

Green Energy for Bella Italy - Not Without **HOBAS®**



The trenchless installation of approximately 60 m HOBAS CC-GRP Pressure Jacking Pipes under highway A4 through Lonato (Brescia, Italy) was recently completed within one week only. Most importantly, this was conducted with no traffic disruptions.

The described section is actually part of a 650 m long HOBAS CC-GRP penstock DN 1600 and DN 1500 running to a hydro power station that is built for Idroelettrica m.c.l., an energy company belonging to the Consorzio di Bonifica Medio Chiese.

Studio Frosio in Brescia, a renowned engineering office specialized in hydro power stations was responsible for the construction which was planned with the following key data:

Net head (to generator)	8.76 m
Average flow rate	3.12 m ³ /sec
Maximal flow rate	4.30 m ³ /sec
Output	300 kW

The engineers who already knew the advantages of HOBAS CC-GRP due to projects in the past, based their decision on three major requirements: to minimize friction loss (the nominal head was only 10.3 m), to underpass the highway A4 by jacking withstanding also the constant traffic loads and to have a material that is resistant to corrosive substances.

HOBAS CC-GRP Pipe Systems with their mirror-like inner pipe surface grant a K-factor below 0.01 which ensures an optimal flow rate. High stiffnesses and compression can be achieved with the production process, namely centrifugal casting. This makes HOBAS CC-GRP gravity as well as pressure pipes suitable for trenchless applications such as jacking and microtunneling. No extra protection that is easily damaged or worn during installation is necessary since HOBAS CC-GRP Pipe Systems are highly corrosion resistant.

The penstock consists of a first short section DN 1600 laid in open trench, further 60 m with the same outer diameter run below the highway. A reducer on the other end of the jacking section switches to a 250 m long DN 1500 pipe that finally leads to the power house. Two tees were installed along this section for future access.

Apart from one bend that was necessary in the first part where the route takes a sharp curve, the pipeline was installed without bends. Changes in direction were achieved by taking advantage of the ability of HOBAS FWC couplings to allow an angular deflection.

Year of Construction

2007

Length of Pipe

650 m

Pressure Class

PN 2

Stiffness Class

SN 10000, 64000

Diameter

DN 1500, 1600

Installation Method

open cut, jacking

Application

WaterLine®

Client

**Idroelettrica m.c.l. Scarl
(Consorzio di Bonifica
Medio Chiese**

Contractor

**ATI Faccetti Costruzioni SpA,
Zeco SpA, Pato s.r.l**

Advantages

**hydraulic characteristics, withstands
heavy traffic loads, corrosion resistance**

To bear the heavy traffic loads the line generally required a stiffness of 10000 N/m², whereas the jacking section asked for SN 64000 to suit a jacking force of 4.821 kN (applied on less than 40% of the part). PN 2 was chosen for the complete line.

With an optimal exploitation of the given low head HOBAS contributed to environmentally friendly production of energy. The advantage of such "green sources" is remarkable. Based on EU research, a comparison of energy input and emissions of a hydro and a thermal power plant run with oil and at an annual production of 2,000,000 kWh shows:

Emissions	Hydropower Plant	Thermal Power Plant
SO ₂	0	20.8 t p.a.
CO ₂	0	1,530 t p.a.
NOx	0	4.9 t p.a.
Partikel	0	2.1 t p.a.
Methan	0	2.7 t p.a.

In this case 383 tonnes crude oil can be saved per year when power is generated with water.

The figures prove the importance of small hydro power stations and an increase in numbers of hydro plants can be observed over the past years. A list of reference projects shows that HOBAS CC-GRP Pipe Systems have characteristics most suitable for this environmentally friendly application.

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