References

Sea outlet - discharge of stream water into the Gdańsk Bay



Uponor involvement

- WehoPipe pipes DN 1600 PE100 PN6 SDR26 SN4 – 1900 m; DN 1000÷1400 – 880 m, DN 200÷500 – 138 m, Weho chambers DN 1000 ÷ 1600 – 25 pcs. and special fittings DN 500 ÷ 1000 – 10 pcs

Sea outlet - discharge of stream water into the Gdańsk Bay

A project to convey Sopot area stream waters further out in the Gdańsk Bay was initiated. It is yet another of the many environmentally friendly projects that have recently been carried out in Poland where PE pipes were used.
The seaside town of Sopot, located on the southern shores of the Baltic Sea is one of Poland's major tourist destinations. This health-spa and bathing resort town has attracted visitors ever since its first spa opened in the 16th century. Ever since then, the rich and famous have built their mansions in Sopot and still today the town has the highest property prices in Poland, apart from the capital Warsaw. Intense development is taking place on the waterfront, with new spa resorts and luxurious hotels being built. Like any other tourist destination, Sopot needs to invest in infrastructure to protect the environment.

Project Facts:

Location
Sopot, Poland

Completion
2009

Building Type
Municipal

Product systems
Tailor made constructions

Project Type
New building

Partners

Investor:
Municipality of the city of Sopot
Contractor:
Consortium of
comapnies: Hydrobudowa S.A.
Gdańsk/PRCIP Sp. z o.o. Gdańsk

There are eleven small streams in the Sopot area, which have a total length of 21 kilometres and incorporate seventeen ponds. Their estuary sections consist of concrete canals (Ø1000), which have their outlets on the beach. The existing storm water drainage system is connected to the streams flowing through the city. When it is raining, storm waters wash out waste and pollutants from the Sopot area and discharge them directly to the coastal zone, resulting in periodical failure to meet the standards for bathing water quality. Consequently, public swimming and recreational areas must temporarily be closed, which deteriorates the value and reputation of Sopot as a health and seaside resort.
Another major frustration is the flooding of streets and buildings located in the lower part of the city, due to the insufficient capacity of storm water interceptors and collecting pipes, and an inadequate number of retention tanks and reservoirs which could alleviate the storm water drainage system during flash storms.

A project to convey Sopot area stream waters further out in the Gdańsk Bay was initiated. It is yet another of the many environmentally friendly projects that have recently been carried out in Poland. Like other projects aiming to make local water and sewer systems compliant with strict EU standards, the success of this project also depended heavily upon the quality of the materials used, as well as the reduction of cost and construction time. The use of WehoPipe PE-HD pipes made it possible to fulfil all of the requirements.

Construction of a marine outfall is the first and most vital stage of a larger project called ‘‘Protection of Gdańsk Bay waters – construction and modernisation of the storm water drainage system in Sopot’’. The project, which is worth 18 million euros and is 20% co-financed by the European Union’s Cohesion Fund and 80% by local funds, is mainly aimed at the protection of homes in the lower part of Sopot against flooding. Another goal is the improvement in water quality and clarity in the city’s public swimming and recreational areas.

Three separate collecting systems will be created for Sopot streams and three double-pipe discharge pipelines will be installed deep into Gdańsk Bay, 345 – 375 metres away from the outfalls located on the beach. In the first phase of the project, two outfall systems – conveying water from six streams – will be constructed, while the second phase – planned in the upcoming years – involves pipe systems for the remaining streams. Uponor Infra was chosen as the supplier of piping solutions for both outfall systems.

PE-HD WehoPipe (DN/OD 1600mm PN6 SDR26) pipes were used to build the discharge pipelines and WehoPipe pipes (DN/OD 1200 – 1600) were used to construct the land section of the pipeline. Uponor Infra also supplied a wide range of non-standard inspection chambers, sedimentation chambers and special fittings. The contract also obliged the company to provide welding machines and installation crew, who made most of the joints.

Land section

Having been manufactured in the Uponor Infra factory in Kleszczów near Bełchatów, the pipes were transported to the construction site in 15-metre segments, which were joined by butt welding on the Sopot beach. These several tens of metres long welded, ready-to-install segments were then moved to the construction site and lowered into trenches by pipe layers equipped with lifting slings. In the trenches, individual segments were connected with one another using flange joints.

The pipeline project also included inspection and sedimentation chambers, which were made – as prefabricated components – of pressure pipes with eccentric manhole risers (inspection chambers) or symmetrical ones with straight stubs (sedimentation chambers). They are equipped with hermetic polyethylene hatches of 800 mm in diameter, which are installed by means of flange joints secured with screws. The hatches were installed 80 cm below beach level.

Marine section

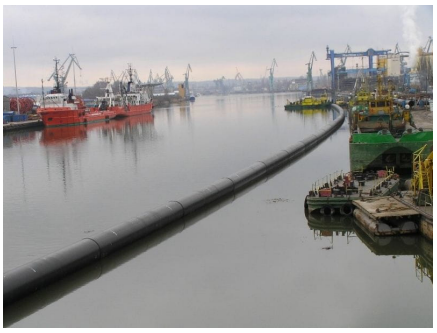
The discharge pipelines – two of which are each 345 metres long and two 375-metre ones (DN/OD 1600 mm) were butt welded directly next to the river Martwa Wisła (Dead Vistula), 15 kilometres away from the construction site. The pipelines were then fitted with end closures, ballasted with reinforced concrete weights and towed by tugboats to Gdańsk Bay. The trenches had been dug in Gdańsk Bay and water was pumped into the pipelines in order to sink them. The last installation phase was under water and involved joining the pipelines with outlet chambers and receiving tanks, which connect outlets with the pipelines installed on the beach. In spite of periodically unfavourable weather conditions, the whole operation was smooth and easy. The first phase of the project was finished in December 2009, over a dozen or so months after the first work had begun.

Excellent properties of PE pipes

Polyethylene pipes are flexible, which makes them easily adaptable in various soil conditions and increases their resistance to vibrations, load and soil movement. Due to their low weight, PE pipes are easy and quick to install. They can be manufactured in considerably longer lengths than traditional pipes, which significantly shortens the installation time. What's more, polyethylene pipes have superior chemical resistance and don't corrode, which is a key factor when it comes to applications in salt water. Therefore, PE-HD pipes are the perfect solution for marine projects.

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