

Note

**HaskoningDHV UK Ltd.
Industry & Buildings**

To: Natural Resources Wales Marine Licencing Team
From: Royal HaskoningDHV
Date: 28 February 2022
Our reference: PB9014-RHD-ZZ-XX-NT-C-0226
Classification: Project related
Checked by: Jamie Gardiner

**Subject: Response to comments on the Holyhead Breakwater Re3furbishment
Scheme Marine Licence Application**

Natural Resources Wales (NRW) has provided comments made on the Marine Licence application, submitted by Royal HaskoningDHV on behalf on Stena Line Ports Ltd (reference: CML2143, 25 October 2021), relating to the proposed Holyhead Breakwater Refurbishment Scheme. This note provides responses to the comments made where further information was requested, namely on Local Biodiversity, Flood Risk. The comments, together with the Applicant's response, are presented in the below table.

In response to the requirement to produce an outline Biosecurity Risk Assessment, this has been provided as a separate report (ref: PB9014-RHD-ZZ-XX-RP-C-0225) and issued alongside with this note.

Reference	Topic	Comment	Applicants Response
Local Biodiversity			
Given the features of relevance to this topic are all above Mean High Water Spring, it is considered that these comments should apply to the planning application rather than the marine licence; however, for transparency we have included our responses below.			
CML2143 – Holyhead Breakwater Refurbishment NRW 25/10/2021 Section 4 - Local Biodiversity	Local Biodiversity	The LPA Ecological Adviser (LPA EA) is generally in agreement with much of the evaluation and proposed action, however concerns have been raised in a number of areas, and clarification is required. The LPA EA consultation response has been attached to me email. Can you please address the comments and clarification requested in section 4 of their response letter relating to the Protection of Local Biodiversity.	See below for responses to all the LPA in relation to the protection of local biodiversity.
CML2143 – Holyhead Breakwater Refurbishment IoACC 13/10/2021 Section 4 – Local Biodiversity	Reptiles	13.5.4.6 Reptiles: It is stated that two species were recorded in the phase 1 habitat survey (EP1HS). Comment: In order to understand the significance of this, these records need to be related to the proposal – where were they and how far away are they?	Records of reptiles within the study area were identified through a desk-based assessment of existing ecological surveys undertaken for the adjacent Holyhead Waterfront Development Scheme (Royal HaskoningDHV, 2019a ¹ , uploaded with this note). Common lizard <i>Zootoca vivipara</i> were recorded on two occasions during a site survey (16 th September 2019) at 29m and 33m south-west from the proposed scheme boundary. Both records were located within an area of semi-improved grassland immediately adjacent to a dense gorse stand that extends the south façade of Soldier’s Point House’s northern perimeter wall.

¹ Royal HaskoningDHV (2019a), Reptile Survey. Holyhead Waterfront Development. Reference: PB8909-RHD-ZZ-XX-RP-Z-007.

Reference	Topic	Comment	Applicants Response
			The closest record of Slow worm <i>Anguis fragilis</i> was 261m south-east from the proposed scheme boundary, in an area of bare ground adjacent to poor semi-improved grassland and tall ruderal species.
	Invasive Species	13.5.4.9 Invasive Species: Notes have been included with respect to recording of Japanese knotweed in the study area, but again, this needs to be better clarified as to where and how significant the record(s) are for the proposal.	<p>Records of Japanese knotweed <i>Fallopia japonica</i> within the study were identified through a desk-based assessment of existing ecological surveys undertaken for the adjacent Holyhead Waterfront Development Scheme (Royal HaskoningDHV, 2019a¹).</p> <p>The Holyhead Waterfront Development Ecological Report (Royal HaskoningDHV, 2019b²) identified a small stand of Japanese knotweed (consisting of several young shoots, covering <1m² based upon a review of available photographs) at the location indicated in Figure 13-1 (TN2). The stand of Japanese knotweed is located at the landward edge of Soldier's Point within the scheme boundary, in the south-east of the site.</p> <p>Given the location, at the edge of Soldier's Point, and limited extent of the Japanese knotweed stand, it is not considered significant for the proposal. With appropriate biosecurity measures, such as fencing the area and preventing access and toolbox talks for construction workers, the risk of this species spreading is negligible. It is proposed that this would be included in the Construction Environmental Management Plan (CEMP).</p>
	Reptiles	13.6.6.3 Reptile: This refers to precautionary vegetation removal and dismantling of any potential refugia present in the site. Comment: It is unclear whether there are any such features in the proposal	No refugia were identified in the proposed works area as part of the Holyhead Waterfront Development Ecological Report (Royal HaskoningDHV, 2019b ² , uploaded with this note). As a precaution, a pre-construction

² Royal HaskoningDHV (2019b), Holyhead Waterfront Development Ecology Report. Reference PB8908-RHD-ZZ-XX-RP-Z-008.

Reference	Topic	Comment	Applicants Response
		area or not. However, unmitigated removal would lead to loss of biodiversity (or at least biodiversity potential). There needs to be a way of replacing/restoring such features, but the lack of clarity over their possible existence is unhelpful and needs to be clarified.	ecological walkover is proposed to be undertaken to confirm that there remains no refugia. If refugia are found to be present onsite, these would be dismantled and removed by a suitably qualified ecologist and reinstated post construction. This will be considered as part of the CEMP.
	Local Wildlife Sites	13.6.3 Local Wildlife Site: noted recommendation for reducing impacts 'may' include directing light away from the site. Comment: There should be a firm statement as to whether or not this should be done	Comment noted. Lighting would be directed away from the local wildlife site. This will be considered as part of the CEMP.
	Local Wildlife Sites	Table 13-9 includes specifying the fencing off of a buffer zone between the LWS and Soldier's Point quay works area. This area should be defined on proposal plans for agreement.	As the contractor requirements onsite are currently unknown, the location of the fencing cannot be confirmed. It is proposed that the location of the fencing would be determined as part of the CEMP produced by the chosen contractor.
	Invasive Species	13.6.6.4 Dispersal of Invasive Species: advises invasive species survey and management plan ahead of the works phase. Comment: such a plan and action are not dependant on the present permission, and it is advised that this should be actioned as soon as possible. There should not be doubt about possible presence of invasive in any of the areas in and near to the proposal.	The Phase one habitat survey of Soldiers Point (Royal HaskoningDHV, 2019b ²) identified Japanese knotweed onsite, located at the landward edge of Soldier's Point within the scheme boundary, in the south-east of the site. An invasive species survey would be undertaken prior to construction to determine whether the Japanese knotweed stand has spread and to provide specialist guidance on the management of this species during the construction phase, if required. This will be considered as part of the CEMP.

Reference	Topic	Comment	Applicants Response
	Ecological Enhancement	Enhancement: in view of the Council's duty under the Environment Wales Act (2016) to seek to maintain and enhance biodiversity whilst carrying out its functions, and instructions from the Chief Planner to Heads of Planning (Oct 2019) on application of this duty in planning cases The Council requests that habitat improvements are secured as part of the application to be agreed in an Ecological Enhancement Plan, with a chapter to include land-based biodiversity.	It is proposed that this will form a condition to the planning permission.
Coastal Defence and Flood Risk			
CML2143 – Holyhead Breakwater Refurbishment. NRW 25/10/2021 Section 5 – Flood Risk	Flood Risk	<p>NRW TE recognise any repairs or upgrading to the breakwater will in general have a beneficial impact on flood risk to the marina during the most prevalent weather conditions at this location and as such we would welcome these measures.</p> <p>However, while the development would not be considered typical development, as Figure 2 contained in TAN 15, it is unclear why the Extreme Water Level taken from the Coastal Flood Boundary Data Set has used the T150 value (3.87m AOD) rather than the T200 value (3.91m AOD) and also why climate change over the next 50 years only has been considered rather than 75 years.</p> <p>TAN15 advises that a proposed development must provide a safe and secure working environment throughout its life and an assessment should include a flood event which has a 0.1% probability of occurrence in any year.</p> <p>The Chief Planning Officer letter from Welsh Government, dated 9 January 2014, affirms this</p>	<p>It is worth noting that the breakwater refurbishment works are intended to be placed in the intertidal zone and are designed specifically to be submerged and subjected to wave action.</p> <p>The water level considered in the flood consequences assessment (FCA) was +4.44mAOD. This included an extreme water level with a return period of 100 years (+3.87mAOD), combined with allowances for skew surge and sea level rise (both with a 50 year return period) of +0.037m and +0.53m respectively.</p> <p>In light of NRW's comments, the FCA has been revised to consider a water level of +4.82mAOD. This includes an extreme water level with a return period of 200 years (+3.91mAOD), combined with allowances for skew surge and sea level rise (both with a return period of 75 years) of 0.051m and +0.90m respectively. This satisfies the requirements of the TAN15 guidance.</p> <p>The revised FCA can be seen in Appendix A of this note.</p>

Reference	Topic	Comment	Applicants Response
		<p>point. As the CPO letter advises, the lifetime of development for other development is 75 years.</p> <p>Therefore, it is necessary to take account of the potential impact of climate change over the lifetime of development. Sections 7.4 and 7.5.4 of the EIA do not indicate any justification or reasoning in relation to the above point. On this basis we advise that these points are addressed.</p>	<p>The relevant updated sections are 4.7 and 4.8. The conclusions of the assessment are unchanged, and the tidal flood risk remains low.</p>

Appendix A

Revised Flood Consequences Assessment

AMBIENTAL

ENVIRONMENTAL ASSESSMENT

TAN15 Flood Consequence Assessment

PROJECT NUMBER: 5937

HOLYHEAD BREAKWATER



Document Issue Record

Project: 5937

Prepared for: Isle of Anglesey County Council (IoACC)

Reference: 5937-FCA-01

Site Location: Holyhead harbour

Proposed Development: The Isle of Anglesey County Council (IoACC) are intending to undertake the refurbishment of Holyhead Breakwater that is capable of providing a long-term, robust tidal flood defence to the Port of Holyhead.

Consultant		Date	Signature
Author	Steven Brown	15/12/2020	
Document Check	Lydia Sayers	16/12/2020	
Authorisation	Steven Brown	17/12/2020	
Revised (4.7, 4.8 & 4.9)	Peter Simpson	29/07/2021	

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1. Introduction

- 1.1 The Isle of Anglesey County Council (IoACC) are intending to undertake the refurbishment of Holyhead Breakwater that is capable of providing a long-term, robust tidal flood defence to the Port of Holyhead.
- 1.2 The existing breakwater is a historic, grade II* listed structure, originally constructed in 1875. It is formed by a rubble mound which is largely submerged, with a width exceeding 100m. The mound is topped by a vertical structure formed from blockwork walls containing rocky fill.
- 1.3 The indicative redline boundary is provided in Figure 1. The exact site footprint would be dependent on the boundary of extent of the existing breakwater relative to the interface with the natural seabed.

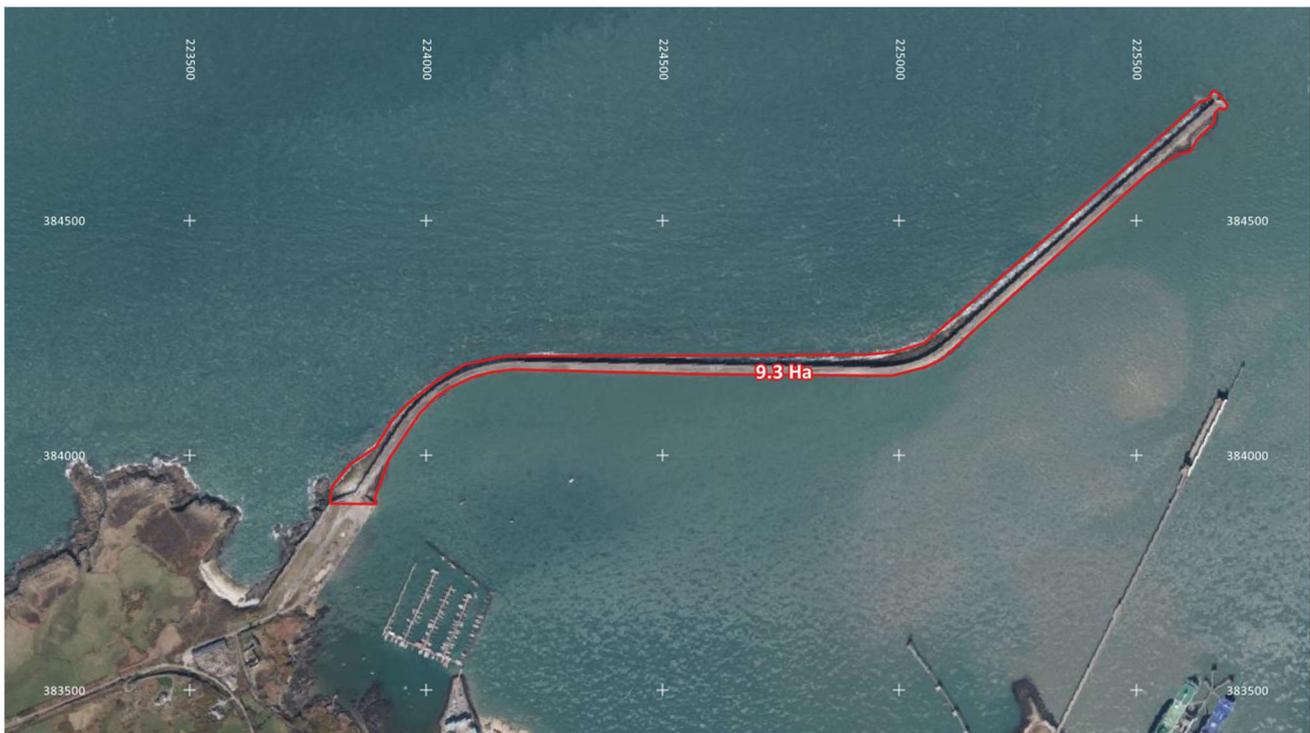


Figure 1: Site Location Plan (contains Bing Virtual Earth Data)

- 1.4 The purpose of this document is to provide a TAN-15 Flood Consequence Assessment (FCA) to support the planning application for the proposed improvements to the breakwater.
- 1.5 This report has been written in accordance with the requirements of Technical Advice Note 15 (TAN 15, 2004), Climate Change Allowances for Planning Purposes (2016)¹, Flood Risk in Anglesey: Be Prepared (2013)², Strategic Flood Consequence Assessment (Level 1, 2013)³, and the Statutory SuDS Guidance⁴.

¹<https://gweddill.gov.wales/topics/planning/policy/policyclarificationletters/2016/c-03-16-climate-change-allowances-for-planning-purposes/?lang=en>

²<https://www.anglesey.gov.uk/documents/Docs-en/Highways/Flooding/Flood-Risk-in-Anglesey-be-prepared.pdf>

³<https://www.anglesey.gov.uk/documents/Docs-en/Planning/Planning-policy/Local/Supporting/Topic-Paper-8-Strategic-Flood-Consequences-Assessment-Level-1.pdf>

⁴<https://gweddill.gov.wales/topics/environmentcountryside/epa/flooding/drainage/?lang=en>

Development Proposals

1.6 A copy of the development proposals are provided as Figure 2 below, and are generally for the reinforcement and upgrading of the existing Holyhead Breakwater.

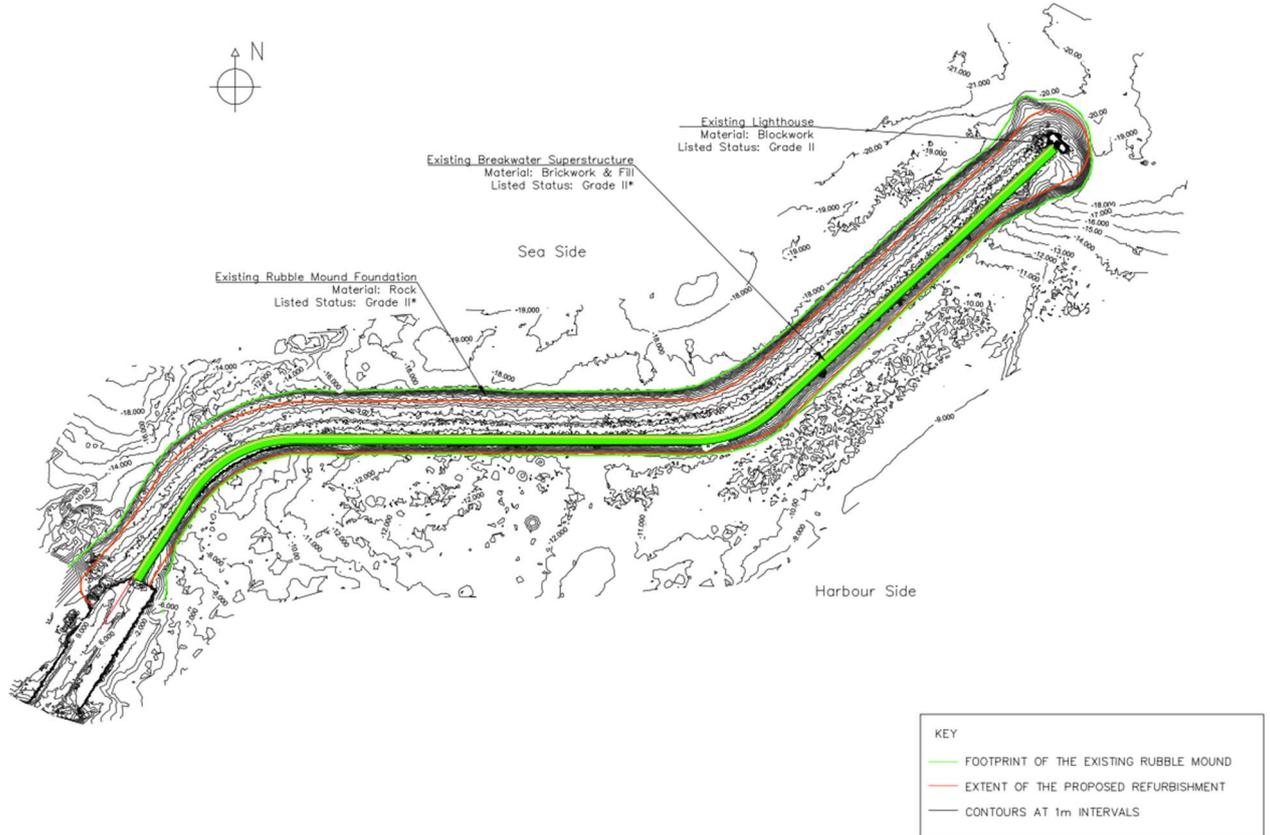


Figure 2: Development Proposals (Architects Masterplan)

Topography

1.7 The site is formed of an artificial breakwater that extends into the North Sea. Ground levels extend from below sea level to the current breakwater level.

2. Development Advice Map Classification

- 2.1 Under TAN15 (see Figure 4), flood risk should be considered when considering new developments, and should direct new developments away from those areas which are at high risk of flooding. Where development has to be considered in high risk areas (zone C), only those developments which can be justified on the basis of the tests outlined in section 6 and section 7 can be located within such areas.

Description of Zone		Use within the precautionary framework
Considered to be at little or no risk of fluvial or tidal/coastal flooding.	A	Used to indicate that justification test is not applicable and no need to consider flood risk further.
Areas known to have been flooded in the past evidenced by sedimentary deposits.	B	Used as part of a precautionary approach to indicate where site levels should be checked against the extreme (0.1%) flood level. If site levels are greater than the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further.
Based on Environment Agency extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal)	C	Used to indicate that flooding issues should be considered as an integral part of decision making by the application of the justification test including assessment of consequences.
Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.	C1	Used to indicate that development can take place subject to application of justification test, including acceptability of consequences.
Areas of the floodplain without significant flood defence infrastructure.	C2	Used to indicate that only less vulnerable development should be considered subject to application of justification test, including acceptability of consequences. Emergency services and highly vulnerable development should not be considered.

Figure 3: Composition and use of Development Advice Map Zones (Figure 1 TAN15)

- 2.2 An excerpt (Figure 5) indicates that the site lies in Zone C2 (Blue) as indicated on Figure 5. Due to the limitations of the mapping (extending only a short distance offshore) the majority of the breakwater is indicated to be in Zone A.

3. Climate Change Allowances

- 3.1 The Welsh Government in 2016, published updated climate change allowances for use in Planning Purposes. The advice is split between different regions (Figure 7), with the proposed development located in the ‘Western Wales’ River Basin District.

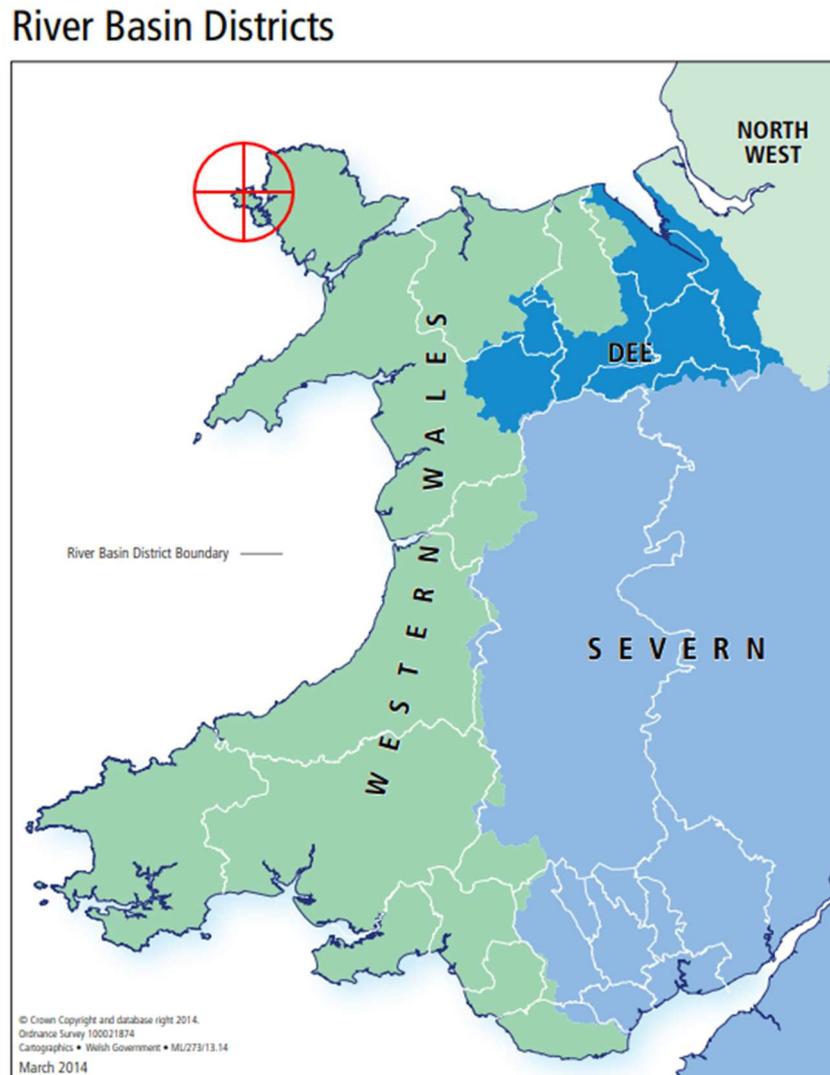


Figure 7: River Basin Districts

- 3.2 The climate change guidance indicates that for River Flows a 25% increase should be allowed for, based on the application of the Central Estimate (Change Factor). Furthermore, the guidance identifies that based on a 2008 reference year sea level, an allowance of approximately 300mm should be allowed for when considering the potential change in sea levels, as a result of climate change over the next 50 years.
- 3.3 The impacts of climate change on the flood risk profile are discussed under the relevant sections below.
- 3.4 As part of the design of the breakwater, a detailed model of the tidal processes has been developed and this has been used to derive the design flood levels for the breakwater refurbishment.

4. Site Flood Hazards

Causes of flooding

4.1 Generally, the most common forms of flooding are as follows:

River flooding that occurs when a watercourse cannot cope with the water draining into it from the surrounding land. This can happen, for example, when heavy rain falls on an already waterlogged catchment.

Coastal flooding that results from a combination of high tides and stormy conditions. If low atmospheric pressure coincides with a high tide, a tidal surge may happen which can cause serious flooding.

Surface water flooding which occurs when heavy rainfall overwhelms the drainage capacity of the local area. It is difficult to predict and pinpoint, much more so than river or coastal flooding.

Sewer flooding that occurs when sewers are overwhelmed by heavy rainfall or when they become blocked. The likelihood of flooding depends on the capacity of the local sewerage system. Land and property can be flooded with water contaminated with raw sewage as a result. Rivers can also become polluted by sewer overflows.

Groundwater flooding that occurs when water levels in the ground rise above surface levels. It is most likely to occur in areas underlain by permeable rocks, called aquifers. These can be extensive, regional aquifers, such as chalk or sandstone, or may be more local sand or river gravels in valley bottoms underlain by less permeable rocks.

Mechanisms of Flooding

4.2 The NRW Development Advice Map indicates the site to be located within Zone C2 (areas without significant flood defences). Table 1 summarises the potential sources of flooding to the site.

4.3 The proposed development is not within an area that is considered to currently benefit from flood defences.

Source	Description
Historic	No historic records identified.
Fluvial/Tidal	Flood Zone C2
Surface	Discreet areas are at risk of surface water flooding attributable to offsite flows.
Groundwater	The risk of groundwater flooding is low.
Sewer	Low risk of sewer flooding.

Table 1 Summary of flood sources.

Records of Historical Flooding

- 4.4 The Natural Resources Wales Historic flood extent outline does not indicate any records of flooding having occurred at the site.
- 4.5 The Anglesey Strategic Flood Consequences Assessment indicates one historic flood event; however, this is not in close proximity to the site and was recorded in 1907.

Fluvial/Tidal Flood Risk

- 4.6 According to the Development Advice Maps the site is partially located in Flood Zone C2.
- 4.7 The development will improve an existing coastal flood defence by refurbishing Holyhead Breakwater. All the refurbishment materials are rock armour / concrete armour and have been selected / designed to function in a submerged / inter-tidal environment. There will be no access for vehicles or pedestrians (neither public nor staff) to the refurbishment. The refurbishment is designed to be partially or fully submerged without suffering damage or inconvenience and therefore will not be negatively impacted by tidal flooding or sea level rise. Therefore whilst the probability of flooding is certain, the impact of flooding on the proposed development is zero. In accordance with TAN15 guidance, the Extreme Water Level considered in drafting this assessment is +4.88mAOD, derived as follows:

UK Coastal Flood Boundary Conditions 2011 - Point ID 1014, Return period 200 years, Extreme Water Level = +3.93mAOD

+ 75 years of skew surge [UKCP18] = 0.051m

+ 75 years of sea level rise [UKCP18] (95% confidence) = 0.90m

- 4.8 This development has no impact on tidal flooding of the adjacent existing breakwater. However, this refurbishment will reduce the risk of inundation of the existing breakwater due to wave overtopping. Small-scale physical model tests have demonstrated that the refurbishment can reduce wave overtopping of the breakwater tenfold when compared to the existing situation. This will likely result in less frequent / less severe inundation of the lower promenade. Furthermore, by protecting the existing breakwater this development will allow for the continued beneficial sheltering of the adjacent coastline from waves and associated overtopping.
- 4.9 On this basis, the tidal flood risk is assessed to be low.

Surface Water (Pluvial)

- 4.10 The NRW Risk from Surface Water Flood Mapping, see Figure 8, shows the site to contain discreet areas with high to low risk of surface water flooding, which are not considered to pose a significant flood risk to the proposed development.
- 4.11 As the proposal is offshore, surface water can run-off into the sea, and as such no specific mitigation measures are considered necessary.



Figure 8: Surface Water Flood Risk Map. (Source: Natural Resources Wales)

Groundwater

4.12 Groundwater flooding is the emergence of groundwater at the ground surface or into subsurface voids or structures, arising as a result of:

- abnormally high groundwater heads or flows;
- the introduction of an obstruction to groundwater flow; or
- the rebound of previously depressed groundwater levels.

4.13 Groundwater flooding most commonly occurs in unconfined aquifers; either major aquifers from which considerable amounts of water can be discharged or in shallow permeable sediments. Flooding locations are typically near areas of natural groundwater discharge such as river valleys and spring lines.

4.14 In order to provide adequate flood defence to the site from the risk of tidal flooding, it is proposed to raise ground levels across the site. This would also provide adequate mitigation for the risk of groundwater flooding.

4.15 The site is formed of made ground raised above the seabed and the proposals are to raise levels further, which will result in a reduction in the risk of groundwater flooding and no further mitigation measures are anticipated.

Sewer

4.16 Sewer flooding is usually associated with a failure (blockage or collapse) or a lack of sewer capacity to convey the surface water flood event. The long-term flood risk from surface water map provides an

indication of the likely direction of flows resultant from sewer flooding. A sewer failure could occur at any point on the network and is considered to be a residual risk.

- 4.17 However, as the site is offshore, sewer flooding is assessed to be Very Low and no further mitigation measures are necessary for the Proposed Development.

5. Surface Water Management Strategy

5.1 A central component of sustainable surface water management is to demonstrate how the increases in impermeable surfaces, and the associated increases in surface water run-off will be mitigated. Fundamentally it needs to demonstrate that:

- The total rate of surface water discharged from the site will not be greater post-development than it was pre-development; and,
- The water quality discharged from the site, will not be polluted by particles and other material mobilised from the ground surfaces as a result of rainfall events.

5.2 The above objectives are achieved through the provision of surface water storage (attenuation) and the provision of Sustainable Drainage Systems (SuDS). Surface water run-off generated by development sites, where impermeable surface areas are increased, have the potential to exacerbate flood risk to others, by increasing the peak rate of surface water discharged from the Site.

5.3 As the proposals are for a refurbishment of an existing offshore flood defence, any surface water accumulating on the site should be allowed to gravitate into the sea. It is considered that no specific management measures need be included within the proposals.

6. Residual Risks

Identification of Residual Risks

6.1 Residual risks are those remaining after applying the sequential approach to the location of development and taking mitigating actions. Examples of residual flood risk include:

- the failure of flood management infrastructure such as a breach of a raised flood defence, blockage of a surface water conveyance system, overtopping of an upstream storage area, or failure of a pumped drainage system;
- failure of a reservoir; or,
- a severe flood event that exceeds a flood management design standard, such as a flood that overtops a raised flood defence, or an intense rainfall event which the drainage system cannot cope with.

Defence Breach

6.2 The proposed development is for a flood defence, therefore if the defence was to fail, there would be an increased flood risk elsewhere. Therefore, appropriate maintenance and inspection will be undertaken over the lifetime of the flood defence asset, to manage the risks associated with a breach.

Reservoir Failure

6.3 The NRW Risk from Reservoir Map demonstrates that the site is outside flood extents in the event of reservoir flooding. Therefore, the site is not at risk of reservoir flooding, and no specific mitigation measures are required.

Drainage Exceedance

6.4 The site is located offshore, and therefore is not considered to be at risk from drainage exceedance events.

Development within 3m of a Public Sewer

6.5 Based on the current information the proposed development is not within 3m of a Public Sewer, and therefore easements or diversions are unlikely to be required. However, this should be confirmed with the Public Sewer Authority, and developed as part of the detailed design.

Floodplain Compensation

6.6 Floodplain compensation is required when development proposals have the potential to displace floodwater, which could result in an increased risk of flooding to vulnerable types of land use.

6.7 Floodplain compensation is not normally required for tidal flooding, and therefore, for the proposal's floodplain compensation is not considered necessary.

Flood Risks

6.8 Based on the findings of this assessment, no specific design measures are recommended beyond those integrated into the design of the flood defence.

Impact to Flood Risk Elsewhere

6.9 The proposed development is not predicted to impact fluvial, pluvial, or groundwater flows, and as such will not alter these flood risks in the area.

6.10 The proposed development is to provide an improvement to the tidal flood defences in the area, and therefore the scheme will have a positive impact of reducing tidal flood risk to others.

7. Conclusion

- 7.1 The Isle of Anglesey County Council (IoACC) require a Flood Consequence Assessment to support the proposed refurbishment of the Holyhead Breakwater.
- 7.2 This report has been written in accordance with the requirements of Technical Advice Note 15 (TAN 15, 2004), Climate Change Allowances for Planning Purposes (2016), Flood Risk in Anglesey: Be Prepared (2013), Strategic Flood Consequence Assessment (Level 1, 2013), and the Statutory SuDS Guidance.
- 7.3 This assessment has considered the potential impacts of climate change, based on the values attributable to the Western Wales River Basin District.
- 7.4 No records of historic flooding have been determined for the site.
- 7.5 The Development Advice Maps indicate that part of the Site is in Zone C2, and is therefore considered to be at risk of tidal/fluviial flooding. As the proposals intend to reduce the tidal flood risk to the area, the proposals are considered to be compatible with the flood risk.
- 7.6 The NRW Risk from Surface Water Flood Mapping shows the site to contain discreet areas with high to low risk of surface water flooding; however, these are not considered to pose a significant risk to the development.
- 7.7 The risk of sewer flooding to the development is considered low, as is the residual risk of a breach or overtopping of the flood defences, and reservoir flooding. Due to the low risk attributable to these sources, no further flood mitigation measures are considered necessary.
- 7.8 Based on the proposed mitigation measures it is concluded that flood risk can be managed in accordance with the requirements of TAN15.

Appendix I - Supporting Information