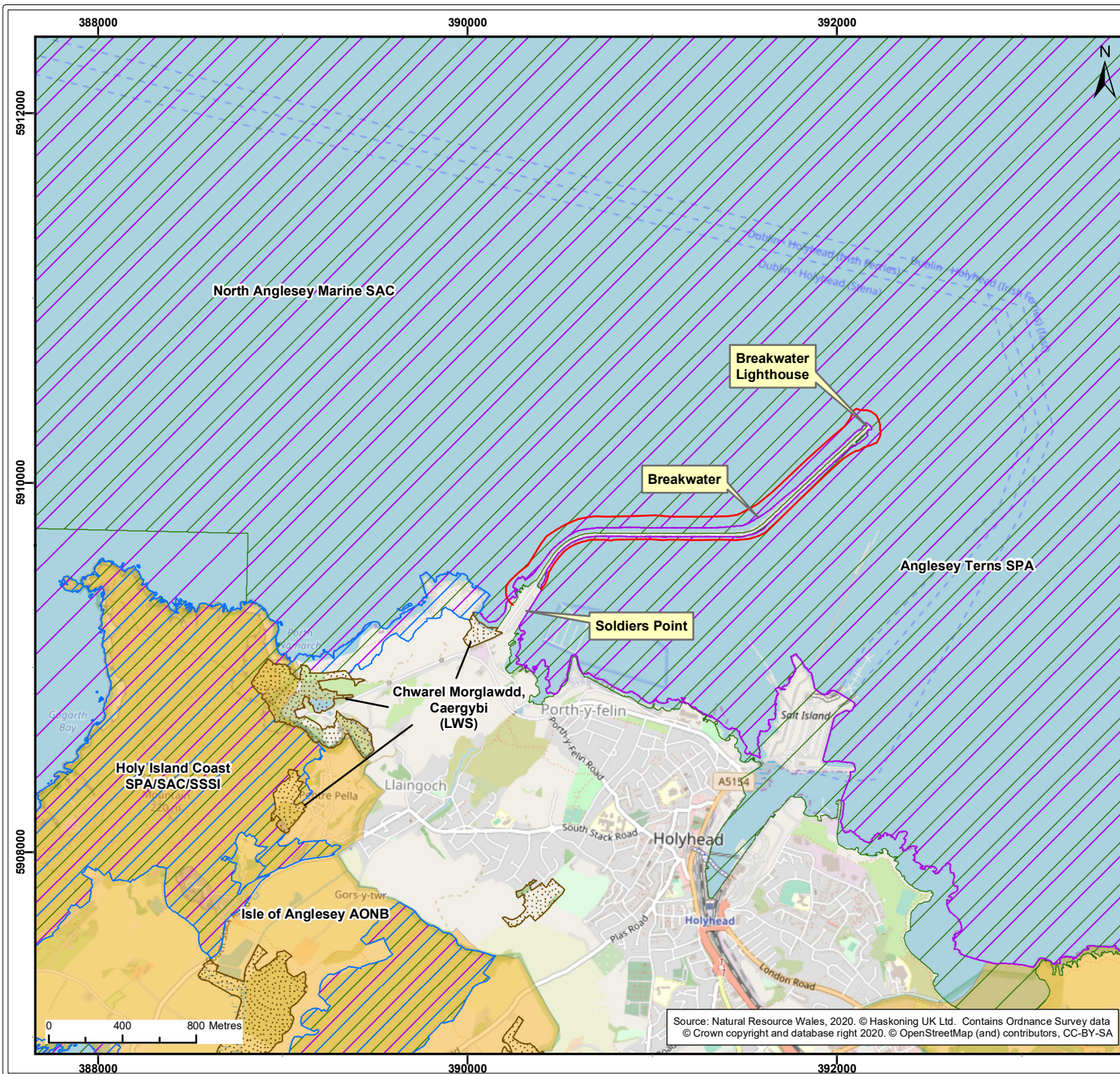
Species	Count	% of relevant population	Interest type
Common tern <i>Sterna hirundo</i> (breeding)	189 pairs	1.5% of GB population	Annex I species
Arctic tern <i>Sterna paradisaea</i> (breeding)	1,290 pairs	2.9% of GB population	Annex I species
Roseate tern <i>Sterna dougalli</i> (breeding)	3 pairs	5% of GB population	Annex I species
Sandwich tern <i>Sterna sandvicensis</i> (breeding)	460 pairs	3.3% of GB population	Annex I species

The site qualifies as an area used regularly by at least 1% of the Great Britain population of a species listed in Annex I of the Birds Directive.

6.1.2 Gogledd Mon Forol/North Anglesey Marine SAC

The proposed scheme is also located within the North Anglesey Marine/Gogledd Môn Forol SAC (Figure 6-1) which is recognised as an area with predicted persistent high densities of harbour porpoise *Phocoena phocoena* (Heinänen and Skov, 2015). The site covers an area of 3,249km², reaching north-west from the Isle of Anglesey into the Irish Sea. This is a single feature site, proposed for designation solely for the purpose of aiding the management of harbour porpoise populations throughout UK waters, in accordance with EU legislation.

The North Anglesey Marine SAC has been recognised as an area with predicted persistent high densities of harbour porpoise. The area included within the site covers important summer habitat for porpoise, which was identified as part of the top 10% persistent high-density areas for the summer seasons within the UK (Joint Nature Conservation Committee (JNCC) and NRW, 2017).



- Legend:
- Holyhead Breakwater
 - Special Protection Area (SPA)
 - Special Area of Conservation (SAC)
 - Site of Special Scientific Interest (SSSI)
 - Area of Outstanding Natural Beauty (AONB)
 - Local Wildlife Site

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

Title:
European and Nationally Designated Sites

Figure:	6.1	Drawing No:	PB9014-101-002
---------	-----	-------------	----------------

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	02/04/2020	AB	MRE	A4	1:30,000
01	31/05/2019	GC	SM	A4	1:30,000

Co-ordinate system:	WGS 1984 UTM Zone 30N
---------------------	-----------------------

ROYAL HASKONINGDHV
INDUSTRY AND BUILDINGS
 2 ABBEY GARDENS
 GREAT COLLEGE STREET
 WESTMINSTER
 LONDON
 SW1P 3NL
 +44 (0)20 7222 2115
www.royalhaskoningdhv.co.uk


Royal HaskoningDHV
Enhancing Society Together

Source: Natural Resource Wales, 2020. © Haskoning UK Ltd. Contains Ordnance Survey data © Crown copyright and database right 2020. © OpenStreetMap (and) contributors, CC-BY-SA

6.1.3 Glannau Ynys Gybi/Holy Island Coast SPA

The Holy Island Coast SPA sites lies approximately 150m to the north west of Holyhead Breakwater, at its closest point, and predominantly consists of sea-cliffs (rising 120m above sea level) and grasslands. The site is designated due to its support of a resident population of Chough (*Pyrrhocorax pyrrhocorax*), which are dependent on the diverse habitats of the site and the low levels of agricultural management, both during the breeding (protected by the Wildlife and Countryside Act 1981) and wintering periods (listed under Annex 1 of the EC Birds Directive 1979). Present at the site are 18 pairs (5.3% of the UK breeding population and 2.6% of the UK wintering population) (JNCC, 2001).

6.1.4 Glannau Ynys Gybi/Holy Island Coast SAC

The Annex I habitats that are a primary reason for the selection of the Holy Island Coast SAC are; vegetated sea cliffs of the Atlantic and Baltic Coasts; and, European dry heaths. Holy Island has hard rock acidic cliffs and supports important examples of coastal cliff heathland vegetation. In addition to maritime heath with several rare species such as spotted rock-rose *Tuberaria guttata*, there are extensive maritime cliff-crevice and grassland communities (JNCC, 2016). The closest point of the site is approximately 150m to the north west of Holyhead Breakwater.

6.2 National Designations

6.2.1 Glannau Ynys Gybi/ Holy Island Coast SSSI

This site is of special interest for its geological and biological features, including heathland and maritime grassland communities, coastal cliffs and ledges, its assemblages of vascular plants and birds, invertebrates and its solid geology (Anglesey Nature, 2019). The site lies on the north-west corner of Holy Island and includes the most westerly point on Anglesey. The closest point of the coastline is approximately 150m to the north west of Holyhead Breakwater. Given this site and its interest features are covered by the Holy Island Coast/Glannau Ynys Gybi SAC, any effects to this site will be considered by the HRA.

6.2.2 The Anglesey Area of Outstanding Natural Beauty

The approximate coverage of the Anglesey AONB is 211km², covering one third of the island. The AONB is predominately a coastal designation and covers the majority of Holy Island. The designation reaches the cliffs close to the western edge of the beginning of the Breakwater and covers the majority of the west coast of Holy Island. The main features are; low cliffs alternating with coves and pebble beaches; sheer limestone cliffs interspersed with fine sandy beaches; and, stretches of sand dunes with beaches (IoACC, 2019). Potential visual impacts of the proposed scheme that could affect the AONB will be considered by the visual assessment, see **Section 8.5**.

6.3 Local Designations

6.3.1 Chwarel Morglawdd Caergybi/Holyhead Breakwater Quarry Local Wildlife Site (LWS)

The site consists of a disused quarry, a small area of dry heathland and a series of small enclosures. It borders the Holy Island Coast SSSI. The site supports important flora and is an important feeding and nesting area for birds including shelduck, oystercatcher, ringed plover and red-breasted merganser. A small outlier of the LWS is located immediately adjacent to Soldiers Point (**Figure 6-1**).

7 Topics Scoped out of the EIA

7.1 Coastal Processes and Geomorphology

Potential impacts to coastal processes and morphology may arise from the proposed scheme through effects on the physical and sedimentary processes regimes; however, these effects in themselves are not considered to be impacts; any impacts would be consequential effects of the changes on other sensitive receptors such as marine ecology, fisheries and cultural heritage. Therefore, the assessment focuses on the potential for changes/effects rather than on impacts.

During construction, aspects of the proposed scheme with the potential to influence coastal processes and geomorphology are:

- Short term increases in suspended sediment concentrations during placement of the ACBM on the leeward side of the Breakwater and Tetrapods on its seaward side; and,
- Changes in sea-bed level due to deposition of the additional suspended sediment after placement of the materials.

During operation, aspects of the proposed scheme with the potential to influence coastal processes and geomorphology are:

- Changes to the wave and tidal current regimes due to the presence of the wider Breakwater; and,
- Changes to sediment transport and erosion/accretion patterns due to presence of the wider Breakwater.

Given the small footprint of the refurbishment works, a maximum of 15m wide on the leeward side of the Breakwater and up to 50m on the seaward side, the short period of activity during construction at any location along the Breakwater and the fact that all works will be restricted to the existing rubble mound, the disturbance would cause only minor and temporary enhancements in suspended sediment concentration. These would be typically less than 1-5mg/l a short distance from the release point over a small geographical area (a few hundred metres). Given the low volumes of sediment predicted to be released during construction, the deposition on the seabed will be extremely small in thickness, potentially less than a millimetre as sediments are highly likely to be transported away by waves and tidal currents.

During operation, the increase in the height of the rubble mound has the potential to locally change the wave and tidal current regimes. The refurbishment would only result in a small and consistent change in the height of the rubble mound. Hence, the direction of approach of waves and tidal currents would not change. The bathymetry local to the Breakwater would only change over a short width (about 50m) and so changes to wave heights and tidal current velocities would also be minimal. Regionally, waves and tidal currents would not change from their baseline conditions. Since it is expected that the changes in waves and tidal current flow would be small and local to the Breakwater, then the changes in sediment transport would be similar in scale.

The potential effects on Coastal Processes and Geomorphology of the proposed scheme are therefore considered to be negligible or less. For this reason, hydrodynamic and sediment dispersion modelling is not considered necessary to understand the proposed scheme's effects on coastal processes. As such **Coastal Processes and Geomorphology has been screened out of EIA.**

7.2 Marine Water and Sediment Quality

As outlined in **Section 2**, the construction of the proposed scheme would involve the placement of rock and concrete armour onto the existing rubble mound. Key activities that could affect marine water and sediment quality are any regrading works required to remove areas of the rubble mound. Given these works would be on the rubble mound itself, the only sediment that could be disturbed is that which has been deposited within cracks and crevices within the mound itself. Due to the highly energetic environment on the seaward side of the Breakwater, it is considered that the potential for sediment to be present would be higher on the leeward side, due to the sheltered conditions; however, the potential release of fine sediment during construction is considered to be low, with any sediment plumes being temporary and small in scale. As such, sediment quality information is not considered to be required to inform any consent applications.

The WFD compliance assessment will be undertaken to understand the proposed scheme's effect on the statuses of the WFD waterbodies stated in **Section 11**.

In addition, all construction works would be carried out in accordance with CIRIA best practice guidelines for coastal and marine site working as presented in the CEMP. This would also include a Marine Pollution Contingency Plan mitigating impacts on marine water and sediment quality as a result of spills and leaks. As such **Marine Water and Sediment Quality has been scoped out of the EIA**.

7.3 Marine Mammals

The west coast of Anglesey has one of the highest diversities of marine mammals within the Celtic and Irish Seas (Baines and Evans, 2012). There are three species of marine mammal that are common on or near to Holyhead Harbour: harbour porpoise (*Phocoena phocoena*), bottlenose dolphin (*Tursiops truncatus*) and grey seal (*Halichoerus grypus*). There are also several species that have the potential to be near including: common dolphin (*Delphinus delphis*), Risso's dolphin (*Grampus griseus*), minke whale (*Balaenoptera acutorostrata*) and harbour seal (*Phoca vitulina*).

Potential impacts to marine mammals during the construction phase of the proposed scheme include:

- Underwater noise from the tipping of rock and from vessels;
- Increased collision risk with construction vessels; and,
- Disturbance to seals at haul-out sites.

No potential impacts are anticipated from maintenance works that would occur during the operational phase.

Taking the limited requirement for the tipping of rock, which would be localised to the Breakwater, and the proximity of Holyhead Port, disturbance from underwater noise and increased collision risk is considered negligible. The potential impact to seal haul-out sites is also predicted to be negligible given there are no haul out sites near to the proposed works. As such, Marine Mammals have been scoped out of the EIA.

7.4 Terrestrial Ecology

There is the potential for a site compound and concrete batching plant to be located on Solders Point; however, this area comprises mostly bare ground with some grassland habitat, considered to be of low ecological value (**Plate 7.1**). Prior to construction, a walkover survey would be carried out to ensure that no protected species, such as reptiles, would be affected during the construction works.



Plate 7.1 Photograph of Solders Point, looking towards the Breakwater

In order to prevent any direct damage to the LWS a buffer of 20m will be established around the boundary of the LWS to prevent any machinery or Tetrapods being placed within the site. As such no direct impacts to the LWS are anticipated; however potential indirect impacts could arise from emissions to air and from noise.

Given the limited terrestrial ecological interest, **Terrestrial Ecology has been scoped out of the EIA**, with the exception of potential indirect impacts to the LWS, which would be considered by the assessment on air quality (see **Section 8.3**) and noise (see **Section 8.4**).

7.5 Commercial and Recreational Navigation

Potential impacts to Commercial and Recreational Navigation could arise during delivery of construction materials and plant. There would not be any potential impacts during the operational phase. All works would be undertaken under approval of Stena Line, as Statutory Harbour Authority (SHA), who would issue Notices to Mariners and communication with other vessels using Very High Frequency (VHF) radio. Taking this mitigation into account, potential impacts to commercial and recreational navigation are considered to be negligible and as such **Commercial and Recreational Navigation has been scoped out of the EIA**.

7.6 Fish and Shellfish Resource and Commercial Fisheries

The waters surrounding the Breakwater contain low intensity spawning grounds for sandeel (*Ammodytidae*), plaice (*Pleuronectes platessa*), whiting (*Merlangius merlangus*), sole (*Solea solea*), cod (*Gadus morhua*) and mackerel (*Scomber scombrus*). In addition, the area includes low intensity nursery areas for tope shark (*Galeorhinus galeus*), thornback/spotted ray (*Raja clavata* and *R. monatgui*) and whiting. Several species of conservation importance have been recorded during surveys along the north Anglesey coast, including Raitt's sandeel (*Ammodytes marinus*), plaice, herring (*Clupea harengus*), sole and tope shark (Horizon Nuclear Power, 2016).

There are also a number of shellfish species, which are of particular interest to fishermen in the area, including crab (*Cancer pagurus*) and lobster (*Homarus gammarus*), as well as mussels (*Mytilus edulis*) (Royal HaskoningDHV, 2015). Holyhead Port is one of three commercial fishing ports in Wales which record landing statistics and is one of the most active ports for the Welsh fishing fleet (Pantin *et al.*, 2015). The most significant fishing activity in the inshore waters around Anglesey and Holyhead Port is potting to catch shellfish.

Given the vast majority of the proposed scheme is limited to the existing rubble mound, any low intensity spawning/nursery grounds adjacent to the proposed scheme, should they be present, are not considered to have the potential to be significantly affected. Furthermore, any navigational issues with construction vessels will be managed with the SHA (see **Section 7.5**). Consultation with local fishermen would be undertaken to ensure that any impacts to their activities are minimised as far as possible during the proposed works. As such, **Fish and Shellfish Resource and Commercial Fisheries has been scoped out of the EIA.**

7.7 Traffic and Transport

As the delivery of all materials would be made by barge, there would be no traffic impacts and as such **Traffic and Transport has been scoped out of the EIA.**

7.8 Accidents and Natural Disasters

Table 7.1 provides a list of Major Accident and Disasters compiled from the National Risk Register (Cabinet Office, 2017), the UK Government's Emergency Response and Recovery Guide (Cabinet Office, 2013) and the Red Cross' Disaster and Crisis Management Guidance (International Federation of Red Cross and Red Crescent Societies (IFRC), 2018). The assessment considers how the location and the use of the proposed scheme would affect the risk posed by each type of accident or disaster and whether this accident or disaster type is likely and requires further consideration.

Table 7.1 Initial List of Accidents and Disasters and Determination of Further Consideration.

Accident/Disaster Type	Location risk	Proposed use risk	Further consideration required?
Biological hazards: epidemics	x	x	No (screened out)
Biological hazards: animal and insect infestation	x	x	No (screened out)
Earthquakes	x	x	No (screened out)
Mass movements	x	x	No (screened out)
Tsunamis	x	x	No (screened out)
Volcanic eruptions	x	x	No (screened out)
Severe weather: storms	✓	✓	Yes
Severe weather: drought	x	x	No (screened out)
Severe weather: extreme temperatures	x	x	No (screened out)
Floods	✓	✓	Yes
Tidal waves/storm surges	✓	✓	Yes
Wildfires	x	x	No (screened out)
Poor air quality events	x	x	No (screened out)

Accident/Disaster Type	Location risk	Proposed use risk	Further consideration required?
Transport accidents	x	x	No (screened out)
Industrial accidents	x	x	No (screened out)
Electricity, gas, water supply or sewerage system failures	x	x	No (screened out)
Urban fires	x	x	No (screened out)
Famine/food security	x	x	No (screened out)
Displaced populations	x	x	No (screened out)
Complex emergencies	x	x	No (screened out)
Terrorist incidents	x	x	No (screened out)
Cyber attacks	x	x	No (screened out)
Disruptive industrial action	x	x	No (screened out)
Public disorder	x	x	No (screened out)
Severe space weather	x	x	No (screened out)

Therefore, the following accidents and disasters have been screened in to further consideration to identify whether there are sufficient national regulations, policies and procedures in place that may mitigate or prevent them (**Table 7.2**):

- Severe weather- storms;
- Tidal waves/storm surges; and,
- Floods.

Table 7.2 Refined List of Accidents and Disasters.

Accident and disaster type	Standard UK policies and procedures in place for mitigation/prevention	Further screening outcome
Severe weather: storms	National Severe Weather Warning Service - Met Office ⁸	Out
Tidal waves/storm surges	National Severe Weather Warning Service - Met Office	Out
Floods	Flood Warning Service – NRW ⁹	Out

Table 7.2 identifies that there are warning systems available which would help to prevent a loss of life by allowing residents and tourists to prepare for any of these natural disasters. The Holyhead Breakwater is an integral structure to the protection of Holyhead Bay, town and Port from severe weather, storm surges, tidal waves and any consequential flooding. The refurbishment of Holyhead Breakwater will extend the life of the structure and will therefore have an overall beneficial effect on accidents and disasters. As such **Accidents and Natural Disasters has been scoped out of the EIA.**

7.9 Climate Change

The EIA Directive 2014/52/EU sets out the requirement for climate change to be considered as part of the EIA process. Potential impacts to climate change arising from the construction of the proposed scheme

⁸ <https://www.metoffice.gov.uk/weather/warnings-and-advice/uk-warnings#?date=2019-05-31>

⁹ <https://naturalresources.wales/flooding/check-flood-warnings/?lang=en>

include the release of Green House Gas (GHG) emissions associated with fuel consumption by plant and equipment, marine vessel and embodied GHGs associated with construction materials.

It is considered that once the construction of the proposed scheme is complete, further potential impacts to climate change would be minimal and better than the existing situation given the reduced maintenance requirements. Best practice measures will be adhered to, including machinery and plant is kept in good condition and switched off when not in use, thereby minimising the use of fuel as far as possible. Furthermore, given the proposed scheme is the refurbishment of a coastal defence structure, its design takes into account climate change, specifically sea level rise. As such, the proposed scheme has taken account of climate change. As such, **Climate Change has been scoped out of the EIA.**

7.10 Population and Human Health

Whilst the proposed scheme is localised to the Breakwater, the concrete batching plant could be located on Salt Island or Solders Point. Whilst there are no residential properties near to these locations, assessments on air quality (see **Section 8.3**) and noise (see **Section 8.4**) will be undertaken to confirm that there would be no significant impacts to residential receptors. Given this **Population and Human Health has been scoped out of the EIA.**

7.11 Tourism and Recreation

Whilst access to the Breakwater would be prevented during the construction phase of the proposed scheme, this would be temporary. No other potential impacts to Tourism and Recreation are anticipated. As such **Tourism and Recreation has been scoped out of the EIA.**

7.12 Existing Infrastructure and Other Users

The Holyhead Breakwater provides shelter to the town of Holyhead and the Port of Holyhead. The Breakwater provides direct shelter to the shipping berths on Salt Island. There is no existing infrastructure that would be affected by the proposed scheme. Proposed projects include the West Anglesey Marine Demo Zone, the redevelopment of Holyhead Marina and the Holyhead Waterfront Regeneration Scheme. Given that these projects are proposed rather than existing, they will be considered as part of the Cumulative Impact Assessment (CIA) (see **Section 9**).

The Breakwater is regularly used for recreational fishing and commercial potting takes place on seabed around the footprint of the rubble mound. The public are also able to walk along the length of the superstructure. Irish Ferries Freight lies on Salt Island and is a commercial shipping company handling up to 12 sailings between Holyhead and Dublin a day (Irish Ferries Freight, 2016). A total of 3,212 tonnes of freight passed through Holyhead in 2013 (DfT, 2015). Holyhead New Harbour is also used by Holyhead Marina, Holyhead Sailing Club boathouse and moorings, small boat holders' association moorings, Holyhead Boatyard (comprising the Holyhead Group of companies: Holyhead Towing Company, Holyhead Marine Services, Holyhead Shipping Agency), Holyhead Maritime Museum and Holyhead coastguard station.

The potential effect to other users will be investigated elsewhere within the EIA (i.e. potential impacts on commercial fisheries (see **Section 7.6**). Potential impacts to Commercial and Recreational navigation would be managed by adhering to the requirements of the SHA as described in **Section 7.6**. As such **Existing Infrastructure and Other Users has been scoped out of the EIA**; however, it will be important to identify the key organisations that are likely to be affected by the proposed scheme and to undertake consultation to identify the main issues and to suggest possible mitigation.

7.13 Waste

The only waste generated during the refurbishments works is considered to arise from the fabrication of the concrete armour and general site activities. There would be no need to remove any material from the marine environment. No unusual wastes would arise in terms of types of waste or quantity. There are no potential impacts from waste during the operational phase of the proposed scheme.

Construction waste would be managed using a Site Waste Management Plan (SWMP), with material being reused on site as much as possible. **As such Waste has been scoped out of the EIA.**

7.14 Socio-economics

The proposed scheme is considered to have a beneficial impact on the Socio-economics of Holyhead by ensuring the continued protection of the town and Port. No further assessment is considered necessary. As such **Socio-economics has been scoped out of the EIA.**

8 Scoping of Environmental Effects

8.1 Marine and Coastal Ecology

8.1.1 Baseline conditions

8.1.1.1 Benthic ecology

Seabed sediment of the west coast of Wales is typically medium to coarse, consisting of mainly gravel and sand, with a low proportion of mud and clay sediments. Data from the NRW HabMap project (NRW, 2017) shows the predicted biotopes in and around Holyhead Breakwater are:

- SS.SSa.IMuSa.FfabMag - Infralittoral muddy sand;
- SS.SCS.ICS.SLan - Infralittoral coarse sediment; and,
- SS.SMp.KSwSS.LsacR - Kelp and seaweed (on sublittoral sediment).

These biotopes are typically characteristic of those found on sandy/gravelly substrate and in mobile, well swept environments. Benthic communities typically consist of common polychaete, crustacean, mollusc or echinoderm based. The HabMap data shows that these biotopes are typically common in the Anglesey area and wider Welsh coastal area.

The carpet sea squirt (*Didemnum vexillum*) is known to be present in the Holyhead area. *D. vexillum* is an alien species capable of smothering large areas, posing a threat to native marine ecosystems (Black and Veatch, 2009). Surveys undertaken on behalf of NRW in 2018, post storm Emma, to assess the presence and possible spread of *D. vexillum* in Holyhead showed very little change in the extent and distribution of *D. vexillum* in Holyhead Harbour compared to previous surveys, with *D. vexillum* being located only on floating structures in and immediately adjacent to the remains of Holyhead Marina (Holt, 2018).

8.1.1.2 Intertidal ecology

The west coast of Anglesey has substantial lengths of exposed shores which are largely coastal cliff headlands interspersed with beaches of moderately coarse sediment. The intertidal areas within the New Harbour and surrounding the Breakwater are typical of those encountered along the Anglesey coast. Data from the European Marine Observation and Data Network (EMODnet) (EMODnet, 2017) was used to identify the habitats present, which included:

- *Semibalanus balanoides*, *Patella vulgata* and *Littorina* spp. - on exposed to moderately exposed or vertical sheltered eulittoral rock;
- *Laminaria digitata* – on moderately exposed sublittoral fringe bedrock;
- *Verrucaria maura* – on very exposed to very sheltered upper littoral fringe rock;
- *Fucus serratus* – on moderately exposed lower eulittoral rock;
- *Porphyra purpurea* – on sand-scoured mid or lower eulittoral rock; and,
- *Ascophyllum nodosum* - on full salinity mid-eulittoral rock.

8.1.2 Potential impacts during construction and operation

Potential impacts to Marine and Coastal Ecology during the construction phase of the proposed scheme include:

- Direct loss of benthic and epibenthic species and habitats within the footprint of the proposed scheme; and,
- Spread of invasive species, i.e. *D. vexillum*.

It should be noted that the chevron and Tetrapod units would quickly become colonised by similar species to that already present on the rubble mound.

No potential impacts are anticipated during the operational phase of the proposed scheme.

8.1.3 Proposed approach to the EIA

In order to characterise the biotopes and species present on the rubble mound, a benthic ecology and intertidal survey will be undertaken as agreed with NRW and the IoACC (**Section 5.2.3**). This will inform the baseline environment and subsequent assessment of potential construction impacts within the Environmental Statement.

8.2 Ornithology

8.2.1 Baseline conditions

The Irish Sea around Anglesey is used by a wide number of seabird species, including coastal and offshore birds. There are a number of sites in the immediate vicinity of the Breakwater that are designated (either in whole or in part) for their ornithological interests under national and international legislation (see **Section 6**).

A breeding bird survey undertaken in May and June 2016 of Salt Island and the coast area between Salt Island and Newry Beach (**Plate 8.1**) identified a total of 17 species of breeding birds as well as three additional probable breeding species above MHWS. Species identified included black guillemot (*Cephus grylle*) greylag goose (*Anser anser*), oystercatcher (*Haematopus ostralegus*), herring gull (*Larus argentatus*) and carrion crow (*Corvus corone*), amongst others. None of the species identified are listed on either Annex 1 of the EU Birds Directive (Directive 2009/147/EC) or under Schedule 1 of the Wildlife and Country Act 195, as amended. No bird species were found to be breeding in numbers of national significance (RPS, 2016). Seven pairs of black guillemot were found to be breeding within the wider area and were considered to be at a level that was regionally significant to Wales. Intertidal habitats below MHWS were considered to be of little or of no importance to water birds (RPS, 2016).

The Wetland Bird Survey (WeBS) monitors non-breeding water birds in the UK. The principal aims of the WeBS are to identify population sizes, determine trends in numbers and distribution and identify important sites for water birds. There is a monitoring location in Holyhead Harbour (site code 68408) which covers the New Harbour between the Breakwater and Salt Island.

8.2.2 Potential impacts during construction and operation

Potential impacts to ornithology during the construction phase of the proposed scheme include:

- Displacement and disturbance to breeding birds due to construction activities (vessel movements and light pollution); and

- ### 8.2.3 Proposed approach to the EIA

[illegible]

8.3 Air Quality

8.3.1 Baseline conditions

The IoACC carries out air quality monitoring at Marine Square (using nitrogen dioxide (NO₂) diffusion tubes), within the study area. However, monitoring at this location only began in October 2018 and therefore the data capture was not sufficient to be included. The nearest diffusion tube monitoring of NO₂ is approximately 6.5km south-east of the proposed scheme in Valley. However, this location is not considered to be representative of the proposed scheme due to the distance from the site.

40

provided by Defra for the 1km x 1km grid squares which cover the proposed scheme footprint. This information is presented within **Table 8.1**.

Table 8.1 2019 NO₂, PM₁₀ and PM_{2.5} concentrations for the 1km by 1km grid square covering the study area (annual means)

Grid square	Background pollutant concentrations (µg/m ³)		
	NO ₂	PM ₁₀	PM _{2.5}
223500, 383500	3.74	6.69	4.40
224500, 383500	6.42	7.12	4.75

The annual mean background concentrations of NO₂ and PM₁₀ concentrations shown in **Table 8.1** are 'well below' (i.e. less than 75% of) their respective Air Quality Objectives of 40µg/m³, and 'well below' the annual mean PM_{2.5} Objective of 25µg/m³.

The closest residential properties are located approximately 250m from the proposed scheme. Residential properties are also situated in close proximity to Holyhead port, which may be used for the delivery of materials during construction. The proposed scheme is also situated within the Anglesey Terns SPA and North Anglesey Marine SAC.

8.3.2 Potential impacts during construction and operation

The following emission sources associated with the construction phase of the proposed scheme have the potential to impact on local air quality conditions:

- Dust emissions generated by construction activities associated with the construction of the proposed scheme, have the potential to cause nuisance to, and soiling of, sensitive receptors;
- Emissions of exhaust pollutants from marine vessels, have the potential to adversely impact upon local air quality at sensitive receptors; and
- Emissions of NO₂, PM_{2.5} and PM₁₀ from non-road mobile machinery (NRMM) operating within the proposed scheme footprint, have the potential to adversely impact local air quality at sensitive receptors in close proximity to the works.

No potential impacts are anticipated during the operational phase of the proposed scheme.

8.3.3 Proposed approach to the EIA

An air quality assessment will be undertaken as part of the EIA. This will consider the potential impact of construction phase dust emissions on identified receptor locations in the vicinity of the proposed scheme. The assessment will be undertaken in accordance with the latest guidance provided by the Institute of Air Quality Management (IAQM) (IAQM, 2016). Using the guidance, the risk of dust impacts will be determined at identified receptor locations within 350m of the construction works. Mitigation measures commensurate with the level of risk from the site will be recommended.

The methods for delivery of construction goods and materials is planned via marine vessels. The potential impact of emissions from marine vessel movements would depend on the volume and frequency of movements, the type of vessels used and the proximity of the vessel routes to sensitive receptor locations.

Scheme-generated vessel traffic has the potential to lead to increases in pollutant concentrations at sensitive human receptor locations, as it is anticipated that all construction materials and rock used during the works will be transported to Holyhead by vessel. There are likely to be emissions of NO_x, PM_{2.5}, PM₁₀, CO and SO₂ from the vessels during manoeuvring, cruising and hotelling, which may lead to an increase in

ambient air pollutant concentrations in the vicinity of the proposed scheme. If marine vessel movements are not anticipated to be significant in the context of existing vessels operating in the area, it is likely that a qualitative assessment could be undertaken. If a detailed assessment is required, emissions of NO_x, PM_{2.5}, PM₁₀, CO and SO₂ from the marine vessels will be considered at human and ecological receptor locations in the vicinity of the Holyhead Breakwater.

Potential impacts of emissions from vessels will be considered at designated ecological sites where they are located in proximity to these sources, and where significant vessel movements would occur.

8.4 Noise

8.4.1 Baseline conditions

Receptors in the vicinity of the proposed scheme are likely to be influenced by the baseline traffic flows on the surrounding road network along with existing commercial noise from the Holyhead Port. The main noise and vibration sensitive receptors potentially affected by the proposed scheme are residential properties in the vicinity of the site as well as marine and terrestrial species (in particular birds).

A baseline noise survey was undertaken to inform the Holyhead Waterfront Regeneration Scheme EIA (Conygar Holyhead, 2020) in March 2019. This survey identified a number of Noise Sensitive Receptors (NSRs) related to the project; those in closest proximity to the proposed scheme include Beach Road/Maes-Y-Mor and existing marina complex, close to the Boathouse Hotel. **Table 8.2** provides a summary of the lowest measured LA₉₀¹⁰ noise level recorded at the two NSRs.

Table 8.2 Summary of lowest background noise levels at NSR sites in closest proximity to the proposed scheme (Conygar Holyhead, 2020)

Noise Sensitive Receptor	Lowest Recorded LA ₉₀ dB	
	Daytime	Night-time
Location 1 – Beach Road/ Prince Charles Road	42	38
Location 2 – Boathouse Hotel	41	36

8.4.2 Potential impacts during construction and operation

The potential impacts associated with noise during the construction phase may include:

- Importation and placing of bulk materials;
- Operation of concrete batching plant;
- Movement of mobile plant on the construction site; and,
- Noise from temporary fixed plant.

No potential impacts are anticipated during the operational phase of the proposed scheme.

8.4.3 Proposed approach to the EIA

A construction noise impact assessment will be undertaken which will assess the potential noise impact at the nearest residential and ecological receptors. The construction phase assessment will comprise a desk-

¹⁰ This represents the sound pressure level which is exceeded 90% of the time, expressed in dB or dB(A). LA₉₀ is used to quantify background noise levels

based review of potential construction noise and vibration impacts, on existing relevant potentially affected noise sensitive receptors adjacent to the site.

Given available information, a baseline noise survey is not proposed. The EIA will identify any mitigation measures which will be incorporated into the project design to minimise any adverse effects of construction noise on the local community.

The modelling exercise, if required, can be undertaken using SoundPLAN noise prediction software which directly implements the calculation algorithm described in International Standard Organisation (ISO) 9613. The calculation method takes account of air absorption, distance attenuation, barriers and topography, and light downwind conditions from source to receptor. The assessment of the potential noise impacts associated with the construction phase would be undertaken with regard to the methodology contained within BS 5228:2009+A1:2014, 'Code of Practice for Noise and Vibration Control on Construction and Open Sites'.

8.5 Landscape/Seascape and Visual Setting

8.5.1 Baseline conditions

Holyhead Breakwater is located within the Holyhead Bay and the Skerries Marine Character Area (MCA) (NRW, 2015a). This MCA encompasses the coastal and inshore waters of Holyhead Bay in western Anglesey, extending northwards to include the Skerries. Landward views of this MCA are relatively contained to the western coastline and rising backdrop of Anglesey and Holy Island, whilst open, expansive views are afforded out to sea. Aside from the development at Holyhead, the entire coastline is within the Anglesey AONB. The Holyhead Mountain coast and the coastline from Church Bay to Carmel Head (including the Skerries) are also defined as Heritage Coast (NRW, 2015a).

8.5.2 Potential impacts during construction and operation

The proposed scheme is not considered to have the potential to significantly affect the overall landscape and seascape character of the area, given that the works limited to the refurbishment of an existing structure. The presence of the construction plant and machinery, concrete batching plant and site compound would have an adverse effect on the character of the area; however, this would be temporary and managed by adhering to best practice measures adhered to via the production of the CEMP. Potential impacts on landscape and seascape character have therefore been scoped out of further assessment.

Potential impacts to the visual setting during the operational phase of the proposed scheme include:

- Changes to visual setting due to the presence of the Tetrapod units.

8.5.3 Proposed approach to the EIA

The proposed scheme would affect the visual appearance of the seaward side of the Breakwater. A visual assessment is being undertaken as agreed with GAPS, RCAHWW, IoACC and NRW (see **Section 5.2.2**) to understand the proposed scheme's potential impact on the area's visual setting. Initial photomontages of how the proposed scheme would look along the seaward side of the Breakwater can be seen in **Plate 8.2**.

Existing View



Photomontage view of the proposed refurbishment

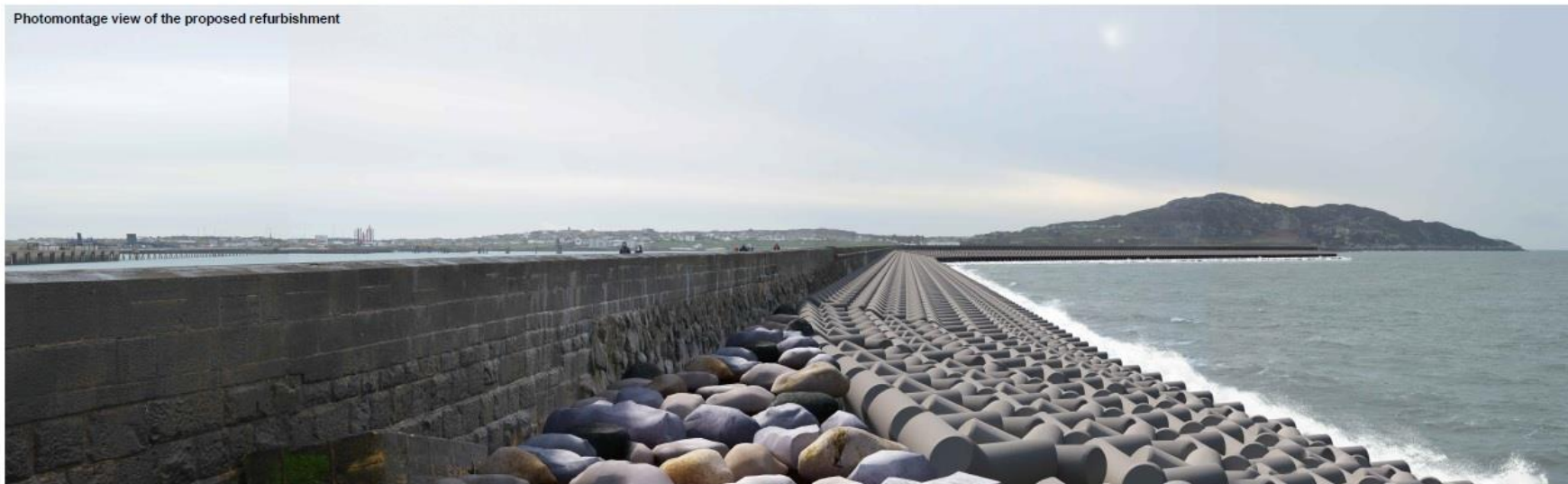


Plate 8.2 Viewpoint looking south west from the head of Holyhead Breakwater towards Holyhead Mountain

8.6 Cultural Heritage

8.6.1 Baseline conditions

8.6.1.1 Holyhead Breakwater

Holyhead Breakwater is a Grade II* listed structure, built between 1848 and 1873, and the longest breakwater in the UK. In 2017, Royal HaskoningDHV commissioned GAT to carry out an historic building appraisal to further understand the historical importance of the Breakwater in support of the Environmental Appraisal for the project undertaken for the IoACC. The Level 4 Building Record prepared by GAT is included as **Appendix C** to this Scoping Report.

In summary, the Breakwater as a whole forms a very significant element within the port's historic landscape for which there is no parallel in Wales, with the closest parallel being the breakwater and port at Portland in Dorset, where similarities can be noted in terms of personnel involved, methodology and surviving historic remains. The scale of the undertaking at Holyhead needs to be viewed in terms of this and other harbours worldwide. These monuments form one of the best-preserved maritime engineering landscapes of the mid-19th century. The concentration of later development around the inner harbour has meant that much has been preserved from the 19th century breakwater era within the wider port.

In addition to the evidential, historical and aesthetic value of the Breakwater as analysed throughout the Level 4 report, the Breakwater can also be considered to have significant communal value. Communal value can be interpreted in many ways, including its role in collective experience, identity or memory and as an asset with social value and a source of social interaction distinctiveness. The Breakwater reflects many of these values as it is a significant and monumental representation of the town's *raison d'être* as a major port and port town and Holyhead draws elements of its identity and collective memory from the Breakwater. It is still used by the local community as a promenade, providing a focal point of social interaction and distinctiveness, including an appreciation of the views over the surrounding port, town and countryside.

It is clear that the Breakwater and its associated hinterland should be viewed as being of **local, national and international** significance. Due to its status as a Grade II* listed structure, Listed Building Consent for the refurbishment works will be required.

8.6.1.2 Other cultural heritage assets

Details of other designated heritage assets within the study area have been accessed from the Cof Cymru - National Historic Assets of Wales online service¹¹ and designated historic assets GIS data¹² which include data on:

- Scheduled Monuments;
- Listed Buildings;
- Protected Wrecks;
- Registered Historic Landscapes; and,
- World Heritage Sites.

¹¹ Designated Historic Asset Descriptive Information, The Welsh Historic Environment Service (Cadw), 30/05/2019, licensed under the Open Government Licence - <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

¹² Designated Historic Asset GIS Data, The Welsh Historic Environment Service (Cadw), 30/05/2019 [the date that you received the data from Cadw], licensed under the Open Government Licence <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

There are no Scheduled Monuments, Protected Wrecks, Registered Historic Landscapes or World Heritage Sites within the study area

In addition to the Grade II* listed structure of Holyhead Breakwater, the Breakwater also includes a pier end three-storey lighthouse, built in 1873, a large stone quay from which the Breakwater extends, built in 1847, and a late 19th century small stone building located at the end of the quay.

Further Listed Buildings include:

- Three buildings considered to be associated with the construction of the Breakwater located nearby on the foreshore; Soldier's Point House (14760), a Screen Wall to Soldier's Point House (14761) and Porthyfelin House (14759); and,
- Four further buildings located along the shoreline of the New Harbour: the Zodiac Restaurant (former lifeboat house) (14729), the Trinity House Office (14730), the Trinity Yard Large Workshop (14731) and the Trinity Yard Small Workshop (14732).

The nearest recorded protected wreck is the Royal Yacht Mary (DW3) located at Skerries, approximately 11km north of the Port of Holyhead. The yacht was built by the Dutch East India Company in 1660 and was given by the City of Amsterdam to Charles II on his restoration to the English throne. Yachts were built for speed and Charles II used it for recreational sailing; later it was used for official tours of duty and on one such trip in 1675 it sank off Anglesey. The wreck was rediscovered in 1971 and has been archaeologically excavated over a 25-year period.

In addition to designated heritage assets, there are a range of non-designated heritage assets within the study area. The Historic Wales portal¹³ indicates records of structures and buildings held by the GAT Historic Environment Record (HER) and records of several wrecks and reported losses held by the National Monuments Record of Wales (NMRW) in the study area. Full data searches from both the HER and NMRW will be required to inform the detailed baseline conditions presented in the EIA.

8.6.1.3 Maritime archaeological potential

Wrecks and debris from vessels may be present on the seabed adjacent to the Breakwater, lost as a result of any number of reasons, including human error, adverse weather conditions, collision with other vessels or navigational hazards or, for more recent vessels, mechanical faults.

8.6.2 Potential impacts during construction and operation

Potential impacts to cultural heritage during the construction phase of the proposed scheme include:

- The proposed works and placement of anchoring blocks have the potential to cause direct disturbance and damage, and possibly even loss of known and undiscovered artefacts of marine archaeological significance;
- Construction activities have the potential to disturb the setting of heritage assets and historic landscapes/seascapes; and,
- The physical appearance of the proposed scheme has the potential to affect the setting of heritage assets and historic landscapes/seascapes.

¹³ <https://historicwales.gov.uk>

8.6.3 Proposed approach to the EIA

A Cultural Heritage baseline assessment will be undertaken, including, but not limited to the following:

- A description of the known heritage assets with a defined study area and the potential for further archaeological remains to be present (including consideration of reported losses) based upon searches of relevant data including:
 - Records of wrecks and obstructions from the UK Hydrographic Office;
 - Records of designated heritage assets from Cadw;
 - Records of non-designated heritage assets from the NMRW and GAT HER; and,
 - Existing archaeological reports and other secondary sources relevant to the study area.
- An assessment of the significance of the assets identified in the baseline assessment; and,
- An assessment of the contribution of setting to the significance of key assets and the potential effects upon the setting of all designated and key non-designated heritage assets and the historic landscape/seascape within the study area.

The assessment will consider direct impacts, setting impacts and indirect impacts, and will be undertaken in accordance with relevant standards and guidance provided by the Chartered Institute for Archaeology (CIfA), Cadw and GAT. Specific reference will be made to a range of guidance including, but not limited to, the following:

- Cadw (2011) Conservation Principles for sustainable management of the historic environment in Wales¹⁴;
- CIfA (2014) Standards and guidance for historic environment desk-based assessment¹⁵;
- Cadw (2017) Managing Change to Listed Buildings in Wales¹⁶; and,
- Welsh Government (2019) Managing the marine historic environment of Wales Consultation Document¹⁷.

Consultation will continue to be undertaken at key stages throughout the assessment process with these organisations and other relevant stakeholders (including GAT and the RCAHMW maritime officer) for the visual assessment (see **Sections 8.5**). The information obtained from the desk-based study, and any subsequent survey, stages would inform the EIA, and mitigation would be embedded in the scheme's design in order to, as far as possible, minimise impacts to the Breakwater and other known heritage assets.

¹⁴ https://cadw.gov.wales/docs/cadw/publications/Conservation_Principles_EN.pdf

¹⁵ https://www.archaeologists.net/sites/default/files/CIfAS&GDBA_2.pdf

¹⁶ <https://cadw.gov.wales/docs/cadw/publications/historicenvironment/20170531Managing%20Change%20to%20Listed%20Buildings%20in%20Wales%2024303%20EN.pdf>

¹⁷ <https://gov.wales/managing-marine-historic-environment-wales>

9 Cumulative Impact Assessment

CIA assesses the potential impacts of a proposed scheme with other past, present (current) and reasonably foreseeable (proposed) plans and projects. With respect to 'past' projects, a useful ground rule in CIA is that the environmental impacts of schemes that have been completed should be included within the environmental baseline; as such, these impacts are already taken into account in the EIA process for a development. Consequently, generally completed projects can be excluded from the scope of CIA. However, the environmental impacts of recently completed projects may not be fully manifested and, therefore, the potential impacts of such projects should be taken into account.

In line with established practice, this assessment will be limited to plans and projects where there is sufficient information to allow consideration of the potential for a cumulative effect to arise. In the absence of publicly available information (usually in the form of consent applications) or a defined 'scheme', it is not possible to undertake a proper consideration of cumulative effects (i.e. if proposals are speculative or where assumptions regarding potential impacts may be contentious).

All receptors considered as part of the EIA will initially be considered as part of the CIA, with a view to remove receptors from the scope where no pathway is predicted. The CIA will be undertaken using the same methodology as used for the EIA.

9.1 Initial List of Potential Plans and Projects

The following projects have been identified as having the potential to result in cumulative effects with the proposed scheme as a result of their location and the potential impacts that could arise during the construction and operational phases:

- **Holyhead Waterfront Regeneration Scheme**— A joint venture between Stena Line and Conygar Investment Company PLC (Conygar), who are proposing a mixed-use marina development on Newby Beach, Holyhead. This development will include 326 homes, a 500 berth marina and 50,000 sq.ft of marine related retail, leisure, restaurants hotel and office space. Outline planning permission for this development was granted in 2012; however, no development works have begun. It is expected that the detailed scheme will be submitted for full planning permission in 2018 (Isle of Anglesey County Council, pers. comm. September 2018).
- **Holyhead Port Expansion** – Stena Line Ports Ltd is proposing a new deep water cruise berth at Holyhead Port. This project would comprise of the reclamation of two intertidal/subtidal areas (known as the Salt Island Expansion and Pelham Patch Development) and the dredging of an approach channel. The proposal consists of the creation of 9 hectares of land through the reclamation of the two areas which will provide new berths and associated landside areas for port-related use. The approach channel will be dredged to a depth of 10m below Chart Datum (bCD). It is estimated that the capital dredge will take up to 12 weeks to complete.
- **Holyhead Marina** – Holyhead Marina Ltd is proposing to rebuild Holyhead Marina which was destroyed during Storm Emma in early March 2018. The proposals include building a permanent 500m sea wall that will create a permanent safe harbour with 24 hour tidally unrestricted access.

These projects and any others identified during the EIA process will be monitored so that updated and new information can be incorporated into the CIA, as far as practicable.

10 Habitats Regulations Assessment

10.1 Introduction

EU obligations in respect of habitats and species are imposed through Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive), which requires Member States to designate important wildlife sites throughout the European Community as SACs and to give protection to habitats and species listed in the Directive as being threatened or of Community interest (SCIs).

The EU imposes obligations in respect of birds through Directive 2009/147/EC on the conservation of wild birds (Birds Directive). The Birds Directive provides a framework for the conservation and management of wild birds in Europe. Of particular relevance is the requirement to identify and designate SPAs for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance. Together with SACs and SCIs, SPAs and sites that are in the process of designation as SACs and SPAs (proposed SACs (pSACs), cSACs and pSPAs) form a network of protected areas known as Natura 2000 sites; or 'European sites'.

These obligations at a European level are transposed into UK legislation via The Conservation of Habitats and Species Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017 (the Habitats Regulations). As a matter of Government policy, the obligations also apply to Ramsar sites. Ramsar sites are wetlands of international importance as defined following the Convention on Wetlands (Ramsar, Iran, 1971).

10.2 The HRA Process

The HRA process helps meet the requirements of Article 6(3) of the Habitats Directive, which states that any plan or project that is not directly connected with or necessary to the management of a European site, but would be LSE on such a site, either on its own or in-combination with other plans or projects, will be subject to an appropriate assessment of its implications for the European site in view of its conservation objectives.

According to the Waddenzee judgement (Judgement of 7.9.2004 – Case C-127/02), an appropriate assessment will be required if a likely significant effect cannot be excluded on the basis of objective information. The Sweetman Opinion (Opinion of Advocate General 22.10.2012 – Case C-258/11) states that the question is simply whether the plan or project concerned is capable of having an effect.

The HRA process (in its entirety) follows a four-staged approach, as detailed in the Planning Inspectorate's Advice Note 10 (Planning Inspectorate, 2017):

1. Screening: The process of identifying potentially relevant European sites, and whether the proposed Project is likely to have a significant effect on the qualifying features of the site, either alone or in-combination with other plans and projects. If it is concluded at this stage that there is no potential for LSE, there is no requirement to carry out subsequent stages of the HRA.
2. Appropriate Assessment: Where a LSE for a European site(s) cannot be ruled out, either alone or in-combination with other plans and projects, assessment of the potential effects on the integrity of the site(s), again either alone or in-combination with other plans and projects, in view of its qualifying features and conservation objectives is required. Where there are potential adverse effects, an assessment of mitigation options is carried out and mitigation measures (where available) are proposed to address the effects. If there nonetheless remains a likely significant residual adverse effect, the HRA must progress to Stages 3 and 4.

3. Assessment of Alternative Solutions: Identifying and examining alternative ways of achieving the objectives of the project to establish whether there are solutions that would avoid or have a lesser effect on the site(s).
4. Imperative reasons of overriding public interest (IROPI): Where no alternative solution exists and where an adverse effect on site integrity remains, the next stage of the process is to assess whether the development is necessary for IROPI and, if so, the identification of compensatory measures needed to maintain site integrity or the overall coherence of the designated site network.

10.3 European Sites

The proposed scheme is located within the following European designated sites (**Figure 6-1**):

- North Anglesey Marine/Gogledd Mon Forol SAC; and,
- Anglesey Terns/Morwenoliaid Ynys Mon SPA.

The proposed scheme is also located adjacent to the following European designated sites (**Figure 6-1**):

- Holy Island Coast/Glannau Ynys Gybi SAC; and,
- Holy Island Coast/Glannau Ynys Gybi SPA.

An HRA will therefore be undertaken to assess the potential impacts of the proposed scheme, both alone and in-combination, on the European sites listed above. The information for an HRA will be presented as a chapter within the Environmental Statement.

11 Water Framework Directive

11.1 Introduction

The WFD (Council Directive 2000/60/EC) was adopted by the EC in December 2000. The WFD requires that all EU Member States must prevent deterioration and protect and enhance the status of aquatic ecosystems. This means that Member States must ensure that new schemes do not adversely impact upon the status of aquatic ecosystems, and that historical modifications that are already impacting it need to be addressed.

The WFD is transposed into national law by means of the Water Environment (WFD) (England and Wales) Regulations 2017. These Regulations provide for the implementation of the WFD, from designation of all surface waters (rivers, lakes, transitional (estuarine) and coastal waters and ground waters) as water bodies to the requirement for achievement of good ecological status or good ecological potential by 2021.

The WFD applies to all water bodies, including those that are man-made. The consideration of the proposed refurbishment works under the WFD will, therefore, apply to all water bodies that have the potential to be impacted by the proposed works.

11.2 The WFD Process

The WFD process, as outlined in guidance published by NRW (OGN72 – Guidance for assessing activities and projects for Compliance with the WFD) and the Environment Agency (Clearing the Waters For All) follows a three stage process:

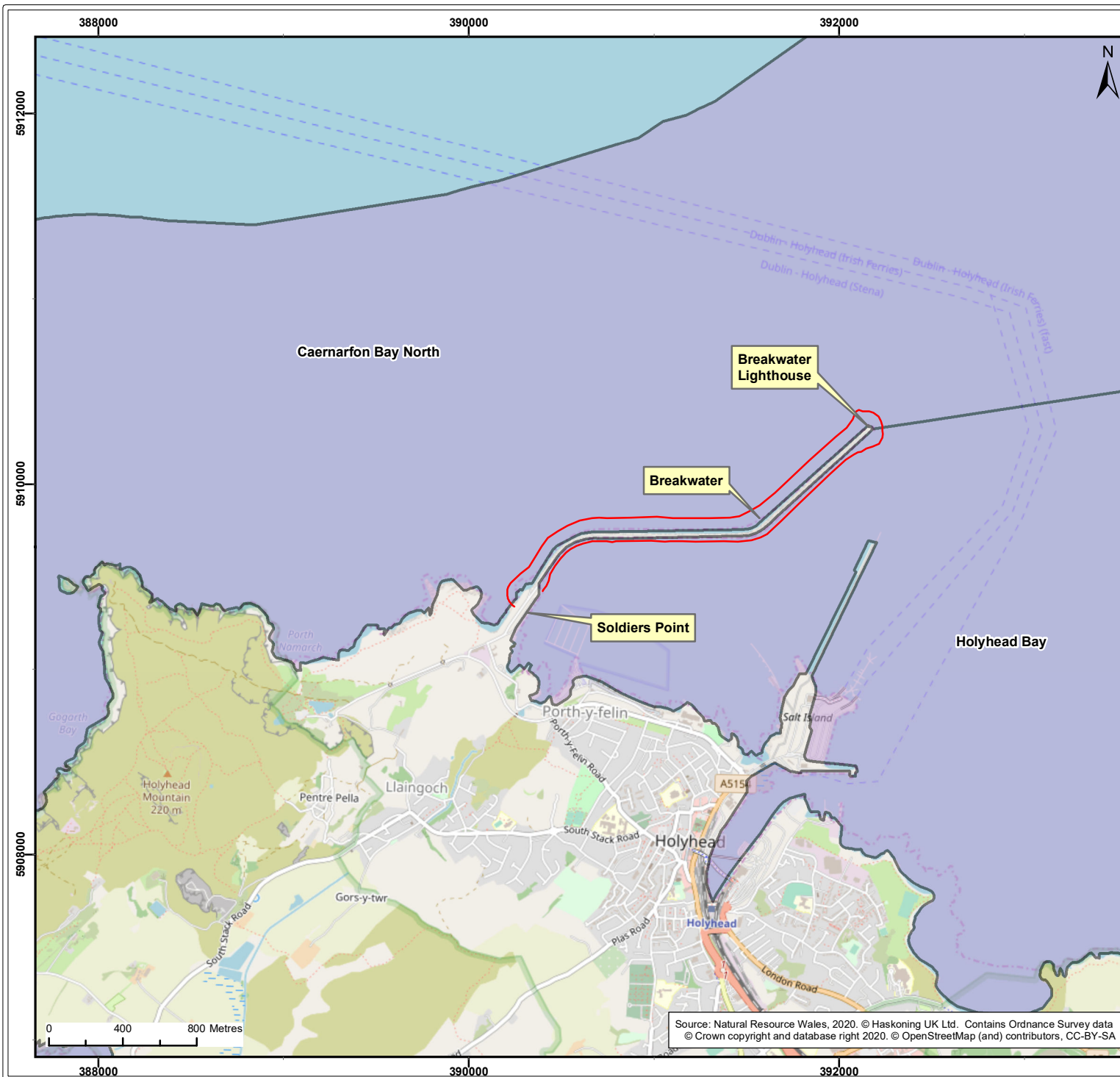
- Screening: exclude any activities that do not need to go through the scoping and detailed assessment stages;
- Scoping: identify the quality elements that are potentially at risk from the proposed activity and need further assessment; and,
- Detailed assessment: consider the potential impacts of activities on surface and ground water bodies, identify ways to minimise the effect and identify if an activity may prevent the water body achieving good status or cause deterioration.

Holyhead Breakwater borders two waterbodies (**Figure 11-1**):

- The seaward side of the Breakwater is within the Caernarfon Bay North coastal waterbody (GB621010380000); and,
- The leeward side of the Breakwater is within the Holyhead Bay coastal waterbody (GB681010360000).

It is considered that the proposed scheme is not a low risk activity, as defined in the Clearing the Waters for All guidance, and therefore a WFD Compliance Assessment will be undertaken to ensure the activities do not have a non-temporary effect on the status of the waterbodies using the information contained within the Water Watch Wales website¹⁸. If it is established that an activity is likely to affect water body status (that is by causing deterioration or by preventing achievement of the WFD objectives for that water body) potential measures to avoid the non-temporary deterioration will be investigated and evaluated in terms of cost and whether the cost of implementing them is disproportionate.

¹⁸ <http://waterwatchwales.naturalresourceswales.gov.uk/en/>



Legend:

- Holyhead Breakwater
- WFD Coastal Water Body

Client:

Isle of Anglesey
County Council

Project:

Holyhead Breakwater
Refurbishment Scheme

Title:

WFD Waterbodies

Figure: 11.1

Drawing No: PB9014-101-003

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	02/04/2020	AB	MRE	A4	1:30,000
01	31/05/2019	GC	SM	A4	1:30,000

Co-ordinate system: WGS 1984 UTM Zone 30N



**Royal
HaskoningDHV**
Enhancing Society Together

**ROYAL HASKONINGDHV
INDUSTRY AND BUILDINGS**
2 ABBEY GARDENS
GREAT COLLEGE STREET
WESTMINSTER
LONDON
SW1P 3NL
+44 (0)20 7222 2115
www.royalhaskoning.co.uk

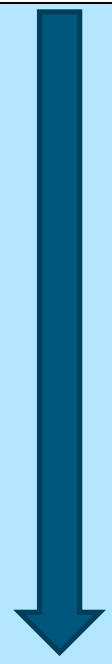
Source: Natural Resource Wales, 2020. © Haskoning UK Ltd. Contains Ordnance Survey data
© Crown copyright and database right 2020. © OpenStreetMap (and) contributors, CC-BY-SA

12 Proposed Approach to the EIA

12.1 EIA Methodology

This section presents the proposed methodology for undertaking the EIA for the proposed scheme. The EIA is required under the EIA Directive (2014/52/EU) and is an iterative tool for systematically examining and assessing the impacts of the construction methods, operation and decommissioning phases of a development on the environment. Relevant EIA legislation and good practice guidelines recommend that EIA proceeds in a number of steps which are summarised below in **Table 12-1** (IEMA, 2004).

Table 12-1 Stages of the EIA process

	Task	Aim	Output (Examples)
	Consultation	Consult with statutory and non-statutory organisations	Local knowledge and information
	Primary data collection	Identify the baseline/ existing environment	Background data including existing literature and specialist studies
	Specialist studies	To further investigate those environmental parameters which may be subject to potentially significant effects	Specialist reports (e.g. hydrodynamic modelling and ecology)
	Impact assessment	To evaluate the baseline environment in terms of sensitivity To evaluate and predict the impact (i.e. magnitude) upon the baseline To assess the resultant effects of the above impacts (i.e. determine significance)	Series of significant adverse and beneficial impacts
	Mitigation measures	To identify appropriate and practicable mitigation measures and enhancement measures	The provision of solutions to avoid offset or reduce adverse impacts (e.g. sensitive scheduling to avoid noise and traffic impacts) Feedback into the design process
	ES	Production of the ES in accordance with EIA guidance	Final ES

12.1.1 Topics scoped out of the EIA

Topics that are considered to not require further assessment and therefore have been scoped out of the EIA are presented in **Table 12-2**.

Table 12-2 Topics scoped out of the EIA

Topic	Justification
Coastal processes and Geomorphology	The potential effects on Coastal Processes and Geomorphology of the proposed scheme are therefore considered to be negligible or less.
Marine water and sediment quality	Potential release of fine sediment during construction is considered to be low. All works would be carried out in accordance with best practice and the requirements of the SHA.
Marine mammals	No significant underwater noise impacts, works are within a harbour adjacent to a major port.
Terrestrial ecology	No terrestrial habitats will be directly affected by the proposed scheme. The LWS would be assessed by the assessments on air quality and noise.
Commercial and recreational navigation	Construction vessels would operate under the requirements of the SHA.

Topic	Justification
Fish and Shellfish Resource and Commercial Fisheries	No significant loss of habitat or effects to water quality, potential impacts to navigation managed by the SHA.
Traffic and Transport	Marine delivery of construction material.
Accidents and Natural Disasters	Screened out of further assessment.
Climate Change	Proposed scheme has been designed to take account of climate change and would minimise effects to climate change using best practice measures.
Population and Human Health	Assessment on air quality and noise being undertaken. No other significant effects to population and human health anticipated.
Tourism and recreation	No significant effects to tourism and recreation anticipated.
Existing Infrastructure and Other users	No existing infrastructure would be affected. Potential impacts to other users would be temporary and managed through consultation.
Waste	Construction waste managed using a SWMP. No new or significant waste streams anticipated.
Socio-economics	The proposed scheme is considered to have a beneficial impact on the socio-economics of Holyhead by ensuring the continued protection of the town and Port. No further assessment is considered necessary.

12.1.2 Impact Assessment

An EIA provides an assessment of the potential impacts on sensitive receptors as a result of a proposed scheme's effects upon the environment. For each potential impact, the assessment will identify each receptor's sensitivity to change and the magnitude of the impact on that receptor. It is not always possible to assess impacts from specific construction methods as they are not always known. In these instances, the impacts will be assessed against either a range of potential construction methodologies or using the construction method that is anticipated to result in the most significant impacts, to ensure all options for the construction of the proposed scheme are assessed.

Each impact will be defined as direct, indirect, or cumulative, any inter-relationships present, whether it is a temporary or permanent impact and if it is a beneficial or adverse impact, local, regional or national. If the resultant impact assessed is considered to be 'significant', then further options for mitigation may be required. The following sections outline the approach that will be undertaken to impact assessment.

12.1.3 Sensitivity of Receptor

The sensitivity of a receptor is the level at which that receptor has the capacity to change and adapt to identified impacts and the level at which it has the ability to recover. This is informed through the baseline information gathering within the EIA process. **Table 12-3** defines the level of sensitivity of receptors.

Table 12-3 The sensitivity of receptor

Sensitivity	Definition
High	Individual receptor has very limited capacity to avoid, adapt to, accommodate or recover from the anticipated impact.
Medium	Individual receptor has limited capacity to avoid, adapt to, accommodate or recover from the anticipated impact.
Low	Individual receptor has some tolerance to avoid, adapt to, accommodate or recover from the anticipated impact.
Negligible	Individual receptor is generally tolerant to and can accommodate or recover from the anticipated impact.

12.1.4 Magnitude of Effect

The magnitude of effect relates to the level at which the receptor will be impacted using the duration of the impact, timing, scale, size and frequency to determine the magnitude of the impact to each receptor. The definitions of magnitude (**Table 12-4**) be used as a guide only and may be more specific for some receptors (for example marine mammals).

Table 12-4 The magnitude of effect

Magnitude	Definition
High	Spatial & Temporal Extent: the impact will occur over a large spatial scale and/ or over a long time period or create a permanent change. Intensity: the impact occurs repeatedly or continuously and/ or at a high level of intensity.
Medium	Spatial & Temporal Extent: the impact will occur over a local to medium spatial scale and/ or over a short to medium time period. Intensity: the impact occurs at a medium to high frequency (or repeatedly/ continuously for a moderate length of time) and/ or at a moderate level of intensity (or occurring occasionally/ intermittently for short time frames at a moderate to high intensity).
Low	Spatial & Temporal Extent: the impact will occur with the development site or on a small spatial scale and/ or over a short time period and create a temporary change. Intensity: the impact occurs occasionally/ intermittently for a short period of time and/ or at a low level of intensity.
Negligible	Spatial & Temporal Extent: the impact will occur over a very localised spatial scale and/ or will occur over a very short time period or create a temporary change.

12.1.5 Impact Matrix

The significance of the impact on each receptor is determined by a combination of the sensitivity of receptor and the magnitude of impact using an 'Impact Matrix'. Once both the sensitivity and magnitude of an impact to a receptor have been identified the impact matrix set out in **Table 12-5** below will be used to determine the significance of that impact. Potential impacts should always be assessed on the basis of the worst-case scenario in order to assess and mitigate to the highest possible level of impact.

Table 12-5 Impact matrix used for the assessment of impacts

Magnitude of Effect	Receptor Sensitivity			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

Impacts defined as either 'Major' or 'Moderate' as a result of the above process will be considered as significant. Where significant impacts are identified, the impact must be reduced through mitigation to below the level of significance wherever possible.

12.1.6 Mitigation

Mitigation can be implemented either through the project design process or through additional specific measures such as; avoidance of the receptor, reduction of impact, compensation, remediation or enhancement. Once mitigation measures have been proposed, the impact will again be assessed to determine the new significance of impact; these are the residual impacts. Potential monitoring of those impacts would also be set out in order to monitor and assess the actual impacts to receptors and/ or to conform to legal requirements of the developmental consent of the project.

12.2 Consideration of Alternatives

In accordance with Article 5 of the EIA Directive, the ES will include a description of the main alternatives considered by the applicant and an indication of the main reasons for selecting the preferred option, taking into account the environmental effects of the alternatives. This section of the ES helps to justify the selection of the preferred option(s) to be taken forward.

12.3 Consultation Process

It will be necessary to engage with stakeholders throughout the EIA process with the aim of ensuring that all relevant stakeholders with the potential to be impacted by the proposed scheme are consulted.

Key stakeholders will be identified through a stakeholder mapping exercising. The likely key stakeholders that will be included in all consultations are: the MMO, NRW, Isle of Anglesey County Council, Cadw, RSPB Cymru, Holyhead Town Council, Gwynedd Archaeological Trust, The Crown Estate, North Wales Wildlife Trust, Holyhead Coastguard, Holyhead Marina, various users of sea around Holyhead (such as Holyhead Sailing Club and Anglesey Divers, local fishermen and the local communities).

12.4 Preparation of the Environmental Statement

The ES is a formal document that presents the findings of the EIA process. The ES will take the form of:

- **Project Introduction** – including a statement of need and a description of the EIA process, with details on Screening, Scoping, consultation and impact assessment methodology;
- **Project Description** – a detailed description of the construction and operational phases of the proposed scheme, including the alternatives considered and reasons for selection preferred project;
- **Baseline Environment** – detailed description of the existing environment for all environmental parameters identified as requiring further assessment during the Scoping stage;

- **Impact Assessment** – detailed description of the potential impacts of the proposed scheme (both positive and negative), mitigation measures and residual impacts for all environmental parameters;
- **Summary of Findings** – a summary table detailing the predicted impacts and residual impacts following mitigation;
- **A list of references** of information and publications cited in the ES; and,
- **Appendices** – survey information and supplementary report that may be produced during the EIA process.

13 References

Anglesey Nature (2019). Holy Island Coast SSSI. Available at: <http://www.angleseynature.co.uk/WEBMAPS/glannauydesc.htm>. [Accessed on: 12/03/2019]

Baines, M.E. and Evans, P.G.H. (2012) Atlas of the marine mammals of Wales. CCW Monitoring Report No. 68, pp 139

Black and Veatch, (2009). Holyhead Breakwater Environmental Scoping Report. September 2009.

Cadw (2019). Record. Available online at: <http://historicwales.gov.uk/#zoom=0&lat=300000&lon=258000&layers=BFFFFFFFTTTT> [Accessed 25/04/2019].

Conygar Holyhead. (2020). Holyhead Waterfront Regeneration Scheme. Environmental Statement Volume 2 – Main Report. Document 2485-01/HOLYHEAD WATERFRONT S73.

DfT (2018a) Port and domestic waterborne freight statistics. Available at URL: <https://www.gov.uk/government/statistical-data-sets/port-and-domestic-waterborne-freight-statistics-port>. [Accessed on: 14/12/2018]

DfT (2018b) Sea Passenger Statistics: Table SPAS0101. Available at URL: <https://www.gov.uk/government/statistics/sea-passenger-statistics-all-routes-2017-final>. [Accessed on: 18/12/2018]

Heinänen, S. & Skov, H. (2015). The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area, JNCC Report No.544 JNCC, Peterborough.

Holt, R.H.F. (2018). *Didemnum vexillum*: survey of distribution and extent in Holyhead Harbour after storm Emma, October 2018. NRW Evidence report no. 306. 48 pp.

IAQM. (2016). Guidance on the assessment of dust from demolition and construction. Version 1.1.

IFRC (2018). Red Cross's Disaster and Crisis Management Guidance. Available at <https://www.ifrc.org/PageFiles/91314/1209600-DM-Position-Paper-EN.pdf>. Accessed [30/03/2020]

IoACC (2019) Anglesey Area of Outstanding Natural Beauty (AONB). Available at: <https://www.visitanglesey.co.uk/en/about-anglesey/aonb/> [Accessed on: 31/05/2019]

Isle of Anglesey County Council (2013) Holyhead 2020: Realising Sustainable Community Benefit. Stage 2 submission to The Welsh Government Vibrant and Viable Places Programme.

NRW (2015a). Marine Character Areas MCA 7: Holyhead Bay and the Skerries. Available online: <https://naturalresources.wales/evidence-and-data/maps/marine-character-areas/?lang=en> [Accessed on: 31/05/2019]

NRW (2017) Habitat Mapping for Conservation and Management of the Southern Irish Sea (HabMap). Available at: <http://lle.gov.wales/catalogue/item/HabitatMappingForConservationAndManagementOfTheSouthernIrishSeaHABMAP/?lang=en>



Royal Haskoning. (2012) West of Wales Shoreline Management Plan 2: PDZ17 Holy Island and West Anglesey. June 2012.

Royal HaskoningDHV. (2019). Holyhead Breakwater Refurbishment Scheme. EIA Screening Report Document number PB9014-RHD-ZZ-XX-RP-Z-0062. July 2019.

Royal HaskoningDHV (2015). Morlais Tidal Demonstration Array Scoping Report. April 2015.

Royal HaskoningDHV (2017) Coastal Risk Management Programme – Outline Business Case: Holyhead Breakwater. Version 1. 14th June 2017

RPS (2016). Salt Island, Holyhead: Survey of Breeding Birds 2016. Report to Stena Sealink Ports Ltd.

Welsh Government (2019). Welsh National Marine Plan. Number: WG37346



Royal HaskoningDHV is an independent, international engineering and project management consultancy with over 138 years of experience. Our professionals deliver services in the fields of aviation, buildings, energy, industry, infrastructure, maritime, mining, transport, urban and rural development and water.

Backed by expertise and experience of 6,000 colleagues across the world, we work for public and private clients in over 140 countries. We understand the local context and deliver appropriate local solutions.

We focus on delivering added value for our clients while at the same time addressing the challenges that societies are facing. These include the growing world population and the consequences for towns and cities; the demand for clean drinking water, water security and water safety; pressures on traffic and transport; resource availability and demand for energy and waste issues facing industry.

We aim to minimise our impact on the environment by leading by example in our projects, our own business operations and by the role we see in “giving back” to society. By showing leadership in sustainable development and innovation, together with our clients, we are working to become part of the solution to a more sustainable society now and into the future.

Our head office is in the Netherlands, other principal offices are in the United Kingdom, South Africa and Indonesia. We also have established offices in Thailand, India and the Americas; and we have a long standing presence in Africa and the Middle East.



royalhaskoningdhv.com