

# 1.2 KM's of Pipeline & A Concrete Pump - Creating Benchmarks.

ON THE SPOT  
REPORT No. 3

## Pratibha Modak Sagar Tunnel Project

*“Concrete was pumped to a whopping distance of 1180 meters inside a tunnel by employing a single Schwing Stetter’s stationary concrete pump SP 3500HD. Its performance was not just limited to the distance pumped (1180 meters), but also in the pumping volume achieved. Customer was able to complete 450 meters of tunneling in a month, against 250 meter/month earlier and also did a matchless 82 m<sup>3</sup> in four hours of time”.*

### Project description

Brihanmumbai Municipal Corporation (BMC) is supplying drinking water to Mumbai City and suburbs to the tune of 3,350 mld (million liters per day), making its water supply system eighth largest in the world. With the growing demand, it was necessary for them to raise their capacity to 4,200 million liters per day from the existing 3350 million liters.

To meet this increasing demand, a new reservoir 'Middle Vaitarana' along the Vaitarna River as a third source was constructed recently between the already existing two reservoirs Lower and Upper Vaitarna under the Mumbai-IV Water Supply project. The water from middle Vaitarna dam will be released into the lower lake also called Modak Sagar in a controlled manner from where it will be drawn for treatment and supplied to the city.

The tunnel which is being constructed by Pratibha Industries in joint venture with Austria-based Ostu-Stettin Hoch u Tiefbau GmbH has done long distance pumping at 1180 meter at Modaksagar site using Schwing Stetter SP 3500HD Pump. Schwing Stetter India has supplied its equipment for the concreting of Modaksagar Tunnel linings, which is situated at the very west end of the MVP project area, approximately 100 kms outside the city of Mumbai.

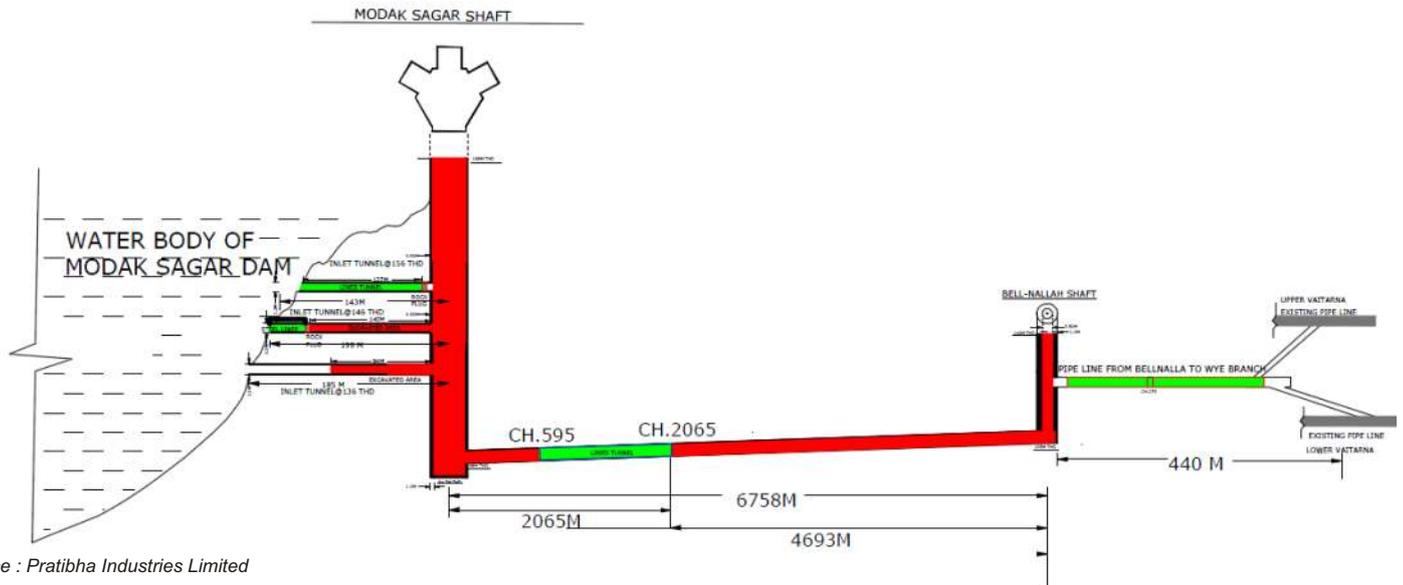


Modak Sagar Tunnel Project Site



Modak Sagar dam

# Modak Sagar Tunnel Project Plan



Source : Pratihba Industries Limited

This project involves the construction of a 7.5 km long tunnel of 4,100 mm diameter with allied works such as intake and pipeline for transportation of water. The tunnel is laid around 90 meters below the ground level, which will have their intake close to Modaksagar dam, and their outlets within the same existing service- and bifurcation chamber at Bell Nallah.

## SCHWING STETTER MOVES CONCRETE. **WORLDWIDE**

### Consistent: SP 3500HDR Pump

Schwing portable concrete pumps are successfully deployed worldwide, whenever vast quantity of concrete have to be pumped over extremely long horizontal and vertical distance. They are also fast, reliable and economically efficient in handling concrete under challenging conditions with regard to concrete design, jobsite and climate.



Schwing & Prathiba Team with Schwing SP 3500HD



Schwing SP 3500HD

A Schwing SP 3500 HD pump with Rock Valve technology was being used for this project. Its long stroke length of 2000 mm helped to reduce the number of Rock Valve shifting, thus increasing the pumping capacity and reducing wear and tear of significant parts. The pump has a 125 mm diameter differential cylinder and 180 mm delivery cylinder. It gave an area ratio of 2.07 i.e. a maximum hydraulic pressure of 350 bar leading to a concrete pressure of 169 bar approximately.

### Efficient: Tunnel setup for pumping

The concrete pump was placed inside shaft bottom below 100 meters from the ground level and the pipeline was laid using concrete thrust blocks supports and anchoring the pipes on the tunnel walls. The concrete from batching plant was transported using a Transit Mixer, which unloaded the concrete into another Transit Mixer placed at the shaft bottom around 100 meter below.

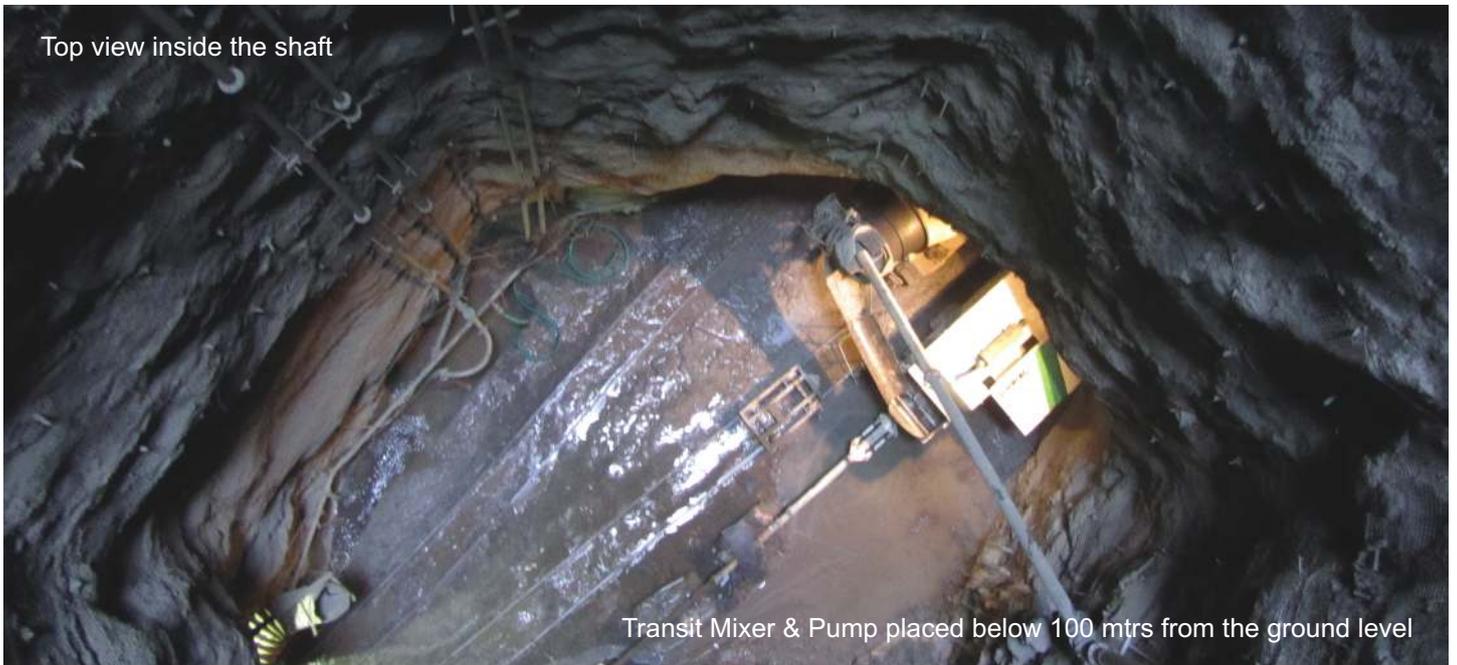
Subsequently, the concrete which was collected by Transit Mixer is then fed into the concrete pump for lining the tunnel. For the efficient work progress the cleaning system components were kept organized near the concrete pump and a compressor was also placed for emergency cleaning at the outlet end.

To maintain the pipeline clean in case of blockage, water line was reserved for every 300 meters.

SSI and BASF engineers worked jointly to formulate a successful concrete placing cycle. The entire concrete in the pipeline was utilized into the pour by the Schwing Rock Valve with the water cleaning system after every pour. This unique feature demonstrates the sealing efficiency of Rock Valve technology.

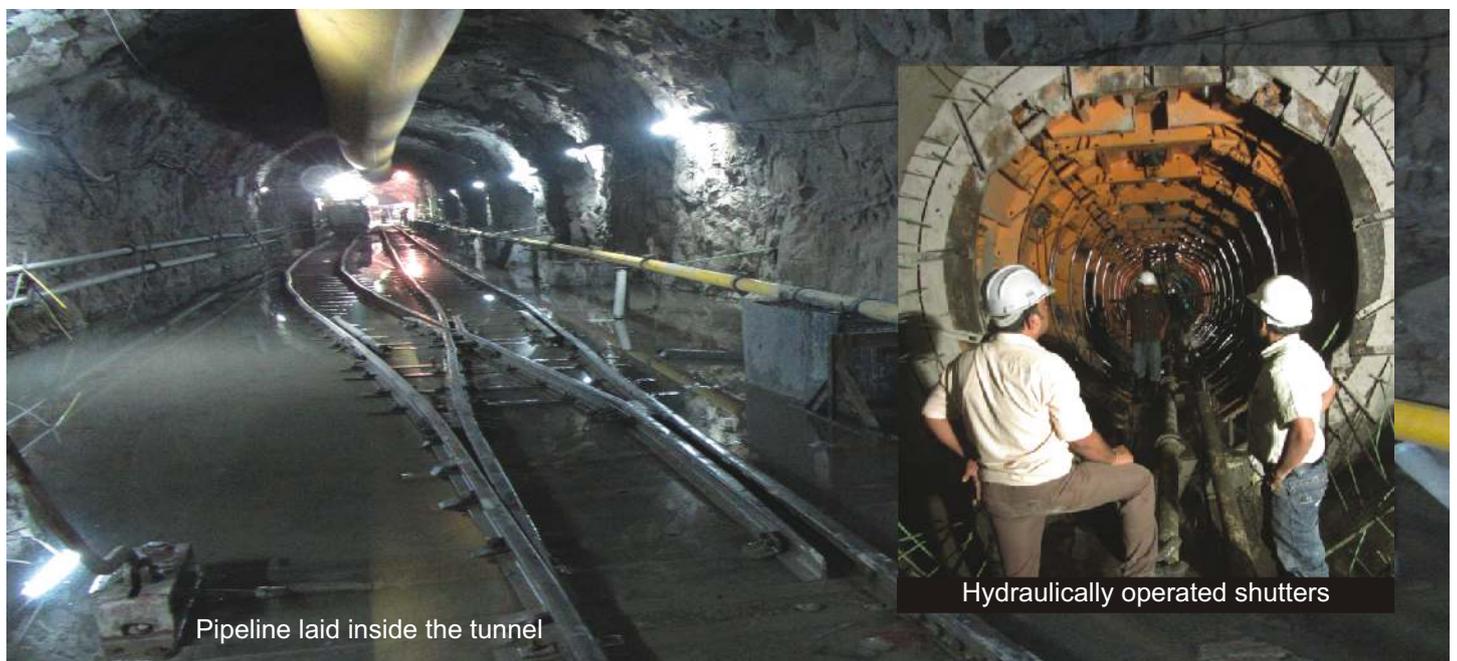


Schwing Stetter Transit Mixer unloading the concrete



Top view inside the shaft

Transit Mixer & Pump placed below 100 mtrs from the ground level



Pipeline laid inside the tunnel

Hydraulically operated shutters

## Triumph - Record during the pour

Initially the project was started with conventional concreting with short distance concrete pump with agitator cars for concrete tunnel lining. The lining was done using hydraulically operated shutters with M25 grade concrete at 300 mm thickness. The agitator car which was pulled using diesel locomotive had a maximum capacity of 9 m<sup>3</sup> and achieved maximum average speed of 250 meters of tunnel construction in a month.

To amplify the speed of concrete lining, customer adopted the new technology of long distance concrete pumping and installed for pumping at a distance of 1180 meters. The customer has achieved highest progress of 450 meter tunnel construction in a month and 82 m<sup>3</sup> in a four hours of time by using Schwing Stetter concrete pump.

### Customer Talk



Schwing & Prathiba Team at Project site

### Mr. Vivek P.V, Manager Projects, Pratibha Industries Limited



Pratibha Industries felt that working with the innovative idea of long distance pumping was one of the challenging jobs it has faced during this project. But with the dedicated expert team's support from Schwing Stetter India, this job was accomplished with great success, setting a new benchmark.

employing Schwing Stetter's equipment, has saved them in their capital cost, time and workforce thus adding up to their profitability.

With a touch of contentment from doing business with SSI, he added "We are very delighted with the technical support extended by SSI for this unique and challenging assignment and amazed at their expertise in concrete pumping. This concrete pump SP 3500HD is truly a winner in proving its capabilities"

Schwing Stetter has helped in training their team (Pratiba Industries Limited) to achieve maximum results He also added that

#### Details:

Owner: Municipal Corp of Greater Mumbai  
General Contractor: Pratibha Ostu-Stettin Joint Venture  
SSI Equipment: SP3500 HD/1820 and 3 nos of TMs.



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