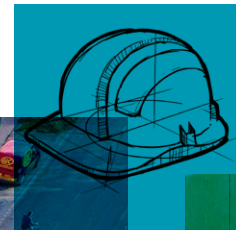


# Rockflow attenuation and infiltration systems

High absorption capacity





A high water absorption capacity is important when choosing an infiltration system, particularly where there is a lack of space. Rockflow is an ideal choice due to the unique material properties of stone wool.

**Rockflow consists of up to 95% voids ratio**

This allows Rockflow to store large quantities of water. By its nature, an infiltration system made of Rockflow takes up less space than, for example, a tank comprising granular filter media. Almost all of the buffer’s space is available for the storage of rainwater: once the Rockflow buffer has emptied after a rainfall event, a small volume remains (between 1-6%, on average 3%) depending on the design. This is known as retained water.



Rockflow can retain almost its own volume in water.

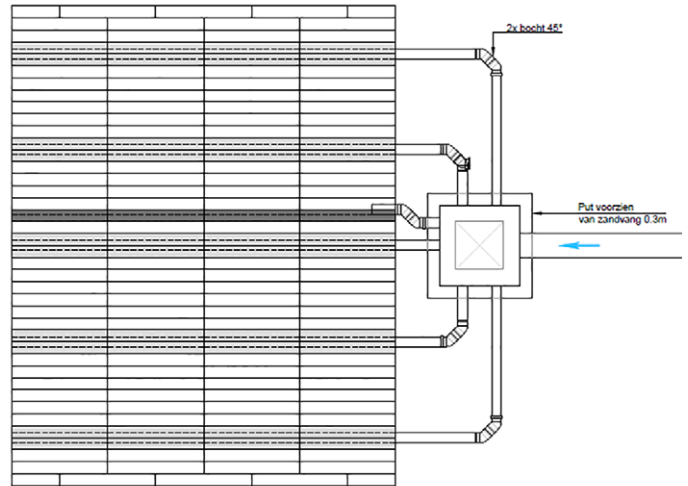
**A Rockflow buffer completely fills with water within 15 minutes**

The filling speed of stone wool is rapid and absorption into the stone wool itself is not the limiting factor for filling the system. Internal research into the transport speed of water within the stone wool shows that, in practice, stone wool does not delay the incoming water.

The Rockflow system’s maximum filling speed depends on the capacity of the inlet pipes. In the Netherlands, these transport the water via Ø125mm PVC connections into the stone wool elements and ensure the water is optimally distributed over the entire system. With an adaptor, Ø100mm and Ø150mm pipes (minimum sizes used in the UK) can be easily connected to the Rockflow system. Larger diameters are incorporated using multiple inlets.

By following our design principles your Rockflow system will always have enough inlet connections. The system can cope with a peak inflow from heavy rain equal to 100mm/hr.

The Danish division of engineering consultants WSP carried out thorough testing of the Rockflow stone wool. Their results show that stone wool’s water absorption and attenuation capacity remains greater than 90% throughout the entire lifespan of the product.



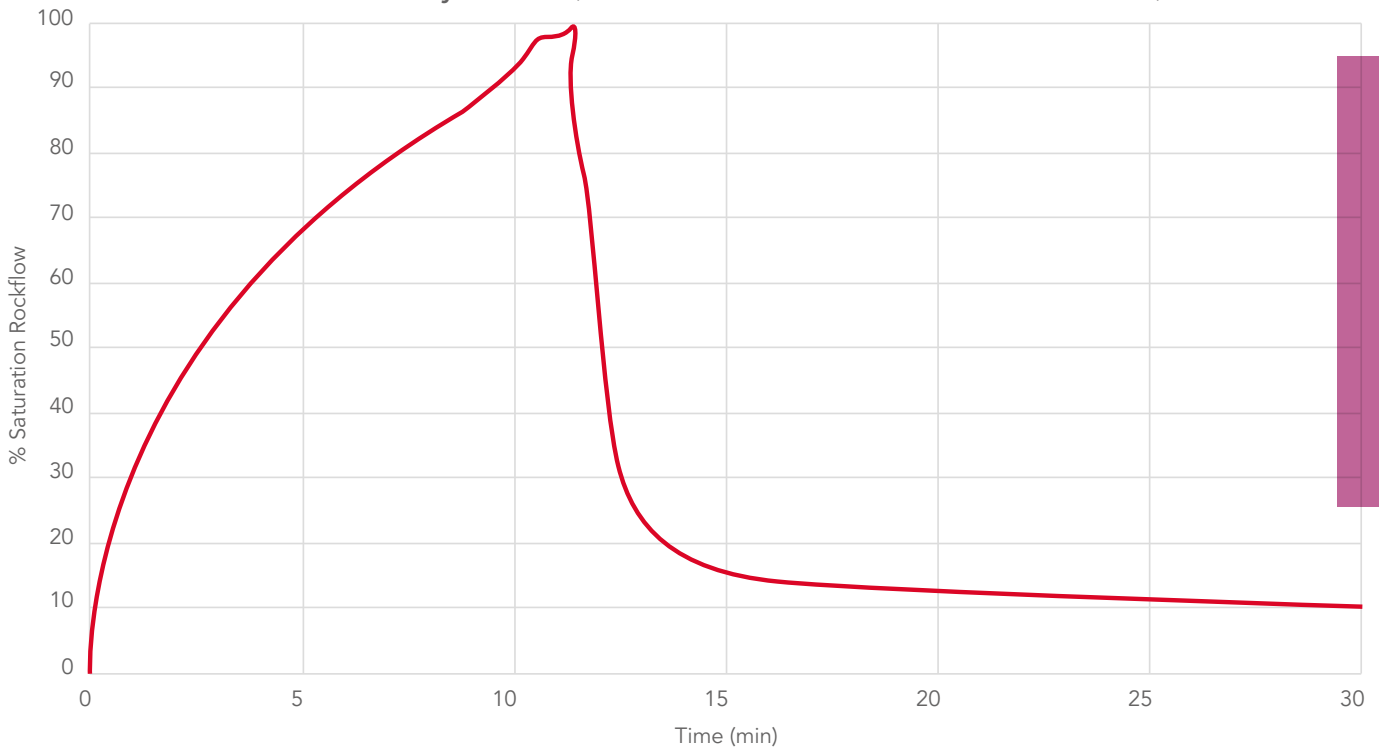
Elk Rockflow-kanaal moet vanuit een inspectieput middels Ø125 leiding met maximaal 45° bochten bereikbaar zijn. In het basisontwerp zit een kanaal h.o.h. 1,20m.

**Rockflow becomes available for the next extreme downpour within 24 hours**

Rockflow systems are designed so that they can be completely empty and available again within 24 hours. The speed at which a system empties depends partly on the material properties of the system and of the surrounding substrate and its infiltration rate. Emptying of the Rockflow buffer occurs using gravitational forces and capillary action. The system may also drain to a pipe at a lower level.

The fuller the system is, the faster the water drains away due to the head of pressure in the upstream components/ network.

## Rockflow hydraulics (based on measurements in Jan/Feb 2020)



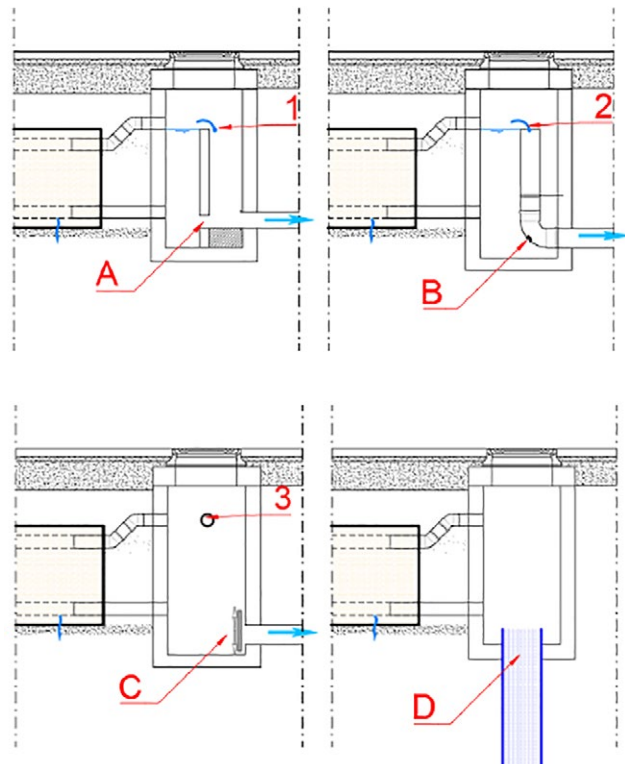
This graph shows the filling and emptying behaviour of a Rockflow buffering system with 5m<sup>3</sup> stone wool, a water column of a maximum of 1 metre and free drainage.

### High groundwater level or poor soil permeability?

Even high groundwater levels do not preclude the use of stone wool. At our infiltration system at a supermarket in Zevenaar, groundwater levels regularly rise to just below the underside of the buffer or during extreme events partially into the buffer. In spite of this, measurements taken by engineering consultants IB Land, reveal that infiltration occurs within a matter of hours.

Even if the type of soil or other factors hinder complete infiltration within 24 hours, a suitable Rockflow system can be designed. The unreleased water may be conveyed away to a system which does have sufficient capacity. This is done either by delayed discharge to a watercourse or using a vertical infiltration outlet to below the poorly draining layer. This allows the system to be emptied within 24 hours in accordance with typical design criteria.

An emergency overflow is desirable for every attenuation system. Although the size of the system is designed to accommodate more than the anticipated flow, in the event of extreme rainfall, the emergency overflow is used (subject to an acceptable point of discharge).



Solutions for Rockflow systems in soils with poor permeability. Options A-C use different methods to connect to the water course. Option D has a deep infiltration pipe allowing the water to reach a deeper water-permeable layer.

## Stone wool has a greater infiltration surface area than alternative systems

The greater the infiltration surface area, the faster and more reliably a water retention system will be emptied after rainfall. With stone wool the infiltration surface area consists of half of the sides as well as the complete underside of the stone wool element. In alternative systems made of plastic or using granular media, and wrapped in a geotextile, the side walls are the only infiltration surfaces as the base is taken to block with silt over time.

Using Rockflow, the channels are the only place where sediment can accumulate. Due to the fibrous structure of stone wool, particles larger than 45µm are prevented from passing. This means limited silt enters the stone wool matrix and the underside of the buffer remains available for infiltration. The channels themselves can be rinsed clean using normal jetting methods if inspection reveals cleaning is necessary (see fact sheet 'Durable and easy to maintain' and Rockflow's maintenance and cleaning guide).

Due to the increased infiltration surface area, Rockflow allows the collected water to infiltrate more rapidly than in other solutions. This is a particular advantage for soil types with poor permeability (i.e. a low k-value of 30-50cm per day). These superior performance characteristics mean it is often not necessary to discharge water by any other method other than via attenuation and infiltration.



Stone wool has a large infiltration surface.

## ROCKWOOL: Your partner in design

Rockflow offers versatility, design freedom and high capacity for water absorption and infiltration. Our team will support you during the design phase. Our in-house consultants and local technical representatives will provide whatever advice you require during the design stage. This may include checking soil permeability calculations, and checking that the proposed system is the correct shape and dimensions to ensure optimum throughput and ease of maintenance. We will verify that the design meets your requirements and specifications.

## More information about the hydraulic behaviour of Rockflow.

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ROCKWOOL Group is the world leader in stone wool products, from building insulation to acoustic ceilings, external cladding systems to horticultural solutions, engineered fibres for industrial use to insulation for the process industry and marine & offshore. We are committed to enriching the lives of everyone who experiences our products and services, and to helping customers and communities tackle many of today's biggest sustainability and development challenges including energy consumption, noise pollution, fire resilience, water scarcity, urban flooding and more.

