

Legend:

- Holyhead Breakwater
- ▲ Potential Salt Island Batching Plant
- Study Area for Desk-Based Assessment
- Study Area for Settings Assessment

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

Figure: 4.1 Drawing No: PB9014-200-004

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On the 20th September 2019 a note was provided (see **Appendix A1**) to present the proposed methodology and viewpoint locations for undertaking a visual assessment and heritage settings assessment of the proposed refurbishment works for agreement with GAPS, Cadw, RCAHMW, the IoACC and NRW. Responses were received from GAPS and Cadw and 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 with the IoACC, Cadw, GAPS and RCAHMW was undertaken on the 25th March 2020 in order to present the draft findings of the heritage settings assessment and, in particular, the draft photomontages of how the proposed scheme would look from the above viewpoints (see **Section 6**). A note on the possible refurbishment options and how these would affect the heritage significance of the Breakwater was also issued prior to the meeting (see **Appendix A3**).

In summary, the collated advice from all consultation is as follows:

- There are three areas of potential archaeological impact for the proposed work:
 - 1 physical impact to the Breakwater itself;
 - 2 visual impact, i.e. change in appearance of the Breakwater; and,
 - 3 impact on nearby archaeology during pre-construction investigations and construction works.
- Item 1 has been addressed through the completion of a comprehensive building record by GAT (GAT report 1355 (**Appendix A1**));
- Item 2 (see **Section 6**) requires consideration of designated historic assets within a 3km boundary of the Breakwater to include:
 - Listed Buildings:
 - 5743 Holyhead Breakwater, Soldier's Point II*;
 - 5744 Lighthouse on Holyhead Breakwater II;
 - 5771 Customs House, Salt Island II;
 - 5772 Harbour Office, Salt Island II*;
 - 5773 George Iv Arch, Salt Island II*;
 - 14729 Zodiac Restaurant, Beach Road (N Side) II;
 - 14730 Trinity House Office, Beach Road (N Side) II;
 - 14731 Trinity Yard Large Workshop, Beach Road (N Side) II;
 - 14732 Trinity Yard Small Workshop, Beach Road (N Side) II;
 - 14755 Gunpowder Magazine, Breakwater Quarry II;
 - 14756 Cottage on corner of Pentre Pella (Including Foregarden Wall);
 - 14759 Porthyfelin House, Soldier's Point II;
 - 14760 Soldier's Point House, Solider's Point II; and,

- 14761 Screen Wall to Soldier's Point House, Soldier's Point II.
- Scheduled Monuments:
 - AN019 Caer y Twr.
- Conservation Areas:
 - Holyhead Beach.
- The settings assessment (see **Section 6**) should follow the methodology set out in the Cadw guidance Setting of Historic Assets in Wales (Cadw/Welsh Government, May 2017);
- 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;
- Item 3 (see **Section 5**) mainly requires consideration of the numerous wrecks and their shed cargo that are recorded around the Breakwater, to include records from RCAHMW, particularly to inform the placement of any anchor blocks on the seabed;
- Items 2 and 3 should also consider ancillary activities, specifically the proposed concrete batching plant location, since both the Salt Island and Soldier's Point options would have cultural heritage implications; and,
- Evidence-gathering should include a site visit.

Details of how consultation has informed the assessment and impact statement are included in the relevant sections of this report.

5 Desk-Based Assessment

5.1 Sources

In order to effectively assess impacts to archaeology and heritage, the presence of both known receptors (offshore and onshore) and the potential for previously undiscovered receptors to be present has been considered. Known receptors comprise both designated and non-designated historic assets.

The primary sources used for the DBA and settings assessment are as follows:

- Records of designated historic assets from Cadw (Cof Cymru National Historic Assets of Wales¹) including GIS datasets downloaded from the Welsh Government's Lle GeoPortal;
- Records of non-designated (onshore) historic assets from GAT Historic Environment Record (HER);
- Records of non-designated (offshore) historic assets from RCAHMW National Monuments Record of Wales (NMRW);
- Holyhead Breakwater Level 4 Building Record (GAT, 2017) (**Appendix A1**);
- Holyhead Breakwater Refurbishment Scheme Visual Appraisal (Appendix 14.1 of the EIA Report); and,
- Sources relevant to the character of the study area including:
 - Holyhead: Understanding Urban Character (Cadw, 2019);
 - Holyhead Beach Conservation Area Character Appraisal (IoACC, 2005); and,
 - Holyhead Mountain Village Conservation Area Character Appraisal (IoACC, 2005).

¹ Available at: <https://cadw.gov.wales/advice-support/cof-cymru/search-cadw-records>. Designated Historic Asset Descriptive Information, The Welsh Historic Environment Service (Cadw), 2020, licensed under the Open Government Licence <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

5.2 Designated Historic Assets

Records of designated historic assets have been downloaded from Cadw, with GIS datasets downloaded from the Welsh Government's Lle GeoPortal. The locations of designated historic assets are illustrated on **Figure 5.1** and a gazetteer is included in **Appendix A4**. There are no World Heritage Sites, Protected Wrecks nor Registered Historic Landscapes within the 3km study area.

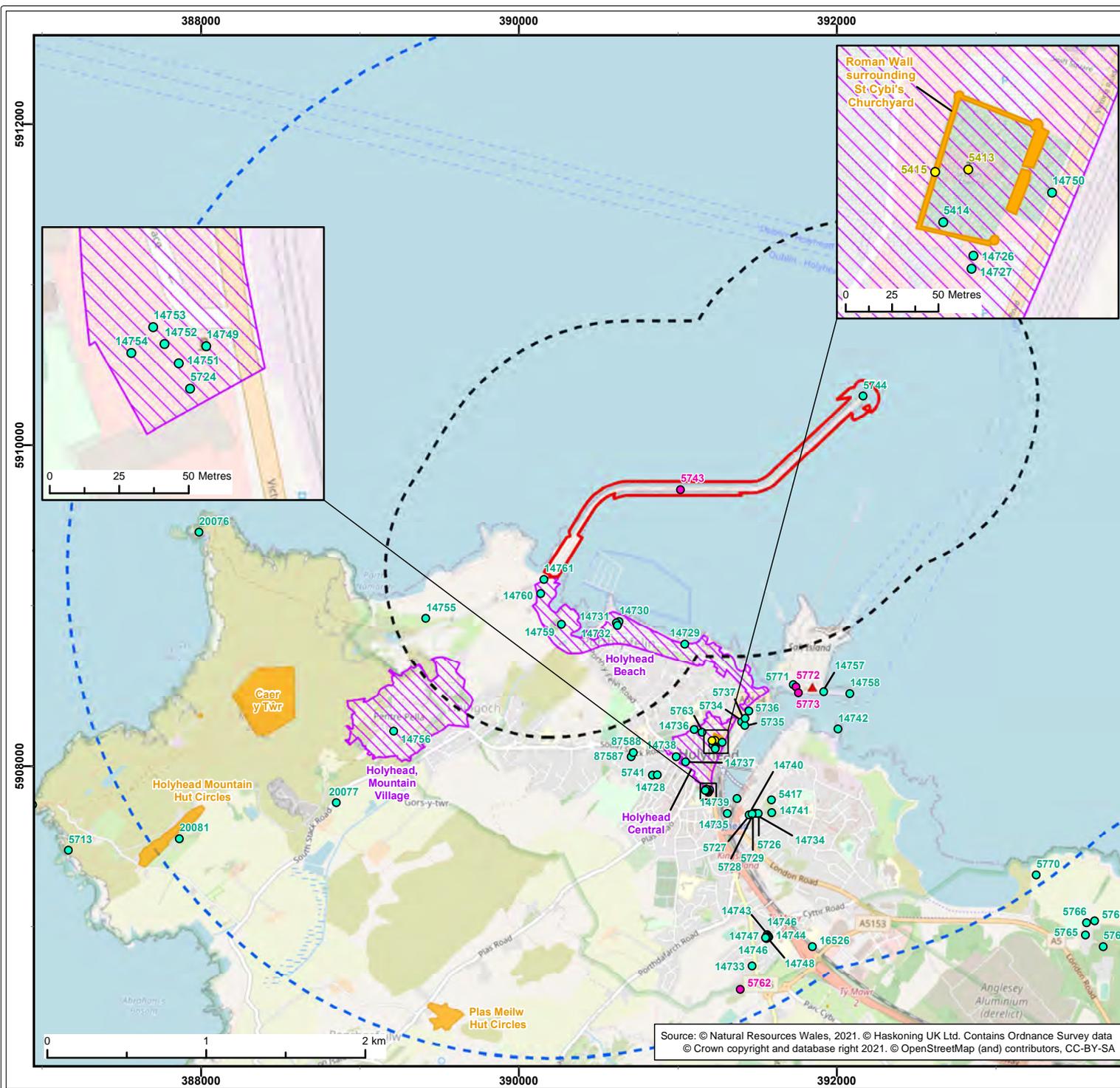
There are seven Scheduled Monuments within the 3km study area:

- AN019 Caer y Twr;
- AN147 Gogarth Bay round cairn;
- AN133 Enclosed Hut Circle Settlement at Capel Llochwydd;
- AN016 Holyhead Mountain Hut Circles;
- AN033 Plas Meilw Hut Circles;
- AN017 Penrhos Feilw Standing Stones; and,
- AN031 Roman Wall Surrounding St Cybi's Churchyard.

None of these are located within the footprint of the proposed refurbishment works, nor the batching plant and storage yard locations, and none are within the 1km DBA study area. Therefore, there will be no direct, physical impact to any Scheduled Monuments. Potential impacts to the setting of these Scheduled Monuments are considered in **Section** below.

There are 64 Listed Buildings within the 3km study area:

- Two Grade I:
 - 5413 St Cybi's Churchyard; and,
 - 5415 Walls of upper churchyard.
- Four Grade II*:
 - 5743 Holyhead Breakwater;
 - 5762 Kingsland Windmill; and,
 - 5772 Harbour Office and 5773 George IV Arch on Salt Island.
- 58 Grade II:
 - 5744 Lighthouse on Holyhead Breakwater;
 - Seven within Porth-y-felin and at Soldier's Point:
 - 14729 Zodiac Restaurant;
 - 14730 Trinity House Office;
 - 14731 Trinity Yard Large Workshop;
 - 14732 Trinity Yard Small Workshop;
 - 14760 Soldier's Point House;
 - 14761 Screen Wall to Soldier's Point House; and,
 - 14759 Porthyfelin House;



Legend:

- Holyhead Breakwater
- ▲ Potential Salt Island Batching Plant
- Study Area for Desk-Based Assessment
- Study Area for Settings Assessment
- Conservation Area
- Scheduled Monument

Listed Building Grades

- I
- II
- II*

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

Title: Designated Heritage Assets

Figure: 5.1 Drawing No: PB9014-200-005

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- 14755 Gunpowder Magazine and 20076 Former powder magazine within the Breakwater County Park;
- 14756 Cottage on corner of Pentre Pella (Including Foregarden Wall);
- 20077 Ffynnon y Wrach and 20081 Tan-y-Cytiau along South Stack Road;
- 5771 Customs House, 14757 Admiralty Pier (including Sea Wall between Salt Island Bridge and George IV Arch and 14758 Lighthouse on Admiralty Pier on Salt Island;
- 14742 South Pier (to the south of Admiralty Pier and Salt Island);
- 5770 The Battery on the headland of the Penrhos Coastal Park; and,
- 40 within, or to the South of Holyhead itself.

Only eight of the Listed Buildings are located within the 1km DBA study area but beyond the footprint of the proposed refurbishment works, batching plant and storage yard locations. Consequently there will be no direct, physical impact to any of these eight Listed Buildings:

- 14729 Zodiac Restaurant;
- 14730 Trinity House Office;
- 14731 Trinity Yard Large Workshop;
- 14732 Trinity Yard Small Workshop;
- 14755 Gunpowder Magazine ;
- 14759 Porthyfelin House;
- 14760 Soldier's Point House; and,
- 14761 Screen Wall to Soldier's Point House.

Given that the Breakwater and Lighthouse form the focus of the refurbishment works, and will require LBC, a separate heritage impact statement for these structures is included in **Section 7** below.

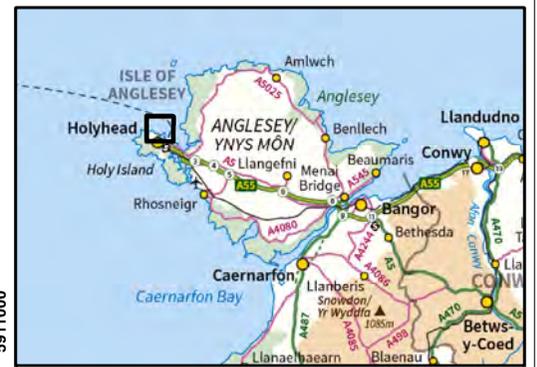
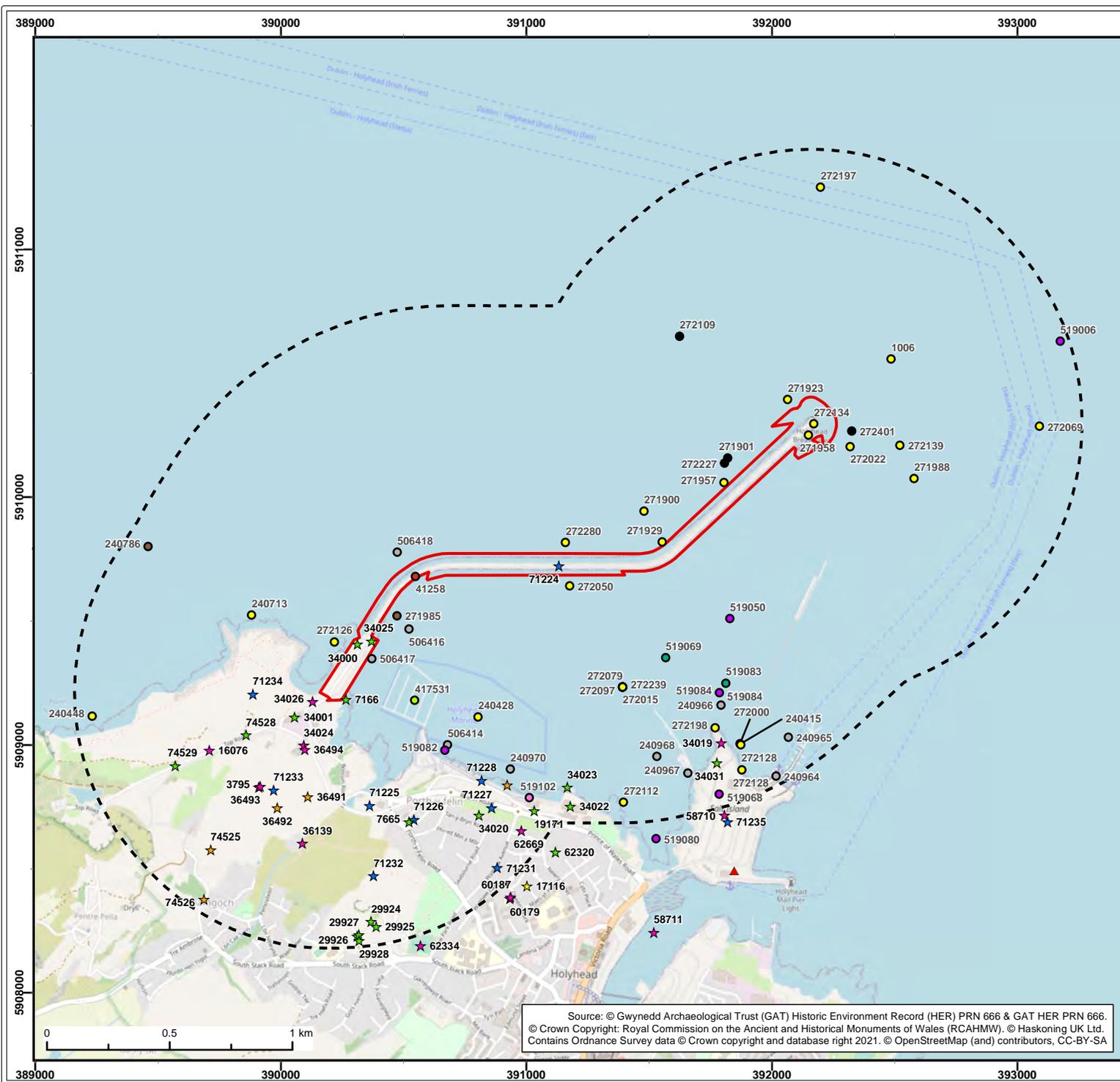
There are also three Conservation Areas within the study area: Holyhead Mountain Village, Holyhead Central and Holyhead Beach, none of which overlap with the footprint of the proposed works. These are considered further as part of the settings assessment below (**Section 6**).

5.3 Non-designated Historic Assets (Onshore)

The GAT HER records 48 non-designated historic assets above mean low water within the 1km DBA study area, comprising:

- 10 'character areas' relating to the Holyhead urban characterisation study (Cadw, 2019);
- 14 documentary references to former historic assets referenced in documentary sources, shown on aerial photographs or recorded on historic maps;
- 5 earthworks or modified surfaces;
- 1 record concerned with the settlement of Holyhead; and,
- 18 non-designated buildings or structures.

There are no non-designated historic assets recorded within the proposed location of the concrete batching plant on Salt Island. The locations of these historic assets are illustrated on **Figure 5.2** and a gazetteer is included in **Appendix A5**.



Legend:

- Holyhead Breakwater
- ▲ Potential Salt Island Batching Plant
- Study Area for Desk-Based Assessment
- ★ Character Areas
- ★ Documentary References
- ★ Earthworks or Modified Surfaces
- ★ Settlement
- ★ Building or Structure
- Breakwater
- Dead 'Wreck
- Documented Loss
- Documented Loss (Aircraft)
- Documented Navigational Aid
- Named Location
- Navigational Hazard
- New Harbour Marina
- Wreck (Finds)
- Wreck (Structure)
- Beaching Ground

GAT HER

RCAHMW

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

Title: Non-Designated Heritage Assets

Figure: 5.2 Drawing No: PB9014-200-006

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Only four of these historic assets are located within (or in close proximity to) the footprint of the proposed refurbishment works:

- Quay, Holyhead Breakwater (PRN 34000) relating to the first stage of the construction of the Holyhead Breakwater in 1847 (see Plate 01, Plate 02 and Plate 29 in **Appendix A1**);
- Structure, Breakwater Landing Stage (PRN 34025), a late 19th century small stone building located at the end of the quay (see Plate 01, Plate 02 and Plate 29 in **Appendix A1**);
- Folly, Soldier's Point (PRN 7166), a ruined stone folly with a castellated roof, arched windows and a tiled floor, the northern corner eroding onto the beach below; and,
- Battery, Soldier's Point (PRN 34026), marked on the OS 1887 map, survives as a stone front with a low opening and a mound behind.

All four of the above historic assets are located within or in close proximity to the proposed Soldier's Point storage area. As such, there may be potential for direct (physical) impact during offloading and movement of materials and concrete units. If accidental damage occurs this has the potential to be significant and is assessed fully in Chapter 15 of the EIA Report.

All other historic assets are located beyond the immediate working area and there is no potential for direct physical impact. Also, as there are no groundworks above mean low water, there is no potential for buried archaeology to be encountered onshore during the proposed scheme and this is not considered further.

5.4 Non-designated Historic Assets (Offshore)

There are 60 maritime records from the NMRW provided by the RCAHMW within the 1km DBA study area. The locations of these historic assets are illustrated on **Figure 5.2** and a gazetteer is included in **Appendix 5.4**. The 60 records can be summarised as follows:

- New Harbour Marina;
- Holyhead Breakwater;
- A Beaching Ground at Newry beach shown on a historic chart;
- Two reefs (Outer Platters and Skinners Rock) which historically acted as navigational hazards;
- Six records of former navigation aids marked on historic charts;
- A documentary record of an aircraft (NPRN 506968) a Saro London II (K6927), a British military biplane flying boat, lost in 1940 whilst attempting to land in Holyhead Harbour in deteriorating weather. The remains of the aircraft have not been found, but may be located in the vicinity;
- 41 documentary records of vessels including:
 - 31 named vessels from the post-medieval and modern periods recorded as lost in the vicinity of Holyhead. The remains of these vessels have not been found, but may be located in the vicinity; and,
 - 10 unidentified wrecks which were not subsequently found to be present at the reported locations ('DEAD' wrecks).
- The Holyhead New Harbour Named location (the function of which is for information retrieval purposes only, representing the centre of a diffuse geographical area which has the potential to include a great many wrecks and downed aircraft as suggested by repeated references to the area within documentary sources);

- Two wrecks represented by remnants of cargo:
 - Various items from the wreck named as the *Morning Star* (NPRN 240786) and lost off Anglesey in 1804 have been recovered and reported to the Receiver of Wreck, including cannon flints, and broken crockery/plates with a floral designs or blue and black stripes; and,
 - Blue and white crockery lies scattered across the seabed immediately adjacent to the Breakwater and gunflints have also been recovered, both may have been part of the general cargo of the *Star of the Sea* (NPRN 271985) which ran aground at Soldier's Point in 1873.
- Four known wrecks:
 - *Kirkmichael* (NPRN 271901), a steel-hulled barque lost 22 December 1894 after being driven against the outer wall of the Breakwater and reported to survive as wreckage in 10-12m of water, along the outer side of the Breakwater 330m from the Lighthouse, close to the wreck of the *Osseo* (NPRN 272227) although the full character and extent of archaeological remains is presently unknown;
 - *Osseo* (NPRN 272227) a steel or iron barque lost 30 December 1894 after it was caught in a gale and ran onto the Breakwater and reported to survive flat on the seabed in close proximity to the *Kirkmichael* (NPRN 271901) although the full character and extent of the archaeological remains is presently unknown;
 - HMS *Campina* (NPRN 272401) a steam trawler hired as an armed patrol vessel in September 1939 and then purchased in June 1940 lost after detonating a mine on 22 July 1940 a few yards from the Holyhead New Harbour Lighthouse. Considerable steel wreckage is reported to remain *in situ* covered in kelp, standing up to 4m high in places; and,
 - *Oria* (NPRN 272109) an iron-hulled steamship lost 7 January 1905 after a collision with the *Stella Maris* which sustained significant damage amidships and sank almost immediately. Some crew members from both ships stayed onboard the *Oria* to try to bring it into Holyhead, but finally foundered a third of a mile northwest of the Breakwater Lighthouse. The wreck is reported to have had all its superstructure removed and to have settled into the seabed. The boiler now forms the highest point above the seabed. Wooden cotton reel and fragments of plates and serving dishes have been recovered and reported to the Receiver of Wreck.

Eighteen of the above records are located within the maximum working area defined for the refurbishment works. This includes the Breakwater itself (which is addressed in **Section 7**) and 10 of the documented losses of vessels, which represent approximate locations of loss and do not (except by chance) correspond to actual remains on the seabed. These document losses are, however, indicative of the potential for further remains, which have not previously been recorded, to be present within the working area.

Three of the 18 records within the working area correspond to 'DEAD' wrecks (i.e. locations at which remains have previously been reported, but which have not subsequently been located by survey). One of these corresponds to a concrete tank barge (NPRN 506417) which sank 70m from the northeast end of Soldier's Point in May 1985, but was removed in 2002. As a recent wreck, this is not considered to be of archaeological interest. With respect to the remaining two 'DEAD' wrecks, however, remains may still be present in the vicinity of these recorded positions, however, possibly fragmentary or buried, and therefore undetectable on the surface through survey. As such, direct (physical) impact could occur, for example, with the anchoring of vessels, or the placement of jack-up spud legs at these locations.

The remaining four records within the working area are three of the four known wrecks, *Kirkmichael* (NPRN 271901) *Osseo* (NPRN 272227) and HMS *Campina* (NPRN 272401), and one of the wrecks represented by remnants of cargo, the *Star of the Sea* (NPRN 271985). It is noted in the NMRW description that for *Kirkmichael* (NPRN 271901) and *Osseo* (NPRN 272227), the full character and extent of archaeological remains is presently unknown, whilst HMS *Campina* (NPRN 272401), is represented by a considerable



amount of steel wreckage and *Star of the Sea* (NPRN 271985) is represented by blue and white crockery scattered across the seabed immediately adjacent to the Breakwater.

In order to understand more fully the potential for surviving archaeological material at these recorded locations, account has been taken of additional surveys undertaken within the study area.

A video transect survey of the leeward and seaward sides of the Breakwater was undertaken using a Remotely Operated Vehicle (ROV) and Drop-Down Video (DDV) in order to characterise the intertidal and subtidal habitats and species present on the Breakwater for the assessment of marine ecology (see Chapter 11 of the EIA report). During the survey, mixed sediments composed of bedrock, boulders, cobbles and coarse gravel were seen to be dominant across the shallower portions of the site near to the Breakwater while muddy sands and mixed sediments were dominant in the deeper waters and open areas of seafloor.

On the leeward side (see **Appendix 11.1**), the survey contractor (Carcinus Ltd) recorded the presence of abandoned / lost posts and other debris in the form of sunken boats observed by the ROV, including a small boat at the end of the Breakwater, adjacent to the roundhead (**Plate 3 in Appendix 11.1**) (a recent loss and not of archaeological interest). On the seaward side (see **Appendix 11.2**) the survey contractor (Ocean Ecology Limited) did not report any debris observed on the imagery, other than rusted chain matrix and concrete blocks present at the foot of the Breakwater structure, which are not considered to be of archaeological interest. Notably, no anthropogenic material was observed in transects in the vicinity of the recorded locations of the previously recorded wreck locations described above.

This suggests that there is a large amount of debris on the leeward side of the Breakwater and within the harbour associated with the operation of a busy port. This is further supported by sidescan sonar and multibeam data acquired by Shoreline Surveys in 2018 and 2020, on behalf of Stena, following the destruction of Holyhead Marina in March 2018 by gale force winds. These surveys show a large amount of debris, including sunken vessels, pontoon structures, mooring blocks and other associated wreckage.

Whilst historic wrecks are known to be present within the study area, therefore, no evidence of archaeological material has been observed during the video transect survey, although modern rubbish and debris has been recorded on the leeward side of the Breakwater. Furthermore, whilst there is potential for the burial of archaeological material, possibly associated with former losses reported within the study area, the potential for survival is limited by the dominance of rocks and coarse sediments closer to the Breakwater which are less conducive to the preservation of archaeological material, and the relatively shallow depths of fine sediment overlying bedrock more generally within the harbour (see Chapter 7 of the EIA report). This suggests that the potential for coherent, intact wreck structure to be preserved within the study area is limited, with greater potential for the presence of isolated finds or fragmented and dispersed wreckage.

Furthermore, as works impacting the seabed, beyond the footprint of the Breakwater, are limited to the placement of anchors or jack-up spud legs, the potential for encountering chance finds of wreck material is relatively low.

The recorded locations of wrecks beyond the working area, *Oria* (NPRN 272109) and finds from the *Morning Star* (NPRN 240786), and the 'DEAD' wrecks (NPRNs 240964, 240965, 240966, 240967, 240968, 240970, and 506414), are not anticipated to be subject to potential impact as activities are not planned to take place beyond the immediate working area.

6 Settings Assessment

6.1 Approach

The settings assessment presented below follows the approach set out in Cadw's guidance on the Setting of Historic Assets in Wales (Cadw, 2017), as follows:

- Stage 1: Identify the historic assets that might be affected by a proposed change or development.
- Stage 2: Define and analyse the settings to understand how they contribute to the significance of the historic assets and, in particular, the ways in which the assets are understood, appreciated and experienced.
- Stage 3: Evaluate the potential impact of a proposed change or development on that significance.
- Stage 4: If necessary, consider options to mitigate or improve the potential impact of a proposed change or development on that significance.

In determining which historic assets could be affected (Stage 1) an initial screening exercise was carried out drawing upon the Zone of Theoretical Visibility (ZTV) established by DDraw (UK) Ltd (DDraw) for the visual appraisal undertaken for the proposed scheme (see Chapter 14 of the EIA Report). The ZTV was generated using target points located on the outward edges of the proposed Tetrapod units, taking into account screening afforded by landform, buildings and significant vegetation belts. The ZTV does not take into account other minor, intervening features that, in combination, would further reduce visibility across the study area. The ZTV is therefore considered to represent a 'worst case' scenario. This was supported by a site visit on the 4th and 5th March 2020.

As stated in **Section 4** above, on the basis of the information presented during consultation, Cadw agreed that potential impacts on the designated historic assets would be limited to the Breakwater and Lighthouse; however, the results of the settings assessment are nonetheless included below for completeness and to demonstrate fully how significant impacts to the setting of other designated historic assets would not occur.

6.2 Stage 1

The ZTV analysis (Drawing 03 in Appendix 14.1 of the EIA Report) indicates patchy or intermittent visibility to proposed structures from lower lying, gently undulating coastal margins and more uniform visibility from elevated, open landscape areas on the eastern flank of Holyhead Mountain. The designated historic assets within the 3km study area have been mapped against the ZTV and illustrated in **Figure 5.2**.

To the west of Holyhead Mountain there will be no intervisibility as indicated by the ZTV, and confirmed during the site visit. Therefore, all designated historic assets west of Holyhead Mountain, and to the south along South Stack Road have been screened out of the settings assessment. Similarly, the ZTV shows that there is no intervisibility with the Holyhead Central Conservation Area, nor to historic assets to the south of Holyhead, and these have also been screened out of further assessment.

On Salt Island, the ZTV screens out the locations of:

- 5772 Harbour Office (Grade II*);
- 5773 George IV Arch (Grade II*); and,
- 5771 Customs House (Grade II).

The ZTV does suggest that some intervisibility between parts of the Admiralty Pier and Lighthouse and the Breakwater is possible; however, given the level of shipping activity and other intervening ancillary structures on Salt Island features, in practice, the proposed scheme would be indiscernible from the eastern side of the port. Similarly, beyond Salt Island, the intervening ferry and freight activities and existing tall silo structures and other buildings located within the busy port screen the view towards the Breakwater from the Grade II South Pier (14742) (to the south of Admiralty Pier and Salt Island). From the Grade II Listed Battery on the headland of the Penrhos Coastal Park (5770) views of the Breakwater are also partially screened by Salt Island, but also of a sufficient distance (over 3km from the Breakwater itself, and only just inside the 3km buffer from the working area) that the Tetrapods on the Seaward side would be indiscernible. These have also been screened out of the assessment.

With respect to the possible location of the batching plant on Salt Island, all five of the Listed structures within this area of the port are in close proximity and there is potential for the settings of these historic assets to be affected by the sight, sound, any dust created, and even smell, during the construction phase whilst the batching plant is operational. These historic assets have therefore been taken forward for assessment, although only potential impacts upon setting from the proposed batching plant have been considered.

It is anticipated that for the construction phase, should the Salt Island location be selected, deliveries of materials to the batching plant would take place by road. All other movements of materials would take place using marine based plant. Along this public and well established route to the port, impacts upon the setting of designated historic assets are not anticipated to occur. Large numbers of vehicles, including heavy goods vehicles, already use this route to and from Holyhead Port and, when considered against this baseline, the increased vehicle movements associated with deliveries to the batching plant by road, will not result in a material change to the heritage significance of historic assets in the vicinity of this route.

This leaves five groups of designated historic assets which have been taken forward to Step 2. Given that the Breakwater and Lighthouse form the focus of the refurbishment works, and require LBC, a separate heritage impact statement for these structures is included in **Section 7** below. The remaining four groups considered in **Section 6.3** below are:

- Holyhead Beach Conservation Area, including:
 - 14759 Porthyfelin House (Grade II);
 - 14760 Soldier's Point House (Grade II);
 - 14761 Screen Wall to Soldier's Point House (Grade II);
 - 14729 Zodiac Restaurant (Grade II);
 - 14730 Trinity House Office (Grade II);
 - 14731 Trinity Yard Large Workshop (Grade II); and,
 - 14732 Trinity Yard Small Workshop (Grade II).
- Breakwater County Park, including:
 - AN019 Caer y Twr. Scheduled Monument; and,
 - 14755 Gunpowder Magazine (Grade II).
- Holyhead Mountain Village Conservation Area, including:
 - 14756 Cottage on corner of Pentre Pella (Including Foregarden Wall) (Grade II).
- Salt Island:
 - 5771 Customs House (Grade II);

- 14757 Admiralty Pier (including Sea Wall between Salt Island Bridge and George IV Arch) (Grade II);
- 5773 George IV Arch (Grade II*);
- 5772 Harbour Office (Grade II*); and,
- 14758 Lighthouse on Admiralty Pier (Grade II).

6.3 Stage 2

6.3.1 Holyhead Beach Conservation Area

The Holyhead Beach Conservation Area was originally designated in June 1971 (IoACC, 2005). The reason for designation is provided as follows:

Most of Newry Beach evolved from agricultural land to an enclosed working area established during the construction period of the Great Breakwater. Later after completion of the Breakwater the central area was transformed by the construction of a two tier promenade and landscaping to create a vast green public open space that even today is used for functions. The unique character and history of the imposing buildings and rugged landscape to the west, the vast public open space to the centre, and the more urban 19th century development to the east are all considered worthy of protection and enhancement.

The Conservation Area lies on the shoreline of the New Harbour overlooking Holyhead Bay with the dominant landscape feature being the vast green open spaces (IoACC, 2005). This corresponds to the Character Area 'The Outer Harbour, Soldier's Point and the North Shore', defined in the Holyhead urban characterisation study (Cadw, 2019) and recorded by the GAT HER (71224).

In 1840, the tithe map records the north shore area as a pattern of small fields and plots of land (Cadw, 2019). With the commencement of the Breakwater in 1847 came a supporting infrastructure including a railway running parallel to the shore from the quarries on Holyhead Mountain and various industrial infrastructure projects, including a brickworks near the quarries and an array of workshops closer to the foot of the Breakwater. This also included the construction of Soldier's Point House (14760 and 14761), built in 1849 for Charles Rigby, the contractor for the Breakwater, and Government House or Porth y Felin House (14759), built 1849 for G. F. Dobson, the resident engineer. Both were designed to provide commanding views of the New Harbour works (IoACC, 2005).

Soldier's Point House is an example of an early Victorian castellated building, and has two stories, barred windows and curtain wall towers. It is faced in stucco. The house became a hotel in the mid-twentieth century but fell into disuse around the turn of the twenty-first century and was subsequently heavily damaged by fire in 2011. Despite this, some original internal features and fittings survive, particularly in the eastern half of the house. Soldier's Point House is listed as relatively unspoilt example of style, and for its historical connection with construction of Holyhead Great Breakwater. It also has group value with the screen wall to the north, constructed of dark local rubble with quartz banding and dressings to arrow loops and with rustic, garden architecture type battlements. The wall also has a high octagonal castellated tower with shallow arched doorways, and is *an impressive example of style* (IoACC, 2005).

Porth y Felin House is a two storey, U-plan building, the central block having rear wings to each end. It is externally stuccoed, with band courses below the eaves and at first floor level, and has shallow-pitch slate roofs with low rectangular stucco chimney stacks. It is listed as relatively unspoilt example of style, and for its historical connection with construction of Holyhead Great Breakwater; however, as with Soldier's Point House, the structure is also in an advanced state of disrepair. The Conservation Area character appraisal

(IoACC, 2005: 34) states that the scale and prominent position of the neglected house and grounds greatly affects the appearance of this part of the Conservation Area.

For both Soldier's Point House and Porth y Felin House, their construction specifically to provide views of the harbour works clearly demonstrates that setting, with views from the properties of the Breakwater, is a primary contributor to their heritage significance. Plate 1 shows a panoramic view towards the Breakwater from Porth y Felin House, produced by DRaW for consultation.

Plate 1: View towards the Breakwater from Porth y Felin House (DRaW (UK) Ltd)



This area is largely separated from the rest of the town by the Board of Trade Wall (1849 to 1850) that demarcated the official landholdings associated with harbour and Breakwater and runs inland of Newry Beach, containing the town along its northern edge. North of this wall, the only significant building projects which took place were all directly associated with the operation of the port and harbour. This includes the Trinity House depot and workshops (14730, 14731 and 14732) which were built around 1870 as the maintenance depot for the coastal lights.

The Trinity House Office (14730) has rendered walls with a pyramidal slate roof, two large chimneys and a gabled porch with side entrance doorway. A small yard links to an outbuilding with a monopitch roof. The Trinity Yard Small Workshop (14732) is a single storey rendered building, with a slate roof with raised ridge vent and two tall chimneys to rear, three camber-headed openings to the front and a central camber-headed doorway. The Trinity Yard Large Workshop (14731) also has rendered walls with an asphalted roof with ridge light and side elevations of five bays and segmental-headed blind panelling. The gable ends had kneelers and the building has a large camber-headed doorway towards the sea and a central doorway on the land side, flanked by segmental-headed windows. All three are listed for their special interest within a scarce group of nautical workshops. Their function means that their location and setting is part of their value as historic assets, although their location is more functional than to provide views of the sea, as designed for Soldier's Point and Porth y Felin House.

In summary the Conservation Area is characterised as follows (IoACC, 2005: 23):

- Two grand Victorian buildings, set within a natural landscape and accessed by a winding track, pre-dominate the western end;
- Green open space, promenade and maritime buildings pre-dominate the central part; and,
- Two and three storey terraces, that in part form a Square, give the eastern end an urban appearance.

The ability to view outward is defined as an important quality of the Conservation Area (IoACC, 2005: 23-24) with key views defined as follows:

- the upper and lower promenades towards the lively new harbour, enormous Breakwater, harbour Lighthouse and passing ferries, Holyhead Mountain and Quarry and Porth y Felin House and Soldier's Point; and,
- the easterly edge, by Marine Square, towards the Inner Harbour.

Noteworthy inward views are defined as:

- the sea (allowing ferry passengers a first view of Holyhead), Breakwater and New Harbour towards the promenades and greens;
- the far eastern end of the Conservation area towards Hibernia Row; and,
- Soldier's Point over the New Harbour towards Trinity Yard Workshops and the greens beyond.

Viewpoints 1 and 2 in Appendix 14.1 of the EIA Report show the views towards Breakwater from the promenade along Newry Beach within Holyhead Beach Conservation Area and from Soldier's Point respectively. **Plate 2** below shows a panoramic view northward from the Conservation Area, with the Breakwater in the background and the maritime museum to the right of the image. This building, formerly housing the Zodiac Restaurant (14729), is itself a key historic asset of the Conservation Area, housed in the former lifeboat station, constructed, c. 1850s and extended in 1888, and believed to be the oldest surviving lifeboat house in Wales.

Plate 2: View northwards from Holyhead Beach Conservation Area



6.3.2 Breakwater County Park

The Breakwater County Park opened in 1990 on the site of an old quarry which supplied stone for the Breakwater. Two designated monuments within the park have settings which could be impacted by the proposed scheme.

Caer y Twr Scheduled Monument (AN019) comprises a hillfort, which probably dates to the Iron Age period (c.800 BC - AD 74), located on the top of Holyhead Mountain. It is defended by a strong 3m thick dry-stone wall, enclosing c. 6.9 hectares, which runs along the north and east sides of the fort (in places to a height of nearly 3m), with the south and west sides naturally protected by steep cliffs. On the north east side of the fort is a simple inturned entrance, about 3m wide, which makes use of a natural gully. The interior of the fort is rough and rocky, with no sign of any contemporary habitation sites, although excavation has revealed the possible remains of a Roman signal station on the summit.

The monument is considered to be of national importance for its archaeological potential to enhance knowledge of later prehistoric domestic life, social organisation and defensive practices. The site forms an important element within the wider, later prehistoric landscape and has expansive views in all directions. The hillfort was constructed for defensive purposes, and deliberately sited on the highest point of the island so as to command panoramic views across large areas. Its setting, therefore, is a primary contributor to its heritage significance, with its location having also been key to its contemporary status as a symbol of power

which could be seen from the surrounding landscape; however, whilst much of the land visible from the hillfort in all directions remains largely undeveloped, modern elements such as radio towers and agricultural structures do intrude.

During the site visit (March 2020) it was not possible to reach the summit of Holyhead Mountain due to declining light and weather conditions although **Plate 3** shows the view towards the Breakwater on ascent.

Plate 3: Elevated view of the Breakwater during ascent of Holyhead Mountain from Breakwater Country Park



The Grade II Listed gunpowder magazine (14755) was built to store explosives for the Breakwater quarries and is built of grey stone, with a front porch with a monopitch roof, a doorway with a steel door and a small window. The ends each have three buttresses, and the interior has two chambers separated by thick walls with brick vaults. The building was listed as a scarce example of this building type, illustrating the engineering history of the quarry and the Great Breakwater. Its setting in proximity to the Breakwater and the quarry forms part of its group value and a key part of its heritage significance.

Viewpoints 5 and 6 in Appendix 14.1 of the EIA Report shows views from the country park looking north towards the Breakwater. **Plate 4** also shows the view from the area of the gunpowder magazine as seen during the site visit in March 2020.

Plate 4: View towards Breakwater from Gunpower Magazine in Breakwater Country Park



6.3.3 Holyhead Mountain Village Conservation Area

The Holyhead Mountain Village Conservation area was originally designated in 1991 (IoACC, 2003). The reason for designation is provided as follows:

The majority of the present Mountain Village was built between 1848 and 1850 to provide housing for the work force employed in the construction of Holyhead Breakwater. It was, at the time, one of four Holyhead Mountain villages each linked by footpaths and narrow lanes provided for cart traffic. A system of enclosures evolved where householders were allowed to build a stone wall enclosing a piece of land. The enclosures and quarry village are unique to this part of Anglesey. Most of the village has retained its character with the enclosures, together with connecting winding lanes, presenting a strong pattern. In view of the village's social history and its unique built environment it is considered that the village's character is worthy of protection and enhancement.

The cottage on corner of Pentre Pella (14756) is an early 19th century cottage, one of a group built for quarry workers at the nearby Breakwater quarry. It has heavily rendered walls, with chimneys, a slurried roof and a central large gabled porch which links to the foregarden wall. It is listed the best preserved example of a quarry worker's house in the settlement. As such, its survival as a representative example of a particular style of workers cottage, and its internal setting as part of a community of quarry worker cottages, might be considered to contribute more to its heritage significance than outward views from the property.

However, in general views into and out of the village are deemed to be important to the overall character of the area and key outward views are noted as (IoACC, 2003: 19-20):

- from the end of the lane by Tŷ-mawr down towards the old Breakwater quarry below;
- looking landwards to unrivalled panoramic views of the whole of Holy Island, the greater part of Anglesey and the Snowdonia mountain range;
- from most of the higher ground northwards towards Carmel Head and the Skerries;
- from the west of Tŷ-mawr where the Breakwater and gunpowder magazines provide the major focus; and,
- from the field gate by Pentre Canol down towards Holyhead and the Breakwater.

There are also noteworthy inward views from:

- the higher ground down towards Pentre Pella;
- the lower and upper end of Pentre Pella along the terrace;
- the green patch of land up towards Pentre-Fferam-Gorniog; and,
- Llaingoch looking upwards towards the mountain and the village.

Viewpoints have not been prepared from the Mountain Village Conservation Area, and this area was not visited during the site visit in March 2020; however, using images online it can be determined that the leeward side of the Breakwater is visible from the corner of Pentre Pella, albeit at a distance and with intervening vegetation and walling partially obscuring the view.

6.3.4 Salt Island

Each of the historic assets within this group were constructed in response to the 1810 Act of Parliament which addressed essential improvements to the harbour at Holyhead. In the early 19th century, Holyhead become established as the principal port for communication with Ireland and was the station for the Post Office steam packets. The harbour improvement scheme (with the exception of the George IV Arch designed by Thomas Harrison) was designed by renowned engineer John Rennie, who specialised in the design of bridges and harbours.

Salt Island was not visited during the site visit in March 2020 although this area was visited as part of a settings assessment undertaken by Royal HaskoningDHV for the Holyhead Port Expansion EIA on 14th and 15th November 2018 (Royal HaskoningDHV, 2019). During the site visit it was noted that, as individual historic assets, the immediate setting is highly localised, with a number of factors distracting from an appreciation of their setting in the form of port noise and traffic. The significance of these historic assets is, however, in part, former from their integral group value as part of this important 1820s harbour scheme. As a group, visual links between these assets within the Port setting, allow their age, association and historical character setting to be well appreciated, although these visual links are frequently blocked by the high concentration of heavy goods vehicles in the vicinity. Modern development within the port of unsympathetic design (particularly the former passenger terminal / waiting area which exists as a corrugated building at the beginning of the Admiralty Pier) further restricts these interlinking views (see **Plate 5** and **Plate 6**).

Plate 5: View eastwards, southwards of the proposed batching plant location showing the George IV Arch (5773) in the foreground towards the Admiralty Pier (14757), showing the Lighthouse on Admiralty Pier (14758) in the distance.



Plate 6: View from the of the Harbour Office (5772), looking eastwards, across the proposed locations batching plant location towards the Lighthouse on Admiralty Pier (14758)



6.4 Step 3

As described in **Section 4**, on the basis of the information presented during consultation, Cadw agreed that the impacts on the designated historic assets will be limited to the Breakwater and Lighthouse.

From a visual impact perspective, this conclusion is supported by the results of the visual appraisal presented in Chapter 14 of the EIA Report. In summary:

- During construction, the most adverse visual effects would be experienced by users of the coastal path and margins that are in close proximity to the proposed storage facilities located on Soldier's Point; however, distant construction activity alongside the Breakwater would not incur significant visual effects, seen in context of the existing harbour and regular movements of vessels and other related activity; and,
- During operational stages adverse visual effects will be limited to close range, landside receptors on the rocky headland and beach immediately to the west of Soldier's Point (that obtain views to the seaward side of the Breakwater) and in views obtained from the Breakwater itself, in particular from the head of the Breakwater looking towards Holyhead Mountain.

With respect to the Holyhead Beach Conservation Area, from the area of Trinity Yard and the Maritime Museum (Zodiac Restaurant) (see Viewpoint 1 in Appendix 14.1 of the EIA Report), during construction, cranes and barges will be visible but, in the context of the existing busy port activities, including regular movements of large vessels, the construction related activity would not result in a significant change. Once installed the Tetrapod's on the leeward side will be visible as a uniform, thin sliver at the base of the wall and, whilst the appearance of new concrete will appear in contrast to the existing fabric of the Breakwater, over time this will weather and become even less distinct. This limited visual disturbance will result in only a negligible change to the setting of the Trinity House group of nautical workshops and the former lifeboat station and, therefore, the heritage significance of these designated historic assets will not be affected.

With respect to the Holyhead Beach Conservation Area, from the area of Soldier's Point (see Viewpoint 2 in Appendix 14.1 of the EIA Report), during construction, cranes and barges will be visible but again, in the context of the existing busy port activities, including regular movements of large vessels, the construction related activity would not result in a significant change to the setting of the designated historic assets. Once installed, the existing Breakwater would largely screen views towards the proposed concrete armour features and there will be no change to the setting of the designated historic assets. Consequently, the heritage significance of these designated historic assets will not be affected.

The area at Soldier's Point is already an existing industrial quay, owned by Stena Line Ports. It is for this reason that it has been decided to use this area as a temporary storage yard during the construction phase. This storage of units will be visually intrusive and would affect the setting of the designated historic assets to a moderate degree. This change would, however, be temporary and short-term and, overall the heritage significance of Soldier's Point House, the screen wall and Porth y Felin House will not be affected to a significant degree. Visual links towards the Breakwater will be maintained in the longer term and, consequently, the primary purpose of their construction, to command views of the mid-19th century New Harbour works, will not be interrupted.

With regard to the Holyhead Beach Conservation Area as a whole, the primary value of the open spaces will not be affected by the proposed scheme whilst both inward and outward views will be maintained. Within the area of Soldier's Point short term effects from the presence of the storage yard will occur, although, as stated in the Conservation Area character appraisal (IoACC, 2005: 34) the scale and prominent position of the neglected Port y Felin house and grounds greatly affects the appearance of this part of the Conservation Area, together with the now heavily fire damaged Soldier's Point House.

With respect to views from the Breakwater Country Park (Caer y Twr and the gunpowder magazine) Viewpoints 5 and 6 in Appendix 14.1 of the EIA Report) describe the visual impacts from two locations along the Isle of Anglesey Coastal Path. During construction there would be short term, temporary effects only. Cranes, supply vessels and barges would be clearly visible although in the context of the existing busy port activities, including regular movements of large vessels, the construction related activity would not result in a significant change in the view. Significant, discernible changes to the setting of Caer y Twr and the gunpowder magazine are not, therefore, anticipated to occur during construction.

At low tide and calm seas the Tetrapods and concrete armour structure will be visible with initial disparity in both colour and texture between the two surfaces with the lighter colour concrete units contrasting with the dark Breakwater wall. These changes would be visible from Caer y Twr and the gunpowder magazine, although longer term weathering, sea action and general patination of the Tetrapods would improve over time. Although the localised view of the Breakwater itself would change, this visual change is concluded to be a minor/moderate adverse effect on the view and the overall appearance of the Breakwater from middle distance (Viewpoint 5) and negligible adverse effect from greater distances (Viewpoint 6).

In conclusion, there would be no material change to the heritage significance of Caer y Twr nor the gunpowder magazine themselves as a result of the localised visual changes in setting.

Given the above conclusions, views from the Holyhead Mountain Village Conservation area are, similarly, not anticipated to be affected to a significant degree and the setting and heritage significance of the cottage on the corner of Pentre Pella would not be subject to change.

On Salt Island, if works are completed in a single construction phase, the refurbishment of the Breakwater would be undertaken over an estimated two-year period. If the works are undertaken in three phases, each phase would take approximately nine months to complete, with an approximate interval between each consecutive phase of two years. On this basis, although changes to the setting of historic assets will occur associated with the presence of the batching plant, any such changes would be temporary and of sufficiently short duration that they would not give rise to material harm. Furthermore, given the nature of the current setting (Plate 5 and Plate 6), the batching plant would be seen in the context of activities associated with the busy operating ferry terminal, including vehicular movements and shipping activity surrounded by a myriad of buildings and portside / infrastructure facilities. As concluded in the visual appraisal (Chapter 14 of the EIA Report), Salt Island is the hub of ferry and freight activity and there are existing tall silo structures and other buildings located within the busy port. As such, proposed storage, fabrication and associated activity would not significantly contrast or conflict with existing visual character. On this basis, the setting of the listed structures on Salt Island would not be subject to a change which would be considered to result in material harm to their heritage significance.

Changes to the setting of the Breakwater and Lighthouse are discussed in **Section 7** below.

6.5 Step 4

Within the wider study area, as no changes to the setting of designated structures from the proposed scheme are anticipated to result in material harm to their heritage significance, no mitigation is proposed.

The visual impacts of the proposed Tetrapod's and armour units on the Breakwater and Lighthouse are discussed in **Section 7** below.

7 Holyhead Breakwater and Lighthouse

7.1 Historic Background

The discovery of flint tools show the earliest activity on Anglesey dating from the Mesolithic, with later settlement evidence from the Neolithic, and other later Bronze Age and Iron Age monuments, such as hut circles, stone circles, burial cairns and standing stones featuring among the highest concentration in Britain (Cadw, 2019). The Caer y Twr hillfort on Holyhead Mountain represents a key focus of this important prehistoric landscape with several hut circle settlement groups around the base of the Mountain. The earliest evidence for a settlement at Holyhead itself is the Roman fort of Caer Gybi, established as part of the coastal defences of Roman Britannia in the late fourth century. In the early sixth century a monastic precinct was established within the walls, the fort itself presumed to have fallen out of use following withdrawal of Roman occupation, and this later became the site of the church of St Cybi.

During the Middle Ages, documentary evidence suggests that Holyhead maintained a role as a port, and, in the late sixteenth century, it became the main gateway for government communication with Dublin and acquired official status as a post town and port (Cadw, 2019). In the eighteenth century, this link with Ireland remained at the forefront of the ports prosperity, with Holyhead is described as ‘the great thoroughfare between both kingdoms’, although in spite of this role, ‘Holyhead boasted neither a proper harbour, nor any recognizable urban form’ (Cadw, 2019: 9).

Following the Union with Ireland Act in 1800, a programme of works intended to improve coastal traffic was begun, with the building of South Stack Lighthouse in 1809 and culminating in the creation of a new harbour, authorized by an Act of Parliament in 1810 (Cadw, 2019). At the same time, Telford’s road, or the parliamentary road from London to Holyhead (A5), was begun in 1815, with the bridge over the Menai completed in 1826. John Rennie was appointed as engineer for the new harbour and he oversaw the construction of quay walls on Salt Island and the Admiralty Pier. After his death in 1821, Thomas Telford assumed responsibility for the harbour project, completed by the construction of a graving dock on the south side of the harbour, protected by a second pier (the south pier) and contained by a walled compound. With the Chester and Holyhead Railway Act, passed in 1844, Holyhead became the official port for Ireland and the terminus of the new railway, and with the opening of the Britannia Bridge in 1850, travel direct from London was made possible. The port itself was also developed and expanded, with the construction of the Holyhead ‘Great Breakwater’ between 1847 and 1873, to reduce the exposure of the port and to accommodate a larger number of vessels using Holyhead as a harbour of refuge.

A comprehensive analytical record, drawing on the full range of primary and secondary sources of information about the Breakwater is presented in the Level 4 Building Record produced by GAT in 2017 and included as **Appendix A1**.

Details of the construction of the Breakwater are recorded in a paper entitled ‘Holyhead New Harbour’ by Hayter and published by the ICE in 1876. The paper provides information concerning the design and construction of the Breakwater and notes key decisions that were made to determine the final alignment.

In summary, the key information and stages of development for the Breakwater are as follows:

- In 1847, James Meadows Rendel’s proposals included the building of a new harbour, to be created by a long north Breakwater leaving the shore at Soldier’s Point, west of Salt Island, and an east Breakwater running off the north end of Salt Island;
- A contract for the new harbour works was signed by Messrs J. and C. Rigby and others with the Lords of the Admiralty on 2nd February 1848;

- Works began in 1848 with laying down a seven foot gauge tramway from the proposed quarries to the south-west to the start of the north Breakwater, and along the shore to Salt Island to service the east Breakwater;
- Work on the eastern Breakwater was stopped due to dangerous working conditions, with the intention of continuing it once the north Breakwater was long enough to offer protection. Ultimately, however, the eastern Breakwater was abandoned due to the decision to principally operate as a harbour of refuge rather than to accommodate quay side facilities such as a packet pier. The start of the east Breakwater is still evident at Salt Island;
- The initial design of the northern Breakwater was an 'L' shape with the shorter length attached to the land before turning east;
- The rubble used to form the foundations of the Breakwater came from the northern side of Holyhead Mountain and laying the foundations was the most difficult and dangerous part of the work, which was frequently hindered by storms, and it is recorded that 20 workmen lost their lives between 1849 and 1852;
- A solid wall of stone was laid on top of the foundation, 39ft high, of two decks, with a rail track laid on the lower, and a parapet on the seaward side;
- The huge limestone blocks used for the plinths, cornices, parapets, paving, copings and other ashlar of the Breakwater were of limestone and were brought from Moelfre on the east side of Anglesey by sailing boat;
- Some underwater walling was in sandstone brought from Runcorn in Cheshire;
- In February 1854, Commander Skinner, the harbourmaster, wrote to the Lords of the Admiralty urging them to consider enlarging the harbour. As the construction of the north Breakwater neared completion, it became apparent that it would prove too small to act as a harbour of refuge given the number and frequency of incoming vessels;
- The decision to lengthen the initial structure by some 2,000ft, led Rendel to turn the Breakwater back to the north, creating a 'z' shape, and a total length of 7,860ft thus making it the largest Breakwater in Britain;
- James Rendel died on 21st November 1856, and his role as chief engineer was taken by John Hawkshaw, although the resident engineer was George Dobson, who was a brother-in-law to Rendel;
- In 1857 the Breakwater was extended by a further 500ft by Messrs Rigby;
- The Lighthouse at the end of the Breakwater was built between 1845 and 1873 and probably designed by John Hawkshaw;
- The Breakwater work was completed in 1873, at a cost of £1,285,000 and the Prince of Wales performed the opening ceremonies;
- Work on the Breakwater has been continuous since it was opened, with repairs frequently required due to damage caused by the gales that hit the coastline during winter; and,
- Until 1985 the Port owners were British Rail (the State) but, in 1984, the Port was sold to Seacontainers Ltd who then sold the port to Stena Line Ports Limited on 9th April 1990.

With regards to more recent maintenance activities, records indicate that 3,000 to 4,000 tonnes of rock was tipped on the rubble mound each year between 1967 and 1976 (see **Appendix A3**). The source of this rock is understood to be Holyhead Mountain but when the quarry closed down rock was sourced from much further afield namely Beshesda slate quarries and Penamanemawr granite quarries. Due to financial constraints (mainly due to the significant increases in rock transportation costs), Sealink Ports Ltd took the

decision in 1984/1985 to abandon the planned rock replenishment programme, although the level of maintenance had actually been diminishing for a number of years beforehand. Since 1985, when the port was transferred to the private sector, there has been ongoing maintenance of the superstructure only.

7.2 Surviving Structure

In summary, the surviving elements of the Breakwater and Lighthouse, as set out in detail in **Appendix A1**, are as follows:

- The Breakwater was built by dumping stone from Holyhead mountain to form a rubble mound, upon which was erected a massive wall faced with limestone blocks;
- The seaward side rises nearly 40ft above high tide, ending in a parapet wall which protects a walkway some 3m wide and a lower quay 13m wide;
- The lower quay carried a railway along its length and at the end of the Breakwater marks are visible of the former rails, some apparently of the 7ft gauge tramway although sleepers which remain in situ close by (laid longitudinally not across the track) are of standard gauge width;
- Every 183m pairs of steps go down to the water, with a mooring post alongside. Another set of steps leads to the higher parapet, with an arched opening alongside;
- Interspersed equally between each set of steps are refuge shelters built into the Breakwater wall between the upper and lower stages, consisting of three small chambers, with two outer square headed doors and a central round headed one. Many are now blocked;
- Towards the north-east end of the Breakwater, a wider section of parapet housed two storerooms and a former latrine;
- The Breakwater ends in a large oval platform with a square Lighthouse reached from the lower quay by large steps, at one side of which is a round drum pillar with rope-moulded decoration around a horizontal band – a similar pillar can be seen at the start of the Breakwater;
- The Lighthouse was built in 1873 to a design by John Hawkshaw to mark the end of the Breakwater and is square in plan, with chamfered angles, and a stepped plinth. It has horizontal roll moulding at first floor level. There is a walkway around circular lantern, on moulded cornice supports and with iron railings. Inside there are three floors and a basement entered through the lower stage of the Breakwater; and,
- A large quay survives, which formed the first stage of the construction of the Breakwater, following the start of the construction work in 1847. It is still in use for storage, and has steps down to the sea at the north end, and a single stone structure of uncertain use.

7.3 Statement of Significance

The Level 4 Building Record prepared by GAT (2017: 25, **Appendix A1**) states that, 'the Breakwater as a whole forms a very significant element within the port's historic landscape for which there is no parallel in Wales'. Based upon the detail provided in Sections 7 and 8 of Level 4 Building Record, and additional information from secondary sources and engineering reports (see **Appendix A1**), the primary historic vales of the Breakwater and Lighthouse are set out in **Table 1**.

Project related



Table 1: The Principle Historic Values of the Holyhead Breakwater and Lighthouse

Value	Significance	Comments
Evidential	High	<p>The harbour and especially the great Breakwater were hugely challenging projects which required pioneering construction techniques and demanded resilient building materials (Cadw, 2019: 54). The great Breakwater is remarkable by virtue of its immense size and for the techniques which were pioneered during its construction (Cadw, 2019: 85).</p> <p>The Breakwater is typical of one built during the Victorian period and consists of a mound of rubble stone, upon which is erected a substantial stone superstructure, the end of the Breakwater being terminated by a head, on which sits the Grade II Listed Lighthouse.</p> <p>The construction of the rubble mound was formed by dumping a large quantity of rock quarried from the nearby Holyhead Mountain which was then moved around by the action of the waves and then regularly replenished until the sea shaped the rubble mound to the form required.</p> <p>The superstructure comprises a solid sea wall of masonry, built principally of larger quartz rock (individual units weighing up to 15ton), also quarried from the Holyhead Mountain, and set in lias-lime mortar. The sea wall supports a 12.2m wide promenade road-way which is also supported by a lee side retaining wall. The space between the sea wall, lee wall and promenade surface is filled with a layer of stone placed on a loose stone core material. The plinths, cornices, parapets, paving, coping and other ashlar works are constructed from Anglesey limestone.</p> <p>The head at the seaward end of the Breakwater is mostly built of ashlar masonry using stone that is partly Runcorn sandstone and partly Anglesey limestone set dry below Mean Low Water Springs (MLWS) or Anglesey limestone set in mortar above MLWS.</p>
Historical	High	<p>The construction of the Holyhead Breakwater reflects governmental interest in the question of harbours of refuge, reflected in the work of a Royal Commission which in 1847 discussed the need for a harbour of refuge at Holyhead to protect shipping on its way to or from Liverpool as well as the safeguarding of the Holyhead packet boats. The Breakwater was a massive engineering undertaking which reflected the importance with which the protection of shipping was viewed. The town of Holyhead was also changed significantly by the construction of the Breakwater, with a significant increase in population.</p> <p>The work at Holyhead had close links with international harbour Breakwater projects, including direct links with Ponta Delgada on the island of São Miguel in the Azores, reflecting the importance of British trade and engineering at the height of the British Empire.</p> <p>The Holyhead and Portland Breakwaters were amongst the most important works designed by the engineer James Meadows Rendel. It is considered that he himself wished to be remembered for Holyhead and Portland harbours, which he considered his greatest works and which were unfinished at the time of his death. The works were completed by John Hawkshaw, superintending engineer from 1857-73 and John Dobson, the resident engineer, The contractors were Messrs J & C Rigby, of London who also acted as agents for the supply of machinery and equipment for the Breakwater at Ponta Delgada, several examples of which were supplied from Holyhead.</p>
Aesthetic	High	<p>The Great Breakwater today is regarded as the finest Breakwater in the British Isles and is a Grade II* Listed Building. Its length and distinctive 'z' shape, make it unique as an unequalled defence against the sea.</p> <p>Modifications and repairs to both the rubble mound and the superstructure have been continuous since it was opened although these are largely sympathetic and do not detract significantly from the overall aesthetic value, forming an important part of the Breakwater's historic development themselves.</p>

Value	Significance	Comments
Communal	High	The Breakwater 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.
Overall significance	High	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 19 th century Breakwater era within the wider port.

7.4 Impact Statement

Since its construction in the 1870's, Holyhead Breakwater has suffered from inherent weaknesses in its initial design and construction. The quartz rock used to form the original rubble mound was unsuitable by modern standards for use in the harsh marine environment, suffering relatively rapid attrition. This led to a reduction in stone size in the rubble mound and subsequent mobility of the rock along and away from the Breakwater. As the rubble mound lowers, the wave climate becomes larger and this exacerbates both the deterioration of the mound and of the masonry superstructure due to the large waves crashing into the front face of the structure.

In order to prevent the rubble mound from further reduction, which would eventually lead to the catastrophic failure of the masonry superstructure, various options were explored (see **Appendix A1**) and it was concluded that the preferred option is a solution to hold as much of this rubble mound material in place as possible. This would comprise the placement of large concrete armour units (Tetrapods and Z-shaped blocks) on the rubble mound to hold the top portion of the rubble mound in place whilst also trying to minimise the violent action of the waves crashing into the listed masonry superstructure. On the leeward side the preferred solution is to place an articulated concrete block mattress on to the existing rubble mound profile

The potential for direct (physical) impacts to the Breakwater itself is minimal with works largely limited to the placement of the armour units which will be undertaken from marine based plant. Where the level of the existing rubble mound undulates along its length due to the seabed topography and the influence of environmental conditions, some regrading of the rubble mound may be necessary in order to ensure the stability of the armour units placed on the mound. Regrading works would be carried out by spreading the rubble using a long-reach excavator from a jack-up / floating barge. However, it is anticipated that very little regrading works would be required, and there would be no requirement for the removal of rubble from the site.

With regard to setting and character, on the leeward side, the articulated concrete block mattresses would be located below the water surface and consequently, are not anticipated to result in any change to the visual appearance or setting of the Breakwater; however, on the seaward side and the Breakwater round head, the concrete armour units would be visible, introducing a change to the visual appearance of the Breakwater. Although every effort has been made to minimise the height of the proposed scheme, which has to be formed from two layers, it will stand approximately 5.2m high above the existing rubble mound and therefore, it will hide some of the existing seaward masonry superstructure from view.

In summary, the description of how visitors experience the aesthetic of the Breakwater and Lighthouse are set out in the visual appraisal (see Chapter 14 of the EIA Report) as follows:

- The initial section from Soldier's Point passes the ruined Soldier's Point House and the screen wall to the house. There is a sense of neglect on the quayside approach with general waste, rough grassland, ponded stone aggregate surfaces, abandoned boats and material stockpiles detracting from the quality and character of the view;
- Moving seaward along the Breakwater views rapidly become more open and exposed. There is often the dramatic sound of waves breaking against seaward defences, the call of gulls and rush of the wind. The solidity of the Breakwater structure and mass of the stonework become apparent although in context of the vast surrounding sea and sky above, its scale is diminished and the serpentine form retains a certain grace;
- The wide stone parapet wall stands approximately 1.2m above the upper landing and looking directly out towards the sea, it prevents views down onto the base of the Breakwater. The base and lower wall can be seen in views along the length of the Breakwater, where the observer has sight of the opposing sweep of the wall;
- The Lighthouse at the head of the Breakwater is the focal point of the outward journey. It is generally seen to sit below the distant land mass of Anglesey but the unusual square white tower with black band remains a distinct feature in the local scene and is the destination for recreational users of the Breakwater;
- The head of the Breakwater comprises of a lozenge shaped landing enclosed by a massive stone parapet wall. The area provides a full vista of the surrounding seascape and bay. Passenger ships pass close by, adding scale and drama to the scene; and,
- The head projects out into the seaward and leeward side of the Breakwater allowing views back along the outer walls of the Breakwater. The view along the near vertical, dark stone wall on the seaward side, draws the eye unavoidably to Holyhead Mountain. Waves are often seen and heard crashing against the outer wall.

The Breakwater is a significant visual feature seen from the town and coastal margins with most outward views north from Holyhead capturing something of the Breakwater as it extends north eastwards across Holyhead Bay. The extent to which this experience will be affected by the proposed scheme would, however, depend upon the height of the tide and the sea state, which will largely determine the visibility and prominence of the Tetrapods. It should be noted, however, that the Tetrapods would remain visible to some extent at all states of the tide.

As outlined in the settings assessment above, material changes to the significance of historic assets within the study area are not expected to occur as a result of this change in setting; however, the setting of the Breakwater and Lighthouse themselves would change and, as identified in the visual appraisal, the greatest changes would be associated with views experienced by recreational users of the Breakwater, with the view from the head of the Breakwater being most affected. The scale, mass and regimented lines of the Tetrapods would contrast notably with the shadowed Breakwater wall. Most of the lower section of the wall would be screened and its existing visual character, seen to rise up from a rocky base, would be significantly altered. This change would be most measurable in close proximity, with views from the Breakwater and across the harbour, and towards the hills and mountain and other features on the horizon largely unaffected.

These views have been assessed in detail in the visual appraisal (see Chapter 14 of the EIA Report) with specific focus on the Breakwater itself in Viewpoints 3 and 4. Drawings 05 and 06 provide a photomontage illustrating how the armour units would appear looking south west from the head of the Breakwater towards

Holyhead Mountain and looking north east from Holyhead Breakwater, approximately 800m from shore, respectively.

In the long term, the visual prominence of Tetrapods would be reduced due to the effects of weathering, algal growth and general patination. The visual appraisal also suggests that storm and exceptional sea conditions will cause a limited amount of displacement to some of the Tetrapods which will provide minor visual relief to the otherwise highly regimented, linear arrangement of the units. Without these works, if the Holyhead Breakwater is breached, then the cost of repair is likely to be prohibitively expensive and a significant breach could ultimately lead to the closure of Holyhead Port. In such an event, any redevelopment plans for Holyhead including reestablishment of a marina in Holyhead would be unviable due to the increased wave climate within the existing harbour and the increased flood risk to low lying areas.

In conclusion, whilst the ACBM solution on the leeward side will have no impact upon heritage significance, the introduction of Tetrapods along the seaward side would adversely affect the visual character of the historic assets, and consequently result in an adverse effect upon the significance of the Breakwater and Lighthouse.

In terms of mitigation, the Level 4 building record provides a detailed account of the Breakwater and its significance and, as such, in itself represents a primary form of mitigation for the Breakwater and Lighthouse; however, in securing the longevity and ongoing utility of the structure, and in minimising the risk of significant breaches and storm damage to the superstructure, including the Lighthouse, over time, the public benefit represented by the Tetrapod solution, which, as described in **Appendix A3**, has been identified as the only viable solution for refurbishment, should be weighed against the significance of the identified impact. It may also be possible to consider additional mitigation, such as colour matching or the use of textured finishes to the armour units, to minimise the visual impact as far as possible.

8 Summary of Potential Impacts

In summary, the DBA (**Section 5**), settings assessment (**Section 6**) and heritage impact statement for the Breakwater and Lighthouse (**Section 7**) set out the following conclusions with regard to potential impacts to historic assets as a result of the proposed scheme:

- With the exception of the Breakwater and Lighthouse, there would be no direct (physical) impact to designated historic assets, as all are located outside the immediate working area (see **Section 5.2**);
- There is potential for accidental direct (physical) impact to non-designated historic assets located within or in close proximity to the proposed Soldier's Point storage area, during offloading and movement of materials and concrete units. These include the Soldier's Point Quay (PRN 34000), a late 19th century small stone building located at the end of the quay (PRN 34025) the remains of a Folly (PRN 7166) and the remains of a Battery (PRN 34026) (see **Section 5.3**);
- All other non-designated historic assets are located beyond the immediate working area and there is no potential for direct physical impact (see **Section 5.3**);
- As there are no groundworks above mean low water, there is no potential for buried archaeology to be encountered onshore during the proposed scheme (see **Section 5.3**);
- There is limited potential for the survival of intact, coherent wreck structure and no evidence for archaeological material has been observed on video transects; however, archaeological material may still survive in some form (possibly fragmentary or as more isolated finds) particularly associated with the locations of unnamed 'DEAD' wrecks NPRN 506416 and 506418 and recorded wrecks within the working area (*Kirkmichael* NPRN 271901, *Osseo* NPRN 272227, *HMS Campina* and *Star of the Sea* NPRN 271985) (see **Section 5.4**);

- Due to the nature of planned activities beyond the footprint of the Breakwater itself (limited to the placement of anchors or jack-up spud legs), the potential for encountering chance finds of wreck material is relatively low (see **Section 5.4**);
- During construction cranes, supplies and barges would be visible but, in the context of the existing busy port activities, including regular movements of large vessels, the construction related activity would not result in a material change to the heritage significance of designated historic assets (see **Section 0**);
- The temporary use of the existing industrial Soldier's Point Quay as a storage yard would have a greater visual impact on historic assets in the immediate vicinity although these will be temporary and short-term. This part of the Holyhead Beach Conservation Area is currently negatively affected by the neglected Porth y Felin house and grounds and the heavily fire damaged Soldier's Point House;
- During operation, the concrete armour units will be visible from designated historic assets although the localised change in appearance is concluded not to affect the heritage significance of these historic assets to a significant degree; and,
- The setting of the Breakwater and Lighthouse would be subject to change from the presence of the Tetrapods, although, in securing the longevity and ongoing utility of the structure, and in minimising the risk of significant breaches and storm damage to the superstructure, including the Lighthouse, over time, the public benefit should be weighed against this change.

In terms of mitigation, the Level 4 building record provides a detailed account of the Breakwater and its significance and, as such, in itself represents a primary form of mitigation for the Breakwater and Lighthouse. Potential impacts are assessed in detail in Chapter 15 the EIA Report.

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A1 Holyhead Breakwater Level 4 Building Record

HOLYHEAD BREAKWATER

Level 4 Building Record



HOLYHEAD BREAKWATER

Level 4 Building Record

Prosiect Rhif / Project No. G2489

Adroddiad Rhif / Report No.1355

Prepared for: YGC

January 2017

Written by: Rob Evans & Neil McGuinness

Front cover image: View of Holyhead Breakwater from the west showing a ferry passing beyond the lighthouse (Archive Image: G2498_020)

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1 SUMMARY

Gwynedd Archaeological Trust was commissioned by Royal HaskoningDHV to carry out a historic building appraisal and record of Holyhead Breakwater, Ynys Môn. Holyhead Breakwater comprises a 2.4km long stone-built structure designed to provide maritime shelter at the Port of Holyhead, as well as protection from coastal erosion.

The breakwater was built between 1848 and 1873 and is a Grade II listed structure. In addition to the pier, which forms the main structure, 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.*

The Level 4 building record provides a comprehensive analytical record and draws on the full range of primary and secondary sources of information about the breakwater and discusses its significance in terms of architectural, social, national and economic history. In particular, this includes its relationship with similar 19th century breakwaters and the impact on Holyhead socially and economically during construction and use.

The construction of the Holyhead Breakwater reflects governmental interest in the question of harbours of refuge, reflected in the work of a Royal Commission which in 1847 discussed the need for a harbour of refuge at Holyhead to protect shipping on its way to or from Liverpool as well as the safeguarding of the Holyhead packet boats, similar to that employed at Portland for Channel shipping. The Breakwater was also of international significance as technology and equipment were exported to overseas breakwater developments, including the breakwater at Ponta Delgada in the Azores.

The building of the breakwater had a great effect on the town itself. The population increased from 3,869 in 1841 to 8,863 in 1851. The larger population was particularly drawn to Holyhead after 1845 when preparatory work was started on the Great Breakwater. There was also much other work available from a host of employers,

which resulted in a move from rural Anglesey as men left farms and smaller communities for Holyhead with its offer of more profitable work.

The effect of these developments was, however, to result in the port becoming something of a 'through port' moving goods and people from England to Ireland, with more limited benefit for the town of Holyhead itself. The port and railway did however continue to provide significant employment in the town.

2 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was commissioned by *Royal HaskoningDHV* to prepare a historic building appraisal and record of Holyhead Breakwater, Ynys Môn (Primary Reference Number (PRN) 11821; NGR SH24008420; Figure 01). Holyhead Breakwater comprises a 2.4km long stone-built structure designed to provide maritime shelter at the Port of Holyhead/Holyhead, as well as provide protection from coastal erosion. The breakwater was built between 1848 and 1873 and is a Grade II* listed structure (ref. 5743). In addition to the pier, which forms the main structure, the breakwater also includes a pier end three-storey lighthouse (PRN 11822; NGR SH2567484751), built in 1873, a large stone quay from which the breakwater extends, built in 1847 (PRN 34000; SH23818388), and a late 19th century small stone building located at the end of the quay (PRN 34025; NGR SH23868389).

The historic building appraisal and record has been completed as part of a project appraisal report (PAR) for a flood risk management appraisal in line with Flood and Coastal Erosion Risk Management – Appraisal Guidance (FCERM-AG), which will appraise a range of options.

The historic building appraisal and record has been completed in accordance with the following guidance:

- Conservation Principles (Cadw, 2011);
- Guide to the conservation of historic buildings, BS7913:2013;
- Guidelines for digital archives Royal Commission on Ancient and Historic Monuments of Wales, 2015;
- Management of Archaeological Projects (English Heritage, 1991);
- Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide (Historic England, 2015);
- Standard and guidance for the archaeological investigation and recording of standing buildings and structures (Chartered Institute for Archaeologists, 2014); and

- Understanding Historic Buildings: A guide to good recording practice (Historic England, 2016).

The following sources of information have also been consulted as part of the record (as identified in the *Scope Holyhead Breakwater Project Appraisal Report*):

- Holyhead Breakwater Environmental Scoping Report, Black & Veatch Ltd., 2009;
- Outline design drawings and indicative landscape plan; Black & Veatch/Stena, 2009;
- Engineering report, Black & Veatch Ltd, 2009;
- High resolution aerial photographic survey undertaken on 28th September 2015 (1109 images), capable of being post-processed to provide a dense point cloud of the breakwater along with 3d mesh in AutoCAD format.

A copy of the draft report must be approved by Gwynedd Archaeological Planning Services (GAPS) and the Isle of Anglesey County Council (IOACC) Senior Planning and Conservation Officer prior to final issue.

3 AIMS AND PURPOSE

3.1 Level 4 Building Recording

This historic building appraisal and record has been completed in accordance with a Level 4 building record as described in *Understanding Historic Buildings: A guide to good recording practice* (Historic England, 2016).

Level 4 recording provides a comprehensive analytical record and draws on the full range of primary and secondary sources of information about the breakwater and discusses its significance in terms of architectural, social, national and economic history. In particular, this includes its relationship with similar 19th century breakwaters and the impact on Holyhead socially and economically during its construction and use.

The Level 4 record was completed using a combination of a photographic record, a drawn record and an analytical record.

4 SPECIFICATION, METHODS AND TECHNIQUES

4.1 Photographic Record

A photographic record of the breakwater was completed by *Civil Engineering Solutions* undertaken on 28th September 2015. A total of 1109 high resolution aerial photographic images were taken during the survey; the location of each image is detailed on *Civil Engineering Solutions* drawings CES391-1 to CES391-7. These images have been used by GAT as the core photographic record for the Level 4, as they include images in plan and elevation of the entire structure, including views that would not be possible from a landward record. Selected images have been used to illustrate the structural appearance, function and phasing of the breakwater, including any industrial remains. GAT has also prepared general views of the breakwater in its wider setting and landscape (GAT ref.: G2489_001 to G2489_060).

4.2 Drawn Record

The drawn record does not include additional plans and elevations prepared on site by GAT. The drawn record includes:

- A site plan based on the 1:10000 Ordnance Survey County Series locating the breakwater within the regional landscape;
- Reproduction of contemporary drawings that illustrate the construction and use of the breakwater;
- Reproduction of historic maps that illustrate the construction and use of the breakwater.

A list of primary and secondary illustrative source materials are included in the bibliography (see Section 10 below).

4.3 Analytical Record

The analytical record includes a detailed examination of available primary and secondary sources. Information was sourced from the following:

1. The regional Historic Environment Record (HER, Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, Gwynedd LL57 2RT) was examined for information concerning the breakwater and a 100m area. This included an examination of the core HER, the 1:2500 County Series Ordnance Survey maps and any secondary information held;
2. Archive data and historic maps were consulted in the regional archives at Llangefni (Anglesey Archives, Industrial Estate Rd, Llangefni LL77 7JH) and at the Bangor University Department of Manuscripts (Bangor University, Bangor, Gwynedd LL57 2DG);
3. The National Monuments Record (NMR RCAHMW, National Monuments Record of Wales, Plas Crug, Aberystwyth SY23 1NJ) was checked for sites additional to those recorded in the HER.
4. On-line catalogue search of the National Library of Wales;
5. The National Archives (Kew, Richmond, Surrey TW9 4DU) was examined for primary sources.
6. The Welsh Newspapers Online portal curated by The National Library of Wales (<http://www.llgc.org.uk/index.php?id=4723>) was examined for contemporary newspaper articles.

5 ARCHIVING

Upon final approval, a final copy of this report will be sent to the client and Gwynedd Archaeological Planning Services. It will also be sent to the Historic Environment Record located at the Gwynedd Archaeological Trust. Submission of digital information to the Royal Commission on the Ancient and Historical Monuments of Wales will be undertaken in accordance with the RCAHMW Guidelines for Digital Archives Version 1 (2015). Digital information will include the photographic archive and associated metadata.

6 RESULTS

6.1 Introduction

The Great Breakwater at Holyhead Harbour, constructed between 1847 and 1873 was a major engineering project, involving up to 1,300 workers at the height of its construction, along with many other workers in ancillary trades. The construction was also an element of wider developments and expansion at the port, along with the arrival of the railways at Holyhead. The broader history of the development of the port has been widely recorded, for example by Richard Scott Jones' *Holyhead Waterfront, Holyhead, Anglesey. Archaeology and Cultural Heritage Desk Based Assessment* (2010) and the *Holyhead Harbour Conservation Plan* (2003) produced by Donald Insall Associates, which includes a detailed chronology. Further published sources also give a historical overview of the development of the breakwater and the associated quarry, including Owens (1987) and Hughes and Williams (1981).

This report therefore concentrates on the social, national and economic history, architecture, development and significance of the Great Breakwater itself, with some contextualisation to help to explain its wider significance.

6.2 Historical Development of the Breakwater

Following the shift in marine transport from sail to steam ships operating between Holyhead and Ireland, which began in the 1820s, the existing pier had become over used, and it was also exposed in bad weather. As a result, plans for a new harbour and port were drawn up, including the construction of a Great Breakwater. The contract for the work was signed by Messrs J. and C. Rigby and others with the Lords of the Admiralty on 2nd February 1848 (National Archives, RAIL 837/2).

The engineer in charge of planning the developments was James Meadows Rendel. His proposals included the building of a new harbour, to be created by a long north breakwater leaving the shore at Soldiers Point, west of Salt Island, and an east breakwater running off the north end of Salt Island (National Archives, RAIL 837/81; Figure 02). A new pier for the railway and steam packets was to be built, and the railway was to run in a tunnel under Holyhead to emerge by the new pier. The first year of work involved laying down a seven foot gauge tramway from the proposed

quarries to the south-west to the start of the north breakwater, and along the shore to Salt Island to service the east breakwater. Small branch lines were constructed for the proposed railway pier, also linking a creosote works and sawmill. Work commenced on the north and east breakwater, however the latter was stopped because of dangerous working conditions, with the intention of continuing it when the north breakwater was long enough to offer protection. It was never restarted, and the railway pier was also never built when the Chester and Holyhead railway decided to withdraw from the arrangement. The north breakwater, however, was continued, and in view of the large number of vessels requiring refuge within it, was subsequently extended on two occasions.

The initial design of the breakwater was an 'L' shape with the shorter length attached to the land before turning east, measuring 5,100 feet long, from Soldier's Point to terminate at the Platter's Buoy, and a 2,100 foot pier from Salt Island, enclosing an area of 316 acres, three quarters of a mile long, at an estimated cost of £700,000. Two contracts were initially let to Messrs Rigby (National Archives, RAIL 837/2 and 837/4), the first took care of the preliminary works and consisted of walling around Soldier's Point and establishing the tramways between the quarry site, the north breakwater and the east breakwater on Salt Island. The second contract was for the construction of the two breakwaters and steam packet pier, which began in January 1848, with approximately 1,300 men employed on the project. Initially the works were described as 'getting on very slow' in a letter of February of that year, but the pace of work soon picked up (Anglesey Archives, WDAX/21). The north breakwater was designed to be formed 150 feet wide at low water. The building of the breakwater and the quarry works is described in detail in Edwin Owens *The Holyhead Breakwater and Quarries* (1987).

The work was hazardous, and more than 40 men died between 1849 and 1852 (Jones 2010, 33). The timber staging was constructed 150ft wide, on which ran five separate rail lines 20ft above high water. Some 250 waggons were employed, tipping an average of 4,000 tons of stone a day. Locomotives were used on the staging, though horses were used on the line to and from the quarry (Hayter 1876). Hayter describes in depth the technical details of the waggons and locomotives used and the details of their operation.

In February 1854 Commander Skinner, the harbourmaster, wrote to the Lords of the Admiralty urging them to consider enlarging the harbour. It was decided that the proposed entrance to the harbour, and the requirement for anchorage space, was too small for the safety of the sailing ships, which were the majority of the ships using the harbour. The proposed east breakwater and packet pier, shown on the 1852 plan, were abandoned (Figure 02). The north breakwater was extended by 2,500ft, with a dramatic turning north-east, making the breakwater one and a half miles long, at that time the longest in Europe, and giving the harbour three times the area and much deeper water. It is this change of plan that gave the breakwater its unique, peculiar and distinctive shape.

The decision to lengthen the initial structure by some 2,000ft, led Rendel to turn the breakwater back to the north, creating a 'z' shape, and a total length of 7,860ft thus making it the largest breakwater in Britain. James Rendel died on 21st November 1856, and his role as chief engineer was taken by John Hawkshaw. However the resident engineer was George Dobson, who was a brother-in-law to Rendel. In 1857 the breakwater was extended by a further 500ft by Messrs Rigby, using the same method as agreed in the initial build, for which the contractor was paid 2s 7d for every ton of stone deposited, an improvement on the previous 2s 4d a ton (National Archives, RAIL 837/10). In 1851, by which time 626,000 tons of stone had been deposited in the sea, 182 vessels took shelter in the harbour. By 1854 1,801 vessels were making use of the new harbour and in 1876 it was noted that an average of 3,500 vessels per annum used the new harbour and facilities (Owens 1987, 13 and 29).

The rubble used to form the foundations of the breakwater came from the northern side of Holyhead Mountain. The methodology employed in the rubble quarrying is described in detail by Harrison Hayter in 1876, but involved the improvement over time in blasting technique and consequently the volume of stone that could be quarried at any one time. Occasionally blasts were unsuccessful, and on July 2nd 1852 a blast caused the windows of the harbourmasters house to be blown out (Anglesey Archives, WM/18). Rubble quarrying reached a peak when 100,000 tons was removed in a single blast (Anglesey Archives, WDD/1731). This incident is described in detail (with a slightly lower estimate as to the volume of rock dislodged) by R.T. Williams, an eye-witness to the event, *'on 6th September 1854, 6,000lbs of*

explosive brought down 40,000 tons of rock, and on Friday 16th January 1857 the most tremendous explosion of all took place when 16,000lbs of explosive removed 90,000 tons of rock' (Hughes and Williams 1981, 89).

The stone was deposited on the rubble breakwater core from waggons running over a temporary wooden staging (Hayter 1876, 105-106). The railway system employed was completely isolated and was laid to the broad 7ft gauge. This ensured stability in operation on a very exposed and windswept site, and was used on a number of other locomotive-worked breakwater and harbour railways, such as Portland in Dorset (Neale 1997, 20).

The original specification for the works states that *'the stone is to be deposited in the works in layers of from 15 to 20 feet in thickness from wooden stages with railways laid upon them from which the waggons are to be emptied. In the lower layers of the work the stone which arises in opening the quarries on the mountain is to be used. In the succeeding layers the proportion of large stone must be increased, so that the top or upper layer shall have the largest proportion of large stone. But in each of the layers a proper proportion of small stone shall be deposited to insure the solidity of the whole mass, and the better to secure that important object, the quarries shall be kept clear by conveying to the work, day by day and in the same waggon, the various sized materials as they arise in the process of quarrying'* (National Archives, RAIL 837/4).

The staging for the breakwater was intended solely as a scaffolding for the work. Upon every fourth pile a cast iron bollard for ships mooring against the scaffold. During the process of forming the rubble core mound, *'the staging at the end of the work was frequently washed away by gales before it was well surrounded; but it was considered by the contractors better to adopt the staging described than to be at the cost of one of a more permanent and expensive character, especially as the timber removed during gales could, as a rule, be recovered'* (Hughes and Williams 1981, 106). A violent storm in 1856 caused £8,000 worth of damage to the staging. Timber was ripped off the structure and driven up on the Newry Beach. The contractors had vessels on site which collected the timber and it was re-used in the staging. The superstructure on the seaward side of the breakwater was constructed principally of

massive quartz-rock stone blocks from the Holyhead Mountain quarries (Figure 04-05, Plate 30).

Laying the foundations was the most difficult and dangerous part of the work, which was frequently hindered by storms, and it is recorded that 20 workmen lost their lives between 1849 and 1852. The depth of the water was in places 55ft, and the rubble mound, 250ft to 400ft wide at the base had to be continually reinforced owing to storm damage (Lane 1989, 53). In total it has been estimated that 7,000,000 tons of stone was laid in the construction of the breakwater (Hayter 1876, 105). A solid wall of stone was laid on top of the foundation, 39 ft high, of two decks, with a rail track laid on the lower, and a parapet on the seaward side.

The huge limestone blocks used for the plinths, cornices, parapets, paving, copings and other ashlar of the breakwater were of limestone and were brought from Moelfre on the east side of Anglesey by sailing boat. These were set in lime mortar (Figure 04). The specification stated that '*the heads of the breakwaters are to be brought up with block work to the level of low water spring tides by the aid of diving bells. The bell work for the head of the North Breakwater to commence by levelling the rubble stone deposits to receive the square blocks at a level of 30 feet below low water spring tides. This levelling to be done by the deposit of a greater proportion of small stone which will readily admit of a bed being made fit for the reception of the first course of blockwork*' (National Archives, RAIL 837/4). The rear of the ashlar blocks was to be left rough to make a good bond with the rubble core.

Some underwater walling was in sandstone brought from Runcorn in Cheshire (Davidson, *forthcoming*, Hayter 1876). A drawing of a section through the breakwater created after the completion of the works shows the relationship between the stone foundations, rubble core and superstructure (Figure 05).

The Breakwater Quarry (PRN 7165) is more than 500 feet wide all along its length, and in some parts very deep. Such was the demand for stone that during its operation huge blasting operations were carried out on a daily basis, sometimes up to three times a day (Lane 1989, 52). Following the completion of the breakwater in 1876, the quarry at Holyhead Mountain was leased to William Wild, who established a brickworks at the quarry. The Moelfre Quarry, used for the ashlar masonry was known as Jersey Quarry.

The lighthouse at the end of the breakwater was built between 1845 and 1873 and probably designed by John Hawkshaw, the Superintendent Engineer of the harbour works from 1857 to 1873. This three storied lighthouse has chamfered angles and a stepped plinth set on an oval platform on the breakwater, and has a roll-moulded string course projecting above the first floor level and is 22ft 3in square. A moulded cornice supports a walkway around the circular lantern (Denton and Leach 2011, 78-79). The lighthouse is designated a Grade II Listed Building.

The breakwater work was completed in 1873, at a cost of £1,285,000 (Hollands 1973; Haslam *et al.* 2009; Figure 03) and the Prince of Wales performed the opening ceremonies. A watercolour painted by G.H. Andrews conveys the scene at the time (Figure 06). An inscribed plaque on the wall of the lighthouse reads:

“This Breakwater was commenced in 1845, and on August 19th, 1873,

Albert Edward, Prince of Wales, declared the work to be complete.

Superintendent Engineers – James Meadows Rendel, 1845-56

John Hawkshaw 1851-73 G.C. Dobson, Resident Engineer.

J. & E. Rigby, Contractors.”

The Great Breakwater today is regarded as the finest breakwater in the British Isles and is a Grade II* Listed Building (Figures 01 to 08).

6.2.1 Development and Modifications to the Breakwater

Work on the breakwater has been continuous since it was opened, with repairs frequently required due to damage caused by the gales that hit the coastline during winter (Plate 28). In 1878 William Williams, contractors of Holyhead, were paid £1,100 by the Treasury for repairing the foundations, and further huge amounts of rubble were deposited in 1880, 1886, 1887, 1889-1890 (National Archives, RAIL 837/23) and 1904 (National Archives, RAIL 837/30; Figure 07). In 1911 and 1913 S. Pearson and Sons, contractors of Westminster added 267,000 tons to the foundations from the quarry, and in 1914, 24 steel cases filled with concrete were placed around the north-east end of the breakwater, which remain clearly visible today (National Archives, RAIL 837/32, Figure 08; Plate 12). A ‘Breakwater Gang’

who carried out continuous maintenance to the breakwater was maintained up to and including the time that British Rail owned the breakwater from 1948 to 1993 (Roberts 2002, 16-27).

6.3 Technical Specification and Construction associated with the Breakwater

6.3.1 The Great Breakwater

The Great Breakwater is 2.4 miles long and is z-shaped in plan, and was constructed between 1848 and 1873. It was designed by J.M. Rendel, who was replaced by John Hawkshaw after the former's death on 21st November 1856. The resident engineer, who oversaw the day to day work on the breakwater, was John Dobson, and the contractors were J and C Rigby. The breakwater was, in engineering terms, a very significant development, and several new techniques were pioneered during its construction. The breakwater was built by dumping stone from Holyhead mountain to form a rubble mound, upon which was erected a massive wall faced with limestone blocks (Plate 26).

The seaward side rises nearly 40 ft above high tide, ending in a parapet wall which protects a walkway some 3m wide and a lower quay 13m wide. The latter carried a railway along its length for maintenance, and at the end of the breakwater marks are visible of the former rails, some apparently of the 7ft gauge tramway (Plate 23). Every 183 metres (200 yards) pairs of steps go down to the water, with a mooring post alongside (Plate 21). Another set of steps leads to the higher parapet, with an arched opening alongside (Plate 22). Interspersed equally between each set of steps are refuge shelters built into the breakwater wall between the upper and lower stages, consisting of three small chambers, with two outer square headed doors and a central round headed one (Plate 20). Many are now blocked but it would appear that the two outer chambers contained benches at each end, whereas the central chamber may have been for animal shelters (Plate 19). Towards the north-east end of the breakwater, a wider section of parapet housed two store rooms and a former latrine (Plates 24). The breakwater ends in a large oval platform with a square lighthouse. This is reached from the lower quay by large steps, at one side of which is a round drum pillar with rope-moulded decoration around a horizontal band - a similar pillar can be seen at the start of the breakwater (Plate 18).

6.3.2 *Breakwater Lighthouse*

The lighthouse was built to a design by John Hawkshaw to mark the end of the Breakwater (Plates 14, 25). It was built in 1873 and was square in plan, with chamfered angles, and a stepped plinth. It has horizontal roll moulding at first floor level. There is a walkway around circular lantern, on moulded cornice supports and with iron railings. Inside there are three floors and a basement entered through the lower stage of the breakwater.

The interior of the lighthouse was not observed, but the following description is taken from Davidson (*forthcoming*). 'A Central pillar runs up from basement to light workings. Basement has storage tanks etc and ladder up to ground floor. Ground floor now largely empty with stairs up to first floor which has three bunks built into cupboards against the walls, and a base where stove was situated. Second floor has large dresser - turntable for light visible in roof. Slate steps up to third floor - parapet walls c. 1m high surmounted by circular glass walls in large diamond panes and iron glazing bars. The light has been removed, but a large turntable is supported on rollers, with two sets of gears to turn it in a glass fronted cylindrical cabinet below'.

6.3.3 *Breakwater Quay*

A large quay survives, which formed the first stage of the construction of the breakwater, following the start of the construction work in 1847. It is still in use for storage, and has steps down to the sea at the north end, and a single stone structure of uncertain use (PRN 18137) remains from the 19th century (Plates 01-02, 29). It is a small square building of stone, with large blocked openings in the wall, and a fireplace inside, which is probably a guard or watchman's hut. The building is shown on the 1887 Ordnance Survey map. The structures built on the breakwater quay are shown on an LNWR plan of late 19th century date (Figure 09).

6.3.4 *Kilns and Associated Structures Soldier's Point*

Now all demolished, but they werestill standing in 1890, when there were two ranges of buildings, both with chimneys. A brick platform still survives which may be one of the chimney bases. A kiln was constructed as early as 1850 (shown on Rendel's

map), and this was referred to as "old kiln" on the 1900 OS 1:500 scale plan, second edition sheet V.14.

6.3.5 *Engine Shed, Breakwater*

A large engine shed, built soon after the start of works, sometime between 1850 and 1857. This is far too large and well-built to be simply a loco shed, and is almost certainly the core part of an engineering complex that included the repair and maintenance of the locomotives and probably the wagons and cranes. The building was burnt down in the 1970's, and has been entirely re-roofed, but nonetheless it is an important survivor, both as an essential part of the breakwater construction site, and on a wider scale as a rare example of a construction company's repair facilities. The building is some 74m long by 13m wide. It is divided into a series of bays by wide piers and long windows between each pier, starting about 1m above the ground, and continuing to eaves heights. The front is divided into two openings by a single pillar, and all built of local rubble. Rails of standard gauge are visible in front of the shed. The building has a right-angled wing at the east end, which appears to be original, but was originally longer.

6.3.6 *Breakwater Tramway*

A 7ft gauge tramway was built 1848-9 to carry stones from a quarry to the proposed breakwater off Soldier's Point. An extension was also built to Salt Island, though that scheme was later abandoned. Special wagons designed by the resident engineer Dobson were used to tip stones from a timber staging to create a wide mound upon which the breakwater was subsequently built. Written records testify to their being five parallel tracks running along the staging (Davidson, *forthcoming*). The tramway continued to be used for maintenance, though in 1910, when a contract for major repair works was let to S Pearson and Son, a new standard gauge line was laid alongside, and following 1913 only this gauge was used. Rail marks visible at the end of the breakwater are 7ft in width, though sleepers which remain in situ close by (laid longitudinally not across the track) are of standard gauge width. Remains of the standard gauge rails are visible outside the Engine Shed (PRN 18110), and further north, where the track to the breakwater crosses the fence line (Plate 17; Figure 09).

6.3.7 *Breakwater Tramway to Salt Island*

The original tramway from the quarries to the proposed pier off the north end of Salt Island (PRN 18109) was constructed 1848-9. It was built to a broad 7ft gauge, primarily because the broader footprint allowed greater stability for the very heavy weights to be transported. The rails were taken up sometime after 1853, and the line of the tramway is now followed by the main access route to the Breakwater Quarry Country Park to the west, and underlies much of Beach Road to the east. A section may remain buried east of the coastguard station, though the area is now grassed over. There were two branches from it, one to the creosote works, and one to a proposed pier off Newry beach which was never constructed (Figure 09). An archaeological evaluation, involving two trenches cut across this tramway, was carried out north of Hibernia Row, Holyhead in 2004 (Smith, 2004). This identified that the track bed survives intact in many places, together with its sleeper stones, although without the iron chairs, fixing pins and rails (*ibid.* 3).

6.3.8 *Soldier's Point*

The house at Soldier's point was built in 1849 by Rigby, the contractor for the Breakwater. Built to impose with considerable use of towers and turrets, it is, perhaps, a natural successor to the work carried out by Rigby at Swindon and Bristol Temple Meads, where castellated ornamentation is much in evidence. It is now in a dilapidated and decayed state. Similar work was carried out by Jesse Hartley for Point Lynas lighthouse.

7 HISTORICAL CONTEXT AND SIGNIFICANCE

7.1 National and International Significance

The 1840s were a period of unprecedented maritime development in the United Kingdom and in 1845 the government set up the Tidal Harbours Commission. They were concerned about the state of many harbours around the British coastline, and the Admiralty considered that Holyhead, with an ever increasing number and size of vessels using the port as a harbour of refuge, required further improvements. The port was also of significance as it was used by the Irish Mail packet boats, having been furnished with the Admiralty pier by John Rennie Senior in the 1820s.

The construction of the Holyhead Breakwater reflects governmental interest in the question of harbours of refuge, reflected in the work of a Royal Commission which in 1847 discussed the need for a harbour of refuge at Holyhead to protect shipping on its way to or from Liverpool, as well as the safeguarding of the Holyhead packet boats, similar to that employed at Portland for Channel shipping. At the same time as the construction of the breakwater at Holyhead the Liverpool dock system was expanding rapidly and was of crucial importance to Britain's growing dominance in world trade. The docks at Liverpool are a World Heritage site as a supreme example of Britain's pre-eminence as a world maritime trading power. Holyhead breakwater was a massive undertaking which reflected the importance with which the protection of shipping was viewed, and was closely connected to the expanding trade from Liverpool (Insall 2003, 56). The importance of harbours of refuge, very current in the mid-19th century at the time the breakwater was constructed, had declined by the time the breakwater was finished, owing to the dominance of steam ships for maritime trade at this slightly later time.

The Holyhead breakwater is amongst the largest ever constructed in Britain and Ireland, with Plymouth, Portland and Dublin breakwaters being constructed at around the same time. All these examples, with the exception of Dublin, were constructed with rail tipped stone. The Holyhead and Portland breakwaters were amongst the most important works designed by the engineer James Meadows Rendel. It is considered that he himself wished to be remembered for Holyhead and Portland

harbours, which he considered his greatest works and which were unfinished at the time of his death. His sons George and Stuart later attempted to get plaques placed in both ports naming Rendel as the creator of them. They had by then become established as major port installations, which reflected the importance with which they were viewed (Rendel 1998, 79).

Certainly Rendel's work at Portland provides the clearest parallels for his work at Holyhead, and it is clear that he designed the same type of breakwater for both locations. Very similar construction methodologies were also used also at the two breakwaters, except convict labour was used at Portland whereas free labour was used at Holyhead (Legg 2000; Jackson 1999, 63-73). The Brunel gauge railway, cranes, wagons and timber staging used during the construction were a clear parallel with Holyhead. It must also be borne in mind that Portland was a strategic fortified port, whereas Holyhead was unfortified. However it is clear that Portland forms a close parallel, not only in terms of personnel and methods involved but also in terms of surviving historic remains.

The construction of breakwaters on an industrial scale can be traced back internationally to the fortified breakwater at Cherbourg, begun in 1783, which as late as 1847, when the Holyhead Breakwater was being constructed, was '*the greatest piece of hydraulic engineering ever executed*', though this was followed by substantial breakwaters at Le Harve and Marseilles (Kirkpatrick 1998, 13). The first example of this kind of breakwater in England is at Plymouth, built in 1811, and the main characteristic of this and its successors is the use of forms of contractors' railways to ensure a regular flow of stone to the work site (Naish 1992, 37-56).

The locomotives and engineering material used in the construction of the Holyhead Breakwater were in great demand owing to the state of the art nature of the equipment being used. Joseph and Charles Rigby Ltd. also acted as agents for the supply of machinery and equipment for the breakwater at Ponta Delgada on the island of São Miguel in the Azores, which was finally completed in the early 1900s, although work had commenced in 1861. At least two broad gauge locomotives were sent from Holyhead to the Azores. This resulted in the use of the broad gauge for the harbour railway there, and its introduction to European rail systems. A large cast iron water tank and two lathes were also supplied from Holyhead. Plaques to this effect

were attached to at least one of the engines and are thought to have survived until the 1960s. A cement mixer, mounted on a broad gauge wagon frame has a plaque inscribed:

J. & C. RIGBY

HOLYHEAD HARBOUR

WORKS

This machinery survives today at Ponta Delgada, along with a large raised water tank for locomotive use with the above inscription but dated to 1862. These indicate the significance of the engineering links worldwide that the creation of harbours of refuge in the mid-19th century were to have on harbour engineering worldwide (Ponta Delgada and the Broad Gauge Harbour Railways, seen at www.internationalsteam.co.uk/trains/azores01.htm and www.churcher.crcml.org/Articles/Article2010_08html). Equipment from the work at Portland Harbour also found its way to Ponta Delgada. These worldwide links demonstrate the international nature of major engineering projects, and the reach of British commercial interests and trade at the height of the British Empire in the mid to late 19th century.

7.2 Local Significance

The building of the breakwater had a great effect on the town of Holyhead itself. The population increased from 3,869 in 1841 to 8,863 in 1851 (figures from census returns, quoted in Hollands 1973; Owens 1987, 11-12). The larger population was particularly drawn to Holyhead after 1845 when preparatory work was started on the Great Breakwater. Messers Rigby as the main contractors sub contracted a certain amount of the work, and men from Parys Mountain near Amlwch were employed on Holyhead Mountain to quarry the quartzite. There was much other work available from a host of employers, which resulted in a move from rural Anglesey as men left farms and smaller communities for Holyhead with its offer of work (Owens 1987, 12). As the town grew rapidly, more infrastructure was required, and in 1866 water was piped into the town from Traffwll Lake near Caergeiliog, and drainage was installed. Many of the new port working householders were not wealthy enough to pay to have the water piped into their home, but would have collected it from taps placed at street corners (*ibid.* 106). The town developed such that there were 58 public houses, inns and hotels by 1897, and historic map evidence shows that development in the area of the New harbour and Newry beach was expanding at this time (Ordnance Survey 1st edition 25 inch map of 1887-89).

The harbour of refuge was largely redundant for its original purpose by the time it was completed, as steam power dominated on the Irish Sea by 1873 (Jackson 1983, 95). However the harbour improvements under Rendel were mirrored by the improvement of land communication. The railway, masterminded by George and Robert Stephenson was fast approaching Holyhead. When the Llanfair to Holyhead section of the railway opened on 1st August 1848, complementing the already completed Chester to Bangor section, the Admiralty Packets were sent on the first train to Holyhead. The government steamers from Birkenhead were now instructed to take up their new stations on the Holyhead to Dublin route. Four new packet ships were built for this service by the government, though the Chester and Holyhead Railway had been hoping to receive a contract for carrying the mails, and had ordered new steamers ready for the Holyhead to Dublin service. Thus began a dual service of rail passengers and mails by rail and steamer that came to characterise the nature of the port of Holyhead well into the 20th century. In 1856 the port of Holyhead was described as being an '*extensive and commodious one*' and was now

fully linked with the railway connection (Hughes and Williams 1981, 99). The construction of the Great Breakwater considerably affected the layout of the port, enabling it to develop these characteristics.

The effect of these developments was, however, to result in the port becoming something of a through port moving goods and people from England to Ireland, with more limited direct benefit for the town of Holyhead itself. The port and railway did, however continue to provide significant employment in the town. The Royal and the Castle Hotels served passengers through the railway and port, and were considered high class hotels in the 1850s. However in 1859 *'the uncomfortable looking fishing village of Holyhead [was] full to repletion and woe betide the unlucky voyageur (sic) that comes down by the night train in the expectation of getting a bed. Paltry little dens and roadside alehouses command a price for dingy accommodation which would make our best London houses stare. However the daily number of visitors is greater now than ever it was at Portland...'* (ibid. 96-97). Thus outside the main established accommodation Holyhead remained significantly underdeveloped. This began to change from the 1860s onwards, with considerable expansion within the town itself and the port area. This expansion is to some extent a result of the construction of the Great Breakwater at Holyhead.

8 STATEMENT OF SIGNIFICANCE

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.

The construction of the Holyhead Breakwater reflects governmental interest in the question of harbours of refuge, reflected in the work of a Royal Commission which in 1847 discussed the need for a harbour of refuge at Holyhead to protect shipping on its way to or from Liverpool as well as the safeguarding of the Holyhead packet boats. The breakwater was a massive engineering undertaking which reflected the importance with which the protection of shipping was viewed. The town of Holyhead was also changed significantly by the construction of the breakwater, with a significant increase in population.

The work at Holyhead had close links with international harbour breakwater projects, including direct ones at Ponta Delgada on the island of São Miguel in the Azores, reflecting the importance of British trade and engineering at the height of the British Empire.

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.

9 ACKNOWLEDGEMENTS

The author would like to thank Jamie Gardiner of Royal HaskoningDHV for commissioning the work and to the staff at the National Archives, Kew for their help in sourcing material. The assistance of the staff at Anglesey Archives and the University Archives at Bangor is also gratefully acknowledged. The guidance of David Jump, the Isle of Anglesey County Council Senior Planning and Conservation Officer, and Ashley Batten and Jenney Emmett of GAPS is also acknowledged.

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WM18 Book kept by William Nance, Manager, for the six years ending in October 1857, of the mining operations for the stone required for the breakwater at Holyhead

Bangor University Archives

X/KG 338 Report on Anchorage of proposed Refuge Harbour at Holyhead by James H. Christie

Gwynedd Archives, Caernarfon

X/LNWR/356 Late 19th century plan of Soldier's Point at the landward end of the breakwater showing the structures and tramway located on it

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PCD D9 M16 Chart of the New & Old Harbours of Holyhead, 1852

National Archives, Kew, London

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RAIL 837/4 dated 16th August 1848 Contract for the construction of the two breakwaters and the Steam Packet Pier at Holyhead

RAIL 837/8 dated 8th August 1904 Contract for Repairs to the Holyhead Breakwater

RAIL 837/10 dated 23rd April 1857 Contract for the Extension of the North Breakwater at Holyhead between Messers Rigby and others with the Lords of the Admiralty

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RAIL 837/81 Plan of James Rendel's Breakwater Proposals of 1846

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Figure 01: Location Map, based on 1:10000 Ordnance Survey County Series Map Sheet SH28sw and SH28se. Scale: 1:10000@A4. Crown Copyright. All Rights Reserved. License number AL100020895.

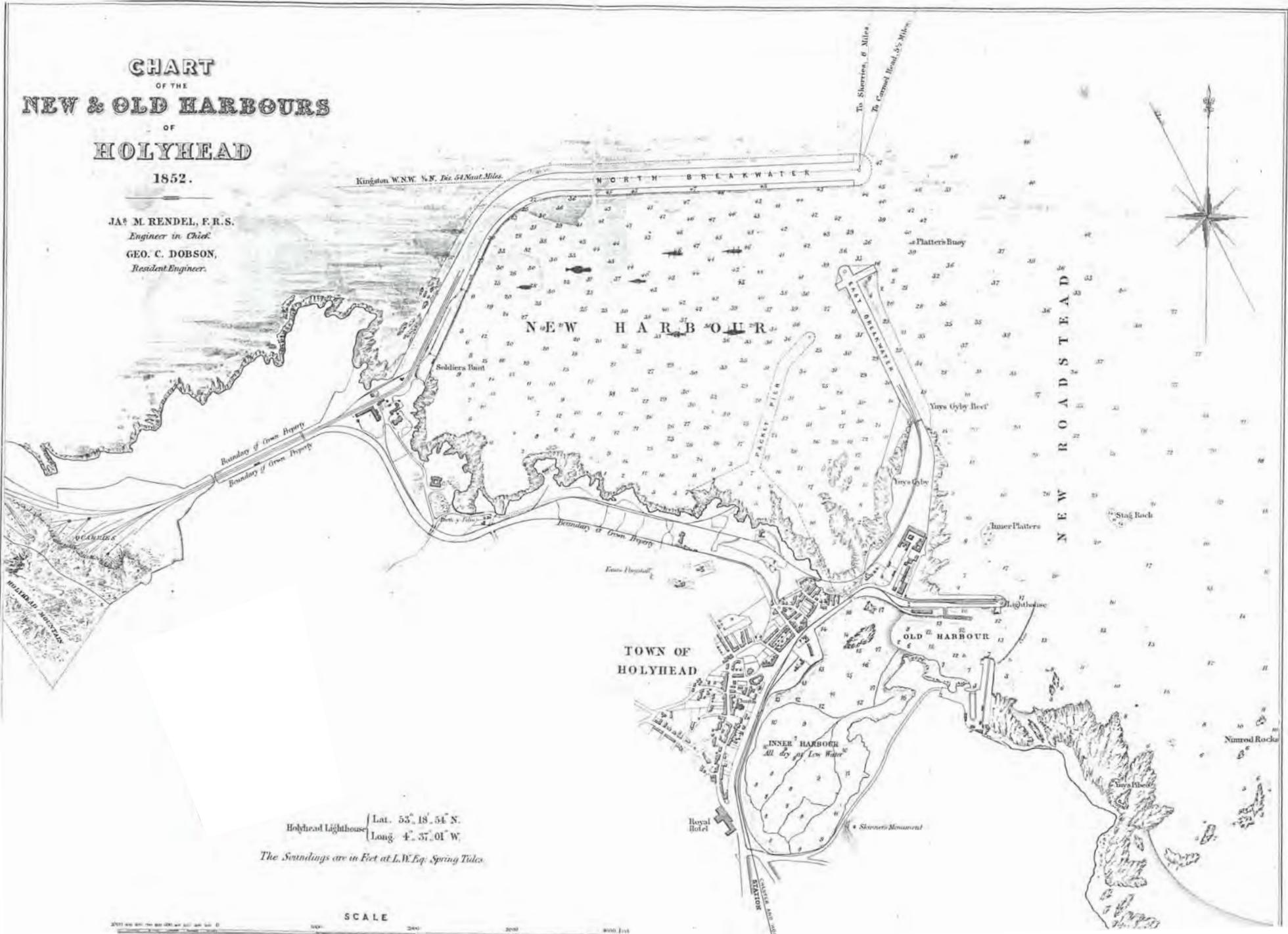


Figure 02. Plan of the proposed North Breakwater dated to 1852, two years before it was amended with the 2,500 yard north-eastern extension



Figure 03: The Great Breakwater as completed in 1873. Drawing taken from the *Minutes of Proceedings of the Institution of Civil Engineers Vol. XLIV Session 1875-76. Part 2*. Not to Scale

SECTION
OF
HOLYHEAD BREAKWATER

SCALE 30' PER INCH

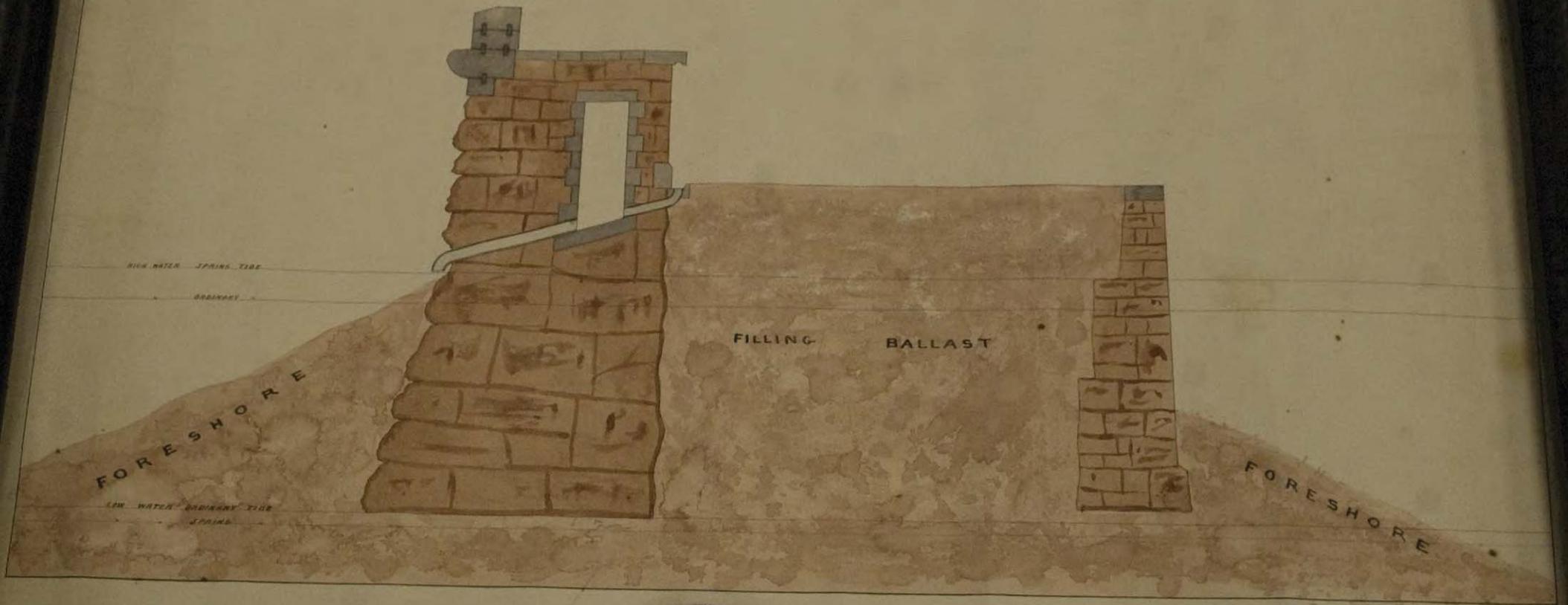
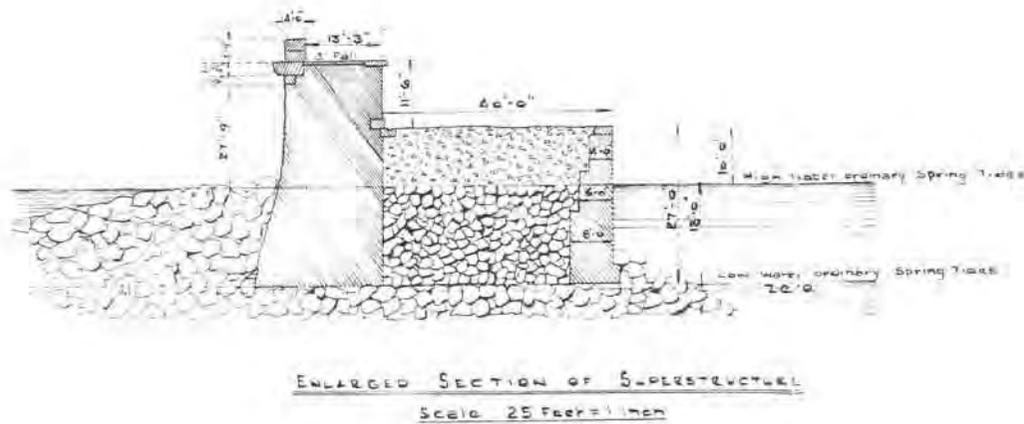
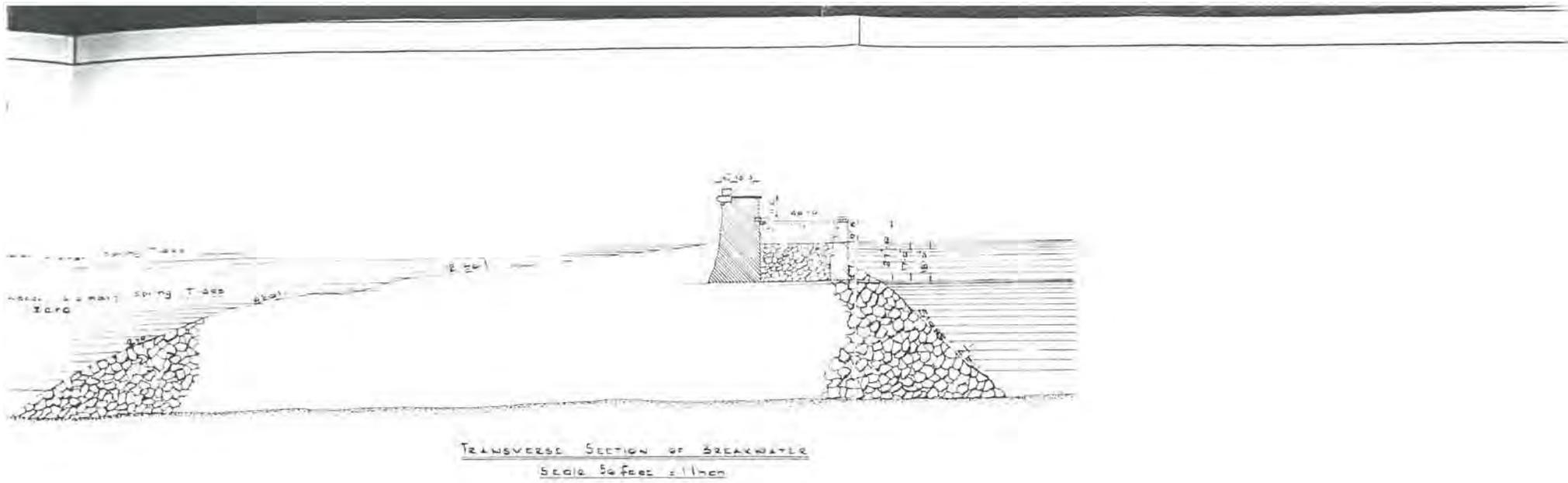


Figure 04: Cross-section through the Holyhead Breakwater, drawn in 1852 (Anglesey Archives WDD/86). Image not to scale, black items are weights used to hold the drawing down flat for photography.



Letter	Date	Description of revisions
British Railways Board Divisional Civil Engineer British Rail London Midland Rail House Gresty Road Crewe CW2 6EA Telephone Crewe 55		
S	T	
31 st JULY 1981		Divisional Civil Engineer
<u>HOLYHEAD BREAKWATER</u> <u>1876</u>		
Scale		
File Numbers		
Drawing Number		

BR 006

MY 1

H

Figure 05: British Railways Board copy of section drawings of the Holyhead Breakwater in 1876 upon completion of the breakwater. Not to Scale



Figure 06: View of the Great Breakwater at Holyhead in 1874 shortly after its completion. Image by G.H. Andrews (NLW)

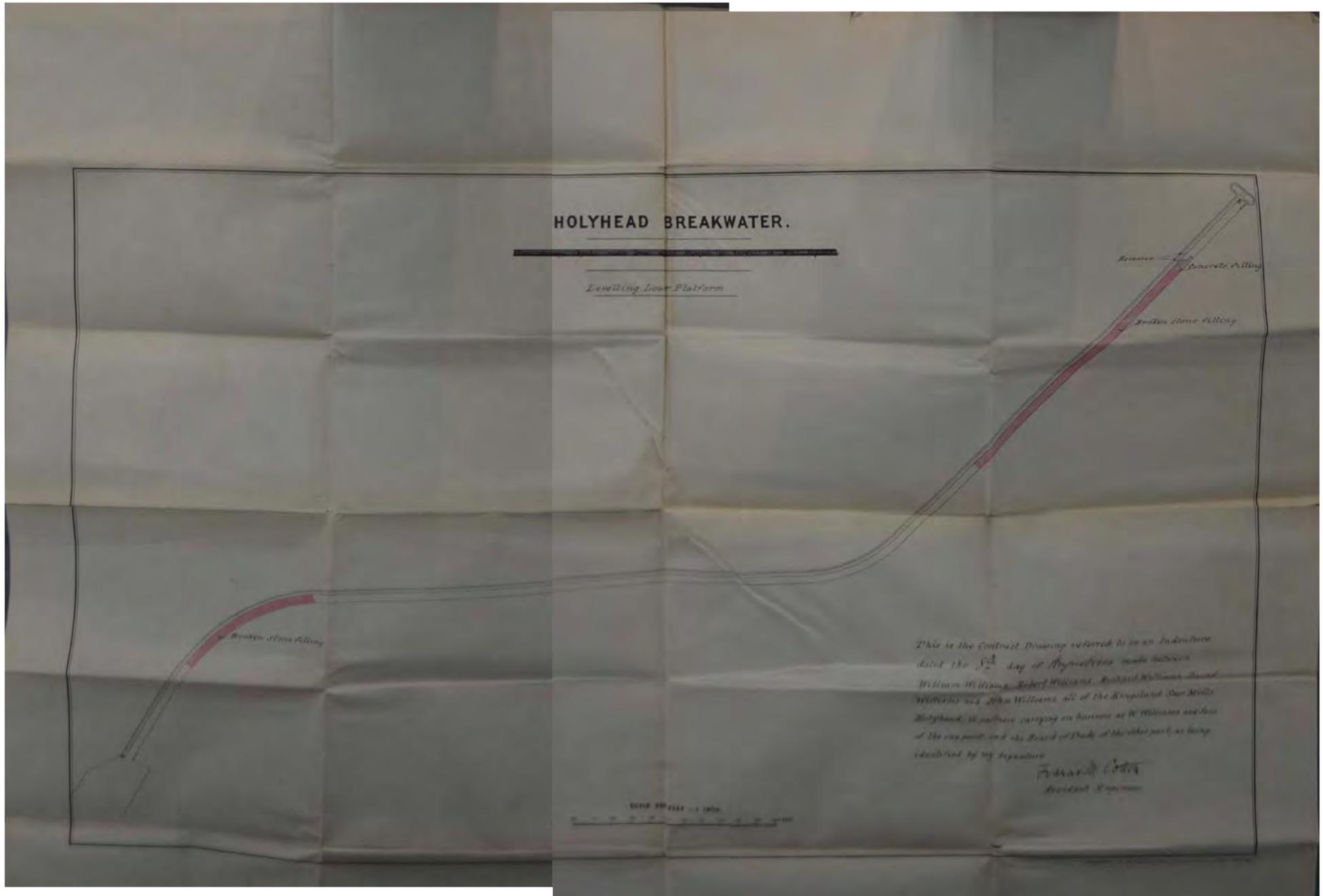


Figure 07: Plan showing area to be repaired of the Holyhead Breakwater in 1904 (National Archives, RAIL 837/8).

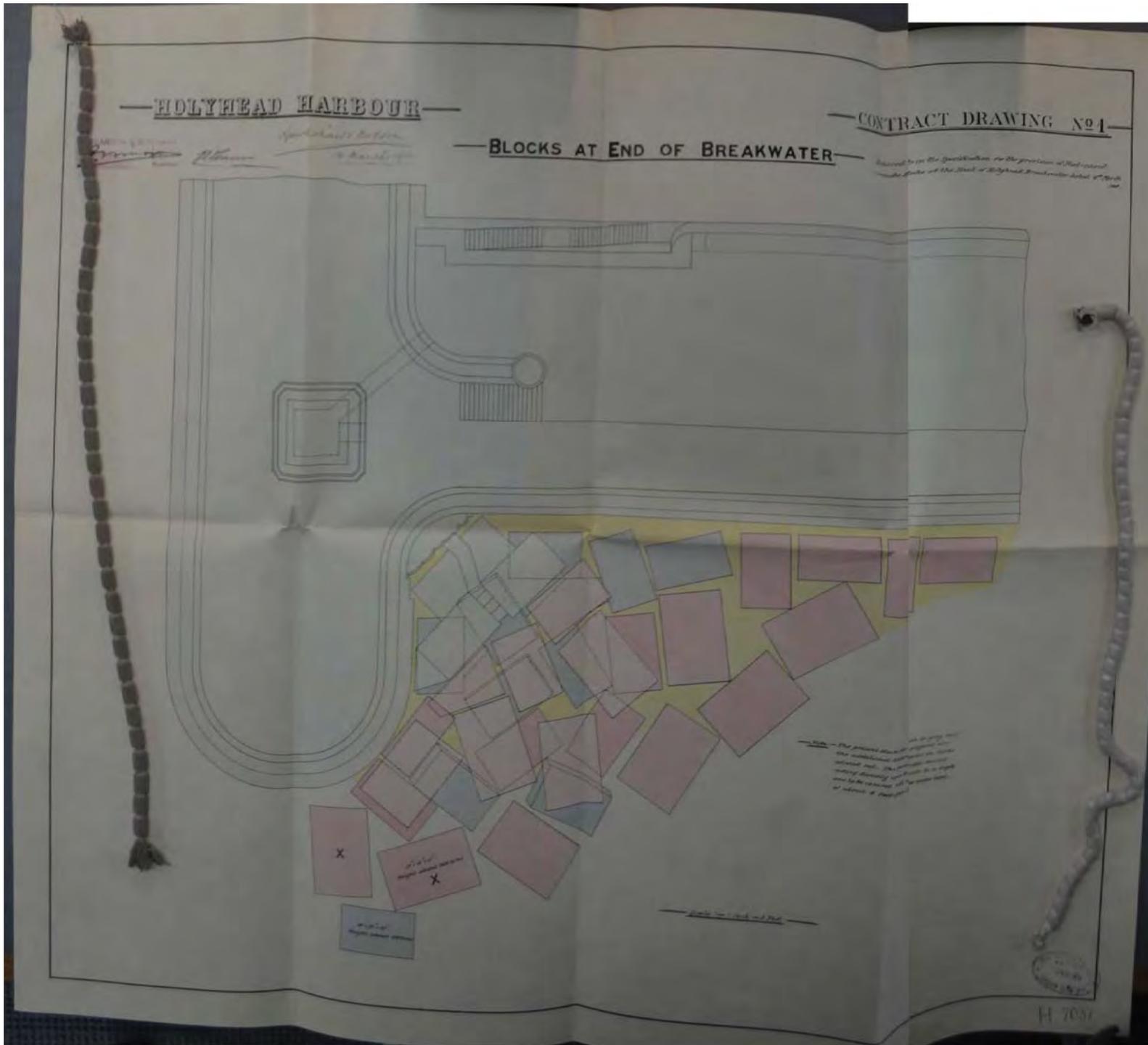


Figure 08: Plan showing steel encased stones deposited at the north-east end of the breakwater in 1914 as a protective measure (National Archives, RAIL 837/32).
Not to Scale

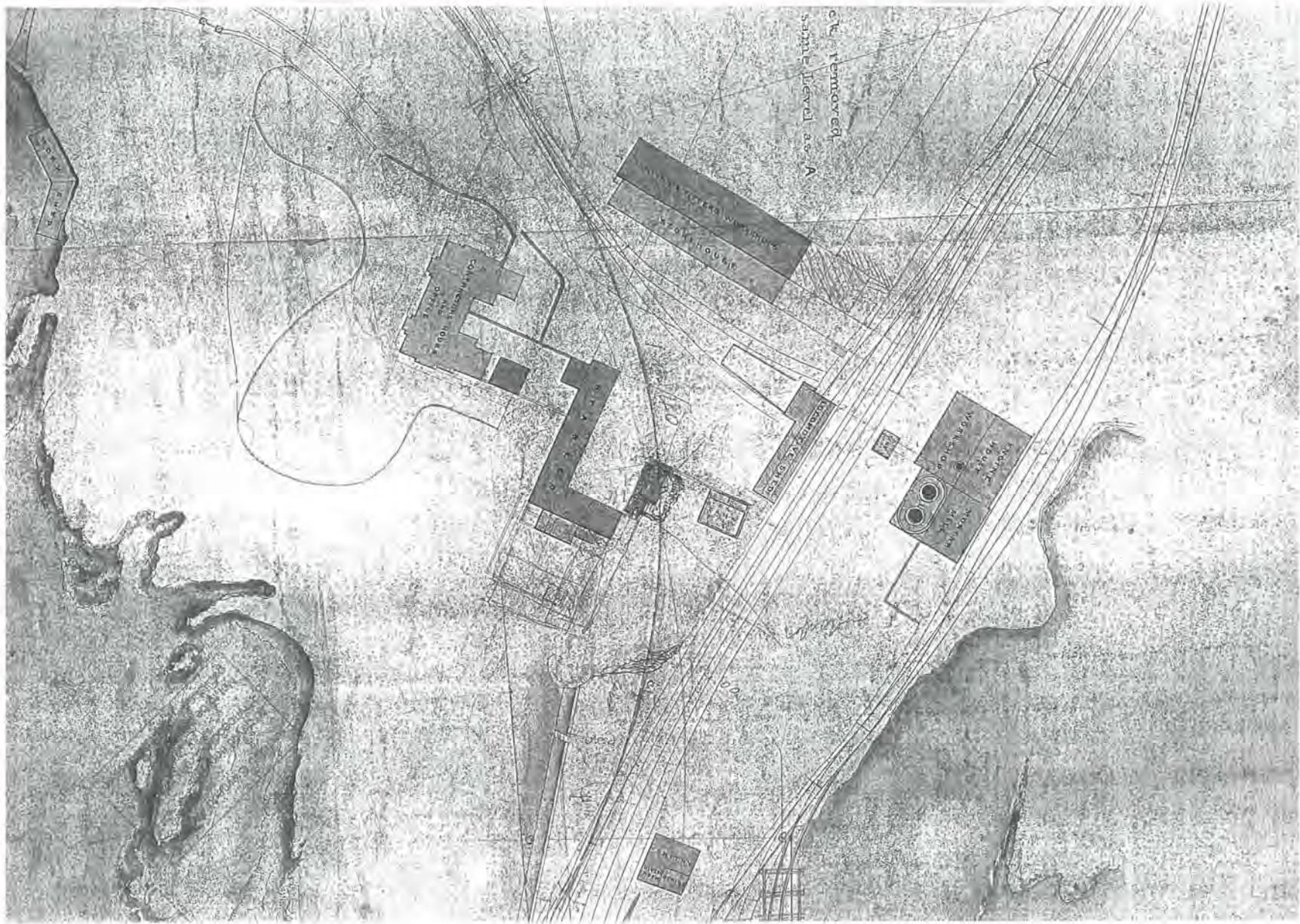


Figure 09: Late 19th century plan of Soldier's Point at the landward end of the breakwater showing the structures and tramway located on it (Gwynedd Archives; X/LNWR/356).



Plate 01: Holyhead Breakwater's Landsend with view of the remnants storage and working area on the portside and decorated bollard on the seaward (sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 988.jpg).



Plate 02: View from portside of the lands end of former storage and working area and beginning of parapet marked by the decorated bollard (sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 1088.jpg).

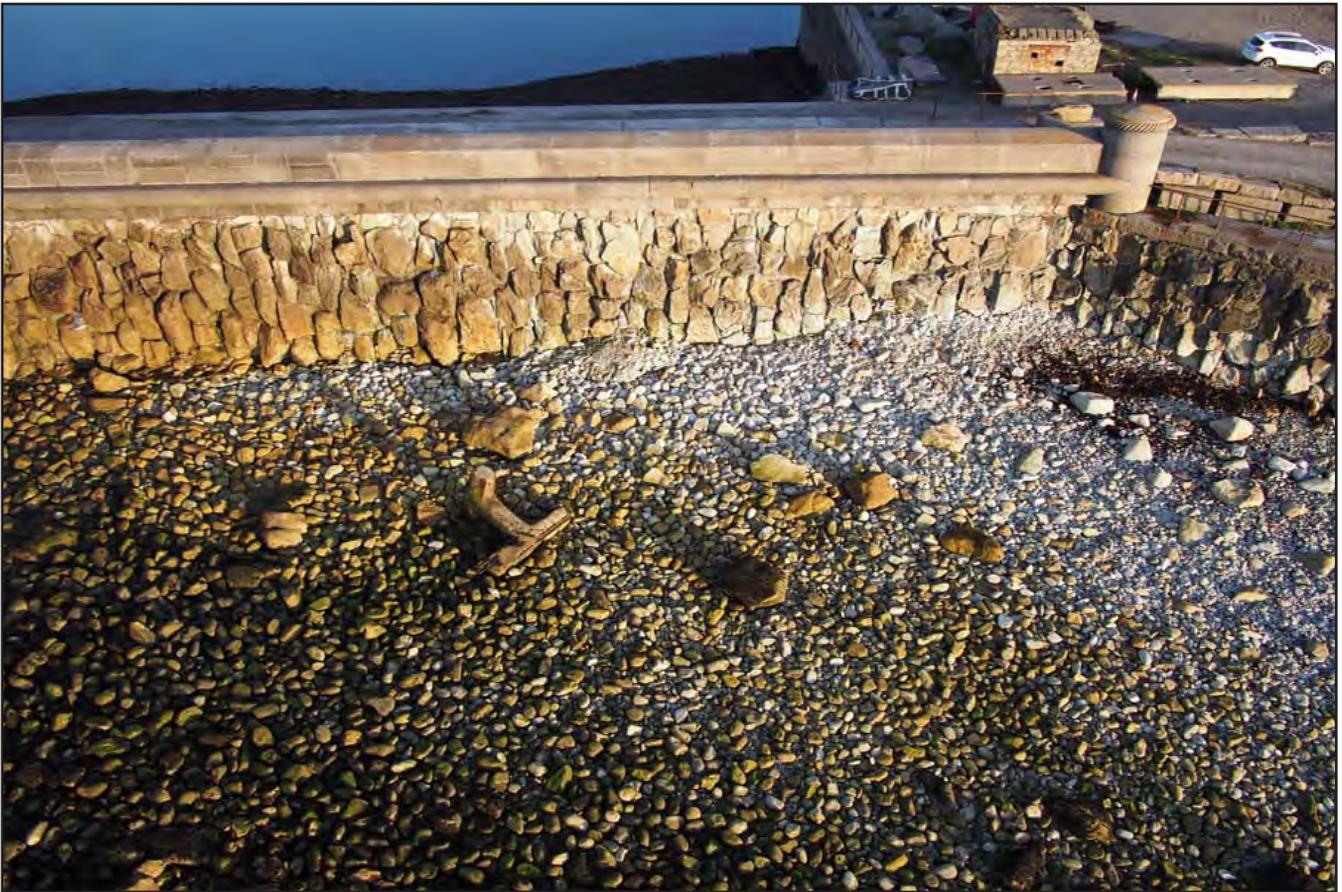


Plate 03: Seward view of the parapet at landsend, showing large rubble foundation blocks supporting the parapet (sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 1086.jpg).

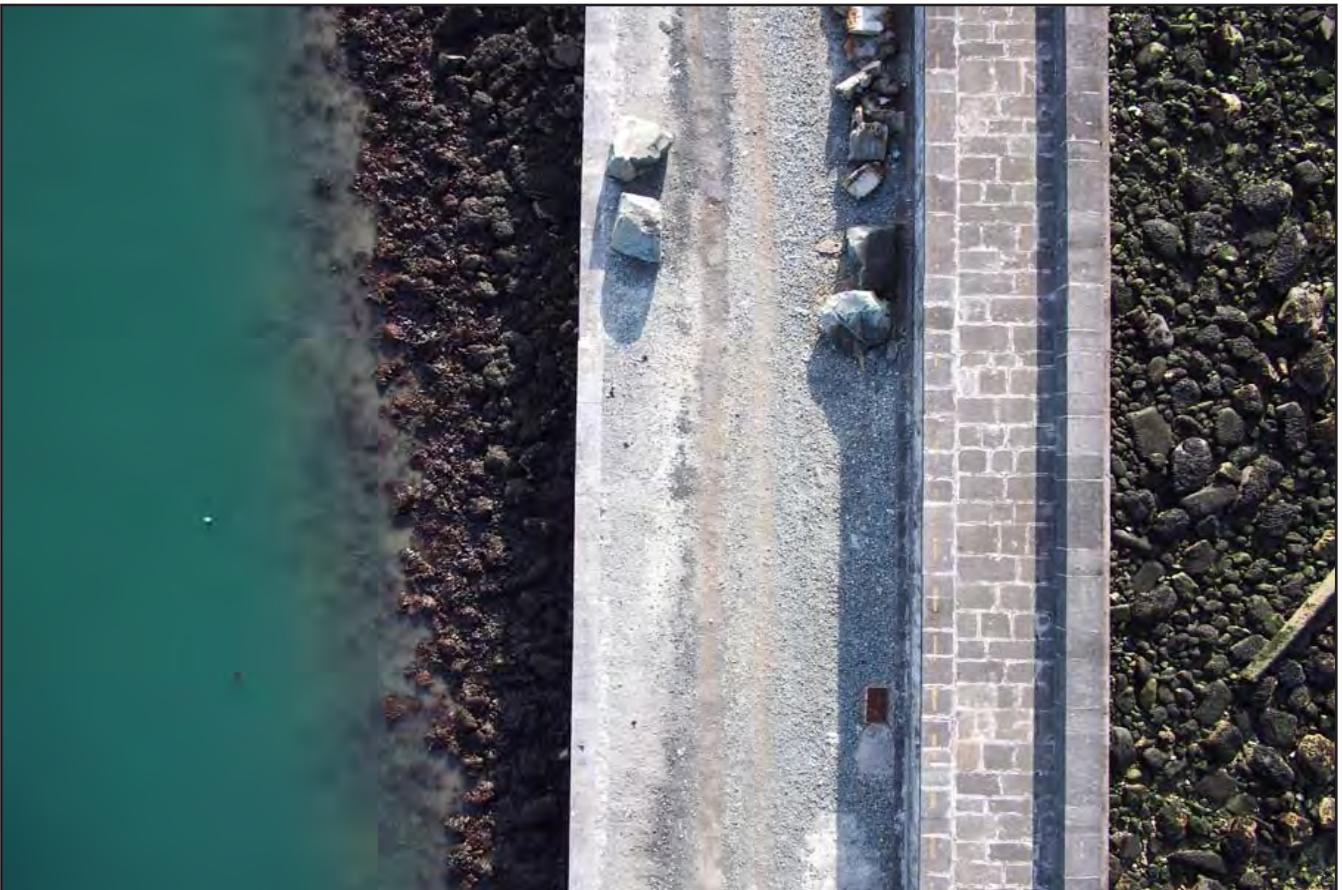


Plate 04: Birdseye view of breakwater showing the parapet's Ashlar masonry of quarried stone from Moelfre and the slip road with former manhole access in view (sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 256.jpg).



Plate 05: Seaward side view of rubble sourced from Holyhead Mountain used as supporting foundations of the parapet (sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 186.jpg).



Plate 06: Seaward view of parapet with the remnants of a later addition of a ladder, possibly used in emergencies (sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 206.jpg).



Plate 07: View of mid - 20th century concrete repairs to the seaward side of the breakwater, with the upper slabs molded to resemble original ashlar masonry of the parapet (sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 193.jpg).



Plate 08: View of further concrete repair work along seawards side of the breakwater (sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 203.jpg).

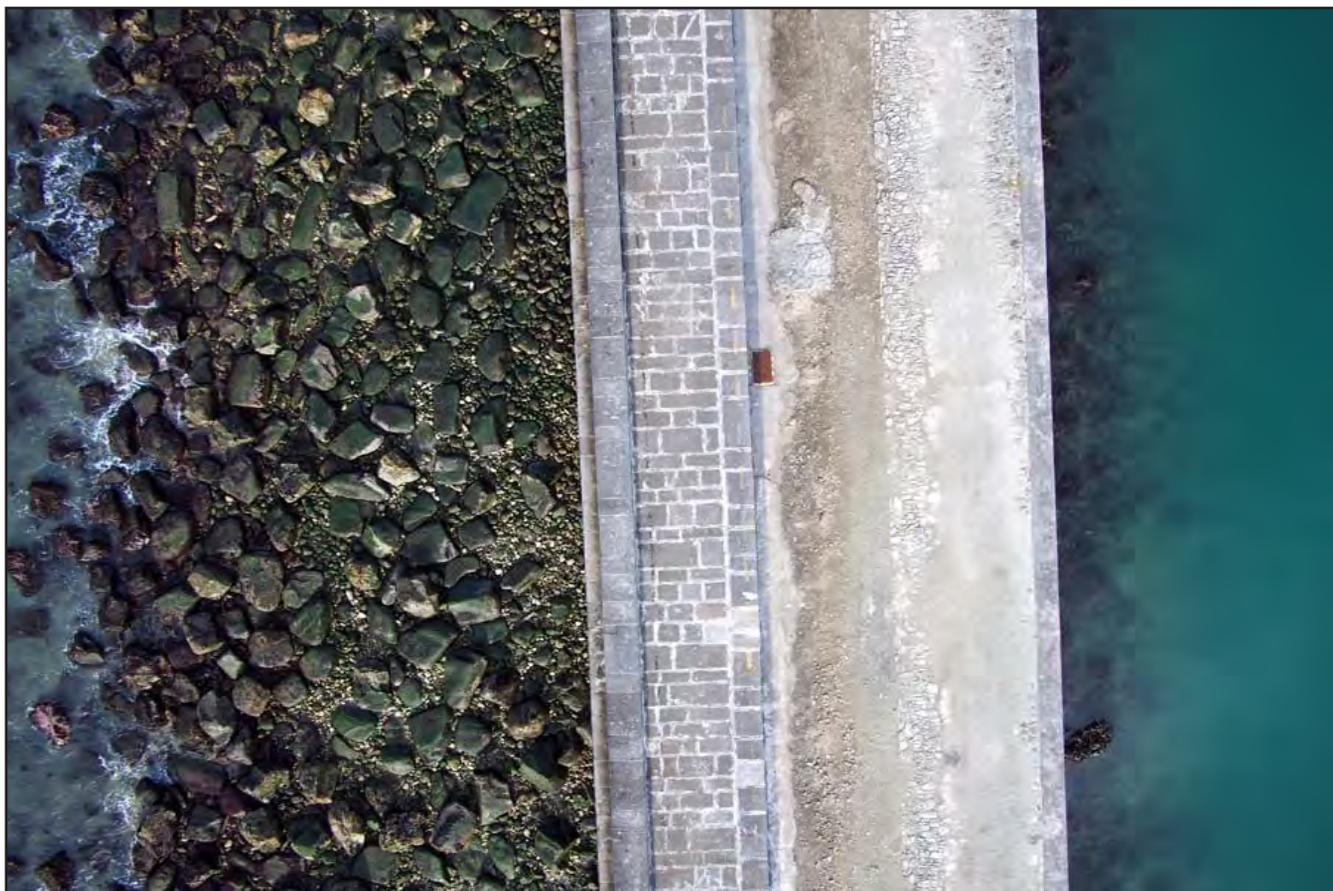


Plate 09: Birds-eye view of breakwater showing remnants original surface on portside, former manhole, and the ashlar masonry of quarried stone from Moelfre and rubble sourced from Holyhead mountain on the seaward side (sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 062.jpg).

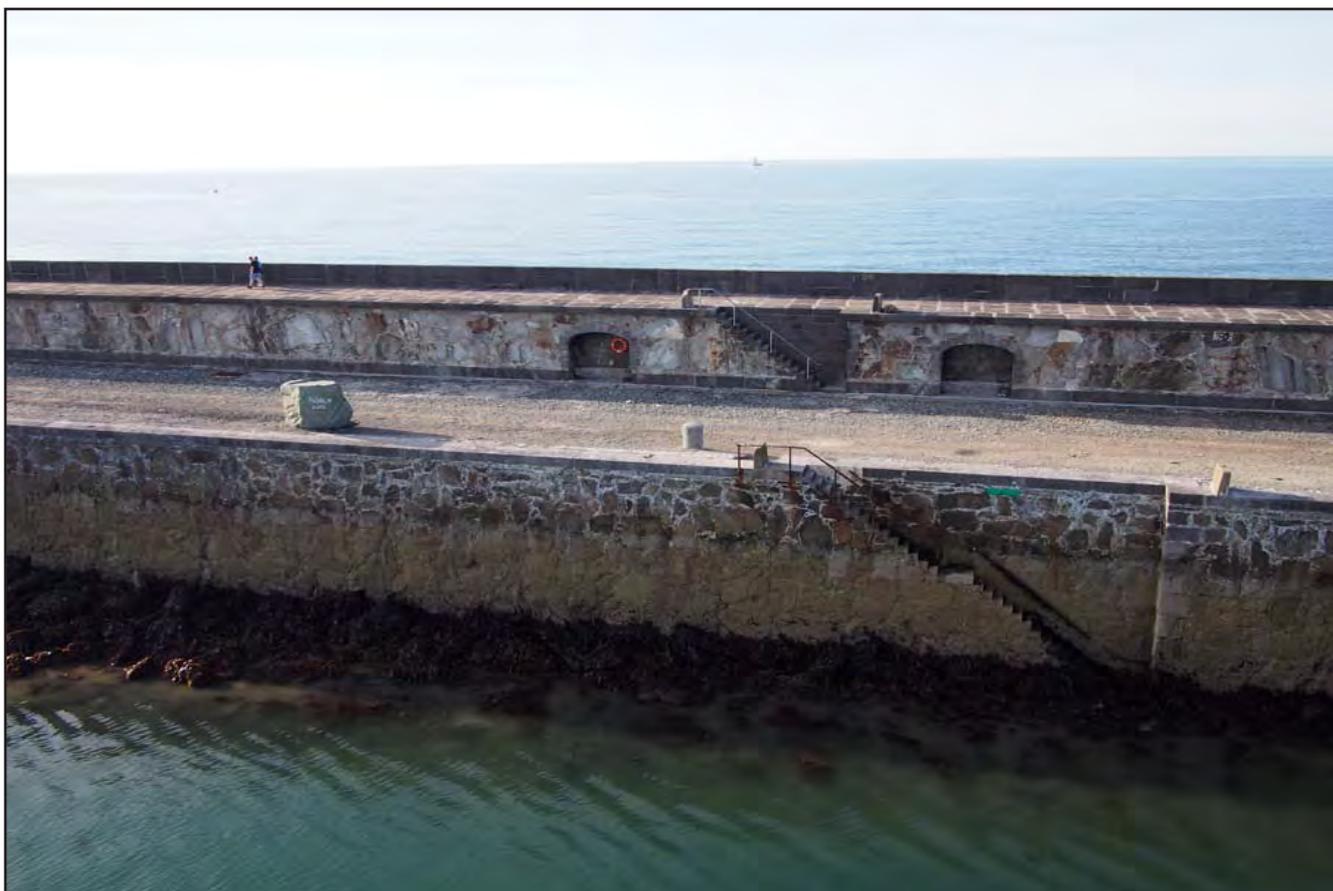


Plate 10: Portside view of mooring post, and staircases leading into the sea, and onto the parapet. Note two original alcoves with masoned seated areas possibly used for shelter during shipments (sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 377.jpg).



Plate 11: Portside view of the tail end of breakwater showing relationship with the ashlar masonry with view former storage and convenience area (sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 151.jpg).

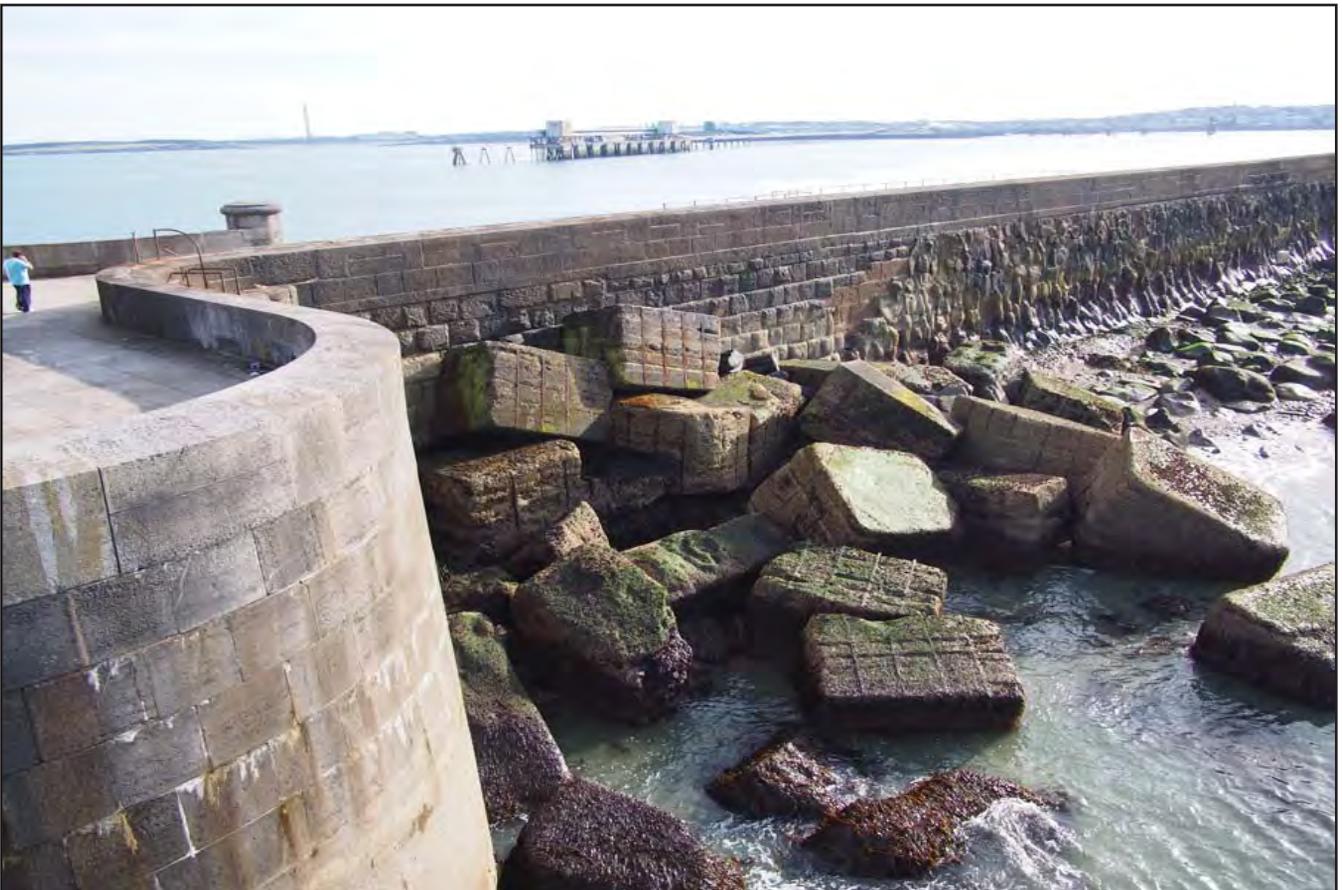


Plate 12: Seaward view of the breakwater's tail end showing large stone ballas, as seen in Figure 08 (sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 168.jpg).



Plate 13: Aerial view of the tail end of the breakwater with the light house
(sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 225.jpg).

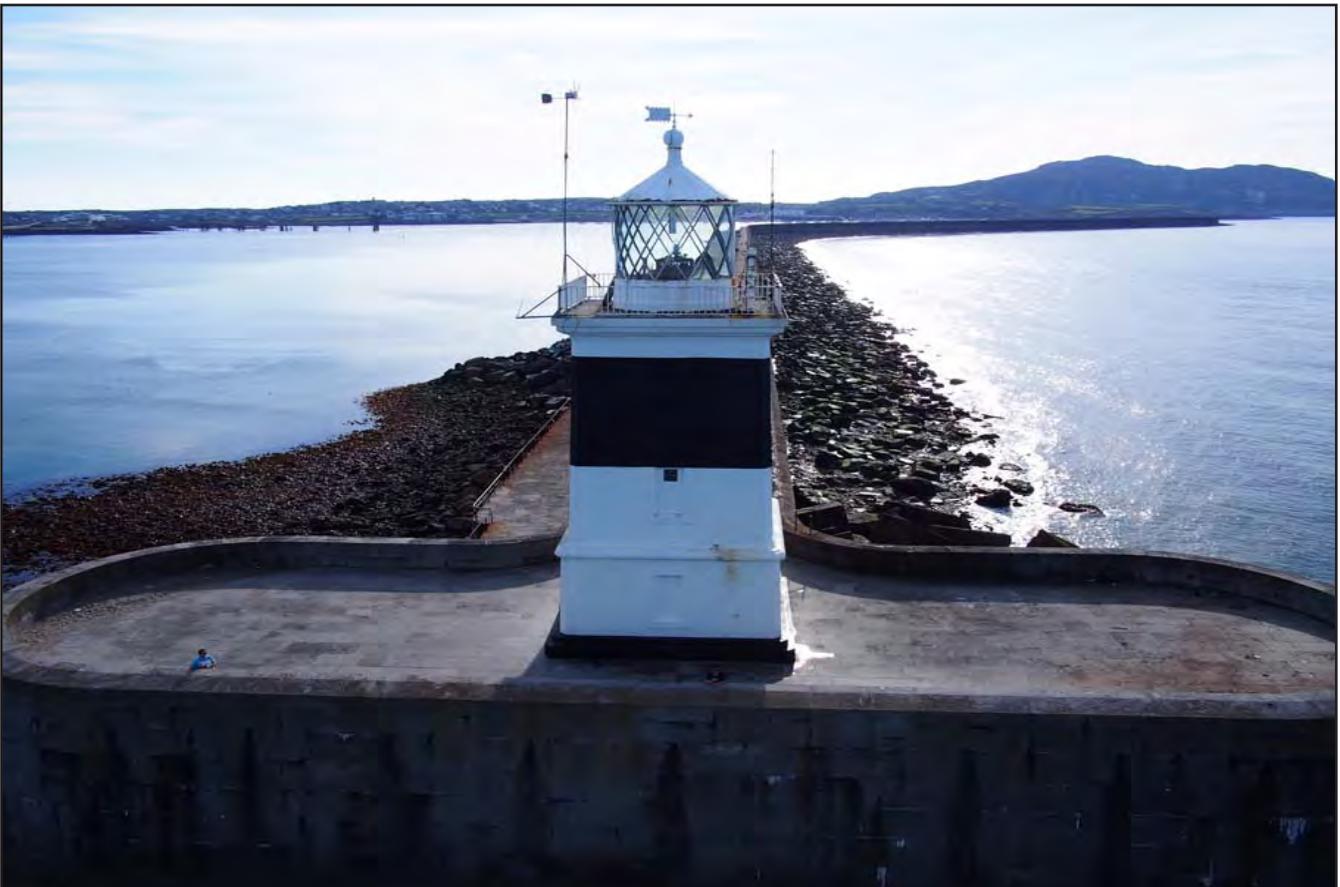


Plate 14: View of full length of breakwater showing its curve leading towards landsend at Holyhead Mountain
(sourced from Civil Engineering Solutions: 20150928 Holyhead Breakwater 160.jpg).



Plate 15: Holyhead Breakwater - view from east looking towards Holyhead mountains from upper parapet (archive image: G2498_042).



Plate 16: Holyhead Breakwater - general view from the southwest looking from the upper parapet (archive image: G2498_047).



Plate 17: Holyhead Breakwater - view from northeast detailing surviving remnant of rail at landward end of hardstanding/building area (archive image: G2498_001).



Plate 18: Holyhead Breakwater - view from southeast of large stone drum with roped design at end of the parapet (archive image: G2498_003).



Plate 19: Holyhead Breakwater - interior view of barrel vaulted refuge chamber (archive image: G2498_009).



Plate 20: Holyhead Breakwater - view from southwest of three barrel vaulted refuge chambers (archive image: G2498_010).



Plate 21: Holyhead Breakwater - view from east of bollard for tying up vessels; located along lower breakwater walkway (archive image: G2498_013).



Plate 22: Holyhead Breakwater - view from south of refuge within the breakwater parapet and stairway between upper and lower levels (archive image: G2498_015).

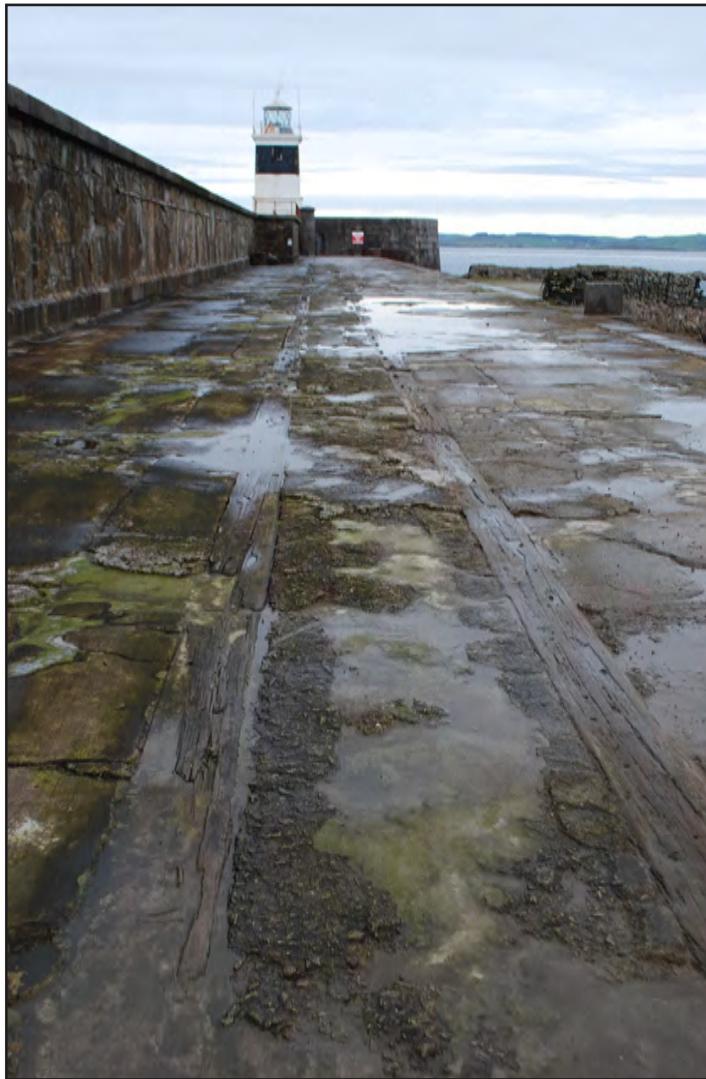


Plate 23: Holyhead Breakwater - view from west of wooden sleepers located along lower breakwater walkway near the lighthouse (archive image: G2498_022).



Plate 24: Holyhead Breakwater - view from southeast of upper parapet storage area and central latrines (archive image: G2498_015).

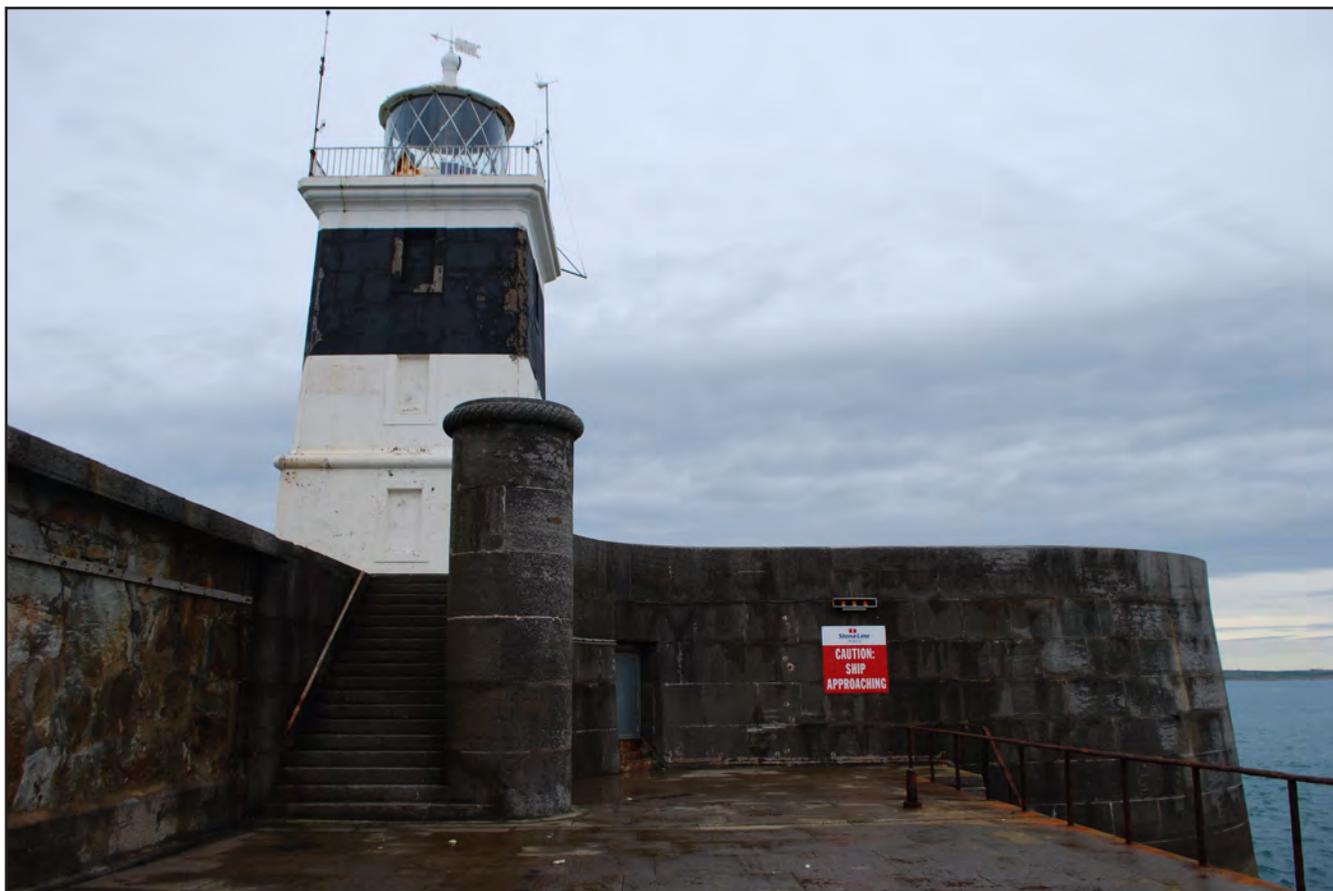


Plate 25: Holyhead Breakwater - view from west of the lighthouse (archive image: G2498_025)



Plate 26: Holyhead Breakwater - view from southeast of parapet ashlar showing cyclopean blocks (archive image: G2498_037)



Plate 27: Holyhead Breakwater - view from east-southeast of breakwater dog leg showing seaward side (archive image: G2498_040).



Plate 28: Holyhead Breakwater - view from east of storm damage repair to the parapet and carriageway (archive image: G2498_046).



Plate 29: Holyhead Breakwater - view from north of former wharf at southwestern end of the breakwater (archive image: G2498_050).



Plate 30: Holyhead Breakwater - view from northwest of the breakwater quarry (archive image: G2498_058).

11 APPENDIX I: PROJECT DESIGN

HOLYHEAD BREAKWATER (G2489)

PROJECT SPECIFICATION FOR:
LEVEL 4 BUILDING RECORD

Prepared for

ROYAL HASKONINGDHV

December 2016

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

HOLYHEAD BREAKWATER

PROJECT SPECIFICATION FOR LEVEL 4 BUILDING RECORD

Prepared for *Royal HaskoningDHV*, December 2016

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 - 2.1.2 Drawn Records 5
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1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been asked by *Royal HaskoningDHV* to prepare a project specification for a historic building appraisal and record of Holyhead Breakwater, Ynys Môn (Primary Reference Number (PRN) 11821; NGR SH24008420; Figure 01). Holyhead Breakwater comprises a 2.4km long stone-built structure designed to provide maritime shelter at the Port of Holyhead/Holyhead as well as protection from coastal erosion. The breakwater was built between 1848 and 1873 and is a Grade II* listed structure (ref. 5743). In addition to the pier, which forms the main structure, the breakwater also includes a pier end three-storey lighthouse (PRN 11822; NGR SH2567484751), built in 1873, a large stone quay from which the breakwater extends, built in 1847 (PRN 34000; SH23818388), and a late 19th century small stone building located at the end of the quay (PRN 34025; NGR SH23868389).

The historic building appraisal and record will be completed as part of a project appraisal report (PAR) as part of a flood risk management appraisal in line with Flood and Coastal Erosion Risk Management – Appraisal Guidance (FCERM-AG), which will appraise a range of options. The historic building appraisal and record will be completed in accordance with a Level 4 building record as described in *Understanding Historic Buildings: A guide to good recording practice* (Historic England 2016).

The historic building appraisal and record will be completed in accordance with the following guidance:

- Conservation Principles (Cadw, 2011)
- Guide to the conservation of historic buildings, BS7913:2013;
- Guidelines for digital archives Royal Commission on Ancient and Historic Monuments of Wales 2015;
- Management of Archaeological Projects (English Heritage, 1991);
- Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide (Historic England, 2015);
- Standard and Guidance for the archaeological investigation and recording of standing buildings and structures (Chartered Institute for Archaeologists, 2014); and
- Understanding Historic Buildings: A guide to good recording practice (Historic England 2016).

The following information will also be consulted as part of the record (as identified in the *Scope Holyhead Breakwater Project Appraisal Report*):

- Holyhead Breakwater Environmental Scoping Report, Black & Veatch Ltd., 2009;
- Outline design drawings and indicative landscape plan;
- Engineering report;
- High resolution aerial photographic survey undertaken on 28th September 2015 (1109 images), capable of being post processed to provide a dense point cloud of the breakwater along with 3d mesh in AutoCAD format.

Additional available information is also identified in the *Scope Holyhead Breakwater Project Appraisal Report* section 3, which may also be consulted as part of the record.

Gwynedd Archaeological Trust is certified to ISO 9001:2008 and ISO 14001:2004 (Cert. No. 74180/A/0001/UK/En) and is a Registered Organisation with the Chartered Institute for Archaeologists and a member of the Federation of Archaeological Managers and Employers (FAME).

2 METHODOLOGY

The historic building appraisal and record will be completed in accordance with a Level 4 building record as described in *Understanding Historic Buildings: A guide to good recording practice* (Historic England 2016).

Level 4 provides a comprehensive analytical record and will draw on the full range of primary and secondary sources of information about the breakwater and discuss its significance in terms of architectural, social, national and economic history. In particular, this will include its relationship with similar 19th century breakwaters and the impact on Holyhead socially and economically during construction and use.

The Level 4 record will be completed using a combination of a photographic record, a drawn record and an analytical record.

2.1.1 *Photographic Record*

A photographic record of the breakwater has been completed by *Civil Engineering Solutions* undertaken on 28th September 2015. A total of 1109 high resolution aerial photographic images were taken during the survey; the location of each image is detailed on *Civil Engineering Solutions* drawings CES391-1 to CES391-7. These images will be used by GAT as the core photographic record for the Level 4, as they include images in plan and elevation of the entire structure, including views that would not be possible from a landward record. Selected images will be used to illustrate the structural appearance, function and phasing of the breakwater, including any industrial remains. GAT will also prepare general views of the breakwater in its wider setting and landscape.

2.1.2 *Drawn Records*

The drawn record will not include additional plans and elevations prepared on site by GAT. Any plans and elevations will be generated using the aerial photographic images completed by *Civil Engineering Solutions*.

Drawn records will include:

- A site plan based on the 1:10000 Ordnance Survey County Series locating the feature within the regional landscape;
- Reproduction of contemporary drawings that illustrate the construction and use of the breakwater;
- Reproduction of historic maps that illustrate the construction and use of the breakwater.

2.1.3 Analytical Record

The analytical record will include a detailed examination of available primary and secondary sources. Information will be sourced from the following:

1. The regional Historic Environment Register (HER, Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, Gwynedd LL57 2RT) will be examined for information concerning the study area. This will include an examination of the core HER, the 1:2500 County Series Ordnance Survey maps and any secondary information held;
2. Archive data and historic maps, will be consulted in the regional archives at the Llangeni (Anglesey Archives, Industrial Estate Rd, Llangefni LL77 7JH) and at the Bangor University Department of Manuscripts (Bangor University, Bangor, Gwynedd LL57 2DG);
3. The National Monuments Record (NMR RCAHMW, National Monuments Record of Wales, Plas Crug, Aberystwyth SY23 1NJ) will be checked for sites additional to the HER, and if required additional supporting information will be examined at the NMR.
4. On-line catalogue search of the National Library of Wales;
5. The National Archives (Kew, Richmond, Surrey TW9 4DU) will be examined for primary sources. The National Archives currently list 42 record items related to the breakwater.
6. The Welsh Newspapers Online portal curated by The National Library of Wales (<http://www.llgc.org.uk/index.php?id=4723>) will be examined for contemporary newspaper articles. The Welsh Newspapers Online portal currently lists 112,307 articles related to the breakwater.

2.2 Monitoring Arrangements

A copy of this design and all subsequent reporting must be approved by Gwynedd Archaeological Planning Services (GAPS) and the Isle of Anglesey County Council (IOACC) Senior Planning and Conservation Officer prior to final issue in each instance. The GAPS Archaeologist will need to be informed of the project timetable and the role of GAPS must be acknowledged in all reporting. The relevant contact details are:

GAPS

- Ashley Batten ashley.batten@heneb.co.uk | 01248 370926; and
- Jenny Emmett jenny.emmett@heneb.co.uk | 01248 370926.

IOACC Senior Planning and Conservation Officer:

- David Jump djxpl@ynysmon.gov.uk | 01248 752461

3 PROCESSING DATA, ILLUSTRATION, REPORT AND ARCHIVING

Following completion of the stages outlined above, a report will be produced within one month incorporating the following:

1. Non-technical summary
2. Introduction
3. Aims and purpose
4. Specification
5. Methods and techniques, including details and location of project archive
6. Level 4 Results
7. Summary and conclusions
8. List of sources consulted.
9. Appendix I – approved GAT project specification

The Level 4 results will provide a comprehensive analytical record and will draw on the full range of primary and secondary sources of information about the breakwater and discuss its significance in terms of architectural, social, regional and economic history. In particular, this will include its relationship with similar 19th century breakwater's and the impact on Holyhead socially and economically during construction and use.

4 DISSEMINATION AND ARCHIVING

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. The Historic Building Recording requirements and approaches outlined in this project specification will be undertaken during December 2016 and January 2017. A final report will be submitted to the Historic Environment Record within six months of submitting the draft report (subject to approval).

The following dissemination will apply:

- A paper report(s) plus digital report(s) will be provided to the client (draft report then final report).
- A digital report will be provided to GAPS (draft report then final report).
- A paper report plus a digital report will be provided to the regional Historic Environment Record, Gwynedd Archaeological Trust; this will be submitted within six months of report completion (final report only).
- A digital report and archive (including photographic and drawn) data will be provided to Royal Commission on Ancient and Historic Monuments, Wales (final report only) in accordance with the *RCAHMM Guidelines for Digital Archives Version 1*. Digital information will include the photographic archive and associated metadata.

4.1 Historic Environment Record

In line with the regional Historic Environment Record (HER) requirements, the HER must be contacted at the onset of the project to ensure that any data arising is formatted in a manner suitable for accession to the HER. This will include the completion of a HER Enquiry Form at the start of the project.

5 PERSONNEL

The project will be managed by John Roberts, Principal Archaeologist GAT Contracts Section and attended by a team of project archaeologists experienced in historic building recording. The team will be responsible for completing the Level 4 record in accordance with the methodology listed in [section 2.0](#).

6 INSURANCE

Public Liability

Limit of Indemnity- £5,000,000 any one event in respect of Public Liability

INSURER Aviva Insurance Limited

POLICY TYPE Public Liability

POLICY NUMBER 24765101CHC/000405

EXPIRY DATE 22/06/2017

Employers Liability

Limit of Indemnity- £10,000,000 any one occurrence.

The cover has been issued on the insurers standard policy form and is subject to their usual terms and conditions. A copy of the policy wording is available on request.

INSURER Aviva Insurance Limited

POLICY TYPE Employers Liability

POLICY NUMBER 24765101CHC/000405

EXPIRY DATE 22/06/2017

Professional Indemnity

Limit of Indemnity- £5,000,000 in respect of each and every claim

INSURER Hiscox Insurance Company Limited

POLICY TYPE Professional Indemnity

POLICY NUMBER

HU PI 9129989/1208

EXPIRY DATE 23/07/2017

7 SOURCES CONSULTED

1. British Standards Institute, 2013. *BS 7913:2013 Guide to the conservation of historic buildings*
2. Cadw, 2011. *Conservation Principles*.
3. *Civil Engineering Solutions* drawings CES391-1 to CES391-7
4. Chartered Institute for Archaeologists, 2014. Standard and Guidance for the archaeological investigation and recording of standing buildings and structures.
5. Historic England, 2016. *Understanding Historic Buildings: A guide to good recording practice*.
6. Royal Commission on Ancient and Historic Monuments of Wales 2015 Guidelines for digital archives

8 FIGURE 01

8.1 Location Map, based on 1:10000 Ordnance Survey County Series Map Sheet SH28sw and SH28se. Scale: 1:10000@A4. Crown Copyright. All Rights Reserved. License number AL100020895.



Figure 01: Location Map, based on 1:10000 Ordnance Survey County Series Map Sheet SH28sw and SH28se. Scale: 1:10000@A4.
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Gwynedd Archaeological Trust
Ymddiriedolaeth Archaeolegol Gwynedd

Craig Beuno, Ffordd y Garth, Bangor, Gwynedd. LL57 2RT
Ffon: 01248 352535. Ffacs: 01248 370925. email: gat@heneb.co.uk





A2 Proposed scope of the Visual and Heritage Setting Assessments

Note

**HaskoningDHV UK Ltd.
Industry & Buildings**

To: Cadw,
Gwynedd Archaeological Planning Service (GAPS),
Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW),
Isle of Anglesey County Council (IoACC) and
Natural Resources Wales (NRW)

From: Sarah Marjoram

Date: Friday, 20 September 2019

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Classification: Project related

Subject: Holyhead Breakwater Refurbishment Scheme – Proposed Scope of the Visual and Heritage Setting Assessments

1 Introduction

Stena Line and the IoACC are proposing the refurbishment of Holyhead Breakwater. The rubble mound which supports the Breakwater superstructure is subject to movement and erosion by wave action and currents, which over the years has resulted in undermining the superstructure. The rubble mound extends approximately 120m from the seaward side of the Breakwater superstructure, and approximately 40m from the leeward side.

The refurbishment would involve the placement of concrete armour units (Tetrapods) along the length of the seaward side of the superstructure, around the lighthouse end and along the leeward side of the breakwater for approximately 100m. Chevron units would be placed at the toe of the Tetrapods to prevent these being moved by the physical force of water movement. The Tetrapods would extend approximately 30m seawards from the superstructure and would have a crest height of +6.7mCD (see **Plate 1** below). The finished design has a 50-year design life to a 100-year design standard, 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 Mean High Water Spring (MHWS) level which is +5.6mCD and would therefore be visible throughout the tidal cycle. At high tide, between eight and 15m width of Tetrapods would be visible along the length of the Breakwater.

An Articulated Concrete Block Mattress (ACBM) would be installed along the leeward side of the Breakwater, which would not be visible at any state of the tide (see **Plate 2** below). This would halt the ongoing movement of the rubble mound, providing a long-term solution to the ongoing erosion.

The construction of the refurbishment works would be undertaken entirely by 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.

A suitable method of anchoring the barge has yet to be confirmed; however, it could involve a series of anchor points installed on the Breakwater superstructure, or 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 and mattress to the jack-up/floating barge, which would then take the material and place this onto the existing rubble mound foundation.

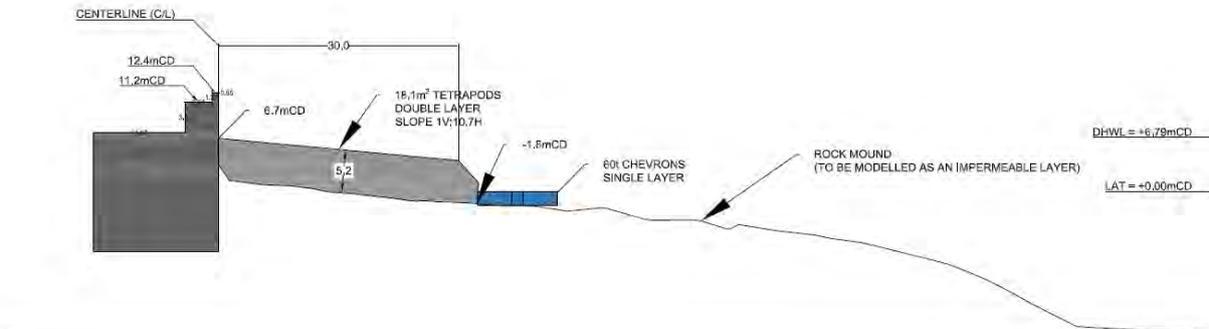


Plate 1 Proposed refurbishment of the seaward side of the Breakwater (LAT – Lowest Astronomical Tide; DHWL – Design High Water Level)

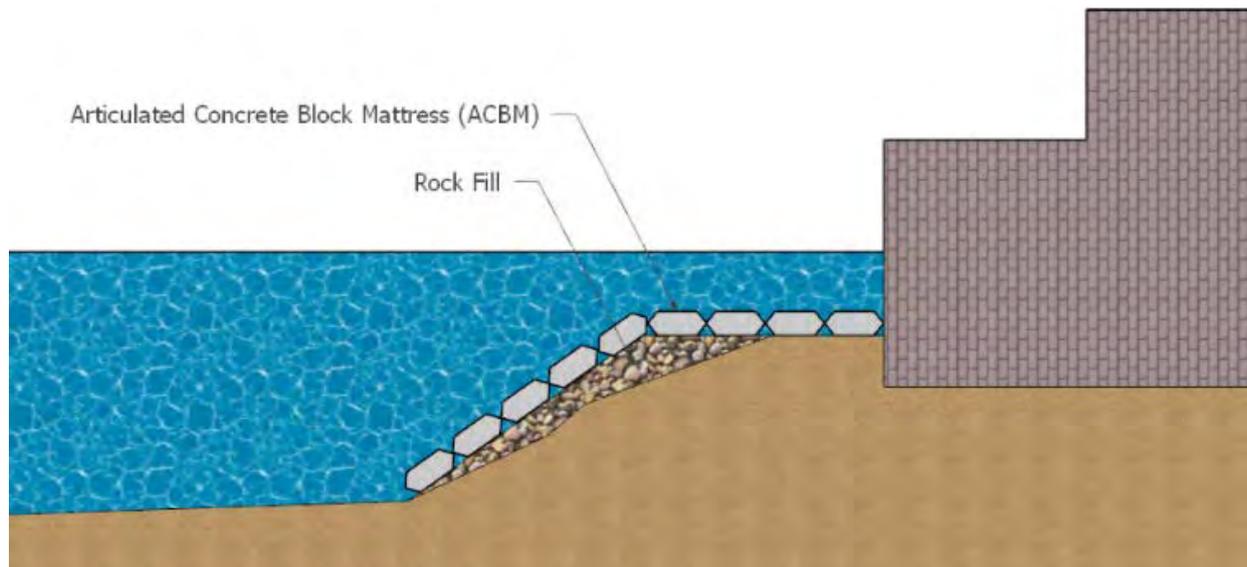


Plate 2 Proposed refurbishment of the leeward side of the Breakwater

2 Purpose of This Note

This note presents the proposed methodology and viewpoint locations for undertaking a visual assessment and heritage settings assessment of the proposed refurbishment works for agreement with GAPS, Cadw, RCAHWW, IoACC and NRW.

3 Proposed Approach

The visual assessment would comprise photomontages of the proposed scheme, which would be used to assess the potential impacts of the proposed scheme on the local visual and heritage setting. Given the nature of the proposed works being concrete armour in front of an existing structure that are only partly visible at high water, no impact on the local seascape/landscape character is anticipated and a full Landscape and Visual Impact Assessment is not considered necessary.

3.1 Viewpoints

Three viewpoints are proposed from which photomontage images of the proposed refurbishment works would be produced (see **Figure 1** at the end of this note), as follows:

- **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 Area of Outstanding Natural Beauty (AONB) looking north east along the seaward side of the breakwater; and,
- **View 3** – an elevated view of the breakwater looking north east from Holyhead Mountain and the AONB.

These viewpoints have been chosen as they are considered to represent the most appropriate views of the breakwater from visually sensitive locations. Viewpoints from other locations have been considered, such as Newry Beach and across the bay from Penrhyn Bay Caravan Park, however the proposed refurbishment works would either not be visible (from Newry Beach) or the distance is such that the refurbishment works would not be visible (Penrhyn Bay Caravan Park) and as such these locations have been discounted.

3.2 Assessment methodology

3.2.1 Visual assessment

The assessment would be undertaken following standard industry guidance (such as the ‘Guidelines for Landscape and Visual Impact Assessment’, 3rd Edition) to summarise the key predicted issues and effects of the scheme.

A 3D model would be produced using Civil 3D for the purpose of depicting how the proposed refurbishment works would look like once completed. This would then be used in the production of photomontage images. Photomontage images would be produced for daytime only, given the refurbishment works would not be visible at night time. They will provide a realistic representation of what the proposed refurbishment works would look like once completed.

The following stages of development would be assessed from the agreed viewpoints:

- existing baseline condition;
- construction stage effects; and,
- visual effects once completed.

3.2.2 Heritage setting assessment

The results of the visual assessment will be used to inform a heritage settings assessment of the breakwater and lighthouse. Assessing the setting of a heritage asset and how that setting contributes to its significance follows the methodology recommended in the Setting of Heritage Assets: Historic Environment Good Practice Advice in planning Note 3 (Historic England, 2017).

This guidance document recommends a stage-based approach for assessing the implications of development proposals, as follows:

- Step 1: identify those heritage assets whose settings might be affected;
- Step 2: assess whether, how and to what degree setting makes a positive contribution to the value of those heritage assets;
- Step 3: assess the effect of the proposed development on the significance of those assets as a result of changes to setting;
- Step 4: maximise enhancement and minimise harm; and,
- Step 5: make and document decisions and monitor outcomes.

The first four steps of this process would be undertaken as part of the assessment. Given the localised nature of the proposed refurbishment works, only the breakwater and lighthouse are proposed to be included in the heritage setting assessment.



Figure 1 Proposed viewpoints



A3 Refurbishment Options and Impacts to Heritage Significance Note