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Baltic Sea Region

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SUSTAINABLE WATERS
WaterMan

Water Recycling Toolbox

Rain garden for the greening of a public car park

Braniewo Municipality

Gdańsk University of Technology

Real-world pilot replication blueprint

Interreg
Baltic Sea Region

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the European Union

SUSTAINABLE WATERS
WaterMan

Introduction to the pilot measure

Rain garden for the greening of a public car park

Braniewo Municipality

Gdańsk University of Technology

15 March 2023

GDAŃSK UNIVERSITY OF TECHNOLOGY

WaterMan Kick-off meeting

Kalmar & Västervik, Sweden (14-16/03/2023)

Braniewo Municipality (PP5) &GUT (PP7)

Presented by Magdalena Gajewska

WP- 2 PILOTING

WaterMan pilot actions in Braniewo (Poland)

- 2.2 Pilot measure / recirculation of retained water: **Urban raingarden at public swimming pool**
- 2.3 Pilot measure / reuse of treated water: **Reuse of public swimming pool water**
- 2.4 Local model strategy: **Municipal water re-use strategy**

Responsible Project Partner:

Braniewo Municipality (PP 5)

Gdansk University of Technology (PP7),
Faculty of Civil and Environmental Engineering

[Source: geoportal.gov.pl]

Location:

Łąkowa 1 Street, **Braniewo**, Poland

[Source:mos.braniewo.pl]

Municipal Sports Center „Zatoka”

Recreation & Rehabilitation Complex „Healthy Braniewo”

Infrastructure:

- **Indoor pool complex:**
  - sport swimming pool
  - leisure pool with wading pool
  - SPA bath

- **Wellness facilities:**
  - sauna rooms (x2)
  - gym
  - massage parlour
  - rest zone
  - tanning beds

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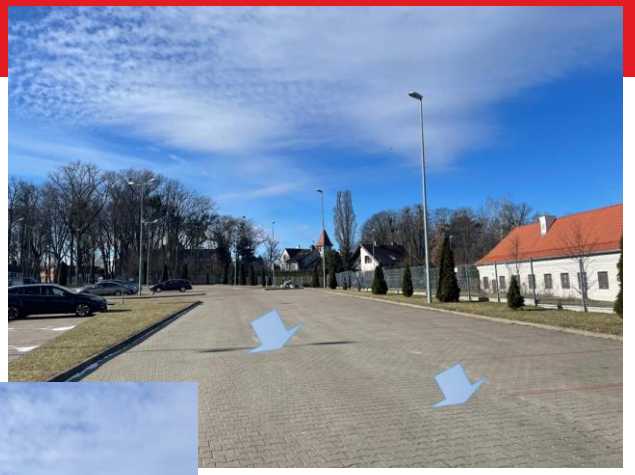

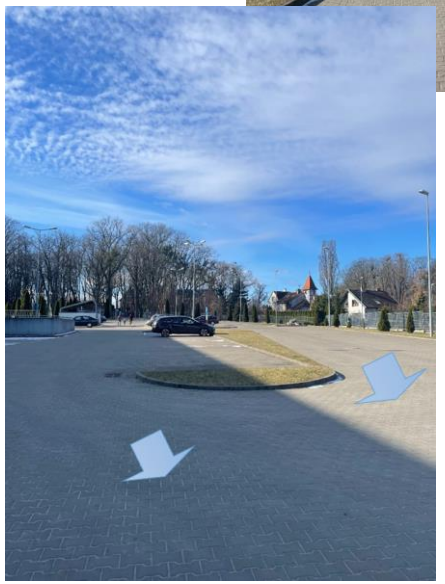

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2.2 Pilot measure / recirculation of retained water: Urban raingarden at public swimming pool

5 PLACE FOR RAINGARDEN

Retention flowerbed

2.2 Pilot measure / recirculation of retained water: Urban raingarden at public swimming pool

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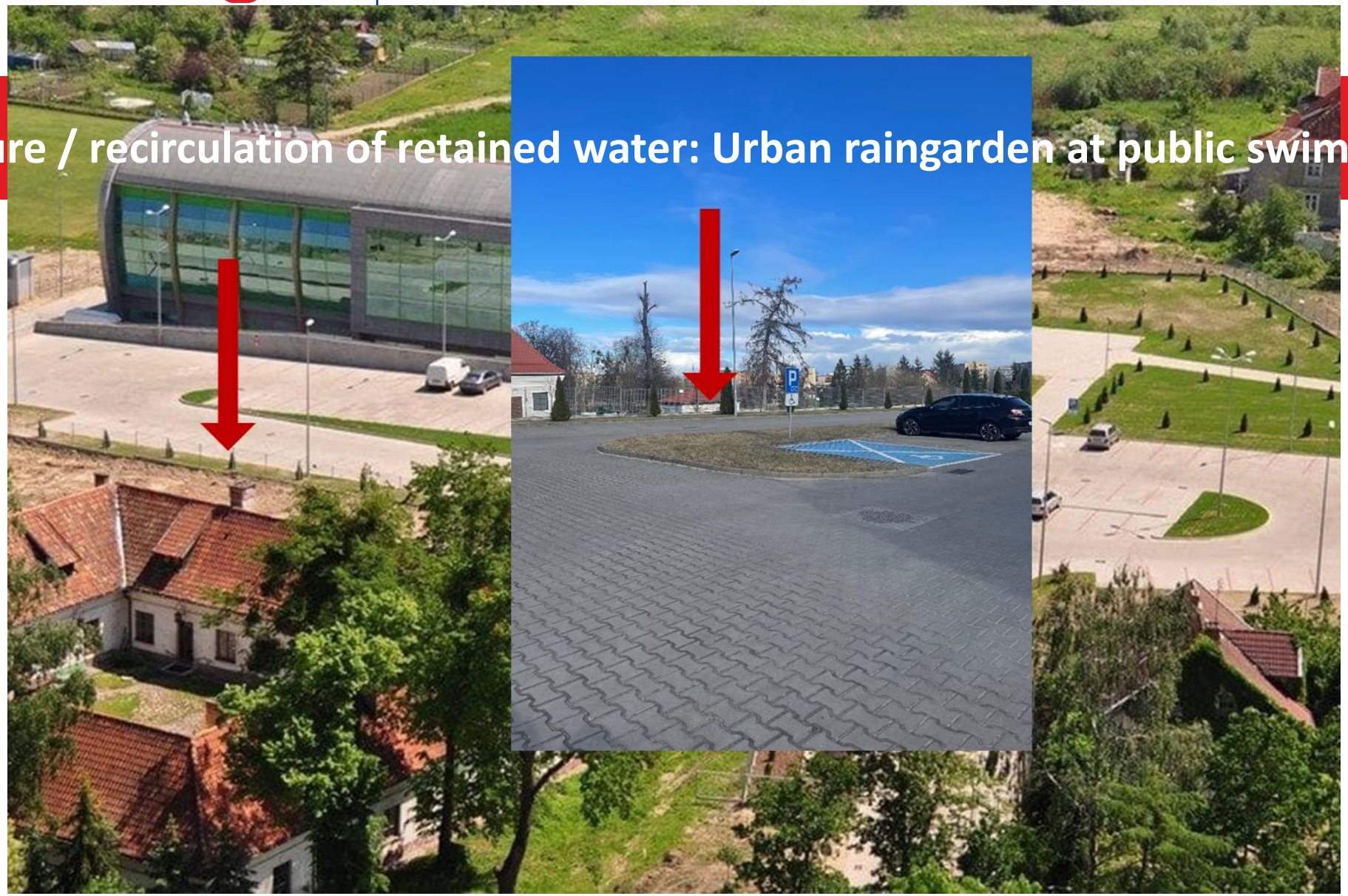

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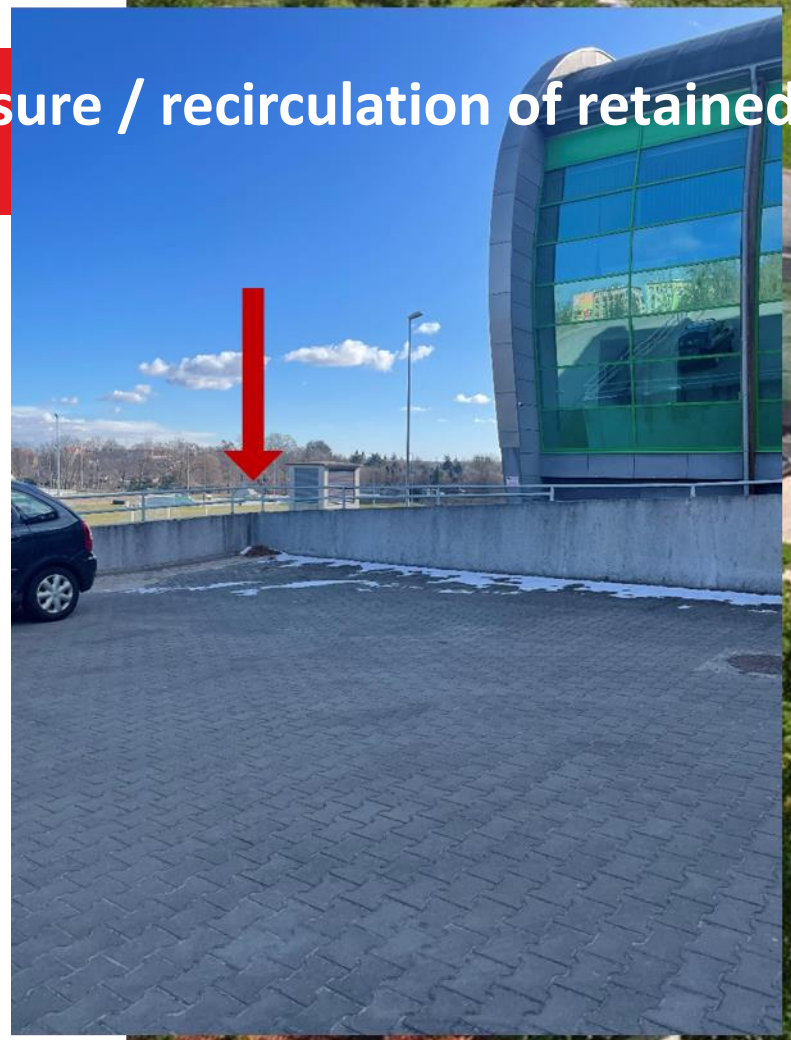

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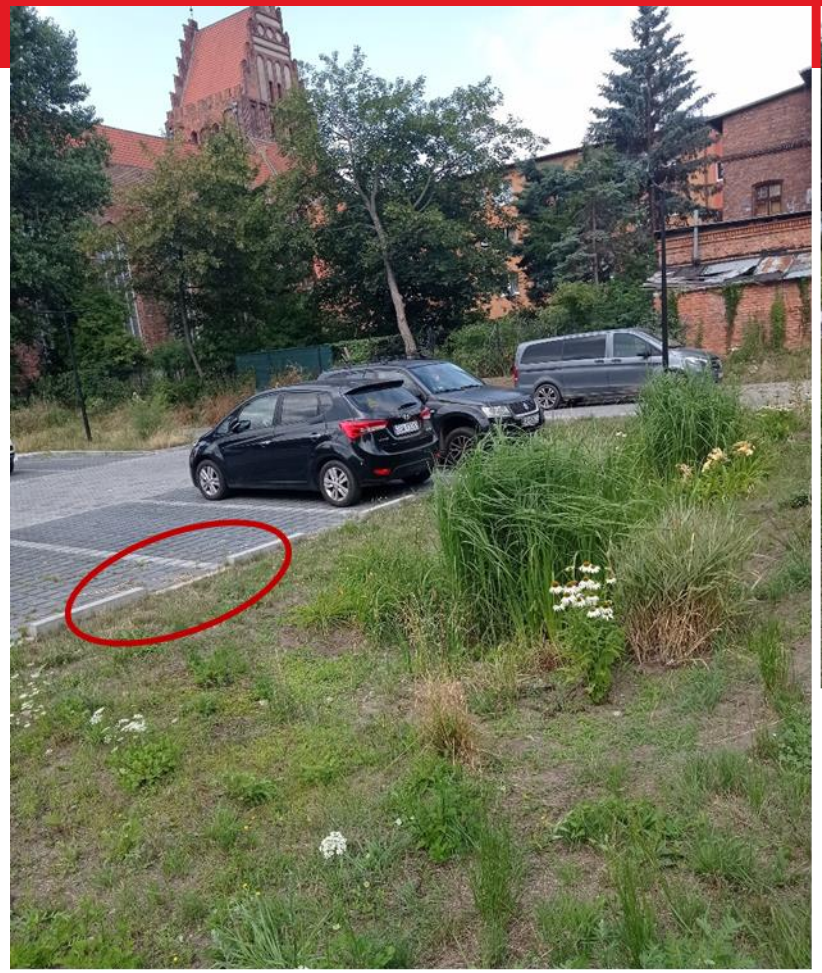

JAGGED CURBS

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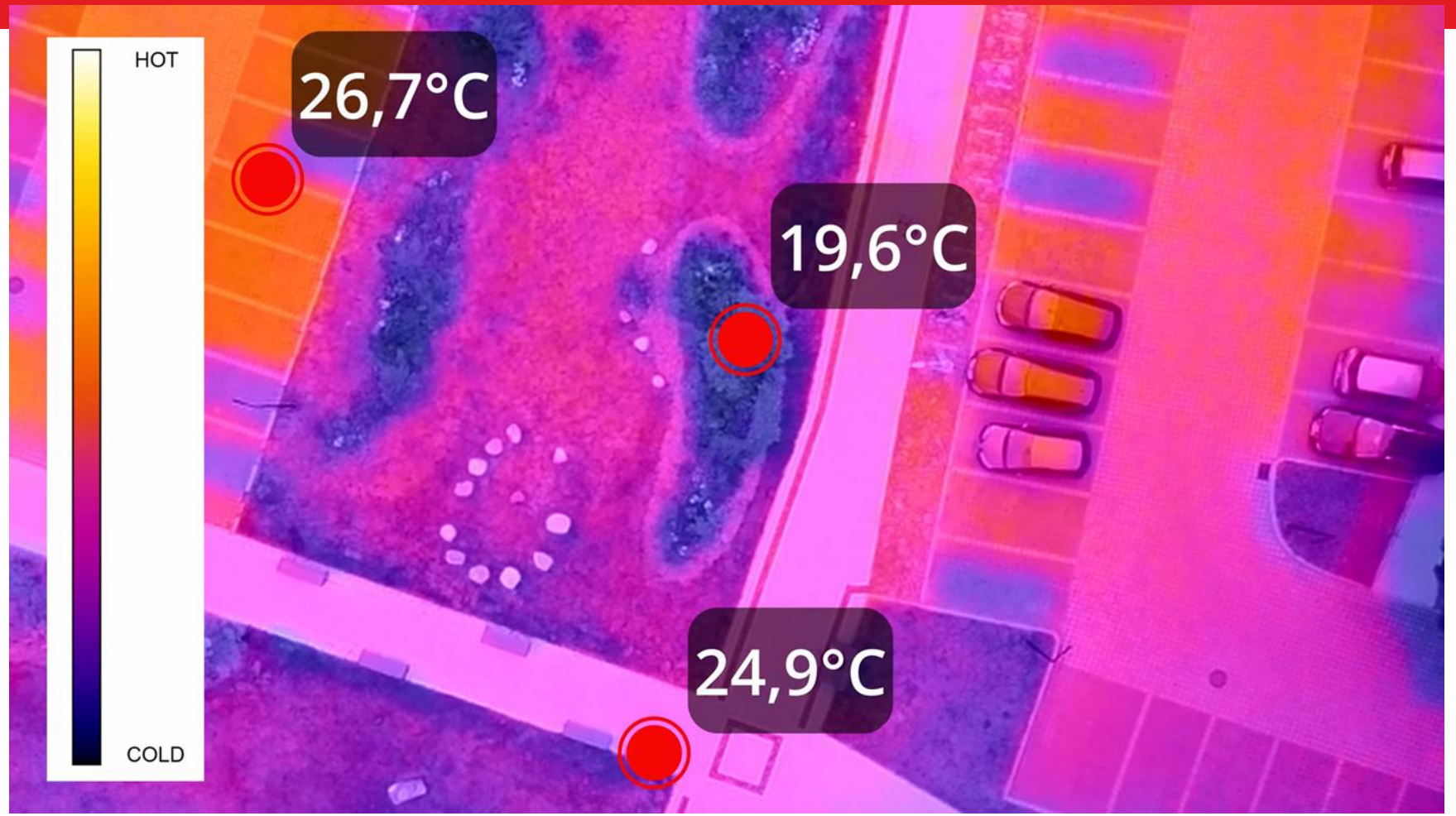

2.2 Pilot measure / recirculation of retained water: Urban raingarden at public swimming pool

GUTTER

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Baltic Sea Region

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SUSTAINABLE WATERS
WaterMan

1st Peer-review session

Rain garden for the greening of a public car park

Braniewo Municipality

Gdańsk University of Technology

5 Sept 2023

GDAŃSK UNIVERSITY OF TECHNOLOGY

WaterMan Partner meeting & on-site visit
Ringsted & Kalundborg / DK
5-6 Sept 2023

Braniewo Municipality (PP5) &GUT (PP7)

Presented by Magdalena Gajewska

WP- 2 PILOTING

WaterMan pilot actions in Braniewo (Poland)

- 2.2 Pilot measure / recirculation of retained water: **Urban raingarden at public swimming pool**

Recirculation of retained water: Urban raingarden at public swimming pool

Responsible Project Partner:

Braniewo Municipality (PP 5)

Gdansk University of Technology (PP7),
Faculty of Civil and Environmental Engineering

[Source: geoportal.gov.pl]

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- **Wellness facilities:**
  - sauna rooms (x2)
  - gym
  - massage parlour
  - rest zone
  - tanning beds

issues and challenges

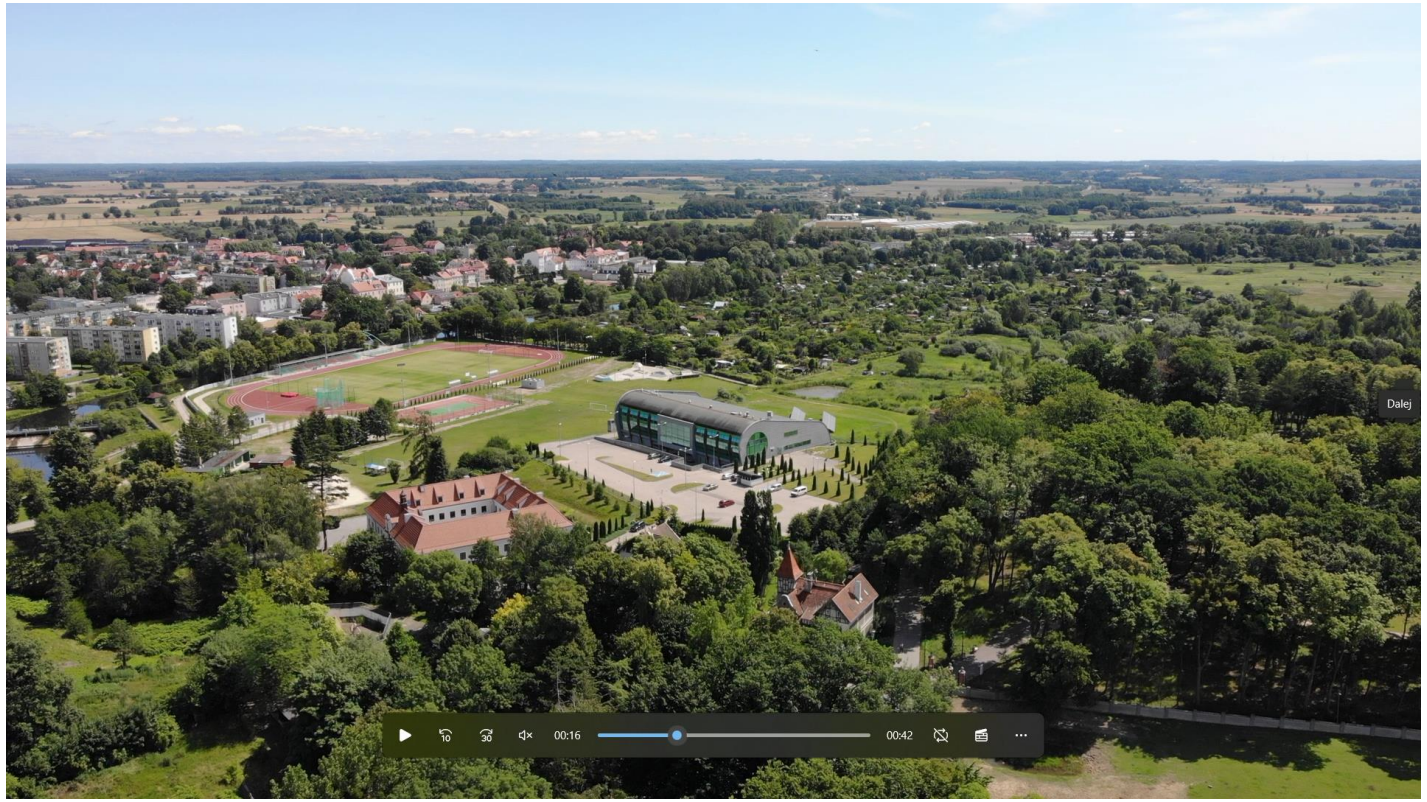
ISSUES

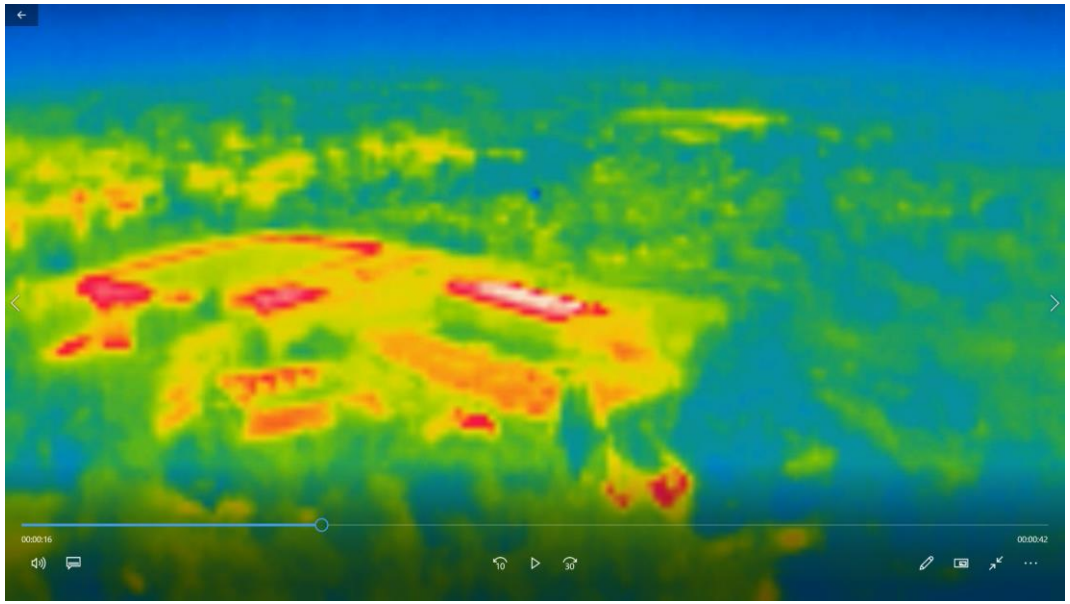
- concreted area around the swimming pool building - parking lot and surroundings:
- heats up (urban heat island effect)
- generates a large surface runoff during precipitation
- rainwater drained to the rainwater drainage system
- a small amount of urban greenery - mainly grass - dries up or is watered with tap water

CHALLENGES :

- transformation of urban greenery into functional greenery
- rataine rainwater at the point of origin

2.2 Pilot measure / recirculation of retained water: Urban raingarden at public swimming pool





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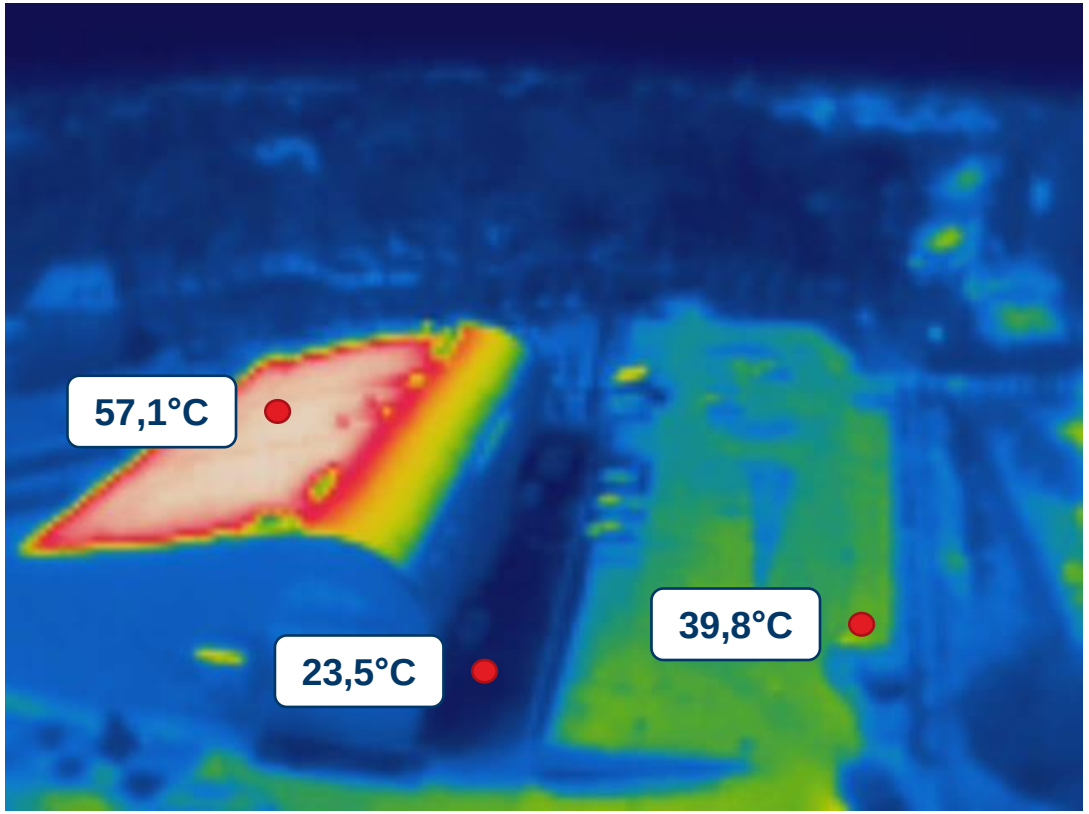

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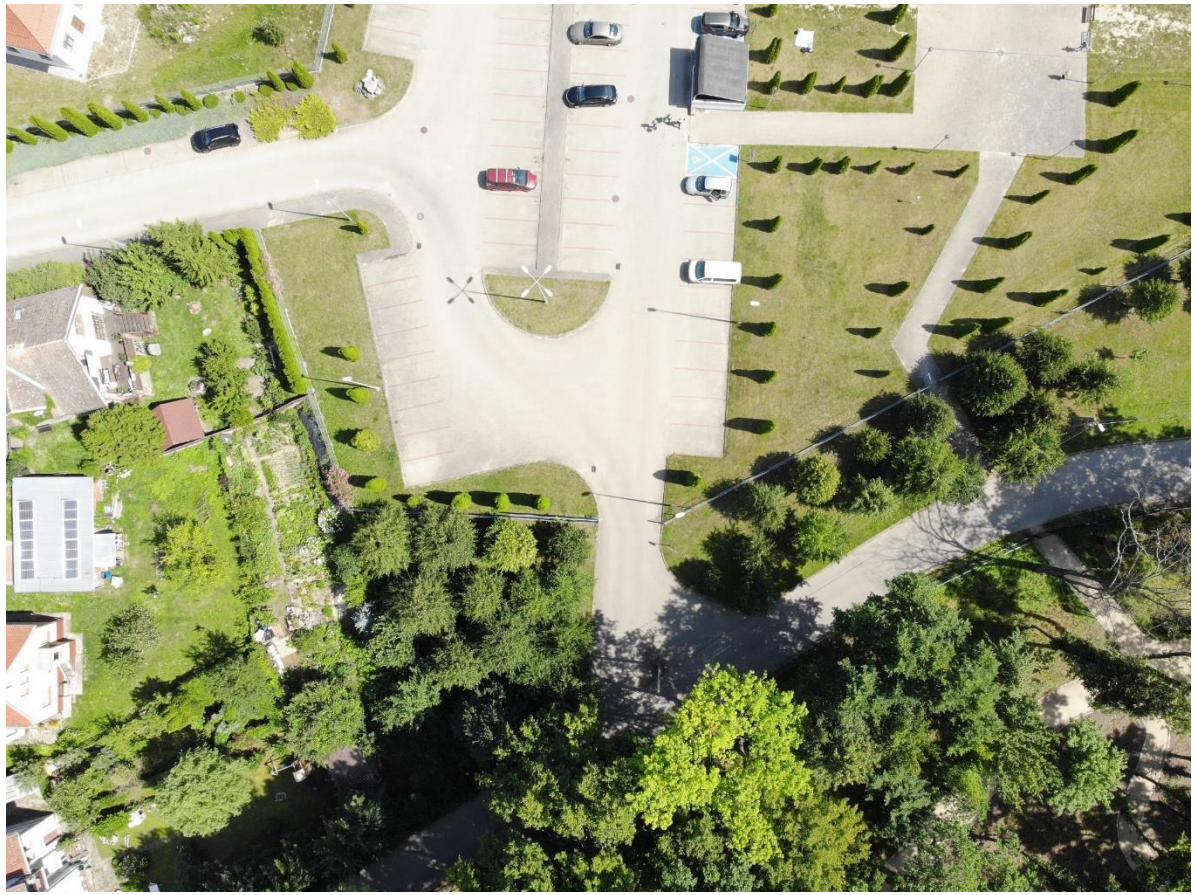

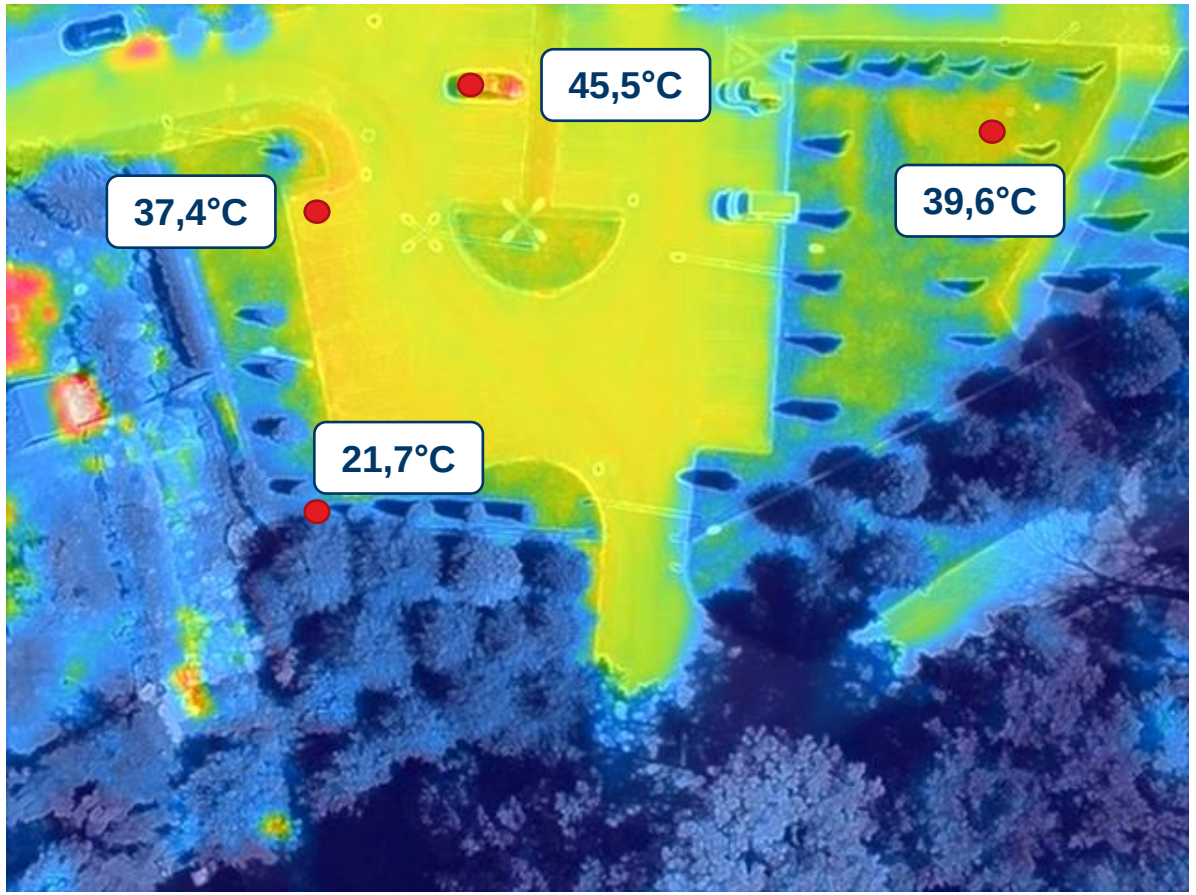

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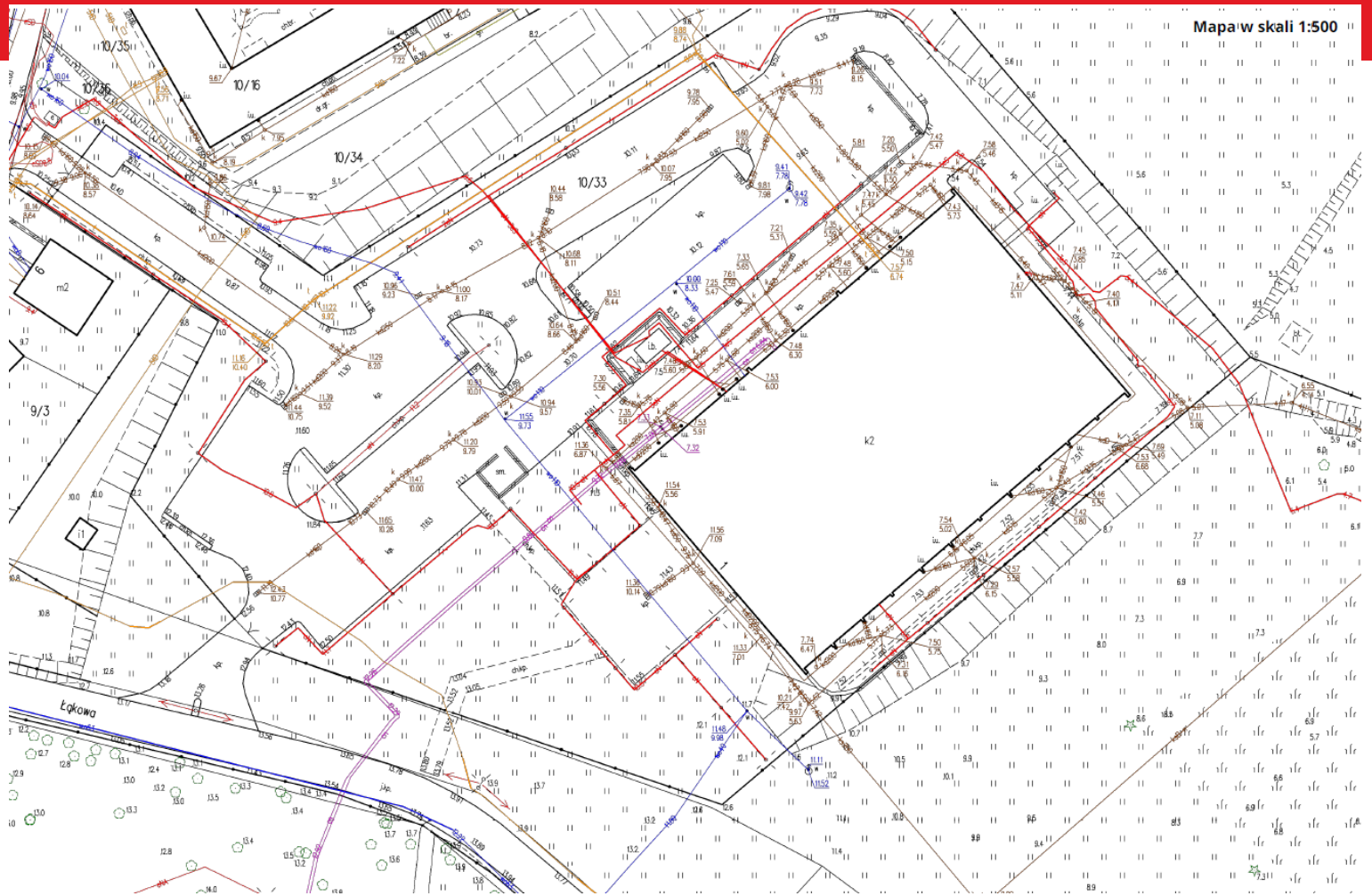

Catchment area:
~ 10 000 m^2

Main assumption - precipitation to manage:

30 mm from each m^2 of impermeable pavement

Roof area:
~ 2 000 m^2 → Rain water volume:
~ 65 m^3

Parking area:
~ 3 500 m^2

Street area:
~ 800 m^2 → Rain water volume:
~ 125 m^3

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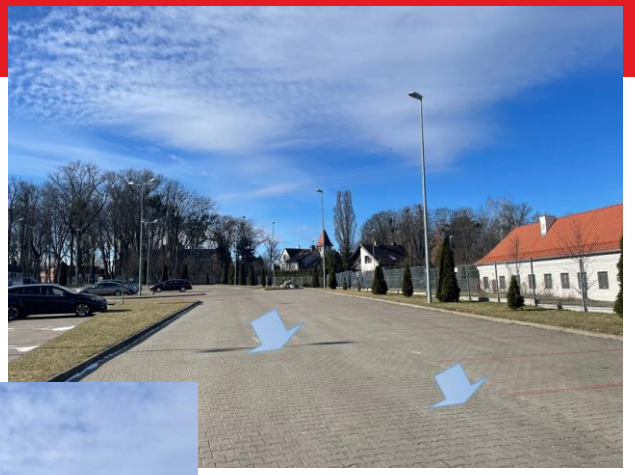
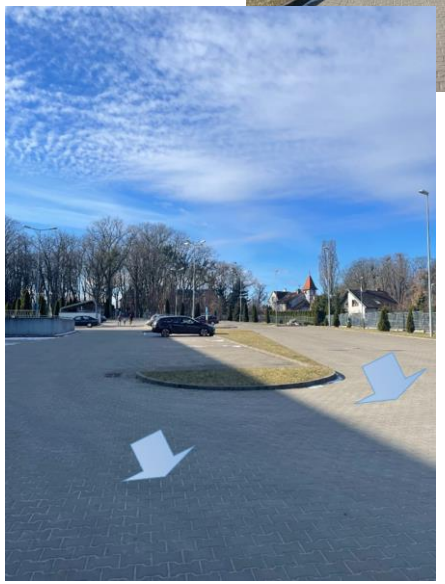
RESEARCH UNIVERSITY EXCELLENCE INITIATIVE

SOLUTION

2.2 Pilot measure / recirculation of retained water: Urban raingarden at public swimming pool





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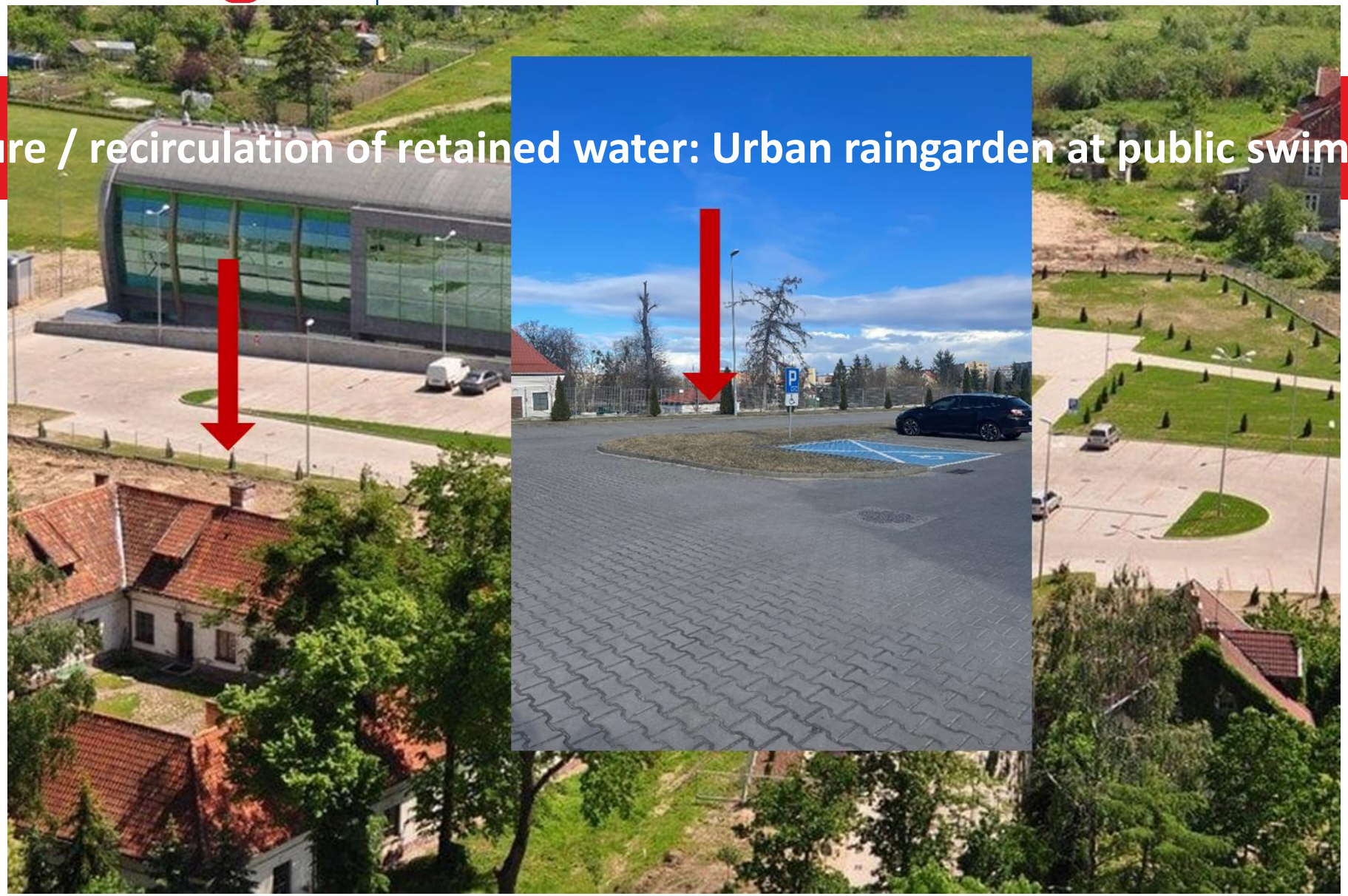

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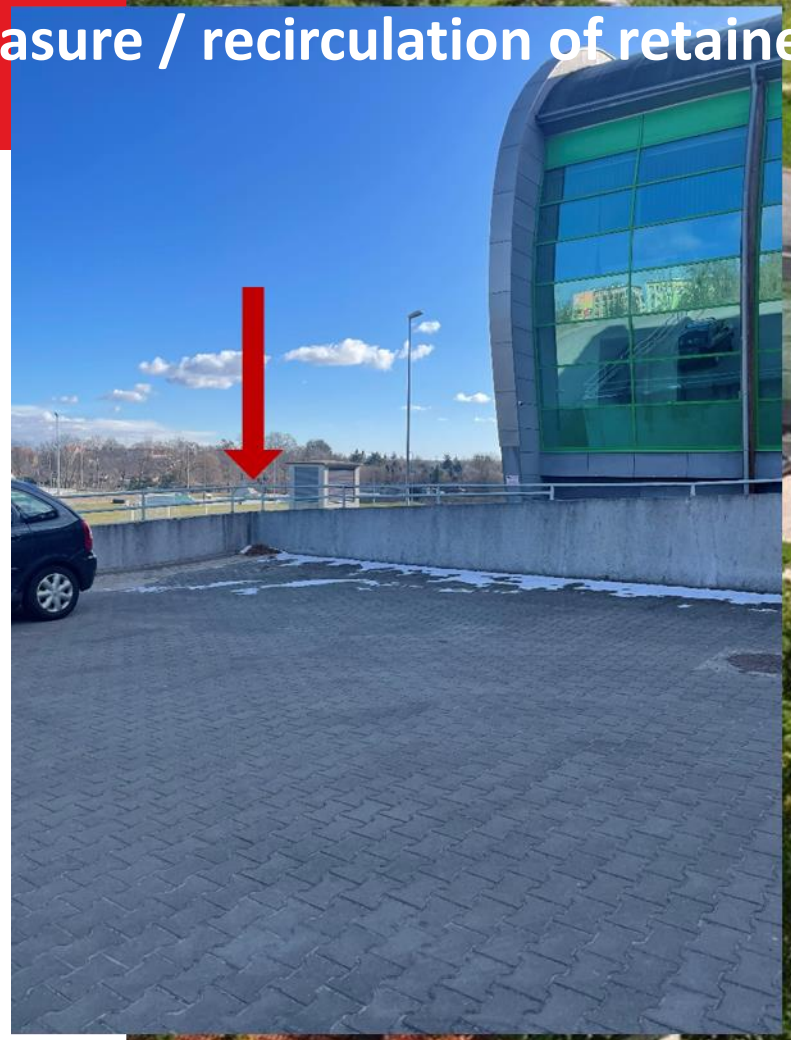

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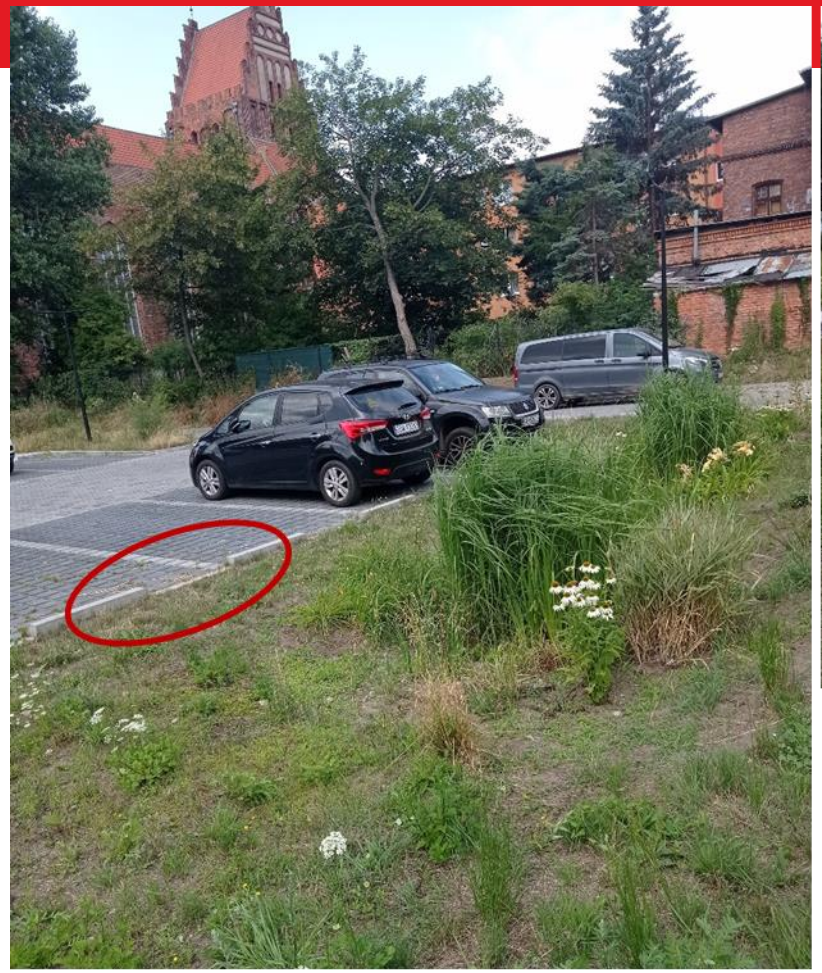

JAGGED CURBS

2.2 Pilot measure / recirculation of retained water: Urban raingarden at public swimming pool

GUTTER

Recirculation of retained water: Urban raingarden at public swimming pool

BENEFITS

1. no discharges or limiting the amount of rainwater discharged into the stormwater sewage system and its use for maintaining greenery- economic benefit
2. limiting the need to water the greenery with tap water on the premises - economic benefit- reuse of rainwater (CE)
3. lowering the ambient temperature - reducing the urban heat Island – ecosystem service benefit (human well being)
4. increasing biodiversity- ecosystem service benefit
5. improving the aesthetics of the place and creating a place of rest – ecosystem service (human well being)

1st Peer & expert review session: Recommendations & conclusions

- Retention tank for rainwater: Consider “nature embedded” / green design (e.g. with vegetation on the top), in order to avoid creating another steel construction. Otherwise, the tank may counteract the ambitions to make the swimming pool surroundings greener and to decrease the temperature.
- The swimming pool roof may be a better place for the photovoltaics (solar panels), than placing it on top of the retention tank. Maybe in this way the panels could even generate the energy for the whole process?
- Keep an eye on salinity (important for watering the grass). Do you need to lower salt concentrations in times of low precipitation and if yes, how can they be ensured (not mixing with rainwater)?
- Reconsider monitoring of bacteria, if e.g. the storage time of water in the tank is long. Question: Will mixing rainwater & pool water be enough to keep the water disinfected with the help of the residual chlorine?).
- Put “water reuse” on the local agenda in parallel to the planning & implementation. Start the stakeholder involvement as soon as possible. Inform the public about the plans early.

Pilot replication bluprint: Braniewo / PL: Rain garden for the greening of a public car park

Interreg
Baltic Sea Region

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SUSTAINABLE WATERS
WaterMan

Absorption report

Rain garden for the greening of a public car park

Braniewo Municipality
Gdańsk University of Technology

07 November 2023

GDAŃSK UNIVERSITY OF TECHNOLOGY

Absorption report: Pilot measures in Braniewo / PL

Uptake of recommendations & adjustments of the concept after the 1st peer & expert review session

Braniewo Municipality (PP5) & GUT (PP7)

Presented by Magdalena Gajewska

Ronne 07-11-2023

WP- 2 PILOTING

WaterMan pilot actions in Braniewo (Poland)

- **2.2 Pilot measure/recirculation of retained water: Urban raingarden at public swimming pool**
- **2.3 Pilot measure/reuse of treated water: Reuse of public swimming pool water**

Responsible Project Partner:

Braniewo Municipality (PP 5)

Gdansk University of Technology (PP7),
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4. **Retention tank for rainwater& swmming pool water : Consider “nature embedded” / green design (e.g. with vegetation on the top), in order to avoid creating another steel construction. Otherwise, the tank may counteract the ambitions to make the swimming pool surroundings greener and to decrease the temperature.**

- **Initial assumptions envisioned the construction of an underground tank, with photovoltaic panels installed on the pool ceiling**
- **We recommend the construction of an open tank with a vegetation area, which will contribute to the renaturalization of the water discharged from the pilot.**

5. **The swimming pool roof may be a better place for the photovoltaics (solar panels), than placing it on top of the retention tank. Maybe in this way the panels could even generate the energy for the whole process**

- **The issue of photovoltaic panels is not the subject of the WaterMan project.**
- **There is a need to change the initially proposed location if the open retention tank option is accepted.**
- **Placing panels on the roof would require a construction expertise.**

6. **Keep an eye on salinity (important for watering the grass). Do you need to lower salt concentrations in times of low precipitation and if yes, how can they be ensured (not mixing with rainwater)?**

- **We are aware of the problem caused by excessive saltwater irrigation of the grass, and field studies are planned on a section of the field.**
- **The technology for purifying pool water in the pilot facility will be focused not only on achieving the required quality parameters but also on limiting further increases in water salinity.**
- **The only realistic method to reduce salinity is the use of membrane methods (reverse osmosis), and we are prepared to conduct such studies.**
- **An effective method that reduces the negative environmental impact is precisely the mixing of pool water with rainwater.**

7. **Reconsider monitoring of bacteria, if e.g. the storage time of water in the tank is long. Question: Will mixing rainwater and pool water be enough to keep the water disinfected with the help of the residual chlorine?**

- **Water intended for watering lawns does not need to be devoid of bacteria; however, it cannot contain indicator bacteria (E.coli and Legionella if aerosols are formed). Such bacteria may be present in used pool water. Chlorination is an effective method for their elimination, thus preventing their secondary proliferation in the retention tank.**

9. Put “water reuse” on the local agenda in parallel to the planning and implementation. Start the stakeholder involvement as soon as possible. Inform the public about the plans early.

- Appropriate information activities regarding the local water reuse strategy are carried out in the Braniewo commune. Further dedicated actions are also planned.

Interreg
Baltic Sea Region

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SUSTAINABLE WATERS
WaterMan

2nd Peer-review session

Rain garden for the greening of a public car park

Braniewo Municipality

Gdańsk University of Technology

7 November 2024

WaterMan
All-partner Meeting

Berlin 4-7 November 2024

Braniewo (PP5) & GUT (PP7)

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Recreation & Rehabilitation Complex „Healthy Braniewo”

[Source: geoportal.gov.pl]

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RESEARCH UNIVERSITY EXCELLENCE INITIATIVE

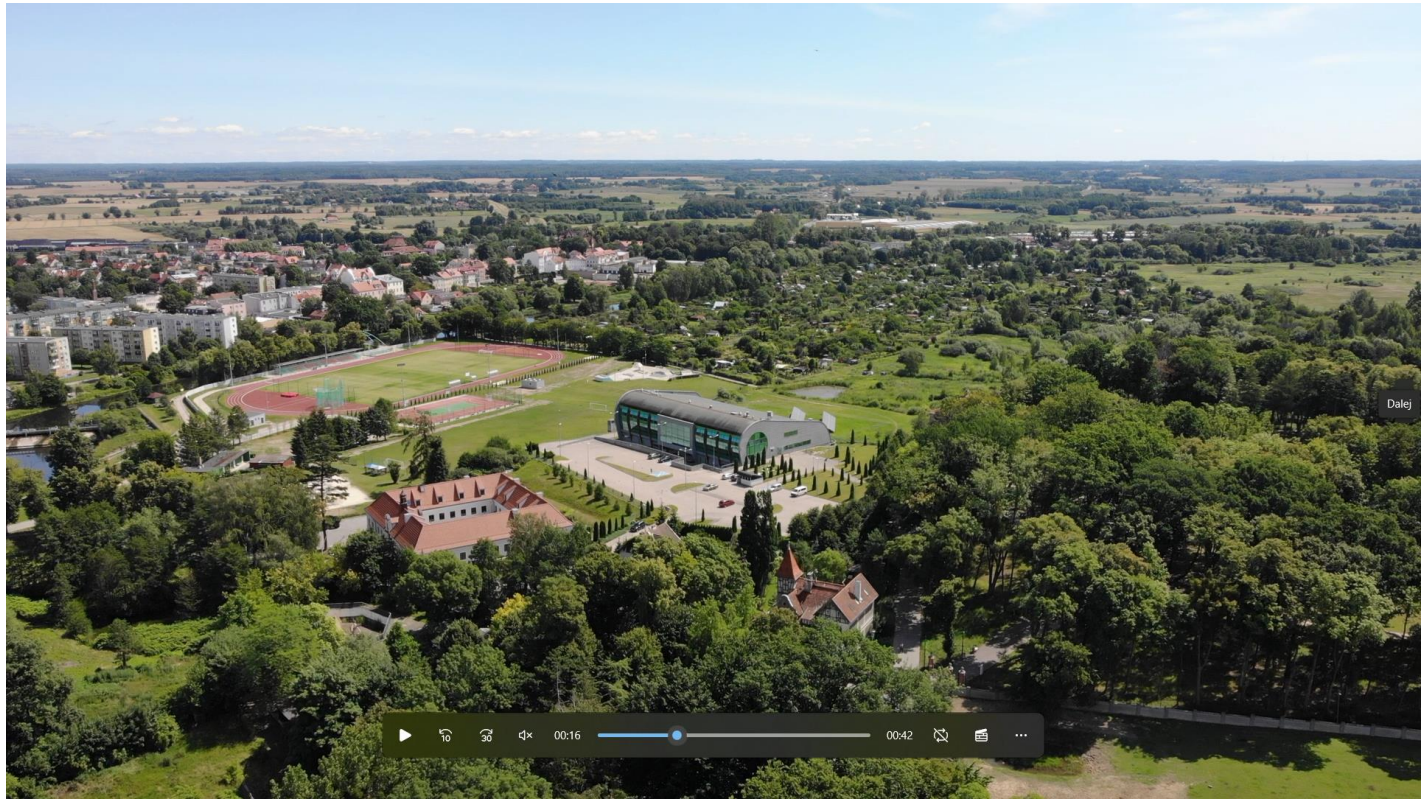
Braniewo / PL:

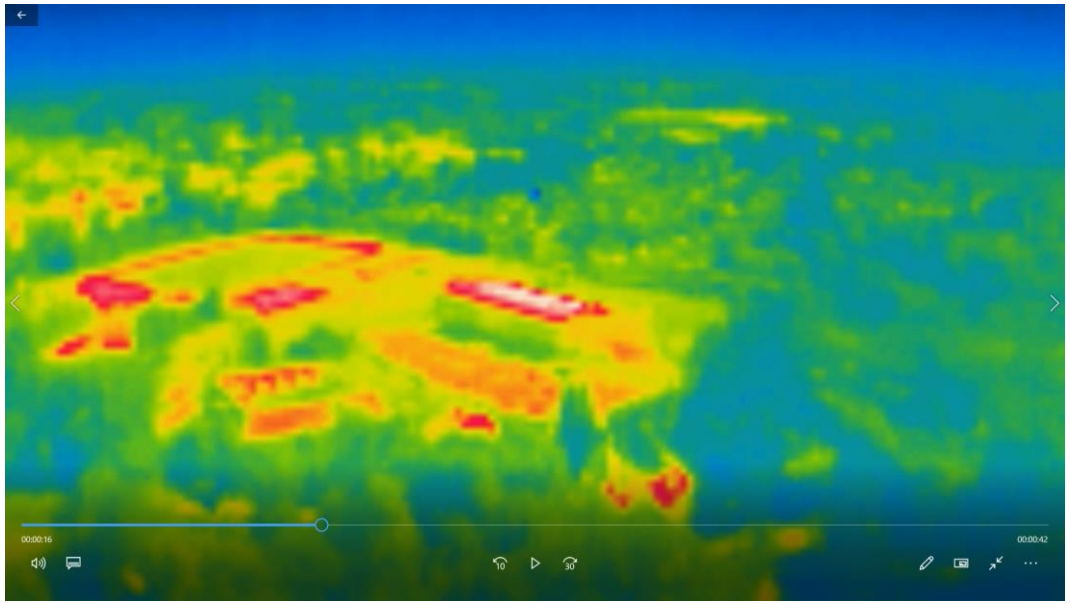
Reusing swimming pool water for irrigation of football fields

&

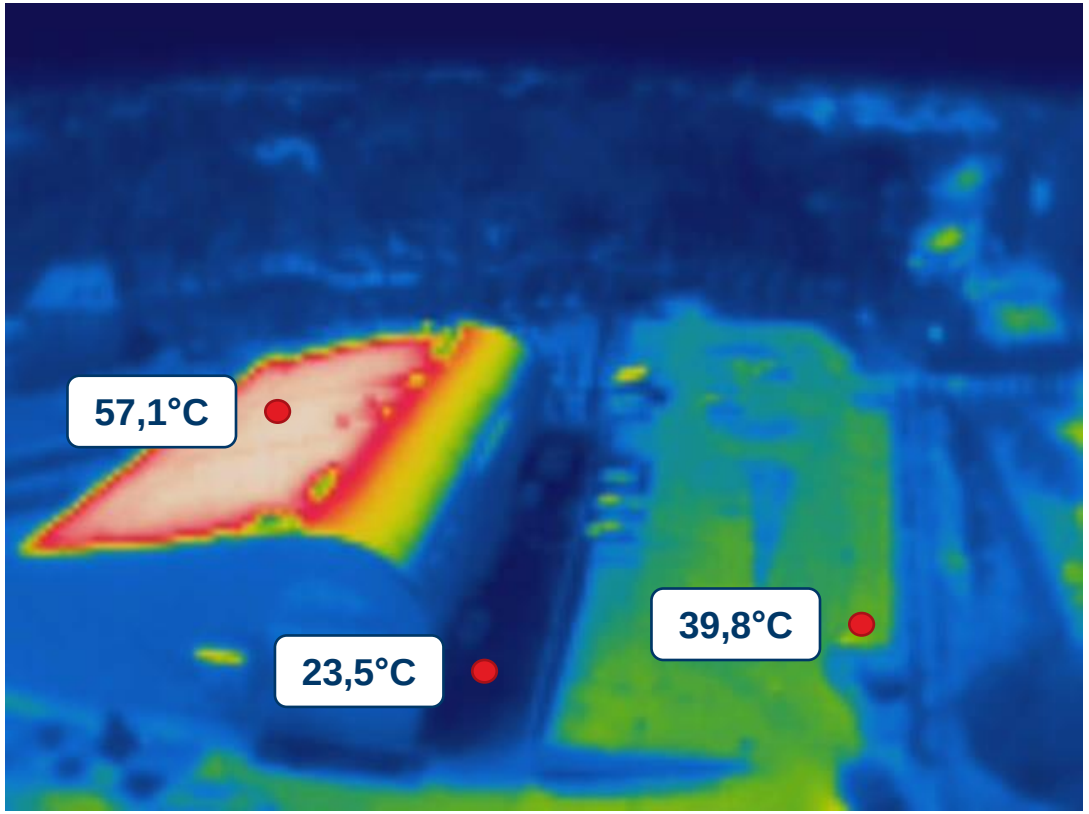
Creating urban rain gardens in the Municipal Sports Centre

Creating urban rain gardens in the Municipal Sports Centre





Creating urban rain gardens in the Municipal Sports Centre



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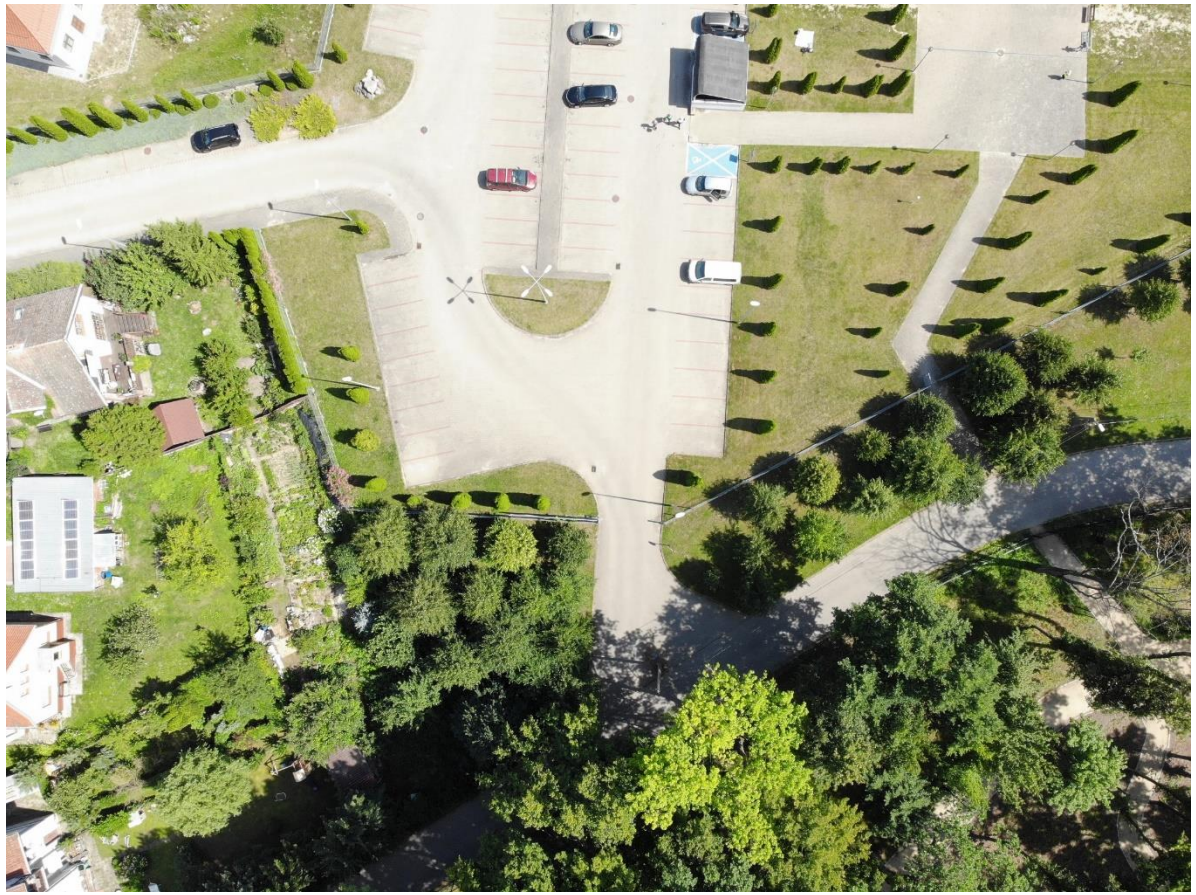

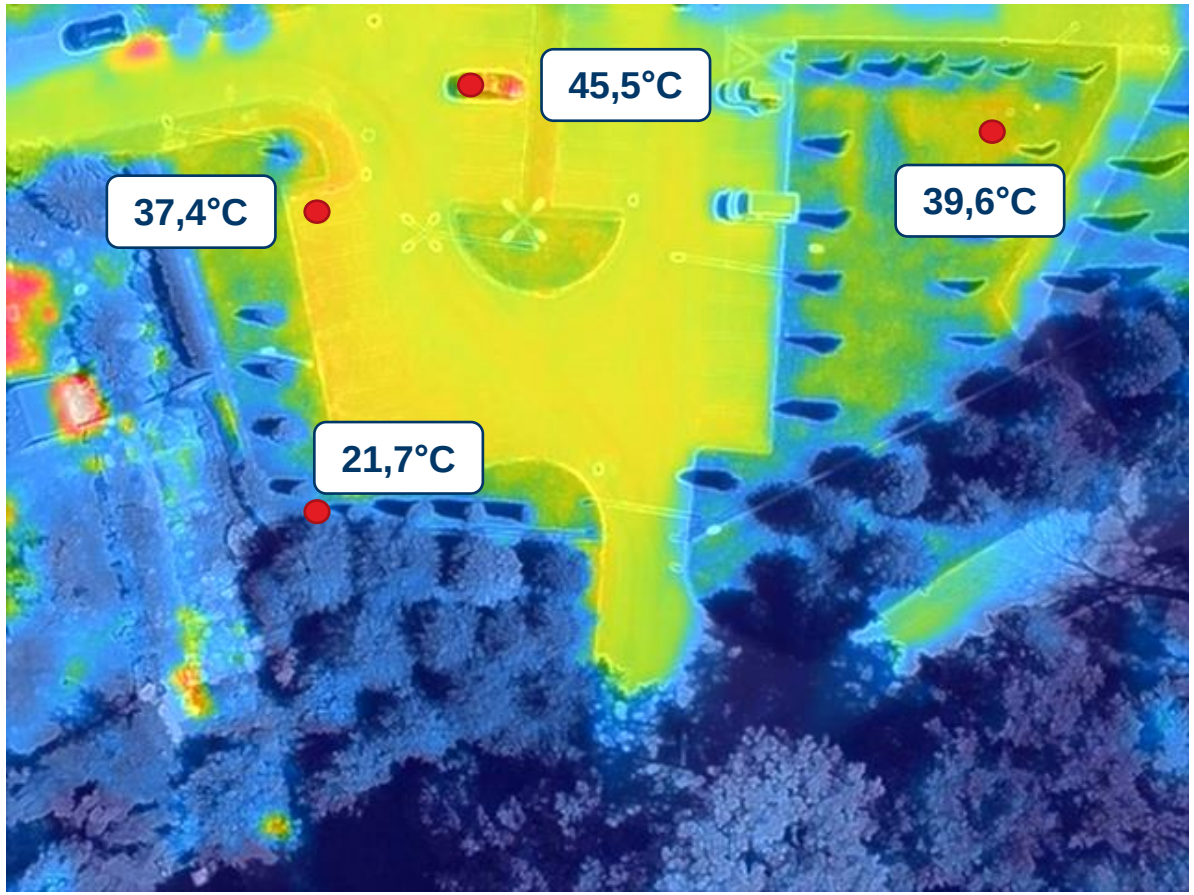

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RESEARCH UNIVERSITY EXCELLENCE INITIATIVE

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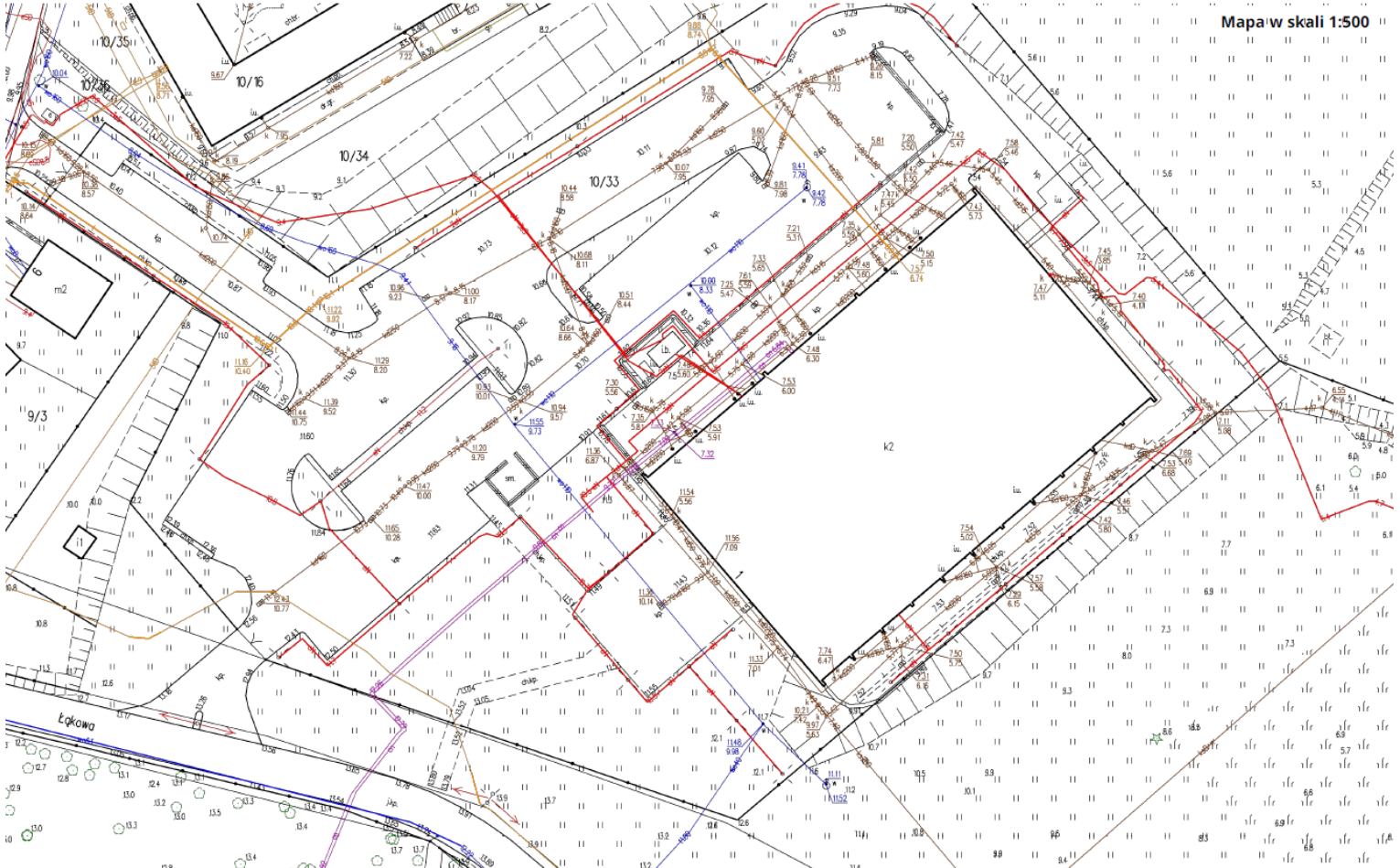

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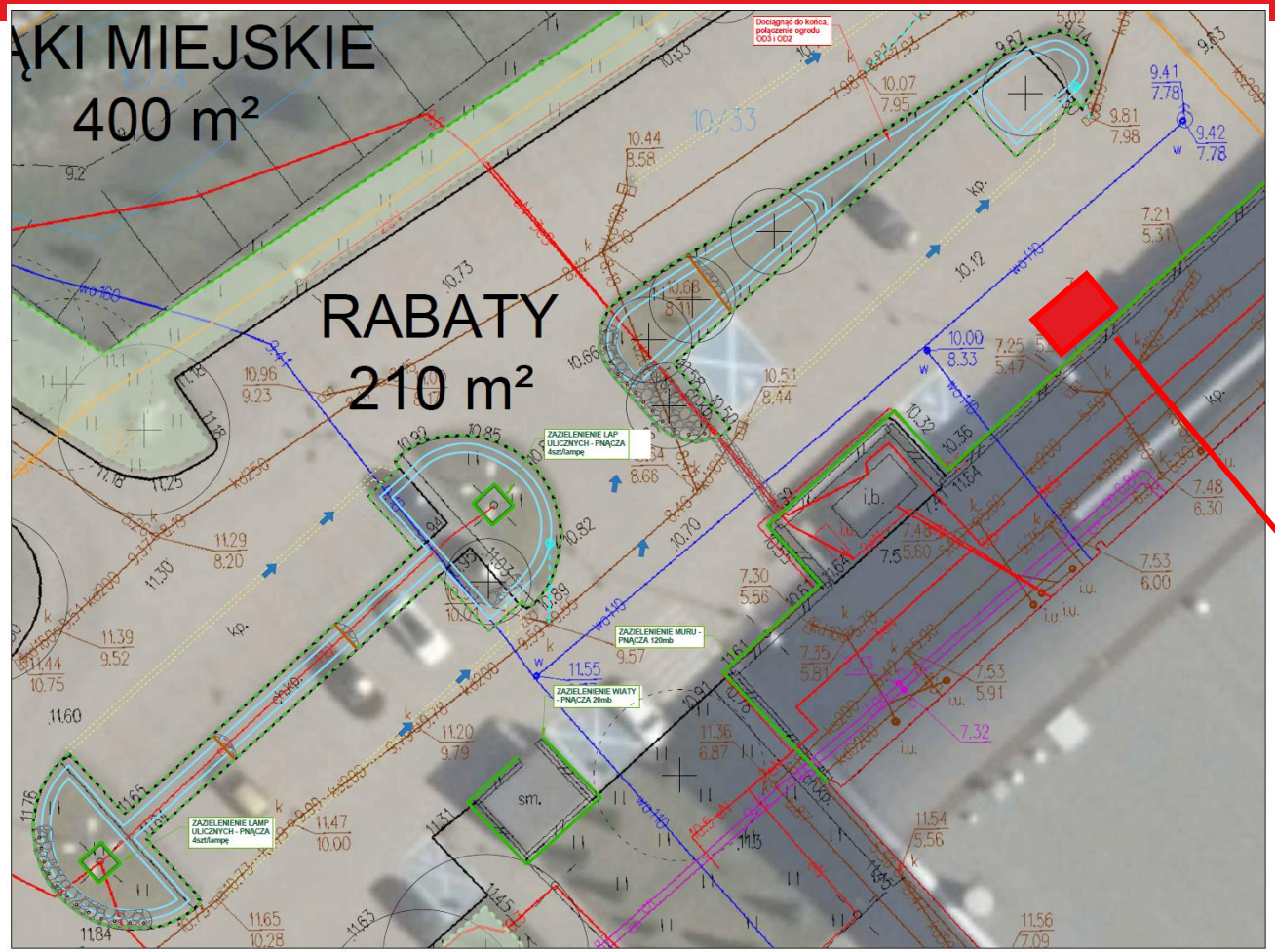
Creating urban rain gardens in the Municipal Sports Centre

GDAŃSK UNIVERSITY OF TECHNOLOGY | RESEARCH UNIVERSITY EXCELLENCE INITIATIVE | OPTION 1

Creating urban rain gardens in the Municipal Sports Centre

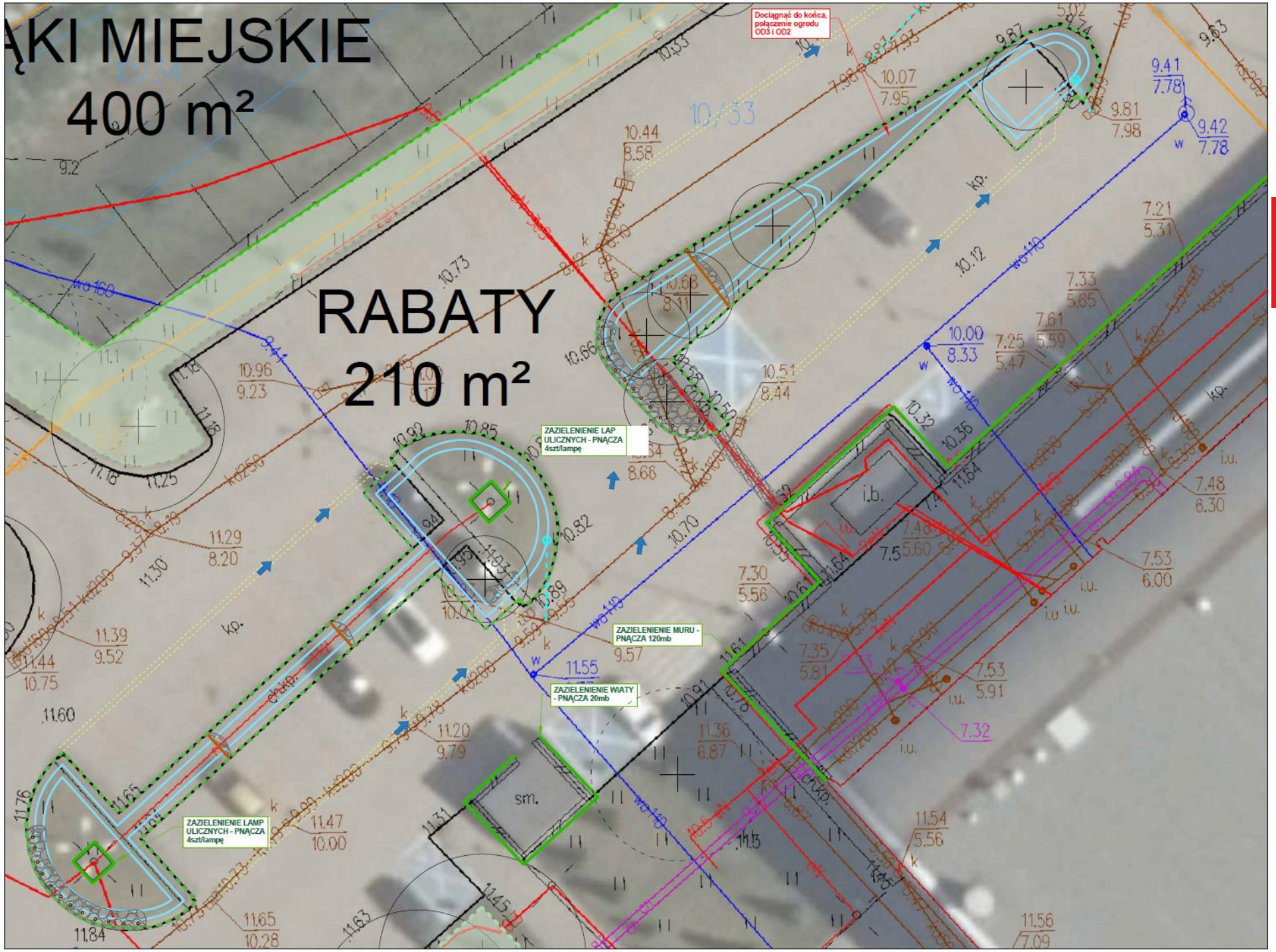


1. Flower meadow – 400 m²
2. Retention flowerbed – 210 m²
3. 2 parking places taken for greenery
4. Greening of street lamps - climbing plants
5. Greening of rubbish sheds - climbing plants
6. Greening the retaining wall - climbing plants

Closed retention tank (in the parking)

Esti[illegible] nd care instructions:

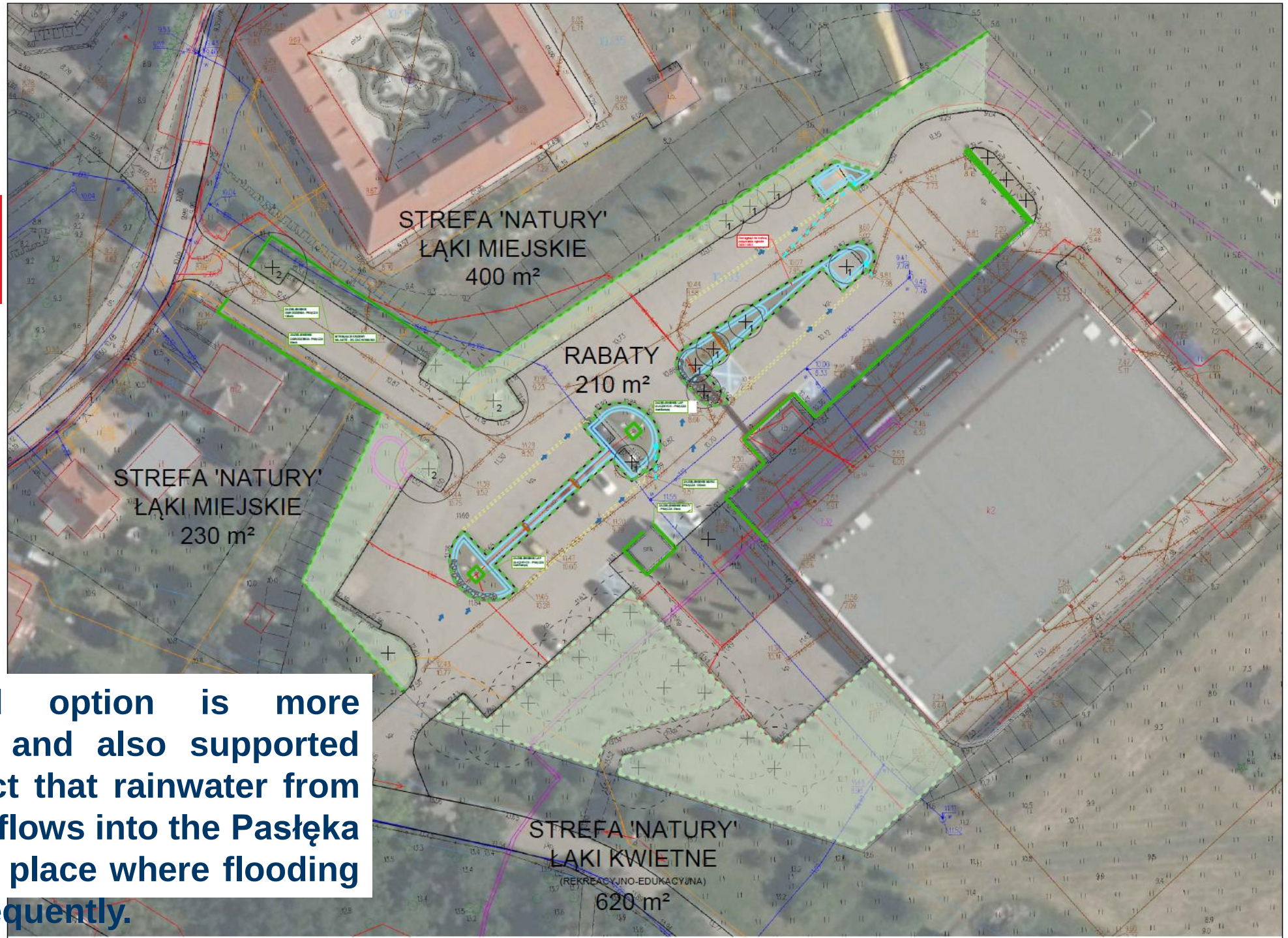
Option 1: 280,000 PLN net. (approx. EUR 63,500 net)


ĄKI MIEJSKIE
400 m²
RABATY
210 m²
Dociągnąć do końca, połączenie ogrodu OD3 i OD2
ZAZIELENIENIE LAP ULICZNYCH - PNĄCZA 4szt/lampę
ZAZIELENIENIE MURU - PNĄCZA 120mb
ZAZIELENIENIE WIATY - PNĄCZA 20mb
ZAZIELENIENIE LAMP ULICZNYCH - PNĄCZA 4szt/lampę
i.b.
sm.
kp.
i.u.

Creating urban rain gardens in the Municipal Sports Centre

1. Flower meadows – 400 m² + 230 m²
2. Flower meadow including educational and recreational pathways – 670 m²
3. Retention flowerbed – 210 m²
4. 2 parking places taken for greenery
5. Greening of street lamps - climbing plants
6. Greening of rubbish sheds - climbing plants
7. Greening the retaining wall - climbing plants

… Closed retention tank (in the parking)



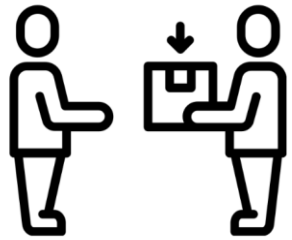
The 2nd option is more favorable and also supported by the fact that rainwater from the basin flows into the Pasłęka River in a place where flooding occurs frequently.

Creating urban rain gardens in the Municipal Sports Centre

1. reducing the urban heat island effect
2. improved drainage of the car park area and use of rainwater, which has so far been discharged into the drainage system to irrigate greenery and increase soil moisture - mitigating thermal conditions
3. improvement of the local microclimate (air circulation, air purification from pollutants (dust, etc.),
4. aesthetics of the space and increasing its attractiveness for visitors to the MSC (small architecture, camouflage greenery)
5. economical approach to greenery maintenance
6. increasing the awareness of the inhabitants of Braniewo regarding climate change and the operation of green infrastructure.

Involvment of Stekholdres
By Association of Polish Communes Euroregion Baltic

Recipients



- External stakeholders (external environment)
- Recipients/ local stakeholders - consumers of treated water
- Municipal employees representing the City Hall, budgetary entities and entities with a municipal budget share (other municipal workers from the nearest municipalities
- Young people (school children, ecological youth clubs supported by teachers and school administration, parents' councils)
- General public

Ways to engage them in the pilot programme and motivate them to use recycled water

Possible actions:

- "Civic and Urban Engagement Days"
- A series of workshops titled "Water-Sensitive Cities"
- Conferences with dedicated training sessions for local government authorities, employees, and organizational units
- Awareness-Raising Events
- An Educational and Informational Campaign
- Contest for kids and youth

Working with external stakeholders (external environment)

Engaging and informing the invitation of various stakeholders:

Central:
- Gospodarstwo Wody Polskie (National Water Agency)
- Ministry of Environment
- General Directorate for Environmental Protection (GDOŚ)
- Chief Inspectorate for Environmental Protection (GIOŚ)

Regional level:
- Voivodeship Departments (Department of Environment and Agriculture);
- Regional Water Management Boards
- Regional Inspectorates for Environmental Protection carry out monitoring of water quality
- Voivodeship Fund for Environmental Protection and Water Management in Olsztyn

County level:
- Counties (poviats):
Poviat Environmental Protection and Water Management Fund (PFOŚiGW);
District Sanitary and Epidemiological Station in Elbląg
- County Office (Poviat Starosty in Braniewo)

AIMS:
- **gain political and strategic support**
- **to strengthen the impact of project activity and impact area**
- **interest of external audiences and transferability of solutions**
- **better publicity and building up local government expertise in this area**

How to do it? Individual invitations, bilateral meetings, participation in open events (project and external), invitation and study trip during event in Braniewo

2nd Peer & expert review session: Recommendations & conclusions

Further info from the presentation:

- An option: underground reservoir – for private and for public use.
- New use case for autumn and winter (part of strategy, not part of the pilot): discharge the water to the ditches (to increase water table in the melioration ditches and ensure that the neighbouring soil benefits from the water in early spring). > Braniewo suffers mostly from the droughts in springtime – vegetation is suffering.

Comments from the peer & expert review:

- Prioritize / organise users according to their needs & re-use demand. Perhaps also in relation to conditions (e.g. wet weather, dry weather – who will be allowed to use). This is very important.
- You have a lot of potential users. Select one user with which you will go to with “real testing”, evaluation, etc. We recommend here to have a very concrete, detailed plans for the last months of evaluation. Plan it now.

Pilot replication bluprint: Braniewo / PL: Rain garden for the greening of a public car park

Interreg Baltic Sea Region

Co-funded by the European Union

SUSTAINABLE WATERS WaterMan

Status updates

Rain garden for the greening of a public car park

Braniewo Municipality

Gdańsk University of Technology

Date of updates

Interreg Baltic Sea Region

Co-funded by the European Union

Access the „BSR Water Recycling Toolbox" here.
https://www.eurobalt.org/waterrecyclingtoolbox/

SUSTAINABLE WATERS
WaterMan

The „BSR Water Recycling Toolbox" was elaborated as part of the project "WaterMan - Promoting water reuse in the Baltic Sea Region through capacity building at local level", The project is co-financed by the European Union (European Regional Development Fund) and implemented within the Interreg Baltic Sea Region Programme. More information:

eurobalt.org/WaterRecyclingToolbox
interreg-baltic.eu/project/waterman

WaterMan promotes a region-specific approach to water recycling, which intends to use the alternation of too much and too little water that has become typical in the Baltic Sea Region to make the local water supply more resilient, and supports municipalities & water companies in adapting their strategies.