

TECHNICAL SOLUTION TO THE SuDS STORM WATER ON WENSLEY ROAD

READING 19195 March 2021 rev. none

OVERALL DESIGN SOLUTION

1. The storm water to roofs and paths is collected and carried to the highway in conventional pipes with Sit-trap manholes etc. The entry point from the pipes into the below highway construction has a diffuser detail to prevent erosion of the granular layer under the highway.
2. The highway construction is considered as a series of terraced ponds filled with gravel with check dams at defined points. These check dams hold water back in the upstream pond as the outlet pipe has a flow capacity less than the flow into the pond. The granular material in the ponds is a type 3 material with angular gravel with hard point capacity all to create a voids ratio of 30% - this void is what holds the storm water. The depth of the gravel is stated on the drawings and suits each separate pond area.
3. As the site slopes downwards so the number of terraced ponds increases each having its own input from hard surfaces plus a regulated flow from the upstream pond.
4. The discharge into the public sewer is via a flow control device specified to give a discharge rate of 5l/s into the public sewer. Several public sewer positions accept this discharge.
5. It has been calculated the controlled run-off rate is less than the original discharge rate so relieving the load in the existing public sewers.
6. Calculations have been prepared for a range of storm event with future climate change allowance to determine the capacity requirement of these gravel-filled ponds.
7. A alternative design would be to install storm cells in the highway which have a greater void ratio (95%) which would create the same storage capacity as the gravel with 30% voids ratio but in a smaller plan area.(30/95 less plan area).
8. Our current solution adopts various proprietary products from the Permavoid Product list such as "Permavoid Rainwater Diffusers", Permavoid "Permafoam Check Dams", etc as appropriate. Permavoid is a trade name for Polypipe.

FINAL DESIGN TO HIGHWAYS

9. The final design of the works requires Reading BC Highways to accept the SuDS principles used above.
10. WFBA require specific CBR tests in the planned highway routes to develop the load capacity calculations for the roadways.
11. WFBA need clarification as to the intended use of the highways as currently we have used Cat 1-2 for the non-adopted routes and Cat 5 for the adopted routes – final construction thicknesses are governed by CBR and Loading and Adoption strategy.
12. Block laying pattern is governed by Clause 5 of Reading BC Specification for Estate Roads.

TEMPORARY CONDITIONS.

13. The works are the permanent design for the site.
14. The site traffic cannot run on the Type 3 materials nor can they discharge storm water off the haul roads directly to the permanent works.
15. It is anticipated GCL will adopt a bound material to act both as the construction site surface over the Type 3 materials and as an impermeable surface during construction.
16. The storm water run-off from the haul roads will need to be captured, passed through dirt traps and then into the permanent drainage solution as clean water. Suggest the use of regular speed-control type humps in the haul road leading to Road Gullies and geotextile wrapped gravel catchpits with discharge pipes into the permanent works.
17. It is likely these temporary drainage features will need to be removed at completion of the works.
18. It may be possible to incorporate the Haul Road bound material into the works by coring 100mm diameter holes at 1m x 1m centres across the construction to permit passage of water from the blocks into the permeable construction below.