



Strukton
Immersion Projects

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Aqueduct 57 - Netherlands

Project information

Client:	Kombinatie Uitvoering N57
Duration:	(KUN57) 2 years
Date of completion:	February 2010
Contract value (EUR):	€ 1.241.000,00

Description of the activities

The engineering, work preparation and execution of floatation, transport, "immersion" / winch down of a tunnel element for the aqueduct in the intersection of the provincial road N57 with the channel "Kanaal door Walcheren" at Middelburg. The works included the engineering, delivery and assembly of three steel bulkheads and dive support during sand flow.

Details

Type:	Aqueduct with 2x2 carriage ways
Length immersed section:	117 meters
Total amount of elements:	1
Element measurements:	TE01 (LxBxH) = 117 x 22,35 x 7,85m
Depth:	15 meters
Achieved placing tolerances:	Vertical: +/- 10 mm, horizontal: +/- 25 mm
Foundation:	Sandflow



Specific information

For the crossing of the provincial road N57 with the channel through Walcheren the immersion technique was as construction method. The aqueduct was built in a casting basin in the southern approach of the tunnel as a immersed tunnel element. The tunnel element was floated while flooding the casting basin. After floatation the closure wall of the casting basin was removed to create an open connection to the channel through Walcheren.

The immersion of this tunnel element was not done in the traditional way. In this project the tunnel element was pulled down towards its final position. Before immersion the freeboard of the element was reduced to 5 centimeters by adding ballast concrete to minimize the pulling forces. For pulling down four winches were used on top of the sheet piled trench walls in the embankments.

The winch wires were connected to the roof of the tunnel via an anchor point in the underwater concrete of the casting basin. During lowering the element was guided in both transverse and longitudinal direction until it finally touched the temporary jacking system in vertical direction. While continuously pulling down the aqueduct, the sand flowed foundation was formed and ballast concrete was added to create negative buoyancy. Finally the pulling construction was demobilized.

For this project our in house developed modular steel bulkheads were used, having the advantage of a quick mobilization and demobilization. At the rear end of the tunnel element a dry closure joint was created so the approached could be built directly connected to the immersed part of the aqueduct.