

# Coastal Flood Defences - Cliff Stabilisation

Coastal flood defences are key to protecting our coasts against flooding, which happens when normally dry, low-lying flat land is inundated by sea water. There are both hard and soft coastal engineering methods which can be used to mitigate the risk of flooding and coastal erosion.

## Soft Engineering

Cliff stabilisation is a form of soft engineering - these methods are usually a more sustainable and sometimes cheaper approach to coastal defences, using natural processes to protect the shoreline against flooding and erosion.

Cliffs can fail due to a number of different factors, such as composition or rock type, geological structure (faults, joints, etc), climate and wave energy. There are **soft and loose cliffs** made up of sand, silt, clay, marl or chalk which are more prone to erosion and landslides, and **hard cliffs** made up of limestone, granite or sandstone. Erosion of cliffs in coastal areas results in the retreat of the coastline because the amount of material which is eroded exceeds that which is deposited. Stabilisation techniques are used to limit the amount of erosion and the potential for landslides, collapse and falling rocks.

One cliff stabilisation technique is to reduce the slope of the cliff and revegetate the cliff top. Planting vegetation helps to strengthen the cliff structure and increase cohesion, which will help to keep the cliff in place and prevent cliff material from slumping and sliding off.

Another method can be to drain any excess water from the cliff. This will prevent water from flowing along planes of weakness which can lead to rock sliding and sediment sliding to the base of the cliff. It will also limit the likelihood of liquefaction which can cause mudflows.

## Advantages and Disadvantages

- + Reduces the risk of injury or death to beach users by slumping or sliding of cliff material.
- + Enables the development of buildings and facilities on the cliff top with a reduced risk of collapse and failure.
- + The stability of the cliffs will encourage tourism in coastal resorts and will have economic benefits for the area.
- + Planting vegetation on cliff tops will increase the biodiversity of the area as it will act as a food source or habitat for wildlife.
- × Vegetation growth is not immediate and will take time - therefore this may be more of a long term solution.
- × Trampling across areas where the seeds have been planted can disrupt and prevent vegetation growth.



## Case Study: Filey, Scarborough - March 2018

Scarborough Borough Council has approved urgent work to stabilise cliffs in Filey to protect the only access road to a hamlet of 45 properties from crumbling into the sea. The scheme will involve cliff drainage, soil reinforcement, and planting to reduce the risk of landslips. The work will be carried out in three phases and is expected to be completed by the end of 2019. A £572,000 Flood Defence Grant from the Government will fund the project which is being delivered by the Environment Agency.