References

Vortex chamber to Horsens

New chamber solution helps Horsens avoid large excavations and extensive handling of contaminated soil

Limited space, deep excavations and stormwater treatment requirements associated with a major sewer separation project in central Horsens have led Samn Forsyning to choose a custom-designed solution. According to the contractor, Aarsleff, the solution reduces the size of the excavation, soil handling requirements and installation time.

Project Facts:

Location	Completion
Horsens, Denmark	2026

Building Type

Municipal

When stormwater and wastewater need to be separated in densely built-up urban areas, it is not only the pipes and capacity that need to add up. The limited space beneath the city can be just as challenging. This was the experience of Samn Forsyning during a sewer separation project in the central Jyllandsgade district of Horsens, where stormwater is to be discharged into the nearby Bygholm River. This led to the choice of a new type of solution.

“We had originally designed the project using traditional sedimentation chambers. However, this would have required more than 70 cubic metres of sedimentation capacity distributed across several locations in the city, and the practical design proved unrealistic. We therefore needed a different solution that could provide the necessary treatment without taking up large areas in the city. This is where a Vortex chamber became a very attractive option for us,” says Jette Porsgaard, Project Manager at Samn Forsyning.

Extreme conditions called for a new approach

Envidan has served as consultant on the project, while Aarsleff has been the contractor. At Aarsleff, Project Manager Simon Østergaard Jensen was involved in recommending the alternative Vortex solution.

"The alternative was large underground concrete sedimentation chambers that would have had to be installed below the outlet level in an excavation four to five metres deep. This would have required an enormous surface area, extensive sheet piling and complex bracing – while at the same time we would have had to handle contaminated soil and minimise the risk of vibrations affecting neighbouring properties. Being able to reduce the size of the excavation and the amount of materials required for the project is therefore a major advantage," he says, adding:

"Especially in urban areas, we are under considerable time pressure due to excavation permits and traffic closures. To obtain the necessary permits, it is therefore essential that the chamber solution helps optimise the installation time to the extent that it does."

Georg Fischer company Uponor supplied the custom-designed Vortex chamber. At seven metres deep and three and a half metres in diameter, it is Uponor's largest Vortex solution to date. The chamber was therefore delivered in two sections for assembly on site, helping to meet the requirements for a short installation time while ensuring optimised treatment performance.

"This has been an unusual project for us because of the extreme conditions. The chamber had to be reinforced to withstand pressure from groundwater below, lateral pressure from the surrounding ground and traffic loads from above. We also had to develop a solution for pumping sediment from the bottom of the chamber during emptying, while ensuring that it can handle a flow of 3,000 litres of water per second during cloudburst events," says Morten Albér Christensen, Stormwater Solution Expert at Uponor.

Four new chambers on their way to Horsens

Unlike larger solutions, the Vortex chamber requires more frequent maintenance, as there is less capacity for sediment storage. Samn Forsyning has therefore opted to equip the chamber with an alarm that automatically provides notification when it is time for emptying. The Vortex solution in the city centre also marks the beginning of a broader collaboration.

"We have ordered four additional chambers because the combination of a small footprint, bypass functionality and improved treatment at the outlet is well suited to several of our projects. It enables us to establish sedimentation solutions in locations where it would be difficult to find sufficient space for traditional solutions," says Jette Porsgaard, Project Manager at Samn Forsyning.