



Environment, Roads & Facilities

Flood Risk and Infrastructure

ERFCF2305N Llanfairfechan Coastal Squeeze Assessment

Coastal Squeeze Assessment

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1.0 Introduction

1.1 Purpose of this document

Conwy County Borough Council (CCBC) have produced this Coastal Squeeze Assessment to supplement the Llanfairfechan Coastal Defence Marine Licence.

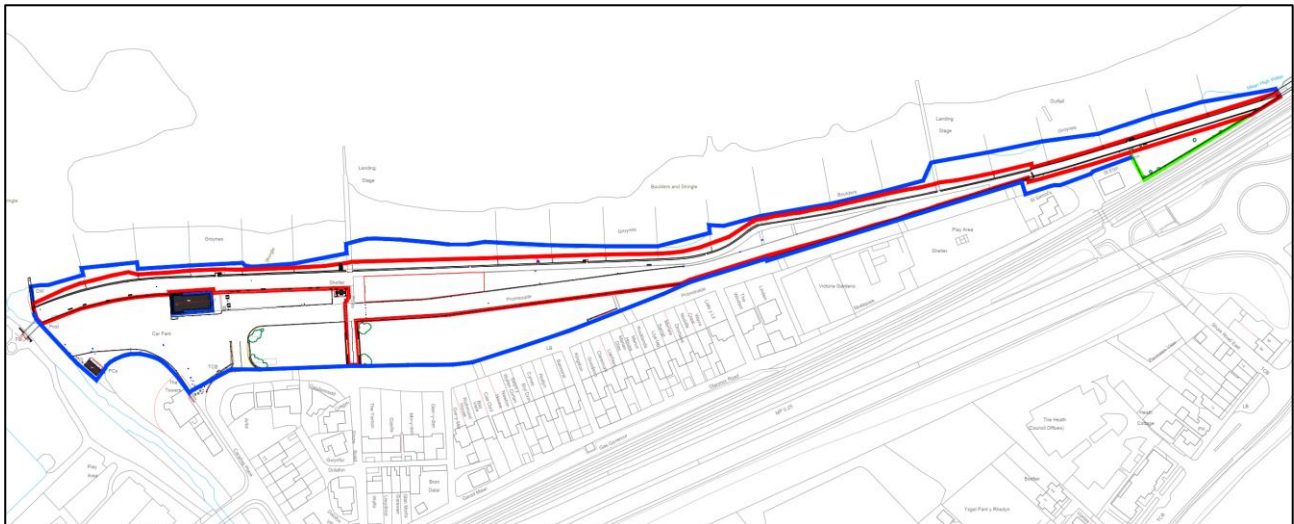
1.2 Project background

The sea defences at Llanfairfechan extend for approximately 1.8km around the coastline, comprising several forms of construction, using masonry, mass concrete and rock armour. The defences under consideration extend north-east to south-west from Shore Road East to the Afon Ddu (Llanfairfechan) and provide some protection to the promenade and town. However they are subject to overtopping during storm events and with climate change, the frequency and severity of these events is anticipated to increase.

A section of the sea wall was breached during a storm in October 2021 with further damage to the frontage occurring in November and December that year. Storm Pierrick in April 2024 resulted in a flooding event across the entire Llanfairfechan frontage, including flooding of the properties lining the promenade. As a result, there is a need to improve the coastal defences along the frontage.

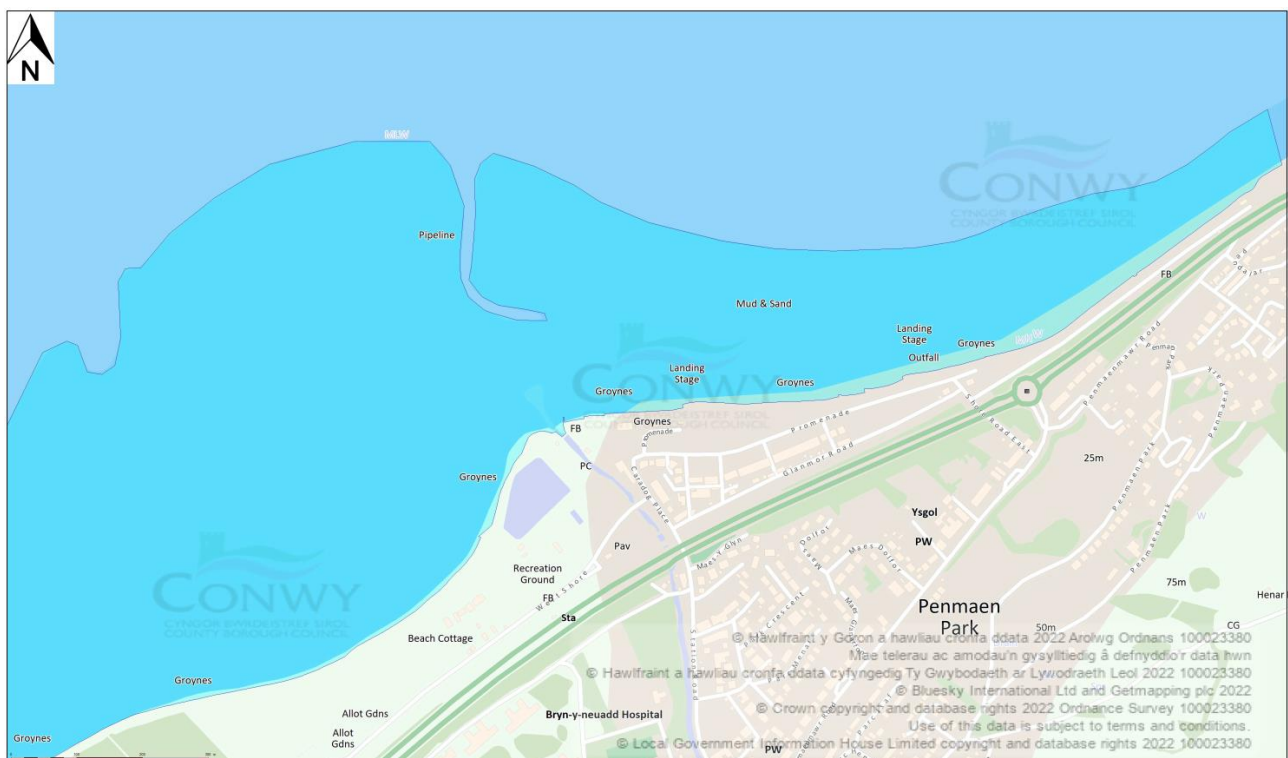
1.3 Site location

Llanfairfechan is a seaside town in North Wales, within the administrative area of CCBC. The A55 trunk road passes through the town, running parallel to the London-Holyhead railway, both of which separate the main town from the waterfront. The Scheme extends from the mouth of the Afon Ddu (Llanfairfechan) to the west, to the eastern extent of the promenade. The beach predominantly comprises sand and shingle with regular wooden groynes. A slipway is located in the centre of the Scheme area along with four pedestrian accesses through the sea wall, these are fitted with storm boards and a flood gate over winter periods. A pedestrian promenade and cycleway run along the length of the sea wall and are backed by the Promenade road to the eastern end of the Scheme. In the central section of the Scheme area, the promenade is separated from the road by amenity grassland and boat storage and to the western end, a car park and café. Residential houses, guest houses, a garden, playground and cafes line the vehicular promenade. The Scheme itself focusses on the sea wall which separates the promenade from the beach. Though the existing sea wall is in relatively good condition, some sections require maintenance works which will also be undertaken as part of the Scheme. The national grid references for the western and eastern Scheme boundaries are approximately (SH 67834 75452) and (SH 68544 75570).

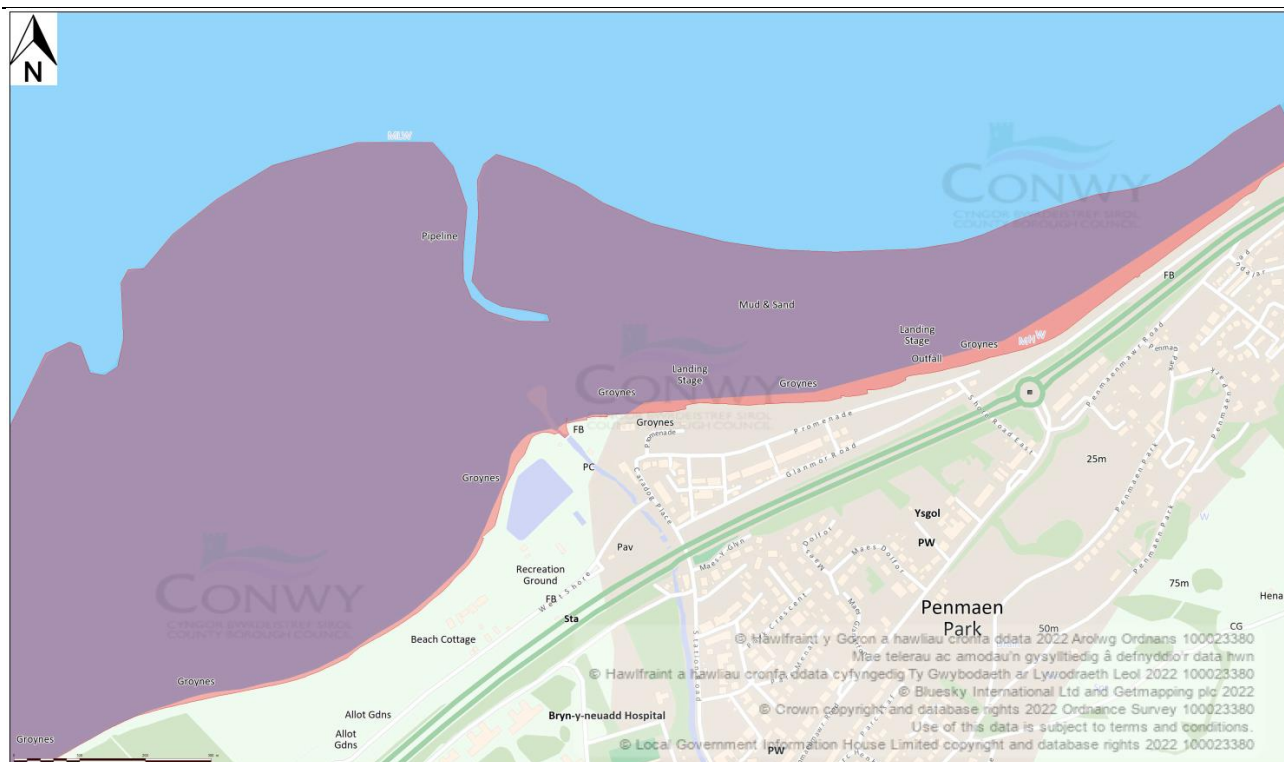


Scheme Location Drawing (ERCF2305N PL009) Proposed Site (red) Existing CCBC Ownership Boundary (blue) Private Ownership Boundary (green)

The foreshore of the Llanfairfechan is within the Menai Strait & Colwyn Bay Special Area of Conservation (SAC) and Traeth Lafan Sites of Special Scientific Interest (SSSI). The SAC consists of intertidal mudflats and sandflats.



SAC - Y Fenai a Bae Conwy / Menai Strait and Conwy Bay



SSSI - Traeth Lafan

1.4 Scheme description

1.4.1 Coastal defence works

The proposed scope of work comprises repairs to, and increasing the height of, 725m of the existing sea wall by approximately 500mm using concrete.

The main design consists of a cantilever retaining wall constructed from the promenade on the landward side of the existing sea wall, however approximately 140m will need to be constructed from the seaward side (from the promenade path on the seaward side of the wall). This 140m length is to be constructed in front of the junction of the Promenade highway with Shore Road East and a private property. The design will consist of a 1.5m excavation in the existing promenade on the seaward side. The works in this location are approx. 3.0m above mean High Water Spring (MHWS) and approx. 2.5m from the foreshore, meaning the works will have minimal intrusion on the beach in this area.

2.0 Policy Unit and Policy Plan

Llanfairfechan coast is covered by the Trwyn Maen Dylan to Garizim and Pen y Parc to Trwyn Penmon PDZ16 Policy Development Zone. Llanfairfechan is policy unit 16.33 and has the following policy plans:

- Short-term (2005-2025) Epoch 1 – Policy Plan – Hold The Line
- Medium-term (2025-2055) Epoch 2 – Policy Plan – Hold The Line
- Long-term (2055-2105) Epoch 3 – Policy Plan – Management Realignment (Maintain defences with long term aim to adjust to a more favourable alignment.)

With the introduction of Epoch 3 changing to MR there may be a chance to realign the existing sea defence. However, a flooding assessment would need to be completed towards the closure of Epoch 2 (2055) to assess the viability of the policy change and its impact on local businesses and properties. The change in policy may create a greater chance for regular flooding. The policy will be challenge by CCBC in the coming years.

3.0 Coastal Squeeze Assessment

A coastal squeeze assessment is required for the subsequent loss of habitat caused by maintaining the existing and proposed sea defences during Epoch 2 and Epoch 3. Detailed in the *NRW Assessment of Coastal Squeeze* estimated habitat loss has been estimated, see below:

Policy Unit	Habitat Loss (Ha) Epoch 1	Habitat Loss (Ha) Epoch 2	Habitat Loss (Ha) Epoch 3	Habitat Type	Designated Site
16.33	0.03	0.4	Null	Mudflats and Sandflats	Menai Strait and Conwy Bay SAC

There is no habitat loss completed for Epoch 3. Since the proposed structural elements (cantilever section of wall promenade side) of the scheme is designed for 120 years this will surpass Epoch 3. However, it is anticipated the existing sea defence will require maintenance works before the end of Epoch 3 and wall realignment will need to be assessed at this time, since realigning the wall will affect the surrounding businesses and properties.

Since the scheme will impact the coastal squeeze in Epoch 3, a loss of habitat loss value is required for the Welsh Government's National Habitat Creation Programme.

Based on the *Understanding the likely scale of deterioration of Marine Protected Area features due to coastal squeeze: Volume 2- Results and discussion* details the anticipated losses of mudflat and sandflats. From the losses estimated in *Table 3. Coastal squeeze mudflat and sandflat habitat loss/gain across epochs associated with different management scenarios across Wales* the estimated is loss of habitat is:

Management Scenario and SLR allowance	2055 (ha)	2105 (ha)	Total Loss (ha)
Defences Maintained - 70th percentile SLR allowance	-60.6	-174.4	-235.00
Defences Maintained - 95th percentile SLR allowance	18.34	-346.36	-328.02

Therefore, the total loss of mudflats for Wales -235.00 70th percentile or -328.0 ha 95th percentile.

NRW have provided the following sea level rise values for 2145 Conwy:

Local Authority Area	Allowance RCP 8.5 (percentile)	Mean sea level rise (metres) by NRW for 2145
Conwy	70 th	1.18
	95 th	1.66

Since the Mean Low Water Spring (MLWS) for Llanfairfechan is -2.9m OD. This will encroach up the foreshore and reduce the beach area.

The table below shows the estimated Mean Low Water Spring levels based on the above (Sea level rise 2145 + MLWS):

Local Authority Area	Allowance RCP 8.5 (percentile)	Estimated Mean Low Water Spring (metres OD) by 2145
Conwy	70 th	-1.72
	95 th	-1.24

Therefore, using the estimated mean low water spring values and the latest Welsh Coastal Monitoring Centre profile data the losses are:

Local Authority Area	Allowance (percentile)	Estimated Mean Low Water Spring (metres OD) by 2145	Habitat Loss (ha)
Conwy	70 th	-1.72	25.0
	95 th	-1.24	27.7

The total loss of habitat for Llanfairfechan of Epoch 2 and 3 is 70th percentile 25.0 ha or 95th percentile 27.7 ha. The flood risk area from the sea is 7.5 ha, which is less than the 27.7ha habitat loss area.