Reserved Matters Applications: Flood Risk and Drainage Checklist

This document provides a list of the information that, in general, must be submitted to support reserved matters applications in relation to flood risk and drainage. Note that this checklist must be read alongside the checklist for outline planning applications that should have been completed previously.

Application details

SITE:	Land off Rosemary Lane, Leintwardine, Herefordshire
DESCRIPTION:	Application for approval of reserved matters following Outline approval for a development of up to 45 dwellings with means of access and associated works
APPLICATION NO:	190161
GRID REFERENCE:	OS 340721, 273988
APPLICANT:	Mr Richard Cambray
DATE OF THIS RESPONSE:	17/042020

Outline planning approval has been granted for this development subject to a number of conditions. Conditions relating to flood risk and drainage aspects include:

7. No development in relation to the provision of roads and drainage infrastructure shall take place until details of the engineering and specification of the roads and highway drains have been submitted to and approved in writing by the local planning authority. None of the dwellings hereby permitted shall be occupied until the development has been carried out in full accordance with the details as approved.

13. None of the dwellings hereby permitted shall be occupied until a scheme for the drainage of surface water, including surface water run-off, and works for the disposal of foul sewage have been provided on site, in accordance with details that shall have been first submitted to and approved in writing by the local planning authority.

This is our third response for the reserved matters application for this development. Information that has been provided by the applicant to address our previous concerns includes:

- Application for discharge of reserved matters
- Drainage Layout Sheet 1 and Sheet 2 (Ref: 55-01_P3 and 55-02_P2)
- Exceedance Plan Sheet 1 and Sheet 2 (Ref: 55-06_P1 and 55-07_P1)
- Drainage Longsection Sheet 1 and Sheet 2 (Ref: 55-04_P2 and 55-08 P1)
- Attenuation Details (Ref: 55-09_P1)
- Drainage Construction Details (Ref: 55-03_P1)
- Flow Control Manhole Details (ref: 55-05_P2)
- Updated Calculations (dated 10/13/2020)

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

Development description

The Applicant proposes a development comprising of up to 57 dwelling, public open space and associated infrastructure on a currently greenfield site used for agriculture. The site measures approximately 2.6 hectares (ha). The site slopes from approximately 130mAOD in the north western corner to approximately 120m AOD in the south-eastern corner. A minor watercourse flows through the field to the east of the site and discharges to the River Teme to the south.

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		
Detailed drawings 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 amended drainage plan shows the proposed surface water drainage to discharge to a Severn Trent Water (STW) public sewer in the south-east of the site. The previously submitted proposals proposed discharge to an existing ordinary watercourse in the south-east corner of the site that in turn discharges to the River Teme. It is unclear why these proposals have changed. **Prior to the Council approving the reserved matters application we recommend that the applicant clarifies why discharge to the ordinary watercourse can no longer be achieved.** An existing STW sewer passes through the east of the site. The sewer will be diverted as part of the proposed development. It is unclear if the STW public sewer is a surface water sewer (as indicated by the writing on the drawing) or a combined sewer (as indicated by the legend). **Prior to the Council approving the reserved matters application we recommend that the applicant clarifies the nature of the sewer and amends the drawings appropriately to avoid future confusion.** Attenuation is proposed in a mixture of offline attenuation ponds, oversized pipes and offline below ground crates. The previously submitted proposals also included permeable paving in private driveways and private access roads although this has been removed. We have concerns regarding these changes as discussed below.	✘
Detailed drawings of proposed features such as infiltration structures, attenuation features, pumping stations and outfall structures	Detailed drawings of the proposed attenuation cellular system have been provided. However, manhole references and invert levels in the details drawing do not correlate with the layout drawing. In our previous response we also requested details be provided for the proposed swale and outfall. The swale has now been replaced with two attenuation ponds. The Applicant has provided sections in the bottom right hand corner of drawing 55-01 but it is not clear where these cross sections are taken. Additionally, one of these details shows a headwall above the invert level of the pond. The drawings provide little detail of the proposed construction of the pond. **Prior to the Council approving the reserved matters application we recommend that the applicant provides further details for the proposed attenuation ponds and their outfall headwalls.** The detail for the attenuation basins and headwall should include information on invert levels cover levels and slope gradients. The Applicant should also confirm whether they intend for one of the headwalls to be so far above the invert level of the basin. We also recommend that discrepancies between the details drawing and the layout drawing is resolved, prior to the Applicant issuing the next set of information.	✘
Demonstration that best practice SuDS have been promoted, appropriate to the size and nature of development	The applicant had previously included a swale – although it was noted this had only allowed for the lower sections of the swale to be fully operational, the swale would have provided some treatment (particularly with the recommended changes). The applicant had also	✘

Information required	Reviewer comments	✓✘
	previously proposed to use permeable paving in private driveways and private access roads and we were supportive of this approach, although the revised drainage drawings no longer show permeable paving. The amended design has included two pond features which we approve of in principle. However, these features are offline and will only be operational during large flood events to provide storage and therefore its effectiveness of providing treatment is minimal. **Prior to the Council approving the reserved matters application we recommend that the applicant revises their design to provide improved treatment.** This should include the use of permeable paving as previously proposed. We also recommend the proposed attenuation ponds are used during all rainfall events.	
Infiltration rates at the location(s) and proposed depth(s) of any proposed infiltration or attenuation structure(s), undertaken in accordance with BRE Digest 365 methodology	In our previous response we stated that we support the use of unlined attenuation structures even with poor infiltration rates, however it is still unclear as to whether the structures are lined or unlined. **We recommend that this is clarified prior to the Council approving the reserved matters application**.	✘
Trial pit/borehole logs demonstrating that the depth to groundwater below the base of any proposed infiltration or unlined attenuation structure(s) is greater than 1m at the location(s) and proposed depth(s) of the proposed structure(s)	The ground investigation report states that groundwater was encountered at 3m below ground level in one of the monitoring boreholes, although not in any of the remaining monitoring boreholes.	✓
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	Calculations have been provided that show the majority of the system does not surcharge up to and including the 1 in 2 annual probability storm event with the exception of pipes 1.012 and 1.013 and pipes 3.004 and 3.005. This is likely to be due to the location of the offline storage systems relative to the flow controls. We do not have any objections to the surcharging shown in the Applicant's current calculations.	✓
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	Calculations have been provided that show the system does not flood in all events up to and including the 1 in 30 annual event.	✓
Off-site discharge		
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 FRA submitted as part of the outline application provided greenfield runoff rates as follows: 1 year = 4.8 l/s/ha Qbar = 5.7 l/s/ha 30 year = 11.2 l/s/ha 100 year = 14.7 l/s/ha We understand from the submitted Microdrainage calculations that the site will introduce approximately 0.91ha of impermeable surface.	✓
For discharge to a watercourse, sewer or local authority asset,	The submitted drainage plans and Microdrainage calculations indicate a maximum discharge rate from the entire site of 5.7 l/s. This is similar to	✓

Information required	Reviewer comments	✓✘
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	the equivalent Qbar rate for the impermeable area of the site and is therefore considered acceptable.	
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	The submitted drainage plans indicate that runoff will flow through both an eastern arm and western arm. The eastern arm is served by offline attenuation ponds and approximately 120m of oversized pipes and manholes. A flow control is included on manhole SW15 which connects into the northern offline attenuation pond and limits flow to 1.9 l/s. The western arm is served by a geocellular attenuation tank. At the manhole where the eastern and western arms meet a second flow control and offline attenuation pond are included. The second flow control limits flow to 5.7 l/s. Both attenuation ponds are set at a level that means they are not used during the 1 in 2 year rainfall event. No cover levels or invert levels for the proposed crate storage has been provided on the drainage plans. The submitted attenuation details drawing indicates an invert level of c.106.500 which does not align with other levels for the drainage system. **As noted above, we recommend that discrepancies between the details drawing and the layout drawing are resolved, prior to the Applicant issuing the next set of information.**	✘
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	During previous conversations with the Applicant, it was understood that the surface water from the site would be discharged to the existing watercourse. However, the Applicant's most recent layout drawing appears to show discharge into either a combined or surface water sewer. **Prior to the Council approving the reserved matters application we recommend that the applicant confirms the proposed discharge location for their surface water system. We also recommend that the Applicant confirms the capacity of the downstream system to demonstrate that it is appropriate to receive discharge from the development.**	✘
Pollution		
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	As per above the applicant proposes attenuation ponds however these are offline and only provide storage for large storm events and therefore do not provide pollution treatment during smaller storm events. We also note that the previously proposal to include permeable paving has been removed from the drainage plans. **Prior to the Council approving the reserved matters application we recommend that the applicant demonstrates how appropriate treatment from vehicular areas will be provided.** We recommend that this includes a revised design such that the proposed attenuation ponds are used during all rainfall events. Alternatively, the Applicant could explain why this will not be possible and demonstrates how their surface water drainage system will control pollution.	✘
Exceedance		
Description and drawing demonstrating the management of surface water runoff during events that may temporarily exceed the capacity of the	Our previous response outlined our concerns with water flowing towards the south-east corner of the site and towards the public highway. The proposed ponds will help to capture water draining down the eastern part of the site although it is unclear how this water will be directed into the ponds and not allowed to flow off to the east of the	✘

Information required	Reviewer comments	✓✘
drainage system, such as temporary exceedance of gullies during events greater than the 1 in 5 annual probability event, up to the 1 in 100 annual probability event with an allowance for climate change.	site. The southern portion of the site is also steeply sloping and the applicant's Exceedance Plan still shows water leaving the site boundary. It also unclear how water from the western part of the site will be directed towards the attenuation ponds. We therefore recommend that consideration is given to the provision of measures which guide surface water towards the proposed ponds rather than allowing it to leave the site. **Prior to the Council approving the reserved matters application we recommend that the applicant demonstrates how consideration has been given to risks associated with exceedance of the site drainage system.** This is important because gullies are typically designed for relatively small rainfall events and can be surcharged during relatively small rainfall events (particularly those with a short duration and high intensity). This means that runoff may not be captured during events which the pipe system and attenuation system have been designed for. Suitable designs sometimes include bunds along site boundaries and raised tables within the highway which help to attenuate flows and encourage discharges into the below ground network. It would also be acceptable for the Applicant to demonstrate that the proposed gully design has capacity for the 1 in 100 year rainfall event, with an allowance for climate change, and with a 15 minute storm duration.	
Access, adoption and maintenance		
If access or works to third party land is required, details of these works and 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 watercourse/sewer	No access to third party land will be required.	✓
Confirmation that the adoption and maintenance of the surface water drainage system has been agreed with the relevant authority	The submitted drainage plan indicates the drainage system will be adopted by STW, however we note that the email from STW dated 11.12.2019 indicates STW would not be adopting the drainage system. **Prior to the Council approving the reserved matters application we recommend that the applicant clarifies the proposed adoption of the drainage system.**	✘
Demonstration that appropriate access is available to maintain SuDS features (including pumping stations)	Appropriate access to SuDS features is available.	✓
Operational and maintenance manual for all proposed drainage features that are to be adopted and maintained by a third party management company[1]	If maintenance by a third party management company is proposed we highlight that the applicant will be required to submit an operation and maintenance manual for these elements.	✓ (with note)

[1] Note that further information will be needed if the Council are to adopt and maintain part or all of the proposed drainage system, and further consultation with the Council will be required

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	✓✘
Strategy		
Detailed construction drawings of the proposed foul water drainage system including location manholes, external pipework, package treatment plants, drainage fields, pumping stations and discharge locations	The submitted Drainage Plan shows the proposed foul water drainage strategy. Foul water from the development is proposed to be discharged to an existing public foul sewer located to the south of the site although the location of this sewer/connection has not been shown. **Whilst we agree with the proposals in principle, we recommend that the location of the foul drainage connection is clarified prior to the Council approving the reserved matters application.**	✘
Discharge to a sewer		
If discharge to the public sewerage system is proposed, confirmation that this has been agreed with the relevant authority	The email from STW dated 11.12.2019 suggests that they approve of the proposed connection to the foul sewer.	✓
Access, adoption and maintenance		
If access or works to third party land is required, details of these works and 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 watercourse/sewer	As the connection to the existing STW foul sewer is not known it is not clear if access to third party land is required. **We recommend that this is clarified by the applicant prior to the Council approving the reserved matters application.**	✘
Confirmation that the adoption and maintenance of the foul water drainage system has been agreed with the relevant authority	The email from STW dated 11.12.2019 suggests that they approve of the proposed connection to the foul sewer and we assume that this also includes agreement in principle to adopt the foul drainage system.	✓
Operational and maintenance manual for all proposed drainage features that are to be adopted and maintained by a third party management company[2]	If the drainage system is adopted by STW a maintenance plan is not required.	✓

[2] Note that further information will be needed if the Council are to adopt and maintain part or all of the proposed drainage system, and further consultation with the Council will be required

Overall Comment

Whilst the amended drainage strategy addresses many of our previous concerns in principle, we recommend that prior to the Council approving the reserved matters application the applicant addresses our concerns raised below:

- Clarification regarding the proposed change to the design and amended approach to discharge surface water runoff to a STW sewer instead of the existing watercourse.
- Clarification regarding the nature of the existing STW sewer and, specifically, if this sewer is a surface water or combined sewer and noting that drawings should be revised accordingly.
- Provides further details for the proposed attenuation ponds and their outfall headwalls.
- Provides clarification of the invert levels for all attenuation features and incoming/outgoing pipework.
- Provides further evidence of treatment of runoff prior to discharge, noting that discharging runoff through the proposed attenuation basins is recommended.
- Confirms whether the proposed attenuation structures are lined or unlined.
- Confirms the proposed discharge location for their surface water system, whilst also confirming the capacity of the downstream system to demonstrate that it is appropriate to receive discharge from the development.
- Demonstrates how consideration has been given to risks associated with exceedance of the site drainage system.
- Clarifies the proposed adoption of the surface water drainage system.
- Clarifies the location of the foul water drainage connection.
- Confirmation that access to third party land is required for the foul water connection.