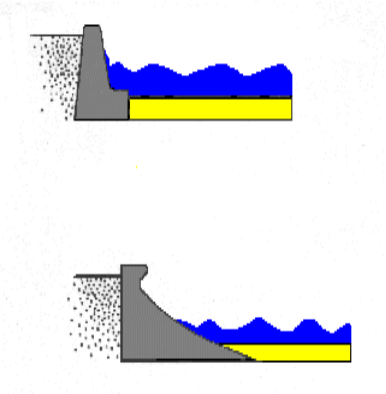
Sea defences

Sea wall

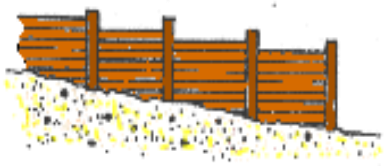


The traditional 'hard' defence is the sea wall. In the past sea walls were vertical and deflected the energy of the waves away from the coast. In doing so, however, they suffered a lot of expensive damage in a short period of time. Modern sea walls have a slope and curved top, which breaks up the energy of the wave and prevents water going over the top of the wall during heavy storms. Sea walls are very expensive (£2000-£5000 per metre) but should last 20-30 years.

Breakwater

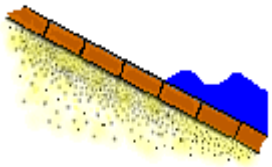
A breakwater is often used to protect a harbour but may be used to protect a stretch of coastline. They are usually made of concrete or blocks of stone but recent cheaper alternative suggestions have included oil drums and used tyres. They have to be strong enough to take the full force of the waves. Since they have to be built in deep water they are, like sea walls, expensive to build.

Groynes

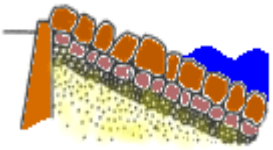


The best form of natural defence is a beach, which efficiently absorbs the energy of the waves. Along many coasts, however, long shore drift causes the beach to thin out in places and erosion of the land behind becomes a problem. Groynes are designed to slow down long shore drift and build up the beach. They are usually made of tropical hardwoods, which are more resistant to marine borers and erosion. A few are made of concrete, steel or in more recent times large rocks. They are built at right angles to the shore and spaced about 50-100 metres apart. Groynes may have a life of 15-20 years but often have to be replaced rather than repaired.

Revetments



A cheaper alternative to sea walls is the revetment (about £1200 per metre). This is a sloping feature, which breaks up or absorbs the energy of the waves but may let water and sediment pass through. The older wooden revetment consists of posts fixed into the beach with wooden slats between. Modern revetments have concrete or shaped blocks of stone laid on top of a layer of finer material. Rock armour or riprap consists of layers of very hard rock with the largest, often weighing several tonnes, on the top. Riprap has the advantage of good permeability plus it looks more natural.



Gabion

The gabion is a metal cage filled with rocks, about 1 metre by 1 metre square. They are stacked to form a simple wall. They are used to protect a cliff or area in the short term only, since they are easily damaged by powerful storm waves and the cages tend to rust quite quickly. Gabions have the advantage of ease of use and are relatively cheap but their life span is short.

Beach nourishment

Where long shore drift is a serious problem and the supply of beach material is poor, it may be necessary to supplement the natural system by adding lorry loads of sand and shingle to the beach. The natural processes will then spread the material along the coast to help build up the natural defences. This is called beach nourishment. Sometimes dredgers may be anchored offshore and the sediment sprayed on to the beach using high pressure hoses.

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A seawall is a structure, which is designed to protect a shoreline from flooding and erosion. Seawalls are only one part of a larger coastal defence system, which is designed, with several protections in case one or more fail. Many visitors to seaside towns are familiar with the concept of a sea wall, as are residents of these regions. There are a number of different ways to construct a seawall, depending on available materials and the needs, which the seawall needs to meet.

Essentially, a seawall acts as a layer between the vulnerable coastline and the ocean. Wave action can beat at the seawall without eroding the coast, although the seawall itself will eventually break down and require repair or replacement. Seawalls also help to insulate communities from flooding, although high waves can still breach most seawalls. A seawall can also provide a space for recreation, since the top of a seawall is often flat, allowing people to walk on it or to fish from it.

In some cases, a seawall will be constructed on shore to break high waves, which might otherwise damage structures and roads on the shore. In these instances, several lower barriers may be added to the seawall, to help break up the wave energy before the waves hit the wall. Other sea walls are built in the water right next to a shoreline, as is the case on many islands. Some nations also build seawalls in the open water to act as flood barriers and to dissipate waves before they reach the shore, encouraging them to break more gently.

Many seawalls are curved, allowing waves to break against them while reducing their energy. Others are straight, and they are designed to bring waves to a standstill. It is not uncommon to bury low mounds of rubble in front of a seawall to assist with the goal of reducing the power of waves as they hit the shore. In the case of a seawall, which is meant to resist flooding, the seawall may be quite high so that it can cope with storm surge.

Traditional seawalls are built from large rocks, pebbles, and other rubble; some remains of ancient seawalls built in this style can be seen in many communities. A modern seawall can be made from these materials, although it may also integrate concrete, metal bars, and other tools to make the seawall sturdier. Cheaper seawalls may be made from wood and plastic, which provide some protection although they can potentially fail in heavy weather.