
European Centre for Medium-Range Weather Forecasts (ECMWF)

Planning Condition Report 18 - Drainage

Doc No: ECMWF-BDP-ZZ-ZZ-RP-C-000011
Rev: P09
Date: 08/12/25

BDP.

Document Control Sheet

Project Name: European Centre for Medium-Range Weather Forecasts

Project Number: P3002898

Report Title: Planning Condition Report 18 - Drainage

Date: 08/12/2025

Rev: P09

	Name	Position	Date
Prepared By	LJ	Senior Civil Engineer	08/12/2025
Reviewed By	BB	Senior Civil Engineer	08/12/2025
Approved by	CHF	Associate Director	08/12/2025

Revision	Description	Date
P01	Issued for Discharge of Planning Condition 18	27/06/2024
P02	Issued for Discharge of Planning Condition 18	29/07/2024
P03	Issued for Discharge of Planning Condition 18	07/08/2024
P04	Updated from TA Comments – Appendix Updates	09/09/2024
P05	Updated following Security Change Issue	17/09/2024
P06	Updated following amended drainage outfall location	15/10/2024
P07	Updated following TA Comments – Appendix Updates	27/11/2024
P08	Updated following drainage redesign and TA comments – Appendix updates	18/08/2025
P09	Updated following TA comments on P08 and building drainage updates	08/12/2025

Planning Condition 18 – Drainage

It is noted that the following planning condition is to be met before development can take place:

“No development shall take place until full details of the drainage system for the site have been submitted to and approved in writing by the Local Planning Authority. The details shall include:

- 1. Calculations indicating the Greenfield runoff rate from the site.*
- 2. BRE 365 test results demonstrating whether infiltration is achievable or not.*
- 3. Use of SuDS following the SuDS hierarchy, preferably infiltration.*
- 4. Full calculations demonstrating the capacity of attenuation features to cater for 1 in 100-year flood event with a 40% allowance for climate change and runoff controlled at Greenfield rates, or preferably better.*
- 5. As connection to an existing surface water sewer is proposed, we need to see confirmation from the utilities supplier that their system has got capacity, and the connection is acceptable.*
- 6. Separate drainage systems for any proposed adopted highways and residential dwellings.*
- 7. A drainage strategy plan indicating the location and sizing of SuDS features.*
- 8. Details demonstrating how any SuDS for this development would be managed throughout the lifespan of the development and who will be responsible for maintenance.*

The approved scheme shall be implemented prior to the first occupation of the development and shall be maintained in the approved form for as long as the development remains on the site.”

Updates to Appendices for drainage redesign - P08 and P09 Issue

The following updates have been made to the strategy in the P08 and P09 issues:

- Site investigation works identified that the existing University of Reading (UoR) manhole proposed for discharge of surface water (Ex MH138) is approx. 244mm shallower than what was shown in the information which the drainage design was based on, resulting in the need to redesign the proposed drainage at the south of the site.
- As such, the proposed surface water network has been redesigned and rerouted to instead discharge to an adjacent existing private UoR manhole downstream (Ex MH03). As Ex MH03 is located outside of the site planning boundary, all necessary stakeholder engagement has been carried out with UoR to approve the proposed strategy. Refer to Appendix E for updated drainage layouts and Appendix F for correspondence with University of Reading.
- The invert level at the point of connection into the existing UoR foul sewer (at FW.10) has been updated to reflect the level measured on site. The foul drainage in the south wing of the building has been amended by the contractor to suit findings. This has been reviewed in line with Building Control regulations, and additional requirements have been noted on the proposed drainage drawing. Refer to Appendix E for updated drainage layouts.
- Minor report updates to reflect changes requested by the Client's Technical Approval (TA) team.
- An updated pack of appendices which reflects all the changes outlined for P08 and P09 above has been included.

Response

We have met the condition as follows:

1. Calculations indicating the Greenfield runoff rate can be found in Appendix A. The table below summarises the results:

Greenfield Runoff Rates	
Qbar	6.62 l/sec
1 in 1 Year	5.62 l/sec
1 in 30 Years	15.22 l/sec
1 in 100 Years	21.1 l/sec

2. A Geotechnical report received from Mace, reference “ECMWF-CGL-XX-WS-RP-L-000002”, outlines that whilst infiltration is achievable, the groundwater level on site was found to be too high for infiltration to be a method for discharge, as there is less than 1m of freeboard from the groundwater level to the base of the proposed tanks (as recommended by the Ciria SuDs Manual). A copy of the Geotechnical report can be found in Appendix B.
3. As per the previous point, infiltration was not deemed feasible for the site. However, various SuDS features have been incorporated within the drainage system, such as open water features and permeable paving, which are proposed to be lined with an impermeable membrane. Please refer to the Drainage Hierarchy table below for an outline of the surface water disposal routes and their suitability for the proposed site:

Drainage Hierarchy		Explanatory note
1	Rainwater use as resource	Rainwater harvesting (RWH) is proposed. Grey water reuse is proposed.
2	Rainwater infiltration to ground	Limited opportunities due to high groundwater table and poor infiltration rates. Green infrastructure components (wetlands, swales, and raingardens) are proposed across the site but these will be lined with an impermeable geomembrane and discharge into the surface water network.
3	Rainwater attenuation in green infrastructure features for gradual release	Wetlands, swales, raingardens, and below ground cellular storage will be utilised across the site for attenuation. The utilisation of tanked permeable paving is proposed within the car park.
4	Rainwater discharge direct to a watercourse	Surface water runoff is collected and discharged to new wetlands / swales, where appropriate. Surface water runoff is indirectly discharged to Whiteknights Lake.
5	Controlled rainwater discharge to a surface water sewer or drain	Separate surface water drainage networks are proposed for surface water runoff with restricted / controlled discharge rates, except for the access roads which will be drained as per the existing arrangement.
6	Controlled rainwater discharge to a combined sewer	Existing access road located north-west of the site currently drains unrestricted to an existing surface water sewer. This existing arrangement is to be retained.

4. Surface water flows from the site will be collected via the proposed drainage network and discharge into the existing private University of Reading (UoR) owned drainage system. As outlined in the original drainage strategy submitted for planning, the total discharge from building and car park and external areas catchments will be limited to 7.2l/s for all rainfall events. For the 1 in 100 year + 40%CC event, this represents a betterment of 98.4% from the existing pre-development runoff rates for the same event. For the eastern access road catchment, the runoff is proposed to be unrestricted, mimicking the existing condition. As such, flows entering the existing drainage system are reduced significantly from pre-development flowrates. There have also been no reported capacity issues within the existing system. The existing and proposed peak runoff rates for the site are outlined in the section below. These have been calculated based on the impermeable areas shown in Table 1 below.

Table 1 - Existing and proposed impermeable areas

	Impermeable area, ha	Permeable area, ha	Total area, ha
Pre-development (existing)	1.25	0.56	1.81
Post-development (proposed)	1.07	0.74	
Reduction in impermeable area by approx. 0.18ha (minimum)			

Using areas shown in Table 1, the existing and proposed peak surface water runoff rates for the site have been estimated, based on the Modified Rational Method, as per CIRIA SuDS Manual 2015 C753, Eq. 24.5:

$$Q = 2.78 C i A$$

Where;

$C = C_v C_r$ is non-dimensional runoff coefficient, assumed to be equal 1

i is rainfall intensity for the design return period and a duration (assuming 29.06 mm/hr for 1 in 1 year event and 92.21mm/hr for the 1 in 100 year event)

A is total catchment area being drained (in Ha)

Based on the above, existing and proposed peak surface water runoff estimates have been calculated as shown in the Table 2 below:

Table 2 – Existing and proposed peak surface water runoff estimates

	Existing (total)	Proposed (building and car park catchments)	Proposed (eastern access road catchment) – 0.203 Ha	Proposed (total)
1 in 1 year	101 l/s	7.2 l/s	16.38 l/s	23.60 l/s
1 in 100 year	320.4 l/s	7.2 l/s	51.97 l/s	59.17 l/s
1 in 100 year +40CC	448.6l/s	7.2 l/s	72.80 l/s	80 l/s

As shown Table 2, the proposed site runoff discharging from the site into the existing system via the new outfall proposed is 23.60 l/s, which represents a 76.7% betterment in discharge rate for the 1 in 1 year event. In the 1:100 year + 40% CC event, the proposed site runoff discharging from the site into the existing system via the new outfall proposed is 80 l/s, which represents a betterment of 82.2% for this event.

Surface water drainage modelling calculations are found in Appendix C. These demonstrate that the below ground drainage system has been designed to cater for all storm events up to and including the 1 in 100 year + 40% climate change event. For the proposed drainage network for the building catchment, refer to the MicroDrainage calculations in Appendix C. For the proposed drainage network for the car park and eastern access road catchments, refer to InfoDrainage calculations in Appendix C.

- As outlined in the previous section, surface water flows from the site will be collected via the proposed drainage network and discharge into the existing private University of Reading (UoR) owned drainage system. Proposed discharge rates are reduced significantly on from pre-development discharge rates. There have also been no reported capacity issues within the existing system.

Foul water flows from the site will discharge indirectly to a Thames Water foul water sewer, via UoR private drainage. The CCTV drainage survey and/or dye testing will be used to gain Section 106 approval from Thames Water. A predevelopment enquiry has been submitted to Thames Water and Thames Water has confirmed capacity in the existing system to receive the additional foul flows from the proposed development. Refer to Appendix D for Thames Water correspondence.

- The proposed surface water drainage networks for the entire site are proposed to be combined prior to discharging into the existing UoR owned private surface water drainage system running along the southern boundary of the site. The use of oil interceptors have been incorporated to ensure any runoff from the private access roads is treated prior to discharging into the existing sewer. Alongside this, lined permeable paving is proposed for the car parking bays improving the water quality into the system. Refer to the proposed drainage drawings in Appendix E.
- The following SuDS features have been incorporated in the design:
 - Rainwater harvesting

- Grey water reuse in buildings
- Attenuation tanks
- Permeable Paving
- Open water features (swales and wetlands)
- Tree pits for attenuation

An updated Drainage Layout has been included in Appendix E visualising the above SuDS features including their respective sizes and locations.

8. All SuDS components within the redline boundary of the ECMWF site will be privately owned by the University of Reading. The tenant/occupier will maintain drainage systems within the redline boundary of the ECMWF site and outside of the redline it will be the responsibility of the existing land owner UoR. The landlord has been involved in the development of the design and this strategy is aligned with a wider agreement for how the site is managed.

Refer to the following tables for the management and operation of SuDS components proposed for the development, based on the guidance from C753: The SuDS Manual:

Operation and Maintenance Requirements for Attenuation Storage Tanks		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface or filter for blockage by sediment, algae, or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre- treatment structures and/or internal forebays	Annually, or as required
Remedial Actions	Repair/rehabilitate inlets, outlet, overflows, and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents, and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years as required

Operation and Maintenance Requirements for Rainwater Harvesting Systems		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspection of the tank for debris and sediment buildup, inlets/outlets/withdrawal devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank, inlets, outlets, gutters, withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional Maintenance	Cleaning and/or replacement of any filters	Three monthly (or as required)
Remedial Actions	Repair of overflow erosion damage or damage to tank	As required