Preliminary Results of Hydraulic Modelling Study Six Bells Colliery Site ED1.2

Preliminary Results of Hydraulic Modelling Study
Six Bells Colliery Site ED1.2

1.0 Introduction

1.1 Commission

URS was commissioned by Blaenau Gwent County Borough Council (CBC) to undertake hydraulic modelling of the site to determine the likely extent of fluvial flooding at the Six Bells Colliery Site.

1.2 Background

The Stage 3 Strategic Flood Consequence Assessment included a culvert capacity analysis of the 6 Bells Culvert, which passes through the site. This study recommended that a hydraulic modelling study should be undertaken to determine whether the current flood risk mapping available can be revised so that the site can then be allocated within the Local Development Plan (LDP).

The hydraulic modelling would investigate the likelihood of the culvert capacity becoming exceeded and the likely flow paths of any subsequent flooding. The hydraulic modelling may recommend mitigation measures required to minimise the impact of flooding at the site, if necessary.

2.0 Site Location and Description

2.1 Location

The Lower Plateau, Six Bells Colliery is located in Six Bells a village south of the town of Abertillery. The approximate NGR for the site is SO220 029. The site is bordered to the north by Chapel Road and the Six Bells Baptist Church. To the east of the site are existing residential properties. The western boundary of the site is defined by sloping ground that rises up to Six Bells Road. To the south of the site is existing open space, also associated with the colliery site. A site location map is provided below.

2.2 Layout and Topography

The site is itself relatively flat and predominantly consists of reclaimed land. To the east and west of the site, the land rises relatively steeply. To the south of the site, the topography remains relatively uniform, with the slope generally following the gradient of the river. A full topographical survey was commissioned as part of this study, detail of this will be incorporated into the final report to be published on the 2nd of February.

3.0 Methodology

3.1 Hydraulic Model

In order to undertake the hydraulic modelling of the Ebbw Fach River and the 6 Bells culvert, the following work is/has been undertaken:

- Utilised a channel survey to construct a hydraulic model of the Ebbw Fach River and the culvert, within the vicinity of the site;
- Requested hydrological flow data from the Environment Agency appropriate for the site;
- Utilised the topographical survey data collected as part of the study;
- Utilised hydraulic model results to assess the likely flood depths, extents and potential time to inundation at the site;
- Undertaken sensitivity testing in line with Environment Agency recommendations (e.g. manning's roughness, slope, culver blockage and flows);
- Produced maps showing maximum flood extents for the key flood events (1% annual probability, 1% plus climate change and 0.1%, consistent with TAN15);
- Identification of potential mitigation measures required to minimise any flood risks posed to the site from the Ebbw Fach River.

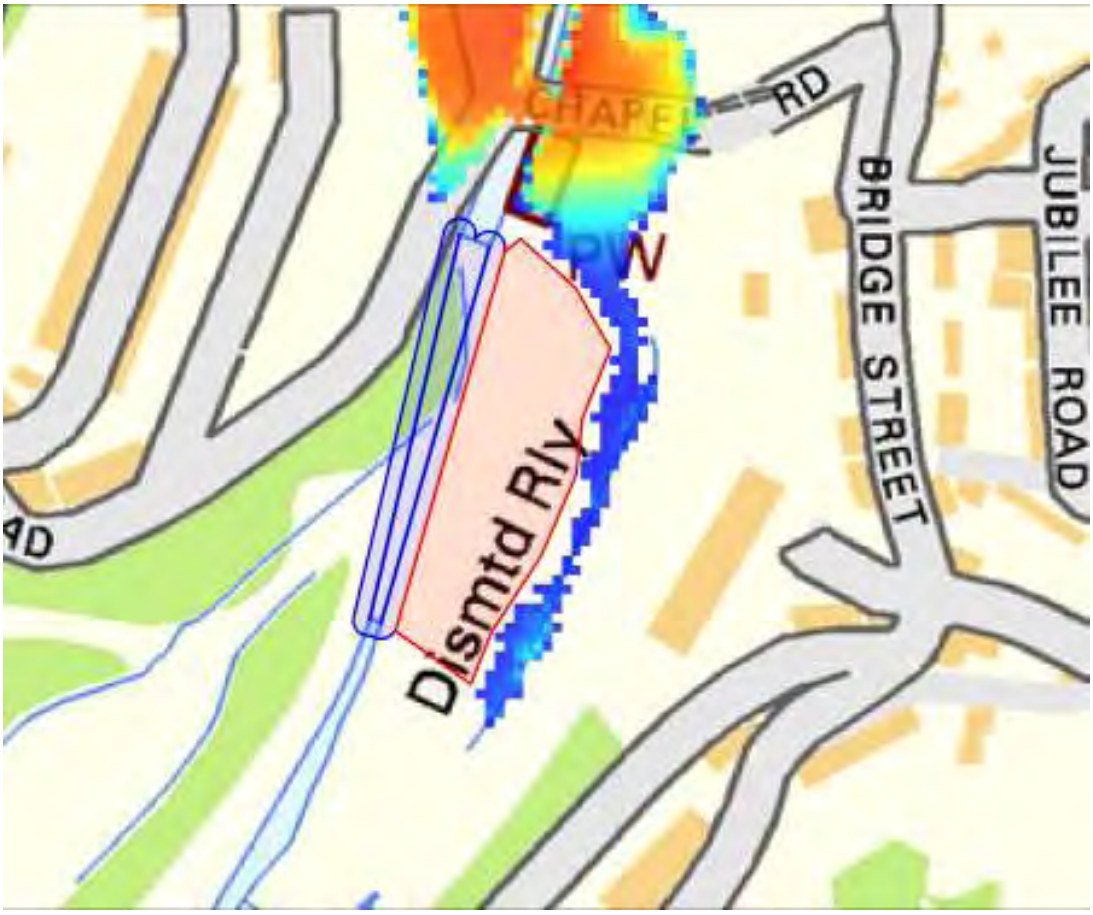
4.0 Results and Discussion

4.1 Model Findings

The preliminary 1 in 1000 year flood extent shown below identifies that the northern and the eastern extremity of the site floods.

The orange colour depicts the flood depths of approximately 2m and dark blue is less than 0.5m. Floodwater spills out the bank at Chapel Road, where it accumulates. When the depth is sufficient, it spills over a crest of land, on the approximate alignment of the southern edge of the chapel and runs along the eastern side of the site.

Figure 2: 1 in 1000 year flood extent



4.2 Discussion

The findings suggest that there is sufficient space to locate the school building outside the 1 in 1000 year floodplain and outside the 5m buffer required from the culvert alignment, as required by the Environment Agency. This culvert buffer zone is shown by a blue hatch in Figure 2, whilst the red hatch shows the approximate extent available for the school building.

The proposed new entrance to the site will also be located outside of the floodplain.

4.3 Recommendations

- It is advised that the northern part of the site should be utilised for recreation areas.
- The floodplain through the site should be formalised, to control the conveyance of floodwater in extreme conditions or if a structure blockage were to occur.
- The school building should be designed based upon the principles of flood resilience.

5.0 Conclusion

The Final report will be made available as part of the submission documents to Welsh Government on the 2nd February 2012.