Accepted greenfield rates by the EA in 2008 were:-

1yr:- 2l/s/ha

30yr:- 5.4l/s/ha

100yr:- 7.4l/s/ha

However, they have failed to include long term storage (volume control) which is a requirement when discharging all storms at equivalent greenfield rates. This would not been accepted by LLFA if being audited today.

Carriageway is split into 4 segments due to the falls (high points and low points). Working west to east:-

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Catchment | Imp. Area served by drainage | Flow Rates  (greenfield rate \*area) | MLM rates | Audit |
| Zone 1  (Pond 1+2) | 1688+2730= 0.44Ha | 1l/s  2.4 l/s  3.3 l/s | 1yr = 3.1l/s  30yr = 3.7l/s  100yr =5.1l/s | Not acceptable |
| Zone 2  Pond 3 | 1126+2890+1110=  0.512Ha | 1l/s  2.7 l/s  3.7 l/s | 1yr = 2.5  30yr = 3  100yr = 4.5 | Not acceptable |
| Zone 3  (Pond 4) | 3394+939= 0.433Ha | 1l/s  2.4 l/s  3.3 l/s | 1yr = 2.9  30yr = 3.4  100yr = 4.9 | Not acceptable |
| Zone 4 | 2130 = 0.213Ha | 0.4l/s  1 l/s  1.5 l/s | 1yr = n/a  30yr = n/a  100yr = n/a | Not acceptable although I know its 5l/s |

\*assuming my PDF measuring tool is working correctly. Some contributing areas in the hydraulic calcs match to my measurements and some don’t so I’m even more confused.

**Would like a drainage contributing areas plan to confirm acceptable flow rates**

Although the chosen rates are higher than what I think they should be, SCC and Anglian Water generally both adopt a minimum 5l/s for most flow control devices as a “flush thru” flow. So in that respect the rates are too low but that’s usually for orifice plates

This is especially important because MLM are using very small orifice plates (42-46mm usually) which is far below our minimum 75-100mm dia acceptable aperture size. Normally would use a Hydrobrake (vortex FC) for these small flows. If they can reduce the head (water level) they could enlarge the orifice plate and still maintain the correct discharge rate. Alternatively specify hydrobrakes.

**Pond 1/2**

* Probably is a bit close to the footing on the road, probably should be offset 5m.
* Don’t like the link pipe being 150mm should be a bit bigger to reduce blockage
* Depths are ok, just needs wet bench if publicly accessible.
* Pond 2 - Invert of the inlet pipe is 1m below the base of the pond?
* Suggest maximizing the filtration/retention time in the ponds by putting inlets and outlets at either ends

**Pond 3**

* Too deep, total depth = 1.9m which is above our normal 1.5m max depth. Needs to bigger in plan to reduce the water depth which is currently 1.55m deep.
* Needs a wet bench
* Suggest maximizing the filtration/retention time in the pond by putting inlets and outlets at either ends
* Again, invert of the inlet pipe is 1m below the base of the pond?

**Pond 4**

* Just needs a wet bench
* Suggest maximizing the filtration/retention time in the ponds by putting inlets and outlets at either ends
* Is a bit close to the realigned watercourse.

**Pond 5**

Already built

**General**

* Although there are interceptors I would still like interception Storage – suggest sinking the base of all ponds by 100mm below invert of the outlet pipe. Interception storage should be sized to first 5mm of rainfall over the imp. area.
* Conveyance network appears to be designed to DMRB standards, so the 1yr, 5yr and 100yr results are given in the calcs and not the 30yr standard which is normally taken for developments. Some networks are surcharging in the frequent events (1yr) which contravenes DMRB
* But otherwise all networks are good in the 5yr storm but some networks are flooding in the 100yr+CC storm which is allowed to do but ask for exceedance plan, as this when flooding does occur this exceedance shouldn’t leave the highway boundary under DMRB.
* Mismatches between the drainage layout for the resi applications and the relief road – please mask sure all plans showing correct layout.