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### Prestressed Concrete Railway Bridge Constructed Using DYWIDAG Strand Tendons

Railway Intersection Masaryk / Main Station, Prague, Czech Republic

The Czech Republic is modernizing its railway system at full speed. As part of its overall improvement strategy, a central intersection in the capital of Prague is being enlarged. This crosspoint is used both by trains running towards the main station (Hlavni nadrazi, also called the Wilson Station) and towards Masaryk terminal (Praha Masarykovo nádrazi).

Both stations are important for national and international long-distance traffic. The main station was built between 1901 and 1909 in the art nouveau style, whereas the Masaryk station, which was built between 1844 and 1845, is the oldest station in Prague. The two stations are only about 500m apart, but since there was no satisfactory crossover, switching and changing trains was difficult. The "new connection" will provide a solution to this problem by establishing a new way in which trains coming from the North are regulated. The construction of a new, 440m long bridge with four tracks was a major measure in the creation of the new connection. The construction of this 22-26m wide

bridge was a challenge for everyone involved because the site is in the middle of the city and traffic flow had to continue both on the street and on the tracks. In addition, the bridge leads directly into a railway tunnel that crosses underneath Vitkov Mountain in Prague.

The complicated and technically demanding structure was planned by the engineering office SUDOP in Prague and built by the joint venture Skanska, SSZ, Subterra and Metrostav. The post-tensioning work was carried out by SM7 A.S., DSI's licensee for the Czech Republic and for Slovakia. The bridge deck was constructed in lengths of 32 and 40m on gantry trusses. The collateral cantilevers were produced in a casting yard directly on site underneath the bridge and lifted and mounted onto the deck as precast concrete elements. The cross-section has a height of 3.20m that increases to 3.70m at the pylon. The roadway slab has a thickness of 30cm, thickening to 80cm at the pylon.

For the transverse post-tensioning of the precast concrete elements, SM7 A.S. supplied type MA 6812 DYWIDAG Strand Tendons using 0.62" diameter strand. Longitudinal post-tensioning of the precast concrete elements was carried out using type MA 6819 and MA 6822 bonded DYWIDAG Strand Tendons using the same strand. All of the DYWIDAG tendons were inserted into HDPE ducts.

SM7 A.S. is proud to have been awarded the contract to post-tensioning this important railway bridge, which is one of the few to have been constructed using the prestressed concrete method.

**Owner** Department for Traffic, Prague, Czech Republic +++ **General Contractor** Joint venture Skanska, Metrostav, Subterra, SSZ, Prague, Czech Republic +++ **Contractor** SSZ, Prague, Czech Republic +++ **Consulting** SUDOP, Prague, Czech Republic

**DSI Units** SM7 A.S. Prague, Czech Republic / DSI Austria, Elsbethen/Salzburg, Austria

**DSI Scope** Supply of 382t of DYWIDAG Strand Tendons types MA 6812, MA 6819 and MA 6822, St 1570/1770 and couplers type R 6822; technical assistance

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