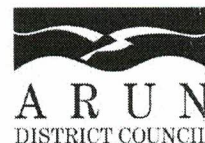




FL2891

34-44 CARLTON RD
BOGNOR REGIS



Surface Water Drainage Proposal Checklist

Ground Investigation Results				
Results Required		Results Provided?		
Winter groundwater monitoring results (Please refer to guidance note 1 below)		Yes	☒	No
Period of winter groundwater monitoring ^{Note 1}		From	01/05/2018	
		To	29/04/2019	
Maximum recorded groundwater level		49.28 mAOD 0.5 mBGL		
Winter infiltration test results ^{Note 2}		Yes	☒	No
Date of winter infiltration testing		28/03/2019		
Details of the location and depth of the infiltration testing ^{Note 3}		Yes	☒	No
Minimum infiltration rate ^{Note 4}		7 x 10 ⁻⁶ m/s		

Guidance Notes

1. A full winters groundwater monitoring should be undertaken, (October to March inclusive) to enable the peak annual groundwater levels to be established. The extent of winter monitoring for developments of less than 5 properties should be discussed with the council's Engineers.
2. Infiltration testing should be undertaken during the wet winter months (typically January) and in line with BRE365, or a similar approved method. Tests should be repeated 3x, to replicate saturated ground conditions. Please note that infiltration testing is to be carried out at a time and depth agreed with the Councils engineers.
3. Infiltration testing should be undertaken at the location and depth of any proposed infiltration structures. This must be above the maximum recorded groundwater level in that vicinity.
4. The minimum infiltration rate obtained at the location and depth of the proposed infiltration structures should be used to inform the design of the structures.

Proposed Method of Surface Water Disposal			
Infiltration	Yes	☒	No
On-site, via soak-away structures			
If on-site infiltration is not to be used, has justification for this been provided? Note 5	Yes		No
Attenuation (on-site) with a restricted discharge to a watercourse on, or adjacent to, the site	Yes		No
Attenuation (on-site) with a restricted discharge to a surface water sewer on, or adjacent to, the site	Yes		No
Attenuation (on-site) with a restricted discharge to a foul water sewer on, or adjacent to, the site	Yes		No

Guidance Notes

5. If on-site infiltration is not being used to drain the site you will need to provide evidence that demonstrates on-site infiltration is unviable.

Version 3.0 (20.11.2019)

Drainage Design: Supporting Calculations				
Calculations Required			Calculations Provided?	
Infiltration Structures	Half-drain time for 10 year event (plus climate change allowance)	Yes ☒	No ☐	Hours
		659		
	Half-drain time for 100 year event (plus climate change allowance)	Yes ☒	No ☐	Hours
		1200		
	Calculations demonstrating that the 1 in 100 year event, plus climate change allowance can be accommodated on-site. Note 7	Yes ☒	No ☐	
Attenuation and Subsequent Restricted Discharge	Lowest base level of infiltration structure	49.34		
		mAOD mBGL		
	Has the design sought to provide treatment of potential contaminants? E.g. hydrocarbons. FORH/AD/E	Yes ☒	No ☐	
	Pre-development run-off rate calculations	Yes ☐	No ☐	l/s
	Proposed discharge rate Note 6			
Attenuation and Subsequent Restricted Discharge	Calculations demonstrating that the 1 in 100 year event, plus climate change allowance can be accommodated on-site. Note 7	Yes ☐	No ☐	l/s
	Has the design sought to provide treatment of potential contaminants? E.g. hydrocarbons.	Yes ☐	No ☐	
	If your proposed scheme incorporates any impermeable lined attenuation features we require calculations to demonstrate that appropriate resistance to floatation (due to groundwater levels) is catered for in the design	Yes ☐	No ☐	
	If you propose discharging into or altering an ordinary watercourse; have you sought Ordinary Watercourse/Land Drainage Consent? Note 8	Yes ☐	No ☐	
	If discharging to a watercourse, piped system or the sea, has the proposed drainage network been modelled against predicted top water levels for the 1 in 100 year storm event plus climate change allowance, within the existing system? Note 9	Yes ☐	No ☐	

Guidance Notes

- Any proposed discharge rate must be less than, or equal to, the pre-development rate. Greenfield sites must use the mean flow rate (Q_{bar}) and be based upon the area occupied by the development, ignoring significant open spaces. Please note that the minimum acceptable discharge rate is 2l/s when using formal flow control devices, unless otherwise agreed. Additionally, if you are developing a brownfield site, we expect you to provide fully detailed plans of the existing surface water drainage arrangements on site, including impermeable areas, gullies, outfalls, pipes & diameters, manholes, etc. We generally seek 50% betterment in terms of run off from brownfield sites.
- The appropriate factor of safety from the table below must be applied to your calculations to ensure your design is fully in accordance with CIRIA R156/ CIRIA C753.

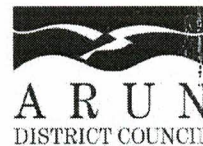
Factor of Safety Table						
Size of Area to be Drained	Consequences of failure					
	No damage or inconvenience		Minor inconvenience, e.g. surface water on car park		Damage to buildings or structures or roads.	
	Cv=1.0	Cv=0.75	Cv=1.0	Cv=0.75	Cv=1.0	Cv=0.75
<100 m ²	1.5	2	2	3	10	13
100m ² to 1000m ²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

8. Ordinary Watercourse/Land Drainage Consent will need to be sought, ideally in parallel with planning permission, if you propose discharging into, culverting or altering a watercourse.
9. Modelling is required to ensure that problems, such as surcharged outfalls, are addressed.

Plans/Drawings/Diagrams				
Required		Provided?		
Plan detailing the location of groundwater monitoring and infiltration testing		Yes	☒	No
Detailed drainage layout plan Note 10		Yes	☒	No
Construction detail plans Note 11		Yes	☒	No
Exceedance flow route plans Note 12		Yes	☒	No
Impermeable area plan		Yes	☒	No
If ground levels are being raised $\geq 300\text{mm}$ above existing levels and is unavoidable, have fully detailed plans been provided, together with drainage proposals, to address any potential drainage related issues.		Yes	N/A	No

Guidance Notes

10. 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 management of surface water runoff. Please note that ground raising should be avoided unless there are exceptional circumstances.
11. Site specific construction detail plans should be supplied if your proposed drainage scheme includes any of the following elements: pipe bed and surround; infiltrating structures; attenuating structures; manholes; catch-pits/silt traps; control devices; permeable paving; headwalls.



12. Unless specifically requested by the council's drainage engineers 'Exceedance Flow Route Plans' are only required for developments of more than 5 residential properties or more than 0.5ha of commercial development .