

It's raining harder and harder, and our city can't handle it

Make Amsterdam Rainproof.
Visit rainproof.nl to see what you can do.

Together, we can catch those raindrops
and make Amsterdam Rainproof



Amsterdam Rainproof

every drop counts



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What's wrong?

We increasingly have to deal with extreme rainstorms. They make our city vulnerable. As the city fills up with buildings and paved surfaces, there's nowhere left for the rainwater to go. The result: increasing flooding and damage, also near you.



Copenhagen

2 July 2011

Extreme downpour

150 mm of rain fell in just 2 hours that day. The result: 1 billion euros in damage.



Amsterdam

28 July 2014

Major downpour

90 mm fell from the sky within a few hours. Streets overflowed, houses flooded, and traffic came to a standstill as tunnels filled with floodwater.



Rainwater seeps into houses across town, and basements and cellars turn into cisterns.



Such heavy rainfall causes major traffic disruptions. Streets are submerged and many tunnels become impassable as water levels rise.



Heavy rainfall

20 mm an hour is the volume of rainwater that our sewers can process. When it rains harder, the water finds a different route.



Drizzle

1 mm is a whole day of drizzle, but even that represents 219 million litres of water falling in Amsterdam – enough to fill 232 swimming pools!

mm.

160

150

140

130

120

110

100

90

80

70

60

50

40

30

20

10

1

What you can do

Everyone can contribute by introducing smart solutions, big and small, to prevent damage, and by using rainwater, for example to water your garden. And it makes your neighbourhood more beautiful. Join in! Every drop counts. Increase our city's sponge capacity and make Amsterdam Rainproof.



Roof

A green roof helps hold onto rainwater. It suits lots of different roof structures and helps keep the building cooler. It benefits biodiversity, and if you add an extra water storage layer, a blue roof is even better for storing rainwater.



Building

Rainwater capture systems, a green or blue roof, higher thresholds by the front door, and no wooden floors in the basement: all these measures help prevent damage and make your house more rainproof.



Neighbourhood

Less pavement and more green, ditches, little gardens along the building fronts, and waterside plants near your home make your neighbourhood more beautiful. Greenery holds a lot of water and creates a better microclimate.



Garden

If you have a garden, balcony or roof terrace, set up a rain barrel with a tap on the side so you can water your plants for free. Remove some pavement from your garden and replace it with a plant or pond, or lay permeable paving.



Street

Rainproofing a street is as easy as laying a hollow road and higher kerbs. Urban infiltration strips, swales and open gutters bring rainwater drainage out into the open and make the city more beautiful.



Square

Rainwater-fed fountains, open gutters and more greenery transform a city square into a place to play with water – and make it easier to accommodate heavy rainfall.



Park

Green parks, swales and ponds make key contributions to temporary water storage and slow down rainwater drainage from the surrounding area. They are good for plants and animals and contribute to a cooler neighbourhood.

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Make your neighbourhood rainproof. How? Use these tips!

Amsterdam Rainproof

Amsterdam Rainproof: that's you, us and all the people of Amsterdam working together. We share a common goal: to help Amsterdam handle the increasingly frequent downpours. Even better, we want to make better use of the free rainwater that currently flows directly into the drains. The extreme rainstorms cause damage, primarily because the city is increasingly paved in buildings, asphalt and paved gardens – no raindrops can seep through!

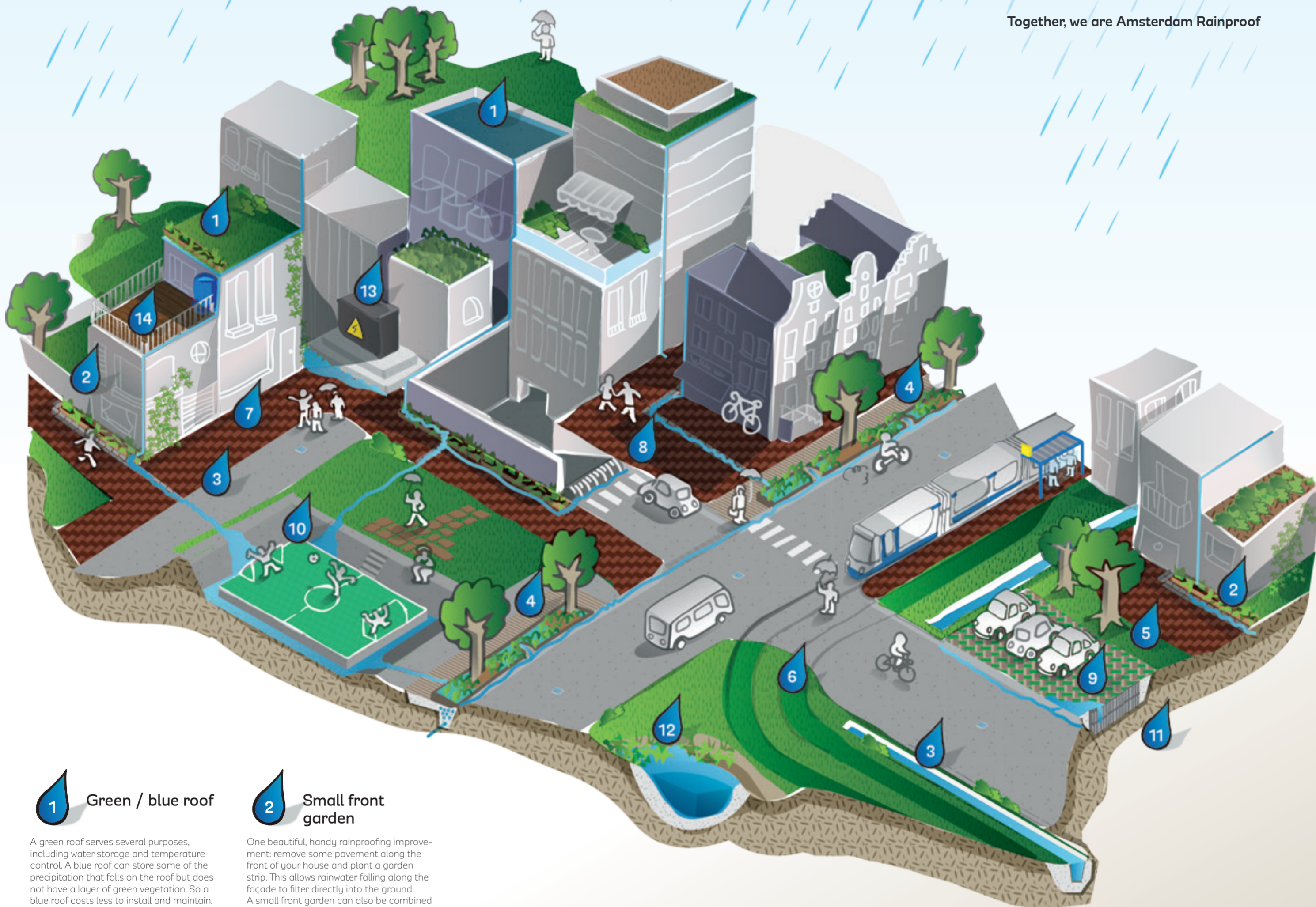
Introducing Rainproof initiatives together...

If you add improvements to your house or garden, make them Rainproof. If you'd like to make an even bigger difference, work with others on joint initiatives. Rainproof wants to link citizens, entrepreneurs, knowledge workers and public servants in ongoing projects and new initiatives. When we work together, we can transform Amsterdam into a city that uses smart solutions to make the best of heavy rainfall.

...that make the difference.

The following suggestions offer tangible tips for what you can do – as a local resident or a professional. Visit [Rainproof.nl](http://rainproof.nl) for a comprehensive overview. If you have an idea, story or other contribution for Rainproofing your city, let us know! We'd be happy to link you to other Rainproof locals.

Together, we are Amsterdam Rainproof



1 Green / blue roof

A green roof serves several purposes, including water storage and temperature control. A blue roof can store some of the precipitation that falls on the roof but does not have a layer of green vegetation. So a blue roof costs less to install and maintain. Rainwater is buffered, since the drain flows much slower and the spillway is higher. Considering rainproofing your house or building by adding a green roof or blue roof? Ask a professional supplier for advice.

2 Small front garden

One beautiful, handy rainproofing improvement: remove some pavement along the front of your house and plant a garden strip. This allows rainwater falling along the façade to filter directly into the ground. A small front garden can also be combined with a closed-off drainpipe, although you would then also need a spillway towards a nearby pond or gutter. Win-win: small front gardens contribute to greener streets.

3 Open gutter

An open gutter is a simple above-ground drainage solution that can be used in a garden, along the street, in parks and on city squares. Rainwater can flow through open gutters to nearby retention or infiltration zones. An open gutter needs to be on a slope. An additional advantage of an open gutter is that you can see the impact of a rainstorm and enjoy a lovely glimpse of the course that the water follows. It also shows how vital it is to rainproof the city.

4 Urban infiltration strips

Urban infiltration strips temporarily store rainwater from the surrounding area and help it seep into the soil. How it works: rainwater from buildings and streets is directed to these infiltration strips through open gutters. These bottomless containers filled with gravel, soil and plants detain the rainwater, allowing it to seep into the soil more slowly. The plants even help filter the water somewhat before it infiltrates into the soil.

5 Infiltration zones

In infiltration zones, the rainwater that falls on buildings or streets infiltrates into the soil via an adjacent green strip, like a grass-covered field. In times of drought, the rainwater keeps the groundwater at an acceptable level. Introducing slight variations in level facilitates temporary (limited) rainwater storage. Extended infiltration is possible if enough room is available and the soil is suitable.

6 Green between the tram rails

The space between the tram rails is perfect for a grass strip if it's not being used by other traffic. Rainwater can easily seep into the soil through this grass strip. Grass is easy to maintain and keeps the soil from eroding away. Other traffic surfaces, like streets, should only be paved when absolutely necessary, and paving should be water-permeable where possible.

7 Water-permeable paving

Paving stones with open grouting allow rainwater to seep into the ground. This cuts down on sewer volumes and supplements groundwater automatically. There are also paving stones with notched edges that allow rainwater to drain partly. Water-permeable paving is a great option for paved gardens and other areas.

8 Speed bumps

The impact of flooding right after heavy rainfall can be diminished by strategic placement of speed bumps, helping direct the water towards open water or green zones. The water can also be stored temporarily between two speed bumps and a kerbed pavement. Speed bumps can also be placed so lower-lying vulnerable areas do not fill up with rainwater flowing along the road from the surrounding area.

9 Grass concrete blocks

Less frequently travelled parking places, roads, access lanes to garages and gardens can be made water-permeable by using grass concrete blocks. This allows rainwater to seep into the soil and supplement groundwater. Depending on the soil beneath, the infiltration percentage for grass concrete blocks can go as high as 100%. A great rainproofing solution to use in your garden.

10 Water square

A water square is a sunken section of public space that visibly collects rainwater from the surrounding area and stores it. In a water square, water storage is combined with other functions, like playing and sports.

11 Infiltration crates

Infiltration crates are a solution for temporary underground rainwater storage, allowing delayed drainage into the soil. They can be used in gardens, sports fields, roads and car parks. The advantage: they only take up space underground, so they facilitate even more efficient land use.

12 Rainwater pond

Rainwater ponds have capacity to accommodate higher water levels, allowing them to store rainwater on a temporary basis and drain it away slowly. The vegetation in the pond and the green banks help clean the water. The water can also infiltrate into the soil, if it's clean enough and the soil is the right type and has enough capacity. There are also rainwater ponds for buffering and purifying contaminated water from busy roads and parking lots.

13 Rainproof utilities

In high flood-risk areas, public utilities like sewers, data, drinking water, energy and communications facilities need to be structured so they are operational 24/7 – even during extreme rainstorms. Public utilities situated above the ground, like transformer boxes and network junctions, can be placed higher off the ground at locations that have higher flood risks.

14 Detached downpipe

By removing the connection between the downpipes on your building or house and the public sewers, you cut down on rainwater flowing into the sewers. To avoid water damage, it is crucial to direct rainwater away from your building or house. Make sure you arrange sufficient retention and infiltration capacity, for example by providing rainwater ponds or infiltration zones. Rainwater can also be reused.

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