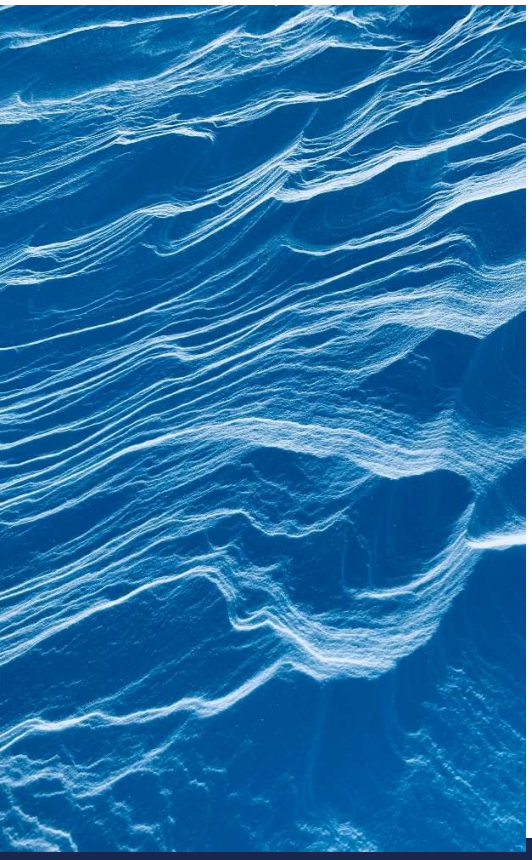

Surface Water Drainage Strategy

AEG02623_UB10_Hillingdon_06

Site Address: 141 Long Lane
Hillingdon
London
UB10 9JN

aegaea
Flood risk, water and environment

UK Experts in Flood Modelling, Flood Risk Assessments, and Surface Water Drainage Strategies

aegaea
Flood risk, water and environment

Document Issue Record

Project: Surface Water Drainage Strategy

Prepared for: Mr. Rajendrasinh Gohil

Reference: AEG02623_UB10_Hillingdon_06

Site Location: 141 Long Lane, Hillingdon, London, UB10 9JN

Consultant		Date
Author	Jack Allen	25/07/2023
Document Check	Oliver Harvey	27/07/2023
Authorisation	Nick Darling-Drewett	28/07/2023

Please Note:

aegaea

Flood risk, water and environment

Table of Contents

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Flood risk, water and environment

1. Introduction

1.1. Aegaea were commissioned to undertake a Surface Water Drainage Strategy (SWDS) to accompany a panning application to discharge planning condition 9 attached to Hillingdon planning decision notice (ref: 73428/APP/2020/1913). This SWDS has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance.

1.2. We understand that some details have been submitted with the discharge of condition application (Hillingdon Ref 73428/APP/2022/3679) but that the LPA have requested further information to demonstrate that the scheme can incorporate sustainable drainage systems (SUDS) into the designs of the development.

Site Overview

1.3. The proposed development is located at 141 Long Lane, Hillingdon, London, UB10 9JN (Figure 1).

Figure 1: Site Location (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © https://www.openstreetmap.org and contributors)

1.4. The existing site currently consists of a residential dwelling. The proposed development is for the construction of a new residential scheme (Figure 2).

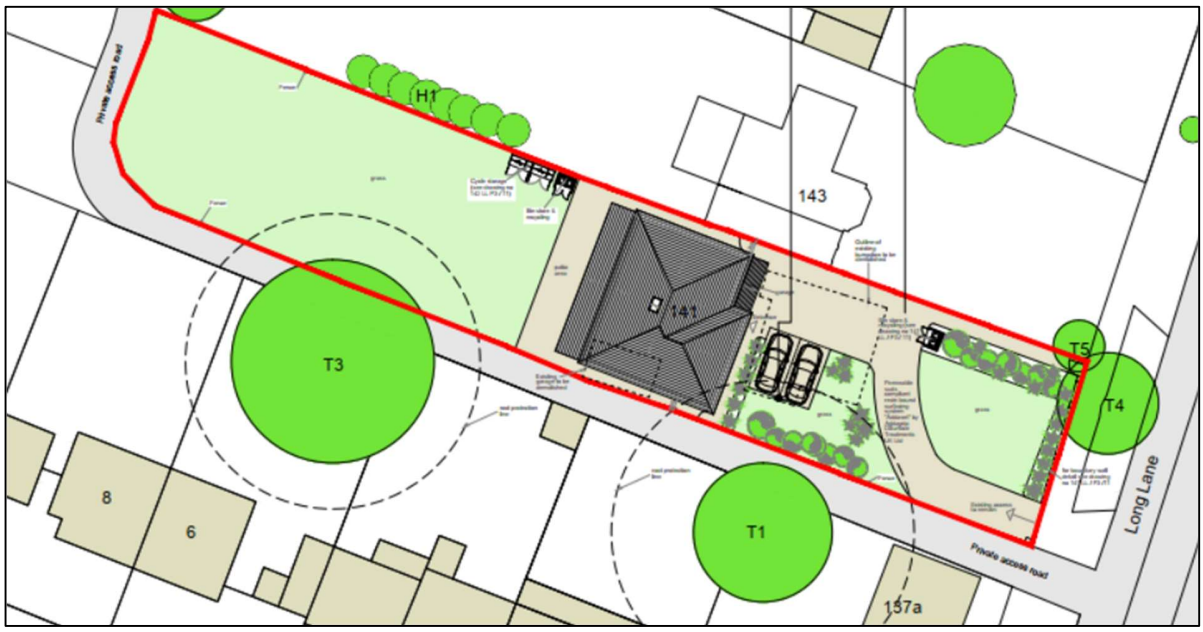


Figure 2. Proposed Development (Source: GGC Design Ltd)

1.5. Environment Agency Light Detection and Ranging (LiDAR) data Digital Terrain Model (1m resolution) indicates that the ground elevations of the site varies between approximately 43.43 metres Above Ordnance Datum (m AOD) to 41.77m AOD (2m LiDAR data).

Planning Requirements

1.6. Full planning permission has been granted (ref 73428/APP/2020/1913) subject to condition 9 of the Hillingdon planning decision notice relating to surface water drainage.

> *9. No development approved by this permission shall be commenced until a scheme for the provision of sustainable water management has been submitted to and approved in writing by the Local Planning Authority. The scheme shall clearly demonstrate that sustainable drainage systems (SUDS) have been incorporated into the designs of the development in accordance with the hierarchy set out in accordance with Policy 5.15 of the London Plan and will:*
>
> *i. provide information about the design storm period and intensity, the method employed to delay and control the surface water discharged from the site and the measures taken to prevent pollution of the receiving groundwater and/or surface waters;*
>
> *ii. include a timetable for its implementation; and*
>
> *iii. provide a management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime.*
>
> *The scheme shall also demonstrate the use of methods to minimise the use of potable water through water collection, reuse and recycling and will:*

iv. provide details of water collection facilities to capture excess rainwater;

v. provide details of how rain and grey water will be recycled and reused in the development.

Thereafter the development shall be implemented and retained/maintained in accordance with these details for as long as the development remains in existence.

REASON

To ensure the development does not increase the risk of flooding in accordance with Policy DMEI 10 of the Hillingdon Local Plan Part 2 (2020) and London Plan (2016) Policy 5.12.

1.7. This report will provide details of a detailed surface water drainage scheme incorporating the measures ***i-v*** listed in Condition 9.

2. Surface Water Drainage Strategy

Nearby Watercourses

2.1. The nearest watercourse to the site is a ditch located 240m to the north. There are a number of private residential dwellings between the site and the watercourse, therefore, it will not be possible to discharge surface water from the site into this watercourse.

Ground Conditions

2.2. The British Geological Survey's (BGS) mapping shows that there are no superficial deposits underlying the area. The bedrock underlying the area is mapped as London Clay Formation - Clay, silt and sand.

2.3. Clay bedrock at the site suggests that there is impeded drainage at the site and infiltration drainage would not be possible for the proposed development.

Existing Drainage Infrastructure

2.4. Thames Water Sewer Asset plans have been included in this report as Appendix A and reproduced as Figure 3.

2.5.

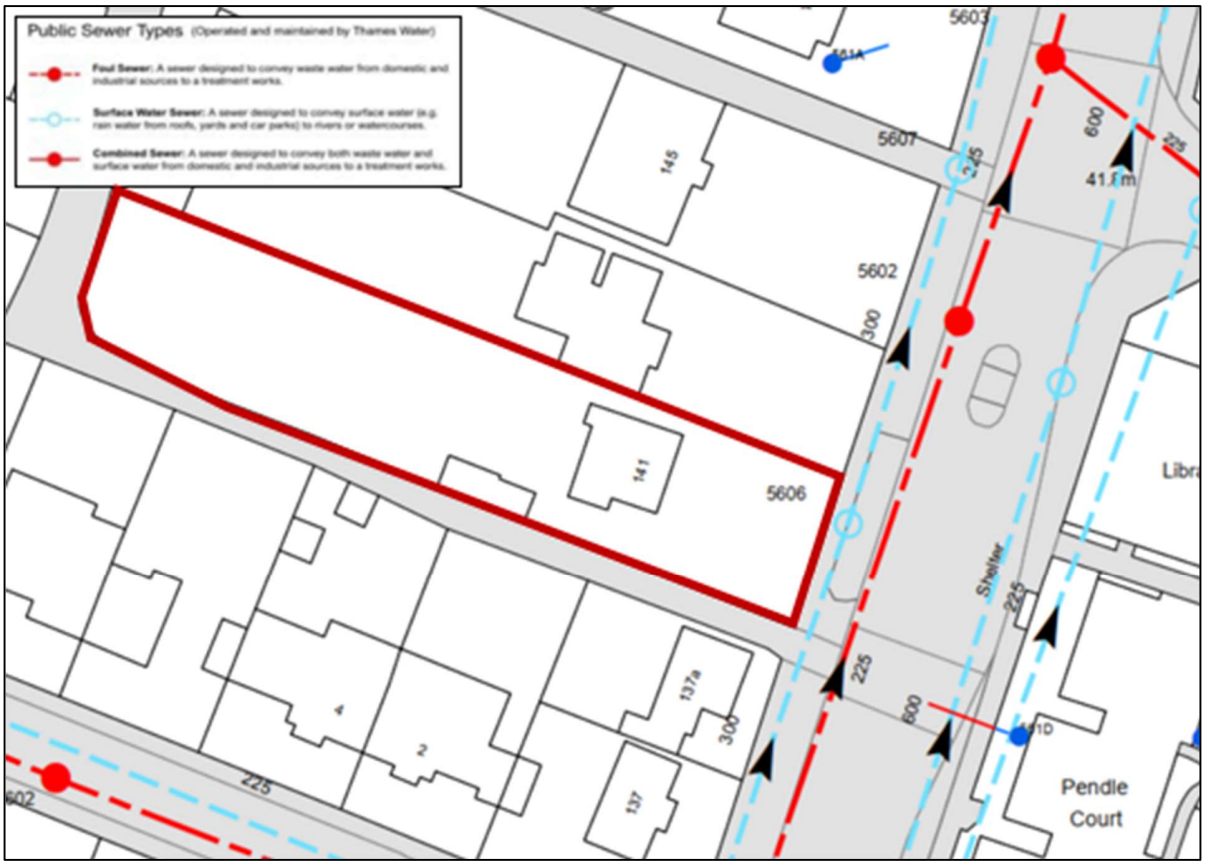


Figure 3. Sewer Asset Plan (Source: Thames Water)

2.6. Figure 1 above shows that there are public surface water and foul sewer beneath Long Lane flowing from south to north. A surface water manhole (reference: 5606) is located adjacent to the sites eastern boundary and is proposed to be utilised as the outfall for this drainage strategy.

2.7. The proposed outfall to the Thames Water surface water sewer is subject to capacity checks and approval from Thames Water.

Greenfield Runoff Rate

2.8. The total site area is approximately 0.114ha.

2.9. The proposed plans indicate that the development includes a total hardstanding area of approximately 422m^2 (0.042ha). The proposed plans are included as Appendix B.

2.10. The IH-124 method was developed as part of the original Flood Studies Report (FSR) in 1975 and was devised to calculate runoff from small catchments by estimating the mean annual flood flow (Qbar) using the following equation:

$$QBAR_{rural} = 0.00180 \times AREA^{0.89} \times SAAR^{1.17} \times SOIL^{2.17}$$

Where:

$Qbar_{rural}$ is the mean annual flood flow from a rural catchment (approximately 2.3 year return period).

AREA is the area of the hardstanding surfaces in ha.

SAAR is the Standard Average Annual Rainfall for the period 1941 to 1970 in mm.

SPR is Standard Percentage Runoff coefficient for the SOIL category. The SOIL category is extracted from UK Winter Rainfall Acceptance Potential (WRAP) map.

2.11. The ICP SuDS variation is a scaled-down version of the IH-124 runoff method for estimating peak flow rates from both undeveloped and partly urbanised catchments that are smaller than 50 ha in size, which is appropriate in this instance.

2.12. The parameters used for estimating the greenfield runoff rates for the site are presented in Table 1.

Table 1. IH-124 Input Parameters

Greenfield runoff rates from the site – simulation criteria	
Rainfall Data	FSR
Area	0.042 Ha
SAAR	637.0
SOIL	0.3
Region	Region 6

2.13. Table 2 displays the estimated Q_{BAR} greenfield runoff rate for an impermeable area of 0.042Ha. The Q_{BAR} rate of 0.1l/s would be unfeasible to design to as it would increase the risk of blockage. Therefore, 1l/s is a more feasible discharge rate, which as close to greenfield rates as feasibly possible.

Table 2. Greenfield Runoff Rates

Return Period	Greenfield Runoff Rate (l/s)
1 in 1 Year	0.1
1 in 2 Year (Q_{BAR})	0.1
1 in 30 Year	0.2
1 in 100 Year	0.2

Brownfield Runoff Rate

2.14. InfoDrainage Software (v2024.2) was used to calculate the existing runoff rates from the development proposals area. It was assumed that the existing hardstanding surfaces are positively drained (372m^2) to provide an indicative existing runoff rate.

2.15. Calculations indicate that that during the present day 1 year, 30 year and 100 year events the maximum outflow may be 10.5l/s, 21.6/s, and 27.5l/s respectively (Table 3). Therefore, restricting rates to the greenfield Q_{bar} rate would provide a betterment to the existing (unrestricted) scenario in terms of surface water runoff.

Table 3: Existing (Unrestricted) Runoff Rates

Catchment	Area	1 in 1 Year	1 in 30 Year	1 in 100 Year
Existing	372 m^2	10.5l/s	21.6l/s	27.5l/s

Surface Water Drainage Strategy

2.16. In accordance with the SuDS management train approach, the use of various SuDS measures to reduce and control surface water flows have been considered in detail for the development.

2.17. The management of surface water has been considered in respect to the SuDS hierarchy below, as detailed in the CIRIA 753 “The SuDS Manual” (section 3.2.3).

Table 4. SuDS Drainage Hierarchy

SUDS DRAINAGE HIERARCHY			
		Suitability	**Comment**
1.	**Store rainwater for later use**	✓	Rainwater harvesting for the proposed development should be considered. There are plot scale opportunities for rainwater harvesting measures such as water butts and these should be implemented where practical. The captured rainwater could be re-used throughout the landscaping on site.
2.	**Use infiltration techniques, such as porous surfaces in non-clay areas**	x	The British Geological Survey's (BGS) mapping shows that there are no superficial deposits underlying the area. The bedrock underlying the area is mapped as London Clay Formation - Clay, silt and sand. Clay bedrock at the site shown on BGS mapping indicates that infiltration drainage is not feasible at the site.

	3.	**Attenuate rainwater in ponds or open water features for gradual release**	x	Space on site within the confines of the approved layout does not allow for large above ground SuDS such as basins or ponds.
	4.	**Attenuate rainwater by storing in tanks or sealed water features for gradual release**	✓	Has been deemed an appropriate option for attenuation tanks.
	5.	**Discharge rainwater direct to a watercourse**	x	The nearest watercourse to the site is a ditch located 240m to the north, which is not a feasible distance to utilise for the proposed development.
	6.	**Discharge rainwater to a surface water sewer/drain**	✓	It is proposed to discharge surface water sewer from the site into the surface water manhole on Long Lane (Thames Water MH5606). The proposed outfall to the Thames Water surface water sewer is subject to capacity checks and approval from Thames Water.
	7.	**Discharge rainwater to Combined Sewer**	x	Discharging to a surface water sewer is a preferred method of discharge in the drainage hierarchy.

2.18. On review of the SuDS drainage hierarchy, and with reference to both national and local policy, it is proposed that the surface water runoff from the development is managed via permeable paving and geocellular storage. The primary method of attenuation will be a series of an underground attenuation tank; however, additional storage will be provided by rainwater planter bioretention systems located at the ground level beneath rainwater downpipes. Surface water from the proposed development will ultimately be discharged to manhole a public surface water sewer beneath Long Lane. The proposed outfall to the Thames Water sewer is subject to capacity checks and approval from Thames Water.

2.19. Rainwater planter bioretention systems have not been accounted for within the storage calculations in the subsequent sections of this report but would provide additional benefit. This represents a conservative approach whereby these SuDS features have been assumed to be at full capacity at the onset of the modelled storm events.

2.20. The proposed Surface Water Drainage Layout is included as Appendix C and a Construction Details Drawing included as Appendix D.

InfoDrainage Modelling

2.21. A network model has been produced in InfoDrainage software (v 2024.0).

2.22. The model comprises;

- 5no. contributing catchment areas across the proposed development area representing hardstanding surfaces for a total area of 0.042ha. An additional 10% allowance for urban creep has been included in the calculations, this represents a conservative approach whereby an

allowance is made for the conversion of permeable areas to impermeable areas over the lifetime of the development.

- 1 proposed hydrobrake manhole restricting flows to 1l/s (UNIT REFERENCE: CHE-0045-1000-1000-1000).
- 1 manhole downstream of the proposed hydrobrake manhole, representing the proposed outfall to the public surface water sewer beneath Long Lane.
- 3no. Lined permeable paving (Type C) units representing the dwelling driveway, hardstanding areas surrounding the dwelling, and the site access with a total plan area of 274m^2, porosity of 30%. The depth of the permeable paving for the hardstanding surrounding the dwelling, the driveway, and the site access is 0.15m, 0.2m, and 0.3m respectively.
- 1 geocellular attenuation unit 4.0m (W) x 4.5m (L) x 1m (H), with 95% porosity.

2.23. The runoff from the dwelling rooftop and areas of hardstanding surrounding the dwelling, the driveway, and the site access have been delineated as separate catchments. The hardstanding areas surrounding the dwelling, the driveway, and the site access have been applied as a lateral inflow into the permeable paving units. The dwelling roof has been delineated as two catchments that are both applied as point inflows into the into the geocellular crate system, within the plot boundary.

2.24. Surface water flows downstream to the proposed outfall to the public surface water sewer beneath Long Lane, where flows are restricted to 1.0 l/s. Excess flows will back up into the geocellular system upstream of the existing manhole. The proposed outfall to the Thames Water sewer is subject to capacity checks and approval from Thames Water.

2.25. The system is designed to manage the 1 in 100 (+45% allowance for climate change) storm event.

2.26. Table 5 summarises the simulation criteria for the InfoDrainage model.

Table 5 Simulation Criteria

Catchment Area Simulation Parameters	
Rainfall Data	FSR
Total Area	0.047 Ha (includes a 10% allowance for Urban Creep)
Return Periods	1, 30, 30+40% for climate change, 100, 100 +45% for Climate Change. Summer and Winter
Storm Durations	15, 30, 60, 120, 240, 360, 480, 960, 1440 minute
Volumetric Runoff Coefficient	0.9 (summer and winter storms)
Percentage Impervious	100%
Time of Concentration	5 minutes

2.27. The full calculation outputs can be found in Appendix E of this report although the 1in100year +45% climate change results have been summarised below:

- The maximum flow rate through the hydrobrake manhole and into the public surface water sewer would be 1l/s for the critical storm event (240 minute winter).
- The maximum depth in the 1m deep geocellular storage tank would be 0.920m for the critical storm event (240 minute winter).
- The maximum depth in the 0.15m deep permeable paving (Surrounding Paving) is 0.105 for the critical storm event (60 minute summer).
- The maximum depth in the 0.20m deep permeable paving (Driveway) is 0.173 for the critical storm event (60 minute summer).
- The maximum depth in the 0.30m deep permeable paving (Site Access) is 0.260 for the critical storm event (60 minute summer).
- No flooding is observed in the critical storm event based on the InfoDrainage model.

2.28. As such, these results indicate that the runoff from the proposed development could be accommodated within a drainage system of the approximate size modelled, with surface water runoff restricted to 1l/s.

Water Quality

2.29. A key element of SuDS is that they have the potential to improve the quality of surface water discharged from a site. In order to assess this, the "Pollution hazard indices for different land use classifications", provided in the CIRIA SuDS Manual (C753) as table 26.2, has been reviewed. The indices use four different methods of assessing pollution potential based on the hazard level, total suspended solids (TSS), Metals, and Hydrocarbons.

2.30. The Pollution Hazard Indices are summarised in Table 6 below (with reference to table 26.3 in the CIRIA SuDS manual).

Table 6: Pollutant Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Residential car parks and low traffic roads	Low	0.5	0.4	0.4

Table 7: Mitigation Hazard Indices for discharges to surface waters

SuDS	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7

2.31. Runoff from residential roofs is generally considered low contamination risk and does not usually warrant any significant treatment. However, to prevent potential sediment from impacting the SuDS system, sediment traps should be provided on the bioretention outlet to the storage structure to prevent sedimentation in the below ground network, with rodding access provided either side for cleaning and maintenance.

2.32. Permeable paving will provide sufficient treatment for the trafficked areas of the proposed development.

Maintenance

2.33. Table 8 presents details regarding the maintenance requirements for the proposed SuDS included as part of the development, taken from the CIRIA C753 The SuDS manual. Each manufacturer will have bespoke requirements however the below should be used as a guide. All SuDS are to be maintained by the property owner.

Table 8: Specific SuDS Maintenance Requirements (Source: CIRIA SuDS Manual)

Maintenance Schedule	Required Action	Typical Frequency
Permeable Paving		
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 manufacturer's recommendations
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeks by an applicator rather than a sprayer	As required
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has 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 structure by remedial sweeping	Every 10 to 15 years 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, 48hr after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Geocellular Storage		
Regular Maintenance	Inspect and identify any area that are 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 from 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

Designing for Exceedance

2.34. Exceedance events are those greater than the design rainfall event, i.e. greater than the 100 year rainfall event plus 45% increase for climate change.

2.35. Periods of exceedance occur when the rate of surface water runoff exceeds the drainage system capacity. Conveyance beneath ground cannot, generally, be economically or sustainably constructed to the scale required for the most extreme rainfall events. This may result, on occasion, in the surface water runoff exceeding the capacity of the drainage network, with excess water (exceedance flow) being conveyed above ground.

2.36. For situations where extreme rainfall intensity exceeds inlet capacities, or for extreme storm events exceeding the design flood event considered for drainage design, surface water would flow overland towards the east of the site, flowing overland towards Long Lane into the highway drainage network. Exceedance flows should not ingress into any properties onsite.

3. Conclusions

3.1. Aegaea were commissioned to undertake a Surface Water Drainage Strategy (SWDS) with regards to a discharge of condition requirement for condition 9 attached to Hillingdon planning decision notice (ref 73428/APP/2020/1913). This SWDS has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance.

3.2. The existing site currently consists of a residential dwelling at 141 Long Lane, Hillingdon, London, UB10 9JN. The proposed development is for the construction of a new residential scheme.

3.3. On review of the SuDS drainage hierarchy, and with reference to both national and local policy, it is proposed that the surface water runoff from the development is managed via permeable paving and geocellular storage. The primary method of attenuation will be an underground attenuation tank. Surface water from the proposed development will ultimately be discharged to a public surface water sewer beneath Long Lane. The proposed outfall to the Thames Water sewer is subject to capacity checks and approval from Thames Water.

3.4. Small-scale SuDS features such as rainwater planter bioretention systems are proposed to be located beneath rainwater downpipes for additional storage. However, rainwater planter bioretention systems have not been accounted for within the storage calculations but would provide additional benefit.

3.5. The 1in100year +45% climate change results have been summarised below:

- The maximum flow rate through the hydrobrake manhole and into the public surface water sewer would be 1l/s for the critical storm event (240 minute winter).
- The maximum depth in the 1m deep geocellular storage tank would be 0.920m for the critical storm event (240 minute winter).
- The maximum depth in the 0.15m deep permeable paving (Surrounding Paving) is 0.105 for the critical storm event (60 minute summer).
- The maximum depth in the 0.20m deep permeable paving (Driveway) is 0.173 for the critical storm event (60 minute summer).
- The maximum depth in the 0.30m deep permeable paving (Site Access) is 0.260 for the critical storm event (60 minute summer).
- No flooding is observed in the critical storm event based on the InfoDrainage model.

3.6. Surface Water Drainage Strategy should be submitted as part of the planning application to satisfy the condition 9 attached to Hillingdon planning decision notice (ref 73428/APP/2020/1913).

Appendix A – Thames Water Asset Plans

Asset location search

Property Searches

Aegaea
66 Swaledale Road
WARMINSTER
BA12 8FJ

Search address supplied

141
Long Lane
Hillingdon
Uxbridge
UB10 9JN

Your reference 2623

Our reference ALS/ALS Standard/2023_4862785

Search date 25 July 2023

Notification of Price Changes

From 1st April 2023 Thames water Property Searches will be increasing the prices of its CON29DW, CommercialDW Drainage & Water Enquiries and Asset Location Searches. Historically costs would rise in line with RPI but as this currently sits at 14.2%, we are capping it at 10%.

Customers will be emailed with the new prices by January 1st 2023.

Any orders received with a higher payment prior to the 1st April 2023 will be non-refundable. For further details on the price increase please visit our website at www.thameswater-propertysearches.co.uk

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Asset location search

Property Searches

Search address supplied: 141, Long Lane, Hillingdon, Uxbridge, UB10 9JN

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 searchprovides maps showing the position, 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 address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Asset location search

Thames Water Property Searches

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.

This report 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:

Affinity Water Ltd
Tamblin Way
Hatfield
AL10 9EZ
Tel: 0345 3572401

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.

Payment for this Search

A charge will be added to your suppliers account.

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. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational 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

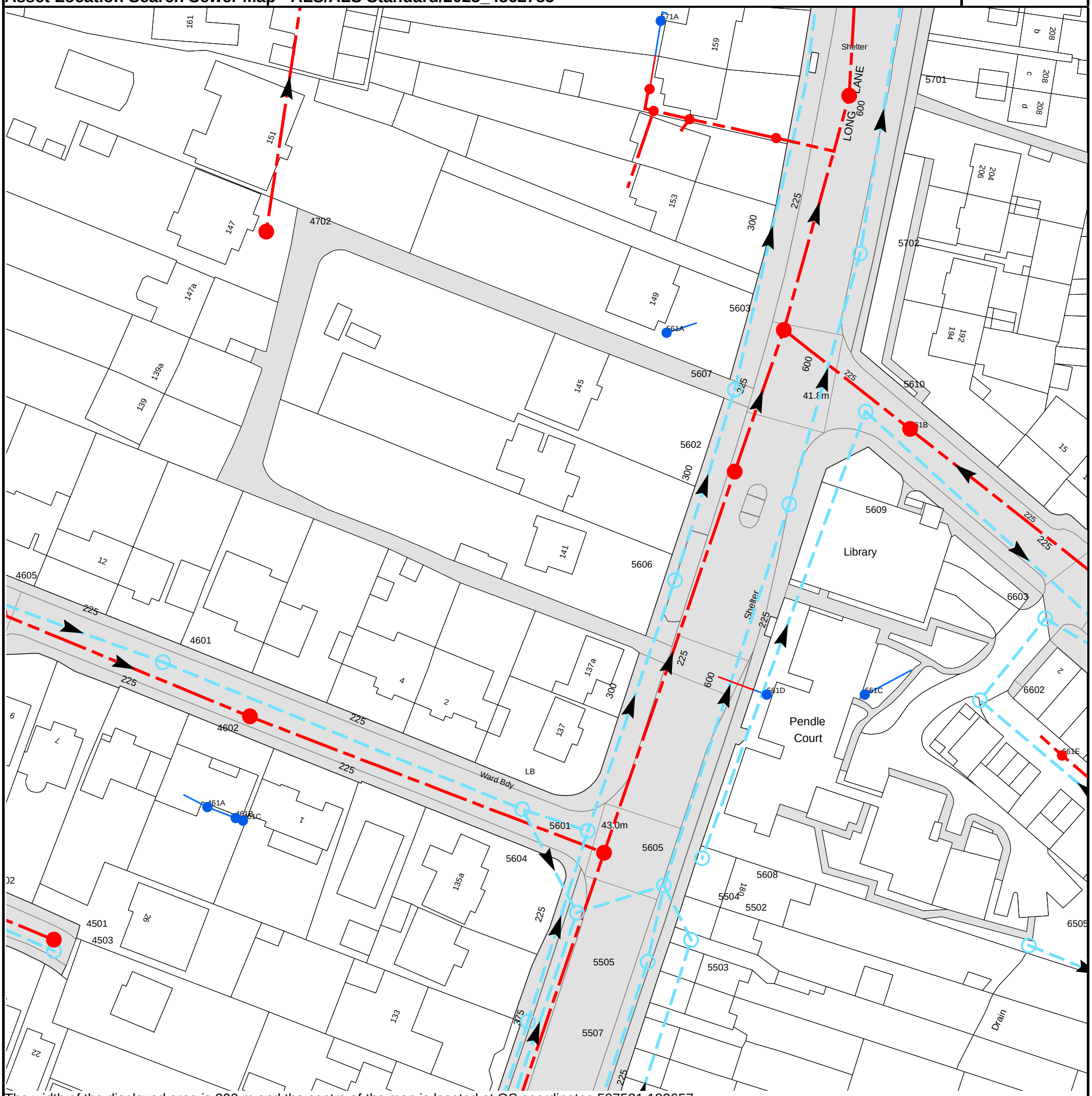
Clean Water queries

Should you require any advice concerning clean water operational issues or 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/2023_4862785



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 507521,183657

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.

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
5609	42.02	40.24
561C	n/a	n/a
6602	41.18	40.19
6505	41.97	41.31
6603	41.3	40.01
661E	n/a	n/a
4702	42.78	41.99
5707	n/a	n/a
5704	n/a	n/a
571A	n/a	n/a
561A	n/a	n/a
5705	n/a	n/a
5607	41.54	40.32
5602	41.52	39.85
5706	n/a	n/a
5603	n/a	n/a
5701	41.14	39.27
5702	n/a	n/a
5610	41.33	39.55
561B	n/a	n/a
4601	44.46	43.08
461A	n/a	n/a
461B	n/a	n/a
461C	n/a	n/a
4602	n/a	n/a
5604	n/a	n/a
5507	43.8	42.35
5505	n/a	n/a
5605	43.02	41.47
5601	42.97	40.63
5503	43.4	41.9
5504	n/a	n/a
5606	42.13	40.5
5502	n/a	n/a
5608	42.99	41.37
561D	n/a	n/a
4503	46.9	45.9
4501	46.4	45.6

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

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

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.
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.

Payment Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment within 14 days of the date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service or will be held to be invalid.
4. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
5. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
6. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800.

If you are unhappy with our service, you can speak to your original goods or customer service provider. If you are still not satisfied with the outcome provided, we will refer the matter to a Senior Manager for resolution who will provide you with a response.

If you are still dissatisfied with our final response, and in certain circumstances such as you are buying a residential property or commercial property within certain parameters, The Property Ombudsman will investigate your case and give an independent view. The Ombudsman can award compensation of up to £25,000 to you if he finds that you have suffered actual financial loss and/or aggravation, distress, or inconvenience because of your search not keeping to the Code. Further information can be obtained by visiting www.tpos.co.uk or by sending an email to admin@tpos.co.uk.

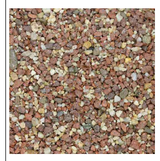
If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0300 034 2222 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

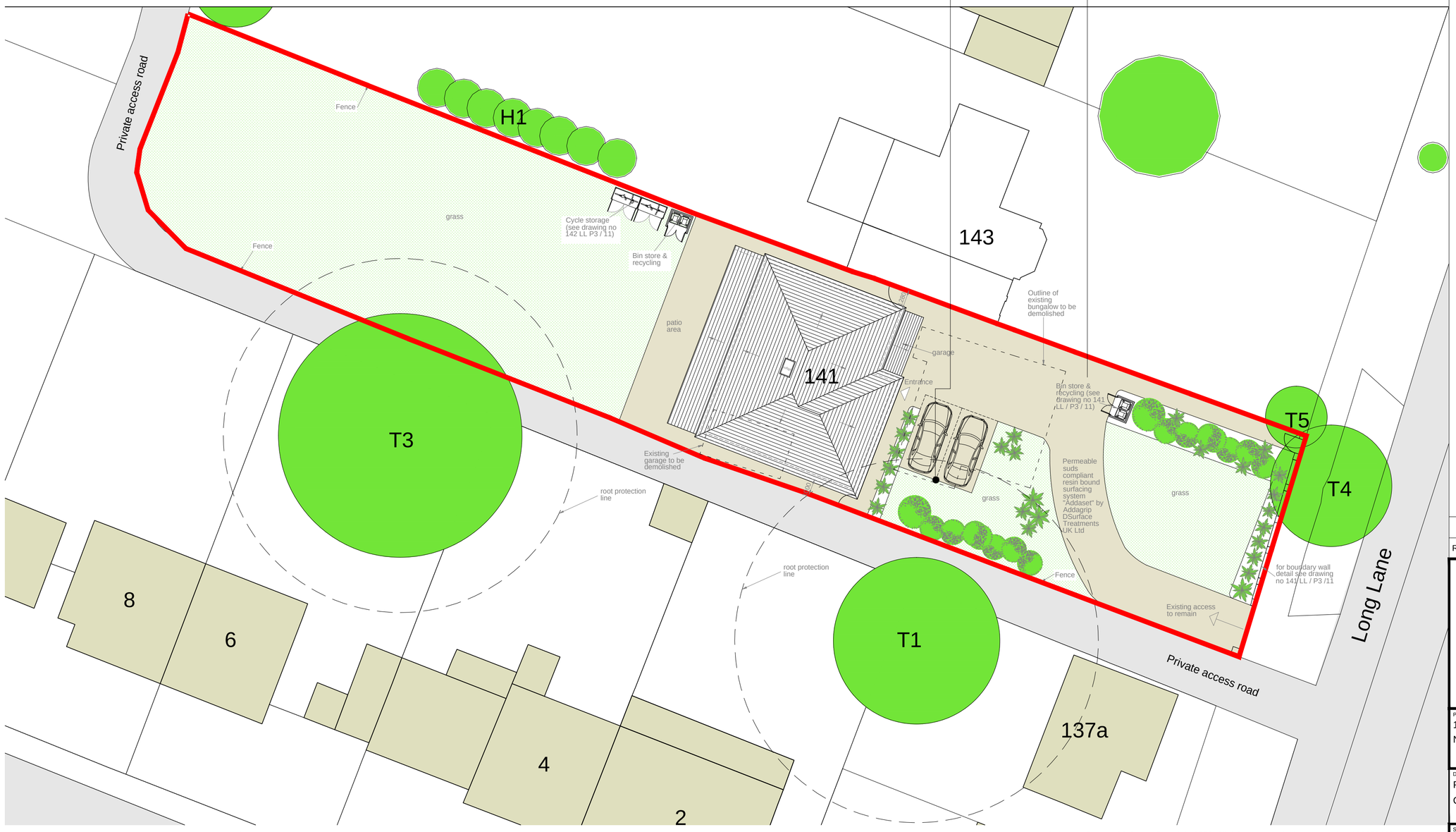
Credit Card	**BACS Payment**	**Telephone Banking**
Please Call **0800 009 4540** quoting your invoice number starting CBA or ADS	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number

Appendix B – Proposed Development

1 Active dual power freestanding electric charging point.



"Addaset Tuscan Pebble" resin bound surface by Addagrip



PROPOSED SITE PLAN, scale 1:200

NOTES

The Contractor must verify all dimensions at the site before setting out, commencing work, or making any shop drawings. Any discrepencies must be reported to the Contract Administrator / Architect before proceeding.
This drawing to be used for estimating purposes only. The Contractor must not use this drawing for construction until the structural design has been carried out and confirmation given by Building Control that the design is acceptable.
Architect's drawings to be used in conjunction with the structural drawings.

DO NOT SCALE FROM THIS DRAWING.

0 1 5 10
Metres

Rev	Revision notes	Initials	Date
-	-	-	-

GGC DESIGN LTD
CHARTERED ARCHITECT
Tel: 01895 251323
Mob: 07976 732636
g.g.calton11@btinternet.com

PROJECT
141 LONG LANE, HILLINGDON UB10 9JN
NEW HOUSE

DESCRIPTION
PROPOSED SITE PLAN
CONDITION 4.2

SCALE	DRAWN BY	CHECKED BY	DATE
1:200 @ A2	JT, GC	GC	14/10/22

DRAWING No.
141 LL / P3 / 04

REVISION
C

Appendix C – Surface Water Drainage Layout

NOTE

ALL LEVELS ARE TO METERS ABOVE ORDNANCE DATUM (AOD) UNLESS OTHERWISE SPECIFIED.

GROUND LEVELS ARE BASED ON EA 1m RESOLUTION LiDAR DATA.

PROPOSED OUTFALL SUBJECT TO APPROVAL FROM THAMES WATER

PERMEABLE PAVING FOR DRIVEWAY TO DRAIN TO SITE ACCESS PERMEABLE PAVING VIA PERFORATED PIPES

PERMEABLE PAVING SURROUNDING THE DWELLING TO DRAIN GEOCELLULAR STORAGE TANK VIA PERFORATED PIPES

PERMEABLE PAVING FOR SITE ACCESS TO DRAIN TO MH1 VIA PERFORATED PIPES

TYPE C PERMEABLE PAVING CONSTRUCTION - FOR ALL PAVING STRUCTURES

Aquaflow® BLOCK PAVING OR SIMILAR PERMEABLE SURFACING. Aquaflow® BLOCKS PROVIDE DRAINAGE THROUGH VERTICAL CHANNELS AND ALLOW WATER THROUGH AT A RATE OF APPROXIMATELY 9000mm PER HOUR (9000 LITRES PER m^2 PER HOUR)

TOTAL AVAILABLE AREA: CIRCA. 274m^2
DRAINING AREA: ONLY DRAINING ITSELF
SUB-BASE DEPTH - SITE ACCESS: 0.3m; DRIVEWAY; 0.2m, HARDSTANDING SURROUNDING DWELLING: 0.15m
VOID RATIO: 30%

TO BE UTILISED FOR CONVEYANCE AND TREATMENT. SURFACE WATER TO BE CONVEYED INTO THE UNDERGROUND DRAINAGE NETWORK

SUB-BASE TO BE LAID FLAT

FINISHED (SUBJECT TO ARCHITECT SPECIFICATION - BLOCK PAVING OR SIMILAR.
SUB-BASE TO BE LINED (NO INFILTRATION)

1. PERMEABLE BLOCK SURFACING
2. LAYING COURSE MATERIAL
3. GEOTEXTILE
4. SUB-BASE - 6-20mm CLEAN CRUSHED STONE - THICKNESS TBC. SUBJECT TO SITE CBR'S
5. IMPERMEABLE MEMBRANE

ENSURE SUFFICIENT COVER IS PROVIDED FOR ANTICIPATED LOADING - UP TO MANUFACTURER'S SPECIFICATIONS

ANY RUNOFF NOT FILTERED THROUGH PERMEABLE PAVING TO BE FILTERED THROUGH CRUSHED STONE MEDIUM TO REDUCE RISK OF SILTING

143

141

Cycle storage (see drawing no 142 LL P3 / 11)

Bin store & recycling

patio area

bungalow to b demolished

garage

Entrance

Existing garage to be demolished

1.001
100mmØ
1:114.592

Bin store & recycling (see drawing no 141 LL / P3 / 11)

MH1
C.L: 42.200
I.L: 40.600
0.45Ø

1.002
100mmØ
1:49.850

T5

T4

Permeable suds compliant resin bound surfacing system "Addaset" by Addagrip DSurface Treatments UK Ltd

grass

grass

Fence

for boundary wall detail see drawing no 141/LL / P3 /11

Existing access to remain

root protection line

T1

CELLULAR STORAGE - AQUACELL OR SIMILAR CRATE STORAGE

TANK LOCATED BENEATH DRIVEWAY

EXCEEDANCE LEVEL: 42.400
IL: 40.800
PLAN AREA: 18m^2
DEPTH: 1.0m
MAXIMUM RESIDENT VOLUME: 15.735m^2
TOTAL VOLUME AVAILABLE: 17.70m^2

HYDROBRAKE FLOW CONTROL
EXACT LOCATION AND DESIGN TO BE CONFIRMED

LIMITING RUNOFF TO 1l/s FOR ALL STORM EVENTS UP TO AND INCLUDING 100YEAR+45%CC

CL: 42.200
IL: 40.600
MODELLED MAX FLOW: 1.0l/s

UNIT REFERENCE: CHE-0045-1000-1000-1000

PROPOSED OUTFALL TO EXISTING THAMES WATER SURFACE WATER MANHOLE
C.L: 42.13
I.L: 40.50

PROPOSED OUTFALL SUBJECT TO APPROVAL FROM THAMES WATER

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT REPORTS, PLANS AND ARCHITECTURAL DRAWINGS
2. THIS DRAWING SHOULD NOT BE SCALED. THERE SHOULD BE NO RELIANCE ON THIS DRAWING WITH REGARDS TO DIMENSIONS. ALL DIMENSIONS SHOULD BE CONFIRMED ON SITE.
3. ANY DISCREPANCY ON THIS DRAWING SHOULD BE REPORTED TO AEGAEA IMMEDIATELY FOR CLARIFICATION.
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5. AEGAEA HAVE PRODUCED THIS DRAWING BASED ON THE DRAWINGS AND INFORMATION PROVIDED BY THE CLIENT AVAILABLE AT THE TIME OF PRODUCTION. WE CANNOT ACCEPT RESPONSIBILITY FOR DISCREPANCIES RESULTING FROM NEW PLANS/ INFORMATION BEING ISSUED POST-ISSUE OF THIS DRAWING. THE CONTRACTOR SHOULD REVIEW THIS DRAWING IN LIGHT OF WIDER SITE INFORMATION SUCH AS CONTAMINATION, UTILITIES SURVEYS AND SITE INVESTIGATIONS
6. IT IS THE RESPONSIBILITY OF THE PRINCIPLE CONTRACTOR TO MAKE THE DESIGNER AND CLIENT AWARE OF SITE-SPECIFIC RISKS AND HAZARDS THAT MAY AFFECT THE DRAWING AND SPECIFICATION

LEGEND

- EXISTING FOUL SEWER
- EXISTING SURFACE WATER SEWER
- PROPOSED SURFACE WATER DRAIN
- HYDROBRAKE MANHOLE
- EXISTING THAMES WATER SURFACE WATER MANHOLE
- RWP — RAINWATER PIPE
- RAINWATER PLANTER
- PROPOSED GEOCELLULAR STORAGE TANK
- PROPOSED TYPE C PERMEABLE PAVING

CLIENT: REFLECT GROUP LTD

SITE: 141 LONG LANE, HILLINGDON, LONDON, UB10 9JN

DRAWING: SURFACE WATER DRAINAGE LAYOUT

DRAWING NUMBER: DR001

DATE: 27/07/2023 | **REV: A**

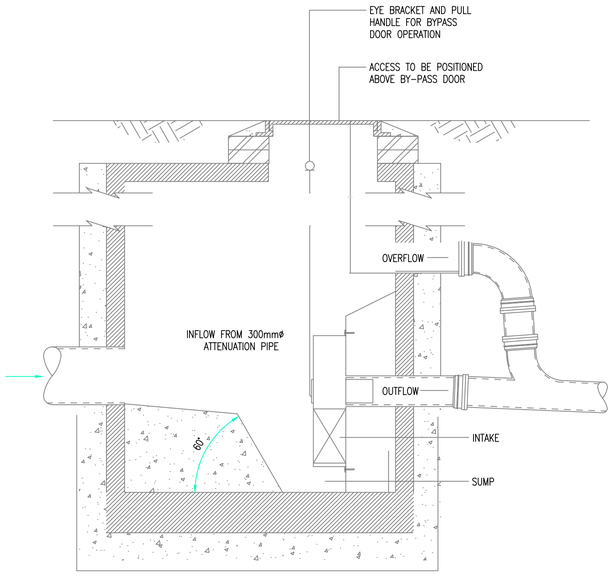
DRAWN BY: JA

DRAWING SCALE: NTS

PRELIMINARY DRAWING FOR PLANNING ONLY - NOT FOR CONSTRUCTION

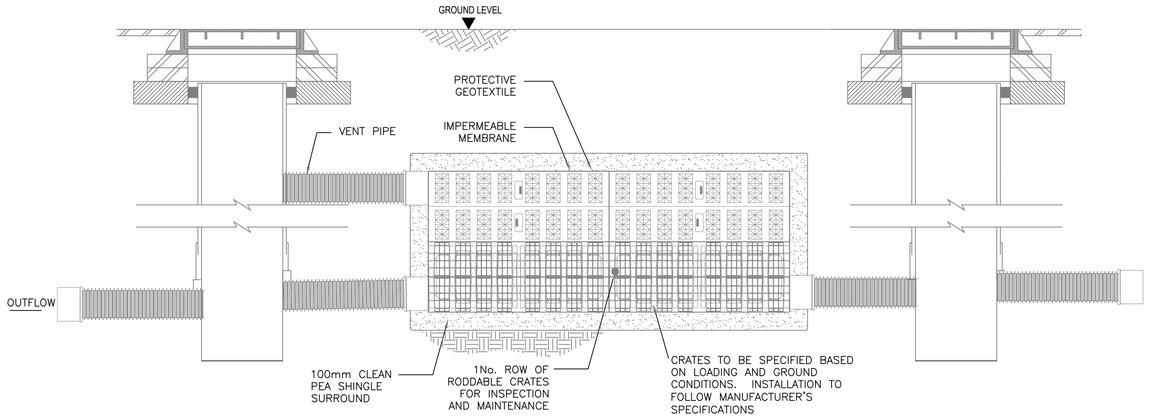
aegaea
Flood risk, water and environment

Appendix D – Construction Details



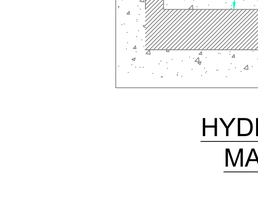
HYDROBRAKE MANHOLE.

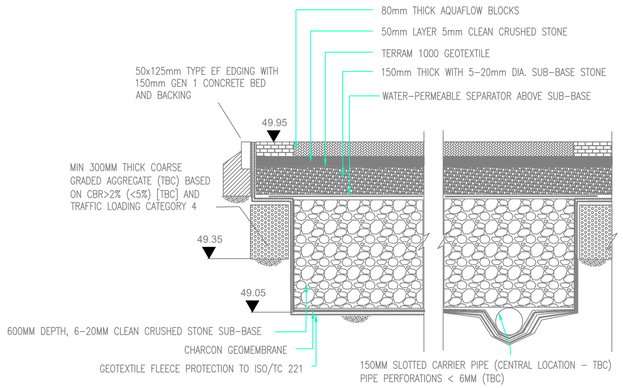
(1:20)



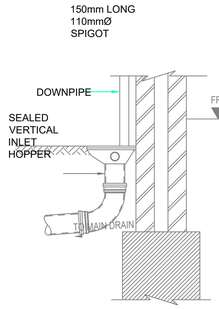
TYPICAL ATTENTUATION TANK DETAILS (ONLINE)

(1:20)



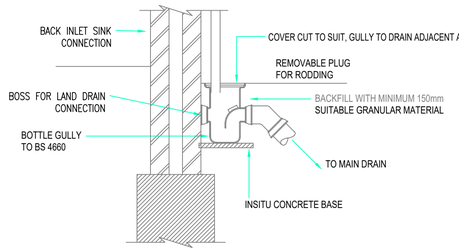


PROPOSED PERMEABLE PAVEMENT WITH SUB-BASE STORAGE



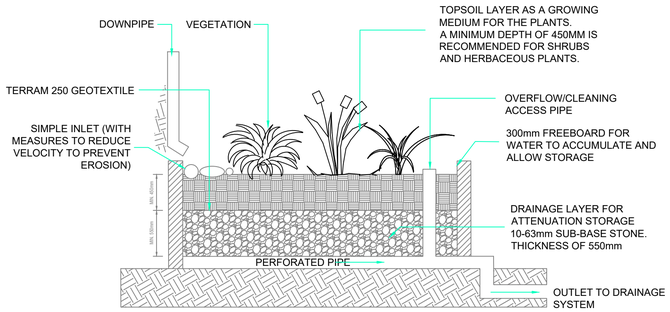
RWP CONNECTION.

(1:20)



TRAPPED RWP CONNECTION.

(1:20)



RAISED PLANTER (1:20)

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT REPORTS, PLANS AND ARCHITECTURAL DRAWINGS
2. THIS DRAWING SHOULD NOT BE SCALED. THERE SHOULD BE NO RELIANCE ON THIS DRAWING WITH REGARDS TO DIMENSIONS. ALL DIMENSIONS SHOULD BE CONFIRMED ON SITE.
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6. IT IS THE RESPONSIBILITY OF THE PRINCIPLE CONTRACTOR TO MAKE THE DESIGNER AND CLIENT AWARE OF SITE-SPECIFIC RISKS AND HAZARDS THAT MAY AFFECT THE DRAWING AND SPECIFICATION

CLIENT: REFLECT GROUP LTD

SITE: 141 LONG LANE, HILLINGDON, LONDON, UB10 9JN

DRAWING: SURFACE WATER DRAINAGE - CONSTRUCTION DETAILS

DRAWING NUMBER: DR002

DATE: 27/07/2023 | **REV: A**

DRAWN BY: JA

DRAWING SCALE: NTS

PRELIMINARY DRAWING FOR PLANNING ONLY - NOT FOR CONSTRUCTION

aegaea
Flood risk, water and environment

Appendix E – InfoDrainage Calculations

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Inflows Storm Phase: Phase	Company Address:		

Site Access

Type : Catchment Area

Area (ha)	0.01

Preliminary Sizing

Volumetric Runoff Coefficient	0.900
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.900
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Driveway

Type : Catchment Area

Area (ha)	0.01

Preliminary Sizing

Volumetric Runoff Coefficient	0.900
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.900
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Dwelling Roof (north)

Type : Catchment Area

Area (ha)	0.008

Preliminary Sizing

Volumetric Runoff Coefficient	0.900
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.900
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Inflows Storm Phase: Phase	Company Address:		

Dwelling Roof (south)

Type : Catchment Area

Area (ha)	0.008

Preliminary Sizing

Volumetric Runoff Coefficient	0.900
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.900
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Surrounding Paving

Type : Catchment Area

Area (ha)	0.006

Preliminary Sizing

Volumetric Runoff Coefficient	0.900
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.900
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address:		

Site Access PP

Type : Porous Paving

Dimensions

Exceedance Level (m)	42.300
Depth (m)	0.300
Base Level (m)	42.000
Paving Layer Depth (mm)	5
Membrane Percolation (m/hr)	3.0
Porosity (%)	30
Length (m)	14.400
Long. Slope (1:X)	1000.00
Width (m)	7.000
Total Volume (m^3)	8.921

Inlets

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Site Access
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (3)
Outlet Type	Free Discharge

Advanced

Conductivity (m/hr)	600.0

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address:		

Driveway PP

Type : Porous Paving

Dimensions

Exceedance Level (m)	42.400
Depth (m)	0.200
Base Level (m)	42.200
Paving Layer Depth (mm)	5
Membrane Percolation (m/hr)	3.0
Porosity (%)	30
Length (m)	14.400
Long. Slope (1:X)	1000.00
Width (m)	7.000
Total Volume (m^3)	5.897

Inlets

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Driveway
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (1)
Outlet Type	Free Discharge

Advanced

Conductivity (m/hr)	500.0

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address:		

Surrounding PP

Type : Porous Paving

Dimensions

Exceedance Level (m)	42.400
Depth (m)	0.150
Base Level (m)	42.250
Paving Layer Depth (mm)	5
Membrane Percolation (m/hr)	3.0
Porosity (%)	30
Length (m)	6.000
Long. Slope (1:X)	1000.00
Width (m)	12.000
Total Volume (m^3)	3.132

Inlets

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Surrounding Paving
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe
Outlet Type	Free Discharge

Advanced

Conductivity (m/hr)	500.0

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address:		

Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	42.400
Depth (m)	1.000
Base Level (m)	40.800
Number of Crates Long	1
Number of Crates Wide	1
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	4.5
Crate Width (m)	4
Crate Height (m)	1
Total Volume (m³)	17.700

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Dwelling Roof (south) Dwelling Roof (north) Pipe
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	114.
Outlet Type	Free Discharge

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address:		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Driveway	Driveway PP		Time of Concentration	0.010	100	10	110	0.010
Dwelling Roof (north)	Cellular Storage		Time of Concentration	0.008	100	10	110	0.009
Dwelling Roof (south)	Cellular Storage		Time of Concentration	0.008	100	10	110	0.009
Site Access	Site Access PP		Time of Concentration	0.010	100	10	110	0.011
Surrounding Paving	Surrounding PP		Time of Concentration	0.006	100	10	110	0.007
TOTAL		**0.0**		**0.042**				**0.047**

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address:		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	10
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Title: UK and Ireland Rural Runoff Calculator	Company Address:		

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.042
SAAR (mm)	637.0
Soil	0.3
Region	Region 6
Urban	0
Return Period (years)	0

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	0.1	0.1	0.1	0.2	0.2

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address:		

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 (m^3)
Site Access	FSR: 1 years: +0 %: 15 mins: Summer	0.01	1.8	0.777
Driveway	FSR: 1 years: +0 %: 15 mins: Summer	0.01	1.7	0.723
Dwelling Roof (north)	FSR: 1 years: +0 %: 15 mins: Summer	0.01	1.5	0.634
Dwelling Roof (south)	FSR: 1 years: +0 %: 15 mins: Summer	0.01	1.5	0.634
Surrounding Paving	FSR: 1 years: +0 %: 15 mins: Summer	0.01	1.0	0.458

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address:		

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 (m^3)
Site Access	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.4	1.916
Driveway	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.1	1.785
Dwelling Roof (north)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.6	1.555
Dwelling Roof (south)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.6	1.555
Surrounding Paving	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.6	1.125

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address:		

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 (m^3)
Site Access	FSR: 100 years: +0 %: 15 mins: Summer	0.01	5.7	2.486
Driveway	FSR: 100 years: +0 %: 15 mins: Summer	0.01	5.3	2.316
Dwelling Roof (north)	FSR: 100 years: +0 %: 15 mins: Summer	0.01	4.6	2.023
Dwelling Roof (south)	FSR: 100 years: +0 %: 15 mins: Summer	0.01	4.6	2.023
Surrounding Paving	FSR: 100 years: +0 %: 15 mins: Summer	0.01	3.4	1.461

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address:		

FSR: 30 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 (m^3)
Site Access	FSR: 30 years: +40 %: 15 mins: Summer	0.01	6.2	2.684
Driveway	FSR: 30 years: +40 %: 15 mins: Summer	0.01	5.7	2.502
Dwelling Roof (north)	FSR: 30 years: +40 %: 15 mins: Summer	0.01	5.0	2.179
Dwelling Roof (south)	FSR: 30 years: +40 %: 15 mins: Summer	0.01	5.0	2.182
Surrounding Paving	FSR: 30 years: +40 %: 15 mins: Summer	0.01	3.6	1.578

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address:		

FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m^3)
Site Access	FSR: 100 years: +45 %: 15 mins: Summer	0.01	8.3	3.607
Driveway	FSR: 100 years: +45 %: 15 mins: Summer	0.01	7.7	3.365
Dwelling Roof (north)	FSR: 100 years: +45 %: 15 mins: Summer	0.01	6.7	2.934
Dwelling Roof (south)	FSR: 100 years: +45 %: 15 mins: Summer	0.01	6.7	2.937
Surrounding Paving	FSR: 100 years: +45 %: 15 mins: Summer	0.01	4.9	2.120

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

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

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
MH1	FSR: 1 years: +0 %: 60 mins: Summer	42.200	40.600	40.881	0.281	1.3	0.045	0.000	0.7	2.922	Surcharged
Thames Water Surface Water Manhole	FSR: 1 years: +0 %: 480 mins: Summer	42.130	40.500	40.519	0.019	0.7	0.000	0.000	0.7	8.841	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

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

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
MH1	FSR: 30 years: +0 %: 120 mins: Winter	42.200	40.600	41.134	0.534	0.9	0.085	0.000	0.7	8.551	Surcharged
Thames Water Surface Water Manhole	FSR: 30 years: +0 %: 120 mins: Winter	42.130	40.500	40.520	0.020	0.7	0.000	0.000	0.7	8.529	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

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

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
MH1	FSR: 100 years: +0 %: 240 mins: Winter	42.200	40.600	41.325	0.725	0.9	0.115	0.000	0.8	18.827	Surcharged
Thames Water Surface Water Manhole	FSR: 100 years: +0 %: 240 mins: Winter	42.130	40.500	40.521	0.021	0.8	0.000	0.000	0.8	18.806	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

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
MH1	FSR: 30 years: +40 %: 240 mins: Winter	42.200	40.600	41.387	0.787	1.0	0.125	0.000	0.9	19.680	Surcharged
Thames Water Surface Water Manhole	FSR: 30 years: +40 %: 240 mins: Summer	42.130	40.500	40.521	0.021	0.9	0.000	0.000	0.9	19.671	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Depth

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
MH1	FSR: 100 years: +45 %: 240 mins: Winter	42.200	40.600	41.719	1.119	1.2	0.178	0.000	1.0	24.148	Surcharged
Thames Water Surface Water Manhole	FSR: 100 years: +45 %: 240 mins: Winter	42.130	40.500	40.523	0.023	1.0	0.000	0.000	1.0	23.713	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

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

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. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Site Access PP	FSR: 1 years: +0 %: 480 mins: Summer	42.104	42.005	0.089	0.005	0.4	1.639	0.000	0.000	0.2	3.669	81.631	OK
Driveway PP	FSR: 1 years: +0 %: 480 mins: Summer	42.265	42.209	0.051	0.009	0.3	1.045	0.000	0.000	0.1	1.870	82.280	OK
Cellular Storage	FSR: 1 years: +0 %: 60 mins: Summer	40.883	40.883	0.083	0.083	2.0	1.418	0.000	0.000	1.1	2.450	91.992	OK
Surrounding PP	FSR: 1 years: +0 %: 240 mins: Summer	42.288	42.256	0.032	0.006	0.3	0.403	0.000	0.000	0.2	1.059	87.127	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

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

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. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Site Access PP	FSR: 30 years: +0 %: 240 mins: Summer	42.185	42.010	0.171	0.010	1.6	3.113	0.000	0.000	0.6	6.516	65.101	OK
Driveway PP	FSR: 30 years: +0 %: 240 mins: Summer	42.314	42.217	0.100	0.017	1.1	2.022	0.000	0.000	0.4	3.327	65.704	OK
Cellular Storage	FSR: 30 years: +0 %: 120 mins: Winter	41.134	41.134	0.334	0.334	2.5	5.716	0.000	0.000	0.8	4.812	67.709	OK
Surrounding PP	FSR: 30 years: +0 %: 120 mins: Summer	42.320	42.261	0.064	0.011	1.0	0.791	0.000	0.000	0.6	1.975	74.753	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

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

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. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Site Access PP	FSR: 100 years: +0 %: 240 mins: Summer	42.223	42.012	0.208	0.012	2.1	3.811	0.000	0.000	0.8	8.919	57.282	OK
Driveway PP	FSR: 100 years: +0 %: 240 mins: Summer	42.339	42.223	0.125	0.023	1.4	2.588	0.000	0.000	0.6	4.501	56.108	OK
Cellular Storage	FSR: 100 years: +0 %: 240 mins: Winter	41.326	41.326	0.526	0.526	2.1	8.989	0.000	0.000	0.7	10.332	49.213	OK
Surrounding PP	FSR: 100 years: +0 %: 120 mins: Summer	42.335	42.263	0.079	0.013	1.4	0.980	0.000	0.000	0.9	2.650	68.708	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Resident Volume

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. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Site Access PP	FSR: 30 years: +40 %: 240 mins: Summer	42.231	42.013	0.217	0.013	2.2	3.974	0.000	0.000	0.9	9.697	55.448	OK
Driveway PP	FSR: 30 years: +40 %: 240 mins: Summer	42.347	42.232	0.133	0.032	1.5	2.826	0.000	0.000	0.6	4.877	52.084	OK
Cellular Storage	FSR: 30 years: +40 %: 240 mins: Winter	41.387	41.387	0.587	0.587	2.2	10.043	0.000	0.000	0.8	10.466	43.259	OK
Surrounding PP	FSR: 30 years: +40 %: 120 mins: Summer	42.339	42.264	0.083	0.014	1.5	1.029	0.000	0.000	0.9	2.839	67.155	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Resident Volume

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. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Site Access PP	FSR: 100 years: +45 %: 240 mins: Summer	42.275	42.016	0.260	0.016	3.0	4.780	0.000	0.000	1.4	13.675	46.421	OK
Driveway PP	FSR: 100 years: +45 %: 240 mins: Summer	42.388	42.276	0.173	0.076	2.0	4.048	0.000	0.000	0.8	6.820	31.352	OK
Cellular Storage	FSR: 100 years: +45 %: 240 mins: Winter	41.720	41.720	0.920	0.920	3.2	15.735	0.000	0.000	0.7	11.275	11.103	OK
Surrounding PP	FSR: 100 years: +45 %: 60 mins: Summer	42.361	42.269	0.105	0.019	2.8	1.314	0.000	0.000	1.7	3.032	58.057	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		

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
114.	FSR: 1 years: +0 %: 15 mins: Summer	Pipe	Cellular Storage	MH1	42.400	40.858	0.100	0.712	0.3	0.21	1.2	OK
Pipe (3)	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	Site Access PP	MH1	42.314	42.032	0.100	0.393	0.2	0.02	0.4	OK
Pipe	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	Surrounding PP	Cellular Storage	42.406	42.265	0.040	0.343	0.2	0.02	0.3	OK
1.002	FSR: 1 years: +0 %: 480 mins: Summer	Pipe	MH1	Thames Water Surface Water Manhole	42.200	40.837	0.019	8.841	0.6	0.08	0.7	Surcharged
Pipe (1)	FSR: 1 years: +0 %: 30 mins: Summer	Pipe	Driveway PP	Site Access PP	42.414	42.223	0.031	0.323	0.2	0.04	0.3	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		

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
114.	FSR: 30 years: +0 %: 60 mins: Winter	Pipe	Cellular Storage	MH1	42.400	41.101	0.100	2.322	0.2	0.16	0.9	Surcharged
Pipe (3)	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	Site Access PP	MH1	42.314	42.059	0.100	0.716	0.3	0.05	1.2	OK
Pipe	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	Surrounding PP	Cellular Storage	42.406	42.279	0.100	0.622	0.3	0.05	1.0	OK
1.002	FSR: 30 years: +0 %: 120 mins: Winter	Pipe	MH1	Thames Water Surface Water Manhole	42.200	41.134	0.020	8.529	0.7	0.08	0.7	Surcharged
Pipe (1)	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	Driveway PP	Site Access PP	42.414	42.253	0.073	0.940	0.3	0.13	0.9	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		

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
114.	FSR: 100 years: +0 %: 60 mins: Winter	Pipe	Cellular Storage	MH1	42.400	41.236	0.100	1.909	0.2	0.2	1.1	Surcharged
Pipe (3)	FSR: 100 years: +0 %: 15 mins: Summer	Pipe	Site Access PP	MH1	42.314	42.076	0.100	0.978	0.3	0.07	1.6	OK
Pipe	FSR: 100 years: +0 %: 15 mins: Summer	Pipe	Surrounding PP	Cellular Storage	42.406	42.286	0.100	0.843	0.3	0.07	1.4	OK
1.002	FSR: 100 years: +0 %: 240 mins: Winter	Pipe	MH1	Thames Water Surface Water Manhole	42.200	41.325	0.022	18.806	0.7	0.1	0.8	Surcharged
Pipe (1)	FSR: 100 years: +0 %: 30 mins: Summer	Pipe	Driveway PP	Site Access PP	42.414	42.268	0.094	1.303	0.3	0.18	1.2	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		

FSR: 30 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
114.	FSR: 30 years: +40 %: 30 mins: Winter	Pipe	Cellular Storage	MH1	42.400	41.180	0.100	0.879	0.3	0.21	1.2	Surcharged
Pipe (3)	FSR: 30 years: +40 %: 15 mins: Summer	Pipe	Site Access PP	MH1	42.314	42.082	0.100	1.073	0.3	0.08	1.8	OK
Pipe	FSR: 30 years: +40 %: 15 mins: Summer	Pipe	Surrounding PP	Cellular Storage	42.406	42.288	0.100	0.923	0.3	0.07	1.5	OK
1.002	FSR: 30 years: +40 %: 240 mins: Summer	Pipe	MH1	Thames Water Surface Water Manhole	42.200	41.382	0.022	19.671	0.7	0.1	0.9	Surcharged
Pipe (1)	FSR: 30 years: +40 %: 30 mins: Summer	Pipe	Driveway PP	Site Access PP	42.414	42.272	0.100	1.413	0.3	0.19	1.3	OK

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		

FSR: 100 years: Increase Rainfall (%): +45: 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
114.	FSR: 100 years: +45 %: 30 mins: Winter	Pipe	Cellular Storage	MH1	42.400	41.352	0.100	0.389	0.3	0.32	1.8	Surcharged
Pipe (3)	FSR: 100 years: +45 %: 15 mins: Summer	Pipe	Site Access PP	MH1	42.314	42.111	0.100	1.554	0.3	0.11	2.5	Surcharged
Pipe	FSR: 100 years: +45 %: 15 mins: Summer	Pipe	Surrounding PP	Cellular Storage	42.406	42.300	0.100	1.302	0.3	0.1	2.1	OK
1.002	FSR: 100 years: +45 %: 240 mins: Winter	Pipe	MH1	Thames Water Surface Water Manhole	42.200	41.719	0.024	23.713	0.7	0.12	1.0	Surcharged
Pipe (1)	FSR: 100 years: +45 %: 30 mins: Summer	Pipe	Driveway PP	Site Access PP	42.414	42.301	0.100	1.974	0.3	0.26	1.7	Surcharged

Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Phase Management Storm Phase: Phase	Company Address:		

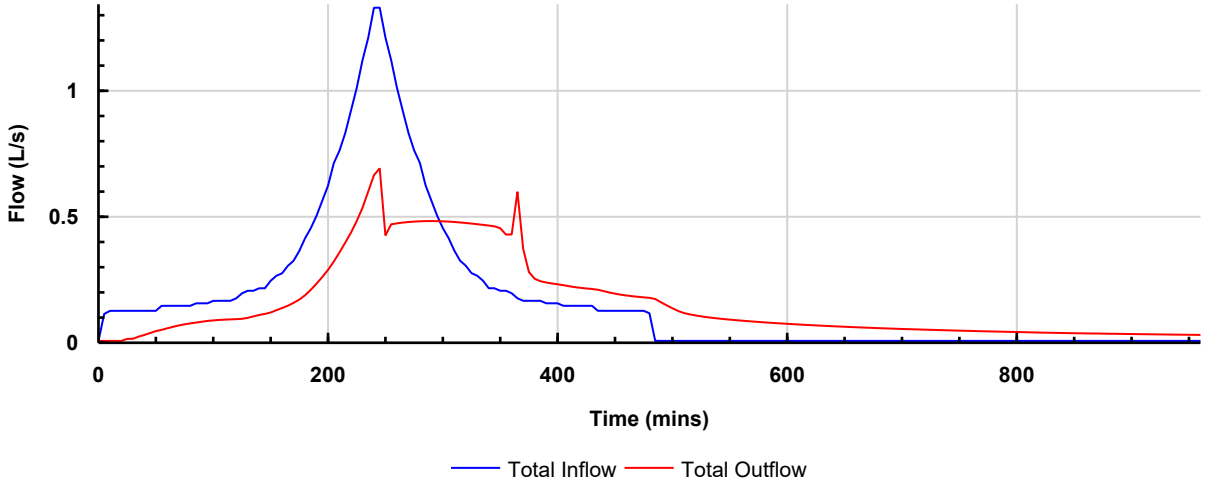
Phase
FSR: 1 years: Increase Rainfall (%): +0: 480 mins: Summer

Tables

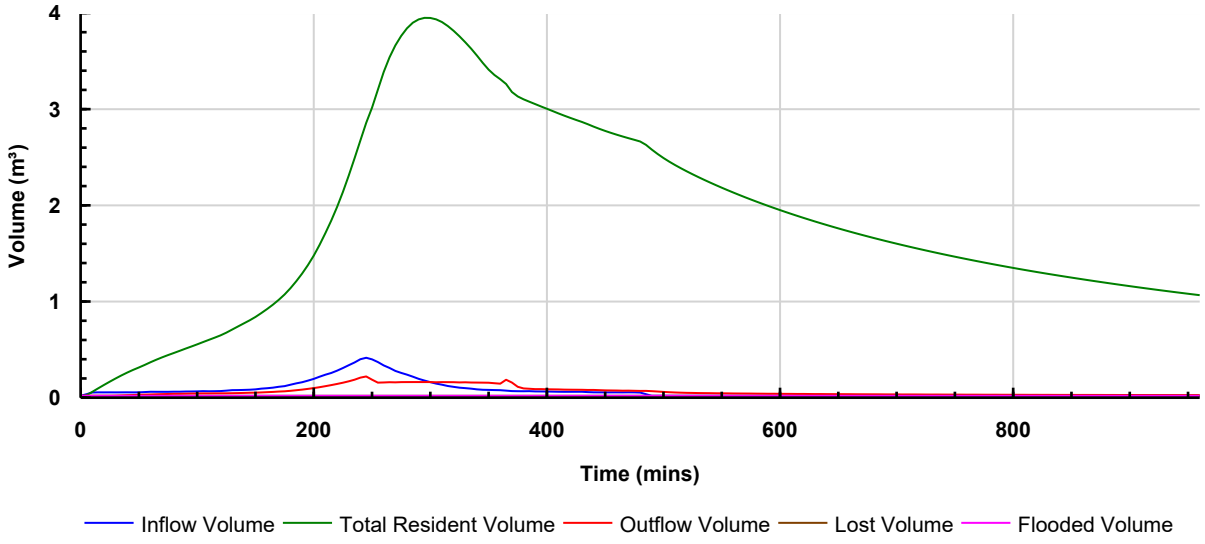
Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Thames Water Surface Water Manhole			0.7	8.841
TOTAL	1.3	9.887	0.7	8.841

Graphs

Flow Graph



Volume Graph



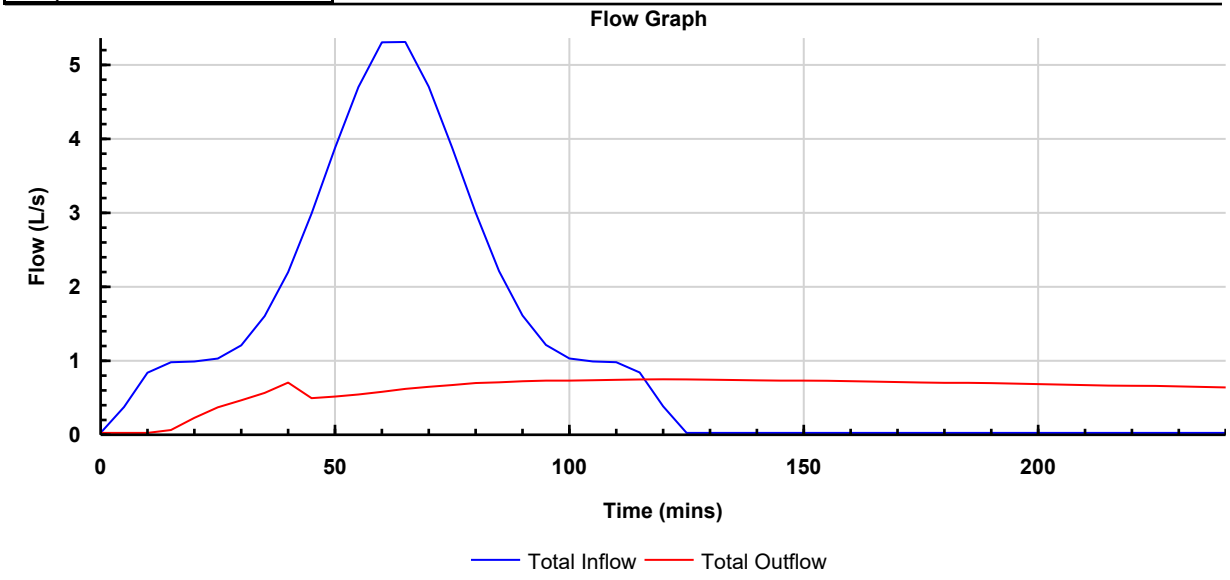
Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Phase Management Storm Phase: Phase	Company Address:		

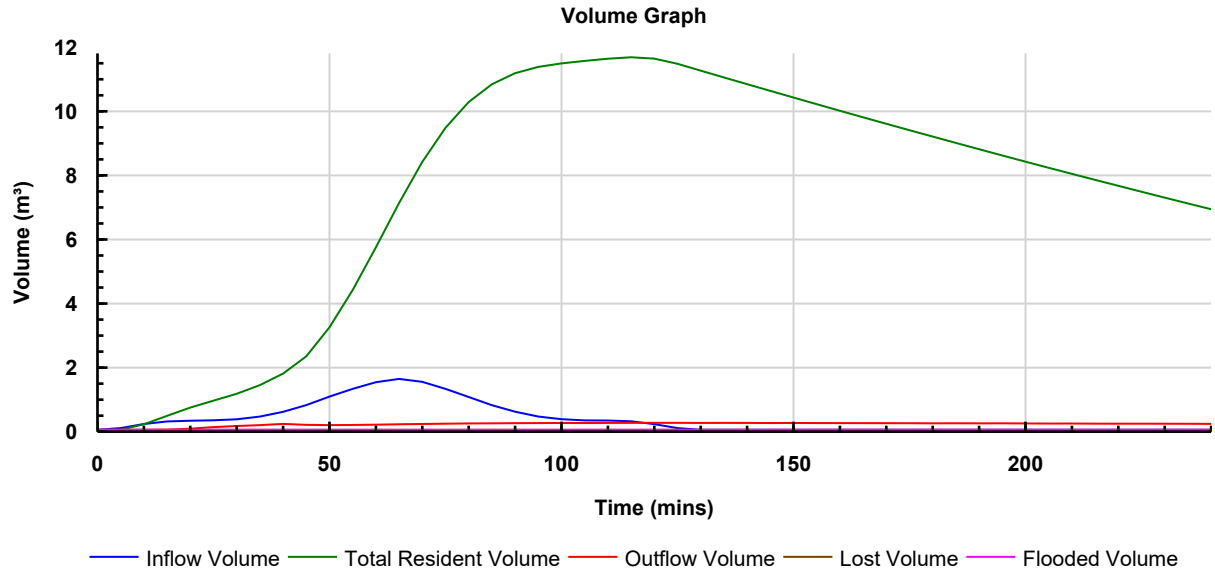
Phase
FSR: 30 years: Increase Rainfall (%): +0: 120 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Thames Water Surface Water Manhole			0.7	8.529
TOTAL	5.3	15.571	0.7	8.529

Graphs





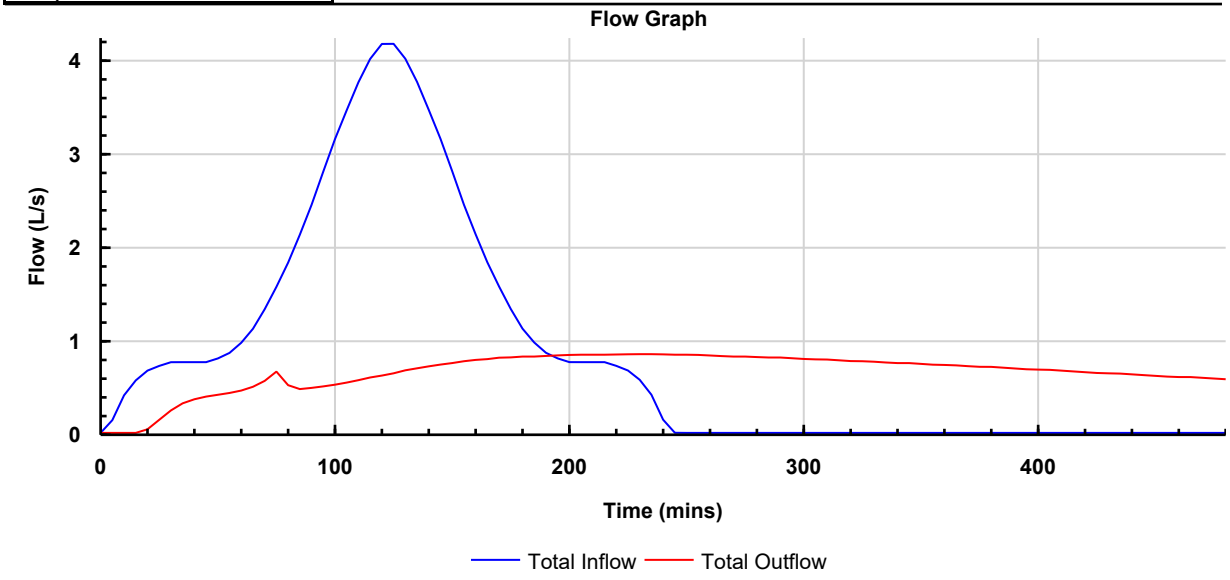
Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Phase Management Storm Phase: Phase	Company Address:		

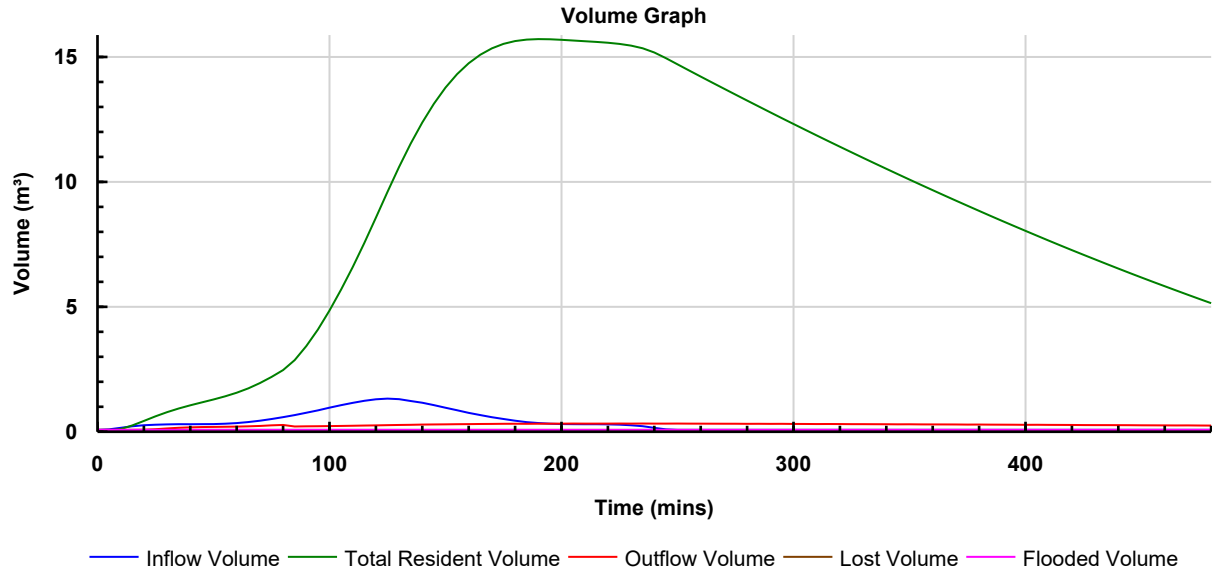
Phase
FSR: 100 years: Increase Rainfall (%): +0: 240 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Thames Water Surface Water Manhole			0.8	18.806
TOTAL	4.2	24.008	0.8	18.806

Graphs





Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Phase Management Storm Phase: Phase	Company Address:		

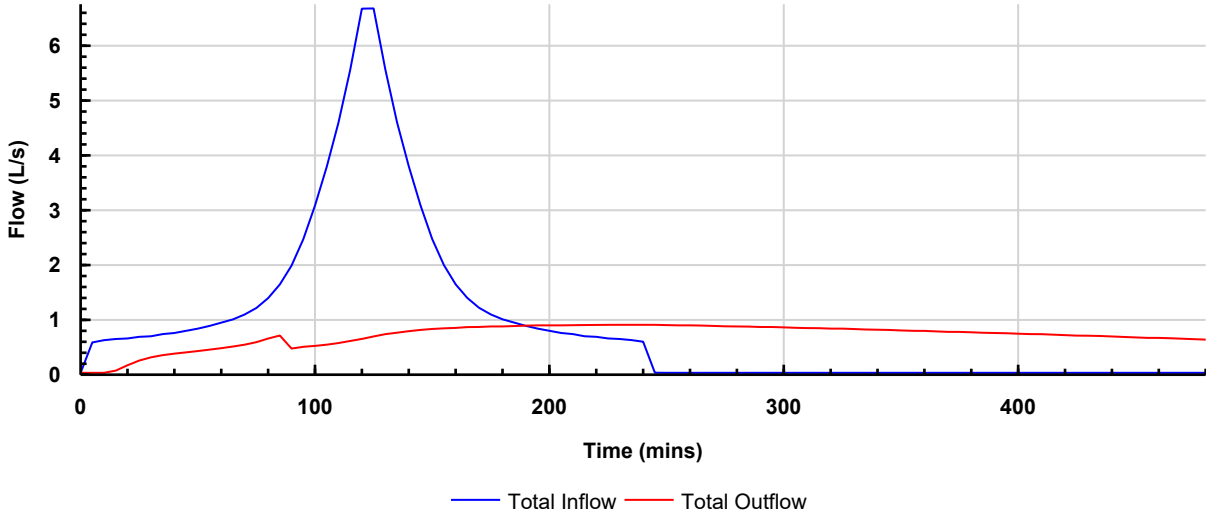
Phase
FSR: 30 years: Increase Rainfall (%): +40: 240 mins: Summer

Tables

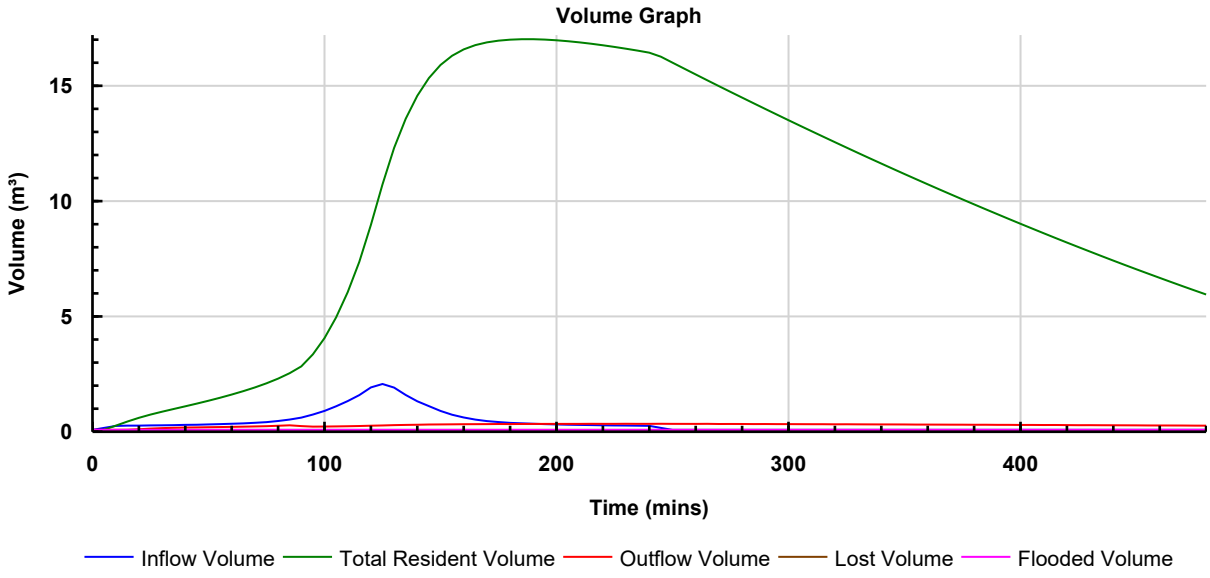
Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Thames Water Surface Water Manhole			0.9	19.671
TOTAL	6.7	25.724	0.9	19.671

Graphs

Flow Graph



Volume Graph



Project:	Date: 26/07/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Phase Management Storm Phase: Phase	Company Address:		

Phase
FSR: 100 years: Increase Rainfall (%): +45: 240 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Thames Water Surface Water Manhole			1.0	23.713
TOTAL	6.1	34.812	1.0	23.713

Graphs