



RIDGE

**DETAILED DRAINAGE STRATEGY
LAND WEST OF GATESMEAD
CREST NICHOLSON
OPERATIONS LTD**
April 2026

**DETAILED DRAINAGE STRATEGY
LAND WEST OF GATESMEAD
CREST NICHOLSON OPERATIONS LTD**

April 2026

Prepared for

Crest Nicholson Operations Ltd
500 Bourne Business Park,
5 Dashwood Lang Road,
Addlestone,
Surrey
KT15 2HJ

Prepared by

Ridge and Partners LLP
1 Royal Court
Kings Worthy
Winchester
SO23 7TW

Tel: 01962 834400

Contact

Sami Sultan
Civil Engineer
samisultan@ridge.co.uk

VERSION CONTROL

PROJECT NAME: Land West of Gatesmead
 PROJECT NUMBER: 5029426
 DOCUMENT REFERENCE: 5029426-RDG-XX-XX-T-C-309950
 DOCUMENT STATUS: S2 – Suitable for Information

REV	DATE	DESCRIPTION	AUTHOR	CSE	ICSE
P01	06/03/2026	Draft issue	Sami Sultan Civil Engineer BSc GMIC	Chris Levitt Principle Engineer B.Eng. (Hons) MICE	Tom Clark Associate MEng
P02	09/04/2026	Client Comments	Maya Levita-Elliott Graduate Civil Engineer BSc (Hons)	Chris Levitt Principle Engineer B.Eng. (Hons) MICE	Tom Clark Associate MEng
P03	29/04/2026	Updated to latest layout	Sami Sultan Civil Engineer BSc GMIC	Chris Levitt Principle Engineer B.Eng. (Hons) MICE	Tom Clark Associate MEng
P04	29/04/2026	Red line Boundary updated	 Sami Sultan I am the author of this document 14.05.2026	Chris Levitt Principle Engineer B.Eng. (Hons) MICE	Tom Clark Associate MEng

CONTENTS

1. INTRODUCTION	5
1.1. Appointment and Brief	5
1.2. Aims and Objectives	5
1.3. Limitations	5
1.4. Reference Information	6
2. PROJECT BACKGROUND	8
2.1. Site Location and Existing Land Use	8
2.2. Topography	8
2.3. Proposed Development	8
3. SURFACE WATER DRAINAGE STATEMENT	10
3.1. Context	10
3.2. SuDS Constraints	10
4. SURFACE WATER MANAGEMENT	13
4.1. Existing Drainage	13
4.2. Existing Site Location Data	13
4.3. Existing Total Site Area	13
4.4. Calculation of Greenfield	13
4.5. Proposed Site Total Area	13
4.6. Proposed Site Impermeable Area & Percentages	14
4.7. SuDS Management Train & Proposed SuDS Features	14
4.8. Water Quality	15
4.9. Summary	16
5. FOUL WATER MANAGEMENT	18
5.1. Existing Drainage	18
5.2. Proposed Foul Water Discharge Rate.	18
6. MAINTENANCE PLAN	20
7. CONCLUSION	23

APPENDICES

Appendix A: Existing Site Plan/ Topographical Survey/Asset Records
 Appendix B: Proposed Master Plan
 Appendix C: Infiltration testing results
 Appendix D: Info-Drainage Hydraulic Calculations
 Appendix E Drainage strategy layout

SECTION 01

INTRODUCTION

1. INTRODUCTION

1.1. Appointment and Brief

This Detailed Drainage Strategy (DS) has been prepared on behalf of Crest Nicholson Operations Ltd for a proposed Residential development at Land west of Gatesmead , (hereby referred to as the site).

The purpose of this document is:

- Provide an analysis of the impact of the proposed development on surrounding foul water infrastructure and identify the constraints present on the site in terms of suitability of conventional gravity drainage.
- Demonstrate the principles of surface water management in terms of constraints on discharge, permitted discharge rates and required volumes of attenuation (where required), describing how these can be accommodated within the development proposals.

1.2. Aims and Objectives

It is intended to follow the procedures and guidance outlined in the National Standards for Sustainable Drainage Systems (SuDS) 2025 and CIRIA C753 (2015) in the preparation of this document.

The DS has been prepared with reference to the following requirements:

- The DS must:
 - Ensure that flood risk to the Application Site and surrounding area is not increased over the lifetime of the Proposed Development.
 - Conform with all relevant National and Local flood risk policies.
 - Adopt current design standards; and
 - Consider long-term maintenance with respect to practicality, ownership and funding.
- The DS should:
 - Mimic the existing drainage characteristics of the Application Site as far as is practical.
 - Look for opportunities to provide a reduction in flood risk to the Application Site and the surrounding area.
 - Adhere to current best practice guidance.
 - Contribute to the enhanced amenity and aesthetic value of the Application Site; and
 - Propose opportunities for biological enhancement and provide habitats for wildlife in urban areas.

1.3. Limitations

The purpose of this report as outlined in Section 1.2, together with those related matters specifically referred to therein and it is not intended to be used for any other purposes. The report is for the sole benefit and may only be relied upon by the addressee, to whom we will owe a duty of care. The report and any part of it is confidential to the addressee and should not be disclosed to any third party for any purpose, without the prior written consent of Ridge and Partners LLP as to the form and context of such disclosure. The granting of such consent shall not entitle the third party to place reliance on the report, nor shall it confer any third-party rights pursuant to the Contracts (Rights of Third Parties) Act. The report may not be assigned to any third party.

1.4. Reference Information

The following documents have been consulted:

- CIRIA. (2015). C753 – The SuDS Manual.
- Secretary of State. (2015). Building Regulations Approved Document H.
- British Geological Survey Online Mapping Tool.
- DEFRA / EA Interactive online mapping (magic.defra.gov.uk).
- National Standards for Sustainable Drainage Systems (SuDS) 2025

SECTION 02

PROJECT BACKGROUND

2. PROJECT BACKGROUND

2.1. Site Location and Existing Land Use

The application site is situated West of Gatesmead. The existing site is currently a greenfield site.

The Ordnance Survey grid reference for the application site is TQ 33152 25636, approximately 125636N, 533152E and the nearest postcode is RH16 1AN. The approximate total area of the proposed application site is 4.53ha, the proposed developed area is approximately 1.82ha.



Figure 1 - Site Location Plan

2.2. Topography

The northeast of the site is at circa 48m above sea level and the southwest sits higher at circa 64m above sea level.

2.3. Proposed Development

The aspiration for the site is to construct 49 new homes together with open space and associated infrastructure.

SECTION 03

SURFACE WATER DRAINAGE

STATEMENT

3. SURFACE WATER DRAINAGE STATEMENT

3.1. Context

Without mitigation and consideration, the proposed redevelopment of the site could lead to an unacceptable increase in the rate and volume of surface water generated from the site.

To comply with current guidance and best practice, sustainable drainage systems (SuDS) will be required to be implemented in order to manage the volume, rate and quality of surface water discharged off-site.

3.2. SuDS Constraints

Geology

According to the British Geological Survey (BGS) Geology Viewer, the site is underlain by Sand Sandstone and silt stone interbedded. These sedimentary rocks are fluvial, palustrine and shallow marine in origin. They are detrital, forming deposits reflecting the channels, floodplains and deltas of a river in a coastal setting. Infiltration is not feasible due to poor ground permeability observed on site, which prevents effective infiltration-based drainage solutions.

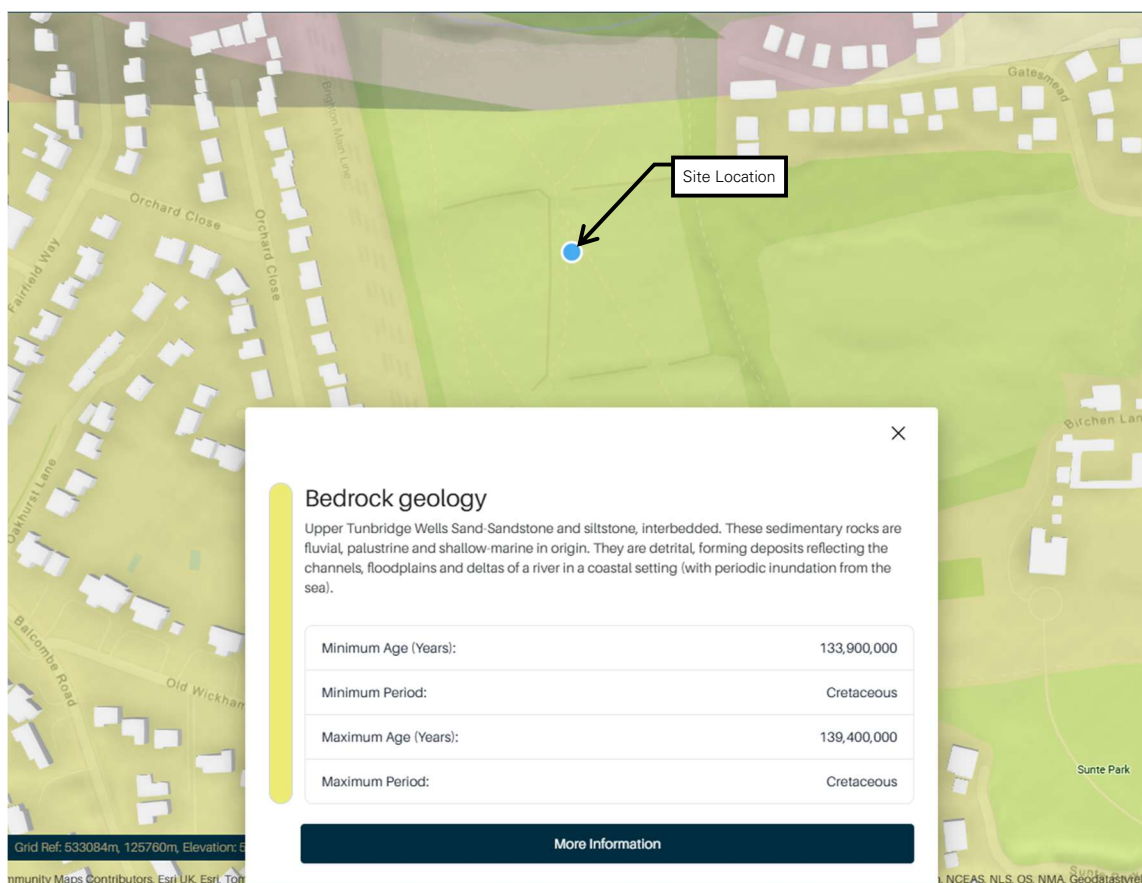


Figure 11 – BGS Extract Bedrock Geology & Superficial Deposits

Infiltration testing in accordance with BRE 365 were carried out by Ridge and Partners LLP on the 17/18 of July 2025. The test show that infiltration was not possible and therefore the use of infiltration-based SuDS features (e.g. soakaways, infiltration basins or permeable paving) is not feasible for this scheme. The infiltration test results can be found attached in appendix C.

Hydrogeology

Two watercourses interact with the site: the first runs parallel to the northern boundary, and the second runs along the eastern boundary, conveying flows eastwards to the River Ouse approximately 2.11 km downstream.

Topography

The site exhibits a notable topographical gradient, ranging from approximately 49 metres AOD in the southeast to around 48 metres AOD in the Northeast. This natural slope presents both opportunities and constraints for SuDS design. On the positive side, the gradient facilitates gravity-driven drainage, which can support features such as filter drains, swales, and attenuation ponds. However, careful consideration must be given to flow velocities and erosion risks, particularly in steeper sections. The elevation change may also require stepped or tiered SuDS components to manage runoff effectively and prevent bypassing of treatment stages.

The topographical survey can be found attached in Appendix A

Trees

The siting and location of proposed SuDS features is considered to be constrained by existing trees. The RPA's along all boundaries of the site and for the outfall need to be taken in to account.

Public Safety and Maintenance

In accordance with the SuDS hierarchy, open surface water attenuation features are preferred to underground tanks owing to the added amenity and biodiversity benefits.

Due consideration must however be given to the vulnerability and safety of future residents in the design of such drainage features within a low-density environment, taking into account guidance offered by the Royal Society for the Prevention of Accidents (RoSPA).

Consideration must also be given to the access and future maintenance of these features, which lend themselves to significant landscaped areas remaining under public ownership.

SECTION 4

SURFACE WATER MANAGEMENT

4. SURFACE WATER MANAGEMENT

4.1. Existing Drainage

The current site is an existing greenfield land.

4.2. Existing Site Location Data

The site location and hydrological data used within the assessment is summarised as follows:

- Grid Reference: TQ 33152 25636 (125636N, 533152E)
- Average Annual Rainfall (SAAR): 827 mm/year
- Soil Index: 0.47
- UK Hydrological Region: Region 7

4.3. Existing Total Site Area

Total existing site area is calculated as follows

ITEM	AREA (SQ. M)	AREA (HECTARES)
Within red line boundary	45300	4.53
Totals: 45300		4.53

4.4. Calculation of Greenfield

Greenfield runoff rates have been estimated for the developable site area using the methodology outlined in the Institute of Hydrology Report 124 method as set out within the Interim Code of Practice for SuDS (ICP) and Environment Agency guidance for catchment areas of 50 hectares or less.

This method of assessment is widely recognised as current best practice for estimation of catchment release rates for small catchments.

RETURN PERIOD (1 IN X YEARS)	GREENFIELD RUN OFF RATE (L/S)
1	8.6
QBar (2.3)	10.1
30	23
100	32.3

4.5. Proposed Site Total Area

Total proposed site area is calculated as follows:

ITEM	AREA (SQ. M)	AREA (HECTARES)
Extent of the Development	17900	1.79
Totals: 17900		1.79

4.6. Proposed Site Impermeable Area & Percentages

Total impermeable areas for the proposed site have been calculated as follows:

	IMPERMEABLE	PERMEABLE
Area (Ha)	1.79	2.74
Percentage (%)	39.51	60.49
Change from Existing (%)	+39.51	-39.51

4.7. SuDS Management Train & Proposed SuDS Features

In accordance with the surface water drainage hierarchy, runoff generated by the Proposed Development should be discharged to ground via infiltration, where practicable.

However, the underlying soils at the application site is unsuitable for infiltration, infiltration testing in accordance with BRE 365 were carried out by Ridge and Partners LLP on the 17/18 of July 2025. The test show that infiltration was not possible and therefore the use of infiltration-based SuDS features (e.g. soakaways, infiltration basins or permeable paving) is not feasible for this scheme. The infiltration test results can be found attached in appendix C. The next option in the hierarchy is to discharge surface water at the greenfield runoff rate to a natural watercourse. A watercourse is located along the northern boundary of the site and will serve as the outfall for the development. A discharge consent will be required prior to construction of the drainage network.

A range of SuDS components—such as swales, porous paving and an attenuation pond—have been incorporated into the strategy to provide attenuation, water quality improvements, amenity and biodiversity benefits.

Surface water runoff from the roofs of the proposed dwellings will be conveyed via rainwater downpipes into the surface water network located within the site roads.

Runoff from roads and footpaths will be collected via road gullies, conveyed to swales, and then directed into the surface water network before being attenuated within an attenuation pond located to the northeast of the development. The attenuated flows will then discharge at a controlled rate of (QBar) = 10.1 L/s via a flow control within manhole SWMH_41, before out falling into the adjacent northern watercourse. Porous paving has also been included within private driveways to provide additional attenuation and improve water quality from the development.

The hydraulic calculations show the scheme is able to accommodate for the 1 in 100 year +45%cc storm event. The water rises in the pond to a depth of 1.377m during the 1 in 100 years + 45%cc storm event. Minimal flooding occurs in some permeable paving however the excess surface water flood will positively drain to the swale following the designed overland flow route. The swale has sufficient capacity to contain the additional flood water. The half drain down time in the calculations appears to fail in some of the porous paving, this is because orifices have been introduced in the porous paving to restrict the flow and attenuate the water in the subbase of the permeable paving.

The Drainage Strategy Layout is provided in Appendix E, and the hydraulic calculations are included in Appendix D.

4.8. Water Quality

The Proposed Development intends to construct Porous Paving for all the private driveways of the development in addition to multiple swales collection the surface water runoff from the footpaths and the roads, all out falling into an attenuation basin located before the outfall northeast of the development. Then controlled at green field runoff rate before gravitating into the water course. The table below shows the treatment train the system provides and details the Combined Pollution Mitigation of the development:

SUMMARY TABLE	
Land Use Type	Residential Parking
Pollution Hazard Level	Low
Pollution Hazard Indices	
TSS	0.5
Metals	0.4
Hydrocarbons	0.4
SuDS components proposed	
Component 1	Porous Pavement
SuDS Pollution Mitigation Indices	
TSS	0.7
Metals	0.6
Hydrocarbons	0.7
Component 2	Attenuation Basin
SuDS Pollution Mitigation Indices	
TSS	0.5
Metals	0.5
Hydrocarbons	0.6
Combined Pollution Mitigation Indices	
TSS	0.95
Metals	0.85

Hydrocarbons	>0.95
Acceptability of Pollution Mitigation	
TSS	Sufficient
Metals	Sufficient
Hydrocarbons	Sufficient

4.9. Summary

Surface water management is summarised as follows:

- Surface water will be managed within the Application Site and as close to source as possible.
- Porous paving swales and an attenuation basin along with the surface water network are designed to accommodate the 1 in 100 yr. + 45 % storm events.
- The development is controlled at a rate of (QBar) = 10.1 L/s via a flow control within manhole SWMH_45
- The permeable paving provides a total storage of 275.813m³, the swales provide 48.682m³ and the attenuation pond provides 868.967m³, the total storage on site equates to 1193.462m³
- The SuDS features (Permeable Paving, attenuation basin...) utilized in the strategy will allow for the adequate treatment prior to discharge into the water course.

With the above in consideration, the Proposed Development would therefore contribute to no increase in flood risk associated with surface water within the vicinity of the Application Site.

SECTION 5

FOUL WATER MANAGEMENT

5. FOUL WATER MANAGEMENT

5.1. Existing Drainage

The existing site is a greenfield land used for agricultural purposes; no foul water connection can be found on site.

The closest outfall connection can be found on Gatesmead.

5.2. Proposed Foul Water Discharge Rate.

The Proposed development comprises of 49 homes.

According to the British standards building flows and loads chart, standard residential domestic dwellings flow is 150L/PP/Day.

The number of occupancies for the developments is 291 residents. The flow rate generated from the development is $291 \times 150 = 43,650\text{L/day}$ which equates to 0.505L/s. The peak foul flow rate for the site is $0.505 \times 6 = 3.03\text{L/s}$.

The foul water will gravitate towards a Type 3 pumping station, in accordance with the DCG, located to the north of the site. From there, it will be pumped via a rising main to a foul water manhole adjacent to Gatesmead, before finally gravitating to the existing foul water manhole on Gatesmead.

All foul water drainage will be designed and constructed in accordance with the Building Regulations Part H

Primary foul runs have been preliminarily sized as ranging between 150-300mm diameter pipes.

A Section 106 agreement with Southern Water will be required before construction to connect into existing foul water manhole located in Gatesmead.

SECTION 6

MAINTENANCE SCHEDULE

6. MAINTENANCE PLAN

Maintenance requirements of all SuDS components have been considered as part of the proposed drainage scheme. It is important for the performance of the surface water systems that they are maintained on a regular basis after extreme storm events, 1 in 30-year event or more. Maintenance should always be completed alongside the manufacturer's requirements. A summary of the management and maintenance requirements and the expected design life of the above surface water drainage assets is provided in table below:

ELEMENT / DRAINAGE COMPONENT	OWNERSHIP	MAINTENANCE REQUIREMENTS
Swales	Management Company	To regularly cut grass, clippings should be removed either offsite or placed outside the swale area to prevent the build-up of nutrients and pollutants. For wet swales, mowing of wetland vegetation is not required. Inspections should include checking inlets, outlets, and overflow structures for blockages, assessing infiltration areas for signs of ponding, and examining inlets and facility surfaces for silt accumulation. Inspection monthly/ as required
Flow Restriction Device & Chamber	Management Company	To be monitored for silt build-up and cleaned as required using suction methods. Check function of flow restriction componentry to suit manufacturer's guidance. Inspection annually and before / after extreme storm events.
Catchpit Manholes	Management Company	To remove Litter and debris and inspect for any sediment oil grease silt build up accumulation regularly Inspection every six monthly for litter and debris and before / after extreme storm events
Permeable paving	Management Company	To be monitored and cleaned via brushing and vacuuming and jetting when any debris / silt. Inspection to include both the channel and silt trap / gulley outlets. Inspection annually and before / after extreme storm events
Rainwater Pipes	Homeowners	Clearance of leaves / debris from guttering and hopper inlets. Rodding points provided to clear blockages via conventional rodding methods. Inspection annually and before / after extreme storm events.

DETAILED DRAINAGE STRATEGY

RIDGE

Soil Vent Piles / "Stub Stacks"	Homeowners	Rodding points to be provided to clear blockages via conventional rodding methods. Inspection annually.
Gullies (Internal & External)	Management Company	To be monitored for silt build-up and cleaned as required. Where provided, ensure air traps are primed and sealed to prevent smells. Inspection quarterly.
Below Ground Pipework Generally	Management Company	To be inspected for reduction in cross-sectional area (i.e. due to blockage, silt or debris build-up, root ingress etc) general condition of materials, pipe displacement and the like. Inspection annually and where appropriate before / after extreme storm events.
Manholes / Inspection Chambers Generally	Management Company	To be inspected for debris and integrity of chambers and covers generally. Inspection annually and where appropriate before / after extreme storm events.
Headwalls	Site Operator / Maintenance Company	To be inspected for debris and integrity of Headwalls generally. Inspection annually and where appropriate before / after extreme storm events
Attenuation basins	Management Company	To regularly cut grass, clippings should be removed either offsite or placed outside the swale area to prevent the build-up of nutrients and pollutants. Inspections should include checking inlets, outlets, and overflow structures for blockages, and examining inlets and facility surfaces for silt accumulation. Inspection quarterly/ as required and where appropriate before / after extreme storm events
Adopted Foul network	Southern water	To be inspected for debris and blockages and integrity of chambers and covers generally. Inspection annually.
Adopted Foul Pumping station	Southern water	To be inspected regular inspections and planned maintenance, including routine checks of pumps, controls, alarms, and valves, along with periodic cleaning of the wet well to remove debris and grease build-up. Both duty and standby pumps should be tested to ensure reliable operation, and all electrical and mechanical components must be inspected annually in line with manufacturer and adoption standards. Inspection quarterly.

SECTION 7

CONCLUSION

7. CONCLUSION

Ridge and Partners LLP have been appointed by Crest Nicholson for a proposed residential development at the Land West of Gatesmead, Haywards Heath.

Surface water generated from the proposed development will be managed in a sustainable manner.

The site is underlain by Sand Sandstone and silt stone interbedded. Infiltration testing has been carried out on site however the results show the test failed. The test results can be found attached in Appendix C.

The technical assessment of flood risk presented within this document demonstrates that the immediate and residual flood risks over the lifetime of the development are readily manageable and the redevelopment proposals are deemed acceptable in terms of flood risk throughout their lifetime, without increasing flood risk elsewhere.

Surface water will be managed within the Application Site and as close to source as possible.

Porous paving swales and an attenuation basin along with the surface water network are designed to accommodate the 1 in 100 yr. + 45 % storm events.

The development is controlled at a rate of (QBar) = 10.1 L/s via a flow control within manhole SWMH_41.

The SuDS features (Permeable Paving, attenuation basin...) utilised in the strategy will allow for the adequate treatment prior to discharge into the watercourse.

The foul water will gravitate towards a Type 3 Pumping Station in accordance with the DCG then pumped via a rising main towards a foul water manhole located adjacent to Eastmans Field, then gravitating towards the exiting foul water manhole

The flow rate generated from the development equates to 0.505L/s. The peak foul flow rate for the site is $0.505 \times 6 = 3.03 \text{ L/s}$

All foul water drainage will be designed and constructed in accordance with the Building Regulations Part H

A Section 106 agreement with Southern Water will be required before construction to connect into existing foul water manhole located in Gatesmead.

It is important for the performance of the surface water systems that they are maintained on a regular basis after extreme storm events, 1 in 30-year event or more.

APPENDIX A

EXISTING SITE PLAN / SURVEY/ASSET RECORDS

Ordnance Survey (c) Crown Copyright 2025. All rights reserved. Licence number 100022432

Ordnance Survey (c) Crown Copyright 2025. All rights reserved. Licence number 100022432



APPENDIX B

MASTER PLAN