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[REDACTED]

From: Mark Akmenkalns [REDACTED]
Sent: 05 November 2021 16:54
To: Katherine Richards [REDACTED]
Subject: D1886 - Climping - BPC Additional Information 05-11-2021

Katherine,

Further to receiving initial comments from the LPA Drainage Engineer I would summarise our responses as below which I trust you will pass to the LPA. Please refer to the data link for all supporting information [REDACTED]
[REDACTED]

Existing Planning & Drainage Strategy

Firstly it is worth noting that this site already has planning approval with a drainage strategy that adheres surface water drainage assessment report supplied by Ambiental dated Aug 2015. Said report concludes infiltration may not be viable and the watercourse due east is a suitable alternative, adhering to natural topography.

Groundwater & Infiltration Testing

We acknowledge the LPA requires some additional testing over the current winter period. This is now currently under way, and we will continue to engage with Laura Gibbons accordingly.

Existing Catchments, Downstream Network & Capacity Consideration

Noting the 'direction of flow' extract from the Ambiantal surface water drainage assessment report, based on LiDAR, we have corroborated these findings with review of the current LiDAR which demonstrate the site conveys surface water run-off easterly toward the watercourse being the lower lying area. This is a lesser tributary of the River Arun which lies approximately 1.2m due east.

Review of the FEH 'river catchments' go some way to inform the approximate splits in the local area, however these do not hold sufficient detail for the site area exclusively nor does this information acknowledge other drainage infrastructure or minor tributaries that are known to exist.

In any event both the LiDAR and FEH show the natural topography conveys surface water run-off to the existing watercourse and the site is part of this catchment.

In order to gauge a better understanding of the local infrastructure, we proceeded to undertake a more thorough investigation of the local infrastructure and catchment topography. Drawing PL102, which focuses on the existing Public Highway catchment in isolation concludes a similar low point in vicinity the eastern culvert leading to the watercourse. The watercourse along the perimeter of the southern boundary collects run-off from both the site and Public Highway catchments which converge at the Church Lane roundabout and flow north towards the outfall as a 225mm diameter spine. The northern Highway drainage is routed as a 300mm diameter spine and the Highway drainage catchment appears to switch to another network approximately 100m north of the Horsemere Green Lane junction which is further clarified on new drawing PL102.1. CCTV investigations were completed whilst we were present on site and we were able to confirm a positive piped connection (450mm diameter) to the eastern watercourse exists.

I now attach new drawing PL102.2 which attempts to provide a visual summary of the site-wide catchments, however this does not account for the various existing drainage infrastructure which intercepts the run-off therefore this is anticipated to be different. The catchment associated with Horsemere Green Lane is known to be served by soakaways (residential pockets); the Public Highway is drained through a series of watercourses and culverts which converge at the pond within the residential property known as 'Flettons' (This is also shown on the Arun DC records). A small section of the easternmost part of Horsemere Green Lane drains towards said pond so little, if any of the catchment gets to the Church Lane network. Other watercourse tributaries are annotated as this gives a feel for where catchments are likely to split when comparing this with the LiDAR.

The site and its surrounding topography is proven to be very flat and therefore run-off behaviour is anticipated to be sluggish and infiltration is negligible. The topography shows the site exceedance flow will ultimately drain the vast majority of the site easterly towards Church Lane. Whilst it is likely that some run-off will simply sit on the site for long durations, parts of the site clearly fall to the perimeter watercourse (south) and/or Public Highway (west & east boundaries) where road gullies convey the run-off into the same network in Church Lane.

The overall catchment size served by the existing culvert as proven via the CCTV is relatively small. The 450mm diameter culvert gradient is laid at approximately 1:140 and thus is capable of dealing with peak flow of the order of 272l/sec (ignoring surcharge scenario). The proposed site infrastructure includes a high level of SuDS in the form of basins and permeable pavements both of which mimic greenfield run-off behaviour (natural attenuation) meaning the time of concentration will not be significantly increased. By using flow control techniques this is also regulated for ALL storm severities (betterment to existing). The current surface water proposals will restrict flows to QBAR (Greenfield pro/rata) being 19.54l/sec ensuring no increases and would represent less than 7% of the available capacity of the existing culvert.

We are therefore confident in the watercourse connection strategy being the most suitable solution here. Once we are both able to observe the additional groundwater data it may be prudent to add a level of infiltration to some/all of the basins and adjust the outfall pipe invert to form a crude 'overflow'. This is something we can discuss later on.

RPZ/Landscaping

We note your comments in respect of root protection areas which I suspect you are reviewing in vicinity of the north east corner. We concur with your concerns and confirm the landscaping proposals have been coordinated to minimise any impacts and look for new planting to be set back outside the 3.0m maintenance buffers. There are a few minor conflicts, however it is understood this is addressed in the AIA report as below:

"3.10 [drainage] will include the excavation of swales/attenuation basins within the root protection areas of T3, G6, T40 and G47. The encroachments into these rpas are not considered to be great enough to warrant removal of the trees, however the excavation will need to occur sensitively with Arboricultural supervision.

3.11 a new underground surface water pipe will encroach the rpa of G86 beneath Church Lane. Given the size and proximity of the trees, the presence of roots beneath the existing road surface should be assumed, despite the likely unfavourable rooting conditions. As such, the pipe must be installed sensitively as described in the AMS"

Additional Information Required

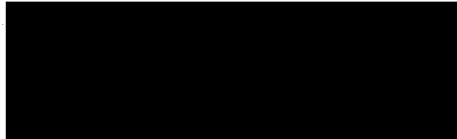
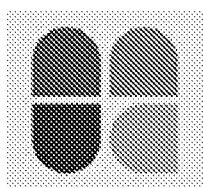
- Please see new drawing PL300 illustrating some cross sections for the ultimate storage basin (Pond 8) annotating inverts, slopes, maximum water levels and relationship to existing ground levels.
- Catchment and capacity information is summarised above.
- Flotation calculation for the ultimate storage basin (Pond 8) are enclosed. Whilst this is for Pond 8 we have considered the potential groundwater to be 1.0mbgl and so would require anchoring. This can be reviewed once we have the new data against the proposed ground levels, but in crude terms where the groundwater is likely to be shallower than 1.0m we would look to propose concrete bases at detailed design stage.
- The drainage drawings have been updated to include the RPZ areas and 3.0m buffer zones.

I trust that the above is clear and I look forward to discussing with you at your earliest opportunity.

Regards,

Mark Akmenkalns

Managing Director



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