

Outline Planning Applications: Flood Risk and Drainage Checklist

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

Application details

SITE:	Land South of the A480, Credenhill
DESCRIPTION:	Outline planning permission for up to 100 dwellings including means of access onto the A480
APPLICATION NO:	193794
GRID REFERENCE:	OS 345441, 243639
APPLICANT:	Spreckley/Van Straaten
DATE OF THIS RESPONSE:	19/05/2020

This response is in regard to flood risk and drainage aspects. In previous responses to this application concerns were raised regarding the following aspects:

- An ephemeral watercourse was identified that flows from adjacent fields and on to the A480, posing flood risk to the site via the field entrance at the east of the site. We recommended that the FRA and drainage strategy were revised to take account of this feature.
- Infiltration rates within the site are very low, with a half drain time of c.100 hours indicated by the drainage calculations for a 10 year event. We recommended that consideration was given to controlled discharge to a swale running along the MOD site perimeter fence that conveys surface water into a culvert that passes below the MOD site. The flow rate from the site during the 100 year storm would need to be limited to QBar to ensure compliance with volumetric discharge requirements.

The applicant has responded to these concerns, with additional information presented in the following documents:

- Flood Risk Assessment (rev P06, dated April 2020)
- Illustrative Drainage Strategy (ref: LOC-BWB-ZZ-XX-DR-CD-0004, rev P01)

We highlight that any planning application should be submitted in accordance with the Herefordshire SuDS Handbook and the Herefordshire Council Planning Applications Flood Risk & Drainage Checklist available on the Council's website:

https://www.herefordshire.gov.uk/info/200142/planning_services/66/about_planning_services/11

Comments to points raised

Ephemeral watercourse

The amended FRA discusses the identified overland flow route that is reported to enter the site from the A480 at the site's entrance, flowing through the site broadly parallel to the eastern site boundary towards the south of the site. The FRA identifies the location of a 'perimeter swale' located along the southern site boundary that receives this runoff and discharges water to the east to a culverted watercourse. The culverted watercourse conveys water south beyond the site boundary and beneath the adjacent MOD site. The figure below was provided by the LLFA (swale shown in green, culvert shown in orange). We understand that the full extent of the swale and entrance to the culvert is located on land that is in the wider ownership of the applicant.



The flow route through the site is stated to be associated with changes made to ground levels by the land owner in the north-east of the site to allow flooding from the A480 to pass through the site and alleviate flooding to two existing cottages off the south-east corner of the site. This overland flow route must therefore be retained as part of the development.

This applicant proposes to maintain an overland flow corridor along the eastern boundary of the site to convey runoff from the A480 to the perimeter swale as per the current situation. The applicant has estimated the likely flow rate that would be expected during the 100 year + 70% climate change event using ReFH – stating this to be 0.53 m³/s. The Illustrative Drainage Strategy shows a swale along the eastern site boundary that is stated to be 300mm deep with 1:4 banks, with an indicative capacity calculation indicating that the swale will have an approximate capacity of 0.99 m³/s. The FRA and Illustrative Drainage Strategy states that detailed design of the feature is proposed at the detailed design stage.

We accept the assessment presented by the applicant to support the planning application and agree that detailed assessment can be undertaken to support the discharge of conditions. As acknowledged in the FRA, this will need to include demonstration that this overland flow route will not pose risk to safe access and egress and will not discharge to the proposed development's drainage system; and similarly that runoff from the proposed development will not discharge at an unattenuated rate to the proposed swale. It is expected that this assessment will also consider the approximate capacity of the downstream culverted watercourse, taking the size and characteristics of the respective upstream catchment into account. Ongoing maintenance of the receiving swale will be required to reduce flood risk.

The applicant could consider installing the swale further to the east of the proposed junction, but there would be a need to present details of the profile and alignment of the proposed junction within this application. The road would need to be a minimum of 300mm higher than the A480 carriageway, with a level section of road which then dips as vehicles drive into the site. The proposed highway layout would need to be approved by HC Highways. Some changes would be needed to the ground level and these would also need to be reviewed.

Surface Water Management Strategy

The total site area is stated to measure 3.8ha. The proposed impermeable area is stated to measure 1.26ha. The applicant proposes to discharge site-generated surface water runoff to the perimeter swale in the south of the site and, subsequently, the culvert to the south-east of the site. The FRA states that discharge will be limited to the equivalent greenfield Q_{bar} rate of 8.9 l/s, calculated using FEH methods. However, we note that this is the rate calculated for the whole of the 3.8ha site area and highlight that discharge should instead only consider those areas that are drained by the proposed surface water drainage system (i.e. the impermeable areas of the development). Applying an area of 1.26ha would suggest a peak discharge rate of 3 l/s. **Prior to the Council granting planning permission we recommend that the applicant confirms that this lower discharge rate can be achieved and sufficient storage accommodated in the proposed development.** In practice if the balancing pond is presented to Herefordshire Council for adoption then a higher rate of discharge may be negotiated, to ensure that a hydrobrake with an orifice size of circa 100mm can be utilised. The selection of discharge rate will depend on whether the site roads will be presented for adoption, as public surface water sewers will be required and in turn the balancing pond will need to be adopted by a statutory authority such as Herefordshire Council (a commuted sum would apply)

The detailed design will need to give consideration to the capacity of the receiving culverted watercourse to receive discharge from the site during a range of storm events. On-site mitigation may be required to manage these risks and prevent increased flood risk elsewhere.

The FRA states that attenuation will be provided in a detention basin sized to cater for the 100 year event + 20%CC, and tested for the 100 year event + 40%CC. The FRA also states that a 10% allowance for urban creep will be applied to the drainage calculations (although we highlight this should not be included when calculating peak discharge rate as per above). The FRA states that the basin will be positioned so as to not receive discharge from the proposed eastern perimeter swale. The FRA also states that exceedance flows from the drainage system will be directed overland towards the proposed detention basin. We approve of this approach. If groundwater levels are a minimum of 1m below the base of the detention basin (with no risk of seasonal rise) we would welcome the use of an unlined feature to promote infiltration during smaller rainfall events.

We note that the submitted Microdrainage calculations use FSR rainfall data. FEH 2013 rainfall data should be used to inform the detailed design.

The FRA states that upstream treatment measures will be incorporated into the detailed design, such as a sediment forebay, conveyance swales, bioretention areas and pervious pavements. We approve of this approach.

The FRA states that the drainage system will be maintained by a third party management company. Note our comments on road adoption above

Overall Comment

We are supportive of the applicant's approach to managing overland flood risks and site-generated surface water runoff. We understand that the applicant is considering aligning the swale to the east of the junction and if this is their intent we request details of the proposed layout, profile and alignment of the junction.

Prior to the Council granting planning permission we recommend that the applicant confirms that a lower discharge rate commensurate to the equivalent Q_{bar} discharge rate from only impermeable areas of the development can be achieved and sufficient storage accommodated in the proposed development. Given the sensitivity of downstream receptors, limiting offsite discharge is considered of upmost importance.

Should the Council be minded to grant planning permission, we recommend that the Applicant submits the information requested above along with the following information within any subsequent reserved matters application:

- Confirmation of groundwater levels to demonstrate that the invert level of any unlined attenuation features can be located a minimum of 1m above groundwater levels.
- Detailed drawings of the proposed surface water drainage system, swales and detention basin including cross sections that clearly illustrate invert levels, top of banks levels, inlet structures and outfall structures.
- Detailed assessment (1D/2D modelling) and drawings of the proposed overland flow route and demonstration that this will not pose risk to safe access and egress, will not discharge to the proposed development's drainage system, and that runoff from the proposed development will not discharge at an unattenuated rate to the proposed swale.
- 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 and using FEH 2013 rainfall data.
- 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 and using FEH 2013 rainfall data.
- Calculations that demonstrate the drainage system will provide sufficient capacity to manage up to the 1 in 100 year event and allowing for the potential effects of climate change up to a peak rainfall intensity increase of 40%.
- Confirmation of the proposed methods of treating surface water runoff to ensure no risk of pollution is introduced to groundwater or watercourses both locally and downstream of the site, especially from proposed parking and vehicular areas.
- Description and drawing demonstrating the management of surface water runoff during events that may temporarily exceed the capacity of the drainage system.
- Operational and maintenance manual for all proposed surface water drainage features that are to be adopted and maintained by a third party management company, including ongoing maintenance of the existing culvert entrance.
- A detailed foul water drainage strategy showing how foul water from the development will be disposed of and illustrating the location of key drainage features including DCWW sewerage connections.
- If access or works to third party land is required, details of these works and agreement in principal with necessary landowners/consenting authorities to cross third party land and/or make a connection to the proposed watercourse/sewer.