

# Ostend Coastal Protection – Final Solution



**Financed by:** Ministry of the Flemish Community

**Client:** Ministry of the Flemish Community

**Date:** 1996 – 2000

**Budget:** € 392 500

**Location:** Ostend, Belgium

**Partners:** text

## Assignment:

Haecon has derived design conditions for the coastal protection at Ostend, based on refraction calculations. Subsequently a design of a beach nourishment combined with a groyne extension was made after a comparative study of several alternatives, based mainly on calculations of the coastline evolution and of the sedimentation in the harbour. An alternative consisting of a renewal of the dike revetment was also designed.

## Scope of Services:

- Derivation of hydraulic design conditions
- Coastline evolution simulations
- Design of beach nourishment
- Design of groyne
- Design of renewal of dike revetment
- Calculation of increase in sedimentation in the harbour
- Refraction/diffraction
- Hydraulic design conditions
- Coastline evolution
- Beach profile evolution
- Sedimentation
- Beach nourishment
- Groyne construction
- Renewal of dike revetment

## Technical Description:

The coastal protection at the city centre of Ostend consists of a dike, which is severely damaged, while the beach in front of it has been eroded almost completely. This has led to a deterioration of the dike stability, which has become critical in several places. Furthermore, the run-up of the waves exceeds the top level of the dike during several storms each year. This poses the threat of a flooding of the city centre of Ostend.

In order to derive the hydraulic design conditions correctly, a series of refraction-diffraction calculations were performed. With the derived hydraulic conditions, several alternative beach nourishments were designed. This design was based on the 10-year coastline evolution, on the beach profile evolution during design storm conditions, on the calculated transverse and longitudinal transport of sediment and on the calculated increase in sedimentation in the harbour.

The proposed design consists of a beach nourishment in combination with a groyne extension. The final design was translated into proper technical specifications of this groyne extension and the associated nourishment.

An alternative design consisting of a renewal of the dike revetment was also made. Both the proposed design and the alternative dike revetment renewal were checked in accordance with the Dutch Guidelines on Coastal Safety.

The further study made an evaluation of the wave climate in the different building stages and also made a design of the temporary storage of the rocks used in the groyne extension.

At the end of the project an optimisation of the beach nourishment design with groyne extension was performed.

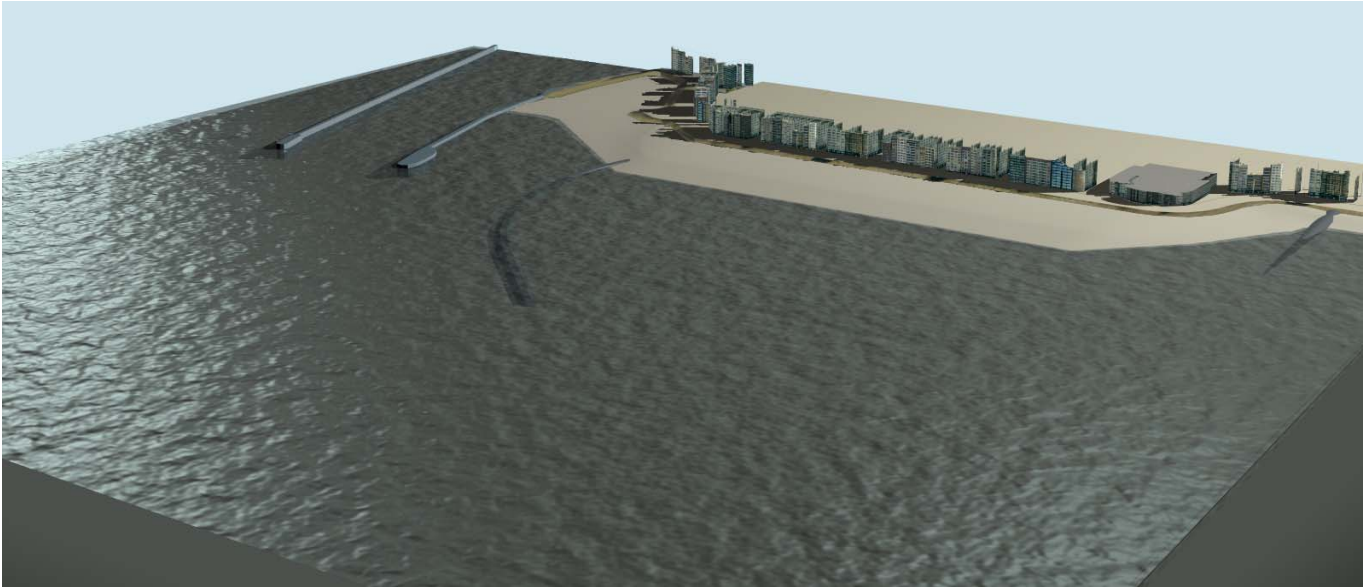


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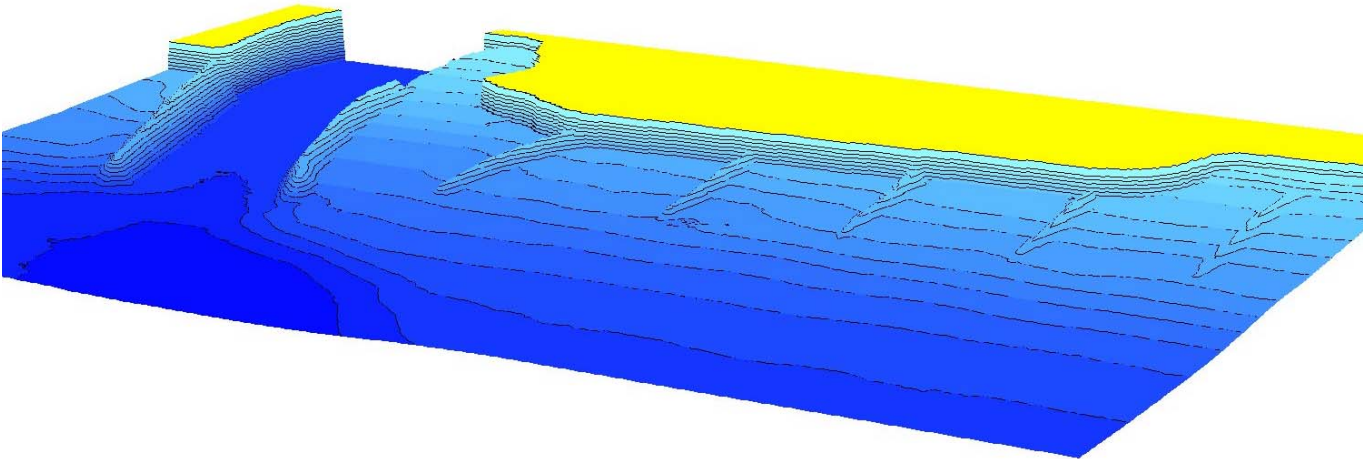
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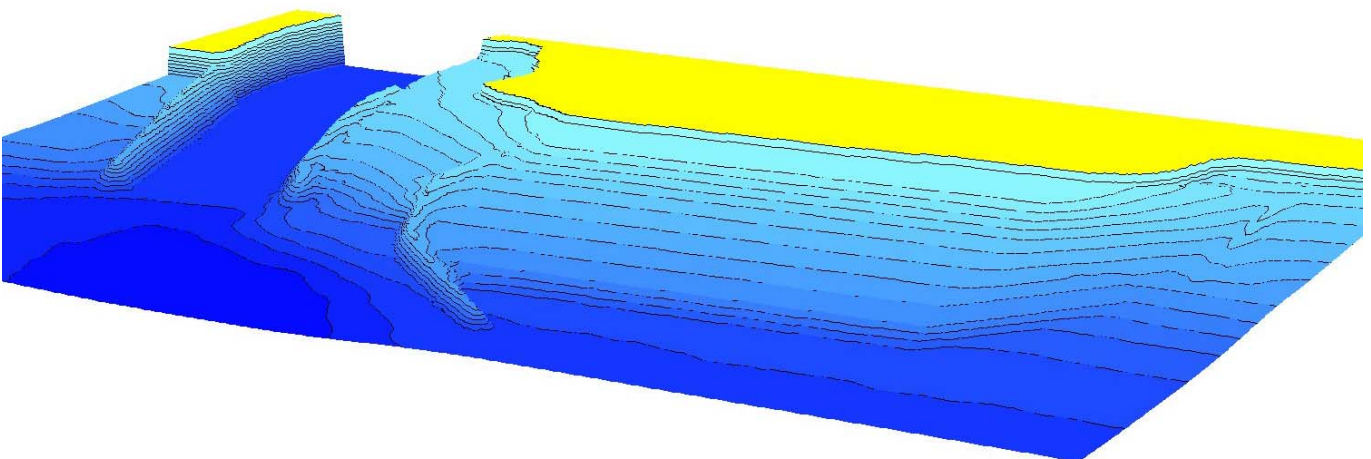
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*Structural Solution for Ostend Coastal Protection – High Tide View*



*Existing situation*



*Final Situation*

*Local Refraction Model of the Existing and the Final Situation*