



The TCV is developed and manufactured by Seascope to stabilize two submerged tunnels with a total length of 2500 m.

The tunnels are situated underground, 35 m under street level in a big city. The tunnels are 4 m wide and 4 m high excavated in basalt rock. The clients requirements were to build a fully electrical remote crawler which is able to pull 4 tns. We were not allowed to use any hydraulic oil systems in case of any pollution, because the tunnels are submerged with fresh drinking water.

The TCV was designed so it stabilize the tunnels by filling them with aggregate. The challenge was not only to design and built the crawler, but also to design the complete pump system. The pump system had to be able to transport ½" aggregate through a 6" rubber hose over a max. length of 600 m. Finally we succeeded using a special aggregate/water mixing funnel with dredging pumps. We were able to pump 30-40 m³/hr of aggregate in a 350 m³/hr mixture of water/aggregate.

The TCV is based on 4 steel wheels which each has their own electrical propulsion motor. The TCV can drive at a speed of 5 m/min and be able to pull 4 tns. It is fully controlled from a control panel with PC and PLC built into a 20 ft. container. The TCV is connected to the surface controls using a 1200 m long reinforced neutral buoyant umbilical. All data communications and video signals are transmitted over fiber optics. The system is powered from the surface over 1000 vac. The positioning inside the tunnel is realized using an odometer in combination with, sonars, profilers and altimeters.

Seascope trained a team (European and Local) to operate the TCV and the pump station. The project has been carried out completely under supervision of Seascope. For the diving and operations of the TCV we hired a diving company, which worked together with us during 1,5 years on site, filling a total length of 1500 m of tunnel. This equals a total volume of 21000 m³ of aggregate.

Specifications

- Fully electrical (1000 vac);
- Remotely controlled;
- Speed: 5 m/min;
- 1000 m horizontal displacement;
- Bullard pull of 4 tns;
- Aggregate pump capacity over 600 m rubber hose:
 - 30-40 m³/hr of aggregate.
 - 350 m³/hr mixture of water/aggregate.

