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## Sleepers Hill, Winchester - Proposed Drainage Improvements

### Brief & Existing Situation

Following a meeting with Sleepers Hill Association on site RPF Associates were asked to look into possible improvements to reduce the amount of surface water running down the side channels of Sleepers Hill causing occasional localised flooding and discharging into Airlie Road. This site investigation concentrated, at the Client's request, on the lower section of Sleepers Hill below (east of) George Eyston Drive.

From observations and the topographic survey carried out in 2011 Sleepers Hill runs steeply downhill from west to east and has a pronounced profile with a high centreline over the upper section which sheds water from the carriageway surface to the side channel lines effectively. The section above George Eyston Drive has a gradient typically of 1:18 (5.6%) but further east this steepens up to 1:10 (10%) for most of the remaining length running towards the junction with Airlie Road.

The existing carriageway drainage currently relies on water soaking into the adjacent soft verges, particularly on the north side where this is supplemented with a series of narrow swales in the verge to which surface water is channelled. Some water soaks away into the verges in these swales and remaining flows are piped under adjoining driveways or channelled from one swale to the next one along its route downhill/eastwards. The situation on the south side of the carriageway is noticeably different with the same use of soft verges to channel surface water run off along the upper section. However, from the property Neatham east the edge of the carriageway is kerbed and this is maintained east to Airlie Road with gaps in the kerbing at the location of accesses to properties along this section. Most of these properties are sited below road level and some have experienced flooding due to surface water run-off using their driveways as a route downhill instead of being maintained on the channel line. There is only one gully sited together with an adjacent soakaway near the junction with Airlie Road and this is a kerb inlet gully and whilst unobtrusive it is not very effective in collecting water from the road channel into the soakaway. It is also prone to blocking with detritus washed down the channel from Sleepers Hill.

If the carriageway at Sleepers Hill was being designed now it would require a vastly increased number of gullies and soakaways of varying forms to intercept surface water in storm conditions and reduce the volume of water running down the channels. However, this brief is to consider what measures can be realistically achieved to reduce the volume of surface water reaching Airlie Road and try to reduce the incidence of flooding to the properties from George Eyston Drive eastwards within the restrictions imposed by the existing layout of carriageway, verges and the existing underground services.

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## Proposed Drainage Recommendations

a) Consider constructing soakaway in the northern verge area between Westacre Waverley/Struts/St Philips and on the south side between Hartrow and Neatham/Amberley to improve permeability of verge areas and increase the volume of run-off absorbed by the verges prior to the point east of the shared access to Waverley/Struts/St Philips where, due to the profile of the access as it joins Sleepers Hill water is shed across the carriageway from the northern channel to the kerbed southern channel.

b) Owner of Bickleigh to consider alterations to driveway profile and/or drainage to alleviate flooding problems. The existing precast concrete drainage channel does not have the capacity to channel all passing water east of the driveway opening. This is exacerbated by the existing driveway sloping down towards the house with no additional drainage to intercept it. It was noted that the property Neatham had the PCC drainage channel across its driveway with the addition of another slotted drainage channel 2-3m behind to pick up run-off not intercepted by the channel. This arrangement could work at Bickleigh and the levels would seem to suggest that an additional slotted drain would drain across the drive and the outfall routed east to the road channel. The unsightly lump of macadam located upstream of the driveway at Bickleigh which is used to defer the water flow is a hazard to motorists and any partially sited pedestrians and its continued use is not recommended.

c) Consider constructing soakaways in the southern verge area between Pellinore and Folly Cottage and again from Hollygate to St Marys so that road gullies can be sited to intercept surface water run off and pipe it into the verges. There are no structural boundary walls in the vicinity that could be affected by this proposal. The soakaways would have to be constructed using clean stone wrapped in a geotextile to prevent ingress of fine material that would clog up these soakaways in time and would have to be shaped/sited around the existing services with hand digging required accordingly. We would ideally look to get at least 5m<sup>3</sup> of soakaway material placed per gully (max 2 No).

d) Consider changing the existing kerb inlet gully on the south side just before Airlie Road junction for a gully and pot arrangement connected to the existing soakaway which should in turn be cleaned out and tested. This will intercept the water running along the southern channel far more effectively than the existing arrangement.

For all of these recommendations the main obstacle that will cause problems for a), c) and d) are the existing underground services in both the north and south verges. This doesn't mean the works are not possible, just that they will be difficult, take more time and be more expensive to construct due to the protective measure required at each location. In addition we would recommend CAT scanning in advance of any works and possibly some trial holes so that we can design/plan the works as effectively as possible and reduce any delays during construction by having to amend the designs to suit these services.

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## Cost Estimates

- a) Construction costs approximately £4-5,000  
RPF Design Fees approximately £800
- b) Construction costs approximately £1,000  
RPF Design Fees approximately £400
- c) Construction costs approximately £4-5,000  
RPF Design Fees approximately £800
- d) Construction costs approximately £1,000  
RPF Design Fees approximately £300
- e) CAT scanning and trial holes to confirm if a) and c) £1,000  
are feasible in conjunction with existing services £250

Our fee estimates cover localised site surveys, working up scheme drawings/sketches (as required) and the time of our CAD operator as well as information required to comply with Health and Safety and CDM legislation. If all works were carried out together there would be some savings in both construction costs and fee costs. Fee estimates do not cover procurement of the works as this could vary according to the whether this work were done in separate packages or all as one scheme.

As with all of these proposals they are not particularly scientific solutions and we cannot quantify with any certainty the extent to which each will improve matters. Certainly the owners of Bickleigh should take some responsibility for the design of their driveway and drainage thereof (option b). A new gully and soakaway just upstream from their entrance would be the ideal solution but the foundations to the existing boundary wall in this area would be adversely affected by this proposal therefore we have not suggested it. Sleepers Hill Association can try and reduce the flow of surface water reaching their access onto the road by implementing a) above. We would recommend that e) was undertaken first to see if a) and c) are feasible. Then implement, if feasible, a) (in conjunction with b)) and d). The scheme at d) would not require e) to be carried out first.



Peter Fox  
RPF Associates

Note: Construction costs and fee estimates are budget costs only and fees are based on RPF Associates current hourly rate of £50/hr (2012/13). These estimates do not allow for any unknown costs or expenditure and a contingency of 10-15% is recommended for budgetary purposes. All of the above are subject to Vat at the current rate

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