

Application Reference: BN/18/25/DOC Site Name: Eastmere Stables Eastergate Lane Eastergate PO20 3SJ	Initial Issue Date: 07/10/2025 Issue Date: 07/10/2025 Reviewer Reference: ADC/EXT4
--	---

Summary and Recommendation:

Condition 9: **Objection**

Please note: Any DOC application should only have a maximum of two consultation responses. If this is the second response for an open application and there are still comments outstanding, then please object to the application.

	ADC Drainage Comments	Designer Response	ADC Drainage Comments	Designer Response	
Date:	18/08/2025	01/09/2025	07/10/2025	26/03/2026	
Condition Number:					
Comment Number					
1.	ADC response (BN/18/25/DOC) 17/04/2025 ADC would expect at least 4 groundwater monitoring observations over two wet months ideally January and February. The groundwater monitoring lasted only for approximately 2 weeks (31/10/24 – 13/11/24) Designer response (BN/18/25/DOC) 17/04/2025 The Drainage Strategy report submitted at planning stage by Motion contained full winter groundwater monitoring results by Mate Geotechnical Services. These have been appended to this response for ease of reference. ADC response (BN/18/25/DOC) 18/08/2025 This information was not submitted with the current DOC and will need to be. However, the information was reviewed after having to research previous planning applications (BN/128/24/RES). Our consultation on BN/128/24/RES discussed the groundwater monitoring and infiltration testing, and contributed towards our objection at that time. I am not aware of any further testing/monitoring since that application, to support this proposal. Based upon the current design, there are essentially only two groundwater monitoring points with relevant data ie. GWP#1 (Peak GWL 14.216m AOD) and GWP#4 (Peak GWL 13.666m AOD). These are located at either end of the permeable road extents. The road is the sole means of infiltration into the ground. No groundwater data	Please refer to the supporting statement from Mate Geo-Technical Services, which provides commentary on the soil infiltration testing undertaken for the proposed site. The statement notes that the slowest rate of 3.069 x 10⁻⁴ m/s taken within TP4 (which was done at a depth suitable for permeable pavement) is typical across most of the site, with the exception of the "made-up" area, where infiltration is not proposed within the drainage strategy. The hydraulic model has been updated to incorporate this value. Winter groundwater levels have been added to the drainage layout and interpolated at key points along the road length. This shows that a freeboard of 771mm is achieved at the site entrance, which is maintained roughly until the northern side of the impermeable membrane section, at which point the freeboard is 688mm. The lowest freeboard is at the end of the road, close to GWP#1, where a freeboard of 575mm is achieved. We would hope that, as per previous sites in this district, the freeboard of 1m, which is generally aimed more at point infiltration features such as soakaways, could be relaxed in this case to facilitate the SuDS design.	As per the previous ADC drainage response a single test is insufficient. An interpolated result for the remainder of the extent of the permeable paving is unacceptable. Additional testing should be carried out along the extent of the infiltration "blanket" and at the proposed formation levels and the results used in each section of permeable paving/infiltration blanket designs, A freeboard of less than 1m is unacceptable. A review of the drainage design solution should be undertaken	Additional and extensive BRE365 testing has now been undertaken. Refer to Constructive Evaluation report ref: CE25.2049 6 No. tests were completed alongside the road construction and at the proposed formation levels. Tests generally proved good infiltration potential between 1 and 2 x 10⁻³ m/s. The slowest test was in TP06 at 7.96x10⁻⁴ m/s. The previously submitted hydraulic model was based on a rate of 3.069x10⁻⁴ m/s but this has been re-run with the improved infiltration rate. The model now shows no flooding in all events including the climate change + urban creep scenarios. The 1m freeboard from highest WGM levels to formation of the permeable subbase is now demonstrated via the new winter groundwater monitoring data. Refer to Ground Management Report ref: G6737-1. Three boreholes were monitored regularly over the winter period as agreed at the pre-app meeting. The highest recorded levels have been added to the drainage layout in their correct positions, and a further groundwater level has been interpolated from the readings for completeness of data long the length of the road. Although the levels came extremely close to the 1m freeboard level towards the north of the site following the	

	is available for the central areas of the permeable road. In this case, despite the variability in groundwater levels, we are willing to accept that the levels between these two points can be interpreted to provide anticipated groundwater levels along the length of the road. The applicant must show these interpretations on a suitable plan. It is essential that a min. one metre freeboard is achieved between the base of the permeable paving and peak groundwater levels. This is not being achieved in the vicinity of GWP#1 and there may be similar issues once groundwater levels are fully understood for the remaining length of the road. In terms of infiltration testing, there is only one usable test location which is TP4. This was undertaken at a suitable depth and location to reflect the current design. All other tests are at unsuitable depths and locations. Without further testing being provided at appropriate depths and locations along the permeable road, it is not possible to review the current design. It is a requirement that testing <u>must</u> be undertaken at the depth and location of any infiltration structure, and where there is an extensive longitudinal structure such as proposed, then a suitable number of tests are required along its length. Taking an average rate of all tests undertaken on the site (which are variable) is not acceptable. Therefore, further winter infiltration testing is required at agreed depths and locations to support the design.			intense rainfall in February, the 1m freeboard was achieved over the monitoring period in all locations.	
2.	ADC response (BN/18/25/DOC) 17/04/2025 The hydraulic drainage calculations need to contain the whole drainage network including the private pipes Designer response (BN/18/25/DOC) 17/04/2025 It is not feasible to provide this within the hydraulic model as all the pipes discharge into the subbase blanket in different locations. This request has not been made on other similar infiltration blanket schemes recently approved with ADC.	Please refer to the updated hydraulic model calculations submitted. All pipes and manholes (inclusive of the channel drain at the site entrance) have been modelled as requested. Liaison with the software manufacturer has been undertaken on how best to create a representative hydraulic model for the site. Causeway (the product manufacturer) recommended that a node was provided for each permavoid inlet into the subbase, which would then connect to a common junction node being discharging into a permeable paving node (note that the software does not currently support shared	Thank you for the updated calculations. But updated calculations will be required to take into account of the specific infiltration test results along this road.	The previously submitted hydraulic model has been updated to reflect the newly established infiltration rate of $7.96 \times 10^{-4} \text{m/s}$ (2.8656m/hr).	

	ADC response (BN/18/25/DOC) 18/08/2025 The calculations submitted have not been fully checked due to the fact that the design is likely to change as a result of other comments made. However, the entire network will need to be modelled, which includes the associated pipework/manholes (+channel drain at the entrance) to ensure that the system will perform on all design storms without detriment to property, etc. There are concerns that due to the levels of some of the lower lying properties there may be a flood risk during extreme events and therefore it is important to fully model the system to confirm if this is the case or not. It is suggested that the applicant discusses the best way to achieve the modelling required with the manufacturer of the software. It is noted that the infiltration rate in the calculations is 2.65×10^{-4}, which does not reflect the average rate specified in the Drainage Statement. Nevertheless, this rate is likely to change based upon item 1. The base slope input for the permeable paving must reflect the design. A copy of the FEH22 point descriptor file will need to be submitted, so that the coordinates and parameters can be checked.	outfalls, hence the introduction of the junction node). The connecting links are reduced to 1m in length to minimize their attenuation potential. The permeable paving subbase was divided into sections based on the proposed levels strategy (and to keep the hydraulic model manageable) and linked together to represent the total storage area. These links are also 1m in length to minimize their attenuation potential. Causeway deemed the modelling of the private drainage to be superfluous, however it has been actioned for completeness on this occasion. Please refer to the response for item 1 regarding the infiltration rate used for the design. The base slope of the permeable paving has been updated to align with the proposed levels strategy. The FEH xml file has now been provided.			
3.	ADC response (BN/18/25/DOC) 17/04/2025 Provide an impermeable area plan explaining in which pipe each impermeable area will discharge. Designer response (BN/18/25/DOC) 17/04/2025 Catchment Plan now included ADC response (BN/18/25/DOC) 18/08/2025 Please label indicated areas in m² and total these areas. There are some slight differences in terms of impermeable areas (plots 6 and 7), between this drawing and the hard landscaping plan – please correct accordingly.	Catchment areas added to plan	Please provide areas of permeable paving on the catchment plan	Permeable paving areas now added to the catchment plan	
4.	ADC response (BN/18/25/DOC) 17/04/2025	Please refer to the response for item 1 regarding the infiltration rate used for the design.	As per the response to item 1 and previous ADC responses additional	Refer to response to item 1. Winter infiltration testing completed.	

	Provide infiltration testing results undertaken during the wet winter months, (October to March) and in line with BRE365, or a similar approved method. Tests should be repeated 3 times consecutively, to replicate saturated ground conditions. Designer response (BN/18/25/DOC) 17/04/2025 This information was submitted at planning stage within the Motion FRA. We have appended it to this response for ease of reference. ADC response (BN/18/25/DOC) 18/08/2025 See response to item 1.		winter infiltration tests need to be carried out		
5.	ADC response (BN/18/25/DOC) 17/04/2025 A safety factor of 10 should be taken into account at the hydraulic calculations. Designer response (BN/18/25/DOC) 17/04/2025 As the road gently slopes towards the highway, and the buildings are set above the road, we believe that the consequence of failure would be exceedance run-of that would not cause damage to buildings and so, for an area greater than 1000m² and a Cv of 1.0, we have updated the calculations to allow for a FOS=5, which we believe to be appropriate in this case. This leads to the permeable subbase depth increasing to 650mm. ADC response (BN/18/25/DOC) 18/08/2025 Please provide evidence that damage to buildings or structures or roads, will not occur as a result of failure of the permeable paving. See also response to item 4.	Refer to the updated hydraulic calculations, which reports minimal flooding in the 1:100YR+45%CC+10%UC event only and for short duration storms. The flooding is very minor (<1m³) and is limited to manholes within gardens, which will not cause damage to buildings, structures or roads. Therefore, the FOS of 5 applied to the permeable paving is appropriate.	Thank you, but updated calculations and exceedance flow assessment will need to be carried out in conjunction with the additional infiltration test results and drainage solution	Updated calculations now show no flooding due to improved infiltration rate. The general exceedance routing plan for potential failure of the system submitted previously therefore still stands, noting that the site gently falls to the south and so this would be the direction of travel for exceedance flows resulting from system failures.	
6.	ADC response (BN/18/25/DOC) 17/04/2025 Provide specific detailed construction details for each section of permeable paving. Designer response (BN/18/25/DOC) 17/04/2025 There is one permeable paving construction detail, but with two options for either permeable or impermeable lining, which is clearly	The void ratio within the hydraulic calculations has been amended to 30%, in accordance with the construction details.	Thank you item closed	Noted	

	noted on the detail. However, we have separated these out to satisfy this request. ADC response (BN/18/25/DOC) 18/08/2025 Permeable paving with infiltration – specify the geotextile proposed and clearly show that it will extend up the sides of the structure. Permeable paving without infiltration (made ground area) – specify the membrane proposed and clearly indicate that it will extend up the west and east sides of the structure only and presumably not the northern and southern ends. The void ratio specified (30%) in both construction details does not reflect the ratio used in the hydraulic calculations (35%).				
7.	ADC response (BN/18/25/DOC) 17/04/2025 There are occasions where the pipe cover depth near the plots is less than 0.6m. In these occasions concrete bed and surround should be provided. Designer response (BN/18/25/DOC) 17/04/2025 This is covered by the pipe bed and surround details on drawing 5550, which note the differentiation based on location and cover depth. The pipes referred to here would be class Z bedding. ADC response (BN/18/25/DOC) 18/08/2025 The construction details only refer to verges and carriageways. Please adjust to include areas around buildings/in gardens.	Notes now added to also include gardens.	Thank you item now closed	Noted	
8.	Indicate permeable paving formation levels on drainage layout plan, for the entire length of permeable road.	This has now been added via 'SBIL' level annotation.	Thank you item now closed	Noted	
9.	Catchpits are required immediately upstream of all diffuser units.	Missing catchpits added to drawing and table	Thank you item now closed	Noted	
10.	Specify all levels associated with the channel drain at the site entrance (ie. Outlet invert, manhole cover and invert, diffuser unit invert. Pipe diameters and gradients also to be shown.	Now added to drawing	Thank you item now closed	Noted	

Surface Water Drainage Comment Tracker

11.	All pipes not connecting to manholes to be connected via oblique 45 degree junctions. Please specify.	Pipes and connection where needed now show oblique connection	Thank you item now closed	Noted	
12.	No pipes to connect against the direction of flow, examples; Connection to manhole north east corner of plot 9 & north side of plot 3.	Pipes updated to show oblique connections to remove apparent against flow connection	Thank you item now closed	Noted	
13.	It is not clear how some of the property driveways/hardstanding's will be drained. Please clearly indicate. The installation of permeable paving in all these areas may help assist in addressing the likely shortfall in storage volume, when the comments in this consultation are taken into account.	Driveways drain either by gullies at low spot into drainage system to diffuser unit fall and drain into permeable paving	All driveways need to be actively drained and cannot simply fall over footway and into permeable highway. This would give rise to a risk of ice forming in winter over the footways Plot 1, 5, 6, 7 & 8 all lack drainage.	Plots 5-8 do not cross footways as the driveways connect directly to the permeable paving, so while we do not tend to agree with the suggested requirement for additional drainage measures here, we have included cut-off ACOs as agreed with the client in the interests of getting this condition discharged.	
14.	Catchpit manhole construction detail – there appears to be text written over text. Please adjust.	Notes tidied up	Thank you item now closed	Noted	
15.	Provide full construction details for channel drain.	Added to drawing	Thank you item now closed	Noted	
16.	Drg 5102 – notes 29 and 30 are irrelevant to this scheme – please remove.	Removed from drawing.	Thank you item now closed	Noted	
DRAINAGE MAINTENANCE PLAN					
1.	ADC response (BN/18/25/DOC) 17/04/2025 Include the approved design drawings in the document. Designer response (BN/18/25/DOC) 17/04/2025 Now included, see updated document ADC response (BN/18/25/DOC) 18/08/2025 Will need to be updated once the drawings are approved.	Updated drawings now included in RevC, subject to approval	Updated design drawings will need to be added on approved drawings	Updated drawings now added and document reissued	
2.	ADC response (BN/18/25/DOC) 17/04/2025 A pre-handover inspection should be stipulated. It should contain a check list to facilitate consistent inspection of the condition of the system. There should be details of who to contact if the surface water drainage system is not functioning correctly Designer response (BN/18/25/DOC) 17/04/2025 Now included, see updated document ADC response (BN/18/25/DOC) 18/08/2025 Section 13.0 – typo 'fee' should read 'free'.	Typo corrected and additional comments incorporated.	Thank you item now closed	Noted	

	The inspection should include all manholes, gullies, channel drain and permeable surfaces, to ensure all are fit for purpose, in accordance with the design and in good condition.				

If a designer would like a .docx version of this document to aid administration of responses, please request this by email to land.drainage@arun.gov.uk.