



Project: Drinking water tunnel. | **Location:** Bangkok, Thailand.

Background: "Seventh Bangkok Water Supply Improvement Scheme".

Contractor: Asiatic Development Co. Ltd.. | **Client:** Metropolitan Waterworks Authority (MWA).

Construction method: Segment Lining. | **Tunnel length:** 3,300m.

Challenges: Tight curve drives. Groundwater. No settlement. Obstacles.

EPB 3776 AH | Water Tunnel | Thailand.



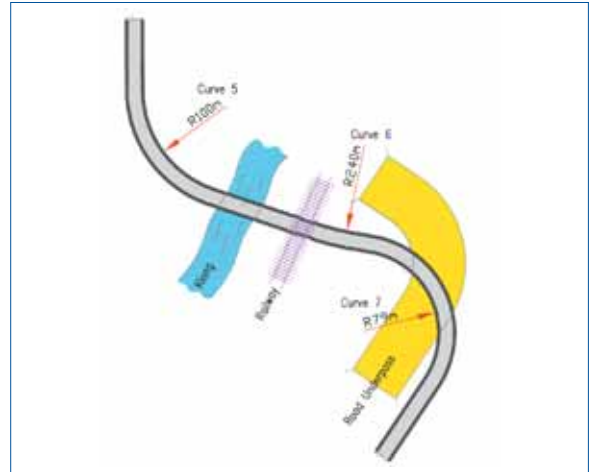
- Curved tunnel construction with segments.
- Mud conveyance via conveyor belt and skip.
- Handling of the segments inside the tunnel.
- Construction of reception shaft.



Tight curve drives with obstacles.

Within the "Seventh Bangkok Water Supply Improvement Scheme" of the Waterworks Authority of Bangkok, the water supply network of the Asian metropolis is to be improved and extended.

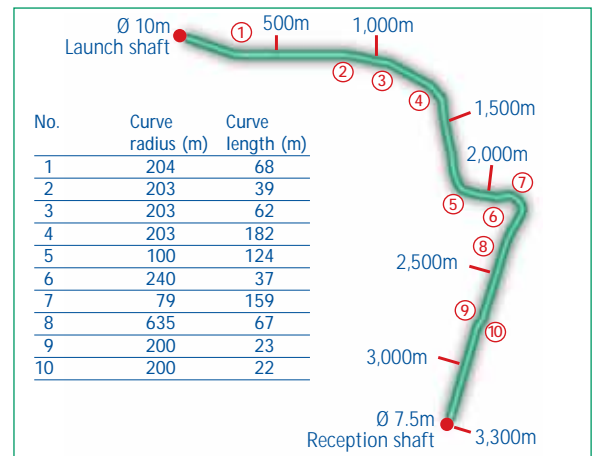
A 3,300m long segmentally lined water tunnel had to be built without harming traffic and environment. The underground crossing of a road, a railway track and a Klong had to be as safe as possible in order to avoid settlement at the surface. During the underpassing of a road in an angle of 90 degrees, 20 concrete pillars had to be crossed underground. The concrete segments to be used had been specifically designed and manufactured for this project. Thus, also the tunnelling machine had to be tailor-made for this tunnel diameter.



With precision around the curves.

The routing of the segmentally lined tunnel was a real challenge for the crew as well as for the EPB (Earth Pressure Balanced) shield. The horizontal and vertical deviation of +/- 40mm, claimed by the contractor, required extreme precision. A minimum of 1.5bar pressure at the tunnel face and precisely coordinated soil conditioning by the foam generator assured the good tunnelling performance. At a depth of 18m in groundwater, silt, sand and clay-containing soil, ten tight curves had to be driven. Despite the challenge, the wear of the cutting tools was relatively small. Only the gage cutting tools had to be replaced. A rail system installed in the tunnel provided segments and concrete for the tunnel production "just in time". On its way back to the surface, it served for the disposal of the excava-

ted material. The LNS-S Guidance System was included in the delivery of Herrenknecht Asia Ltd.



FUNCTION
DRINKING WATER
SOIL
CLAY
SILT
SAND
GROUNDWATER
TUNNEL LENGTH
3,300m
DIAMETER (ID)
3,776mm
CHALLENGES
TIGHT CURVE DRIVES
GROUNDWATER
NO SETTLEMENT
OBSTACLES
EXECUTION DATE
2002/2003

MACHINE
EPB 3776 AH
OD: 4,310mm
POWER: 400kW
RPM: 0-3.6rpm
MAX. TORQUE: 1,375kNm
WEIGHT: 200t
CUTTER HEAD
STANDARD
GUIDANCE SYSTEM
LNS-S
CONSTRUCTION METHOD
SEGMENT LINING

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