



Press Release

HERRENKNECHT

Doha tunnels its way to the top. 111 kilometers of new metro tunnels in 26 months.

October 11, 2016

Schwanau, Germany / Doha, Qatar

September 25, 2016, 10.44 a.m. local time in Doha, Hamad International Airport: unstoppable and precisely a 7 meter tunnel boring machine pierces the final target wall of the "Red Line South". It is the last of 76 breakthroughs in the gigantic milestone project Doha Metro. The TBM breaking through marks the spectacular finale of one of the most ambitious tunnel structures in the world. Cleverly master-planned and highly professionally directed by client Qatar Rail, it took just 26 months to provide the capital of Qatar with three city-wide metro lines: 111 kilometers of brand new, ultra-modern metro tunnel systems. Where before there was nothing, at peak times 2.5 kilometers of tunnel per week were added underground. The result is not only an entry in the Guinness Book of Records.

_____ "The world has never seen such performance. What Qatar Rail and our contractors in Doha have accomplished in just 26 months of construction time with the highest standards of performance, safety and quality is an absolutely Olympic achievement in modern infrastructure development," says Herrenknecht Chairman of the Board of Management Dr.-Ing. E.h. Martin Herrenknecht in summing up the mega tunnelling project Doha Metro that was brilliantly completed on September 25, 2016 with the final breakthrough of one of the company's EPB Shields. High-level political guests such as the Qatari Prime Minister and Minister of the Interior H.E. Sheikh Abdullah bin Nasser bin Khalifa al Thani, the Minister of Transport and Communication of Qatar H.E. Jassim Saif Ahmed al Sulaiti as well as the ambassadors of France, Korea and Japan in Qatar showed their admiration at an official completion ceremony. A total of around 200 guests, including the top management of Qatar Rail and leading representatives of the joint venture contractors, celebrated a unique technical construction and engineering achievement. 111 kilometers of newly bored and built tunnels under the capital of Qatar in just over two years outshine everything previously achieved in urban metro tunnelling worldwide.

Herrenknecht AG
Schlehenweg 2
77963 Schwanau

Corporate Communications
Tel. +49 7824 302-5400
pr@herrenknecht.de

www.herrenknecht.com



Tunnelled into the Guinness Book of Records.

From August 2014 to September 2016, on three main lines (Red Line, Green Line, Gold Line) four international joint ventures consistently pushed forward a total of 21 TBMs designed and equipped by Herrenknecht specifically for the project. A performance presentation of superlatives. 470,497 individual concrete segments (so-called lining segments) were mechanically assembled into 70,071 high quality tunnel rings. At peak times 20 TBMs tunnelled their way forward simultaneously, 2.5 kilometers per week of spotless metro tunnels grew under Doha. This Olympic quality parallel performance has gained the project a place in the Guinness Book of Records. In addition to the geology consisting primarily of Simsima Limestone, the demands on each TBM were complex – just from the dense urban development alone. The routes of the individual metro lines run under highly populated areas, for example near the impressive beach promenade Corniche, under the high-rise neighborhoods of Doha City and the tourist centers with their attractive hotel facilities. Settlement-free tunnelling was therefore one of the core requirements during construction.

Ideally prepared for all eventualities.

With innovative German tunnelling technology the construction joint ventures completed a total of 76 breakthroughs; more than 40 times the machines were quickly pushed forward in intermediate shafts ready for the next section – and once again tuned for speed. Up to 125 Herrenknecht service staff and specialists from 19 countries were at hand wherever contractors, machine technology and extraordinary events required them.

In order to keep to the ambitious masterplan and the tight schedules, man and machine were in operation on the huge construction site around the clock, seven days a week. In addition to excellent planning, expertise and high material and machine quality, for Dr. Markus Demmler, Senior Director of the Qatar Integrated Railway Project, one prerequisite was vital for the success of the project: "Managing 21 TBMs working smoothly beneath a metropolis like Doha is only possible with 100 percent commitment from all partners involved." All the participating companies handled the gigantic project with pioneering boldness and the highest degree of team spirit and operational professionalism. The Herrenknecht full-service competence center set up near Doha specifically for the project provided additional support. Competent and proactive contacts were available here for all matters relating to tunnelling technology, assembly and disassembly, provision of specialist personnel, tunnelling support, spare and wear parts management as well as the maintenance and refurbishment of the used cutting tools.

Herrenknecht AG
Schlehenweg 2
77963 Schwanau

Corporate Communications
Tel. +49 7824 302-5400
pr@herrenknecht.de

www.herrenknecht.com



The centerpiece of a grand vision.

The newly emerging metro system in Doha is only the beginning of the mobilization of public transport in Qatar. Whether in the urban centers or in the countryside – everywhere people will be able to travel by public transport. "Qatar's vision is to connect every corner of the country by public transport," explains Demmler. "The Doha Metro project represents the supporting backbone of an integrated public transport system," says Qatar's Minister of Transport Katar H.E. Jassim Saif Ahmed al Sulaiti in describing the substantial significance of the metro network, the first three lines of which are scheduled to be opened by 2020. By 2026 an extensive expansion by 72 additional stations and another metro line is planned. The station Msheireb in the center of the metropolis already forms the accumulation point of the whole system. All lines meet here, 12 breakthroughs ended at this mammoth station alone. Linked in all directions of the city, soon every metro journey will save valuable time and several kilograms of polluting greenhouse gases compared to a trip by car. Acceleration, mobility and environmental protection are the driving forces of the mega project. The development of the regional and national network will conveniently bring all residents of Qatar closer together.

In 26 months, four international construction joint ventures have built a 111 kilometer metro tunnel system in Doha on three lines – a new benchmark worldwide. Cleverly master-planned and highly professionally directed by client Qatar Rail, a rapid pace was maintained at all times while ensuring the highest standards of safety, quality and health. Herrenknecht's contractors are:

- › for the Red Line North the ISG joint venture (Salini Impreglio S.p.A./ SK Engineering & Constructing Co Ltd/ Galfar Al Misnad Engineering & Constructing W.L.L
- › for the Red Line South the Qatari Diar Vinci Construction JV (QDVS)/ GS Engineering & Construction Corp./ Al-Darwish Engineering W.L.L
- › for the Green Line Contractor PORR Bau GmbH/ Saudi Binladin Group Company Ltd/ Hamad Bin Khalid Contracting Co. W.L.L.
- › for the Gold Line the joint venture Aktor S.A./ Larsen & Toubro Limited/ Yapi Merkezi Insaat VE Sanayi Anonim Sirketi/ Sezai Turkes Feyzi Akkaya Marine Construction/ Al Jaber Engineering LLC)

Project film: Flow³ - Championship Alliance in Doha

<http://allaround.herrenknecht.com/en/issue-5.html#flow>

Client website:

<https://www.qr.com.qa/English/Projects/Pages/DohaMetro.aspx>

Herrenknecht AG
Schlehenweg 2
77963 Schwanau

Corporate Communications
Tel. +49 7824 302-5400
pr@herrenknecht.de

www.herrenknecht.com



Project data

Doha tunnels its way to the top. 111 kilometers of new metro tunnels in 26 months.

MACHINE DATA S-844-849 / S-860-868 / S-920-925

Machine type: 6 x EPB Shield

- › Shield diameter: 7,050 mm
- › Drive power: 1,440 kW
- › Torque: 4,769 kNm

Machine type: 9 x EPB Shield

- › Shield diameter: 7,050 mm
- › Drive power: 1,280 kW
- › Torque: 4,239 kNm

Machine type: 6 x EPB Shield

- › Shield diameter: 7,110 mm
- › Drive power: 1,440 kW
- › Torque: 4,769 kNm

PROJECT DATA

Project

- › Doha Metro, Doha, Qatar

Client

- › Qatar Rail

Contractors

- › Red Line North: ISG joint venture (Salini Impregilo S.p.A./ SK Engineering & Construction Co. Ltd/ Galfar Al Misnad Engineering & Contracting W.L.L.)
- › Red Line South: Qatari Diar Vinci Construction (QDVC); GS Engineering & Construction (GS E&C); Al Darwish Engineering (ADE)
- › Green Line: PORR Bau GmbH/ Saudi Binladin Group Company Ltd/ Hamad Bin Khalid Contracting Co. W.L.L.
- › Gold Line: Aktor S.A./Larsen & Toubro Limited / Yapi Merkezi Insaat VE Sanayi Anonim Sirketi / Sezai Turkes Feyzi Akkaya Marine Construction / Al Jaber Engineering LLC

Geology

- › Mainly Simsima Limestone, Midra Shale and Rus Formation

Advance lengths

- › Red Line North: 22.8 kilometers, Red Line South: 32.6 kilometers, Gold Line: 23.3 kilometers, Green Line: 33.4 kilometers; all lines were built as parallel twin tunnels

Herrenknecht AG
Schlehenweg 2
77963 Schwanau

Corporate Communications
Tel. +49 7824 302-5400
pr@herrenknecht.de

www.herrenknecht.com

**Photos:****Doha tunnels its way to the top. 111 kilometers of new metro tunnels in 26 months.**

Photo 1

On September 25, VIPs and project participants celebrated the final breakthrough together. Guests at the ceremony included (from left to right) the CEO and Chairman of Qatar Rail Abdulla Abdulaziz Turki al Subaie, the German ambassador to Qatar Hans-Udo Muzel, the Minister of Transport and Communication of Qatar H.E. Jassim Saif Ahmed al Sulaiti and Dr.-Ing E.h. Martin Herrenknecht.

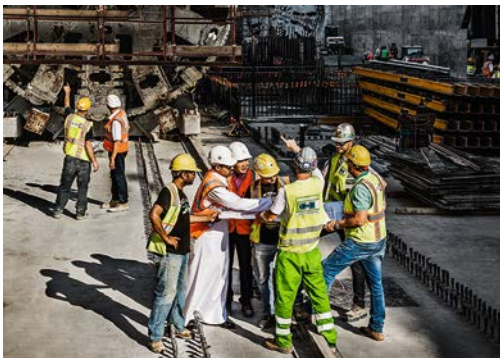


Photo 2

After the arrival of the first machine in the capital of Qatar and the assembly on site, in August 2014 excavation of the new metro lines for Doha began. For the coordination of all work on the three lines optimally harmonized teamwork was essential.



Photo 3

Since September 25, 2016 all tunnelling work on the three new metro lines has been complete. Further construction work at the individual stations and the finishing of the segmentally lined tunnels will continue until 2020.

Herrenknecht AG
Schlehenweg 2
77963 Schwanau

Corporate Communications
Tel. +49 7824 302-5400
pr@herrenknecht.de

www.herrenknecht.com

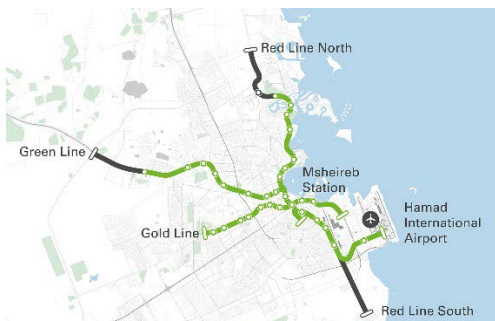


Photo 4

In future the new metro system will be used for 630,000 passenger trips per day. And that is just the beginning. The construction of an additional line is already in planning. 111 kilometers of underground tunnels were driven for the first three metro lines.



Photo 5

The four joint ventures ordered a total of 21 Herrenknecht EPB Shields for the metro construction in the metropolis of Doha. In just two years they excavated 111 kilometers of new, high quality tunnels.

Herrenknecht AG
Schlehenweg 2
77963 Schwanau

Corporate Communications
Tel. +49 7824 302-5400
pr@herrenknecht.de

www.herrenknecht.com



For further information: Please contact us.

Herrenknecht AG

Herrenknecht is the only company worldwide to deliver tunnel boring machines for all geologies and in all diameters – ranging from 0.10 to 19 meters. The product range comprises tailor-made machines for traffic, supply and disposal tunnels, technologies for pipeline installation as well as additional equipment and service packages. Herrenknecht also manufactures drilling rigs for vertical and inclined shafts as well as deep drilling rigs.

In 2015 the Herrenknecht Group achieved total revenues of 1.343 billion euros. The Herrenknecht Group employs around 5,000 people worldwide, including around 180 trainees. With 76 domestic and overseas subsidiaries and associated companies working in related fields, Herrenknecht provides comprehensive services close to each project and customer.

› <http://www.herrenknecht.com/en/references>

Your contact:

Achim Kühn

Head of Corporate Communications, Branding und Public Affairs

Phone +49 7824 302-5400

Fax +49 (0)7824 302-4730

pr@herrenknecht.de

Herrenknecht AG
Schlehenweg 2
77963 Schwanau

Corporate Communications
Tel. +49 7824 302-5400
pr@herrenknecht.de

www.herrenknecht.com