Amstetten, March 2013

Press release

**Speedy solutions for a high-speed link**

Hauma Railway Station is a new showcase project in the Israeli capital. A national megaproject, it involves the building of a central underground station for the new high-speed rail link between Tel Aviv and Jerusalem. Doka supplied the formwork solution for several interconnecting tunnels and other structures. In fact, a number of different products from the Doka portfolio – such as Load-bearing tower Staxo, Large‑area formwork Top 50 and the ‘Heavy-duty SL-1’ tunnel formwork system – are keeping work moving ahead safely and cost-efficiently on this huge project.

The express railway line between Tel Aviv and Jerusalem is being given a brand-new terminus in the heart of the capital. The station consists of a complex system of tunnels, which is presenting the lead contractor Ramet Ltd. and its partners with numerous challenges. The bulk of the work is being carried out underground under severe space constraints, confronting the site team with working-conditions such as they have never experienced before. This, plus the limited storage space on-site and the fact that vehicle access is via a busy main thoroughfare, all calls for innovative solutions, especially in terms of logistics. The team of technicians from Doka Israel worked with the specialists at Doka HQ in Amstetten to develop a comprehensive formwork concept for this project.

Central shaft for top speeds

The heart of the site is the 80 m deep central shaft, with a diameter of 22 m. This will provide access to the platforms of the high-speed rail link, and contains a complicated network of different interconnecting tunnels and ventilation tunnels, stairwells and lift systems. The vertical shaft was built using a special solution assembled from Large-area formwork Top 50 and Doka dam formwork for its single-sided walls. These custom-built formwork elements were supplied to the site pre-assembled and ready for immediate use, and were then lowered into the shaft, which involved some carefully planned logistics. Every single 4 m long casting section of the central tunnel was poured during the night and stripped out the very next day, so as not to obstruct road traffic at this chokepoint in the city’s transport network.

The many tunnel openings presented yet another challenge during the pouring of its single-sided walls. This was solved by preparing special formwork units which could be joined by ring-systems, making it unnecessary to fetch the formwork out from the depths of the shaft.

The intermediate floor slabs and inside walls in the central cylindrical shaft were formed and poured using Timber-beam slab formwork Dokaflex 1-2-4 and the lightweight Framed formwork Frami system.

The project comprises a series of different tunnels, each requiring a separate technical solution. The ventilation tunnels connected to the central shaft are being formed using Doka’s ‘Heavy-duty SL-1’ tunnel formwork system. This efficient, high-performing tunnel formwork traveller carries a Top 50 circular formwork unit and permits tunnel-forming cycle times of between two and three days.

Work on Tunnel N° 21 took place at the very bottom of the central shaft, 70 m below ground. With its wall height of around 14 m, this structure called for a special solution with a tall Supporting construction frame. This was the first time that this system had been used with a circular formwork. However, this custom application for these tried-and-tested Doka systems required precisely detailed statical planning to ensure that the system and its heavy loads could still be moved. Despite the great height of the Supporting construction frame, it can still be advanced quickly to the next casting section, by means of an integrated roller gear. Work on the above-ground buildings commenced while construction was still in progress on the underground part of the Hauma Railway Station.

Structures above and below ground in Jerusalem

Both the station building and the service building make an imposing impression – both above and below the ground of the Israeli capital. Parts of these modern edifices have a fair-faced concrete finish, accomplished by the use of high-performing Xlife sheeting. The above-ground part of the station building comprises a spacious concourse, an office building and a ventilation tower. For architectural and environmental reasons, the service building on the eastern side of the plot is also partly underground.

**Flexible, high-performing all-in-one solution**

The Heavy-duty supporting system SL-1 from Doka that has been fielded for the tunnels of the Hauma Railway Station is a flexible and high-performing formwork system. Designed for high loads, the Heavy-duty supporting system SL-1 provides an exceedingly strong, torsion-proof subconstruction for the tunnel formwork. This modularly designed system ensures swift, economically efficient construction progress, regardless of the shape and load. The extra-stable formwork allows only the very smallest of deformations, and can easily be re-adjusted in any direction thanks to the fine pitch screw-threads. The fully rentable tunnel formwork traveller achieves short repositioning times thanks to the all-hydraulic rail guidance. The formwork traveller can be moved safely even on steep longitudinal and transverse gradients. The integrated working platforms and ladderways on this CE-labelled system provide extra safety during the forming operations. Its short cycle times, and ease of formwork set-up and removal, were clinch factors for the client. This heavy-duty supporting system was previously fielded on the large-scale upgrade and extension of the M4 metro line in the Hungarian capital Budapest. The Heavy-duty supporting system SL-1 is fully compatible with Large-area formwork Top 50. The flexible Top 50 system accommodates any architectural requirement and saves craneage because of its large gang-forms.

**In brief**

**Hauma Railway Station**

Location: Jerusalem, Israel

Contractors: Ramet Ltd.

Start of construction: August 2010

Completion scheduled for: 2016

Types of structure: Various different types of building and tunnel systems

Systems in use: Products: Heavy-duty supporting system SL-1, Large-area formwork Top 50, Load-bearing tower Staxo 100, Supporting construction frames, Framed formwork Framax Xlife

Services: Formwork pre-assembly

**About Doka:**

Doka is one of the world leaders in developing, manufacturing and distributing formwork technology for use in all fields of the construction sector. With more than 160 sales and logistics facilities in over 70 countries, the Doka Group has a highly efficient distribution network which ensures that equipment and technical support are provided swiftly and professionally. An enterprise forming part of the Umdasch Group, the Doka Group employs a worldwide workforce of more than 5600.

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**Caption:**

Doka\_2013\_03\_Hauma\_Railway\_Station\_IMG\_01

Overcoming the logistical challenges in the building of the Hauma Railway Station: The tunnel formwork was delivered to the site pre-assembled and then lowered into the central shaft.

Photo: Doka