

We would **not recommend discharge of conditions** until the following information has been provided and following points addressed.

- 1) Insufficient information has been provided regarding the design of the suspended above ground tank.

We require full design drawings for this feature including details of its construction, including but not limited to:

- Details of the materials used to make the tank
- Details of any welding or riveting
- Details of any galvanising
- Details of any seals or joints
- Details of any expansion joints (if required) and calculations confirming whether this will be necessary.
- Details of the support mechanism (we appreciate this has been submitted under different application, but this will be required in this application also)

We also require signoff on the design for the tank from your structural engineer.

- This signoff must show that the engineer has considered the impacts of higher than design flood levels on the drainage system's buoyancy or the impact that the drainage system becoming buoyant would have on the building above
- Signoff of the tank from the manufacturer
- Confirmation from the manufacturer that the tank will be fully watertight
- Details of the access arrangements for maintenance and inspection, including detailed drawings of any maintenance hatches
- Details of any confined space signage
- Details of any foul air prevention systems (if required)
- Details of the openings in the grills to permit entry for maintenance access.
- Buoyancy calculations to confirm the tank will not damage the building in the event flood levels are at a reasonable worst-case level.

- 2) Surface and bed levels for the proposed permeable surfacing should be included on the drainage drawing.
 - 3) Confirmation of land ownership for the track should be provided. It is unclear whether the track lies within the confines of the site or is controlled by a 3rd party landowner. If the latter, confirmation from the landowner that the proposed connections across the track can be made should be provided. This point can be resolved if the applicant confirms that the track is within their land ownership boundary.
 - 4) Connections to the watercourse / ditch will require IDB approval (Outfalls 2 and 3) and evidence of this should be provided. For the northern most connection (Outfall 1), ordinary watercourse consent from Arun DC will be required and evidence for this will also be required. Please note that the Environment Agency are the responsible IDB in this area.
- As the levels agreed as part of the LDC will impact the surcharge calculations (point 5 below), this will need to be agreed prior to approval / DOC.

- 5) During earlier discussions with the LPA it was acknowledged that remediation for onsite contamination resulted in raised ground levels and this is also stated in Condition 11 of the originally approved application. As there is potential for this to conflict with the drainage design and proposed level of the carpark required as flood compensation, we require confirmation that the agreed carpark level of 2.80m AODN will be achieved.
- The levels on the drainage drawing suggest land raising has not been carried out, however, it is unclear if the 2.80m level will be achieved across the entire permeable carparking area.
 - The applicant should confirm whether land raising has been carried out as per the contamination mitigation strategy or not been carried out as per the drainage design drawing.
- 6) The original Arboricultural tree survey Report submitted to planning includes section 11.15, which assumes no services within RPZ's across the site. Further to this, the plan associated with the Arboricultural report shows an exclusion zone for tree protection. Outfall 1 is located within this RPZ and exclusion zone. The applicant should provide evidence that the arboriculturist is satisfied that the proposed headwall, pipework and work to be carried out within the exclusion zone and RPZ will not damage these trees in a way which affects the conclusions of the Arboricultural Report. We request a statement from the arboriculturist confirming that this outfall is acceptable.
- 7) We note that in several cases the incoming pipe invert level is potentially below the 1:10 year water level within the storage tanks. Either:
- Justification as to why the design does not have to achieve this requirement should be provided.

Or

- The design should be amended to ensure that this requirement is achieved.
- 8) A flap valve will be required on the outlet for each of the headwalls (with the exception of the diverted watercourse). This must be included within the surcharge calculations. The reason for this is to prevent silt and potentially contaminated floodwater from reaching the storage tanks.
- 9) A justification for why vents have not been included within the tank designs that are not vented should be provided. If vents are required for all tanks, then they should be included on the drawings. Vents should be located at a sufficient elevation to prevent floodwater ingress into the tanks (i.e. above the design flood level) unless there is good reason why this cannot be achieved and any impacts of the vents being below this level are fully considered.
- 10) Buoyancy calculations are required for all of the proposed SuDS and elements of the drainage system.

- 11) The applicant should confirm that the pipe is not likely to be surcharged during the 1:10 year storm. The pipe could be raised to provide a larger difference between the soakaways invert level and the pipe inlet invert level, or additional crates could be included within the design, to lower the 1:10 year water level.
- 12) Discharge into the paving rather than tanks should be justified, this follows previous correspondence with Arun DC regarding the proposed discharge into the tanks rather than permeable paving.
- 13) If the drainage calculations only account for runoff draining from impermeable surfaces, then the calculations should use a CV of 1.0.
 - The requirement to use CV 1.0 is based on recent clarifications from HR Wallingford which suggest the values of 0.84 and 0.75 often used are in error and confirm that a value of CV = 1 should be used in situations where runoff from only the impermeable areas is considered.
 - It is noted that CV 1.0 is only considered applicable to the sizing of the SuDS, and pipework may still be designed to lower values.
- 14) The drainage calculations include a 10*2 (20)m³ per ha additional storage volume, which is not included within the design. A justification for this value should be provided, or this value reduced to 0.
- 15) We would expect details for the proposed culvert realignment to include an assessment of the hydraulic performance of the new culvert. With adjusted K values to account for the nearly 90° angle. Alternatively, any suitable argument that confirms that the 90° bend will have a negligible impact on flows or volumes discharged through this system can be presented.
- 16) Index Methodology calculations should be provided to ensure that the proposed drainage system will provide sufficient treatment for runoff draining from the roofs and hardstanding across the site.
 - If water quality targets are not achieved, justification as to why they cannot be achieved should be provided.
- 17) The catchpit drawings should include a dimension to confirm the minimum depth of the catchpit below the inlet and outlet invert levels. This depth should be a minimum of 300mm inline with our policy requirements.