

Coastal Defences

The majority of the UK's coastline is managed in order to prevent or minimise coastal erosion. These management strategies often require the use of coastal defences to fix the land-sea boundary or reduce the impact of erosion. Coastal defences used in the UK broadly fall into two categories, hard and soft engineering defences.

Soft Engineering

Soft engineering is a more sustainable, long-term and potentially cheaper approach to coastal defence, working with natural processes to protect the shoreline.

Beach - a beach in itself acts as a coastal defence as it reduces wave impact and prevents inland flooding. However the beach needs to be properly managed to ensure it is wide and high enough to prevent from being overtopped during high sea levels. This can be done through beach replenishment where beach-grade sediments are used to 'top-up' the beach, increasing its level of protections shown in the diagram below.



Hard Engineering

Hard engineering can be more costly, have a shorter life time and be more intrusive than soft engineering, providing a temporary fix. Hard engineering defences often cause more problems elsewhere.

Groynes - A barrier extending from the beach, offshore into the sea. Groynes are used to slow the loss of beach grade sediment through long shore drift. With proper groyne field design, beach erosion can be reduced due to trapped sediment on the up-drift side of the groyne. Groynes can be constructed out of wood, stone or concrete depending on the size of native beach material. Although acting to reduce the erosion on site, groynes typically cause sediment starvation down-drift, shifting the erosion further down the coastline. An example of a wooden groyne is shown below on the Whitstable frontage.



Sea dike - Large land-based sloped structures used to prevent overtopping during high tide and storm events. Instead of providing protection against wave action, sea dikes fix the land-sea boundary in place to prevent inland flooding. They are typically created out of sand, clay or mud often incorporating a grass cover layer. This form of coastal defence is not typically used in the UK due to large space requirements.

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Revetments - Onshore sloped structures used to reduce the landward migration of the beach due to coastal erosion. Wave energy is limited by the structure to reduce the erosive power of the wave action. They can be constructed out of concrete, stone or asphalt. The structure should be designed to have a crest sufficiently high to stop wave overtopping during a storm event. The diagram below shows a recently constructed rock revetment at Warden Bay.

Breakwater - Offshore sloped or vertical structures reducing incoming wave energy arriving at the coastline. As well as reducing erosion, this also creates calmer waters for harbours and shipping. They can be constructed out of concrete or stone and rock. An example is shown in the diagram below at Herne Bay.



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Sea wall - Vertical or near-vertical structures designed to limit erosion due to wave attack. Typical construction materials include concrete, steel and timber. The concrete Northern Sea Wall at Reculver is shown below. Concrete curved superstructures can be incorporated to reduce wave overtopping.



Further Reading

<http://www.georesources.co.uk/coastman.htm>