

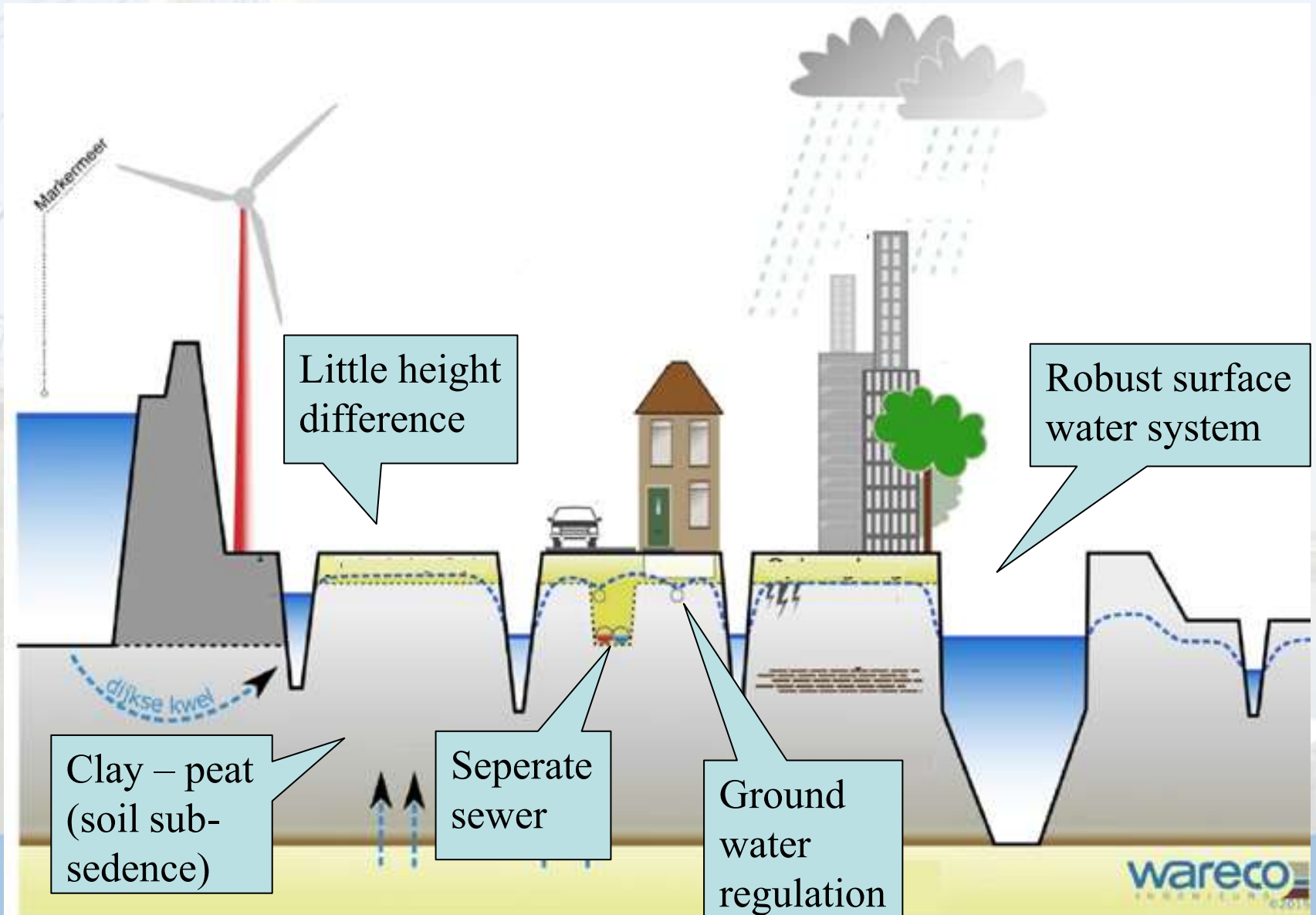


Addressing climate change in the city of Almere

Examples of storm water solutions
Ir. Maria Rus, city of Almere

Gemeente Almere

City of Almere: new city (oldest part 1976)



Heavy rainfall stress test

- Goal: rainfall T=2 no water on the street
- Goal: rainfall T=100 (in 2050) no damage

Model results, focus on:

- Main infrastructure accesible
- Prevention water in buildings



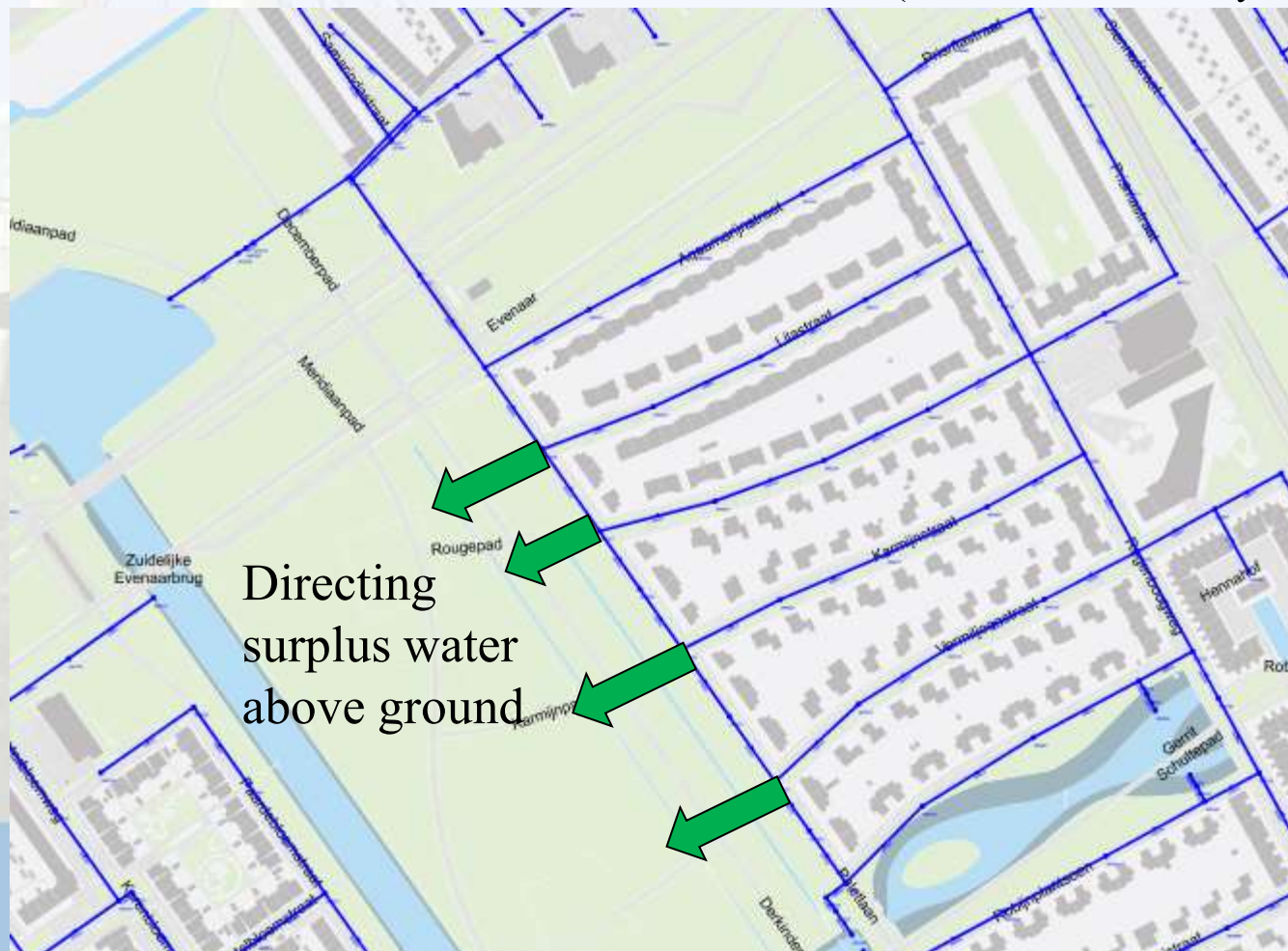
(Stresstest <https://almere.klimaatlas.net/>)

Photo: NOS)

Solutions

- Enlarging ~~sewer~~ → expensive
 - Oldest storm water sewers: life span minimum 30 years left
- Retaining water where it does less harm + use for groundwater <<soil subsidence

(Almere in Kaart, city of Almere)



Examples of solutions in Almere (new neighbourhood)



- Directing water
- Above ground

(Photos: City of Almere)

- Retaining water
- Combined solutions
- Always groundwater regulation



Example reconstruction public space



- Greener public space
- Water retention
- (limited) infiltration
- Groundwater regulation

(Photos Regenboogbuurt: Nanda Sluijsmans, twitter)



Example reconstruction public space



(google streetview 2009 - 2020)

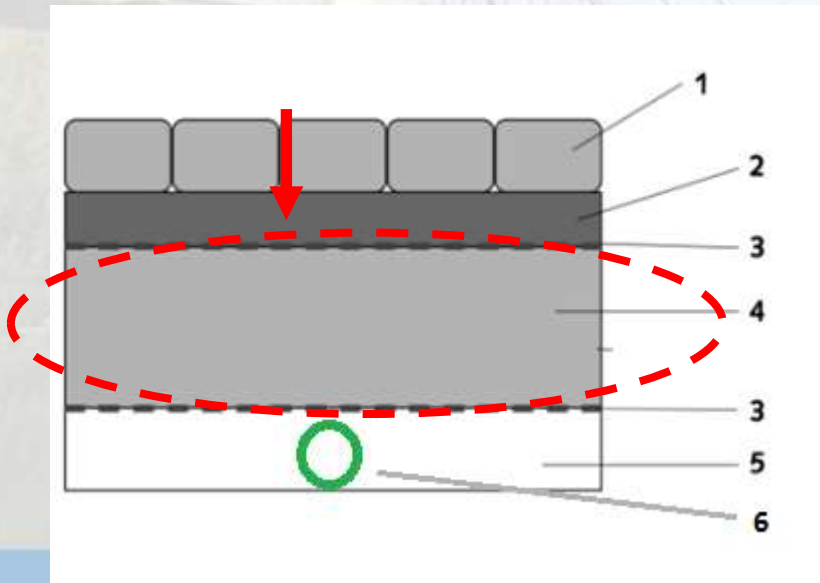
Greener public space - (limited) infiltration - directing water

Example limited public space (new neighbourhood)

- Porous pavements with retention in substructure

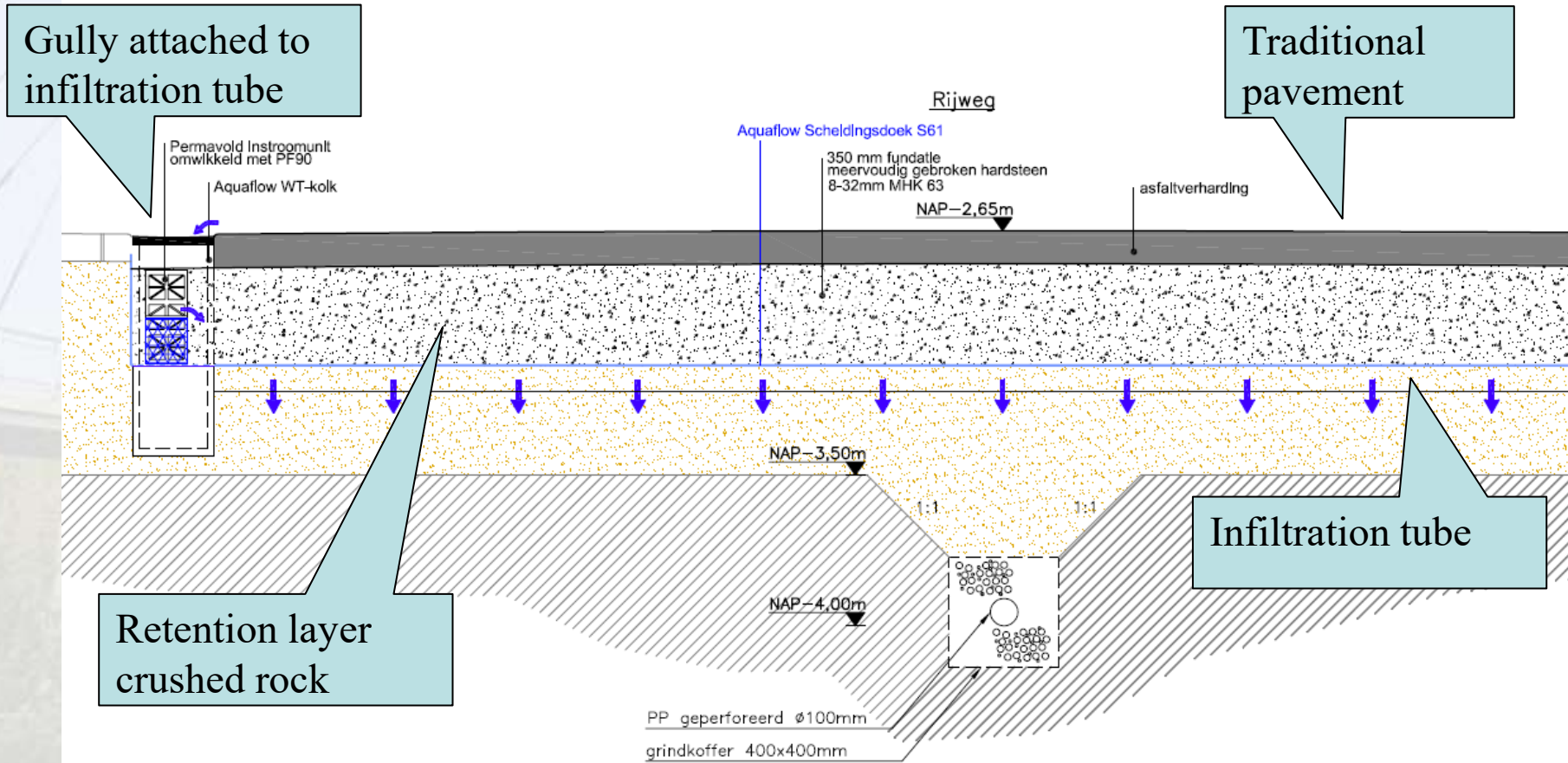
Problems:

- Top layer blockage
- Choice substructure different from design due to cost reduction (recycled building waste) → blockage retention, blockage groundwater regulation



1. Porous pavement
2. layer for stability bricks
3. Geotextile
4. Retention layer
5. Sand layer
6. Groundwater regulation

Example limited public space: improved

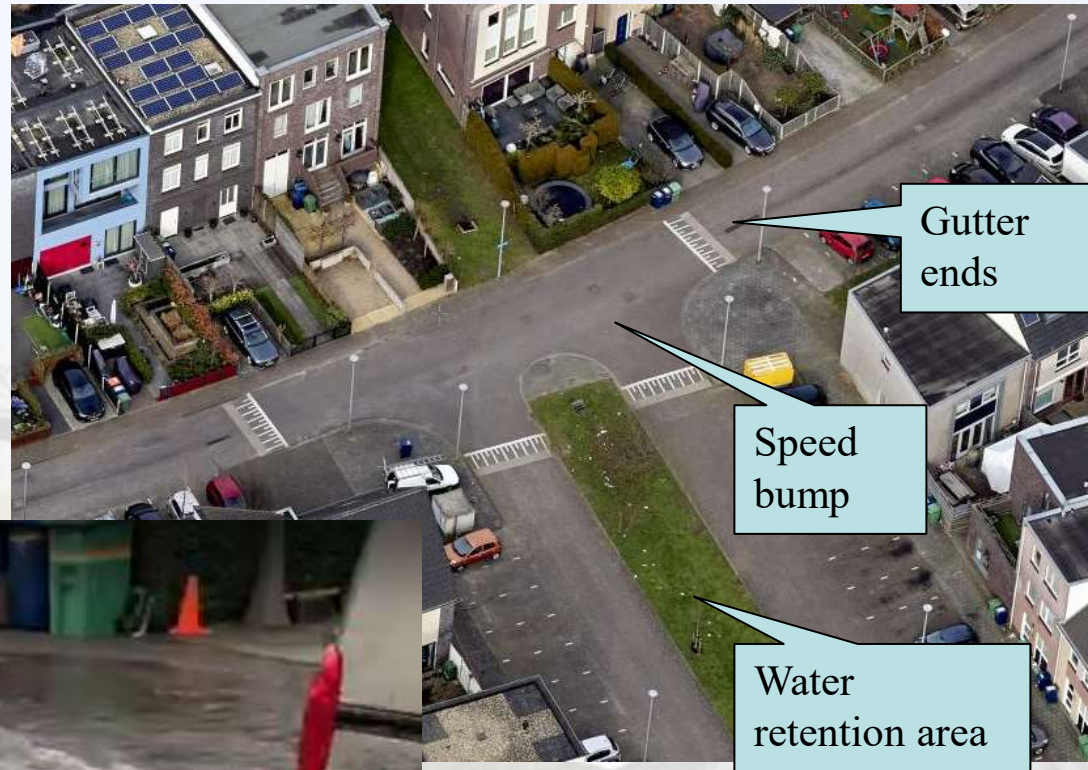


(figure City of Almere)

Challenges in implementation

- Surface flow: consultation traffic engineers in first design. In implementation overruled without feedback

(<https://www.1almere.nl/2021/10/21/hevige-regen-zorgt-voor-wateroverlast>)



<https://app.slagboomenpeeters.com/> 2021