Surface water drainage on Sleepers Hill
October 2024

Background:

Sleepers Hill has no formal surface water drainage system as one would find on a public road. Instead, there are basically road channels running down the north and south sides of the road which channel the water to the bottom of the hill. Due to the profile of the road, at various places along the hill the water in the north side channel crosses the road to join the south side channel with the net effect that around 70-80% of the surface water runs in the south channel.

The following developments have resulted in an increase in the amount of water running down the hill:

1. Continuing housing development of the north side of the hill
2. Increase in the use of non permeable driveways and pavements/verges
3. Climate change leading to an increase in rainfall and in the number of short intense downfalls

As a result of these changes the current system can no longer cope leading to localised flooding of verges, gardens and garages. As these developments are likely to continue, the problem will only get worse leading to the potential flooding of houses. In addition to the flooding risk, the increase in water flowing down the hill affects pedestrians using the road and causes detritus to be deposited along the hill and into Airlie Road. Frontagers on the south side have responded to this increased threat by installing higher kerbing, larger drainage channels and other defences. However, by using techniques that solely redirect the water back into the channels without seeking to reduce its volume, this merely exacerbates the issue for their immediate downside neighbours. To seek solutions to these issues, the SHA has commissioned 2 investigations – one in 2013/14 and now one in 2024.

The 2013/14 drainage reports:

RFP Associates were asked to investigate drainage options in 2013 for the section of Sleepers Hill below GED. They came up with 3 suggestions namely:

1. The installation of soakaways (1 in the north verge and 3 in the south verge)
2. Amend the driveway profile/drainage arrangements at Bickleigh (which had experienced flooding)
3. Change the existing kerb inlet gully (just before the Airlie Road junction) to a gully and pot arrangement

To test the feasibility of option 1 (the main proposal), six trial holes were dug in 2014 (3 in the north verge and 3 in the south verge). The holes on the north side found services around 800mm from the road edge at a depth of 300-500mm. On the south side, services were found at around 500mm from the road edge at a depth 300mm (and in one case covered by tree roots). The report concluded that traditional soakaways would not be very effective given the limited width and depth available. Instead, it suggested installing grips in the north verge (simple shallow trenches dug into the verge

designed to allow water to infiltrate directly into the surrounding soil/chalk). However, these require regular clearing out (3-4 times a year).

Following the report, the drainage arrangement at the junction with Airlie Road (option 3) was amended and a pipe was installed under the entrance to Waverley but no further works occurred.

The 2024 drainage report:

Paul Basham Associates (PB) were commissioned this year to look at drainage options along the whole of the road. Given the constraints (need to allow both pedestrian use and occasional parking on the south verge, existence of services and tree roots (both verges) and land ownership), PB presented 3 options, namely:

1. Permeable block paving in 5-10m bands across the road
2. Permeable pavement (south verge)
3. Narrow filter drains (north verge only as cannot sustain traffic)

The report concluded that option 1 would have the greatest impact and would be the most feasible solution to apply at scale. However, it would also be the most expensive. There is also concern whether the large quantity of water running in the south road channel could effectively by directed into the porous substrate created in the middle of the road and whether block paving is prone to subsidence (unintended traffic calming feature?). Very rough guess is construction cost of £5-10k per 5m band.

Option 2 will be cheaper than option 1 and using a cellweb system can be installed even where services and tree roots are shallow (minimum depth below road channel of 150mm, ideal (to support an HGV) of 250mm). However, a flush or very low kerb is required to allow storm water to spread over the verge. It is anticipated that only a few locations down the hill will be suitable (too narrow, very shallow tree roots, lack of frontager consent etc). Very rough guess is construction cost of £5-8k per 20m of verge.

Option 3 would be the cheapest but suitable sites will be very limited if not zero.

The report also recommended BRE 365 soakage and chalk density testing (£2-3k) and a detailed design and modelling exercise for any option chosen (£5-6k). Following discussions, it was agreed that rough soakage rates could be determined ourselves (by digging a hole and filling it with water), and that PB could design each option up to a level of detail to allow contractors to quote at £950 plus VAT per option.

Conclusions and proposed way ahead:

It is clear from the 2 studies commissioned that no easy solutions to our drainage issues exist. However, it is also clear that the issues are becoming more acute over time and that leaving individual frontagers to fend for themselves will not lead to an optimal outcome. It is therefore proposed that we trial one or two drainage schemes to determine their cost, gauge their effectiveness and see the reactions of residents. Depending on the outcome of the trial(s), further areas along the road to install similar solutions could be sought.

In order of preference the following trial schemes should be considered:

1. Permeable pavement using the verge in front of Meadow – there are no trees along this stretch, services are 300mm below the surface, usable width is 1m, the existing kerb is low enough to remain and the owners have given permission subject to agreeing the final form.
2. Permeable block paving in the road – location to be determined.
3. Filter drains or grips in north verge if suitable locations can be found.

Committee decisions:

The Committee is asked to consider the following:

1. Should we follow the proposal to trial one or two drainage schemes or do nothing?
2. If we are to trial, does the Committee agree with the order of preference listed?
3. Depending on the outcome of 1 & 2, what spending limit (in addition to amounts already spent) should we seek from members at the forthcoming AGM (suggest up to £10k for 1 scheme and up to £20k for 2 schemes).