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CC-GRP Jacking Pressure Pipes Are Part of Venice's Major Environmental Plan

HOBAS for Italy's Blue Lagoon



The lagoon of Venice is not only the largest in Italy but also one of the world's most famous. Situated between the drainage basin of the mainland and the sea it has been subjected to more and more pollution due to increasing industrial and agricultural developments in the region.



In 2000, the Regional Government of Veneto set up a master plan to prevent further pollution and treat the water running from the basin into the lagoon. The project Fusina (P.I.F. – Progetto Integrato Fusina) forms the main part of the planned efforts and ranks regarding its extent and integral approach concerning wastewater treatment and environmental protection among the first in Europe.

Within the bounds of this project, the existing treatment plant in Fusina is transformed into a “multipurpose

facility” that purifies sanitary sewage and stormwater of Mestre, Marghera and Mirese (together approximately 350,000 inhabitants), industrial effluents and polluted groundwater from the Marghera harbor.

In order to optimize the treatment, the new plant collects sewage separately and according to the following scheme:

- Sewage type A: Sanitary sewage and stormwater from Mestre, Marghera and 17 towns in the region Mirese.
- Sewage type B1: Industrial effluents from the Marghera port basin.
- Sewage type B2: Stormwater and sullage.
- Sewage type B3: Polluted groundwater.

Type A sewage is biologically treated with ultrafiltration membranes and consequently phytodepuration. The latter is conducted on an area of around 15 hectares where the water is purified through metabolic processes of nymphae (water lilies) and other water plants. Walks and bikeways were built between the naturalistic water lanes to make the area attractive also for recreation. Instead of daily diverting 75.000 m³ of water from the river Sile, the treated water is used by local industries and for cooling water in petrochemical plants.

Purified type B sewage and exceeding type A water that cannot be re-used is led through a 20 km long DN 1400 pipeline into the sea.



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The total costs for the planning and realization of the master plan amounts to 194 million euro, of which 93 are financed by the Regional Government Veneto and the rest is provided for by the grantee S.I.F.A. (Sistema Integrato Fusina Ambiente –Integral Environmental System Fusina) whose major shareholders are Veneto Acque SpA, Veritas SpA and Impresa Mantovani SpA.

The all in all 20 km long outlet to the sea conveys the treated water 10 km from the plant in Fusina to Lido di Venezia and another 10 km to the sea where large tanker ships dock. In order to cross the Lido sandbar, 351 m DN 1400, PN 6 pipes were installed by microtunneling. The general contractor Impresa Costruzioni Mantovani was responsible for the installation and entrusted I.CO.P. SpA with the microtunneling job.

“It took a long time for us to find a pipe that suits our requirements”, explains engineer Meneghini who is site manager at Mantovani SpA. “We needed a jacking pipe that would also withstand the operating pressure of the line. After a long research period we chose HOBAS CC-GRP Jacking Pipes since these inherently possess the characteristics necessary for jacking as well as for pressure pipes: mechanical strength and optimal hydraulic properties. Normally, two different pipe systems would have been utilized to match all requirements.”

The HOBAS CC-GRP Jacking Pressure Pipes that were chosen in 3 m long sections, with an external diameter of 1720 mm and a wall thickness of 85 mm allow a maximal jacking force of 6926 kN. The leak-tight pipe system with its high performance couplings is produced to withstand an operating pressure of 6 to 10 bar. The very smooth outer surface of the pipes enabled comparably low jacking forces and allowed a single jack over the complete section of 351 m. Only the starting and receiving pit were used saving on three originally planned intermediate stations.

Thanks to the use of an MTBM (Micro Tunnel Boring Machine) drill head with a hydraulic soil removal (mucking) system and the smooth surface of HOBAS CC-GRP Pipes the line was installed within less than a month. The extremely small roughness coefficient of the inner liner of the pipes and the, compared to other materials, light wall construction reduced the volume of excavated material considerably keeping costs to a minimum and making the installation a complete success.



Year of Construction	2009- 2010
Total length of pipe	351 m
Pressure Class	PN 6
Diameter	De 1720
Stiffness Class	SN 140000
Installation Type	Microtunneling
Application	Sea Outlet, WaterLine
Client	Impresa Costruzioni Mantovani SpA
Contractor	S.I.F.A. Sistema Integrato Fusina Ambiente, subcontractor: I.CO.P. SpA



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Advantages	excellent hydraulic properties, economic installation, low weight, small roughness coefficient.
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