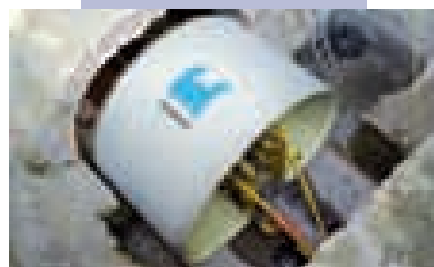


Pipe solutions
save an important
French route

By Alexandra Dobnigg

Highway Reinforcement

The French highway network spans almost 12,000 route km, 60% of which are administered in a concession system by private companies such as Autoroutes Paris-Rhin-Rhône (APRR). Thousands of metal culverts have been installed along the roads to channel water, and 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 life and are at risk to collapse any time, causing road ruptures.



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. The highway companies conducted an extensive inventory, and 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 six highway companies introduced a compulsory rehabilitation program in accordance with the technical specifications by the French Water Act of 1992.

HOBAS GRP pipe systems have contributed to the security upgrade of the constructions and highways. Thanks to its environment-friendly characteristics and exceptionally long lifetime properties, GRP is an ideal material that fulfills all requirements. Its solutions are based on trenchless technologies that permit work without traffic disruptions.

Project Overview

The project in question was located on Highway A31, which connects the town of 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 1,800 km (approx. 1,118 miles).

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 involved a group of no less than 11 large-scale hydraulic constructions; nine 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 685 m (approx. 2,247 ft).

APRR first invited tenders that HOBAS France approached. An overall solution was developed considering the geometry of each channel and grouping



GRP pipe replaced damaged metal pipes on France's Highway A31 while additional lanes were built.

the constructions by size. This led to the proposal of four NC-Line profiles and one circular CC-GRP Pipe OD 1,720 for the rehabilitation of nine elliptical constructions. Standard CC-GRP pipes were suggested for the remaining circular constructions, and for the arch, an NC-Line ID 2,880 x 1,800. Apart from this, an alternative solution was proposed—sliplining NC-Line arches and CC-GRP pipes using both flush couplings and standard FWC couplings.

APRR opted for the latter proposal. Thus, 635 m (approx. 2,083 ft) of pipes ranging from DN 1,200 to DN 2,400 have been installed between May 2007, when

first deliveries were made, and the end of November 2007. Slightly more than 50 m (approx. 164 ft) of NC-Line profiles completed the lot.

Post-Installation Feedback

“Works were accomplished more easily, thanks to the simple handling and jointing of HOBAS pipes,” said civil engineer Norbert Cheminot, head of the Special Constructions Office of Eiffage Travaux Publics Reseaux, contractor in charge of pipes installation and specialist for trenchless technologies. “Working on highways without



The pipe installation provided many benefits, including French Water Act compliance and the ability to conduct an open installation where the road was extended.

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.”

The solutions provided a clever and made-to-measure technical solution that combined standard CC-GRP pipes with arch-shaped NC-Line panels, and they offer 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 lifetime,” said a technical member of APRR’s area staff. “The solution also allowed an open installation for the part where the roads were enlarged.” [www](#)

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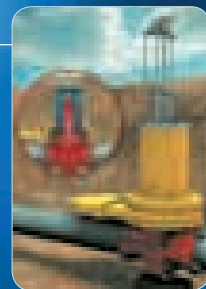
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