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**CIVIL AND STRUCTURAL ENGINEERS**

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Our ref: CP/13:0001/4527  
Date: 01st March 2013  
E-mail: ChrisP@mjaconsulting.co.uk

**HA/2013/113856/02-L01**

**Pre-application Enquiry**  
**Flood Risk Assessment**  
**Manor Farm and Copeys Nursery, Hallett Road, Havent**

Dear Miss Giles,

Thank you for your recent comments relating to the FRA submitted for the above development.

Please find enclosed the revised Flood Risk Assessment (Rev E) which has been updated to cover the issues highlighted in your letter of 28.02.13 and my subsequent discussion with George Woodward on the 01.03.13.

Please also find below the individual responses to each of the comments:

*You intend to intercept overland flows from the existing developed area to the west of your site and then convey these flows into your proposed drainage system. However, you have not taken account of these overland flows in your drainage calculations and storage requirements. This needs to be done and additional storage provided if necessary, to ensure that the existing properties are drained effectively and that flood risk is not increased to either the existing or proposed properties.*

**FRA Ref: Appendix D & 6.4.2**

The attenuation ponds are presently shown as indicative in terms of size and available storage volumes.

Although we feel the occurrence of overland flow from the existing development to the west will be very rare, a full allowance for the potential runoff from this area will be included in the pond detailed design storage calculations.

This will ensure that the existing properties are drained effectively and that flood risk is not increased to either the existing or proposed properties.

Please see an update to the 'Post-Development Runoff' calculation in Appendix D of the FRA to also include an allowance for this offsite runoff.



**MICHAEL A JENNINGS ASSOCIATES LIMITED**

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*We note that you intend to raise ground levels even further than before, in the region of 450mm above existing levels, using a free-draining aggregate. This would result in a relatively permeable layer lying above the existing relatively impermeable ground, with the proposed soakaways cutting through both. This could lead to water moving laterally out of the soakaways through the fill material. What implications does this have from a geotechnical point of view? Could lateral flows travel sub-surface along the prevailing topography and affect either the existing or proposed properties?*

**FRA Ref: 5.2.5 & 5.5.3**

Following discussions with our geotechnical engineer (Dominic Brightman of Wilson Bailey), whilst we feel that there would be a suitable level of interaction through the free-draining stone material used to raise the site and the existing strata, we acknowledge that the lower infiltration rates of the existing strata could cause residual lateral flows within the free-draining stone material.

The possibility of high groundwater and for lateral flow has been considered within the geotechnical design of the house foundations, potential issues will be mitigated through the use of vibro stone columns.

The topography of the site would suggest that any lateral groundwater flow at the site will be in an easterly direction away from the existing development and towards the Nore Farm Stream.

Any lateral flow that has not infiltrated into the existing strata will be collected at the eastern boundary of the site by a series of collector cells and distributed into the attenuation ponds.

This will ensure that the peak flow rate into the Nore Farm stream is not increased as a result of the raising of the site.

*The borehole log in Appendix E indicates extremely high groundwater levels over this winter, in one location only 210mm below the ground. Whilst it is important that infiltration is included in the drainage design to reduce the amount of runoff entering the Nore Farm Stream as much as possible, there is a real risk of groundwater infiltration into the attenuation ponds. In your design, the attenuation ponds are effectively providing a backup means of safely attenuating runoff, and would only come into operation when the soakaways cannot function, i.e. when groundwater is high. Because of this we recommend that the ponds are lined to prevent groundwater ingress interfering with their designed operation. Will this change your storage requirements?*

**FRA Ref: 5.2.4, 7.10, 7.15 & 9.10**

All attenuation ponds will be lined with an impermeable lining to prevent any interaction with the groundwater and the lack of infiltration within these ponds will be accounted for in the detailed design sizing calculations.

*You state that a management company will own and maintain all of the SUDS features. Given the importance of the maintenance for the functioning of the system we recommend that this arrangement is incorporated into a Section 106 agreement. This would obviously be a matter of discussion for yourselves and Havant Borough Council though.*

**FRA Ref: 7.16**

The arrangement for the long term maintenance of SUDS will be incorporated into a S106 agreement.

I trust you find the amendments to the FRA acceptable to overcome the objection, however should you require additional information then please do not hesitate to contact me.

Yours sincerely,



**CHRIS PENDLE**  
**FOR MJA CONSULTING**