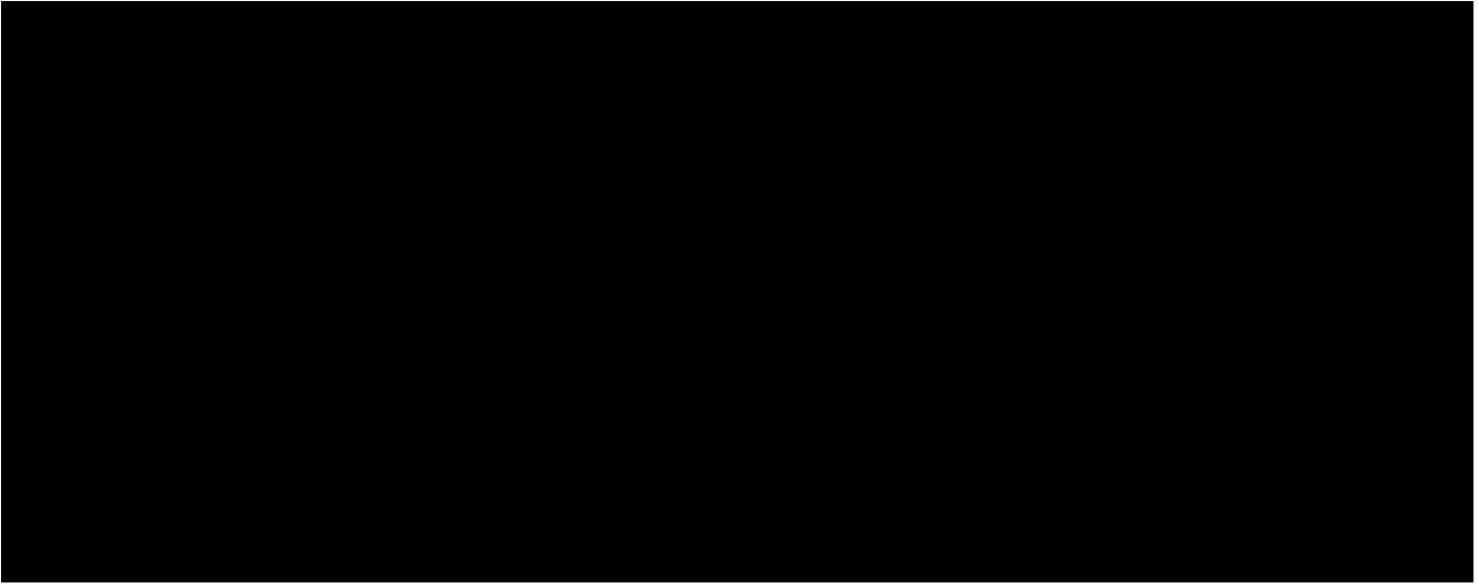






From: Laura Gibbons
Sent: 20 February 2019 15:43

Cc: Michael Eastham
Subject: Saltbox- Drainage

Nia,

Thank you for your time this morning. As promised, below is a summary of the outstanding drainage issues/ my comments.

1. Shallow infiltration testing is going to be conducted at the depths and locations of potential permeable paving areas. If the results of this are $\times 10^{-6}$ or greater permeable paving should be implemented as part of the surface water drainage scheme. If it is demonstrated that half drain times exceed 24 hours for the 1 in 10 year plus 40% climate change event a high level overflow to the watercourse can be provided. We would expect this overflow to only come into use when water levels exceed the 1 in 100 year plus 40% climate change event levels. If it is demonstrated that infiltration rates are $\times 10^{-7}$ or less the original scheme should be taken forwards.
2. As a minimum I require evidence that a Flood Risk Activity Permit application has been made to the Environment Agency to construct outfalls within the main river. Without this I cannot recommend the discharge of the condition as there would technically be no way to dispose of the surface water.
3. There are bank erosion issues upstream, I do not know if this extends into the site. This is something to bear in mind when designing the outfalls and liaising with the Environment Agency.
4. Confirmation will need to be provided that 8m easement is provided to the top of bank of main river, and 3m to the top of bank of ordinary watercourse.

5. I will need confirmation that the proposed outfall to the north is constructible given its proximity to overhead cables. If this cannot be guaranteed the outfall should be repositioned away from the overhead cables.
6. The attenuation basins are proposed to be deeper than groundwater. Therefore the basins will need to be lined. Flotation calculations must be submitted with the DOC application to demonstrate that the design adequately accounts for these forces. If this results in changes to basin footprints revised plans will need to be submitted for BE/135/18/PL.
7. Full details must be submitted of how adequate treatment of surface water is to be achieved via the proposed surface water drainage scheme.
8. A maintenance manual should be submitted.
9. The DOC application (BE/2/19/DOC) should be submitted in full accordance with the advice within the drainage submissions checklist (attached for ease of reference). If pre-commencement conditions are to be avoided on the other application (BE/135/18/PL) the detailed submitted will need to be to level set out within the drainage checklist.

Please note that I am out of the office from this Friday to the 5th March.

Kind Regards,

Laura Gibbons, MEng, GMICE
Engineer (Drainage & Coastal)

Laura Gibbons | Engineer (Drainage & Coastal), Engineering Services, Arun District Council | Location: First Floor, Arun Civic Centre, Maltravers Road, Littlehampton, BN17 5LF

Internal: 37818 | External: +44 (0) 1903 737818 | Fax: +44 (0) 1903 716018 | E-mail: laura.gibbons@arun.gov.uk

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Surface Water Drainage Proposal Checklist

Foreword

Before completing this checklist you are advised to read “Arun/Chichester District Council Supplementary Requirements for Surface Water Drainage Proposals”.

The Surface Water Drainage Proposals Checklist is designed to clearly outline Arun/Chichester District Council’s expectations and requirements for Surface Water Drainage Proposals and to expedite their review. This document should be used when completing Discharge of Conditions Applications or if the applicant wishes to avoid pre-commencement conditions relating to surface water drainage.

The Town and Country Planning Regulations now require pre-commencement conditions to have the prior agreement of the applicant regarding their wording and use. If an applicant wishes to avoid surface water drainage pre-commencement conditions they will need to submit detailed surface water drainage proposals in line with the Surface Water Drainage Proposal Checklist.

The below details are required to enable Arun/Chichester District Council to examine if proposals follow the hierarchy for sustainable drainage and if the design will adequately drain the site.

N.B. It will be difficult for Arun/Chichester District Council to undertake an appropriate and therefore timely assessment of your application if you answer “no” to any of the questions below, or if you fail to provide any of the information requested.

Checklist

Winter groundwater monitoring results included	Y/N
Winter infiltration test results included	Y/N
Period of winter groundwater monitoring	
Maximum recorded groundwater level (AOD)	
Date of infiltration testing	
Depth of infiltration testing	
Minimum infiltration rate recorded (At location of infiltrating structure)	
Plan showing the location of winter groundwater monitoring and infiltration testing included	Y/N
Method of surface water disposal proposed (Delete as appropriate)	Infiltration / Attenuation with discharge to watercourse / Attenuation with discharge to surface water sewer / Attenuation with discharge to foul sewer
If infiltration is <u>not</u> to be used: Justification supplied	Y/N
If infiltration is proposed: half drain time for 10 year event + climate change allowance (hours)	

If infiltration is proposed: half drain time for 100 year event + climate change allowance (hours)			
If infiltration is proposed: lowest base level of infiltrating structure			
If attenuation is proposed: calculations of pre-development runoff rates included *	Y/N	Rate	l/s
If attenuation is proposed: is proposed discharge rate less than or equal to pre-development rate?*	Y/N	Rate	l/s
Calculations included demonstrating that the 1 in 100 year plus climate change event can be accommodated on site**	Y/N		
If proposing an impermeable lined attenuation feature/s, calculations included demonstrating that resistance to floatation (due to groundwater levels) is achieved and catered for in the design	Y/N/Not applicable		
If alterations or discharge to an ordinary watercourse is proposed: has Ordinary Watercourse Land Drainage Consent been sought?	Y/N		
Drainage layout plans included***	Y/N		
Construction detail plans included****	Y/N		
Exceedance flow route plans included (Not required for <5 properties)	Y/N/Not applicable		

*If developing brownfield sites, please provide fully detailed plans of the existing surface water drainage arrangements on site, including impermeable areas, gullies, outfalls, pipes & diameters, manholes, etc.

**If infiltration is proposed the following factor of safety should be applied to calculations (in accordance with CIRIA R156/ CIRIA C609)

Size of Area to be Drained	Consequences of failure					
	No damage or inconvenience		Minor inconvenience, e.g. surface water on car park		Damage to buildings or structures or roads.	
	Cv=1.0	Cv=0.75	Cv=1.0	Cv=0.75	Cv=1.0	Cv=0.75
<100 m ²	1.5	2	2	3	10	13
100m ² to 1000m ²	1.5	2	3	4	10	13
>1000m ²	1.5	2	5	6.5	10	13



***Please note that drainage layout plans should include:

- All surface water drainage pipes labelled with; diameters, pipe materials, falls and invert levels.
- All infiltrating and attenuating structures (including permeable paving) labelled with; dimensions, invert and cover levels.
- All manholes labelled with; cover levels, invert levels, cover types detailed.
- All silt traps clearly labelled with sump depths.
- Control structures with outflow rates and invert levels.
- Proposed/existing levels of any areas subject to ground raising, together with suitable measures/detailed drawings for the associated managing of surface water runoff. Please note that ground raising should be avoided unless there are exceptional circumstances.

****If your proposed drainage scheme includes any of the following elements site specific construction detail plans should be supplied: pipe bed and surround; infiltrating structures; attenuating structures; manholes; catchpits/silt traps; control devices; permeable paving; headwalls.