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Dear Katherine,

Following our meeting last month, EAS have updated the scheme Drainage Strategy to address your comments and resolve the LLFA's holding objection. I attach the updated report here for your review and comment.

EAS's point-by-point response is below:

1. We understand that the applicant is proposing to include a green/blue roof for the roof area, rain-gardens and permeable paving on the access road. The applicant has updated a drainage drawing with the additions however, the FRA/Drainage Strategy does not reflect these changes. As this is full application with the final layout being agreed, we require the detailed design of all features proposed. We require further commentary and a drawing of how the green roof, raingardens and permeable paving will connect into the wider drainage network. We would also expect that full above ground green SuDS be utilised as much as possible, e.g., water reuse, green roofs, bio-retention areas, attenuation basins or ponds etc. in accordance with the four pillars of SuDS.

The SuDS Report and SuDS Layout Drawing are aligned to ensure that all SuDS Features are discussed and shown on both.

2. Prior treatment stages such as permeable paving have briefly been included on a drawing however, the paving has not been sized. We note on the drawing that the use of smart sponges is still proposed however, we reiterate that this is not a sustainable way of treating diffuse pollution at source. We therefore, expect the applicant to incorporate other SuDS such as permeable paving or filter strips for the access road prior to discharge into the attenuation features. A proprietary product such as a 'smart sponge' would only be acceptable as an additional treatment stage for a sensitive discharge location. We note that the site lies in Source Protection Zone II. Therefore, the proposed strategy must provide a robust level of treatment in accordance with the Environment Agency's guidance. Infiltration in Zone I is unacceptable however, possible in Zone II and III with appropriate additional step of treatment for a sensitive location. The applicant must demonstrate that they have complied with the CIRIA SuDS Manual in relation to water quality treatment and additional mitigation may be needed if the discharge location is deemed sensitive. Paragraph 174 of the NPPF and PPG specifically states that SuDS can improve water quality.

EAS Response: The SuDS Report and SuDS Layout Drawing are aligned to ensure that all SuDS Features are discussed and shown on both.

3. The applicant has now included the use of green roofs, permeable paving and raingardens in addition to a geocellular tank lengthening the surface water management train for the development. This allows the surface water to be managed in stages providing resilience to the system and reduces the risk of failure. However, no commitment to their use has been included in the FRA/Drainage Strategy and accompanying drawings. As the principals in the FRA/Drainage Strategy will be taken forward, we require all statements in the FRA to be reflective of the new proposed strategy which includes additional SuDS features. In response to EAS comments, as this is full planning stage, we require the detailed design of all proposed drainage features regardless that the additional features do not remove the need for a geo-cellular attenuation device. We acknowledge that the applicant has sized the proposed geo cellular attenuation device however, if infiltration proves viable, higher storage volumes will be required, much higher than at present. The features should be sized for the worst case scenario of infiltration drainage at 1×10^{-6} m/s, which will require a greater amount of storage on the site. This could be provided within permeable paving areas.

EAS Response: The drainage strategy now allows for a Permeable Paving Infiltration System to manage all surface water runoff from external hardstanding areas. An infiltration rate of 1×10^{-6} m/s (FEH22 Data and a CV Value of 1) has been used in the hydraulic model.

4. We acknowledge that the applicant reiterates that 'the agreed outfall to Thames Water is not an alternative discharge option, this outfall will be required even if there is small scale infiltration in the form of unlined permeable paving'. However, in the absence of infiltration testing at the locations and depths of the permeable paving, this statement is not in accordance paragraph 167 of the NPPF and SuDS Non-Statutory Technical Standards (SNSTS) S7 and S8. Commentary has not been provided in accordance with the four pillars of SuDS and rainwater harvesting has not been evidenced or justified as to why is not viable. We require the applicant to include specific required investigations and assessments regarding the future provision of SuDS including how investigations will be undertaken to evidence that the SuDS disposal location hierarchy has been proven such as:

a) Infiltration has been shown to be favourable (using BRE365 or equivalent testing) but further detailed information is required for shallow infiltration features, where they are located so the required space can be identified for infiltration features.

EAS Response: The drainage strategy now allows for a Permeable Paving Infiltration System to manage all surface water runoff from external hardstanding areas. An infiltration rate of 1×10^{-6} m/s (FEH22 Data and a CV Value of 1) has been used in the hydraulic model.

b) Calculation of the brownfield site pre- and post- development runoff rates and volumes. As the site is brownfield, we require details if the site has been returned to greenfield runoff rates and volumes in the strategy. If this is not possible, we require at least 50% betterment to runoff rates and volumes and justification if it cannot go back to greenfield rates and volumes in accordance with SNSTS S3 (no pumping stations should be necessary without significant justification why drainage cannot be discharge via gravity).

EAS Response: Brownfield and Greenfield Runoff Rates have been calculated and added to the SuDS Report which provides justification for the proposed maximum 3.5 l/s outfall rate.

c) Areas that are deemed sensitive and require additional water quality treatment, such as groundwater source protection zones and groundwater / surface drinking water safeguarding zones.

EAS Response: Water treatment proposed is in line with CIRIA SuDS Manual Guidance.

5. Section 3.9 details the existing drainage through CCTV survey and does not detail the pre-development runoff rate. Section 5.1-5.4 of the FRA uses the Modified Rationale Method to calculate pre-development brownfield runoff rate however, we require pre-development greenfield runoff rates (using FEH to calculate) to also be supplied. The post development runoff rates for all rainfall return periods up to and including the 1 in 100 year plus climate change event should be modelled using the most up to date FEH rainfall model (see below), FSR is not accepted. We note that only the 1 in 100 year plus climate change surface water calculations have been provided. Surface water calculations should also be provided including half drain down times for the 1 in 1 year, 1 in 30 year, 1 in 30 year plus climate change and 1 in 100 year with an associated drainage layout plan drawing. We require a full detailed drainage plan including location of SuDS measures, pipe runs and discharge points, informal flooding (no flooding to occur below and including the 1 in 30 year rainfall return period). This drawing should correspond with any modelling labels of drainage runs and SuDS features showing storage volumes. The drawings currently are not acceptable for full application as they do not include proposed pipe numbering, manhole cover levels, invert levels and finished floor levels necessary for review at detailed design. Drawing must include locations, depth and extent of any flooding at 1 in 100 plus 40% climate change.

EAS Response: Brownfield and Greenfield Runoff Rates have been calculated and added to the SuDS Report. Brownfield rates were calculated by modelling a 'dummy' drainage network and using FEH22 data. Greenfield runoff rates were also calculated using FEH22 data. The Brownfield Runoff Rates include rates for 1:2yr, 1:30yr, 1:30yr + CC, 1:100yr and 1:100yr + CC storm events.

6. The applicant shall confirm if urban creep is applicable or been included in the SuDS storage calculations. Any flatted development is not expected to include a 10% urban creep allowance on impermeable areas.

EAS Response: Urban Creep has not been added as it is not appropriate. This is flatted development covering the majority of the site, and not individual properties.

7. The applicant should note that for all infiltration SuDS features, the drainage calculations should show the volumetric runoff coefficient (Cv) =1. Volumetric runoff coefficient (Cv) values used for network analysis currently are 0.75 and 0.84 for summer and winter respectively. Given the drainage calculations only consider runoff generated by the positively drained area which comprises impermeable surfaces (i.e hardstanding and roofs), the selected Cv values are unlikely to be characteristic for infiltration SuDS, thus higher values (e.g Cv = 1.0) should be applied.

EAS Response: The Hydraulic Models supporting the Proposed SuDS Layout include FEH22 Data, CV Values of 1 and are run to include 1:2yr, 1:30yr, 1:30yr + CC, 1:100yr and 1:100yr + CC storm events.

8. As the planning permission is for full application, detailed design should be provided at this stage. Therefore, all drawings should be marked as 'final drawings' not 'preliminary' or 'draft' unless further details are to be submitted via discharge of condition.

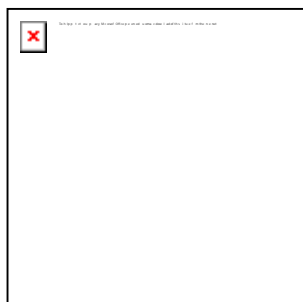
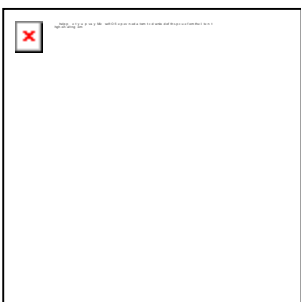
EAS Response: The drawings are marked as Planning. "Final Drawings" would suggest a detailed design stage. I cannot foresee this as being an issue.

9. A Construction management plan for surface water runoff is required for the development including the temporary measures required to prevent the increase of flooding during demolition of the existing building in accordance with SuDS Non[1]Statutory Technical Standards S13 and S14. At this stage a high-level indication of how this would be approached should be provided.

EAS Response: It was agreed that this could be Conditioned.

Kind regards
Bridget

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Bridget Miller
Associate



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