

# HOBAS<sup>®</sup> Case Study

January 2008

## French Highway Secured in Unique HOBAS<sup>®</sup> Fashion

The French highway network spans almost 12000 route kilometers, 60% of which are administered in a concession system by private companies such as APRR (Autoroutes Paris-Rhin-Rhône). Thousands of metal culverts have been installed along the roads to channel water. More than 50% of these are steel circulars or arches. After being in service for 30 to 40 years, these culverts have reached their



maximum lifetime and are at risk to collapse any time causing road ruptures as approximately 20 years ago: Road embankment, paving and culverts needed to be repaired immediately which required an expensive construction of temporary diversions for both water and traffic. As a consequence, the highway companies conducted an extensive inventory. First surveys provided a better overview. It seemed that a significant number of the steel constructions (corrugated galvanized iron culverts) and a number of concrete culverts showed serious defects. Consequently, all 6 highway companies introduced a compulsory rehabilitation program in accordance with the technical specifications by the French Water Act of 1992.

On this account HOBAS<sup>®</sup> GRP Pipe Systems have contributed to the security upgrade of the constructions and highways. Thanks to its environment-friendly characteristics and its exceptionally long lifetime properties HOBAS GRP is an ideal material that fulfills all requirements. It should also be noted that the HOBAS



Solutions for this project are based on trenchless technologies which permit works without traffic disruptions.

The described project is located on Highway A31, which connects the town Beaune and Luxembourg and is part of the APRR network. APRR is a subsidiary of the Eiffage Group, the seventh largest building and

concession company in Europe, and is in charge of the second most important French highway network with 1800 km.

This project is noteworthy for its dual purpose:

- to rehabilitate damaged metal pipes that were severely corroded for some parts;
- and to extend the road by one lane in each direction.

Moreover, rehabilitation involves a group of not less than 11 large-scale hydraulic constructions, 9 of which were originally elliptical, one was circular but strongly buckled, and one was in the shape of an arch. The total length of installed pipe adds up to 685m.

APRR first invited tenders that HOBAS France approached. An overall solution was developed considering the geometry of each channel and grouping the constructions by size. This led to the proposal of 4 different and individual NC-Line® profiles plus one circular CC-GRP Pipe OD 1720 for the rehabilitation of 9 elliptical constructions. Standard CC-GRP HOBAS Pipes were suggested for the remaining circular constructions and for the arch a NC-Line® ID 2880x1800. Apart from this, an alternative solution was proposed sliplining NC-Line® arches and HOBAS® CC-GRP Pipes using both flush couplings and standard FWC couplings.

APRR opted for the latter proposal. The mixed technologies confirm the adaptability and flexibility of HOBAS Products. Thus, 635 m of pipes ranging from DN 1200 to DN 2400 have been installed between May 2007 when first deliveries were made and end of November 2007. Slightly more than 50 m of HOBAS NC-Line® profiles completed the lot.



“Works were accomplished more easily, thanks to the simple handling and jointing of HOBAS Pipes”, explained Civ. Eng. Norbert Cheminot, site manager of DLE EIFFAGE TP, contractor in charge of pipes installation and specialist for trenchless technologies. “Working on highways without disrupting the traffic is always a challenge. The HOBAS Solution required less heavy equipment, and turned the usually complex storage and handling into easy installation.”

HOBAS Pipe Systems was clearly the right solution for this project. It provided a clever and made-to-measure technical solution combining standard CC-GRP Pipes with arch-shaped NC-Line® panels, and offers an exceptionally long lifetime under constant mechanical loading. The highway companies appreciate the products’ hydraulic properties despite a small reduction in dimension, and a low roughness

coefficient thanks to the smooth liner surface, maximizing the flow rate and minimizing maintenance. "It was very important for us to find a rehabilitation solution that meets the terms of the French Water Act, something that would not affect the hydraulic condition of the existing pipeline and offer a long life-time." Said Mr. Caisey a technical member of APRR's area staff. "The solution also allowed an open installation for the part where the roads were enlarged."

<b>Year of Construction</b>	2007
<b>Duration of Construction</b>	8 months
<b>Length of Pipes Laid</b>	635 m
<b>Pressure Class</b>	PN 1
<b>Diameter</b>	DN 1200, DN 1400, DN 1500, DN 1800, DN 2000, DN 2100, DN 2400.
<b>Stiffness Class</b>	SN 5000 and SN 10000
<b>Length of NC Line shapes :</b>	50 m
<b>NC-Line :</b>	ID 2880x1800
<b>Application</b>	Rehabilitation (Relining) and Open installation (extension sides)
<b>Client</b>	APRR (Autoroutes Paris Rhin Rhône)
<b>Contractor</b>	DLE – Eiffage TP
<b>Advantages</b>	Hydraulic properties, long lifetime, light weight,

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