

VISTRY HOMES LIMITED

THE LANDINGS, LAND AT FORD AIRFIELD, FORD

**SURFACE WATER DRAINAGE ADDENDUM (ARUN
DISTRICT COMMENTS)**

**REPORT REF.
2205771-R29**

February 2025

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1. Introduction

1.1. Ardent Consulting Engineers (ACE) was appointed by Vistry Homes Limited to advise on the drainage and flood risk aspects of the proposals for a residential-led mixed-use development on Land at Ford Airfield, Ford. The Local Planning Authority (LPA) is Arun District Council (ADC) and the Lead Local Flood Authority is West Sussex County Council (WSCC).

1.2. The development will be brought forward via a number of reserved matters applications, this Technical Note relates to the RM4 reserved matters application (ref. F/16/24/RES), which consists of:

Approval of reserved matters (layout, scale, appearance and landscaping) following outline consent F/4/20/OUT for phase RM4 (South), for the erection of 357 no. residential dwellings plus associated roads, infrastructure, parking, landscaping, open space & play areas, and associated works.

1.3. A Drainage Technical Note (DTN) was previously prepared by Ardent (Report ref. 2205771-R18-B) in support of the reserved matters application. The DTN was submitted as part of planning application F/16/24/RES in September 2024. The DTN was further amended (Report ref. 2205771-R18-C) in December 2024 following scheme amendments.

Post-submission comments

1.4. In their response to the planning application (letter ADC/SB dated 6th January 2025), Arun District Council's (ADC) Engineers raised an objection to the planning application. A summary of their comments is provided in Table 1-1 below, together with Ardent's response.

Table 1-1 Post-submission comments from Arun District Council

Critical Item	Summary	Ardent's response
Calculations	<p>Calculations for pre-development runoff rates and volumes must be based upon the positively drained area only.</p> <p>Proposed discharge rates must not increase flood risk onsite or elsewhere. Discharge rates must be restricted to QBAR or 2l/s/ha, depending on whichever is higher.</p>	<p>Refer to Appendix A and Section 2.1 below.</p> <ul style="list-style-type: none"> - Drawing no. 2205771-250 in Appendix A outlines the extents of the pre-development catchments and compares existing and proposed discharge rates.. - A summary description of the pre-development and post-development discharge rates can be found in Section 2.1 below.
Calculations	A surcharged outfall must be modelled.	Both outfalls will be located at the head of the watercourses, and therefore will not encounter surcharged outfall conditions.
Natural catchments	<p>The submission must define the natural drainage characteristics within, and hydraulically linked to, the site and demonstrate that the drainage proposals will integrate with and not compromise the function of the natural and existing drainage systems. (...)</p> <p>Designs must replicate the natural drainage catchments of the site. All surface water drainage designs must therefore drain via gravity to corresponding points of discharge.</p>	<p>Refer to comment 1 above.</p> <p>The airfield runway and hardstanding historically drained to a piped connection running beneath the airfield and ultimately outfalling to the River Arun. Connection to this outfall was considered as part of the outline application and survey work was undertaken. The findings are summarised in the submitted JNP Group Flood Risk Assessment and Drainage Strategy Technical Note, dated Feb 2021 which concluded that the re-use of the outfall was not feasible for the following reasons:</p> <ul style="list-style-type: none"> • <i>It is private sewer and is not been regularly maintained</i>

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		<ul style="list-style-type: none"> • The asset is approximately 80 years old • Buildings have been constructed over the sewer which could prevent a sewer requisition agreement • It is extremely unlikely any of the building owners would consent to build over agreements retrospectively. • The specification [and gradient] of the sewer is does not meet current adoptable standards • There are incoming sewers from other existing premises further downstream. Existing incoming flows are not regulated.
Plans	Plan areas, depths, and levels of drainage infrastructure must accurately correspond with the supporting calculations.	<p>The following drawings have been updated and are included in Appendix C:</p> <ul style="list-style-type: none"> • Ardent Drawing 2205771 – D142 (Sheet 1 of 2) • Ardent Drawing 2205771 - D143 (Sheet 2 of 2) • Ardent Drainage Ardent Drawing 2205771- D020 <p>For ease of reference, the site wide drainage strategy shows the impermeable area associated with each development catchment to correlate with the hydraulic calculations.</p>
Water Quality Benefits	An assessment of water quality is necessary to evidence that the proposed design provides adequate treatment of surface water.	An assessment was carried out following CIRIA753 Simple Index Treatment Method and submitted with the planning application. This has been reproduced in Section 2.2 below for ease of reference.
Biodiversity and Amenity Benefits	The surface water drainage design must provide biodiversity and amenity benefits.	Refer to Section 2.3 of this Technical Note.
Trees and Planting	There should be no conflict between surface water drainage infrastructure and existing or proposed trees or planting.	This has been considered in the design. The proposed planting species that are to be located within close proximity to SUDS infrastructure and outlined within submitted

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	The design must consider the potential growth of proposed trees and adequate mitigation must be provided to protect drainage infrastructure where conflict cannot be avoided.	<p>Landscape Plans produced by Tor & Co and provided at Appendix D:</p> <ul style="list-style-type: none"> • TOR-RM4-XX-DR-L-P-013 • TOR-RM4-XX-DR-L-P-014 • TOR-RM4-XX-DR-L-P-015 • TOR-RM4-XX-DR-L-P-017 • TOR-RM4-XX-DR-L-P-018 • TOR-RM4-XX-DR-L-P-019 • TOR-RM4-XX-DR-L-P-021
Third Party Land Crossings	Provide evidence that permission has been secured for the proposed drainage outfalls, outside of the site boundary.	Excerpts of the land sale agreement are enclosed in Appendix E confirming permission to provide the proposed drainage outfalls.

2. Additional information

2.1 Pre-development catchment calculations

- 2.1. The surface water drainage strategy for the wider development site separates the site into three catchments, each discharging offsite through a separate outfall (Outfalls 1, 2 and 3). Outfalls 2 and 3 are part of this reserved matters application (RM4).
- 2.2. Drawing No. 2205771-250 (**Appendix A**) shows the pre-development drainage areas which currently direct surface water to these same outfall locations. It should be noted that the site is relatively flat, so the catchments have been identified as accurately as possible based on the topographical survey. Areas which do not contribute to these catchments in the baseline scenario have been identified in the plan, and excluded from the contributing areas. All contributing areas are greenfield land.
- 2.3. As part of the planning application, JNP Group initially specified the QMed value manually as 1.0, which resulted in a Qbar rate calculation of 1.14 l/s/ha. However, we have recalculated the greenfield runoff rate using the FEH method, utilising point data from the FEH Web Service. This approach provides more accurate results, and the Qbar rate has been recalculated as 2.42 l/s/ha. Specifically, we used a BFIHOST value of 0.63, obtained from the FEH Web Service.
- 2.4. We believe that the point data from the FEH Web Service provides a more precise estimate, and therefore, we have used the Qbar rate of 2.42 l/s/ha for the proposed drainage calculations to support our planning application. A summary of the greenfield runoff estimation results is enclosed in **Appendix B**.
- 2.5. The greenfield runoff rate for each pre-development catchment is indicated in Table 2-1 below.
- 2.6. The proposed maximum allowable discharge rates per catchment have been calculated based on the respective gross development areas. This results in maximum allowable discharge rates far lower than the pre-development scenario. Refer to comparison table below:

Table 2-1 – Pre and Post-Development Discharge Rates

Catchment/ Proposed Outfall no.	Greenfield catchment area (ha)	Pre-development Greenfield Runoff Rate (Qbar) (l/s)	Post-development maximum allowable discharge rate (1 in 100YR +CC) (l/s)
1	32.33	78.23	13.3* *Discharge rate based on existing outfall pipe.
2	8.15	19.72	6.80
3	22.19	53.70	8.40

2.7. In terms of the post development runoff volume, the proposed development will result in an increase the runoff volume as a result of the introduction of impermeable area and small changes to post development catchment areas. In the absence of infiltration, *The SuDS Manual* (Ciria C753) and the Environment Agency's '*Rainfall Runoff Management for Developments*' recommend two methods for managing increases in runoff volume; either the provision of Long Term Storage or to restrict the proposed discharge rate to the equivalent greenfield Qbar rate. As the proposed drainage strategy will restrict the discharge rate to significantly less than the existing Qbar rate, the increase in runoff volume will be adequately managed.

2.2 Water Quality Benefits

2.8. Based on the CIRIA753 Simple Index Treatment Method, the development would have an associated pollution hazard level between 'Low' and 'Medium' (considering the level of traffic at the main access road). Conservatively, a 'Medium pollution hazard level has been used for the site.

2.9. The recommended stage of treatment, in line with Tables 26.2 and 26.3 of the SuDS Manual, will be met through the proposed swales and bioretention basins. Refer to Tables 2-2 below.

Table 2-2 - Pollution Indices (South)

Pollution index 'Medium. For surface water discharge from medium/high traffic roads			
	Required mitigation indices		
Source	TSS	Metals	Hydrocarbons
Medium	0.7	0.6	0.7
Type of SuDS component provided			
Swale	0.50	0.60	0.60
Bioretention system (x0.5)	0.40	0.40	0.40
Total	0.90	1.00	1.00
Check	+0.20	+0.40	+0.30

2.3 Biodiversity and amenity

2.10. Priority has been given to above-ground SuDS features which provide amenity, biodiversity and water quality benefits. The proposed planting within RM4 swales includes 'short grass' and 'wildflower meadow mix'.

2.11. The IRM application (ref. F/14/24/RES) includes the proposed SUDS Basins. The planting mix within basins will include 'basin marginal planting', 'basin shrub planting', 'short grass' and 'wildflower meadow mix'. The proposed planting mix for basin shrubs and marginal is provided below (ref. F/14/24/RES: *RMIN-XX-DR-L-P-010-C-INFRA-PLANT-SCHEDULES*)

[illegible]

2.12. The ponds (located within IRM) have been designed as permanent water features to enhance amenity and ecological benefits. Any permanent water is provided below the invert level of the outfall so as not to compromise the attenuation volume.

2.13. A Biodiversity Net Gain Assessment was undertaken for the site by Urban Edge Environmental Consulting (Ref RM4_11.A) and submitted as part of the application.

2.14. Appendix VII of the report comprises a description of the post-development habitats. The assessment of the "SuDS and bioswale" habitat indicates the proposed SUDS will provide a diverse and ecologically appropriate range of vegetation, prioritising native species. The selection of planting is suited to enhancing wetland and riparian habitats.