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 at Cinders Farm, Cinder Lane, St Michaels, Tenbury Wells, WR15 8PN
DESCRIPTION:	Proposed conversion of traditional barns to 6 No. dwellings.
APPLICATION NO:	193325
GRID REFERENCE:	358606, 264692
APPLICANT:	Mr P Rose
AGENT:	Mr Martin Teale
DATE OF THIS RESPONSE:	18/05/2020

This response is in regard to flood risk and land drainage aspects, with information obtained from the following sources:

- Application for full planning permission
- Proposed Site Layout (Ref: 4212BP-01 April 2020)
- Surface and Foul Water Drainage Strategy Date: 4th April 2020)

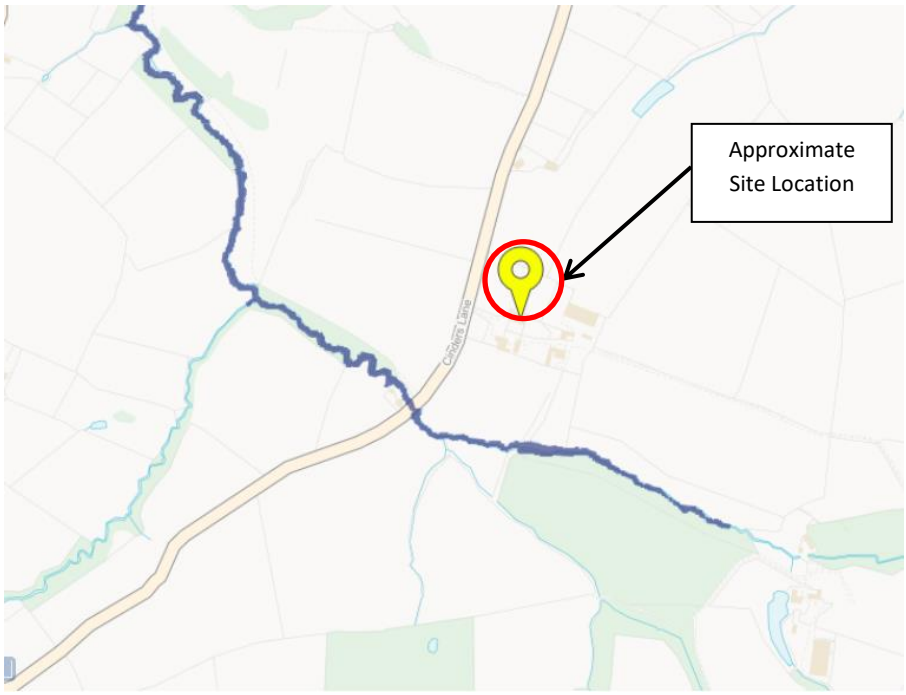
In our previous response we recommended that the following be provided prior to the council granting planning permission:

- Results of infiltration testing at the locations and proposed depths of any proposed surface water infiltration structures undertaken in accordance with BRE 365 and confirmation that groundwater levels would be a minimum of 1m below the base of the infiltration structures, or demonstration that an alternative strategy for the management of surface water runoff is available.
- Further information regarding the proposed operation of the surface water pond; the location, invert level, downstream alignment, condition and capacity of the existing land drain; and the proposed drainage strategy for the access road and parking bays.
- Confirmation that the system will be designed to prevent any flooding of the site in all events up to an including the 1 in 30 annual probability storm event with supporting preliminary calculations.
- Calculations of proposed soakaway and attenuation sizing to demonstrate sufficient space within the site to ensure no increased flood risk up to the 1 in 100 year event and allowing for climate change effects.
- Detailed calculations of greenfield and current runoff rates for the 1 in 1 year, Qbar, 1 in 30 and 1 in 100 year events.
- Detailed calculations of proposed discharge rates and volumes for the 1 in 1 year, Qbar, 1 in 30 and 1 in 100 year events.
- Calculations of the required attenuation volume to manage the rate and volume of runoff up to the 1 in 100 year event and allowing for climate change effects and demonstration that there is sufficient space within the site (including that required to drain the road and parking areas).
- Demonstration that a viable connection can be made to the existing land drain and that the suitability and capacity of the drain has been considered.
- Percolation tests undertaken in accordance with BS6297, and Building Regulations Part H, that demonstrate appropriate infiltration for the foul drainage percolation pipes, or demonstration of an alternative appropriate drainage strategy.
- Completion of a Foul Drainage Assessment (FDA) Form.
- Confirmation of the proposed authority/organisation responsible for adopting and maintaining the proposed surface water and foul water drainage systems.
- Confirmation of land ownership to the south of the site with regard to the proposed connection to an existing ditch and proposed infiltration of foul water effluent to ground.

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

Site location and extract of flood map(s)

Figure 1: Environment Agency Flood Map for Planning (Rivers and Sea), Oct 2019



Development description

The Applicant proposes the conversion of existing agricultural buildings into 6 dwellings with associated parking and access roads. The site occupies an area of 0.55ha and is currently used for agricultural purposes. Part of the site will be retained as green space and an existing depression will be utilised as a pond.

Identifying the need for a Flood Risk Assessment

All Applicants must provide sufficient information to address the points listed below to enable an accurate assessment of flood risk and the need for a flood risk assessment to be made.

Information required	Reviewers comments
Confirmation of the site area in hectares or square metres	Site area confirmed as 0.55ha.
Identification of all main rivers within 20m of the site boundary	There are no main rivers within 20m of the site boundary.
Identification of all ordinary watercourses and land drains within 20m of the site boundary	There are no ordinary watercourses within 20m of the site boundary.
Confirmation of the site's location in Flood Zone 1, Flood Zone 2 or Flood Zone 3, and taking climate change effects into account	The site is in Flood Zone 1.

Information required	Reviewers comments
Confirmation and supporting justification of whether the site is at significant risk of flooding from other sources, including surface water flood risk or flood risk from minor watercourses with unmapped flood extents	The site contains an area indicated as high risk of surface water flooding that is understood to be associated with a localised depression in this site's topography. Information has now been provided confirming the indicated flood risk is at the location of a manmade agricultural drainage basin, into which surface and washdown water has previously been directed. The proposal is to incorporate this as an integral part of the redevelopment's surface water drainage system.

A Flood Risk Assessment (prepared in accordance with NPPF and EA Standing Advice) must support the planning application for any development:

- Located in Flood Zone 2 or Flood Zone 3[1].
- With a site area greater than 1 hectare.
- Located in an area identified to be at significant risk of flooding from other sources, including surface water flood risk or flood risk from minor watercourses with unmapped flood extents.

Review of the information summarised in Section 1 indicates that a FRA is not required to support the planning application for this development.

Surface Water Management Strategy

A surface water management strategy should be submitted that includes the following information:

✓ Information provided is considered sufficient

✘ Information provided is not considered sufficient and further information will be required

Information required	Reviewer comments	✓✘
Strategy		
Summary and illustration of the proposed surface water drainage system including location of SuDS features, manholes, external pipework, attenuation features, pumping stations (if required) and discharge locations	The drainage strategy document has provided a revised scheme that collects and attenuates surface water from roofs within the existing basin. The Applicant proposes to retain existing hardstanding (with a slight reduction in roof area) and to continue to drain it towards an existing lagoon. It is proposed that any new hardstanding be permeable, with overland flow routes also directed towards the existing lagoon. The Applicant also proposes to include a 5 l/s flow control on the existing lagoon to further reduce discharge rates. The design includes an interceptor upstream of the flow control. The lagoon outfalls into the Cadmore Brook 110m to the south. Detailed drawings of the surface water system have not been provided although information locating the basin, outfall and watercourse are available. In principle we agree with the proposal. Detailed drawings of all parts of the drainage system should be provided as part of the discharge of conditions application. We would expect details for the basin to show levels, including inlet, outlet and overspill levels. A CCTV condition	✘

[1] Note that the Council may also request an assessment of flood risk where the development is indicated to be at risk of flooding when the potential effects of climate change are taken into account.

Information required	Reviewer comments	✓✘
	survey for the existing pipe is expected. These items should be provided as part of to the discharge of conditions application. The revised site plan has removed the hedge from between the attenuation basin and the area of designated green space. Although it is possible that this is to indicate the intention is to separate the drainage basin from private property there is remaining ambiguity due to the position of the label for unit 4 and the outer hedges on the plan enclose the unit 4 property, basin and green space. **Prior to planning permission being granted, the Applicant should clarify the proposed ownership boundary.** We highlight that locating the proposed pond within the garden of a private property would not be considered acceptable.	
Summary of likely ground conditions including permeability and contamination risks	Our review of available data sources suggests the bedrock is expected to be Raglan Mudstone Formation comprising siltstone and mudstone. Soilscapes mapping indicates the soil type for the area is broadly loamy and clayey soils with impeded drainage. Testing to BRE365 has been undertaken and this has confirmed that no infiltration was observed under the test conditions. The drainage strategy has confirmed that infiltration is unsuitable as a method of surface water disposal and we agree this is appropriate. It is noted that groundwater testing was undertaken to 2.5m and the existing basin is described as 1.5m deep at its shallowest. It is not known at which location the test pit was dug. If the variation in the depth the basin is minimal then groundwater testing undertaken 1m below this should be adequate given the site but the lowest point in the basin should be clarified at the discharge of conditions application.	✓ **(with note)**
Confirmation of whether the site is located in a Source Protection Zone or Principal Aquifer	The site is not located in a source protection zone or principle aquifer.	✓
Demonstration that the SuDS hierarchy has been considered in accordance with NPPF and justification for the proposed method of surface water discharge	The applicant demonstrated compliance with the NPPF that promotes the following hierarchy: i) Infiltration to ground ii) Controlled discharge to a local watercourse iii) Controlled discharge into the public sewer network (depending on availability and capacity). We agree that infiltration is not an option for this site and that discharge of water to a local watercourse is appropriate.	✓
Demonstration that best practice SuDS have been promoted, appropriate to the size and nature of development	We agree with the approach to attenuate the roof water in an open basin and provide permeable surfaces for access and driveways, which should slow, evaporate and remove pollutants as far as practicable for smaller rainfall events.	✓
If pumped systems are proposed, justification for the use of these systems, summary of key design principles and assessment of residual risk, with supporting calculations	No pumps are proposed.	✓
Off-site discharge		
For discharge to a watercourse, sewer or local authority asset, confirmation of the relevant	The Applicant proposes to reuse an existing discharge to the watercourse.	✓

Information required	Reviewer comments	✓✗
authority from which consent will be required		
For discharge to a watercourse, sewer or local authority asset, detailed calculations of greenfield and, if relevant, current runoff rates calculated using the methods outlined in The SuDS Manual 2015 for the 1 in 1 year, Qbar, 1 in 30 and 1 in 100 year events	The Applicant states that the Greenfiled runoff rate is 'generally accepted to be' 5 l/s. We note that the greenfield runoff rate varies depending on location and size of the catchment. However, we confirm that a proposed discharge rate of 5 l/s will be acceptable for this site. We note that the site is brownfield and the Applicant proposes to reduce the impermeable area as part of the development.	✓
For discharge to a watercourse, sewer or local authority asset, detailed calculations of proposed discharge rates and volumes calculated using the methods outlined in The SuDS Manual 2015 for the 1 in 1 year, Qbar, 1 in 30 and 1 in 100 year events	Proposed roof areas have been given as 1095m^2. While there is a slight increase in the area of hardstanding, it is proposed that all new hardstanding is permeable. It is not always acceptable to treat permeable paving as softstanding for the purposes of existing and proposed runoff calculations. However, we note that this site is brownfield, is understood to have discharged/flowed to the existing laggon and is likely to have previously been heavily trafficked (and therefore compacted). It is therefore likely that runoff rates from the site will be reduced for all storms up to and including the 1 in 100 year event, with an allowance for climate change. However, as part of the discharge of conditions the applicant will be required to demonstrate that any excess flows generated in the hardstanding areas (i.e. when the ground becomes saturated) does not pose flood risk to the proposed properties and will be directed towards the attenuation lagoon. The site currently contains a lagoon with no formal flow control device fitted. The Applicant proposes to fit a flow control to this lagoon limiting flows to 5 l/s. As noted above, we confirm that a proposed discharge rate of 5 l/s will be acceptable for this site. It is assumed that the lagoon is unlined and will therefore promote infiltration and evaporation during smaller rainfall events. We recommend that this is encouraged in the detailed design of the lagoon.	✓ **(with note)**
For discharge to a watercourse, sewer or local authority asset, detailed calculations of proposed attenuation volume to manage the rate and volume of runoff to greenfield or current rates and volumes, allowing for climate change effects and demonstrating sufficient space within the site	Rainfall rates and calculations have been taken from building regulations which are not usually considered applicable for planning application purposes, as they do not represent rainfall during a 1in 100 year return period with an allowance for climate change (the required design standard). The Applicant has therefore not demonstrated whether or not the lagoon has sufficient capacity for the 100 year return period with an allowance for climate change. However, given the size of the lagoon and size of the development we expect the lagoon to have sufficient capacity. This must be demonstrated as part of detailed calculations submitted to support the discharge of conditions, noting that this should also consider any overland flows that will be directed towards the lagoon from hardstanding areas.	✓ **(with note)**
Clarification if attenuation structures are to be provided partly or wholly above adjacent ground level (i.e. above ground storage), and assessment of potential failure of above-ground attenuation features, including assessment of residual risks to downstream receptors, and	We do not believe any part of the basin is located above ground but this should be highlighted by the applicant if this is the case.	✓ **(with note)**

Information required	Reviewer comments	✓✘
proposed mitigation and management measures		
For discharge to a watercourse, sewer or local authority asset, demonstration that a viable connection can be made and that the suitability and capacity of the downstream system has been explored in consultation with the relevant authority	The drainage strategy has confirmed the location of the existing outfall from the basin in the Cadmore Brook, and that the watercourse ultimately drains to the River Teme upstream of Tenbury Wells. It is expected that total outflow will be reduced by the development. The outfall appears appropriate although levels should be provided as part of the discharge of conditions application.	✓ **(with note)**
For discharge to a watercourse, sewer or local authority asset, consideration of the risk of water backing up the drainage system from any proposed outfall and how this risk will be managed without increasing flood risk to the site or to people, property and infrastructure elsewhere, noting that this also includes failure of flap valves	The basin appears elevated from the watercourse by at least 5 meters. Although invert levels have not been provided, it does not appear that this would be an issue.	✓
Access, adoption and maintenance		
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	It is noted that the outfall from the lagoon crosses land outside the site area. **We recommend that the applicant confirms no works to third party land are required prior to the Council granting planning permission.**	✘
Confirmation of agreement in principle of proposed adoption and maintenance arrangements for the surface water drainage system	No information regarding the adoption and maintenance of the drainage system has been provided. **We recommend that the applicant confirms the proposed authority/organisation responsible for adopting and maintaining the proposed drainage system prior to the Council granting planning permission.** It is unclear if the attenuation basin is within the property boundary of unit 4 or within public open space. **Prior to planning permission being granted, the Applicant should clarify the proposed ownership boundary.** We highlight that any attenuation systems serving more than one property must be located in public open space (i.e. not within individual property boundaries). It is noted that the outfall is located on land outside the site – clarification should be given of intended access arrangements for maintenance of the headwall and the connecting pipe. **Prior to planning permission being granted, we recommend that the Applicant confirms how the headwalls and pipe between the lagoon and the Cadmore Brook will be maintained.**	✘

Information required	Reviewer comments	✓✘
	We also highlight that appropriate access must be made available to maintain the proposed attenuation system. We note that a proposed access might reduce the space available for planting in the green open space. **Prior to planning permission being granted, we recommend that the Applicant updates their design to include a suitable access to allow maintenance of the lagoon.**	

Foul Water Management Strategy

A foul water management strategy should be submitted that includes the following information:

✓ Information provided is considered sufficient

✘ Information provided is not considered sufficient and further information will be required

Information required	Reviewers comments	✓✘
Description and illustration of the proposed foul water drainage system including location of manholes, external pipework, package treatment plants, drainage fields, pumping stations and discharge locations	The drainage strategy proposes the use of a single package treatment plant which discharges into a 27m^2 horizontal flow reed bed. The reed bed in turn discharges into the outflow pipe from the lagoon. The Applicant proposes to incorporate the treated foul outflow upstream of the flow control to restrict total flow to that confirmed for the surface water. The applicant's drainage strategy seeks to include the maximum flows from the reed bed in site discharge estimates. While we commend the Applicant's efforts to control discharge rates, including the outlet from the reed bed upstream of the flow control introduces a risk of storm water backing up and flooding the reed bed. We therefore suggest that the outfall from the reedbed is located downstream of the flow control. We recommend that the applicant demonstrates this change as part of the discharge of conditions.	✓ **(with note)**
Identification of the public foul sewerage network within the vicinity of the development and assessment of the viability to connect to this network	The drainage strategy confirms there are no foul sewers located within the site boundary or within a reasonable distance from the site. We note the correspondence with Severn Trent Water confirming that they have no comment to the development and assume that this also confirms no public sewerage infrastructure in the area. **If a connection to a public foul sewer is not considered feasible, the applicant should complete a Foul Drainage Assessment (FDA) Form prior to planning permission being granted.** The FDA Form can be found on the GOV.UK website at this link: https://www.gov.uk/government/publications/foul-drainage-assessment-form-fda1.	✘
Discharge to a watercourse		
For discharge to a watercourse, confirmation of the relevant authority from which consent will be required	The Applicant proposes to reuse an existing discharge to the watercourse.	✓
Assessment of the suitability and sensitivity of the receiving	For foul effluent disposal it is important that the receiving watercourse must have a constant flow (i.e. not seasonal), and with sufficient flow (at low flow conditions) to dilute the predicted volume of foul water discharge. The applicant's drainage designer H+H has advised that the	✓

Information required	Reviewers comments	✓✘
watercourse, including assessment of low flows	Cadmore Brook has a constant non-seasonal flow. We note that google earth shows water in the brook. On this basis the discharge will be compliant with the Binding Rules We note that the Cadmore Brook ultimately drains to the River Teme which is designated as an SSSI. We note remarks regarding the use of a reed bed to reduce phosphate levels, this proposal has been welcomed by the Council Ecologist. The site does not drain to the River Lugg, Natural England have not imposed specific requirements for phosphate control. We do however support and encourage the use of an appropriately designed reed bed at this site owing to the SSSI downstream. The reed bed design will need to follow guidance in the Building Regulations	
Access, adoption and maintenance		
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	It is noted that the outfall and headwall location crosses land outside the site area. The applicant should confirm that this will not require works on third party land. **We recommend that the applicant confirms no works to third party land are required prior to the Council granting planning permission.**	✘
Confirmation of agreement in principle of proposed adoption and maintenance arrangements for the foul water drainage system	The drainage strategy has set out details for maintenance of the package treatment plant and reedbed. The document suggests the provisions under which the jointly owned foul drainage infrastructure could be overseen and monitored and indicates that a third party maintenance arrangement would be suitable for the site. It is unclear if the package treatment plant and reedbed is proposed within the property boundary of unit 4 or within public open space. **Prior to planning permission being granted, the Applicant should clarify the proposed ownership boundary.** We highlight that any foul treatment infrastructure serving more than one property must be located in public open space (i.e. not within individual property boundaries). We also highlight that appropriate access must be made available to maintain the proposed effluent treatment system. We note that a proposed access might reduce the space available for planting in the green open space. **Prior to planning permission being granted, we recommend that the Applicant updates their design to include a suitable access to allow maintenance of the effluent treatment system.** We recommend that the details of the maintenance of the foul drainage system are requested as part of suitably worded planning conditions. We would typically expect the following points to be addressed: • The party responsible for communication with new residents to advise them of the requirement to dispose of inorganic debris using bins. • Which party will maintain the treatment plant and reed bed. • Which drains will be owned and maintained communally.	✘

Information required	Reviewers comments	✓✗
	• Arrangements for retrieving inorganic debris from the treatment plant when this is discharged. The inorganic debris will need to be removed in a timely manner to ensure continued operation of the plant. • In the event of electrical power failure the residual current device (RCD) may isolate the package treatment plant. In this scenario pollution can be expected to occur. The RCD would need to be installed in an accessible dry place and the location should be confirmed. The party responsible for switching this on should be confirmed. • How failure of the treatment plant will be communicated to the maintainer – normally expected within 3 hours to mitigate the risk of pollution. • Evidence of how the eventual replacement of the package treatment plant will be funded. We also request further details of how the reed bed will be maintained, noting that the reeds need to be cut annually after the second year's growth and all the dead plant material is removed completely from the surface of the bed, whether vertical flow or horizontal flow design	

Overall Comment

We recommend that the following information is provided by the Applicant prior to the Council granting planning permission for this development:

- Clarification of the proposed ownership boundary around unit 4.
- Confirmation that no works to third party land are required as part of the proposals.
- Confirmation of the proposed authority/organisation responsible for adopting and maintaining the proposed surface water drainage system.
- Confirmation of how the headwalls and pipe between the lagoon and the Cadmore Brook will be maintained.
- A revised design which includes a suitable access to allow maintenance of the surface water lagoon and effluent treatment system.
- A completed Foul Drainage Assessment (FDA) Form.