PRESSURE PIPES

Water pressure main pipelines are generally projects for which is required a life expectation of 100 years and more. A correct approach to best result of these projects involve many engineering activities and disciplines from the survey to the planning of the activities to the structural and hydraulic design.

The 60 years BFS (previously CASAGRANDE) experience in the supply of engineering, machinery, assistance for the manufacturing of concrete pressure pipes and for the pipeline construction can summarized as follow:

- 46 factories installed all around the world for PCCP , RCCP, RCP and PCSP types according to EN , AWWA , JIS Standards
- 15,000 km and more of water pressure pipelines built by using BFS Technology from 600 – 4200 I.D. x 6000 – 8000 mm length with working pressure up to 2 Mpa.
- All pipelines are still operating in very good conditions without particular maintenance costs after many years.

Types of pressure pipes:-

a) Pre-stressed Concrete Pipes (P.S.C.) :-

A suitably compacted concrete core longitudinally prestressed with pretensioned high tensile steel wire embedded in the concrete, circumferentially prestressed and coated with cement mortar or concrete to protect the circumferential pretressing wire, to withstand internal pressure and external design loads.

Applications: - Water supply; Lift Irrigation and Drainage schemes which involve medium pressure.

b) Pre-stressed Concrete Cylinder Pipes (P.C.C.P.) :-

Pre-stressed Concrete Cylinder Pipes are rigid pipes designed to take optimum advantage of tensile strength of steel and of compressive strength and corrosion inhibiting properties of concrete. It consists of a concrete lined steel cylinder with steel joint rings welded to its ends wrapped with a helix of highly stressed wire and coated with dense cement mortar or concrete.

Applications: - Water transmissions and distribution pipelines, sewer force mains, cooling water systems and liners for pressure tunnels.

PCCP pipe working cycle for large diameter pipes:

- Steel cylinders prepared by the automatic helical welding system
- Welding of the end rings to the cylinders
- Cylinders vertical testing
- Additional steel cage application on spigot and socket area (if required)
- Concrete preparation in the batching plant , quality control of the materials
- Pouring of concrete by a special distribution system to equalize the level of concrete inside and outside the Cylinder
- Vibration action system on inner and outer moulds in different stages
- Steam curing to reach the required concrete strength, approx. 6 hours
- Demould the inner and outer moulds ,
- Second curing by water spraying
- Remove the pipe and tilt it horizontally
- Circumferential post tensioning operation
- Concrete mortar coating by compact system (slurry sprying not required)
- Curing the concrete mortar for 24 hours
- Pipes laid in the store yard for at least 20 days.

PCCP pipes handling and laying:-

- Pipes will be transported by special saddles on flat truck horizontally
- Pipes will be laid beside the road along the trench by crawl crane
- The trench will be large enough to receive the pipeline and the crawl crane to install the pipes
- Pipe will be transported into the trench by a special trailer in front of the laid pipes
- The crawl crane will lift the pipe from the trailer
- Pipes will be pulled and jointed to the laid piped by using a hydraulic jack from the inside of pipe