Metro Doha – Green Line
Status update

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Contract award
In June 2013, the joint venture PORR-SBG-HBK consisting of Porr Bau GmbH, Saudi Bin Laden Group Riyad and HBK Contracting Company W.L.L. was commissioned with the construction of Green Line M32.

The contract was awarded by Qatar Rail. The order volume amounts to 8.989 billion QAR (approx. 1.858 billion Euros as per June 2013).

Doha's Metro is an integral part of Qatar's raildevelopment programme. Consisting of four lines, the underground network will cover Doha's metropolitan area and establish connections to the city's central area as well as to various commercial and residential zones located in the city. In Doha's centre, the Metro will run underground, while it will mostly run at street level or on elevated tracks in the suburban zones.

Especially for the football world cup in 2022, the Metro will establish connections to the individual stadiums.

Project overview
The Green Line order includes the construction of some 2 x 16.5 km of tunnel, six stations and one external switch hall.

Furthermore, four emergency exit shafts up to 40 m deep, 32 cross-cuts and two additional combined emergency exit/MEP shafts are being installed. When it comes to size, the latter are more like stations than shafts.

Construction time for the tunnels is 42 months and 61 months will pass until the stations are handed over.

Some 500 employees and 3,000 workers are currently working at the construction site.

Execution of construction work
Six tunnel boring machines are operated simultaneously in the course of this project. The TBMs were installed in the 2nd half of 2014 and started up one after the other until January 2015. Four TMBs started at Al Messila station, two machines eastwards in the direction of the city centre to Musheireb station while the other two started boring westwards towards Education City. Both Musheireb and Education City were being built by third parties. This means that close collaborations are required and time frames need to be met precisely.

From Al Bidda to Musheireb, the Green Line will run parallel to the Red Line at a small distance. Musheireb station will serve as the central interchange station between Green Line, Red Line and Golden Line.

Two more machines started in the direction of Education City from the Trough.
On their way from Al Messila to Education City, machines 1 and 2 will cover 6,124 m and pass three stations.

Working their way from Al Messila to Musheireb, machines 3 and 4 will cover 4,068 m and pass one switch box and three stations – among others, Al Bidda station built by Red Line.

Only machines 5 and 6 running from the Trough to Education City and covering 6,279 m will pass no station. Instead, these two machines will cross two emergency exit/MEP shafts.

All machines are supplied from a central segment production plant which is located on the MLPA some 20 km outside of Doha. Approx. 72 segment rings are installed every day in parallel operation. In total, some 21,000 rings with 5+1 segments each are manufactured.

Work at the segment production plant is carried out in continuous mode in order to secure heading supply.

So called multi service vehicles are used to transport the segments to the TBM in the tunnel. These MSVs run on wheels and can transport one complete ring each to the TBM.

In turn, some 4,500 m³ of excavated material must be removed from Al Messila and Trough every day. The excavated material is transported to the MLPA and finally deposited there.

These transports involve complex logistics which is taken care of by a designated project department.

Work on the stations is executed at the same time as heading work. Therefore, work on the stations must be conceptualised in a way that allows the TBMs to push through while the stations remain fully operational. Al Messila station assumes a particularly important role in this process. Al Messila features a station and a switch hall and simultaneously serves as the logistics centre for the supply of four TBMs and the removal of the material excavated by them. The conveyor belt system required for the latter alone is extraordinarily large.
Occupational safety
A separate department is responsible for monitoring work safety. The HSE (Health and Safety Executive) team alone currently consists of 40 work safety engineers who permanently plan and monitor the safety of the work steps and conduct briefings on a daily basis. Among others, this measure has made it possible to record a maximum of six million work hours without a single notifiable (absence from work of more than 24 hours) accident. This is an result to be proud of and one that should be extended further. Great importance is also attached to the quality of the worker housing and working conditions at the construction site. The contract documents already stipulated high standards in this regard which are strictly adhered to by the consortium and our sub-contractors.

Outlook
From December 2015 to April 2016, the TBMs will reach their target points, one after the other. After that, the stations can be completed and the rest of the work in the tunnels can be carried out.