



Bridges

Reference Details:

Owner City of Ústí nad Labem +++
Structural design and supervision CityPlan sro, Prague +++
Architect Roman Koucký, Prague +++
General Contractor Hutní montáže Ostrava +++
Installation of Stay Cables SM7, Prague (DSI licensee)

DSI Services Supply of DYWIDAG stay cables; technical support.

**DYWIDAG bond socket stay cables for an outstanding project****Ústí nad.Labem Bridge, Czech Republic**

The DYWIDAG bond socket stay cable system was chosen to be incorporated into the impressive River Elbe crossing in the Czech Republic. The latest development of this bonded anchorage system combines both superior fatigue behavior and excellent corrosion protection.

This bridge will be the second river crossing for Ústí nad Labem, a city with a population of 100,000. For the first time the downtown area will be connected with the opposite side of the river. The bridge itself is a non-symmetrical stay cable structure with a main span of 123.3 m and end spans of 55.5 m and a 60 m tall pylon that is inclined in both directions. The 24 m wide steel super structure is carried by two planes of DYWIDAG stays that are anchored in the top half of the tower. The design of the bridge considered the local geology since it was necessary to keep the structure as light as possible and to shift the mass more towards the opposite side of the so called Mary's rock formation on the western shore. The weight of the main span was minimized by using a steel orthotropic deck whereas the side spans are composite steel-concrete decks.

The stays are composed of 18 DYWIDAG type C12 cables with 5 to 11-0.62" strands (St 1570/1770) and 12 DYWIDAG C19 cables with 14 to 19 strands:

- The cement grouted anchorage zone in each cable consists of a threaded socket head, an adjustable ring nut, a bearing plate and a conical bond socket. The alkalinity of the grout in the anchorage is the primary corrosion protection for the strand. The grout also functions as bond transfer mechanism to enable the steel socket to participate in carrying the dynamic loads. This way only about 50% of the traffic load is resisted by the strand wedges which substantially enhances the anchorage fatigue life.
- In the free length of the stay cable, galvanized, greased and sheathed strands are enclosed in a black PE pipe resulting in a multiple corrosion protective barrier system.

The proven DYWIDAG cable erection method outlined below was first used on the Quincy Bridge over the Mississippi River in 1986:

- PE welding on the bridge deck
- Uncoiling, stripping and cleaning of the greased and sheathed strand in a predetermined length for the anchorage zone
- Lifting of the PE pipe with winches and temporary support cables
- Inserting of individual strands into the installed PE pipe
- Securing the strands with wedges in the anchor wedge plates.

The stressing was accomplished by DYWIDAG HOZ 3000 rams for the 12 strand system and HOZ 4000 rams for the 19 strand system. The stay cable loads can easily be adjusted with the ring nut after grouting the system and during the entire life of the bridge. In addition, the threaded socket makes it possible to remove the cable for inspection or replacement purposes.

