

Duration : 1995 - 2002

- Contractors :**
1. Continental Construction (i) Ltd Foundation (Canada) Joint Venture (**CFJV**)
 2. Hindustan Construction (I) Ltd. Impregilo, Italy (**NJJV**)

Product : CICO RESIFIX - RESIN CAPSULE

Naphtha Jhakri Hydro Electric Power Project under construction by Naphtha Jhakri Power Corporation Limited a joint venture of Govt. of India & Govt. of Himachal Pradesh. The project is India's largest underground Power Project of 1500 MW. The Construction work is on war footing to commission 2x250 MW units in December 2002.

Head Race Tunnel (HRT) is 27.4 KM long and 10.15 m diameter in the shape of Horse Shoe. This is one of the longest Power Tunnels in the world to convey a design discharge of 405 cum sec with a flow velocity of 5m/sec. The cover along the tunnel varies from 95 m to 1480 m except under Manglad creek, where it is only 9m (rock cover -4m).

During excavation (now completed), the Rock support was mainly done with 4.0m/4.5m long & 25mm dia rock bolts and 50-100 mm thick shotcrete. The rock bolts are fixed with **CICO RESIFIX** (Resin Capsule). Shotcreting was done with **CICO SHOT** (shotcreting accelerator). The lining of the tunnel is done by 400 mm to 600 thick concrete admixed with **CICO PLAST SUPER**. **CICO** Technologies Ltd. (CTL) are proud to be associated with NJPC right from the beginning of the project till now. CTL is the sole supplier of Resin Capsule for 16km length of HRT awarded to CFJV with consistent quality, agreed delivery schedule and continuous field technical support. 11.4 km tunnel built by NJJV also used **CICO RESIFIX** for rock bolting.

CICO RESIFIX - Capsules are also used for the rock support system in desilting chambers & other location by other J.V contractor such as Jaiprakash Industries Ltd. (India) & Hundai (korea). The rock supporting system comprises of 32mm dia 6m long rock bolts in crown and 6/7.5m long 32mm dia rock bolts in wall. 7.5m long rock bolts are provided in middle 1/3rd or middle 2/3 of wall depending on the rock cover. Steel fiber reinforced shortcrete (S.F.R.C) in varying thickness of 200-150mm are provided. Over & above 3 rows of cable anchors of 20m long & 60MT capacity @7.5m horizontally are also provided through R.C.C beam.

Total number of **RESIFIX**, Resin capsules consumed in the project is in the tune of over 6 lakhs in various diameter. **CICO RESIFIX** is nonshrink, can be used in presence of water and develops pull out strength of 12MT in 120 minutes. (testing done at site as per specified displacement based on quality of mother rock & embodiment depth which is generally 1.0m). It is ideally suited for rock bolting in tunnel excavation & rock anchored for desired progress & reliability. **CICO RESIFIX**, Resin capsules are available in various diameters & length, ranging from 15mm to 40mm in diameters & 200mm to 350mm in length. **CICO RESIFIX** can also be made in customised size over 6 lakhs in various diameter.