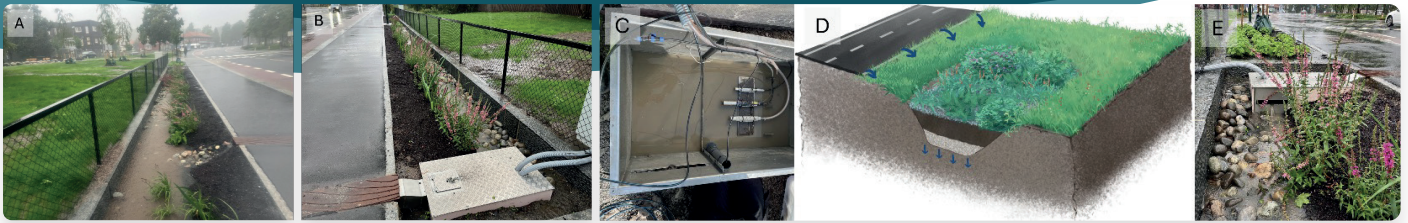


Norway – Raingarden treating road runoff



Rodland, Elisabeth; Karlstrøm, Stina; Tollefsen, Knut Erik; Moe, Jannicke; Meland, Sondre; Gragne, Ashenafi, Gjeitnes, Mari; Ribeiro, Anne Luise, Barkved, Line, 2025, «Illustrations of nature-based solutions for treating urban road runoff in Tåsén, Oslo; **A**) The road and the raingarden during a heavy rain event (August 2023), **B**) the raingarden and the influent monitoring box, **C**) sensors installed in the influent monitoring box, **D**) Illustration of raingarden with treatment from road runoff, **E**) the raingarden and the influent monitoring box showing water flowing over the v-notch».



DESCRIPTION

The Norwegian pilot is a **raingarden that treats runoff** along Tåsénveien in the City of Oslo. It was built as part of an upgrade in the area, where sidewalks and bike lanes on both sides of the road encourage more people to walk, cycle and travel by public transport. The upgrade project on Tåsénveien spans approximately 730 m and includes a stretch of road prone to flooding. It incorporates the planting of over 50 trees and the establishment of five separate rain gardens to **mitigate flooding and to treat runoff**. The pilot monitored is the first of the three rain gardens. The rain gardens are a good example of **nature-based solutions built to retain and remove pollutants** found in the road runoff so that they will not enter water pathways and eventually pollute the Oslofjord.



DESIGN AND TECHNICAL DETAILS

Type of influent

Urban stormwater, including runoff of from road, bike lanes and green areas.

Design criteria

- Impact area of raingarden about 1300 m².
- Raingarden area of about 60 m² offering a potential surface storage volume of about 19.6 m³ along its 33.5 m length.
- Road runoff enters the raingarden through two 20×15 cm inlet gutters located about 16 m apart.
- The inlet received 30m³ of road runoff in one year of monitoring (2023), whereas the outlet received 160m³.
- Automatic ISCO samplers placed at the influent and effluent of the raingarden have time-paced composite water samples at rainfall events.

Climatic conditions

Varied climate with seasonal variations in temperature (-23°C - 31°C) and precipitation (rain and snow).

Operational constraints

- Manpower**
- Skills**
- Seasonal variations**



TAKE-HOME MESSAGES

- **Effective road runoff pollutant removal:** The rain garden had an effective retention potential of TWP and TWP-related compounds from inlet to outlet, and an effective retention potential of TSS and metals such as Al, Cr, Fe and Pb, and some retention potential of Cu, Ni and W.
- **Enhanced environmental and socio-economic value:** The rain garden, with its green infrastructure and enhanced biodiversity pose a positive value for the public, traffic safety and environment.
- **Optimized stormwater mitigation and flood risk:** A stress test of Tåsénveien demonstrated an optimized flood risk and storm water mitigation of the raingarden.
- **High treatment capacity:** The rain garden has an impact area of 1300 m², including road, parking lot, bicycle lane, park area and pedestrian lane. However, due to flaws in the inlet design, a significant proportion of road runoff bypasses the raingarden during heavy rainfall.