

# Rockflow

Part of the ROCKWOOL Group

by  Lapinus®

*A circular storm water management system*

## Hedemora has installed Sweden's first Rockflow rainwater buffer



*Situation after installing Rockflow*

### PROJECT DETAILS:

Rockflow rainwater buffer: 594m<sup>3</sup>

Application: to collect water from an upstream area

**Extreme rainfall also falls more and more frequently in Sweden in summer. Hedemora, a town in a hilly landscape where rainwater has always found a natural path, is the first municipality in Sweden where the increasing flooding has been overcome with a Rockflow rainwater buffer.**

### **Paving and hardening**

With the increase in building and surface hardening, the rainwater system with approximately 90 kilometres of pipes has been overloaded more often than not in recent years. Hedemora is located in the valley through which an

important traffic route also runs, which cuts through the city. Underground, three sewage pipes come together below an important traffic intersection, ending in one sewage pipe which passes under the road. It has become increasingly apparent that the system is no longer able to handle the rainwater volumes. Which meant that the intersection was regularly 30 cm under water. The water was then knee-high in the cellars of the surrounding houses - which are often used as children's rooms in Sweden. An economical damage of around € 100,000 per house. A Rockflow rain buffer of 600 m<sup>3</sup> was installed at this location in November 2019.

*The client was Hedemora Energi, which provides district heating in the area and is also responsible for data cabling, drinking water supply and the sewerage system.*

## Sweden Rainproof

Michael Heijting: "We've known for a long time in the Netherlands that you only move the problem if you transport the water with pipes. Retaining the rainwater for a while is the best solution when you have to handle large quantities of water. If you can then release it in a controlled manner, you can prevent problems in lower-lying locations. This way of thinking is new here in Sweden. The first reaction is always to make the pipes larger so that more water can pass through. But we cannot simply enlarge around 90 km of sewer pipe in the urban areas here, that would be much too expensive."



### Water retention is the best solution

Dutchman Michael Heijting, who previously worked as a contractor at Reimer Construction and Infrastructure in Almere (NL) and as a water level manager at the water board in Coevorden (NL), has been "Projektör" at Hedemora Energi for several years and, in that capacity, initiated this innovative project. He brought the Dutch way of thinking that led to a solution for the flooding.

### Cooperation

At the intersection in question, an apartment complex had previously been built on a remaining piece of green land, and a small rain water buffer had already been constructed. When a parking lot also had to be constructed, the contractor called to ask where he could connect the street gullies to the sewer. Heijting: "This couldn't be considered with a system that was already overloaded, so my advice was to construct a collection basin of about 15 m<sup>3</sup> under the parking lot. I later realized, however, that it was an ideal place to arrange a larger storage area in the middle

of the problem area, so that the other water could also be collected there. With that in mind, I started lobbying within our organisation."

They saw the necessity and, thanks to a financial windfall in another project, there was also some financial legroom to work on the solution together with the property manager. The question then was what it should look like. You can make a swale or use plastic crates, but you don't want to put plastic in the ground if it's not really necessary. In terms of sustainability, I didn't think that was a good idea. I already knew about Rockflow from my work in the Netherlands, so I looked at it in more detail, and came into contact with the water management project manager at Lapinus, Dave Sevriens."

### Benefits of Rockflow

"It soon became clear to me that choosing Rockflow would have many advantages. The terrain is sloping, while the buffer must be flat. As a result, part of it is above ground,



at the existing ground level. If you were to use crates, and there was only a layer of clay used on the outside, it would become very vulnerable. Should something ever go wrong and a leak occur, a container with cassettes would immediately run empty, resulting in a tsunami towards the crossing. We didn't want to take that risk. The advantage of Rockflow is that it retains the water, so if something is damaged, the water just flows out slowly. That was an important argument for a storage facility at this location. It is slightly more expensive, so I still had to sell it internally. But, considering all the arguments, everyone was soon enthusiastic."

What were the other arguments? Heijting: "The durability, the fact that the material is largely recycled and, should it ever be necessary, can itself be recycled again. In addition, and in particular, the strength. As a result, you need little top cover, and don't have to dig that deep. Even if cars are going to be parked on top. With plastic crates, you'd

have to dig much deeper, and that's a problem here. It's a loam soil, and loam is quite a popular commodity in the Netherlands, but has no economic value in Sweden, and you even have to pay to get rid of it."

### A lot of attention

The installation of the buffer took no more than twenty working hours, after which the piping could be connected. Although the stone wool elements look heavy, they only weigh 20 kilos. This increases the ease with which a buffer can be moved and installed. Installation takes place faster compared to other systems. The Rockflow buffer was the first of its kind, and is receiving a lot of interest from other municipalities and government agencies. The project was also highlighted in various press publications: "Stone wool is used in a rainwater buffer for the first time in Sweden. Stone wool is known to most people as insulation material. But here, it is specially engineered to absorb water at a controlled rate."



Heijting: "There has been a lot of publicity. People are also very interested within the partnership of municipalities in our province. Several colleagues have already come to have a look, and I've also been invited to give a presentation about the project at a joint conference."

The use of stone wool also naturally raised questions about, among other things, the cleaning options in the event of contamination and how the elements behave in heavy frost. "Thanks to the input from Lapinus, we were able to answer most of them. The only uncertainty is the behaviour in case of frost, which can reach down to 2 metres into the ground here. But the really heavy showers fall in the summer anyway, so we normally don't need the capacity in the winter."

#### **Space reserved for expansion**

The 1 metre high, 40 metre long and 15 metre wide buffer has a capacity of 594 m<sup>3</sup>. However, the required capacity wasn't the main question when determining the dimensions, the financial elbow room was. "We started from the available budget. The buffer collects the water

from one of the three pipes that meet at the intersection. We expect that the current 600 m<sup>3</sup> will be sufficient to reduce the number of floods from three a year to one at most. We have reserved a budget to also be able to collect the water from the second pipeline in the future. Because the third pipe has less capacity, we would thereby have realised the final solution. In addition, we are considering to build in some small facilities further up hill. This first Rockflow rainwater buffer is certainly not the last in our opinion."



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*The robustness of Rockflow is an important argument when installing under a parking lot. A small demonstration with a crane cleared up all possible doubts in that regard.*

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