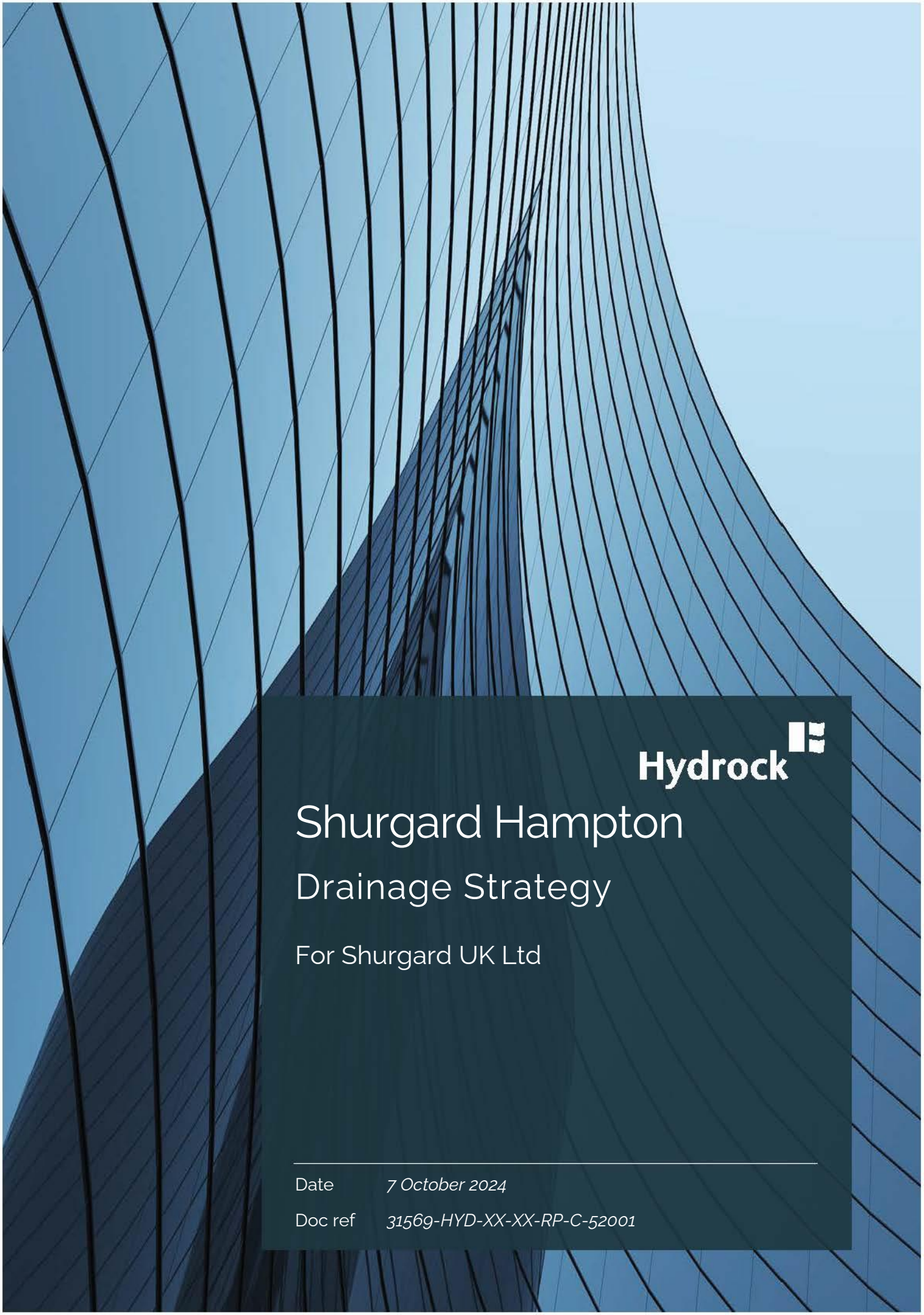

Hydrock

Shurgard Hampton

Drainage Strategy

For Shurgard UK Ltd

Date	*7 October 2024*
Doc ref	*31569-HYD-XX-XX-RP-C-52001*

Document control sheet

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1. Introduction

1.1 Purpose of The Report

Hydrock have been appointed by Shurgard UK Ltd to provide a Drainage Strategy report in support of proposed development at Shurgard Hampton, TW12 2HR.

This report has been prepared to accompany the detailed planning application for the proposed development as outlined in Section 1.2 below.

1.2 Proposed Development

A detailed planning application has been submitted for the demolition of existing buildings Shurgard Hampton and the construction of a new self-storage facility.

Refer to Appendix A for the proposed site layout.

1.3 Scope of The Report

The proposed drainage strategy will be in accordance with both local and national guidelines and will incorporate a 'best practice' approach in reducing the impact of the flooding caused by the new development.

The report is based upon sewer asset information provided by the Thames Water as the sewerage undertaker in relation to public assets within the vicinity of the development site.

The report highlights the key stakeholders in terms of ownership and maintenance to ensure the drainage system is kept well maintained and so reduce the risk of failure. Should the network fail at any point, clearly defined ownership liabilities will ensure that issues can quickly be rectified thereby reducing the potential impact of damage caused by flooding.

1.4 Limitations of The Report

This report has been prepared by Hydrock Consultants Ltd on behalf of Shurgard UK Ltd in connection with the scope of the report as described in Section 1.3 above and takes into account the particular instructions and requirements. It is not intended for and should not be relied upon by any third party.

The information received is summarised within this report. In the event that the information is relied upon and is subsequently found to be incorrect, Hydrock Consultants Ltd accepts no responsibility for any direct and/or consequential loss that may occur as a result.

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1.5 References / Design Codes

- BS EN 752 - Drain and Sewer Systems Outside Buildings.
- Building Regulations Approved Document Part H - Drainage and Waste Disposal.
- Water UK Sewerage Sector Guidance.
- The London Plan (2021)
- CIRIA C753 - SuDS Manual.
- DEFRA Non-Statutory Technical Standards for Sustainable Drainage.

2. Site Information

2.1 Site Location

The application site covers a total area of 0.308 hectares. It is located on the existing site's hardstanding yard area within the London borough of Southwark. The site's postcode is TW12 2HR with the approximate centre of the site being at grid reference E 513140 N 169763.

Figures 2.1 and 2.2 following show the site location and boundary respectively.

Table 2.1: Site Reference Information

Site Address	Shurgard Hampton
	74 Oldfield Road Hampton London
Postcode:	TW12 2HR
National Grid Reference	E 513140 N 169763

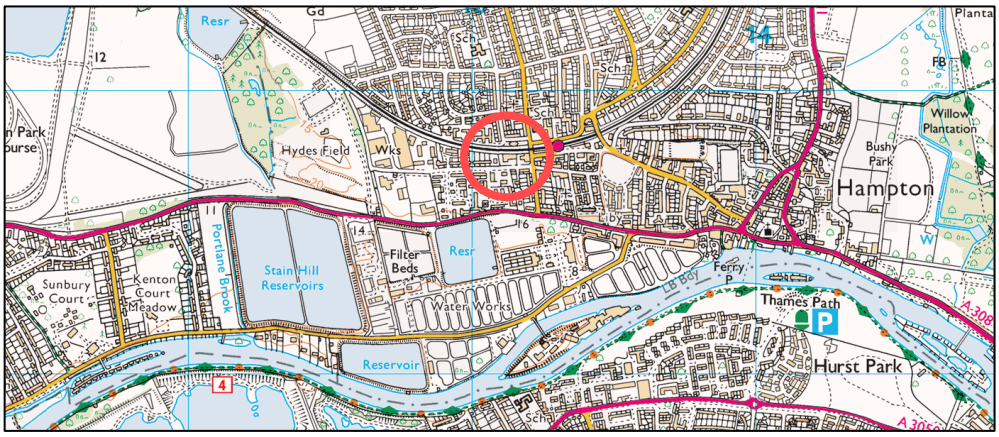


Figure 2.1: Site Location

2.2 Existing Site

The site is currently occupied by existing structures and hard-standing and is therefore considered to be brownfield in nature.

2.3 Site Topography

A July 2018 survey undertaken by Geographical Engineering Operations shows the site slopes gently towards north eastern corner from 17.3m AOD to 16.7m AOD.

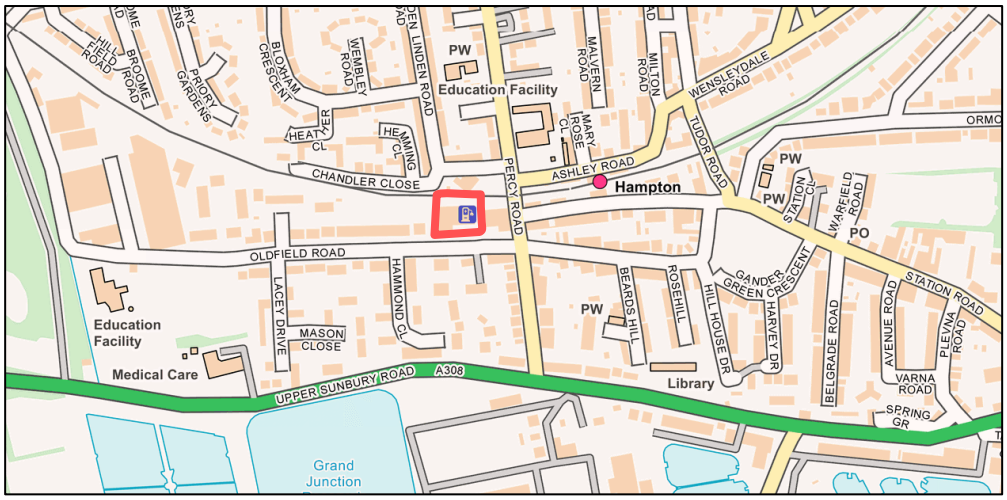


Figure 2.2: Site Boundary Plan

Refer to Appendix B for the topographic and utilities survey.

2.4 Geology & Hydrogeology

British Geological Survey (BGS) mapping indicate that the site geology comprises of a London Clay bedrock with superficial layers of Taplow Gravel.

Boreholes by Southeastern Drilling Services from August 2023 show the site has clay ground.

2.5 Existing Drainage

2.5.1 Watercourse

Environment Agency (EA) maps show the nearest watercourse is the River Thames 600m south.

2.5.2 Sewers and Drains

2.5.2.1 Thames Water Sewers

There are Thames Water sewer in Oldfield Road to South of the site. We believe it is 150mm foul water and 225mm surface water.

Refer to Appendix C for the relevant extract from Thames Water sewer records.

2.5.2.2 Private Drains

The topographic and utilities survey identified that the site has existing surface and foul drainage networks that connect to the Thames Water sewer. The current outfall is combined.

The existing private drainage serving the site will be removed to enable the proposed development.

3. Flood Risk

The site is at 'low' risk of surface water flooding from all sources.

Refer to flood risk assessment 31569-HYD-XX-XX-RP-WENV-0001.

4. Surface Water Management Strategy

4.1 Existing Surface Water Drainage Network

A topographic and utilities survey of the site was done in 2023.

The drainage discharges into the Thames Water sewer at many points inside the site.

Refer to Appendix B for the Topographic and Utilities Survey.

4.2 Existing and Proposed Development Areas

The table below indicates each catchment type area, pre-development:

Table 4.1: Site Catchment Areas

Catchment	**Existing** (sqm)	**Proposed** (sqm)	**Difference** (%age)
Impermeable			
Building / Roof	1270	1707	+14%
Roads / Hardstanding	1525	847	-22%
Soft Landscaping	325	566	+8%
Total Area	**3120**	**3120**	-

Refer to Appendices G and I for the pre and post development catchment plans respectively.

4.3 Pre-Development Surface Water Drainage

4.3.1 Greenfield Run-Off Rates

It is a requirement that on new developments consideration is given to limit discharge as close as reasonably practical to the undeveloped greenfield rate, The following table indicates surface water discharge rates if the site was greenfield i.e., not developed:

Table 4.2: Pre-Development Greenfield Equivalent Run-Off Rates

Storm Event	Greenfield Equivalent Run-off (l/s)
1 in 1 AEP	0.78
1 in 30 AEP	2.10
1 in 100 AEP	2.91
Q_{BAR}	0.91

Refer to Appendix D for the Greenfield Run-off Calculation.

4.3.2 *Brownfield Run-Off Rates*

A utilities survey found that the site seems to leave the site using a 150mm combined connection heading towards Oldfield Road. The survey did not identify that any form of flow restriction has been installed to limit discharge into the network.

The existing brownfield rate has been based upon the capacity of the existing surface water connection to the Thames Water sewer with no form of flow restriction in place.

The existing discharge rates based upon the results of the site survey are shown in Table 4.4, below.

Table 4.3 Pre-Development Brownfield Discharge Rates

Storm Event	Brownfield Discharge Rate (l/s)
1 in 1 AEP	36.9
1 in 30 AEP	48.6
1 in 100 AEP	48.9

4.3.3 *Pre-Development Run-off Volumes*

Based on the existing discharge rates shown above, the discharge volume from the site for the 1 in 100 AEP, 6-hour storm event has been calculated as 171 m^3.

4.3.4 *Pre-Development Flood Exceedance Flows*

Topographical survey information indicates that, should the existing drainage network fail or otherwise have its capacity exceeded, overland flows would follow the site topography and pond above gullies.

Refer to Appendix F for the existing overland flow route plan.

4.4 Proposed Surface Water Drainage Strategy

4.4.1 *Surface Water Discharge Hierarchy*

In line with the requirement of the NPPF, Building Regulations Part H, the London Plan Policy SI.13, and local council planning policy, the method of discharging surface water from the site has been considered via a sequential hierarchy.

The following methods of discharging surface water run-off were considered, in order of preference:

1. Interception and reuse via rainwater harvesting;
2. Infiltration to the ground via a soakaway or other percolation system;
3. Attenuate in ponds or open water features;
4. Attenuate in tanks or sealed water features;
5. A natural watercourse, main river, or tidal outfall;
6. A Thames Water surface water sewer;
7. A Thames Water combined water sewer;
8. A Thames Water foul water sewer;
9. A highway drain.

Table 4.4, below, summarises the suitability of each potential discharge method in line with the drainage hierarchy.

Table 4.4: Drainage Hierarchy Review

Method	Reasoning	Suitable for the site
Interception / Reuse	The development is to consist of limited facilities and landscaping meaning that any harvesting system installed will be regularly left idle	X
Infiltration	Due to site constraints, it is not possible achieve the minimum 6m standoff from the site boundary or building foundations for safe infiltration.	X
Attenuation in above ground features	The site layout has not made allowance for the inclusion of above ground attenuation features.	X
Attenuation in below ground features	Surface water will be stored in a geocellular storage tank located underneath the proposed car parking area.	✓
Surface water body	There are no watercourses or drains within or close to the site.	X
Surface Water Sewer	225mm Thames Water sewer in Oldfield Road	✓
Combined Sewer	N/A	X
Foul Water Sewer	N/A	X
Highway Drain	N/A	X

4.4.2 *Proposed Discharge Rates*

In line with the requirements of the London Plan, Policy SI.13, surface water discharge rates should be restricted to the greenfield run-off rate where possible. On previously developed sites the final discharge rate can be no more than three times the calculated greenfield rate with exceptions for pumped discharge or discharge to tidal waters.

As shown in Section 4.3.1, the greenfield Qbar discharge rate for the site is 0.9 l/s.

The use of a pumped outfall is proposed due to the existing levels of the Thames Water assets located on Oldfield Road as confirmed by a manhole survey.

For a pumped outfall, discharge rates are proposed to be restricted to 1.5l/s.

4.4.3 *Allowance for Climate Change and Urban Creep*

In accordance with EA guidance, an allowance for climate change has been added to the proposed surface water network. As the development work beyond the 2050's, a climate change allowance of 40% is added to the 1 in 100 AEP design storm.

Urban Creep is an additional allowance made to the impermeable catchment of a surface water network to account for potential future increases. As the development proposal is for a self-storage unit and the site is to be over 100% impermeable, no urban creep allowance has been made.

4.4.4 *Proposed Surface Water Drainage Strategy*

As the proposed development is being submitted as a full planning application, a detailed drainage strategy has been prepared. This strategy demonstrates that the site can be positively drained within national and London requirements.

It is proposed that surface water run-off will be positively drained via a gravity system and attenuated in a below ground geocellular storage tank. The water will then be discharged at a restricted rate for all storm events up to and including the 1 in 100 AEP plus 40% allowance for climate change into the Thames Water sewer. Due to the existing network levels, the discharge rate will be restricted to 1.5l/s via a pumped outfall.

4.4.5 *Attenuation Storage Requirements*

In line with the requirements of the DEFRA Non-Statutory Technical Standards for SuDS, all storm events up to and including the 1 in 30 AEP storm event will be retained within the proposed surface water drainage network and exceedance volumes from all other storm events up to and including the 1 in 100 AEP plus 40% allowance for climate change will be retained within the site and manged to as to minimise the risks to people and property.

Expected attenuation requirements are shown in Table 4.5.

Table 4.5: Indicative Attenuation Requirements

Discharge Outfall	Impermeable Area (ha)	Discharge Rate (l/s)	Additional 1 in 100 AEP +40% CC Volume (m^3)	Subbase Attenuation 1 in 100 AEP +40% CC Volume (m^3)	Total Attenuation Required (m^3)
Pumped	0.255	1.5	212	53	159

Refer to Appendices H and I for the proposed drainage general arrangement and supporting calculations.

4.4.6 *Overland Flow Routes*

In the event that there is a failure of the surface water drainage network beyond the design storm or through other circumstances, exceedance flows will be kept inside the site.

5. Sustainable Drainage Systems

5.1 Requirement for Sustainable Drainage Systems

In line with the requirements of the NPPF[1], the Non-Statutory Technical Standards for SuDS and the London Sustainable Design & Construction SPG[2], the design of the surface water drainage system should seek to implement and maximise the use of Sustainable Drainage Systems (SuDS) where possible.

This section reviews the suitability and benefits of the various potential SuDS systems for the proposed development.

5.2 The SuDS Management Train and 4-Pillars of SuDS

The primary purpose of a SuDS system is to manage surface water run-off within a development via mimicking natural methods, attenuating additional water volume generated by the introduction of impermeable areas whilst providing a degree of water treatment to run-off alongside amenity and biodiversity benefits to the local community. These 4 benefits are defined as the 4-Pillars of SuDS as shown in Figure 5.1 below.

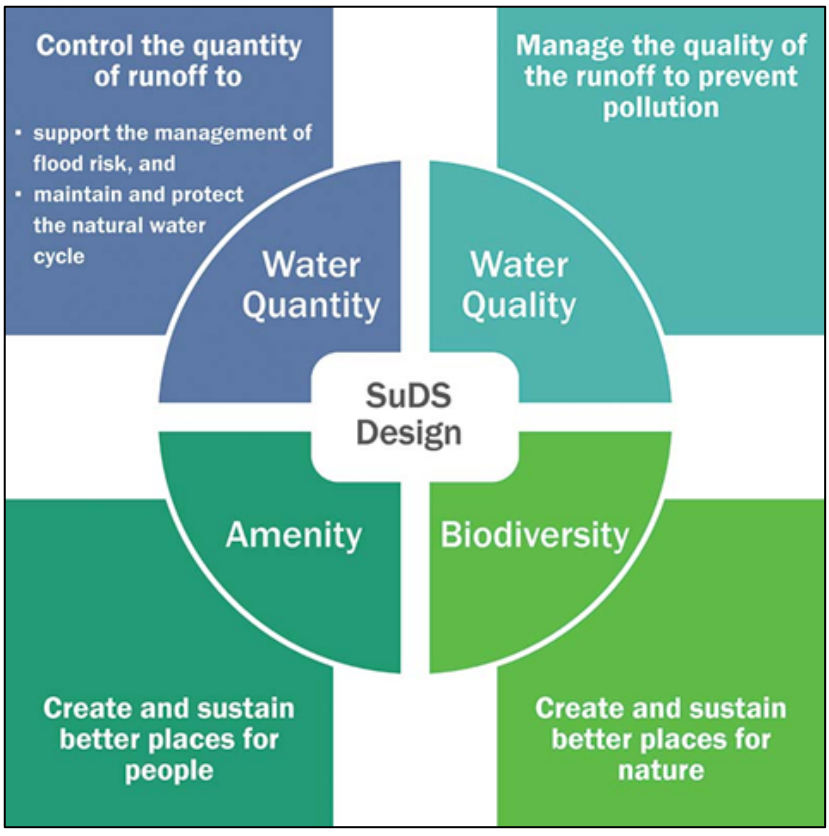


Figure 5.1: The 4 Pillars of SuDS

SuDS are generally implemented following the principle of a management train with systems capturing run-off as early as possible at the source and cascading down into wider site and regional

[1] *Paragraph 169*

[2] *Paragraph 3.4.13*

systems. Figure 5.2 below demonstrates how a SuDS management train may be applied to a development.

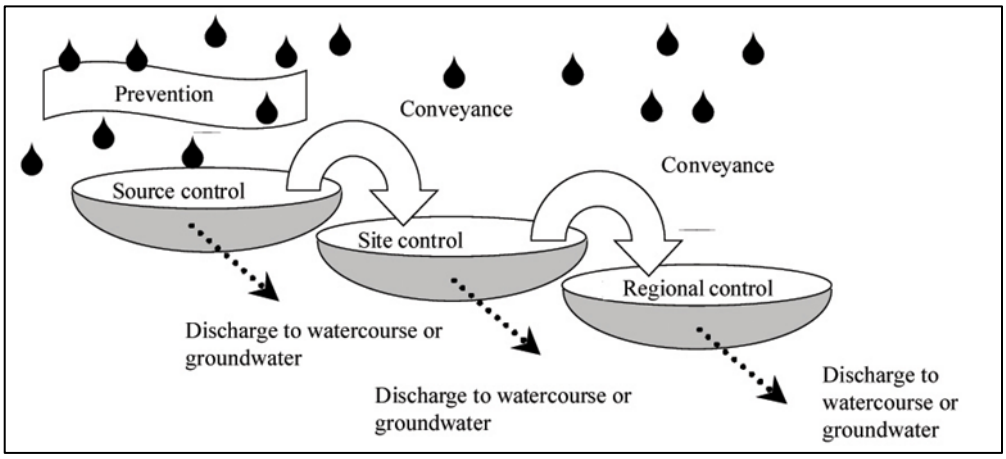


Figure 5.2: The SuDS Management Train

5.3 Suitability of SuDS Elements

The drainage design will adopt the principles and philosophy of SuDS as described above taking into the consideration the site context and location. Wherever possible, opportunities to maximise the use of SuDS have been taken. However, the implementation and selection of SuDS techniques is dependent on the site layout and context. Certain SuDS systems may be more appropriate than others in certain situations.

Table 5.1 below reviews the suitability of potential different SuDS systems against the proposed development.

Table 5.1: Suitability of SuDS Components

Hierarchy	System	Description	Site Suitability
Source Control	Green Roofs	Planted roods that reduce run-off volume and treat pollutants	Suitable for the development
	Rainwater Harvesting	Capture of run-off for reuse as grey water, flushing toilets and irrigation	Not suitable for the development
	Permeable Surfaces	Surfaces that allow water to penetrate into underlying layers. Can be made to infiltrate to groundwater.	Suitable for the development
	Bioretention Areas	Vegetated area with gravel and sand layers to filter and cleanse run-off.	Not suitable for the development

Hierarchy	System	Description	Site Suitability
Site and Regional Control	Filter Drain	Linear drains or trenches with granular fill. Can be made to infiltrate to groundwater.	Not suitable for the development
	Swale	Shallow depressions to convey and filter water. May be 'wet' with above ground attenuation or 'dry' with a gravel layer. Can be made to infiltrate to groundwater.	Not suitable for the development
	Hardscape Storage	Store water above ground within a constructed container. Can be integrated into public realm spaces with an urban character.	Not suitable for the development
	Pond/Basin	Store and treat water. Ponds have a level of standing water whilst basins are generally dry. Can be made to infiltrate to groundwater.	Not suitable for the development
	Wetland	Shallow, vegetated water bodies with a varying water level. Can be integrated with natural or hardscape environment.	Not suitable for the development

5.4 Proposed SuDS Principles

As indicated in Table 5.1 above, the use of geocellular storage and permeable surfaces and green roof are considered suitable for the development. Further, there is the potential to include rainwater harvesting, rain gardens and green roofing within the proposed development.

» Green Roofs

A green/brown roof may be installed on the roof of the new teaching block to provide aesthetic and biodiversity benefits as well as providing source treatment.

» Permeable Surfaces

Permeable paving has been proposed under footpaths and car parking areas, which provides a source of treatment to runoff with the secondary benefit of providing a degree of attenuation in extreme storm events. The rainwater from these areas will infiltrate through a hardstanding surface into an underlying storage/filtration sub-base later. The sub-base is underlain with an impermeable geotextile and is utilised as storage using a perforated piped drainage system.

» Below Ground Tank

A cellular storage tank is proposed to store the storm water. The tank comprises an inline tank with a catchpit manhole situated at both ends to collect silt and debris carried by the pipes. Additionally, a row of inspection and maintenance cells are proposed across the tank for maintenance purposes.

The catchpit downstream of the cellular storage tank has a Hydrobrake to control the discharge rate. The Hydrobrake has been sized to provide reduction of the upstream storage requirement. The discharging pipe is sized to have adequate velocity and reduce the risk of blockages.

5.5 Water Quality

In line with the 4-Pillars of SuDS, the design should seek to provide an appropriate level of water treatment to effectively mitigate the pollution risk associated with the site and not affect the quality of water downstream.

The proposed development has 2 key drivers of pollutant risks to the receiving sewer system, namely pollution from the new parking areas and building roofs.

As the proposed parking area provides less than 50 spaces and is also less than 800m², it is presenting a low pollution risk to surface water and a petrol/oil interceptor is not needed. Treatment will be provided by SuDS components.

It will be required that any gullies and drainage channels will be fitted with silt traps, and catch pits will be incorporated into the system to reduce the risk of silts/salts entering the network.

Table 26.2 of The SuDS Manual identifies the overall pollution hazard level from the site to be Low. As it is proposed to discharge to surface water, the 'Simple Index Approach' (SIA) as detailed in Box 26.2 of The SuDS Manual has been used.

Step 1 of the SIA is to identify the relevant pollution hazard indices for the proposed development, these are shown in Table 5.2 below.

Table 5.2: Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metal	Hydro-carbons
Non-Residential Roofs	Low	0.3	0.2	0.05
Low traffic roads and car parking with infrequent change	Low	0.5	0.4	0.4

Table 26.3 of the SuDS Manual provides various mitigation indices for discharge to surface waters. The mitigation indices for SuDS elements that could be included within the proposed development show in Table 5.3 below.

Table 5.3: Pollution Mitigation Indices

SuDS System	Total Suspended Solids (TSS)	Metal	Hydro-carbons
Permeable Surfaces	0.7	0.6	0.7
Bioretention Areas	0.8	0.8	0.8

The total SuDS mitigation index for each pollutant is a combination of the mitigation index of each proposed SuDS system in the management train. The first element will always be more effective than subsequent elements given that the concentration of pollutants in the runoff decreases.

Equation 5.1: SuDS Mitigation

$$\boldsymbol{Total\ SuDS\ Mitigation = Mitigation\ Index_1 + 0.5(Mitigation\ Index_n)}$$

Although potential SuDS options have been stated, alternative options may be considered provided that the management train meets or exceeds the water quality requirements.

Provided that the mitigation indices of the various treatment trains meet or exceed the requirements of each pollutant, it is expected that there will be no reduction in the quality of water being discharged into the public sewer network.

6. Foul Water Management Strategy

6.1 Pre-Development Foul Water Drainage

As described in Section 2.5, initial site investigations and Thames Water sewer records have identified the following:

6.1.1 Thames Water

There is a 150mm foul sewer in Oldfield Road.

6.1.2 Private Drains

There are existing drains for the current building.

6.2 Post-Development Foul Water Drainage

The proposed foul water network will connect all new soil, waste and ventilating pipes, sanitary appliances, and gullies at ground level and discharge into the Thames Water sewer.

It is expected that discharge into the system will be domestic in nature. Any future expansions which will result in the discharge of trade effluent will require a formal application to Thames Water.

It is proposed that the system will drain via gravity and pumped into Thames Water sewer.

The design of all foul sewers and lateral drains must conform to BS EN 752, BS EN 16933, Building Regulations 2010 Part H, planning policy and best practice guidelines wherever applicable. Sanitary systems within building should be designed in accordance with BS EN 12056-2.

Refer to Appendix H for the proposed drainage strategy.

6.3 Post-Development Foul Water Flow Rates

Existing drains will not need diverting and will be abandoned. New foul flows are negligible.

7. Ownership and Maintenance Responsibilities

It is anticipated and expected that the future maintenance of the drainage network will be undertaken by Shurgard UK Ltd or a suitably qualified management company.

Both the foul and surface water drainage systems will require regular maintenance to prevent a failure of the system or a reduction in the capacity as designed.

The following tables set out the required maintenance actions and frequency for the various elements of the drainage network.

Table 7.1: Proposed Maintenance Schedules for Below Ground Drainage

Permeable Surfaces		
Maintenance Schedule	**Required Action**	**Frequency**
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface).	Annually, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – particular attention should be given to areas where water runs onto pervious surfaces from adjacent impermeable areas.
Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required.
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying.	As required – annually on less frequently used pavements.
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm 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.
Monitoring	Initial inspection.	Monthly for three months after installation.
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action.	Every three months, 48 hrs after large storms in first six months.

	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually.
	Monitor inspection chambers.	Annually.

Reference should be made to the manufacturer recommendations where applicable

Underground Geocellular Tanks		
Maintenance Schedule	**Required Action**	**Frequency**
Regular maintenance	Inspect and identify any areas 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 or 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.
Reference should be made to the manufacturer recommendations where applicable		

Green roofs		
Maintenance Schedule	**Required Action**	**Frequency**
Regular inspections	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural stability.	Annually and after severe storms.
	Inspect soil substrate for evidence of erosion channels and identify sediment sources.	Annually and after severe storms.
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system.	Annually and after severe storms.
	Inspection underside of roof for evidence of leakage.	Annually and after severe storms.
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth.	Six monthly and annually, or as required
	During establishment (i.e. year one), replace dead plants as required	Monthly
	Post establishment, replace dead plants as required (where >5% of coverage)	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting (if appropriate) as required – clippings should be removed and not allowed to accumulate	Six monthly or as required
Remedial actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources of erosion damage should be identified and controlled.	As required.

	If drain inlet has settled, cracked or moved, investigate and repair as appropriate.	As required.

Reference should be made to the manufacturer recommendations where applicable

Other Drainage Items		
Feature	**Maintenance**	**Frequency**
Private Drains	Inspection	CCTV survey every 5-10 years.
	Regular Maintenance	Jet clean system fully every 5-10 years. (Recommend prior to CCTV drainage survey).
	Remedial / Occasional Maintenance	Carry out remedial works as identified in CCTV survey.
Discharge orifice manholes/flow control devices	Inspection	Quarterly.
	Regular Maintenance	Remove silt and debris as necessary to prevent build up.
Gully / Drainage Channels	Inspection	Quarterly
	Regular Maintenance	Remove silt and debris as necessary to prevent build up.

An initial risk assessment has been carried out, Table 5.3 below, and a detailed risk assessment should be undertaken at the detailed design stage and passed on to the development operator as part of the Operations and Maintenance Manual during the handover phase of works.

A formal risk review should be undertaken on an annual basis:

Table 7.2: Pollution Hazard Indices

Operation	Risks	Mitigating Measures
Access to manholes for Inspection and Maintenance.	1. Confined spaces	1. Entry to confined space to be minimised and, where unavoidable, to be carried out by appropriately trained personnel
Removal of silt from outfall	1. Risk to members of the public	1. Access to hazardous areas by members of the public to be prohibited. 2. To be carried out by appropriately trained personnel
Removal of silt from drainage channel	1. Risk to members of the public	1. Access to hazardous areas by members of the public to be prohibited

All inspection and maintenance works should take into consideration the implications of 'lone working' and a suitable assessment should be carried out with suitable risk mitigation measures being implemented.

8. Residual Risk

Provided that the surface and foul water regimes as set out in Sections 4 and 6, above, is implemented, it is expected that the primary residual failure would be as a result of some form of failure of the site drainage system during the life of the development. Therefore, regular, ongoing maintenance as set out in Section 7, above, will be required to ensure that the capacity of the system is maintained as designed.

In addition, there remains the risk of a storm event beyond that of the 1 in 100 AEP plus 40% allowance for climate change design storm which have not have been explicitly accounted for.

9. Consent / Planning

9.1 Thames Water

9.1.1 Sewer Connection

Thames Water requires that any connection to the public sewer network is subject to a S106 application.

9.2 Lead Local Flood Authority

In addition to the above, the LLFA is a statutory consultee for planning applications with regards to flood risk and drainage. It is therefore expected that the Local Planning Authority will consult with the LLFA and seek comments.

9.3 Network Rail

The site is close to Network Rail train tracks.

10. Conclusions and Recommendations

10.1 Conclusions

This report has been produced to develop a surface and foul water drainage strategy in support of the detailed planning application for the extension. It has concluded the following conclusions:

1. Surface water is discharged at 1.5l/s for a pumped system.
2. Using a pumped outfall, 159m^3 of attenuation storage is needed.
3. There is a very small foul water discharge.
4. SuDS are to be green roof and porous paving.
5. Surface and foul water will be pumped into Thames Water sewers.

10.2 Recommendations

Based on the above conclusions, the following recommendations are made:

1. Site-level design is mindful of surface water flows.
2. Site levels do not let water flow or pond inside the building or leave the site.
3. Invert levels of Thames Water sewers are confirmed.
4. S106 applications are made to Thames Water.

Appendix A

Proposed Site Layout

Leylandii
Hgt:9
U/Hgt:30

G4
Beech
Hgt:6
U/Hgt:30

T6
Beech
Hgt:8
U/Hgt:30

T5
Beech
Hgt:6
U/Hgt:30

T4
Purple-leaved plum
Hgt:8
U/Hgt:15

T3 G3 G3 G3
Black pine
Hgt:8
U/Hgt:30

G3
Silver birch
Hgt:12
U/Hgt:25

T2
Fan palm
Hgt:3
U/Hgt:5

G2
Silver birch
Hgt:12
U/Hgt:25

G1
Silver birch
Hgt:12
U/Hgt:25

SMOKE VENTS TO BASEMENT
DIRECT ACCESS
FIRE FIGHTING STAIR
SMOKE SHAFT
+17.00
BUSINESS CENTRE 120sqm
BUSINESS CENTRE 49sqm
Incoming Services
Refuse Storage
18m
Brick WALL
GEO1A

NOTES

ORIGINAL A1

All levels and dimensions to be checked on site prior to construction / fabrication; report discrepancies immediately.
Do not scale dimensions from this drawings.
This drawing is copyright protected.

REVISION

A	110324	Internal layout updated	AF
B	120324	Vents moved, stairs noted	AF
C	130524	Parking amended	AF
D	160524	Van spaces added	AF
E	130724	Building footprint updated	AF

- Visitor Parking:
  2 x Car space
  (1 of which is Accessible)
- Customer Parking:
  7 x Car space
  (2 of which are Electrical Charge points and 2 van spaces)
- Staff Parking:
  1 x Car space
- Electrical Car "Twin" charging point
- Bicycle Parking:
  1 short stay Cargo Bikes
  5 short stay - standard
  20 long stay - of which 1 is cargo
- Refuse Requirement = 0.1 sqm
  Actual Refuse Store = 11m2
- Landscaping zone = 493m2
- Site Boundary = 3094 m2

SCALE 1:125
0 1 2 3 4 5m

N

PLANNING

SCALE	DATE	DRAWN	CHECKED
1:125@A1	FEB'24	AF	

PROJECT
SHURGARD UK
OLDFIELD ROAD, HAMPTON
TW12 2HR

DRAWING
Site Plan
As Proposed

Threesixty Architecture
10 MONTROSE STREET
GLASGOW
G1 1RE
t 0141 229 7575
www.360architecture.com

DRAWING No.
23053GA_D_002E

Appendix B

Topographic and Utilities Survey

DISCLAIMER:

At GEO UK LTD we use skilled and experienced staff, modern up to date techniques and top of the range electromagnetic and radar technology to locate and trace sub-surface utilities. However the performance of the equipment employed in non-invasive surveys can be adversely affected by factors outside the control of GEO UK LTD.. Therefore GEO UK LTD cannot guarantee that all utilities present on site have been located. It is the responsibility of the Client to consult regional authority records and undertake trial digs where appropriate.

Where similar services run in close proximity it may be impossible to separately trace individual services as the trace signal can experience interference. In such cases, services will be shown as a single, annotated line. The displayed depth will refer to the shallowest detected utility.

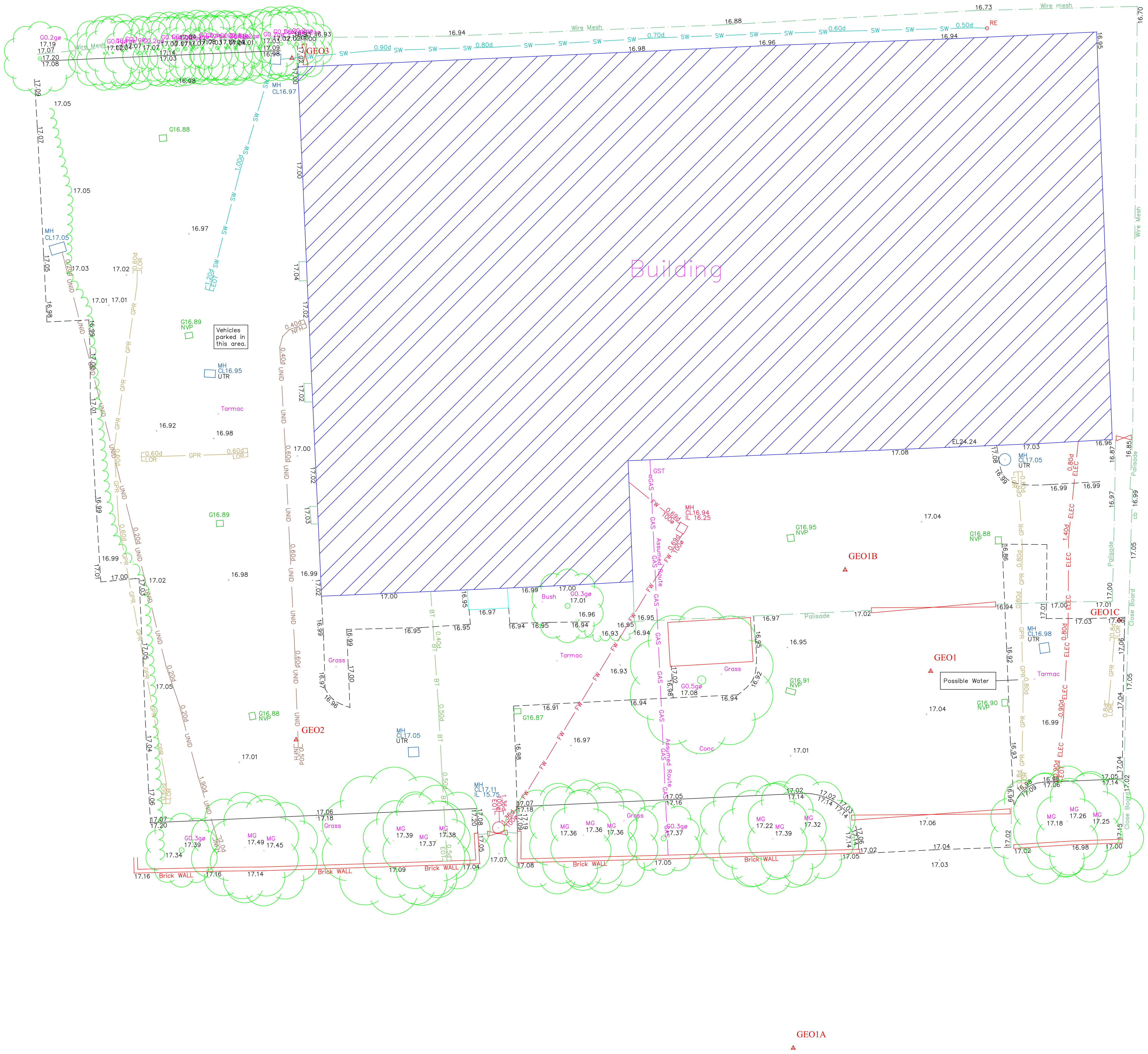
Successful tracing of non-conductive materials may be limited. Drainage gulleys are dye tested where possible to prove connectivity but it is not always possible to introduce the sonde due to narrow pipe sizes and/or accumulated silt.

Depth information of underground services/features are generally accurate to within +/- 10% (i.e. a pipe at 2m deep may be accurate to +/-200mm) but this cannot be guaranteed. Depths shown usually refer to the top of the service. Gravity sewer and drain depths are usually to invert (base of drainage channel) unless otherwise stated.

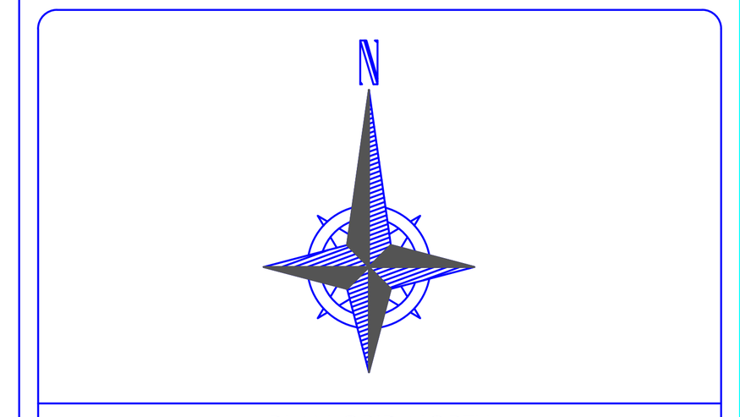
Some above ground features may have been obscured at time of survey. It is not always possible to operate the Ground Penetrating Radar in areas including, but not limited to, dense vegetation, rubble, debris and/or rough/uneven ground.

Existing record information that was made available to GEO UK LTD by the Client or by the statutory utility provider should be regarded only as an indication and cannot be guaranteed.

Excavation in the vicinity of services shown should be carried out with due diligence (Ref. HSG47).



SURVEY STATIONS			
Name	Easting	Northing	Height
GEO1	513153.822	169741.716	17.043
GEO2	513116.349	169737.669	17.011
GEO1B	513148.767	169747.703	17.002
GEO1C	513164.944	169744.749	17.059
GEO1A	513145.704	169719.458	17.033
GEO3	513116.095	169777.929	16.991



PLAN GRID NORTH

File Name: G23457 - Oldfields Road, Hampton Topographical & Utility Survey New.dwg

LEGEND

AV	AIR VALVE
BT	BT INSPECTION COVER
CB	CONTROL BOX
CCTV	CCTV CAMERA POST
COM	COMMUNICATIONS COVER
CL	COVER LEVEL
CTV	CABLE TV COVER
DC	DRAINAGE CHANNEL
DP	DOWN PIPE
DR	DRAIN
EIC	ELEC INSPECTION COVER
ELB	ELECTRIC BOX
ER	EARTH ROD
EP	ELECTRICITY POLE
FFL	FINISHED FLOOR LEVEL
FH	FIRE HYDRANT
G	GULLY
GLT	GROUND LIGHT
GST	GAS TAP
GSV	GAS VALVE
IC	INSPECTION COVER
IL	INVERT LEVEL
KO	KERB OUTLET
LP	LAMP POST
MH	MANHOLE
MKR	MARKER
OP	OUTFALL PIPE
PN	PYLON
PP	PETROL PUMP
RE	RODDING EYE
RWP	RAINWATER PIPE
SOF	SOFFIT LEVEL
SV	STOP VALVE
TCB	TELEPHONE CALL BOX
TL	TRAFFIC LIGHT
TLB	TRAFFIC LIGHT BOX
TP	TELEGRAPH POLE
WM	WATER METER
WO	WATER OUTLET
WST	WATER STOP TAP
WSV	WATER STOP VALVE
EOT	END OF TRACE
OSA	OUT OF SURVEY AREA
UTL	UNABLE TO LOCATE
UTS	UNABLE TO SONDE
UTT	UNABLE TO TRACE
S/L	SIGNAL LOSS
BLK	BLOCKED
NFH	NO FURTHER GPR CONTACTS
BD	BACKDROP PIPE
NVP	NO VISIBLE PIPE
ToP	TOP OF PIPE
⌴	EOT SYMBOL
UTR	UNABLE TO RAISE

BT	BT
CABLE DUCT	DUCT
CABLE TV	CATV
CCTV	CCTV
TELECOMS	COM
EARTH ROD STRIP	ER
ELECTRIC	ELEC
FIBRE-OPTICS	F/O
FUEL LINE	FL
GPR DETECTION LINE	GPR
MAINS GAS	GAS
MAINS WATER	W
SEWER CW	CW
SEWER FW	FW
SEWER SW	SW
TRAFFIC SIGNAL CABLE	TS
UNIDENTIFIED TRACE	UNID
UNIDENTIFIED CABLE	UC
UNIDENTIFIED PIPE	UP
VEHICLE DETECTION CABLE	VDC
SURVEY BOUNDARY	

FROM STATUTORY AUTHORITY PLANS

BT
CABLE DUCT
CATV
CCTV
TELECOMS
ELECTRIC
MAINS GAS
MAINS WATER
SEWER CW
SEWER FW
SEWER SW
FIBRE-OPTICS — F/O STAT

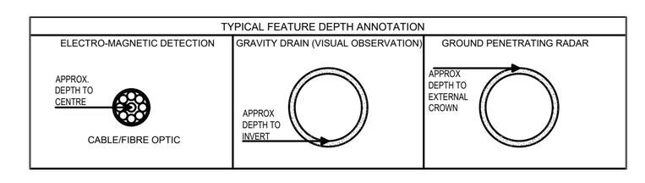
NOTES:

All levels relate to O.S (Newlyn) Datum, Established using network RTK. Survey plotted on a plane local grid, orientated to National Grid.

Services shown as "From Statutory Authority Plans" line styles are taken from Statutory Records plans supplied by the relevant regional authority. These services were not located and are shown for indicative purposes only.

Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of GEO UK Ltd.

TYPICAL FEATURE DEPTH ANNOTATION



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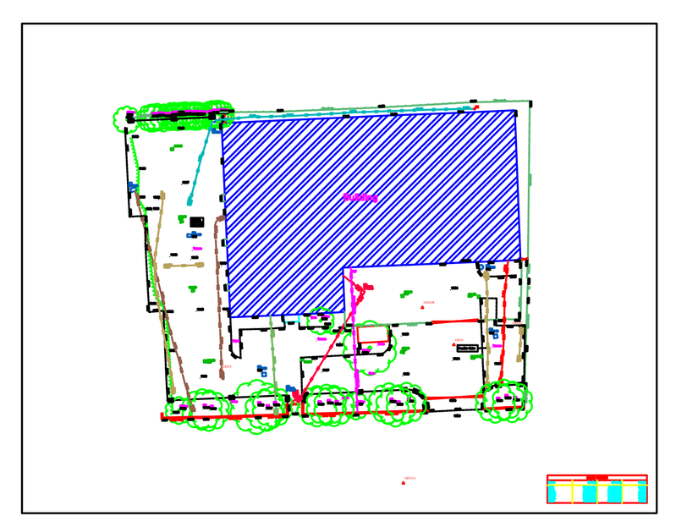
Excavation in the vicinity of services shown should be carried out with due diligence (Ref. HSG47).



SHEET LAYOUT

0 1m 2m 4m 6m 8m

SCALE BAR

REV	DATE	DESCRIPTION

Geographical Engineering Operations

Client
Brownfield Solutions LTD
William Smith House
173-183 Witton Street
Northwich
Cheshire
CW9 5LP

Project Title
Utility Survey of Land at:
Oldfields Road
Hampton
TW12 2HR

Surveyed	Drawn	Checked
DH LM	JAS	GEO UK LTD

Scale	Date	Drawing Ref.	No.	Size	Rev
1:100	JUL 23	G23457	01	A0	--

Appendix C

Thames Water Sewer Records

CommercialDW
Drainage & Water Enquiry

Thames Water Property Searches

SearchFlow Limited
42
Kings Hill Avenue
Kings Hill
West Malling
ME19 4AJKent

Search address supplied	Hilton Banks Ltd, Floor:Not applicable, 74, Oldfield Road, HAMPTON, TW12 2HR
Your reference	SHU001/0041
Our reference	CDWS/CDWS Standard/2023_4846311
Received date	21 June 2023
Search date	21 June 2023

Keeping you up-to-date

Notification of Price Changes

From 1st April 2023 Thames Water property Searches will be increasing the price of it CON29DW, CommercialDW Drainage & Water Enquiries and Asset Location Searches.

Historically cost would rise in line with RPI but as this currently sits at 14.2%, we are capping it at 10%. Customer will be emailed with the new price by January 1st 2023. Any orders received with higher payments prior to 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

CON29DW COMMERCIAL DRAINAGE & WATER SEARCH

DRAINAGE + WATER SEARCHES NETWORK DWSN

CommercialDW
Drainage & Water Enquiry

Thames Water Property Searches

Question		Summary Answer
Maps		
1.1	Where relevant, please include a copy of an extract from the public sewer map.	Map Provided
1.2	Where relevant, please include a copy of an extract from the map of waterworks.	Map Provided
Drainage		
2.1	Does foul water from the property drain to a public sewer?	Connected
2.2	Does surface water from the property drain to a public sewer?	Connected
2.3	Is a surface water drainage charge payable?	See Details
2.4	Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?	No
2.4.1	Does the public sewer map indicate any public pumping station or any other ancillary apparatus within the boundaries of the property?	No
2.5	Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?	Yes
2.5.1	Does the public sewer map indicate any public pumping station or any other ancillary apparatus within the 50metres of any buildings within the property?	No
2.6	Are any sewers or lateral drains serving, or which are proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?	No
2.7	Has a sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?	No
2.8	Is the building, which is or forms part of the property, at risk of internal flooding due to overloaded public sewers?	Not At Risk
2.9	Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.	3.576 Kilometres
Water		
3.1	Is the property connected to mains water supply?	Connected
3.2	Are there any water mains, resource mains or discharge pipes within the boundaries of the property?	Yes
3.3	Is any water main or service pipe serving, or which is proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?	No
3.4	Is the property at risk of receiving low water pressure or flow?	No
3.5	What is the classification of the water supply for the property?	HARD
3.6	Is there a meter installed at this property?	Yes
3.7	Please include details of the location of any water meter serving the property.	See Details

CommercialDW
Drainage & Water Enquiry

Thames Water Property Searches

Question		Summary Answer
Charging		
4.1.1	Who is responsible for providing the sewerage services for the property?	Thames Water
4.1.2	Who is responsible for providing the water services for the property?	Thames Water
4.2	Who bills the property for sewerage services?	See Details
4.3	Who bills the property for water services?	See Details
Trade Effluent		
5.1	Is there a consent, on this property, to discharge Trade Effluent under S118 of the Water Industry Act(1991) into the public sewerage system?	No
Wayleaves, Easements, Manhole Cover and Invert levels		
6.1	Is there a wayleave/easement agreement giving Thames Water the right to lay or maintain assets or right of access to pass through private land in order to reach the Company's assets?	Yes
6.2	On the copy extract from the public sewer map, please show manhole cover, depth and invert levels where the information is available.	See Details

Search address supplied: Hilton Banks Ltd, Floor:Not applicable, 74, Oldfield Road, HAMPTON, TW12 2HR

Any new owner or occupier will need to contact Thames Water on 0800 316 9800 or log onto our website www.thameswater.co.uk and complete our online form to change the water and drainage services bills to their name.

The following records were searched in compiling this report: - the map of public sewers, the map of waterworks, water and sewer billing records, adoption of public sewer records, building over public sewer records, the register of properties subject to internal foul flooding, the register of properties subject to poor water pressure and the drinking water register.
Thames Water Utilities Ltd (TWUL) holds all of these.

TWUL, trading as Property Searches, are responsible in respect of the following:-

(i) any negligent or incorrect entry in the records searched

(ii) any negligent or incorrect interpretation of the records searched

(iii) any negligent or incorrect recording of that interpretation in the search report

(iv) and compensation payments

Maps

1.1 Where relevant, please include a copy of an extract from the public sewer map.

A copy of an extract of the public sewer map is included, showing the public sewers, disposal mains and lateral drains in the vicinity of the property.

1.2 Where relevant, please include a copy of an extract from the map of waterworks.

A copy of an extract of the map of waterworks is included, showing water mains, resource mains or discharge pipes in the vicinity of the property.

Drainage

2.1 Does foul water from the property drain to a public sewer?

Records indicate that foul water from the property drains to a public sewer.

2.2 Does surface water from the property drain to a public sewer?

Records indicate that surface water from the property drains to a public sewer.

2.3 Is a surface water drainage charge payable?

Records indicate that a surface water charge is applicable at this property.

2.4 Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundary of the property?

The public sewer map indicates that there are no public sewers, disposal mains or lateral drains within the boundaries of the property. However, from the 1st October 2011 there may be lateral drains and/or public sewers which are not recorded on the public sewer map but which may prevent or restrict development of the property.

2.4.1 Does the public sewer map indicate any public pumping station or any other ancillary apparatus within the boundaries of the property?

The public sewer map included indicates that there is no public pumping station within the boundaries of the property.

2.5 Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?

The public sewer map included indicates that there is a public sewer within 30.48 metres (100 feet) of a building within the property.

2.5.1 Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?

The public sewer map included indicates that there is no public pumping station within 50 metres of any buildings within the property.

2.6 Are any sewers or lateral drains serving, or which are proposed to serve, the property the subject of an existing adoption agreement or an application for such an agreement?

Records confirm that Foul sewers serving the development, of which the property forms part are not the subject of an existing adoption agreement or an application for such an agreement.

The Surface Water sewer(s) and/or Surface Water lateral drain(s) are not the subject of an adoption agreement.

2.7 Has a sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?

There are no records in relation to any approval or consultation about plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain. However, the sewerage undertaker might not be aware of a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain.

2.8 Is the building which is or forms part of the property, at risk of internal flooding due to overloaded public sewers?

The property is not recorded as being at risk of internal flooding due to overloaded public sewers.

From the 1st October 2011 most private sewers, disposal mains and lateral drains were transferred into public ownership It is therefore possible that a property may be at risk of internal flooding due to an overloaded public sewer which the sewerage undertaker is not aware of. For further information it is recommended that enquiries are made of the vendor.

2.9 Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.

The nearest sewage treatment works is Esher STW which is 3.576 kilometres to the south of the property.

Water

3.1 Is the property connected to mains water supply?

Records indicate that the property is connected to mains water supply.

3.2 Are there any water mains, resource mains or discharge pipes within the boundary of the property?

The map of waterworks indicates that there are water mains, resource mains or discharge pipes within the boundaries of the property.

3.3 Is any water main or service pipe serving, or which is proposed to serve, the property the subject of an existing adoption agreement or an application for such an agreement?

Records confirm that water mains or service pipes serving the property are not the subject of an existing adoption agreement or an application for such an agreement.

3.4 Is the property at risk of receiving low water pressure or flow?

Records confirm that the property is not recorded on a register kept by the water undertaker as being at risk of receiving low water pressure or flow.

3.5 What is the classification of the water supply for the property?

The water supplied to the property has an average water hardness of 111.4mg/l calcium which is defined as HARD by ThamesWater.

3.6 Is there a meter installed at this property?

Records indicate that there is a meter installed at this property.

3.7 Please include details of the location of any water meter serving the property.

Records indicate that the property is served by a water meter, which is located within the property.

Charging

4.1.1 – Who is responsible for providing the sewerage services for the property?

Thames Water Utilities Limited, Clearwater Court, Reading, RG1 8DB is the sewerage undertaker for the area.

4.1.2 – Who is responsible for providing the water services for the property?

Thames Water Utilities Limited, Clearwater Court, Reading, RG1 8DB is the water undertaker for the area.

4.2 Who bills the property for sewerage services?

If you wish to know who bills the sewerage services for this property then you will need to contact the current owner. For a list of all potential retailers of sewerage services for the property please visit www.open-water.org.uk

4.3 Who bills the property for water services?

If you wish to know who bills the water services for this property then you will need to contact the current owner. For a list of all potential retailers of water services for the property please visit www.open-water.org.uk

Trade Effluent

5.1 Is there a consent, on this property, to discharge Trade Effluent under S118 of the water Industry act (1991) into the public sewerage systems?

No.

Wayleaves, Easements, Manhole Cover and Invert levels

6.1 Is there a wayleave/easement agreement giving Thames water the right to lay or maintain assets or right of access to pass through private land in order to reach the Company's assets?

Yes, records indicate that there is a wayleave and/or an easement affecting this site. Please note that if you require further information about wayleaves and/or easements, these enquiries cannot be dealt with over the phone. To request more details about the wayleave and/or an easement please email TWPROPERTYRECORDS@thameswater.co.uk. Please include a boundary plan which clearly shows the site boundary along with a copy of this search result. Failure to include the plan and copy of this search result may delay the response. Alternatively you may write to: Thames Water Property, 1st Floor West, Clearwater Court, Vastern Road, Reading, Berkshire, RG1 8DB, however email is preferred. We endeavour to respond within 20 working days.

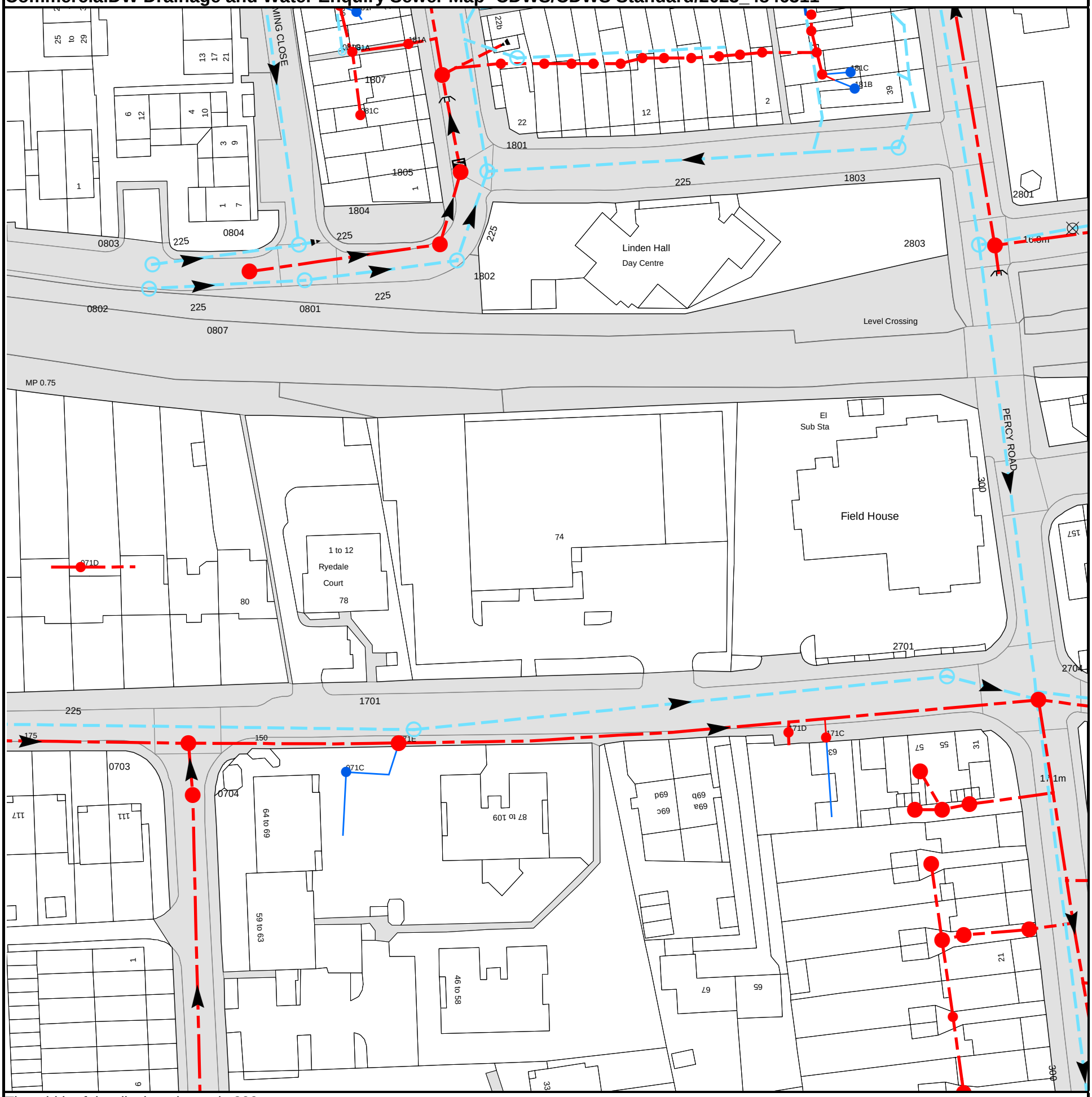
6.2 On the copy extract from the public sewer map, please show manhole cover, depth, and invert levels where the information is available.

Details of any manhole cover and invert levels applicable to this site are enclosed.

Payment for this Search

The charge will be added to the NLIS Account. This search was ordered through National Land Information Services, Russell Square House, 10-12 Russell Square, London WC1B 5LF.

CommercialDW Drainage and Water Enquiry Sewer Map- CDWS/CDWS Standard/2023_4846311



The width of the displayed area is 200m

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 no survey information is available.

Manhole Reference	Manhole Cover Level	Manhole Invert Level
071D	n/a	n/a
1805	17.01	n/a
081D	n/a	n/a
081G	n/a	n/a
081A	n/a	n/a
081F	n/a	n/a
181A	n/a	n/a
1807	15.24	n/a
18YZ	n/a	n/a
18ZQ	n/a	n/a
18VW	n/a	n/a
18VX	n/a	n/a
18VY	n/a	n/a
18VZ	n/a	n/a
18WP	n/a	n/a
18WQ	n/a	n/a
18WR	n/a	n/a
18WS	n/a	n/a
18WT	n/a	n/a
18WV	n/a	n/a
18VT	n/a	n/a
18VV	n/a	n/a
18VS	n/a	n/a
18VR	n/a	n/a
181C	n/a	n/a
181B	n/a	n/a
26ZQ	n/a	n/a
26ZP	n/a	n/a
26YZ	n/a	n/a
26YY	n/a	n/a
26YX	n/a	n/a
26YV	n/a	n/a
27YY	n/a	n/a
17ZY	n/a	n/a
27YX	n/a	n/a
071C	n/a	n/a
27YQ	n/a	n/a
171E	n/a	n/a
171C	n/a	n/a
171D	n/a	n/a
1701	n/a	n/a
2704	n/a	n/a
2701	n/a	n/a
1802	16.96	n/a
2801	16.8	15.05
2803	16.8	12.33
1804	n/a	n/a
1801	17.03	15.01
1803	n/a	n/a
081C	n/a	n/a
0802	16.92	n/a
0803	16.97	n/a
0703	16.89	n/a
0704	16.94	n/a
0807	n/a	n/a
0804	16.89	n/a
0801	16.97	n/a

Con29DW Commercial Drainage and Water 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

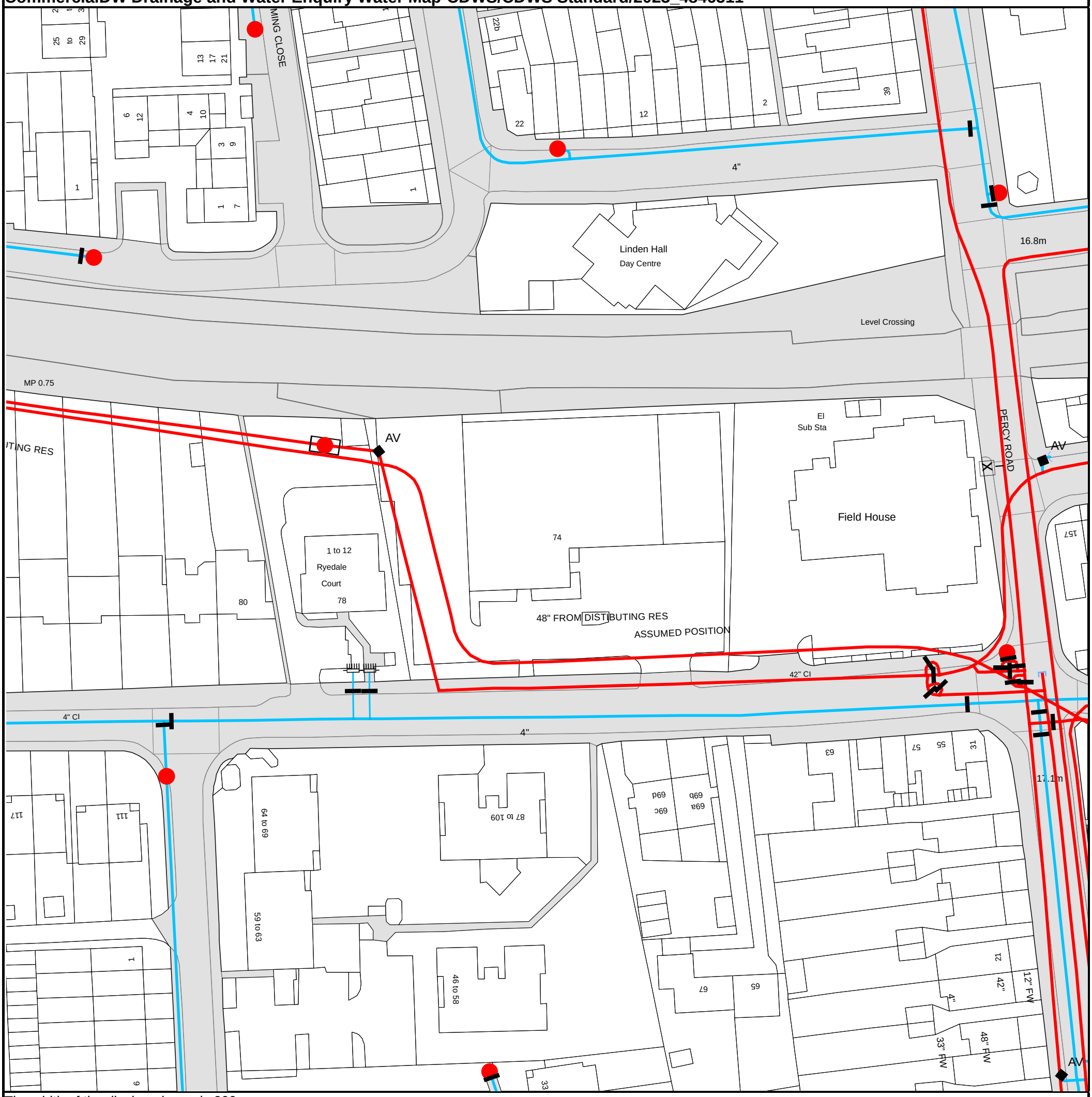
Notes:

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.

Thames Water Utilities Ltd, Property Searches, PO Box 3189, Slough SL1 4W
T 0800 009 4540 **E** searches@thameswater.co.uk **I** www.thameswater-propertysearches.co.uk

CommercialDW Drainage and Water Enquiry Water Map-CDWS/CDWS Standard/2023_4846311



The width of the displayed area is 200m

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.

Con29DW Commercial Drainage and Water 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.

Thames Water Utilities Ltd, Property Searches, PO Box 3189, Slough SL1 4W
T 0800 009 4540 **E** searches@thameswater.co.uk **I** www.thameswater-propertysearches.co.uk

For your guidance:

- Thames Water Property Searches Complaints Procedure:
  - Thames Water Property Searches offers a robust complaints procedure. Complaints can be made by telephone, in writing, by email (searches@thameswater.co.uk) or through our website (www.thameswater-propertysearches.co.uk)

As a minimum standard Thames Water Property Searches will:

- endeavour to resolve any contact or complaint at the time of receipt. If this isn't possible, we will advise of timescales;
- investigate and research the matter in detail to identify the issue raised (in some cases third party consultation will be required);
- provide a response to the customer within 10 working days of receipt of the complaint;
- provide compensation, if no response or acknowledgment that we are investigating the case is given within 10 working days of receipt of the complaint;
- keep you informed of the progress and, depending on the scale of investigation required, update with new timescales as necessary;
- provide an amended search, free of charge, if required;
- provide a refund if we find your complaint to be justified; take the necessary action within our power to put things right.

If you want us to liaise with a third party on your behalf, just let us know.

If you are still not satisfied with the outcome provided, we will refer the matter to a Senior Manager, for resolution, who will respond again within 5 working days.

If you remain dissatisfied with our final response you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). Further information can be obtained by visiting www.tpos.co.uk or by sending an email to admin@tpos.co.uk

Question 1.1

For your guidance:

- The Water Industry Act 1991 defines Public Sewers as those which Thames Water have responsibility for. Other assets and rivers, watercourses, ponds, culverts or highway drains may be shown for information purposes only.
- 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.
- Assets other than public sewers may be shown on the copy extract, for information.

Question 1.2

For your guidance:

- The "water mains" in this context are those, which are vested in and maintainable by the water company under statute.
- Assets other than public water mains may be shown on the plan, for information only.
- Water companies are not responsible for private supply pipes connecting the property to the public water main and do not hold details of these. These may pass through land outside of the control of the seller, or may be shared with adjacent properties. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
- 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.

Question 2.1

For your guidance:

- Water companies are not responsible for any private drains that connect the property to the public sewerage system and do not hold details of these. The property owner will normally have sole responsibility for private drains serving the property. These may pass through land outside the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
- If foul water does not drain to the public sewerage system, the property may have private facilities in the form of a cesspit, septic tank or other type of treatment plant.
- An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

Question 2.2

For your guidance:

- Sewerage Undertakers are not responsible for any private drains that connect the property to the public sewerage system, and do not hold details of these.
- The property owner will normally have sole responsibility for private drains serving the property. These private drains may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
- In some cases, 'Sewerage Undertakers' records do not distinguish between foul and surface water connections to the public sewerage system.
- At the time of privatisation in 1989, Sewerage Undertakers were sold with poorly-kept records of sewerage infrastructure. The records did not always show which properties were connected for surface water drainage purposes. Accordingly, billing records have been used to provide an answer for this element of the drainage and water search.
- Due to the potential inadequacy of 'Sewerage Undertakers' infrastructure records with respect to surface water drainage, it is the customer's responsibility to inform the Sewerage Undertaker that they do not receive the surface water drainage service. If on inspection, the buyer finds that surface water from the property does not drain to a public sewer, then the property may be eligible for a rebate of the surface water drainage charge. If you wish to know who bills the sewerage services for this property then you will need to contact the current owner. For a list of all potential retailers of sewerage services for the property please visit www.open-water.org.uk.
- If surface water from the property does not drain to the public sewerage system, the property may have private facilities in the form of a soakaway or private connection to a watercourse.
- An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

Question 2.3

For your guidance:

- If surface water from the property drains to a public sewer, then a surface water drainage charge is payable.
- Where a surface water drainage charge is currently included in the property's water and sewerage bill but, on inspection, the buyer finds that surface water from the property does not drain to a public sewer, then the property may be eligible for a rebate of the surface water drainage charge. If you wish to know who bills the sewerage services for this property then you will need to contact the current owner. For a list of all potential retailers of sewerage services for the property please visit www.open-water.org.uk.

Question 2.4

For your guidance:

- Thames Water has a statutory right of access to carry out work on its assets. Employees of Thames Water or its contractors may, therefore, need to enter the property to carry out work.
- Please note if the property was constructed after 1st July 2011 any sewers and/or lateral drain within the boundary of the property are the responsibility of the householder.
- The approximate boundary of the property has been determined by reference to the Ordnance Survey Record or the map supplied.
- The presence of a public sewer running within the boundary of the property may restrict further development. The Company has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the Company, or its contractors, needing to enter the property to carry out work.
- 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.

Question 2.4.1

For your guidance:

- Private pumping stations installed before 1st July 2011 will be transferred into the ownership of the sewerage undertaker.
- From the 1st October 2016 private pumping stations which serve more than one property have been transferred into public ownership but may not be recorded on the public sewer map.
- The approximate boundary of the property has been determined by reference to the Ordnance Survey Record or the map supplied.
- The presence of a public pumping station within the boundary of the property may restrict further development. The company has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the company, or its contractors, needing to enter the property to carry out work.
- 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.

Question 2.5

For your guidance:

- From the 1st October 2011 there may be additional lateral drains and/or public sewers which are not recorded on the public sewer map but are also within 30.48 metres (100 feet) of a building within the property.
- The presence of a public sewer within 30.48 metres (100 feet) of the building(s) within the property can result in the local authority requiring a property to be connected to the public sewer.
- The measurement is estimated from the Ordnance Survey record, between the building(s) within the boundary of the property and the nearest public sewer.
- 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.

Question 2.5.1

For your guidance:

- Private pumping stations installed before 1st July 2011 will be transferred into the ownership of the sewerage undertaker.
- From the 1st October 2016 private pumping stations which serve more than one property have been transferred into public ownership but may not be recorded on the public sewer map.
- The presence of a public pumping station within 50 metres of the building(s) within the property can result in the local authority requiring a property to be connected to the public sewer.
- The measurement is estimated from the Ordnance Survey record, between the building(s) within the boundary of the property and the nearest public sewer.
- 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.

Question 2.6

For your guidance:

- Any sewers and/or lateral drains within the boundary of the property are not the subject of an adoption agreement and remain the responsibility of the householder. Adoptable sewers are normally those situated in the public highway.
- This enquiry is of interest to purchasers who will want to know whether or not the property will be linked to a public sewer.
- Where the property is part of a very recent or ongoing development and the sewers are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains and sewers for which they will hold maintenance and renewal liabilities.
- Final adoption is subject to the developer complying with the terms of the adoption agreement under Section 104 of the Water Industry Act 1991 and meeting the requirements of 'Sewers for Adoption' 6th Edition.

Question 2.7

For your guidance:

- From the 1st October 2011 most private sewers, disposal mains and lateral drains were transferred into public ownership and the sewerage undertaker may not have been approved or consulted about any plans to erect a building or extension on the property over or in the vicinity of these.
- Buildings or extensions erected over a sewer in contravention of building controls may have to be removed or altered.

Question 2.8

For your guidance:

- For reporting purposes buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- A sewer is "overloaded" when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- "Internal flooding" from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- "At Risk" properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company's reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water Utilities Ltd on Tel: 0800 316 9800 or website www.thameswater.co.uk

Question 2.9

For your guidance:

- The nearest sewage treatment works will not always be the sewage treatment works serving the catchment within which the property is situated.
- The sewerage undertaker's records were inspected to determine the nearest sewage treatment works.
- It should be noted that there may be a private sewage treatment works closer than the one detailed above that has not been identified.
- As a responsible utility operator, Thames Water Utilities Ltd seeks to manage the impact of odour from operational sewage works on the surrounding area. This is done in accordance with the Code of Practice on Odour Nuisance from Sewage Treatment Works issued via the Department of Environment, Food and Rural Affairs (DEFRA). This Code recognises that odour from sewage treatment works can have a detrimental impact on the quality of the local environment for those living close to works. However DEFRA also recognises that sewage treatment works provide important services to communities and are essential for maintaining standards in water quality and protecting aquatic based environments. For more information visit www.thameswater.co.uk

Question 3.1

For your guidance:

- The Company does not keep details of private supplies. The situation should be checked with the current owner of the property.

Question 3.2

For your guidance:

- The boundary of the property has been determined by reference to the plan supplied. Where a plan was not supplied, the Ordnance Survey Record was used. If the Water undertaker mentioned in Question 4.1.2 is not Thames Water Utilities Ltd the boundary of the property has been determined by the Ordnance Survey.
- The presence of a public water main within the boundary of the property may restrict further development within it. Water companies have a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of the Company, or its contractors, needing to enter the property to carry out work.

Question 3.3

For your guidance:

- This enquiry is of interest to purchasers who will want to know whether or not the property will be linked to the mains water supply.

Question 3.4

For your guidance:

- “Low water pressure” means water pressure below the regulatory reference level, which is the minimum pressure when demand on the system is not abnormal.
- Water Companies are required to include in the Regulatory Register that is presented annually to the Director General of Water Services, properties receiving pressure below the reference level, provided that allowable exclusions do not apply (i.e. events which can cause pressure to temporarily fall below the reference level)
- The reference level of service is a flow of 9 litres/minute at a pressure of 10metres / head on the customer's side of the outside stop valve (osv). The reference level of service must be applied on the customer's side of a meter or any other company fittings that are on the customer's side of the main stop tap. The reference level applies to a single property. Where more than one property is served by a common service pipe, the flow assumed in the reference level must be appropriately increased to take account of the total number of properties served. For two properties, a flow of 18 litres/minute at a pressure of 10metres/head on the customers' side of the osv is appropriate. For three or more properties the appropriate flow should be calculated from the standard loadings provided in BS806-3 or the Institute of Plumbing handbook.
- **Allowable exclusions** The Company is required to include in the Regulatory Register properties receiving pressure below the reference level, provided that allowable exclusions listed below do not apply.
- **Abnormal demand:** This exclusion is intended to cover abnormal peaks in demand and not the daily, weekly or monthly peaks in demand, which are normally expected. Companies should exclude from the reported figures properties which are affected by low pressure only on those days with the highest peak demands. During the report year companies may exclude, for each property, up to five days of low pressure caused by peak demand.
- **Planned maintenance:** Companies should not report low pressures caused by planned maintenance. It is not intended that companies identify the number of properties affected in each instance. However, companies must maintain sufficiently accurate records to verify that low-pressure incidents that are excluded because of planned maintenance are actually caused by maintenance.
- **One-off incidents:** This exclusion covers a number of causes of low pressure; mains bursts; failures of company equipment (such as pressure reducing valves or booster pumps); firefighting; and action by a third party. However, if problems of this type affect a property frequently, they cannot be classed as one-off events and further investigation will be required before they can be excluded.
- **Low-pressure incidents of short duration:** Properties affected by low pressure, which only occur for a short period, and for which there is evidence that incidents of a longer duration would not occur during the course of the year, may be excluded from the reported figures.
- Please contact your water undertaker mentioned in Question 4.1.2 if you require further information on water pressure.

Question 3.5

For your guidance:

- Water hardness can be expressed in various indices for example the hardness settings for dishwashers are commonly expressed in Clark's degrees, but check with the manufacturer as there are also other units. The following table shows the normal ranges of hardness.

Thames Water Hardness Category	Calcium (mg/l)	Calcium Carbonate (mg/l)	English Clarke degrees	French degrees	General/ German degrees
Soft	0 to 40	0 to 100	0 to 7	0 to 10	0 to 5.6
Medium	41 to 80	101 to 200	8 to 14	11 to 20	5.7 to 11.2
Hard	Over 80	Over 200	Over 14	Over 20	over 11.2

- Please contact your water undertaker mentioned in Question 4.1.2 if you require further information on water hardness.

Question 3.6

For your guidance:

- The Water Industry Act 1991 Section 150, The Water Resale Order 2001 provides protection for people who buy their water or sewerage services from a person or company instead of directly from a water or sewerage company. Details are available from the Office of Water Services (OFWAT) website is www.ofwat.gov.uk.
- The Company may install a meter at the premises where a buyer makes a change of use of the property or where the buyer uses water for:
  - Watering the garden other than by hand (this includes the use of sprinklers).
  - Automatically replenishing a pond or swimming pool with a capacity greater than 10,000 litres.
  - A bath with a capacity in excess of 230 litres.
  - A reverse osmosis unit Where a meter does not serve the property and the customer wishes to consider this method of charging, they should contact the current owner if they wish to know who bills the sewerage and water services for this property. For a list of all potential retailers of sewerage and water services for the property please visit www.open-water.org.uk.

Question 3.7

For your guidance:

- Where a meter does not serve the property and the customer wishes to consider this method of charging, they should contact the current owner if they wish to know who bills the water services for this property. For a list of all potential retailers of water services for the property please visit www.open-water.org.uk.

Question 5.1

For your guidance:

- If a Trade effluent consent applies to the premises which are the subject of this search, it is for the applicant to satisfy itself as to the suitability of the consent for its client's requirements. The occupier of any trade premises in the area of a sewerage undertaker may discharge any trade effluent proceeding from those premises into the undertaker's public sewers if he does so with the undertaker's consent. If, in the case of any trade premises, any trade effluent is discharged without such consent or other authorisation, the occupier of the premises shall be guilty of an offence.
- Please note any existing consent is dependent on the business being carried out at the property and will not transfer automatically upon change of ownership.
- For further information regarding Trade Effluent consents please contact: Trade Effluent Control, Crossness STW, Belvedere Road, Abbey Wood London SE2 9AQ.

Question 6.1

For your guidance:

- This question relates only to private agreements between the water company acting in a private capacity and a landowner. Such contracts may often be part of a conveyance or land transfer, or a deed of grant of easement.
- If there is no formal easement, then a sewer or water main may have been constructed following the service of notice under the provisions of the Public Health Act 1936, Water Act 1945,Water Act 1989 or Water Industry Act 1991 as applicable. The company does not hold copies of these notices. However, in the absence of evidence to the contrary there is a legal presumption that all matters were properly dealt with. All rights and obligations relating to sewers and water mains are now covered by the Water Industry Act 1991. Where rights exist at the boundary of the property, but we are not sure of the exact correlation, we will answer “Yes” to this question. A documentary right can exist even if the physical asset itself has not yet been laid, or has been moved, or removed. Likewise the position of the right and of the asset may differ.
- You may also find that an asset is protected both with contractual rights and statutory rights. Please consult your solicitor as to why this may happen, and its effects.
- We refer to “defined” assets for the following reasons: Often a contract may give the water company an expressed right to install and maintain assets within an area but without stating the exact position or route of such assets. Also, the law may imply rights where none have been mentioned specifically in a related contract, such as a conveyance. Finally, rights may come into being through long use. In any of these cases the rights are undefined, and although the water company may need to rely on them from time to time, as we cannot map the rights accurately, we will answer “no” to this question.
- Information obtainable from physical inspection (including Trial Bore Holes) overrides information contained in the report.
- Any error in answering this question is not to be regarded as a waiver of the water company’s rights or title, or an agreement or representation that the water company is prepared to vary or discharge any of its rights or title.

Customer and Clients are asked to note these terms, which govern the basis on which this CommercialDW Drainage & Water Enquiry is supplied

Definitions

'Client' means the person, company or body who is the intended recipient of the Report with an actual or potential interest in the Property.
'Company' means a water service company or their data service provider producing the Report.
'Customer' means the person, company, firm or other legal body placing the Order, either on their own behalf as Client, or, as an agent for a Client.
'Order' means any request completed by the Customer requesting the Report.
'Property' means the address or location supplied by the Customer in the Order.
'Report' means the drainage and/or water report prepared by The Company in respect of the Property.
'Thames Water" means Thames Water Utilities Limited registered in England and Wales under number 2366661 whose registered office is at Clearwater Court, Vastern Road, Reading, Berks, RG1 8DB;

Agreement

1 Thames Water agrees to supply the Report to the Customer and the Client subject to these terms. The scope and limitations of the Report are described in paragraph 2 of these terms. Where the Customer is acting as an agent for the Client then the Customer shall be responsible for bringing these terms to the attention of the Client. The Customer and Client agree that the placing of an Order for a Report indicates their acceptance of these terms.

The Report

2. Whilst Thames Water will use reasonable care and skill in producing the Report, it is provided to the Customer and the Client on the basis that they acknowledge and agree to the following:-

2.1 The information contained in the Report can change on a regular basis so Thames Water cannot be responsible to the Customer and the Client for any change in the information contained in the Report after the date on which the Report was produced and sent to the Client.

2.2 The Report does not give details about the actual state or condition of the Property nor should it be used or taken to indicate or exclude actual suitability or unsuitability of the Property for any particular purpose, or relied upon for determining saleability or value, or used as substitute for any physical investigation or inspection. Further advice and information from appropriate experts and professionals should always be obtained.

2.3 The information contained in the Report is based upon the accuracy, completeness and legibility of the address and other information supplied by the Customer or Client.

2.4 The Report provides information as to the location and connection of existing services and should not be relied on for any other purpose. The Report may contain opinions or general advice to the Customer and the Client and Thames Water cannot ensure that any such opinion or general advice is accurate, complete or valid and accepts no liability therefore.

2.5 The position and depth of apparatus shown on any maps attached to the Report are approximate, and are furnished as a general guide only, and no warranty as to its correctness is given or implied. The exact positions and depths should be obtained by excavation trial holes and the maps must not be relied on in the event of excavation or other works made in the vicinity of apparatus shown on any maps.

Liability

3 Thames Water shall not be liable to the Client for any failure, defect or non-performance of its obligations arising from any failure of, or defect in any machine, processing system or transmission link or anything beyond Thames Water's reasonable control or the acts or omissions of any party for whom Thames Water are not responsible.

3.1 Where the Customer sells this report to a Client (other than in the case of a bona fide legal adviser recharging the cost of the Report as a disbursement) Thames Water shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) be liable for any loss or damage whatsoever and the Customer shall indemnify Thames Water in respect of any claim by the Client.

3.2 Where a report is requested for an address falling within a geographical area where Thames Water and another Company separately provide Water and Sewerage Services, then it shall be deemed that liability for the information given by Thames Water or the Company as the case may be will remain with Thames Water or the Company as the case may be in respect of the accuracy of the information supplied. Where Thames Water is supplying information which has been provided to it by another Company for the purposes outlined in this agreement Thames Water will therefore not be liable in any way for the accuracy of that information and will supply that information as agent for the Company from which the information was obtained.

3.3 Except in respect of death or personal injury caused by negligence, or as expressly provided in these Terms:

3.3.1 The entire liability of Thames Water or the Company as the case may be in respect of all causes of action arising under or in connection with the Report (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) shall not exceed £2,000,000 (two million pounds); and

3.3.2 Thames Water shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) be liable for any loss of profit, loss of goodwill, loss of reputation, loss of business or any indirect, special or consequential loss, damage or other claims, costs or expenses;

Copyright and Confidentiality

4. The Customer and the Client acknowledge that the Report is confidential and is intended for the personal use of the Client. The copyright and any other intellectual property rights in the Report shall remain the property of Thames Water or the Company as the case may be. No intellectual or other property rights are transferred or licensed to the Customer or the Client except to the extent expressly provided

4.1 The Customer or Client is entitled to make copies of the Report but is not permitted to copy any maps contained in, or attached to the Report

4.2 The maps contained in the Report are protected by Crown Copyright and must not be used for any purpose outside the context of the Report.

4.3 The Customer and Client agree (in respect of both the original and any copies made) to respect and not to alter any trademark, copyright notice or other property marking which appears on the Report.

Payment

5. Unless otherwise stated all prices are inclusive of VAT. The Customer shall pay for the price of the Report specified by Thames Water, without any set off, deduction or counterclaim.

5.1 Unless payment has been received in advance, Customers shall be invoiced for the agreed fee once their request has been processed. Any such invoice must be paid within 14 days. Where the Customer has an account with Thames Water, payment terms will be as agreed with Thames Water.

5.2 No payment shall be deemed to have been received until Thames Water has received cleared funds.

5.3 If the Customer fails to pay Thames Water any sum due Thames Water shall be entitled but not obliged to charge the Customer interest on the sum from the due date for payment at the annual rate of 2% above the base lending rate from time to time of Natwest Bank, accruing on a daily basis until payment is made. Thames Water reserves the right to claim interest under the Late Payment of Commercial Debts (Interest) Act 1998.

5.4 Thames Water reserves the right to increase fees on reasonable prior written notice at any time.

Cancellations or Alterations

6. Once an Order is placed, Thames Water shall not be under any obligation to accept any request to cancel that Order and payment for the Order shall still be due upon completion of the Report. In cases where an error has been made in the original Order (e.g. the Customer has supplied an incorrect address), the Customer will need to place a second Order, detailing the correct information, and shall be liable to pay a second charge in accordance with clause 5 above.

Delivery

7. On receiving your order the reports will be posted to you within 10 working days from receipt.

7.1 Delivery is subject to local post conditions and regulations. All items should arrive within 12 working days, but Thames Water cannot be held responsible should delays be caused by local post conditions, postal strikes or other causes beyond the control of Thames Water.

General

8. If any provision of these terms is or becomes invalid or unenforceable, it will be taken to be removed from the rest of these terms to the extent that it is invalid or unenforceable. No other provision of these terms shall be affected.

8.1 These terms shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts.

8.2 Nothing in this notice shall in any way restrict the Customer or Clients statutory or any other rights of access to the information contained in the Report.

These Terms & Conditions are available in larger print for those with impaired vision.

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.
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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 D

Greenfield Run-off Calculation

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Oliver Chard
Site name:	Shurgard Hampton
Site location:	TW12 2HR

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.41561° N
Longitude:	0.37451° W
Reference:	1647952421
Date:	Feb 29 2024 09:05

Runoff estimation approach

FEH Statistical

Site characteristics

Total site area (ha):	0.308

Methodology

Q_{MED} estimation method:	Calculate from BFI and SAAR
BFI and SPR method:	Calculate from dominant HOST
HOST class:	22
BFI / BFIHOST:	0.374
Q_{MED} (l/s):	0.8
Q_{BAR} / Q_{MED} factor:	1.14

Hydrological characteristics

	Default	Edited
SAAR (mm):	598	598
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):	0.91	0.91
1 in 1 year (l/s):	0.78	0.78
1 in 30 years (l/s):	2.1	2.1
1 in 100 year (l/s):	2.91	2.91
1 in 200 years (l/s):	3.42	3.42

Appendix E

Not Used

Appendix F

Existing Overland Flow Routes and Catchment Plan

OS NORTH

DO NOT SCALE

KEY PLAN

NOTES

1. FOR GENERAL DRAINAGE NOTES REFER TO DRAWING 31569-HYD-SW-XX-DR-C-7000.
2. FOR DRAINAGE AND CIVIL SPECIFICATION REFER TO 31569-HYD-SW-XX-SP-C-52000.
3. FOR GENERAL CIVIL NOTES REFER TO DRAWING 31569-HYD-SW-XX-DR-C-7001.
4. FOR EXTERNAL BUILDUP DETAILS REFER TO DRAWING - 31569-HYD-SW-XX-DR-C-7300.
5. FOR EXTERNAL WORK GENERAL ARRANGEMENTS REFER TO DRAWING 31569-HYD-SW-XX-DR-C-7200.
6. FOR ATTENUATION TANK DETAILS REFER TO DRAWING 31569-HYD-SW-XX-DR-C-7040.
7. FOR PROPOSED CATCHMENT AREAS, REFER TO DRAWING 31569-HYD-SW-XX-DR-C-7030.

LEGEND

	BUILDING / ROOF	= 1270m²
	HARDSTANDING (YARD)	= 1525m²
	SOFT LANDSCAPING	= 325m²
	TOTAL	= 3120m²

THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND SHOULD NOT BE USED FOR DETAILED DESIGN OR COSTING.

REVISIONS

Rev.	Revision Notes	Date	Drawn By	Checked | Approved
P01	INITIAL ISSUE	14/03/24	VK	CMH

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CLIENT

SHURGARD SELF-STORAGE

PROJECT

SHURGARD HAMPTON

TITLE

EXISTING DRAINAGE CATCHMENT PLAN

HYDROCK PROJECT NO.	SCALE @ A1
C-31569-C	AS SHOWN

STATUS DESCRIPTION	STATUS
SUITABLE FOR INFORMATION	S2

DRAWING NO.	REVISION
31569-HYD-SW-XX-DR-C-7020	P01

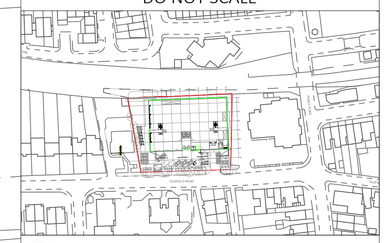
1:150 @ A1
1:300 @ A3
0 1 2 3 4 5 6 7 8 9 10 m

Appendix G

Proposed Drainage Strategy General Arrangement

OS NORTH

KEY PLAN



DO NOT SCALE

NOTES

1. FOR GENERAL DRAINAGE NOTES REFER TO DRAWING 31569-HYD-SW-XX-DR-C-7000.
2. FOR DRAINAGE AND CIVIL SPECIFICATION REFER TO 31569-HYD-SW-XX-SP-C-52000.
3. FOR GENERAL CIVIL NOTES REFER TO DRAWING 31569-HYD-SW-XX-DR-C-7001.
4. FOR EXTERNAL BUILDUP DETAILS REFER TO DRAWING - 31569-HYD-SW-XX-DR-C-7300.
5. FOR EXTERNAL WORK GENERAL ARRANGEMENTS REFER TO DRAWING 31569-HYD-SW-XX-DR-C-7200.
6. RAINWATER DOWNPIPE POSITIONS TO BE CONFIRMED BY ARCHITECT.
7. PUBLIC SEWER CONNECTIONS SUBJECT TO THAMES WATER S106.

THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND SHOULD NOT BE USED FOR DETAILED DESIGN OR COSTING.

LEGEND

- PROPOSED FOUL WATER DRAINAGE
- PROPOSED SURFACE WATER DRAINAGE
- EXISTING PRIVATE SEWER
- EXISTING PRIVATE SEWER TO BE REMOVED
- EXISTING SURFACE WATER DRAINAGE
- THAMES WATER MAIN EASEMENT (3.0m STANDOFF)
- PROPOSED ATTENUATION TANK
- PROPOSED ATTENUATION TANK INSPECTION UNITS.
- PROPOSED FOUL WATER FLOOR GULLY (FG)
- SITE BOUNDARY OUTLINE
- BUILDING OUTLINE
- PU 01 — PROPOSED FOUL WATER DROPPER POINT (PU) (Roddable access to be provided at GF).
- RWP 01 — PROPOSED SURFACE WATER DROPPER POINT (RWP) (Roddable access to be provided at GF).
- PROPOSED CONCRETE PIPE SURROUNDING
- PROPOSED FILTER DRAIN DETAIL 31569-HYD-SW-XX-DR-C-7300
- PROPOSED PIPE SURROUNDING PART OF THE PERMEABLE PAVING SYSTEM 31569-HYD-SW-XX-DR-C-7300
- PROPOSED RISING MAIN

REVISIONS

Rev.	Revision Notes	Date	Drawn By	Checked | Approved
P03	PUMPED OUTFALL UPDATE	07/10/24	ÓF	CMH | VK
P02	GRAVITY OUTFALL UPDATE	30/09/24	ÓF	CMH | VK
P01	INITIAL ISSUE	06/09/24	ÓF	CMH | VK

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CLIENT

SHURGARD SELF-STORAGE

PROJECT

SHURGARD HAMPTON

TITLE

PROPOSED DRAINAGE GENERAL ARRANGEMENT

HYDROCK PROJECT NO.	SCALE @ A1
C-31569-C	1:150

STATUS DESCRIPTION	STATUS
SUITABLE FOR INFORMATION	S2

DRAWING NO.	REVISION
31569-HYD-SW-XX-DR-C-7010	P03

1:150 @ A1
1:300 @ A3
0 1 2 3 4 5 6 7 8 9 10 m

Filename: M:\31000-31999\31569 - Shurgard UK - Hampton\02_Stazed_Published\C_Civil_Engineer\DR_Drawings\2024_10_07 Third Issue\31569-HYD-SW-XX-DR-C-7010 Proposed Drainage GA.dwg

Appendix H

Proposed Overland Flow Routes and Catchment Plan

DO NOT SCALE

KEY PLAN

NOTES

1. FOR GENERAL DRAINAGE NOTES REFER TO DRAWING 31569-HYD-SW-XX-DR-C-7000.
2. FOR DRAINAGE AND CIVIL SPECIFICATION REFER TO 31569-HYD-SW-XX-SP-C-52000.
3. FOR GENERAL CIVIL NOTES REFER TO DRAWING 31569-HYD-SW-XX-DR-C-7001.
4. FOR EXTERNAL BUILDUP DETAILS REFER TO DRAWING - 31569-HYD-SW-XX-DR-C-7300.
5. FOR EXTERNAL WORK GENERAL ARRANGEMENTS REFER TO DRAWING 31569-HYD-SW-XX-DR-C-7200.
6. FOR ATTENUATION TANK DETAILS REFER TO DRAWING 31569-HYD-SW-XX-DR-C-7040.

LEGEND

	BUILDING / ROOF	= 1707m^2
	HARDSTANDING	= 847m^2
	SOFT LANDSCAPING	= 566m^2
	TOTAL	= 3120m^2

THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND SHOULD NOT BE USED FOR DETAILED DESIGN OR COSTING.

REVISIONS

Rev.	Revision Notes	Date	Drawn By	Checked | Approved
P01	INITIAL ISSUE	06/09/24	ÓF	CM | VK

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CLIENT

SHURGARD SELF-STORAGE

PROJECT

SHURGARD HAMPTON

TITLE

PROPOSED DRAINAGE CATCHMENT PLANS

HYDROCK PROJECT NO.	SCALE @ A1
C-31569-C	1:150

STATUS DESCRIPTION	STATUS
SUITABLE FOR INFORMATION	S2

DRAWING NO.	REVISION
31569-HYD-SW-XX-DR-C-7030	P01

1:150 @ A1
1:300 @ A3
0 1 2 3 4 5 6 7 8 9 10 m

Filename: M:\31000-31999\31569 - Shurgard UK - Hampton\02_Shared_Published\C_Civil_Engineer\DR_Drawings\2024_09_09_First Issue\31569-HYD-SW-XX-DR-C-7030_P01 Proposed SW Catchment Plan.dwg

Appendix I

Proposed Drainage Supporting Calculations

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm (pumped outfall)

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	Maximum Time of Concentration (mins)	30	Add Flow / Climate Change (%)	0	Min Vel for Auto Design only (m/s)	1.00
M5-60 (mm)	20.000	Foul Sewage (l/s/ha)	0.000	Minimum Backdrop Height (m)	0.200	Min Slope for Optimisation (1:X)	500
Ratio R	0.426	Volumetric Runoff Coeff.	0.750	Maximum Backdrop Height (m)	1.500		
Maximum Rainfall (mm/hr)	50	PIMP (%)	100	Min Design Depth for Optimisation (m)	1.200		

Designed with Level Soffits

Manhole Schedules for Storm (pumped outfall)

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
IC01 (west)	17.000	0.700	Open Manhole	600	2.000	16.300	225				
IC02	16.990	0.974	Open Manhole	600	2.001	16.016	225	2.000	16.016	225	
MH03 CP	16.950	2.300	Open Manhole	1200	2.002	14.650	450	2.001	15.815	225	940
JUN01	16.950	2.337	Junction		2.003	14.613	450	2.002	14.613	450	
JUN02	16.950	2.373	Junction		2.004	14.585	450	2.003	14.577	450	
AT01	16.950	2.400	Open Manhole	1350	2.005	14.550	450	2.004	14.557	450	7
IC01 (east)	17.000	0.700	Open Manhole	600	3.000	16.300	150				
IC03	16.950	0.912	Open Manhole	600	3.001	16.038	150	3.000	16.038	150	
MH04 CP	16.950	2.413	Open Manhole	1200	2.006	14.550	150	2.005	14.537	450	
								3.001	15.909	150	1359
MH05	17.080	2.574	Open Manhole	1200	2.007	14.506	150	2.006	14.506	150	
MH06 outfall	16.900	2.429	Open Manhole	1200		OUTFALL		2.007	14.471	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
IC01 (west)	513162.598	169779.486	513162.598	169779.486	Required	
IC02	513111.309	169776.943	513111.309	169776.943	Required	
MH03 CP	513112.920	169737.374	513112.920	169737.374	Required	
JUN01	513128.404	169737.850			No Entry	
JUN02	513143.314	169738.305			No Entry	
AT01	513154.898	169738.761	513154.898	169738.761	Required	
IC01 (east)	513162.925	169779.484	513162.925	169779.484	Required	
IC03	513164.850	169740.203	513164.850	169740.203	Required	

Manhole Schedules for Storm (pumped outfall)

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
MH04 CP	513157.452	169738.785	513157.452	169738.785	Required	
MH05	513157.543	169732.120	513157.543	169732.120	Required	
MH06 outfall	513158.624	169726.990			No Entry	

Area Summary for Storm (pumped outfall)

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
2.000	User	-	100	0.098	0.098	0.098
2.001	User	-	100	0.053	0.053	0.053
2.002	User	-	100	0.068	0.068	0.068
2.003	User	-	100	0.029	0.029	0.029
2.004	User	-	100	0.035	0.035	0.035
2.005	-	-	100	0.000	0.000	0.000
3.000	User	-	100	0.009	0.009	0.009
3.001	User	-	100	0.020	0.020	0.020
2.006	-	-	100	0.000	0.000	0.000
2.007	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.312	0.312	0.312

Free Flowing Outfall Details for Storm (pumped outfall)

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
2.007	MH06 outfall	16.900	14.471	0.000	1200	0

Simulation Criteria for Storm (pumped outfall)

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

Number of Input Hydrographs 0 Number of Online Controls 1 Number of Offline Controls 0 Number of Storage Structures 6 Number of Time/Area Diagrams 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Region	England and Wales	Ratio R	0.426	Cv (Summer)	0.750
Storm Duration (mins)	30	Return Period (years)	1	M5-60 (mm)	20.000	Profile Type	Summer
Cv (Winter)	0.840						

Online Controls for Storm (pumped outfall)

Hydro-Brake® Optimum Manhole: MH04 CP, DS/PN: 2.006, Volume (m³): 3.0

Unit Reference	MD-SHE-0048-1500-2200-1500	Objective	Minimise upstream storage	Invert Level (m)	14.550
Design Head (m)	2.200	Application	Surface	Minimum Outlet Pipe Diameter (mm)	75
Design Flow (l/s)	1.5	Sump Available	Yes	Suggested Manhole Diameter (mm)	1200
Flush-Flo™	Calculated	Diameter (mm)	48		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.200	1.5	Flush-Flo™	0.212	0.9	Kick-Flo®	0.428	0.7	Mean Flow over Head Range	-	1.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.8	0.500	0.8	1.200	1.1	2.000	1.4	3.000	1.7	5.000	2.2	7.000	2.6	9.000	2.9
0.200	0.9	0.600	0.8	1.400	1.2	2.200	1.5	3.500	1.9	5.500	2.3	7.500	2.6	9.500	2.9
0.300	0.9	0.800	1.0	1.600	1.3	2.400	1.6	4.000	2.0	6.000	2.4	8.000	2.7		
0.400	0.8	1.000	1.1	1.800	1.4	2.600	1.6	4.500	2.1	6.500	2.5	8.500	2.8		

Storage Structures for Storm (pumped outfall)

Porous Car Park Manhole: IC02, DS/PN: 2.001

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0	Width (m)	4.0	Depression Storage (mm)	5
Membrane Percolation (mm/hr)	1000	Porosity	0.30	Length (m)	18.0	Evaporation (mm/day)	3
Max Percolation (l/s)	20.0	Invert Level (m)	16.515	Slope (1:X)	0.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: MH03 CP, DS/PN: 2.002

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0	Width (m)	5.0	Depression Storage (mm)	5
Membrane Percolation (mm/hr)	1000	Porosity	0.30	Length (m)	24.6	Evaporation (mm/day)	3
Max Percolation (l/s)	34.2	Invert Level (m)	16.410	Slope (1:X)	0.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: JUN01, DS/PN: 2.003

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0	Width (m)	5.0	Depression Storage (mm)	5
Membrane Percolation (mm/hr)	1000	Porosity	0.30	Length (m)	40.0	Evaporation (mm/day)	3
Max Percolation (l/s)	55.6	Invert Level (m)	16.750	Slope (1:X)	0.0	Cap Volume Depth (m)	0.100

Cellular Storage Manhole: JUN02, DS/PN: 2.004

Invert Level (m)	14.600	Infiltration Coefficient Side (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	100.0	0.0	1.600	100.0	0.0	1.601	1.0	0.0

Porous Car Park Manhole: AT01, DS/PN: 2.005

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0	Width (m)	4.0	Depression Storage (mm)	5
Membrane Percolation (mm/hr)	1000	Porosity	0.30	Length (m)	71.0	Evaporation (mm/day)	3
Max Percolation (l/s)	78.9	Invert Level (m)	16.410	Slope (1:X)	0.0	Cap Volume Depth (m)	0.400

Porous Car Park Manhole: IC03, DS/PN: 3.001

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0	Width (m)	4.0	Depression Storage (mm)	5
Membrane Percolation (mm/hr)	1000	Porosity	0.30	Length (m)	15.8	Evaporation (mm/day)	3
Max Percolation (l/s)	17.6	Invert Level (m)	16.515	Slope (1:X)	0.0	Cap Volume Depth (m)	0.350

Time Area Diagram for Green Roof at Pipe Number 2.000 (Storm (pumped outfall))

Area (m³) 970 Depression Storage (mm) 5 Evaporation (mm/day) 3 Decay Coefficient 0.050

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.017627	12	16	0.009674	24	28	0.005309	36	40	0.002914	48	52	0.001599	60	64	0.000878	72	76	0.000482	84	88	0.000264
4	8	0.014432	16	20	0.007920	28	32	0.004347	40	44	0.002386	52	56	0.001309	64	68	0.000719	76	80	0.000394	88	92	0.000216
8	12	0.011816	20	24	0.006485	32	36	0.003559	44	48	0.001953	56	60	0.001072	68	72	0.000588	80	84	0.000323	92	96	0.000177

Time Area Diagram for Green Roof at Pipe Number 2.000 (Storm (pumped outfall))

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
96	100	0.000145	100	104	0.000119	104	108	0.000097	108	112	0.000080	112	116	0.000065	116	120	0.000053			

Time Area Diagram for Green Roof at Pipe Number 2.003 (Storm (pumped outfall))

Area (m³) 280 Depression Storage (mm) 5 Evaporation (mm/day) 3 Decay Coefficient 0.050

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.005088	16	20	0.002286	32	36	0.001027	48	52	0.000462	64	68	0.000207	80	84	0.000093	96	100	0.000042	112	116	0.000019
4	8	0.004166	20	24	0.001872	36	40	0.000841	52	56	0.000378	68	72	0.000170	84	88	0.000076	100	104	0.000034	116	120	0.000015
8	12	0.003411	24	28	0.001533	40	44	0.000689	56	60	0.000309	72	76	0.000139	88	92	0.000062	104	108	0.000028			
12	16	0.002792	28	32	0.001255	44	48	0.000564	60	64	0.000253	76	80	0.000114	92	96	0.000051	108	112	0.000023			

Time Area Diagram for Green Roof at Pipe Number 2.004 (Storm (pumped outfall))

Area (m³) 340 Depression Storage (mm) 5 Evaporation (mm/day) 3 Decay Coefficient 0.050

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.006178	16	20	0.002776	32	36	0.001247	48	52	0.000560	64	68	0.000252	80	84	0.000113	96	100	0.000051	112	116	0.000023
4	8	0.005059	20	24	0.002273	36	40	0.001021	52	56	0.000459	68	72	0.000206	84	88	0.000093	100	104	0.000042	116	120	0.000019
8	12	0.004142	24	28	0.001861	40	44	0.000836	56	60	0.000376	72	76	0.000169	88	92	0.000076	104	108	0.000034			
12	16	0.003391	28	32	0.001524	44	48	0.000685	60	64	0.000308	76	80	0.000138	92	96	0.000062	108	112	0.000028			

Time Area Diagram for Green Roof at Pipe Number 3.001 (Storm (pumped outfall))

Area (m³) 190 Depression Storage (mm) 5 Evaporation (mm/day) 3 Decay Coefficient 0.050

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.003453	16	20	0.001551	32	36	0.000697	48	52	0.000313	64	68	0.000141	80	84	0.000063	96	100	0.000028	112	116	0.000013
4	8	0.002827	20	24	0.001270	36	40	0.000571	52	56	0.000256	68	72	0.000115	84	88	0.000052	100	104	0.000023	116	120	0.000010
8	12	0.002314	24	28	0.001040	40	44	0.000467	56	60	0.000210	72	76	0.000094	88	92	0.000042	104	108	0.000019			
12	16	0.001895	28	32	0.000851	44	48	0.000383	60	64	0.000172	76	80	0.000077	92	96	0.000035	108	112	0.000016			

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

Simulation Criteria

Areal Reduction Factor 1.000 Hot Start Level (mm) 0 Foul Sewage per hectare (l/s) 0.000 MADD Factor * 10m³/ha Storage 2.000 Flow per Person per Day (l/per/day) 0.000
Hot Start (mins) 0 Manhole Headloss Coeff (Global) 0.500 Additional Flow - % of Total Flow 0.000 Inlet Coeffiecient 0.800

Number of Input Hydrographs 0 Number of Online Controls 1 Number of Offline Controls 0 Number of Storage Structures 6 Number of Time/Area Diagrams 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Region England and Wales M5-60 (mm) 20.000 Ratio R 0.416 Cv (Summer) 0.750 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DTS Status ON Inertia Status ON
Analysis Timestep 2.5 Second Increment (Extended) DVD Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
2.000	IC01 (west)	60 Winter	2	+0%	100/480 Winter				16.354	-0.171	0.000	0.13			4.7	OK	
2.001	IC02	15 Winter	2	+0%	100/30 Winter				16.090	-0.151	0.000	0.23		8	8.2	OK	
2.002	MH03 CP	480 Winter	2	+0%	30/60 Winter				14.956	-0.144	0.000	0.04		367	4.2	OK	
2.003	JUN01	480 Winter	2	+0%	30/60 Summer				14.956	-0.107	0.000	0.03		322	4.6	OK*	
2.004	JUN02	480 Winter	2	+0%	30/60 Summer				14.955	-0.080	0.000	0.01		430	1.9	OK*	
2.005	AT01	480 Winter	2	+0%	30/30 Winter				14.959	-0.041	0.000	0.01		395	1.4	OK	
3.000	IC01 (east)	15 Winter	2	+0%	100/360 Winter				16.335	-0.115	0.000	0.12			1.7	OK	
3.001	IC03	15 Winter	2	+0%	100/240 Winter				16.067	-0.121	0.000	0.08		6	1.6	OK	
2.006	MH04 CP	480 Winter	2	+0%	2/15 Winter				14.960	0.260	0.000	0.07			0.9	SURCHARGED	
2.007	MH05	2880 Winter	2	+0%					14.533	-0.123	0.000	0.07			0.9	OK	

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

Simulation Criteria

Areal Reduction Factor 1.000 Hot Start Level (mm) 0 Foul Sewage per hectare (l/s) 0.000 MADD Factor * 10m³/ha Storage 2.000 Flow per Person per Day (l/per/day) 0.000
Hot Start (mins) 0 Manhole Headloss Coeff (Global) 0.500 Additional Flow - % of Total Flow 0.000 Inlet Coeffiecient 0.800

Number of Input Hydrographs 0 Number of Online Controls 1 Number of Offline Controls 0 Number of Storage Structures 6 Number of Time/Area Diagrams 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Region England and Wales M5-60 (mm) 20.000 Ratio R 0.416 Cv (Summer) 0.750 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DTS Status ON Inertia Status ON
Analysis Timestep 2.5 Second Increment (Extended) DVD Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
2.000	IC01 (west)	30 Winter	30	+0%	100/480 Winter				16.380	-0.145	0.000	0.26			9.7	OK	
2.001	IC02	15 Winter	30	+0%	100/30 Winter				16.136	-0.105	0.000	0.55		4	19.3	OK	
2.002	MH03 CP	600 Winter	30	+0%	30/60 Winter				15.480	0.380	0.000	0.06			6.5	SURCHARGED	
2.003	JUN01	600 Winter	30	+0%	30/60 Summer				15.480	0.417	0.000	0.05			7.1	SURCHARGED*	
2.004	JUN02	600 Winter	30	+0%	30/60 Summer				15.480	0.445	0.000	0.02			3.2	SURCHARGED*	
2.005	AT01	600 Winter	30	+0%	30/30 Winter				15.533	0.533	0.000	0.02			2.0	SURCHARGED	
3.000	IC01 (east)	15 Winter	30	+0%	100/360 Winter				16.349	-0.101	0.000	0.22			3.1	OK	
3.001	IC03	60 Winter	30	+0%	100/240 Winter				16.079	-0.109	0.000	0.17		28	3.3	OK	
2.006	MH04 CP	600 Winter	30	+0%	2/15 Winter				15.544	0.844	0.000	0.08			1.0	SURCHARGED	
2.007	MH05	600 Winter	30	+0%					14.536	-0.120	0.000	0.09			1.0	OK	

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

Simulation Criteria

Areal Reduction Factor 1.000 Hot Start Level (mm) 0 Foul Sewage per hectare (l/s) 0.000 MADD Factor * 10m³/ha Storage 2.000 Flow per Person per Day (l/per/day) 0.000
Hot Start (mins) 0 Manhole Headloss Coeff (Global) 0.500 Additional Flow - % of Total Flow 0.000 Inlet Coeffiecient 0.800

Number of Input Hydrographs 0 Number of Online Controls 1 Number of Offline Controls 0 Number of Storage Structures 6 Number of Time/Area Diagrams 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Region England and Wales M5-60 (mm) 20.000 Ratio R 0.416 Cv (Summer) 0.750 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DTS Status ON Inertia Status ON
Analysis Timestep 2.5 Second Increment (Extended) DVD Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
2.000	IC01 (west)	960 Winter	100	+40%	100/480 Winter				16.562	0.037	0.000	0.10			3.6	SURCHARGED	
2.001	IC02	960 Winter	100	+40%	100/30 Winter				16.560	0.319	0.000	0.16		299	5.7	SURCHARGED	
2.002	MH03 CP	960 Winter	100	+40%	30/60 Winter				16.558	1.458	0.000	0.08		237	8.1	SURCHARGED	
2.003	JUN01	960 Winter	100	+40%	30/60 Summer				16.558	1.495	0.000	0.07			9.0	SURCHARGED*	
2.004	JUN02	960 Winter	100	+40%	30/60 Summer				16.558	1.523	0.000	0.04			5.2	SURCHARGED*	
2.005	AT01	960 Winter	100	+40%	30/30 Winter				16.557	1.557	0.000	0.03		198	3.4	SURCHARGED	
3.000	IC01 (east)	960 Winter	100	+40%	100/360 Winter				16.521	0.071	0.000	0.03			0.4	SURCHARGED	
3.001	IC03	960 Winter	100	+40%	100/240 Winter				16.521	0.333	0.000	0.05		316	1.1	SURCHARGED	
2.006	MH04 CP	600 Winter	100	+40%	2/15 Winter				16.573	1.873	0.000	0.12			1.4	SURCHARGED	
2.007	MH05	960 Winter	100	+40%					14.541	-0.115	0.000	0.12			1.4	OK	