

Application Reference: A/134/24/DOC Site Name: Broadlees Dappers Lane Angmering BN16 4EN	Initial Issue Date: 17.10.2024 Issue Date: 06.02.2025 Reviewer Reference: ADC/EXT2/D2134/63
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Summary and Recommendation:

Condition 15: **Objection**

Condition 17: **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 recommend that the application is refused.

	ADC Drainage Comments	Designer Response	ADC Drainage Comments	Designer Response	ADC Drainage Comments
Date:	21/03/2024 [A/38/24/DOC]	26/07/2024	17/10/2024	18/11/2024	06/02/2025
Condition Number: 15 (Surface Water Drainage Design)					
Comment Number					
1.	Please provide a copy of the FRA report to review against the strategy advised at planning stage. Please ensure all applicable data is submitted against each condition.	Natta to supply a copy of the FRA report in application.	Noted, however this document has not been supplied. Comment outstanding.	FRA report included	Noted. Comment closed.
2.	Please provide a copy of your final hydrological assessment report inclusive of groundwater monitoring. Whilst the design makes some reference to groundwater, please provide suitable evidence to demonstrate the seasonal peak and freeboard to each SuDS feature.	Proposed hydraulic calculations and groundwater monitoring included in ARC Drainage Strategy Report - 23086-ARC-DRAINAGE STRATEGY - 2024.07.04	Noted. Comment closed.		
3.	Please provide a site plan / topographic survey detailing the historic overland flow routing.	Proposed site plan and topo survey included in ARC Drainage Strategy Report - 23086-ARC-DRAINAGE STRATEGY - 2024.07.04.	Noted. Comment closed.		
4.	Please provide a copy of your catchment area plans together with any classification of urban creep being applied.	Catchment areas shown on ARC drawing 23086-ARC-XX-XX-DR-D-5010. drawing included in Drainage Strategy Report. urban creep noted in report.	Noted. Comment closed.		
	Hydraulic Calculations:				
5.	The 1D model must include a supporting plan to denote all nodes/links or cascade approach. Whilst a key plan is provided this does not identify the permeable pavement nodes.	Key plan included in ARC Drainage Strategy Report - 23086-ARC-DRAINAGE STRATEGY - 2024.07.04. permeable paving areas indicated on ARC Drainage GA drawing 5001-P3.	Noted. Comment closed.		
6.	There are 2 sets of infiltration testing and it is not clear which data has been used for the design rate of 1.11x10(-4). With reference to the ST geotechnical report TP203 is located in the middle of the site with a nominally lower rate of 7.9x10(-5); the designer must justify the choice of design rate best suited and	The lower rate of 7.9x10(-5) has now been implemented as shown in ARC Drainage Strategy Report - 23086-ARC-DRAINAGE STRATEGY - 2024.07.04 and on ARC Drainage GA drawing 5001-P3. both sets of information have been included in Appendix A of the	Noted and criteria accepted. Comment closed.		

	design guidance used i.e. BRE or CIRIA.	report and shown in table form on the Drainage GA drawing.			
7.	Further to the above, the design must clarify the appropriate infiltration safety factor base on the geotechnical testing and design guidance. The hydraulic calculations appear to use a factor of 2 which again is not clarified.	Using the CIRIA SUDS Guidance we have implemented an infiltration safety factor of 3.0 taken from table 25.2.	Noted and safety factor criteria accepted. Comment closed.		
8.	The calculations criteria for drain down is set to 240mins. Please summarise the half drain down time to 50% for each storage feature. This shall be illustrated for 10yr, 30yr, 100yr. Please note that our minimum compliance is required for at least the 10yr+CC (45%) storm.	The drainage calculations included in the 23086-ARC-DRAINAGE STRATEGY - 2024.07.04 document indicate the half drain down time for each of the soakaways. Calculations criteria has been altered to 1440mins (24hours).	The updated calculations are now corrected to the criteria specified, however it is noted that the larger network N2 is reporting a very low 'mass balance' thus likely there are potential anomalies and unreliable results. This needs to be reviewed and fixed before they can be accepted. Comment outstanding.	Calcs have been updated to suit comments and remove the low mass balance. Included in revised report.	Noted. Please ensure all calculations are checked against the engineering drawings. Node 17 is modelled as a 1500mm however the engineering illustrates an 1800mm. The error is noted to have been fixed. Comment closed.
9.	Nodes sizes do not correlate with drawing 5001 drainage general arrangement; storage is being falsified.	The drainage design has been greatly altered. The node sizes between the Drainage GA and the Calculations now correlate.	Noted. Comment closed.		
10.	Cellular storage criteria is set to 100% which is incorrect; this must correlate with the supplier product being specified.	This has been altered in the latest calculations to be 95% to suit manufacturers specifications.	Noted. Comment closed.		
11.	Ring soakaways 13.1,14.1,15.1,16.1 are modelled incorrectly. The design must first clarify the design guidance, safety factor and sides/base output. Secondly porosity is applied to the 'pit' granular surround, usually set to 30% and the pit size must be greater than the rings as per guidance. This must be drawn correctly on the drainage GA.	The ring soakaways have now been removed from the proposed design in favour of filtration tanks in the road. The permeable paving has now been indicated as tanked with the filtration tanks being the only area of infiltration.	Noted. Comment closed.		
12.	The calculations ignore the fact that cellular storage sits below permeable pavement. Both simulate the same surface area being used to discharge run-off falsifying the results.	The permeable paving has now been indicated as tanked with the filtration tanks being the only point of infiltration.	Noted. Comment closed.		
	Drawing 5001 Drainage GA:				
13.	The drawing is badged preliminary and all drainage is subject to detailed design hence cannot be used for DOC.	The proposed drainage drawing is still badged as Preliminary however notes have been altered to remove 'subject to detailed design'.	Noted, however the information submitted for DOC must represent a detailed design and suitable for construction purposes. Furthermore the drawing does not appear to reflect an engineering design	Refer to Appendix 'G' drawing number 23086-ARC-XX-XX-DR-D-6100 - P3 - PROPOSED FINISHED LEVELS	Noted. Drawing 6100 demonstrates the levels and contours which coincide with the drainage design.

			and no surface elevation design or surface finishes drawings have been provided other than a high level exceedance plan.		
14.	Permeable pavement formation levels must be annotated.	The proposed construction depths of the permeable paving have been noted on the ARC Drainage Drawing 5001-P3.	Noted, depths are annotated in the key, however the 'formation levels' of permeable pavements may vary or be specified flat; further annotation is require to the plans and this often shown in conjunction with the surface elevation design which has not yet been submitted.	revised external works drawing added to Appendix G drawing number 23086-ARC-XX-XX-DR-D-6001 - P3 - EXTERNAL WORKS GA	Drainage drawing 5001 and finishes drawing 6001 do not appear to be coordinated. Drawing 5001 annotate 450mm permeable sub-base depths, drawing 6001 annotates 650mm depth for access roads and 325mm depth for car parks. The calculations annotate 450mm & 350mm to various features. Drawing 5008 annotates 500m access road, 450mm for parking and 320mm for other tie-ins. All data must be reviewed and corrected. Furthermore bespoke cross sections are required for soakaways 3 & 4 to prove the make-ups do not clash. Comment outstanding.
15.	Ring soakaways are drawn incorrectly and do not show the pit size. Base invert levels are not shown. Furthermore these must be demonstrated to be at least 5m from dwellings.	Ring soakaways have been removed from the proposed design. Proposed soakaways are designed to be a minimum of 5.0m from any building.	Noted. Comment closed.		
16.	Best practice for infiltration system must include catchpits.	The drainage system and soakaways have been designed in accordance with CIRIA SUDS guidance and building regs part H.	The drainage drawing does not specify the manhole types to verify where catchpits have been included. Comment outstanding.	Refer to Appendix 'G'; drawing 23086-ARC-XX-XX-DR-D-5001-P4. Catchpits indicated.	Noted. Comment closed.
	Baffles are noted, however these are not shown.	Baffles have been indicated on the ARC Drainage Layout GA 5001-P3.	Noted, 2 No baffles are now shown in vicinity of plots 35/36, however these need to be validated in conjunction with the levels design. Comment outstanding.	proposed levels drawing 23086-ARC-XX-XX-DR-D-6100 - P3 - PROPOSED FINISHED LEVELS included in Appendix G. Detail included for baffels in drawing 5008-P2	Noted. This may require further update in response to comment 14. Comment closed.
17.	Site elevation design has not been provided so levels, crossfalls, overland flow, check dams, other protective measures to 3rd party land/highway cannot be reviewed.	Proposed contours are indicated on the ARC flood exceedance route drawing 5011-P1.	As cited above the exceedance drawing is insufficient in respect of an engineers design. Comment outstanding.	Refer to updated Appendix 'E' drawing 23086-ARC-XX-XX-DR-D-5011-P2	Noted. Comment closed.

18.	The landscaping proposals shown differ to the special drawing B22052/101. Please provide the latest landscaping design and specification, coordinated with services.	Natta to provide a copy of the latest Landscaping plan with application.	Noted, however this document has not been supplied. Comment outstanding.	please refer to Appendix 'G' drawing B24003-201B-Dappers Lane-External Works	Noted. Comment closed.
19.			Without sight of the landscaping, the layout background suggests there are tree pits and other planted features in vicinity of the SUDS so we assume root barriers or other detailing will apply?	drawing number B24003-201B-Dappers Lane-External Works added to appendix G in revised Drainage Strategy Report.	Noted. Comment closed.
20.			Without sight of the landscaping, the layout background suggests existing/proposed trees along the northern boundary, however no RPZ areas are defined, these shall be shown on the engineering drawings to demonstrate compliant stand off distances or provide Arb supporting data.	pipe size in Drainage GA drawing 23086 - ARC - XX - XX - DR - D - 5001 - P4 proposed surface water layout avoids the TPZ in this area.	Noted. No further comments in respect of drainage, however the ADC tree officer shall be consulted giving consideration to the RPZ and levels drawing 6100 and the potential impacts along the north boundary. Root barrier may also be required. Comment closed.
21.			Noting the groundwater data, the engineering drawings must annotate the freeboard between peak GW and the SUDS formations.	1.0m freeboard is currently noted on the drawing 23086 - ARC - XX - XX - DR - D - 5001 - P3 in the notes for Infiltration test results 2	Noted. Comment closed.
	Drawing 5003 Drainage Details:				
22.	These details are not identified on the drainage GA; please clarify and/or provide a suitable manhole schedule.	This drawing has been removed from report and superseded by ARC drawing 5008-P1 included in the Drainage Strategy Report.	Noted on omission hence comment closed. New drawing 5008 - see comments below.		
	Drawing 5004 Drainage Details:				
23.	These details are not identified on the drainage GA; please clarify and/or provide a suitable manhole schedule.	This drawing has been removed from report and superseded by ARC drawing 5008-P1 included in the Drainage Strategy Report.	Noted on omission hence comment closed. New drawing 5008 - see comments below.		
	Drawing 5005 Drainage Details:				
24.	Besides the rodding eye these details are not identified on the drainage GA; please clarify and/or provide a suitable manhole schedule.	This drawing has been removed from report and superseded by ARC drawing 5008-P1 included in the Drainage Strategy Report.	Noted on omission hence comment closed. New drawing 5008 - see comments below.		
	Drawing 5006 Drainage Details:				
25.	Where is the flow control to be used? Where are channel drains?	This drawing has been removed from report and superseded by ARC drawing	Noted on omission hence comment closed.		

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	Where are permeable paving collection trenches used?	5008-P1 included in the Drainage Strategy Report.	New drawing 5008 - see comments below.		
	Drawing 5007 Soakaway Details:				
26.	This details does not reflect the drainage GA. How does the cellular tank work directly underneath permeable pavement? There are no standard details for the 2 No. variable depth permeable pavements. There are no details for check dams and/or baffles.	This drawing has been removed from report and superseded by ARC drawing 5008-P1 included in the Drainage Strategy Report. Check dams detail included in 5008-P1 drawing.	Noted on omission hence comment closed. New drawing 5008 - see comments below.		
27.	Drawing 5008 SUDS Details:				
28.			The check dam detail (assuming this is a baffle?) is incomplete in terms of materials and specification.	Please refer to appendix 'H' drawing 23086-ARC-XX-XX-DR-C-5008-P2 for check dam details (materials and specification)	Noted. Comment closed.
29.			Permeable pavement depths are specified as 350mm and 40% voids, both differ on other drawings and calculations.	Calculations and drawings show permeable paving depth to be 450mm overall with sub-base depth as 320mm. Sub base material changed to 30% void. Please refer to calculations in Appendix 'F'. Please refer to Appendix 'H' drawing 23086-ARC-XX-XX-DR-D-5008-P2 drawing	As above this needs to be correct across all information, fundamentally the 'inverts' must represent what will be built. Comment outstanding.
30.			The large 900mm diameter filter drain detailing differing dimensions for bedding.	Bedding details re-drawn included in revised 23086-ARC-XX-XX-DR-D-5008-P2 drawing	Noted. Comment closed.
31.			There is no detail of the tie-in with permeable surfaces with existing and/or impermeable surfaces. i.e terminal check dams and arrangement of liners.	Refer to detail included in Appendix 'H' drawing 23086-ARC-XX-XX-DR-D-5008-P2 drawing.	Noted. Comment closed.
32.			There are instances where the geocellular tanks are overlaid with the permeable surfaces so additional cross sectional details are required.	Refer to Appendix 'H' drawing 23086-ARC-XX-XX-DR-D-5008-P2 drawing detail SECTION THROUGH SOAKAWAY BENEATH PERMEABLE PAVING	As above, uncertainty remains on sub-base depths and details for each bespoke arrangement shall be evidenced, rather than generic. Comment outstanding.
Condition Number: 16 (Watercourses)					
Comment Number					
1.	No comments.		Comment closed.		
Condition Number: 17 (SUDS Maintenance)					
Comment Number					
1.	The report refers to road gullies however these do not appear on the design.	The maintenance strategy has been updated to remove this item.	Noted. Comment closed.		

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2.	The report refers to silt traps (catchpit) however these do not appear on the design.	The maintenance strategy has been updated to remove this item.	Noted, however noting infiltration features are being used silt traps/catchpits are essential. Comment outstanding.	Refer to Appendix 'G' drawing 23086-ARC-XX-XX-DR-C-5001-P4 catchpits have been shown	Noted. Comment closed.
3.	Please provide a schematic drawing to denote the extent/areas for future maintenance, this shall be included / reference therein and highlight key SuDS features.	All areas shown on ARC Drainage GA drawing 5001-P3 and Impermeable Areas plan 5010-P1.	Noted, however the ADC policy dictates a bespoke maintenance plan is provided. Comment outstanding.	Refer to the SUDS Maintenance Strategy. Plans have been included.	Noted. Comment closed.
4.			The approved design drawings must be included in the document.	Proposed Drainage GA, External works and impermeable areas added to appendices.	Noted. Comment closed.
5.			The report must ensure there are clear details of who to contact if the surface water drainage system is not functioning correctly.	Contact details added to SUDS Maintenance Strat	Noted. Comment closed.
6.			There is no action plan for dealing with accidental spillages of pollutants.	Refer to the SUDS Maintenance Strategy Note 4.3.	Noted. Comment closed.
7.			There is no advice provided as to what to do if alterations are to be made to the development or, works are to be carried out which may affect the surface water drainage system.	Refer to the SUDS Maintenance Strategy Note 4.4	Noted. Comment closed.
8.					Section 2 fails to correctly summaries all SUDS features. This must make clear on all types used i.e. 'tanked' permeable pavements and the oversized pipe trench (soakaway 2). The report must be updated to suitably cover all items listed.

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.