



▲ The bridge on the outskirts of Ostrava was designed to provide an attractive crossing in a popular residential area.

The cable-stayed bridge across the River Odra and Lake Antosovicke is part of the D47091/2 Hrušov – Bohumín motorway. The bridge is situated in a recreational area on the outskirts of Ostrava and so a project aim was to bridge the river with a crossing of attractive design.

The superstructure is suspended from symmetrical stay cables in a semi-radial layout, supported by a single pylon on the bridge's axis. The cable-stayed section is 201m long and the

pylon has an overall height of 48.6m of which 37.5m is above the deck. A steel column coupled with an outer concrete jacket forms the pylon. The superstructure is made up of parallel two-cell box girders, with a constant cross-section and a height of 2.2m. The girders are connected to each other along the bridge's axis using an intermediate coupling plate at the upper cross-section level and by prefabricated struts at the lower level. The bridge was built using an overhead movable scaffolding system, which was supported by temporary mounting pillars because of the large spans involved. Support for the bridge deck comes from 28 stay cables using the VSL SSI 2000 System. The stay cables are formed from parallel seven-wire greased strands of 15.7mm diameter and 1,860MPa strength.

They are overlaid with a tightly extruded HDPE cover, as well as an outer HDPE stay pipe equipped with helical ribs to reduce wind



▲ HDPE pipe ready for installation

Scope of works performed

- Design support for application of the VSL SSI 2000 System
- Supply of stay cables

vibrations. Workshop prefabricated anchors and deviators help capture lateral forces arising from cable rotations. Lengths of the stay cables range from 23m to 99m, with 55 strands in the shortest and 91 strands in the longest cables. The total weight of the installed strands is 188t. The active anchors for the stay cables are located in the bridge deck with an axial spacing of 6.07m while the passive anchors in the pylon are at a 1.2m spacing. The intermediate plate was concreted and the steel guide pipes were installed in the formwork. The passive anchors – which ranged from 175kg to 381kg – were then installed in the pylon



▲ Prefabricated active anchorage

▼ Active anchorage installation



▼ HDPE pipe installation



and the active stay cable anchors (367kg to 626kg) were installed in the anchoring blocks of the intermediate coupling plate. The HDPE pipes for the stay cables were welded together on the bridge deck from 12m sections. They were equipped with the first strand - the so-called 'master strand' and seated on mobile troughs to prevent the

▼ Stressing the master strand



OWNER

RSD CR

ENGINEER

Stráský, Hustý and Partners, Ltd.

MAIN CONTRACTOR

"D47091/2" Association

SUPPLIER

Skanska DS a.s., division 77-Bridges

VSL ENTITY

VSL SYSTEMS (CZ), s.r.o.

DATE

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tube surface from being damaged while being installed. Installation of the stay cable pipes was performed step by step from the longest to the shortest. The 'second strand' was run and tensioned once the master strand had been tensioned to the installation force. Once all the HDPE pipes had been installed, the stay cables were fitted with the remaining strands using the 'strand by strand' method, which ensures that the strands run parallel to each other. The final tuning of the forces in the stay cables was performed once the bridge was carrying all the permanent loads.

Installation of the stay cables was successfully completed in a very short time. The final force tuning in the cables and installation of the deviators was performed 14 weeks after the anchorage mounting in the structure. The critical activities – including installing the pipes, threading and tensioning the strands – were carried out in just 30 days.



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