C1/CAS01/Chapel/RA/RA/DR1

8th October 2016

FAO Guy Evans
Cassidy Ashton
10 Hunters Walk
Canal Street
Chester
CH1 4EB

Dear Guy

Land off Combs Road, Chapel-en-le-Frith.
Drainage report

Further to recent dialogue, meetings and site investigations please find below a review of the site investigations and walkover survey on the above-mentioned development.

Our brief was to undertake infiltration tests in accordance with BRE365 to ascertain the likelihood for discharging proposed surface water into the ground to promote a sustainable means of dealing with drainage.

During the site works we also undertook a site survey/walkover to ascertain alternative means of dealing with run-off should the tests results be negative. These works were done on 9th October 2016.

This review has therefore been split into two parts, being:

- **Infiltration tests.**
- **Walkover survey/alternative drainage strategy.**

This review should be read in accordance with the attached drawing ref: CAS01-Site Notes, which is a marked up pdf annotating test locations, pertinent photograph locations and survey results.

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Infiltration tests

We excavated three trial holes in preparation for infiltration testing, ref: SA1 – 3 as indicated.

SA1 was excavated to a depth of 1.5m where water ingress was noted in the pit base. This pit was not tested as BRE365 and Building Regulations Part H requires the test to be done above ground water levels. It was noted that the strata was of a clayey nature and infiltration was unlikely, this pit was left open in order to let the water equalise and this confirm water table levels at this location. Over the duration of the day water of depth 100mm was recorded in the pit base. (1.4m BGL)

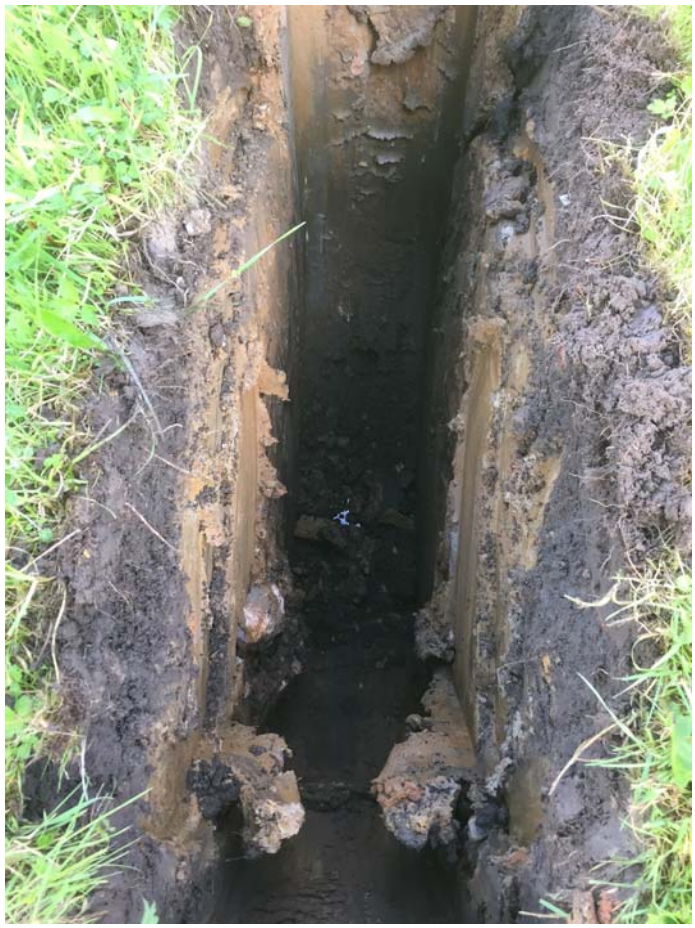

Photo 1 – SA1 with water ingress at base.

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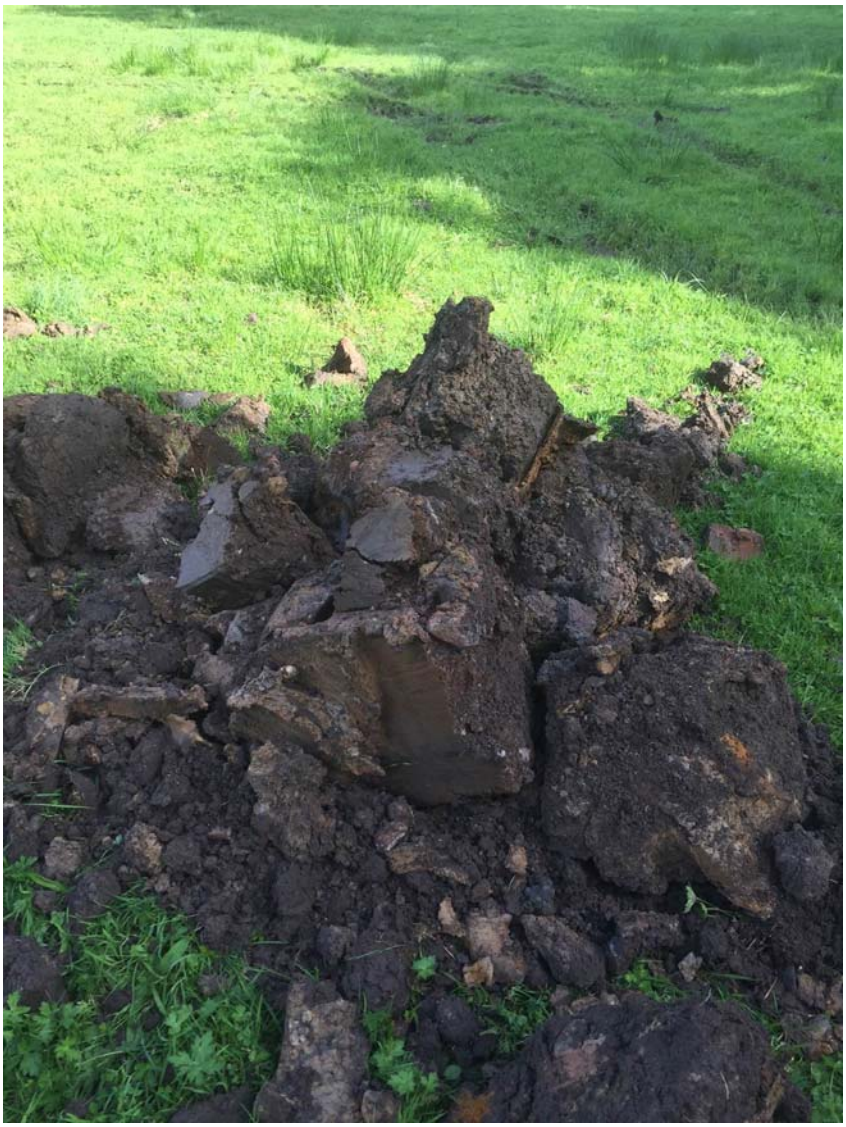

Photo 2 – SA1 excavated material

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SA2 was excavated to a depth of 1.2m. The excavated material was still clayey in nature but more gravelly than SA1. Groundwater was not recorded so a test was commenced. Unfortunately over the duration of the day zero infiltration was recorded at this location.

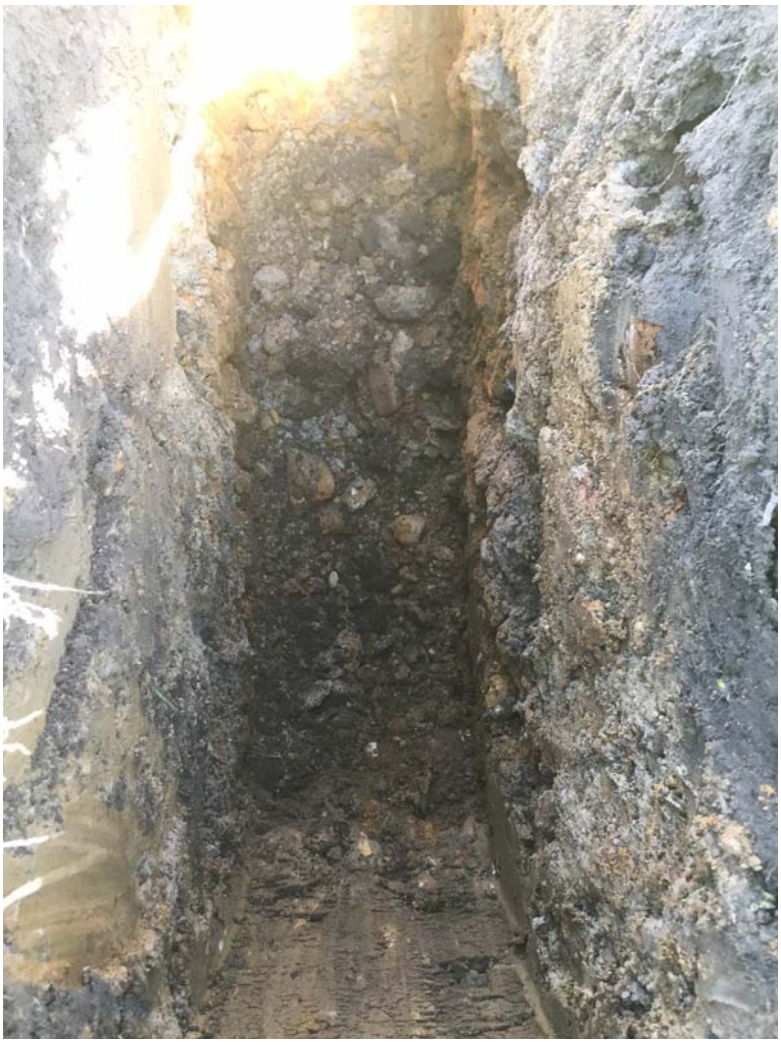

Photo 3 – SA2 pit base.

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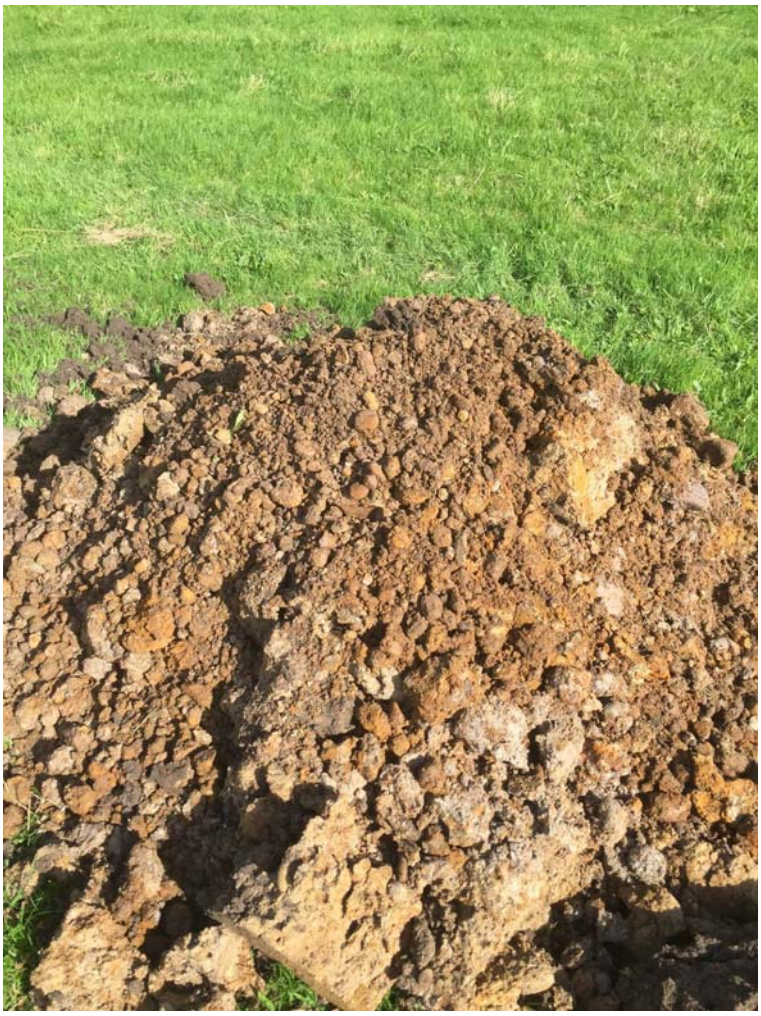

Photo 4 – SA2 excavated material.

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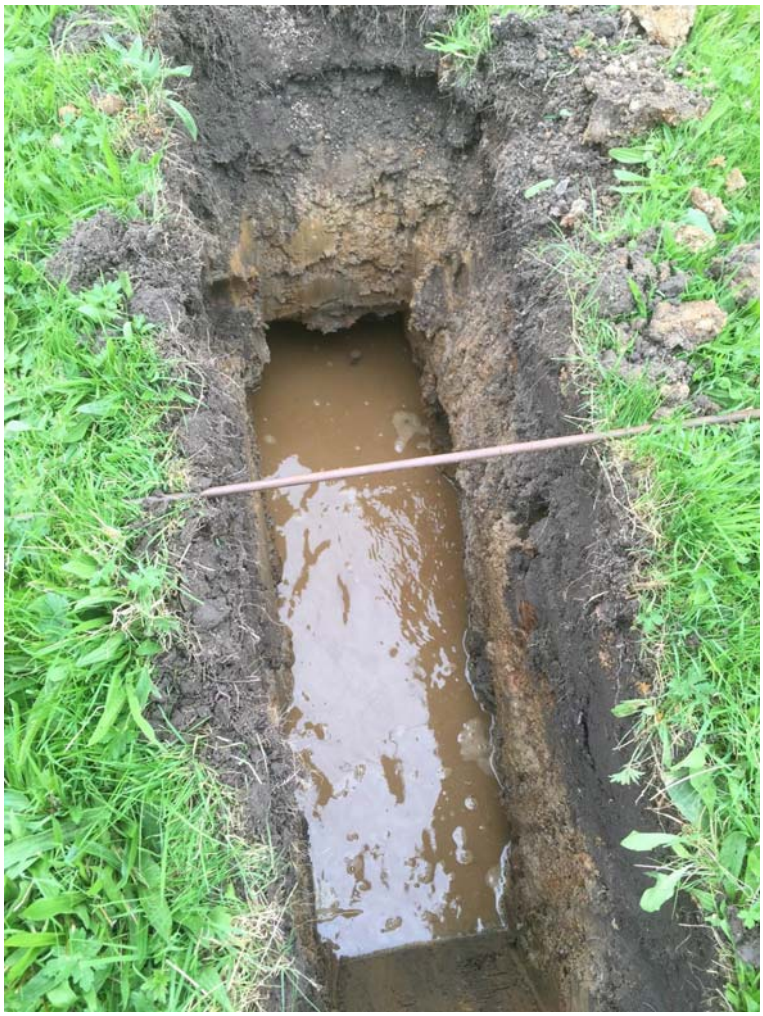

Photo 5 – SA2 infiltration test.

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SA3 was excavated to a depth of 1.3m. The stratum was initially gravelly clay and becoming more cohesive in nature at depth. The overlaying gravelly clay was moist.
A test was also undertaken on the pit and again zero infiltration recorded.

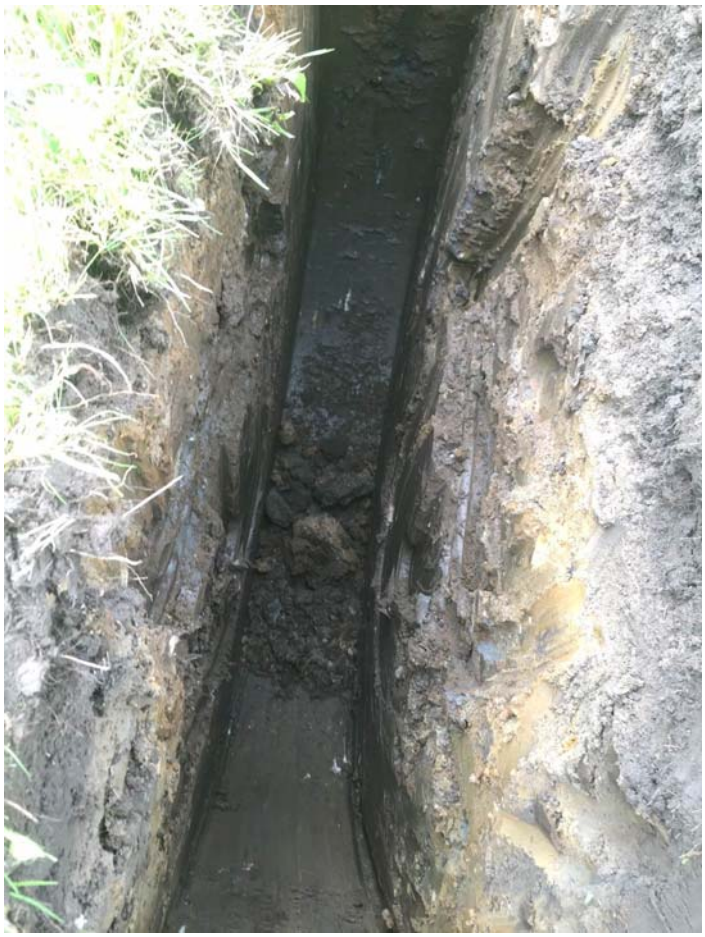

Photo 6 – SA3 pit base

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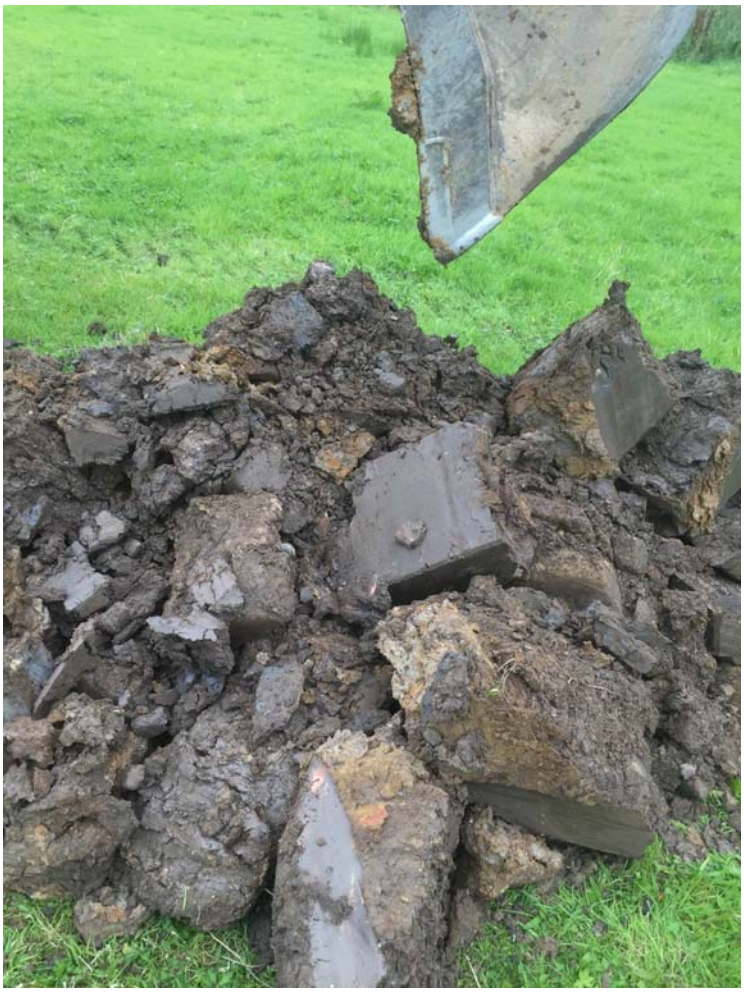

Photo 7 – SA3 excavated material

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It was therefore concluded that infiltration was not a viable means of dealing with surface water and focus was made on an alternative strategy.

Walkover survey/alternative drainage strategy.

The topography of the field falls generally towards the northern western boundary where it meets the golf club 1st hole tee.
There is a ditch excavated along this boundary on the golf course side which has been provided to prevent overland run off from the development field

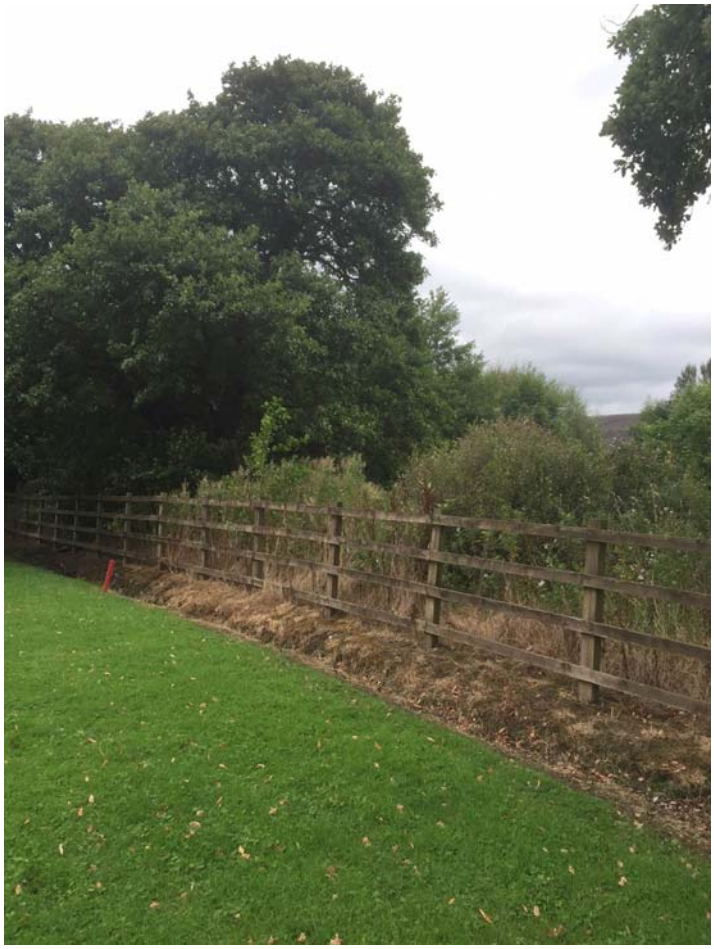

Photo 8 – Ditch along north eastern boundary at golf course

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This ditch heads east along the boundary and then north into a 225 pipe which crosses the golf course access road.

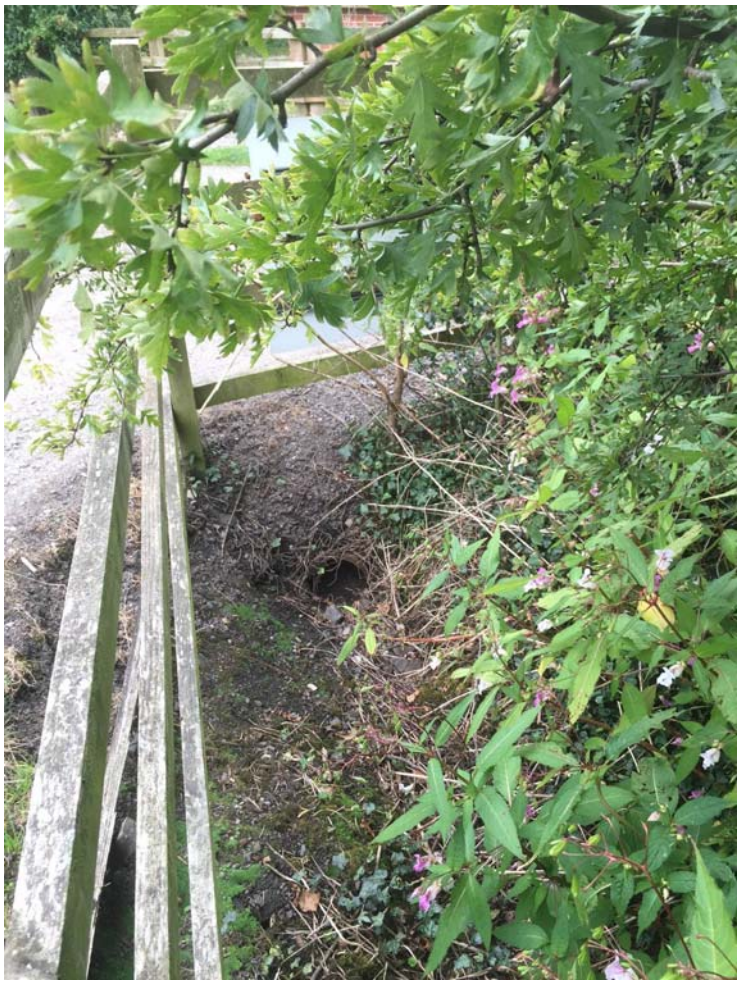

Photo 9 – 225mm pipe from ditch under access road.

This pipe then crosses the road and discharges into a manhole on the opposite side of the road.

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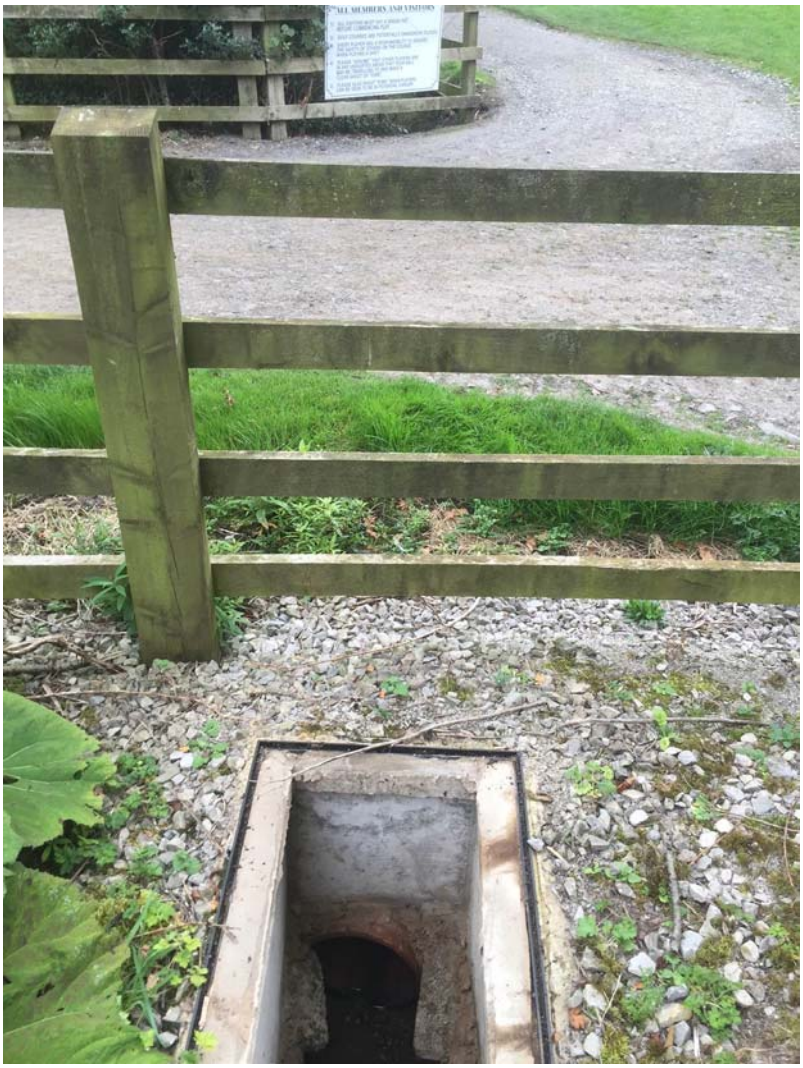

Photo 10 – 225mm pipe from ditch under access road and into manhole.

From the above photo it is clear that the ditch connects into the manhole, the ditch is located beyond, underneath the white sign fixed to the fence. This manhole had another pipe from the east and seems to cater land drainage for this area of the golf course.

This manhole has an outfall pipe which then discharges into Combs Reservoir.

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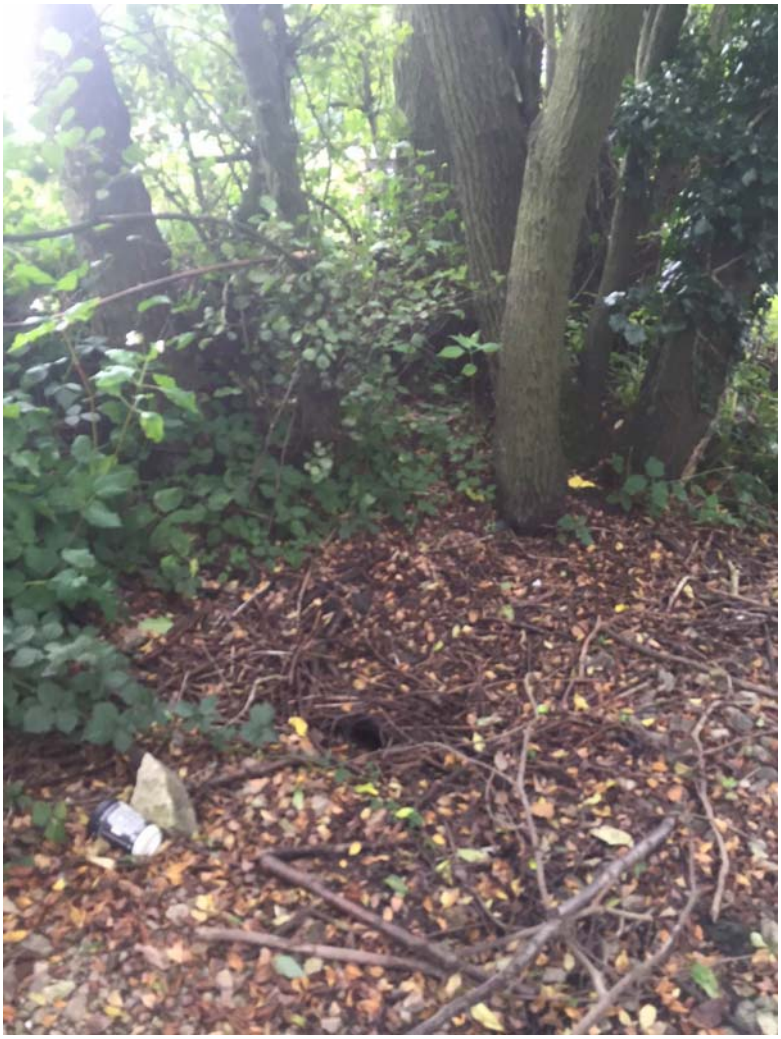

Photo 11 – 225mm pipe from manhole into Combs Reservoir bank.

When standing at the outfall pipe and facing the reservoir it is clear to see a wet area leading down to the reservoir which proves that this system is functioning.

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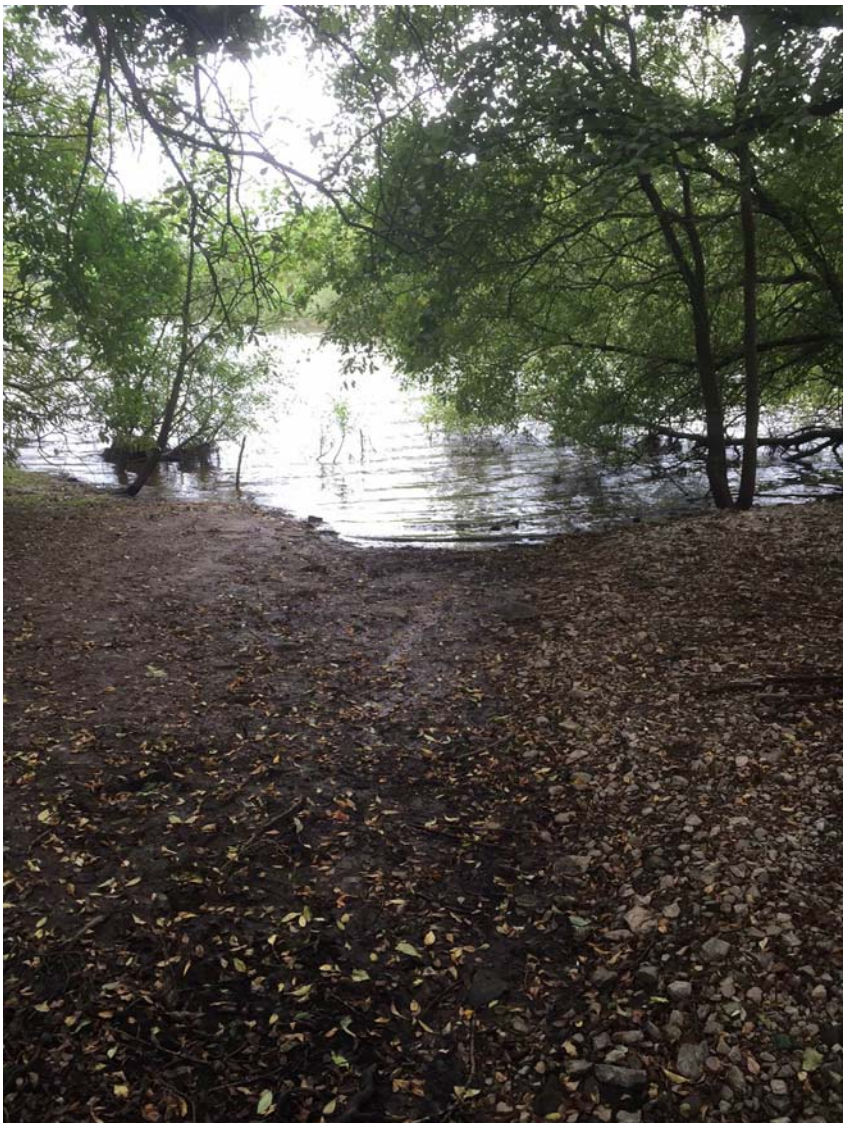

Photo 12 – Looking from 225mm pipe towards Combs Reservoir.

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It is therefore proposed to utilise this system as the proposed outfall for the development.

A balancing pond can be provided on site with a flow control device such as hydro brake or orifice plate prior to the ditch outfall. This device would limit flows to a Greenfield rate equivalent to that currently conveying overland to this ditch.

The balancing pond would be designed to cater for the 1:100yr event plus climate change and therefore not increase the flood risk or pipe flow downstream through the 225mm pipe and ultimately into Combs reservoir.

In order to ensure water quality the balancing pond would be designed to have a low flows channel which could be planted and this would then lead into the flow control device. Beyond the control device the system would run through a polishing swale, again assisting with water quality prior to connecting to the golf course system and ultimately Combs reservoir.

As the site does benefit from the topography and falls to the ditch the outfall could be into the ditch along the boundary or if preferred further downstream nearer the pipe outfall. This could be discussed at detailed design stage with the golf course.

Should you require this approach as a strategy drawing then please let me know and we can make arrangements to provide?

I trust you will find the above of assistance, however, if you have any queries or require further information please do not hesitate to contact me.

Yours sincerely,

Robert Ankers
DIRECTOR
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