

# MANAGING AND MAINTAINING BEACHES

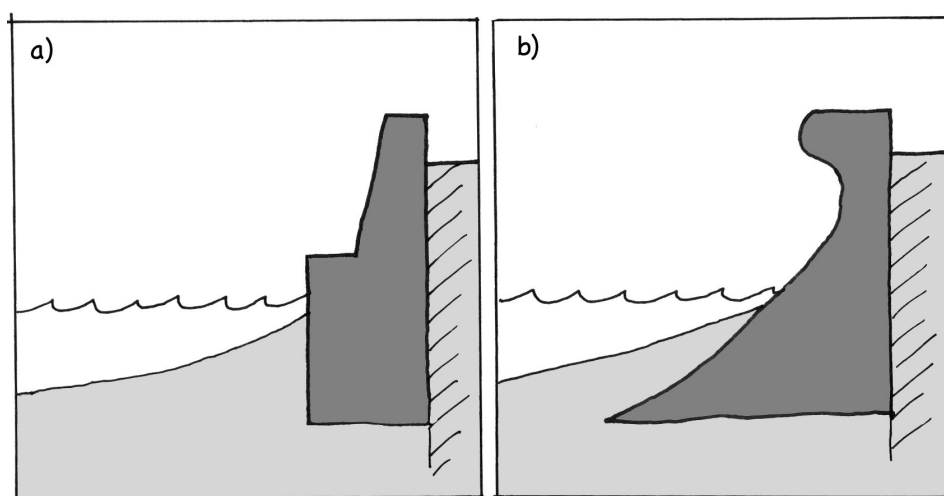
## WHAT TECHNIQUES ARE AVAILABLE AND WHAT DO THEY COST?

### 1. HARD DEFENCES

These are major engineering works, usually built of stone, concrete or timber, which cost a lot of money to build and maintain.

**A. SEA WALLS** are expensive stone or concrete structures that deflect the waves back from the coastline. In South East England new seawalls cost around £2 million to £5 million per km, but can be expected to last 30-50 years before needing major maintenance.

Two main types of sea wall.



Many sea walls were built in the late 19th and early 20th centuries to protect the promenades, coastal hotels and tourist buildings at resorts such as Brighton and Eastbourne. Many of them are now coming to the end of their design life and so will need renewal in the near future.

a) Although they protect coastal buildings and roads, do they actually reduce the force of the waves?

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b) What might be happening at the base of the wall?

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c) Why are there two slightly different shapes of wall?

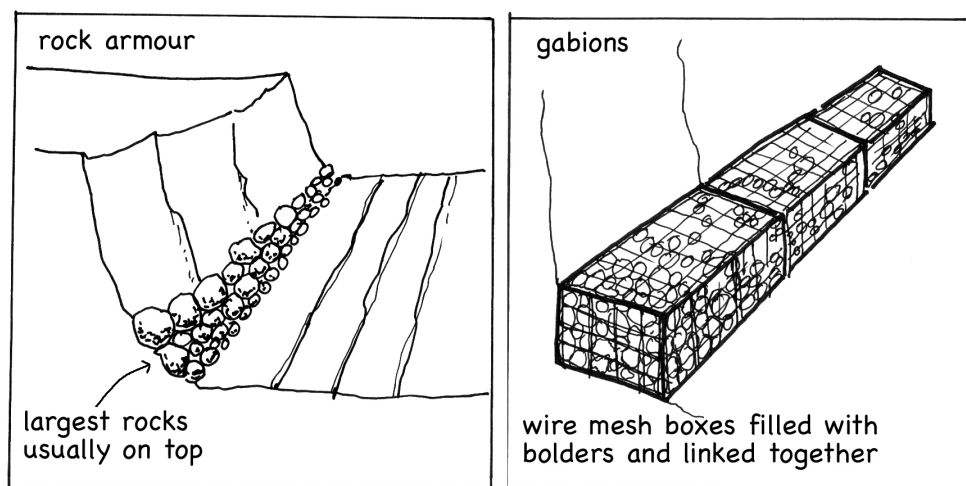
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**B. ROCK BARRIERS** or **REVETMENTS** can be built in place of sea walls. They may be constructed using **ROCK ARMOUR** (also called **RIPRAP**) or **GABIIONS** where small blocks or boulders are held together in rectangular wire mesh cages, often linked together. Small rock armour barriers cost about £1 million to £1.5 million per km; gabions are cheaper, but do not last as long because of wave damage and rusting. Because rock armour and gabion structures let water through, they do not have to be placed like sea walls near high water mark (for instance at the base of cliffs), but can be placed midway down a beach or even out to sea as artificial islands or reefs.

**Rock armour and gabions.**



a) What are the advantages and disadvantages of rock barriers?

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b) What are the advantages and disadvantages over sea walls?

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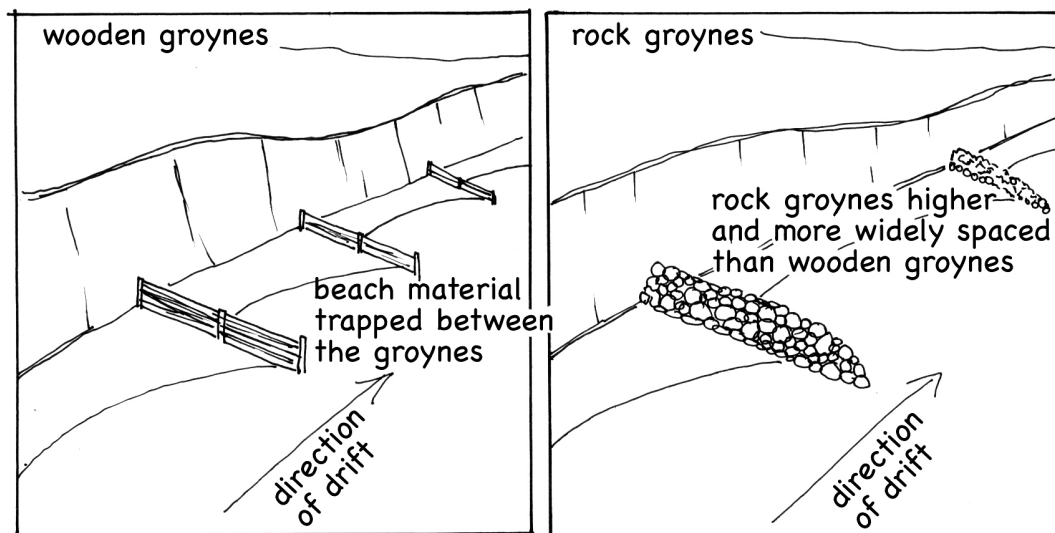


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**C. GROYNES.** These are structures built at right angles to the coastline, which were traditionally made of wood but are now very often made of piled up rock (riprap). They typically cost about £0.6 million per km if made of wood or as much as £1.5 million per km if constructed of rock.

**Wooden groynes and rock groynes**



a) How do groynes help protect the coast?

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b) What are the advantages and disadvantages of building groynes of wood rather than rock?

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## 2. SOFT ENGINEERING

This means working more closely with nature, adapting and helping natural processes to protect the coast rather than building hard engineering structures.

**A. BEACH REPLENISHMENT (BEACH RECHARGE)** Shingle or sand is added to a beach to make good natural losses and to increase the volume and the height of the beach. It may be brought by lorry from inland sand and gravel pits, but more usually it is dredged from the sea bed, usually at least 1 km offshore, then pumped ashore from the dredger.

Beach replenishment helps to protect the coastline behind from wave attack, but it is expensive. Each cubic metre of shingle added to a beach costs about £20; to replenish a badly depleted stretch of beach can cost £5 million per km. The current replacement cost of the beach recharge schemes that have been undertaken in South East England is around £140 million.

a) Why do you think shingle is taken from so far offshore rather than brought in by lorry from inland pits?

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**B. BEACH RECYCLING** Shingle or sand is removed from a beach where it is accumulating (for example, against a breakwater) and added to a beach that is experiencing losses. It is often used in conjunction with **BEACH REPROFILING** (which means reshaping the beach) to prepare beaches for the onslaught of future storms. Recycling is much cheaper than beach recharge - only about £1-£2 per cubic metre.

## 3. HOW CAN THE COAST BE BEST PROTECTED?

Soft engineering solutions are now more favoured by coastal planners than hard engineering solutions. Often, however, coastal protection schemes use a combination of hard and soft solutions, e.g. beach recharge often needs groynes to retain the beach material.

a) Write a short report on the advantages of beach recharge and recycling schemes over hard engineering schemes. Some techniques are obviously more suited to certain areas than others. Bear in mind the costs involved.

