Soil Infiltration Testing and Groundwater Monitoring- Wick, Littlehampton

On behalf of Arun District Council

Summary of Report Findings

-13.7841 - Wick, Littlehampton Lett 13.12.13

-13.7841 - Wick, Littlehampton Lett 13.02.13

-14.7982 - Wick, Littlehampton Lett 03.03.14

The investigation at the fours site in Wick, Littlehampton was completed through the winter period 2013/14. The four site areas are referred to as Land North of 31-40 Joyce Close, Land North of 7-12 Joyce Close, Land North of 67 Greenfields and Land between 99-100 Greenfields. It was understood during the investigation period that a fifth site known as Clun Road did not required continuing as part of the works.

At the end of November (29.11.13) the window sample boreholes were drilled at each site to a depth of 4.00m and installed with groundwater monitoring standpipes to allow future monitoring.

Soil types encountered were consistent with the published data maps for the region. Beneath a veneer (0.50m to 0.65m depth) of Made Ground or reworked soils (probably as a result of construction) sandy, loamy, silty Clay soils were proven and considered representative of the Brickearth strata. These were generally proven to depths between 2.20m and 2.80mbgl. An approximately 1.0m thick silty fine to medium Sand deposit was encountered below the latter cohesive soils in three of the five boreholes and again considered representative of the Brickearth.

Towards the base of the window sample holes the recovered soils were described as cream/light brown/yellow brown gravelly Silt with the gravel fraction containing chalk clasts. The recovered soils suggest the top of the underlying solid deposits of the Upper Chalk Group was close and in two locations (WS1 and WS2, Land North of 31-40 Joyce Close, Land North of 7-12 Joyce Close respectively) gravelly Silt of Chalk was noted at 3.25m and 3.70m respectively.

No groundwater was encountered during the installation of the window sample holes. The subsequent commissioned groundwater monitoring for the period of December through to April showed below ground levels rising to the base of the standpipes at the site known as Land North of 31-40 Joyce Close and to lesser extent Clun Road site. Levels between 3.20m and 3.73mbgl were recorded from the start of January to the end of February.

Soil infiltration testing to BRE 365 guidance was carried during the winter period in February (11/12.2.14). Testing was completed in trial pits to depths of 2.60m and 2.70m, thus within those Brickearth soils described above. The pits were rapidly filled with clean potable water and the fall in water level monitored.

Slow soakage was observed and for the single test completed at each location the only water level to fall below 50% fill depth was at the Land North of 31-40 Joyce Close and Land North of 7-12 Joyce Close sites. Its subsequent infiltration rate based on the monitoring from 75-50% fill depth was of the order of 5 $x10^{-6}$ m/s. With all other tests showing even slower rates the results suggest these soils to 2.60m to 2.70m depth having poor infiltration characteristics.

On review of the data CE were requested by the Client to completed further tests at the site. These subsequent tests focused on more shallow deposits with testing at each site location at 0.45m and 1.20m depth. The works were completed at the end of February (27/28.2.14) within hand excavated trial pits.

The most notable change in result compared to the deeper testing was at 31-40 Joyce Close and Land North of 7-12 Joyce Close sites. At 31-40 Joyce Close a good infiltration rate was recorded within TP1b with the third test reading of the order of 5.0×10^{-5}m/s. Thus an improvement of infiltration was noted of the order of 10 compared to the previous, deeper, test at the same location. At the site known as Land North of 7-12 Joyce Close an improvement was also recorded in the 1.20m deep test. A rate of the order of 1×10^{-5} m/s was calculated for the single test completed.

However similar improvements in infiltration was not observed in the remaining site locations. Poor soakage within the soils was again seen at the Land North of 67 Greenfields and Land between 99-100 Greenfields.

The infiltration testing across the sites has shown variable results but overall poor results. Best values were seen at shallow level (of the order of 1.20m) at the east of the investigation area (31-40 Joyce Close, TP1b).

The results do reflect the upper soil unit in the fact that the Brickearth deposits are typically found unstratified with variable fine grained matrix such as silty Clays and silty Sands thus susceptible to changes in infiltration.

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