

FLOOD RISK ASSESSMENT

GRID REF: 515074, 231647

LAND EAST OF WALNUT TREE ROAD
PIRTON, SG5 3QX

prepared for
BLAKENEY ESTATES LTD

JULY 2025

REFERENCE: ST3657/FRA-2507-REV2
REVISION 2



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APPENDICES

- A Site Location Plan
- B Topographical Survey
- C AWS Sewer Records
- D Runoff Calculation Sheets
- E Indicative Drainage Strategy
- F MicroDrainage Output Files

1. Introduction

- 1.1.1 Stomor Ltd. have been commissioned by Blakeney Estates Ltd to prepare a Flood Risk Assessment (FRA) and Drainage Strategy to support the proposed development at Land East of Walnut Tree Road, Pirton. A Site Location Plan is provided in **Appendix A**.
- 1.1.2 The application site is greenfield, currently comprising arable land, with a total area of approximately 3 hectares (ha).
- 1.1.3 Development proposals comprise 50No. residential units with associated open space and parking.

1.2. Policy Context

- 1.2.1. The FRA has been prepared in accordance with relevant national, regional, and local planning policy and guidance on flooding as follows:
- The National Planning Policy Framework (NPPF) published by Department for Communities and Local Government (DCLG), and the accompanying National Planning Practice Guidance (NPPG).
 - The Environment Agency (EA) published advice for Preparing a Flood Risk Assessment: Standing Advice (April 2012, updated July 2024).
 - The EA's Approach to Groundwater Protection (March 2017, updated October 2023).
 - North Hertfordshire Council (NHC) Local Plan 2011-2031 (November 2022, updated December 2022).
 - North Hertfordshire District Council Strategic Flood Risk Assessment Level 1 (July 2008)
 - North Hertfordshire District Council Strategic Flood Risk Assessment Update (2016)
- 1.2.2. Furthermore, the FRA follows the methodology prescribed in Construction Industry Research and Information Association (CIRIA) document C624: Development and Flood Risk (2004), Guidance for the Construction Industry.

1.3. Flood Risk Vulnerability and the NPPF Sequential Test

- 1.3.1. The Indicative Floodplain Map obtained from the UK government website is provided in **FIGURE 1.1**. This shows that the application site is located within Flood Zone 1, land assessed to have a low probability of flooding.

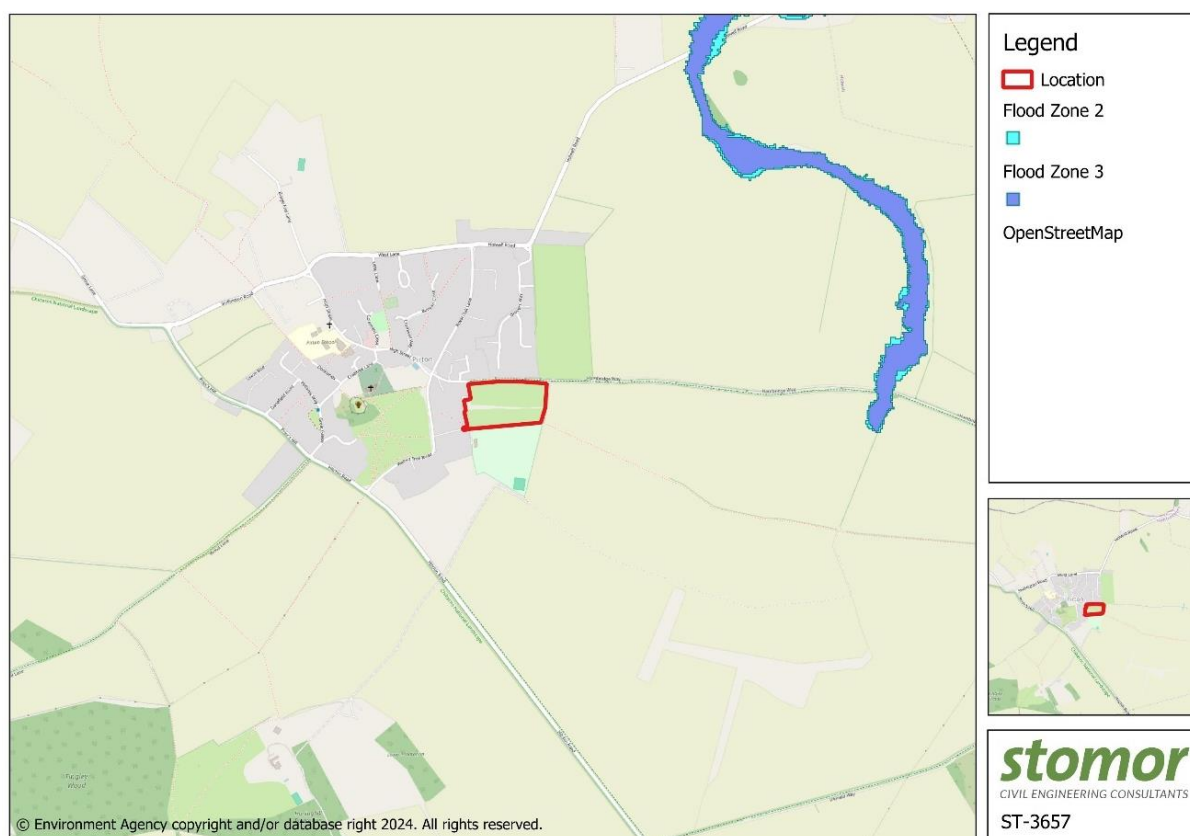


FIGURE 1.1: UK Government Flood Map for Planning

1.3.2. The difference between Flood Zones 1, 2 and 3 are described in Table 1: Flood Zones from the Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government Flood Risk and Coastal Change guidance (updated August 2022), reproduced below:

Zone 1 Low Probability	Land assessed as having a less than 0.1% annual probability of river or sea flooding.
Zone 2 Medium Probability	Land assessed as having between a 1% and 0.1% annual probability of river flooding, or land having between a 0.5% and 0.1% annual probability of sea flooding.
Zone 3a High Probability	Land assessed as having a 1% or greater annual probability of river flooding, land having a 0.5% or greater annual probability of flooding from the sea.
Zone 3b The Functional Floodplain	Land where water from rivers or the sea has to flow or be stored in times of flood. Normally comprises land having a 3.3% or greater annual probability of flooding, or land designed to flood (such as a flood attenuation scheme).

1.3.3. The Flood Risk and Coastal Change Category (ID 7) of the NPPG and associated documents identifies that a Flood Risk Assessment is required areas at risk of flooding.

- 1.3.4. The Flood Risk and Coastal Change Category of the NPPG and associated documents identify that site-specific flood risk assessments should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.
- 1.3.5. The development would have a NPPF flood risk vulnerability classification of More Vulnerable. In accordance with the 2024 NPPG guidance, the sequential test should be followed in areas at risk from any sources of flooding including access routes and areas of land raising. A small area of the site is shown to be at risk from surface water flooding. However, this is considered an isolated area with the contributing surface water runoff being associated with the site. Therefore, the Sequential Test is not considered to be required.

2. Site Location & Surrounding Area

- 2.1.1. The application site is approximately 3.0 ha of greenfield land, currently comprising arable land.
- 2.1.2. The site is located to the southeast of Pirton, with proposed access from Walnut Tree Road. The site boundary is defined by residential development to the north and west, arable land to the east and a recreation ground to the south.
- 2.1.3. Inspection of the topographical survey shows that the site generally falls to the southeast. Surveyed ground levels range from approximately 70.00mAOD to 66.75mAOD within the site. A copy of the topographical survey is attached in **Appendix B**.
- 2.1.4. The nearest watercourse to the site is an Ordinary Watercourse that runs along the north and east boundary. The nearest EA Designated Main River is the River Purwell located approximately 3.25km east of the site.
- 2.1.5. EA catchment data identifies that the site is located within the Ouse Upper Bedford Chalk catchment area, within Anglian River basin district.
- 2.1.6. Inspection of the EA's groundwater source protection zone data shows that the site does not lie within a Groundwater Source Protection Zone. Therefore, there should be no restrictions on the areas discharging via infiltration methods.
- 2.1.7. The site is located within a Principal aquifer for the bedrock designation and a Secondary (undifferentiated) aquifer for the Superficial Drift Designation. The site is also located within a Drinking Water Safeguard Zone (Surface Water). Inspection of the Groundwater Vulnerability Map identifies that the groundwater at the site is at high risk.

3. Site Background

- 3.1.1. The site is greenfield and currently comprises arable land. Historical mapping information indicates that allotments were located to the south of the site during the 1830s to 1880s.
- 3.1.2. A Level 1 Strategic Flood Risk Assessment (SFRA) for the area was prepared by WSP, on behalf of the North Hertfordshire District Council, in July 2008 with an update provided in 2016. The SFRA is used as a desk-based study to map all forms of flood risk to provide an evidence base to locate new development primarily within low-risk areas. The information allows the planning authority to identify the level of detail required for the site-specific Flood Risk Assessments.
- 3.1.3. Inspection of the British Geological Survey (BGS) website identifies that the underlying ground conditions of the site comprise West Melbury Marly Chalk Formation (chalk) at bedrock with superficial deposits of Lowestoft Formation (diamicton) to the east of the site. In addition, inspection of the Soilscales website indicates that the site lies in a region with freely draining soil.
- 3.1.4. The Listers Geo Ground Investigation Report December 2024 states that Lowestoft Formation is present across the site. Below this is West Melbury Marly Chalk Formation is encountered extending down 6m.

4. Existing Drainage

4.1. Surface Water Drainage

- 4.1.1. The site is greenfield in nature. Therefore, there is no existing drainage infrastructure within the site. The current surface water runoff likely discharges to ground before travelling overland to the Ordinary Watercourse adjacent to the northern and eastern boundaries.
- 4.1.2. Anglian Water Services (AWS) sewer records are provided in **Appendix C**. The sewer records show there are no surface water sewers within close proximity to the site.
- 4.1.3. Greenfield runoff rates have been calculated based upon the IH124 Method, for a development area of 3.05 ha. Geotechnical information from the WRAP map of the Wallingford Procedure indicates that the underlying soil conditions would reflect Winter Rain Acceptance Potential (WRAP) Soil Class 1, which gives flow rates as follows:

Greenfield Runoff (l/s)		
1 in 1 year	Q1	0.37
1 in 30 years	Q30	1.00
1 in 100 years	Q100	1.50

- 4.1.4. A copy of the Greenfield Runoff calculation sheet is provided in **Appendix D**.

4.2. Foul Water Drainage

- 4.2.1. The public sewer records identifies a public foul rising main located along Hambridge Way, which runs adjacent to the northern site boundary. The nearest gravity fed public foul water sewers are location to the northwest of the site, within Hambridge Way, and to the west, within Walnut Tree Road.

5. Proposed Development

- 5.1.1. Development proposals comprise the construction of 50No. residential units with associated open space and parking covering a development area of approximately 3ha
- 5.1.2. Development proposals are likely to generate an impermeable area of approximately 0.996ha.

6. Proposed Site Drainage

6.1. Surface Water Drainage

- 6.1.1. In accordance with EA guidance, the order of consideration for the disposal of surface water runoff from a development should be as follows: infiltration methods, watercourses, then public sewer network.
- 6.1.2. Infiltration tests were undertaken on site (available in the Listers Geo Ground Investigation Report December 2024 pg.26). However, the rate could not be calculated as the ground did not allow any water to infiltrate. Infiltration is therefore not considered viable as a method of discharge.
- 6.1.3. The nearest watercourse is an unnamed Ordinary Watercourse that runs along the northern and eastern boundaries of the site. The current surface water runoff likely discharges to ground before travelling overland to the Ordinary Watercourse adjacent to the northern and eastern boundaries of the site. It is therefore proposed that runoff from the site will discharge at a controlled rate into the ordinary watercourse to match the existing scenario.
- 6.1.4. An Indicative Drainage Strategy is provided in **Appendix E**. The strategy demonstrates how the proposed development can be effectively drained, and the amount of storage required to avoid flooding within the site during all storms up to and including the 1 in 100-year storm event plus a 40% allowance for climate change.
- 6.1.5. The proposed drainage strategy has been modelled using MicroDrainage. Copies of MicroDrainage output files for the development are provided in **Appendix F**, demonstrating that the proposed SuDS features provide sufficient storage to avoid flooding during the 1 in 100-year storm event plus 40% allowance for climate change.
- 6.1.6. The indicative drainage strategy incorporates SuDS features which will need to have clear, enforceable maintenance regimes in place so that they provide effective flood protection and water treatment for the long term.
- 6.1.7. The CIRIA SuDS Manual C753 promotes the use of the Simple Index Approach as a method of determining water quality risk management and is generally regarded as the accepted method within the industry.
- 6.1.8. Table 26.2 of the SuDS Manual gives pollution hazard indices for different land use classifications. A summarised version of this table is reproduced below:

Land use	Pollution hazard level	Total suspended solids	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Residential driveways, low traffic roads and non-residential car parking with infrequent change (i.e. <300 traffic movements/day)	Low	0.5	0.4	0.4

6.1.9. Table 26.3 of the SuDS Manual provides typical treatments levels from various SuDS features discharging to surface waters. The following SuDS features will be included as part of the surface water drainage proposals for the development:

	Mitigation Indices		
Type Of SuDS Component	TSS	Metals	Hydrocarbons
Detention Basin	0.5	0.5	0.6
Permeable Pavement	0.7	0.6	0.7

6.1.10. To deliver adequate treatment, the selected SuDS components should have a total mitigation index that equals or is greater than the pollution hazard index. Where a single SuDS component is insufficient, additional components in a series would be required, where:

$$\text{Total SuDS mitigation index} = \text{mitigation index}_1 + 0.5 (\text{mitigation index}_2)$$

6.1.11. A factor of 0.5 is used to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentrations. In a series of multiple subsequent components, each is halved.

6.1.12. As a minimum, surface water runoff from residential roofs and low traffic roads will pass through at least a detention basin and permeable pavement. Therefore, at minimum, the total SuDS mitigation index would be as follows:

	Mitigation indices		
SuDS components	TSS	Metals	Hydrocarbons
1) Permeable Pavement	0.7	0.6	0.7
2) Detention Basin	0.25	0.25	0.3
Total	0.95	0.85	1.0

6.1.13. From the above tables the SuDS proposed on the development would provide an adequate level of water treatment for the potential pollution hazards generated by the land uses.

6.2. Foul Drainage

- 6.2.1. The nearest point of connection for foul water flows from the development would be to the private foul water system within Cotman End which is under the Clients control. This discharges into the public foul water sewer in Walnut Tree Road.

6.3. Detailed Design and Approvals

- 6.3.1. The proposed drainage strategy is subject to approval by the LLFA, AWS and the Local Planning Authority.
- 6.3.2. Proposed detailed drainage systems will need to be modelled in MicroDrainage to confirm required pipe sizes and storage volumes.
- 6.3.3. Overland flow routes have been shown on the drainage plan through the development, to identify proposed flow paths for surface water runoff during extreme storm events. Final external levels will be designed to prevent overland flow routes from entering buildings.

6.4. Maintenance of Drainage Features

- 6.4.1. The design process should consider the maintenance of the components (access, waste management etc.) including any corrective maintenance to repair defects or improve performance of SuDS. Inlets, outlets, control structures or other below ground features should be as shallow as reasonably possible to allow easy access for maintenance and to reduce safety risks, while ensuring that sufficient depth is maintained for structural stability.
- 6.4.2. A SuDS Management Plan must be provided prior to the first occupation which will identify the following:
- The function of SuDS,
 - How and why it works on the site,
 - Impacts on amenity and wildlife, indicating how they can be enhanced.
 - Health and safety issues,
 - Long-term expectations for the SuDS on site.
- 6.4.3. Usually, SuDS components are on or near the surface and most can be managed using landscape maintenance techniques. Typical inspection and maintenance requirements for surface SuDS features are identified below:

Activity	Indicative frequency	Typical tasks
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Routine/regular maintenance	Monthly (for normal care of SuDS)	• litter picking • grass cutting (cuttings to compost, wildlife piles or removed from site) Height and frequency dependent upon amenity of grass area. • inspection of inlets, outlets and control structures.
Occasional maintenance	Annually (dependent on the design)	• silt control around components • vegetation management around components • suction sweeping of permeable paving in autumn after leaf fall • silt and debris removal from inlets, outlets, gratings, catchpits, control chambers, soakaways and cellular storage. • strim wet swale or pond edges in September to October or 3-year rotation for wildlife value • wetland vegetation to be cut to 30% height annually and to 100mm on a 3-year rotation • remove overhanging trees or growth within SuDS features
Remedial maintenance	As required (tasks to repair problems due to damage or vandalism)	• inlet/outlet repair • erosion repairs • reinstatement of edgings • reinstatement following pollution • removal of silt build up.

6.4.4. For below-ground SuDS such as permeable paving the manufacturer or designer should provide maintenance advice. This should include routine and long-term actions that can be incorporated into the SuDS Management Plan.

6.4.5. Funding for the maintenance of SuDS features on the site should be resolved at the start of the development process.

7. Potential Sources of Flooding

7.1. Flooding from Rivers or Sea

- 7.1.1. The EA Indicative Floodplain Map (**FIGURE 1.1**) identifies that the site is located within Flood Zone 1. There is an Ordinary Watercourse adjacent to the northern and eastern boundaries of the site. The site is not located with an EA historic fluvial flood outline. The 2008 SFRA also shows no fluvial historic flooding in the area.
- 7.1.2. Based upon the above information, it is considered that the site is at low risk of flooding from fluvial sources.

7.2. Flooding from Land (Surface Water)

- 7.2.1. Flooding from land occurs when intense rainfall is unable to soak into the ground or enter drainage systems. Local topography and built form can have a strong influence on the direction and depth of flow.
- 7.2.2. The EA Indicative Surface Water Flood Map (**FIGURE 7.1**) identifies that the majority of the site is at very low risk of surface water flooding. There is an area of high risk surface water flooding to the north east of the site which appears to be a low point in the topography, with the associated contributing rainfall catchment being generated by land within the site ownership.

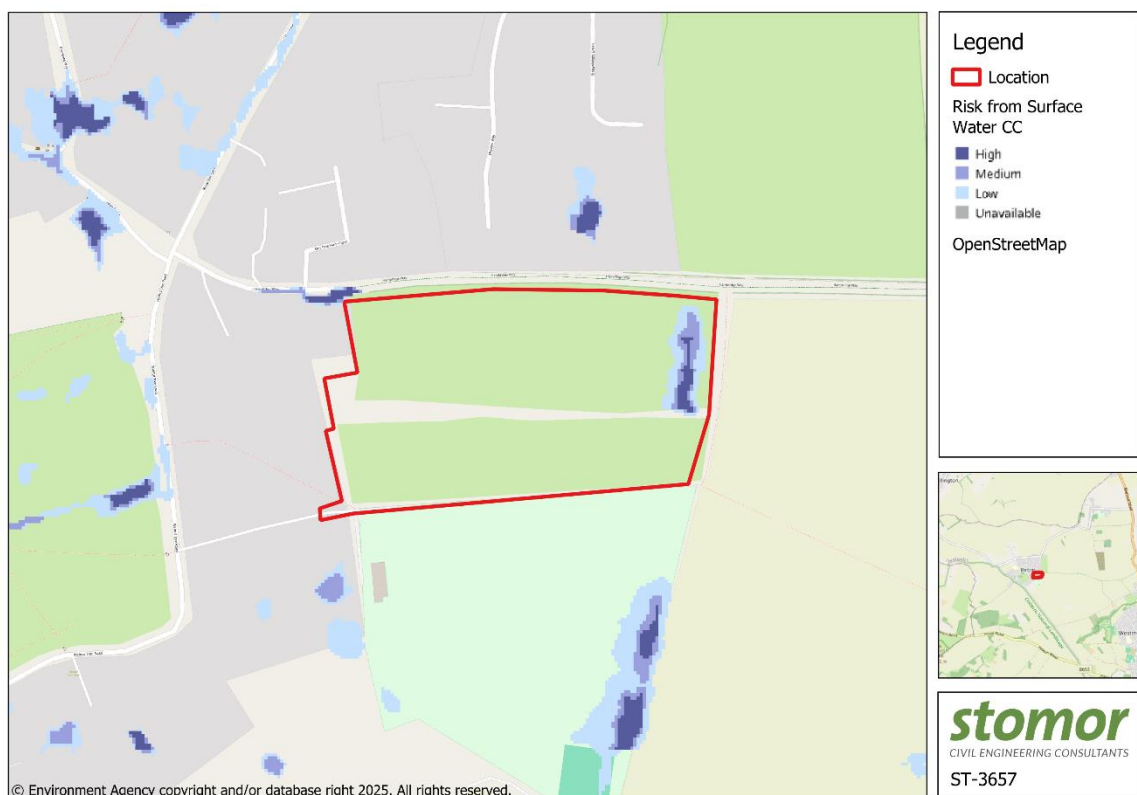


FIGURE 7.1: EA Indicative Surface Water Flood Map Plus Climate Change

- 7.2.3. Overland flow routes will be taken into consideration in the design levels for the proposed development to direct overland flows away from buildings, towards the proposed SuDS features in the lower end of the site.
- 7.2.4. On-site drainage systems have been designed to accommodate runoff volume from a 1 in 100-year storm plus 40% climate change rainfall event, to minimise overland flows except during storms above this event.

7.3. Flooding from Groundwater

- 7.3.1. Groundwater flooding occurs when water levels in the ground rise above surface elevations. Groundwater flooding events are most likely to occur in low lying areas underlain by permeable rocks (aquifers).
- 7.3.2. The SFRA identifies that historical groundwater flooding has not occurred in Pirton.
- 7.3.3. The SFRA shows the site lies within an area with between 25%-50% susceptibility to groundwater flooding.
- 7.3.4. Based on the SFRA and British Geological Survey (BGS) Groundwater Susceptibility data for Land East of Walnut Tree Road, it is reasonable to assume that the site is at medium risk of groundwater flooding. Overland flow routes will be taken into account in the design of levels for the proposed development to direct overland flows away from buildings.

7.4. Flooding from Sewers

- 7.4.1. The SFRA identifies that there is no evidence of historic sewer flooding around the site.
- 7.4.2. The development layout will be designed with consideration of flood routing, to ensure that new buildings and occupants of the site will not be subject to detrimental impacts in the event of flooding from infrastructure failure within or upstream of the site.

7.5. Flooding from Reservoirs, Canals and Other Artificial Sources

- 7.5.1. Inspection of the EA flood map confirms the site is not at risk of flooding from reservoirs, canals or other artificial sources.
- 7.5.2. The Canal and River Trust shows there are no canals within close proximity to the site.

- 7.5.3. No other non-natural or artificial sources of flooding where water is retained above natural ground level, operational and redundant industrial processes including mining, quarrying and sand and gravel extraction, would appear to be located in the vicinity of the site which may cause increase floodwater depths or velocities.

8. Summary and Recommendations

- 8.1.1. Stomor Ltd. has been commissioned by Blakeney Estates Ltd to prepare a Flood Risk Assessment (FRA) and Drainage Strategy (DS) to support the proposed residential development at Land East of Walnut Tree Road, Pirton.
- 8.1.2. The application site is greenfield, currently comprising arable land, with a total area of 3 hectares (ha).
- 8.1.3. Development proposals comprise construction of 50No. residential units with associated open space and parking.
- 8.1.4. The proposed development would have a NPPF flood risk vulnerability classification of 'More Vulnerable'. The application site is situated within Flood Zone 1, where all development uses are considered suitable.
- 8.1.5. The nearest watercourse to the site is an Ordinary Watercourse that runs along the northern and eastern boundaries of the site. The nearest EA Designated Main River is the River Purwell located 3.25km east of the site.
- 8.1.6. It is considered that the site would be at low risk of flooding from fluvial, sewers and artificial sources. The site is shown to be at medium risk of groundwater flooding. The majority of the site is shown to be a very low risk from surface water flooding with a small area at high risk during the climate change event.
- 8.1.7. The proposed surface water drainage strategy demonstrates SuDS features to provide sufficient storage to avoid flooding within the site during the 1 in 100-year storm event + 40% allowance for climate change.
- 8.1.8. Overland flow paths and exceedance routes will be taken into account in design of levels for the proposed development to direct overland flows away from buildings.





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REV: | BY: | DATE: | DETAILS:

PROJECT: Land South of Hambridge Way
Pirton

CLIENT: .

ISSUE STATUS:

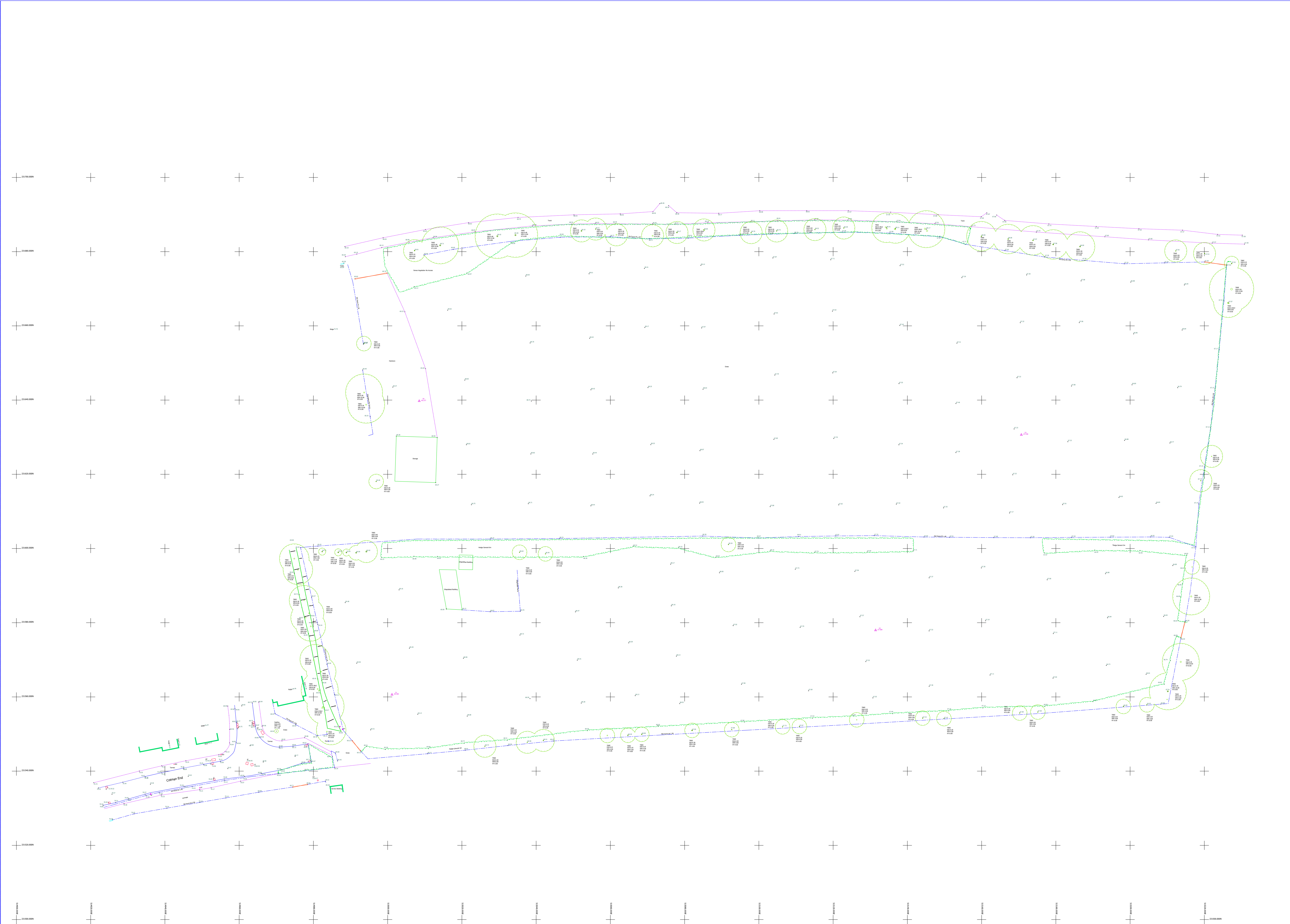
DESIGN ☐ B of Q ☐ CONSTRUCTION ☐ RECORD ☐

DRAWING TITLE: Location Plan

SCALE: ~1:1250 (A3) DATE: Sept 2024 BY: JB

DRAWING NO: 22130 (B) 010 REVISION: -





Topographical Abbreviations

A/R	Assumed Route	MKR	Marker
BH	Borehole	MT	Mercury Telecom Cover
BOL	Bollard	OHC	Overhead Cable
BT	British Telecom Cover	QHP	Overhead Pipe
BW	Barbed Wire Fence	OSBM	Ordinance Survey Bench Mark
BWK	Brickwork	PB	Post Box
CATV	Cable TV Cover	PGM	Permanent Ground Marker
CB	Close Boarded Fence	PR	Post & Rail Fence
CCTV	Closed Circuit TV	PW	Post & Wire Fence
CHLK	Chainlink Fence	PWM	Post & Wire Mesh Fence
CHPL	Chestnut Paling Fence	RE	Rodding Eye
CL	Cover Level	RG	Road Gully
CM	Cable Marker	RN	Road Name
CP	Catch Pit	RS	Road Sign
CPL	Catch Pit Base Level	RW	Retaining Wall
DIA	Diameter	RWP	Rain Water Pipe
DK	Drop Kerb	SAP	Sapling
DP	Down Pipe	SC	Stop Cock
EJB	Electricity Junction Box	SPR	Spread
EC	Electricity Cover	STA	Traverse Station
EP	Electricity Pole	SV	Stop Valve
ER	Earthing Rod	SVP	Soil Vent Pipe
FH	Fire Hydrant	SW	Storm Water
FIG	Feed Into Ground	TB	Telephone Box
FW	Foul Water	TBM	Temporary Bench Mark
G	Gully	TFR	Taken From Records
GV	Gas Valve	TJB	Telephone Junction Box
HT	Height	TRP	Trid Pit
IC	Inspection Cover	TL	Traffic Light
IL	Invert Level	TP	Telephone Pole
IR	Iron Railing Fence	UTL	Unable To Lift
KO	Kerb Outlet	UTT	Unable To Trace
LB	Litter Bin	VP	Vent Pipe
LC	Lamp Column	WKH	Water Key Hole
LP	Lamp Post	WM	Water Meter
MH	Manhole	WV	Water Valve

Survey Station Information

STA No.	Easting	Northing	Level
S1	515001.169mE	231560.618mN	69.369
S2	515131.439mE	231577.973mN	67.589
S3	515170.701mE	231630.644mN	67.238
S4	515008.504mE	231639.750mN	69.277

5	-	
4	-	
3	-	
2	-	
1	ACC Survey Extended	02/09/2024
0	ACC First Complete Issue	12/03/2024
Rev	Description	



CHINERY LAND SURVEYS

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SURVEYED	RJC
DRAWN	RJC
SCALE	1:500

BLAKENEY ESTATES

LAND ADJACENT TO 17 WALNUT TREE ROAD
PIRTON, HITCHIN SG5 3PX

TOPOGRAPHICAL SURVEY

JOB No	DRAWING NUMBER
CLS24036	CLS24036001 Rev1

A1 Sheet - 841mm X 594mm





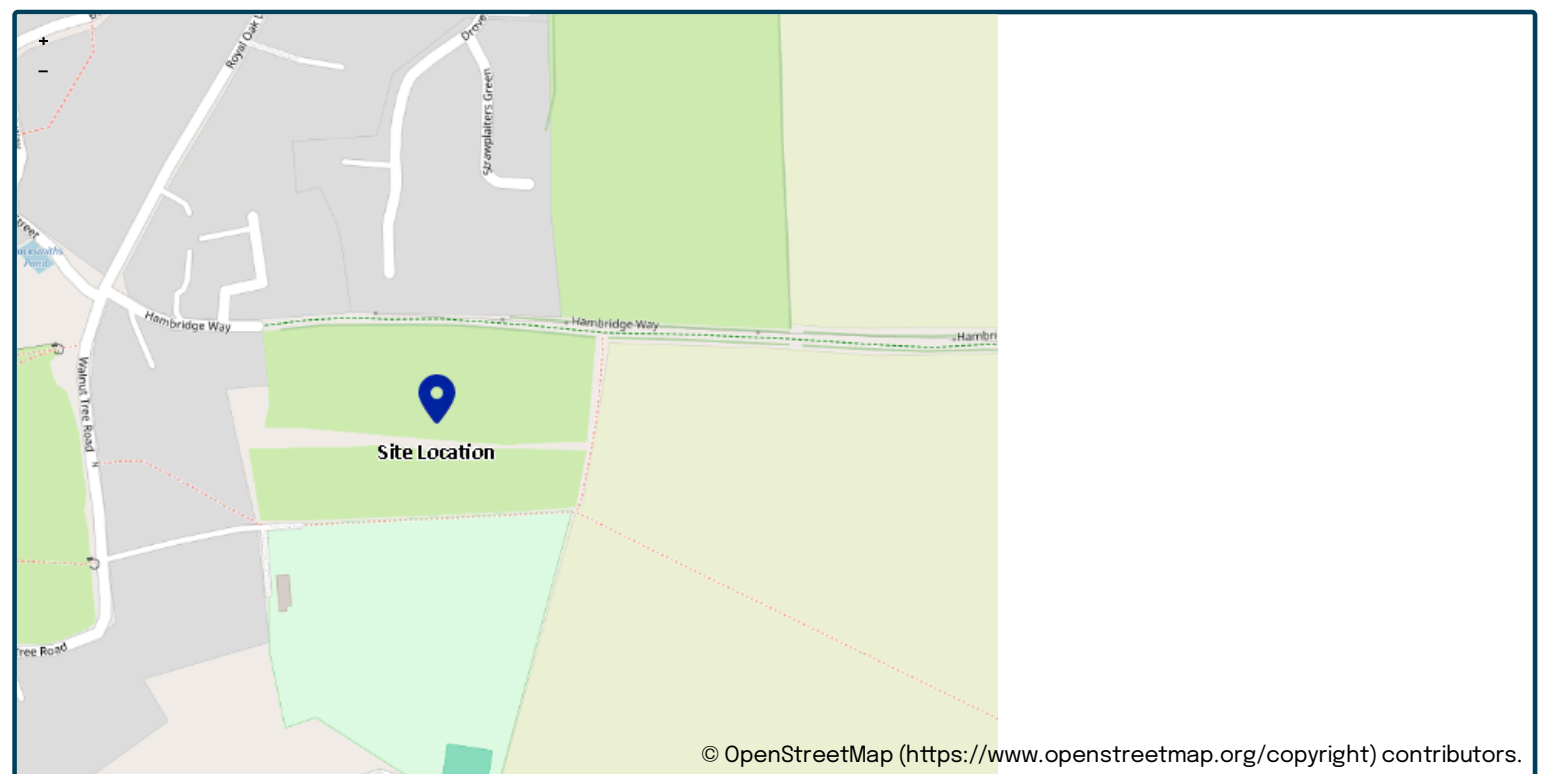
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	21/07/2025
Calculated by	Lourdes Gascon
Reference	ST-3657
Model version	2.0.1

Location

Site name	Walnut Tree Rd
Site location	Pirton



Site easting	515115
Site northing	231603

Site details

Total site area (ha)	3.05	ha
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Greenfield runoff

Method

Method	IH124	
	<u>My value</u>	<u>Map value</u>
SAAR (mm)	598 mm	☐ 598
How should SPR be derived?	WRAP soil type	
WRAP soil type	1	☐ 1
SPR	0.1	
QBar (IH124) (l/s)	0.43 l/s	

Growth curve factors

	<u>My value</u>	<u>Map value</u>
Hydrological region	5	☐ 5
1 year growth factor	0.87	
2 year growth factor	0.89	
10 year growth factor	1.65	
30 year growth factor	2.45	
100 year growth factor	3.56	
200 year growth factor	4.21	

Results

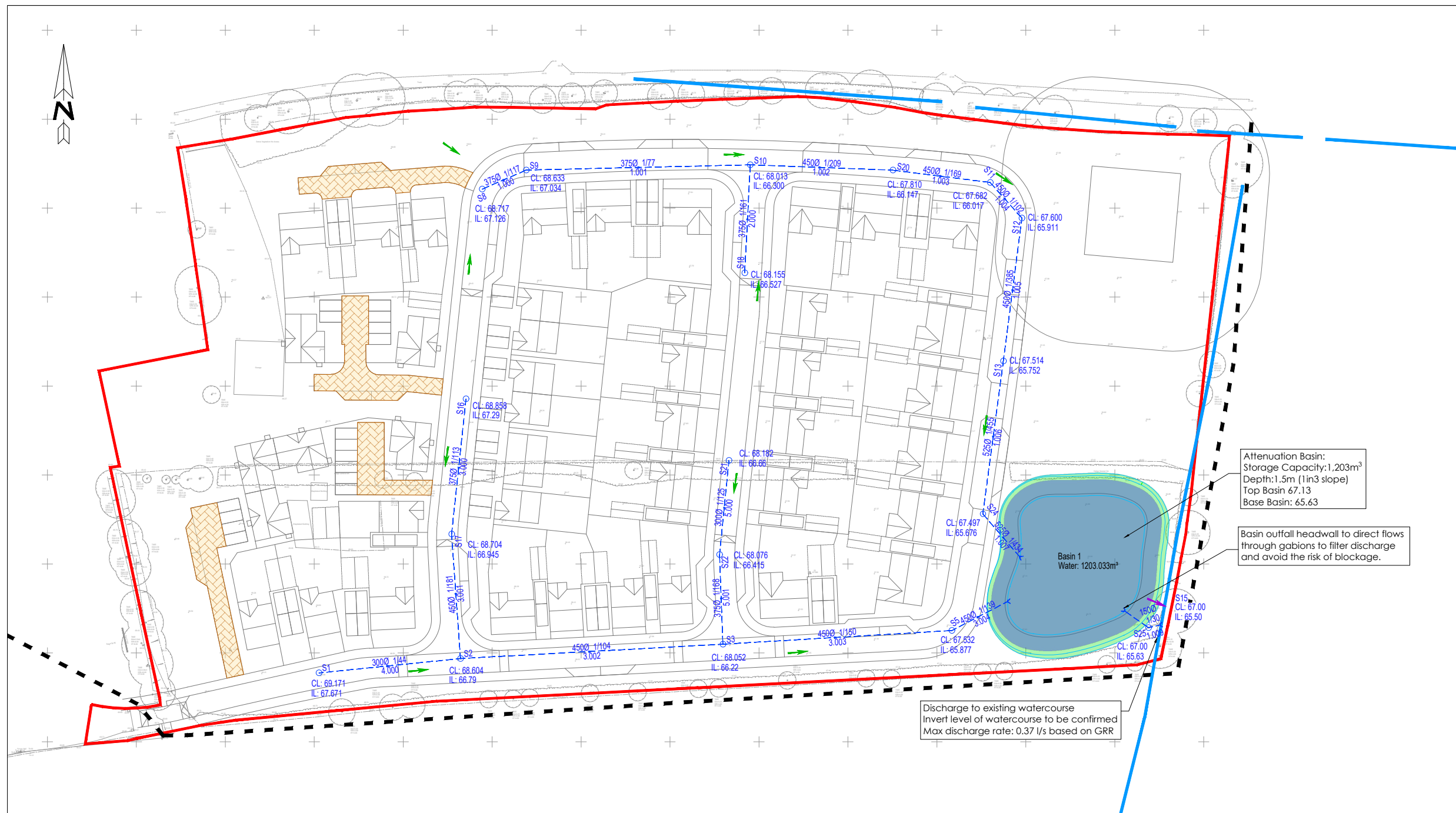
Method	IH124	
Flow rate 1 year (l/s)	0.37 l/s	
Flow rate 2 year (l/s)	0.38 l/s	
Flow rate 10 years (l/s)	0.7 l/s	
Flow rate 30 years (l/s)	1 l/s	
Flow rate 100 years (l/s)	1.5 l/s	
Flow rate 200 years (l/s)	1.8 l/s	

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.0.1) 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) (<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.





- KEY
- SITE BOUNDARY
 - PUBLIC FOOTPATH
 - PROPOSED INFILTRATION / DETENTION BASIN
 - ORDINARY WATERCOURSE/DRAINAGE DITCH
 - PROPOSED POROUS PAVING
 - OVERLAND FLOW ROUTES
 - EXCEEDANCE FLOW ROUTES
 - PROPOSED SURFACE WATER PIPE RUN
 - PROPOSED SURFACE WATER MANHOLE

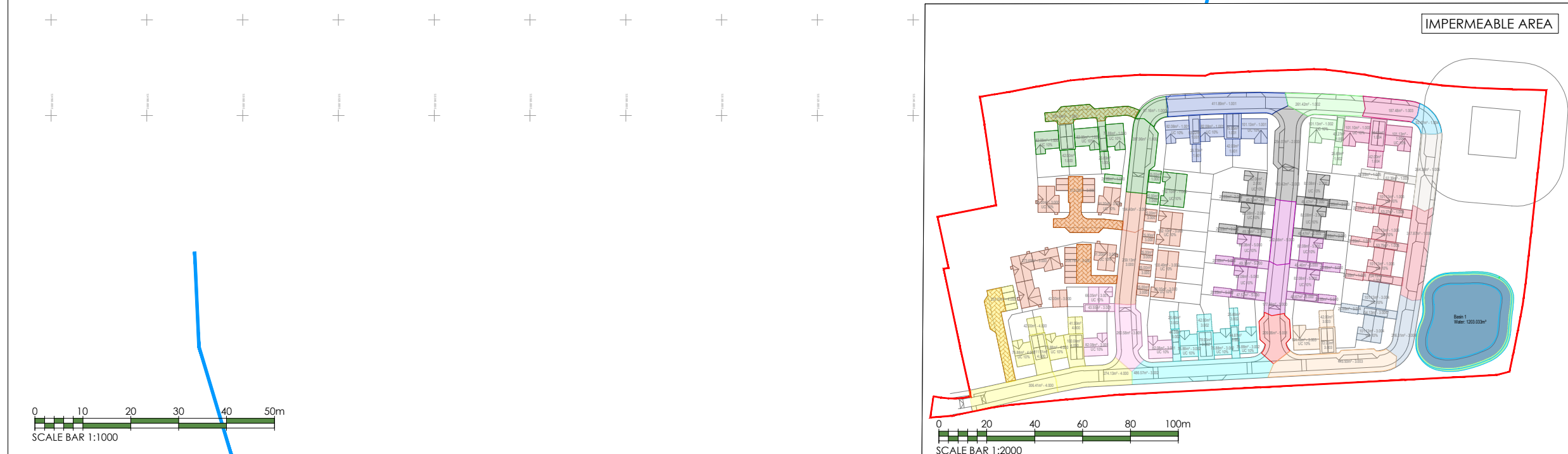
TOTAL IMPERMEABLE AREA: 13.959m²
SOIL TYPE: 1
GREENFIELD RUNOFF RATE: 1 in 1 y 0.37 l/s
1 in 30 y 1.0 l/s
1 in 100 y 1.5 l/s

Attenuation Basin:
Storage Capacity: 1.203m³
Depth: 1.5m (1 in 3 slope)
Top Basin: 67.13
Base Basin: 65.63

Basin outfall headwall to direct flows
through gabions to filter discharge
and avoid the risk of blockage.

Discharge to existing watercourse
Invert level of watercourse to be confirmed
Max discharge rate: 0.37 l/s based on GRR

THIS IS AN INDICATIVE DRAINAGE & LEVELS STRATEGY
AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.
DRAINAGE PROPOSALS ARE SUBJECT TO DETAILED DESIGN.
THE ACTUAL POSITION AND DETAILS OF ANY EXISTING SERVICES
ARE SUBJECT TO A DETAILED SURVEY.



Rev	Description	Date	Drawn	Checked	Apvd.
Project					
Land South of Hambridge Way, Pirton					
Drawing Description					
Indicative Drainage Strategy					
Project Number		Drawing Number			
ST-3657		501			
Scale		Date	Drawn	Checked	Approved
AS SHOWN@A3		25.07.25	LGM	NK	SJB
Client		Architect			
Blakeney Estates Ltd					

Do not scale off the drawing.
Only written dimensions should be taken.
Any discrepancies or errors should be brought
to the attention of the engineer immediately.
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Existing Network Details for Surface Network 1

```
# - Indicates pipe length does not match coordinates
```

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	10.783	0.092	117.1	0.124	5.00		0.0 0.600	o	375	Pipe/Conduit
1.001	50.400	0.659	76.5	0.090	0.00		0.0 0.600	o	375	Pipe/Conduit
2.000	24.323	0.151	161.0	0.095	5.00		0.0 0.600	o	375	Pipe/Conduit
1.002	32.096	0.154	209.1	0.044	0.00		0.0 0.600	o	450	Pipe/Conduit
1.003	22.038	0.130	169.1	0.030	0.00		0.0 0.600	o	450	Pipe/Conduit
1.004	10.721	0.105	101.6	0.014	0.00		0.0 0.600	o	450	Pipe/Conduit
1.005	32.396	0.084	385.0	0.034	0.00		0.0 0.600	o	450	Pipe/Conduit
1.006	34.693	0.076	455.1	0.084	0.00		0.0 0.600	o	525	Pipe/Conduit
1.007	15.525	0.036	433.8	0.000	0.00		0.0 0.600	o	525	Pipe/Conduit
3.000	30.598	0.270	113.3	0.201	5.00		0.0 0.600	o	375	Pipe/Conduit
3.001	28.035	0.155	180.9	0.056	0.00		0.0 0.600	o	450	Pipe/Conduit
4.000	32.010	0.731	43.8	0.129	5.00		0.0 0.600	o	300	Pipe/Conduit
3.002	59.085	0.570	103.7	0.095	0.00		0.0 0.600	o	450	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	67.126	0.124	0.0	1.67	184.9
1.001	67.034	0.214	0.0	2.07	229.0
2.000	66.527	0.095	0.0	1.43	157.4
1.002	66.300	0.353	0.0	1.40	223.0
1.003	66.147	0.383	0.0	1.56	248.2
1.004	66.017	0.397	0.0	2.02	320.7
1.005	65.911	0.431	0.0	1.03	163.8
1.006	65.752	0.515	0.0	1.04	225.9
1.007	65.676	0.515	0.0	1.07	231.4
3.000	67.290	0.201	0.0	1.70	187.9
3.001	66.945	0.257	0.0	1.51	239.9
4.000	67.671	0.129	0.0	2.38	168.5
3.002	66.790	0.482	0.0	2.00	317.6



Micro
Drainage

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Simulation Criteria for Surface Network 1

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0
 Number of Offline Controls 0
 Number of Time/Area Diagrams 0
 Number of Online Controls 1
 Number of Storage Structures 1
 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 515037 231595 TL 15037 31595
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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Micro Drainage Network 2020.1																																																																																															
Online Controls for Surface Network 1 Hydro-Brake® Optimum Manhole: S25, DS/PN: 1.009, Volume (m³): 2.5 Unit Reference MD-SHE-0028-4000-1000-4000 Design Head (m)1.000 Design Flow (l/s)0.4 Flush-Flo™Calculated ObjectiveMinimise upstream storage ApplicationSurface Sump AvailableYes Diameter (mm)28 Invert Level (m)65.630 Minimum Outlet Pipe Diameter (mm)75 Suggested Manhole Diameter (mm)1200 <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.000</td><td>0.4</td><td>Kick-Flo®</td><td>0.256</td><td>0.2</td></tr><tr><td>Flush-Flo™</td><td>0.127</td><td>0.3</td><td>Mean Flow over Head Range</td><td>-</td><td>0.3</td></tr></table> The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>0.3</td><td>1.200</td><td>0.4</td><td>3.000</td><td>0.6</td><td>7.000</td><td>0.9</td></tr><tr><td>0.200</td><td>0.3</td><td>1.400</td><td>0.5</td><td>3.500</td><td>0.7</td><td>7.500</td><td>1.0</td></tr><tr><td>0.300</td><td>0.2</td><td>1.600</td><td>0.5</td><td>4.000</td><td>0.7</td><td>8.000</td><td>1.0</td></tr><tr><td>0.400</td><td>0.3</td><td>1.800</td><td>0.5</td><td>4.500</td><td>0.8</td><td>8.500</td><td>1.0</td></tr><tr><td>0.500</td><td>0.3</td><td>2.000</td><td>0.5</td><td>5.000</td><td>0.8</td><td>9.000</td><td>1.1</td></tr><tr><td>0.600</td><td>0.3</td><td>2.200</td><td>0.6</td><td>5.500</td><td>0.8</td><td>9.500</td><td>1.1</td></tr><tr><td>0.800</td><td>0.4</td><td>2.400</td><td>0.6</td><td>6.000</td><td>0.9</td><td></td><td></td></tr><tr><td>1.000</td><td>0.4</td><td>2.600</td><td>0.6</td><td>6.500</td><td>0.9</td><td></td><td></td></tr></table> <tr><td colspan="3">©1982-2020 Innovyze</td></tr>			Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.000	0.4	Kick-Flo®	0.256	0.2	Flush-Flo™	0.127	0.3	Mean Flow over Head Range	-	0.3	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	0.3	1.200	0.4	3.000	0.6	7.000	0.9	0.200	0.3	1.400	0.5	3.500	0.7	7.500	1.0	0.300	0.2	1.600	0.5	4.000	0.7	8.000	1.0	0.400	0.3	1.800	0.5	4.500	0.8	8.500	1.0	0.500	0.3	2.000	0.5	5.000	0.8	9.000	1.1	0.600	0.3	2.200	0.6	5.500	0.8	9.500	1.1	0.800	0.4	2.400	0.6	6.000	0.9			1.000	0.4	2.600	0.6	6.500	0.9			©1982-2020 Innovyze		
Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)																																																																																										
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Date 25/07/2025 09:06					
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Micro Drainage			Network 2020.1		
2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for <u>Surface Network 1</u>					
<u>Simulation Criteria</u>					
Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000					
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000					
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800					
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000					
Foul Sewage per hectare (l/s) 0.000					
Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0					
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0					
<u>Synthetic Rainfall Details</u>					
Rainfall Model FEH					
FEH Rainfall Version 2013					
Site Location GB 515037 231595 TL 15037 31595					
Data Type Point					
Cv (Summer) 1.000					
Cv (Winter) 1.000					
Margin for Flood Risk Warning (mm) 300.0					
Analysis Timestep 2.5 Second Increment (Extended)					
DTS Status OFF					
DVD Status ON					
Inertia Status ON					
Profile(s) Summer and Winter					
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440					
Return Period(s) (years) 2, 30, 100					
Climate Change (%) 0, 35, 40					
</					

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<u>2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1</u>		

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Micro Drainage			Network 2020.1																																																																																																																	
30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1																																																																																																																				
Simulation Criteria Areal Reduction Factor 1.000 Hot Start (mins) 0 Hot Start Level (mm) 0 Manhole Headloss Coeff (Global) 0.500 Foul Sewage per hectare (l/s) 0.000 Additional Flow - % of Total Flow 0.000 MADD Factor * 10m³/ha Storage 2.000 Inlet Coeffiecient 0.800 Flow per Person per Day (l/per/day) 0.000																																																																																																																				
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Synthetic Rainfall Details Rainfall Model FEH Rainfall Version Site Location GB 515037 231595 TL 15037 31595 Data Type Cv (Summer) Cv (Winter) FEH 2013 31595 Point 1.000 1.000																																																																																																																				
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<table><tr><th colspan="3"></th><th colspan="4">Water Surcharged Flooded</th></tr><tr><th>PN</th><th>US/MH Name</th><th>Event</th><th>US/CL (m)</th><th>Level (m)</th><th>Depth (m)</th><th>Volume (m³)</th><th>Flow / Cap.</th></tr><tr><td>1.000</td><td>S8</td><td>15 minute 30 year Summer I+35%</td><td>68.717</td><td>67.340</td><td>-0.161</td><td>0.000</td><td>0.61</td></tr><tr><td>1.001</td><td>S9</td><td>15 minute 30 year Summer I+35%</td><td>68.633</td><td>67.250</td><td>-0.159</td><td>0.000</td><td>0.61</td></tr><tr><td>2.000</td><td>S18</td><td>15 minute 30 year Summer I+35%</td><td>68.155</td><td>66.993</td><td>0.092</td><td>0.000</td><td>0.38</td></tr><tr><td>1.002</td><td>S10</td><td>15 minute 30 year Summer I+35%</td><td>68.013</td><td>66.888</td><td>0.138</td><td>0.000</td><td>0.93</td></tr><tr><td>1.003</td><td>S20</td><td>15 minute 30 year Summer I+35%</td><td>67.810</td><td>66.760</td><td>0.163</td><td>0.000</td><td>0.94</td></tr><tr><td>1.004</td><td>S11</td><td>1440 minute 30 year Winter I+35%</td><td>67.682</td><td>66.637</td><td>0.170</td><td>0.000</td><td>0.05</td></tr><tr><td>1.005</td><td>S12</td><td>1440 minute 30 year Winter I+35%</td><td>67.600</td><td>66.637</td><td>0.276</td><td>0.000</td><td>0.07</td></tr><tr><td>1.006</td><td>S13</td><td>1440 minute 30 year Winter I+35%</td><td>67.514</td><td>66.637</td><td>0.360</td><td>0.000</td><td>0.07</td></tr><tr><td>1.007</td><td>S24</td><td>1440 minute 30 year Winter I+35%</td><td>67.497</td><td>66.637</td><td>0.436</td><td>0.000</td><td>0.09</td></tr><tr><td>3.000</td><td>S16</td><td>15 minute 30 year Summer I+35%</td><td>68.858</td><td>67.621</td><td>-0.044</td><td>0.000</td><td>0.71</td></tr><tr><td>3.001</td><td>S17</td><td>15 minute 30 year Summer I+35%</td><td>68.704</td><td>67.514</td><td>0.119</td><td>0.000</td><td>0.67</td></tr><tr><td>4.000</td><td>S1</td><td>15 minute 30 year Summer I+35%</td><td>69.171</td><td>67.822</td><td>-0.150</td><td>0.000</td><td>0.50</td></tr></table>									Water Surcharged Flooded				PN	US/MH Name	Event	US/CL (m)	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	1.000	S8	15 minute 30 year Summer I+35%	68.717	67.340	-0.161	0.000	0.61	1.001	S9	15 minute 30 year Summer I+35%	68.633	67.250	-0.159	0.000	0.61	2.000	S18	15 minute 30 year Summer I+35%	68.155	66.993	0.092	0.000	0.38	1.002	S10	15 minute 30 year Summer I+35%	68.013	66.888	0.138	0.000	0.93	1.003	S20	15 minute 30 year Summer I+35%	67.810	66.760	0.163	0.000	0.94	1.004	S11	1440 minute 30 year Winter I+35%	67.682	66.637	0.170	0.000	0.05	1.005	S12	1440 minute 30 year Winter I+35%	67.600	66.637	0.276	0.000	0.07	1.006	S13	1440 minute 30 year Winter I+35%	67.514	66.637	0.360	0.000	0.07	1.007	S24	1440 minute 30 year Winter I+35%	67.497	66.637	0.436	0.000	0.09	3.000	S16	15 minute 30 year Summer I+35%	68.858	67.621	-0.044	0.000	0.71	3.001	S17	15 minute 30 year Summer I+35%	68.704	67.514	0.119	0.000	0.67	4.000	S1	15 minute 30 year Summer I+35%	69.171	67.822	-0.150	0.000	0.50
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 1

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	S8		73.0	OK
1.001	S9		130.0	OK
2.000	S18		51.3	SURCHARGED
1.002	S10		180.4	SURCHARGED
1.003	S20		191.1	SURCHARGED
1.004	S11		9.8	SURCHARGED
1.005	S12		10.6	SURCHARGED
1.006	S13		12.6	SURCHARGED
1.007	S24		12.6	SURCHARGED
3.000	S16		117.4	OK
3.001	S17		136.7	SURCHARGED
4.000	S1		76.3	OK

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Micro Drainage	Network 2020.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 1

US/MH			US/CL		Water Level	Surcharged Depth	Flooded Volume	Flow /
PN	Name	Event	(m)	(m)	(m)	(m ³)	Cap.	
3.002	S2	15 minute 30 year Summer I+35%	68.604	67.415	0.175	0.000	0.82	
5.000	S21	15 minute 30 year Summer I+35%	68.182	67.280	0.320	0.000	0.64	
5.001	S22	15 minute 30 year Summer I+35%	68.076	67.164	0.374	0.000	0.45	
3.003	S3	15 minute 30 year Summer I+35%	68.052	67.058	0.388	0.000	1.29	
3.004	S5	1440 minute 30 year Summer I+35%	67.532	66.637	0.310	0.000	0.12	
1.008	S23	1440 minute 30 year Winter I+35%	67.130	66.637	0.547	0.000	0.02	
1.009	S25	1440 minute 30 year Winter I+35%	67.000	66.676	0.896	0.000	0.02	

US/MH			Pipe	
PN	Name	Overflow (l/s)	Flow (l/s)	Status
3.002	S2	240.7	SURCHARGED	
5.000	S21	55.6	SURCHARGED	
5.001	S22	57.9	SURCHARGED	
3.003	S3	308.4	SURCHARGED	
3.004	S5	27.0	SURCHARGED	
1.008	S23	1.7	SURCHARGED	
1.009	S25	0.4	SURCHARGED	

Stomor Ltd

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Welwyn Garden City
Herts AL7 4BQ

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 1

Simulation Criteria

Areal Reduction Factor 1.000

Hot Start (mins) 0

Hot Start Level (mm) 0

Manhole Headloss Coeff (Global) 0.500

Foul Sewage per hectare (l/s) 0.000

Additional Flow - % of Total Flow 0.000

MADD Factor * 10m³/ha Storage 2.000

Inlet Coeffiecient 0.800

Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0

Number of Offline Controls 0

Number of Time/Area Diagrams 0

Number of Online Controls 1

Number of Storage Structures 1

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH

FEH Rainfall Version 2013

Site Location GB 515037 231595 TL 15037 31595

Data Type Point

Cv (Summer) 1.000

Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status OFF

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years) 2, 30, 100

Climate Change (%) 0, 35, 40

PN	US/MH Name	Event	Water Surcharged Flooded					Flow / Cap.
			US/CL (m)	Level (m)	Depth (m)	Volume (m³)		
1.000	S8	15 minute 100 year Summer I+40%	68.717	67.779	0.277	0.000	0.76	
1.001	S9	15 minute 100 year Summer I+40%	68.633	67.696	0.287	0.000	0.75	
2.000	S18	15 minute 100 year Summer I+40%	68.155	67.505	0.603	0.000	0.46	
1.002	S10	15 minute 100 year Summer I+40%	68.013	67.399	0.648	0.000	1.17	
1.003	S20	15 minute 100 year Summer I+40%	67.810	67.183	0.586	0.000	1.19	
1.004	S11	15 minute 100 year Summer I+40%	67.682	66.987	0.520	0.000	1.36	
1.005	S12	1440 minute 100 year Summer I+40%	67.600	66.917	0.556	0.000	0.16	
1.006	S13	1440 minute 100 year Winter I+40%	67.514	66.916	0.639	0.000	0.09	
1.007	S24	1440 minute 100 year Winter I+40%	67.497	66.916	0.716	0.000	0.12	
3.000	S16	15 minute 100 year Summer I+40%	68.858	68.559	0.894	0.000	0.83	
3.001	S17	15 minute 100 year Summer I+40%	68.704	68.398	1.003	0.000	0.78	
4.000	S1	15 minute 100 year Summer I+40%	69.171	68.492	0.521	0.000	0.61	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 1

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
3.002	S2	15 minute 100 year Summer I+40%	68.604	68.285	1.045	0.000	0.99
5.000	S21	15 minute 100 year Summer I+40%	68.182	67.898	0.938	0.000	0.77
5.001	S22	15 minute 100 year Summer I+40%	68.076	67.794	1.004	0.000	0.60
3.003	S3	15 minute 100 year Summer I+40%	68.052	67.692	1.022	0.000	1.65
3.004	S5	1440 minute 100 year Summer I+40%	67.532	66.917	0.590	0.000	0.15
1.008	S23	1440 minute 100 year Winter I+40%	67.130	66.917	0.827	0.000	0.02
1.009	S25	1440 minute 100 year Winter I+40%	67.000	66.956	1.176	0.000	0.02

PN	US/MH Name	Pipe Overflow (l/s)	Flow (l/s)	Status
3.002	S2	290.4	SURCHARGED	
5.000	S21	67.5	FLOOD RISK	
5.001	S22	77.8	FLOOD RISK	
3.003	S3	395.7	SURCHARGED	
3.004	S5	35.0	SURCHARGED	
1.008	S23	1.8	FLOOD RISK	
1.009	S25	0.4	FLOOD RISK	



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