References

Lightening structure of the General Road viaducts



Uponor involvement

- Weholite pipes SN2 DN700 mm – total 6257m (4133m in 2010 and 2124m in 2012)

Lightening structure of the General Road viaducts

Use of polyethylene pipes in the construction of viaducts of the Generals' Route not only helped to lighten their structures but also lowered project cost.
Increasing traffic problems in Białystok, in north-east Poland, led the local authorities to approve a project of the Generals' Route designed to link the eastern and western part of the city. Use of polyethylene pipes in the construction of viaducts not only helped to lighten their structures but also lowered project cost.

Project Facts:

Location	Completion
Białystok, Poland	2012
Building Type	Product systems
Transportation	Tailor made constructions
Project Type	
New building	

Partners

Contractor:
Mosty Łódź S.A i EUROVIA S.A
Investor:
City of Grudziądz

The Generals' Route project, estimated at almost 366 million euro, is the key investment for the city. The Generals's Route together with the Copernican and Independence Routes form a bypass around the city centre, allowing the transport of residents. One of the principal objectives of the venture is to limit traffic density by redirecting transit traffic to the outskirts of the city. The Generals' Route, running thought the streets of General F. Kleeberg, General S. Maczek, General W. Anders, General S. Sosabowski and General N. Sulik allow to connect the national transit roads running from Warsaw to the border crossings in Budzisko and Bobrowniki. Local authorities hope the investment will not only limit existing inconveniencies to residents and drivers passing through Białystok but also stimulate the region's economic growth.

First stage of the project carried out in 2010 was among others the General Maczek Str. extension that included the construction of new interchanges with overpasses and viaducts over the railway station. In order to lighten two objects's structure PE Weholite pipes were used. Uponor Infra manufactured and delivered to the construction site over 4km of PE-HD Weholite pipes, with ring stiffness class of SN2 and size of DN700 mm. The length of the pipe sections was customized at the Uponor Infra plant to match exactly the dimensions of viaduct's spans and reinforcement structure. The second stage carried out in 2012 was the extension of the General Andres Str., where to lighten the estacade 2km of Weholite SN2 DN700m pipes were used.

The decision to use plastic pipes to lighten the viaduct's structure, wasn't a pioneering one. Polyethylene pipe were used to build the Diameter Route in Grudziądz in 2007 for the first time. Before that engineering designers had relied on steel pipes as their component of choice in similar projects. Steel pipes were not only significantly heavier than plastic pipes but also susceptible to damage from chemicals and adverse environmental factors. Weholite pipes provided the perfect answer to the challenges of the project: lightweight, air-tight, extremely durable and easy to install, they put an end to problem of corrosion. Some savings were made in the use of concrete grout and reinforcing steel, which lowered overall project cost.

After prerequisite construction work on the viaduct was completed, the pipes were placed between reinforcement bars of the viaduct's spans. The pipes were then secured with additional reinforcement, to prevent ejection by uplift force during the pumping of concrete. Pumping concrete grout into the spans constituted the final stage of the installation. According to the contractor overseeing the project, everything went smoothly and according to plan.

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