

**Interreg**



Co-funded by  
the European Union

**Central Baltic Programme**

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**MUSTBE**

***Multidimensional storm water  
treatment in urban areas for  
cleaner Baltic Sea***

*Pori's pilot site nr2, treetank  
solution*

2.10.2024, Pori

Alexi Siirtola, Construct engineer,  
City of Pori





## Pori's pilotsite nr 2: Treetank

**Interreg**



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**PORI**

**MUSTBE**

June 1910



Picture: John Englund

12.8.2007



Picture: Jari Hietala



## Summer 2019

Green parking place close to city center  
With nice woods



## Summer 2024

worn, used parking space. Trees are not well, they don't grow, size is the same as in 2019. Edge stones are loose, asphalt has bumps. Storm water drains directly into gullies untreated

# Winter 2023-2024

## Some more challenges



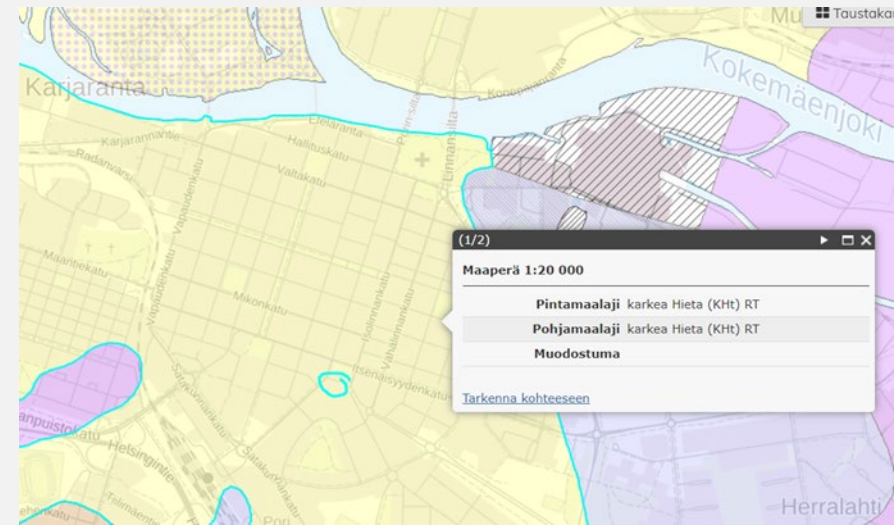
Snow melts-freezes-melts-freezes...-  
>ice-water, not good for asphalt nor to  
trees.

- catchment area,  
1700 m<sup>2</sup>

- Landuse:
  - Urban 100 %

Soiltype:  
fine sand, infiltration  
might be possible

Storm water could include:  
Heavy metals: e.g., lead and zinc.  
PAH compounds  
Microplastics  
Oils and greases  
Tire rubber



## OUR GOALS FOR THE PROJECT

- **Reduce amount** of storm water
- Improve the **quality of stormwater** by reducing emissions, Targets:
  - Suspended solids 60%
  - Total nitrogen 30%
  - Hydrocarbons (oil products) 50% - calculated, assumed based on correlation with suspended solids
  - Metals 40% - calculated, assumed based on correlation with suspended solids
- Have some **more green**; trees, bushes, hays
- Reduce the urban **heat island effect**
- By planting **different tree species** to test which one can stand the storm waters best
- **Create a model** for street renovation to future renewings in the city of Pori
- Have an example that **Nature Based Solutions** can be used in **dense city area** too
- And to have a place where to study **what NBS-structure is and how it works** to everyone who works for urban development
- **to create a more pleasant urban environment**



## SOME MORE GOALS AND CHALLENGES IN THE PROJECT

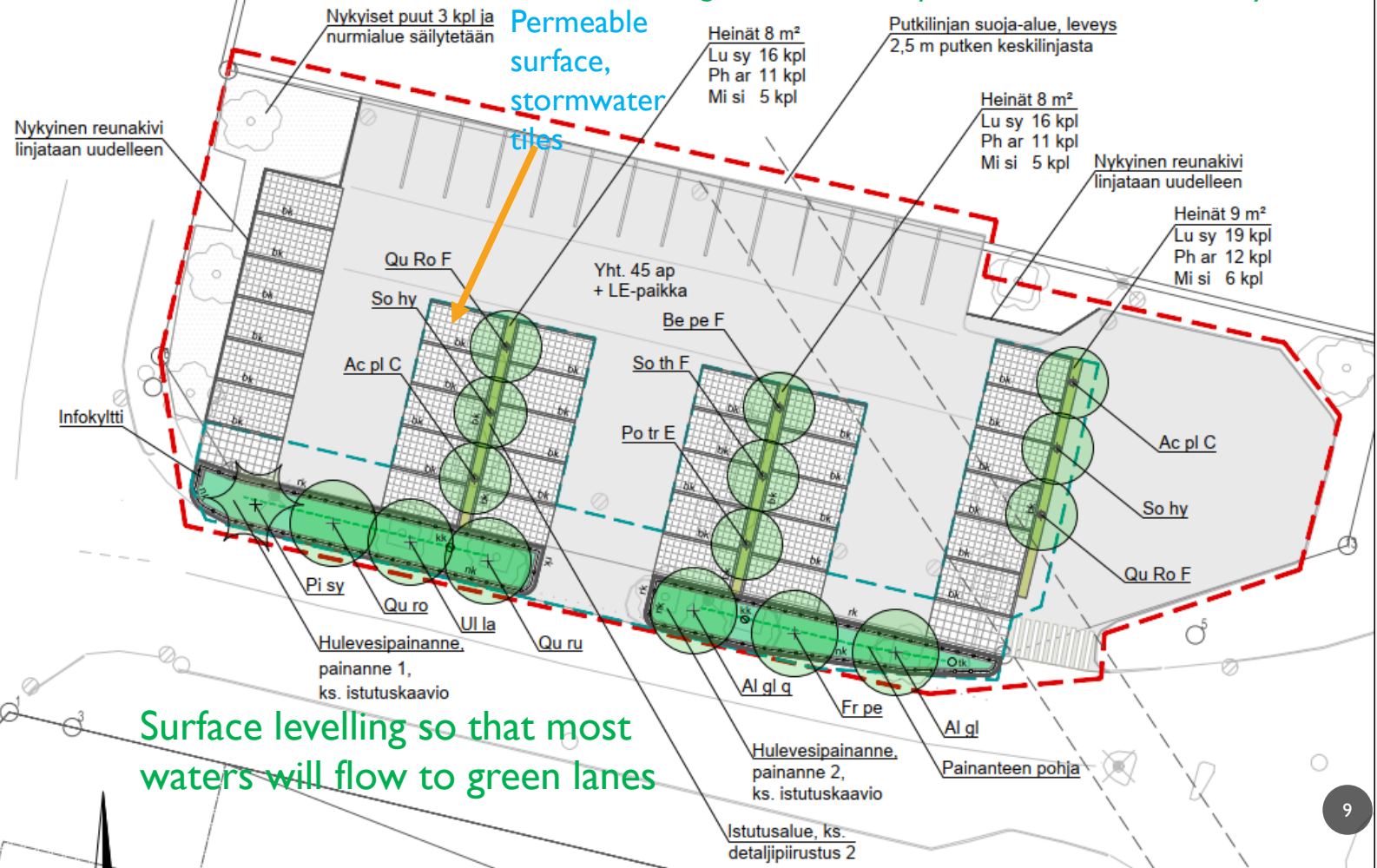
- Dense city area,
- Little space for ordinary NBS-structures.
- Storm water pipe network is full of water when it's raining heavily, that's why detention and infiltration is needed
- How to measure the amount and quality of storm waters that flows to storm water pipe network
- In parking place we are trying to save as many parking places as possible
- How to guide pedestrians to legal routes
- Protect trees from colliding cars and snowplows
- Improve the lightning



# How to achieve goals

## Street arboretum

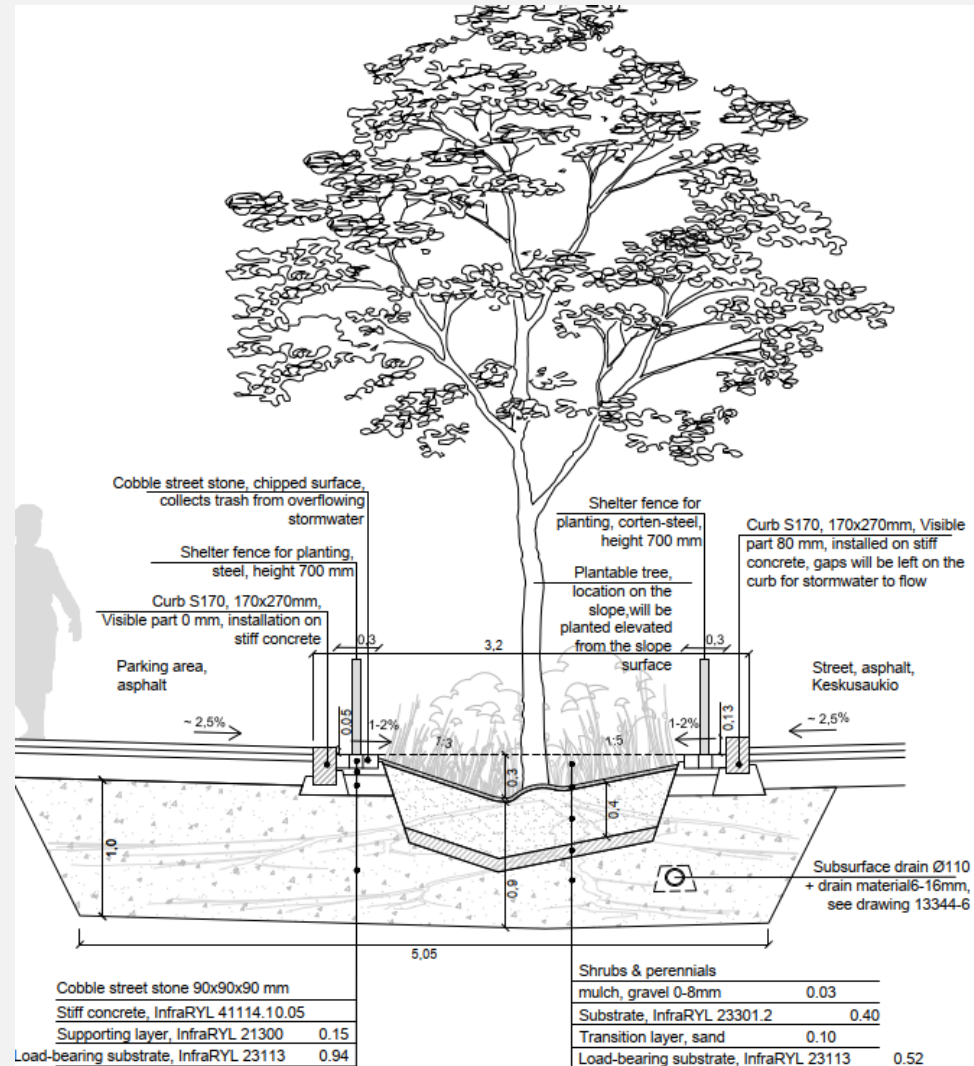
## More green, different species of trees, bushes, hays



Surface levelling so that most waters will flow to green lanes

Cross section of green area where storm waters are filtrated through gravel and sand layers

Some water is infiltrated to base soil and overflowing waters will flow to storm water pipe network



## September 2024, construction starts



Construction site is fenced



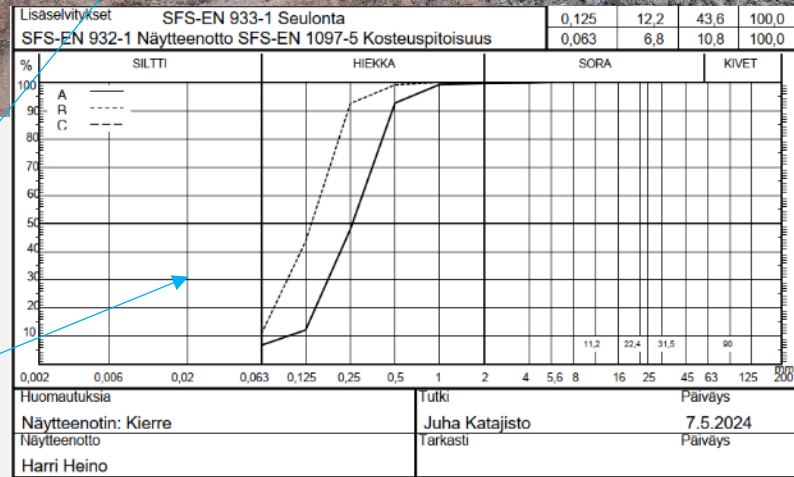
Trees have been felled and waiting to taken away





Asphalts were peeled and intact concrete blocks were transferred to a recycling depot

fine sand was found underneath the construction layers, same on the granulometry curve. This means that infiltration is possible. (Same kind of sand as in Yyteri beach)



NBS needs pipes  
as well for  
overflowing waters



Connection  
to existing  
pipeline



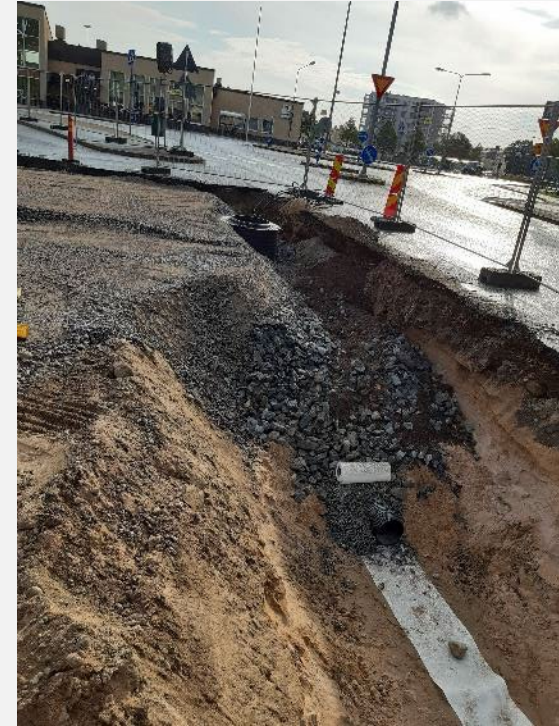
Load-bearing  
substrate under  
construction  
crushed stone  
from which the  
fines have been  
screened out and  
mould/dirt



Approved by the nature (fox visited our construction site and tried to dig a nest?)



Pipes being assembled under the green lane and load-bearing substrate on pipes



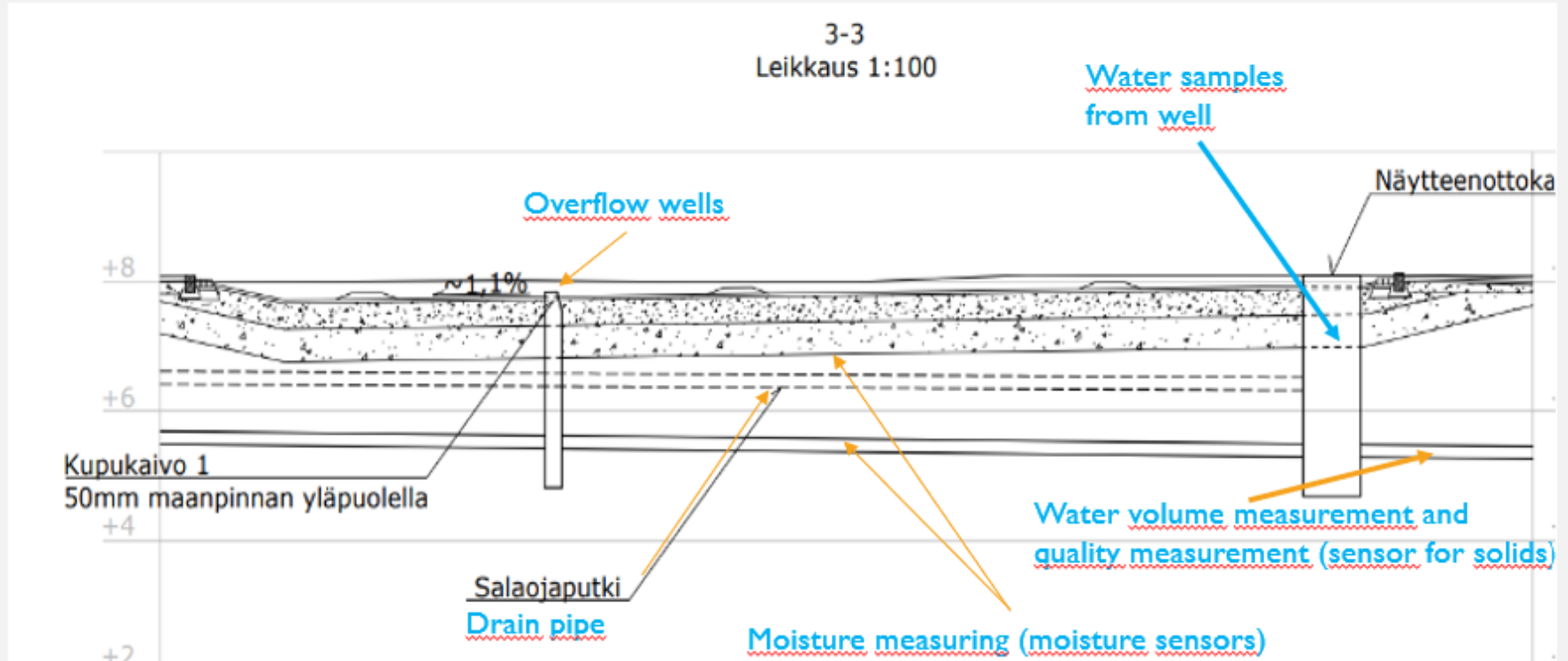
The well, where we should take the water analyses and measure the the amount and quality of storm water



Sometimes there is small chaos. Quite small construction site. Some landmasses need to be taken away and some new should brought in



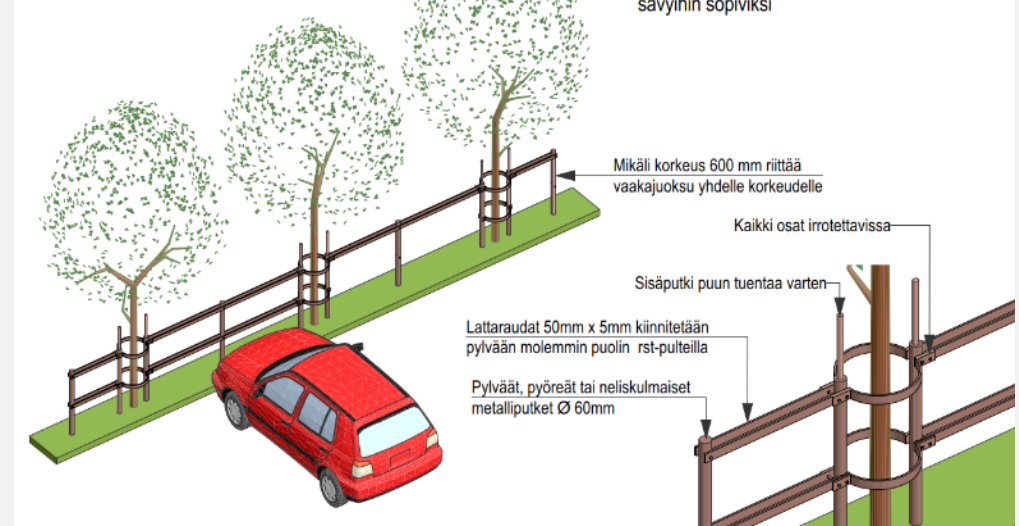
# How to monitor and prove our methods are working



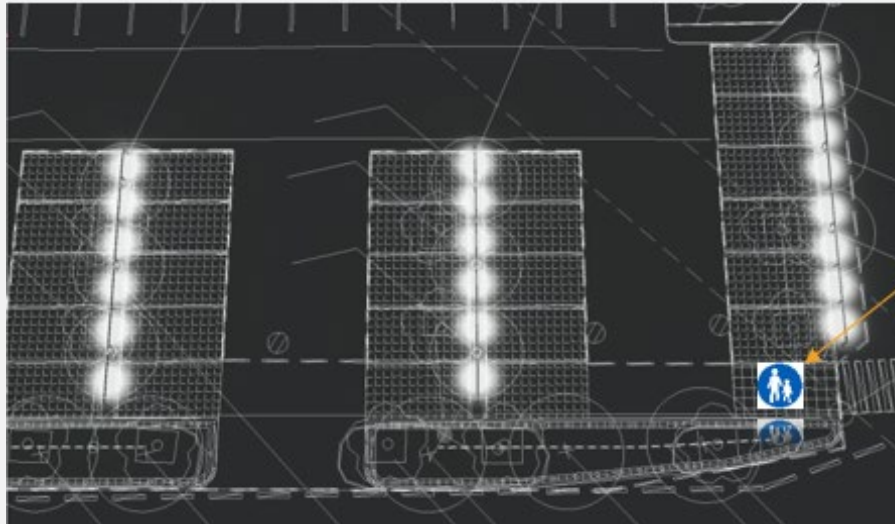
longitudinal section



# Trees will be protected by fences



# Lightning improvements for better safety



a traffic sign is projected onto the paving to prevent cars from parking on the pavement



## NEXT TO DO AND REMEMBER

- Construction should be ready by the end on November
- Measurement devices are being placed during the construction.
- Monitoring begins
- Reporting of results continues
- Pay the bills
- Get money from Interreg Baltic Sea -program
- Maintenance program should be finalised
- Parking place will be handed over to the maintenance department and they start to take care of it





Keskusaukio in the year 2035?

For the  
cleaner  
Baltic Sea!  
(the sand in  
Yyteri looks  
same,  
doesn't it ;)

Thank you!

