

EmpowerClimate

30 November 2021 | Online training

WS 14. Water management and climate actions in municipalities

This project is part of the European Climate Initiative (EUKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

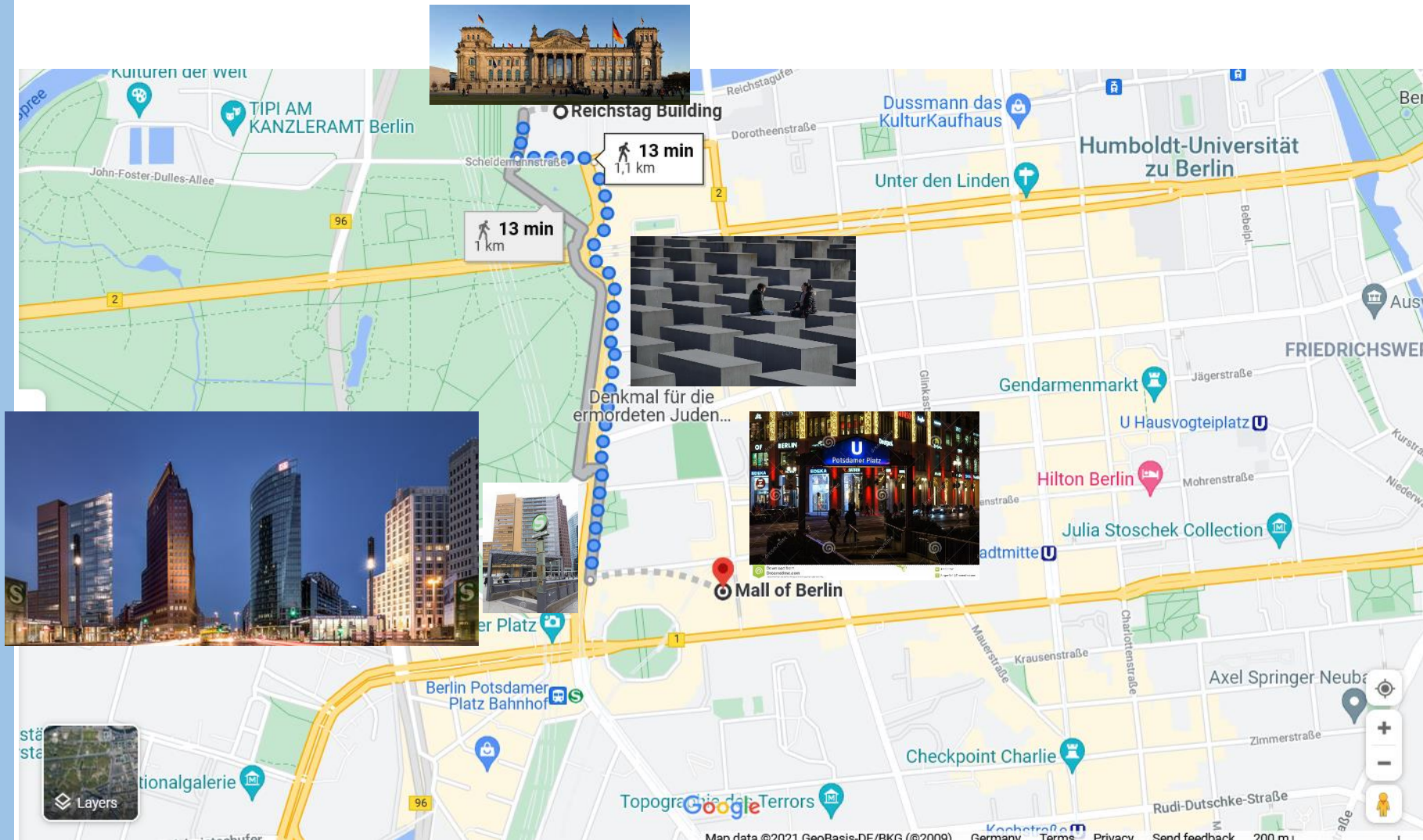
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Study Tour Nostalgia: Potsdamer Platz



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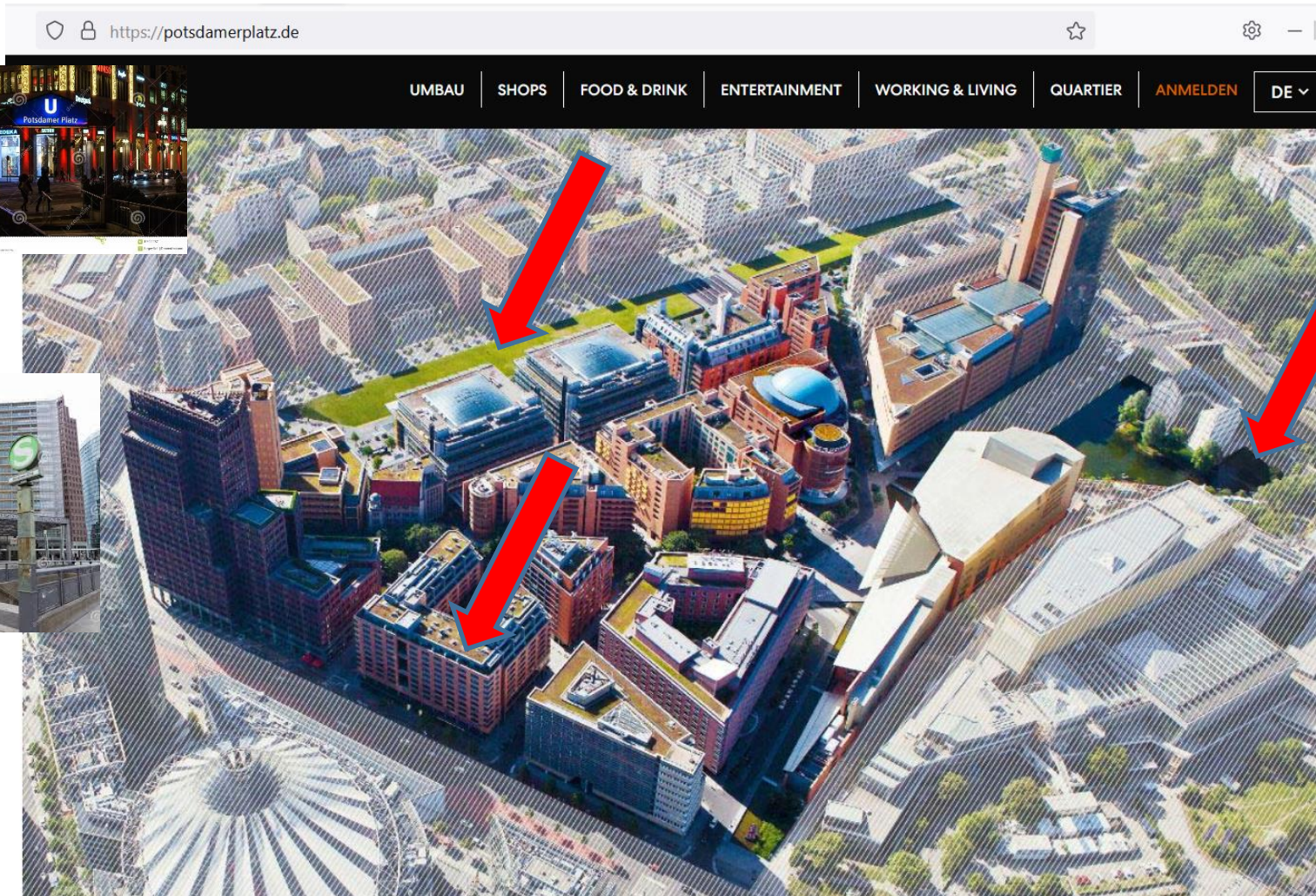
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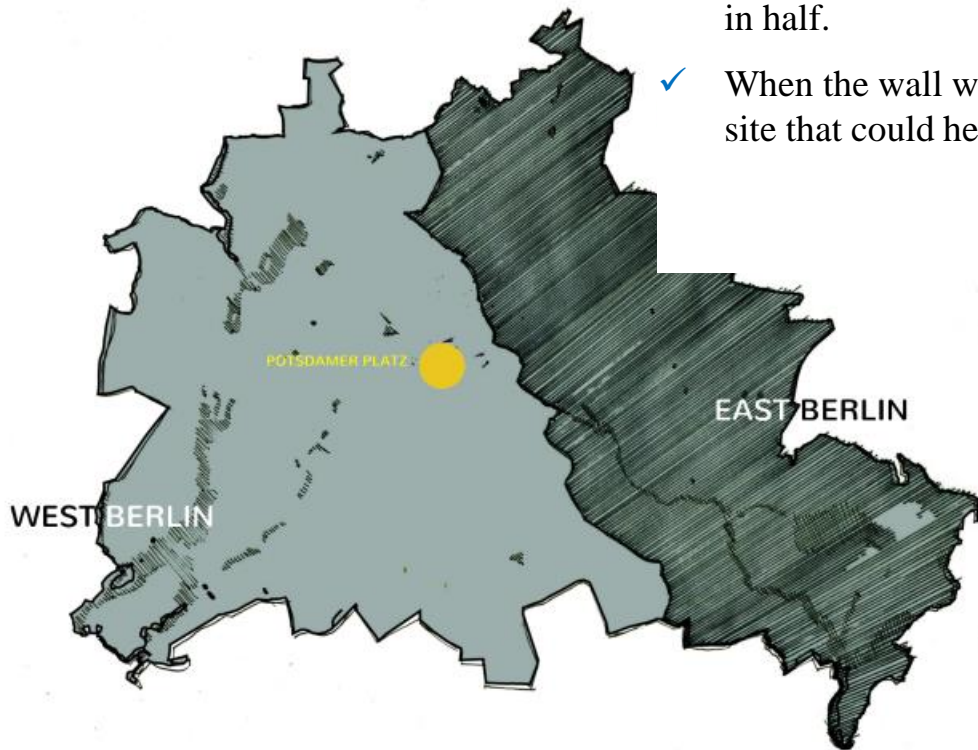
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Rebuilding Potsdamer Platz

Historic site

Before 1990s

- ✓ The original Potsdamer Platz became a major cultural hub within Berlin in the 1920's and 1930's. During World War II, the site was completely destroyed. In the 1960's the Berlin wall split the city in half.
- ✓ When the wall was torn down in 1989, Potsdamer Platz became a site that could help to blend the many diverse regions of Berlin.



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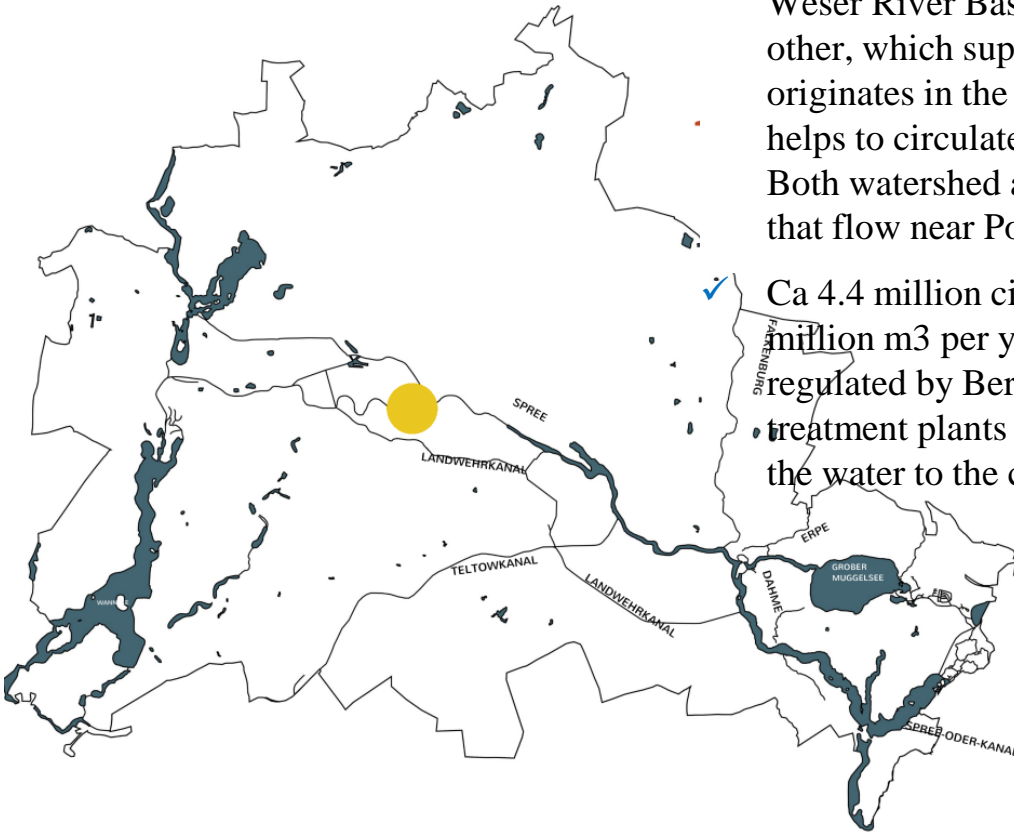
Considering Natural Elements and Urban Needs

Berlin waters

Connection to Potsdamer Platz

- ✓ The boundaries of Berlin encompass portions of two watersheds. Weser River Basin originates in the hills of Weserbergland. The other, which supplies water to the streams nearest Potsdamer Platz originates in the mountains of the Czech Republic and Slovakia. This helps to circulate about 711 m³ per second of water through the area. Both watershed are linked via the stream and canal systems of Berlin that flow near Potsdamer Platz.

- ✓ Ca 4.4 million citizens of Berlin + companies purchase ca 200 million m³ per year. Water consumption and water recycling is regulated by Berliner Wasserbetriebe (a private company). Sewage treatment plants respond to water related behaviors and return back the water to the canal system.



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Goals and Elements

Economical

- reduce energy costs
- longer lasting infrastructure

+

Ecological

- reduce stormwater runoff
 - ↳ pollution reduction
 - ↳ water reuse
 - ↳ habitat preservation

+

Experiential

- spaces for leisure
- visual pleasure

POTSDAMER PLATZ

Client: City of Berlin, Daimler Chrysler Immobilien

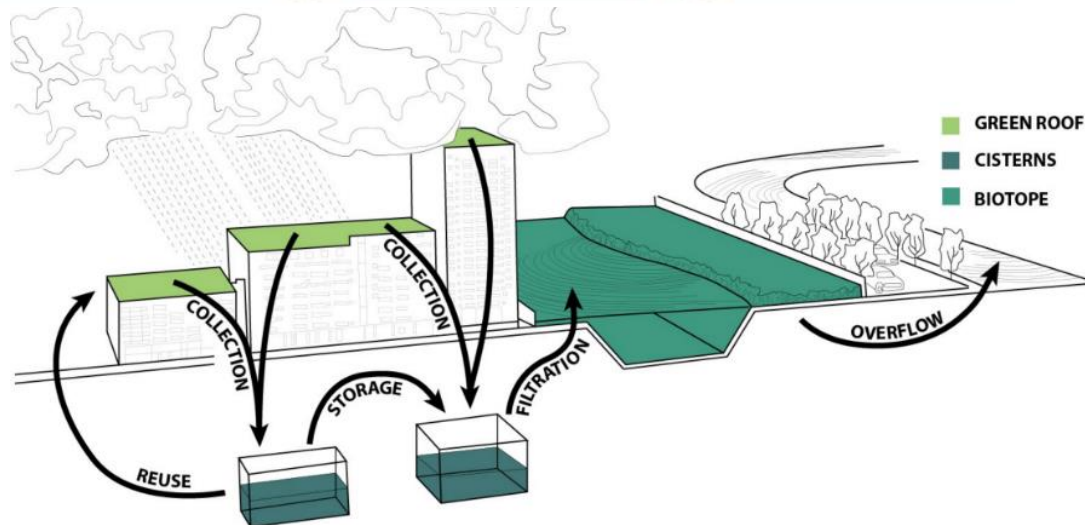
Master planners: Hilmer and Sattler

Architects: Atelier Dreiseidl, Renzo Piano, Christoph Kohlbecker, Arata Isozaki, Christoph Kohlbecker, Hans Kollhoff, Ulrike Lauber and Wolfram Wöhr, José Rafael Moneo and Richard Rogers.

Completion date: 1998

Award: DGNB Silver Sustainable Urban District

Area: ~68,000m²



Concept elements

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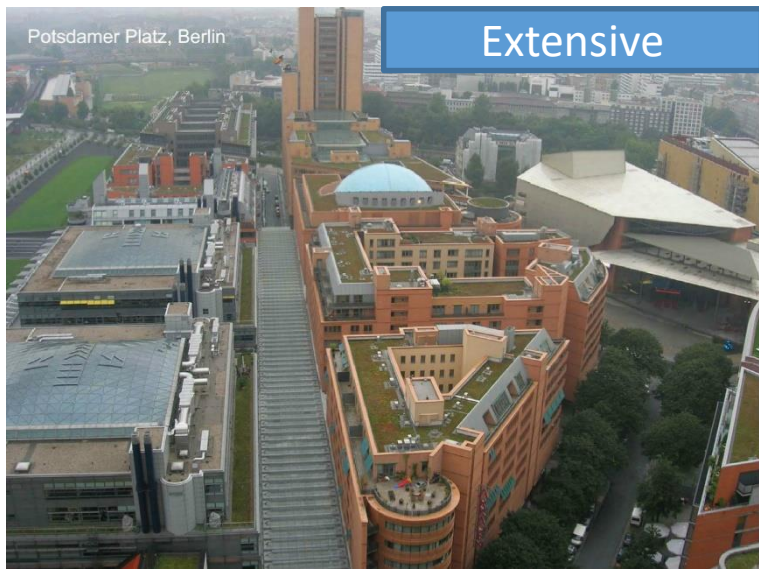


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1. Water collection

- ✓ 23,000 m³ of rainwater is harvested from the roofs of 19 buildings in the area through the use of extensive collection as well as intensive green roofs



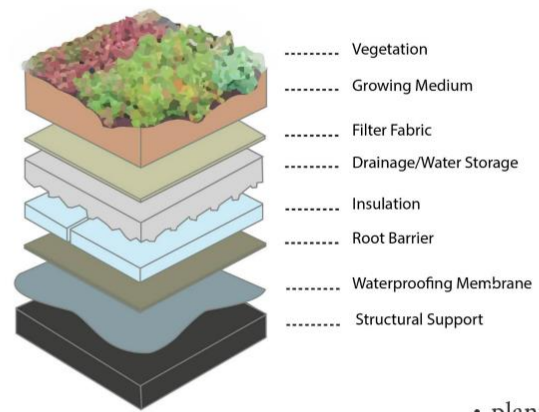
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Green Roofs

Extensive Greenroof Features



- plant nourishment and support
- drainage
- insulation systems
- waterproofing systems

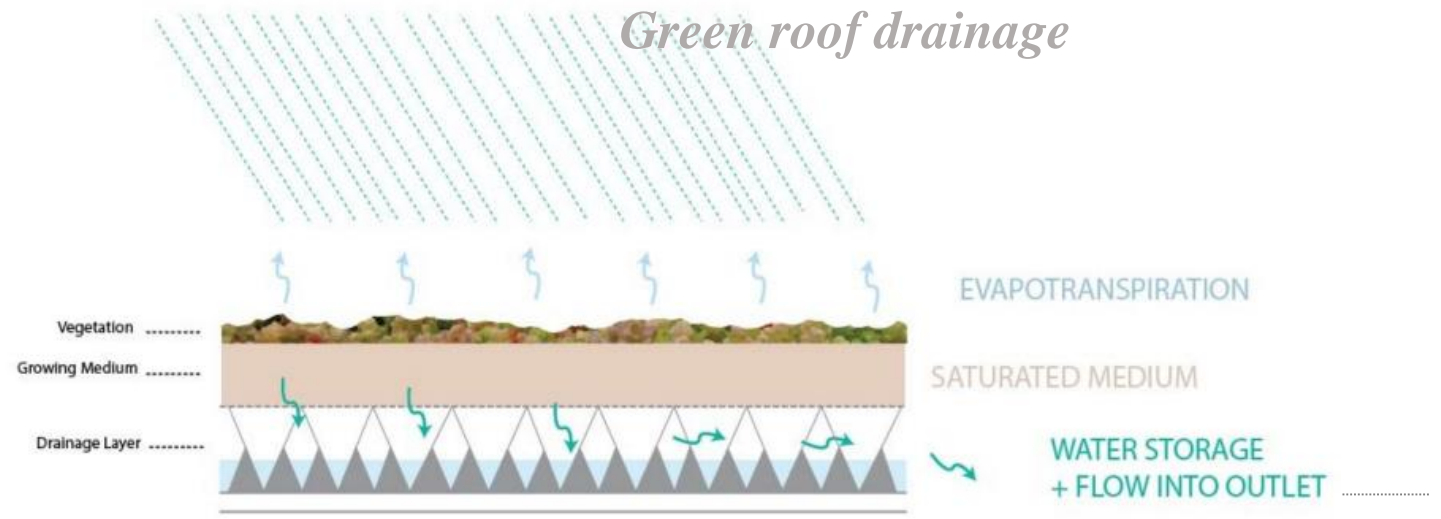


Sedum



Allium

Green roof drainage



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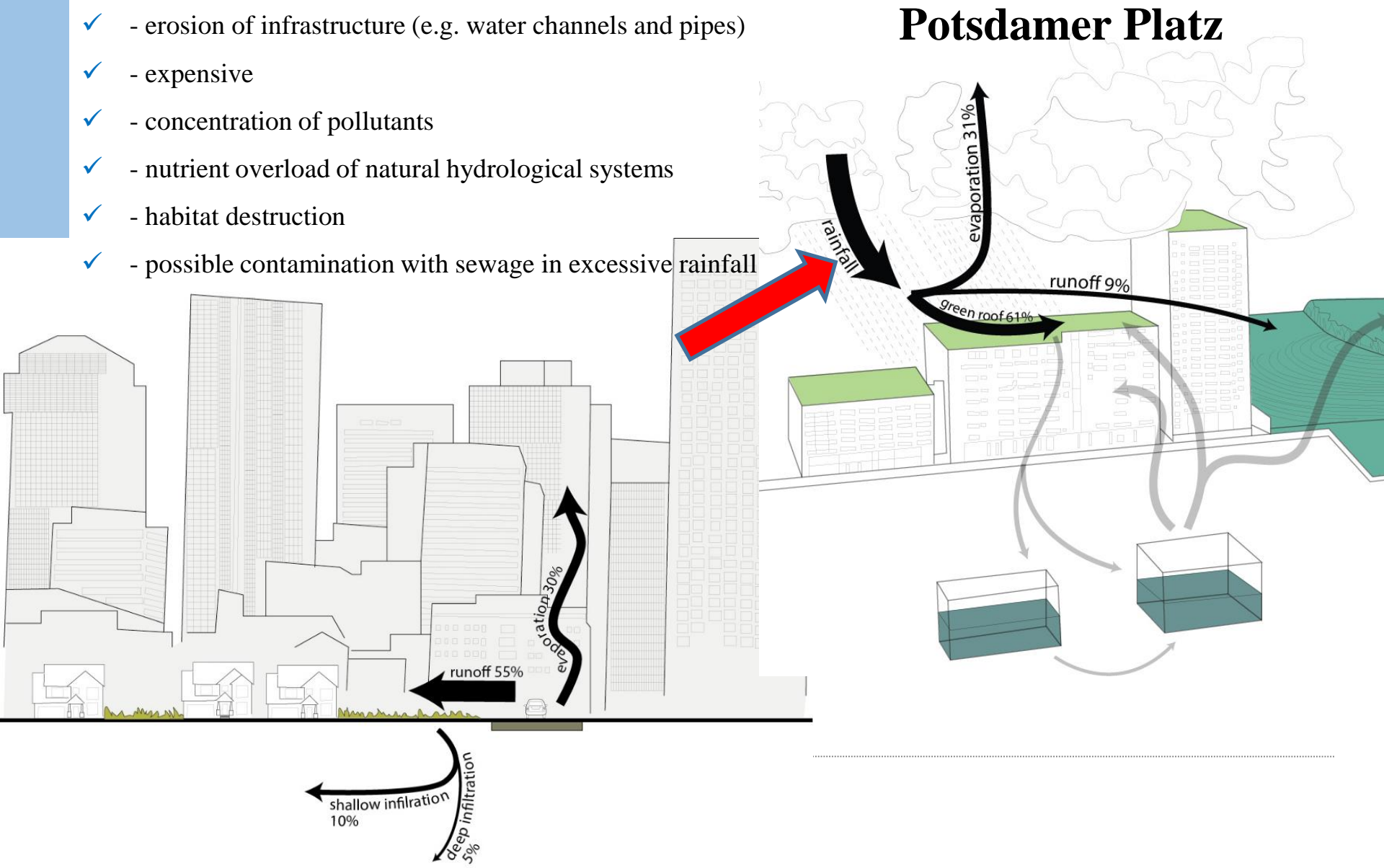


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Typical urban rainfall vs Potsdamer Platz

Negative impacts of runoff

- ✓ - erosion of infrastructure (e.g. water channels and pipes)
- ✓ - expensive
- ✓ - concentration of pollutants
- ✓ - nutrient overload of natural hydrological systems
- ✓ - habitat destruction
- ✓ - possible contamination with sewage in excessive rainfall



Runoff



<http://www.garrettmedia.com/photo/37661542>

Natural Runoff

$Q = ARC$

runoff volume =

surface area x rainfall x coefficient of runoff

$$Q = (68\,000\text{m}^2)(0.556\text{m})(0.3)$$

$$Q = 11\,342\text{m}^3$$

runoff sources:
<http://www.fda.gov/oc/decisions/unavailable-cases/01-jun/01jun01/01jun01-water-creation-a-scientist-s-view.pdf>
http://www.swissre.com/water/en/uripat/pdfs/WS-1-GEN_MAN_DS-1.5-Manual-en-WS1D.pdf



http://www.mika.com/yoko/StarDag_City

Urban Runoff

$Q = ARC$

runoff volume =

surface area x rainfall x coefficient of runoff

$$Q = (68\,000\text{m}^2)(0.556\text{m})(0.8)$$

$$Q = 30\,246\text{m}^3$$



Potsdamer Platz Runoff

$Q = ARC$

runoff volume =

surface area x rainfall x coefficient of runoff

$$Q(\text{water}) = (12\,000\text{m}^2)(0.556\text{m})(0)$$

$$Q(\text{water}) = 0\text{m}^3$$

$$Q(\text{green space}) = (12\,000\text{m}^2)(0.556\text{m})(0.3)$$

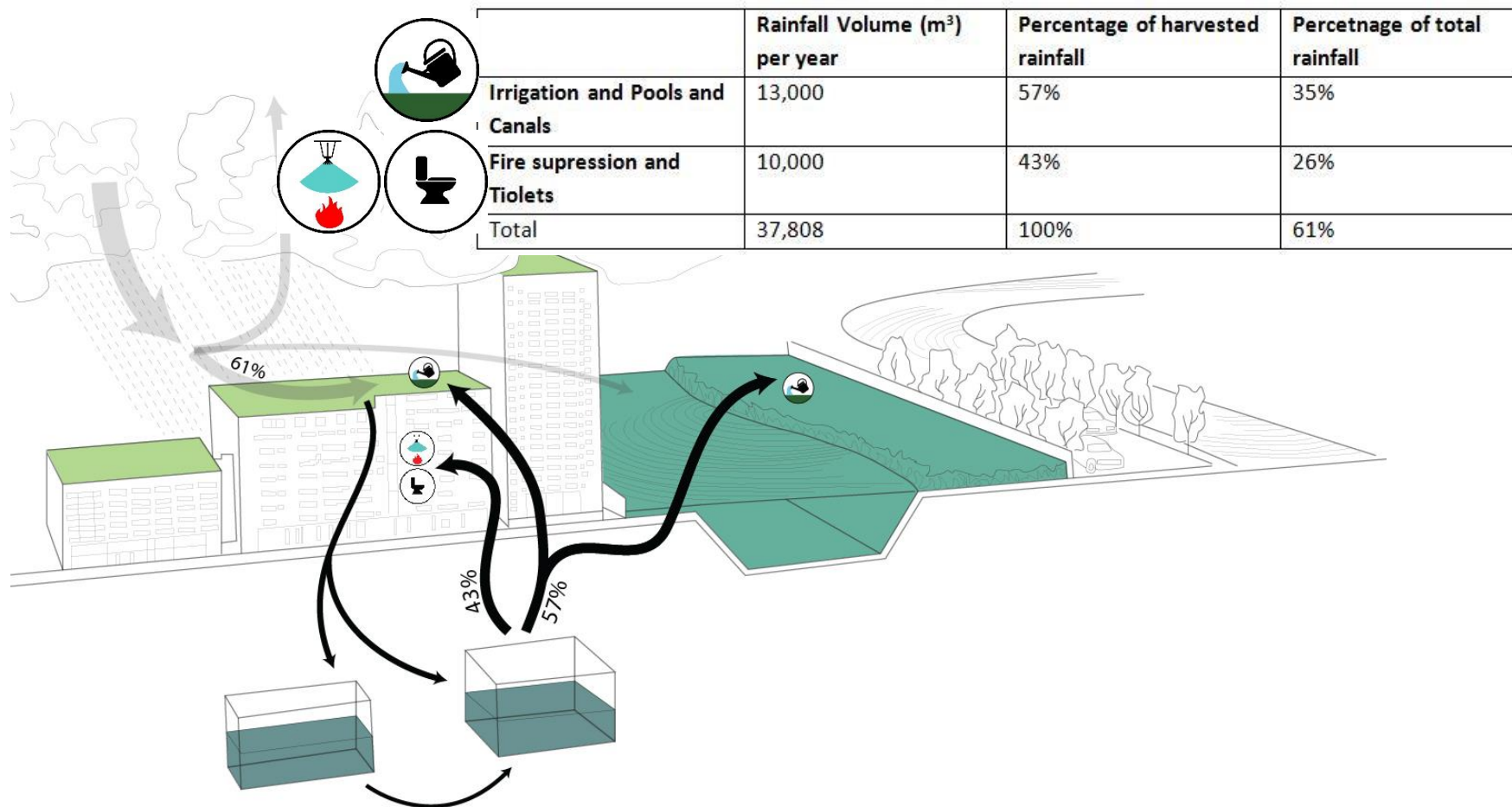
$$Q(\text{green space}) = 2002\text{m}^3$$

$$Q(\text{commercial}) = (44\,000\text{m}^2)(0.556\text{m})(0.8)$$

$$Q(\text{commercial}) = 19\,571\text{m}^3$$

$$Q(\text{total}) = 21\,572\text{m}^3$$

2. Water reuse



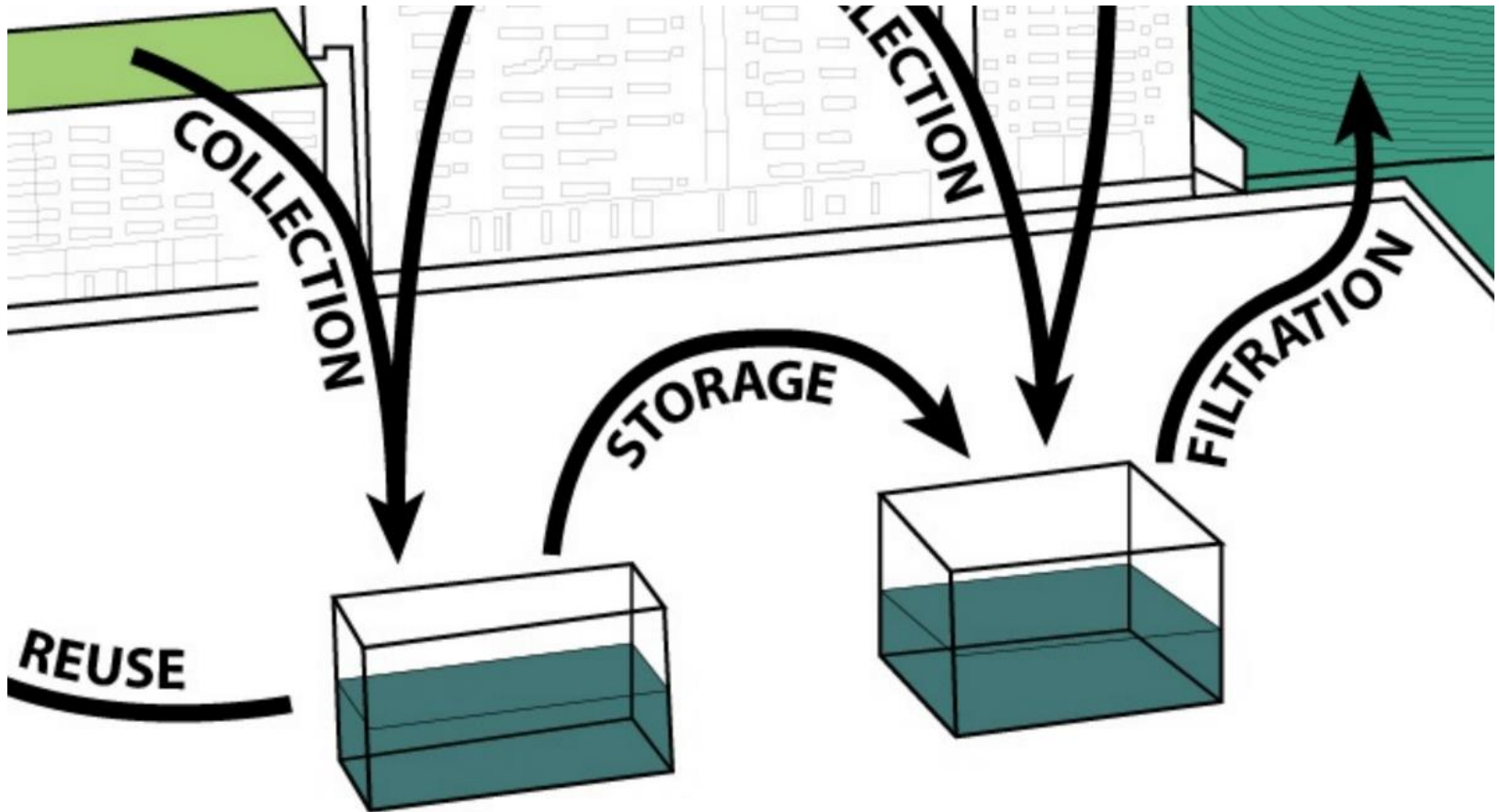
- ✓ 80% of the time rainwater is used before city domestic water
- ✓ 20,000m³ of drinking water is saved each year

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3. Cisterns



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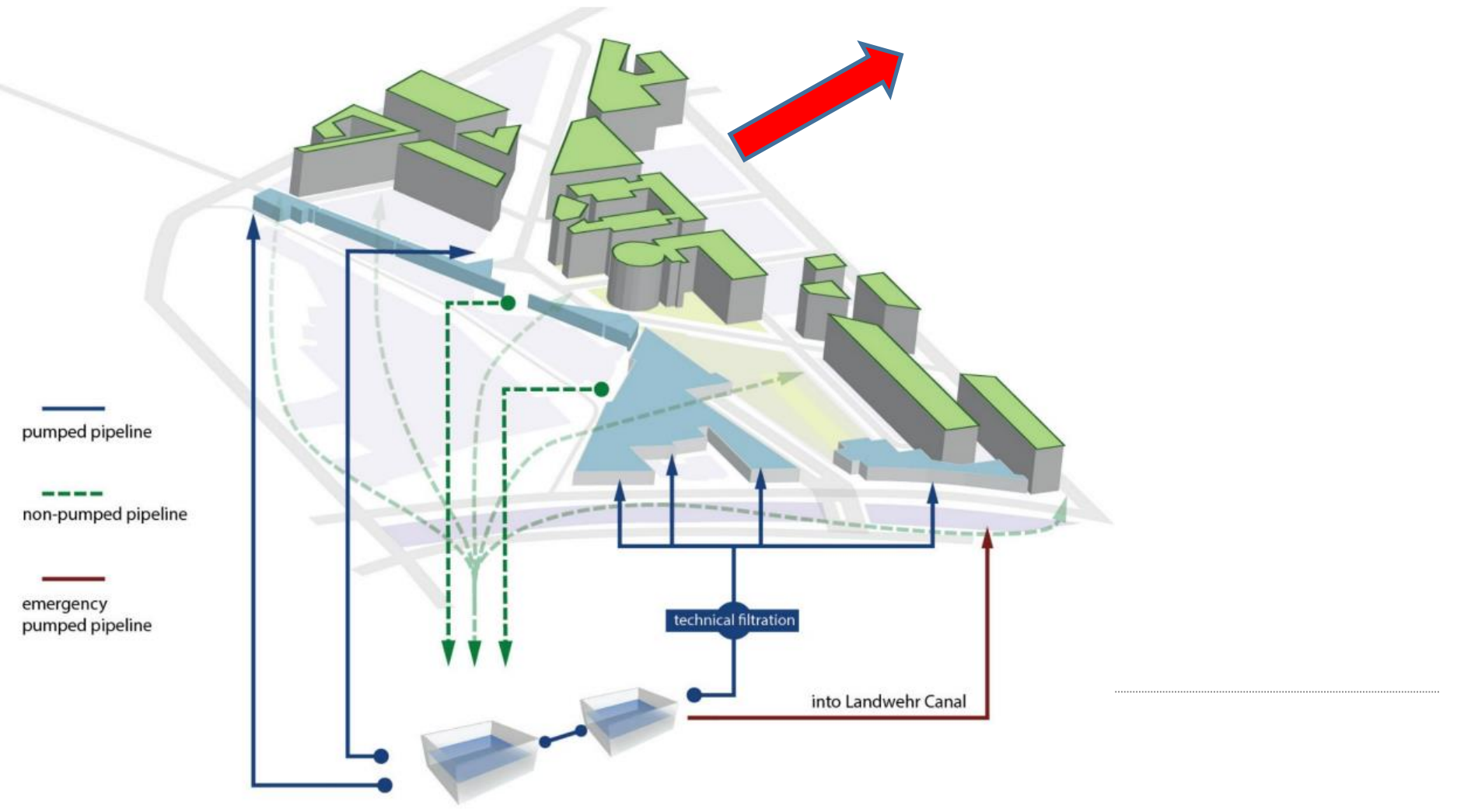
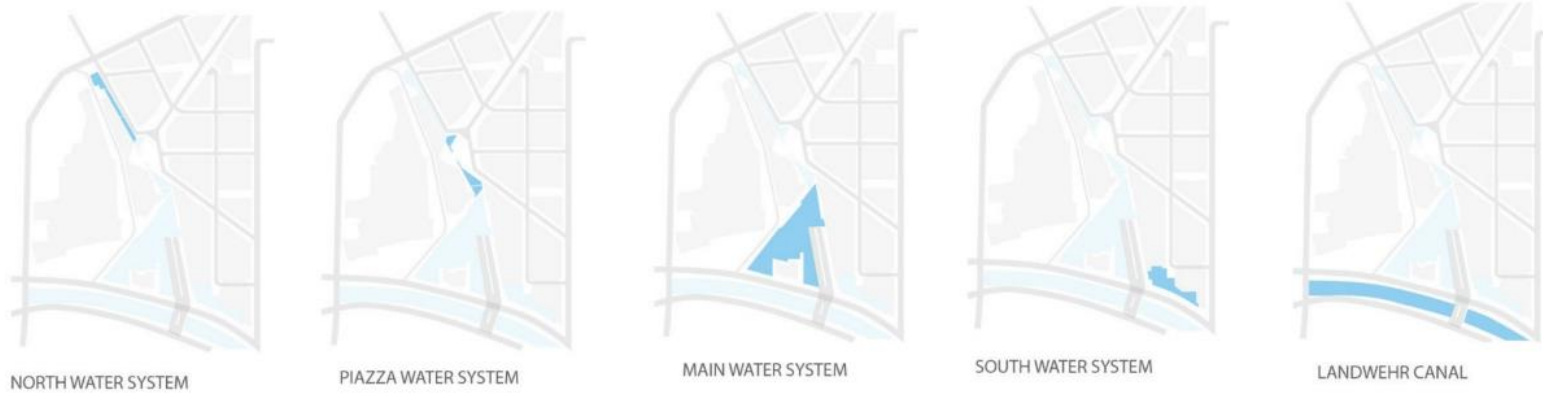


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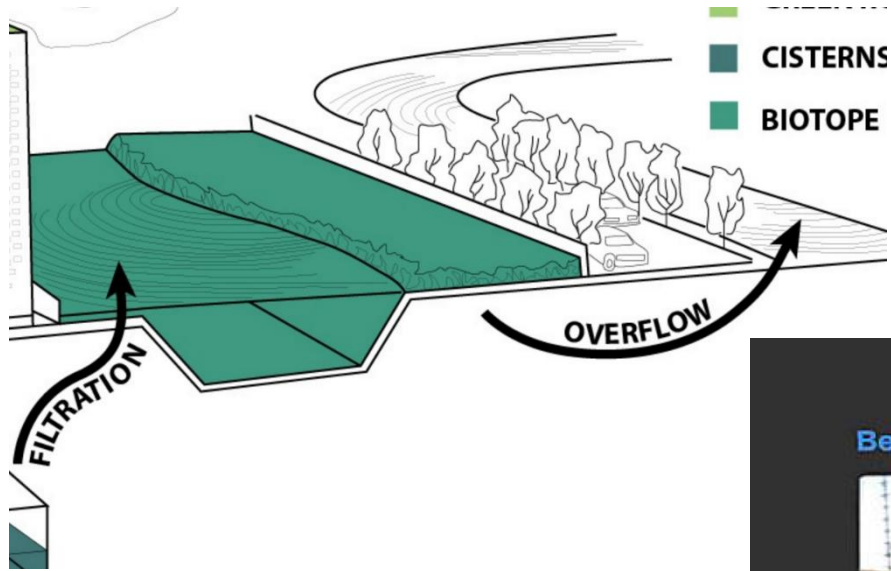


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4. Biotopes



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5. Human connection



Google Maps: Ardeij Artjes



Google Maps: Street View



<http://www.dla-art.com>



Google Maps: Aydin Karam

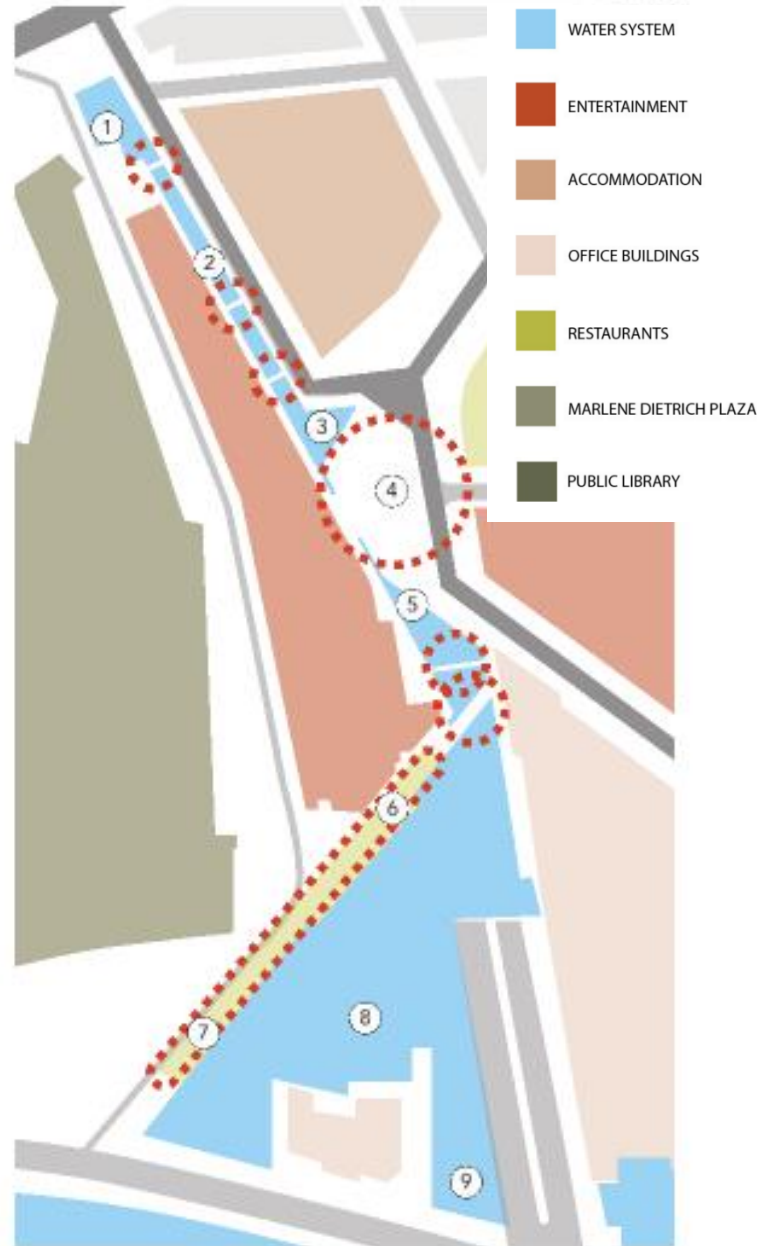


Photo: Waterworks by Herbert Dreier



<http://www.dla-art.com>



<http://www.pondart.com>



<http://www.pondart.com>



<http://www.swissbar.ch>

GOOD LUCK!



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