# Use of light weight carbon fiber reinforced hollow core cylinders for the stressing of permanent anchors

**Reference Details:**

**Owner** DB-Projekt Verkehrsbau GmbH, Germany +++ **Contractor** JV Röhrmoos-Obermenzing, Germany +++ **Subcontractor** Stump Spezialtiefbau GmbH, Langenfeld, Germany

**DSI Services** Delivery of about 700 Permanent Anchors, type SUSPA-DSI 6/3.

## Use and distribution of innovative carbon fiber reinforced hollow core cylinders

Currently several major infrastructure projects for ICE and ECE bullet train tracks are under construction in Germany. This initiative will result in the construction of new lines or the extension of existing lines all of which are designed for speeds up to 300 km/h. One key component of the extension project is the ICE high speed railway from Munich to Berlin. In the course of the construction work a number of new sheet pile wall retaining structures will be built on a 20 km section of the track between Munich and Ingolstadt.

The tie backs required for this project were executed by Stump Spezialtiefbau GmbH,Germany. About 700 SUSPA-DSI 6/3 Permanent Anchors were used.
Due to their extremely low weight carbon fiber reinforced hollow cylinders represent a significantly improved alternative to traditional all aluminium hollow core cylinders. The weight reduction compared with traditional hollow core cylinders made of aluminium is up to 70 %. Carbon fiber reinforced cylinders ensure simple and quick handling and positioning without the use of hoisting gear or special means of transport and are primarily used in bridge, prestressed concrete and foundation engineering.

3,200 kN carbon fiber reinforced cylinders are used in bridge construction for post-tensioning of external tendons in hollow box girders. The post-tensioning work can easily be carried out by two workmen without any hoisting gear.
Carbon fiber reinforced hollow core cylinders particularly present special advantages in special foundation engineering. The standard cylinder used for this application weighs only 24 kg in the shortest design and has a capacity of 1,200 kN.

Carbon fiber reinforced cylinders are exclusively distributed worldwide by SUSPA-DSI GmbH, Königsbrunn, Germany. Within the scope of the ICE high speed railway SUSPA-DSI GmbH was awarded another contract for the delivery of about 700 permanent anchors in the Röhrmoos-Obermenzing section which were successfully post-tensioned using carbon fiber reinforced hollow core cylinders.





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