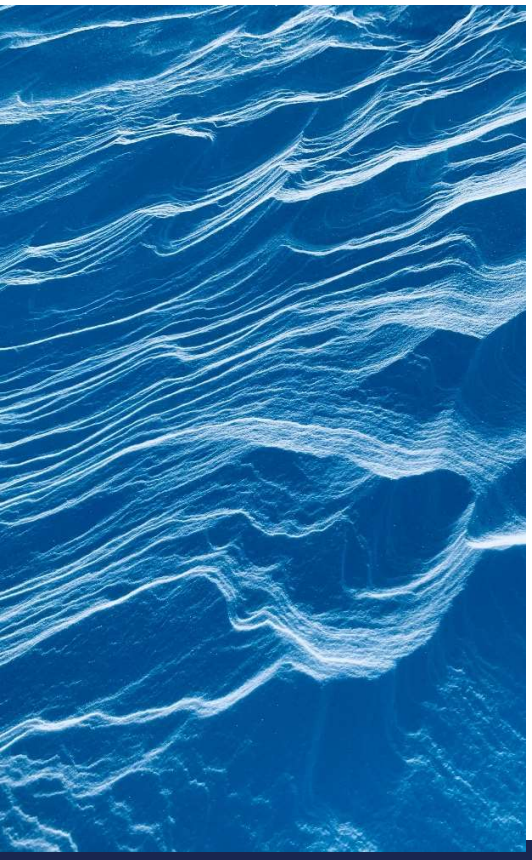


Surface and Foul Water Drainage Strategy

AEG02558_NW6_Camden_06

Site Address: 54 Maygrove Road
Camden
NW6 2ED

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: Build Generation Ltd

Reference: AEG02558_NW6_Camden_06

Site Location: Eaglehurst, Hurst Lane, Egham, TW20 8QJ

Consultant		Date	Signature
Author	Jack Allen	01/06/2023	
Document Check	Oliver Harvey	01/06/2023	
Authorisation	Daniel Cook	02/06/2023	

Please Note:

aegaea

Flood risk, water and environment

Table of Contents

aegaea

Flood risk, water and environment

1. Introduction

1.1. Aegaea were commissioned by Build Generations Ltd to undertake a Surface Water Drainage Strategy (SWDS) to accompany an application to discharge Condition 4 of Camden Borough Council's planning consultation response (dated 21 February 2023).

Site Overview

1.2. The site of the proposed development is 54 Maygrove Road, Camden, NW6 2ED (Figure 1). The site currently comprises of an existing dwelling.

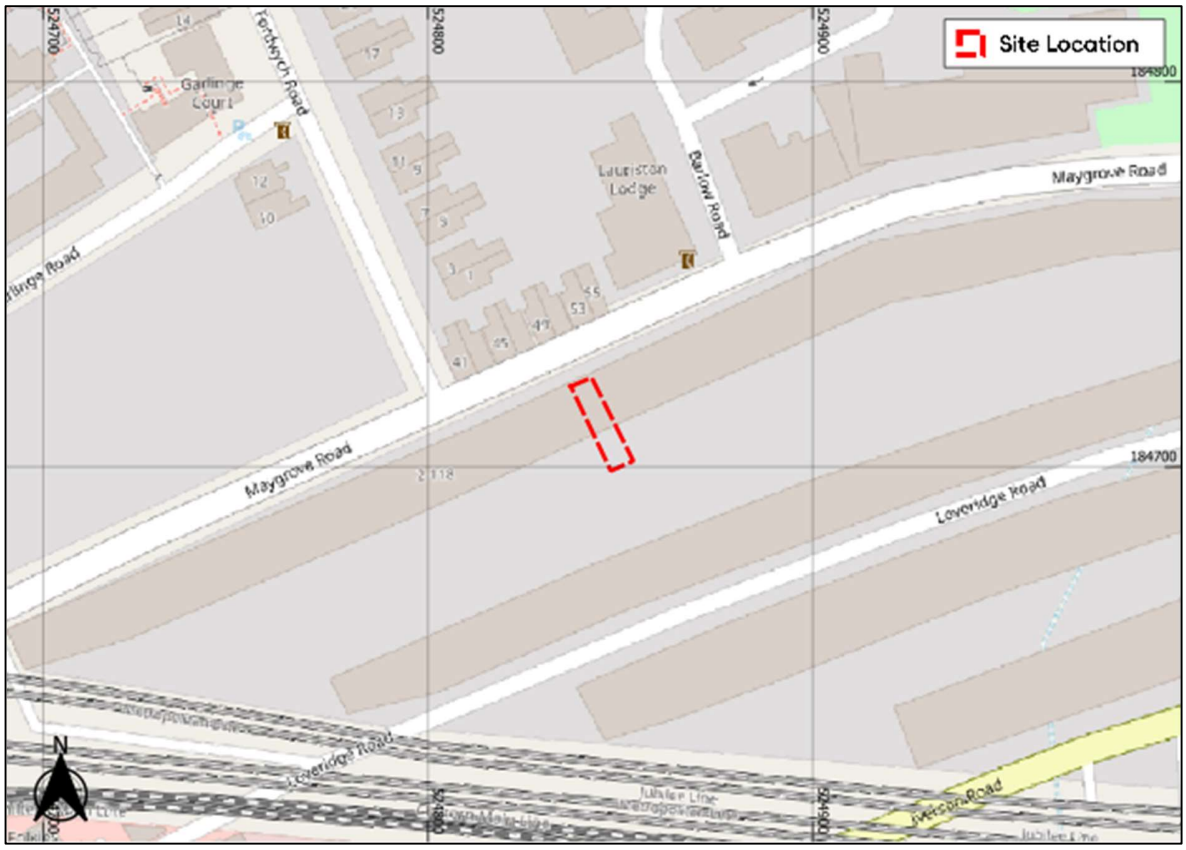


Figure 1: Site Location Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © https://www.openstreetmap.org and contributors)

1.3. The proposed development is for the is for the erection of a single storey lower ground floor rear extension (and replacement of lower ground floor window with doors).

1.4. Environment Agency Light Detection and Ranging (LiDAR) data Digital Terrain Model (1m resolution) has been utilised to visualise the topography of the site and surrounding area.

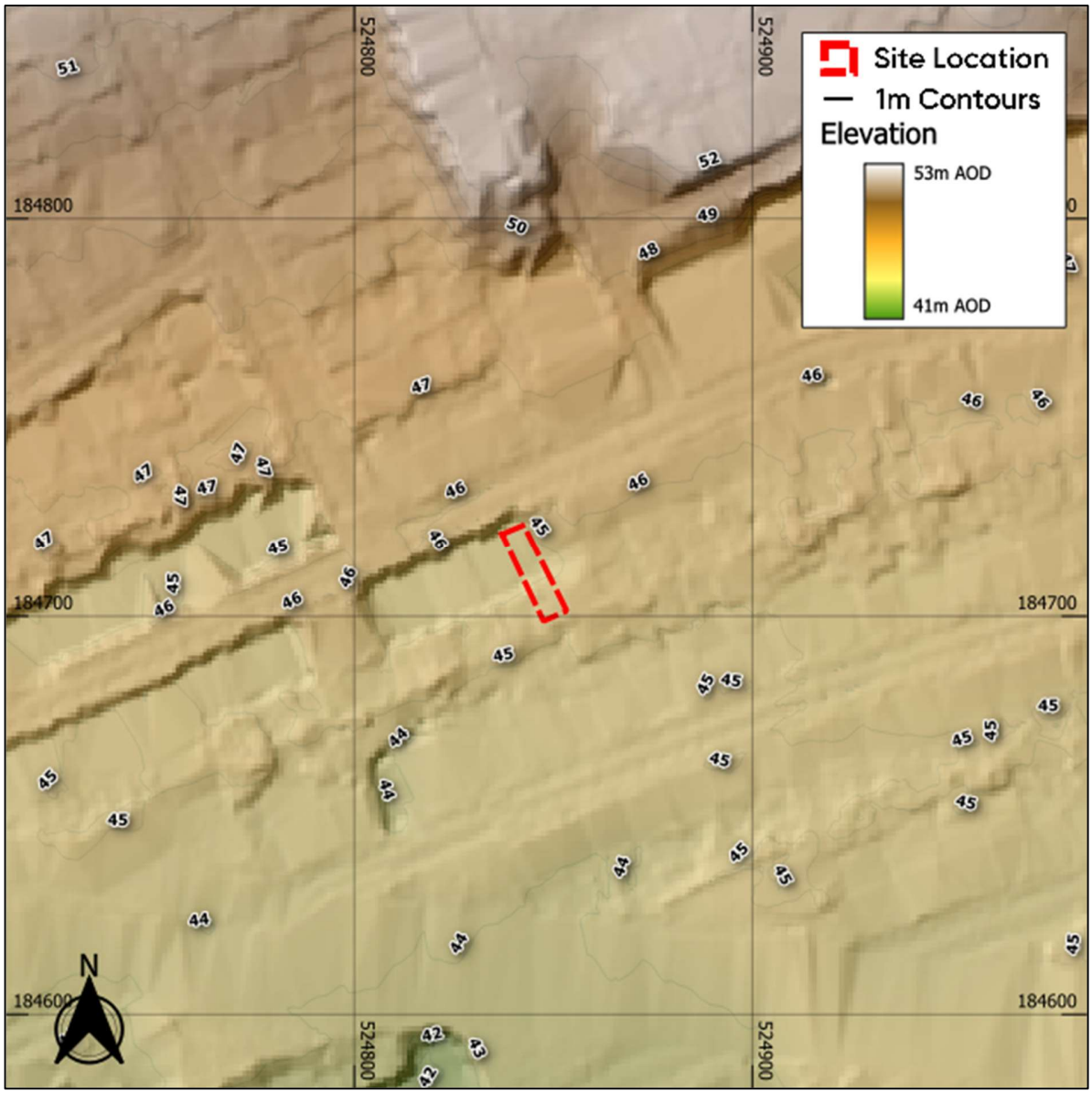


Figure 2: Site Topography (Sources: EA 1m LiDAR, Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © https://www.openstreetmap.org and contributors)

1.5. Figure 2 shows that the site, elevations fall from approximately m Above Ordnance Survey Datum (mAOD) in the west to approximately 44.42m AOD in the east.

1.6. Camden Borough Council is the Lead Local Flood Authority (LLFA). The site sits within the Environment Agency's London Management Catchment region.

Planning Requirements

1.7. Full planning permission has been granted for the proposed development, based on the below Planning Condition 4, relating to surface water drainage.

> *Prior to commencement of the development, full details of the sustainable drainage system and proposed SuDs measures shall be submitted to and approved in writing by the local planning authority. The details shall include an assessment on the ground conditions for a soakaway and if not a suitable alterative should be proposed. An up to date drainage statement and a lifetime maintenance plan and supporting evidence should be provided including:*
>
> *- The proposed SuDS or drainage measures including storage capacities;*
>
> *- The proposed surface water discharge rates or volumes.*
>
> *The systems shall thereafter be retained and maintained in accordance with the approved details.*
>
> *Reason: To reduce the rate of surface water run-off from the buildings and limit the impact on the storm-water drainage system in accordance with policies CC2 and CC3 of the London Borough of Camden Local Plan 2017.*

2. Surface Water Drainage Strategy

Surrounding Water Environment & Existing Drainage

Infiltration Potential

2.1. The British Geological Survey's (BGS) mapping shows that the site is underlain by London Clay Formation comprising clay, silt and sand.

2.2. BGS mapping also shows that there are no superficial deposits at the site.

2.3. Borehole records near the site (BGS Reference: TQ28SW899) confirm that the geology in the vicinity of the site comprises a mixture of clay, sand and gravel.

2.4. Due to the space restrictions at the site, it would not be feasible to provide drainage in a soakaway and comply with Building Regulation Part H, in providing a 5m buffer from a soakaway to any buildings.

2.5. It is assumed that geology comprising clay will not feasibly allow the proposed development to discharge surface water via infiltration.

Watercourses

2.6. The nearest watercourse to the site is the Grand Union Canal approximately 2.4km to the south of the proposed development.

2.7. As such, a watercourse this distance would not be a feasible method of surface water drainage for the development.

Sewers

2.8. Thames Water asset plans have been provided and are included in this report as Appendix A.

2.9. Based off Thames Water asset plans (Figure 3), it is assumed that the existing site discharges to the public surface water sewer beneath Maygrove Road. The sewer flows from east to west and discharges into a combined sewer at the junction between Maygrove Road and Fordwych Road, approximately 40m to the west of the site.

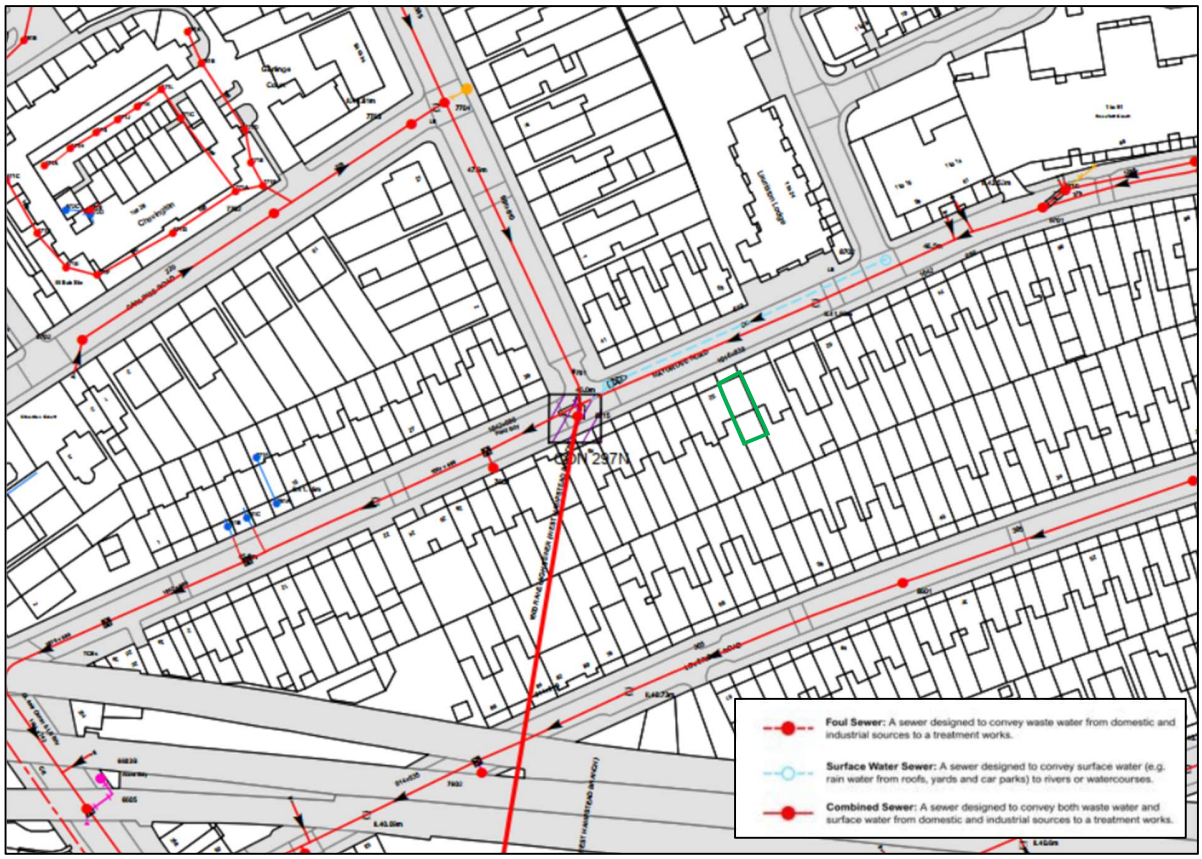


Figure 3 Thames Water Asset Plan (Site Location in Green)

2.10. The proposed drainage strategy is to drain the extension and the rear of the existing dwelling into the surface water sewer beneath Maygrove Road as close to greenfield rates as possible to provide a betterment to the existing scenario, where surface water from the dwelling likely drains unrestricted.

2.11. The connection should be confirmed with Thames Water prior to construction. A full CCTV survey of the existing drainage should be undertaken to assess the condition of the existing infrastructure so any existing drainage can be utilised.

Greenfield Runoff Rates

2.12. The proposed plans indicate that the extension includes a total hardstanding area of approximately 43m^2 (0.004ha), and the rear of the existing dwelling is approximately 27m^2 (0.003). Therefore, the total impermeable area that will be positively drained within the proposed SWDS will be 0.007ha.

2.13. The proposed plans are including as Appendix B in this report.

2.14. The greenfield runoff rate for an area of 0.007ha has been calculated been calculated using the IH-124 method (via the ICP SuDS variation) within InfoDrainage Software v2023.

2.15. 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:

$$Qbar_{rural} = 0.00108(0.1 \times AREA)0.89 \times SAAR1.17 \times SPR2.17\ m^3/s$$

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.

2.16. 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.

2.17. 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	0.007 Ha
SAAR	653.0
SOIL	0.470
Region	Region 6

2.18. As the impermeable area at the site is small at 70m^2, the estimated Q_{BAR} greenfield runoff rate is below 0.05l/s. It would be unfeasible to design to a rate so low as it would significantly increase the risk of blockages. Therefore, 1l/s is a more feasible discharge rate, which as close to greenfield rates as feasibly possible.

Brownfield Runoff Rate

2.19. InfoDrainage Software (v2023.2) was used to calculate the existing runoff rates from the development proposals area. It was assumed that the existing hardstanding surfaces from the existing dwelling and associated hardstanding areas are positively drained (70m^2) to provide an indicative existing runoff rate.

2.20. Calculations indicate that that during the present day 1 year, 30 year and 100 year events the maximum outflow may be 1.3l/s, 3.2/s, and 4.1l/s respectively (Table 2). Therefore, restricting

rates to the greenfield Q_{bar} rate would provide a betterment to the existing scenario in terms of surface water runoff.

Table 2: Existing (Unrestricted) Runoff Rates

Catchment	Area	1 in 1 Year	1 in 30 Year	1 in 100 Year
Existing Site	70 m^2	1.3l/s	3.2l/s	4.1l/s

Surface and Foul Water Drainage Strategy

2.21. 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.

2.22. The management of surface water has been considered in respect to the SuDS hierarchy below (Table 3), as detailed in the CIRIA 753 “The SuDS Manual” (section 3.2.3).

Table 3 SuDS Drainage Hierarchy

SUDS DRAINAGE HIERARCHY				
			Suitability	**Comment**
	1.	**Store rainwater for later use**	✓	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 for irrigation of the landscaping on site.
	2.	**Use infiltration techniques, such as porous surfaces in non-clay areas**	x	BGS mapping shows that the site is underlain by London Clay Formation comprising clay, silt and sand. Mapping also shows that there are no superficial deposits at the site. Boreholes near the site confirm the geology comprises clay, sand and gravel, therefore it is assumed infiltration drainage will not be viable. Unfeasible to comply with Building Regulation Part H, in providing a 5m buffer from a soakaway to any buildings.
	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**	✓	Attenuation is proposed in the form of porous paving.
	5.	**Discharge rainwater direct to a watercourse**	x	There are no watercourses within a feasible distance to the site.
	6.	**Discharge rainwater to a surface water sewer/drain**	✓	It is proposed to replicate the presumed exiting scenario and discharge to the public surface water sewer beneath Maygrove Road as close to greenfield rates as possible. The connection should be confirmed with Thames Water prior to construction. A full CCTV survey of the existing drainage should be undertaken to assess the condition of the existing infrastructure so any existing drainage can be utilised.
	7.	**Discharge rainwater to Combined Sewer**	x	It is preferred to discharge to the surface water sewer adjacent to the site, with is a preferred method of discharging surface water.

2.23. The proposed drainage strategy is proposed to utilise one outfall to the existing public surface water sewer to the northwest of the site is proposed. Surface water runoff will be conveyed from the dwelling rooftop and patio into a gravity piped drainage network to the public surface water

sewer. Type C porous paving will be utilised to convey and attenuate surface water runoff from the rooftop and the paving area. Rooftop runoff will enter a rainwater pipe and conveyed into a bioretention planter for additional storage before entering the porous paving unit.

2.24. A full CCTV / connectivity survey should be carried out to confirm the dimensions and the condition of the existing drainage system within the site.

2.25. As the greenfield rate for the 1 in 100 year storm for 0.007ha of impermeable area is below 0.05l/s, it is proposed to discharge surface water from the extension and the rear of the existing dwelling at a rate of 1l/s to avoid increasing the risk of blockages, for up to and including the 1 in 100 year critical storm event (plus an allowance for climate change). Excess flows above 1l/s will be restricted and will back up into the type c porous paving feature prior to being gradually discharged.

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

InfoDrainage Calculations

2.27. A network model has been produced in InfoDrainage software (v 2023.0).

2.28. The model comprises;

- 2no. contributing catchment areas across the proposed development area representing hardstanding surfaces for a total area of 0.004 ha. 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.
- 2 proposed surface water manholes.
- 1 type c porous paving unit 4.5m (W) x 5.0m (L) x 0.25m (H), with 30% porosity.

2.29. The runoff from the dwelling rooftop and the driveway have been delineated as separate catchments, both applied as a point inflow into the porous paving unit, within the plot boundary.

2.30. Surface water flows downstream to the manhole to the west of the dwelling via gravity, where flows are restricted to 1.0l/s. Excess flows will back up into the porous paving system upstream. The system is designed to manage the 1 in 100 (+45% allowance for climate change) storm event.

2.31. Table 4 summarises the simulation criteria for the InfoDrainage model.

Table 4 Simulation Criteria

Catchment Area Simulation Parameters	
Rainfall Data	FSR
Total Area	0.0077 Ha (includes a 10% allowance for Urban Creep)

Return Periods	2, 30, 30+35% for climate change, 100, 100 +40% 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

2.32. The full calculation outputs can be found in Appendix E of this report although the 1 in 100 year +40% climate change results have been summarised below:

- The maximum flow rate through the proposed Thames Water surface water sewer connection will be 0.9l/s for the critical storm event (15mins Summer).
- The maximum depth of surface water in the 0.35m deep porous paving is 0.329m for the critical storm event (60mins Summer).
- No flooding is observed in the critical storm event based on the InfoDrainage model.

2.33. 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.

Maintenance

2.34. Table 5 presents details regarding the maintenance requirements for the proposed SuDS included as part of the development (geocellular crate systems), taken from the CIRIA C753 'The SuDS Manual'. Each manufacturer will have bespoke requirements however the below should be used as a guide.

2.35. It is expected that the SuDS features on site will remain in private ownership, maintained and managed by the developer, or a third party appointed by the developer.

Table 5. Maintenance Requirements for Pervious Pavements

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 runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment

Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required - once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 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, 48hr after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Designing for Exceedance

2.36. 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.

2.37. 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 southeast of the dwelling to landscaped areas.

Water Quality

2.38. In order to protect the downstream receiving water body, 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 table 26.2 of the CIRIA SuDS Manual (C753) has been reviewed. The indices use four different indicators for assessing pollution potential based on the hazard level, total suspended solids (TSS), Metals, and Hydrocarbons.

2.39. The Pollution Hazard Indices are summarised in Table 6 below (with reference to table 26.3 in the CIRIA SuDS manual). The pollution hazard indices for “residential roofs” and “low traffic roads” have been used.

2.40. Runoff from residential roofs is generally considered very low contamination risk and does not usually warrant any significant treatment. All downpipes should be fitted with silt traps to reduce the amount of sediment entering the subsurface piped network.

2.41. However, treatment of runoff from the driveway will be required. A petrol interceptor should be installed at the downstream end of the proposed drainage system, but upstream of the existing (outfall) manhole being discharged to, to treat runoff prior to entering the existing downstream system.

Table 6 Pollutant Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Low	0.3	0.2	0.05
Low Traffic Roads	Low	0.5	0.4	0.4

Table 7. Permeable Paving Mitigation Indices.

Mitigation Measure	TSS	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7

3. Conclusions

3.1. This SWDS has been undertaken with reference to the Condition 4 of Camden Borough Council's planning consultation response (dated 21 February 2023), with respect to the development at 54 Maygrove Road, Camden, NW6 2ED.

3.2. The proposed development is for the erection of a single storey lower ground floor rear extension (and replacement of lower ground floor window with doors).

3.3. The proposed drainage strategy is to utilise one outfall to the existing public surface water sewer to the northwest of the site is proposed. Surface water runoff will be conveyed from the dwelling rooftop and patio into a gravity piped drainage network to the public surface water sewer. Type C porous paving will be utilised to convey and attenuate surface water runoff from the rooftop and the paving area. Rooftop runoff will enter a rainwater pipe and conveyed into a bioretention planter for additional storage before entering the porous paving unit.

3.4. A full CCTV/ connectivity survey should be carried out to confirm the dimensions and the condition of the existing drainage system within the site.

3.5. The total peak flow rate leaving the site will be 1l/s, as the Q_{BAR} for the 0.004ha hardstanding would increase the risk of blockage. Excess flows from the outfalls will back up into the porous paving feature prior to being gradually released.

3.6. The full calculation outputs can be found in Appendix E of this report although the 1in100year +40% climate change results have been summarised below:

- The maximum flow rate through the proposed Thames Water surface water sewer connection will be 0.9l/s for the critical storm event (15mins Summer).
- The maximum depth of surface water in the 0.35m deep porous paving is 0.329m for the critical storm event (60mins Summer).
- No flooding is observed in the critical storm event based on the InfoDrainage model.

3.7. This surface water drainage strategy document should be submitted to address condition Condition 4 of Camden Borough Council's planning consultation response (dated 21 February 2023)

.

Appendix A – Thames Water Asset Plan

Asset location search

Property Searches

Aegaea
23 Barlow Road 23 Barlow Road

CHESHIRE
CW9 8QS

Search address supplied 54
Maygrove Road
London
NW6 2ED

Your reference Maygrove Road

Our reference ALS/ALS Standard/2023_4835480

Search date 31 May 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: 54, Maygrove Road, London, NW6 2ED

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.

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

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

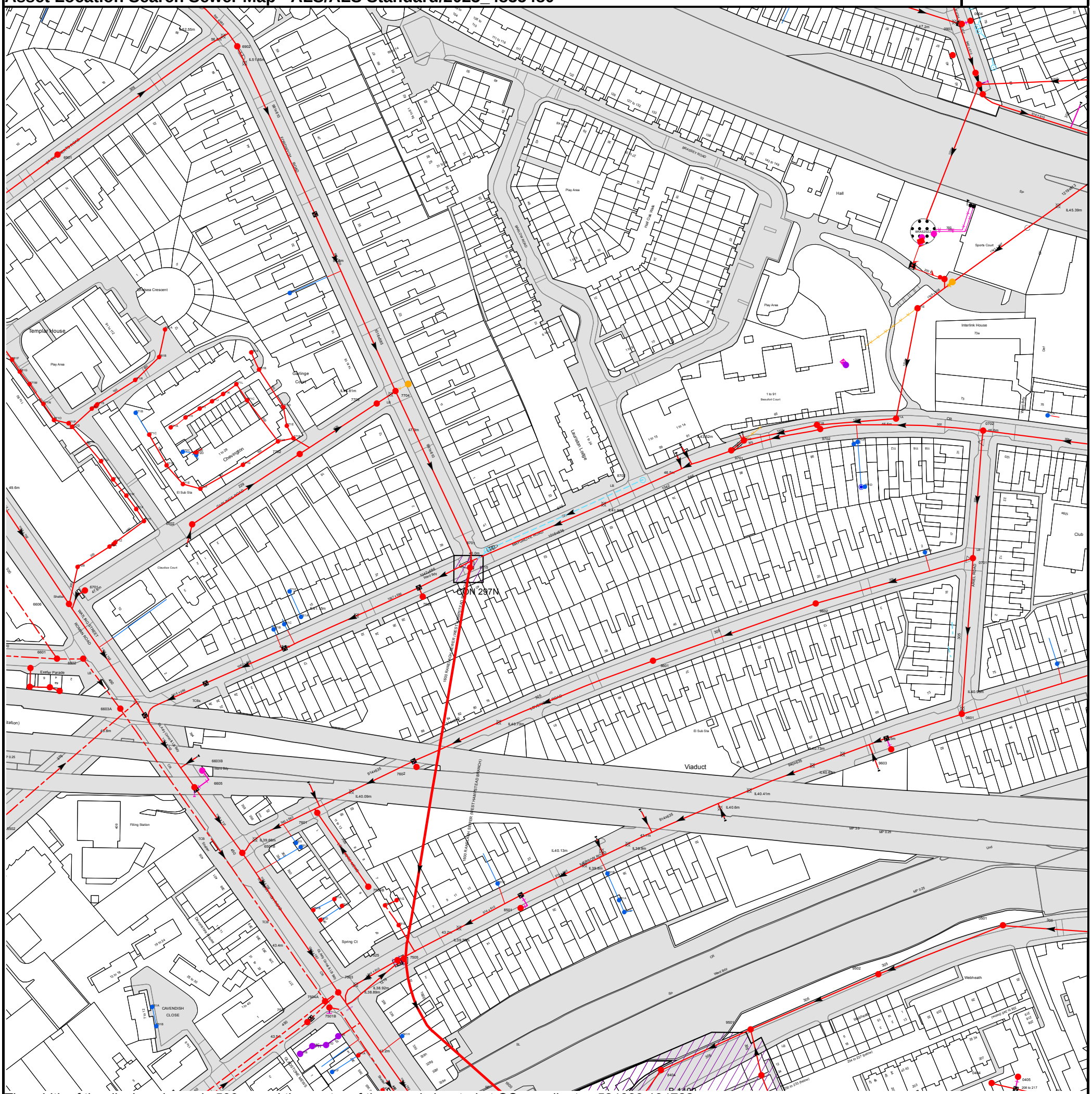
Clean Water queries

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_4835480



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 524839,184722

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
671D	n/a	n/a
671A	n/a	n/a
672C	n/a	n/a
671E	n/a	n/a
671H	n/a	n/a
6702	47.77	45.43
672E	n/a	n/a
672D	n/a	n/a
671I	n/a	n/a
671F	n/a	n/a
671J	n/a	n/a
671K	n/a	n/a
671L	n/a	n/a
671G	n/a	n/a
771C	n/a	n/a
761B	n/a	n/a
771A	n/a	n/a
771D	n/a	n/a
761C	n/a	n/a
771E	n/a	n/a
771F	n/a	n/a
771B	n/a	n/a
7702	48.31	45.01
761A	n/a	n/a
7703	48.64	44.7
7704	48.7	44.7
7603	n/a	n/a
8715	n/a	31.84
8701	46.05	40.1
8702	46.36	43.61
8601	44.83	41.34
9701	46.43	42.265
9603	n/a	n/a
0601	44.64	40.85
061A	n/a	n/a
9602	45.35	41.95
0701	45.8	42.09
071B	n/a	n/a
971D	n/a	n/a
971E	n/a	n/a
971F	n/a	n/a
971C	46.47	43.55
0702	46.62	42.76
9702	46.48	42.48
971B	46.51	43.67
971A	46.6	43.8
071A	n/a	n/a
9801	n/a	n/a
081E	51.9	44.96
081A	51.89	44.69
081B	51.69	n/a
081C	51.69	n/a
081D	51.69	n/a
741A	n/a	n/a
741B	n/a	n/a
741C	n/a	n/a
741D	n/a	n/a
741E	n/a	n/a
741H	n/a	n/a
7527	n/a	n/a
7501B	43.17	40.43
7504A	43.24	40.39
7503	43.13	38.83
7525	43.11	n/a
7505	43.09	31.6
751E	n/a	n/a
751D	n/a	n/a
851C	n/a	n/a
751B	n/a	n/a
8501	n/a	n/a
751C	n/a	n/a
751F	n/a	n/a
751G	n/a	n/a
851A	n/a	n/a
751A	n/a	n/a
7504B	43.37	n/a
851B	n/a	n/a
751H	n/a	n/a
7601	n/a	n/a
7602	n/a	n/a
0404	n/a	n/a
0405	n/a	n/a
9401	n/a	n/a
9501	n/a	n/a
9502	n/a	n/a
0501	n/a	n/a
741G	n/a	n/a
741F	n/a	n/a
8404	n/a	n/a
091A	49.39	46.66
091B	49.54	39.9

Manhole Reference	Manhole Cover Level	Manhole Invert Level
091C	49.67	46.77
09FC	n/a	n/a
09CB	n/a	n/a
09FD	n/a	n/a
09FB	n/a	n/a
0903	n/a	n/a
0904	50.32	n/a
09FA	n/a	n/a
781B	n/a	n/a
681B	n/a	n/a
781A	n/a	n/a
681A	n/a	n/a
781C	n/a	n/a
6902	56.02	51.96
6603A	45.57	42.57
66BD	n/a	n/a
66BC	n/a	n/a
56AD	n/a	n/a
56AE	n/a	n/a
6601	46.81	43.86
6602	46.61	43.41
6606	47.5	40.61
6701	47.45	44.83
672B	n/a	n/a
672A	n/a	n/a
671Z	n/a	n/a
671Y	n/a	n/a
671X	n/a	n/a
671W	n/a	n/a
671V	n/a	n/a
671U	n/a	n/a
671C	n/a	n/a
671Q	n/a	n/a
671P	n/a	n/a
671O	n/a	n/a
671B	n/a	n/a
671T	n/a	n/a
671S	n/a	n/a
671N	n/a	n/a
671M	n/a	n/a
671R	n/a	n/a
581G	n/a	n/a
581F	n/a	n/a
6901	57.08	53.22
651B	n/a	n/a
651A	n/a	n/a
6501B	43.83	39.58
751I	n/a	n/a
6605	n/a	n/a
6603B	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

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

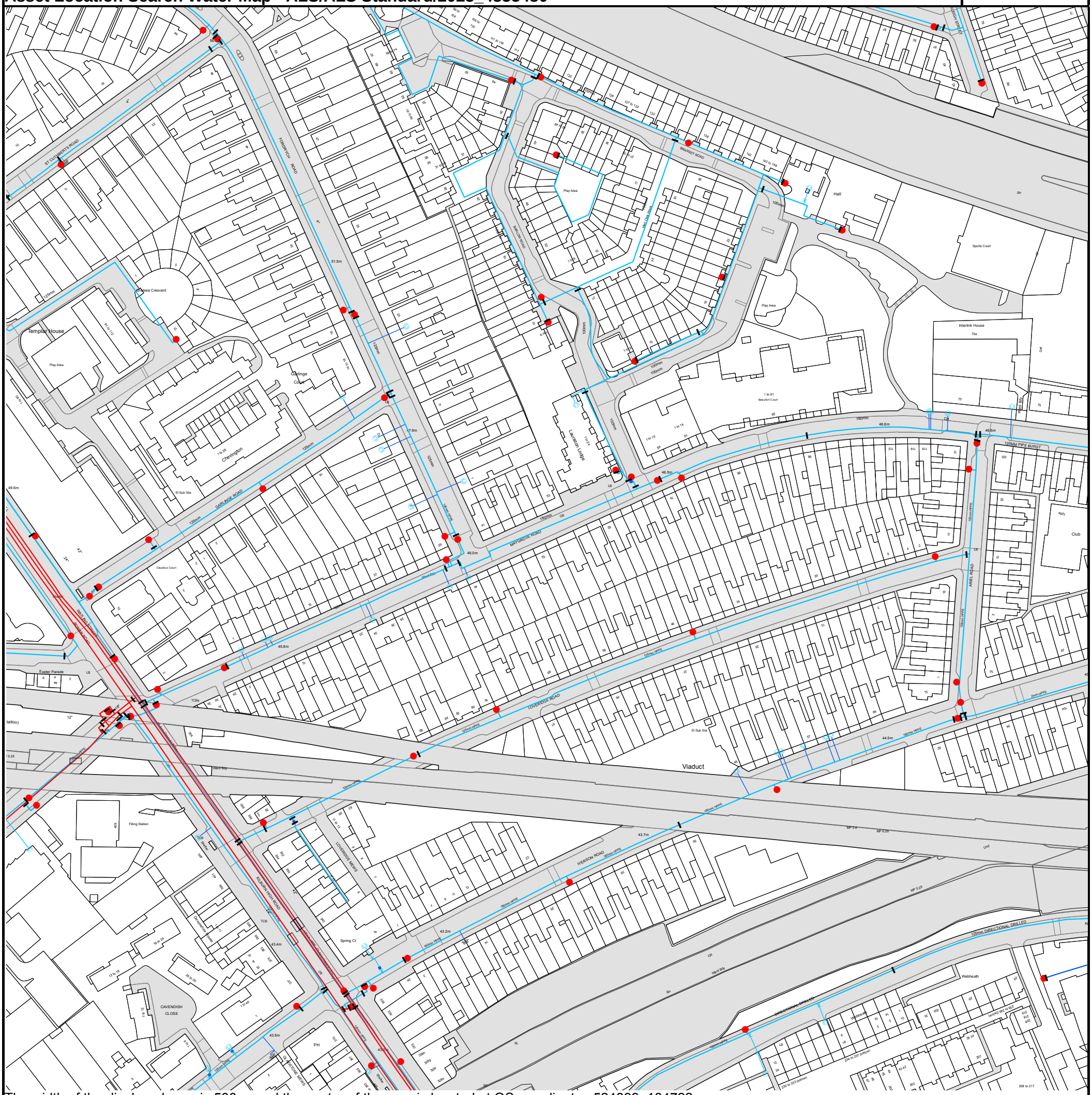
Ducts may contain high voltage cables. Please check with Thames Water.

- 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.

Asset Location Search Water Map - ALS/ALS Standard/2023_4835480



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 524839, 184722.

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 - Water Key

Water Pipes (Operated & Maintained by Thames Water)

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger

Casement: Ducts may contain high voltage cables. Please check with Thames Water.

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

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.

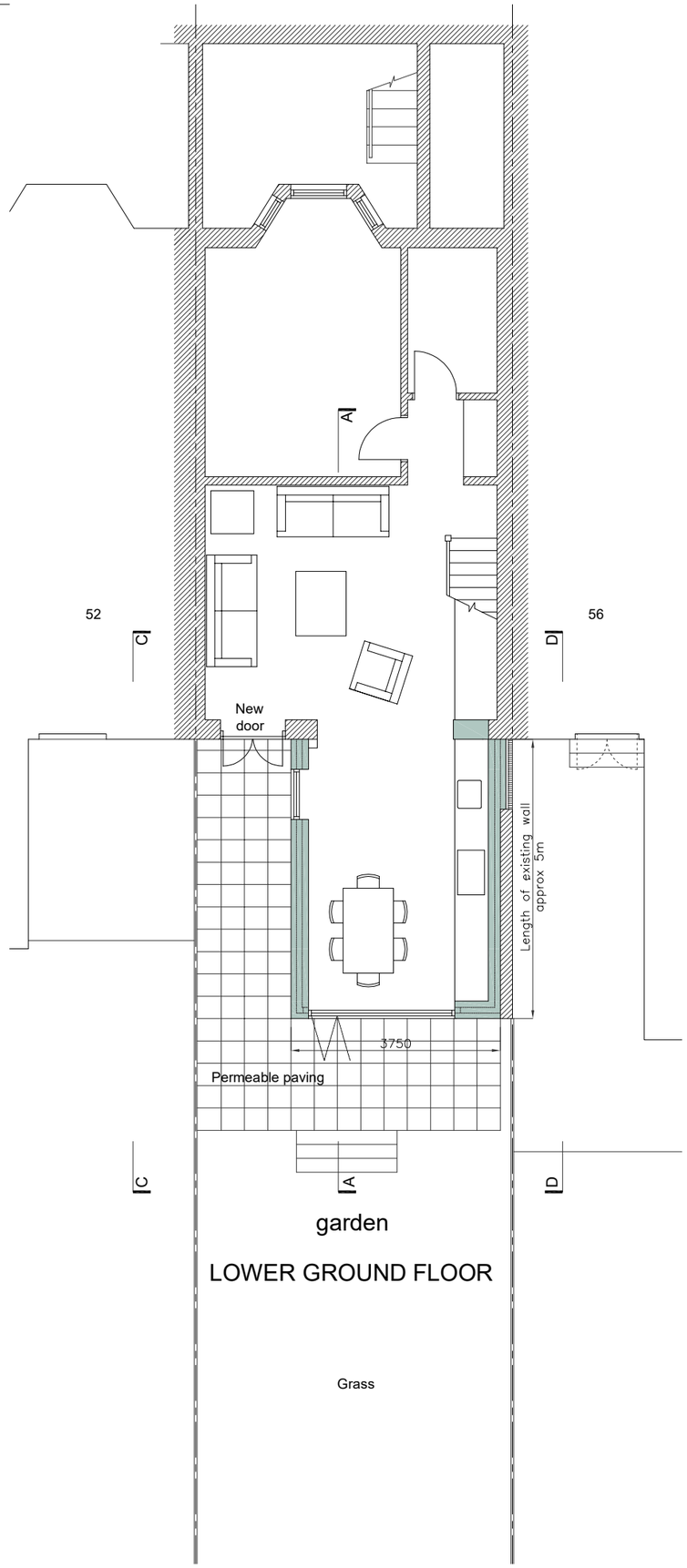
If you are still dissatisfied with our final response, and in certain circumstances such as you are buying a residential property or commercial property within certain parameters, The Property Ombudsman will investigate your case and give an independent view. The Ombudsman can award compensation of up 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.

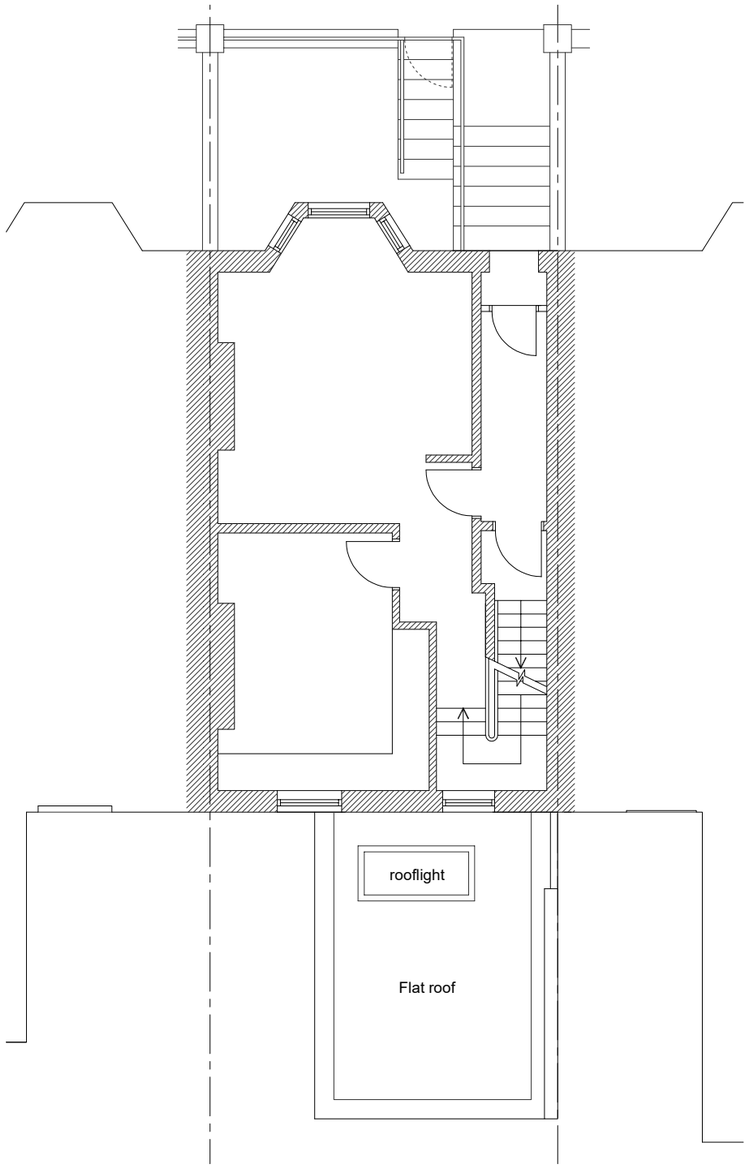
Ways to pay your bill

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 – Site Plans



LOWER GROUND FLOOR



GROUND FLOOR / ROOF PLAN

0 metre 1 2 3 4 5 6 7 8 9 10m

Revisions:

.	.	.
.	.	.

Site: 54A MAYGROVE ROAD LONDON NW6 2ED	Project: REAR EXTENSION	
Drawing Title: PLANS AS PROPOSED	Scale: 1:100 (@ A3)	Drawing No: P419.11
	Date: Nov 2022	Rev: .

Appendix C – Surface Water Drainage Layout

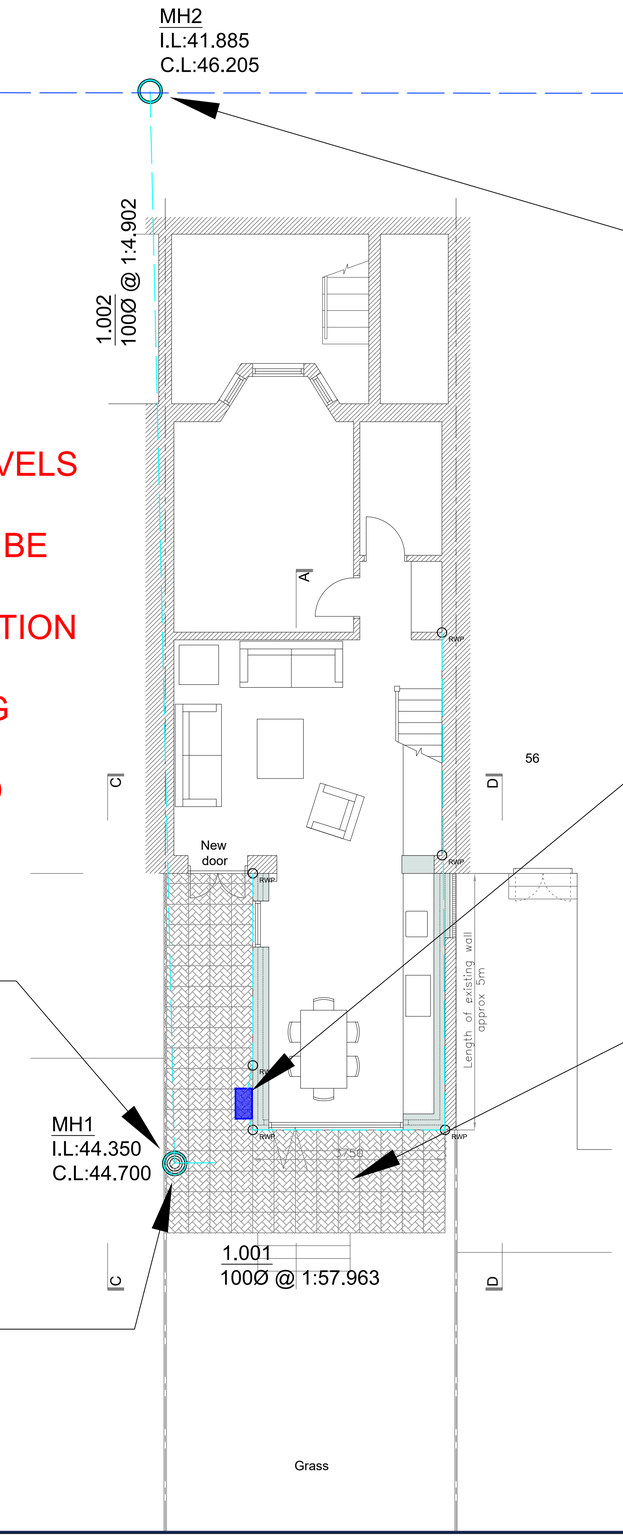
NOTES

ALL LEVELS ARE TO METRES ABOVE ORDNANCE DATUM (AOD) UNLESS OTHERWISE SPECIFIED
GROUND LEVELS BASED ON EA 1M RESOLUTION LIDAR DATA.

TOPOGRAPHIC SURVEY SHOULD BE UNDERTAKEN TO CONFIRM GROUND LEVELS

THE PUBLIC SEWER CONNECTION IS TO BE CONFIRMED WITH A THAMES WATER CAPACITY CHECK PRIOR TO CONSTRUCTION

A CCTV DRAINAGE SURVEY OF EXISTING DRAINAGE AND BRE365 INFILTRATION TESTING SHOULD ALSO BE CONDUCTED PRIOR TO CONSTRUCTION



PROPOSED OUTFALL CONNECTION TO EXISTING PUBLIC SURFACE WATER SEWER BENEATH MAYGROVE ROAD. INVERT AND COVER LEVEL INTERPOLATED FROM EXISTING MANHOLES UPSTEAM AND DOWNSTREAM

INDICATIVE RAISED PLANTER BIORETENTION SYSTEMS

HYDROBRAKE TO BE INSTALLED IN THE EXISTING SURFACE WATER MANHOLE CONNECTION ONSITE

TYPE C POROUS PAVING TO CONVEY SURFACE WATER FROM THE PAVING AND THE DWELLING ROOFTOP INTO THE UNDERGROUND DRAINAGE NETWORK.
PLAN AREA - 20m2
DEPTH - 0.35m
ATTENUATION PROVIDED - POROSITY - 30%

PROPOSED HYDROBRAKE TO RESTRICT FLOWS TO A MAXIMUM OF 1l/s WITH ANY FLOWS ABOVE 1l/s ATTENUATED IN THE PERMEABLE PAVING

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.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORKS AND FOR THE STABILITY, INSTALLATION AND HEALTH AND SAFETY OF THE WORKS.
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

- PUBLIC SURFACE WATER SEWER
- PROPOSED SURFACE WATER DRAIN
- HYDROBRAKE MANHOLE
- EXISTING SURFACE WATER MANHOLE
- PERMEABLE PAVING
- RAINWATER PIPE
- RAISED PLANTER BIORETENTION SYSTEM

CLIENT: BUILD GENERATIONS LTD

SITE: 54 MAYGROVE ROAD, CAMDEN, NW6 2ED

DRAWING: SURFACE WATER DRAINAGE STRATEGY

DRAWING NUMBER: AEG02558_DR001

DATE: 01/06/2023 | **REV: A**

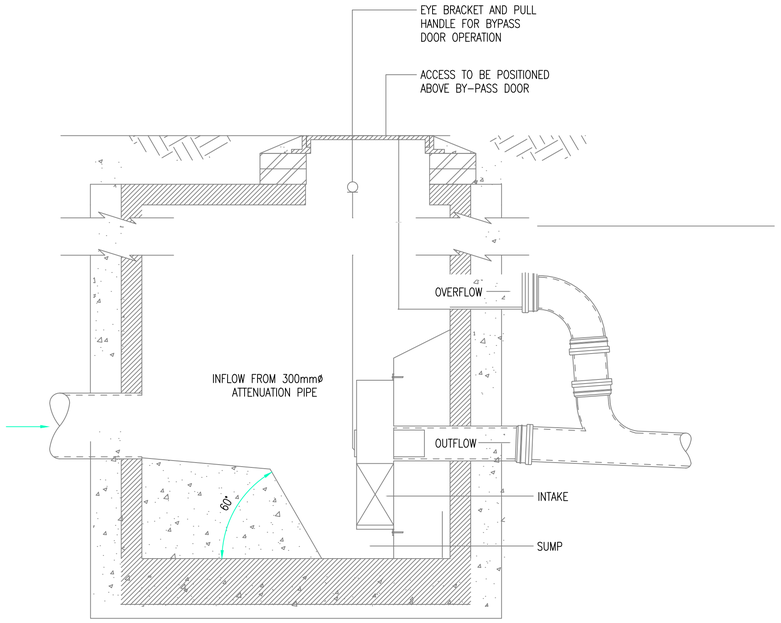
DRAWN BY: JA

DRAWING SCALE: NTS

PRELIMINARY DRAWING FOR PLANNING ONLY - NOT FOR CONSTRUCTION

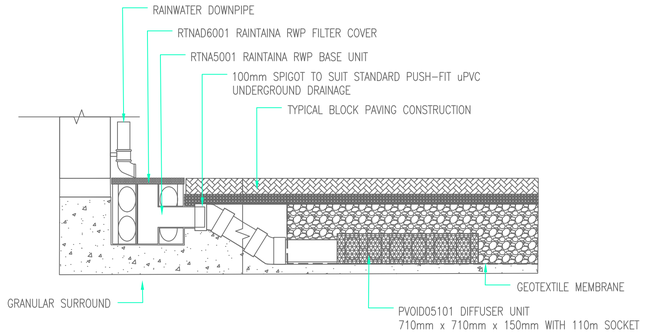
aegaea
Flood risk, water and environment

Appendix D – Construction Details

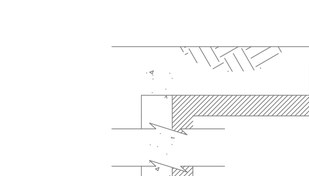


HYDROBRAKE MANHOLE.

(1:20)

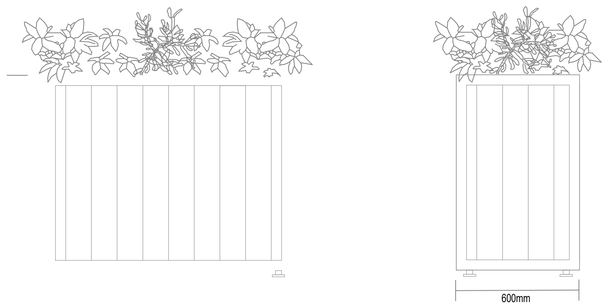


DIFFUSER INLET TO PAVING SUB-BASE



UNIT DIMENSIONS (mm):
SMALL - 1200 (l) x 600 (w) x 950 (d)
STORAGE CAPACITY: 0.3m^3

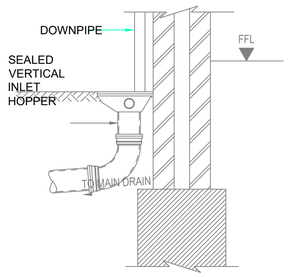
KEY COMPONENTS:
OUTLET WITH INTEGRAL FLOW CONTROL
OVERFLOW OUTLET
INTEGRAL, VERTICAL HIGH-LEVEL EMERGENCY OVERFLOW
HIGH VOLUME STORAGE COMPARTMENT



SUDS PLANTER® - SMALL

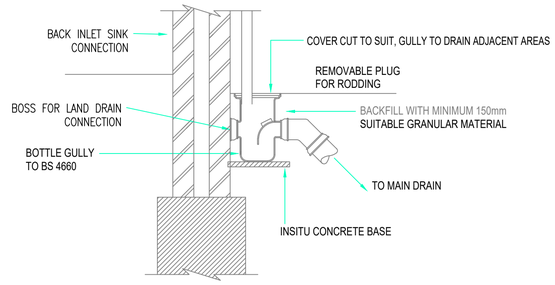
(1:20)

150mm LONG
110mmØ
SPIGOT



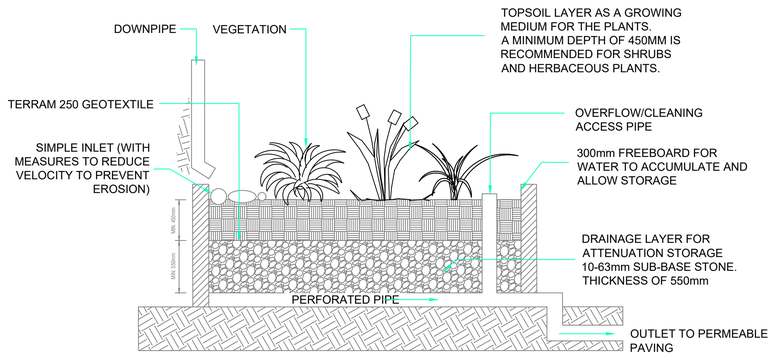
RWP CONNECTION.

(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
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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:

BUILD GENERATION LTD

SITE:

54 MAYGROVE ROAD, CAMDEN, NW6 2ED

DRAWING:

SURFACE WATER DRAINAGE DETAILS

DRAWING NUMBER:

AEG02558_DR002

DATE:

01/06/2023

REV:

A

DRAWN BY:

JA

DRAWING SCALE:

SEE DRAWING

PRELIMINARY DRAWING FOR PLANNING ONLY - NOT FOR CONSTRUCTION

aegaea
Flood risk, water and environment

Appendix E – InfoDrainage Calculation Results

Project:	Date: 01/06/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Inflows Storm Phase: Phase	Company Address:		

Patio Type : Catchment Area

Area (ha)	0.002

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 Type : Catchment Area

Area (ha)	0.002

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

Existing Site Type : Catchment Area

Area (ha)	0.007

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: 01/06/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Inflows Storm Phase: Phase	Company Address:		

Catchment Area

Type : Catchment Area

Area (ha)	0.003

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: 01/06/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address:		

Porous Paving

Type : Porous Paving

Dimensions

Exceedance Level (m)	44.700
Depth (m)	0.350
Base Level (m)	44.350
Paving Layer Depth (mm)	5
Membrane Percolation (m/hr)	3.0
Porosity (%)	30
Length (m)	4.500
Long. Slope (1:X)	200.00
Width (m)	5.000
Total Volume (m³)	2.329

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Patio Dwelling Roof Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Advanced

Conductivity (m/hr)	500.0

Project:	Date: 01/06/2023		
	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	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	21.0
Ratio R	0.440
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000
30.0	0.000
100.0	0.000
30.0	35.000
100.0	40.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date: 01/06/2023		
	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. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Porous Paving	FSR: 1 years: +0 %: 60 mins: Summer	44.457	44.416	0.085	0.066	0.7	0.502	0.000	0.000	0.5	0.624	23	78.439

Project:	Date: 01/06/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

Status
OK

Project:	Date: 01/06/2023		
	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. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Porous Paving	FSR: 30 years: +0 %: 60 mins: Summer	44.544	44.474	0.172	0.124	1.8	0.998	0.000	0.000	1.0	1.933	14	57.133

Project:	Date: 01/06/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

Status
OK

Project:	Date: 01/06/2023		
	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. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Porous Paving	FSR: 100 years: +0 %: 60 mins: Summer	44.595	44.560	0.222	0.210	2.3	1.459	0.000	0.000	1.1	2.622	18	37.368

Project:	Date: 01/06/2023		
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Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

Status
OK

Project:	Date: 01/06/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

FSR: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Porous Paving	FSR: 30 years: +35 %: 60 mins: Summer	44.602	44.569	0.230	0.219	2.4	1.516	0.000	0.000	1.1	2.691	19	34.904

Project:	Date: 01/06/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

Status
OK

Project:	Date: 01/06/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

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

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Porous Paving	FSR: 100 years: +40 %: 60 mins: Summer	44.702	44.676	0.329	0.326	3.3	2.211	0.000	0.000	1.2	3.719	16	5.040

Project:	Date: 01/06/2023		
	Designed by: Chris	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

Status
OK