References

Uponor Vortex stormwater solution



Uponor involvement

- Uponor Vortex chamber

Espoo and Ramboll Finland as pioneers – an innovative method for stormwater treatment was introduced

The City of Espoo is the first in Finland to introduce the Vortex stormwater separation chamber. It can be used to efficiently separate floating and descending solids from stormwater. The aim is to reduce the maintenance costs of the retention system built from stormwater tunnels and prevent solids from ending up in waterbodies.

Project Facts:

Location	Completion
Espoo, Finland	2024
Vrsta objekta	Product systems
Municipal	Storm water

Partners

Investor: City of Espoo
Contractor: Peab Asfalt
Designer: Ramboll Finland Oy &
Uponor

In February 2024, a Vortex stormwater separation chamber will be installed at the Ylämaansola construction site in Kauklahti, Espoo. Many new blocks have been built around the construction site. Laura Karhumäki, Project Manager at the City of Espoo, says that stormwater problems have worsened in recent years. Stormwater has flooded the plots several times. The

entity now being installed is a continuation of the two underground stormwater retention areas built in the area a little earlier.

According to those present at the construction site, the quantitative management of stormwater has become increasingly important, because urban structures are becoming denser and natural stormwater infiltration areas are being eliminated at the same time. The problems are exacerbated by the fact that heavy rainfall and thus stormwater problems are predicted to increase due to climate change.

Controlling the harmful effects of solids

The client is the City of Espoo, which together with Ramboll Finland Oy has wanted to open-mindedly develop stormwater treatment and thereby reduce maintenance costs. Systems will not function optimally if there are blockages.

According to Laura Karhumäki, the goal is that as few solids as possible can reach the retention tunnels.
"A Vortex chamber is much easier to maintain than a retention tunnel. And the more solids and rubbish can be taken away, the better, because that water always eventually discharges somewhere – for example, into a ditch, river or other body of water, she justifies the acquisition of the Vortex chamber.

"We want to reduce the need for maintenance of retention tunnels because there is a large collecting area above them. A wide variety of solids can come from there, starting from sand, leaves and cigarette butts," adds Anni Orkoneva, Unit Manager at Ramboll Finland Oy.

Simple technique that reduces the solids

The Vortex chamber is intended specifically for sites where the aim is to prevent solids from entering the stormwater network or other stormwater treatment systems – for example, wetlands or underground retention systems.

The harmful effects of solids are minimized by separating them from stormwater. "The resolution of Vortex is based on the fact that stormwater starts circulating inside the chamber due to the force of the current, after which centrifugal force presses solid material to the edges of the chamber, which settles to the bottom. Inside the chamber there is a flow control plate that also acts as a water trap that also retains floating debris," says Teemu Salminen, Product Manager at Uponor Infra Oy.

For example, compared to dredging a stormwater basin, Salminen says that maintaining a Vortex chamber is simple because no excavators and trucks are needed to remove solids. It is enough to order a suction truck once a year on site.

– This seems like a pretty foolproof system, adds Kari Auranen, Head Master of the City of Espoo.

Design was carried out in cooperation

According to Uponor Infra's observations, stormwater quality is now being studied extensively, and there is interest in all kinds of stormwater treatment solutions. Salminen describes the demand as growing.
"There are no limit values for the concentrations of harmful substances in stormwater in Finland, but forward-looking public clients and companies have started to develop stormwater treatment solutions with us.

"Ramboll Finland, for example, contacted us about a year ago, and we have been planning the installation of the Vortex chamber at the Ylämaansola construction site in cooperation. We offer our customers planning assistance to ensure that deliveries go as flexibly as possible. Vortex and our other stormwater products are manufactured at Uponor Infra's Vaasa factory.

Lightweight and easy to install

The Vortex chamber to be installed in Espoo seems quite large; The inner diameter measures more than one and a half metres, and the depth of the trench is just over three metres.

"We ended up in this size category based on dimensioning calculations and modelling," says Anni Orkoneva. However, thanks to its light weight, the Vortex chamber, made of polyethylene, can be handled well on site, according to Markus Tiihonen, Site Manager at Peab Asfalt, who is responsible for the earthworks on site. Installation work is standard and is no different from installing a normal chamber.

"We have been melting the soil for excavation work for a few days, and one day has been reserved for installing the chamber. Finally, we will do some backfilling," he says.

When the area is completed, only the lid located on the pedestrian and bicycle route will remain visible from the Vortex chamber, so there is no need to reserve aboveground space for it.

"For residents, this area will look very similar to before, but better because roads and parking lots will be paved with new asphalt. In addition, quite a lot of new shrubs and other plants are planted, says Kari Auranen with satisfaction.

Installation of Vortex chamber in Espoo, Finland











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