

Dear Laura,

Thank you for your comments regarding drainage aspects for the 70 unit scheme.
Please find below a link to the latest set of documents for your review.

We have updated drawings where necessary, provided further details and comments (in green) to your original notes reproduced below.

We trust that the additional information will enable you to recommend discharge of conditions however should you have any further questions / comments do not hesitate to contact our office directly

Condition 8

1. Please confirm distances from infiltration devices to site boundary. Our minimum requirement is 2.5m. We have indicated 2.5m offset from the site boundary and ensured that infiltration blankets are not closer to the boundary than this.
2. Can infiltration blanket 6 be moved to be solely within one rear garden rather than straddling two? Soakaway serves Plot 113-114 and so would expect this to straddle both gardens to reflect their joint ownership. There is no sufficient space between proposed houses and car ports to fit meaningful soakaway entirely within a single garden
3. Pipes 3.006 and 3.005 appear to be modelled as swales rather than pipes. Please update. Pipes 3.006 and 3.005 were modelled as pipes not swales (please see below snapshot of submitted calculations) – Arun DC comment incorrect.

83.003	5.305	0.013	286.0	0.000	0.00	0.0	0.300	3 \=/	300	1:3 Swale
83.004	17.529	0.061	286.0	0.000	0.00	0.0	0.300	3 \=/	300	1:3 Swale
83.005	0.695	0.442	21.9	0.000	0.00	0.0	0.300	3 \=/	300	1:3 Swale
83.006	10.302	0.109	189.0	0.017	0.00	0.0	0.300	3 \=/	300	1:3 Swale

4. Please provide swale cross sections and a long section. Please refer to drawing YAP-130-SK005
5. TP4 has an infiltration rate labelled as $1.8 \times 10^{-6} \text{m/s}$, and this appears to have been used in calculations. The worst case infiltration rate at this location was $1.7 \times 10^{-6} \text{m/s}$. BRE365 test results represented on drawing were based on worst case February results, whereas Arun DC comments refer to March results – TP4 from February is not in the same location as TP4 from March. Drawing 'YAP-130-026G' was updated with March BRE365 test location and prefixes are now added to differentiate between February and March locations.
6. On drawings it is stated that TP8 had poor infiltration rates. Your ground investigation results appear to show this achieved rates of $1.9 \times 10^{-6} \text{m/s}$ which is better than other areas where you have utilised infiltration in design. Please review all infiltration rates used in design. As above for Comment 5.
7. The pervious system network drawing states that TP2 had a measured infiltration rate of $1.5 \times 10^{-6} \text{m/s}$, but results indicate that no rate was able to be calculated here. Infiltration has been applied to the design here, when it shouldn't have been. Please review and ensure consistency between measured infiltration rates and those used in design. This will require a review of linkages of paving areas. As above for Comment 5.

8. The permeable paving areas that are being used for storage because of poor infiltration should all have slightly sloping sub-bases to ensure some conveyance to areas with better infiltration rates. Permeable paving within poor infiltration areas was designed with flat base as the rising water level within sub-base would create hydraulic gradient that would displace water towards areas with better infiltration – no slope necessary.
9. Please provide a construction detail of the diffuser blocks within the permeable paving. Detail now provided – please refer to drawing 'YAP-180-031C5'.
10. I note from your catchment areas plan that some garages are to discharge water into permeable paving sub-bases. Please clearly indicate on plans how these will connect. I.e. pipes, chambers, diffusers. And provide relevant construction details. Garages are connected via pipes/channels into the surface water system however car ports and link roofs will discharge onto previous pavement. Permeable paving beneath car port roof/link roof is covered and therefore not being utilised. As such, the roof run-off can be transferred and spilled over/above the paving to replicate normal run-off and utilise benefits of permeable paving. Please see detail on drawing 'YAP-130-SK006' of the rainwater pipe discharging above and on top of the permeable paving.
11. According to your impermeable areas plan 0.875Ha is draining to permeable paving. Please confirm that this is all included in calculations. The area summary for permeable paving states a total of 0.586Ha. We assume that Arun DC arrived with the area of 0.875 ha as a sum of four components; Car ports and link roofs into pervious paving (0.103 ha), individual driveways (0.186 ha), roads and shared access driveways perv surface (0.464 ha) and footways onto adjacent pervious roads (0.122 ha). First two components, i.e. Car ports/ link roofs and private driveways are not part of the pervious *network system* and were calculated and designed separately - please see "Private Driveways per 100sq.m". We used indicative 100sq.m (with the worst case infiltration obtained on site) to check representative area of drives and car ports – due to number of private drives calculation of each drive separately would be a significant resource requirement with limited benefit as the representative calculations proved that drives will work and there is some spare capacity in the provided drives. The area of 0.586 ha in the perm paving *network system* accounts for roads/ shared access driveways and footways shedding run-off onto adjacent pervious roads.

Kind Regards



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