



## Experimental facility Scheldt Flume

The Scheldt Flume is a state-of-the-art wave flume with a total length of 110 m. The flume has wave generators at both sides, which enables one to use for wave generation and one for wave dissipation. The flume can also be split into two flumes (Eastern and Western Scheldt Flume) such that 2 projects can be performed simultaneously in the two flumes, each being 55 m long.

At one side of the flume a pumping system is installed. The wave generators are equipped with online Active Reflection Compensation. This means that waves propagating towards the wave boards are measured and that the wave boards compensate for these reflected waves. Also wave board control for random second-order waves is operational to compensate for spurious waves.

### Application areas

The Scheldt Flume can be used for coastal and offshore related projects. In such studies aspects of e.g. armour stability, wave impact loading and the determination of the relevant hydraulic conditions for design purposes are at issue. The 2 wave generators make it possible to test structures by wave attacking from both sides. Also the influence of opposed propagating waves on e.g. erosion and dissipation can be studied. It is possible to construct all kind of foreshore bathymetries in our Scheldt Flume, both fixed bed and mobile bed foreshores to ensure the wave behaviour in the model will be the same as in prototype. Current related projects can be carried out because of a powerful pumping system. The facility is equipped with measurement equipment to measure waves, current, wave overtopping, damage profile of rubble mound structures, etc.



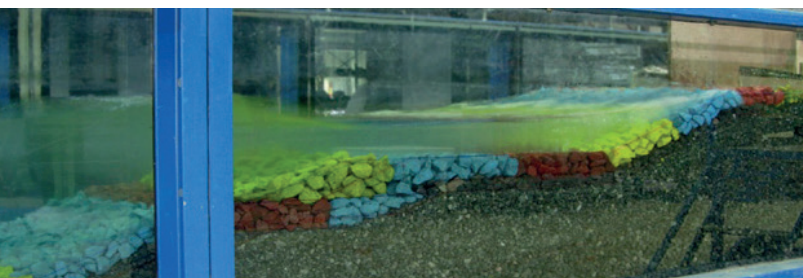


A breakwater model with crest wall in the Scheldt Flume

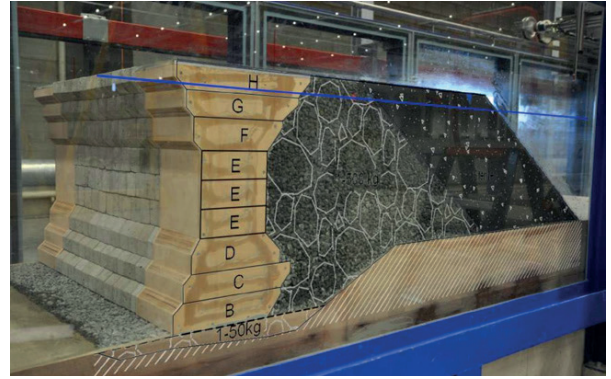
## Projects

We are involved in studies on a diversity of coastal and offshore structures. Typical studies for the Scheldt Flume are related to:

- Breakwaters (stability of armour layers, wave overtopping, wave pressures, wave forces, optimisation of breakwater designs)
- Dikes (wave overtopping, wave run-up, stability of inner slopes, wave forces)
- Jetties (wave pressures and wave forces on piles and decks of jetties)
- Dunes and beaches (dune erosion, stability of beaches)
- Scour and bed protection
- Outfalls (impact of current on erosion)



A revetment model in the Scheldt Flume



Testing the stability of a quay wall

## Technical specifications

### Wave flume

- Length: 110 m
- Width: 1.0 m
- Height: 1.2 m

### Wave generators

- Piston-type (translatory) wave boards
- 2 identical wave boards on both sides
- Full stroke: 2 m (1 m + 1 m)
- Maximum velocity: 1.2 m/s
- Max. acceleration: 4.7 m/s<sup>2</sup>
- Equipped with Active Reflection Compensation

### Wave characteristics

- Frequency range: between  $f = 0.01$  Hz and  $f = 2$  Hz
- Maximum regular wave height  $H_{max,r}$ : 0.4 m
- Maximum significant wave height  $H_{m0}$ : 0.25 m

### Pumping system

- Opposing and following currents
- Max. pumping capacity: 0.6 m<sup>3</sup>/s

### Features

- Glass wall flume with 3 m long observation windows
- Remote-controlled instrument carriage



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Deltares is an independent institute for applied research in the field of water, subsurface and infrastructure. Throughout the world, we work on smart solutions, innovations and applications for people, environment and society. Deltares is based in Delft and Utrecht.

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