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The Hyde, Crawley

Flood Risk Assessment and Surface Water Drainage Strategy

Ref: 251055-CON-XX-XX-RP-C-1000

Approved By: J/Waugh

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Version: 1.2

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1.0 INTRODUCTION

Conisbee have been appointed by JJJV Ltd to produce a Flood Risk Assessment (FRA) and Drainage Strategy for the proposed residential development in west Crawley, located in West Sussex County Council and Horsham District Council.

The site located in Flood Zone 1 according to the Environment Agency (EA) Flood Map for Planning, at low risk of flooding.

A sustainable drainage system is proposed.

Horsham District Council Drainage Department provided comments on the scheme on the 7th April 2026, included in Appendix H, and this report has been updated in response.

1.1 Site Specific Documents

The following documents should be referred to as part of this report:

- **Appendix A:** Topographic Survey
- **Appendix B:** Architectural Proposal
- **Appendix C:** Thames Water Sewer Records
- **Appendix D:** Local Ground Investigation Borehole Logs
- **Appendix E:** Existing Catchment Plan and Greenfield Runoff Rate Calculations
- **Appendix F:** Proposed Drainage Strategy Plan and Proposed Catchment Plan
- **Appendix G:** Surface Water Calculations
- **Appendix H:** SuDS Maintenance Strategy
- **Appendix I:** Thames Water Pre-Development Enquiry Response
- **Appendix J:** Horsham District Council Drainage Department Comments

2.0 EXISTING SITE

2.1 Site Location

The site is located at OS grid reference 524203, 136708. The overall area is 4,918m², 0.49 Ha.

The site is bounded by the following:

- To the north; Is Ilfield golf club.
- To the east; Is Rusper Road.
- To the south; Is Whitehall Drive.
- To the west; Is Ilfield golf club.

A site location plan is shown in the figure below.

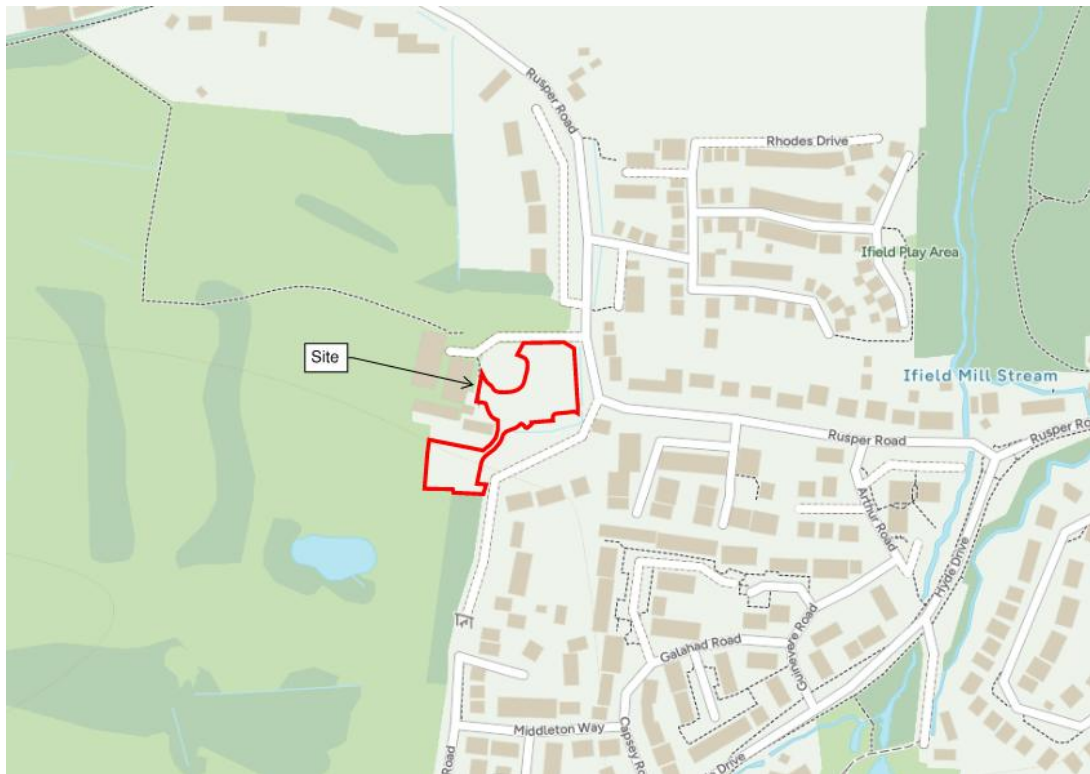


Figure 2.1 Site location plan.

2.2 Existing Site and Topography

The site is a private garden for the Hyde dwelling, which itself is outside the red boundary. The site is comprised of garden lawn, access driveway and a tennis court in the north.

Generally, the site falls to the north, ranging from 72.49m AOD in the southwest to 66.53m AOD in the north.

There is a ditch along the northeastern frontage of the site and an ornamental duck pond to the northwest.

2.3 Geology

According to the British Geological Survey (BSG) data the site is underlain by the Weald Clay Formation – Mudstone.

Mudstone is typically impermeable and unsuitable for surface water infiltration, because of this it is anticipated percolation testing would produce a low infiltration rate.

Local BGS boreholes show the mudstone is approximately 100m thick. The boreholes have been included in Appendix D.

2.4 Hydrogeology

Aquifer geology maps published by the EA show the site is not within an Aquifer.

The site is not located in a Source Protection Zone.

2.5 Existing Site Drainage

Thames Water record drawings have been included in Appendix C and show two 150mm diameter foul sewers to the north of the site. During a site visit, Conisbee engineers could only find the southern most of these two sewers, which is at a depth of approximately 1.15m.

2.6 Existing Surface Water Flow Paths

The existing surface water flow routes for surface water generated within the site follow the general falls of the site from southwest to northeast, as shown in the topographic survey in Appendix A. There is a ditch along the entire southeast boundary of the site which receives these flows. This ditch flows along the east of the site and discharges into a below ground drainage system. The flow routes have been added to Figure 2.2 below.

It is understood that during normal rainfall events, no runoff is produced by the site and only higher magnitude storm events produce surface water flows.

The site also has an existing surface water drainage system which gathers surface water flows via gullies. It is unknown where this discharges too, but it is likely that the below ground drainage system flows northwest into the golf course extent.

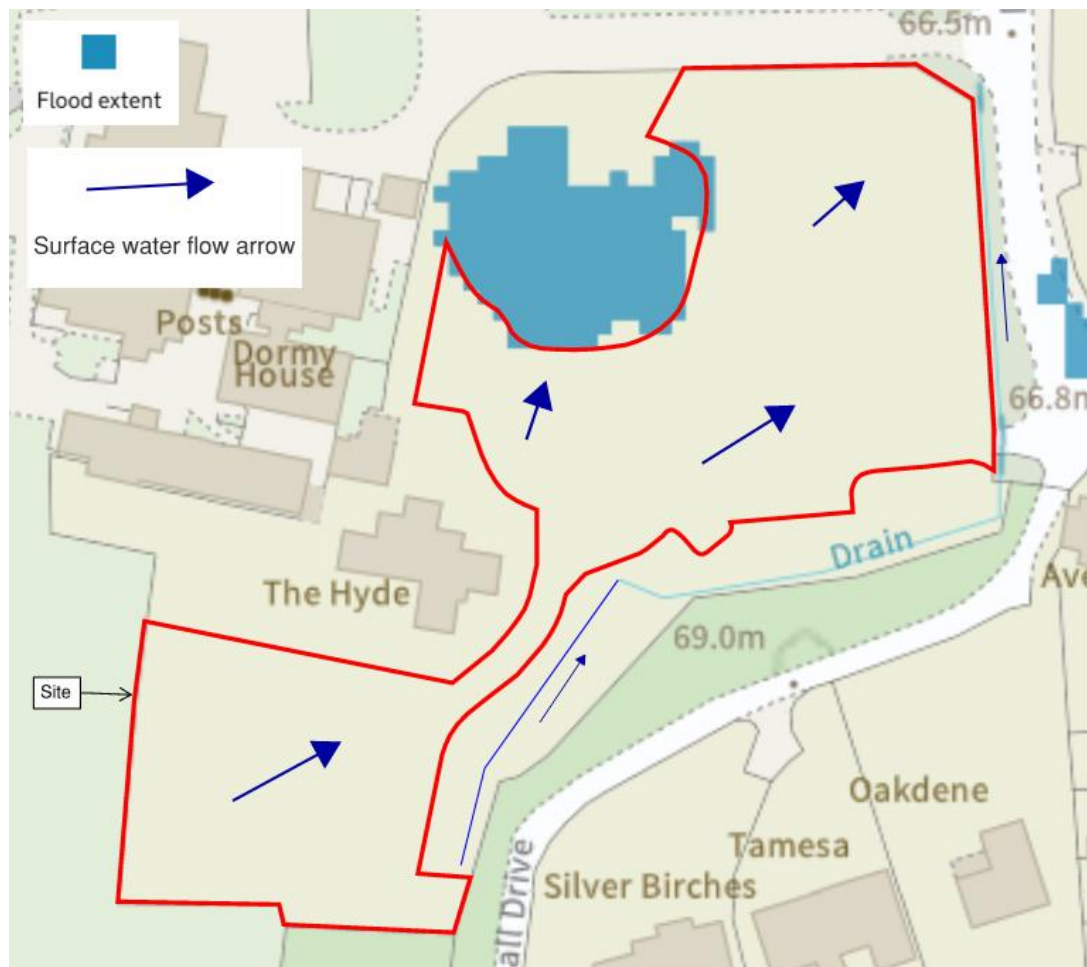


Figure 2.2 – Environment Agency Flood Map for Surface Water (1 in 100 year event) showing the site doesn't receive surface water flows from off-site. Surface water flow routes from surface water generated within the site have been shown, and the full extent of the ditch shown.



Figure 2.3 – Photograph of the existing ditch in the southeast of the site.

2.7 Existing Site Characteristics

The existing permeable and impermeable areas are shown on the existing catchment plan, provided in Appendix E.

The existing hydrological characteristics for the site are as follows:

- $M5_{60min} = 20$
- Ratio $r = 0.4$
- IH 124 Soil Type: 6
- Total Site Area = $4918m^2$
- Total Existing Impermeable Area = $282m^2$
- Total Existing Permeable Area = $4,636m^2$
- Percentage Impermeable (PIMP) = 6%
- $QBAR = 0.4 \text{ l/s}$

Return period	Existing peak run off rate ¹	Greenfield run off rate ²	Existing Discharge volume ³
	[l/s]	[l/s]	[m ³]
1 in 1 year	3.1	0.3	34.8
1 in 30 years	6.1	0.9	76.5
1 in 100 years	12.6	1.2	99.4

¹ The existing run off rates were determined by the Wallingford Rational Method with a rainstorm of 30 minutes duration; Volumetric run-off coefficient = 1 for impermeable areas, and 0 for permeable areas.

² Calculated based on FEH22 rainfall data.

³ Based on BS 8582 section 9.8

3.0 PROPOSED DEVELOPMENT

The proposed development is residential dwellings with associated infrastructure including access road. The proposed layout is included in Appendix B.

The red line boundary shows the area which includes the proposed development. The wide site is under the same ownership but is excluded from the development area.

4.0 FLOOD ZONE, SEQUENTIAL AND EXCEPTION TEST

4.1 Flood Zone

The EA Flood Map for Planning shows the site to be in Flood Zone 1, at very low risk of flooding.

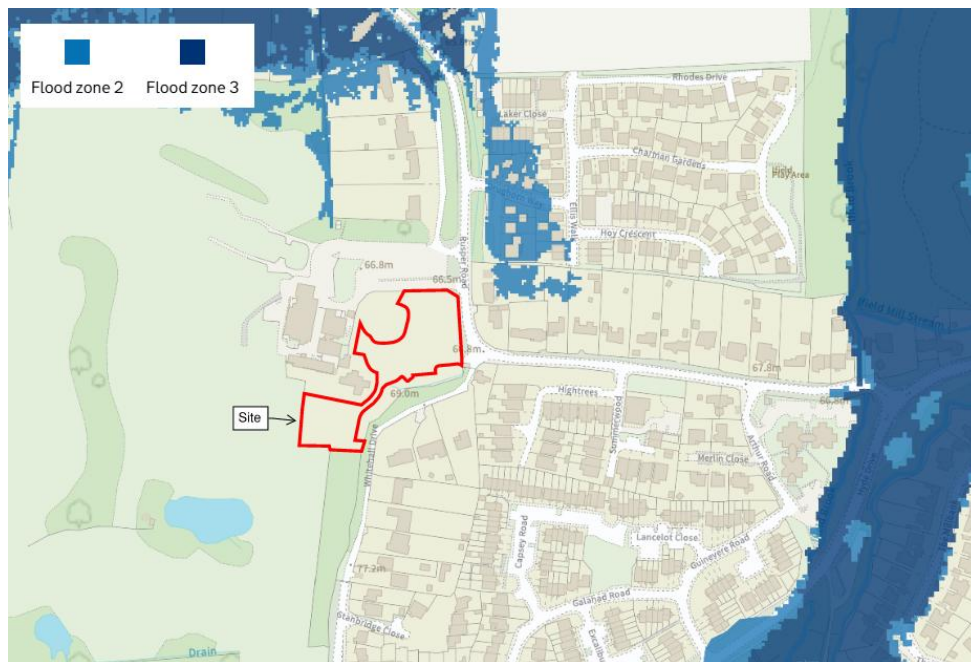


Figure 5.1 – “Flood Map for Planning” from Environment Agency, showing the site in Flood Zone 1, at very low risk of flooding.

4.2 Vulnerability Classification

According to [“Table 2: Flood Risk Vulnerability Classification”](#) in the NPPF Practice Guidance (Flood Risk and Coastal Change) the intended use as residential has a Vulnerability Classification of ‘More Vulnerable’.

4.3 Sequential Test

As the site is in Flood Zone 1, according to Table 3 of the NPPF Practice Guidance, the proposed development is suitable.

Table 5.1 Flood Risk Vulnerability Classification (after Table 3 NPPF Practice Guide Flood Risk and Coastal Change)

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	x	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	x	x	x	✓*

5.0 DEFINITION OF THE FLOOD HAZARD

5.1 Sources of Flooding

Risk of flooding arising from the following sources:

- Fluvial
- Tidal
- Surface Water
- Sewers
- Groundwater
- Artificial Sources

5.1.1 Fluvial Flooding

The EA Flood Map for Planning shows the site to be in Flood Zone 1, at less than a 0.1% annual chance of flooding (low risk).

5.1.2 Tidal Flooding

The site is located at 67m AOD and is at very low risk of flooding from tidal sources.

5.1.3 Surface Water Flooding

The EA Surface Water Flood Map for a 1 in 100-year storm event shows no surface water flooding is predicted within the site.

Therefore, the site is at low risk of surface water flooding.

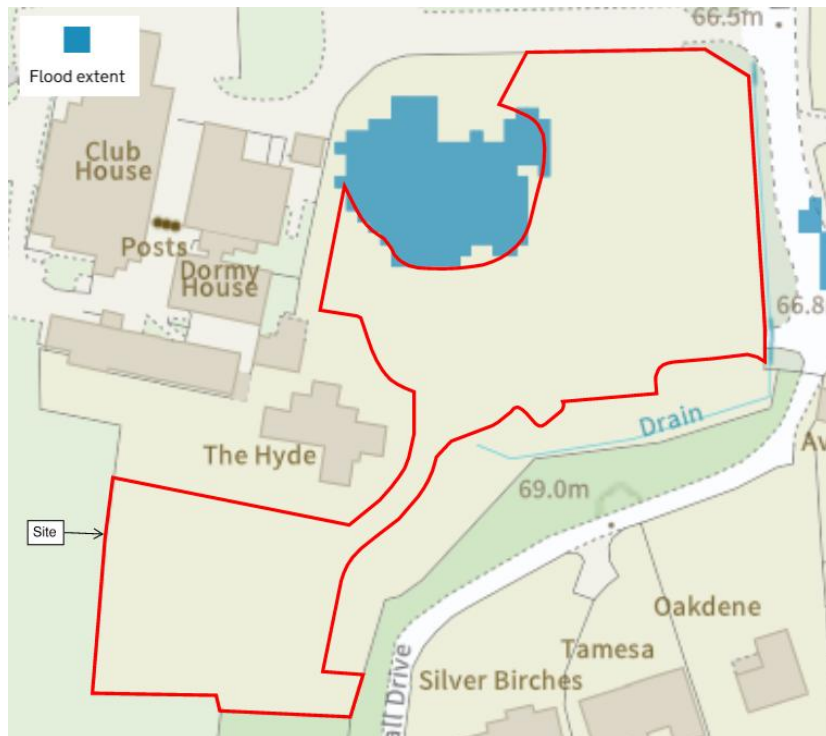


Figure 6.2 - EA Surface Water Flooding Map for a 1 in 100-year event, showing the site to be at low risk of surface water flooding.

5.1.4 Sewer Flooding

Horsham Council SFRA states there has only been 1 historical sewer flooding incident within the Council area, and that was in Billingham.

The proposed development will have finished floor levels raised higher than local sewers.

Therefore, there is a low risk of sewer flooding.

5.2 Groundwater Flooding

Horsham Council SFRA (2010) states no groundwater flooding has occurred within the study area.

The proposed residential dwellings will have finished floor levels raised higher than the surrounding land and will have no basements.

Therefore, it is concluded that the site is at low risk of groundwater flooding.

5.2.1 Flooding from Artificial Sources

The Environment Agency Flood Risk from Artificial Sources Map shows the site at low risk of flooding from artificial sources and reservoirs.



Figure 6.5 – EA Map of Risk of flooding from artificial sources showing the site at low risk of flooding.

6.0 PROPOSED DRAINAGE STRATEGY

6.1 Proposed Surface Water Drainage

6.1.1 Surface Water Disposal Hierarchy

The LLFA, Thames Water, the SuDS Manual and the Building Regulations recommend a hierarchy of methods of disposal of surface water.

Disposal Method	Comments
Re-use water at source	No demand for harvested rainwater on site.
Infiltration	Mudstone geology unsuitable.
Watercourse	Chosen solution.
Surface water sewer	-
Combined Sewer	-

6.1.2 Proposed Surface Water Drainage

The new development will incorporate a Sustainable Drainage System (SuDS) to manage rainfall on site. Drawing 251055-CON-XX-00-DR-C-1000 shows the proposed drainage strategy and is included in Appendix F.

It's proposed to gather surface water within shallow drainage features such as Aco channels and rills from impermeable areas and discharge into the permeable paving access road. Water will flow within the sub-base of the permeable paving to the site access in the east of the site where it will be discharged into the existing ditch at a restricted rate.

Surface water will be discharged at 2.0 l/sec, which is the closest maintainable rate to the 1 in 1 greenfield runoff rate (0.3 l/sec), for all storm events up to and including 1 in 100 +45% climate change allowance. To discharge at a rate lower than 2 l/sec would present an unacceptable blockage risk and increase risk of flooding and uncontrolled discharge during blockage scenarios.

An additional 10% area has been added within the calculations to allow for future urban creep. The surface water calculations have been provided in Appendix G.

6.1.3 Proposed Surface Water Discharge Location

It is proposed to discharge surface water to the existing ditch to the east of the site.

In the proposed outfall location, the ditch is 450mm deep. An assessment has been completed of the ditch to confirm its suitability to receive surface water, and pictures have been included below. The ditch's depth and channel width and structure are suitable for receiving surface water, although it is currently overgrown with vegetation. The proposed development provides a good opportunity for clearing the ditch and committing to ongoing maintenance.

The ditch begins in the south of the site and flows along the site's southeastern boundary. It is culverted beneath the site's access just upstream of the outfall location. From there the ditch flows north into a culvert. From there the exact route of the ditch is unknown, however it is assumed it flows north and connects to other local roadside ditches prior to discharging into Ifield Brook as shown in Figure 6.1 below.



Figure 6.1 – Route of ditch flowing north. In the north of the image is a stream flowing to Ifield Brook.

The ditch is expected to stay dry for most of the year, except during and directly after a storm event. The ditch starts in the southeast of the site, and therefore the only area it serves is the site. There is no local surface water flood risk or evidence of nuisance and therefore it is assumed it is currently in good operation and has sufficient capacity to serve the greenfield runoff rates for higher magnitude storm events. The proposed discharge rate for all storm events up to and including the 1 in 100 +45% climate change storm event (2 l/sec) is lower than the existing 1 in 30 year runoff rate, and therefore it is assumed that the ditch has sufficient capacity for 2 l/sec, as no nuisance has occurred in the existing scenario or surface water flood risk.

The ditch is not located within the redline boundary but is located within the site owner's land. The highway boundary is shown on the proposed drainage strategy showing the connection location is within the owned land.



Figure 6.2 – Photographs of the existing ditch.

6.1.4 Proposed Surface Water Discharge Rate

The proposed surface water discharge rate is 2 l/sec, as close to the 1 in 1 greenfield runoff rate as is maintainable without elevated risk of blockage.

Return period	Greenfield run off rate ²	Existing peak run off rate ¹	Proposed peak runoff rate	Existing Discharge volume ³	Proposed Discharge volume ³
	[l/s]	[l/s]	[l/s]	[m ³]	[m ³]
1 in 1 year	0.3	3.1	2.0	34.8	51.1
1 in 30 years	0.9	6.1	2.0	76.5	112.4
1 in 100 years	1.2	12.6	2.0	99.4	146.0
1 in 100 years + 45 CC	-	-	2.0	-	204.4

¹ The existing run off rates were determined by the Wallingford Rational Method with a rainstorm of 30 minutes duration; Volumetric run-off coefficient = 1 for impermeable areas, and 0 for permeable areas.

² Calculated based on FEH22 rainfall data.

³ Based on BS 8582 section 9.8.

6.1.5 Surface Water Attenuation

To provide sufficient attenuation for a 1 in 100 +45% climate change allowance storm event, two attenuation methods are proposed:

- Permeable Paving
- Sub-base replacement attenuation crates (Permavoid sub-base replacement or similar)

The volume of attenuation provided within the permeable paving is approximately 81m³, however not all of this will be utilised due to ground levels.

Two sections of sub-base replacement attenuation crates are proposed to provide additional volume:

- SWMH01 – 400mm deep, 160m², total volume = 60.8m³
- SWMH03 – 400mm deep, 120m², total volume = 45.6m³

6.1.6 Surface Water Quality

The permeable paving provides water quality improvements sufficient for runoff from the low-risk residential development according to the SUDS Manuel pollution indices.

6.1.7 Exceedance Flows

In the very unlikely event where the capacity of the surface water system is exceeded (storms with a magnitude larger than 1 in 100 +45% climate change), water will leave the site via overland flow. For the site this is always to the east, as shown in the figure below. The overland flow arrows only relate to exceedance flows generated from within the site boundary.

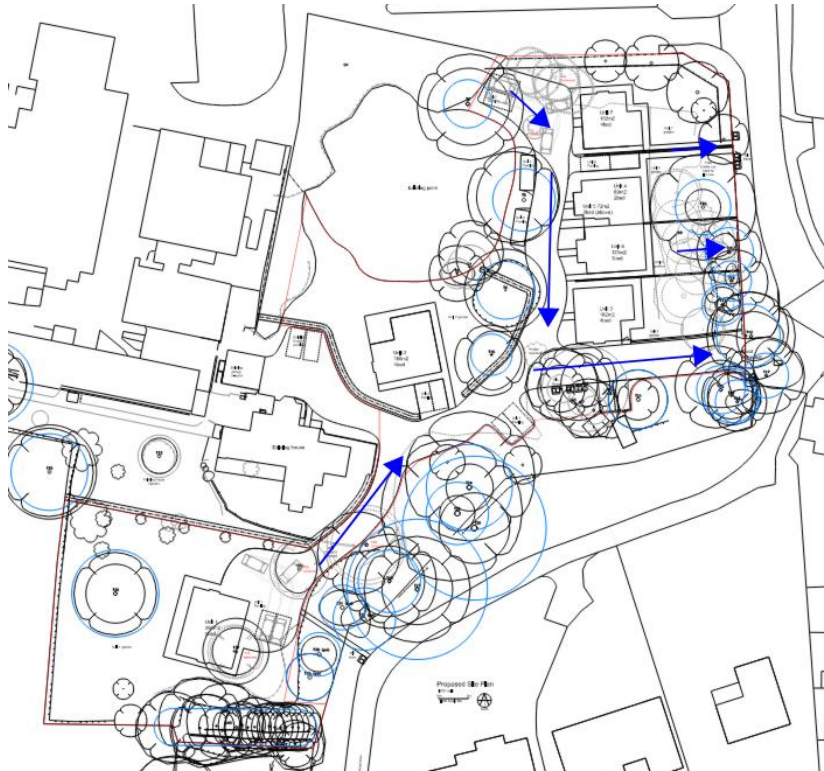


Figure 4.1 Exceedance Flow Route

6.1.8 Maintenance Strategy

All proposed SuDS and drainage are to be maintained for the duration of the development by the client.

A proposed maintenance strategy, in line with the CIRIA SuDS Manual, is included in Appendix G.

6.2 Proposed Foul Drainage

The proposed foul drainage strategy is to make a single new connection to the Thames Water combined water sewer to the north of the site.

Based on a residential population of 4 per house, maximum 7 houses, with a peaking factor of 6, the estimated peak foul flow rate is 0.3 l/s, following the British Flows and Loads guidance.

Currently, the site discharges no foul flow to sewers.

6.2.1 Thames Water Sewer Capacity

Thames Water have been contacted via a pre-development enquiry to confirm whether there is capacity for the increased foul flows from the proposed development.

Thames Water have confirmed that there is sufficient capacity within the sewer and their response has been included in Appendix G. The receiving sewer is 150mm diameter.

7.0 CONCLUSIONS

The site is in Flood Zone 1, at low risk of fluvial and tidal flooding, and there is a low risk of flooding from other sources such as surface water, ground water and sewer flooding.

Surface water runoff from the development is managed using a sustainable drainage system (SuDS) which provides improved water quality.

It is considered that the development will reduce flood risk elsewhere because of the proposed SuDS system.

APPENDIX A: TOPOGRAPHIC SURVEY



APPENDIX B: ARCHITECTURAL PROPOSAL



REVISIONS:
PLEASE READ: Do not scale off these plans. Only marked dimensions should be used. Cross-reference these drawings with all others associated with the project. On existing buildings, site check all dimensions prior to ordering materials and products, or installation, as discrepancies can exist.

DRAWING NOTES:

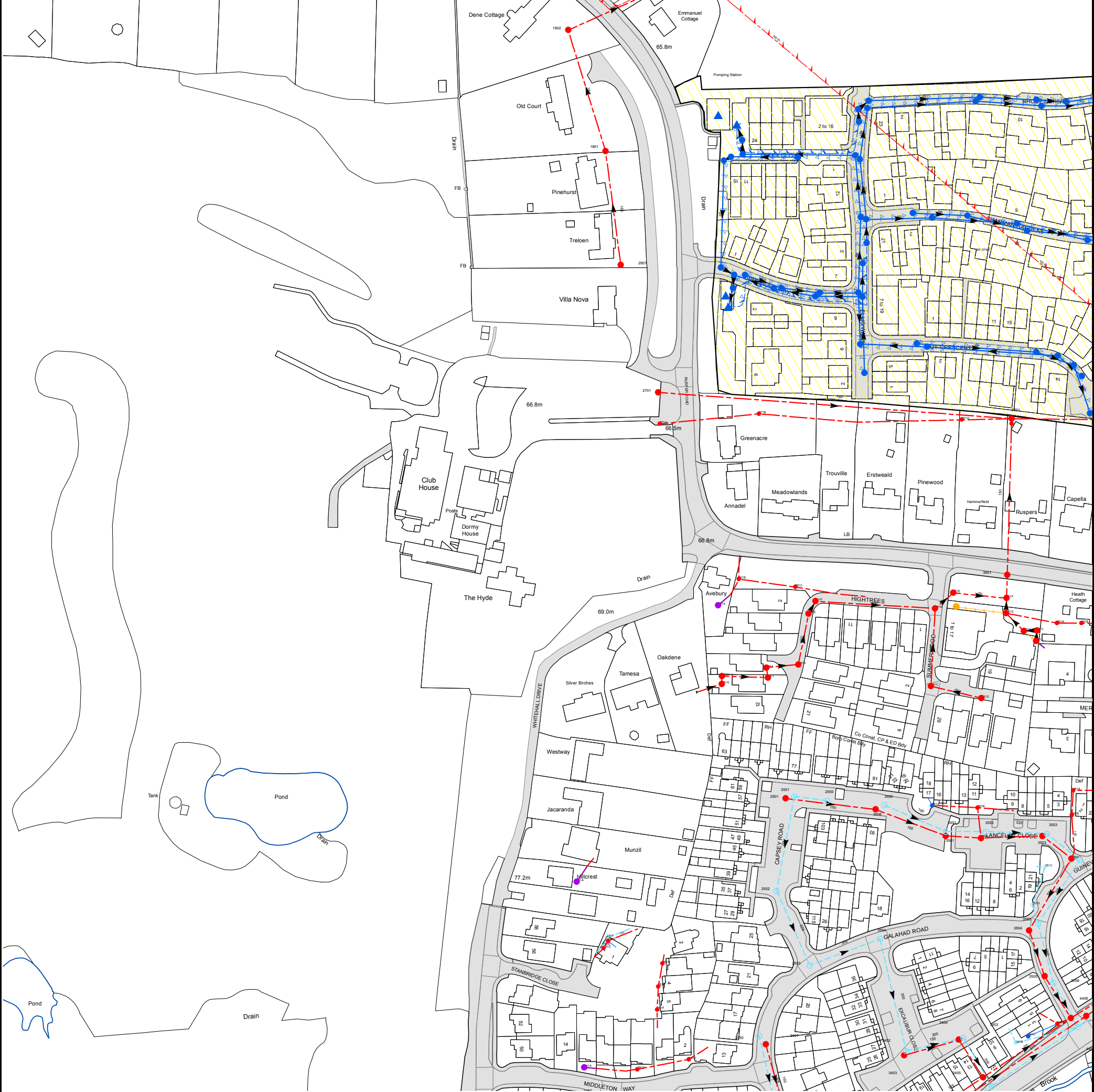
Richardson Architecture Limited
RIBA Chartered

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Drawing Title Proposed site plan
Site Address The Hyde, Ruspur Road, Crawley, RH11 0LN
Client JJUV Limited

Project Number 773
Drawing Number 04
Revision P13
Scale (Paper Size) 1:250 (A1)
Date of Issue October 2025
Project Stage Planning

APPENDIX C: THAMES WATER SEWER RECORDS



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 524168,136704

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2024) with the Sanction of the controller of H.M. Stationery Office, License no. AC0000849556 Crown Copyright Reserved.



Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

	Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Storm Sewer
	Sludge Sewer
	Foul Trunk Sewer
	Surface Trunk Sewer
	Combined Trunk Sewer
	Foul Rising Main
	Surface Water Rising Main
	Combined Rising Main
	Vacuum
	Thames Water Proposed
	Vent Pipe
	Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

	Sewer		Culverted Watercourse
	Proposed		Decommissioned Sewer
	Content of this drainage network is currently unknown		Ownership of this drainage network is currently unknown

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plan are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve		Meter
	Dam Chase		Vent
	Fitting		

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Ancillary		Drop Pipe
	Control Valve		Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Inlet		Outfall
	Undefined End		

Other Symbols

Symbols used on maps which do not fall under other general categories.

	Change of Characteristic Indicator		Public / Private Pumping Station
	Invert Level		Summit

Areas

Lines denoting areas of underground surveys, etc.

	Agreement
	Chamber
	Operational Site

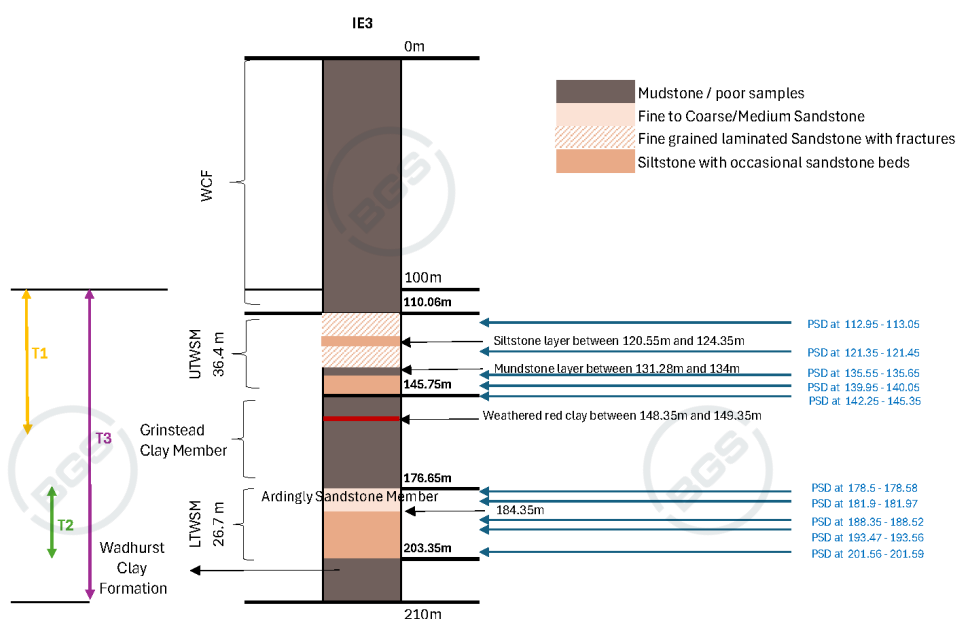
Ducts or Crossings

	Casement	Ducts may contain high voltage cables. Please check with Thames Water.
	Conduit Bridge	
	Subway	
	Tunnel	

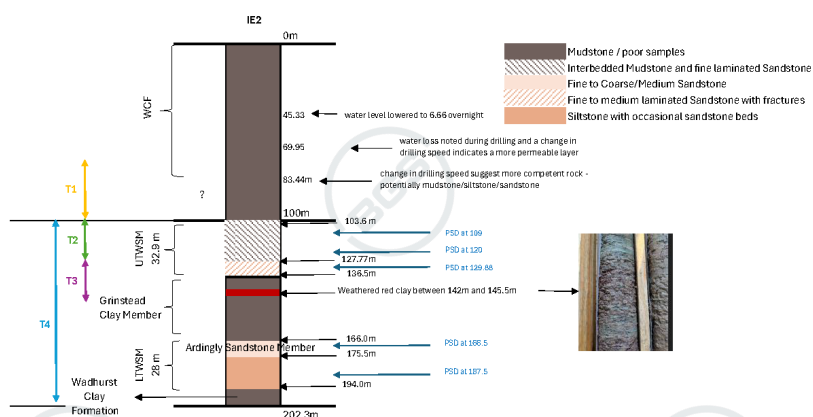
5) 'na' or '0' on a manhole indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

APPENDIX D: LOCAL GROUND INVESTIGATION BOREHOLE LOGS



*Note: WSP Log used for the schematics
Layer of 1m or less thickness are not included



*Note: WSP Log used for the schematics
Layer of 1m or less thickness are not included

APPENDIX E: EXISTING CATCHMENT PLAN AND GREENFIELD RUNOFF RATE CALCULATIONS



hr wallingford

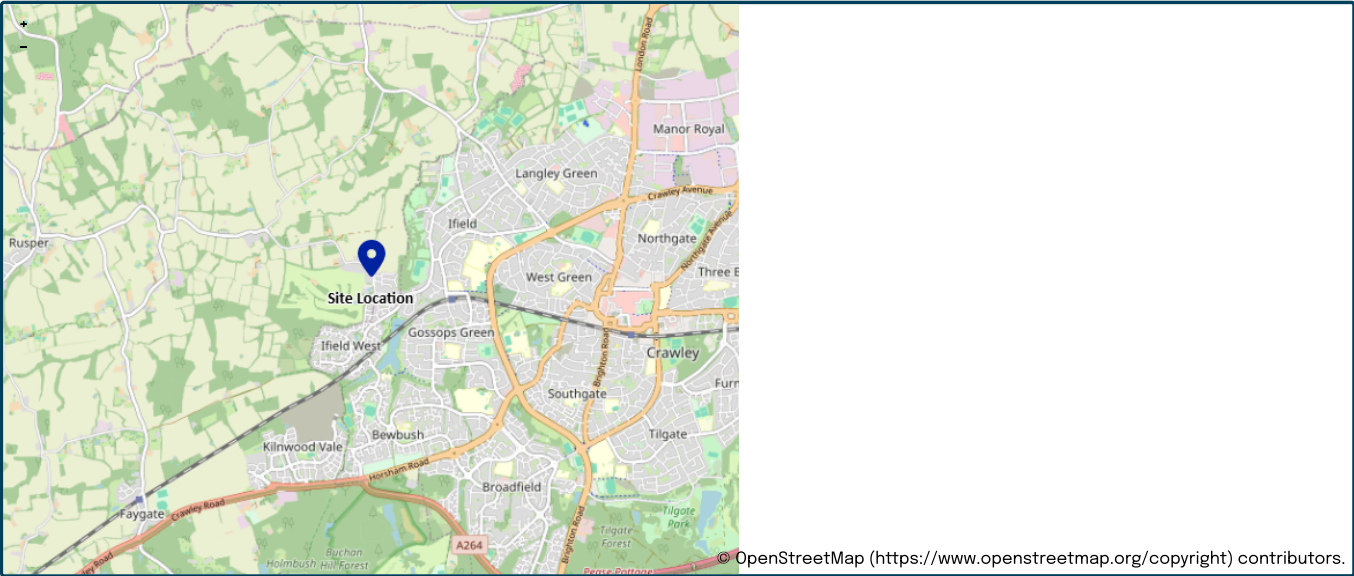
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	20/04/2026	
Calculated by		
Reference		
Model version	2.2.3	

Location

Site name		
Site location		



Site easting (British National Grid)	524196	
Site northing (British National Grid)	136694	

Site details

Total site area (ha)	0.04918	ha
----------------------	--------------------	----

Greenfield runoff

Method

Method	FEH statistical (2025)
--------	-----------------------------------

FEH statistical (2025)

	My value 811	Map value	
SAAR9120 (mm)	811		mm
BFIHOST19scaled	0.277		
QMed-QBar conversion	1.136	☒	1.136
QMed (l/s)	0.3		l/s
QBar (FEH statistical 2025) (l/s)	0.4		l/s

Growth curve factors

Hydrological region	My value 6	Map value ☒ 6
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

Method	FEH statistical (2025)	
Flow rate 1 year (l/s)	0.3	l/s
Flow rate 2 year (l/s)	0.3	l/s
Flow rate 10 years (l/s)	0.6	l/s
Flow rate 30 years (l/s)	0.9	l/s
Flow rate 100 years (l/s)	1.2	l/s
Flow rate 200 years (l/s)	1.4	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

APPENDIX F: PROPOSED DRAINAGE STRATEGY PLANS AND PROPOSED CATCHMENT PLAN

- INVERT LEVELS AND POSITIONS OF EXISTING DRAINS / CHAMBERS / SEWERS WHERE NEW CONNECTIONS ARE TO BE MADE MUST BE CHECKED AND CONFIRMED TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORKS.
2. ALL DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY, THE ENVIRONMENT AGENCY AND IN CONJUNCTION WITH ALL RELEVANT BRITISH STANDARDS, CODES OF PRACTICE AND 'SEWERS FOR ADOPTION' 7TH EDITION AND ANY ADDENDUMS AS APPROPRIATE.
3. ALL DRAINAGE SHALL COMPLY WITH THE TYPICAL DETAILS AND THE REQUIREMENTS OF BS EN 752 AND PART H OF THE BUILDING REGULATIONS.
4. ANY PART OF THE EXISTING DRAINAGE SYSTEM TO BE RETAINED AS PART OF THE NEW SCHEME SHALL BE CLEANED AND INSPECTED. ANY STRUCTURAL DEFECTS SHALL BE REPAIRED USING APPROPRIATE AND APPROVED MEANS.
5. FOR SETTING-OUT DIMENSIONS OF SVP'S, RWP'S ETC, REFER TO ARCHITECT'S OR MECHANICAL ENGINEER'S DRAWINGS. POSITIONS SHOWN ARE INDICATIVE AND SUBJECT TO FINAL DESIGN.
6. ALL FOUL AND RWP CONNECTIONS SHALL BE 100MM DIAMETER UNLESS OTHERWISE SPECIFIED.
7. ALL PRECAST CONCRETE UNITS USED IN THE DRAINAGE WORKS SHALL BE MANUFACTURED USING SULPHATE RESISTING CEMENT.
8. MANHOLE COVERS AND FRAMES SHALL BE TO BS EN 124 AND SHALL BE KITEMARKED. COVERS AND FRAMES SHALL BE HEAVY DUTY D400 IN CARRIAGEWAYS AND VEHICULAR AREAS AND MEDIAN DUTY B125 IN FOOTWAYS AND SOFT LANDSCAPING. IN BLOCKED/CONCRETE PAVED AREAS COVERS SHALL BE RECESSED FABRICATED STEEL. ALL RECESSED COVERS SHALL IN ACCORDANCE WITH THE FACTA ASSOCIATION GRADINGS.
9. COVER LEVELS ARE TO BE ADJUSTED LOCALLY TO SUIT FINISHED GROUND LEVELS.
10. AT LEAST ONE SOIL PIPE AT THE HEAD OF EACH FOUL RUN SHALL LEAVE VENT TO THE ATMOSPHERE.
11. EXISTING DRAINAGE TO BE REMOVED IS TO BE BROKEN OUT TO BED LEVEL AND VOID BACKFILLED WITH GRANULAR MATERIAL, COMPACTED IN LAYERS NOT EXCEEDING 250MM.
12. ALL DRAIN RUNS FROM SVP'S, STUB STACKS OR FW GULLIES TO BE LAID AT 1:40 GRADIENT UNLESS OTHERWISE STATED. ALL RWPS TO BE LAID 1:80 MIN UNLESS OTHERWISE STATED.
13. ALL MANHOLES / INSPECTION CHAMBERS IN BLOCK PAVED AREAS, TO HAVE RECESSED COVERS. MH COVERS IN PAVED AREAS TO HAVE COVER & FRAME ORIENTED 'SQUARE' WITH PAVING TO MINIMISE CUT SLABS OR BLOCKS.
14. ALL PRIVATE DRAINAGE TO BE LAID TO LEVELS SHOWN USING FLEXIBLY JOINTED PIPES, EITHER UPVC TO BS 4660 AND BS 5481 OR VITRIFIED CLAYWARE TO BS EN 295. PIPES BELOW STRUCTURAL BUILDING SLABS OR BASEMENTS SHALL BE CAST IRON TO BS 437.
15. RODDING EYES, ETC ARE TO BE LAID TO MANUFACTURERS MINIMUM COVER AND DEPTH TO ALLOW ADEQUATE FALL FROM ADJOINING UNIT.
16. ALL PROPOSED TREES TO HAVE APPROPRIATE TREE BARRIER DETAILS LINKING PITS TO ENSURE ROOTS ARE DIRECTED AWAY FROM DRAINAGE.
17. WHERE NEW SEWERS ARE CONSTRUCTED WITHIN 5M OF A NEW OR EXISTING TREE THE SEWER SHALL BE CONCRETE ENCASED AGAINST ROOT INTRUSION. REFER TO DRAINAGE DETAILS.
18. ALL NEW DRAINAGE TO BE JETTED AND CCTV SURVEYED ON COMPLETION. CONTRACTOR TO MAKE SURE THAT THE DRAINAGE IS FULLY OPERATIONAL. REFER TO DRAINAGE MAINTENANCE MANUAL FOR MAINTENANCE DETAILS.
19. CDM NOTE: ALL PIPEWORK, SILT TRAPS, CATCHPITS AND TRAPPED GULLIES TO BE REGULARLY INSPECTED EVERY THREE MONTHS AND CLEARED OUT ON A REGULAR FREQUENCY FOR THE FIRST NINE MONTHS. AFTER THIS PERIOD THE FREQUENCY CAN BE REDUCED TO EVERY SIX MONTHS. POROUS SURFACE TO BE REGULARLY SWEEPED THREE TIMES A YEAR TO REMOVE THE SILT.
20. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT CONSBEEB DRAWINGS.
21. HEALTH AND SAFETY: THE WORKS SHALL BE CARRIED OUT BY SPECIALIST COMPETENT AND EXPERIENCED CONTRACTORS WHO ARE MEMBERS OF A RECOGNISED NATIONAL ORGANISATION. OPERATIVES SHALL HAVE RECEIVED FULL AND APPROPRIATE TRAINING FOR THE OPERATIONS THEY ARE TO UNDERTAKE. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH ALL PERTINENT HEALTH AND SAFETY REGULATIONS.

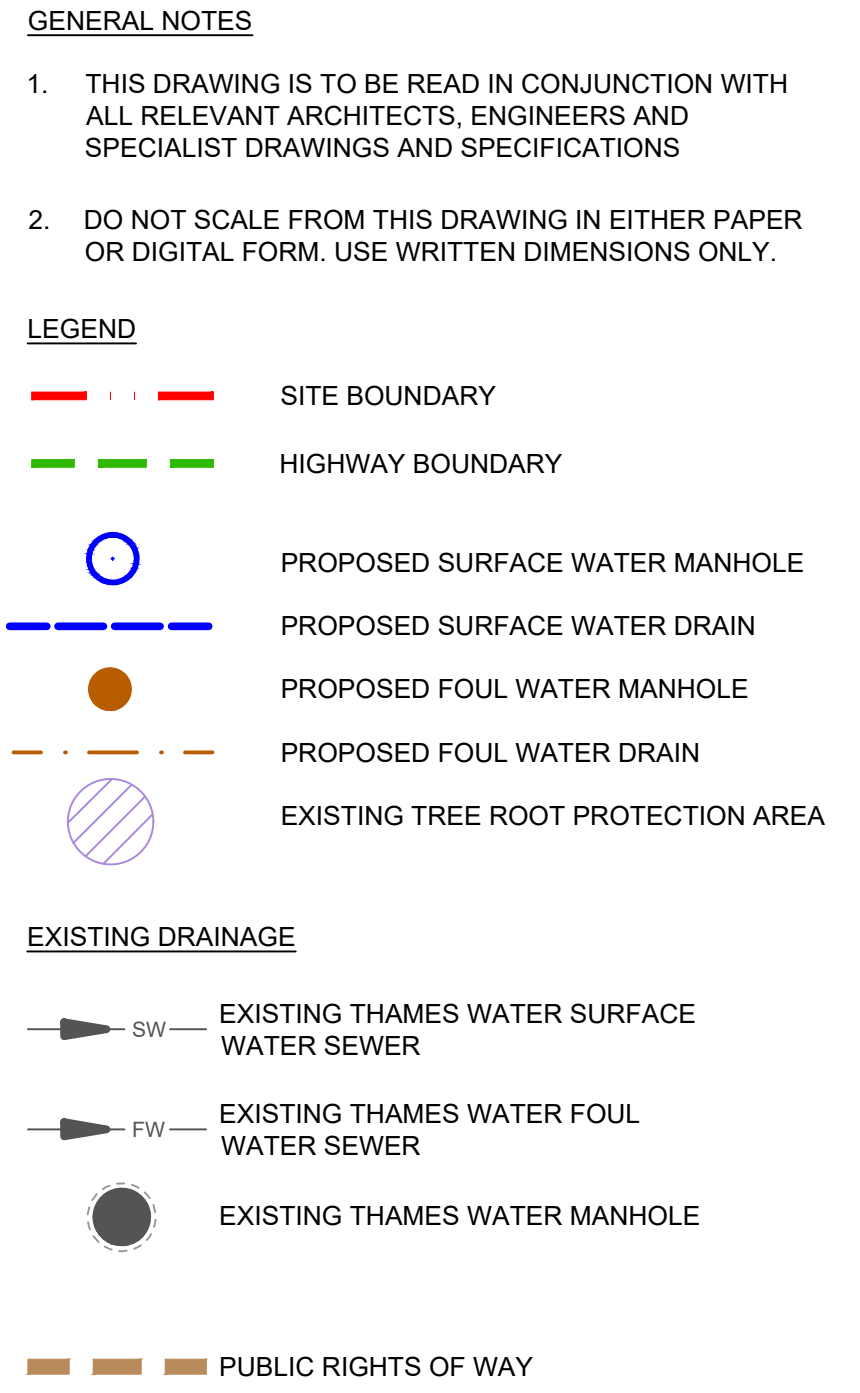
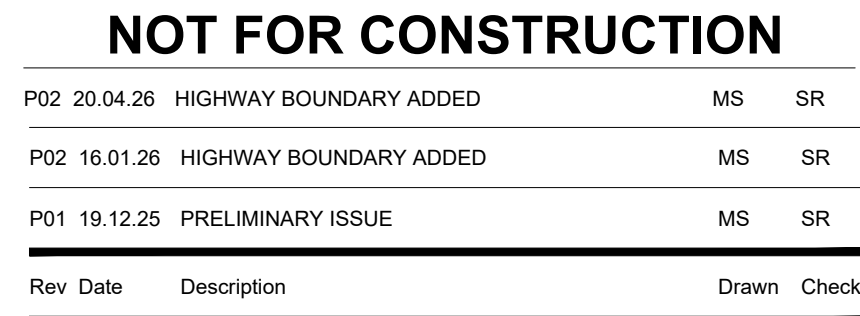


Diagram illustrating the relationship between primary and secondary reinforcement spacing:

- PRIMARY (EVERY 200mm)
- SECONDARY (EVERY 50mm)



Drawing Status S2 FOR INFORMATION	
Project THE HYDE, CRAWLEY	
Title DRAINAGE STRATEGY	
Date	DEC 2025
Scale	1:250@A1
Drawn	MS
Engineer	SR
Project No 251055	
Revision P03	
Drawing No 251055-CON-XX-00-DR-C-1000	



- GENERAL NOTES
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS
 2. DO NOT SCALE FROM THIS DRAWING IN EITHER PAPER OR DIGITAL FORM. USE WRITTEN DIMENSIONS ONLY.

LEGEND

--- SITE BOUNDARY

0 5 10 15
Meters 1:250

NOT FOR CONSTRUCTION

P01 22.04.26	PRELIMINARY ISSUE	MS	SR
Rev	Date	Description	Drawn Check

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Drawing Status	S2 FOR INFORMATION	Date	April 2026
Project	THE HYDE, CRAWLEY	Scale	1:250@A1
Drawn	MS	Engineer	SR
Title	Proposed Catchment Plan	Project No	251055
Drawing No	251055-CON-XX-00-DR-C-1201	Revision	P01

APPENDIX G: SURFACE WATER CALCULATIONS

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	100.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Outfall			66.970	450	524228.488	136705.464	0.460
SWMH01	0.020	5.00	67.150	1200	524225.777	136703.318	0.600
SWMH02	0.040	5.00	68.400	450	524171.294	136683.892	1.500
SWMH03	0.040	5.00	67.500	450	524196.847	136746.105	0.680
SWMH04	0.040	5.00	67.800	1200	524197.008	136701.025	1.150
SWMH05	0.040	5.00	68.500	1500	524186.228	136695.596	1.800

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.000	SWMH03	SWMH04	51.650	0.600	66.820	66.650	0.170	303.8	300	5.96	100.0
1.000	SWMH02	SWMH05	57.843	0.600	66.900	66.700	0.200	289.2	300	6.05	100.0
1.001	SWMH01	Outfall	3.458	0.600	66.550	66.510	0.040	86.5	300	6.74	100.0
1.001_1	SWMH04	SWMH01	28.860	0.600	66.650	66.550	0.100	288.6	375	6.70	100.0
1.001_2	SWMH05	SWMH04	12.070	0.600	66.700	66.650	0.050	241.4	300	6.25	100.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
2.000	0.897	63.4	20.2	0.380	0.850	0.040	0.0	116	0.800
1.000	0.919	65.0	20.2	1.200	1.500	0.040	0.0	115	0.814
1.001	1.692	119.6	91.1	0.300	0.160	0.180	0.0	197	1.856
1.001_1	1.061	117.2	81.0	0.775	0.225	0.160	0.0	230	1.142
1.001_2	1.007	71.2	40.5	1.500	0.850	0.080	0.0	162	1.038

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	1.000	Drain Down Time (mins)	1440	Check Discharge Rate(s)	x
Rainfall Events	Singular	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0	Check Discharge Volume	x
Summer CV	1.000	Skip Steady State	x	Starting Level (m)			

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	0	10

Node SWMH01 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	66.550	Product Number	CTL-SHE-0073-2000-0600-2000
Design Depth (m)	0.600	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node SWMH01 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	66.550
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	692

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	170.0	170.0	0.400	170.0	188.5	0.401	0.0	188.5

Node SWMH01 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Width (m)	6.000	Depth (m)	0.500
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	66.550	Length (m)	30.000	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	768	Slope (1:X)	60.0		

Node SWMH04 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Width (m)	6.000	Depth (m)	0.500
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	66.650	Length (m)	60.000	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	400	Slope (1:X)	150.0		

Node SWMH03 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	66.820
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	368

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	160.0	160.0	0.400	160.0	177.9	0.401	0.0	177.9

Results for 100 year +45% CC +10% Q Critical Storm Duration. Lowest mass balance: 72.64%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Outfall	280	66.537	0.027	2.0	0.0000	0.0000	OK
180 minute winter	SWMH01	128	67.150	0.600	54.2	65.4191	0.0000	FLOOD RISK
480 minute winter	SWMH02	464	67.149	0.249	4.0	0.0397	0.0000	OK
480 minute winter	SWMH03	464	67.150	0.330	8.8	50.1393	0.0000	SURCHARGED
480 minute winter	SWMH04	464	67.149	0.499	13.5	32.9298	0.0000	SURCHARGED
480 minute winter	SWMH05	464	67.150	0.449	8.0	0.7943	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	120.2
480 minute winter	SWMH02	1.000	SWMH05	4.0	0.360	0.062	3.8476	
480 minute winter	SWMH03	2.000	SWMH04	-5.3	0.200	-0.083	3.6372	
480 minute winter	SWMH04	1.001_1	SWMH01	9.6	0.652	0.082	3.1832	
480 minute winter	SWMH05	1.001_2	SWMH04	7.6	0.452	0.107	0.8500	

Results for 100 year +45% CC +10% Q 15 minute summer. 1455 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Outfall	280	66.537	0.027	2.0	0.0000	0.0000	OK
15 minute summer	SWMH01	42	66.858	0.308	109.0	50.1328	0.0000	FLOOD RISK
15 minute summer	SWMH02	10	67.057	0.157	36.6	0.0249	0.0000	OK
15 minute summer	SWMH03	14	66.907	0.087	36.6	13.2037	0.0000	OK
15 minute summer	SWMH04	12	66.893	0.243	107.1	8.2839	0.0000	OK
15 minute summer	SWMH05	11	66.973	0.273	72.5	0.4818	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	68.8
15 minute summer	SWMH02	1.000	SWMH05	35.9	0.690	0.552	3.0149	
15 minute summer	SWMH03	2.000	SWMH04	11.6	0.363	0.184	1.9428	
15 minute summer	SWMH04	1.001_1	SWMH01	94.2	1.827	0.804	2.2997	
15 minute summer	SWMH05	1.001_2	SWMH04	70.4	1.123	0.989	0.7710	

Results for 100 year +45% CC +10% Q 15 minute winter. 1455 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Outfall	281	66.537	0.027	2.0	0.0000	0.0000	OK
15 minute winter	SWMH01	42	66.859	0.309	104.2	50.2090	0.0000	FLOOD RISK
15 minute winter	SWMH02	10	67.051	0.151	34.4	0.0240	0.0000	OK
15 minute winter	SWMH03	15	66.903	0.083	34.4	12.5719	0.0000	OK
15 minute winter	SWMH04	12	66.887	0.237	101.2	7.8975	0.0000	OK
15 minute winter	SWMH05	11	66.959	0.259	67.9	0.4578	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	68.9
15 minute winter	SWMH02	1.000	SWMH05	33.5	0.670	0.516	2.8843	
15 minute winter	SWMH03	2.000	SWMH04	10.8	0.340	0.170	1.8897	
15 minute winter	SWMH04	1.001_1	SWMH01	90.2	1.793	0.769	2.3053	
15 minute winter	SWMH05	1.001_2	SWMH04	65.8	1.084	0.924	0.7470	

Results for 100 year +45% CC +10% Q 30 minute summer. 1470 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	Outfall	500	66.537	0.027	2.0	0.0000	0.0000	OK
30 minute summer	SWMH01	33	66.921	0.371	104.8	60.3451	0.0000	FLOOD RISK
30 minute summer	SWMH02	18	67.051	0.151	33.8	0.0240	0.0000	OK
30 minute summer	SWMH03	37	66.922	0.102	33.8	15.4736	0.0000	OK
30 minute summer	SWMH04	31	66.921	0.271	106.3	10.2219	0.0000	OK
30 minute summer	SWMH05	19	66.959	0.259	67.5	0.4581	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	92.9
30 minute summer	SWMH02	1.000	SWMH05	33.7	0.672	0.519	2.8899	
30 minute summer	SWMH03	2.000	SWMH04	12.9	0.338	0.204	2.2611	
30 minute summer	SWMH04	1.001_1	SWMH01	89.3	1.476	0.762	2.8142	
30 minute summer	SWMH05	1.001_2	SWMH04	65.6	1.083	0.922	0.7618	

Results for 100 year +45% CC +10% Q 30 minute winter. 1470 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	Outfall	499	66.537	0.027	2.0	0.0000	0.0000	OK
30 minute winter	SWMH01	33	66.921	0.371	87.6	60.3016	0.0000	FLOOD RISK
30 minute winter	SWMH02	18	67.034	0.134	27.3	0.0212	0.0000	OK
30 minute winter	SWMH03	37	66.922	0.102	27.3	15.4565	0.0000	OK
30 minute winter	SWMH04	32	66.921	0.271	87.3	10.2640	0.0000	OK
30 minute winter	SWMH05	19	66.927	0.227	54.5	0.4011	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	92.9
30 minute winter	SWMH02	1.000	SWMH05	27.2	0.628	0.419	2.5162	
30 minute winter	SWMH03	2.000	SWMH04	11.7	0.311	0.185	2.2642	
30 minute winter	SWMH04	1.001_1	SWMH01	74.9	1.427	0.639	2.8190	
30 minute winter	SWMH05	1.001_2	SWMH04	53.4	0.979	0.750	0.7407	

Results for 100 year +45% CC +10% Q 60 minute summer. 1500 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	Outfall	764	66.537	0.027	2.0	0.0000	0.0000	OK
60 minute summer	SWMH01	60	67.001	0.451	84.5	65.2354	0.0000	FLOOD RISK
60 minute summer	SWMH02	33	67.029	0.129	25.8	0.0206	0.0000	OK
60 minute summer	SWMH03	64	66.994	0.174	25.8	26.5096	0.0000	OK
60 minute summer	SWMH04	68	66.993	0.343	84.9	16.2999	0.0000	OK
60 minute summer	SWMH05	68	66.993	0.293	51.6	0.5175	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	119.2
60 minute summer	SWMH02	1.000	SWMH05	25.8	0.610	0.396	2.5753	
60 minute summer	SWMH03	2.000	SWMH04	12.9	0.312	0.203	2.9143	
60 minute summer	SWMH04	1.001_1	SWMH01	72.5	1.078	0.619	3.1172	
60 minute summer	SWMH05	1.001_2	SWMH04	50.2	0.916	0.705	0.8473	

Results for 100 year +45% CC +10% Q 60 minute winter. 1500 minute analysis at 1 minute timestep. Mass balance: 91.83%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	Outfall	664	66.537	0.027	2.0	0.0000	0.0000	OK
60 minute winter	SWMH01	56	67.087	0.537	65.4	65.3414	0.0000	FLOOD RISK
60 minute winter	SWMH02	33	67.008	0.108	18.6	0.0172	0.0000	OK
60 minute winter	SWMH03	63	66.976	0.156	18.6	23.7146	0.0000	OK
60 minute winter	SWMH04	58	66.981	0.331	63.7	15.1989	0.0000	OK
60 minute winter	SWMH05	58	66.988	0.288	37.2	0.5093	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	109.6
60 minute winter	SWMH02	1.000	SWMH05	18.6	0.557	0.286	2.4641	
60 minute winter	SWMH03	2.000	SWMH04	11.3	0.295	0.179	2.7732	
60 minute winter	SWMH04	1.001_1	SWMH01	56.3	1.126	0.481	3.0784	
60 minute winter	SWMH05	1.001_2	SWMH04	36.6	0.802	0.514	0.8445	

Results for 100 year +45% CC +10% Q 120 minute summer. 1560 minute analysis at 2 minute timestep. Mass balance: 81.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	Outfall	730	66.537	0.027	2.0	0.0000	0.0000	OK
120 minute summer	SWMH01	88	67.103	0.553	47.9	65.3610	0.0000	FLOOD RISK
120 minute summer	SWMH02	88	67.002	0.102	16.3	0.0162	0.0000	OK
120 minute summer	SWMH03	84	66.988	0.168	20.0	25.5737	0.0000	OK
120 minute summer	SWMH04	90	66.989	0.339	55.9	15.9422	0.0000	OK
120 minute summer	SWMH05	114	67.003	0.303	32.6	0.5354	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	115.2
120 minute summer	SWMH02	1.000	SWMH05	16.3	0.535	0.251	2.6127	
120 minute summer	SWMH03	2.000	SWMH04	-10.6	0.265	-0.167	2.8672	
120 minute summer	SWMH04	1.001_1	SWMH01	46.5	0.917	0.397	3.1056	
120 minute summer	SWMH05	1.001_2	SWMH04	30.8	0.747	0.432	0.8499	

Results for 100 year +45% CC +10% Q 120 minute winter. 1560 minute analysis at 2 minute timestep. Mass balance: 80.41%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	Outfall	712	66.537	0.027	2.0	0.0000	0.0000	OK
120 minute winter	SWMH01	96	67.143	0.593	59.1	65.4107	0.0000	FLOOD RISK
120 minute winter	SWMH02	94	67.004	0.104	11.2	0.0166	0.0000	OK
120 minute winter	SWMH03	96	66.987	0.167	17.8	25.3561	0.0000	OK
120 minute winter	SWMH04	88	66.987	0.337	55.1	15.7737	0.0000	OK
120 minute winter	SWMH05	100	67.002	0.302	22.4	0.5343	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	113.5
120 minute winter	SWMH02	1.000	SWMH05	11.2	0.490	0.172	2.6645	
120 minute winter	SWMH03	2.000	SWMH04	13.4	0.255	0.212	2.8563	
120 minute winter	SWMH04	1.001_1	SWMH01	57.4	0.950	0.490	3.0996	
120 minute winter	SWMH05	1.001_2	SWMH04	20.6	0.684	0.290	0.8499	

Results for 100 year +45% CC +10% Q 180 minute summer. 1620 minute analysis at 4 minute timestep. Mass balance: 77.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute summer	Outfall	788	66.537	0.027	2.0	0.0000	0.0000	OK
180 minute summer	SWMH01	132	67.119	0.569	51.6	65.3813	0.0000	FLOOD RISK
180 minute summer	SWMH02	132	67.004	0.104	12.0	0.0166	0.0000	OK
180 minute summer	SWMH03	116	66.994	0.174	18.0	26.5315	0.0000	OK
180 minute summer	SWMH04	120	66.991	0.341	41.7	16.1206	0.0000	OK
180 minute summer	SWMH05	120	67.000	0.300	24.0	0.5299	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute summer	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	119.9
180 minute summer	SWMH02	1.000	SWMH05	12.0	0.476	0.185	2.5698	
180 minute summer	SWMH03	2.000	SWMH04	11.4	0.235	0.180	2.9154	
180 minute summer	SWMH04	1.001_1	SWMH01	50.1	0.836	0.428	3.1114	
180 minute summer	SWMH05	1.001_2	SWMH04	21.9	0.650	0.307	0.8496	

Results for 100 year +45% CC +10% Q 180 minute winter. 1620 minute analysis at 4 minute timestep. Mass balance: 77.33%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Outfall	788	66.537	0.027	2.0	0.0000	0.0000	OK
180 minute winter	SWMH01	128	67.150	0.600	54.2	65.4191	0.0000	FLOOD RISK
180 minute winter	SWMH02	120	66.998	0.098	8.2	0.0156	0.0000	OK
180 minute winter	SWMH03	132	66.988	0.168	14.3	25.6244	0.0000	OK
180 minute winter	SWMH04	132	66.988	0.338	37.2	15.8625	0.0000	OK
180 minute winter	SWMH05	152	66.995	0.295	16.4	0.5215	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	120.2
180 minute winter	SWMH02	1.000	SWMH05	8.2	0.447	0.126	2.5228	
180 minute winter	SWMH03	2.000	SWMH04	11.2	0.232	0.177	2.8698	
180 minute winter	SWMH04	1.001_1	SWMH01	52.9	0.857	0.451	3.1029	
180 minute winter	SWMH05	1.001_2	SWMH04	15.5	0.610	0.218	0.8484	

Results for 100 year +45% CC +10% Q 240 minute summer. 1680 minute analysis at 4 minute timestep. Mass balance: 74.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	Outfall	108	66.537	0.027	2.0	0.0000	0.0000	OK
240 minute summer	SWMH01	168	67.100	0.550	49.0	65.3572	0.0000	FLOOD RISK
240 minute summer	SWMH02	156	67.009	0.109	10.1	0.0173	0.0000	OK
240 minute summer	SWMH03	152	66.988	0.168	16.1	25.6202	0.0000	OK
240 minute summer	SWMH04	156	66.993	0.343	41.2	16.2794	0.0000	OK
240 minute summer	SWMH05	156	67.011	0.311	20.1	0.5499	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	124.4
240 minute summer	SWMH02	1.000	SWMH05	10.0	0.439	0.154	2.7014	
240 minute summer	SWMH03	2.000	SWMH04	10.7	0.219	0.170	2.8696	
240 minute summer	SWMH04	1.001_1	SWMH01	47.9	0.786	0.408	3.1165	
240 minute summer	SWMH05	1.001_2	SWMH04	18.3	0.586	0.256	0.8500	

Results for 100 year +45% CC +10% Q 240 minute winter. 1680 minute analysis at 4 minute timestep. Mass balance: 73.98%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Outfall	832	66.537	0.027	2.0	0.0000	0.0000	OK
240 minute winter	SWMH01	160	67.114	0.564	46.8	65.3746	0.0000	FLOOD RISK
240 minute winter	SWMH02	164	67.001	0.101	6.7	0.0161	0.0000	OK
240 minute winter	SWMH03	152	66.992	0.172	12.7	26.1610	0.0000	OK
240 minute winter	SWMH04	168	66.990	0.340	38.0	15.9702	0.0000	OK
240 minute winter	SWMH05	192	67.007	0.307	15.8	0.5424	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	123.6
240 minute winter	SWMH02	1.000	SWMH05	6.7	0.420	0.103	2.5500	
240 minute winter	SWMH03	2.000	SWMH04	13.4	0.222	0.212	2.8968	
240 minute winter	SWMH04	1.001_1	SWMH01	45.6	0.779	0.389	3.1065	
240 minute winter	SWMH05	1.001_2	SWMH04	14.5	0.561	0.204	0.8500	

Results for 100 year +45% CC +10% Q 360 minute summer. 1800 minute analysis at 8 minute timestep. Mass balance: 72.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	Outfall	960	66.537	0.027	2.0	0.0000	0.0000	OK
360 minute summer	SWMH01	208	67.132	0.582	42.8	65.3973	0.0000	FLOOD RISK
360 minute summer	SWMH02	208	67.006	0.106	7.6	0.0168	0.0000	OK
360 minute summer	SWMH03	216	66.988	0.168	13.5	25.5563	0.0000	OK
360 minute summer	SWMH04	216	66.992	0.342	38.7	16.2204	0.0000	OK
360 minute summer	SWMH05	216	67.000	0.300	15.1	0.5307	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	134.6
360 minute summer	SWMH02	1.000	SWMH05	9.3	0.394	0.143	2.6146	
360 minute summer	SWMH03	2.000	SWMH04	9.3	0.200	0.147	2.8663	
360 minute summer	SWMH04	1.001_1	SWMH01	42.1	0.715	0.359	3.1146	
360 minute summer	SWMH05	1.001_2	SWMH04	14.1	0.498	0.198	0.8497	

Results for 100 year +45% CC +10% Q 360 minute winter. 1800 minute analysis at 8 minute timestep. Mass balance: 72.64%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	Outfall	952	66.537	0.027	2.0	0.0000	0.0000	OK
360 minute winter	SWMH01	304	67.046	0.496	46.5	65.2917	0.0000	FLOOD RISK
360 minute winter	SWMH02	256	66.987	0.087	4.9	0.0139	0.0000	OK
360 minute winter	SWMH03	224	66.985	0.165	11.0	25.1791	0.0000	OK
360 minute winter	SWMH04	224	66.991	0.341	19.9	16.0607	0.0000	OK
360 minute winter	SWMH05	224	66.995	0.295	11.5	0.5216	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	134.5
360 minute winter	SWMH02	1.000	SWMH05	8.1	0.392	0.125	2.4863	
360 minute winter	SWMH03	2.000	SWMH04	7.8	0.212	0.123	2.8473	
360 minute winter	SWMH04	1.001_1	SWMH01	45.4	0.693	0.388	3.1094	
360 minute winter	SWMH05	1.001_2	SWMH04	12.0	0.500	0.168	0.8485	

Results for 100 year +45% CC +10% Q 480 minute summer. 1920 minute analysis at 8 minute timestep. Mass balance: 73.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute summer	Outfall	1080	66.537	0.027	2.0	0.0000	0.0000	OK
480 minute summer	SWMH01	312	67.066	0.516	48.1	65.3157	0.0000	FLOOD RISK
480 minute summer	SWMH02	272	66.996	0.096	6.0	0.0153	0.0000	OK
480 minute summer	SWMH03	280	66.989	0.169	10.8	25.7221	0.0000	OK
480 minute summer	SWMH04	280	66.993	0.343	41.0	16.2455	0.0000	OK
480 minute summer	SWMH05	272	67.005	0.305	12.0	0.5398	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute summer	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	145.5
480 minute summer	SWMH02	1.000	SWMH05	6.9	0.372	0.107	2.6005	
480 minute summer	SWMH03	2.000	SWMH04	13.0	0.210	0.206	2.8747	
480 minute summer	SWMH04	1.001_1	SWMH01	46.5	0.649	0.397	3.1154	
480 minute summer	SWMH05	1.001_2	SWMH04	11.6	0.446	0.163	0.8500	

Results for 100 year +45% CC +10% Q 480 minute winter. 1920 minute analysis at 8 minute timestep. Mass balance: 99.96%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	Outfall	192	66.537	0.027	2.0	0.0000	0.0000	OK
480 minute winter	SWMH01	464	67.149	0.599	11.4	65.4187	0.0000	FLOOD RISK
480 minute winter	SWMH02	464	67.149	0.249	4.0	0.0397	0.0000	OK
480 minute winter	SWMH03	464	67.150	0.330	8.8	50.1393	0.0000	SURCHARGED
480 minute winter	SWMH04	464	67.149	0.499	13.5	32.9298	0.0000	SURCHARGED
480 minute winter	SWMH05	464	67.150	0.449	8.0	0.7943	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	195.3
480 minute winter	SWMH02	1.000	SWMH05	4.0	0.360	0.062	3.8476	
480 minute winter	SWMH03	2.000	SWMH04	-5.3	0.200	-0.083	3.6372	
480 minute winter	SWMH04	1.001_1	SWMH01	9.6	0.652	0.082	3.1832	
480 minute winter	SWMH05	1.001_2	SWMH04	7.6	0.452	0.107	0.8500	

Results for 100 year +45% CC +10% Q 600 minute summer. 2040 minute analysis at 15 minute timestep. Mass balance: 74.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute summer	Outfall	1215	66.537	0.027	2.0	0.0000	0.0000	OK
600 minute summer	SWMH01	405	67.043	0.493	18.9	65.2877	0.0000	FLOOD RISK
600 minute summer	SWMH02	375	66.987	0.087	4.9	0.0139	0.0000	OK
600 minute summer	SWMH03	345	66.990	0.170	9.6	25.8015	0.0000	OK
600 minute summer	SWMH04	345	66.992	0.342	43.9	16.2057	0.0000	OK
600 minute summer	SWMH05	345	67.001	0.301	13.7	0.5311	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute summer	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	156.6
600 minute summer	SWMH02	1.000	SWMH05	10.6	0.360	0.162	2.5033	
600 minute summer	SWMH03	2.000	SWMH04	6.5	0.183	0.102	2.8787	
600 minute summer	SWMH04	1.001_1	SWMH01	-36.1	0.653	-0.308	3.1141	
600 minute summer	SWMH05	1.001_2	SWMH04	9.3	0.414	0.130	0.8497	

Results for 100 year +45% CC +10% Q 600 minute winter. 2040 minute analysis at 15 minute timestep. Mass balance: 73.10%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	Outfall	240	66.537	0.027	2.0	0.0000	0.0000	OK
600 minute winter	SWMH01	360	67.103	0.553	30.2	65.3619	0.0000	FLOOD RISK
600 minute winter	SWMH02	390	66.984	0.084	4.9	0.0133	0.0000	OK
600 minute winter	SWMH03	405	66.983	0.163	7.9	24.7665	0.0000	OK
600 minute winter	SWMH04	375	66.987	0.337	25.3	15.7651	0.0000	OK
600 minute winter	SWMH05	345	67.000	0.300	9.5	0.5298	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	155.3
600 minute winter	SWMH02	1.000	SWMH05	7.5	0.337	0.115	2.4424	
600 minute winter	SWMH03	2.000	SWMH04	8.4	0.193	0.132	2.8265	
600 minute winter	SWMH04	1.001_1	SWMH01	29.7	0.585	0.253	3.0993	
600 minute winter	SWMH05	1.001_2	SWMH04	8.8	0.419	0.124	0.8496	

Results for 100 year +45% CC +10% Q 720 minute summer. 2160 minute analysis at 15 minute timestep. Mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute summer	Outfall	1815	66.537	0.027	2.0	0.0000	0.0000	OK
720 minute summer	SWMH01	645	67.147	0.597	11.0	65.4162	0.0000	FLOOD RISK
720 minute summer	SWMH02	645	67.147	0.247	4.3	0.0393	0.0000	OK
720 minute summer	SWMH03	645	67.147	0.327	9.5	49.8291	0.0000	SURCHARGED
720 minute summer	SWMH04	645	67.147	0.497	13.0	32.7085	0.0000	SURCHARGED
720 minute summer	SWMH05	645	67.147	0.447	8.6	0.7907	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute summer	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	216.8
720 minute summer	SWMH02	1.000	SWMH05	4.3	0.337	0.066	3.8344	
720 minute summer	SWMH03	2.000	SWMH04	-5.9	0.182	-0.094	3.6372	
720 minute summer	SWMH04	1.001_1	SWMH01	9.2	0.624	0.079	3.1832	
720 minute summer	SWMH05	1.001_2	SWMH04	8.1	0.393	0.114	0.8500	

Results for 100 year +45% CC +10% Q 720 minute winter. 2160 minute analysis at 15 minute timestep. Mass balance: 74.61%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	Outfall	1305	66.537	0.027	2.0	0.0000	0.0000	OK
720 minute winter	SWMH01	420	67.082	0.532	57.4	65.3353	0.0000	FLOOD RISK
720 minute winter	SWMH02	495	66.985	0.085	3.5	0.0135	0.0000	OK
720 minute winter	SWMH03	435	66.981	0.161	5.3	24.5372	0.0000	OK
720 minute winter	SWMH04	495	66.981	0.331	28.1	15.2106	0.0000	OK
720 minute winter	SWMH05	495	66.990	0.290	10.2	0.5120	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	165.4
720 minute winter	SWMH02	1.000	SWMH05	6.5	0.321	0.100	2.4885	
720 minute winter	SWMH03	2.000	SWMH04	9.4	0.192	0.148	2.8149	
720 minute winter	SWMH04	1.001_1	SWMH01	56.3	0.573	0.481	3.0788	
720 minute winter	SWMH05	1.001_2	SWMH04	11.6	0.410	0.163	0.8454	

Results for 100 year +45% CC +10% Q 960 minute summer. 2400 minute analysis at 15 minute timestep. Mass balance: 76.70%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute summer	Outfall	1545	66.537	0.027	2.0	0.0000	0.0000	OK
960 minute summer	SWMH01	540	67.031	0.481	36.2	65.2728	0.0000	FLOOD RISK
960 minute summer	SWMH02	525	66.983	0.083	4.0	0.0131	0.0000	OK
960 minute summer	SWMH03	570	66.982	0.162	7.3	24.6575	0.0000	OK
960 minute summer	SWMH04	555	66.984	0.334	48.3	15.4586	0.0000	OK
960 minute summer	SWMH05	555	66.984	0.284	10.7	0.5017	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute summer	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	184.7
960 minute summer	SWMH02	1.000	SWMH05	8.0	0.326	0.123	2.3936	
960 minute summer	SWMH03	2.000	SWMH04	8.9	0.174	0.141	2.8210	
960 minute summer	SWMH04	1.001_1	SWMH01	-35.3	0.577	-0.301	3.0880	
960 minute summer	SWMH05	1.001_2	SWMH04	7.1	0.376	0.100	0.8414	

Results for 100 year +45% CC +10% Q 960 minute winter. 2400 minute analysis at 15 minute timestep. Mass balance: 77.40%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	Outfall	1530	66.537	0.027	2.0	0.0000	0.0000	OK
960 minute winter	SWMH01	600	67.010	0.460	26.7	65.2475	0.0000	FLOOD RISK
960 minute winter	SWMH02	555	66.989	0.089	3.0	0.0141	0.0000	OK
960 minute winter	SWMH03	570	66.992	0.172	5.0	26.2210	0.0000	OK
960 minute winter	SWMH04	570	66.988	0.337	39.9	15.7785	0.0000	OK
960 minute winter	SWMH05	615	67.001	0.301	6.1	0.5325	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	185.2
960 minute winter	SWMH02	1.000	SWMH05	4.2	0.303	0.064	2.5194	
960 minute winter	SWMH03	2.000	SWMH04	7.6	0.183	0.120	2.8998	
960 minute winter	SWMH04	1.001_1	SWMH01	-34.6	0.537	-0.295	3.0998	
960 minute winter	SWMH05	1.001_2	SWMH04	10.3	0.371	0.145	0.8498	

Results for 100 year +45% CC +10% Q 1440 minute summer. 2880 minute analysis at 30 minute timestep. Mass balance: 99.98%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	Outfall	630	66.537	0.027	2.0	0.0000	0.0000	OK
1440 minute summer	SWMH01	1050	67.133	0.583	7.1	65.3988	0.0000	FLOOD RISK
1440 minute summer	SWMH02	1050	67.133	0.233	2.6	0.0371	0.0000	OK
1440 minute summer	SWMH03	1050	67.133	0.313	5.2	47.6832	0.0000	SURCHARGED
1440 minute summer	SWMH04	1050	67.133	0.483	11.4	31.1695	0.0000	SURCHARGED
1440 minute summer	SWMH05	1050	67.133	0.433	5.2	0.7658	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	266.6
1440 minute summer	SWMH02	1.000	SWMH05	2.6	0.290	0.040	3.7374	
1440 minute summer	SWMH03	2.000	SWMH04	-3.0	0.176	-0.048	3.6372	
1440 minute summer	SWMH04	1.001_1	SWMH01	6.0	0.473	0.051	3.1832	
1440 minute summer	SWMH05	1.001_2	SWMH04	4.9	0.361	0.069	0.8500	

Results for 100 year +45% CC +10% Q 1440 minute winter. 2880 minute analysis at 30 minute timestep. Mass balance: 81.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	Outfall	1950	66.537	0.027	2.0	0.0000	0.0000	OK
1440 minute winter	SWMH01	810	67.006	0.456	28.1	65.2420	0.0000	FLOOD RISK
1440 minute winter	SWMH02	840	66.977	0.077	4.4	0.0122	0.0000	OK
1440 minute winter	SWMH03	810	66.964	0.144	2.4	21.9513	0.0000	OK
1440 minute winter	SWMH04	810	66.969	0.319	28.4	14.1008	0.0000	OK
1440 minute winter	SWMH05	840	66.969	0.269	5.7	0.4757	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	SWMH01	1.001	Outfall	2.0	0.616	0.017	0.0112	220.5
1440 minute winter	SWMH02	1.000	SWMH05	4.5	0.274	0.069	2.3364	
1440 minute winter	SWMH03	2.000	SWMH04	4.4	0.179	0.070	2.6836	
1440 minute winter	SWMH04	1.001_1	SWMH01	27.7	0.489	0.236	3.0328	
1440 minute winter	SWMH05	1.001_2	SWMH04	5.3	0.343	0.074	0.8272	

APPENDIX H: SUDS MAINTENANCE STRATEGY

INTRODUCTION

The purpose of this document is to outline the proposed maintenance schedule for the drainage system and all SuDS features for the proposed development at the Hyde, Crawley.

The maintenance schedule set out here complies with the CIRIA SuDS Manual (C753), which is identified as providing current best practice in the industry. The report does not replace manufacturers' requirements and these should be followed for each product in addition to the information in this document.

For the proposed extents of SuDS features on a plan drawing, please refer to the separate drainage layout plans and drainage strategy report.

ORGANISATION RESPONSIBLE

The client, Oakford Development Limited, will be responsible for undertaking maintenance of the proposed drainage for the whole life of the site.

CONVENTIONAL DRAINAGE SYSTEMS

Gullies, Silt Traps, Manholes, Catchpits & Pipework

On completion of construction, the internal surfaces of the sewers and manholes shall be thoroughly cleansed to remove all deleterious matter, without such matter being passed forward into the existing sewers.

All trapped gullies, silt traps, manholes and catchpits are to be regularly inspected every three months and cleared out on a regular frequency for the first nine months. After this period, the frequency can be reduced to every six months.

All drainage runs will be inspected once a year. The system is to be jetted clear if/when necessary.

Permeable pavements

The pavement should be inspected regularly for clogging, litter, weeds and water ponding, preferably during and after heavy rainfall to check effective operation. Permeable pavements need to be regularly cleaned of silt and other sediments to preserve their infiltration capacity. The SuDS Manual indicates that sweeping once per year is sufficient for most sites, however the sweeping frequency should be adjusted to suit site specific conditions and should also be informed by annual inspection reports.

Care should be taken in adjusting vacuuming equipment to avoid removal of joining material. Any lost material should be replaced.

Table 1 outlines the proposed operation and maintenance regime for permeable pavements. This is adapted from The SuDS Manual (C753).

Table 1: Operation and maintenance requirements for permeable pavements

Maintenance Schedule	Required Action	Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall or reduced frequency as required, based on site- specification observations of clogging - pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediments
Occasional maintenance	Stabilise and mow contributing and advancement areas	As required
	Removal of weeds or management using glyphosphate applied directly into the weeds by an applicator rather than spraying	As required –once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required

	Remedial work to any depressions rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper structure by remedial sweeping.	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth- if required, take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

SuDS PROGRAMME

The proposed SuDS for the site will come online approximately Summer 2027.

The contractor should ensure that during the construction phase (or in any other phasing associated with the site coming online) that SuDS are not damaged by construction works.

OPERATION AND MAINTENANCE MANUAL RECORDS

Documents to be handed over

Conisbee will provide this document to Oakford Development Limited who will provide the document to the construction contractor, and Oakford Development Limited will also include it in the Operation and Maintenance Manual.

Oakford Development Limited will have copies of the drainage design drawings which show locations of the proposed SuDS and any 'as-builts' provided by the contractor.

Maintenance Records

Oakford Development Limited will be provided with the standard proforma in Appendix B of The SuDS Manual to enable them to record the outcomes of inspections.

APPENDIX I: THAMES WATER PRE-DEVELOPMENT ENQUIRY RESPONSE



Sam Rice

Conisbee
1 Offord Street
London
N1 1DH



14 January 2026

Pre-planning enquiry: Confirmation of sufficient capacity

Site Address: The Hyde, Rusper Road, Crawley, RH11 0LN

Dear Sam

Thank you for providing information on your development

Proposed site: The development of 7 general housing to the existing green space at the above site.

Proposed foul water: To discharge via gravity to Manhole TQ2436271A to the north of the site on the understanding that the existing foul water sewer downstream of TQ2436271A is a minimum of 150mm diameter.

Proposed surface water: No surface water sewer capacity check requested.

We have completed the assessment of the foul water flows and surface water run-off based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

Foul Water

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent foul water sewer network to serve your development.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.

Surface Water

In accordance with the Building Act 2000 Clause H3.3 and the National SuDS Standards, positive connection of surface water to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. Before we can consider your surface water needs, you'll need written approval from the lead local flood authority that you have followed the sequential approach to the disposal of surface water and considered all practical means.

National SuDS Standards, Standard 1.2: Runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:

priority 1: collected for non-potable use

priority 2: infiltrated to ground

priority 3: discharged to an above ground surface water body

priority 4: discharged to a surface water sewer, or another piped surface water drainage system

priority 5: discharged to a combined sewer

Note 1: priority 1 is the highest priority and priority 5 is the lowest.

Note 2: for the purposes of this standard, a combined sewer is a sewer intended to receive both foul sewage and surface runoff and does not include a sewer intended to receive only foul sewage, even if it has the capacity to accommodate additional flows or has an element of surface water in it already.

Where connection to the public sewerage network is required to manage surface water flows we will accept these flows at a discharge rate in line with the National SuDS Standards or that stated within the sites planning approval.

No surface water capacity check.

Please see our [FAQ's leaflet](#) for additional information.

Capacity at STW?

The receiving network is served by Crawley STW and there isn't a known performance issue which may cause the EA to object to the development.

Please visit our [website](#) for updates on the site specific upgrades.

What happens next?

Please make sure you submit your connection application, giving us at least 21 days' notice of the date you wish to make your new connections.

If you have any further questions, please contact us on 0800 009 3921.

Yours sincerely,

Gemma Connolley

Adoptions & Pre-Planning Engineer

Developer Services

APPENDIX J: HORSHAM DISTRICT COUNCIL DRAINAGE DEPARTMENT COMMENTS

TO:	Horsham District Council – Planning Dept
LOCATION:	The Hyde Rusper Road Ifield West Sussex
DESCRIPTION:	Outline Application for redevelopment of the site to provide up to 7 dwellings, infrastructure, ancillary parking and landscaping with all matters reserved except access
REFERENCE:	DC/26/0207
RECOMMENDATION:	Object
SUMMARY OF COMMENTS & RECOMMENDATION: The following documents have been reviewed: • Drainage Strategy Plan, Drawing No: 251055-CON-XX-00-DR-C-1000, Rev: P02, Dated: Dec 2025, Author: Conisbee • 'Flood Risk Assessment and Surface Water Drainage Strategy' Report The drainage strategy has specified that surface water from the site is to be discharged into a watercourse at an unrestricted rate. The drainage strategy plan has provided little to no detail about the existing ditch/watercourse, the ownership of the ditch/watercourse been discussed and no assessment of the condition of the ditch/watercourse has been provided. Discharging surface water into a surface water ditch at an unrestricted rate is not permitted. HDC Drainage have determined that this drainage strategy does not meet the requirements of the NPPF and PPG, National standards for sustainable drainage systems (June 2025), and the Horsham District Planning Framework (2015) – Policy 35 and Policy 38. To overrule an objection from HDC Drainage, the drainage strategy for this application must be re-considered. Discharging surface water into a surface water ditch at an unrestricted rate is not permitted. The comments below provide the applicant with the level of detail which HDC Drainage require for review:	
MAIN COMMENTS: • The applicant must provide a site-specific assessment of flood risk, even where a full flood risk assessment is not required. • The applicant must demonstrate an understanding of how surface water currently flows across the site under 'normal' conditions and during rainfall events, providing an assessment of the current and proposed drainage patterns entering the site, within the site and leaving the site. • The applicant should provide a measurement of the total site area, all pre-development permeable and impermeable areas within the red line boundary, all post-development permeable and impermeable areas within the red line boundary, with supporting catchment plans and calculations. • A fully designed surface water management strategy should include: ○ The aim to achieve and better greenfield runoff rates and adherence to the drainage hierarchy.	

- Rationale for SuDS selected in line with the Horsham District Planning Framework (2015) – Policy 38, and industry best practice such as The SuDS Manual (C753).
- The method of foul and surface water disposal must be confirmed in line with the drainage hierarchy (Building Regulations Part H).
- If connections to Southern Water Utilities are proposed as part of the development/ redevelopment, supporting plans and assumed points of connection must be provided as well as expected flow rates. Connection to the public sewerage network is advised, wherever it is reasonable to do so.
- The following flow and volume rates must be provided:
 - existing runoff rates during a 100% Annual Exceedance Probability (AEP), 3.33% AEP, 1% AEP storm events
 - post development discharge rates during a 100% AEP, 3.33% AEP, 1% AEP and 1% AEP + 45% for Climate Change storm events
 - greenfield runoff rate (QBAR)
 - water storage capacity volumes of the proposed drainage features, to attenuate the 1% AEP + climate change storm event (see details below).
- The runoff from the proposed development should, where possible, be restricted to the greenfield 1 in 1 year runoff rate (100% AEP) during all events up to and including the 1 in 100-year rainfall event (1% AEP) + 45% allowance for climate change. Where this is not possible, the runoff from the proposed development should restrict flows to as close as reasonably practical to the greenfield runoff rate for the site.
- If it restricting runoff rates back to the 1 in 1-year greenfield runoff rate is considered unreasonable, HDC Drainage may allow discharge rates to be restricted to as close as feasibly possible, limiting up to a 50% betterment of the brownfield 1 in 1-year runoff rate **as a last resort**.
- The surface water drainage strategy must demonstrate that the proposed SuDS attenuate all runoff from all impermeable areas (with an additional area equivalent to +10% of the area of any residential development, factored into the sum of the total impermeable areas on site, allowing for urban creep) for the 1 in 100-year rainfall event (1% AEP) + 45% allowance for climate change (upper end). Attenuation should be provided on site to ensure that:
 - The 100% AEP storm event does not generate excessive surcharging in the drainage system.
 - The 3.33% AEP storm event is safely contained underground with no flooding.
 - The 1% AEP + climate change storm event is safely contained within the site without risk to persons or property.
- Where infiltration discharge methods are proposed (soakaways/swales etc...), the applicant must provide testing in accordance with BRE365, at the location and depth of the proposed devices.
- Where infiltration testing has not been undertaken, provide an infiltration assessment, supported by a desk-based assessment of soil types, geology and suitability for infiltration potential (See the Horsham District Council Local Plan evidence base), together with an alternative option for surface water disposal.

- If a ditch and/or watercourse is present on site, an assessment of each feature must be provided, to identify whether the feature is expected...
 - to contain flowing water throughout the year (unless there is a drought or an unusually long period of dry weather). The range of expected water levels should be provided.
 - to seasonally dry up
 - to stay dry for most of the year.
- If a ditch and/or watercourse is present on site, context must be provided regarding the connectivity of the ditch and/or watercourse to waterways within in the wider landscape, as well as influences which might affect water levels in the feature, both upstream and downstream.
- If a ditch and/or watercourse is present on site, the applicant must demonstrate that a visual inspection of the ditch and/or watercourse has been undertaken, providing a detailed summary of site conditions on the day of assessment with supporting photographs.
- If a ditch and/or watercourse is present on site or along the boundary of the site, the applicant must demonstrate ownership of the ditch/ watercourse.
- If a ditch and/or watercourse is to be the intended outfall location for surface water and/or treated effluent from a Package Treatment Plant (PTP) / Sewage Treatment Plants System, the applicant must obtain permission from the landowner for use of that feature.
- The applicant must provide evidence of measures to prevent pollution of the receiving groundwater and/or surface water.
- The applicant must provide plans which indicate the expected exceedance routes for storm events greater than the 1% AEP + climate change storm event. The Drainage Strategy must demonstrate that the surface water runoff from these events can be controlled, to confirm there is no adverse flood risk to the development or elsewhere. Evidence of appropriate management and mitigation of exceedance flows are expected within the Drainage Strategy, to demonstrate that the proposed conveyance systems have considered the risks associated to nature, people and property during the event of failure and/or exceedance.
- Supporting foul flow calculations, in line with Sewerage Sector Guidance and/or Building Regulations Part H, is to be provided. It should be noted that any proposed foul water system and foul water treatment unit should be in line with current legislation and best practice for the management of domestic waste, with any method for disposal justified and appropriate permits sought.
- Maintenance and Management Plans must be provided for both the proposed Foul and Surface Water Drainage Strategy, including access requirements, maintenance frequency and responsibility, and proprietary device manuals, for all drainage features and SuDS devices.

Further evidence in addition to that requested above may be required once the additional information is submitted.

Advisory notes:

- In addition to Planning Permission, the applicant may additionally require a permit to discharge treated foul water to a water body or to ground from the Environment Agency, where non-mains foul drainage is proposed.

- In addition to Planning Permission, the applicant may additionally require Ordinary Watercourse Consent (OWC) from the Lead Local Flood Authority at West Sussex County Council, to consent to any works adjacent to or within an ordinary watercourse.
- On the Horsham District Council website, there are several useful documents available to the public, which the applicant may wish to use as guides for their application. To navigate to this page you can follow this link:
<https://www.horsham.gov.uk/planning/local-plan/local-plan-examination/Examination-Library>
Alternatively, here is how to navigate to that page on the HDC Website:
Home > Planning and development > Local Plan > Local Plan examination > Examination Library > Evidence Base Documents > Climate Change and Water
- Whilst not a mandatory requirement, HDC Drainage welcome and encourage the consideration of rainwater harvesting within the proposed development.

ANY RECOMMENDED CONDITIONS:

NA

NAME:	A.Furness
DEPARTMENT:	Horsham District Council - Drainage
DATE:	07/04/2026