

Technical Note

Project title Greystones Harbour PPP
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cc
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As requested by Wicklow County Council (WCC) this technical note has been prepared to clarify the status of the ongoing erosion of the North beach and cliffs, and the associated responsibilities of Sispar under the 30 year concession agreement with WCC.

The beach north of Greystones has been eroding for centuries and will continue to erode into the future, until a stable beach profile is achieved within the coastal 'cell' between the rock headlands at Greystones and Bray Head. Studies of historical data undertaken by Arup indicate average erosion rates of up to 0.5m a year over the last decades for which data is available. The 2020 Irish Coastal Protection Strategy Study (ICPSS) forecasts erosion rates up to 1 to 2m per year. Erosion of the cliffs along the north beach is caused by the action of the sea and the seepage of rainwater through the face of the cliffs. The emerging impacts of climate change from increased intensity weather events, metocean events and rising sea levels are likely to cause increased erosion.



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Measures taken to stop coastal erosion have historically performed badly as working to ‘stop nature’ they have failed to protect coastlines and typically shift the problem to other adjoining areas of coast. The original railway line from Bray to Greystones has been moved inland at least twice during its 150+ year history, with the loss of many bridges and other coastal protection structures. The optimum solution for the Greystones Harbour PPP scheme comprised:

- Replacement of the existing dilapidated harbour and unsafe breakwater structures with a new harbour and marina facility,
- Protection of the old dump just north of the marina from sea erosion with a rock revetment structure, and
- Managed erosion (retreat) of the north beach and cliffs to an extent no greater than that calculated for the ‘do nothing scenario’, i.e. the extent of erosion that would have occurred naturally if no facility was built.

There has never been any objective or intention to stop erosion of the north beach, as it is not a sustainable solution. The ‘managed retreat’ approach is achieved by monitoring erosion every year, implementing beach management measures (mainly beach nourishment using imported shingle) to slow down erosion as required. The concession agreement provides details on the beach management strategy that has been implemented by Sispar, guided by the annual beach monitoring reports prepared by Arup. A location in the central region of the beach (at the CPO boundary) was selected as the point to monitor the actual erosion each year for checking against that allowed. Since completion of the works in 2006 the measured erosion has been well within the limits at the point of measurement, as shown below in the graph up to and including last year 2023. The graph shows the extent of erosion or accretion year-on year. When the erosion has reached the target line Arup have recommended and Sispar have implemented beach nourishment works as required. The graph shows increased erosion over the past 2 years, with more erosion likely as a result of recent storm events. Based on this reliable monitoring information the draft 2023 beach monitoring report recommends placement of beach nourishment this year in 2024.

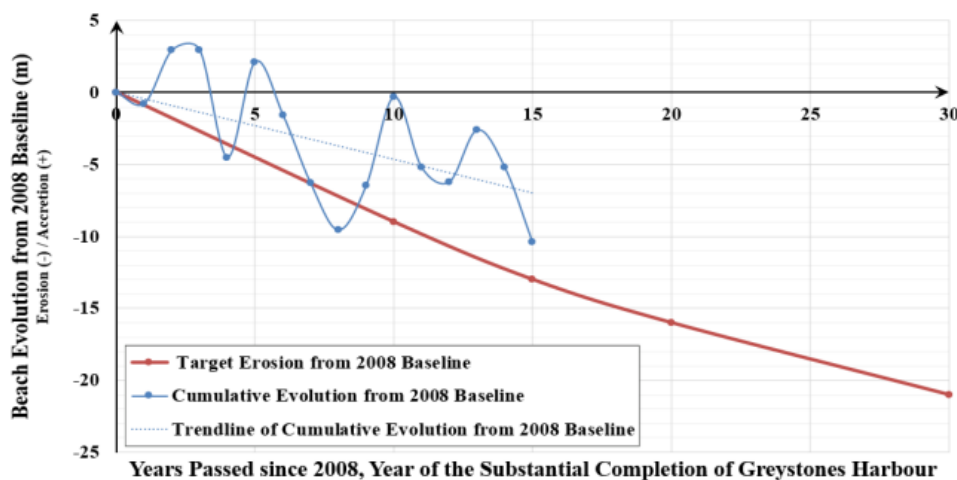


Figure 43 Evolution of the 0mOD contour at the CPO Boundary in relation to the target erosion



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It is evident that the most significant cliff erosion has occurred in the area immediately north of the rock revetment structure. This is due to a combination of factors, including the scouring effect at the edge of the 'hard' revetment, the easily eroded fine sandy soil deposits in this location, and the seepage of rainwater through the cliff face. The enhanced erosion at the north corner of the revetment has partially exposed the toe of the revetment, and the loss of beach restricts beach access in front of the revetment to spring low tide periods only.

The cliff and beach erosion have also impacted the lower section of the access ramp leading down to the beach from the crest of the revetment. This is the only continuous and safe means of pedestrian access to the north beach, and therefore must be maintained. This access ramp has been periodically reinstated and extended over the years, but given the increased risk of more frequent impacts from waves and groundwater flow, works are required to help protect the ramp and maintain safe access over more sustained periods of time. Arup have been retained by Sispar to design and oversee implementation of these local access works. Careful planning and design is required to increase protection of the ramp while minimising the inevitable adverse impacts on the adjoining beach and cliff. It is planned to carry out these works over this year 2024. In the interim we understand that Sispar will implement short-term reinstatement measures to maintain safe pedestrian access. Note that the longer-term solution will have to facilitate the operation of trucks and earthmoving equipment (dozers) for future beach nourishment (shingle importation) works.



The ongoing beach management works will not stop erosion of the cliffs, which will continue in the area north of the revetment along the fenced-off park area. We understand the existing pathway outside the fence was a temporary access route provided during Covid, which will have to be removed given the ongoing cliff erosion in this area. The Cliff Walk route will be aligned through the park as originally designed and always intended. The potential loss of a narrow strip of park space along the cliff line due to erosion is inevitable and was always going to be allowed, so as to preserve the natural coastal environment as much as possible. The stopping of any further erosion of the park area would require the extending of the full rock revetment north of the landfill to the end of the park. This idea is entirely inappropriate as it would:

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- Remove the natural cliff habitat and cover it with a revetment structure,
- Result in the complete loss of the beach due to enhanced erosion in front of the new revetment, hence removing the amenity value of this space,
- Result in significantly increased cliff erosion at the end of the new revetment and beyond, as it would be in a more exposed location. The rockfill groyne (finger) at the end of the marina provides some protection to the existing revetment and adjoining beach area from wave erosion, which would not be the case if the revetment is extended further north,
- Require a new pathway and ramp down the extended revetment to beach level, with increased erosion impacts, and
- Would come at a cost on the order of millions of Euros.

In summary the hugely expensive protection of a thin slice of park would completely obliterate the most accessible area of beach amenity and the adjoining cliff habitat and lead to enhanced erosion further north along the beach and cliffs.



The Greystone Harbour PPP concession agreement provides a 30 year commitment to manage the north beach for the ongoing benefit of the community and the natural environment. Monitoring provisions are included to ensure the rate of erosion can be managed within the limits specified in the concession agreement.

This technical note is provided on behalf of Sispar Ltd. to Wicklow County Council (WCC) in connection with the Greystones North Beach Monitoring Report - Year 15 commission, to brief WCC executive and local Greystones councillors only. It is not intended for any other purpose and this technical note or any sections

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View of North Beach and cliffs from northern section looking back towards Greystones.



Completed beach nourishment works at Greystones North Beach. Site visit 25 May 2014

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