

SUDS REPORT FOR
94 OXFORD ROAD, WOKINGHAM, BERKSHIRE,
RG41 2YJ

DOCUMENT NUMBER.: C3747-R1-REV-A

PREPARED BY

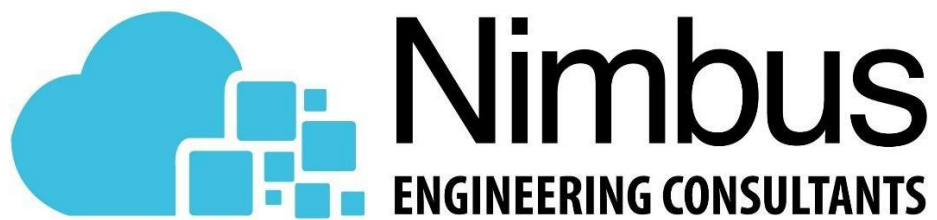


Table of Contents

1. INTRODUCTION..... 3

1.1 Appointment 3

1.2 Objectives..... 3

1.3 Limitations 4

2. GEOLOGY OF THE AREA 5

3. SUSTAINABLE URBAN DRAINAGE SYSTEMS 6

4. SuDS PROPOSALS FOR DEVELOPMENT 10

6. TIMESCALE AND MAINTENANCE OF WORKS 13

7. CONCLUSIONS 18

APPENDICES

APPENDIX A – DRAWINGS

APPENDIX B – SURFACE WATER RUN OFF CALCULATIONS

APPENDIX C – LOCAL WATER AUTHORITY ASSET PLANS

1. INTRODUCTION

1.1 Appointment

Nimbus Engineering have been appointed to provide a solution on the management of surface water run-off and to ensure that there is no risk of flooding caused by the proposed part two-storey, part single-storey side and rear extension of the existing property at 94 Oxford Road.

The existing and proposed site plans, can be found in Appendix A.

1.2 Objectives

This report will address the concerns raised by the Borough and provide details on a suitable Sustainable Urban Drainage System (SuDS) in order to reduce the surface water run-off leaving the site and show that the proposed development will not increase Flood Risk at the site or elsewhere.

1.3 Limitations

The general limitations of this report are:

- A number of data and information sources have been used to prepare this report. Whilst Nimbus Engineering believes them to be trustworthy, Nimbus Engineering is unable to guarantee the accuracy of data and information that has been provided by others;
- This report has been prepared using the best data and information that was available at the time of writing. There is the potential for further information or data to become available, leading to changes in the conclusions drawn by this report, for which Nimbus Engineering cannot be held responsible.

2. GEOLOGY OF THE AREA

According to, the British Geological Survey, the superficial deposits at the site are unknown, as shown in Figure 1, below. The bedrock in the area is of the London Clay Formation, consisting of Clay, Silt and Sand, as shown in Figure 2, below.

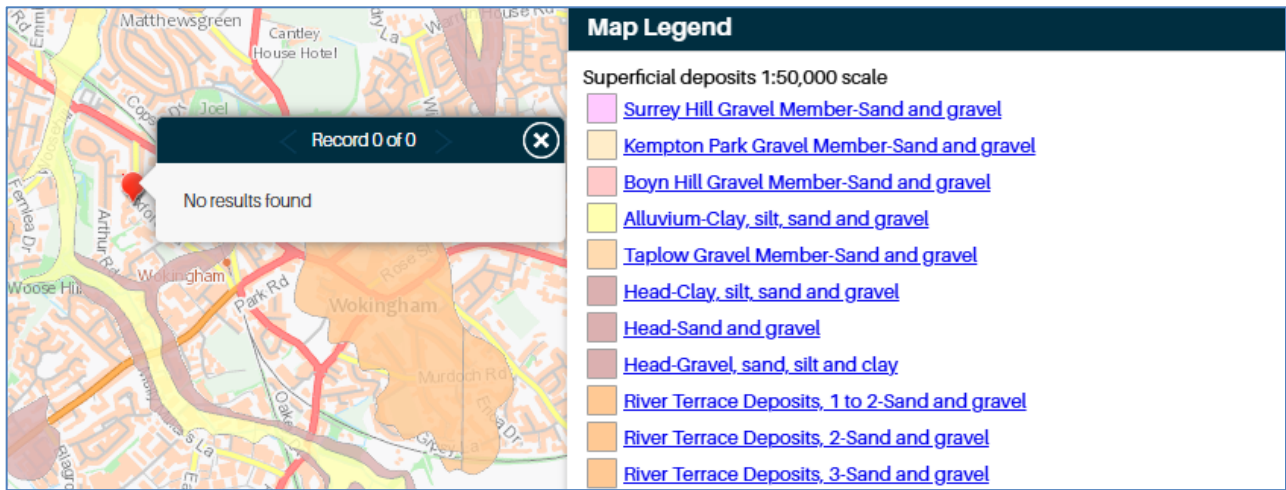


Figure 1- Superficial deposits at the site. (Source: British Geological Society Website (Contains_British Geological Survey materials © URKI [2026]. Base mapping is provided by ESRI)).

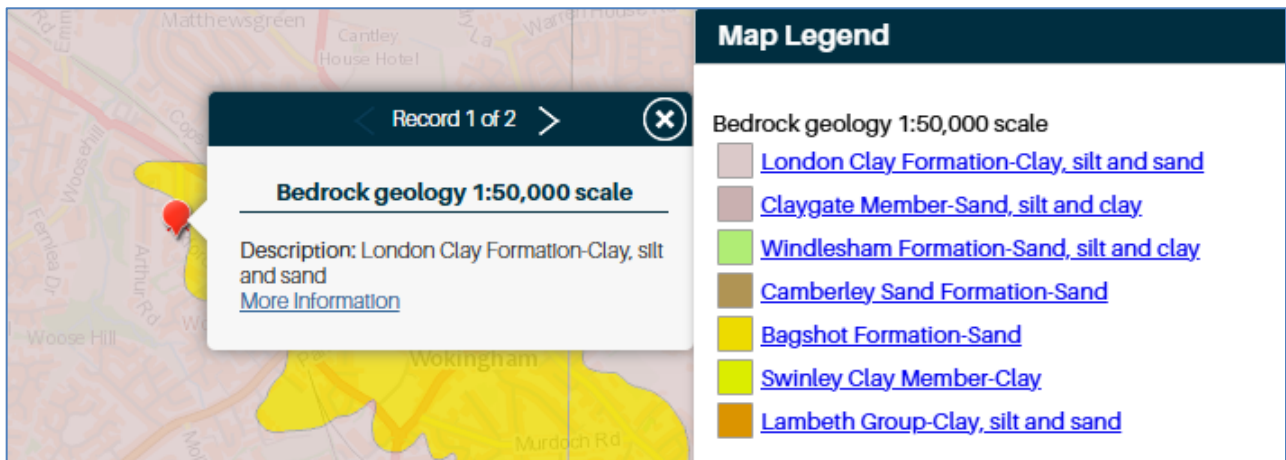


Figure 2- Bedrock at the site. (Source: British Geological Society Website (Contains British Geological Survey materials © URKI [2026]. Base mapping is provided by ESRI))

3. SUSTAINABLE URBAN DRAINAGE SYSTEMS

The total site area is 917m², and the existing dwelling prior to development is approximately 108m². Following the development at this site, the proposed dwelling will have increased by 120m² to a total of 228m² of impermeable areas. Pre and post development surface water runoff calculations showing the peak flow rate leaving the site can be found in Appendix B.

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.

Reducing the rate of surface water discharge from urban sites is one of the most effective ways of reducing and managing flood risk.

Traditional piped surface water systems work by removing surface water from our developments as quickly as possible, however this can cause various adverse impacts:

- Increased downstream flooding, and sudden rises in flow rates and water levels in local water courses.
- Reduction in groundwater levels and dry weather flows in watercourses.
- Reduce amenity and adversely affect biodiversity due to the surface water runoff containing contaminants such as oil, organic matter and toxic materials

SuDS are defined as a sequence of management principles and control structures designed to drain surface water in a more sustainable fashion than conventional piped drainage techniques. SuDS should utilise the natural landscape of an area which as well as slowing down the rate of runoff provides a number of environmental, ecological and social benefits.

These include:

- Protection and enhancement of water quality. As well as providing on-site attenuation, SuDS treat the water, resulting in an improved quality of water leaving the site. This is achieved when the water passes through fine soils and the roots of specially selected plants. Pollutants washed off the hard landscaping by rainfall will be safely removed before the water reaches the natural receiving water course.
- A sympathetic approach to the environmental setting by providing opportunities to create habitats for flora and fauna in urban watercourses and open spaces.
- Meeting the amenity and social needs of the local community and residents in the creation of attractive green spaces.

The various types of SuDS include:

Permeable paving	
Soakaways;	
Swales and basins;	
Bioretention/ rain gardens;	
Green roofs and rainwater re-use;	

Preferably a combination of these techniques should be used as part of the surface water management train, and it is important for all stakeholders, such as developers, architects, landscape architects and engineers to work in order to determine a feasible solution.

The SuDS management train is shown below, and this has been followed when proposing the proposed Sustainable Urban Drainage Systems for this site.

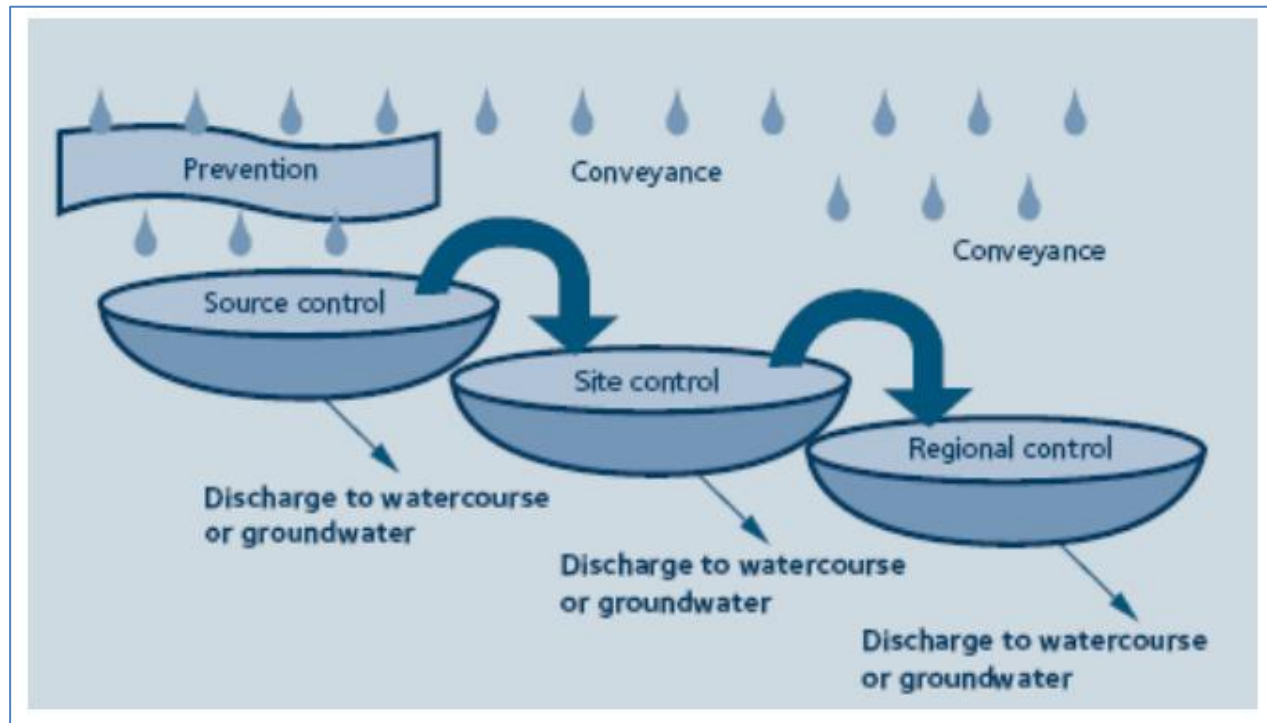


Figure 3 – SuDS Management Train

4. SuDS PROPOSALS FOR DEVELOPMENT

In accordance with the CIRIA SuDS Manual C753, the SuDS hierarchy has been considered in relation to the site-specific constraints and its surroundings. Table 1 below outlines the hierarchical approach considered for the development at 94 Oxford Road, Wokingham, Berkshire, RG41 2YJ.

Sustainable Drainage Proposal	Description	Constraints/Comments	Appropriate
Rainwater Use as a Resource	Use of rainwater runoff for reuse, e.g. Rainwater harvesting tanks, Blue Roofs for irrigation	One wall mounted rainwater harvesting tank will be provided to promote rainwater reuse.	Yes
Rainwater Full Infiltration to Ground (Source Control)	Infiltration devices and/or soakaways. Surface water runoff stored on site and gradually percolating into receiving ground	Full infiltration was determined to be unsuitable for this development due to the underlying geology at the site.	No
Rainwater Partial Infiltration to Ground (Source Control)	Installation of permeable/porous surfacing	Any new uncovered hardstanding areas are to be formed of porous surfacing, such as permeable paving, in order to deal with the run off from low rainfall events at the source.	Yes
Rainwater attenuation in green infrastructure features for gradual release	The onsite storage of all surface water runoff which can then be gradually conveyed to a nearby watercourse, sewer or infiltration into the ground. Forms of green infrastructure features: Green Roofs, Raingardens, Ponds, Swales, Detention	A large area of green or sedum roofing has been proposed on the flat roof of the rear extension.	Yes

	basins, Infiltration Trenches and raingarden planters		
Rainwater discharge direct to a watercourse	All surface water runoff on site discharged at a restricted rate to a nearby watercourse	N/A	N/A
Controlled rainwater discharge to a surface water sewer or drain	All surface water runoff on site discharged at a restricted rate to a nearby surface water sewer or drain, all rainwater runoff stored in below ground attenuation features. E.g. oversized pipes or geo-cellular tanks	The surface water runoff will be attenuated on site and discharged into the existing adjacent SW sewer, at a restricted rate of 0.460l/s, as per the drawings provided in Appendix A.	Yes
Controlled rainwater discharge to a combined sewer	All surface water runoff on site discharged at a restricted rate to a nearby combined sewer all rainwater runoff stored in below ground attenuation features. E.g. oversized pipes or geo-cellular tanks	N/A	N/A

Table 1: SuDS Control Measures for Development

5. PROPOSED SOLUTION

In order to ensure that the SuDS management train has been followed, a wall mounted rainwater harvesting tank will be provided at the rear of the proposed development, as can be seen in the plans provided within Appendix A. A significant area of green or sedum roofing has also been proposed on the flat roof of the proposed extension, as can also be seen on the provided plan.

Additionally, any new or replacement hardstanding areas will be formed of porous surfacing, such as permeable paving, underlain by a hydrocarbon removing geotextile membrane and the road and carparking areas, with the surface water runoff from any sloped areas to be caught by slot drains.

The preferred method of dealing with remaining surface water from the above SuDS components would be to treat and deal with it at source using soakaways, however due to the geological make up of the soils in the area, this was deemed unfeasible for this site.

Therefore, the remaining surface water run off will be conveyed into an below ground, crate-style style attenuation tank with restricted flow to leave the site at 0.46/s, which is the existing site's $Q_{bar(urban)}$. The restricted surface water runoff will then be conveyed, via gravity, to the existing Thames Water Surface Water Sewer adjacent to the site, as shown on the asset plans provided in Appendix C and drawing C3747-01, located within Appendix A of this report.

6. TIMESCALE AND MAINTENANCE OF WORKS

All drainage works shall be completed prior to first occupation and there shall be no adoption of any of the drainage works within the site, the homeowner will be responsible to oversee the long-term maintenance of the drains. The following outline maintenance strategy sets out recommended timescales for maintenance of the proposed drainage works, in line with CIRIA SuDS Design Guide:

- Regular inspection will comprise the inspection and cleaning of catchment, gutters, filters and tanks to reduce the likelihood of contamination, this is recommended to be carried out every 3 to 6 months.
- The catchpit chamber and flow control chambers for the attenuation tanks should be checked and cleaned every 3 months for the accumulation of debris/ silt, in order to ensure that there are no blockages.
- Jet washing of permeable surfaces should be undertaken every 3 to 6 months in order to ensure that the system works properly.

Maintenance schedule	Required action	Typical Frequency
Regular maintenance	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdraw devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank, inlets, outlets, gutters. Withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/ or replacement of any filters	Three monthly (or as required)
Remedial actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

Table 2: Operation and maintenance requirement for RWH systems.

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

Table 3: Operation and maintenance requirements for attenuation storage tanks

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturers recommendations - pay particular attention to areas where water run onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an application rather than spraying	As required- once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, had been raised to within 50mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth- if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 4: Operation and maintenance requirements for pervious pavements.

Maintenance schedule	Required action	Typical Frequency
Regular Inspections	Inspect all components including soil substrate vegetation, drains irrigation systems (if applicable), membranes and roof structure for proper operation integrity of waterproofing and structural stability	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular Maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required
	During establishment (ie year one) replace dead plants as required	Monthly (but usually responsibility of manufacturer)
	Post establishment, replace dead plants as required (where > 5% of coverage)	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting (if appropriate) as required- clippings should be removed and not allowed to accumulate	Six monthly or as required
Remedial Actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material and sources of erosion damage should be identified and controlled	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

Table 5: Operation and maintenance requirement for green roofs.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect from surface and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then 6 monthly intervals
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	Orifice plates within plastic chambers or vortex controls to be jetted from the surface after heavy rainfall events to remove any debris or silt	As required
	Empty catchpits upstream of SuDS features to ensure no debris is passed downstream	3 months or as required
Remedial actions*	In the event of a blockage, a vortex flow control can be removed from the chamber via the lifting cabled located at the access, this will be cleaned at surface level and reinstalled into its original location	As required
	In the event of a blockage, the orifice plate should be jetted from surface, and if blockage is not cleared the orifice plate can be removed by removing fixing bolts. These fixing bolts should be checked and replaced if needed.	As required
Monitoring	Following installation it is important that any extraneous materials i.e. building materials: granular backfill, in-situ pour concrete etc are removed from the unit and the new flow control chamber is fully jetted down	Upon installation
	Inspect/check chamber channel for any debris or silt build-up. Upstream chambers should be checked at the same time as these monitoring works to ensure network is operating at full capacity.	Annually

Table 6: Operation and maintenance requirements for flow control chambers

*All Remedial Works should be carried out by a competent and certified contractor, with no access to chambers or removal of parts to be undertaken by managers.

If the upstream network of the flow control chamber is regularly maintained, little maintenance is required within the chamber as there are no moving parts.

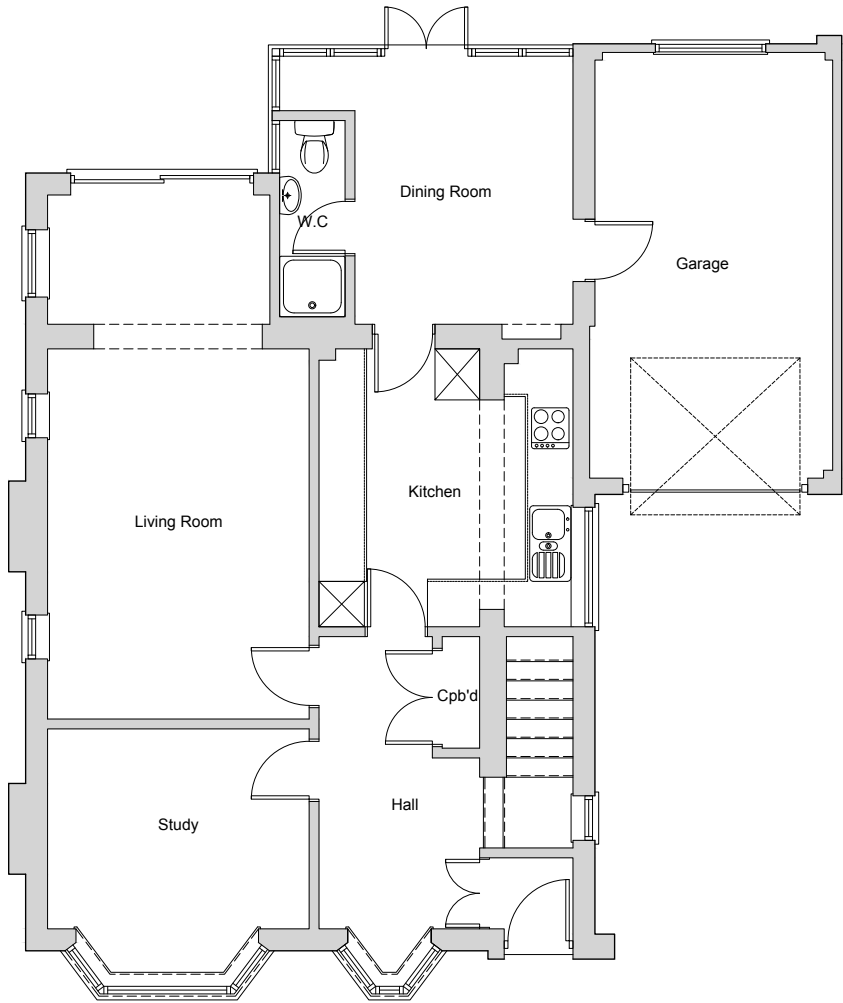
7. CONCLUSIONS

The purpose of this report is to provide a suitable SuDS strategy to the Lead Local Flooding Authority relating to surface water flows arising due to the proposed development.

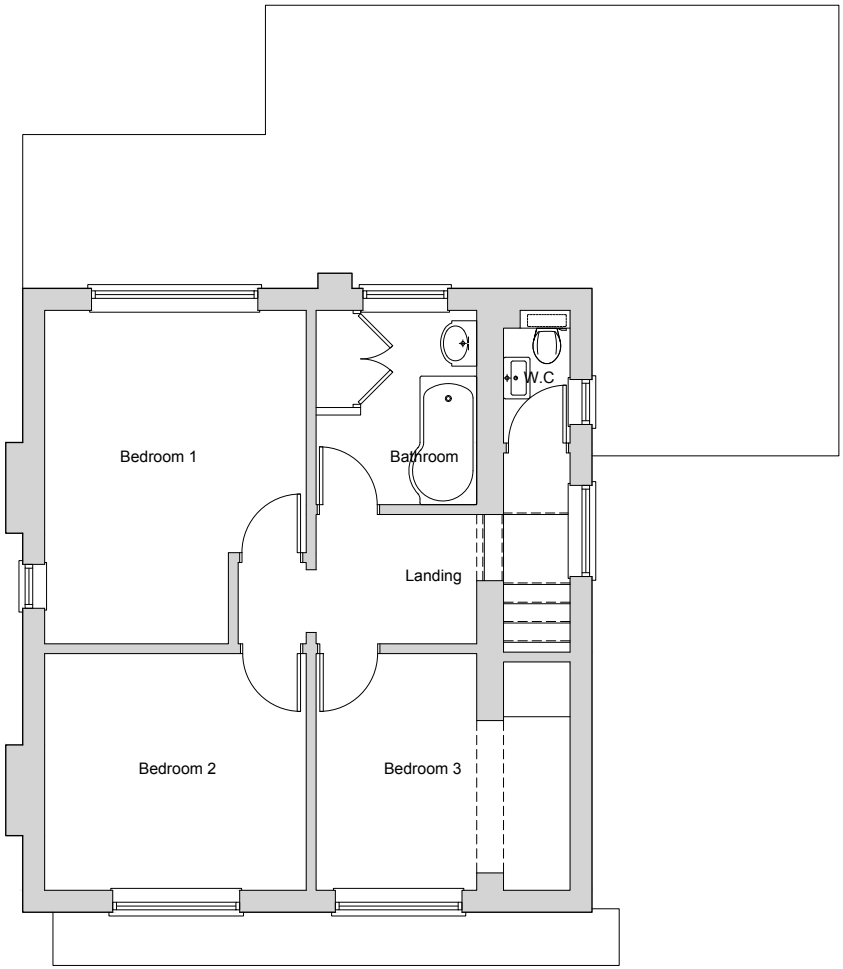
As requested, SuDS have been incorporated into this design, in the form of one wall mounted rainwater harvesting tank, porous paving, green or sedum roofing, and the remaining surface water run off being attenuated on site, via a below ground attenuation tank, with restricted discharge leaving the site set to 0.46l/s.

The proposals represent a 97.33% reduction in surface water runoff for the 1 in 100 year storm event, therefore, it is considered that the proposed SuDS strategy conforms with all relevant national, regional and local planning policy.

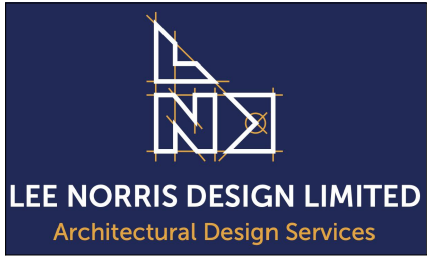
APPENDIX A – DRAWINGS



Ground Floor Plan



First Floor Plan



94 Oxford Road
Wokingham
Berkshire RG41 2YJ

project :

Existing Floor Plans

title :

Mr & Mrs. Kalyan

client :

Lee Norris Design Limited
27 Eden Way, Winnersh
Wokingham, Berkshire RG41 5PQ
Tel: 01189 787226
Mob: 07795 058193
E-mail: lee@leenorrisdesign.co.uk
Web: www.leenorrisdesign.co.uk

Planning and building regulations drawings
for residential extensions, new build,
renovation and conversion projects.

ref : LN

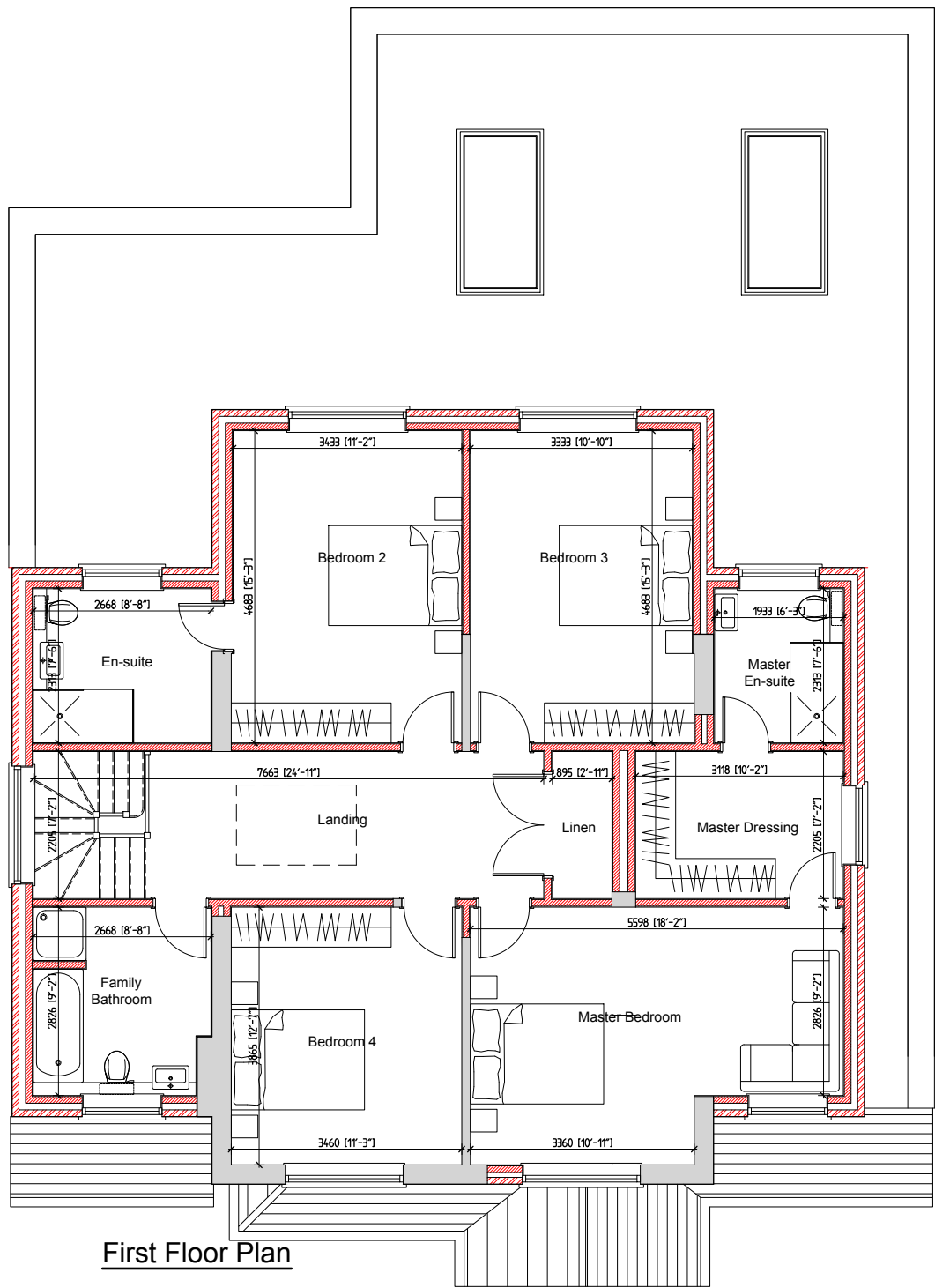
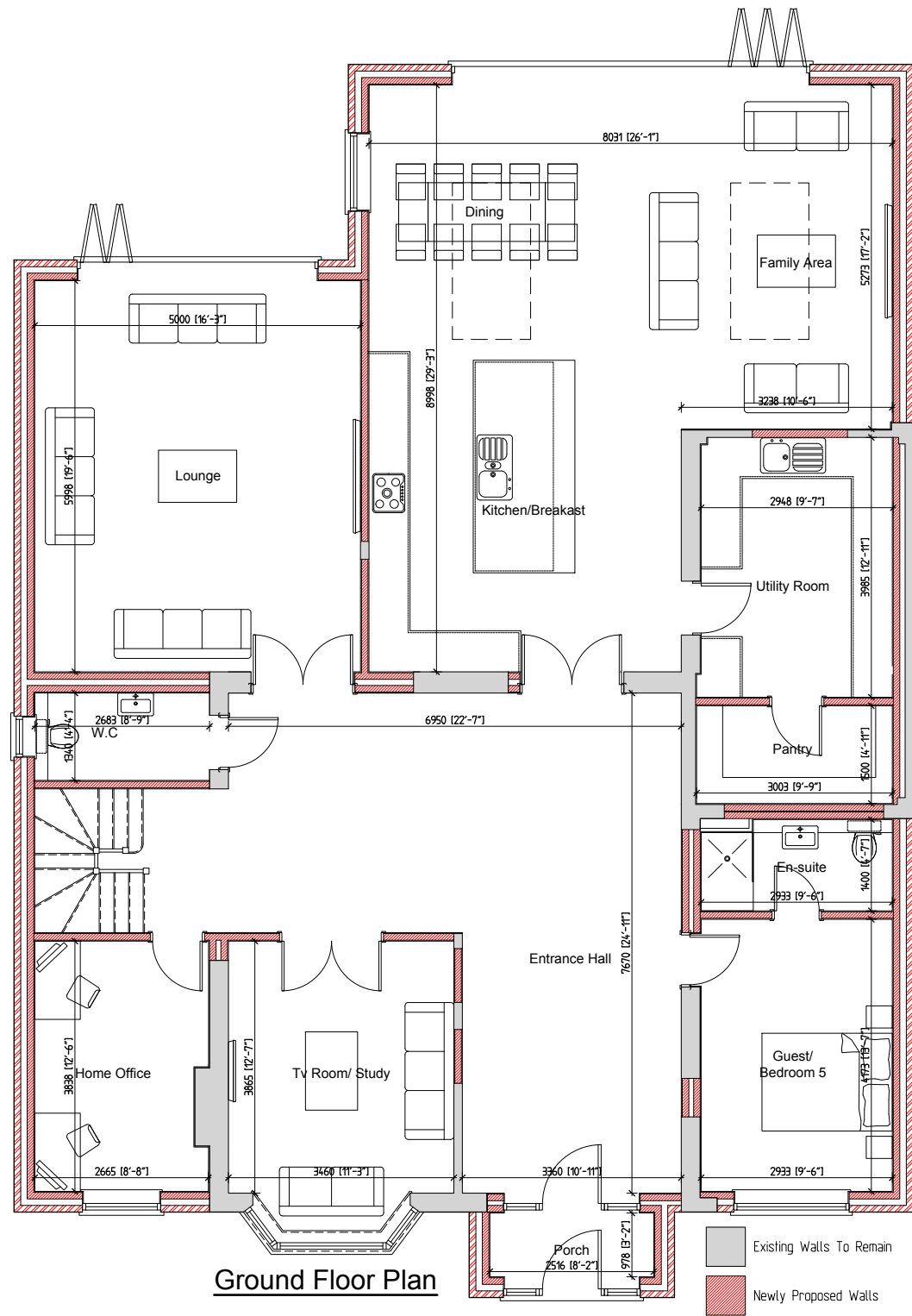
date : Sept'25

scale : 1:100@A3

project : 25-659

dwg no. / rev : 001

Scale: 1:100 0 1 2 3 4 5



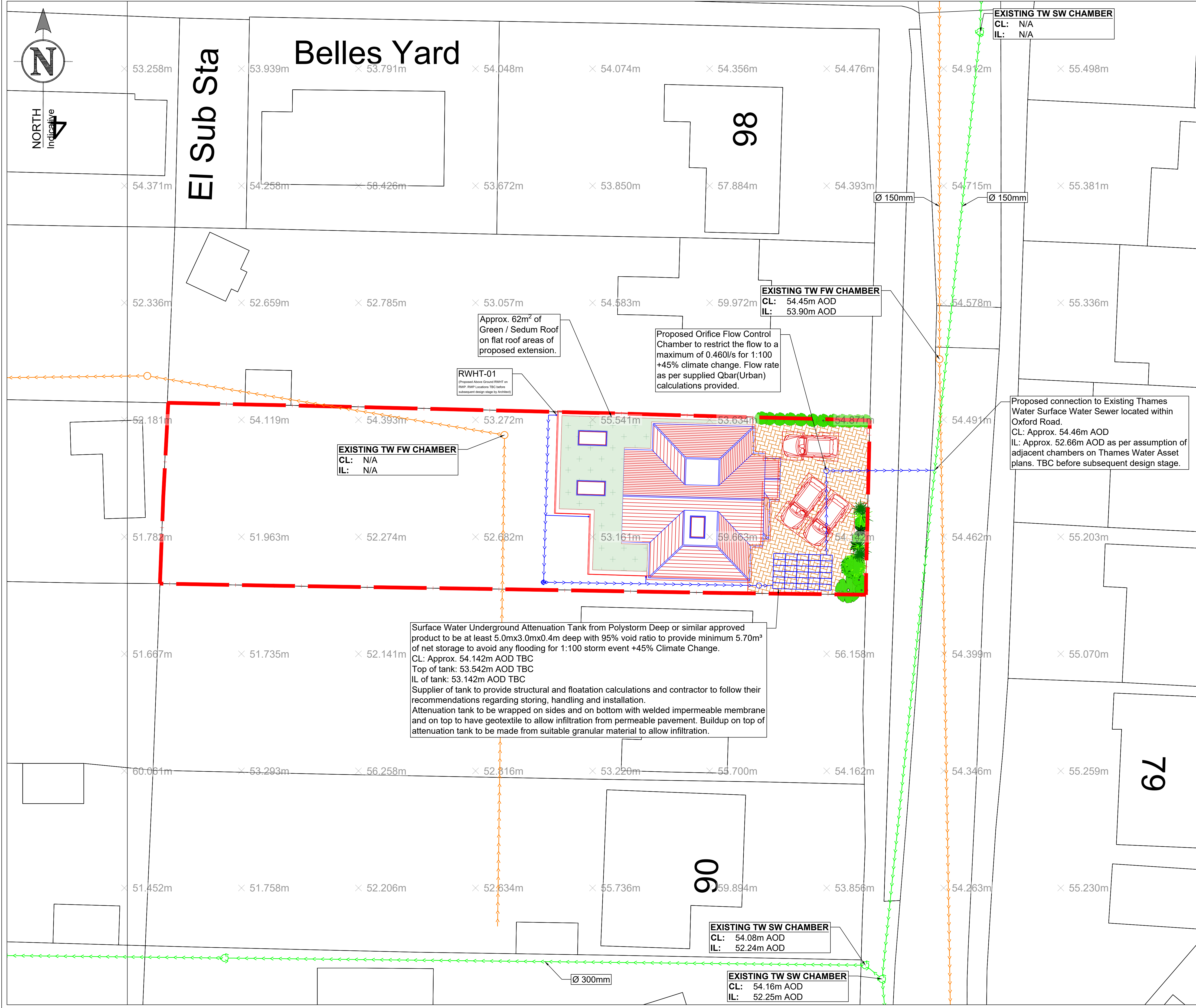
94 Oxford Road
Wokingham
Berkshire RG41 2YJ

Proposed Floor Plans

Mr & Mrs. Kalyan

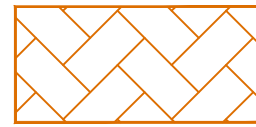
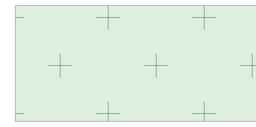
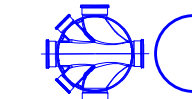
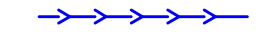
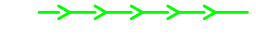
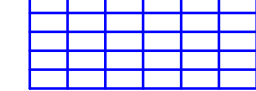
Lee Norris Design Limited	ref : LN
27 Eden Way, Winnersh Wokingham, Berkshire RG41 5PQ Tel: 01189 787226 Mob: 07795 058193 E-mail: lee@leenorrisdesign.co.uk Web: www.leenorrisdesign.co.uk	date : Sept'25
Planning and building regulations drawings for residential extensions, new build, renovation and conversion projects.	scale : 1:100@A3
	project : 25-659
	dwg no. / rev : 002

Scale: 1:100



DRAWING TO BE PRINTED IN COLOUR.

KEY:

-  Proposed Permeable Paving
-  Proposed Green / Sedum Roofing
-  Proposed Site Boundary
-  SW Inspection / Catchpit Chambers
-  Surface Water UPVC Pipes
-  Foul Water Pipe
-  Surface Water Pipe
-  Proposed Attenuation Tank

NOT FOR CONSTRUCTION

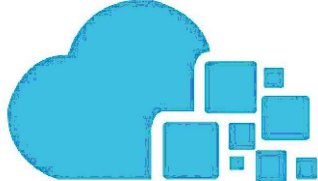
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REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	06-03-26	M.HAM	For Information.	SL	SL

PROJECT:
94 Oxford Road, Wokingham, Berkshire, RG41 2YJ

TITLE:
Outline SuDS Layout & Location Plan

CLIENT:
Archana Kalyan

**Nimbus**
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info@nimbusengineering.co.uk

CHECKED BY: S.L	DATE: 06-03-26	APPROVED BY: S.L	DATE: 06-03-26
DRN BY: M.HAM	SCALE: 1:150	DRAWING NUMBER: C3747-01	REV: A
DATE: 06-03-26	SIZE: A1		

APPENDIX B – SURFACE WATER RUN OFF CALCULATIONS



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Job No. C3747		
Sheet no. 1		
Date 06/03/26		
By M.HAM	Checked	Reviewed

MasterDrain
HY 10.01

Project **94 Oxford Road, Wokingham, Berkshire, RG41 2YJ**

Title **Pre & Post Development SW Runoff Calcs Prior to SuDS**

Data:-

Hydrology (FSR):-

Location = WOKINGHAM

Long reference = 480168

M5-60 (mm) = 18.6

r = 0.41

Hyd. area = 6

Hydrograph = Winter

WRAP = 4

Grid reference = SU8068

SAAR (mm/yr) = 650

Soil = 0.47

Hyd. zone = 8

Area = England & Wales

Site values used in design:-

Total site area = 0.0917 ha

Pre-dev area drained = 0.0108 ha

Imperm runoff factor = 100%

Climate change factor = 45%

Post-dev area drained = 0.0228 ha

Perm runoff factor = 20%

Pre-development

Area to soakaways = 0.0000 ha

Perv. area to SU DS = 0.0000 ha

Area to other SU DS = 0.0000 ha

Pre-dev flow to drain = 0.00 l/s

Post-development

Area to soakaways = 0.0000 ha

Perv. area to SU DS = 0.0000 ha

Area to other SU DS = 0.0000 ha

Post-dev flow to drain = 0.00 l/s

Calculations:-

Revised Post-dev Imperm. area = 0.023 ha

Equiv. Post-dev Imperm. area = 0.023 ha

Equiv. Post-dev Perm. area = 0.014 ha

Total Pre-dev equiv. area ha = 0.027 ha

Total Post-dev equiv. area ha = 0.037 ha

100 yr 6 hour mean intensity = 9.70mm/hr

Results:-

Pre-dev peakflow runoff (l/s) (m^3/s)

R.P.	15	30	60	120	240	360	480	600	Max	CCF	Final	R.P.
1	5.5	3.6	2.2	1.4	0.8	0.6	0.5	0.4	5.5	N/A	5.5	1
30	13.3	8.6	5.4	3.2	1.9	1.4	1.1	0.9	13.3	N/A	13.3	30
100	17.2	11.3	7.0	4.3	2.5	1.8	1.4	1.2	17.2	N/A	17.2	100

Post-dev peakflow runoff (l/s)

R.P.	15	30	60	120	240	360	480	600	Max	CCF	Final	R.P.
1	7.4	4.9	3.0	1.9	1.2	0.8	0.7	0.6	7.4	45	10.8	1
30	18.0	11.7	7.3	4.4	2.6	1.9	1.5	1.3	18.0	45	26.2	30
100	23.4	15.3	9.5	5.8	3.4	2.5	2.0	1.6	23.4	45	33.9	100

100 year 6 hour (x Climate Change Factor) storm gives:-

Pre-dev runoff volume m^3 = 15.7 m^3

Post-dev rainfall volume = 30.9 m^3

Post-dev volume m^3 (excess above SU DS) = 30.9 m^3

100 yr 6 hour mean intensity = 9.70mm/hr

Pre-dev volume to drain at 0 l/s = 0.0 m^3

Post-dev volume to drain at 0 l/s = 0.0 m^3

Post-dev storage volume = 30.9 m^3

Post-dev 5mm imperm volume = 1.1 m^3

Post-dev 5mm perm volume = 3.4 m^3

$Q_{BAR(rural)}$ = 0.406 l/s or 4.427 l/s/ha or 0.000 cumecs - from IoH 124.

The rainfall rates are calculated using the location specific values above in accordance with the Wallingford procedure.



MasterDrain
HY 10.01

Nimbus Engineering Consultants Ltd

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Job No. C3747		
Sheet no. 2		
Date 06/03/26		
By M.HAM	Checked	Reviewed

Project **94 Oxford Road, Wokingham, Berkshire, RG41 2YJ**

Title **Pre & Post Development SW Runoff Calcs Prior to SuDS**

Data summary.

Use the data below for the SUR1 form

Site areas:-

Total site area	=	0.0917 ha ;917.0 m ² [3A]
Pre-development impermeable area	=	0.0108 ha [3B]
Pre-development permeable area	=	0.0809 ha
Post-development impermeable area	=	0.0228 ha [3C]
Post-development permeable area	=	0.0689 ha

Peak runoff:-

Pre-development 1 year storm (15min)	=	5.5 l/s [6A]
Pre-development 100 year storm (15min)	=	17.2 l/s [6C]
Post-development 1 year storm (15min)	=	7.4 l/s [6B]
Post-development 100 year storm (15min)=		23.35 l/s [6D]

Greenfield runoff:-

$Q_{BAR(rural)} = 0.406 \text{ l/s}$ or 4.427 l/s/ha or 0.000 cumecs - from IoH 124.

Climate change factor:-

CCF = 45%

Volumes:-

Pre-development 100 yr/6hr storm [12A]	=	22.8m ³
Post-development 100 yr/6hr storm (add. volume with no SUDS) [12B]	=	30.9m ³
Post-development 100 yr/6hr storm (add. volume with SUDS)	=	30.9m ³
Post-development add. predicted volume (No SUDS) [12C]	=	8.1m ³

You may also require

Data relating to the infiltration test calculations (if applicable)
Evidence to show runoff reduction (if applicable)
Information on calculation methods (if applicable see next sheet)

Note

Numbers in square brackets relate to the
Nov. 2010 v1.1 / issued 11/02/10 copy of SUR1



MasterDrain
HY 10.01

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Job No.
C3747

Sheet no. **3**

Date **06/03/26**

Project **94 Oxford Road, Wokingham, Berkshire, RG41 2YJ**

Title **Pre & Post Development SW Runoff Calcs Prior to SuDS**

By **M.HAM** Checked Reviewed

Definitions and methods

Hydrology

The hydrological constants are derived from the Wallingford maps. They are used to calculate location specific rainfall figures.

Site values and factors

Areas of the site should be entered in hectares (10000 m²). If the Pre-development site is a green field, this box is blank.

Climate Change Factor is initially set at 20% - this may be changed as required.

Greenfield runoff is calculated using the method described in loH 124.

Runoff factors

The impermeable runoff factor is initially set at 98%

The permeable runoff factor is initially set at 20%

Note: the CCF and the runoff factors may be changed by the user to suit the development

The areas draining to soakaways and other SUDS are entered in the appropriate box (in hectares)

Calculations

The post-development area is reduced by subtracting the areas that drain to soakaways or other SUDS, to give a revised figure.

All areas are then multiplied by the appropriate runoff factor to give an equivalent area with 100% runoff.

These are then summated.

This gives a total pre-development equivalent area, and a similar figure for the post-development area.

The 'Post-dev volume to drain (no SUDS)' gives the total runoff to drain if no SUDS were used.

Results

The pre- and post-development areas are subjected to 1,30 and 100 year return period storms with a duration of 15 to 600 minutes.

The Revised Post-dev Imperm. area is the area (in ha) that is not going to SUDS x impervious runoff factor.

The runoff rates are calculated for the chosen hydrograph (Summer or Winter) as l/s. Figures in red indicate m³/s

The peak value is measured, multiplied by the CCF and the total maximum rate is shown.

The pre- and post-development volumes for a 100 year / 6 hour storm are calculated from the area under the hydrograph curve.

Post-dev volume (i.e. excess above SUDS) is that volume produced by the drained area that does not go to SUDS.

Qbar(rural) is calculated in accordance with the procedure laid down in loH 124



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Job No. C3747		
Sheet no. 1		
Date 06/03/26		
By M.HAM	Checked	Reviewed

Project **94 Oxford Road, Wokingham, Berkshire, RG41 2YJ**

Title **IoH 124 (Qbar(urban))Runoff Calcs**

Hydrological Data:-

FSR Hydrology:-

Location = WOKINGHAM
M5-60 (mm) = 18.6
Soil runoff = 0.45
WRAP = 4
Hydrological area = 6

Grid reference = SU8068
r = 0.41
SAAR (mm/yr) = 650
Area = England & Wales
Hydrological zone = 8

Soil classification for WRAP type 4

Clayey, or loamy over clayey soils with an impermeable layer at shallow depth.

Design data:-

Area = 0.000917 Km² - 0.092 Ha - 917 m² % Urbanisation = 12.00%

Calculation method:-

Runoff is calculated from:-

$$Q_{\text{BAR(urban)}} = Q_{\text{BAR(rural)}} (1 + \text{URBAN})^{2\text{NC}} [1 + \text{URBAN} \{ (21/\text{CIND}) - 0.3 \}]$$

where:-

NC varies with the value of SAAR:-

for 500<SAAR<1100 mm then NC = 0.92 - 0.00024SAAR

for 1100<SAAR<3000 mm then NC = 0.74 - 0.000082SAAR

CIND = 102.4SOIL + 0.28 (CWI - 125)

CWI = Catchment Wetness Index

so

CIND = 30.117

CWI = 67.989

NC = 0.764

For areas less than 50Ha, a modified calculation which multiplies the 50Ha runoff value by the ratio of the site area to 50Ha is used
Reducing factor used for these calculations is 0.002

$$Q_{\text{BAR(rural)}} = 0.369 \text{ (l/s)}$$

$$Q_{\text{BAR(urban)}} = 0.460 \text{ (l/s)}$$

$Q_{\text{BAR(urban)}}$ is then multiplied by a growth factor - GC(T) - for different storm return periods derived from EA publication W5-074/A.



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Calculated data:-

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				Sheet no. 2		
				Date 06/03/26		
Project 94 Oxford Road, Wokingham, Berkshire, RG41 2YJ				By M.HAM	Checked	Reviewed
Title IoH 124 (Qbar(urban))Runoff Calcs						

Mean Annual Peak Flow $Q_{BAR(urban)} = 0.46 \text{ l/s}$

Values for $Q_{BAR(urban)}$

Ret. per.	m ³ /hr	l/s	l/s/ha	Ret. per.	m ³ /hr	l/s	l/s/ha
1yr	0.000	0.391	4.265	100yr	0.001	1.450	15.807
2yr	0.000	0.405	4.416	100yr+20%	0.002	1.739	18.969
5yr	0.001	0.589	6.423	100yr+30%	0.002	1.884	20.550
10yr	0.001	0.745	8.129	200yr	0.002	1.703	18.567
30yr	0.001	1.026	11.191	200yr + 30%	0.002	2.213	24.138
50yr	0.001	1.206	13.148	500yr	0.002	2.066	22.532
				1000yr	0.002	2.374	25.894

Growth factors -

1yr	2yr	5yr	10yr	30yr	50yr	100yr	200yr	500yr	1000yr
0.85	0.88	1.28	1.62	2.23	2.62	3.15	3.70	4.49	5.16

The above is based on the Institute of Hydrology Report 124 to which you are referred for further details (see Sect 7). Note that the 200 year growth curve was taken from W5-074/A.

For WRAP type 1 soils, CIND can become negative for lower values of SAAR. In this case the CIND value is multiplied by -1 to return a positive value (CIND is very small at this point).



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By M.HAM	Checked	Reviewed

Project 94 Oxford Road, Wokingham, Berkshire, RG41 2YJ	By M.HAM	Checked	Reviewed
Title Hydrograph Storage Calcs for Extension Area @ 0.460l/s Discharge			

Data:-

Location = WOKINGHAM
M5-60 (mm) = 18.6
Soil index = 0.45
Return period = 100
UCWI = 0.0

Grid reference = SU8068
r = 0.41
SAAR (mm/yr) = 650
WRAP = 4
Climate change = 45%

Clayey, or loamy over clayey soils with an impermeable layer at shallow depth.

Pipeline storage = 0.0 m³
Offline storage = 0.0 m³

Available MH storage = 0.0 m³

Percentage runoff = 100.0% (manual setting)

Imperv. area = 120 m²
Total area = 120 m²
Total runoff = 7.9 m³
Storage (m³) = 5.2 m³ (Sum of all balance quantities)
Total rainfall depth = 65.8 mm

Pervious area = 0 m²
Equiv area = 120 m² (Tot. area x % runoff).
Discharge rate = 0.460 l/s

Calculations :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Outflow (m3)	Balance (m3)	Cumulative (m3)
0.020	20.0	6.6	0.016	0.033	0.000	0.000
0.040	20.0	6.6	0.016	0.033	0.000	0.000
0.060	21.0	6.9	0.017	0.033	0.000	0.000
0.080	21.0	6.9	0.017	0.033	0.000	0.000
0.100	22.0	7.2	0.017	0.033	0.000	0.000
0.120	23.0	7.6	0.018	0.033	0.000	0.000
0.140	24.0	7.9	0.019	0.033	0.000	0.000
0.160	26.0	8.6	0.021	0.033	0.000	0.000
0.180	27.0	8.9	0.021	0.033	0.000	0.000
0.200	29.0	9.5	0.023	0.033	0.000	0.000
0.220	31.0	10.2	0.024	0.033	0.000	0.000
0.240	32.0	10.5	0.025	0.033	0.000	0.000
0.260	33.0	10.9	0.026	0.033	0.000	0.000
0.280	34.0	11.2	0.027	0.033	0.000	0.000
0.300	36.0	11.9	0.028	0.033	0.000	0.000
0.320	38.0	12.5	0.030	0.033	0.000	0.000
0.340	39.0	12.8	0.031	0.033	0.000	0.000
0.360	40.0	13.2	0.032	0.033	0.000	0.000
0.380	42.0	13.8	0.033	0.033	0.000	0.000
0.400	45.0	14.8	0.036	0.033	0.002	0.003
0.420	49.0	16.1	0.039	0.033	0.006	0.008
0.440	53.0	17.4	0.042	0.033	0.009	0.017
0.460	57.0	18.8	0.045	0.033	0.012	0.029
0.480	62.0	20.4	0.049	0.033	0.016	0.045
0.500	66.0	21.7	0.052	0.033	0.019	0.064
0.520	71.0	23.4	0.056	0.033	0.023	0.087
0.540	77.0	25.4	0.061	0.033	0.028	0.114
0.560	84.0	27.7	0.066	0.033	0.033	0.148
0.580	91.0	30.0	0.072	0.033	0.039	0.186
0.600	98.0	32.3	0.077	0.033	0.044	0.231
0.620	105.0	34.6	0.083	0.033	0.050	0.281
0.640	114.0	37.5	0.090	0.033	0.057	0.338
0.660	125.0	41.2	0.099	0.033	0.066	0.403
0.680	135.0	44.4	0.107	0.033	0.074	0.477
0.700	143.0	47.1	0.113	0.033	0.080	0.557
0.720	154.0	50.7	0.122	0.033	0.089	0.645
0.740	164.0	54.0	0.130	0.033	0.096	0.742
0.760	173.0	57.0	0.137	0.033	0.104	0.845
0.780	183.0	60.2	0.145	0.033	0.111	0.957
0.800	194.0	63.9	0.153	0.033	0.120	1.077



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Project **94 Oxford Road, Wokingham, Berkshire, RG41 2YJ**

Title **Hydrograph Storage Calcs for Extension Area @ 0.460l/s Discharge**

Calculations (cont.) :-

Time (hrs)	%Mean intens	Rain mm/hr	Inflow (m3)	Outflow (m3)	Balance (m3)	Cumulative (m3)
0.820	204.0	67.2	0.161	0.033	0.128	1.205
0.840	212.0	69.8	0.168	0.033	0.134	1.339
0.860	219.0	72.1	0.173	0.033	0.140	1.479
0.880	226.0	74.4	0.179	0.033	0.145	1.625
0.900	233.0	76.7	0.184	0.033	0.151	1.776
0.920	239.0	78.7	0.189	0.033	0.156	1.931
0.940	244.0	80.3	0.193	0.033	0.160	2.091
0.960	248.0	81.6	0.196	0.033	0.163	2.254
0.980	249.0	82.0	0.197	0.033	0.164	2.418
1.000	250.0	82.3	0.198	0.033	0.164	2.582
1.020	250.0	82.3	0.198	0.033	0.164	2.746
1.040	249.0	82.0	0.197	0.033	0.164	2.910
1.060	248.0	81.6	0.196	0.033	0.163	3.073
1.080	244.0	80.3	0.193	0.033	0.160	3.232
1.100	239.0	78.7	0.189	0.033	0.156	3.388
1.120	233.0	76.7	0.184	0.033	0.151	3.539
1.140	226.0	74.4	0.179	0.033	0.145	3.685
1.160	219.0	72.1	0.173	0.033	0.140	3.825
1.180	212.0	69.8	0.168	0.033	0.134	3.959
1.200	204.0	67.2	0.161	0.033	0.128	4.087
1.220	194.0	63.9	0.153	0.033	0.120	4.207
1.240	183.0	60.2	0.145	0.033	0.111	4.319
1.260	173.0	57.0	0.137	0.033	0.104	4.422
1.280	164.0	54.0	0.130	0.033	0.096	4.519
1.300	154.0	50.7	0.122	0.033	0.089	4.607
1.320	143.0	47.1	0.113	0.033	0.080	4.687
1.340	135.0	44.4	0.107	0.033	0.074	4.761
1.360	125.0	41.2	0.099	0.033	0.066	4.826
1.380	114.0	37.5	0.090	0.033	0.057	4.883
1.400	105.0	34.6	0.083	0.033	0.050	4.933
1.420	98.0	32.3	0.077	0.033	0.044	4.977
1.440	91.0	30.0	0.072	0.033	0.039	5.016
1.460	84.0	27.7	0.066	0.033	0.033	5.049
1.480	77.0	25.4	0.061	0.033	0.028	5.077
1.500	71.0	23.4	0.056	0.033	0.023	5.100
1.520	66.0	21.7	0.052	0.033	0.019	5.119
1.540	62.0	20.4	0.049	0.033	0.016	5.135
1.560	57.0	18.8	0.045	0.033	0.012	5.147
1.580	53.0	17.4	0.042	0.033	0.009	5.156
1.600	49.0	16.1	0.039	0.033	0.006	5.161
1.620	45.0	14.8	0.036	0.033	0.002	5.164
1.640	42.0	13.8	0.033	0.033	0.000	5.164
1.660	40.0	13.2	0.032	0.033	0.000	5.162
1.680	39.0	12.8	0.031	0.033	0.000	5.160
1.700	38.0	12.5	0.030	0.033	0.000	5.157
1.720	36.0	11.9	0.028	0.033	0.000	5.152
1.740	34.0	11.2	0.027	0.033	0.000	5.146
1.760	33.0	10.9	0.026	0.033	0.000	5.139
1.780	32.0	10.5	0.025	0.033	0.000	5.131
1.800	31.0	10.2	0.024	0.033	0.000	5.123
1.820	29.0	9.5	0.023	0.033	0.000	5.112
1.840	27.0	8.9	0.021	0.033	0.000	5.101
1.860	26.0	8.6	0.021	0.033	0.000	5.088
1.880	24.0	7.9	0.019	0.033	0.000	5.074
1.900	23.0	7.6	0.018	0.033	0.000	5.059
1.920	22.0	7.2	0.017	0.033	0.000	5.043
1.940	21.0	6.9	0.017	0.033	0.000	5.027
1.960	21.0	6.9	0.017	0.033	0.000	5.010
1.980	20.0	6.6	0.016	0.033	0.000	4.993
2.000	20.0	6.6	0.016	0.033	0.000	4.975

Storage volume (m³) = 5.2 m³ (Sum of all balance quantities)



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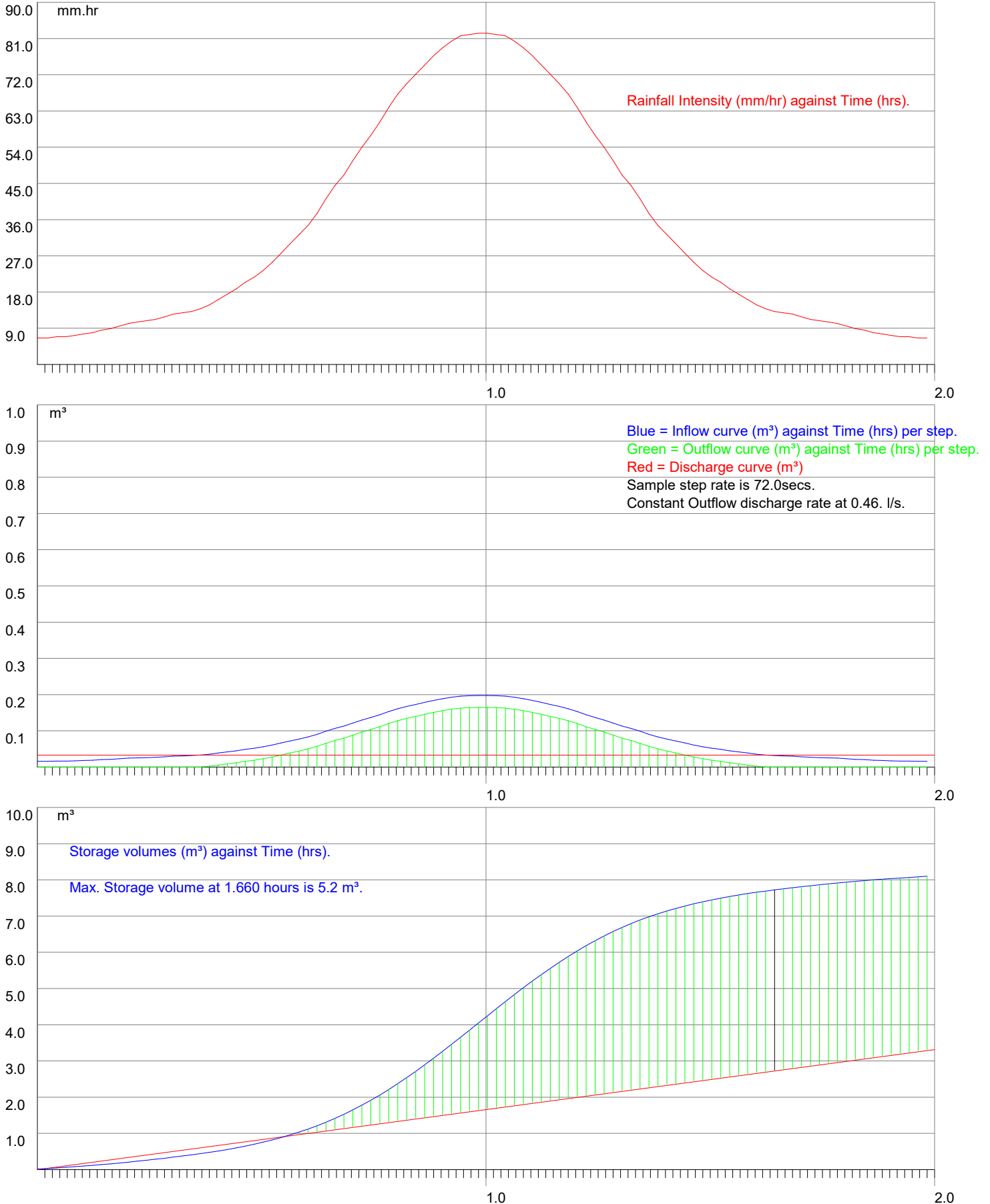
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Job No.	C3747		
Sheet no.	3		
Date	06/03/26		
By	M.HAM	Checked	Reviewed

Project **94 Oxford Road, Wokingham, Berkshire, RG41 2YJ**

Title **Hydrograph Storage Calcs for Extension Area @ 0.460l/s Discharge**





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Title Hydrograph Storage Calcs for Extension Area @ 0.460l/s Discharge			

Maximum storage volumes for varying duration storms.

Storm length (hrs)	Max. Vol (m ³)	Max. Vol time	Mean intens (mm/hr)	Step time. (mins)	Peak found
0.25	3.68	0.25	133.29	0.2	
0.5	4.54	0.50	87.25	0.3	
1	5.08	1.00	54.47	0.6	
2	5.16	2.00	32.92	1.2	Peak found
3	4.93	---	24.23	1.8	
4	4.57	---	19.39	2.4	
5	4.17	---	16.27	3.0	
6	3.75	---	14.06	3.6	
7	3.34	---	12.44	4.2	
8	2.95	---	11.19	4.8	
9	2.57	---	10.19	5.4	
10	2.21	---	9.37	6.0	
12	1.54	---	8.10	7.2	
15	0.70	---	6.78	9.0	
18	0.13	---	5.85	10.8	
20	0.00	---	5.38	12.0	
24	0.00	---	4.64	14.4	
30	0.00	---	3.88	18.0	
36	0.00	---	3.35	21.6	
42	0.00	---	2.95	25.2	
48	0.00	---	2.65	28.8	
54	0.00	---	2.41	32.4	
60	0.00	---	2.21	36.0	
66	0.00	---	2.05	39.6	
72	0.00	---	1.91	43.2	
84	0.00	---	1.68	50.4	
96	0.00	---	1.51	57.6	
120	0.00	---	1.25	72.0	
150	0.00	---	1.04	90.0	
175	0.00	---	0.92	105.0	
200	0.00	---	0.82	120.0	
250	0.00	---	0.69	150.0	
300	0.00	---	0.59	180.0	
375	0.00	---	0.49	225.0	
500	0.00	---	0.39	300.0	
750	0.00	---	0.28	450.0	
1000	0.00	---	0.22	600.0	
1250	0.00	---	0.18	750.0	
1500	0.00	---	0.16	900.0	
1570	0.00	---	0.15	942.0	
2000	0.00	---	0.12	1200.0	
2500	0.00	---	0.10	1500.0	
3000	0.00	---	0.09	1800.0	
3500	0.00	---	0.08	2100.0	
4000	0.00	---	0.07	2400.0	



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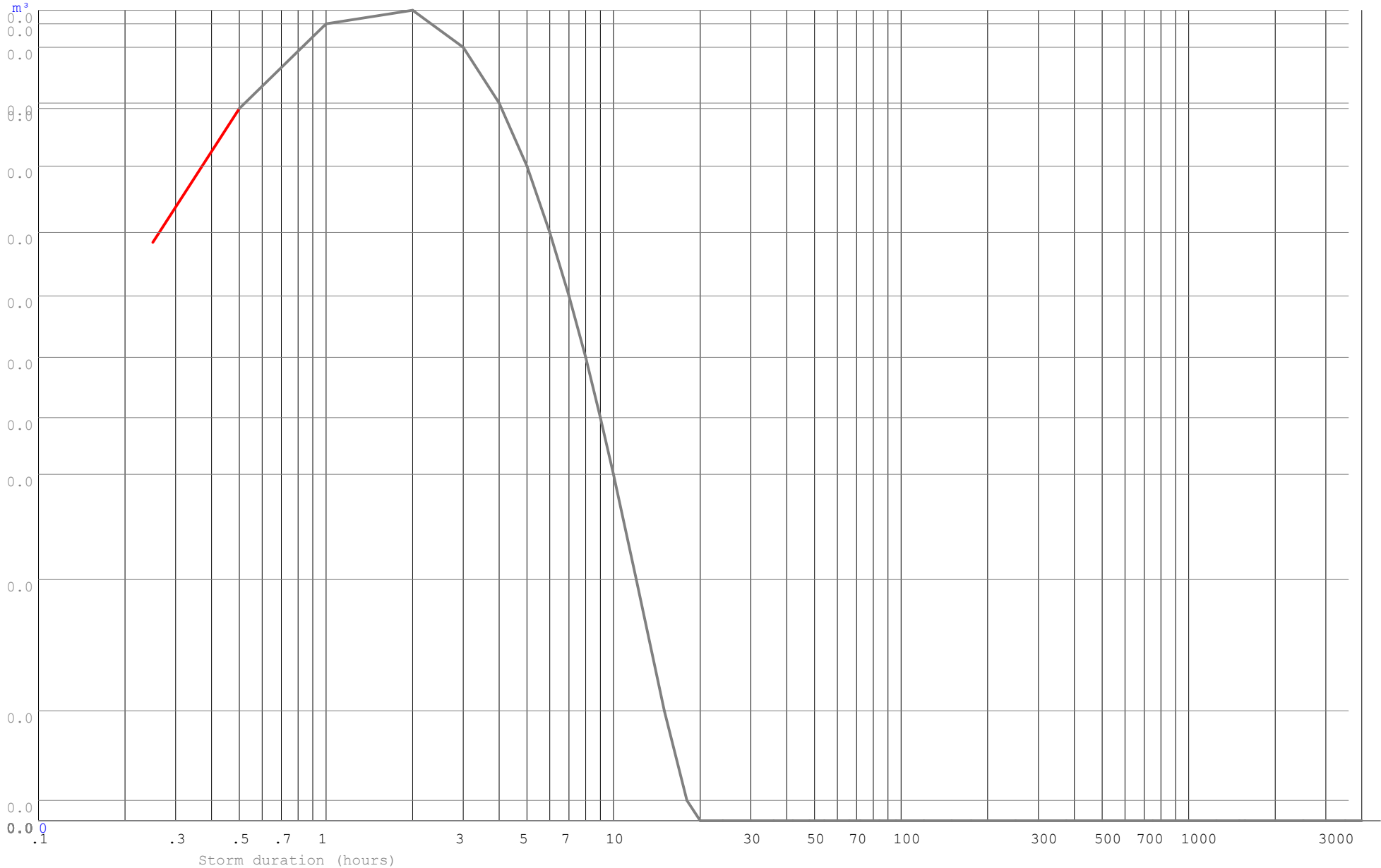
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Date 06/03/26		
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Project
94 Oxford Road, Wokingham, Berkshire, RG41 2YJ

Title
Hydrograph Storage Calcs for Extension Area @ 0.460l/s Discharge

Sequential storage volume at specific storm durations.





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Project **94 Oxford Road, Wokingham, Berkshire, RG41 2YJ**

Title **Hydrograph Storage Calcs for Extension Area @ 0.460l/s Discharge**

Explanatory notes for Peak Flow Storage

- 1) This system uses the rainfall intensity/ duration curve calculated using either the Wallingford or FEH method as selected.
- 2) The balance is calculated from the inflow minus the outflow.
- 3) The storage volume is the maximum value of the balance curve.
- 4) This method was described by Davis (1963) - see Butler & Davies, 2nd edition, p294
- 5) References to 'storm duration' relate only to the hydrograph method (qv).
- 6) There are always 600 steps in the calculation process, thus a 'run' time of 10 hours will be sampled every minute,

Explanatory notes for Hydrograph Storage

- 1) The user has the choice of Summer or Winter curves
- 2) The mean intensity varies with the duration of the storm curve
- 3) There are always 120 steps in the calculation process, irrespective of storm duration.
- 4) The balance is calculated from the inflow minus the outflow.
- 5) The storage volume is the sum of the balance values for each step.
- 6) Varying durations should be tried to find the maximum storage value - this can be narrowed down very closely.

*Modelling using the flow characteristics of the restrictor is available using Vortex Control modelling function. Please be aware that this function needs the full design data file to function.

Why do the two methods give different results?

The rainfall characteristics for each method are very different.

The Peak flow (using the Intensity/Duration/Frequency curve) does not model the actual rainfall. This curve is joined points which represent the mean intensity of a storm at a given duration i.e. a value of 19.5 mm/hr for a 60 minute storm indicates that over the sixty minute period, the mean intensity was 19.5 mm/hr. The calculation method samples the IDF curve for a given location and frequency (Return Period) and calculates the storage for that rate and duration less the outflow volume. The maximum value is displayed as the 'worst case' storage.

The hydrograph method uses a standard curve for either Winter or Summer storms. Traditionally these are symmetrical about the central peak. UK rainfall does not fit into this convenient curve, so the calculations are dealing with a stylised set of data. The mean intensity for the storm is calculated from the IDF curve and applied to the curve data, calculating the storage for that step less the outflow volume. The final storage volume is the sum of the storage for all the steps.

It can be seen that these two methods are very different, and the user may have the choice of which result to use. This is not an exact science, though is often treated as such by those that do not understand the principles of the calculations.

APPENDIX C – LOCAL WATER AUTHORITY ASSET PLANS

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Your reference C3747

Our reference ALS/ALS Standard/2026_5298077

Search date 6 March 2026

Keeping you up-to-date

Notification of price changes

We're changing our report prices from 4th June 2025. The price will increase by 3.5% based on Retail Price Index (RPI).

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Any Questions? We're happy to talk through the changes with you – give our Property Searches team a call on 0800 009 4540 .



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Search address supplied: 94, Oxford Road, Wokingham, RG41 2YJ

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position and size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the contact details below:

Thames Water Utilities Ltd
Property Searches
Clearwater Court
Vastern Road
Reading
RG1 8DB

Email: property.searches@thameswater.co.uk

Web: thameswater.co.uk/propertysearches

Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority. Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners. The public sewer map relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus. The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

With regard to the fresh water supply, this site falls within the boundary of another water company. For more information, please redirect your enquiry to the following address:

South East Water
Rocfort Road

Asset Location Search



Property Searches

Snodland
Kent
ME6 5AH

Tel: 0845 301 0845

www.southeastwater.co.uk.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. You can do this by emailing customer.feedback@thameswater.co.uk with the email subject header 'Enquiry – TWOSA', along with details of the request.

If you have any questions regarding sewer connections, budget estimates, diversions or building over issues please direct them to our service desk which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

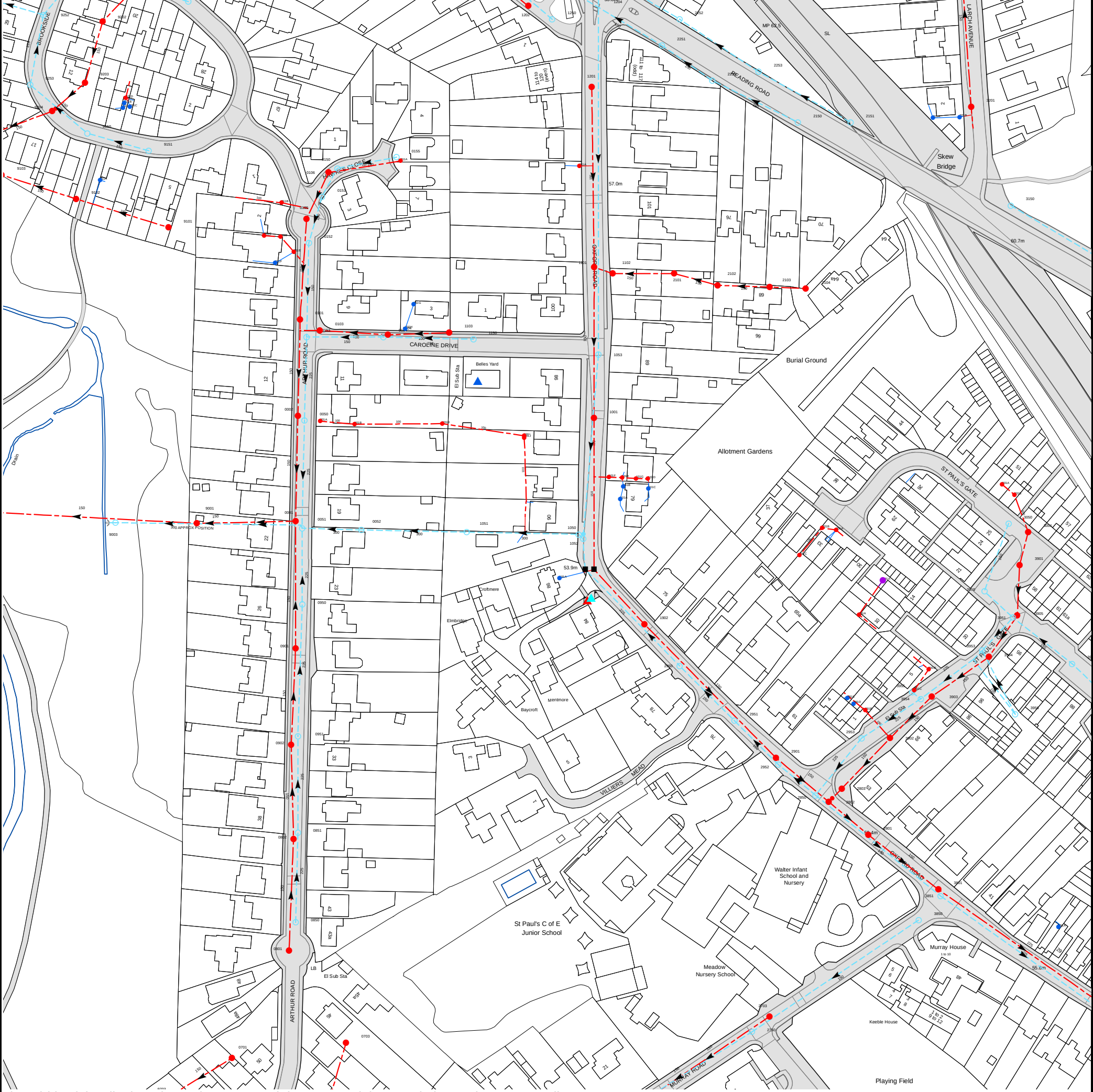
Clean Water queries

Should you require any advice concerning clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2026 5298077



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 480150,169007
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
2104	59.07	58.04
2103	58.74	57.67
2102	58.23	n/a
2101	n/a	n/a
3150	n/a	n/a
2151	n/a	n/a
2150	58.71	57.63
321A	n/a	n/a
321B	n/a	n/a
3201	59.92	58.37
2250	57.43	56.48
2253	n/a	n/a
2251	56.48	55.58
2252	n/a	n/a
381A	n/a	n/a
3952	59.39	58.12
9250	51.07	49.48
1202	56.54	55.24
9252	47.71	46.19
9103	n/a	n/a
9253	48.06	46.51
9204	48.31	46.19
9102	47.23	45.9
9203	n/a	n/a
9150	48.86	47.37
9202	n/a	n/a
921A	n/a	n/a
921B	n/a	n/a
921D	n/a	n/a
921C	n/a	n/a
9151	49.83	48.31
9101	n/a	n/a
001B	n/a	n/a
001A	n/a	n/a
0050	49.9	48.85
0002	49.9	47.91
0153	51.21	49.92
0103	51.58	50.63
0101	51.44	49.52
011F	n/a	n/a
011E	n/a	n/a
0152	52.67	51.53
011D	n/a	n/a
011C	n/a	n/a
0105	53.09	51.17
011B	n/a	n/a
0151	53.54	51.93
0106	53.57	51.81
0150	53.59	52.12
101J	n/a	n/a
101I	n/a	n/a
101H	n/a	n/a
1001	54.45	53.9
1053	n/a	n/a
1150	53.51	52.38
0154	52.32	51.21
0104	52.53	51.87
1103	53.39	52.64
011H	n/a	n/a
011G	n/a	n/a
1102	56.93	55.97
1101	56.09	54.45
111A	n/a	n/a
011A	n/a	n/a
0155	54.31	53.01
1201	56.98	55.63
1250	56.54	55.54
101A	n/a	n/a
101E	n/a	n/a
101B	n/a	n/a
101G	n/a	n/a
1902	54.33	53.38
101D	n/a	n/a
101C	n/a	n/a
2950	54.89	53.67
201C	n/a	n/a
201B	n/a	n/a
201A	n/a	n/a
291C	n/a	n/a
291D	n/a	n/a
291A	n/a	n/a
291B	n/a	n/a
391A	n/a	n/a
3955	57.96	56.48
391C	n/a	n/a
3954	57.74	56.13
391B	n/a	n/a
3903	57.89	56.41
3953	58.83	57.01
3950	59.41	58.01
3904	58.82	57.53

Manhole Reference	Manhole Cover Level	Manhole Invert Level
301A	n/a	n/a
3050	59.95	58.83
3951	59	57.25
301B	n/a	n/a
3956	58.76	57.44
3905	59.33	58.18
3901	59.73	58.58
3001	59.92	58.82
0701	51.06	49.77
0703	52.8	51.12
0801	51.98	49.71
0850	51.73	50.48
0802	50.6	48.67
0851	50.5	49.3
0902	49.53	47.88
0951	49.51	48.23
0901	49.45	46.8
0950	49.88	47.93
191A	n/a	n/a
1052	54.16	52.25
1050	54.08	52.24
1051	n/a	n/a
0052	n/a	n/a
0051	49.15	47.59
9001	n/a	n/a
0001	49.16	46.32
101F	n/a	n/a
2750	55.91	54.09
2703	55.95	54.46
3850	56.14	54.89
3851	56.14	54.35
3801	56.17	52.52
2801	56.25	52.71
2802	56.24	53.12
2850	56.24	54.75
2803	56.65	54.58
2952	55.99	54.82
2901	55.99	53.09
3902	57.34	55.74
2953	56.77	55.28
2951	55.48	54.32
911A	n/a	n/a
9003	n/a	n/a
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.		



Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

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

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

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

Notes:

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

Sewer Fittings

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

	Air Valve		Meter
	Dam Chase		Vent
	Fitting		

Operational Controls

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

	Ancillary		Drop Pipe
	Control Valve		Weir

End Items

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

	Inlet		Outfall
	Undefined End		

Other Symbols

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

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

Areas

Lines denoting areas of underground surveys, etc.

	Agreement
	Chamber
	Operational Site

Ducts or Crossings

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

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

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