

Case Study

Client:

- South Tyneside Council
- Royal HaskoningDHV



Industry:

- Public Sector - Lead local Flood Authority

Location:

- South Tyneside

Solution:

- Fully Integrated 1D/2D Model, with Pluvial & Fluvial Inputs

For more information:

Contact us:

01444 401840
www.raaltd.co.uk
info@raaltd.co.uk

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South Tyneside Surface Water Management Plan

- Due to vast flooding experienced by the catchment in mid-2012, South Tyneside Council commissioned an SWMP to identify the drivers of the flooding, and investigate notional solutions to mitigate against the risk to the community.

The Challenge

- South Tyneside is a vast catchment in terms of land area; the 2D mesh required for the model included 3.5 million elements. With much of the flooding being driven by pluvial flows off fields, the task was to address the causes of the flooding and create cost effective solutions that integrated seamlessly into the urban environment.

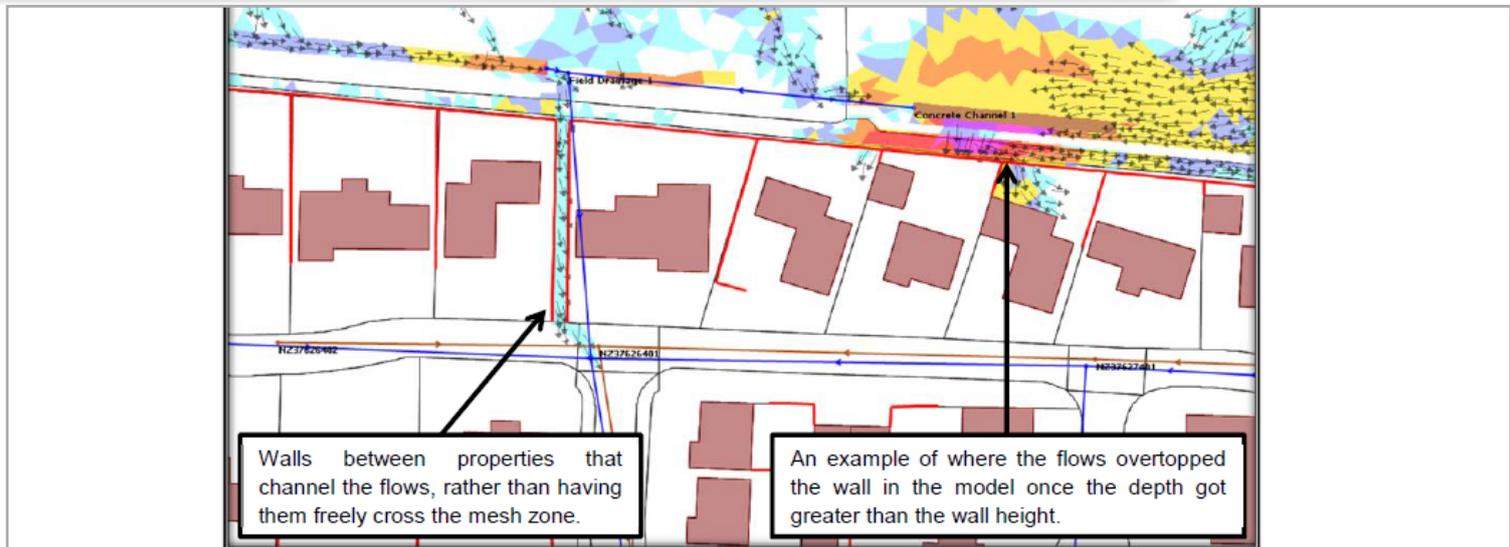


The Solutions

- Many of the areas at risk were adjacent to large open fields, from where pluvial flows cascaded into the residential areas. For this reason, many of the solutions investigated focused on the removal of the ability for these pluvial flows to reach the housing areas.
- Possible solutions included the use of drainage ditches, or its attenuation from getting into the sewerage system. Vast storage ponds were also investigated (making sure they did not form reservoirs) and in places local protection was provided in the form of bunds to redirect flows away from properties.

Adding Value

- DEVELOPMENT OF CATCHMENT SPECIFIC SOLUTIONS
- SUCCESSFULLY ADDRESSED COMMUNITY NEEDS
- ABLE TO DELIVER EFFECTIVE STAKEHOLDER COMMUNICATION
- SOLUTIONS LED TO ELIMINATION OF DOWNSTREAM ISSUES



The Outcome

- A large 2D model was created, along with 5 'detailed' models (containing both pluvial and fluvial inputs); each had a:
 - o 'Do-nothing' scenario
 - o 'Do-minimum' scenario
 - o Final high level scheme to address the flooding in the catchment
- These identified the risks to the catchment and then addressed the flooding risks by way of a series of solution models. As part of the process the team took an innovative approach pushing boundaries and seeking to add value for the client.

Innovation

- As mentioned above this model pushed the limits of all known 2D model types at the time, not only through its size but also by bringing in detailed features, roughness zones and infiltration zones. This pushed the boundaries on 2D modelling paving improving the way modelling is now carried out.

Adding Value

- Value was added by providing solutions which were very catchment specific. Importantly these were able to address the needs of the community as well as the stakeholders.
- By ensuring good communication with the stakeholders, Richard Allitt Associates were able to make certain that the areas identified as being at risk were already known to the council.
- Importantly for the long term success of the work the solutions were designed in such a way that they did not have any adverse effect further downstream.