



Strengthening Whittlesey Washes for future generations

The devastating floods over many areas in the UK during the winter of 2013-2014 highlighted the importance of effective flood defences to protect lives, properties and infrastructure. But in East Anglia building and maintaining flood defences on this low lying, rich agricultural land has been a fact of life for around 400 years.

The Whittlesey Washes south of the River Nene near Peterborough is a large area of open land created by Sir Cornelius Vermuyden in 1642 by building sluices, straightening channels and raising barrier banks. Now part of a major flood defence system, the banks protect nearly 9,000 hectares of farmland as well as hundreds of properties, roads and a rail link from the risk of flooding during combined high tides and river flows.

The flood defence system stores water on an area surrounded by embankments when high tides and high river levels coincide, then releases water back into the river as the tide recedes. The Whittlesey Washes has filled significantly during the Easter 1998 floods, in 2013 and 2014 when part of the South Barrier Bank (SBB) suffered noticeable seepage.

Holding more than 35,000,000 cubic metres of water, the flood storage reservoir is regularly checked for safety under the 1975 Reservoirs Act. Inspections in 2005 and 2012 identified that remedial work on the SBB was essential to reduce the risk of a breach during an extreme flood event.

The project is being implemented by the Environment Agency with support from local Internal Drainage Boards and Councils, Natural England and the RSPB. Royal HaskoningDHV has been involved since the project's inception, using its extensive experience in flood risk management to assess possible options and design solutions.



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Eddie Robinson, Royal HaskoningDHV's project manager explains: "The area is unique as it is such a long embankment and has so many environmental designations. We need to safeguard the site for the next 100 years, but as a Site of Specific Scientific Interest and a Ramsar site (a wetland of international importance), environmental considerations and biodiversity implications are a high priority too.

"It has been an interesting challenge to find a solution that was acceptable to all the stakeholders while satisfying the statutory deadline for starting the works. We had to find innovative and cost effective ways of working to meet industry standards for embankments and cooperated closely with the client to clarify safety levels and acceptable risk. We wanted a sustainable solution that would be in keeping with the landscape and not adversely affect the wildlife and bird population."

Extensive ground investigations and hydraulic modelling were used to investigate a number of scenarios and agree a solution which satisfied all the stakeholders. While the height of the embankment is not being raised it will be strengthened and reshaped, with extra material placed at its base. The banks will slope gently to blend in with the environment, and will be reinforced with geotextiles in the topsoil and grass, rather than concrete, for a more natural look.

Sustainability and biodiversity are high on the agenda with kingfisher banks designed to encourage wildlife as well as hibernacula for reptiles and amphibians (such as great crested newts). All the work will take place over the summer months to avoid disturbing overwintering birds, and ecologists will survey active nests to record when fledglings have left. Sheep are being introduced to maintain the grass as a cost effective and environmentally preferable alternative to mowing, as well as doing less damage than the cattle which previously grazed on the embankment.

Nicola Oldfield, the Environment Agency's project manager comments: "With only 14 months to produce and obtain business case approval, award a contract and start work on the site, the team recognised that technical innovation, risk management, careful planning, teamwork and close collaboration with all the relevant stakeholders were critical to meet the deadline. Royal HaskoningDHV's skills and expertise in flood risk management and proactive approach made an invaluable contribution to the project."

The cost of the construction work is being funded by Flood Defence Grant in Aid with contributions from the Environment Agency's partners. Phase 1 works were completed by Interserve in 2014, and Phase 2 began in July 2014, with Team Van Oord managing the construction work and aiming for completion in 2016.

Eddie concludes: "With climate change bringing increased rainfall and more extreme climate events, building and maintaining effective flood defences is just as vital now as it was 400 years ago. It has been a privilege to have been part of this project team and we are proud that we have successfully seen it through from appraisal of options to detailed design and construction. We have also learned valuable lessons which can be applied to other similar projects."

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