

Renovation of a Controlled Flood Area in the Scheldt Estuary using dredged material from the Durme river

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Introduction: Within the framework of the Flemish flood protection programme „SIGMAPLAN“ for the river Scheldt estuary, W&Z plans to renovate the Controlled Flood Area „Potpolder IV“. Dredged material from the Durme river will be used as building material for the construction of new embankments. The project is a pilot within the Interreg 2 Seas programme, „Using Sediments as A Resource“, USAR.

Methods: Potpolder IV has been serving as flood plain for the Durme river since the 1940s. However, the dikes around the flood plain do not comply any more with the actual flood protection regulations. Furthermore, sedimentation of the river bed impedes the gravitational flow of the watercourses and the functioning of existing pumping stations.

The project covers the complete design cycle for the design of a new ring dike and the adaptation of the existing dikes along the Durme river to an overflow dike in order to realize a Controlled Flood Area. Area surface and length and height of the overflow dike are determined using a 1D Mike11 model of the Scheldt estuary. Around 2,5 km of overflow dike and 3,5 km of ringdike will have to be realized.



Fig. 1: Controlled Flood Area Potpolder IV.

The river recovery plan for the Durme comprises maintenance dredging works, producing 360.000 m³ of dredged sediment. Dredged material has been examined and treatment techniques will be proposed to be able to reuse all the material within the new dike bodies, including contaminated material, in accordance with all safety regulations. Treatment

techniques include dewatering and filtering out of the fine fraction, stabilization techniques in order to obtain better geotechnical characteristics or the use of geobags or geocontainers in the core of the dikes.

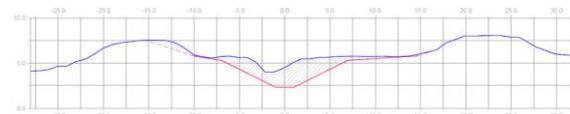


Fig. 2: Typical dredging profile.

The design includes all required works to the watercourses in the area, as well as the replacement of the existing pumping station by a new pumping station with submersible pumps and a gravitational outlet for the main watercourse (ring dike) and an Archimedes screw pump station on the overflow dike.



Fig. 3: Reuse of dredged material (WenZ).

Results: Environmental surveys have been carried out and dredging in the downstream Durme River is ongoing. Potpolder works are planned to start in 2018.

Discussion: Dredging for maintenance of navigation channels and preventing flood risk is a continuous concern in the Scheldt estuary. Beneficial reuse is becoming an obligation in our increasingly fragile and vulnerable environment.

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References: [1] Adams et al. (2013) *The Durme valley river restoration plan*.