DRAINAGE AND SUDS STRATEGY

AT

52B SOUTHBURY ROAD, ENFIELD
EN1 1YB

NOVEMBER 2023

CONTENTS

Report prepared by:

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1. INTRODUCTION

1.1. The purpose of this report is to provide a drainage and SuDS strategy to support the planning application for the proposed development at 52b Southbury Road, Enfield.

1.2. The proposed works consist of the demolition of the existing two storey office building and car park and construction of 3 residential units hard standing for car parking.

1.3. Based on the guidance in the National Planning Policy Framework (NPPF, September 2023) and associated Planning Practice Guidance (PPG - Flood risk and coastal change paragraph 039, updated August 2022), developments should include an appropriate Flood Risk Assessment if any or all of the following criteria are met:

- Site is greater than 1 hectare
- Potentially located in Flood Zone 2 or 3
- Less than 1 hectare in Flood Zone 1, including a change of use in development type.
- Considered a major planning application (as defined by local planning authority)

1.4. In this case, the site is less than 1 hectare and is shown to lie within Flood Zone 1, therefore a flood risk assessment is not required to support the planning application however this report provides details of the proposed drainage strategy for the development including detailing compliance with Enfield policy DMD59, DMD61 and the London Plan.

1.5. This report has been prepared in accordance with the NPPF, local planning policies and the accompanying Technical Guidance.

1.6. This report has been prepared by Richard James BEng (Hons) IEng MICE.

2. POLICY CONTEXT

NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

2.1 The latest NPPF was revised in September 2023, one of the overarching objectives of the NPPF is the encouragement of growth and acknowledgement that decision-makers should adopt a presumption in favour of sustainable development. Paragraph 11 of the document states:

> *"For **decision-taking** this means:*
>
> - *approving development proposals that accord with an up-to-date development plan without delay; or*
> - *where there are no relevant development plan policies, or the policies which are most important for determining the application are out of date, granting permission unless:*
>
>   - *the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development or*
>   - *any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole."*

2.2 Section 14 of the NPPF seeks to address the issues of climate change, flooding and coastal change. In paragraph 159 it states: "Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere."

PLANNING PRACTICE GUIDANCE TO THE NATIONAL PLANNING POLICY FRAMEWORK

2.3 The Planning Practice Guidance (PPG) was first published in March 2014 and at the same time the Technical Guidance to the NPPF was withdrawn. The key difference with the new PPG is that it is a web-based resource, and each section is updated as needed. The document was last updated in August 2022.

2.4 The section covering "Flood Risk and Coastal Change" and was last updated in August 2022.

2.5 The assessment of flood risk is based on the definitions in Table 1 of the PPG. This information is replicated below for ease of reference.

TABLE 1: FLOOD ZONE DEFINITIONS

Flood Zone	Annual probability of river or sea flooding
Zone 1 *Low Probability*	■ Land having less than 1 in 1000 annual probability of river or sea flooding (<0.1%)
Zone 2 *Medium Probability*	■ Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or ■ Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
Zone 3a *High Probability*	■ Land having a 1 in 100 or greater annual probability of river flooding; or ■ Land having a 1 in 200 or greater annual probability of sea flooding.
Zone 3b *The Functional Floodplain*	■ This zone comprises land where water has to flow or be stored in times of flood. ■ Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency.

2.6 The NPPF classifies the Flood Risk Vulnerability of various land uses in Table 2 (reproduced below). The More Vulnerable Classification encompasses usages such as hospitals and buildings used for dwellings. Less Vulnerable applies to buildings used for general industry, storage and distribution.

TABLE 2: LAND USE CLASSIFICATION

Classification	Land Use
Essential Infrastructure	■ Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. ■ Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. ■ Wind turbines.
Highly Vulnerable	■ Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. ■ Emergency dispersal points.

Classification	Land Use
	■ Basement dwellings. ■ Caravans, mobile homes and park homes intended for permanent residential use. ■ Installations requiring hazardous substances consent (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as “essential infrastructure”).
More Vulnerable	■ Hospitals. ■ Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. ■ Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. ■ Non-residential uses for health services, nurseries and educational establishments. ■ Landfill and sites used for waste management facilities for hazardous waste. ■ Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Classification	Land Use
Less Vulnerable	■ Buildings used for shops; financial, professional and other services, restaurants and cafes, hot ■ food takeaways, offices, general industry, storage and distribution and assembly and leisure. ■ Land and buildings used for agriculture and forestry. ■ Waste treatment (except landfill and hazardous waste facilities). ■ Minerals working and processing (except for sand and gravel working). ■ Water treatment plants and sewage treatment plants (if adequate pollution control measures are in place).

2.8 The overall aim is to steer new development to Flood Zone 1. Where there are no reasonably available sites within Flood Zone 1, local planning authorities allocating land in local plans or determining planning applications for development at any particular location should take into account the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required. The table below, replicated from Table 3 of the PPG, indicates which Flood Zones are considered to be appropriate for different land uses based upon the Sequential Test.

TABLE 3: FLOOD RISK VULNERABILITY CLASSIFICATION

Flood Zone	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable (Residential)	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test Required	✓	✓
Zone 3a	Exception Test Required	✓	×	Exception Test Required	✓
Zone 3b Functional Floodplain	Exception Test Required	✓	×	×	×

- ✓ Development is appropriate
- ✗ Development should not be permitted

2.9 The sequential approach requires the application of the Sequential Test whereby, in addition to the requirements of Table 3, development should first be directed to Flood Zone 1, then Flood Zone 2 and lastly Flood Zone 3.

2.10 Where the Exception Test is required it is necessary to demonstrate, partly through a site-specific flood risk assessment, that:

- The development will provide extensive sustainability benefits to the community
- And that these benefits outweigh the flood risk
- When considering the vulnerability of its users, the development will be safe for its lifetime
- Flood risk is not increased elsewhere, and reduced overall where possible

2.11 Further detail on the lifetime of development is also given in the PPG, which advises for residential development that a period of 100 years should be considered whilst for non-residential this is dependent upon the development characteristics.

2.12 The use of sustainable drainage systems is considered by the PPG to offer the following benefits:

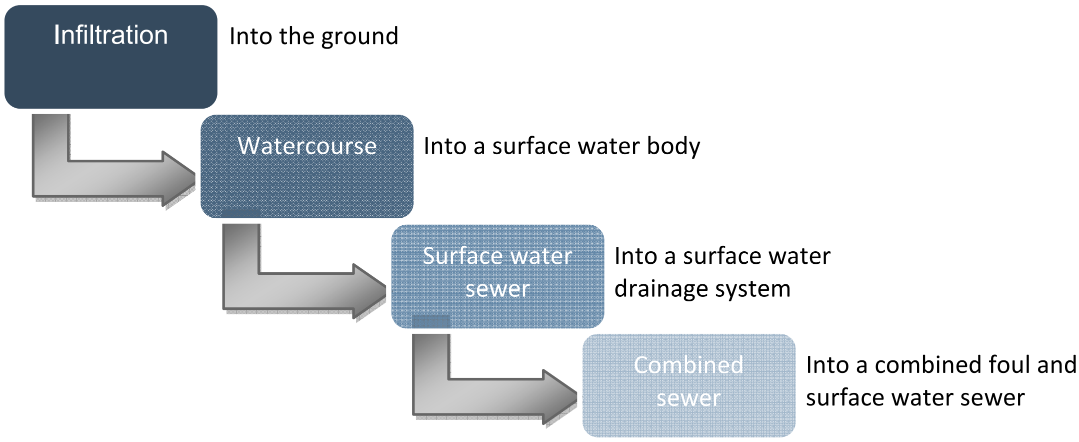
- Reduce the causes and impacts of flooding
- Remove pollutants from urban run-off at source
- Combine water management with green space with benefits for amenity, recreation and wildlife

2.13 In the consideration of major developments, sustainable drainage should be provided unless it can be demonstrated that this would be inappropriate. Major developments are defined in the Town and Country Planning Order 2015; some of these definitions encompass the following:

- Development site area of 1 hectare or more
- Provision of 10 or more residential dwellings
- Development of residential dwellings on a site having an area of 0.5 hectares or more and where the proposed no. of dwellings is not known to fall into the above criterion or not
- Provision of buildings where the floor space to be created by the development is 1,000m^2 or greater

2.14 The aim of sustainable drainage systems is to dispose of surface water using the following hierarchy were reasonably practicable.

TABLE 4: SURFACE WATER DISPOSAL HIERARCHY



2.15 The assessment of what is considered to be reasonably practicable in terms of sustainable drainage system provision should consider the costs associated with the design, construction, operation and maintenance of the system, and whether these are economically proportionate in relation to the consumer costs for an effective drainage system that instead connects directly to a public sewer.

LONDON BOROUGH OF ENFIELD - STRATEGIC FLOOD RISK ASSESSMENT (SFRA)

2.16 The main purpose of the SFRA is to provide sufficient flood risk information to enable an update of any flooding policies within the Borough. In achieving this, the SFRA will achieve the objectives of:

- Influencing Council policy regarding decisions that are made
- Aiding the Council's response to proposed developments
- Recognising means of reducing flood risk
- Inform the emergency flood plans

2.17 Enfield Level 2 Strategic Flood Risk Assessment was prepared in July 2013.

ADDITIONAL POLICY / GUIDANCE

2.18 The following documents were consulted to inform the drainage strategy for the site:

- Enfield Level 2 Flood Risk Assessment July 2013.
- Enfield Local Flood Risk Management Strategy March 2016
- London Plan 2016 5.13
- London Borough of Enfield Policy DM59
- London Borough of Enfield Policy DM61

2.19 **Policy DM59: Flood Risk Management** essentially sets out the aims to minimise the risk of flooding within the borough and to incorporate SuDS into developments to reduce surface water flood risk.

2.20 **Policy DMD61: Managing Surface Water** sets out the requirements for all developments to demonstrate how proposed measures manage surface water as close to its source as possible and follow the drainage hierarchy in the London Plan.

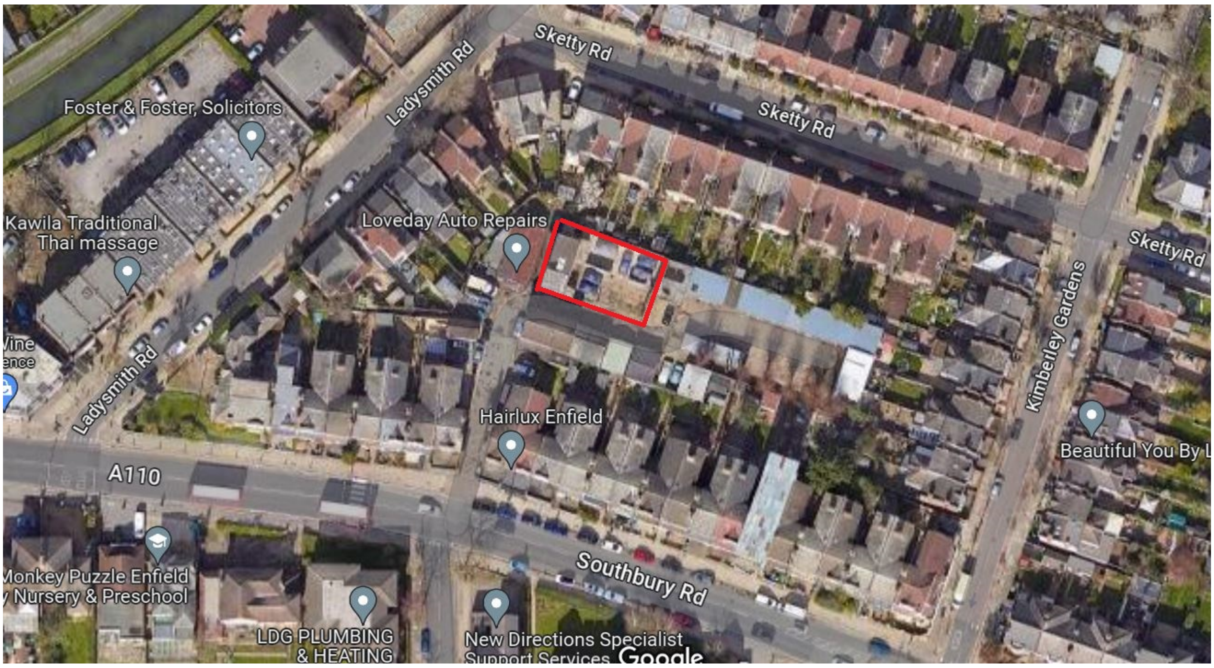
2.21 When considering quantity, the requirement is to seek to achieve greenfield runoff rates and maximise the use of SuDS, including at least one 'at source' SuDS measure resulting in a net improvement in water quantity or quality discharging to the sewer.

2.22 The London Plan **Policy 5.13: Sustainable Drainage** Development should utilise sustainable urban drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the drainage hierarchy.

2.23 The drainage assessment in this report will ensure that any proposals for additional drainage are assessed and mitigated, against flood risk, and incorporate good SuDS practices where possible.

3. DEVELOPMENT DESCRIPTION

3.1 The site is located at 52b Southbury Road Enfield, please refer to image below for the site location and for an areial view of the site.



Site location Map

3.2 The site currently consists of a two-storey office building and car park with an approximate site area of 0.027 hectares.

3.3 The proposed works consist of the demolition of the existing two storey office building and car park and construction of 3 residential units hard standing for car parking.

3.4 Refer to Appendix A for a copy of the existing site layout and Appendix B for a copy of the proposed site layout.

4 GEOLOGY & HYDROLOGY

4.1 The British Geological Survey (BGS) maps and online data for the area shows the site to be in an area where the bedrock geology is London Clay, with superficial deposits of Enfield Silt Member.

4.2 Borehole records near to the site indicate topsoil over clay soil.

4.3 Groundwater was encountered within the borehole at approximately 3.0m below ground.

4.4 The site is located within an unproductive aquifer within superficial deposits.

4.5 The site is located within an unproductive aquifer within the bedrock.

4.6 The sites groundwater vulnerability zone designation is unproductive.

4.7 The site is located within a source protection zone – zone 1 inner protection zone.

5 FLOOD RISK

5.1 The NPPF and the SFRA identifies several potential sources of flooding that must be considered when assessing flood risk, these are considered below in the following order:-

- Flooding from rivers (fluvial flooding)
- Flooding from the sea (tidal flooding)
- Flooding from land
- Flooding from sewers
- Flooding from groundwater
- Flooding from reservoirs, canals, and other artificial sources

FLODING FROM RIVERS (FLUVIAL FLOODING) & SEA (TIDAL FLOODING)

5.2 The indicative flood maps published by the Environment Agency (EA) identify that the entirety of the site is outside an area at risk of fluvial/tidal flooding i.e. located in Flood Zone 1. Refer to Figure 1 for a copy of the fluvial flood map data.

FLOODING FROM LAND & SEWERS

5.3 Maps Contained in the SFRA and Maps published by the Environment Agency indicate that the site is at Low risk of flooding from Surface Water. Refer to Figure 2 for a copy of the surface water food map data.

5.4 Thames Water Sewer flooding records indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

FLOODING FROM GROUNDWATER

5.5 Given the underlaying ground conditions at the site it is unlikely that the site is at risk of flooding due to groundwater.

FLOODING FROM RESERVOIRS, CANALS & OTHER ARTIFICIAL SOURCES

5.6 The EA Risk of Flooding from Reservoirs Map is published on their website to identify areas potentially at risk of flooding from large reservoirs (>25,000 m^3 of water), if they were to fail and release the water they hold. It does not display data for smaller reservoirs.

5.7 There are no canals within the vicinity of the Site, and therefore canal flood risk is considered Negligible.

5.8 Environment Agency Reservoir Flood Mapping shows that flooding from reservoir failure in this area would not extend into the development site. Refer to Figure 3 for a copy of the reservoir failure food map data.

6 SURFACE AND FOUL WATER DRAINAGE DESIGN

EXISTING

6.1 A Thames Water asset plan has been sourced - the water authority responsible for the public sewers in this area. Refer to Appendix C for the Thames Water Asset Plan.

6.2 The public sewer records indicate a 610mm diameter public surface water sewer running through the development, with public foul water sewers shown running behind the properties fronting Southbury road. A 229mm diameter public surface water and 457mm diameter public foul water sewer are also shown running in Southbury Road.

6.3 A survey of the existing drainage indicates that the site is currently positively drained and it is assumed discharges to the surrounding public sewers.

EXISTING RUNOFF RATES

6.4 In Table 5 below, is a summary of the approximate greenfield run off rates for the entire developable site (0.027Ha). Refer to Appendix E for calculations.

TABLE 5: GREENFIELD RUN OFF RATES

Event	Greenfield Run Off Rate
QBar	0.1 l/s
1 in 1 year	0.1l/s
1 in 30 year	0.3 l/s
1 in 100 year	0.4 l/s

6.5 As the site is already developed (brownfield) the greenfield runoff rates above do not give a true representation of the current surface water discharge rates from the site. The total site area is 0.027 Ha of which it is calculated that 270sqm of the site is impermeable.

6.6 On the basis that the site freely discharges, the modified rational method can be adopted in line with Section 24.6.2 of the CIRIA “The SuDS Manual”, in order to determine an estimate for the existing surface water runoff rate from the site. The below table outlines the existing run off rates for a number of events. The average intensities are based on FSR rainfall data and a winter rainfall profile for a duration of 15 minutes, please refer to Appendix D for Micro Drainage results.

Event	Average intensity (i) 15min Winter Event	Calculation	Brownfield Discharge Rate
1 in 1 year	33.7mm/hr	Q= 3.61 x 1.00 x 33.7 x 0.027	**3.28l/s**
1 in 30 year	82.8mm/hr	Q= 3.61 x 1.00 x 82.8 x 0.027	**8.07l/s**
1 in 100 year	107.8mm/hr	Q= 3.61 x 1.00 x 107.8 x 0.027	**10.51l/s**

TABLE 6 - EXISTING SURFACE WATER RUNOFF RATES

CLIMATE CHANGE ALLOWANCES

6.7 The guidance by the EA is replicated below in Table 8 where the drainage system is to be designed to accommodate a 20% climate change allowance on top of the 1 in 100-year storms. Applicants should apply a sensitivity test against the 40% climate change allowance to ensure that the additional runoff is wholly contained within the site and that there is no increase in the rate of runoff discharged from the site.

TABLE 7: PEAK RAINFALL INTENSITY CLIMATE CHANGE ALLOWANCE

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper End	10%	20%	40%
Central	5%	10%	20%

LOCAL GUIDANCE

6.8 Policy DM59: Flood Risk Management sets out the aims to minimise the risk of flooding within the borough and to incorporate SuDS into developments to reduce surface water flood risk.

6.9 The London Plan Policy 5.13: Sustainable Drainage - Developments should utilise sustainable urban drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the drainage hierarchy.

6.10 We reviewed the selection of drainage/attenuation and SuDS components in line with the drainage hierarchy listed in the London Plan policy 5.13 and the table below provides the justification of the SuDS measures:

SUDS technique	Adopted	Not Adopted	Reason
Store Rainwater for later use		×	Rainwater harvesting is not proposed on the scheme due to the high initial installation cost not making the provision of RWH economically viable.
Use infiltration technics		×	Not adopted because the site is underlain by impermeable strata and the site currently has a positive drainage outfall.
Attenuate rainwater in ponds or open water features i.e. Filter Strips / swales	×		The proposed drainage scheme includes permeable paving with sub base storage to proposed car parking area.
Attenuate rainwater in sealed tanks	×		Below ground attenuation is proposed, this is provided by the permeable paving sub base storage.
Discharge direct to a watercourse		×	There are no watercourses surrounding the site.
Discharge to a surface water drain	×		A connection to the public surface water sewer is proposed as per the existing site.
Discharge to a combined sewer		×	There are no combined sewers surrounding the site.

PROPOSED SURFACE WATER STRATEGY

6.11 The underlying geology suggests that disposal of surface water via infiltration is not possible owing to the clay soil shown in the borehole logs.

6.12 Therefore, following the hierarchy (shown in table 4), and with no surface water body in the vicinity of the site, proposals are to discharge to the existing sewer network.

6.13 Given the site is already developed and considered a brownfield site, whilst restricting surface water discharge off site to greenfield would be optimal, the measured greenfield rate for the site as per Table 5 is 0.1l/s. Proposing 0.1l/s is considered a too smaller rate for a flow control device, as it would be highly susceptible to blocking and require frequent ongoing maintenance.

6.14 Policy 3.4 of the Supplementary Planning Guidance (Sustainable Design and Construction) states that in cases such as this, greenfield runoff may not be appropriate as the system would be prone to blockage. The guidance states that for previously developed sites, runoff rates should not be more than three times the calculated Greenfield rate.

6.15 Therefore, the proposed discharge rate post development from the site is to be 0.9l/s for all events including up to and including the 1 in 100-year event plus an allowance of 40% for climate change (three times the 1 in 30 year greenfield runoff rate) This is a significant reduction in comparison to the calculated existing discharge rates shown in Table 6.

6.16 Restricting the surface water discharge from the site to 0.9l/s results in the requirement for attenuation. The attenuation size shall be able to accommodate all events up to an including the 1 in 100-year event plus an allowance of 40% for climate change to ensure no flooding on the site occurs.

6.17 Based on a proposed impermeable area of 200m^2 for the new property and car parking area and a restricted discharge rate of 0.9l/s there is a requirement for between 6.8m^3 and 10m^3 of surface water attenuation. See appendix E for a copy of the microdrainage calculations.

6.18 The proposed attenuation for the development will be provided by permeable paving for the proposed car park area. The flow rate being controlled by a suitable flow control.

6.19 Where possible RWP's will discharge directly onto the surface of the permeable paving with the remaining RWP's being connected to a catchpit manhole and in turn connected directly into the permeable subbase material. This ensures that any runoff from the roof has the added benefit of being filtered therefore improving the quality prior to discharge from the site.

6.20 The surface water discharge will connect to the existing surface water outfall from the site

6.21 A proposed copy of the surface water drainage strategy for the site is included in Appendix F

PROPOSED FOUL WATER STRATEGY

6.22 It is proposed to utilise the existing foul drainage infrastructure post-development, this includes utilising the connections to the public foul sewer.

6.23 Any new foul water pop ups post development will be connected in to the existing foul system either through utilising existing connections or providing new pop ups and connections where practical in to the existing network.

7 SUDS MAINTENANCE AND MANAGEMENT

7.1 The responsibility for the enacting of this SuDS Maintenance and Management Plan will be the responsibility of the property owner.

GULLIES

7.2 Gullies provide a degree of pollution control in preventing silt and debris passing into the sewer network.

GULLY MAINTENANCE

MAINTENANCE SCHEDULE	REQUIRED ACTION	RECOMMENDED FREQUENCY
Regular maintenance	Clean and empty gullies.	Quarterly.

CATCHPITS

7.3 Catchpit chambers and manholes provide a degree of pollution control in preventing silt and debris passing forwards into the drainage network.

7.4 The operation and maintenance requirements are given in the table below:

CATCHPIT MAINTENANCE

MAINTENANCE SCHEDULE	REQUIRED ACTION	RECOMMENDED FREQUENCY
Regular maintenance	Clean and empty catchpits.	Quarterly.

BELOW GROUND MANHOLES AND DRAINAGE - GENERAL

7.5 Manholes and Catchpit Inspections should be frequent and regular, depending on local conditions, but at least annually. The drainage system should be cleaned / jetted as necessary.

PERMEABLE PAVING

7.6 Permeable block paving allows water to infiltrate through gaps between the blocks into a lined layer of granular material, from which it is collected and discharges into the below ground drainage network.

7.7 The operation and maintenance requirements are given the table below:

PERMEABLE PAVING MAINTENANCE

MAINTENANCE SCHEDULE	REQUIRED ACTION	RECOMMENDED FREQUENCY
Regular maintenance	Sweeping. **Note:** Any jointing material between the blocks that is lost or displaced as a result of sweeping must be replaced. New jointing material must be the same type as that removed or a suitable replacement.	Three times a year at the end of winter, mid-summer and after autumn lead fall. Also as required based on site-specific observations.
Occasional maintenance	Stabilise and mow contributing and adjacent areas to prevent excess sediment being washing into the paving. Removal of weed.	As required
Remedial actions	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users. Rehabilitation of surface and underlying sand and geotextile.	As required
Monitoring	Inspect for evidence of poor operation and/or weed growth. If required take remedial action.	Monthly for three months after installation, then during regular maintenance visits.

7.8 Over time the ability of the permeable paving to infiltrate and convey surface water run-off may degrade due to clogging of the joints by silt and other sediments.

7.9 All areas of permeable pavement should be regularly inspected by those responsible, preferably during and after heavy rainfall to check effective operation and to identify any areas of ponding.

8 RECOMMENDATIONS AND CONCLUSIONS

8.1 The proposed works consist of the demolition of the existing two storey office building and car park and construction of 3 residential units hard standing for car parking.

8.2 The existing site is currently fully hard paved.

8.3 The proposed development site is located entirely within Flood Zone 1 land classified as Land having less than 1 in 1000 annual probability of river or sea flooding. The site is classified as 'More Vulnerable' (Flood Risk Vulnerability Classification) and therefore, the development is classified as 'appropriate'.

8.4 The site is anticipated to currently be positively drained to the public sewer in Southbury Road.

8.5 Surface water disposal via infiltration is not considered feasible due to the underlying ground conditions.

8.6 Given the site is already developed and considered a brownfield site, whilst restricting surface water discharge off site to greenfield would be optimal it is considered too smaller rate for a flow control device, as it would be highly susceptible to blocking and require frequent ongoing maintenance. Therefore, the proposed discharge rate post development from is to be limited to 3 times the 30 year greenfield runoff rate of 0.3l/s (0.9l/s total) for all events including up to and including the 1 in 100-year event plus an allowance of 40% for climate change. This provides a significant betterment over the existing situation.

8.7 The proposed drainage scheme includes the provision of permeable paving to the proposed car park area.

8.7 It is proposed that all surface water will be conveyed through a gravity fed surface water system to the outfall location. In order to satisfy the proposed restricted discharge a vortex flow control device will be placed upstream of the discharge location. As a result of the restricted discharge rate surface water attenuation will be required on the development which in this instance is provided by a 400mm deep sub base material beneath the permeable surfacing.

8.8 The surface water drainage design principles set out in this document will ensure that the development does not increase the risk of flooding to the surrounding area.

8.9 The proposed surface water drainage and SuDS design principles set out in this document will ensure that the development does not increase the risk of flooding to the surrounding area and will mimic the pre-development site.

8.10 Taking into account the flood risks to the site from all sources following the proposed development, the overall post-development flood risk is deemed to remain low.

8.11 The drainage strategy and SuDS measures in this report are in accordance with the requirements of London

FIGURES

FIGURE 1

Risk of Flooding from Rivers or Sea

Environment Agency Website

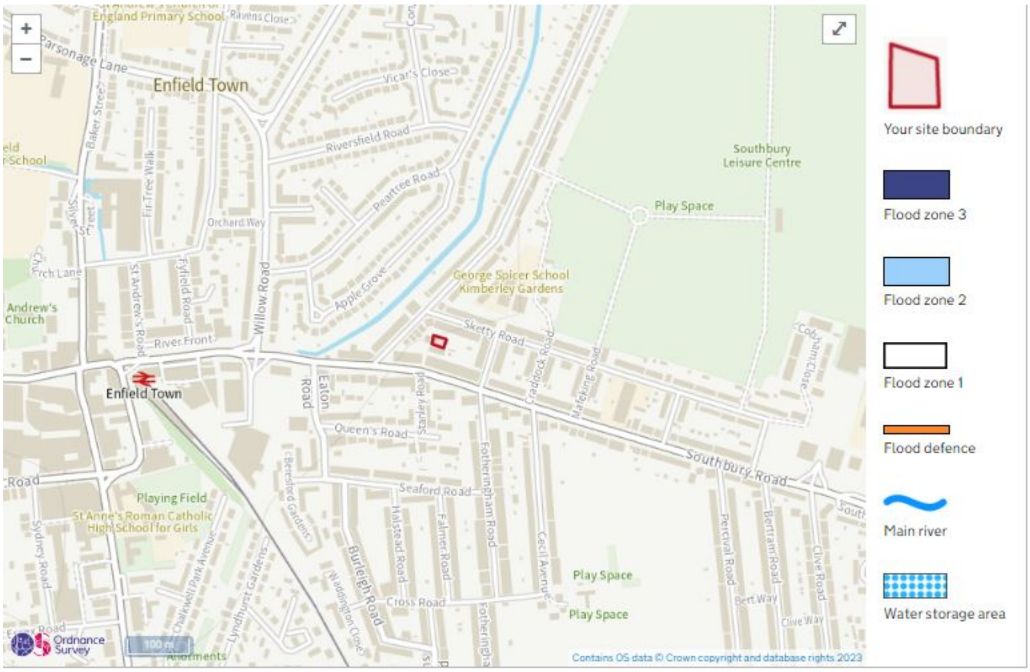


FIGURE 2

Surface Water Flood Risk

Environment Agency Website

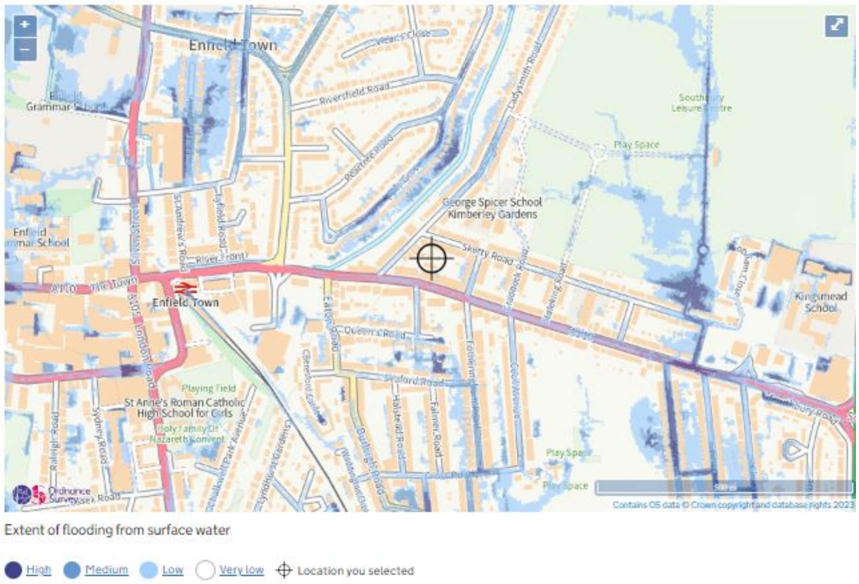
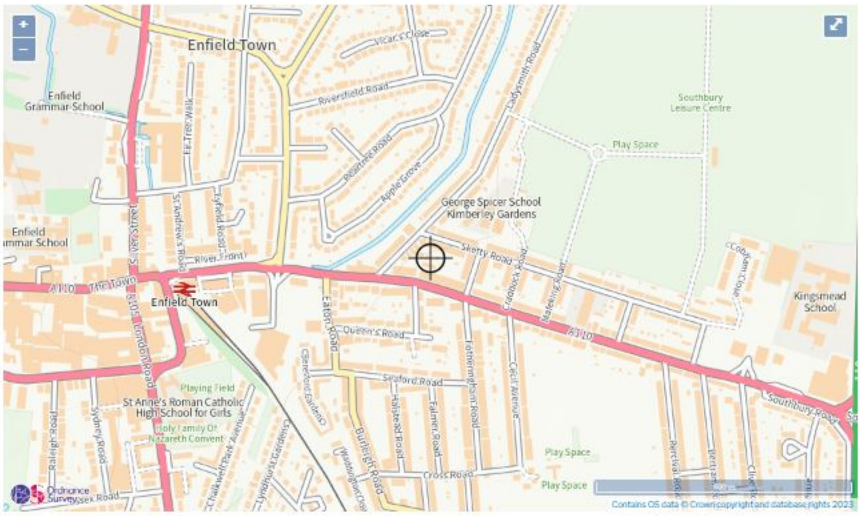


FIGURE 3

Extent of Flooding from Reservoirs

Environment Agency Website



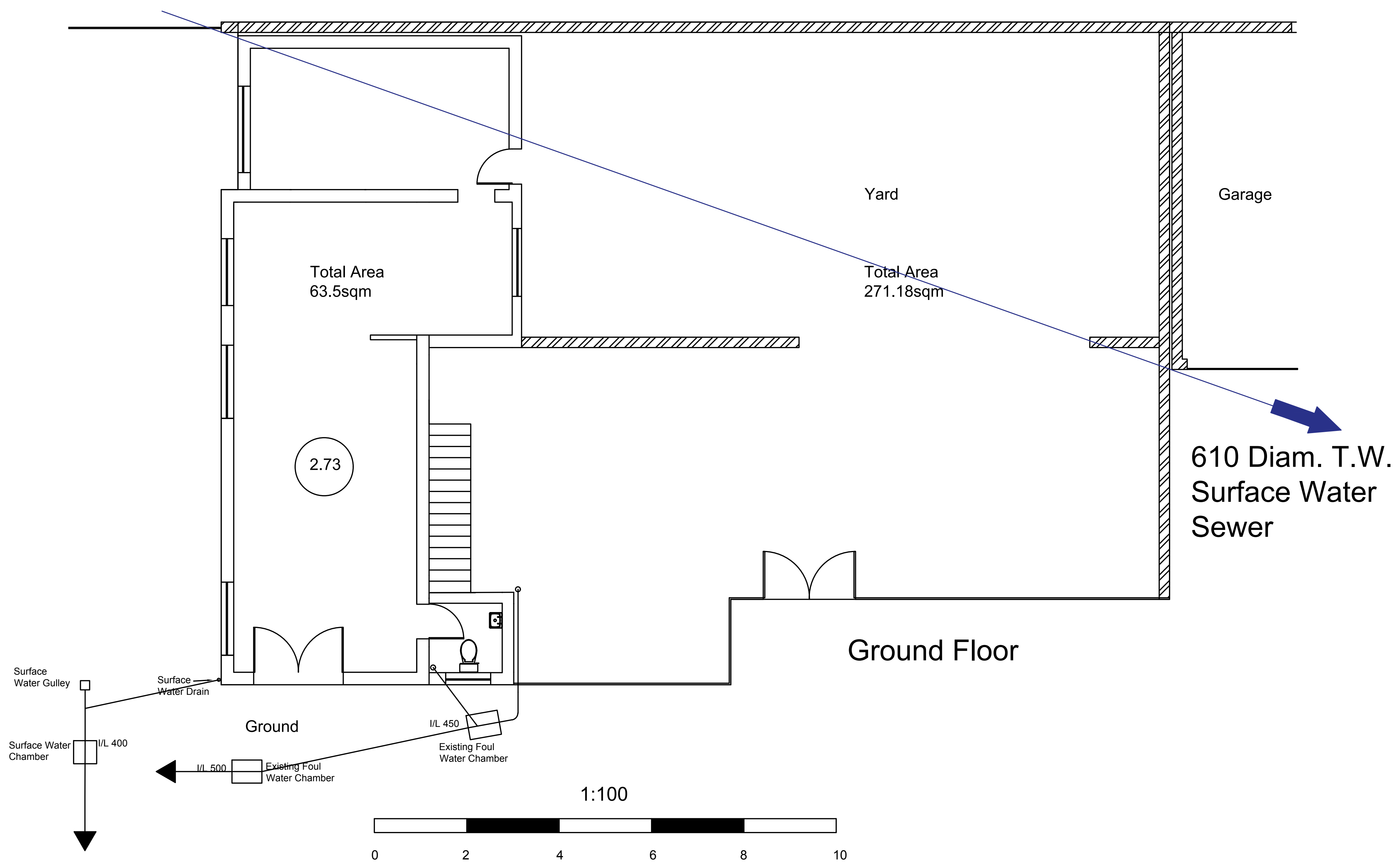
Maximum extent of flooding from reservoirs:

when river levels are normal · when there is also flooding from rivers · Location you selected

APPENDICES

APPENDIX A

Existing Site Layout



Disabled Facilities Consultant

PROJECT

52b, Southbury Road,
Enfield,
Middlesex,
EN1 1YB

Client: Mrs. J. Zervos

Contact: 07887 777635

Drawing Title

Existing Ground Floor Plans

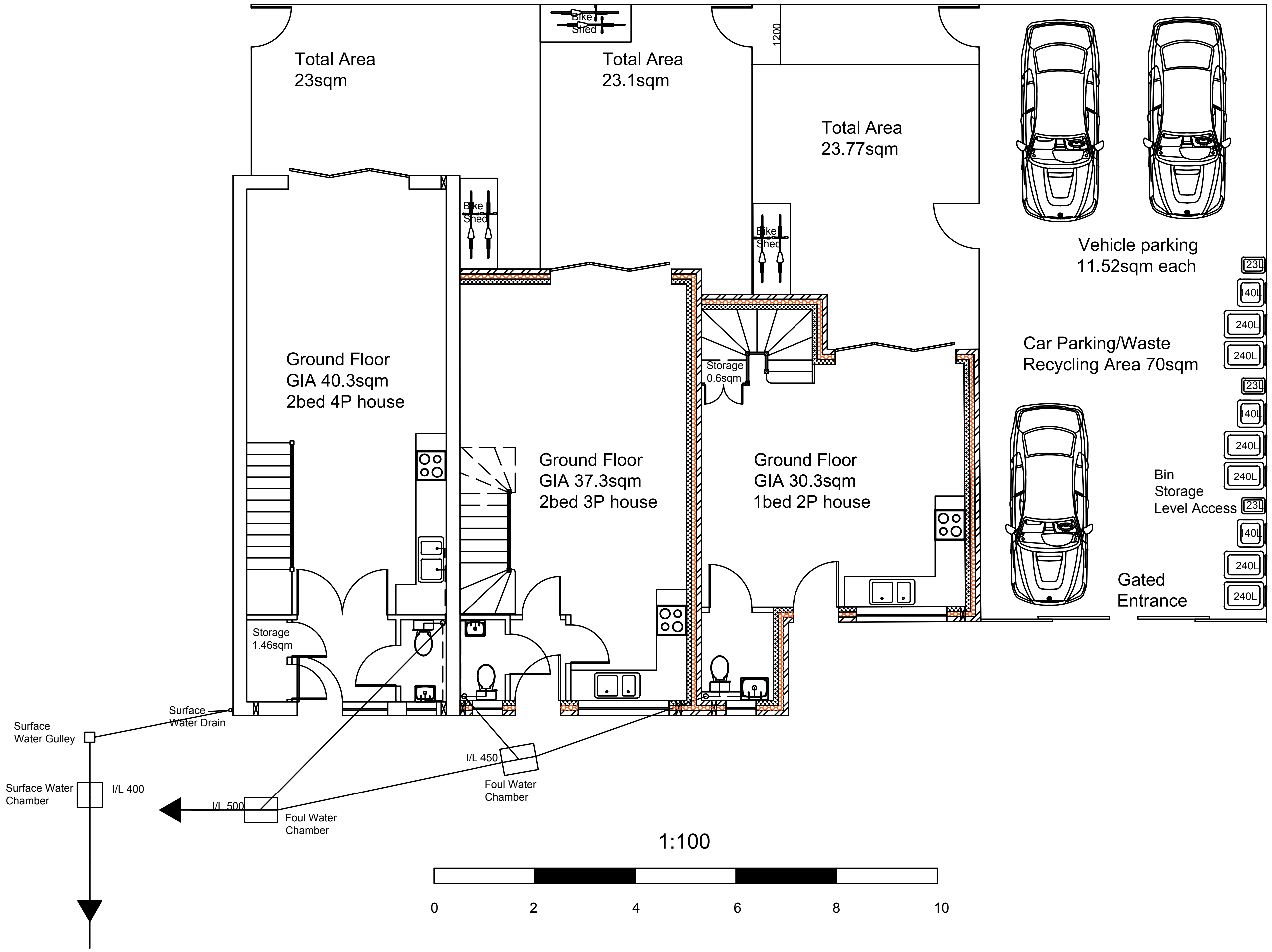
Notes

Drawn By SJW	Scale 1:100 @ A3

Project No./Drawing No.	Rev	Date
52bSR/10/23/1		

APPENDIX B

Proposed Site Layout



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PROJECT

52b, Southbury Road,
Enfield,
Middlesex,
EN1 1YB

Client: Mrs. J. Zervos

Contact: 07887 777635

Drawing Title

Proposed Ground Floor Plans

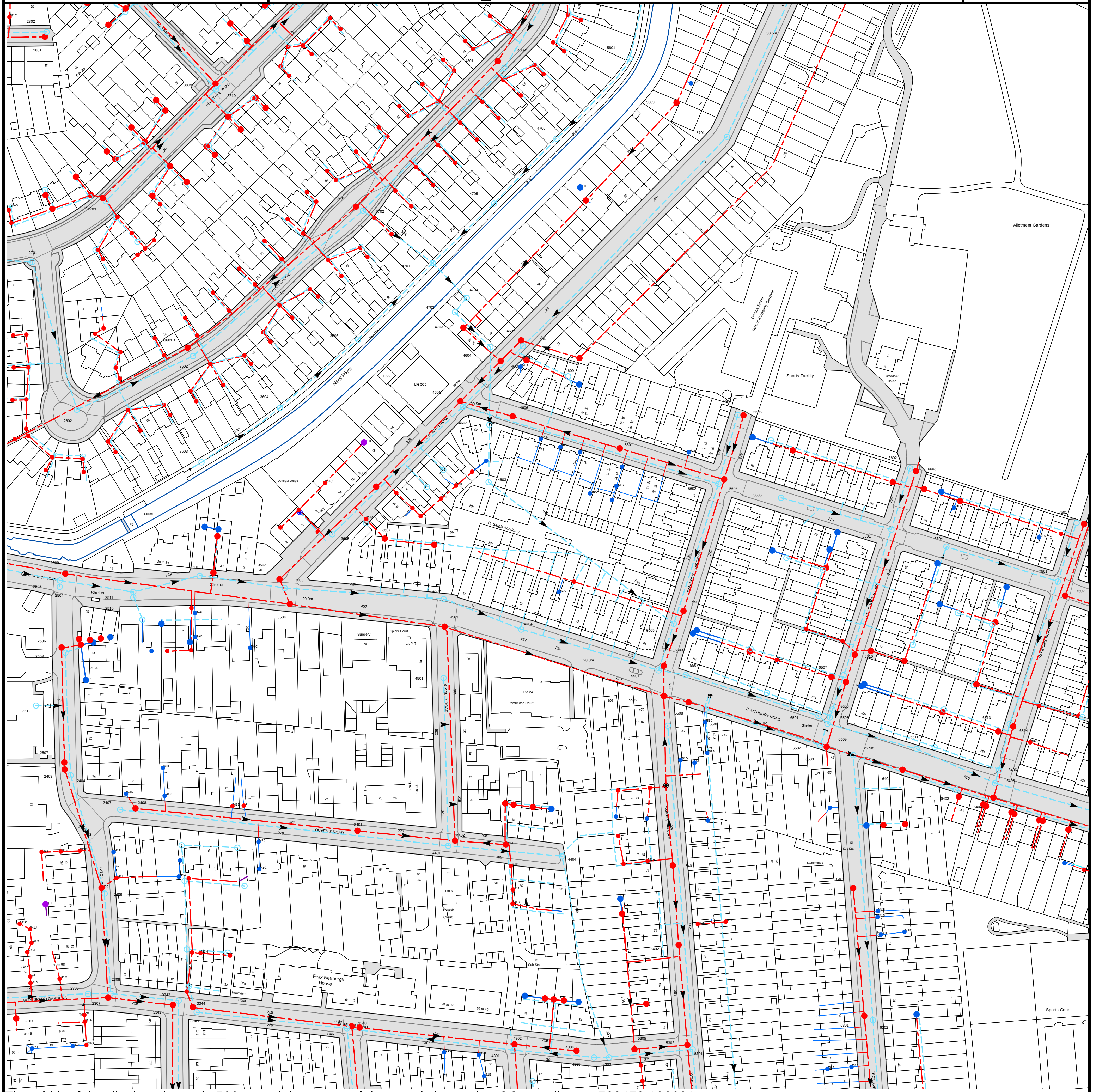
Notes

Drawn By	Scale 1:100 @ A3		
SJW			
Project No./Drawing No.		Rev	Date
52bSR/10/23/4			

APPENDIX C

Thames Water Public Sewer Records and Flooding Records

Asset Location Search Sewer Map - ALS/ALS Standard/2023_4798529



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 533479,196601

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

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
241N	n/a	n/a
35BI	n/a	n/a
35CA	n/a	n/a
241O	n/a	n/a
2307	28.63	27.08
2408	29.34	27.6
6301	24.59	22.74
74BH	n/a	n/a
74DI	n/a	n/a
74DH	n/a	n/a
7410	n/a	n/a
7409	n/a	n/a
7408	n/a	n/a
6411	n/a	n/a
6410	n/a	n/a
6409	n/a	n/a
6408	n/a	n/a
6404	25.28	22.01
6405	25.26	23.53
6406	25.3	23.92
651A	n/a	n/a
65DB	n/a	n/a
6514	25.48	23.35
6513	25.43	24.04
75BG	n/a	n/a
75BC	n/a	n/a
75BD	n/a	n/a
65EJ	n/a	n/a
65FE	n/a	n/a
65EI	n/a	n/a
65FD	n/a	n/a
7502	26.05	23.35
65FB	n/a	n/a
7501	26.06	24.38
761A	n/a	n/a
76AG	n/a	n/a
7602	26.03	24.22
7601	25.95	24.61
6509	26.17	24.67
6510	26.78	23.96
65CI	n/a	n/a
65DD	n/a	n/a
65HD	n/a	n/a
6601	27.46	26.04
66CA	n/a	n/a
6402	25.49	22.67
65HC	n/a	n/a
6602	n/a	n/a
65HF	n/a	n/a
6603	27.67	24.95
6511	25.71	24.21
66AJ	n/a	n/a
65DJ	n/a	n/a
65HA	n/a	n/a
65EG	n/a	n/a
66BC	n/a	n/a
65DA	n/a	n/a
65DF	n/a	n/a
6604	26.94	25.06
661A	n/a	n/a
6403	24.23	22.15
65FH	n/a	n/a
6407	n/a	n/a
66AH	n/a	n/a
65FF	n/a	n/a
38GJ	n/a	n/a
38HB	n/a	n/a
28CI	n/a	n/a
2803	33.48	31.72
38DF	n/a	n/a
38EH	n/a	n/a
38EG	n/a	n/a
38FE	n/a	n/a
48HB	n/a	n/a
48HD	n/a	n/a
48HI	n/a	n/a
48HC	n/a	n/a
48HE	n/a	n/a
48HJ	n/a	n/a
48HF	n/a	n/a
48JA	n/a	n/a
48IC	n/a	n/a
48IH	n/a	n/a
48GJ	n/a	n/a
48IE	n/a	n/a
4801	31.84	29.3
48GF	n/a	n/a
4802	31.92	29.96
27AJ	n/a	n/a
27AE	n/a	n/a
37BE	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
27AG	n/a	n/a
37BD	n/a	n/a
37BH	n/a	n/a
37AE	n/a	n/a
37AD	n/a	n/a
38DI	n/a	n/a
28EF	n/a	n/a
38EB	n/a	n/a
38DJ	n/a	n/a
3810	33.29	31.08
3809	33.28	30.76
38ED	n/a	n/a
38DB	n/a	n/a
38EE	n/a	n/a
38EJ	n/a	n/a
38EF	n/a	n/a
38EI	n/a	n/a
38DC	n/a	n/a
38DD	n/a	n/a
38HF	n/a	n/a
38HC	n/a	n/a
38CJ	n/a	n/a
28DI	n/a	n/a
28CH	n/a	n/a
471A	n/a	n/a
471B	n/a	n/a
4706	31.97	30.29
5701	30.37	29.2
5803	30.64	28.72
48GG	n/a	n/a
581A	n/a	n/a
48GA	n/a	n/a
48GD	n/a	n/a
48GE	n/a	n/a
48FJ	n/a	n/a
5801	32.01	30.36
48FB	n/a	n/a
48FC	n/a	n/a
48FA	n/a	n/a
48II	n/a	n/a
48ID	n/a	n/a
48FG	n/a	n/a
48FD	n/a	n/a
48EI	n/a	n/a
47DB	n/a	n/a
37CB	n/a	n/a
3702	31.98	29.67
3701	32.11	28.74
47CJ	n/a	n/a
4705	31.87	30.07
37GD	n/a	n/a
37GG	n/a	n/a
47DA	n/a	n/a
47CE	n/a	n/a
37HB	n/a	n/a
37HF	n/a	n/a
37HA	n/a	n/a
37HG	n/a	n/a
47CF	n/a	n/a
37HC	n/a	n/a
47BJ	n/a	n/a
37HD	n/a	n/a
47CA	n/a	n/a
47BE	n/a	n/a
47DF	n/a	n/a
47DD	n/a	n/a
47DC	n/a	n/a
47BF	n/a	n/a
47BB	n/a	n/a
47DI	n/a	n/a
47DH	n/a	n/a
27DD	n/a	n/a
281C	n/a	n/a
271A	n/a	n/a
27DE	n/a	n/a
27DG	n/a	n/a
2701	33.09	30.93
2801	33.6	31.5
27DI	n/a	n/a
27DB	n/a	n/a
2802	33.59	32.44
27DC	n/a	n/a
27CI	n/a	n/a
27DH	n/a	n/a
27CJ	n/a	n/a
27CE	n/a	n/a
27CB	n/a	n/a
2702	33.19	31.26
27CC	n/a	n/a
2703	33.23	31.68
27AH	n/a	n/a
28CJ	n/a	n/a
27AI	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
27CF	n/a	n/a
37EF	n/a	n/a
37DJ	n/a	n/a
37DE	n/a	n/a
37FB	n/a	n/a
37FA	n/a	n/a
37FG	n/a	n/a
2704	n/a	n/a
27BI	n/a	n/a
27CH	n/a	n/a
37FF	n/a	n/a
2705	n/a	n/a
37GH	n/a	n/a
37GB	n/a	n/a
2706	n/a	n/a
37GA	n/a	n/a
27BJ	n/a	n/a
37AH	n/a	n/a
27BF	n/a	n/a
27BH	n/a	n/a
37GC	n/a	n/a
37AF	n/a	n/a
37AJ	n/a	n/a
37AG	n/a	n/a
27BD	n/a	n/a
37BB	n/a	n/a
37BC	n/a	n/a
37BG	n/a	n/a
36DJ	n/a	n/a
26EH	n/a	n/a
26EC	n/a	n/a
26EB	n/a	n/a
36DI	n/a	n/a
36DG	n/a	n/a
36DB	n/a	n/a
3602	31.84	30.29
36DH	n/a	n/a
36DA	n/a	n/a
36EH	n/a	n/a
26EF	n/a	n/a
26EA	n/a	n/a
3601B	31.89	28.24
36CH	n/a	n/a
26EE	n/a	n/a
26EJ	n/a	n/a
36FA	n/a	n/a
26DJ	n/a	n/a
36CF	n/a	n/a
36CI	n/a	n/a
26DI	n/a	n/a
37ED	n/a	n/a
37EC	n/a	n/a
37EG	n/a	n/a
37EA	n/a	n/a
37DF	n/a	n/a
361B	n/a	n/a
461A	n/a	n/a
461H	n/a	n/a
4606	30.23	28.25
4602	30.48	28.27
4601	30.54	27.75
46CF	n/a	n/a
46DA	n/a	n/a
461D	n/a	n/a
4605	30.62	27.86
46CH	n/a	n/a
4609	30.23	28.19
4604	30.58	29.34
4608	30.61	28.75
4607	30.65	27.98
3606	32.02	30.27
4703	30.86	28.17
4702	31.08	29.3
4704	31.05	29.32
37DI	n/a	n/a
37DC	n/a	n/a
4701	31.99	29.47
37DA	n/a	n/a
37CF	n/a	n/a
37CI	n/a	n/a
37CJ	n/a	n/a
37CE	n/a	n/a
2504	31.35	28.84
2505	n/a	n/a
2509	31.35	25.84
26BC	n/a	n/a
26BI	n/a	n/a
26BD	n/a	n/a
26BE	n/a	n/a
26CB	n/a	n/a
2601	32.67	27.85
26BH	n/a	n/a
26BF	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
26CC	n/a	n/a
26CJ	n/a	n/a
2602	32.47	30.64
26DB	n/a	n/a
26CI	n/a	n/a
26DA	n/a	n/a
26CH	n/a	n/a
26DF	n/a	n/a
26CF	n/a	n/a
26CG	n/a	n/a
3504	29.96	25.16
2510	30.72	28.51
2511	n/a	n/a
3503	30.09	27.96
3502	30.11	25.97
3501	30.79	28.46
35BA	n/a	n/a
36CD	n/a	n/a
36CC	n/a	n/a
36BC	n/a	n/a
36CB	n/a	n/a
36BD	n/a	n/a
3603	32.01	30.77
26CA	n/a	n/a
26BA	n/a	n/a
26BB	n/a	n/a
26AE	n/a	n/a
26AJ	n/a	n/a
36EF	n/a	n/a
26AI	n/a	n/a
26AD	n/a	n/a
3604	32.03	30.43
36EG	n/a	n/a
36EE	n/a	n/a
36EA	n/a	n/a
36DC	n/a	n/a
36EB	n/a	n/a
55DB	n/a	n/a
55DE	n/a	n/a
55EB	n/a	n/a
55EA	n/a	n/a
5505	27.96	26.56
5506	28.02	25.07
65GE	n/a	n/a
65FJ	n/a	n/a
55EE	n/a	n/a
55EC	n/a	n/a
65GC	n/a	n/a
66BE	n/a	n/a
561B	n/a	n/a
5606	28.36	26.99
461C	n/a	n/a
561C	n/a	n/a
5602	28.76	27.24
5603	28.85	26.54
561A	n/a	n/a
561D	n/a	n/a
461G	n/a	n/a
56BJ	n/a	n/a
5601	29.49	27.41
56CA	n/a	n/a
56BH	n/a	n/a
5605	29.51	27.33
5604	29.45	27.98
4501	28.76	26.4
4504	28.88	27.15
4503	29.23	24.48
4502	29.47	27.44
451A	n/a	n/a
45AH	n/a	n/a
4611	n/a	n/a
4610	n/a	n/a
46BD	n/a	n/a
3605	30.2	28.9
36BI	n/a	n/a
36BE	n/a	n/a
3607	n/a	n/a
361A	n/a	n/a
46CA	n/a	n/a
46CB	n/a	n/a
461F	n/a	n/a
46CC	n/a	n/a
3608	30.36	n/a

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Sewer Flooding
History Enquiry

Thames Water Property Searches

Mason Navarro Pledge Ltd

Search address supplied	Browned Off Tanning 52 Southbury Road Enfield EN1 1YB

Your reference	Southbury Road
Our reference	SFH/SFH Standard/2023_4798562
Received date	**13 March 2023**
Search date	**13 March 2023**

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

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

0800 009 4540

Sewer Flooding

History Enquiry

Thames Water Property Searches

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- 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 on Tel: 0800 316 9800 or website www.thameswater.co.uk

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

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

0800 009 4540

APPENDIX D

Greenfield Runoff Rate and Rainfall Intensities

Date 04/11/2023 12:05	Designed by
File	Checked by
Innovyze	Source Control 2020.1

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	SAAR (mm)	661	Urban	0.000
Area (ha)	0.027	Soil	0.450	Region Number	Region 6

Results	**l/s**
QBAR Rural	0.1
QBAR Urban	0.1
Q100 years	0.4
Q1 year	0.1
Q30 years	0.3
Q100 years	0.4

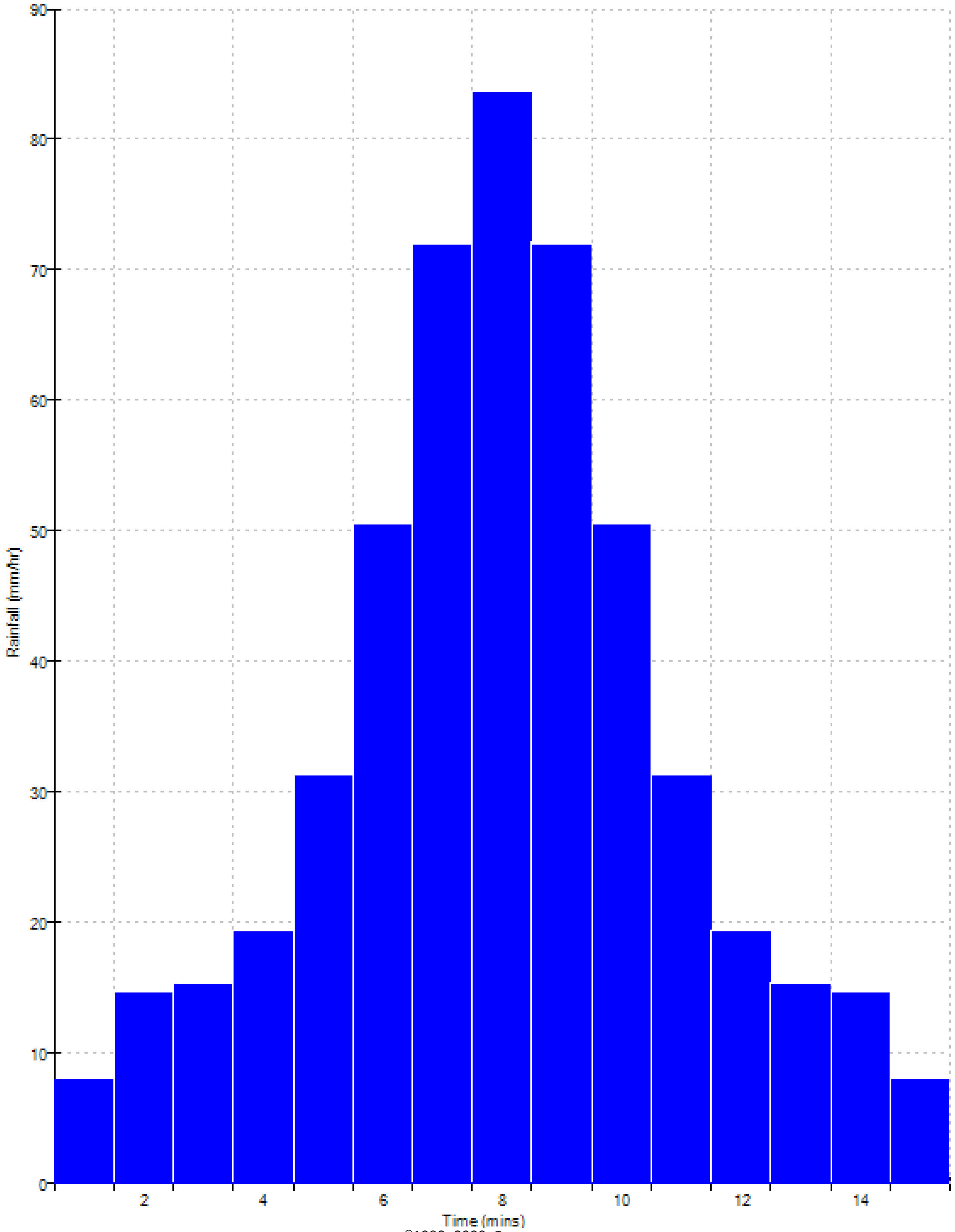
Date 26/03/2023 14:30	Designed by	
File	Checked by	
Innovyze	Network 2020.1	

Rainfall profile

Storm duration (mins) 15

FSR Data

Region	England and Wales
M5-60(mm)	21.000
Ratio R	0.442
Peak Intensity (mm/hr)	83.596
Ave. Intensity (mm/hr)	33.709
Return Period (years)	1.0



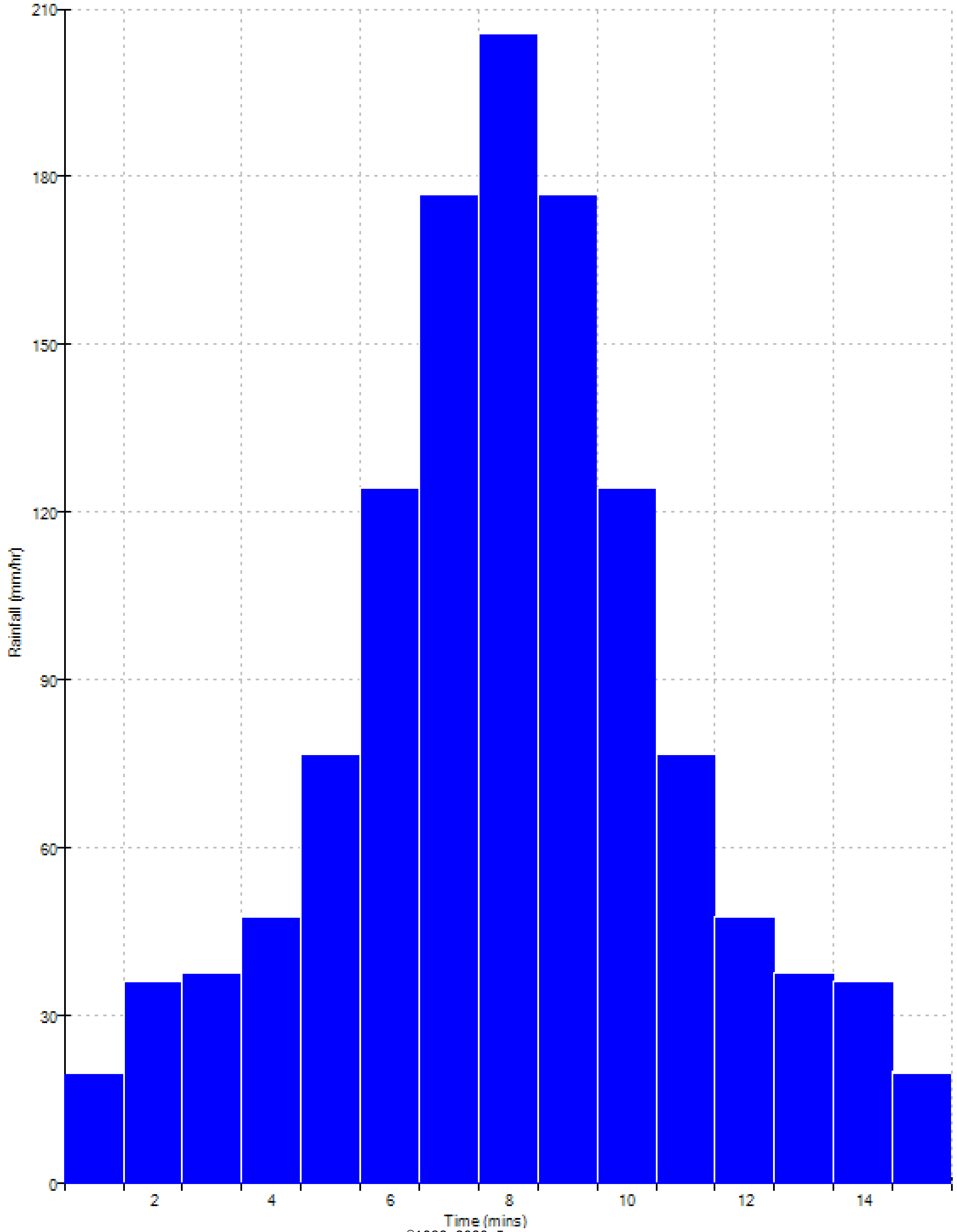
Date 26/03/2023 14:31 File	Designed by Checked by	
Innovyze	Network 2020.1	

Rainfall profile

Storm duration (mins) 15

FSR Data

Region	England and Wales
M5-60(mm)	21.000
Ratio R	0.442
Peak Intensity (mm/hr)	205.348
Ave. Intensity (mm/hr)	82.803
Return Period (years)	30.0



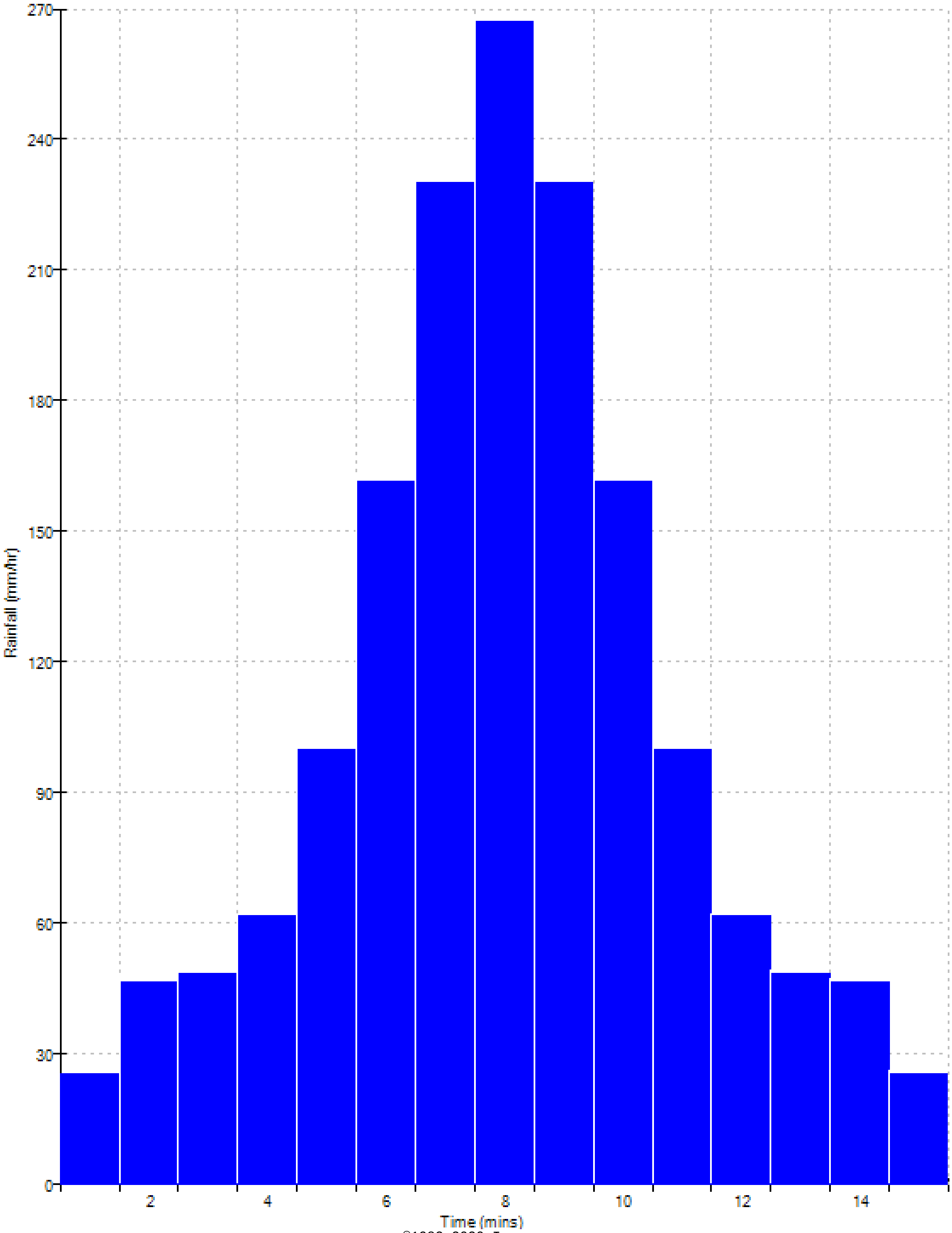
Date 26/03/2023 14:32	Designed by
File	Checked by
Innovyze	Network 2020.1

Rainfall profile

Storm duration (mins) 15

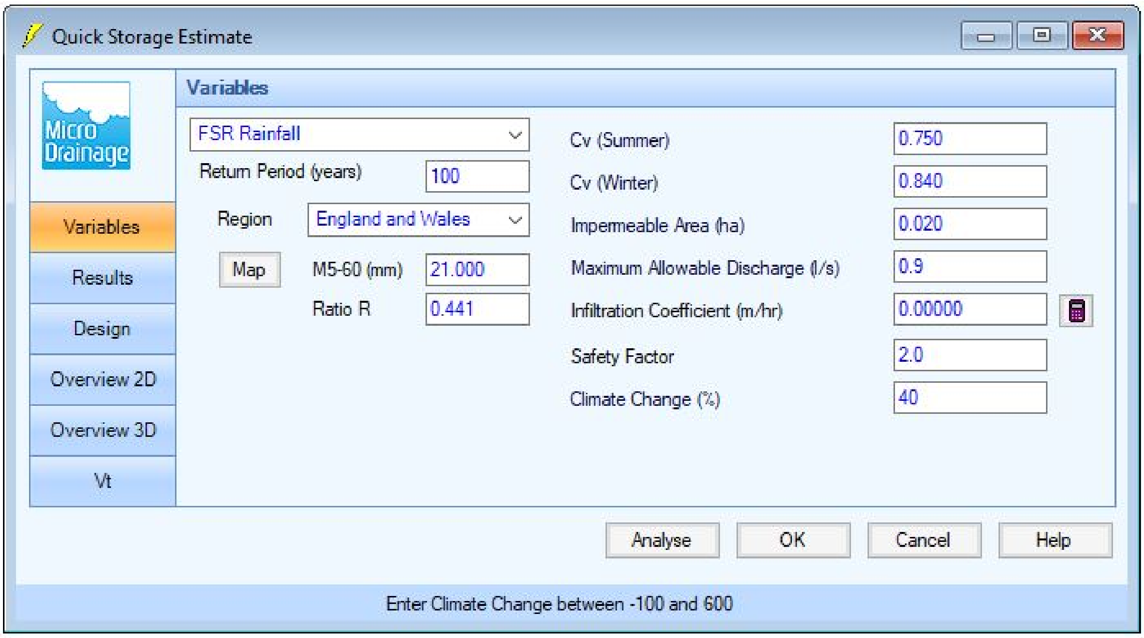
FSR Data

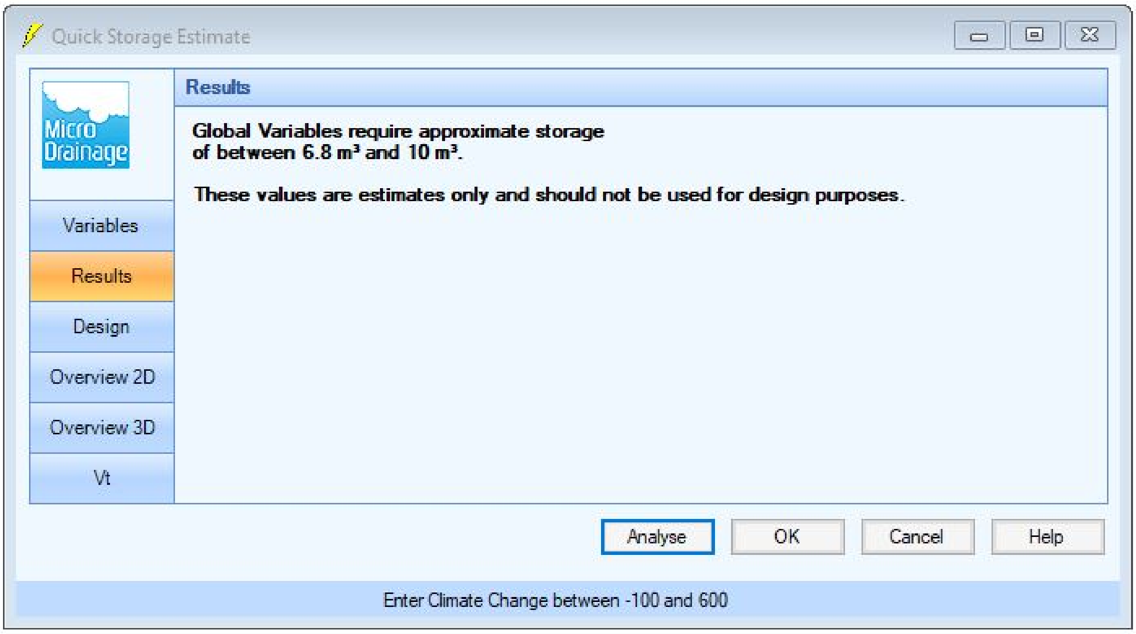
Region	England and Wales
M5-60(mm)	21.000
Ratio R	0.442
Peak Intensity (mm/hr)	267.293
Ave. Intensity (mm/hr)	107.780
Return Period (years)	100.0



APPENDIX E

Microdrainage Surface Water Calculations


Quick Storage Estimate
Micro Drainage
Variables
FSR Rainfall
Return Period (years) 100
Region England and Wales
Map M5-60 (mm) 21.000
Ratio R 0.441
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 0.020
Maximum Allowable Discharge (l/s) 0.9
Infiltration Coefficient (m/hr) 0.00000
Safety Factor 2.0
Climate Change (%) 40
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Analyse OK Cancel Help
Enter Climate Change between -100 and 600


Quick Storage Estimate
Micro Drainage
Results
Global Variables require approximate storage
of between 6.8 m³ and 10 m³.
These values are estimates only and should not be used for design purposes.
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Analyse OK Cancel Help
Enter Climate Change between -100 and 600

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 104 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	4.787	0.287	0.0	0.6	0.6	4.7	Flood Risk
30 min Summer	4.846	0.346	0.0	0.7	0.7	6.0	Flood Risk
60 min Summer	4.884	0.384	0.0	0.7	0.7	6.8	Flood Risk
120 min Summer	4.890	0.390	0.0	0.7	0.7	6.9	Flood Risk
180 min Summer	4.881	0.381	0.0	0.7	0.7	6.7	Flood Risk
240 min Summer	4.866	0.366	0.0	0.7	0.7	6.4	Flood Risk
360 min Summer	4.838	0.338	0.0	0.7	0.7	5.8	Flood Risk
480 min Summer	4.812	0.312	0.0	0.7	0.7	5.3	Flood Risk
600 min Summer	4.789	0.289	0.0	0.6	0.6	4.8	Flood Risk
720 min Summer	4.768	0.268	0.0	0.6	0.6	4.3	Flood Risk
960 min Summer	4.734	0.234	0.0	0.6	0.6	3.6	Flood Risk
1440 min Summer	4.683	0.183	0.0	0.5	0.5	2.6	O K
2160 min Summer	4.636	0.136	0.0	0.4	0.4	1.6	O K
2880 min Summer	4.607	0.107	0.0	0.4	0.4	1.0	O K
4320 min Summer	4.572	0.072	0.0	0.3	0.3	0.4	O K
5760 min Summer	4.552	0.052	0.0	0.2	0.2	0.2	O K
7200 min Summer	4.540	0.040	0.0	0.2	0.2	0.1	O K
8640 min Summer	4.533	0.033	0.0	0.2	0.2	0.1	O K
10080 min Summer	4.530	0.030	0.0	0.2	0.2	0.1	O K
15 min Winter	4.817	0.317	0.0	0.7	0.7	5.4	Flood Risk
30 min Winter	4.885	0.385	0.0	0.7	0.7	6.8	Flood Risk
60 min Winter	4.931	0.431	0.0	0.8	0.8	7.8	Flood Risk
120 min Winter	4.938	0.438	0.0	0.8	0.8	7.9	Flood Risk
180 min Winter	4.925	0.425	0.0	0.8	0.8	7.6	Flood Risk
240 min Winter	4.905	0.405	0.0	0.8	0.8	7.2	Flood Risk
360 min Winter	4.864	0.364	0.0	0.7	0.7	6.4	Flood Risk
480 min Winter	4.827	0.327	0.0	0.7	0.7	5.6	Flood Risk
600 min Winter	4.794	0.294	0.0	0.6	0.6	4.9	Flood Risk
720 min Winter	4.766	0.266	0.0	0.6	0.6	4.3	Flood Risk
960 min Winter	4.720	0.220	0.0	0.5	0.5	3.3	Flood Risk
1440 min Winter	4.657	0.157	0.0	0.5	0.5	2.0	O K
2160 min Winter	4.606	0.106	0.0	0.4	0.4	1.0	O K
2880 min Winter	4.576	0.076	0.0	0.3	0.3	0.5	O K
4320 min Winter	4.546	0.046	0.0	0.2	0.2	0.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	150.774	0.0	5.3	24
30 min Summer	97.235	0.0	6.9	36
60 min Summer	59.609	0.0	8.6	62
120 min Summer	35.288	0.0	10.2	98
180 min Summer	25.632	0.0	11.2	132
240 min Summer	20.319	0.0	11.8	166
360 min Summer	14.638	0.0	12.8	234
480 min Summer	11.592	0.0	13.5	302
600 min Summer	9.667	0.0	14.1	368
720 min Summer	8.330	0.0	14.5	432
960 min Summer	6.583	0.0	15.3	558
1440 min Summer	4.718	0.0	16.4	802
2160 min Summer	3.376	0.0	17.6	1156
2880 min Summer	2.661	0.0	18.4	1508
4320 min Summer	1.900	0.0	19.5	2208
5760 min Summer	1.495	0.0	20.3	2936
7200 min Summer	1.241	0.0	20.9	3632
8640 min Summer	1.065	0.0	21.4	4336
10080 min Summer	0.936	0.0	21.8	4976
15 min Winter	150.774	0.0	6.0	24
30 min Winter	97.235	0.0	7.8	37
60 min Winter	59.609	0.0	9.7	62
120 min Winter	35.288	0.0	11.5	104
180 min Winter	25.632	0.0	12.5	140
240 min Winter	20.319	0.0	13.3	178
360 min Winter	14.638	0.0	14.4	252
480 min Winter	11.592	0.0	15.2	322
600 min Winter	9.667	0.0	15.8	390
720 min Winter	8.330	0.0	16.3	456
960 min Winter	6.583	0.0	17.2	586
1440 min Winter	4.718	0.0	18.5	830
2160 min Winter	3.376	0.0	19.8	1172
2880 min Winter	2.661	0.0	20.7	1504
4320 min Winter	1.900	0.0	22.0	2208

Date 04/11/2023 12:29	Designed by
File Southbury Permeable Paving.SRCX	Checked by
Innovyze	Source Control 2020.1

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
5760 min Winter	4.534	0.034	0.0	0.2	0.2	0.1	O K
7200 min Winter	4.530	0.030	0.0	0.1	0.1	0.1	O K
8640 min Winter	4.527	0.027	0.0	0.1	0.1	0.1	O K
10080 min Winter	4.525	0.025	0.0	0.1	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Winter	1.495	0.0	22.9	2872
7200 min Winter	1.241	0.0	23.6	3640
8640 min Winter	1.065	0.0	24.2	4256
10080 min Winter	0.936	0.0	24.6	5080

Date 04/11/2023 12:29	Designed by
File Southbury Permeable Paving.SRCX	Checked by
Innovyze	Source Control 2020.1

Rainfall Details

Rainfall Model	FSR	Ratio R	0.441	Cv (Winter)	0.840
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	England and Wales	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	21.000	Cv (Summer)	0.750	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.020

Time From:	**(mins) To:**	**Area (ha)**	**Time From:**	**(mins) To:**	**Area (ha)**	**Time From:**	**(mins) To:**	**Area (ha)**
0	4	0.007	4	8	0.007	8	12	0.007

Model Details

Storage is Online Cover Level (m) 5.000

Porous Car Park Structure

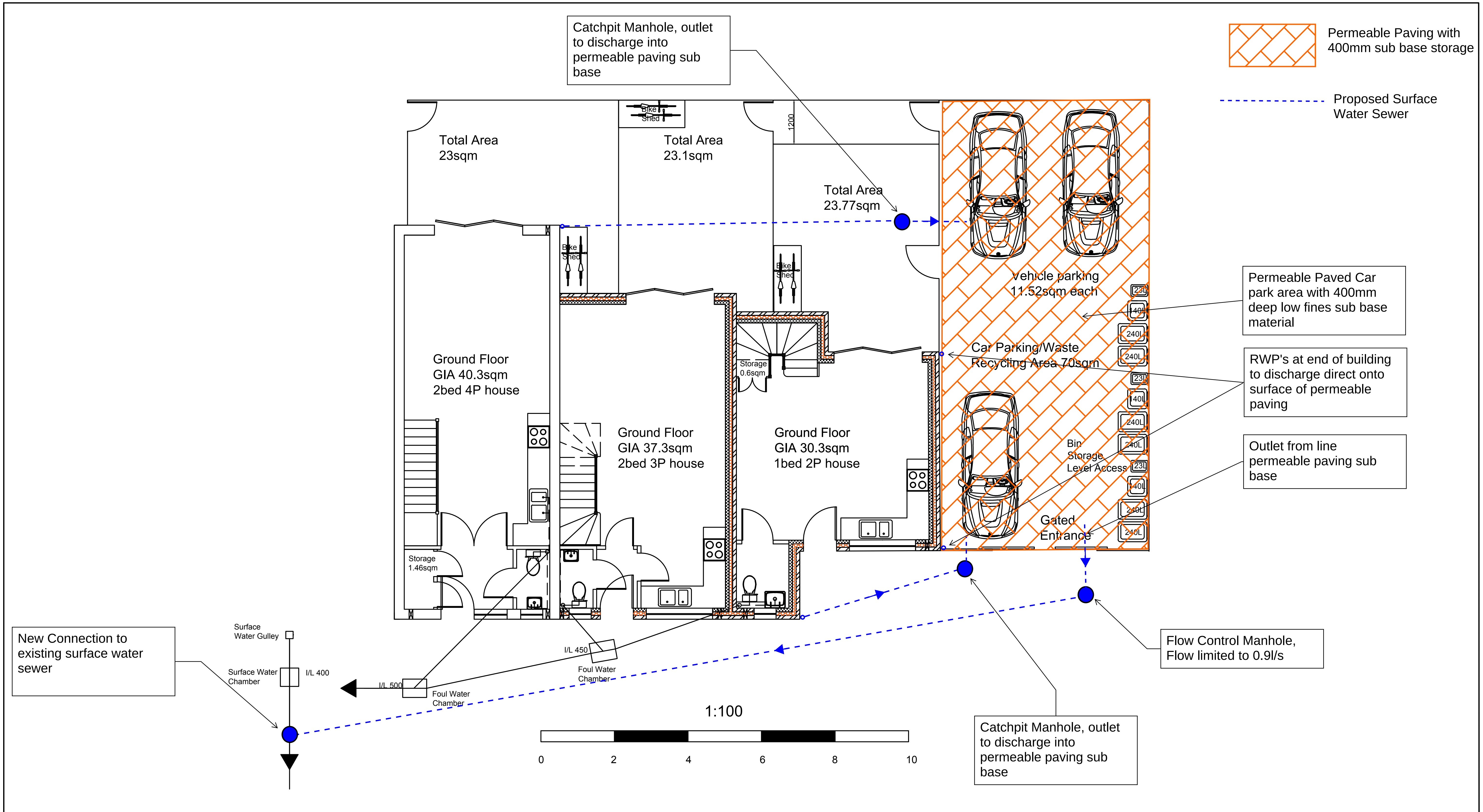
Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.7
Membrane Percolation (mm/hr)	1000	Length (m)	12.3
Max Percolation (l/s)	19.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	4.500	Membrane Depth (m)	0

Orifice Outflow Control

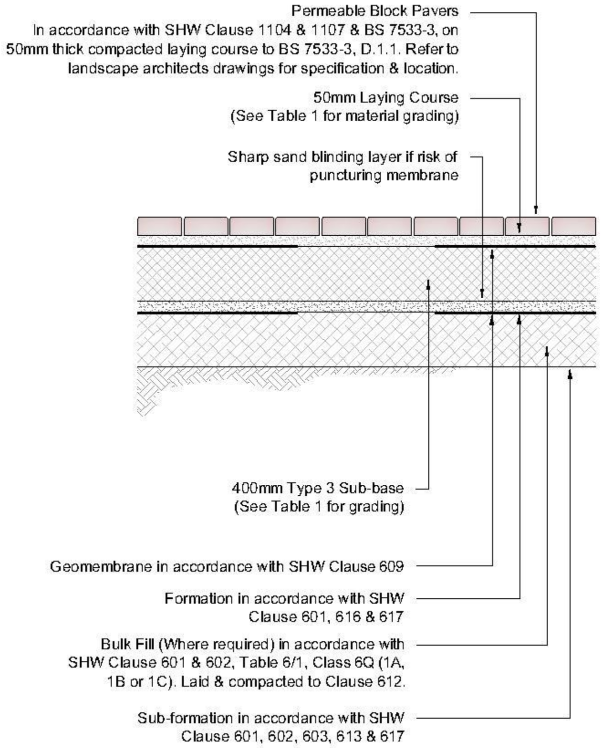
Diameter (m) 0.024 Discharge Coefficient 0.600 Invert Level (m) 4.500

APPENDIX F

Proposed Drainage Strategy



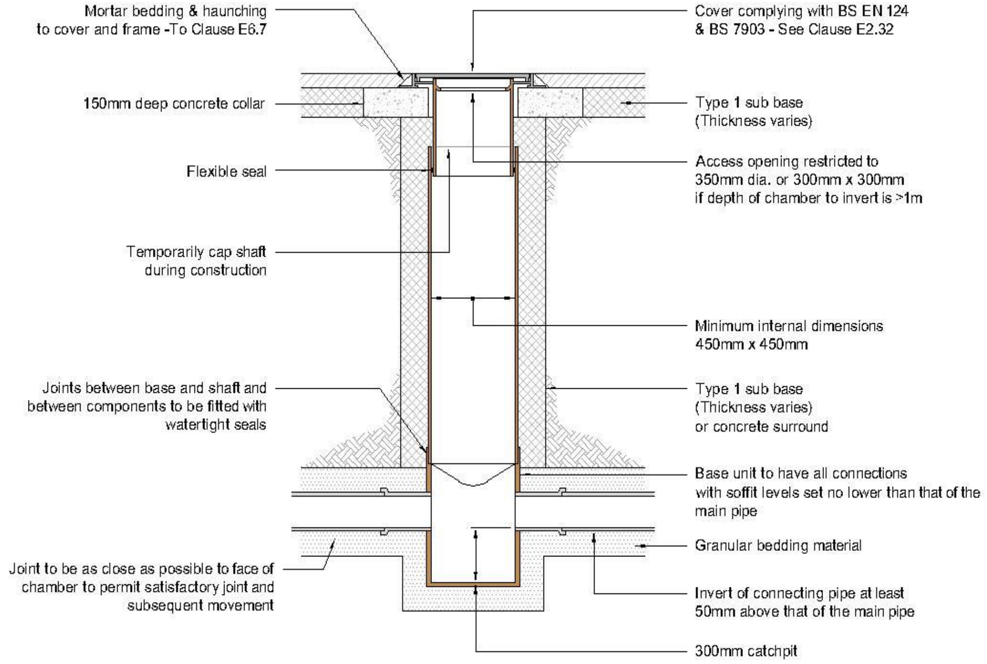
	PROJECT 52b, Southbury Road, Enfield, Middlesex, EN1 1YB Client: Mrs. J. Zervos Contact: 07887 777635	**Drawing Title** PROPOSED DRAINAGE STRATEGY	**Notes**	Drawn By Scale 1:100 @ A3 Project No./Drawing No.: SK200 Rev: A Date: Nov 23



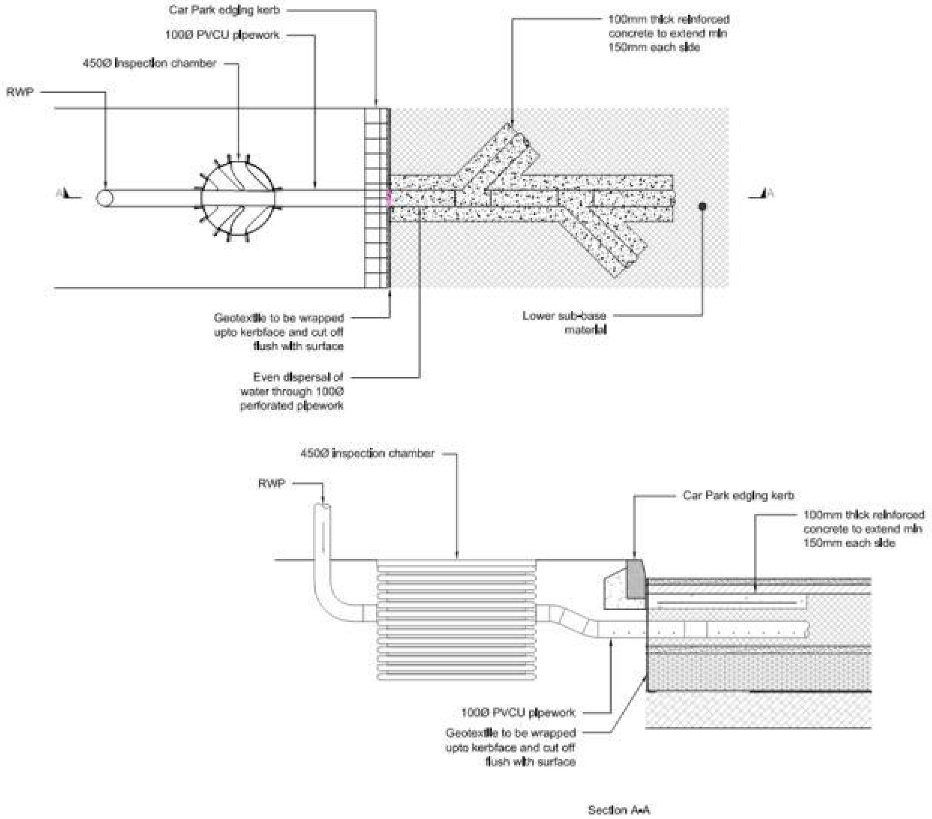
Permeable Car Park Areas
(Scale 1:25)

TABLE 1		
Recommended BS EN 12620 aggregate grading (mm)	Sub-Base Material	Laying Course & Joint Filling Material
	4/20	2/6.3
Recommended BS EN 12620 grading / tolerance category	Gc80/20, GTc20/15	Gc80/20, GTc20/15
Grading Details		
Sieve size (mm)	Percentage by mass passing (%) ISO 565 Sieve	
40	100	-
31.5	98-100	-
20	90-99	-
14	-	100
10	25-70	98-100
6.3	-	80-99
2.0	0-5	0-20
1.0	-	0-5
0.063	-	0-2

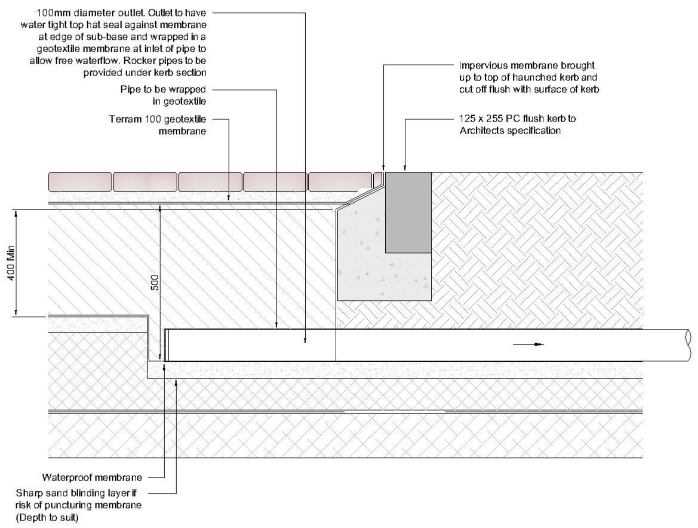
NOTE
These figures have been taken from BS EN 12620



Typical Inspection Chamber Detail with Catchpit - Type 3
Max depth from cover level to soffit of pipe sited in domestic driveways or footways
3.0m, non-entry
(Scale 1:25)



Drainage into Infiltration System
(Scale 1:25)



Typical Section Showing Outfall of Surface Water Pipe
(Scale 1:10)

52b Southbury Road
SuDS Details
04/11/23
SK102 REV A