

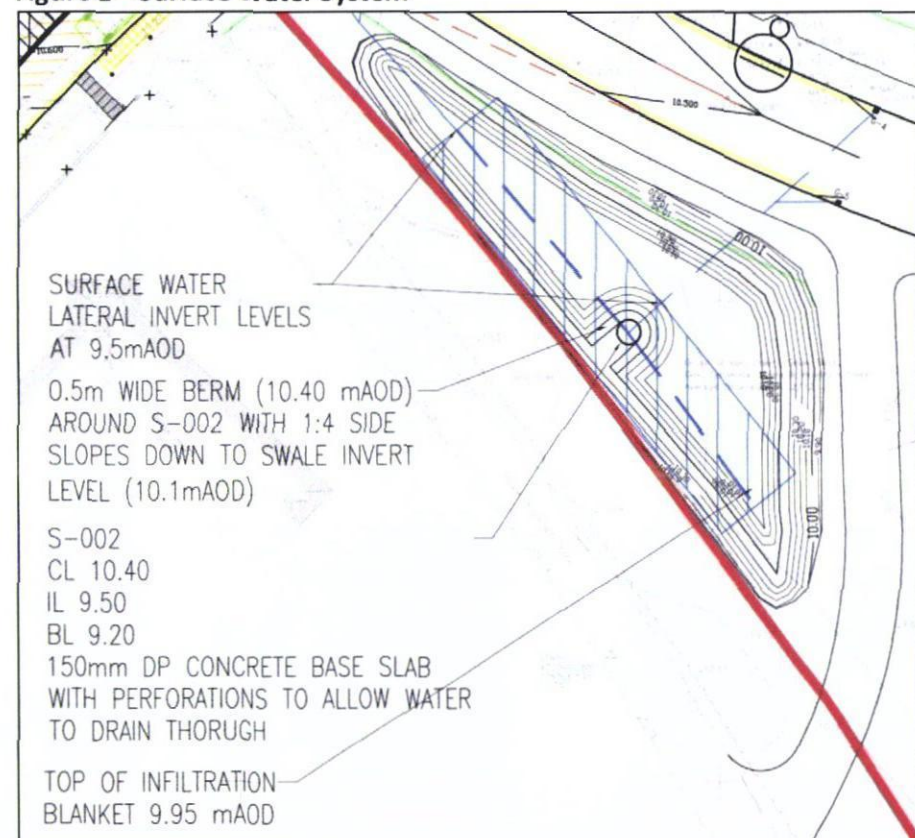
New Lane, Havant – 50400847 – Surface Water Exceedance Flows

A highway surface water SuDS system comprising of a piped discharge to a swale and infiltration blanket has been constructed as part of the New Lane, Havant development. The swale is located between the site access, the Hayling Billy Trail and on-site development.

A total area of 450m² discharges surface water to the surface water system. The system consists of an infiltration blanket of dimensions 5m x 25m x 0.4m with a swale above to provide attenuation in large storm events.

The invert level of the swale is at 10.1m AOD. At the top of the swale is a 0.5m wide berm at 10.4m AOD giving a total available depth of 300mm. This equates to a maximum storage volume of 38.5m³.

Figure 1 – Surface Water System



The infiltration blanket has been modelled using the Micro Drainage WinDes computer software and three return periods have been tested (including an allowance for climate change). The amount of storage required within the swale has been based upon the flooded volume from the most critical storm.

The maximum storage requirement (based on flooded value) for each return period is as follows:

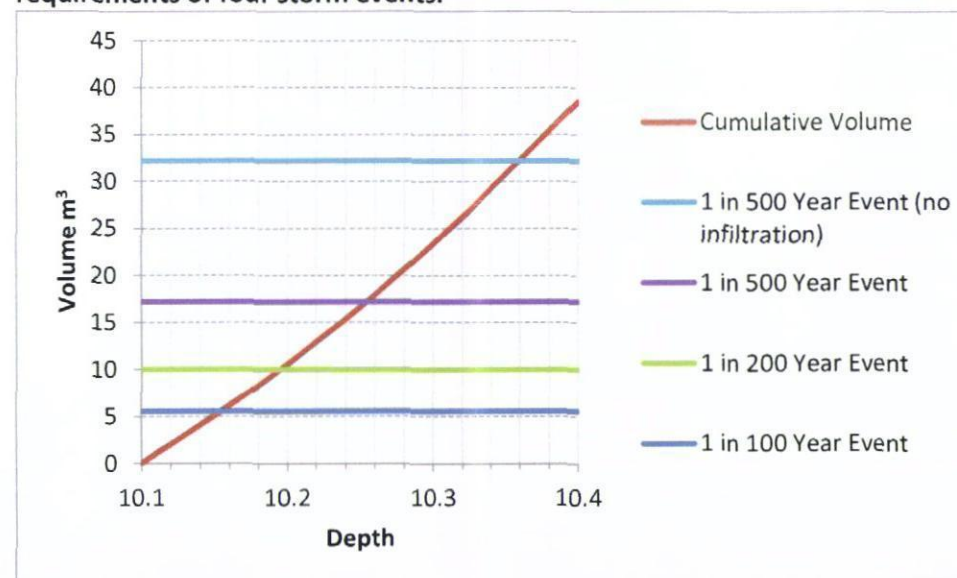
- 100 year + 30% - 5.6m³
- 200 year + 30% - 10.0m³
- 500 year + 30% - 17.2m³

As designed the swale and underlying infiltration blanket could there accommodate flows from a 1 in 500 year (climate change) rainfall event.

A scenario of the infiltration blanket failing (no infiltration) has also been considered. In this scenario, all the surface water which should discharge to ground via the infiltration blanket would discharge into the swale. For the 1 in 500 year storm the total volume which would need to be accommodated is 32.2m³.

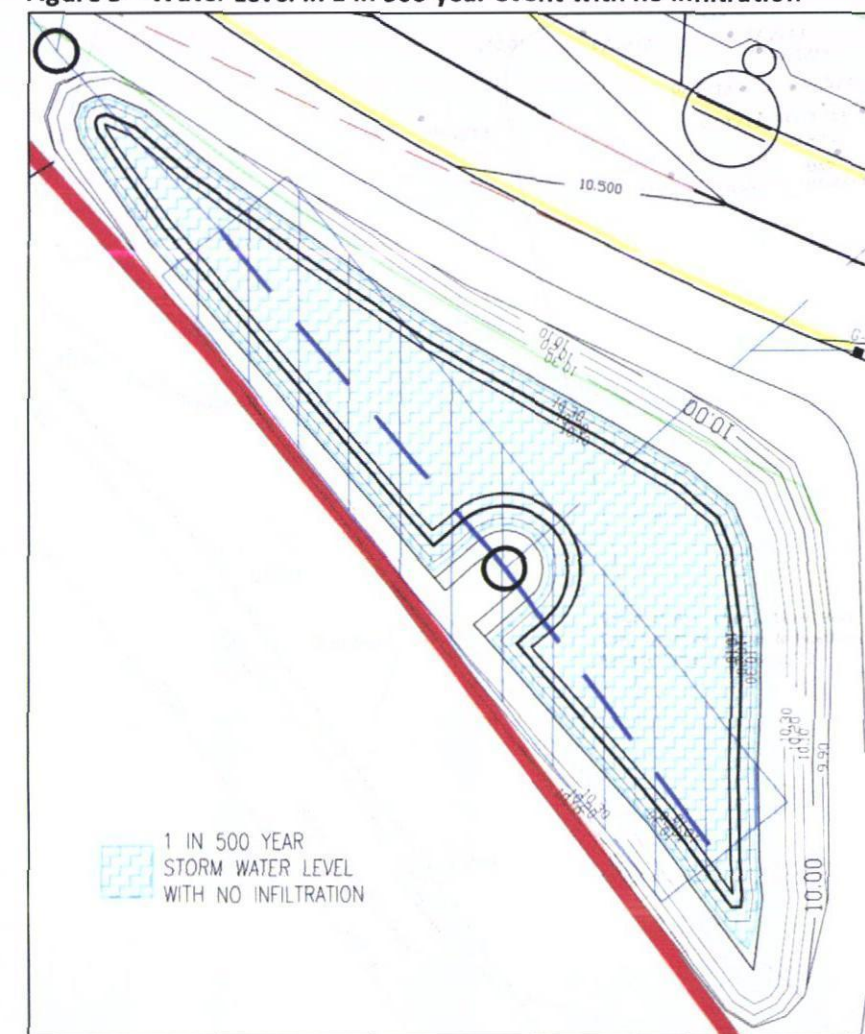
In order to estimate the depth of water for each scenario and determine whether flooding could occur, a rating curve has been plotted showing the volume at each level. This is shown below.

Figure 2 – Rating curve showing depth of swale against volume with storage requirements of four storm events.



It demonstrates that in a 1 in 100 year storm (climate change), the depth of water in the swale will be 10.15m AOD which is 50mm above the invert level of the swale. In the 1 in 200 year scenario (CC), the level of water will be 10.19m AOD, a depth of 90mm. In the 1 in 500 year scenario (CC) the water level would be 10.28m AOD, a depth of 180mm. In the scenario of the infiltration blanket failing in a 1 in 500 year storm (CC), the water level in the swale would be 10.36m AOD. This is a depth of 260mm and would be 40mm below the top of the berm. Therefore, the Billy Trail is only at risk of surface water flooding as a result of the swale overtopping from an event that has a probability of occurring greater than 1 in 500.

Figure 3 – Water Level in 1 in 500 year event with no infiltration



Drawing 847/SK/008 indicates surface water flow routes that could be experienced if gully capacities were exceeded (either through rainfall intensity or maintenance failure). Most of these flows would route onto the on-site streets permeable paving.

The footway/cycleway connecting the road to the Hayling Billy Trail has a low spot part way along it, below the level of the road and the Hayling Billy Trail. Therefore any remaining flows will discharge onto the area of soft landscaping in front of plots 74-75.

