Rainwater recycling
A Mellifiq reference project

Membrane System Recycles Rainwater for Sustainable Urban Living

Mellifiq's rainwater reuse solution enables a smart, resource-efficient water ecosystem for residential area

MELLIFIQ

Rainwater recycling, Malmö Sweden

In this project, we are working with one of Sweden's largest real estate companies, based in Malmö. With nearly 27,000 apartments and 1,000 commercial properties, the company holds one third of the rental market in the city. The goal is to achieve climate-neutral construction and housing by 2030, create green and resilient outdoor environments, and establish circular material flows.

Facts

Location:	Malmö, Sweden
Application:	Rainwater recycling
Industry	Public utility

Solution:

Mellifiq delivery:	A bespoke rainwater recycling system within the confined space of an underground parking garage, consisting of a HydraLuxe flat-sheet membrane filtration system, rainwater collection, and water quality monitoring and control. The project includes the design, automation, commissioning and installation of all process equipment.
Capacity:	2000 L/h
Brands:	watermaid a MELLIFIQ brand

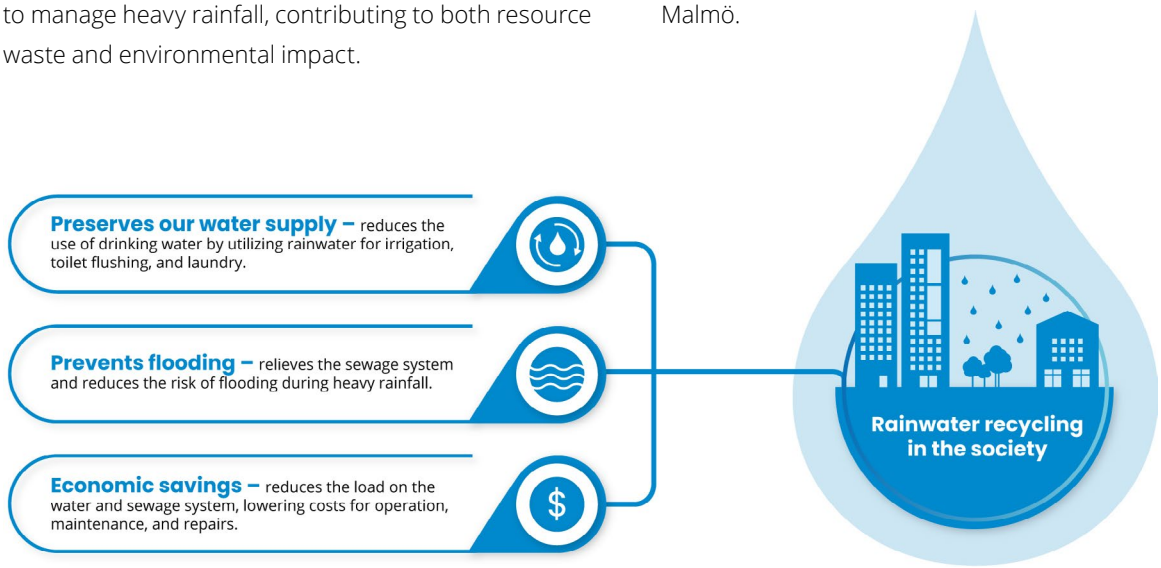
The problem

Water consumption in commercial and residential properties presents growing environmental and economic challenges. Buildings typically rely on potable water for all uses—including flushing toilets, irrigation, and cleaning—exerting unnecessary strain on municipal systems and driving up costs for owners and tenants.

At the same time, climate change and urbanization are intensifying water scarcity and flood risks. Most building infrastructure isn't designed for sustainable water use or to manage heavy rainfall, contributing to both resource waste and environmental impact.

Aligned with the European Union's circular economy target for 2050 and our client's ambition to achieve climate-neutral construction and housing by 2030, concrete actions are being taken to reduce freshwater use, minimize energy consumption, and recover valuable resources across their real estate portfolio.

This commitment is being put into practice through the implementation of an innovative rainwater recycling and treatment system in one of their residential areas in Malmö.



The garage is located underground, at the center of the residential area.

The treatment system is located in a repurposed section of the garage, where four parking spaces were transformed into a functional water treatment facility. The system receives and treats rainwater, which is then used for non-potable purposes such as supplying laundry facilities and irrigating garden plots.

This forward-thinking solution not only promotes sustainability but also contributes to a more resource-efficient and climate-resilient urban environment.

The solution

Mellifiq took on the challenge of installing a customized system within the confined spaces of an underground parking garage. The solution includes rainwater collection, water quality monitoring and control, and advanced filtration systems to enable safe reuse.

Stormwater and roof runoff are collected in a well outside the property and stored in a storage tank. The feedwater (untreated water) is then pumped from the storage tank to the treatment room in the garage, where it first passes through two large rainwater collection tanks with a total volume of 30 m³. At this stage, larger particles such as leaves, soil, and debris are removed.

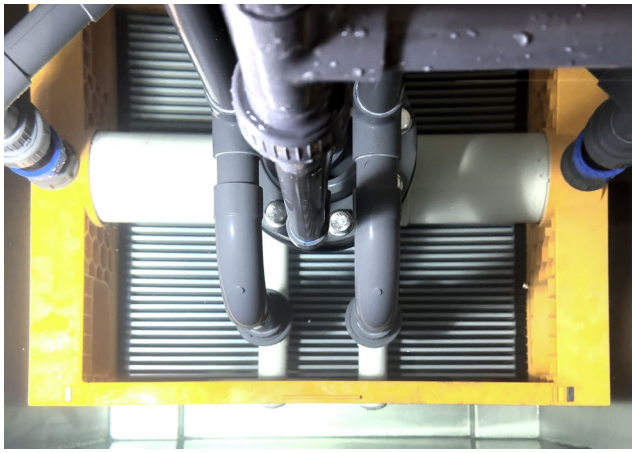
The next stage in the process involves removing finer particles to reduce the load on the subsequent membrane system and improve its efficiency.

The system also includes all necessary pumping solutions, flow meters, and water quality in-line sensors such as turbidity and pH sensors to ensure optimal performance and purification standards.

Rainwater collection tanks with a total volume of 30 m³.

The stations are equipped with a cartridge filter, fan, permeate pump, backwash pump, and electronic meters for flow, turbidity, and temperature.

In the final step, the water flows through the HydraLuxe flat-sheet membrane filtration system, which effectively removes smaller particles and bacteria, ensuring the water is treated to the highest standard. The process uses outside-to-inside filtration, meaning that the feed water surrounds the submerged membrane and is drawn through the membranes.



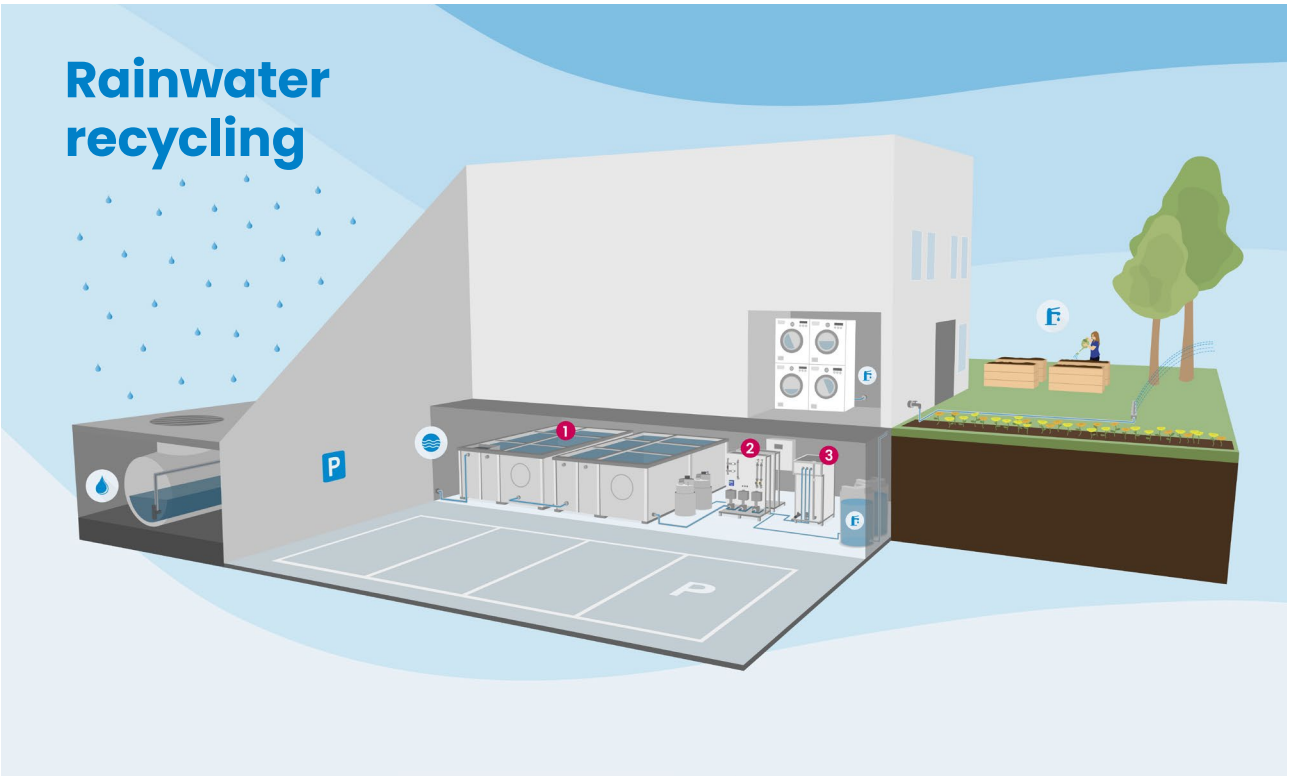
In addition, the treatment facility is equipped with backwashing, clean-in-place (CIP), and chemical dosing for membrane filter cleaning, ensuring effective removal of contaminants from the membranes. The HydraLuxe system features an integrated sprinkler system located in the top permeate module, specifically designed to remove debris and sludge trapped between the membranes.

The sprinkler system mechanically sprays water removing debris and sludge trapped between the membranes.

The permeate water (treated water) is pumped into two 500-liter storage tanks, which are used alternately. One tank supplies both the cultivation plots and washing machines, while the other is refilled and kept in standby until the first tank is empty. The tanks are connected by cables approximately 150 meters long to the laundry and 50 meters to the cultivation plots.

The facility operates entirely through centralized automation. All valves are electric and operated via a local touchscreen HMI, with critical valves featuring failsafe functions to protect the membrane system during power outages. Key instruments include turbidity and temperature sensors, and the system supports remote monitoring and control for efficient operation.

Mellifiq enginners handle the commissioning and installation of all process equipment.



Rainwater recycling – step by step.

Rainwater is collected in a well and pumped to the water treatment system in the garage.

The treatment system is located in the building's garage and filters the water in several stages.

The treated water is stored in tanks and used for the building's laundry room as well as garden irrigation.

1 **Pre-filters in tanks** – The feedwater passes through two tanks, each with a capacity of 15 m³. Here, a rough filtration takes place where larger particles, such as small twigs and leaves, are filtered out.

2 **Pre-treatment stage** – The next step in the process involves removing finer particles to reduce the load on the subsequent system. Two dosing stations keep the filters clean and ensure efficient operation.

3 **Membrane filtration** – The main purification takes place in a HydraLuxe membrane filtration system, which effectively removes contaminants from the water.

Evaluation

In this project, we successfully implemented an automated rainwater treatment solution to a residential area in Malmö, playing a key role in enhancing water management by treating one of our most valuable resources – water.

As water scarcity becomes an increasing global challenge, especially in the face of climate change and urbanization, sustainable water solutions are more critical than ever.

This system not only reduces dependence on freshwater sources but also demonstrates how innovative technology can be integrated into urban infrastructure.

The treated water runs from the garage to a tap in the garden area above.

The rainwater treatment system contains two 500-liter tanks for storing treated water. With this setup, the system can efficiently supply recycled rainwater for multiple laundry cycles and garden irrigation. Each laundry wash requires approximately 50 liters of water, while each garden plot usually needs between 20 to 40 liters of water per week during the growing season.

With both tanks filled, the system can comfortably provide enough water for around 20 full laundry loads or watering between 25 and 50 garden plots. To maintain this supply, a larger 30 m³ tank stores untreated rainwater, which is used to replenish the treated water tanks as needed. The system is capable of treating water at a rate of up to 2000 L/h, providing a reliable flow that supports daily household and garden demands.

With extensive experience in advanced air and water treatment, Mellifiq is pleased to support this forward-thinking initiative and demonstrate how smart, decentralized systems can help reduce the strain on traditional water supplies.

We're excited to see more projects like this take shape– practical, effective solutions that make everyday life more resilient, efficient, and resource-aware.

Garden irrigation and laundry washes can now be supplied with treated rainwater, reducing reliance on potable water.

About Mellifiq

Mellifiq is a multi-awarded environmental service company group, that has since the early nineties evolved into a world leading system and solution provider with multiple groundbreaking applications for industrial, municipal, and real estate clients. We supply cutting-edge technologies to manage the most sophisticated air, water, and energy challenges.

Mellifiq offers a complete range of air and water treatment technologies and solutions across multiple industries such as processing industry, energy sector, food and beverage, pharmaceutical, wastewater treatment and commercial real estate.

Mellifiq offers strong and renowned brands, such as Ozonetech, Nodora and Water Maid, and world-class engineering services combined an excellent track record of more than 40 years of innovation. We help our clients achieve the most efficient and sustainable solutions while creating the maximum value for their businesses.

With several business units across Europe, Mellifiq is headquartered in Stockholm where research and development, production, QA and certification all take place. Our unique technology and our extensive expertise have made us the Center of Excellence for the world's most complex projects, and a global player with installations on all six continents.

Everyday millions of people rely on our solutions for ventilation, disinfection, sanitation, and odor control. We are committed to raising the bar for the concept of clean and the industry standard for engineering, technical services and general contracting.

For additional information, visit our website at www.mellifiq.com

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