Full Planning Applications: Flood Risk and Drainage Checklist

This document provides a list of the information that, in general, must be submitted to support full planning applications in relation to flood risk and drainage.

Application details

SITE:	Land west of A466, St Weonards, Herefordshire
DESCRIPTION:	Residential Development of 32, 35% of which is affordable, SuDS, public space, offsite footpath and associated works.
APPLICATION NO:	200699
GRID REFERENCE:	OS 349522, 224000
APPLICANT:	Ms Jasmine Lyster
DATE OF THIS RESPONSE:	24/11/2020

In our previous response issued in May 2020 we recommended that should the Council be minded to grant planning permission, the following information is requested in suitably worded planning conditions:

1. Results of infiltration testing at the location and proposed depth of the proposed infiltration structure, undertaken in accordance with BRE Digest 365 methodology;
2. Confirmation of groundwater levels to demonstrate that the invert level of the proposed infiltration structure can be located a minimum of 1m above groundwater levels;
3. Detailed calculations of the proposed infiltration structure informed by the results of infiltration testing, including half drain times;
4. Calculations to demonstrate that the proposed surface water drainage system has been designed to prevent the surcharging of any below ground drainage network elements in all events up to an including the 1 in 2 annual probability storm event. FEH 2013 rainfall data is expected;
5. Calculations to demonstrate that the proposed surface water management system will prevent any flooding of the site in all events up to an including the 1 in 30 annual probability storm event. FEH 2013 rainfall data is expected;
6. Calculations that demonstrates that the proposed drainage system will have sufficient capacity to cater for up to the 1 in 100 year event and allowing for the potential effects of climate change. FEH 2013 rainfall data is expected;
7. Detailed drawings of the proposed surface water drainage system and proposed infiltration structure, including detailed cross sections through the infiltration feature;
8. Detailed drawing demonstrating the management of surface water runoff during events that may temporarily exceed the capacity of the drainage system;
9. Operation and maintenance manual for all proposed drainage features that are to be adopted and maintained by a third party management company;
10. If access or works to third party land is required, confirmation that an agreement has been made with the necessary landowners/consenting authorities to cross third party land and/or make a connection to the proposed foul water sewer;
11. Confirmation of the location of the Welsh Water foul water network and receiving manhole, and demonstration that a viable connection can be made.

In addition, we advised that if the results of infiltration testing indicate that infiltration will not provide a feasible means of managing surface water runoff, an alternative drainage strategy must be submitted to the Council for review and approval. Best practice SUDS techniques should be considered, and we promote the use of combined attenuation and infiltration features that maximise infiltration during smaller rainfall events.

The Applicant submitted the following additional information in November 2020:

- Application for full planning permission;
- Designers Response;
- Drainage Strategy Site Wide Plan, drawing ref. 0400 rev. P3;
- Foul water calculations, dated 21/10/2020;

- Drainage Strategy General Arrangement, drawing ref. 0400 rev. P1;
- Drainage Strategy Sewer Connection, drawing ref. 0402 rev. P1;
- Surface Water calculations, dated 21/10/2020.

Comments

1. *Results of infiltration testing at the location and proposed depth of the proposed infiltration structure, undertaken in accordance with BRE Digest 365 methodology.*
   No information was submitted. To allow adoption of the infiltration pond, additional testing will be required. The design is based on one test pit that was filled only once, being left open for 6 hours

2. *Confirmation of groundwater levels to demonstrate that the invert level of the proposed infiltration structure can be located a minimum of 1m above groundwater levels.*
   A review of the submitted Drainage Strategy Site Wide Plan shows that the proposed infiltration depression is proposed to be 1.2m deep. The submitted Designer's Response states that a trial pit was excavated at the proposed location for the infiltration basin. The pit depth was 4.5m below ground level, and after 3 hours no perched water was encountered. The submitted information is satisfactory.

3. *Detailed calculations of the proposed infiltration structure informed by the results of infiltration testing, including half drain times.*
   It is understood that no further soil infiltration tests were undertaken since our last response. As commented in our previous response, only one test was carried out in the area of the proposed infiltration basin. The recently submitted calculations are based on the infiltration rate calculated based on only one test. In accordance with the BRE365 guidance, three tests should be carried out in a trial pit to check the infiltration rate in a saturated ground. The lowest estimated rate should be used for detailed design calculations.

4 & 5 & 6 Drainage Calculations

The recently submitted calculations are based on FEH 1999 rainfall data. As commented in our previous response, FEH 2013 rainfall data should be used in all calculations. The results show no surcharge of the system for the 1 in 1 year event and no flooding from the system for up to and including the 1 in 100 year + 40% climate change allowance. However, as commented above, no further soil infiltration tests were undertaken at the site and the infiltration rate used in the calculations was calculated based on only one test.

The submitted calculations show that seven online flow controls are included in the proposed drainage system. However, no details of these flow controls were submitted and they are not identified on the submitted drawings showing the proposed drainage strategy. The FRA submitted as part of the original application states that a reed bed immediately upstream of the infiltration basin will be incorporated in the design to provide pollution control in addition to the Hydro's First Defence separator. The reed bed is not identified on the recently submitted drawings showing the proposed drainage strategy. It is uncertain whether it is still part of the proposed drainage system.

It is also noted that the longest pipe run (pipes numbered 9.00X etc) in the proposed drainage network is not shown as the main pipe run which may cause confusion.

7. *Detailed drawings of the proposed surface water drainage system and proposed infiltration structure, including detailed cross sections through the infiltration feature.*
   No drawings showing details of the proposed permeable paving and the infiltration basin were submitted.

8. *Detailed drawing demonstrating the management of surface water runoff during events that may temporarily exceed the capacity of the drainage system.*

The submitted Designer's Response states that the drainage calculations show no flooding from the system for up to and including the 1 in 100 year event with climate change allowance. It also states that the gully spacing of maximum 50m would provide enough capacity to prevent any water depth to flow over kerbs in the main road for any event smaller than the 1 in 30 year. We concur with this conclusion. The recently submitted drawing suggests that exceedance flows (assumed to only be in the event of significant blockage) may be conveyed to the land adjacent to the south-western boundary of the site. It is recommended that the Applicant submits a drawing showing the exceedance flows and the levels throughout the site to enable us to review it.

9. *Operation and maintenance manual for all proposed drainage features that are to be adopted and maintained by a third party management company.*
No information was submitted. We understand that the network is to be presented to DCWW for adoption, with the infiltration pond being presented to Herefordshire Council

10. *If access or works to third party land is required, confirmation that an agreement has been made with the necessary landowners/consenting authorities to cross third party land and/or make a connection to the proposed foul water sewer.*
The submitted drawings show that the foul water from the site is proposed to be discharged to the public foul sewer located approximatey 200m to the north of the site. The foul sewer from the site is proposed to be constrcuted along the existing road adjacent to the western boudnary of the site. The submitted information is satisfactory.

11. *Confirmation of the location of the Welsh Water foul water network and receiving manhole, and demonstration that a viable connection can be made.*
The recently submitted drawings show the invert level of the existing foul manhole where the foul flows from the site are proposed to be discharged to. The invert level of the existing foul manhole is a minimum of 20m lower than the invert levels of the very upstream run of the proposed foul water draiange system. The Applicant also submitted foul draiange calculations showing that a gravity connection to the public foul sewer is feasible. The submitted information is satisfactory.

Overall Comment

The infiltration pond will be installed on sloping land. When there is water in the pond this will create hydraulic pressure that will push groundwater sideways. Because the adjacent land is lower than the base of the pond, springs are likely to be created. A clay key is required on the south western side of the pond. Although water could escape below the clay key, the soil will be compressed, and water will need to take a longer route through adjacent soil before emerging on the surface. The clay key will need to be installed so that it is at the same depth as the base of the pond. The key should be 600mm wide.

As previously commented, we have no objection to the proposed development in principle.

Should the Council be minded to grant planning permission, we recommend that the Applicant submits the following information requested in suitably worded planning conditions:

1. Results of infiltration testing at the location and proposed depth of the proposed infiltration structure, undertaken in accordance with BRE Digest 365 methodology. Three consecutive tests should be carried out in a trial pit;
2. Detailed calculations of the proposed infiltration structure informed by the results of infiltration testing, including half drain times. FEH 2013 rainfall data is expected;
3. Calculations to demonstrate that the proposed surface water drainage system has been designed to prevent the surcharging of any below ground drainage network elements in all events up to an including the 1 in 2 annual probability storm event. FEH 2013 rainfall data is expected;

4. Calculations to demonstrate that the proposed surface water management system will prevent any flooding of the site in all events up to an including the 1 in 30 annual probability storm event. FEH 2013 rainfall data is expected;
5. Calculations that demonstrates that the proposed drainage system will have sufficient capacity to cater for up to the 1 in 100 year event and allowing for the potential effects of climate change. FEH 2013 rainfall data is expected;
6. Information on the proposed online flow controls used in the drainage calculations, and identify them on the drainage drawings;
7. Detailed drawings of the proposed surface water drainage system and proposed infiltration structure, including detailed cross sections through the infiltration feature;
8. Detailed drawing demonstrating the management of surface water runoff during events that may temporarily exceed the capacity of the drainage system;
9. Operation and maintenance manual for all proposed drainage features that are to be adopted and maintained by a third party management company.
10. An annotated drawing showing the proposed clay key