

## **Scope**

This document outlines the aims/objectives of the cobble bed re-nourishment project, location of the cobble bed, design of the re-nourished bed including stone selection, quantity and placement, together with access to the beach and the procedure for importing stones to the cobble bed site.

## **Aims and Objectives – the reason for the work**

### Background

The Llandanwg beach and dune system are susceptible to erosion and damage by storm waves, particularly when these coincide with high tides, such as in the storm event which occurred on the 3rd January 2014. Storm erosion of the seaward face of the dunes is a particular problem along a 70m stretch of the beach, on the sea side just to the North of the Llanbedr & Pensarn Yacht Club. Along this stretch, the upper beach is largely devoid of boulders (or cobbles) and the level of the beach is lower than adjacent areas of the upper beach. This is believed to be the result of work many years ago in which boulders were removed for gabions to create a river training wall along the lagoon side of the Spit.

The dip in the level of the beach and absence of boulders along this vulnerable stretch, results in increased water depth and greater wave action at the dune face during storm events, thereby increasing erosion of the dunes. The problem is compounded by wave-induced eddies which form around the North end of the sheet piling. Erosion here could ultimately result in a breach in the dunes and the sea washing over at this narrow point of the spit. Such a development would have serious consequences for the character and environment of Llandanwg beach, its amenities and the fragile dune system.

### Aim

The aim of this re-nourishment project is to restore the upper beach and its cobble bed on this vulnerable stretch to its former profile, so as to reduce the degree of wave action, erosion and 'cliffing' of the seaward face of the dunes, thus helping to protect the dune system and its fragile environment from storm damage. This will be achieved by importing suitable stones to replace the absent boulders.

The re-nourished cobble bed is to blend in with adjoining areas of the upper beach. Imported stones are to be of the same geological origin as existing stones on the beach (glacial till) and similar in size, colour and character. No quarry material will be used.

## **Location and extent of re-nourished Cobble Bed**

The location of the cobble bed, which is some 460m south of St Tanwgs historic church, is shown on the Location Plan attached to the Planning Application together with Plan and Section drawings and a photograph of the site. The bed will extend 70m North from the Northern end of the sheet piling at Llandanwg Spit. It abuts the base of the sand dune 'cliffs' on the sea side and extends down the beach towards the sea approximately 10m.

## **Design of the re-nourished cobble bed, including stone selection, size, placement and fill volume**

Plan and Section drawings are attached to the Planning Application. They are based on beach survey data made available by Gwynedd Council. They show indicative levels for the finished cobble bed.

Imported stones will be comparable in size and character to typical stones already on nearby areas of beach. Suitable stones collected from local fields have been identified at Llanfair, in a field adjacent to Penrhiw. Photos of existing beach stones are attached to this Planning Application together with examples proposed for import.

Prior to placing any stones, pegs will be driven into the surface of the beach to mark the extent of the cobble bed and its finished level, in accordance with the planning requirements.

The greatest depth of stones is towards the top of the beach adjacent to the dunes, with depth reducing towards the bed's lower edge down the beach. The lowest edge of the bed is 3.0m Above Ordnance Datum (AOD), 0.37m above Mean High Water Springs (MHWS) (2.63m AOD).

No work, including movement of dumpers/excavators, is to take place below the MHWS. Therefore a Marine Licence is not required for this work.

It is anticipated that imported stones will be up to about a metre in dimension with the majority of stones being rather smaller. However, there may be merit in under-pinning the cobble bed with some larger key stones at particular locations, for example to serve as lock stones or where the existing beach is particularly low.

Larger stones will be placed first, at the bottom layer of the bed. They will be set into the sand and thus partially buried. Smaller stones will be placed on top of, and between these so that the completed fill matches the character and level of adjacent areas of the beach as set by the pre-positioned level pegs. As the depth of the bed tapers towards its lower seaward edge, stones will be smaller or partially buried.

Since the exact geometry of the beach is unknown, it is anticipated that the final levels will be fine tuned on site to suit the overall lie of the beach. This is because surveying a beach is not an exact process, perhaps because of the dynamic foreshore environment. Indeed discrepancies in levels of up to 0.2m have been observed in the beach survey data. Therefore finer details of stone placement and sequencing will be decided at the re-nourishment site by the installation contractor (J&E Evans, Agricultural and Plant Hire Contractor), with due regard to the requirements of the Planning Approval and safe working.

The fill volume is anticipated to be about 500m<sup>3</sup>. Assuming a stone fill density of 2Tonnes/m<sup>3</sup>, the total weight of imported stones is expected to be in the region of 1000T.

#### **Access to the re-nourishment site and importation procedure**

The following procedure provides for the import of suitably approved, pre-selected stones to the re-nourishment site on Llandanwg beach.

Access to the beach is proposed via the Llandanwg car park and adjoining slip-way owned by Gwynedd Council, thence travelling south approximately 500m along the upper beach above MHWS. The owners of the beach (Gwynedd Council and Crown Estates) have been consulted concerning the activities to take place on their land and notified of the Planning Application via a 'Notice 1'.

The principles underpinning the transport of the stones are as follows:

- The works shall present no hazard to members of the public or other personnel.
- There shall be no damage to public or private property including to the surface or surrounds of roads, the car-park or the slip-way to the beach.
- There shall be no contamination by fuels or lubricants of public or private property including the surface or surrounds of roads, the car-park or the slip-way to the beach, or of the beach itself; nor shall there be any debris deposited on these areas.
- There shall be no importation, deliberate or inadvertent, of materials of an inappropriate type or of invasive non-native species into the coastal environment.
- Dumpers/excavators are to remain above MHWS at all times.

### **Process for importing pre-selected stones from a local field site at Llandanwg / Llanfair**

Field site: The following operation to take place:

- At the field, selected stones will be loaded onto dumper trucks and transported directly to the re-nourishment site on the beach.
- If required, the stones will be cleaned prior to loading to remove any debris or soil.
- At the re-nourishment site, a tracked excavator will be used to position the stones in the cobble bed in accordance with the planning approval.
- The tracked excavator will have been unloaded from a low-loader in the car park prior to moving to the re-nourishment site.
- Upon completion of the works, the areas used during the operation will be returned to their original condition, with any debris cleaned up, warning signs removed, and the beach looking as it did before the operations began, albeit with the cobble-bed elevated to the agreed level.

Alternative procedure (if deemed necessary):

- Stones will be imported by lorry from the selected field site for unloading and transfer to a dumper truck on private land in the Llandanwg area, in agreement with the land owner.
- After loading at the private location, stones will be transported directly to the re-nourishment site on the beach as per the procedure described above. Thereafter, the procedure will be exactly the same.

Prevention of physical and pollution damage to the car park and slipway by excavator: The following measures will be employed:

- The machine's underside and tracks will have been pre-cleaned with a pressure-washer.
- Tyres will be placed along the route from the unloading point in the car park to the beach such that the excavator's tracks will not come into contact with the surface of the car park or the slipway.
- Oil spill kits will be provided and will be accessible to the driver.
- To prevent harm to members of the public, before the work starts signs will be placed in prominent positions in the vicinity, to provide information on the nature of the operations and to request that members of the public keep clear.

- A Banksman will be present during all operations; this person will be CPCS qualified (CITB-registered). Additionally, a Contractor Site Supervisor will be in place at all times during active operations to ensure members of the public maintain a safe distance and that safe working practises are being followed at all times.
- All plant used will have valid Test Certificates and these will be available for inspection by the relevant authorities.
- The haulage contractor to be engaged in the works is J&E Evans.

### **References**

- Supplementary Planning Guidance: Sustainable Design in the National Parks of Wales, September 2011, [http://www.eryri-npa.gov.uk/\\_\\_data/assets/pdf\\_file/0010/136639/SPG-1-Eng.pdf](http://www.eryri-npa.gov.uk/__data/assets/pdf_file/0010/136639/SPG-1-Eng.pdf)
- Welsh Government Circular 002/12, Guidance for Local Planning Authorities on the Use of the Standard Application Form ('1app') and Validation of Applications.
- Welsh Government Applying for Planning Permission and Other Related Consents: A Guide to the Standard Application Form ('1app') and Validation of Applications.