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FLOOD RISK ASSESSMENT AND DRAINAGE STATEMENT

Scheme name:

**Clear View Cottage, Whistley Green, Reading, RG10
ODU**

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Prepared For:	██████████ Mr Horscroft

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Foreword

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Some of the information presented within this report is based on third-party information which is believed to be correct; no liability will be accepted for any discrepancies inaccuracies, mistakes or omissions in such information. The report also assesses the flood risk in relation to the requirements of the Environment Agency and as such assesses the site for a specific flood event and not all flood events. The contents of this document must not be copied or reproduced in whole or in part without the written consent of Infrastruct CS Ltd.



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1.0 Summary

A Flood Risk Assessment (FRA) and drainage strategy have been undertaken to accompany the planning application for the proposed development at Clear View Cottage, Whistley Green, Reading, RG10 0DU. Infrastruct CS Ltd has prepared this report on behalf of the Mrs Coker and Mr Horscroft in accordance with the guidelines set out in the National Planning Policy Framework.

The following table is an overview of the flood risk and drainage strategy for the proposed development of the site, based upon currently available information and finds the following –

ITEM	RESPONSE
Site Location	The site is at Clearview Cottage, Whistley Green, Reading RG10 0DU, bound by Whistley Green to the north, residential dwellings to the east and west and green field land south. The approximate grid reference is 479357E, 174027N.
Size and Current Land Usage	The current site is approximately 0.35ha in plan and was previously used as part of a nursery which included the now developed nursery gardens.
Flood Zone	The development site falls entirely within Flood Zone 1, which is classified as low probability of flooding.
Fluvial Flood Risk	Low – Refer to Section 6.1
Overland Flood Risk	Low – Refer to Section 7.1
Groundwater Flood Risk	Low – Refer to Section 7.2
Sewerage Flood Risk	Low – Refer to Section 7.3
Artificial Flood Risk	Low – Refer to Section 7.4
Proposed Development	The architectural proposals involve the construction of a replacement dwelling of a cottage which has been unoccupied for 15 years.
SuDS Features proposed for this scheme	The proposed SuDS features for the development of land are the use of tanked permeable paving for attenuation and the proposed 2.0 l/s discharge to an existing on site ditch.

Based on this assessment, it is concluded that in accordance with the Flood risk vulnerability and flood zone compatibility table of the Planning Practice Guidance, as indicated within Section 6.7 of this report, the proposed development is appropriate.



2.0 Introduction

2.1 Commission

The client, Mrs Coker and Mr Horscroft, has commissioned Infrastruct CS Ltd to prepare a Flood Risk Assessment (FRA) and drainage statement to support a planning application for replacement dwelling at Clear View Cottage.

2.2 Guidance

This flood risk assessment has been compiled in accordance with the recommendations of the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (PPG).

2.3 Aims and Objectives

The purpose of this flood risk assessment is to assess the potential flood risks by and to the proposed development. It will identify the flood risk zone, potential sources of flood risk, consider the proposed drainage, and will be used to support the proposed planning application.

3.0 Site Details

3.1 Location

The site is at Clearview Cottage, Whistley Green, Reading RG10 0DU, bound by Whistley Green to the north, residential dwellings to the east and west and green field land south.



Figure 3.1.1 - Site Context



Figure 3.1.2 - Site location

3.2 Grid Reference

The Ordnance Survey National grid reference for the centre of the site is:

479357E, 174027N (Nat Grid SU 79357 74027)

3.3 Topography and Site Description

The site covers an approximate brownfield area of 0.35ha. The site is approximately rectangular on plan, with its long axis running in a north-south direction.

Levels vary within the site between 38.02mAOD to the south-western corner and 37.09mAOD to the north-eastern corner. The maximum fall across the site is 0.93m over 112m, giving an average gradient of 1 in 120. Refer to Appendix A for the topographic survey.

3.4 Ground Conditions

Superficial deposits: Kempton Park Gravel Member - Sand and gravel. Sedimentary superficial deposit formed between 116 and 11.8 thousand years ago during the Quaternary period.

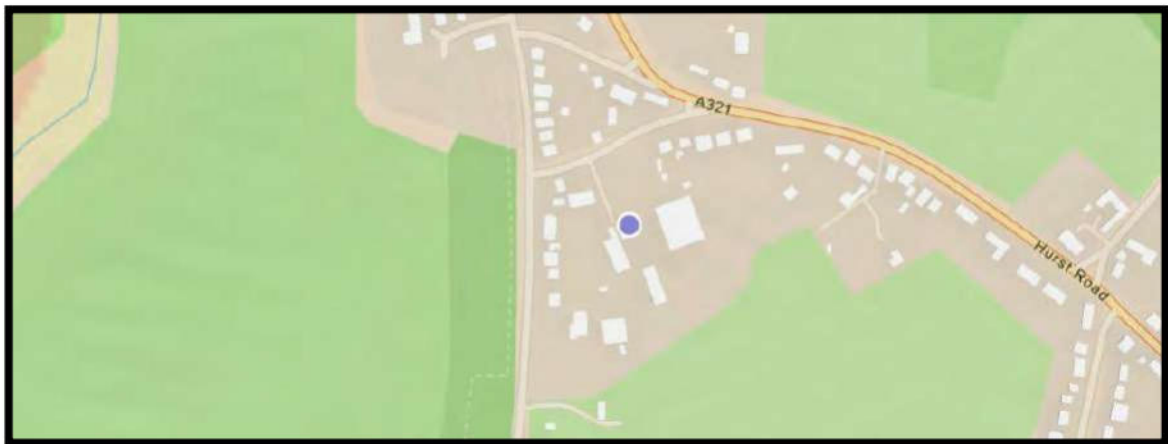


Figure 3.4.1 – Superficial Deposits, from British Geological Survey online database.

Bedrock geology: Lambeth Group - Clay, silt and sand. Sedimentary bedrock formed between 59.2 and 47.8 million years ago during the Palaeogene period.

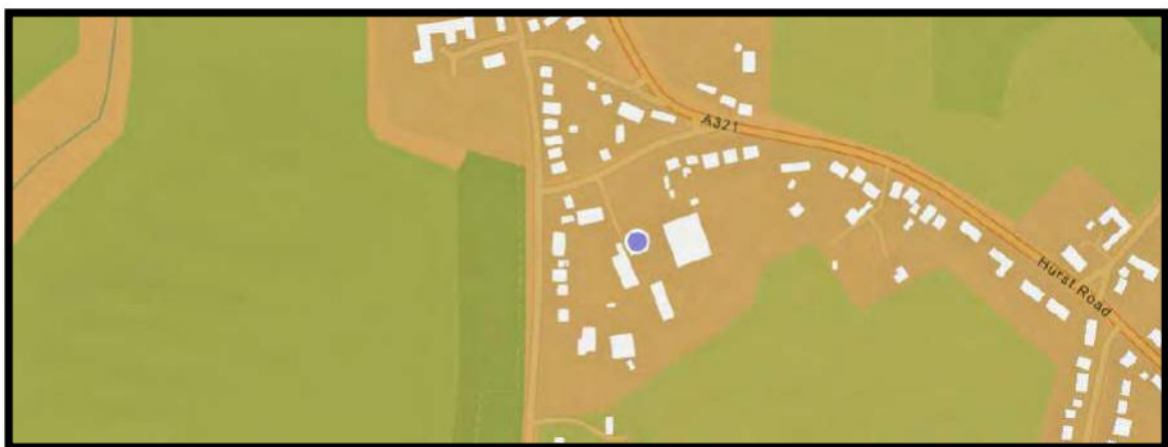


Figure 3.4.2 – Bedrock Geology, from British Geological Survey online database.

Intrusive site investigations carried out adjacent/near the development and shown on the British Geological Survey database (BGS ID: 428034, BGS Ref: SU77SE77, British NGR: 479250,173710) Showed the following strata:

268/578 B

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RECORD OF WELL

At Whitley Green
Town or Village near Telford
County Shropshire 38 NW E

Six-inch County Sheet Plot No 200
Bent
Six-inch National Grid sheet and reference 1935 edition, 54 77 SE (725 737)
For Mid Southern Water Company
State whether owner, tenant, builder, contractor, consultant, etc.
Address (if different from above) Frimley Green
Camberley, Surrey

Level of ground surface above sea level (O.D.) 14.2 (0.7572 m)
If well top is not at ground level, state how far above* 14.2 (0.7572 m)
SHAFT 11 ft (3.35 m); Diameter 11 ft (3.35 m);

HEADINGS (please attach details—dimensions and directions)
BORE 300 ft (91.44 m); diameter at top 42 in (106.68 cm); at bottom 36 in (91.44 cm)

Full details of permanent lining tubes (position, length, diameter, plain, slotted, etc.)
(106.68 m) 42" dia plain steel lining tube 9 ft to 20' 0" (6.09 m)
(91.44 m) 36" dia " " " 7' 6" above 9 ft to 80' 3" (24.47 m)
Below 9 ft. Anchor 36" inside casing cement grouted to surface.
Water struck at depths of 11.38 ft (3.52 m) 73.32 ft (22.32 m) below well top
Rest level of water 15' 7" ft (4.79 m) below well top. Suction at 275 ft (83.82 m)
Yield on 5 days test pumping at 11.570 galls (41.5 l) per hour. Low depression to 230 ft (70.1 m) below well top. Recovery to rest level in 4 days mins hours
Capacity of pump 50,000 g.p.h. (1.83 m³/h)
Date of measurements

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:
Make and/or type Le Grant Motive power Electric
Capacity 50,000 galls (183 m³) per hour. Suction at 275 ft (83.82 m) below well top. Amount pumped 50,000 galls (183 m³) per day. Estimated consumption 50,000 galls (183 m³) per week
Well made by Le Grant (Well Sinking & Eng.) Co. Ltd. Date of sinking commenced 25/5/77
ADDITIONAL NOTES ANALYSIS (please attach copy if available) completed 30/6/77
20 tonnes acid injected 27/7/77
BH test pumped 8400 gal. pH 2.46 ft
further 20 tonnes acid injected 10/8/77
BH retested as above

Record from Le Grant
(Well Sinking & Eng.) Co. Ltd.
Date 25.11.77
Observations and
Remarks
E.R. 144 Val 3rd Sheet
Site marked on ☐ map ☐ (see symbols)
Copy to Le Grant
Date

INSTITUTE OF GEOLOGICAL SCIENCES,
WATER DEPARTMENT,
SOUTH KENSINGTON,
LONDON, S.W. 7

SU 77 SE/77

260/518

Institute use only GEOLOGICAL CLASSIFICATION	NATURE OF STRATA If measurements start below ground surface, state how far.	THICKNESS			DEPTH		
		Feet	Inches	Metres	Feet	Inches	Metres
	Topsoil	1	6	0.4572	1	6	0.4572
	Gravel	9	6	2.89	11	0	3.35
	Mottled Clay	27	0	8.22	38	0	11.58
	Green brown sandy clay	24	0	7.31	62	0	18.87
	Blue Clay and stones	6	6	1.972	68	0	20.87
	Blue sandy silty Clay	1	6	0.4572	70	0	21.33
	Chalk and flints	230	0	70.10	300	0	91.44

3.5 Groundwater

Boreholes were carried out in the vicinity of the site, and groundwater was found within the trial pits at 4.747mbgl. Further in-situ testing is required to confirm the depth of groundwater.

3.6 Existing Site Drainage

A topographic survey was carried out in 2025 by survey base. The full set of documents can be found in Appendix A. Most of the current surface water drains will be abandoned as they will have no purpose. Discharge to an existing ditch is proposed (Section 8.6).

3.7 Existing Watercourses

The nearest main river is the River Loddon, a tributary of the River Thames, which is located 0.385km to the west of the site. There is stream that leads into the River Loddon 0.07km west of the site.



Figure 3.7 – Main River Map from ArcGIS online viewer

3.8 Environment Agency Groundwater and Aquifer Protection

Reference to the Environment Agency Groundwater Protection Zone Map shows the area is sited within a Zone 3 groundwater protection zone. The Environment Agency have defined Source Protection Zones (SPZs) for groundwater sources such as wells, boreholes, and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk.

Zone 3: (Total catchment) - This zone is defined as the total area needed to support the abstraction or discharge from the protected groundwater source.



Figure 3.8.1 – Groundwater Protection Zones

KEY:

	Zone I – Inner Protection Zone		Zone III – Total Catchment
	Zone I – Subsurface Activity		Zone III – Subsurface Activity
	Zone II – Outer Protection Zone		Zone of Special Interest
	Zone II – Subsurface Activity		

The Environment Agency use the zones to set up pollution prevention measures in areas which are at a higher risk, and to monitor the activities of potential polluters nearby.

A study of the aquifer maps on the Environment Agency website revealed the site to be located within a Secondary B superficial aquifer and also within a Secondary B bedrock aquifer.

Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.



Figure 3.8.2 – Aquifer Designation Map – Superficial

KEY:

	Principal		Secondary (undifferentiated)
	Secondary A		Unknown (Lakes & Landslip)
	Secondary B		Unproductive

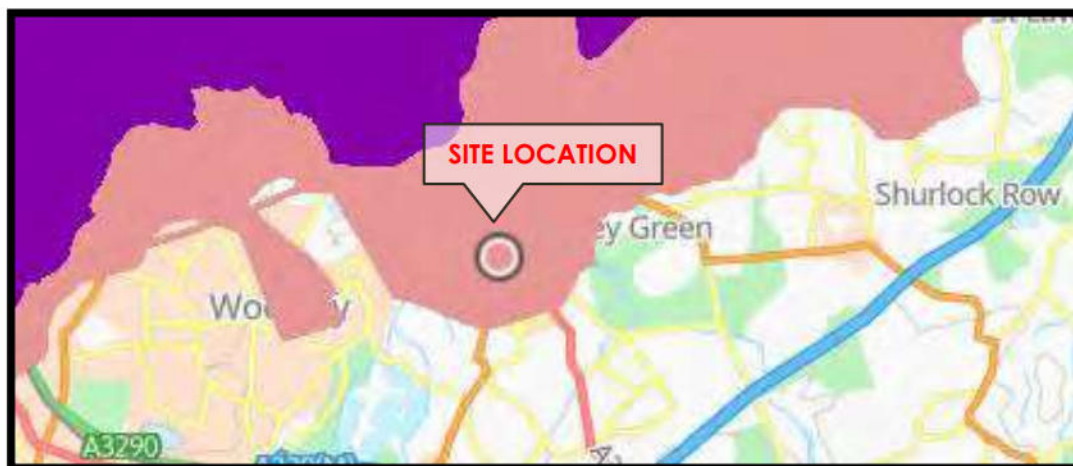


Figure 3.8.3 – Aquifer Designation Map – Bedrock

KEY:

	Principal		Secondary (undifferentiated)
	Secondary A		Unknown (Lakes & Landslip)
	Secondary B		Unproductive

4.0 Proposed Development

The architectural proposals involve the demolition of the existing dwelling and erection of replacement dwelling, carport building with accommodation over, and front garden wall and gate, solar panels to outbuilding, and associated changes to landscaping. The development plans can be found in Appendix B.

5.0 National and Local Planning Policy & Guidance

5.1 National Planning Policy and Guidance

The NPPF and PPG set out government's planning policies for England and how these are expected to be applied. The NPPF and PPG seek to ensure that flood risk is taken into account at all stages in the planning process and is appropriately addressed.

Footnote 63 of the NPPF states that a site-specific flood risk assessment should be submitted for all development proposed in flood zone 2 and flood zone 3 whilst in flood zone 1, an assessment should accompany all proposals involving:

- sites of 1 ha or more;
- land identified as having critical drainage problems or as being at increased flood risk in future;
- or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

NPPF paragraph 170 states that "inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere".

Paragraph 172 of the NPPF states that all plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:

- a) applying the sequential test and then, if necessary, the exception test as set out below;
- b) safeguarding land from development that is required, or likely to be required, for current or future flood management;
- c) using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and
- d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.

NPPF paragraph 173 states that "a sequential risk-based approach should also be taken to individual applications in areas known to be at risk now or in future from any form of flooding, by following the steps set out below".

NPPF paragraph 176 states that "applications for some minor development and changes of use should also not be subject to the sequential test, nor the exception test set out below, but should still meet the requirements for site-specific flood risk assessments set out in footnote 63".

NPPF paragraph 178 states that the application of the exception test should be informed by a strategic or sitespecific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. To pass the exception test it should be demonstrated that:

- a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and



b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

NPPF Paragraph 179 states that "both elements of the exception test should be satisfied for development to be permitted".

NPPF paragraph 181 states that "When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment.

Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
- d) any residual risk can be safely managed; and
- e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

NPPF paragraph 182 states that applications which could affect drainage on or around the site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, and which are proportionate to the nature and scale of the proposal.

These should provide multifunctional benefits wherever possible, through facilitating improvements in water quality and biodiversity, as well as benefits for amenity. Sustainable drainage systems provided as part of proposals for major development should:

- a) take account of advice from the Lead Local Flood Authority;
- b) have appropriate proposed minimum operational standards; and
- c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development.



5.2 Wokingham Plan

CP1 - Sustainable Development:

Planning permission will be granted for development proposals that:

- 1) Maintain or enhance the high quality of the environment;
- 2) Minimise the emission of pollutants into the wider environment;
- 3) Limit any adverse effects on water quality (including ground water);
- 4) Ensure the provision of adequate drainage;
- 5) Minimise the consumption and use of resources and provide for recycling;
- 6) Incorporate facilities for recycling of water and waste to help reduce per capita water consumption;
- 7) Avoid areas of best and most versatile agricultural land;
- 8) Avoid areas where pollution (including noise) may impact upon the amenity of future occupiers;
- 9) Avoid increasing (and where possible reduce) risks of or from all forms of flooding (including from groundwater);
- 10) Provide attractive, functional, accessible, safe, secure and adaptable schemes;
- 11) Demonstrate how they support opportunities for reducing the need to travel, particularly by private car in line with CP6; and
- 12) Contribute towards the goal of reaching zero-carbon developments⁴¹ as soon as possible by:
 - a) Including appropriate on-site renewable energy features; and
 - b) Minimising energy and water consumption by measures including the use of appropriate layout and orientation, building form, design and construction, and design to take account of microclimate so as to minimise carbon dioxide emissions through giving careful consideration to how all aspects of development form

6.0 Flood Risk Policy

6.1 Environment Agency Flood Map

The Flood Map for Planning, shown below, indicates that the site wholly falls within flood zone 1

Flood zone 1, which is defined as land assessed as having a less than 1 in 1,000 annual probability of river flooding in any one year.

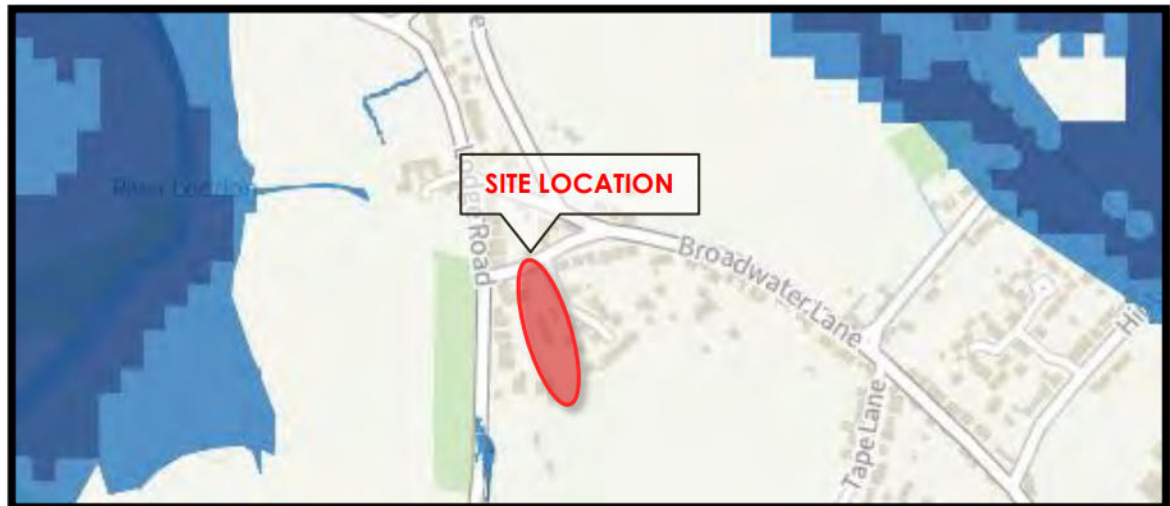


Figure 6.1 - Flood Map for Planning. Flood Zones 2 and 3. Environment Agency © 2025

It is, therefore, the consideration of this FRA that the site has a **low** risk of flooding from fluvial sources.

6.2 Historic Flood Events

The ArcGIS map below shows the site to be located outside all historic flood outlines.



Fig 6.2 – Historic Flood Outlines

6.3 National Planning Policy Framework and Planning Practice Guidance

The National Planning Policy Framework (NPPF) and the accompanying Planning Practice Guidance (PPG) gives direction for development with respect to flooding. These documents promote a sequential approach to encourage development away from areas that may be or are susceptible to flooding. In doing so it categorizes flood zones in the context of their probability of flooding, as shown in the table within Section 6.5 below.

6.4 Flood Zone Definition

The National Planning Policy Framework Definition of Flood Zones

Flood zone	Fluvial	Tidal	Probability of flooding
1	< 1 in 1000 year	<1 in 1000 year	Low probability
2	Between < 1 in 1000 year and 1 in 100 year	Between <1 in 1000 year and 1 in 200 year	Medium Probability
3a	> 1 in 100 year	> 1 in 200 year	High probability
3b	Either > 1 in 30 (3.3%) or as agreed between the EA and the LPA	Either > 1 in 30 or as agreed between the EA and the LPA	Functional flood plain

6.5 Flood Zones – Table 1 PPG

(Note: These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences)

Zone 1 - Low Probability
Definition
This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).
Appropriate uses
All uses of land are appropriate in this zone.
FRA requirements
For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the development on surface water run-off, should be incorporated in a FRA. This need only be brief unless the factors above or other local considerations require particular attention.
Policy aims
In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage techniques.

6.6 Flood Risk Vulnerability Classification - Extract from Table 2 PPG

More Vulnerable

- Hospitals.
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels.
- Non-residential uses for health services, nurseries, and educational establishments.
- Landfill and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

6.7 Flood Risk Vulnerability & Flood Zone Compatibility Table

Vulnerability classification flood zone	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
1	✓	✓	✓	✓	✓
2	✓	Exception test required	✓	✓	✓
3a †	Exception test required (†)	X	Exception test required	✓	✓
3b *	Exception test required (*)	X	X	X	✓ (*)

✓ Development is appropriate X development is not appropriate

Notes to table 2:

- This table does not show the application of the Sequential Test which should be applied first to guide development to the lowest flood risk areas; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and Exception Tests do not need to be applied to those developments set out in National Planning Policy Framework footnote 62. The Sequential and Exception Tests should be applied to 'major' and 'non major' development;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

"†" In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

"*" In Flood Zone 3b (functional floodplain) essential infrastructure that has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

The above table, taken from PPG (Table 3), confirms that residential properties within flood zones 1 are appropriate development.

7.0 Other Sources of Flood Risk to The Development

In addition to the potential for assessing flooding from fluvial and tidal sources NPPF also requires that consideration is given to other mechanisms for flooding:

- Flooding from land – intense rainfall, often in short duration, that is unable to soak into the ground or enter drainage systems, can run rapidly off land and result in local flooding.
- Flooding from groundwater – occurs when water levels in the ground rise above the surface elevations.
- Flooding from sewers – In urban areas, rainwater is frequently drained into surface water sewers or sewers containing both surface and wastewater sewers known as combined sewers. Flooding can result causing surcharging when the sewer is overwhelmed by heavy rainfall.
- Flooding from reservoirs, canals and other artificial sources – Non-natural or artificial sources of flooding can result from sources such as reservoirs, canals lakes etc, where water is held above natural ground levels.

7.1 Flooding from Overland Flows

The risk of flooding due to overland flood flows is considered very low by the Environment Agency. The surface water flood data for the site, shown below, indicates that there is high flood risk west of the site, but very low risk within the site itself.

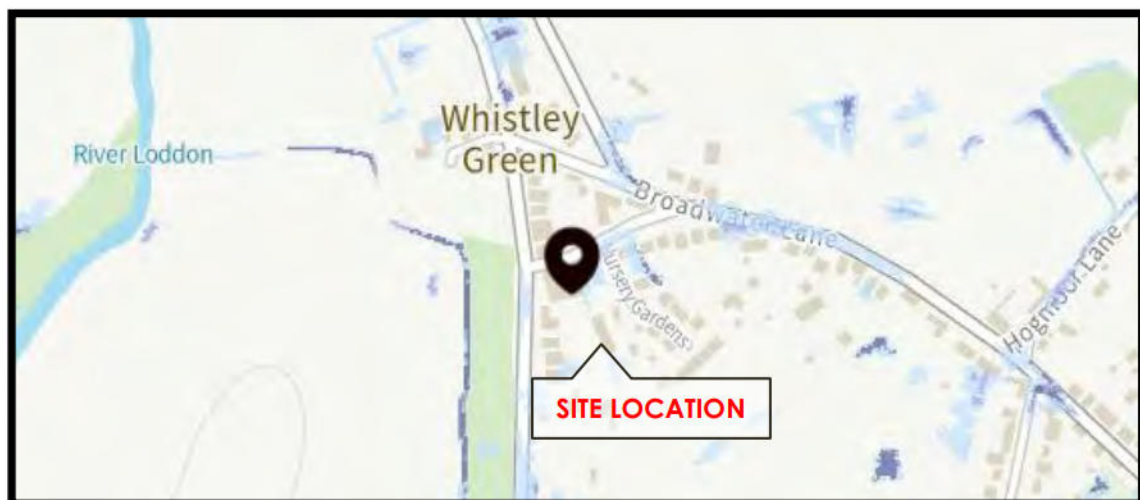


Fig 7.1.1 – Environment Agency © 2025 - Surface Water Flood Risk from Surface Water Flood Risk

It is, therefore, the consideration of this FRA that the site has a low risk of flooding from overland flows.

7.2 Flooding from Rising Groundwater

Groundwater flooding is dependent on local variations in topography, geology and soils. The causes of groundwater flooding are generally understood; however, it is difficult to predict the actual location, timing and extent of groundwater flooding without comprehensive datasets.

There is a lack of reliable measured datasets to undertake flood frequency analysis and even with datasets, this analysis is complicated due to the non-independence of groundwater level data. Surface water flooding incidents are sometimes mistaken for



groundwater flooding incidents, such as where runoff via infiltration seeps from an embankment, rather than locally high groundwater levels.

Section 3.5 of this report confirms that boreholes carried out in the vicinity of the site, found groundwater in borehole at approximate depths 4.747mbgl. This value shows the water table at a lower level of the proposed SuDS features; however, it was taken 260m away from it. Further testing is recommended to establish the groundwater levels along the whole site.

*It is, therefore, the consideration of this FRA that the site has a **low** risk of flooding from rising groundwater levels.*

7.3 Flooding from the Local Sewerage Network

Sewer flooding generally results in localised short-term flooding caused by intense rainfall events overloading the capacity of sewers. Flooding from sewers can also occur as a result of blockage, poor maintenance or structural failure.

As the site is at a higher elevation than the road, it is likely that any sewer flooding would be contained within the public highway, away from the development.

*It is, therefore, the consideration of this FRA that the site has a **low** risk of flooding by surcharging of the local sewer network.*

7.4 Flooding from Reservoirs, Canals & Other Artificial Sources

Reservoirs in the UK have an extremely good safety record. The EA is the enforcement authority for the Reservoirs Act 1975 in England and Wales. All large reservoirs must be inspected and supervised by reservoir panel engineers. It is assumed that these reservoirs are regularly inspected, and essential safety work is carried out. These reservoirs therefore present a minimal risk.

Flooding may result from the failure of engineering installations including flood defence, land drainage pumps, sluice gates and floodgates. Hard defences may fail through the slow deterioration of structural components such as the rusting of sheet piling, erosion of concrete reinforcement and toe protection or the failure of ground anchors. This deterioration can be difficult to detect, so that failure, when it occurs, is often sudden and unexpected. Failure is more likely when the structure is under maximum stress, such as extreme fluvial events.

It must be noted that the EA have mapped the maximum flood extent in the event of reservoir breach. Their maps are an absolute worst-case scenario, which assumes reservoirs are full at the time of breach, that there are no emergency reservoir operating measures and that lots of different reservoirs fail at the same time.

There are no known reservoirs, canals or other artificial sources in the vicinity of the site.

*It is, therefore, the consideration of this FRA that the site has a **low** risk of flooding by reservoirs, canals or other artificial sources.*

8.0 Flood Risk as a Result of the Development

8.1 Effect of The Development Generally

Development by its nature usually has the potential to increase the impermeable area with a resultant increased risk of causing rapid surface water runoff to watercourses and sewers, thereby causing surcharging and potential flooding. There is also the potential for pollutants to be mobilised and consequently flushed into the receiving surface water system.

Increases in both the peak runoff rate (usually measured in litres per second l/s) and runoff volume (cubic metres m³) can result.

8.2 Surface Water Drainage & Sustainable Drainage Systems

Sustainable Drainage techniques (SuDS) cover a range of approaches to manage surface water runoff so that-

'Surface water arising from a developed site should, as far as is practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account. This should be demonstrated as part of the flood risk assessment.'

Sustainable drainage systems (or SuDS) are designed to control surface water run off close to where it falls, combining a mixture of built and nature-based techniques to mimic natural drainage as closely as possible, and accounting for the predicted impacts of climate change. They provide benefits for water quantity, water quality, biodiversity and amenity. Many types of sustainable drainage systems are possible, contributing to reducing the causes and impacts of flooding. Multifunctional sustainable drainage systems are those that deliver a wider range of additional biodiversity and environmental net gains such as to:

- ameliorate urban heating and air pollution;
- replenish groundwater resources;
- contribute to biodiversity net gain targets;
- capture and re-use rainwater;
- store carbon;
- reduce the need for carbon-intensive construction techniques and pumped systems;
- release capacity in combined sewerage systems and at wastewater treatment works;
- create and connect valuable areas of blue-green infrastructure
- reduce lifetime maintenance costs; and
- enhance the attractiveness and value of new development by integrating water management with habitat for wildlife and opportunities for amenity and recreation.

In June 2025, the national standards for sustainable drainage systems (SuDS) were published. They provide information for designers, property developers, local authorities and other interested parties, such as sewerage undertakers and the Environment Agency.

These 7 standards are intended for application in the design of surface water drainage systems for new infrastructure and development, whether on greenfield or brownfield sites, and have been implemented, where possible, in this scheme.

8.3 Peak Storm Design Criteria

The proposed sustainable drainage techniques for the development should accommodate the peak rainfall event for a 1 in 100 year storm event with an additional allowance for climate change. Table 5 of PPG recommends for developments that have a life expectancy beyond 2085, that an additional factor of 40% is applied to the peak volume of runoff.

8.4 Existing Surface Water Runoff Rates

The development site area is approximately 0.35Ha, mostly impermeable. The site currently drains via soakaways into the ground. The existing runoff rates estimated for site are highlighted below:

Return Period	Greenfield Runoff Rate l/s	Existing Runoff Rate l/s
1 in 1 year	0.1	55.9
Qbar	0.1	72.3
1 in 30 year	0.3	136.3
1 in 100 year	0.4	174.6

Table 8.4 Existing Runoff rates

Greenfield runoff rates were calculated using the ICP SuDS Method within MicroDrainage Software. Calculations can be found in Appendix D.

8.5 Infiltration Testing

Boreholes local to the site, as shown in section 3.5, indicate the site is underlain by sandy and silty clay, suggesting poor infiltration. Furthermore, the LandIS Soilscape Viewer states that there's shallow groundwater on site. For these reasons, infiltration is not a viable option and discharge to a watercourse will be used instead.

8.6 Sustainable Drainage Hierarchy

A hierarchical approach has been undertaken in consideration of the application of SuDS in relation to the development. This is in order to meet the design philosophy of ensuring that surface water run-off is managed as close to its source as possible and the existing situation is replicated as closely as possible.

The following drainage hierarchy has been undertaken with reference to the procedures set out in the SuDS Manual (CIRIA C753, 2015) and the Standard 1 of the National Standards to assess the viability of the application of SuDS techniques to this scheme:

- Store rainwater for later use: Above ground rainwater harvesting features such as water butts are recommended to reduce the use of water, however are not enough on their own to accommodate the runoff from large storm events.
- Use infiltration techniques, such as porous surfaces in permeable strata areas: Infiltration based SuDS have been discarded in line with section 8.5 above.
- **Attenuate rainwater for gradual release to a watercourse:** This is the chosen solution, explained below in section 1.4.
- Discharge rainwater to a surface water drain: Not applicable, since a solution higher up in the hierarchy is used.
- Discharge rainwater to the combined sewer: Not applicable, since a solution higher up in the hierarchy is used.

Surface water runoff from the development shall not discharge to a foul drainage system

The sustainable drainage hierarchy shown above is intended to ensure that all practical and reasonable measures are taken to manage surface water higher up the hierarchy (1 being the highest) and that the amount of surface water managed at the bottom of the hierarchy is minimised.

Storing rainwater for later use might be an option but it is not sufficient to accommodate the runoff from the whole development.

The site-specific drainage hierarchy checklist considered for the drainage design for this development is detailed in Table 8.6.

SUDS OPTIONS	Comments	Potential for flow rate control	Volume reduction	Maintenance requirement	Space requirement	Cost	Feasibility in final detailed design
Rainwater harvesting	Rainwater from roof runoff collected for re-use. Cost-benefit considerations	L	M	H	L	H	N
Water butts	Rainwater collection from roof runoff. Included in final design	L	L	L	L	L	N
Living roofs	Vegetated roofs that reduce runoff volume and rate	M	L	M	L	H	N
Bio-retention	Shallow vegetated areas to retain and treat runoff.	L	L	M	M	L	N
Constructed wetlands	Waterlogged areas that can support aquatic vegetation. Replicates existing conditions and provides ecological benefit.	M	L	H	H/M	M	N
Swales	Shallow grassed drainage channels. Replicates existing conditions	H	M	L	M/H	L	N
Soakaways	Subsurface structures that dispose of water via infiltration.	H	H	L	L	M	N
Permeable pavements	Surface that infiltrate through surface. Retains pollutants.	H	H	M	L	M	Y
Tanked storage systems	Oversized pipes or cellular storage.	H	L	L	M	M/H	N
Infiltration basins	Depressions in the ground to store and release water through infiltration	H	H	H/M	H	M/L	N
Detention basins	Temporary retention of runoff with controlled discharge	H	L	M	H	M/L	N

Table 8.6 Drainage design hierarchy (SuDS techniques considered for use in this scheme)

It should be noted that where the SuDS techniques are noted as feasible or possible it does not necessarily follow that they will all be used. Reference should be made to the drainage strategy drawing in Appendix C which indicates the drainage proposals.

8.7 SUDS Techniques Employed

The proposed sustainable drainage techniques for the development will accommodate the peak rainfall event for a 1 in 100 year storm event with an additional allowance for climate change. Table 2 of NPPG recommends for developments that have a life expectancy beyond 2085 and that an additional factor of 40% is applied to the peak volume of runoff, which is in line with the Wokingham LLFA guidance.

Calculations will use the latest FSR data as well as a Cv runoff coefficient of 0.95 for roof and hard landscaping runoff. To account for uncertainties with soil infiltration rates, their possible reduction in performance over time, and the consequence of inadequate performance when using the RP 156 (CIRIA) method, a factor of safety shall be used in sizing the infiltration feature or assessing its performance in accordance with Table S3.1 of National Standards, shown below.

Size of the area to be drained	No damage or inconvenience from flooding	Minor inconvenience from flooding	Damage to buildings or structures, or major inconvenience (for example, flooding of roads)
Less than 100m²	1.5	2	10
100m² to 1000m²	1.5	3	10
More than 1000m²	1.5	5	10

Table 8.7.1 – Factors of safety for use in the hydraulic design of infiltration systems (National Standards for SuDS)

The parking bays will be permeable paved surfaces because this is where oil spillage is most likely to occur, and with adequate aggregate sub-bases, permeable paving can provide water quality treatment as it breaks down hydrocarbons (see 7.10). The main access road will also be tanked permeable paving used for storage of water. Runoff from roofs will be collected and conveyed via a pipe network into an existing ditch. Potential sediments will be trapped using catchpits. Urban creep has been considered when sizing the system.

The base of SuDS features shall not be within 1m of the maximum likely groundwater level on the site with levels determined in accordance with requirement.

Catchment areas for each SuDS feature are highlighted below:

SuDS Technique	Catchment Area (m ²)	Area with 10 % Urban Creep (m ²)
Permeable Paving 1	560	616
Permeable Paving 2	830	913

Table 8.7.A Catchment Areas

Return Period	Existing Runoff Rate (l/s)	Proposed Runoff Rate (l/s)	Reduction (%)
1 in 1 year	55.9	1.4	97.5
Qbar	72.3	1.5	97.9
1 in 30 year	136.3	1.6	98.8
1 in 100 year	174.6	1.8	99.0
1 in 100 year + 40%CC	-	2.0	-

Table 8.7.B Existing and proposed runoff rates



8.8 SuDS Maintenance

Unlike conventional drainage systems, SuDS features are visible, and their function should be easily understood by those responsible for maintenance. When problems occur, they are generally obvious and can be remedied simply, using standard landscaping practice. During the first year of operation of all types of SuDS, inspections should usually be carried out at least monthly (and after significant storm events) to ensure that the system is functioning as designed and that no damage is evident.

Standard 7 of the National Standards states that the designer shall provide a management and maintenance plan that supports the design objectives detailed in standards 1 to 6 and ensures the performance of the surface water drainage system with regards to runoff destinations, everyday and extreme rainfall, water quality, amenity and biodiversity is maintained throughout the lifetime of the development

A full SuDS maintenance report has been produced separately.

During construction, the SuDS systems will be maintained by the contractor. Upon sale of the last plot, the SuDS drainage system inclusive of access road, permeable paving and silt traps are to be maintained by the owner of the freehold or their appointed representative(s).

8.9 Water Quality

Standard 4 of the National Standards for Sustainable Drainage systems states that a 'SuDS approach' that protects surface waters, groundwater and coastal waters by managing the quality of the surface water runoff to adequately address water quality risks from the development must be applied.

According to the CIRIA SUDS Manual, see below, the pollution hazard level for car parks and low traffic roads is low, and the simple index approach should be used. Residential roofs have a very low hazard level and periodic sediment removal is sufficient.

TABLE 4.3 Minimum water quality management requirements for discharges to receiving surface waters and groundwater

Land use	Pollution hazard level	Requirements for discharge to surface waters, including coasts and estuaries ²	Requirements for discharge to groundwater
Residential roofs	Very low	Removal of gross solids and sediments only	
Individual property driveways, roofs (excluding residential), residential car parks, low traffic roads (eg cul de sacs, home zones, general access roads), non-residential car parking with infrequent change (eg schools, offices)	Low	Simple index approach ³ <i>Note: extra measures may be required for discharges to protected resources¹</i>	
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	Simple index approach ³ <i>Note: extra measures may be required for discharges to protected resources¹</i>	Simple index approach ³ <i>Note: extra measures may be required for discharges to protected resources¹</i> In England and Wales, Risk Screening ⁴ must be undertaken first to determine whether consultation with the environmental regulator is required. In Northern Ireland, the need for risk screening should be agreed with the environmental regulator.
Trunk roads and motorways	High	Follow the guidance and risk assessment process set out in HA (2009)	
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured, industrial sites	High	Discharges may require an environmental licence or permit ³ . Obtain pre-permitting advice from the environmental regulator. Risk assessment is likely to be required ⁵ .	

Table 4.3 of the SUDS Manual CIRIA C753. Page 63.

The method is guided by the land use and SuDS performance evidence. The steps to be followed are outlined below.

BOX 26.2 Steps of the simple index approach

Step 1 – Allocate suitable pollution hazard indices for the proposed land use

Step 2 – Select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index

Step 3 – Where the discharge is to protected¹ surface waters or groundwater, consider the need for a more precautionary approach

Note:

1 Designated as those protected for the supply of drinking water (Table 4.3).

Box 26.2 of the SUDS Manual CIRIA C753. Page 567.

Step 1: Pollution hazard indices are presented in table 26.2 below. These indices range from 0 (no pollution hazard for this contaminant) to 1 (high pollution hazard for this contaminant type).

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways ¹	High	0.8 ²	0.8 ²	0.9 ²

Table 26.2 of the SUDS Manual CIRIA C753. Page 568.

Step 2: To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index for each contaminant type that equals or exceeds the pollution hazard index. In this case the principal destination of the runoff is the surface water, so table 26.3 should be used.

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters				
Type of SuDS component	Mitigation indices¹			
	TSS	Metals	Hydrocarbons	
Filter strip	0.4	0.4	0.5	
Filter drain	0.4 ²	0.4	0.4	
Swale	0.5	0.6	0.6	
Bioretention system	0.8	0.8	0.8	
Permeable pavement	0.7	0.6	0.7	
Detention basin	0.5	0.5	0.6	
Pond ⁴	0.7 ³	0.7	0.5	
Wetland	0.8 ³	0.8	0.8	
Proprietary treatment systems ^{5,6}	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.			

Table 26.3 of the SuDS Manual CIRIA C753. Page 569.

SuDS Component	Mitigation Indices			Pollution Hazard Indices		
Swale	0.5	0.6	0.6			
Permeable pavement	0.7	0.6	0.7			
Train = Swale + 0.5*Permeable pavement	0.85	0.9	0.95	0.5	0.4	0.4

In this case, the mitigation indices are above the hazard indices which means the water quality treatment is adequate.

Step 3: Where the discharge is to protected groundwater, a more precautionary approach is needed. As stated in 3.8, the site falls outside Source Protection Zone 1 (it is in zone 2) and therefore no extra protection measures are needed.



9.0 Proposed Foul Water Drainage System

The development proposals will seek to discharge foul water from the development site into the existing on site foul manhole, to the north of the property. Flows into this system will be via a gravity fed connection.



10.0 Recommendations and Conclusion

The development proposals together with the site layout have been assessed in relation to the provision of SuDS drainage associated with the works.

The report has assessed the feasibility of implementing the SuDS hierarchical approach and has confirmed that this development is likely to be able to install suitable drainage measures into the design proposals.

Flood risk to the site has been assessed, and where risks have been deemed above low, mitigation measures have been proposed to reduce the risk to the site.

Therefore, in line with the recommendations of the National Planning Policy Framework, the development site lies within land classified as flood zone 1, which is considered at a low risk of flooding, and therefore appropriate for a development of this nature. Having assessed the other forms of flood risk to and from the development site, this report finds that the site is not considered at high risk from any other sources of flooding.

Floor levels should be raised above the 1% AEP fluvial flood level plus an allowance for climate change assuming 40% increased in flow over the next 100 years.

11.0 References & Bibliography

- The National Planning Policy Framework February 2025
- Planning Practice Guidance.
- Environment Agency - Rainfall-Runoff Management for Developments
- Environment Agency indicative flood maps <https://flood-map-for-planning.service.gov.uk/>
- Environment Agency indicative groundwater source protection zone maps <http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx>
- Environment Agency indicative Aquifer designation maps <https://magic.defra.gov.uk/>
- <https://www.bgs.ac.uk/information-hub/borehole-records/>
- <https://geologyviewer.bgs.ac.uk/>
- Flood Risk Assessment Guidance for New Development, Technical Report FD2320/TR2
- CIRIA 2015, The Sustainable Drainage Systems (SuDS) Manual C753
- National standards for sustainable drainage systems (SuDS) June 2025
- Design and Construction Guidance for adoptable sewers 2022
- Wokingham Borough Council Local Plan.



Appendix A - Topographic Survey



Notes: Coordinate System

The survey has been orientated to the O.S. National Grid (OSGB36) via GPS and the O.S. Active Network. True OSGB36 coordinates have been established at:

Station: CTRL A E: 479362.872 m N: 173993.169 m EL: 37.652 m

and a further OSGB36 point established to create a true O.S. bearing for angle orientation.

ON DETAIL SURVEY

A/C	Air Conditioning Unit	EP	Electricity Pole	O/N	Overhead	Tac	Tactile Paving
AV	Air Valve	FB	Fire Hydrant	PM	Parking Meter	TP	Telephone Pole
Bd	Bed Level	FB	Flower Bed	PS	Paving Slab	TCH	Threshold Call Box
BB	Beltline Beacon	FW	Foul	PO	Post	THL	Threshold Level
BS	Bollard	GV	Gas Valve	PR	Post Box	T/F	Top Of Fence
BH	Borehole	GY	Gully	RI	Riser	T/P	Top Of Parapet Level
Bk	Brick	IC	Inspection Cover	RE	Rodding Eye	T/V	Top Of Vegetation
BSP	Brick Spaving	IL	Invert Level	RS	Road Sign	T/W	Top Of Wall
BT	British Telecom	JB	Junction Box	SP	Sign Post	TL	Traffic Lights
CAB	Cabinet	KO	Kerb Outlet	S/A	Soakaway	UTL	Unable to Lift
CP	Catch Pit	LP	Lamp Post	SLY	Sley	VP	Vent Pipe
Co	Concrete	LI	Light	SC	Stop Clock	WL	Water Level
CL	Cover Level	MH	Manhole Cover	SV	Stop Valve	WM	Water Meter
CLC	Culvert	MP	Master Post	S	Stump	WO	Water Meter Out
dl	Dilapidated	MB	Multiple Bole	SW	Surface Water		
DCH	Drainage Channel	NVP	No Visible Pipes	STN	Survey Control Station		
GR	Grass Road	OVS	Overgrown				

ON FENCES/WALLS/DIVISIONS

A/B	Armo Crash Barrier	H/F	Heras Fence	P/R	Post and Rail Fence	BW	Brick Wall
B/W	Barbed Wire Fence	H/R	Hand Rail	P/W	Post and Wire Fence	CW	Concrete Wall
CL	Chain Link Fence	IR	Iron Rail Fence	S/F	Safety Fence	RW	Reinforcing Wall
C/B	Close Boarded Fence	P/L	Palisade Fence	T/F	Trellis Fence	SW	Stone Wall
E/F	Electric Fence	P/F	Picket Fence	W/M	Wire Mesh Fence	TW	Timber Wall

ON BUILDINGS

CHM	Chimney	EL	Eave Level	HH	Head Height	SH	Sill Height
DH	Door Head	FL	Flat Roof Level	PL	Parapet Level	SWP	Soil Pipe
DP	Down Pipe	FL	Floor Level	RL	Ridge Level	THL	Threshold Level

1

2

Rev	Comments	By	Chkd	Date
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

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Project Name

Clear View Cottage, Whitley Green, Reading, RG10 0DU

CAD Drawing Name

SB13150 - TOPO

Drawing Title

Topographical Survey of (1 OF 2 A1)

Client

Nigel Horscroft

Date

09/07/2025

Scale

A1 @ 1:200

Drawn By

SB - DT

Checked By

SB - CW

SB Code

SB13150

Revision

-

Grid Orientation

NORTH GPS

Site Level Datum

OS GPS

All dimensions are to be checked on site where applicable. This drawing must not be scaled, and only written dimensions should be requested.

Tree species and sizes on this drawing are not guaranteed, and if critical should be verified by an arboriculturist.

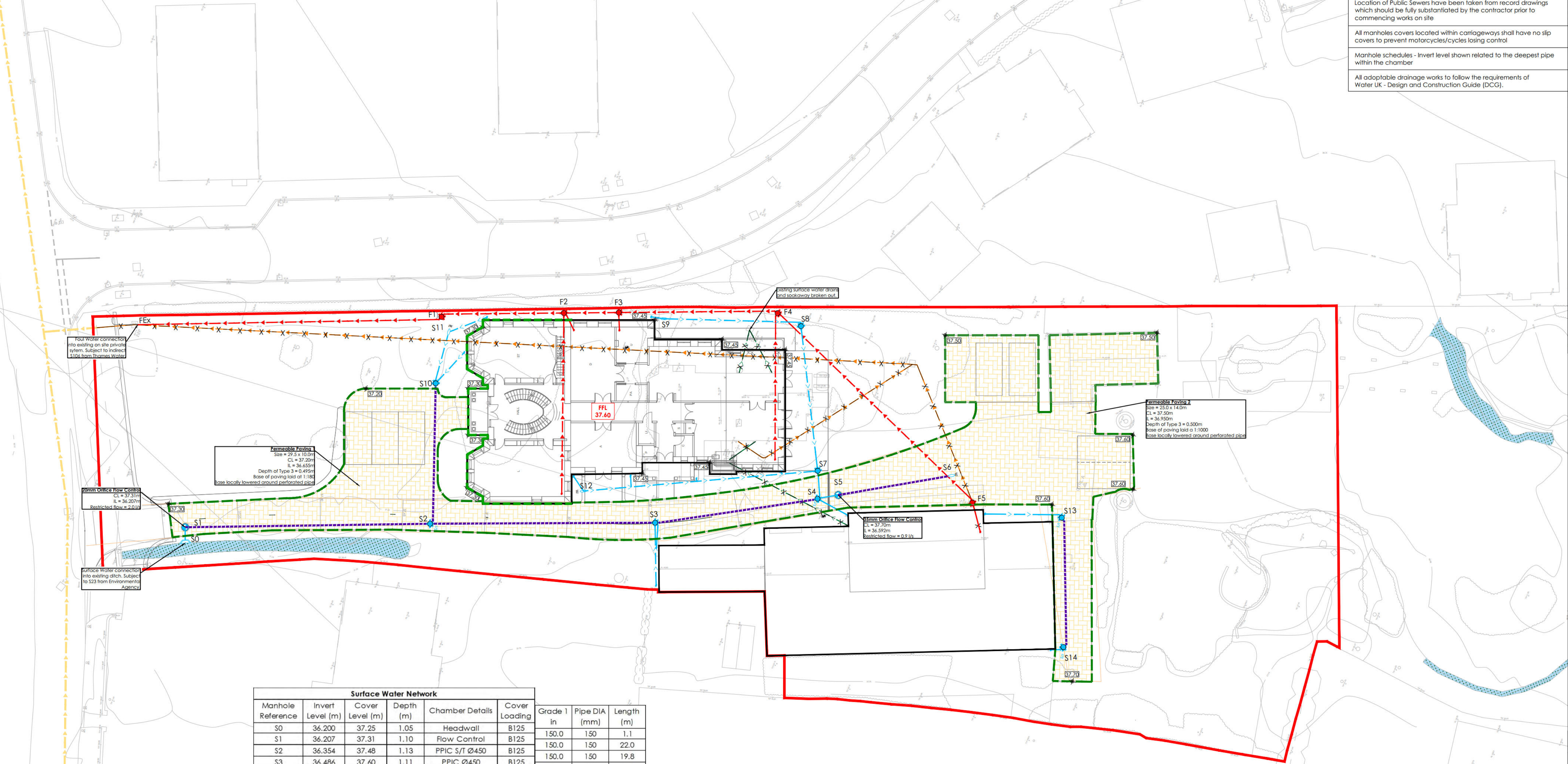
Tree spreads are average about the bole, and heights are approximate at the time of the survey.



Appendix C - Drainage Strategy

DESIGNER NOTE
Surface Water system designed for a 1 in 100 year event plus an allowance of 40% for climate change.
Impermeable areas have had an additional 10% added for urban creep.

- CDM RESIDUAL RISK ITEM**
Overhead cables within site area.
- CDM RESIDUAL RISK ITEM**
Existing services likely within working area.
Danger to site personnel and general public
- CDM RESIDUAL RISK ITEM**
Drainage pipes, manhole rings covers and fittings.
Risk of Manual handling injury.
- CDM RESIDUAL RISK ITEM**
Contact with waste water when making drainage connections.
Risk of infection from Weils disease etc.
- CDM RESIDUAL RISK ITEM**
Above Ground activities.
Possibility of objects falling from operations at high level onto persons working or passing below.
- CDM RESIDUAL RISK ITEM**
Works within confined spaces.



Surface Water Network						
Manhole Reference	Invert Level (m)	Cover Level (m)	Depth (m)	Chamber Details	Cover Loading	
S0	36.200	37.25	1.05	Headwall	B125	
S1	36.207	37.31	1.10	Flow Control	B125	
S2	36.354	37.48	1.13	PPIC S/T Ø450	B125	
S3	36.486	37.60	1.11	PPIC Ø450	B125	
S4	36.581	37.65	1.07	PPIC S/T Ø450	B125	
S5	36.592	37.65	1.06	Flow Control	B125	
S6	37.117	37.63	0.51	Rod. Eye	B125	
S7	36.594	37.55	0.96	PPIC Ø450	B125	
S8	36.678	37.45	0.77	PPIC Ø450	B125	
S9	36.761	37.45	0.69	Rod. Eye	B125	
S10	36.659	37.25	0.59	PPIC Ø450	B125	
S11	36.772	37.30	0.53	Rod. Eye	A15	
S12	36.777	37.45	0.67	Rod. Eye	B125	
S13	36.900	37.60	0.65	PPIC S/T Ø450	B125	
S14	36.975	37.68	0.70	PPIC S/T Ø450	B125	

Foul Water Network						
Manhole Reference	Invert Level (m)	Cover Level (m)	Depth (m)	Chamber Details	Cover Loading	
Fex	35.710	37.85	2.14	Existing	-	
F1	36.053	37.30	1.25	PPIC Ø450	B125	
F2	36.184	37.45	1.27	PPIC Ø450	B125	
F3	36.238	37.45	1.21	PPIC Ø450	B125	
F4	36.410	37.45	1.04	PPIC Ø450	B125	
F5	36.711	37.63	0.92	PPIC Ø450	B125	

DESIGNERS CDM NOTE - RESIDUAL RISKS IDENTIFIED

The design Engineer(s) have analysed this design as the scheme has been developed, in order to identify if there are any significant residual risk hazards (i.e. unusual, unexpected, abnormal or difficult).

Residual risks **HAVE** been identified and are therefore shown on this drawing. These risks have not been possible to remove by design.

This statement assumes that a competent Contractor with the appropriate qualified staff will be employed for the works, and that they will be familiar with site wide construction risks and hazards that they can reasonably be expected to encounter as part of their work.

- BURIED UTILITIES RISK NOTE**
- Buried utilities are present on and in the vicinity of the site.
 - The Contractor must satisfy themselves that they have seen utility returns for the area and that appropriate Risk Assessment Method Statement (RAMS) are in place and implemented to ensure that buried and/or overhead services are located prior to any works taking place.
 - Any RAMS shall address safe procedures for protection and working in the proximity of services.

Construction Note
It is essential that new drainage associated with the development is laid from the outfall(s) into the site. This is essential to avoid unforeseen obstructions where encountered (such as services). If the drainage is laid from the site out to the outfall it can result in significant abortive works to relay and overcome such obstructions.

Location of Public Sewers have been taken from record drawings which should be fully substantiated by the contractor prior to commencing works on site

All manholes covers located within carriageways shall have no slip covers to prevent motorcycles/cycles losing control

Manhole schedules - Invert level shown related to the deepest pipe within the chamber

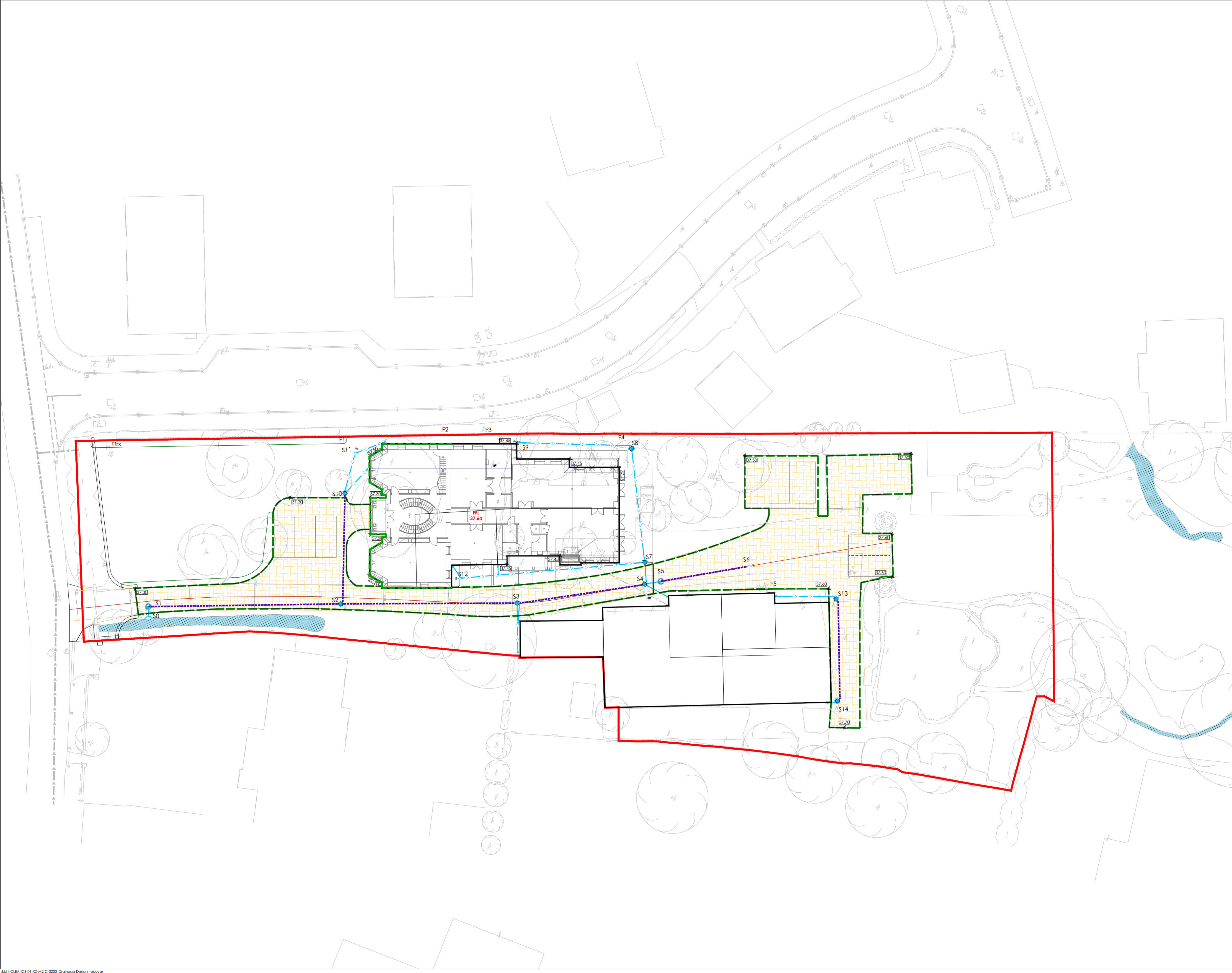
All adaptable drainage works to follow the requirements of Water UK - Design and Construction Guide (DCG).

- NOTES**
- All dimensions and levels are in metres unless otherwise noted
 - This drawing is to be read in conjunction with the relevant Architect's/Engineer's drawings, specifications and CDM documentation
 - This drawing has been produced electronically and may have been photo reduced or enlarged when copied. Work to figured dimensions only (DO NOT SCALE - EXCEPT FOR PLANNING PURPOSES). All dimensions to be checked on site. Any errors or omissions to be reported to the engineer immediately.
 - This drawing contains coloured lines / information that may not be clear if reproduced in black and white.
 - Digital copies of this plan can only be considered accurate if supplied directly by Infrastruct CS Ltd.

Drainage Key	
Sewers	
	Foul water drain (private/non adoptable)
	Surface water drain (private/non adoptable)
	Existing foul water drain (private/non adopted)
	Existing surface water drain (private/non adopted)
	Existing foul water sewer (Adopted)
	Existing surface water sewer (Adopted)
	Redundant sewer
	Perforated pipe (HS Powerslot or similar)
Chamber Key	
FW/SW	
	Mini access chamber (mac) - 300mmØ
	PPIC - 475mmØ*
* General note (Refer to standard details & longitudinal sections for chamber sizes. Size may need to increase dependant on number of incoming pipes/size of incoming pipes)	
	Surface water rodding eye
	Rain water down pipe (roddable access)
	Soil vent pipe/soil stack
	Silt trap (ST) with removable silt bucket
	Office Flow Control
	Manhole reference number
	Surface water sump unit
	Linear drainage channel
	Headwall
	Tree root protection zone (RPZ)
	Impermeable barrier to stop lateral movement of water
	Baffle to prevent rapid through flow of water through permeable paving
	Finished Floor Level (FFL)
	Block paving - permeable
	Existing ditch
Level Key	
	Proposed level
	Underbuild - External level greater than 225mm below DPC

AWAITING ISSUE
ELECTRONIC COPY MUST BE PRINTED
AT TIME OF ISSUE

PO1	FM		Initial issue				09/12/25	
REV	DRAWN	CHECK	REVISION COMMENTS					ISSUE DATE
DRAWING TITLE							SHEET NO.	
Levels & Drainage Design							1/1	
PROJECT								
Clear View Cottage Whitley Green Reading, RG10 0DU								
CLIENT								
Hive Architects				Infrastruct CS Ltd				
SCALE @ A1				ENGINEER				
1:200				R JW				
				DRAFT				
PROJECT NUMBER		STATUS		ISSUE PURPOSE		APPROVED		
6551		S2		INFORMATION		MAD		
PROJECT ORIGIN		PHASE		LEVEL		NO. REVISION		
CLEA		ICS		01		0201		
XX		DR		C		P01		



- NOTES**
1. All dimensions and levels are in metres unless otherwise noted
 2. This drawing is to be read in conjunction with the relevant Architect's/Engineer's drawings, specifications and CDM documentation
 3. This drawing has been produced electronically and may have been photo reduced or enlarged when copied. Work to figured dimensions only (DO NOT SCALE - EXCEPT FOR PLANNING PURPOSES). All dimensions to be checked on site. Any errors or omissions to be reported to the engineer immediately.
 4. This drawing contains coloured lines / information that may not be clear if reproduced in black and white.
 5. Digital copies of this plan can only be considered accurate if supplied directly by Infrastruct CS Ltd.

Catchment Legend	
	45.1m² draining to S11
	67.6m² draining to S9
	85.2m² draining to S7
	124.6 draining to S10
	68.9m² draining to S12
	72.4m² draining to S13
	167.6m² draining to S4
	79.9m² draining to S14
	167.6 m² draining to S3
	348.1m² draining to Permeable Paving 2
	282.9m² draining to Permeable Paving 1

P01	FM	RJW	Initial Issue	09/12/25
REV	DRAWN	CHECK	REVISION COMMENTS	ISSUE DATE
Impermeable Areas Plan				SHEET NO. 1/1
PROJECT Clear View Cottage Whitley Green Reading, RG10 0DU				
CLIENT Hive Architects		 Infrastruct CS Ltd		
SCALE @ A1 1:200				ENGINEER RJW
PROJECT NUMBER 6551	STATUS S2	ISSUE PURPOSE INFORMATION		DRAFT NJ
PROJECT CLEA	ORIGIN ICS	PHASE 01	LEVEL XX	APPROVED MBD
			TYPE DR	NO. REVISION 0700 P01



Appendix D - Drainage Calculations

Infrastruct CS Ltd		Page 1
The Stables High Cogges, Witney Oxfordshire, OX29 6UN		
Date 05/12/2025 16:50 File	Designed by Fergus.McKirdy Checked by	
Innovyze		Source Control 2020.1.3
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 100 Soil 0.150 Area (ha) 0.340 Urban 0.000 SAAR (mm) 700 Region Number Region 6 Results 1/s QBAR Rural 0.1 QBAR Urban 0.1 Q100 years 0.4 Q1 year 0.1 Q30 years 0.3 Q100 years 0.4		
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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.900	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.238	4-8	0.102

Total Area Contributing (ha) = 0.340

Total Pipe Volume (m³) = 2.121

Network Design Table for Storm

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	Auto Design
1.000	20.000	0.083	241.0	0.340	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	10.000	0.042	241.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.33	8.000	0.340	0.0	0.0	0.0	1.01	71.3	46.0
1.001	50.00	5.50	7.500	0.340	0.0	0.0	0.0	1.01	71.3	46.0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.001		10.000	7.459	0.000	0	0

Simulation Criteria for Storm

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 Coeffiecient	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 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.900	Storm Duration (mins)	30
Ratio R	0.400		

1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

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 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.800 Cv (Summer) 1.000
 Region England and Wales Ratio R 0.400 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 0

US/MH				Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water	Surcharged	Flooded		
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level	Depth	Volume	Flow /		
1.000	1 15 Summer		1	+0%	2/15 Summer				8.225	-0.075	0.000	0.90		
1.001	2 15 Summer		1	+0%	2/15 Summer				7.776	-0.024	0.000	1.00		

		Half Drain		Pipe		
US/MH	Overflow	Time	Flow	Level		
PN	Name	(l/s)	(mins)	(l/s)	Status	Exceeded
1.000	1			55.9	OK	
1.001	2			55.7	OK	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

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 0

Number of Storage Structures 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.800

Cv (Summer) 1.000

Region England and Wales

Ratio R 0.400

Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0

DVD Status OFF

Analysis Timestep Fine

Inertia Status OFF

DTS Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Period(s) (years) 1, 2, 30, 100

Climate Change (%) 0, 0, 0, 0

									Water	Surcharged	Flooded	
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.
1.000	1	15 Summer	2	+0%	2/15 Summer				8.319	0.019	0.000	1.16
1.001	2	15 Summer	2	+0%	2/15 Summer				7.830	0.030	0.000	1.31

		Half Drain		Pipe			
PN	US/MH Name	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded	
1.000	1			72.3	SURCHARGED		
1.001	2			72.8	SURCHARGED		

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

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 0

Number of Storage Structures 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.800

Cv (Summer) 1.000

Region England and Wales

Ratio R 0.400

Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0

DVD Status OFF

Analysis Timestep Fine

Inertia Status OFF

DTS Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Period(s) (years) 1, 2, 30, 100

Climate Change (%) 0, 0, 0, 0

					Water		Surcharged		Flooded			
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.
1.000	1	15 Summer	30	+0%	2/15 Summer				8.614	0.314	0.000	2.19
1.001	2	15 Summer	30	+0%	2/15 Summer				8.038	0.238	0.000	2.42

		Half Drain		Pipe			
PN	US/MH Name	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded	
1.000	1			136.3	SURCHARGED		
1.001	2			135.1	SURCHARGED		

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

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 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.800 Cv (Summer) 1.000
 Region England and Wales Ratio R 0.400 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 0

US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water	Surcharged	Flooded		
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level	Depth	Volume	Flow /	
1.000	1 15 Summer		100	+0%	2/15 Summer				8.881	0.581	0.000	2.81	
1.001	2 15 Summer		100	+0%	2/15 Summer				8.225	0.425	0.000	3.08	

			Half Drain		Pipe				
			US/MH	Overflow	Time	Flow			Level
PN	Name		(l/s)	(mins)	(l/s)	Status			Exceeded
1.000	1				174.3	SURCHARGED			
1.001	2				171.6	SURCHARGED			

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Junctions Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
S1	Manhole	479328.757	174067.781	37.310	1.103	36.207	Circular	0.450
OutFall	Manhole	479326.608	174067.435	37.500	1.480	36.020	Circular	0.450
S8 (1)	Manhole	479366.665	174022.485	37.450	0.772	36.678	Circular	0.450
S9	Manhole	479362.625	174034.355	37.450	0.689	36.761	Circular	0.300
S10	Manhole	479352.095	174050.511	37.250	0.591	36.659	Circular	0.450
S13 (1)	Manhole	479359.177	173994.047	37.600	0.700	36.900	Circular	0.450
S14	Manhole	479348.458	173989.514	37.680	0.705	36.975	Circular	0.450

Name	Lock
S1	None
OutFall	None
S8 (1)	None
S9	None
S10	None
S13 (1)	None
S14	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
S1	Inlet	Pipe	(None)	No Restriction
OutFall	Inlet	Pipe (1)	(None)	No Restriction
S8 (1)	Inlet	Pipe (6)	(None)	No Restriction
	Inlet (1)	Catchment Area (4)	(None)	No Restriction
S9	Inlet	Catchment Area	(None)	No Restriction
S10	Inlet	Catchment Area (1)	(None)	No Restriction
	Inlet (1)	Catchment Area (2)	(None)	No Restriction
S13 (1)	Inlet	Catchment Area (6)	(None)	No Restriction
S14	Inlet (1)	Catchment Area (10)	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
S1	Outlet	Pipe (1)	Orifice
	Diameter (m)	0.032	
	Coefficient of Discharge	0.600	
	Invert Level (m)	36.207	
S8 (1)	Outlet	Pipe (3)	Free Discharge
S9	Outlet	Pipe (6)	Free Discharge
S10	Outlet	Pipe (8)	Free Discharge
S13 (1)	Outlet	Pipe (11)	Free Discharge
S14	Outlet	Pipe (9)	Free Discharge

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Inflows Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.8	1.209
Catchment Area (1)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.6	0.684
Catchment Area (2)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.6	0.705
Catchment Area (3)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.8	0.798
Catchment Area (4)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.9	0.411
Catchment Area (5)	FSR: 2 years: +0 %: 15 mins: Summer	0.04	8.7	3.783
Catchment Area (6)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.8	0.795
Catchment Area (7)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	3.8	1.638
Catchment Area (8)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.9	0.396
Catchment Area (9)	FSR: 2 years: +0 %: 15 mins: Summer	0.03	5.9	2.541
Catchment Area (10)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.5	0.663

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Inflows Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 30 years: +0 %: 15 mins: Summer	0.01	5.3	2.289
Catchment Area (1)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.0	1.293
Catchment Area (2)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.1	1.332
Catchment Area (3)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.5	1.506
Catchment Area (4)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	1.8	0.780
Catchment Area (5)	FSR: 30 years: +0 %: 15 mins: Summer	0.04	16.5	7.161
Catchment Area (6)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.5	1.503
Catchment Area (7)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	7.2	3.105
Catchment Area (8)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	1.7	0.756
Catchment Area (9)	FSR: 30 years: +0 %: 15 mins: Summer	0.03	11.1	4.818
Catchment Area (10)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.9	1.254

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Inflows Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 100 years: +0 %: 15 mins: Summer	0.01	6.8	2.967
Catchment Area (1)	FSR: 100 years: +0 %: 15 mins: Summer	0.01	3.9	1.680
Catchment Area (2)	FSR: 100 years: +0 %: 15 mins: Summer	0.01	4.0	1.725
Catchment Area (3)	FSR: 100 years: +0 %: 15 mins: Summer	0.01	4.5	1.950
Catchment Area (4)	FSR: 100 years: +0 %: 15 mins: Summer	0.00	2.3	1.011
Catchment Area (5)	FSR: 100 years: +0 %: 15 mins: Summer	0.04	21.3	9.270
Catchment Area (6)	FSR: 100 years: +0 %: 15 mins: Summer	0.01	4.5	1.947
Catchment Area (7)	FSR: 100 years: +0 %: 15 mins: Summer	0.02	9.3	4.020
Catchment Area (8)	FSR: 100 years: +0 %: 15 mins: Summer	0.00	2.2	0.975
Catchment Area (9)	FSR: 100 years: +0 %: 15 mins: Summer	0.03	14.4	6.240
Catchment Area (10)	FSR: 100 years: +0 %: 15 mins: Summer	0.01	3.8	1.626

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Inflows Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 100 years: +40 %: 15 mins: Summer	0.01	9.6	4.152
Catchment Area (1)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	5.4	2.349
Catchment Area (2)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	5.6	2.418
Catchment Area (3)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.3	2.733
Catchment Area (4)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	3.3	1.419
Catchment Area (5)	FSR: 100 years: +40 %: 15 mins: Summer	0.04	29.9	12.978
Catchment Area (6)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.3	2.721
Catchment Area (7)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	13.0	5.625
Catchment Area (8)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	3.1	1.365
Catchment Area (9)	FSR: 100 years: +40 %: 15 mins: Summer	0.03	20.1	8.730
Catchment Area (10)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	5.3	2.280

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Inflows Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 1 years: +0 %: 15 mins: Summer	0.01	2.2	0.936
Catchment Area (1)	FSR: 1 years: +0 %: 15 mins: Summer	0.01	1.2	0.528
Catchment Area (2)	FSR: 1 years: +0 %: 15 mins: Summer	0.01	1.3	0.546
Catchment Area (3)	FSR: 1 years: +0 %: 15 mins: Summer	0.01	1.4	0.618
Catchment Area (4)	FSR: 1 years: +0 %: 15 mins: Summer	0.00	0.7	0.318
Catchment Area (5)	FSR: 1 years: +0 %: 15 mins: Summer	0.04	6.7	2.925
Catchment Area (6)	FSR: 1 years: +0 %: 15 mins: Summer	0.01	1.4	0.612
Catchment Area (7)	FSR: 1 years: +0 %: 15 mins: Summer	0.02	2.9	1.269
Catchment Area (8)	FSR: 1 years: +0 %: 15 mins: Summer	0.00	0.7	0.309
Catchment Area (9)	FSR: 1 years: +0 %: 15 mins: Summer	0.03	4.5	1.968
Catchment Area (10)	FSR: 1 years: +0 %: 15 mins: Summer	0.01	1.2	0.510

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S1	FSR: 2 years: +0 %: 30 mins: Summer	37.31 0	36.20 7	36.677	0.470	1.9	0.075	0.000	1.4	2.846	Surcharged
OutFall	FSR: 2 years: +0 %: 30 mins: Summer	37.50 0	36.02 0	36.037	0.017	1.4	0.000	0.000	1.4	2.834	OK
S8 (1)	FSR: 2 years: +0 %: 10080 mins: Summer	37.45 0	36.67 8	36.893	0.215	1.0	0.034	0.000	4.2	9.988	Surcharged
S9	FSR: 2 years: +0 %: 15 mins: Summer	37.45 0	36.76 1	36.886	0.125	2.8	0.009	0.000	2.7	1.071	OK
S10	FSR: 2 years: +0 %: 10080 mins: Summer	37.25 0	36.65 9	36.895	0.236	0.1	0.038	0.000	8.2	7.481	Surcharged
S13 (1)	FSR: 2 years: +0 %: 10080 mins: Summer	37.60 0	36.90 0	37.059	0.159	0.0	0.025	0.000	4.3	4.405	Surcharged
S14	FSR: 2 years: +0 %: 15 mins: Summer	37.68 0	36.97 5	37.033	0.058	1.5	0.009	0.000	1.5	0.615	OK

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S1	FSR: 30 years: +0 %: 360 mins: Summer	37.31 0	36.20 7	36.794	0.587	1.8	0.093	0.000	1.6	46.031	Surcharged
OutFall	FSR: 30 years: +0 %: 360 mins: Summer	37.50 0	36.02 0	36.038	0.018	1.6	0.000	0.000	1.6	46.017	OK
S8 (1)	FSR: 30 years: +0 %: 15 mins: Summer	37.45 0	36.67 8	36.950	0.272	6.7	0.043	0.000	6.4	2.463	Surcharged
S9	FSR: 30 years: +0 %: 15 mins: Summer	37.45 0	36.76 1	36.950	0.189	5.3	0.013	0.000	4.9	2.077	Surcharged
S10	FSR: 30 years: +0 %: 4320 mins: Summer	37.25 0	36.65 9	36.995	0.336	0.2	0.053	0.000	7.2	11.738	Surcharged
S13 (1)	FSR: 30 years: +0 %: 15 mins: Summer	37.60 0	36.90 0	37.094	0.194	3.5	0.031	0.000	3.2	1.284	Surcharged
S14	FSR: 30 years: +0 %: 15 mins: Summer	37.68 0	36.97 5	37.085	0.110	2.9	0.018	0.000	2.6	1.183	OK

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S1	FSR: 100 years: +0 %: 360 mins: Summer	37.310	36.207	36.915	0.708	1.8	0.113	0.000	1.8	57.734	Surcharged
OutFall	FSR: 100 years: +0 %: 360 mins: Summer	37.500	36.020	36.039	0.019	1.8	0.000	0.000	1.8	57.716	OK
S8 (1)	FSR: 100 years: +0 %: 15 mins: Summer	37.450	36.678	36.989	0.311	8.5	0.049	0.000	7.9	3.287	Surcharged
S9	FSR: 100 years: +0 %: 15 mins: Summer	37.450	36.761	36.989	0.228	6.8	0.016	0.000	6.1	2.712	Surcharged
S10	FSR: 100 years: +0 %: 15 mins: Summer	37.250	36.659	36.990	0.331	7.8	0.053	0.000	7.3	3.028	Surcharged
S13 (1)	FSR: 100 years: +0 %: 15 mins: Summer	37.600	36.900	37.130	0.230	4.5	0.037	0.000	4.1	1.687	Surcharged
S14	FSR: 100 years: +0 %: 15 mins: Summer	37.680	36.975	37.118	0.143	3.8	0.023	0.000	3.4	1.533	OK

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S1	FSR: 100 years: +40 %: 360 mins: Summer	37.31 0	36.20 7	37.096	0.889	2.0	0.141	0.000	2.0	69.442	Surcharged
OutFall	FSR: 100 years: +40 %: 360 mins: Summer	37.50 0	36.02 0	36.040	0.020	2.0	0.000	0.000	2.0	69.418	OK
S8 (1)	FSR: 100 years: +40 %: 15 mins: Summer	37.45 0	36.67 8	37.057	0.379	11.7	0.060	0.000	10.8	4.731	Surcharged
S9	FSR: 100 years: +40 %: 15 mins: Summer	37.45 0	36.76 1	37.056	0.295	9.6	0.021	0.000	8.4	3.823	Surcharged
S10	FSR: 100 years: +40 %: 15 mins: Summer	37.25 0	36.65 9	37.058	0.399	11.0	0.063	0.000	10.3	4.313	Surcharged
S13 (1)	FSR: 100 years: +40 %: 15 mins: Summer	37.60 0	36.90 0	37.192	0.292	6.3	0.046	0.000	5.7	2.388	Surcharged
S14	FSR: 100 years: +40 %: 15 mins: Summer	37.68 0	36.97 5	37.180	0.205	5.3	0.033	0.000	4.7	2.122	Surcharged

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S1	FSR: 1 years: +0 %: 30 mins: Summer	37.31 0	36.20 7	36.624	0.417	2.0	0.066	0.000	1.4	2.107	Surcharged
OutFall	FSR: 1 years: +0 %: 30 mins: Summer	37.50 0	36.02 0	36.037	0.017	1.4	0.000	0.000	1.4	2.097	OK
S8 (1)	FSR: 1 years: +0 %: 2880 mins: Summer	37.45 0	36.67 8	36.927	0.249	3.0	0.040	0.000	4.5	6.559	Surcharged
S9	FSR: 1 years: +0 %: 2160 mins: Winter	37.45 0	36.76 1	36.921	0.160	0.1	0.011	0.000	4.6	4.272	Surcharged
S10	FSR: 1 years: +0 %: 15 mins: Summer	37.25 0	36.65 9	36.870	0.211	2.5	0.034	0.000	2.4	0.835	Surcharged
S13 (1)	FSR: 1 years: +0 %: 8640 mins: Winter	37.60 0	36.90 0	37.042	0.142	0.0	0.023	0.000	2.8	3.832	OK
S14	FSR: 1 years: +0 %: 15 mins: Summer	37.68 0	36.97 5	37.020	0.045	1.2	0.007	0.000	1.1	0.468	OK

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
Porous Paving 1	FSR: 2 years: +0 %: 720 mins: Summer	36.972	36.666	0.153	0.011	2.3	11.008	0.000	1.1	36.782		73.243	OK
Porous Paving 2	FSR: 2 years: +0 %: 600 mins: Summer	37.114	37.019	0.139	0.069	2.2	12.064	0.000	0.6	16.699		75.554	OK

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
Porous Paving 1	FSR: 30 years: +0 %: 360 mins: Summer	37.072	36.795	0.253	0.140	6.2	19.935	0.000	1.8	46.159		51.542	OK
Porous Paving 2	FSR: 30 years: +0 %: 600 mins: Summer	37.217	37.147	0.242	0.197	4.0	23.765	0.000	0.8	31.405		51.844	OK

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
Porous Paving 1	FSR: 100 years: +0 %: 360 mins: Summer	37.140	36.916	0.321	0.261	7.8	27.207	0.000	1.8	57.984	195	33.866	OK
Porous Paving 2	FSR: 100 years: +0 %: 480 mins: Summer	37.291	37.234	0.316	0.284	6.1	32.022	0.000	0.9	35.358	230	35.113	OK

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



**FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By:
Max. Avg. Depth**

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
Porous Paving 1	FSR: 100 years: +40 %: 360 mins: Summer	37.253	37.097	0.434	0.442	10.7	39.876	0.000	2.0	70.248		3.069	OK
Porous Paving 2	FSR: 100 years: +40 %: 360 mins: Winter	37.431	37.387	0.456	0.437	7.0	47.307	0.000	0.9	31.584		4.140	OK

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: FM	Checked by: RJV		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
Porous Paving 1	FSR: 1 years: +0 %: 720 mins: Summer	36.945	36.665	0.126	0.010	1.9	9.379	0.000	0.9	29.944		77.201	OK
Porous Paving 2	FSR: 1 years: +0 %: 720 mins: Summer	37.092	37.001	0.117	0.051	1.6	9.988	0.000	0.5	14.759		79.762	OK

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	Porous Paving 1	S1	37.364	36.710	0.150	1.730	0.2	0.04	3.0	OK
Pipe (2)	FSR: 2 years: +0 %: 180 mins: Summer	Pipe	Porous Paving 2	Porous Paving 1	37.525	37.057	0.075	7.423	0.2	0.01	0.6	OK
Pipe (3)	FSR: 2 years: +0 %: 10080 mins: Summer	Pipe	S8 (1)	Porous Paving 1	37.450	36.893	0.145	0.243	0.3	0.31	4.2	Surcharged
Pipe (6)	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S9	S8 (1)	37.450	36.886	0.150	1.064	0.2	0.18	2.7	OK
Pipe (8)	FSR: 2 years: +0 %: 10080 mins: Summer	Pipe	S10	Porous Paving 1	37.250	36.895	0.150	0.193	0.5	0.62	8.2	Surcharged
Pipe (9)	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S14	Porous Paving 2	37.680	37.033	0.058	0.615	0.4	0.11	1.5	OK
Pipe (11)	FSR: 2 years: +0 %: 10080 mins: Summer	Pipe	S13 (1)	Porous Paving 2	37.600	37.059	0.122	0.107	0.4	0.32	4.3	Surcharged
Pipe (1)	FSR: 2 years: +0 %: 30 mins: Summer	Pipe	S1	Outfall	37.310	36.677	0.018	2.834	1.2	0.03	1.4	Surcharged

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	Porous Paving 1	S1	37.364	36.811	0.150	4.978	0.3	0.05	4.1	Surcharged
Pipe (2)	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	Porous Paving 2	Porous Paving 1	37.525	37.098	0.105	2.039	0.2	0.02	0.8	OK
Pipe (3)	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S8 (1)	Porous Paving 1	37.450	36.950	0.150	0.002	0.4	0.49	6.4	Surcharged
Pipe (6)	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S9	S8 (1)	37.450	36.950	0.150	2.070	0.3	0.34	4.9	Surcharged
Pipe (8)	FSR: 30 years: +0 %: 4320 mins: Summer	Pipe	S10	Porous Paving 1	37.250	36.995	0.150	0.021	0.4	0.55	7.2	Surcharged
Pipe (9)	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S14	Porous Paving 2	37.680	37.085	0.110	1.183	0.4	0.2	2.6	OK
Pipe (11)	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S13 (1)	Porous Paving 2	37.600	37.094	0.150	0.000	0.3	0.24	3.2	Surcharged
Pipe (1)	FSR: 30 years: +0 %: 360 mins: Summer	Pipe	S1	OutFall	37.310	36.794	0.019	46.017	1.3	0.03	1.6	Surcharged

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe	FSR: 100 years: +0 %: 60 mins: Winter	Pipe	Porous Paving 1	S1	37.364	36.908	0.150	10.680	0.4	0.03	2.8	Surcharged
Pipe (2)	FSR: 100 years: +0 %: 480 mins: Winter	Pipe	Porous Paving 2	Porous Paving 1	37.525	37.253	0.150	35.479	0.2	0.02	0.9	Surcharged
Pipe (3)	FSR: 100 years: +0 %: 15 mins: Summer	Pipe	S8 (1)	Porous Paving 1	37.450	36.989	0.150	0.006	0.4	0.59	7.9	Surcharged
Pipe (6)	FSR: 100 years: +0 %: 15 mins: Summer	Pipe	S9	S8 (1)	37.450	36.989	0.150	2.703	0.3	0.43	6.1	Surcharged
Pipe (8)	FSR: 100 years: +0 %: 15 mins: Summer	Pipe	S10	Porous Paving 1	37.250	36.990	0.150	0.000	0.4	0.55	7.3	Surcharged
Pipe (9)	FSR: 100 years: +0 %: 15 mins: Summer	Pipe	S14	Porous Paving 2	37.680	37.118	0.143	1.533	0.4	0.26	3.4	OK
Pipe (11)	FSR: 100 years: +0 %: 15 mins: Summer	Pipe	S13 (1)	Porous Paving 2	37.600	37.130	0.150	0.000	0.3	0.31	4.1	Surcharged
Pipe (1)	FSR: 100 years: +0 %: 360 mins: Summer	Pipe	S1	OutFall	37.310	36.915	0.019	57.716	1.3	0.03	1.8	Surcharged

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe	FSR: 100 years: +40 %: 30 mins: Winter	Pipe	Porous Paving 1	S1	37.364	36.953	0.150	5.974	0.7	0.03	2.5	Surcharged
Pipe (2)	FSR: 100 years: +40 %: 720 mins: Winter	Pipe	Porous Paving 2	Porous Paving 1	37.525	37.389	0.150	59.943	0.2	0.02	1.0	Surcharged
Pipe (3)	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S8 (1)	Porous Paving 1	37.450	37.057	0.150	0.000	0.6	0.81	10.8	Surcharged
Pipe (6)	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S9	S8 (1)	37.450	37.056	0.150	3.812	0.5	0.59	8.4	Surcharged
Pipe (8)	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S10	Porous Paving 1	37.250	37.058	0.150	0.000	0.6	0.78	10.3	Surcharged
Pipe (9)	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S14	Porous Paving 2	37.680	37.180	0.150	2.122	0.4	0.35	4.7	Surcharged
Pipe (11)	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S13 (1)	Porous Paving 2	37.600	37.192	0.150	0.000	0.3	0.43	5.7	Surcharged
Pipe (1)	FSR: 100 years: +40 %: 360 mins: Summer	Pipe	S1	OutFall	37.310	37.096	0.021	69.418	1.4	0.04	2.0	Surcharged

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe	FSR: 1 years: +0 %: 15 mins: Summer	Pipe	Porous Paving 1	S1	37.364	36.697	0.150	1.280	0.3	0.02	2.1	OK
Pipe (2)	FSR: 1 years: +0 %: 180 mins: Summer	Pipe	Porous Paving 2	Porous Paving 1	37.525	37.035	0.060	5.653	0.2	0.01	0.5	OK
Pipe (3)	FSR: 1 years: +0 %: 2880 mins: Summer	Pipe	S8 (1)	Porous Paving 1	37.450	36.927	0.150	0.106	0.3	0.34	4.5	Surcharged
Pipe (6)	FSR: 1 years: +0 %: 2160 mins: Winter	Pipe	S9	S8 (1)	37.450	36.921	0.150	4.078	0.3	0.32	4.6	Surcharged
Pipe (8)	FSR: 1 years: +0 %: 15 mins: Summer	Pipe	S10	Porous Paving 1	37.250	36.870	0.131	0.000	0.2	0.18	2.4	Surcharged
Pipe (9)	FSR: 1 years: +0 %: 15 mins: Summer	Pipe	S14	Porous Paving 2	37.680	37.020	0.045	0.468	0.4	0.08	1.1	OK
Pipe (11)	FSR: 1 years: +0 %: 8640 mins: Winter	Pipe	S13 (1)	Porous Paving 2	37.600	37.042	0.105	0.105	0.3	0.21	2.8	OK
Pipe (1)	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	S1	OutFall	37.310	36.624	0.017	2.097	1.2	0.03	1.4	Surcharged

Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Phase Management Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			

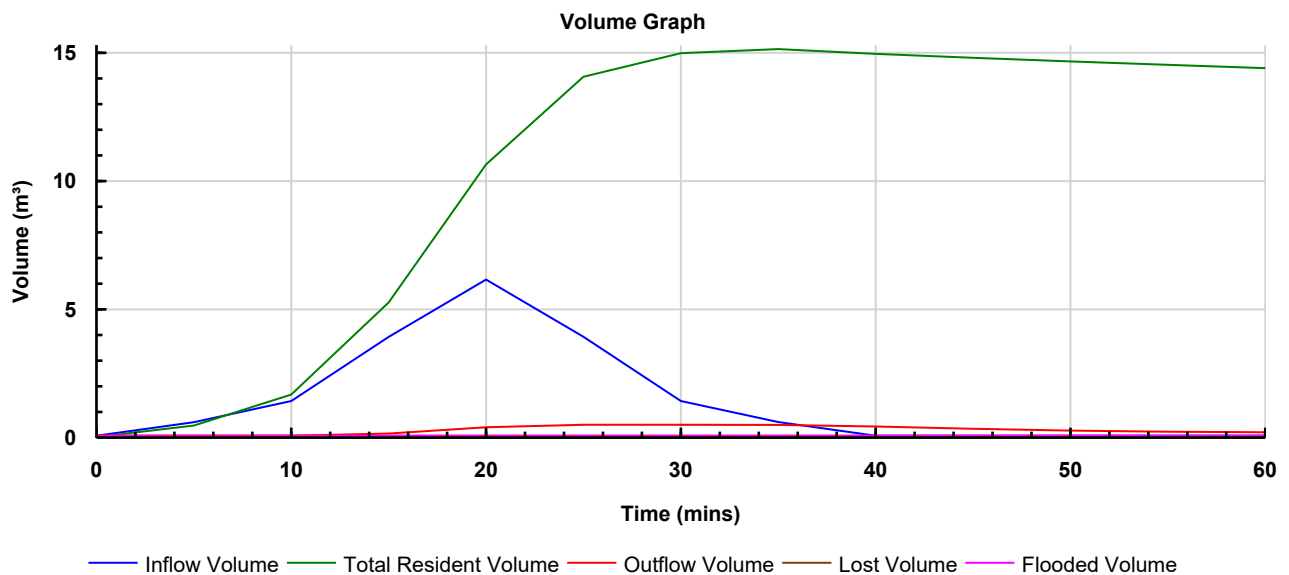
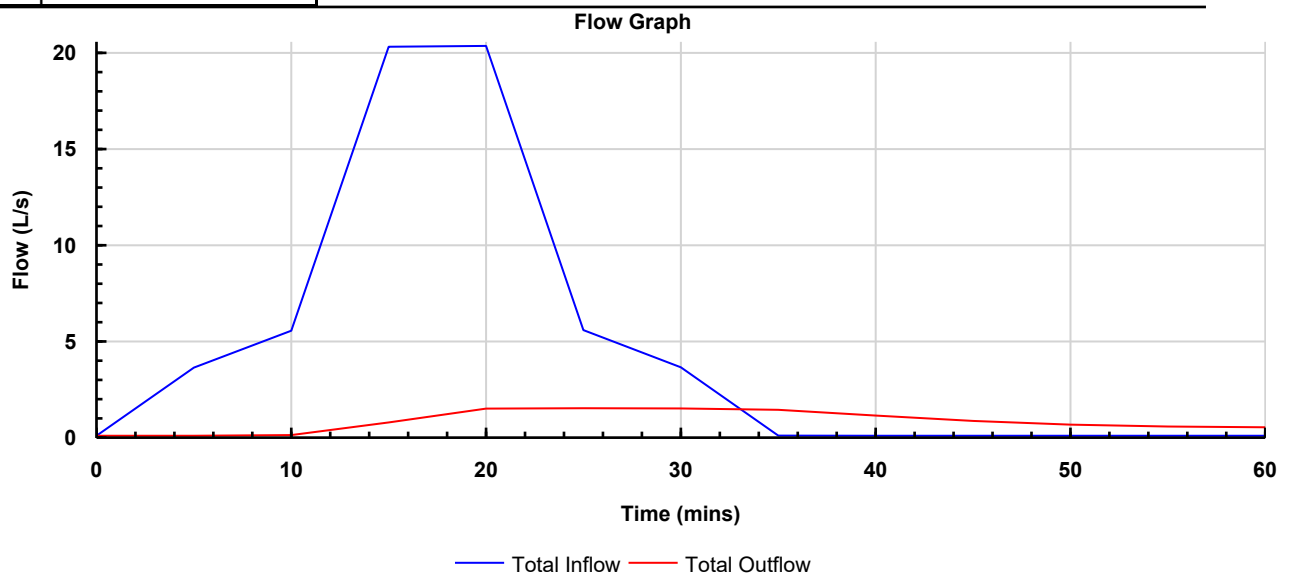


Phase
FSR: 2 years: Increase Rainfall (%): +0: 30 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
OutFall			1.4	2.834
TOTAL	20.4	17.652	1.4	2.834

Graphs



Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Phase Management Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



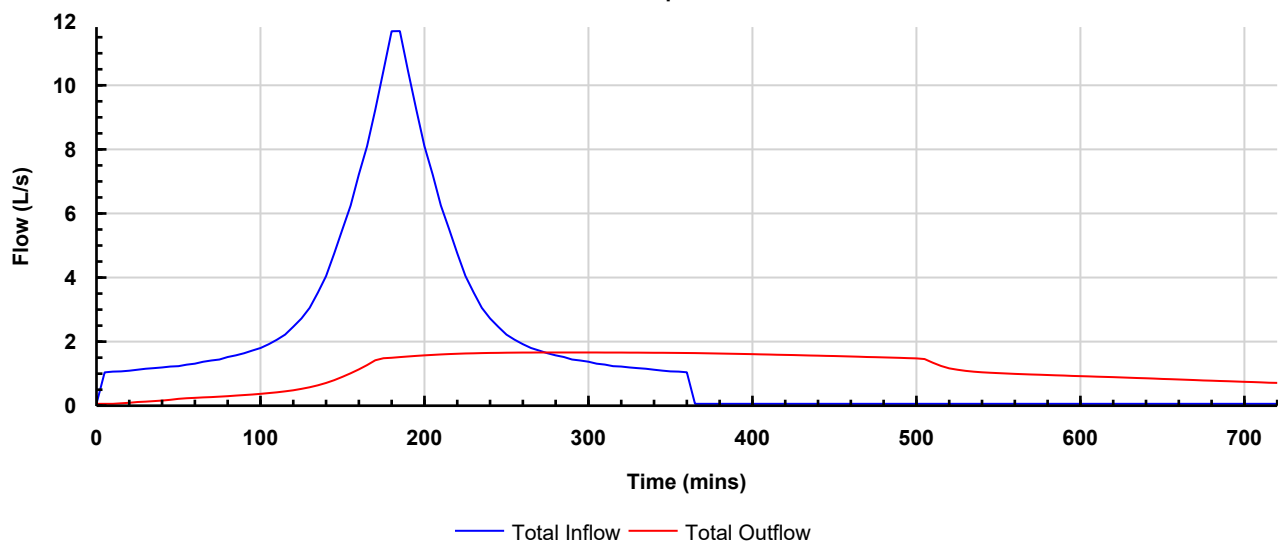
Phase
FSR: 30 years: Increase Rainfall (%): +0: 360 mins: Summer

Tables

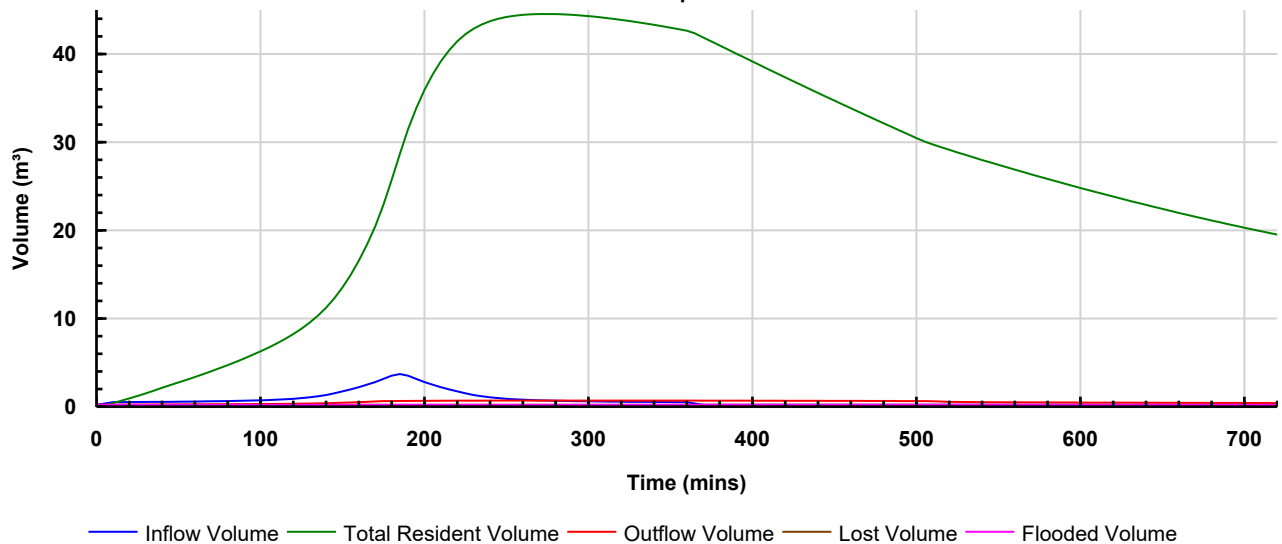
Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
OutFall			1.6	46.017
TOTAL	11.7	66.072	1.6	46.017

Graphs

Flow Graph



Volume Graph



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		Company Address: The Stables High Cogges Witney, OX29 6UN			

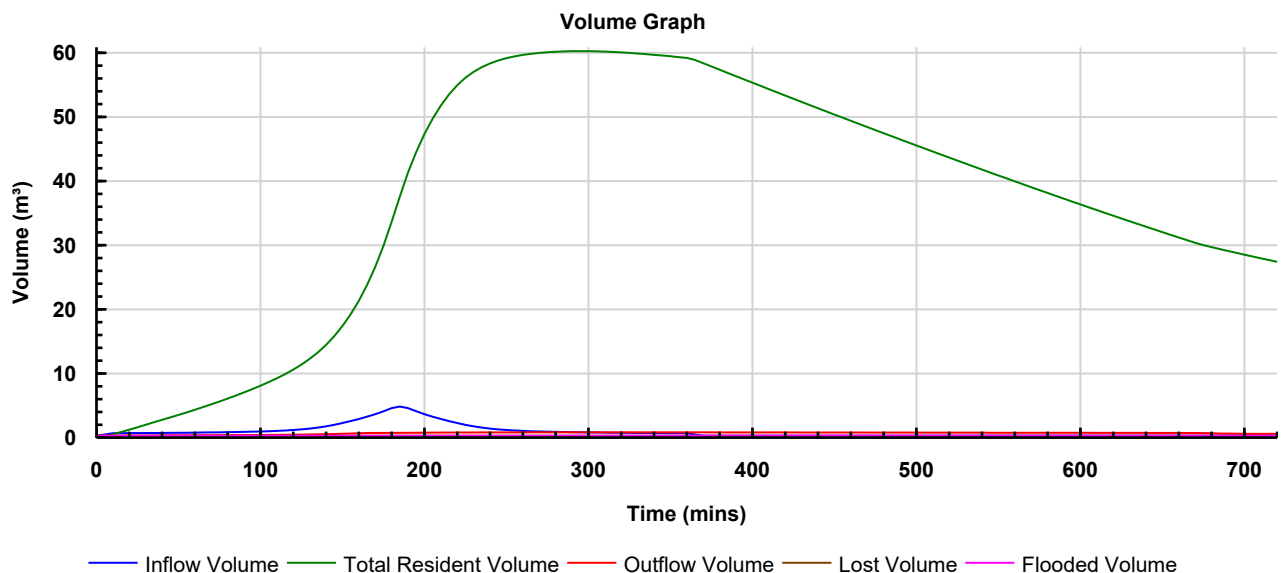
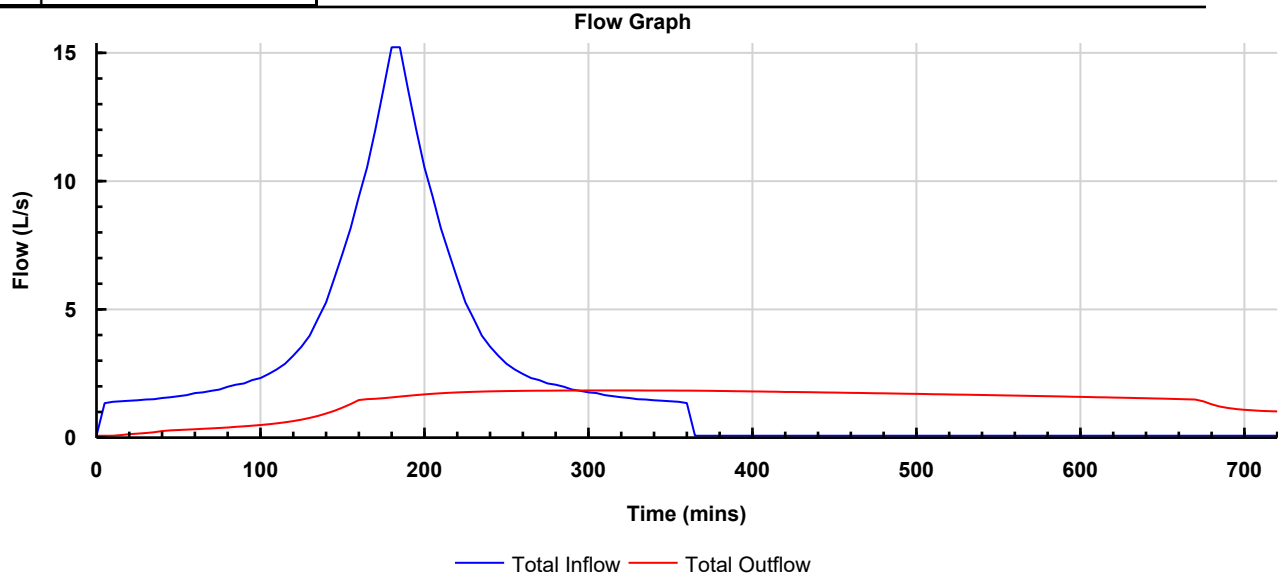


Phase
FSR: 100 years: Increase Rainfall (%): +0: 360 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
OutFall			1.8	57.716
TOTAL	15.2	85.986	1.8	57.716

Graphs



Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Phase Management Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			

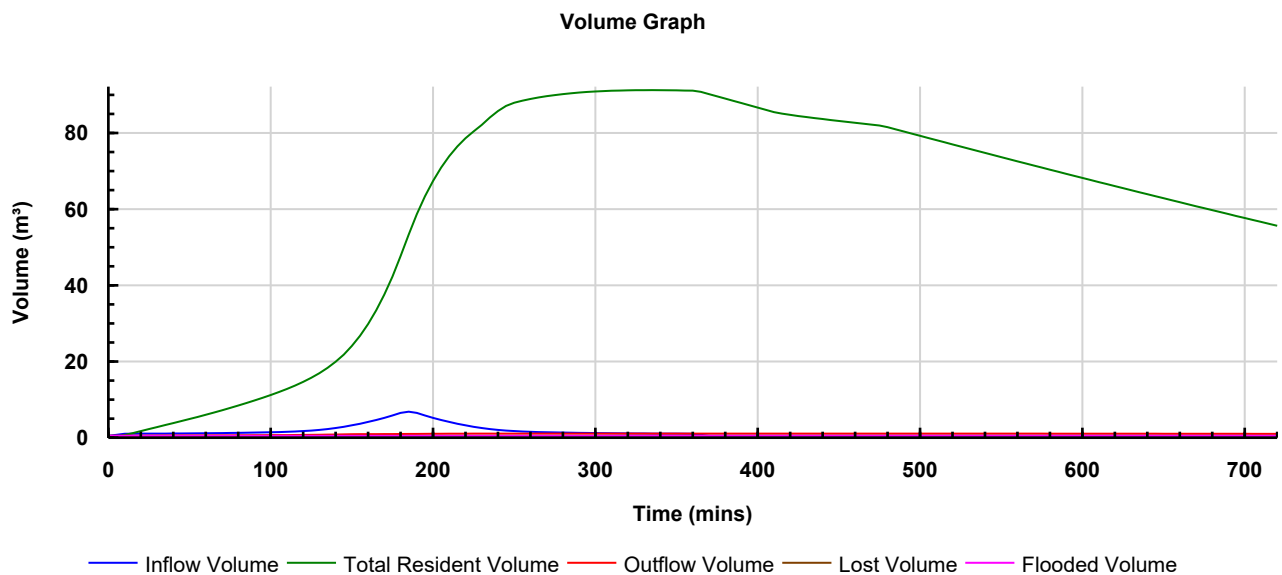
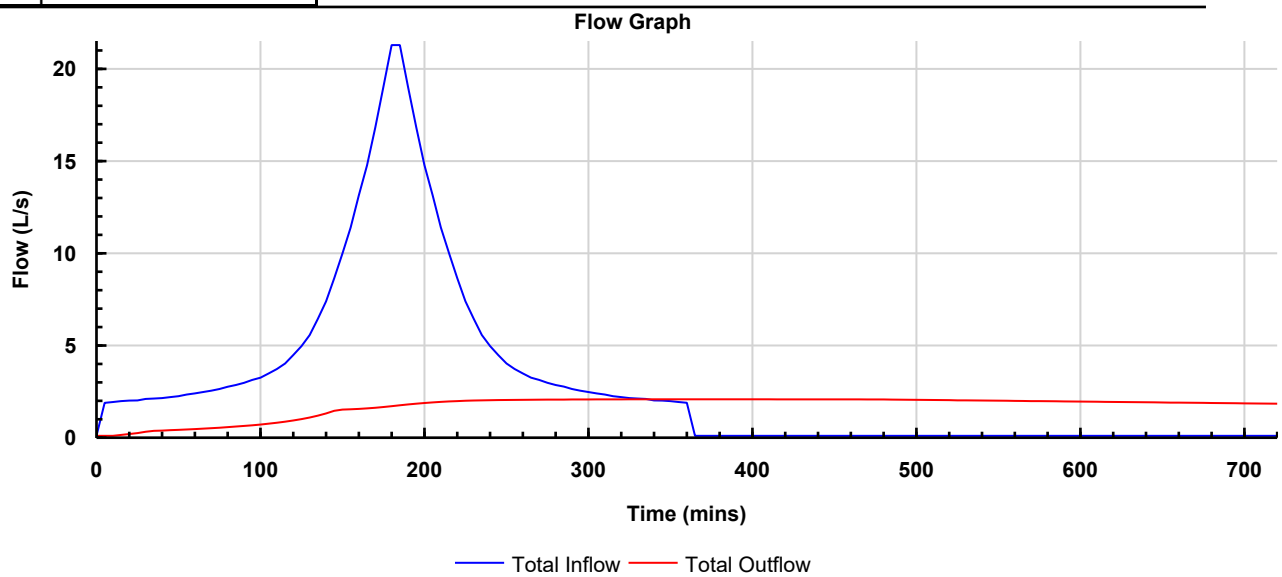


Phase
FSR: 100 years: Increase Rainfall (%): +40: 360 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
OutFall			2.0	69.418
TOTAL	21.3	120.348	2.0	69.418

Graphs



Project: 6551 Clear View Cottage, Whistley Green Reading, RG10 0DU		Date: 20/11/2025		 Infrastruct CS Ltd	
Report Details: Type: Phase Management Storm Phase: Phase		Designed by: FM	Checked by: RJW		Approved By: AJG
		Company Address: The Stables High Cogges Witney, OX29 6UN			



Phase
FSR: 1 years: Increase Rainfall (%): +0: 30 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
OutFall			1.4	2.097
TOTAL	15.8	13.680	1.4	2.097

Graphs

