

Storm water measures in Pori



Matti Lankiniemi M.Sc

Environmental Director
City of Pori, Environmental Agency

Valtakatu 11, 28100 Pori, Finland
Mob.: +358 44 701 1215
matti.lankiniemi@pori.fi

www.pori.fi/ymparisto

UBC Commission on Energy, Environment and Transportation
Joint Meeting
Gdynia, 17-19 March 2010

PORI
CITY OF SEA
AND RIVER

Harbour and
industrial areas

River delta,
largest in nordic
countries

29 March, 2010

Matti Lankiniemi
City of Pori, Environmental Agency



RIVER ESTUARY

River Kokemäki

- 150 km long
- catchment area 27000 km²
- flow on average 340 m³/s
- max flows appr. 900 m³/s
- Waterway of river covers appr. 10 % of all Finland
- The waterway is the fifth largest in Finland



29 March, 2010

Matti Lankiniemi
City of Pori, Environmental Agency





29 March, 2010

Matti Lankiniemi
City of Pori, Environmental Agency



Flooding map

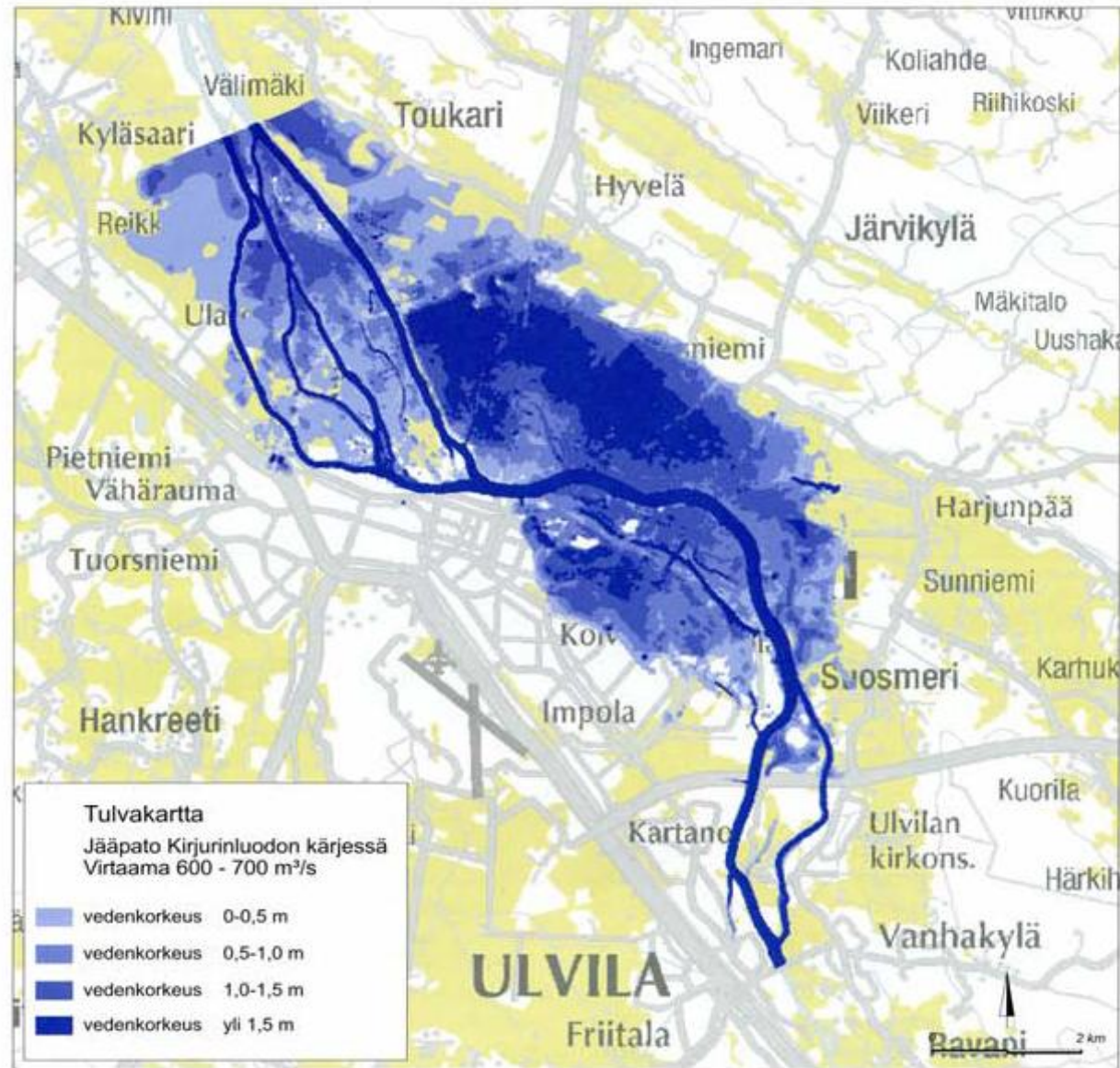
Scenario:

Block of ice at the peak of Kirjurinluoto causes water level to rise at the city center and residential areas

Flow rate 600-700m³/s

Water level:

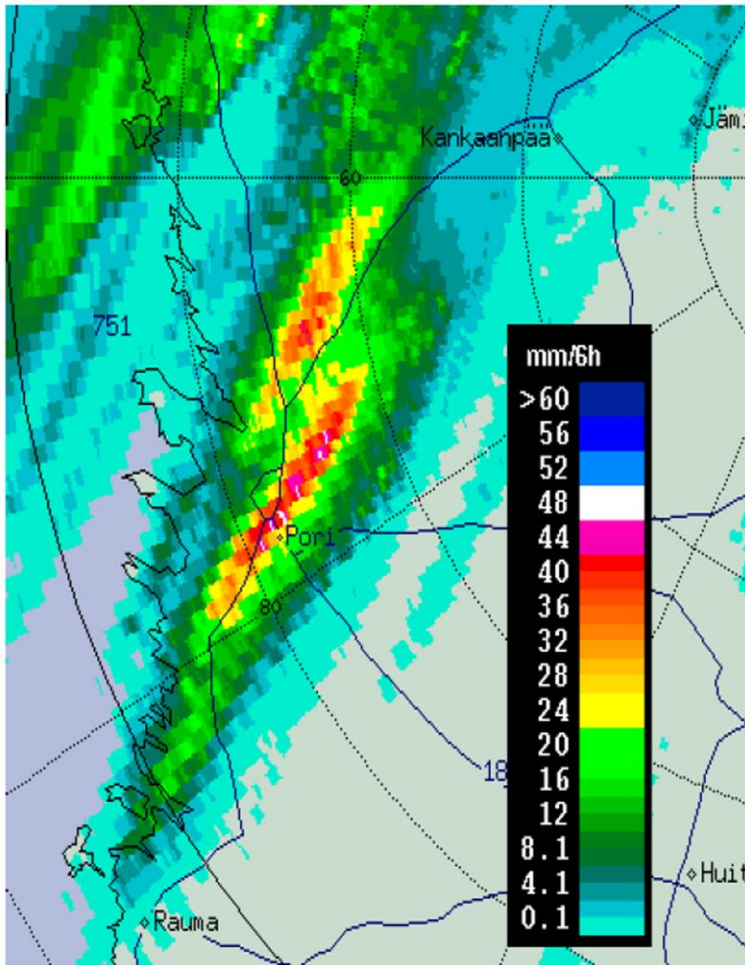
- 0-0,5 m
- 0,5-1,0 m
- 1,0-1,5 m
- 1,5 m <



© Suomen ympäristökeskus



12th of August 2007



rainfall and force of the rain

- It rained almost all day long
- Heavy rain started around 5 pm
- It kept raining three hours non-stop
- Rainfalls were changing
- Highest measured rainfall was 140mm in a private lot
- Usually it rains 72-80mm in August, yearly 515-725mm
- Rainfall area was very narrow strip of land in the center of Pori





29 March, 2010

Matti Lankiniemi
City of Pori, Environmental Agency



Rescue services had 17 units in use from Pori and neighbourhood. There were over 100 rescue operations of pumping water out of the roads and cellars (red dots on the map).





29 March, 2010

Matti Lankiniemi
City of Pori, Environmental Agency



Underpass on Luvianpuistokatu,
which is important street leading to the
city center. It was filled with water and
several cars were stuck under water.

Pictures by Janne Lumme



29 March, 2010

Matti Lankiniemi
City of Pori, Environmental Agency



Recent floods in Finnish cities

City	Year	damages
Vaasa	2003	24 properties
Riihimäki	2004	55 properties
Kouvola	2004	50 properties
Helsinki	2005	sea water level rose
Kotka	2005	sea water level rose
Pirkkala	2005	40 properties
Pori	2007	appr. 1000 reports



Extent of the flood damage in Pori

- Insurance companies compensated 5,7M€ of 939 claims (demands over 8M€)
- Average compensation was 6150€, the highest 70240€
- City of Pori suffered 5M€ in properties and 1m€ in traffic infrastructure
- Afterwards 4M€ has been invested in preventing flood damages



Project 1: retention ponds

- December 2007 : Suntinoja
- Waterway was cleared of trees and other material blocking water from running (same process is done in many important waterways around the City of Pori)
- Retention pond will be built later to the end of the waterway



The pictures are taken before and after clearing. Jouni Pihlanko



On the left:

New pumping station was built to Isojoenranta. It is part of the drainage system in Northern Pori (Jouni Pihlanko 2008)

On the right:

Clearing of the waterway is undergoing



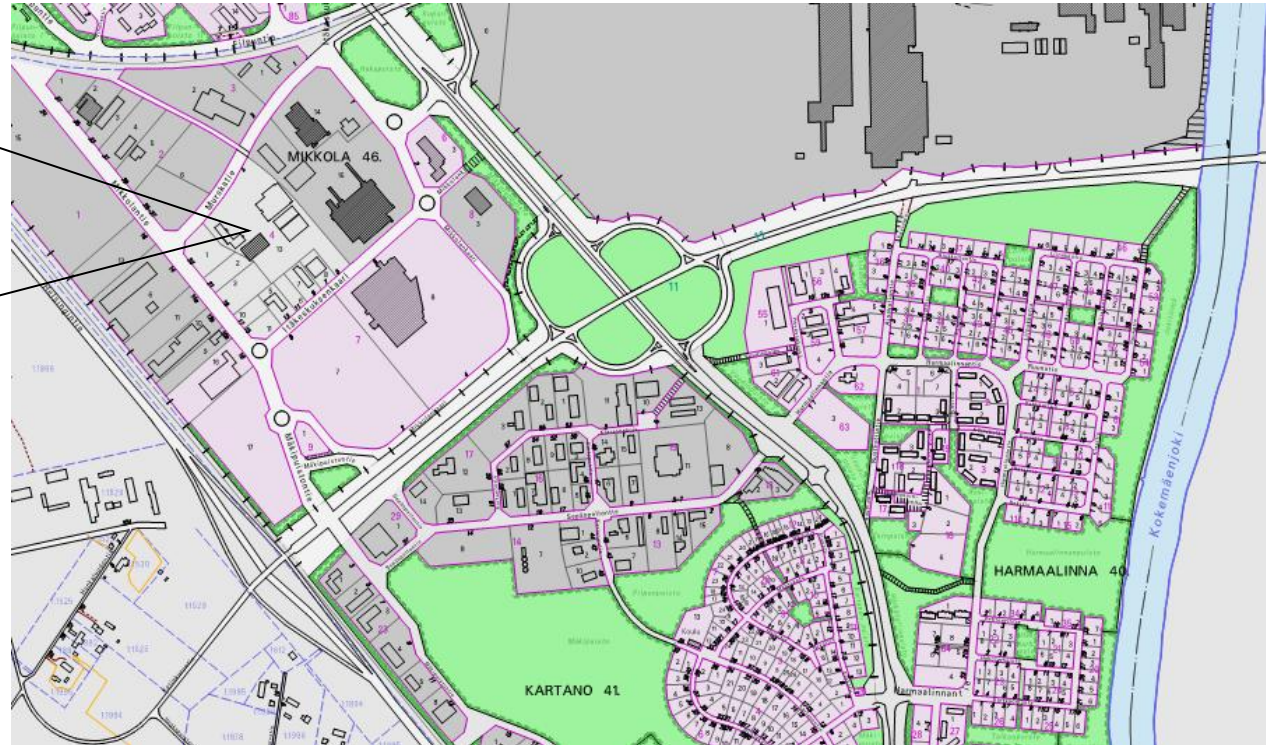
29 March, 2010

Matti Lankiniemi
City of Pori, Environmental Agency



Project 2: reservoir for storm water

Mikkola:
A lot of
commercial and
industrial space,
an airfield,
motorways and
a small
residential area

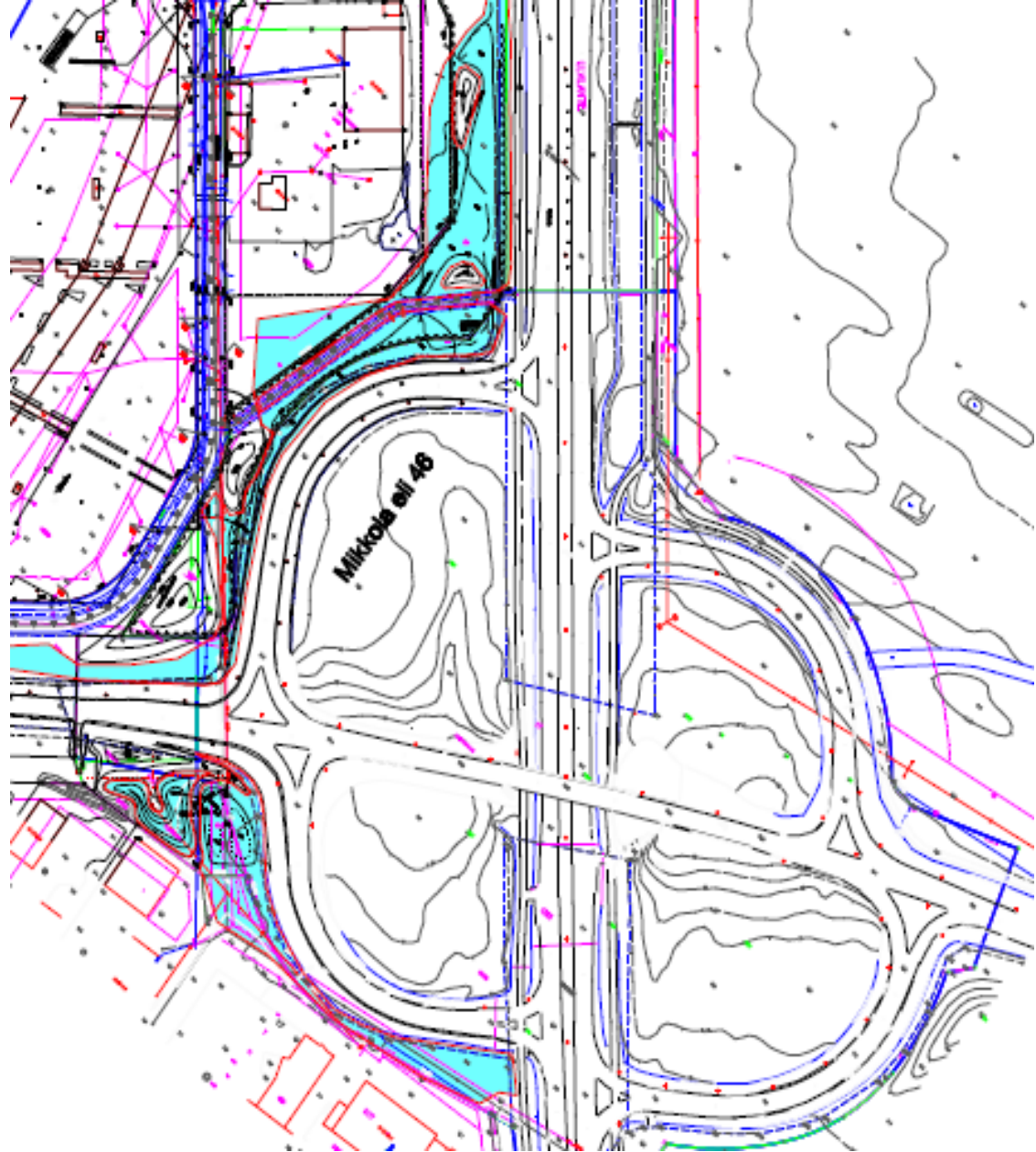


Mikkola:

Two reservoirs were built to traffic greeneries.

They hold 8600m³ and 13500m³ of water.

Around them lies appr. 100000m² of buildings and other water resistant structures.

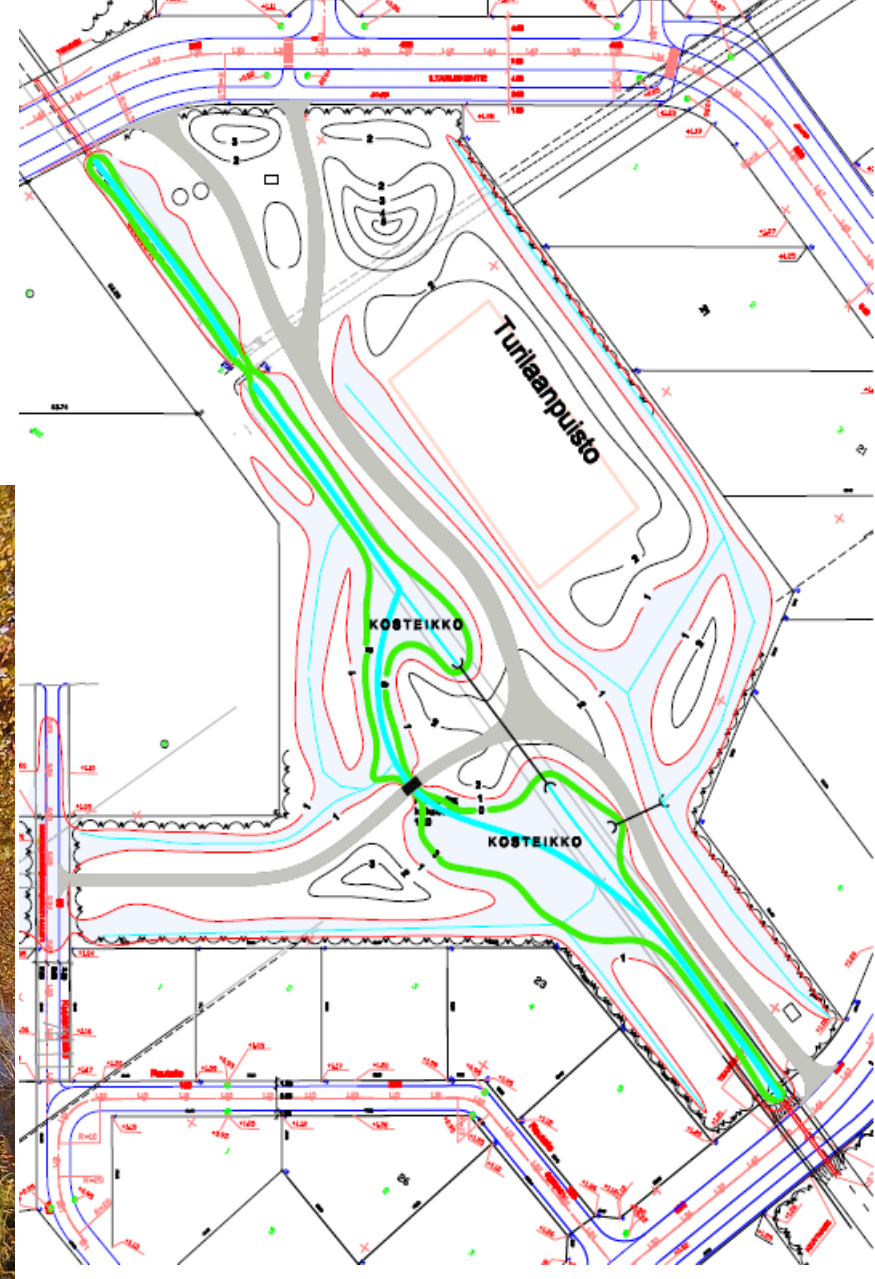


Project 3: ponds in urban parks

- new residential area called Lotskeri suffered from floodwaters in 2007
- Local green area was not built yet, so it was a perfect place to try a new approach: a water element inside the park that would naturally retain water



Lotskeri: Turilaanpuisto
Water will flow freely on
waterways inside the park
and excess will dry out .



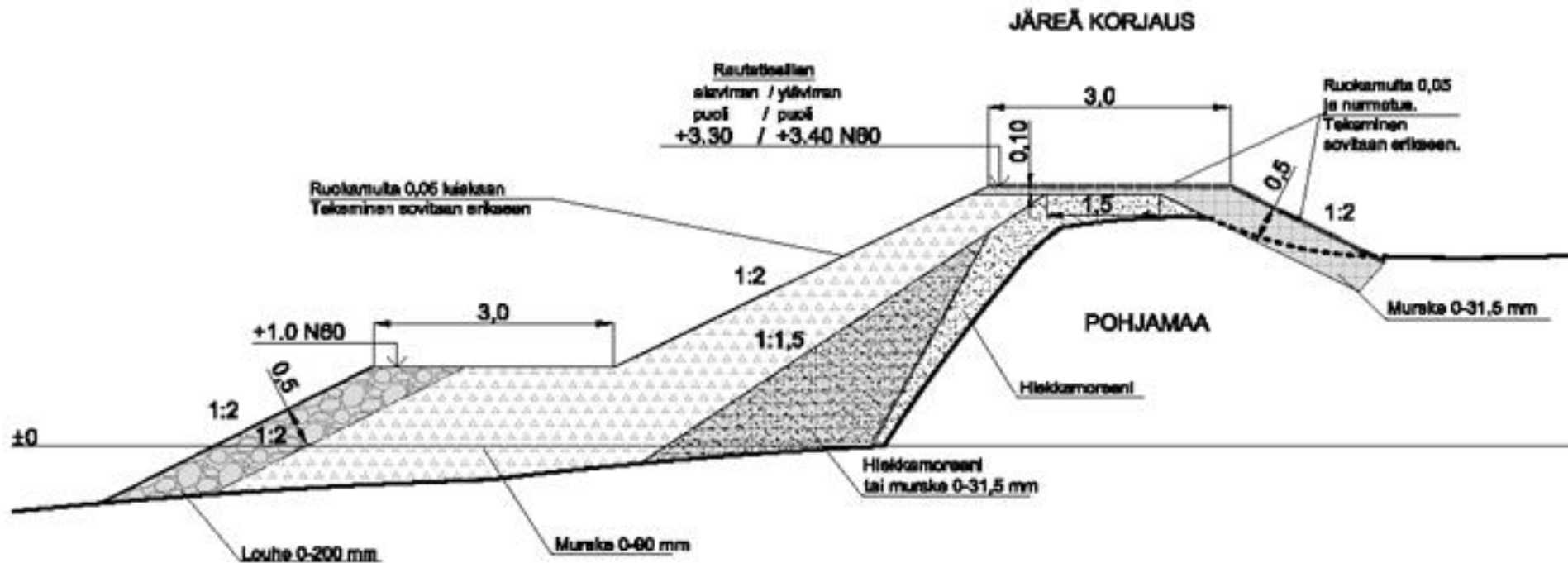
29 March, 2010

Matti Lankiniemi
City of Pori, Environmental Agency



Project 4: strengthening levees:

riverbanks of Kokemäenjoki are typically low, levees add protection against flood damages





29 March, 2010

Matti Lankiniemi
City of Pori, Environmental Agency



Closing up the storm water measures in Pori

- A lot of planning and research is done to protect the city from material flood damage
- A new point of view in local thinking and planning urban structure:
 - how to use existing waterways more efficiently to retent the water
 - how to build water elements to city parks to be part of the drainage system

