



**Strukton**  
Immersion Projects

# Strukton Immersion projects



Transport and immersion of 8 caissons

**Chioggia Flood Barrier - Italy**



## Project information

Client:	Clodia s.c.a.r.l.
Duration:	1,5 years
Date of completion:	September 2014
Contract value (EUR):	€ 8.829.648,00

## Description of the activities

Design and engineering of the immersion pontoon and equipment required for immersion. Preparation and execution of floatation, transport and immersion of eight caissons.

## Details

Type:	Caissons for flood barrier
Length immersed section:	400 meters
Total amount of elements:	8
Element measurements:	Gate caissons (LxBxH) = 59,2 x 46 x 11,5m Shoulder caissons (LxBxH) = 24/20 x 60,8 x 24,5m
Depth:	22,5 meters
Achieved placing tolerances:	Vertical: +/- 10 mm, horizontal: +/- 10 mm
Foundation:	Grout bags



## Specific information

The Chioggia Flood Barrier is part of the MOSE-project, a system of movable barriers to protect Venice and its lagoon from flooding. The Chioggia inlet is one of the three gaps between the sea and the lagoon where barriers are installed. The barrier consists of concrete caissons immersed on the bottom of the inlet and steel mobile gates connected to the caissons with hinges.

The eight caissons were built in a dry dock at approximately 500m from the trench, two shoulder caissons and six gate caissons. The caissons were floated up one by one and moored near the dock gate for the immersion preparations.

The gate caissons creating the middle part of the barrier were immersed with a pontoon. Because currents and waves had a big influence on the immersion system, model test were done to determine the loads and the behaviour of the system. Together with the wave and weather forecast system of the client, safe decisions could be taken to start the immersion operations.

The two shoulder caissons were placed at both ends of the barrier and remain partly above water thus creating access to the caissons for inspection and maintenance. The immersion of the shoulder caissons was done by filling the fifteen ballast clusters step by step. A guiding structure mounted on the quay wall kept the caissons in a controlled position.

All caissons were placed on temporary support pads using a jacking system. The remaining space underneath the caissons was filled by grout injection. During the immersion operation and the grouting works, shipping was blocked for 48 hours.

A special item for this project was the extremely high placing tolerances required for the final working of the gates. At the front side, the caissons were aligned with the previous caisson using a guiding system. At the rear end realignment was done using a jacking system between the caisson and the cofferdam wall of the immersion trench. Extra attention was required for the eccentrically placed immersion joint.