Planning Committee

April 1st 2015

Members Update

Appendix 1: Willow Tree Works Emails and letter from WSP

Comments on the Herrington Consulting review prepared on behalf of Swallowfield Flood Resilience Group

From: Riley, Stephen [mailto:Stephen.Riley@WSPGroup.com]
Sent: 31 March 2015 18:25
To: Cris Lancaster
Cc: Wheeler, Martin
Subject: Swallowfield

Cris

My Comments on the Herrington Consulting review prepared on behalf of Swallowfield Flood Resilience Group are below.

In essence, many of the points raised by Herington Consulting are premature due to them not having access to all the information that has been made available to and reviewed by WSP in reaching our conclusion. Furthermore whilst best practice advises calibration of hydraulic models it is not a mandatory requirement and where data is not available or forthcoming hydraulic models are stress tested through sensitivity runs to provide confidence in modelled results.

Points of particular note are as follows:
Hydrology (Pluvial Model) 2nd bullet point
OM's Technical Note does not clarify whether events are 'summer' or 'winter' storms. WSP has interrogated the hydraulic model and re-run it for the 30 minute summer storm, the results of which are nigh on identical to the 30 minute winter storm. This information was considered in preparation of our response.

Calibration & Verification (Pluvial Model) 1st bullet point
Calibration of hydraulic models is preferable in all cases where suitable data is available (flow and level data). Such data was not available at the time of the assessment. No pretentions that the OM model is a calibrated model have ever been made. In the absence of calibration data the hydraulic models are stress tested through sensitivity runs to provide confidence in modelled results. This is an accepted practice when seeking to establish the relative impact of changes in a flood model rather than absolutes.

Calibration & Verification (Pluvial Model) 3rd bullet point
WSP reviewed a range of return period events with OM's initial submission. The conclusion of that review was that the worst case event for subsequent consideration was the 1 in 100 year plus allowance for climate change event.

Calibration & Verification (Pluvial Model) 5th, 6th & 7th bullet points
No attempts have been made to calibrate the hydraulic model. Data provided by SFRG has been used by OM to verify that flood depths generated by the hydraulic model are comparable to those residents experienced in July 2007 and that changes afforded to the flood levels as a result of the proposed development are negligible.

Calibration & Verification (Pluvial Model) 9th bullet point
It is acknowledged that calibration of hydraulic models is recognised as best practice but by Herrington Consultings own admission this can only credibly be achieved where gauged flow and level data is available. Such data is not availabel for the pluvial flooding experienced in Swallowfield. In the absence of flow and level data hydraulic modelling can still generate useful and credible results, the reliance on which is assessed through sensitivity runs.

Calibration & Verification (Pluvial Model) 10th bullet point
It is acknowledged that the approach presented in OM's Technical Note is not logical. Failings in the logical approach adopted by OM were addressed by WSP in their review of the information and data (including additional runs of the OM hydraulic model) provided.

Topography, Model Sensitivity & the Wider Catchment (Pluvial Model) 1st & 2nd bullet point
If generating a hydraulic model that was to be hydraulically linked with the fluvial floodplain the approach adopted by OM in correcting for differences between topographic data and LiDAR data would not have been accepted by WSP. As the assessment is looking the establish the relative impact of the proposed development as a result of pluvial flooding the datum used in the assessment is irrelevant. The impacts of surcharged outfalls / interaction of the fluvial floodplain can however been assessed from the available data, Figure 1 of the OM Technical note does not include the proposed drainage network, which again demonstrate the impact of a blocked drainage system and or surcharged system is within the tolerances of the hydraulic model results**.**

Topography, Model Sensitivity & the Wider Catchment (Pluvial Model) 4th bullet point
The manner in which OM have combined the two datasets has been assessed by WSP and for the reasons stated above considered to be adequate and robust for the assessment of impact.

Topography, Model Sensitivity & the Wider Catchment (Pluvial Model) 5th bullet point
Hydraulic model results cannot be considered to present absolute values. Moreover the results assist in identifying trends. This is because as the hydraulic model undertakes its calculations it is combining values from adjacent areas (cells) which are also varying due to the receipt of data from their adjacent cells and so on. This process can generate instabilities and artefacts in the hydraulic model results that can be exacerbated in areas where the model is attempting to reconcile sudden changes in ground level (i.e. water falling into a ditch or running off a tall embankment, erroneous topographic data points) or where the topography is encouraging the modelled flood water to change direction. For this reason is it common to consider model results 'in the round' and not to rely on specific values at given points. For this reason 3 points showing increases in flood depth surrounded by flood depths of no or negligible reduction in flood depth cannot be considered reliable or representative.

Topography, Model Sensitivity & the Wider Catchment (Pluvial Model) 6th bullet point
Fluvial hydraulic modelling undertaken by RPS and approved by the Environment Agency confirms the site lies within Flood Zone 1, i.e. will not flood for events up to the 1 in 1000 year event. Notwithstanding this the influence of high river levels on surface water outfalls from the site is acknowledged. Runs of the pluvial model undertaken by OM can be used as surrogates for backwater effect of fluvial events. The OM hydraulic model demonstrates that there is sufficient head in the system/network to drive surface water through the site despite a surcharged outfall.

Topography, Model Sensitivity & the Wider Catchment (Pluvial Model) 7th bullet point
Sensitivity testing of the hydraulic model is considered to have been undertaken through varying the storm profile, land use type, storm event return period and storm duration. The results of this demonstrate that hydraulic model is largely insensitive to variation in model parameters. Further testing of mannings 'n' was considered unnecessary in light of the lack of sensitivity of the model to other more significant parameters.

As I've stated above, Herrington Consulting have not been provided with all of the data that WSP has had at its disposal. We have interrogated Oms hydraulic model not just the figures they have produced, we have undertaken additional runs of their hydraulic model and assessed those resutls

where we saw gaps or ommissions in the OM approach. In all instances we have found the hydraulic model to be largely insensitive to changes in key model parameters.

I hope this assists at the planning committee tomorrow.

Regards

Steve

Stephen Riley
Associate Director

Additional points made by the Environment Agency
From: Maltman, Ashley [mailto:ashley.maltman@environment-agency.gov.uk]
Sent: 31 March 2015 09:12
To: Cris Lancaster
Cc: Johnson, Judith; Pinnick, Victoria
Subject: F/2014/0940 - WINKWORTH MACHINERY LTD WILLOW TREE WORKS, SWALLOWFIELD STREET, SWALLOWFIELD (Our ref WA/2014/117860/02-L01)

Cris,

Further to our phone call conversation this morning in relation to the above proposed development I can provide you with the following summarisation of our position.

I note from the file that the applicants have undertaken hydraulic modelling which has been accepted by us. The hydraulic modelling indicates the development site is located within Flood Zone 1.

As set out on page 2 of our letter dated 3 February 2015, ref WA/2014/117860/02-L01, we do not provide bespoke comments in relation to pluvial (surface water) flood risk on sites below 5 hectares in size, however we do provide standing advice. Given the site is under 5 hectares in size, it is the responsibility of Wokingham Borough Council to assess the impact of pluvial flood risk to the site and surrounding area in relation to the above proposed development.

If you have any further questions please don't hesitate to contact me.

Kind regards

Ashley Maltman
Planning Advisor | Sustainable Places Team
The Environment Agency

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Additional points made by Planning Director Bellway Homes

-----Original Message-----
From: James McConnell [mailto:james.mcconnell@bellway.co.uk]
Sent: 31 March 2015 09:24
To: Cris Lancaster; 'CSWilliams@savills.com'
Cc: Roger Gibbs; Ryan Saul (ryan.saul@odysseymarkides.com)
Subject: RE: F/2014/0940 Willow Tree Works Outstanding actions ~[UNCLASSIFIED]~

Cris

I can only comment on the dialogue issue. I remain of the opinion that the FRG has been fully engaged in the planning process beginning with pre-application discussions and extending right through the determination of the planning application. I think there is some feeling with the FRG that Bellway should have engaged more with the FRG on a one-to-one basis. I do not think that is correct on the basis that we submit the planning application to the local planning authority and so communication should be through the local planning authority. If we are to engage directly with the FRG then this will simply alienate and confuse the local planning authority. This process is the same with any planning application that we submit whereby communication with local interest groups and individuals is via the local planning authority. Bellway considers that the local planning authority has managed this process in an appropriate manner, ensuring effective communication with the FRG throughout the determination of the planning application.

Regards

James

James McConnell
Planning Director
Bellway Homes

Additional comments from Swallowfield Parish Council

From: Peter Sampson [mailto:peter.sampson@theskillsconnection.com]
Sent: 31 March 2015 11:38
To: Andy Couldrick
Subject: F/2014/0940 Willow Tree Works, Swallowfield - Planning Application
Importance: High

Dear Andy,

F/2014/0940 Willow Tree Works, Swallowfield - Planning Application.

I am sure that you are aware of the above application that comes before the Planning Committee tomorrow (1st April). Locally, this has caused great concern about the real harm that might ensue to local residents as well as new members of our community coming to live in the village of Swallowfield.

The purpose of writing to you, personally, is not an attempt to get you involved in the forthcoming decision; I think that Cris Lancaster has done a superb job in gathering opinion in a very diligent manner and the local Flood Resilience Group along with ourselves on the Parish Council and a great many local residents have put forward concerns that, I am sure, the Planning Committee will consider on their merits. I, however, wanted to draw your attention to three issues that I believe might concern you from a standpoint of good governance:

1. I have seen a copy of a flyer that has been sent to all members of WBC's Planning Committee (I have attached a copy for your information) by the developer, Bellway Homes. This states that "extensive consultation with Swallowfield Parish Council, Swallowfield Flood Resilience Group and local residents" has occurred. I really don't like putting comment in these terms, but this is lies! The applicant has been elusive and non-engaging in all of the attempts to discuss aspects of the development with them in a meaningful and constructive manner. As a result, plans are little changed and our residents have a genuine fear that their concerns have been dismissed or ignored. A later comment that the development provides "An opportunity to reduce the threat of further flooding in the village" is controversial to say the least! I wanted you to be aware that your colleagues were in receipt of such highly controversial and unsubstantiated statements.

2. WBC have retained the services of WSP to act as an expert in understanding many of the calculations and modelling in respect to the flood risk. The local flood resilience group have paid a significant amount of money for advice from an independent expert that would seem to leave WSP wanting in many areas of its forensic examination of the developer's figures. Again this information has been supplied to the Planning Committee for consideration but I feel that you should be made aware that there would appear to be a possibility that WBC is using public money for sub-standard advice and adherence to correct protocol.

3. It has become very clear in this process that WBC has been very poorly served by Thames Water in their role as statutory consultees to help your team come to a well-considered decision. On one hand they recently stated that the sewerage system for Swallowfield village is inadequate, but on the other hand they refuse to give metered output from the previous occupants (claiming data protection issues) of the proposed development site that would allow modelling based on fact to occur. I fail to see how WBC can make an informed decision under these circumstances but appreciate that you are somewhat hamstrung once they have rubber-stamped the application. I recently witnessed a local resident of many years in tears over what might happen to his property. He is not a NIMBY, placard waving protestor that can argue the subtleties of flood model calibration but a decent guy that now feels he must leave the village because he is no longer agile enough to deal with sewerage or flood water that he truly believes, based on his tenure in the village, will be entering his property. We already have sewerage flowing down our roads all too often – is it too much to ask that local residents can expect their planning authority to make a well-informed decision? Can WBC not demand that they are able to make a judgement based on all the known facts?

Swallowfield Parish Council very much prides itself on the excellent relationship we have with WBC and I truly believe that we work well together for the benefit of our mutual local residents; a fact that I hope your officers are happy to back up. I do, however, feel compelled to make you aware of the above issues that do not sit well with me in you coming to a fair and well-reasoned decision.

I am more than willing to discuss these matters further should you wish.

Best regards,

Peter

Peter Sampson
Chairman
Swallowfield Parish Council

Additional comments from Thames Water
From: Katy Plimsaul [mailto:Katy.Plimsaul@thameswater.co.uk] On Behalf Of Devcon Team
Sent: 23 March 2015 12:01
To: Cris Lancaster
Subject: RE: F/2014/0940 Willow Tree Works Swallowfield ~[UNCLASSIFIED]~

Dear Chris,

Please see below in answer to your enquiry, we apologise for the delay.

Metered flows in and out of Willow Tree Works - requested from Thames Water:

Foul – 41.5 FTE (includes a provision of part timers) – This would equal just over 1 l/s
Surface – 1.38 l/s
Trade – consent was for 3m3 a day, this equates to an average flow of just over 2 l/s

The water meter readings (only taken once a year) indicate a consumption rate of 4m3 per day – this is about right. 3m3 of trade and 1m3 domestic use.

The existing flows were in the region of 4.38 l/s well above the new proposed discharge rate. Therefore there is a betterment.

Many thanks

Katy Plimsaul
Planner
Development Planning
Thames Water Utilities Ltd, Maple Lodge, Denham Way, Rickmansworth, WD3 9SQ
External: 0203 577 9998,
devcon.team@thameswater.co.uk

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Your Ref: F/2014/0940

Our Ref: 70006354/SR/SK/MW

Date 30th March 2015

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Dear Cris,

Subject: Willow Tree Works, Swallowfield, Pluvial Flood Risk – Resident Comments

Please find set out below WSP's responses to various queries raised by members of the Swallowfield Flood Resilience Group (SFRG) in relation to pluvial (surface water) flooding in Swallowfield.

Background

WSP has been engaged by WBC to assist in the review of drainage and flood risk mitigation proposals for the proposed redevelopment of Willow Tree Works, Swallowfield.

WSP's involvement commenced in October 2014 through discussion with Julia Greene (Flood Risk Manager) of WBC to discuss the principles of the proposed development. The crux of the discussions focussed on the likely impacts of raising the site in a known, and hydraulically modelled (by the Environment Agency), overland flood flow route. WSP and WBC agreed that raising of the site would be expected to result in a detrimental impact on local flood levels and that the applicant should provide further information to demonstrate the impact and, where necessary, propose mitigation measures to avoid exacerbating flood risk to neighbouring property.

Consequently, the applicant was instructed that additional information would be required in the form of hydraulic modelling in order to address concerns regarding the potential for the proposed development to exacerbate flood risk to neighbouring property from pluvial flood sources.

WSP undertook a review of the hydraulic modelling prepared by Odyssey Markides (OM) and reported our findings in a letter to Cris Lancaster on the 28/01/2015. The conclusions of the assessment were that the modelling could not be considered robust due to the limited size of the modelled catchment relative to the size of the subject site, the subject site's position within the modelled catchment and the failure of the model to adequately account for the presentation of catchment flows to the subject site. In addition, the model failed to consider sufficient varying conditions (storm condition, catchment conditions etc.) and that as a result the model could not be considered as robust.

A meeting was held between OM and WSP on the 03/02/2015 to assist in defining the scope of the hydraulic modelling necessary to address WSP's concerns. As a result of this meeting it was agreed that:

- the modelled catchment would be extended to take greater account of overland flows potentially presented to the site from outside of the original model boundary.
- Modelling of a wider variety of conditions would be undertaken to test the sensitivity of the model results / performance of the proposals under a wider range of conditions.

This further hydraulic modelling was reviewed by WSP in February 2015, the conclusions of the review were reported to Cris Lancaster via email on the 13th February and followed up by a letter dated the 18th February 2015 (issued on the 23rd February).

The conclusion of the review was that the modelling assessment had been undertaken in accordance with the agreed scope of works, that the results and sensitivity analysis demonstrated the model results to be robust (largely insensitive) and that the development proposals would therefore have negligible impact on flood levels or a minor beneficial impact. Through the review WSP reached two significant conclusions based on the hydraulic model results:

1. The model results present some irregularities. In some of the model runs 'pockets' of increased or decreased flood depth are observed that are too distant from the site to have been caused by changes made to the model to represent the proposed development. These irregularities are in the order of +10mm. As all other aspects of the physical representation of the hydraulic models remain the same, these 'pockets' are considered to be misleading. Therefore, WSP concluded that 10mm should be removed from all flood depths when considering the impact of the proposed development.
2. A review of the model results enabled an assessment of the sensitivity of the model to be undertaken. The analysis identified that the maximum swing in model results is approximately 80mm. Based on WSP's experience this is considered to reflect a largely insensitive hydraulic model (i.e. results are broadly consistent irrespective of changes in model parameters).

In light of the review WSP recommended approval of the application subject to a condition that the development would be delivered in accordance with the FRA and subsequent supporting hydraulic modelling.

Further to this recommendation a meeting was convened (on the 09/03/2015) between SFRG, Bellway Homes, OM, WBC and WSP to discuss the results of the analysis.

A number of queries arose from SFRG following the meeting, which are addressed below.

Responses to queries raised by Swallowfield Flood Resilience Group

Responses to questions raised in Willow Tree Works F/2014/0940, Swallowfield Flood Resilience Group, Flood Modelling Comments, 15 March 2015, V. 0.2

1) *The "wider conditions" required by WSP have not been met by the production of a set of runs that do not show extended Winter storms or a short Summer one.*
    a. The provided hydraulic model (sensitivity) runs have been sufficient for WSP to determine the confidence that can be associated with the model results. The sensitivity model results show that the maximum swing in model results is approximately ±80mm (previously communicated as 100mm).
    b. The number of permutations of hydraulic model runs it is possible to create is based on variations between a summer or winter storm profile, urban, rural or mixed catchment types and storm duration (e.g. a 30, 60, 120, 240, 360 and 480 minute). This combination of variables could generate 36 hydraulic model runs. Any and all runs performed where model parameters have been varied from the presented baseline are provided purely to assist in the assessment of model result confidence (i.e. how variable are the model results for a change in a given parameter(s)). The model runs completed are sufficient to enable an assessment of confidence to be undertaken without having to run all 36 permutations.
    c. The model runs undertaken demonstrate that with the most conservative assumptions regarding catchment behaviour and storm profile the maximum 'swing' in model results achievable is 80mm. On this basis the model is considered to be largely insensitive and the results of the design runs reliable.
2) *The "comparison event" 30 minute summer storm mentioned by WSP has not been re-modelled.*
    a. Reference to a '30 minute summer storm' in WSPs letter dated the 28/01/2015 was a typographical error and should have read '30 minute winter storm'.

b. WSP has run the OM hydraulic model for the 30 minute summer storm, the results of which indicate the proposed development will have negligible impact.

3) *Variations between modelling runs therefore vary two key input parameters. This is poor modelling practice.*
   a. Where variations in two model parameters has been undertaken it has been done in an attempt to simulate/replicate observed events (i.e. the 1 in 100 year plus allowance for climate change 360 minute summer storm, Figure 3, as a surrogate for the 20th July 2007 storm) or a worst case event (1 in 100 year plus allowance for climate change 30 minute storm urban catchment, Figure 7).

4) *No time intervals have been run between 30 minutes and 4 hours, e.g. 60, 120, 180 minutes. This is a serious omission in understanding the implications of the design.*
   a. A sufficient range of storm durations have been run to give confidence in the model results and enable assessment of impact of the proposed development.
   b. The analysis undertaken by OM and the 30 minute summer storm check undertaken by WSP demonstrates that the proposed development will not have an impact on flood levels when considering short winter or summer storms.
   c. Analysis of the hydraulic model performed by WSP confirms the proposed development will have no impact on flood levels when considering longer duration winter or summer storms.

5) *No sensitivity analysis has been carried out with graduated soil porosity between 0.30 and 0.75 to determine at what porosity the worsening becomes significant by WSP criteria and to assess the effect of saturated soil.*
   a. The effect of a saturated soil has been assessed through the 'urban' landscape model run (Figure 7). The selection of the urban runoff coefficient effectively reduces infiltration across the whole catchment enabling more water to be presented to the site. The results of this analysis are provided in Figure 7. These results do show a worsening in flood depth, but are presented as a sensitivity run and are not considered representative of design scenario. The results of this run have been used to determine that the hydraulic model results are largely insensitive to variation in land use throughout the catchment (i.e. ±80mm).

6) *No calibration of Figure 3 against observed 2007 flood depths, although this run was designed to approximate to this event. (Note: Some calibration has now been carried out at SFRG's request and with our help, however, OM has selected Figure 5, the 480 minute event to calibrate against, NOT Figure 3 which was specified to represent 2007).*
   a. No calibration of the hydraulic model has been undertaken. The hydraulic model is not calibrated and should not be considered as such. During the meeting between SFRG, Bellway Homes, OM, WBC and WSP it was explained by WSP that unless the July 20th 2007 storm profile was run through the hydraulic model and the results used for comparison with the provided flood depth data (of which there are limited records) the exercise would only identify a possible surrogate set of model conditions from the suite of runs already undertaken.
   b. The suggestion of running the 1 in 100 year plus allowance for climate change 360 minute summer storm (results presented in Figure 3) was proposed by WSP to OM as a 'possible' surrogate for the July 2007 flood (i.e. a more extreme set of conditions than had been run by OM prior to the meeting of the 03/02/2015).
   c. The results provided for both the 1 in 100 year plus allowance for climate change 360 minute storm (results presented in Figure 3) and the 1 in 100 year plus allowance for climate change 480 minute storm (results presented in Figure 3) indicate the proposed development will have negligible impact on local flood levels.

7) *Absolute results for flood depths have not been provided. This has the effect of writing and discussing much smaller depth values, e.g. +20mm instead of water depths of 300mm and 320mm.*

a. Flood depths are irrelevant in consideration of the impact of development. The impact of the development is measured in terms of the consequence it has on flood levels (i.e. the amount it will increase or decrease flood levels). Hence why the provided figures only present the difference in flood depths from a comparison of the current site (Willow Tree Works) and the Proposed Development.

8) *The statutory consultee on flooding matters, the Environment Agency, has not been asked to comment on the results.*
   a. The Environment Agency is not the statutory consultee on matters relating to surface water / pluvial flooding. Under the Flood and Water Management Act 2010 this responsibility lies with the Lead Local Flood Authority (LLFA), in this instance this role is fulfilled by Wokingham Borough Council.

Response to queries from Mr Lee Atkins set out in his email dated the 11 March.

1) *Can you also confirm how transparent the modelling software is?*
   a. The hydraulic modelling software is not particularly transparent to the 'lay-person'. That is to say aspects of the model would not be easy to interpret by someone without the necessary training and experience in using the hydraulic modelling software. This particular hydraulic model is not very complex (relatively speaking), consisting of a ground model, pipe network (to represent the existing or proposed drainage systems) and hyetographs of storms. All other parameters affecting hydrology and hydraulics of the model are controlled by coefficients / model parameters.
2) *.....For instance are the gradients of the slopes from the new built up finish ground levels shown and the proximity to the boundary of these design features.*
   a. Through WSPs assessment of the Odyssey Markides hydraulic model we have interrogated the ground model (Triangulated Irregular Network (TIN) model) used as the basis of the model and found it to be reasonable given the constraints associated with the data available at this time.
   b. The TIN effectively takes the known finished floor levels (FFL) of each building and represents this as a block 'standing up' out of the ground. Around each building Odyssey Markides have applied a 1m buffer (to represent footpaths around the buildings) that they have lowered by 300mm from the FFL. From there all other levels are interpolated based on the available data. From these footpaths the model assumes a steady gradient to the next available level point. Where that is a footpath at a similar height the gradient will be flat, where the point is at a lower level the model assumes a constant gradient between the two points (i.e. a steady fall).
   c. As this is part of the basis by which Bellway has demonstrated their proposed development will have no impact, WSP has recommended that the applicant is conditioned to deliver their site levels in a manner consistent with the TIN.
3) *We would like to see the raw design data used in the pre and post development models which you reviewed.*
   a. The raw data is available as a TIN. This is best viewed in AutoCAD. WSP is unable to provide this data due to copyright, however Odyssey Markides may be able to provide the data.
4) *.....We also want to understand how the model treats built up earth banks.....*
   b. The hydraulic model represents built up banks and ditches. These are represented in the TIN and, where necessary, ditches connect to the pipe network.
5) *Does the model assume any permeation into the banks?*
   a. The hydraulic model does not assume any permeation of flood water into any banks.

Yours sincerely,

Stephen Riley
Associate Director

01256 318588