

Hydrological and hydraulic Study of the Melselebeek Catchment



Financed by: Municipality of Beveren

Client: Municipality of Beveren, in co-operation with the Province of East-Flanders

Date: 1999 – 2000

Budget: € 73 500

Location: Melsele, Municipality of Beveren, Belgium

Partners: Ecorem

Assignment:

In September 1998 a severe inundation occurred in the urban centre of Melsele. The water team of Soresma-haecon was awarded the contract for hydrological and hydraulic modelling to investigate measures to prevent flooding of the build-up areas in the future.

Scope of Services:

- Conceptual design of inundation plains
- 1D hydraulic modelling and scenario analysis
- Hydrological modelling
- Flow survey and river topography

Technical Description:

The Melsele stream is a tributary of the Scheldt river. Downstream flow boundaries are determined by pumps and tide sluices in the Polder areas of the "Linkeroever", the left bank of the river Scheldt in the Port of Antwerp harbour terrains. The small catchment (barely 10 km²) area can be divided into a rural upstream and downstream area and an urbanised central area.

In September 1998, major flooding occurred in Flanders and particularly in the downstream Scheldt catchment, in the area of Antwerp specifically.

Several areas in the town centre and build-up areas of the Melsele community have been flooded at that time.

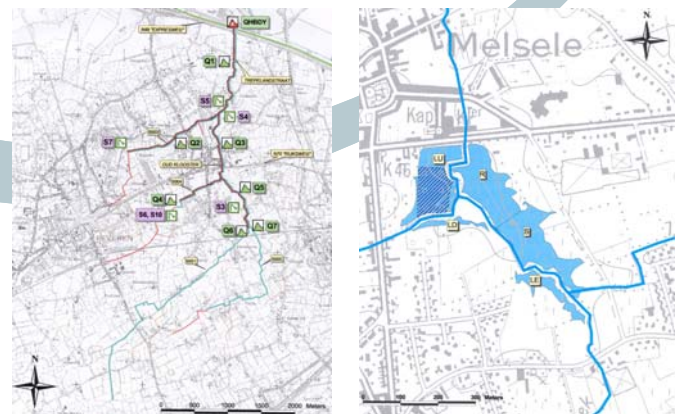
Therefore, the Municipality of Beveren and the Province of East-Flanders ordered a study to investigate local flood mitigating measures.

Soresma-haecon set up detailed hydrological and hydraulic models and conducted an intensive field monitoring to provide the necessary calibration data. The calibrated model is capable of confirming the identified problem areas.

Several scenarios were investigated to study possible flood mitigating measures.

The scenarios include a proper design of stream profile and sections by adapted river bank systems, adapted dimensioning of culverts and conduits, and the implementation of structural works to induce (and control) flooding in natural flood plains.

Numerical simulations show the latter measures allow the alleviation of flooding in downstream build-up areas. Based on these computer results, some practical management tools were suggested to control local flooding problems in the future.



ISIS model set up and modelled flood plain



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