

BorSafe LS-H delivers economic and environmentally friendly water pipe for French fire main installation

Recycling has grown to become a vital part of resource conservation and greenhouse gas reduction. At Cavigny, in the Manche department of north-west France, a new innovative centre for the treatment of household and green waste is under development.

In developing the fire-fighting system for the protection of this high value site, project manager Veolia Environment sought to design a fire main based on material that was both environmentally friendly in its composition and in its installation. The design called for a 110 mm diameter underground pipeline, with an operating pressure of 5 bar, feeding three strategically placed fire hydrants from a rainwater retention basin.

Moreover, the pipe had to be sufficiently robust not to require either special sand-bedded trenching or special backfilling soil. These preparations are usually necessary to eliminate the risk of damage to pipes from hard terrain during both laying and



naturally occurring earth movement when in-situ. By removing those needs it is possible to achieve significant project time and cost savings – up to 50% on the installation stage. And, not least of all, it reduces the transportation of pipe-bedding materials to the site and excavated materials away from it, thereby saving costs and eliminating the greenhouse gases emitted by trucks used to carry out that work.

Matching performance to demand

A number of pipe material options were considered and reviewed against criteria that included resistance to impacts, abrasion and to rock impingement. Ultimately the choice which fulfilled all requirements, including cost/performance parameters was BorSafe™ HE3490-LS-H, a black high-density PE100 compound from Borealis.

BorSafe LS-H is a new generation material, specifically developed to enable the use of faster more economical pipe installation techniques. These include the open-trench sandless bedding of pipes in rugged terrain, and no-dig techniques such as pipe bursting, horizontal drilling or ploughing-in. By definition these methods create tougher, more aggressive laying and installation conditions that demand ever more robust pipe solutions.

BorSafe HE3490 LS-H is well able to cope with these higher stresses. Classified MRS 10.0 the material is characterised by its superior resistance to slow crack growth (SCG), as confirmed by test results above 10,000 h in both the Notch Pipe Testing – according to ISO 13479 and in the Point Loading Test (at 80°C, 4 N/mm² MPa, in Arkopal), as well as offering excellent rapid crack propagation resistance (RCP). This material offers outstanding durability and is capable of delivering a service life exceeding 100 years.

Furthermore, as a product of Borealis' advanced bimodal Borstar® process technology these performance properties are complemented by the material's excellent processability in all diameters. In particular, its Low Sag (LS) quality provides for the maintenance of consistent pipe thickness throughout the production of large diameter pipes.

Pipe installation without special preparation

Traditionally, the materials used for the embedment of PE pressure pipes in open-trench installations have to be carefully chosen as having a fine enough granulometry in order to minimise stress on the pipes. Very often these materials, such as sand for the lower bedding, have to be imported, creating additional costs and adding to installation time. Therefore, a major consideration in the selection of the pipe material for this specific project was the fact that the pipe would be very tough, able to withstand impacts, notches and abrasions, and could be installed with no special ground preparation, even in hard, rocky soils. BorSafe LS-H easily withstands any damage from the re-use of coarse excavated soil, thereby eliminating the need for costly backfilling material.



The speed and economy of installation was also aided by the use of automated electrofusion welding to join the pipes, which were delivered to site in 12-meter lengths. This highly effective jointing technique complements the pipes structural, leak-free integrity – essential to ensure the ‘when needed’ performance of the fire protection system, but also to conserve water resources and contribute to overall project sustainability.

“The choice of Borsafe LS-H PE100 pipes for the fire protection system at the Cavigny facility illustrates the forward thinking that has led this project,” says Marc Palomares, Technical Manager RYB. “For the emergency application, a durable, time-tested and environmentally friendly material was needed. We are extremely confident that this innovative pipe material will be very well received by the French market and applied in many more future projects.”

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