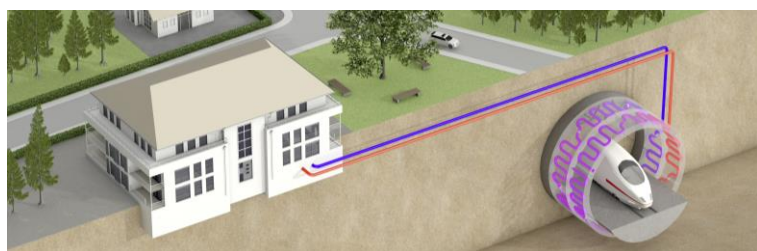


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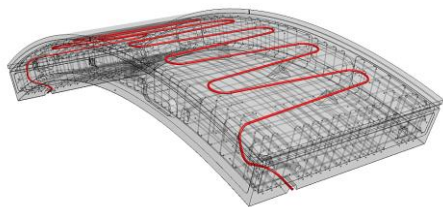
NEW PRODUCT DEVELOPMENTS OFFER HUGE TIME AND COST SAVING POTENTIAL.

Herrenknecht Formwork builds moulds for the energy segment *Energietübbing*[®]. In Jenbach, a small town in Tyrol, Austria, a municipal building is heated with geothermal energy derived from the *Neue Unterinntalbahn* railway tunnel. This is made possible by energy segments produced with moulds from the Herrenknecht Group, which were installed at lot H8 over a distance of 54 meters. Absorber pipes, which are withdrawing heat from or feeding heat to the mountain or tunnel via the tunnel lining are located inside the segments. When the segments were installed, they were joined into a circuit and connected to a heat pump. The *Energietübbing*[®] was developed by the companies Ed. Züblin AG and REHAU AG & Co.



Double benefit in tunnel construction: Since 2012, a 54 m long section with energy segments in the *Neue Unterinntalbahn* railway tunnel heats a municipal building in Jenbach.

As cooperation partner, Herrenknecht Formwork offers matching precision moulds and adapter pockets, guaranteeing a simplified and reliable installation of the absorber pipes and the required means of linking and connection.



Advantages of the energy segment system:

- Double use: tunnel construction and energy recovery
- Reduction of tunnel operating costs
- CO₂-saving for heating and cooling
- Funding potential for renewable energy

For the product *Energietübbing*[®] (energy segment), the companies ZÜBLIN, REHAU and HERRENKNECHT FORMWORK have bundled their respective skills and many years of experience and offer customized solutions. Apart from basic feasibility studies or yield calculations, all steps from pre-dimensioning up to the finished product are perfectly matched to each other.

ZÜBLIN

Ed. Züblin AG
Technical Head Office - Department of Tunnel
Engineering
www.zueblin.de

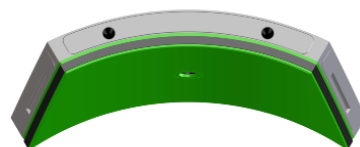


REHAU AG + CO
Business Unit Ground Source Energy
www.rehau.com/tunnelling



Herrenknecht Formwork Technology GmbH
www.herrenknecht-formwork.de

Innovative Combisegments[®]. The new Combisegment[®] generation is equipped with a corrosion-resistant Telene[®] pDCPD inliner and with an already integrated sealing system. This makes it possible to finish water, sewage or cable tunnels in just one step and saves time and money.



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SUCCESSFUL PROJECT CONCLUSION AND NEW CHALLENGES IN THE MIDDLE EAST.



Up to 700 m³ of concrete installed per day: Segment production plant for STEP in Abu Dhabi.

Sophisticated concrete technology for Abu Dhabi. In the ultra-modern capital of the United Arab Emirates, Abu Dhabi, road tankers with the daily arising sewage are caught up in a traffic jam every night: This is why the extremely fast growing city is modernizing its sewage system on a grand scale with STEP (Strategic Tunnel Enhancement Program) by 2015. For the lining of the approx. 40 kilometer long main sewer tunnel, Herrenknecht Formwork together with the partner companies TPA (Stuttgart) and MC Bauchemie, developed a special steel fiber concrete technology for a total of 100,000 segments. During peak times, the pre-cast segment manufacturer CCI (Commodore Cement Industries LLC) produced up to 420 segments a day for the simultaneous supply of 3 tunnel construction sites. Up to four times a day, the 162 pieces of segment moulds from Herrenknecht Formwork demonstrated their dimensional stability even under very difficult environmental conditions with temperatures of up to 55°C. The extensive delivery and service package from Herrenknecht Formwork, including consulting and planning, materials handling equipment, cranes, data capture systems, etc., guaranteed a reliable production in Abu Dhabi from the first to the last segment.

Boom region Middle East. The *Nah- und Mittelostverein e.V.*, Berlin, currently reports of more than 50 railway and transport projects, which are in the study, planning or bidding phase and comprise a volume of 140 billion US dollars up to the year 2020. Following STEP, Herrenknecht Formwork will be on the spot with three other projects:

NEW PROJECTS IN MIDDLE EAST

Project / Country / Length of tunnel	Scope of supply / ID
Herrenknecht-TBM / Ø	
Metro Doha Green Line / Katar / approx.. 36.5km EPB shield / 7,050mm	<ul style="list-style-type: none"> 20 sets of formwork / 6,170mm for stationary production 3D measurement
Metro Doha Red Line North / Katar / approx.. 22.5km EPB shield / 7,050mm	<ul style="list-style-type: none"> 16 sets of formwork / 6,170mm for stationary production Geometric ring design 3D measurement
Makkah Haram Sewer Line / Saudi Arabia / approx. 3,300m and approx. 1,700m 2x EPB shield / 2,800mm	<ul style="list-style-type: none"> 16 sets of formwork / 2,800mm for stationary production Handling equipment



Precision moulds from Herrenknecht Formwork in use.



You can get more information about this in our lectures about segment production and Com-bisegments® technology at the following events:

- **TUCSS** Monthly Seminar, Singapore, 20/02/2014
- **CBIP** Conference, Delhi, India, 26/02/2014
- **WTC**, Foz do Iguazu, Brazil, 11/05/2014 – 15/05/2014

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