

NOTE TO FILE

JBA Project Code 2015s3391
Contract Croesnewydd FCA Update
Client Harrow Estates
Day, Date and Time 27 January 2016
Author Tim Diesner
Subject Croesnewydd FCA Update

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1 Addendum to Croesnewydd Road FCA Update

1.1 Introduction

In response to NRW's comments to the Croesnewydd Road FCA Update, additional modelling was required to demonstrate the flood risk given a 100% blockage of the disused railway culvert to the development site, with respect to flood depths and extent, flood hazard and flood velocities.

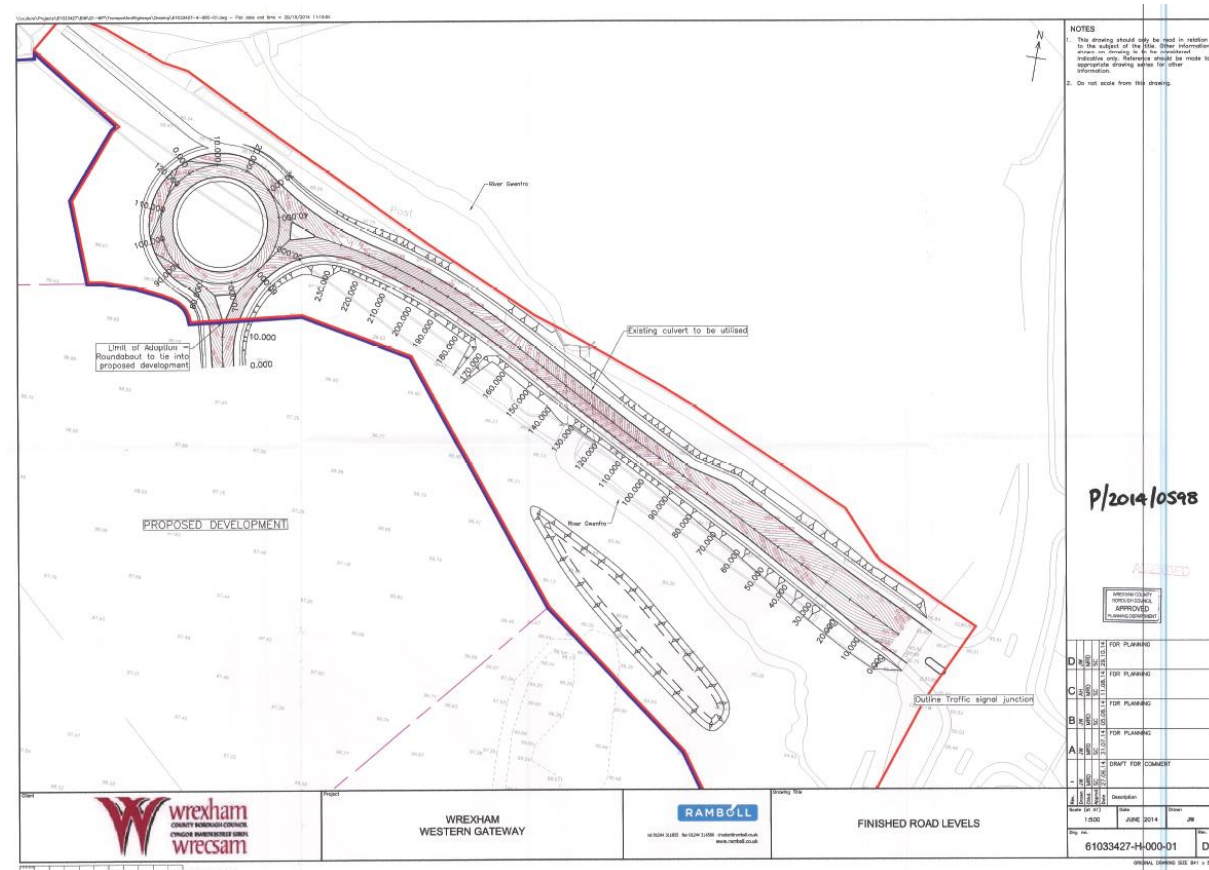
1.2 Model updates

Whilst a 67% blockage of the disused railway culvert was simulated for a 1% AEP event plus climate change for the 2012 Croesnewydd FCA Update, this model did not include representation of the spine road and did not include for a 100% blockage scenario.

The ISTUF model from the 2013 FCA for WAST Development (also used in the 2014 Western Gateway FCA by Atkins) is the most recent version of the hydraulic model of the River Gwenfro at the location of the site and included representation of the link road. The model was updated as follows:

- Updated levels of link road as per submitted planning application P/2014/0598 – this is given in Figure 1 below.

Figure 1 – Updated Levels of Link Road included within the model as per planning application P/2014/0598



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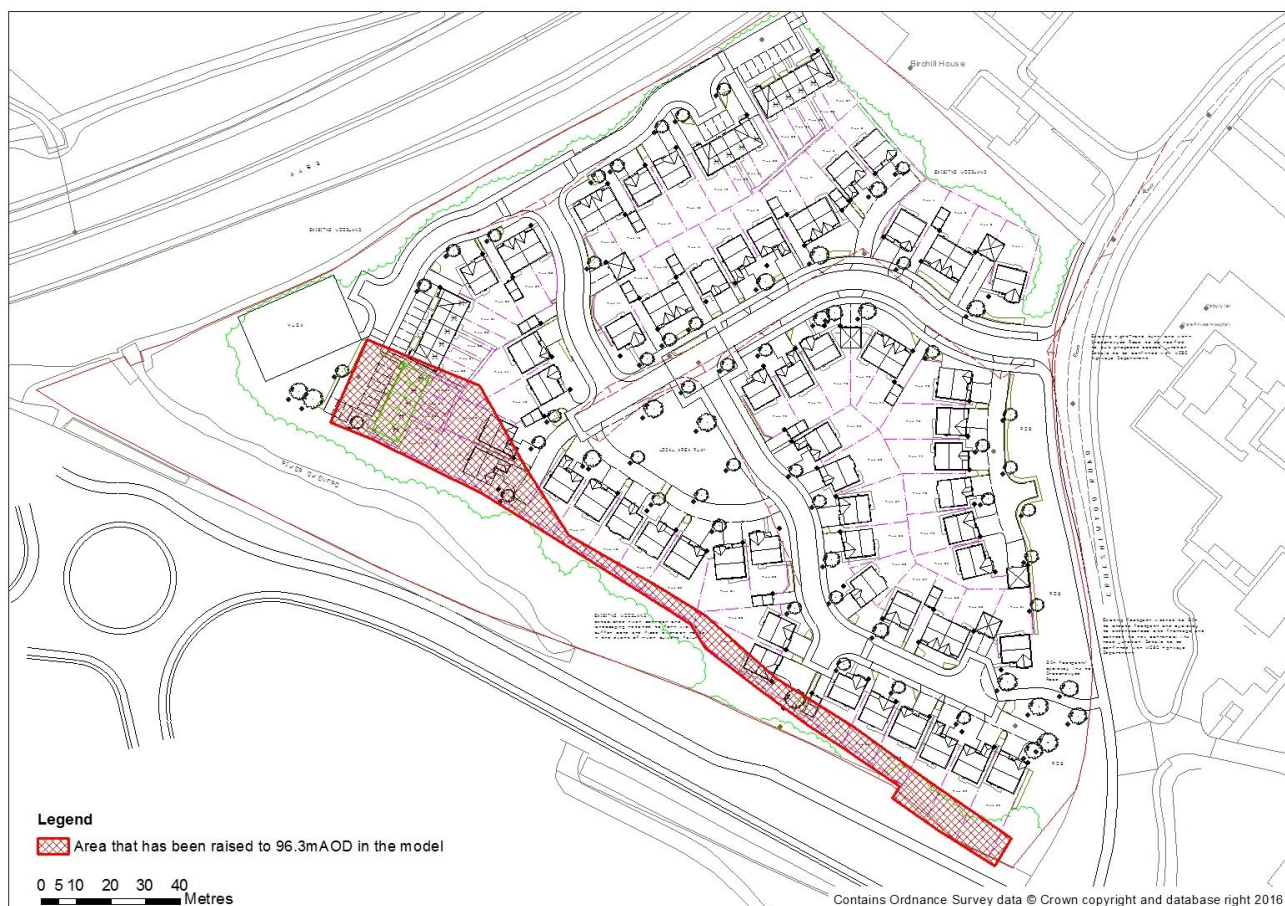
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- 100% blockage configured at disused railway culvert (for model stability purposes a blockage of 95% was actually modelled).
- Most up-to-date LIDAR available used for 2D floodplain (updated).
- Ground levels of plots bordering the river raised to a specified minimum level of 96.3 mAOD.
- Floor slab levels of plots bordering the river raised to a level of 96.45 mAOD - this was not actually necessary as raising the ground levels of plots bordering the river to a minimum level of 96.3m ensured that water no longer reaches the plots.

In order to mitigate the flood risk in this event, MacBryde Homes Ltd have confirmed that ground raising to a minimum of 96.3 mAOD on the development within the river corridor boundary will be carried out, and that the property ground slabs in this location will be set to a minimum of 96.45 mAOD. The area that has been raised to a minimum of 96.3 mAOD within the model is shown below in Figure 2.

Figure 2 – Developable area and river corridor boundary that has been raised to a minimum level of 96.3 mAOD within the model



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1.3 Model results

1.3.1 Flood extent and depth

Figure 3 – Flood Extent and Depth Information for the updated 100% blockage during the 1% AEP event plus climate change

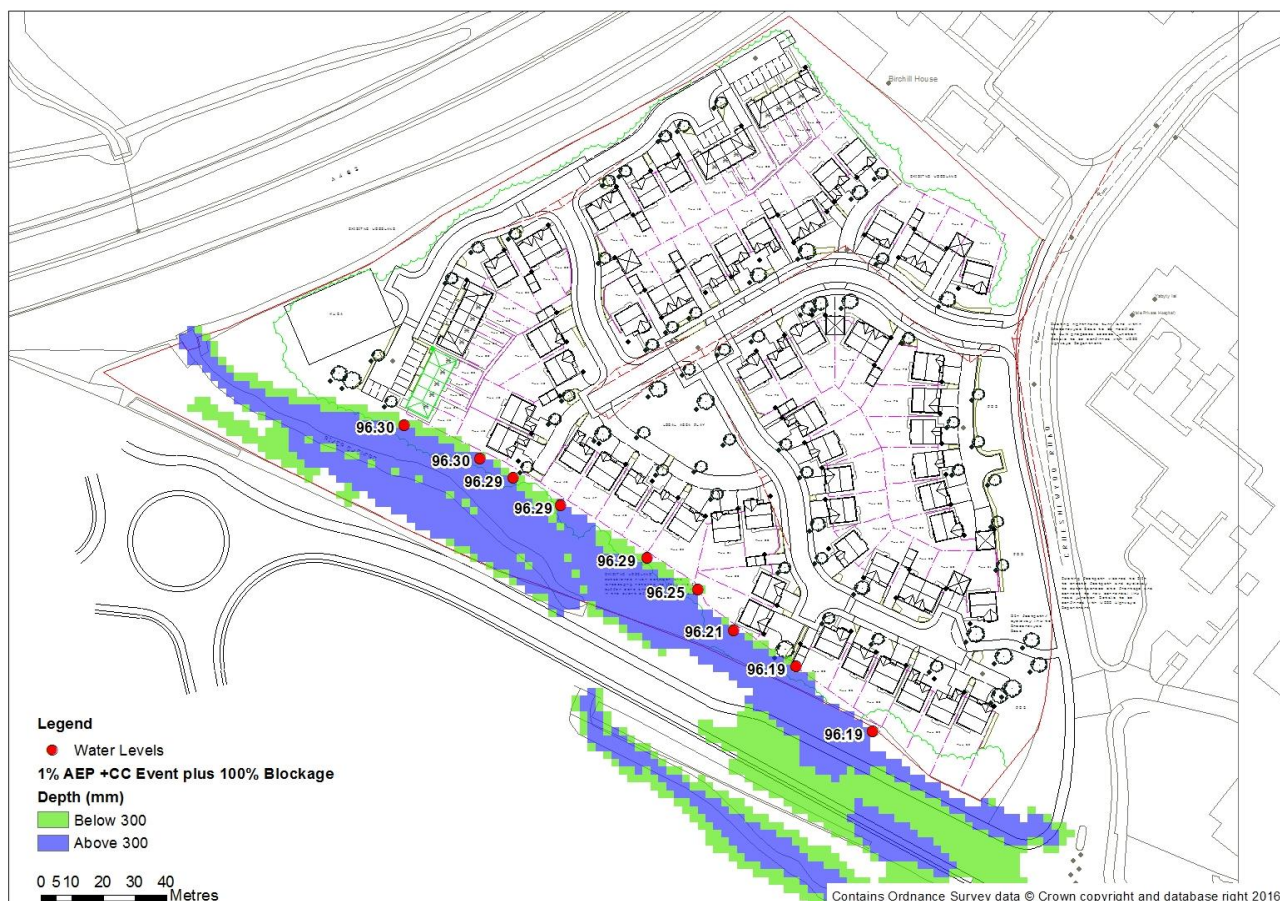


Figure 3 shows that raising the ground levels of plots bordering the river and the building slab levels prevents flooding to the site during the 100% blockage scenario for the 1% AEP event plus climate change. The impact of raising the site levels and consequently removing some storage from the floodplain has minimal effects on flood extent downstream of the site and also minimal effects on water level, with a peak in water levels increase of up to 20mm observed at localised points downstream for this blockage scenario.

1.3.2 Flood Hazard and Velocity

Figure 4 – Flood Hazard Information for the updated 100% blockage during the 1% AEP event plus climate change

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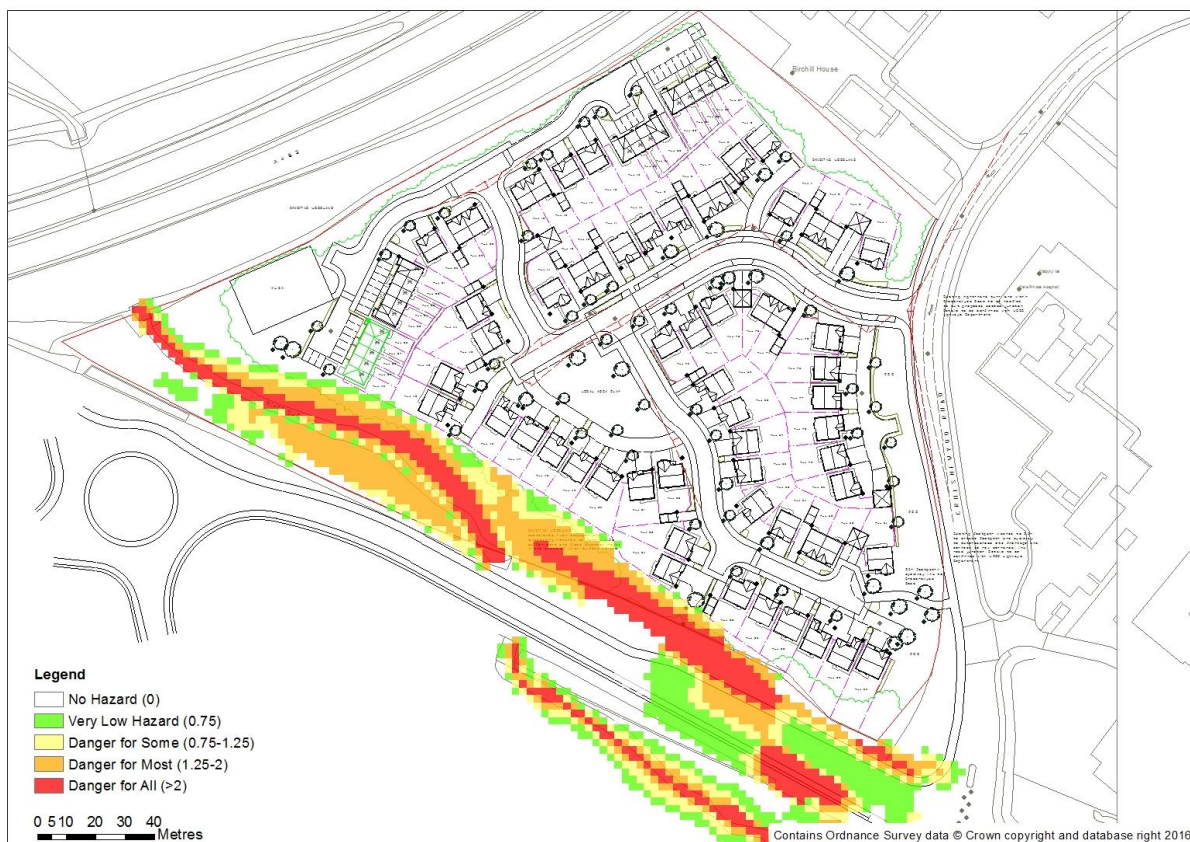


Figure 4 and Figure 5 show the updated flood hazard and flood velocity information for the updated 100% blockage scenario respectively. They both show that the site is no longer at risk from flood hazard or flood velocity.

1.4 Conclusion

The updated modelling demonstrates that the site is not at risk of flooding during a 100% blockage of the disused railway culvert in a 1% AEP plus climate change event, given that the ground levels are raised to a minimum of 96.3 mAOD along the area of the site adjacent to the river, and property levels in this location are constructed with floor slab levels of 96.45 mAOD.

MacBryde Homes Ltd will need to consider the suitability of minimum development levels as predicted water levels under a total culvert failure scenario combined with a 1% AEP design event including climate change are close to the 96.3 mAOD level. A minimum floor slab level of 96.45 mAOD is predicted to remain above flood levels throughout the site.

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Figure 5 – Flood Velocity Information for the updated 100% blockage during the 1% AEP event plus climate change

