



## Experimental facility Pacific Basin

The Pacific Basin is a multifunctional wave current basin, which is used for coastal and offshore related projects in which 3D effects are important, e.g. breakwater heads and foundations of offshore structures. The wave generator is capable of generating both regular and irregular long-crested waves. For wave board control, data acquisition and data processing Deltares' time-series generating and processing package AUKE is used.

Also a wave board control for random second-order waves is operational to compensate for spurious waves. The basin is equipped with a pumping system, in order to create a one-directional flow, enabling the simulation of a current, or a combination of waves and current. The possible angle between wave and flow direction is variable between  $45^\circ$  and  $90^\circ$ .

### Application areas

The influence of three-dimensional wave attack on structures can be substantial. To study phenomena related to such conditions 3D model tests can be carried out in the Pacific Basin. Because of the unique combination of a wave board and a pumping system the Pacific Basin is appropriate to study the impact of waves, current or a combination of waves and current on coastal, offshore and harbour structures.

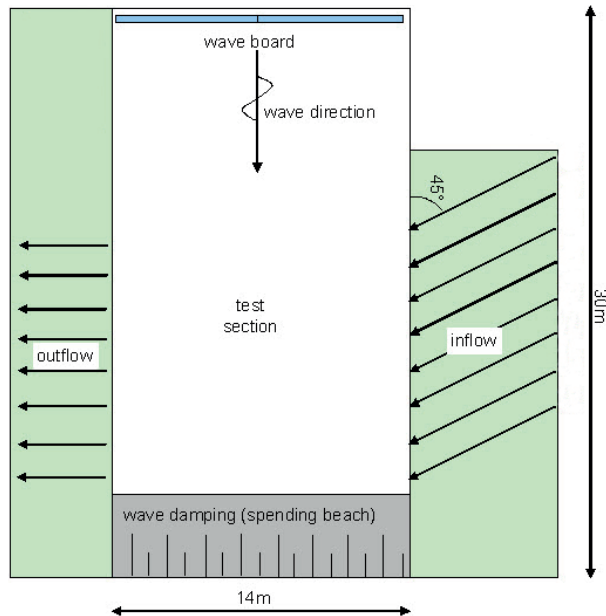
We are involved in many studies where aspects of armour stability, stability of bed protection, scour and erosion related problems are of primary interest. The dimensions and features of the wave maker are such that 3D-models in the Pacific Basin can be made on the same scale as the 2D-models in the Scheldt Flume.



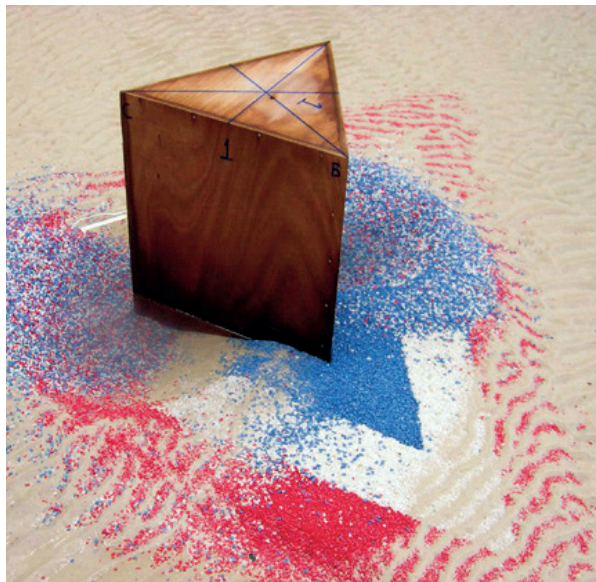
## Projects

Typical studies for the Pacific Basin are related to:

- Breakwaters (3D stability and breakwater roundheads)
- Scour around offshore and nearshore structures
- Revetments
- Mobile bed structures
- Stability of pipeline covering systems



Overview of the Pacific Basin



Design of a dynamically stable scour protection system for a triangular spur can



Studying wave-current interaction



Stability of breakwater armour units and overtopping measurements

## Technical specifications

### Wave basin

- Horizontal dimensions: 30 x 22.5 m
- Basin height: 1.25 m
- Maximum water depth: 1.0 m
- Minimum water depth: 0.25 m

### Wave generator

- Wave board: cradle-type
- Width of the wave maker: 14 m
- Height of the wave board: 1.2 m

### Wave characteristics

- Frequency range:  $f = 0$  to 2 Hz
- Maximum regular wave height  $H_{max,r}$ : 0.45 m
- Maximum significant wave height  $H_{m0}$ : 0.25 m
- Wave damping: spending beach

### Pumping system

- Number of pumps: 8
- Maximum overall pump capacity: 1.8 m<sup>3</sup>/s
- Angle between flow and wave direction: between 45° - 90°



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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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