Briefing Note

PROJECT	**BURFORD CAR PARK**	PROJECT REF	EVY0780
Subject	Hydraulic modelling for planning		Revision
Author	PA	03 Dec 2019	A
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Introduction and purpose of this document

This document is intended to convey an overview of modelling undertaken to support obtaining planning permissions and permits for a proposed extension to Burford Car Park and two new and two new footbridges.

For the purposes of undertaking this work, assumptions have been made regarding the extent of the proposed car park and positioning of the bridge abutments. These may be altered during the design phase of the works if matters proceed. All such outlines show in this report should be taken as a conceptual representation only.

More technical detail will be published in a separate report. The information contained herein is provided for information only and should not be relied upon; the report will be the authoritative document.

The need for modelling

When undertaking any activities in or around rivers or their floodplains, permissions are required under planning regulations. There are also statutory consultees who feed into the process, in particular the Environment Agency (the EA).

One aspect considered by the EA is whether the site lies within functional floodplain. This has a particular technical definition of being the land which would be expected to be flooded at least once every 20 years on average. The proposed car park footprint is entirely within the existing understanding of the functional floodplain, and as such the EA are required to object to any development there.

Through hydraulic modelling we can improve the understanding of the risk of flooding to the area and in particular the proposed development site.

It is also a requirement that the safety of users of the proposed development will be safe should a more significant flood occur (such as that observed in 2007); consideration is given to a flood which might be expected only once every 100 years, including an allowance for climate change. Again, hydraulic modelling can be used to answer this question from a scientific basis.

Finally it is necessary that any proposed development works should not increase flood risk to third parties.

Inputs into the modelling undertaken

New survey of the channel and structures was obtained for this project as well as the development site and existing car park. This was used in combination with aerial survey (at 50cm resolution) available from the EA.

Design flows were assessed following standard industry practices (that is the flows which would be expected to pass through the river system in Burford for the events expected once every 20, 100 and 1000 years (where the 100 year event has also been adjusted with DEFRA climate change allowances).

Selected results

Functional floodplain

The following image shows the modelled depths in and around the proposed site for the 20 year event (with no alterations to represent the development; this is to understand the existing situation to define the functional floodplain).

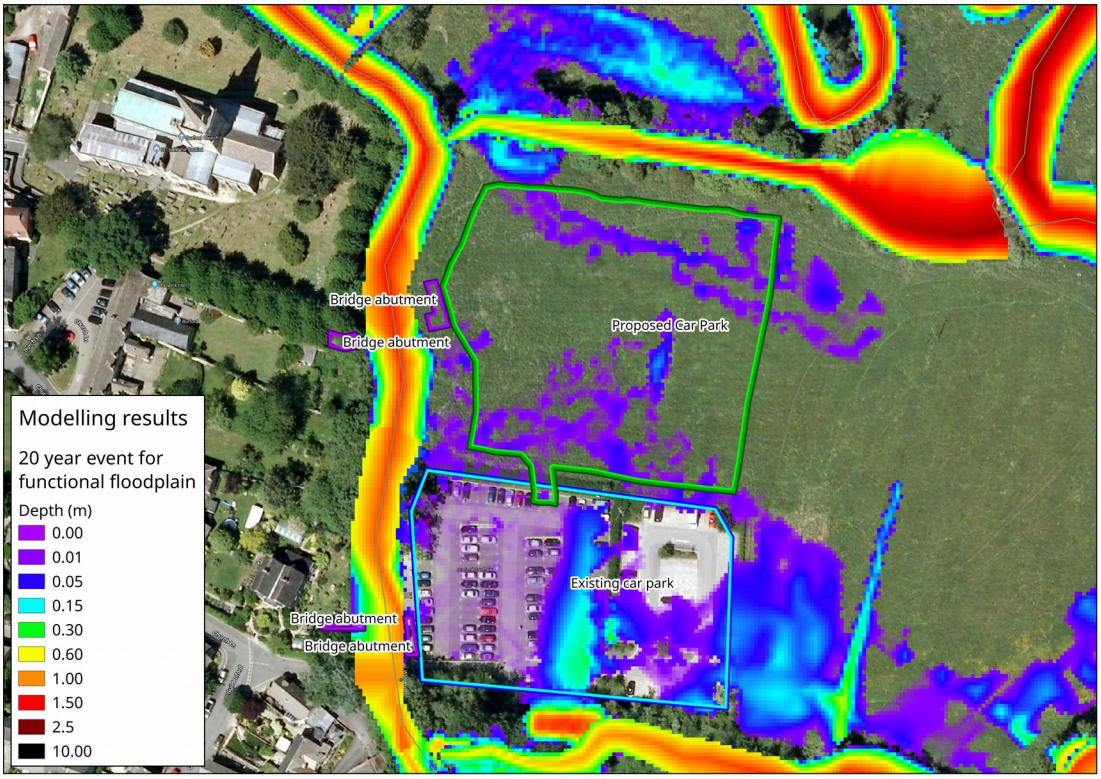

FIGURE 1| FUNCTIONAL FLOODPLAIN

It may be seen that the flood waters do go into the site. As such, the EA would still object to the development as it is within the functional floodplain. However, it should also be noted how shallow this flooding is, mostly less than 5cm deep and all less than 0.15m deep within the proposed development outline.

Significant flood events

The following figures show the flooding resulting from an event which may occur on average every 1000 years (this is the largest event considered being slightly larger than the 100 year event adjusted with DEFRA climate change allowances; there is no climate change allowance applied when modelling the 1000 year event).

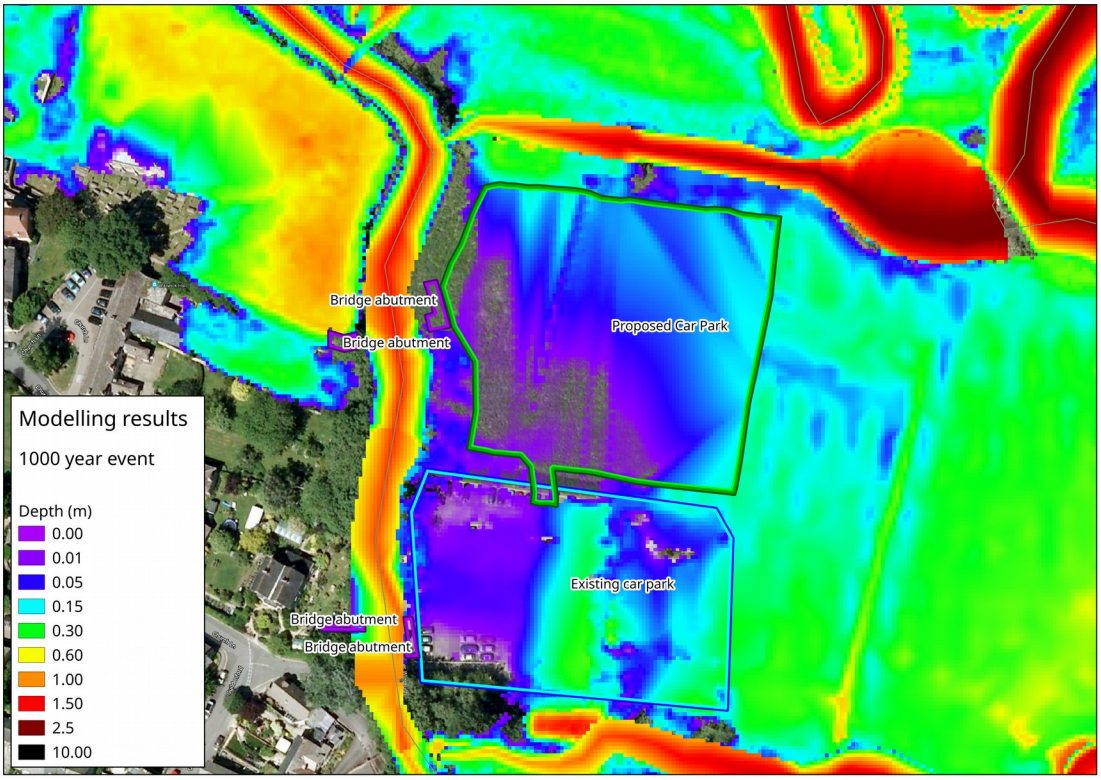

FIGURE 2| CROSS SECTION 1

Again, note that the layout and elevation of the proposed car park are conceptual.

It may be seen that the proposed car park would only have very shallow depths of flooding for the most part, and less than 0.3m of water at the deepest place. By altering the design, this could potentially be decreased further. Such flooding as is shown in the proposed car park is shallower than that shown in the existing car park.

Impact of the development

Considering the 100 year event, the model has been run both with and without the proposed development. The results of these simulations can be compared to see where water levels are changed to ascertain whether there has been any negative impact to third parties. This has been mapped below.

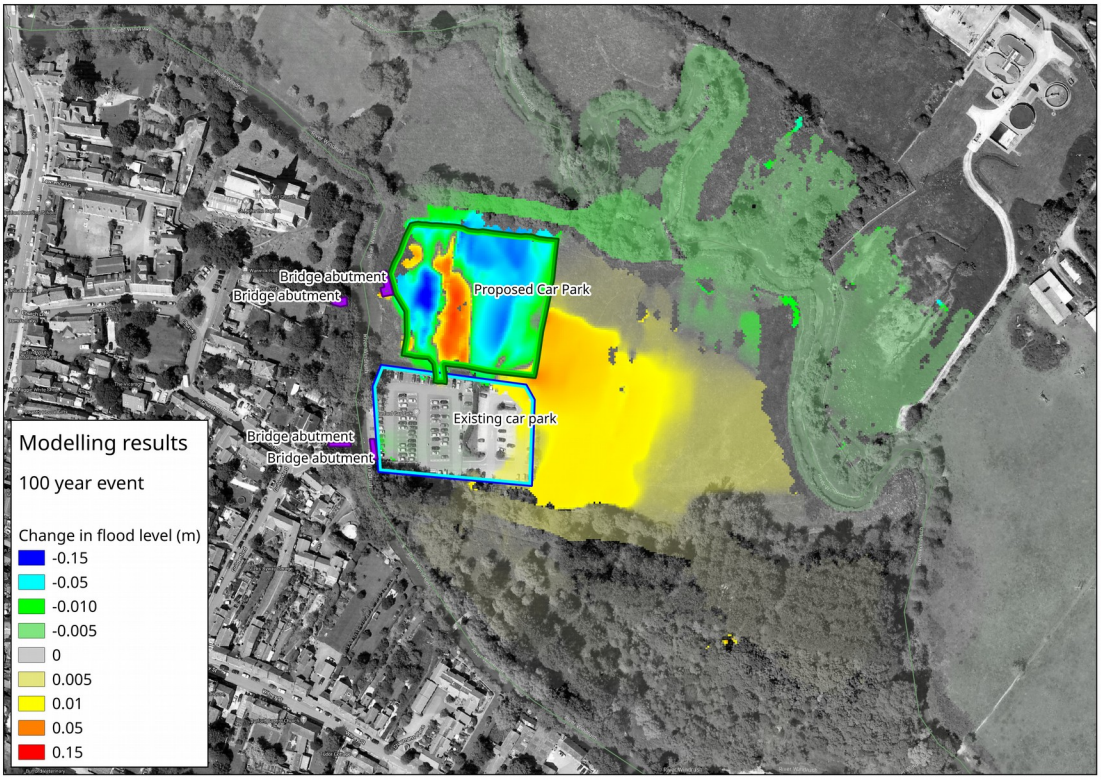

FIGURE 3| CROSS SECTION 2

Areas in yellow-red colouring have been made worse by the conceptual development, while green areas have had flood levels reduced. As may be seen, the area for which levels are worse has been contained to within the extent of the field under the control of those undertaking the development, and does not extend onto third party land. There is a minor reduction in flooding to land on the opposite side of the Windrush to the east.

Some discussion

While the EA must object to development within the functional floodplain, the planning authority may still overrule and grant permission if they so wish. That there is so very little flooding on the proposed site in the 20 year event (figure 1) may assist a planning officer to choose such an action.

An alternative option would be to move the site of the car park to the eastern end of the field where there is unflooded land, so it would not fall within the functional floodplain at all (although it is understood that there are reasons why this would be undesirable).

The planning process is primarily there to ensure that development is safe, does not adversely impact on third parties and for preference is beneficial to the local community.

In this instance flooding to the site is so minimal it does not present danger to people or property (ie. cars parked there) and it may be that refinements in the design could improve this further. Furthermore, there would be a dry escape route for pedestrians via the proposed bridge to the Warwick Hall and such flooding as there is would not pose a hindrance to emergency vehicles if required.

All increases in flood levels are contained within the land under the control of those undertaking the development, and does not extend onto third party land.

It is understood that there are expected to be wider community benefits as part of the scheme, including improved amenity and potential habitat improvements around the site.

All of the above points notwithstanding, it may still be that the planning authority uphold the objection and not grant permission if the car park remains sited where it is.

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