

Ageas Bowl Flood Modelling Study Glasswalled Scenario Draft Results

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1 INTRODUCTION

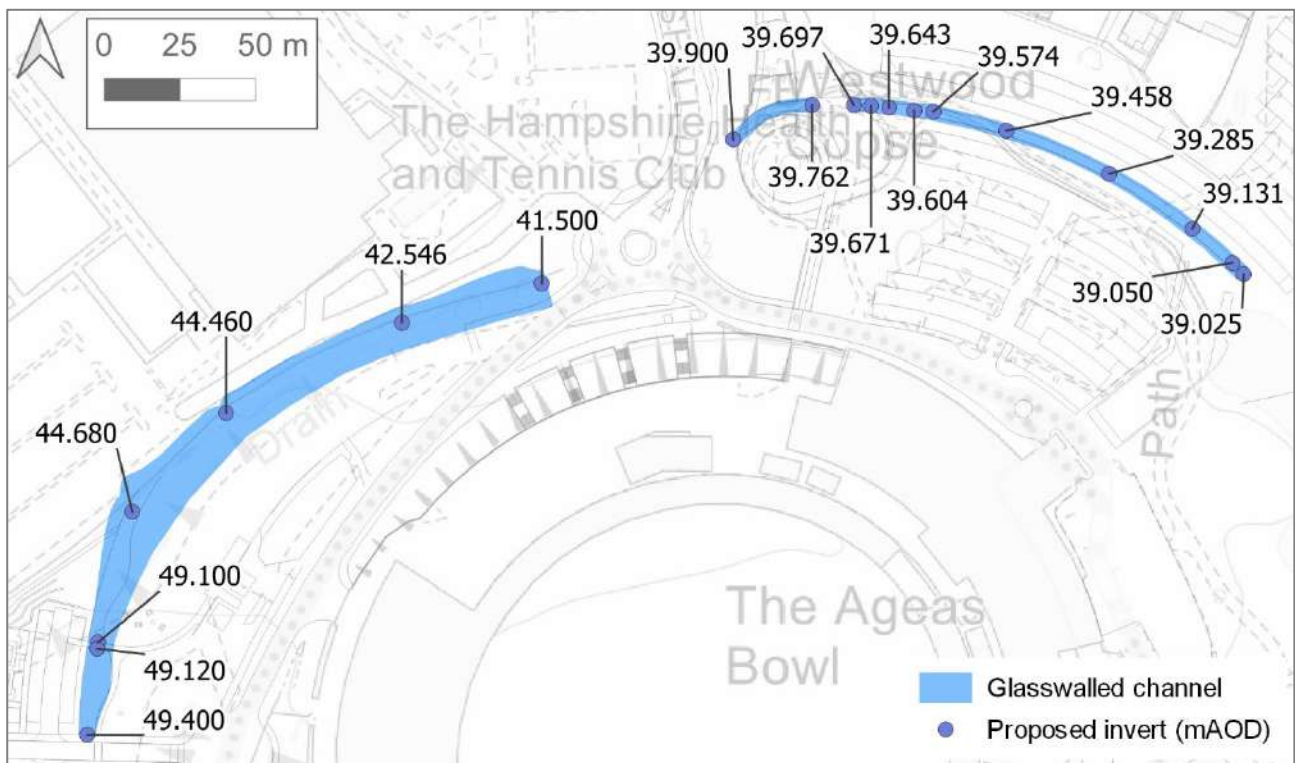
In order to understand the required design elevations of the banktops in the proposed Ageas Bowl development, a “glasswalled” scenario was assessed within the existing flood model of the reach, developed by Thomas Mackay Ltd and reported on in a previous technical note¹. The modelling included a proposed new culvert alignment and daylighted section of the watercourse at the western part of the site, as well as the realigned watercourse at the eastern part of the site.

2 HYDRAULIC MODEL

Glasswalling of the model was achieved by unlinking the watercourse (represented in the 1D domain from Telegraph brook to the first pond) from the 2D domain. This ensured that water was kept within the footprint of the -channel allowing model results to inform the required banktop design elevations in this reach for a given event. The alignment and invert of the channel was taken from design drawings, as shown below in **Figure 1**.

¹ P01158 Ageas Bowl, Southampton Flood Modelling Study Baseline Model Technical Note, Jan 2022

Figure 1. Proposed channel alignment and inverts



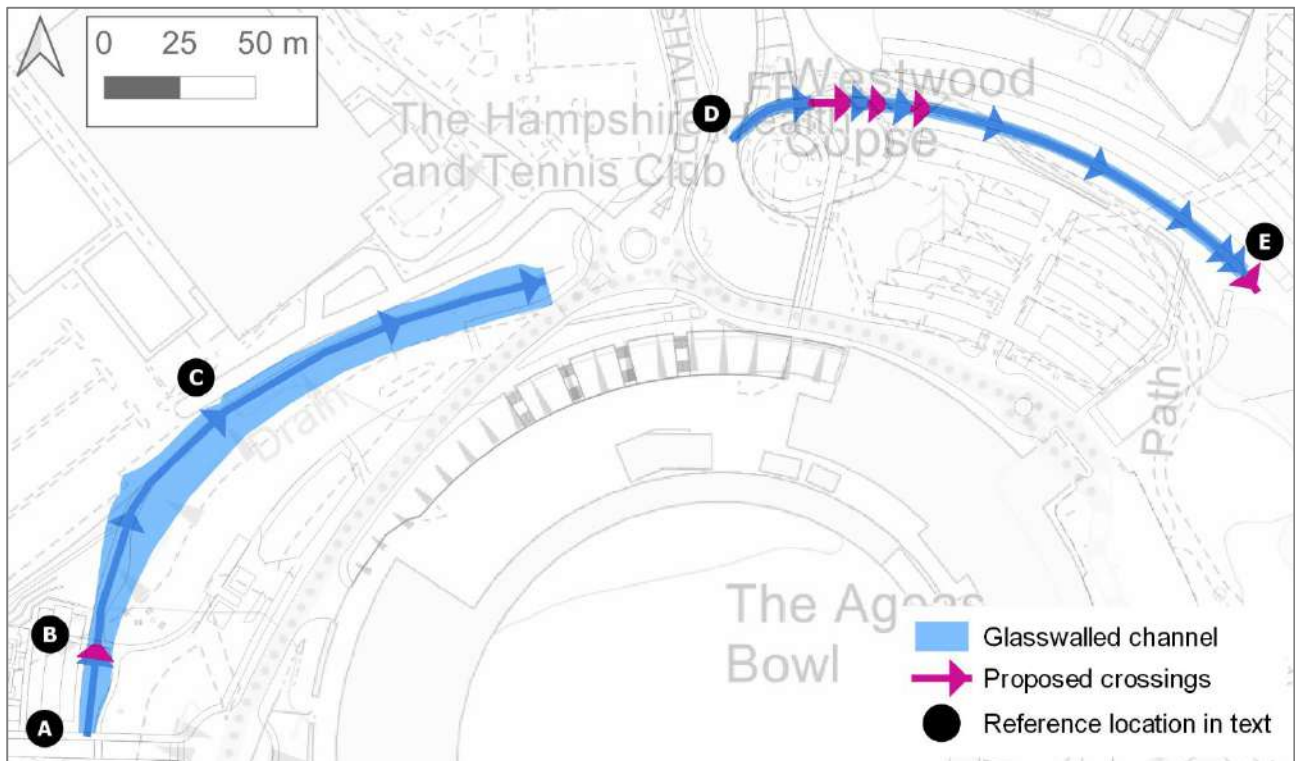
The channel geometry was based on drawings provided in the drainage design for the western part of the development. At the eastern part of the watercourse, the geometry was based on the existing channel shape.

The channel geometry was represented as follows for the locations presented in **Figure 2**:

- A to B – Two-stage Trapezoidal channel (0.2 m deep low-flow channel)
- B to C – Trapezoidal channel
- C to D – Existing watercourse and culvert
- D to E – 3 m width rectangular channel.

The proposed crossings are also shown in to **Figure 2**. One at 'B' and four downstream of 'D'. These were all represented as rectangular conduits with a width consistent with the channel width at that location. All were given an opening height sufficiently large to ensure that they would not surcharge across the range of events modelled.

Figure 2. Proposed crossing and reference locations used in the text



3 RESULTS

The modelled peak in-channel water elevations for a range of design events are provided in the table appended to this note.

These can be used to guide design elevations for the banktops and crossings in the proposed design. These elevations do not include an allowance for freeboard; an appropriate freeboard allowance will need to be added to the peak water elevation provided should this be required.

A further iteration of modelling will need to be undertaken when the development design is completed if there is any requirement to assess the following:

- on-site flood risk
- off-site impacts
- residual risk (for example exceedance events or blockage scenarios)
- sensitivity to storm duration
- sensitivity to modelling choices