REPORT BY

COPSEY

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Project:

37 Edwards Avenue, Ruislip HA4 6UP

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Three New-Build houses: Sustainable Water Management Scheme	**21**
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1	08.Dec-25	Minor amendments			
			NC	SC	NC
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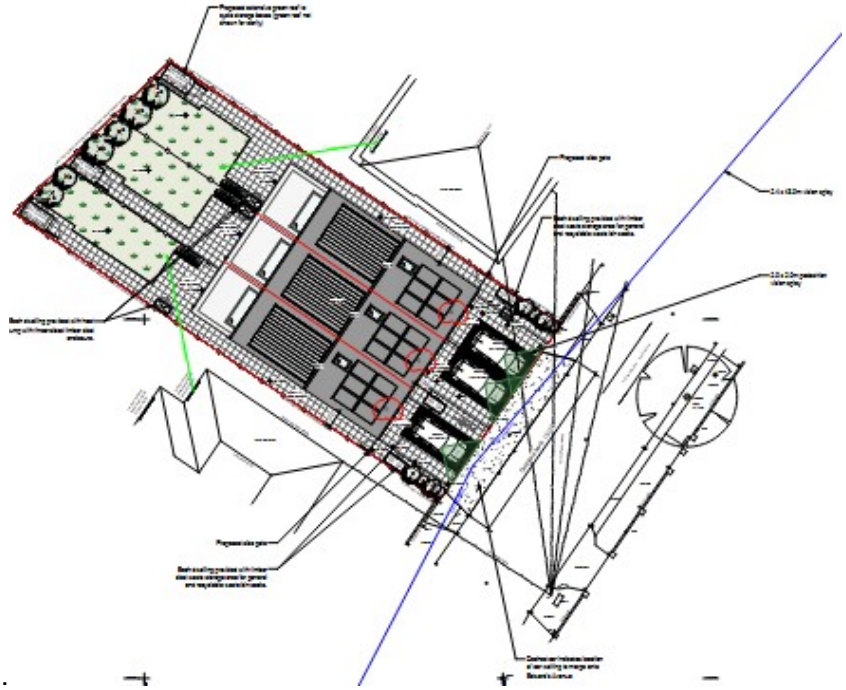
REV.	DATE	REVISION DETAILS
0	03 Dec 2025	Issued for information.
1	08 Dec 2025	Mods to impermeable area, soakaway design & drainage drawings.

Table of Contents

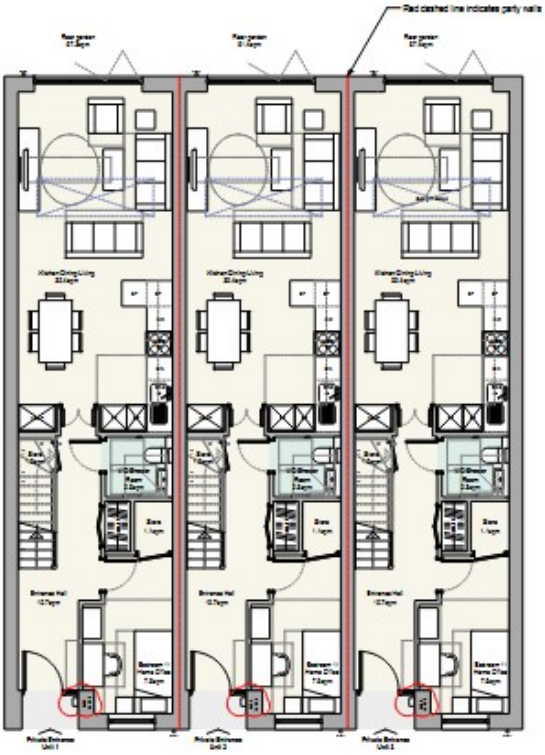
1.0 INTRODUCTION

1.1 Description of new development

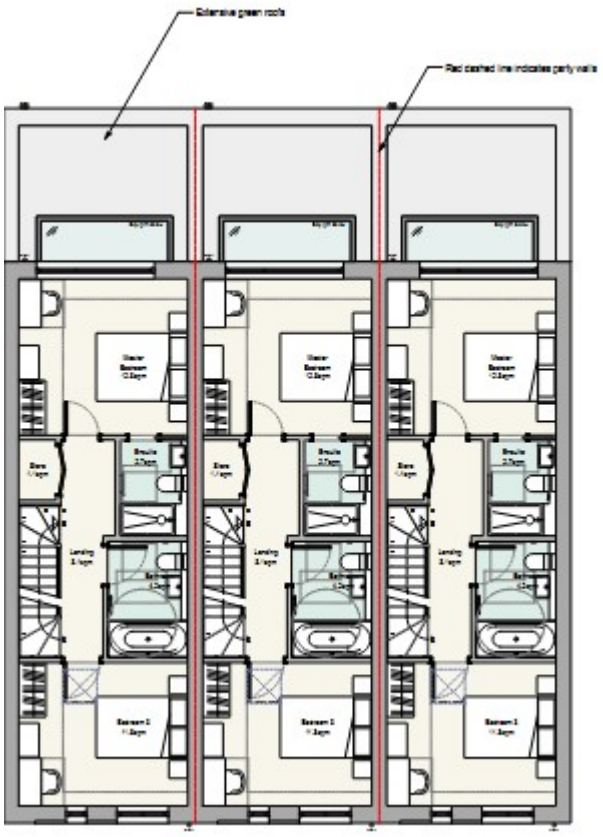
Three new-build attached houses are to be constructed at the vacant site at 37 Edwards Avenue, Ruislip HA4 6UP.



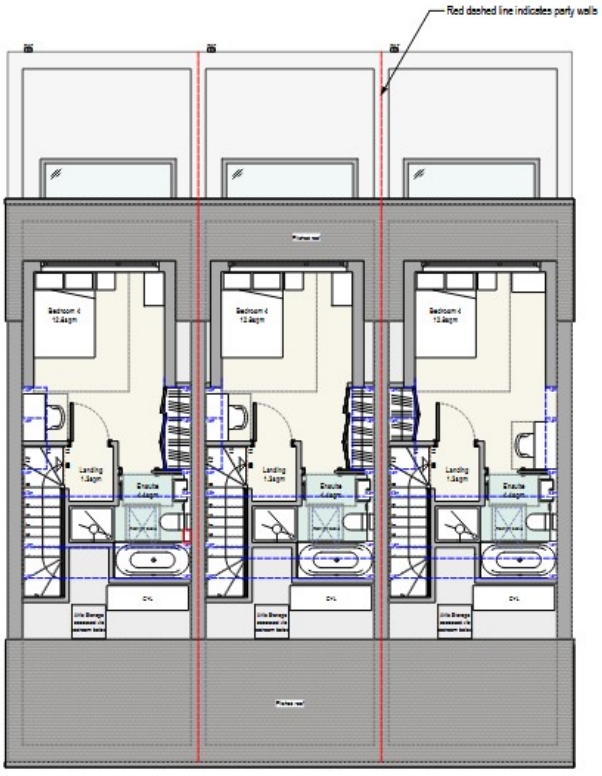
Site Plan



Ground Floor Plan

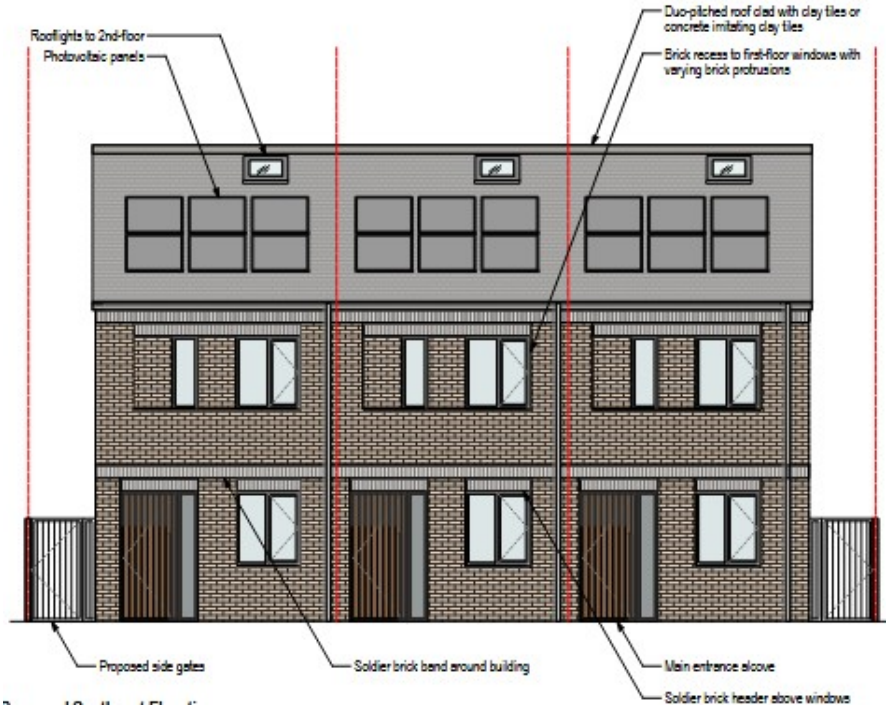


First Floor Plan

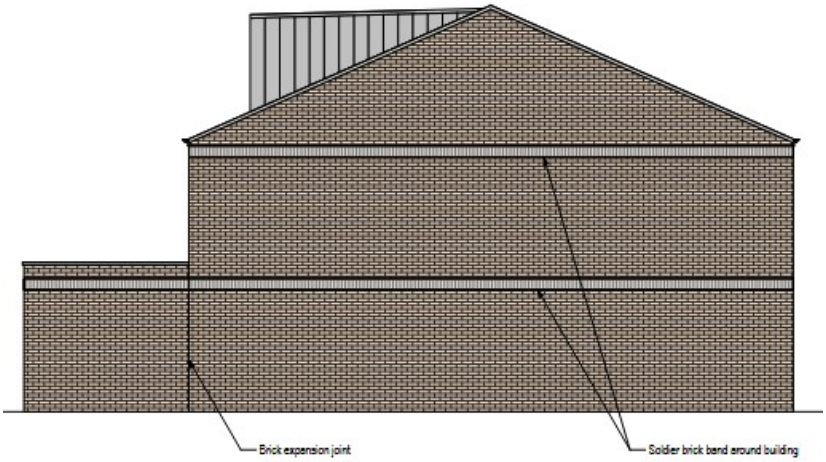


Second Floor Plan

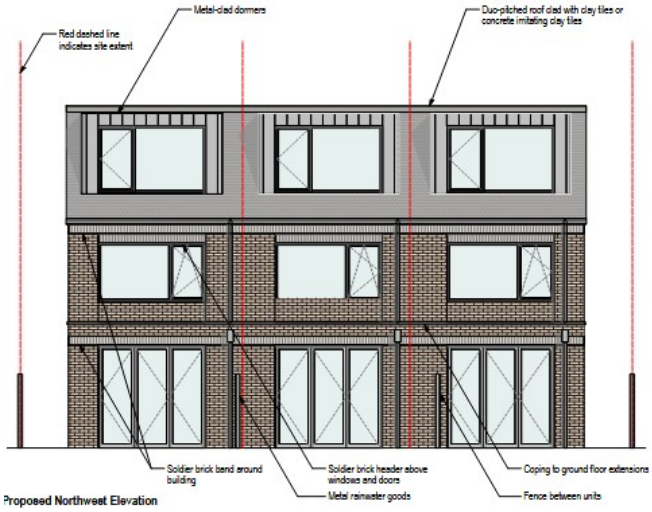
Roof Plan



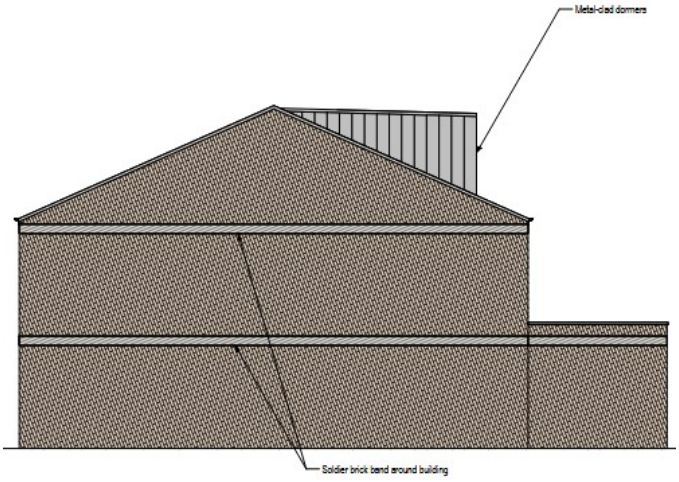
Southeast Elevation



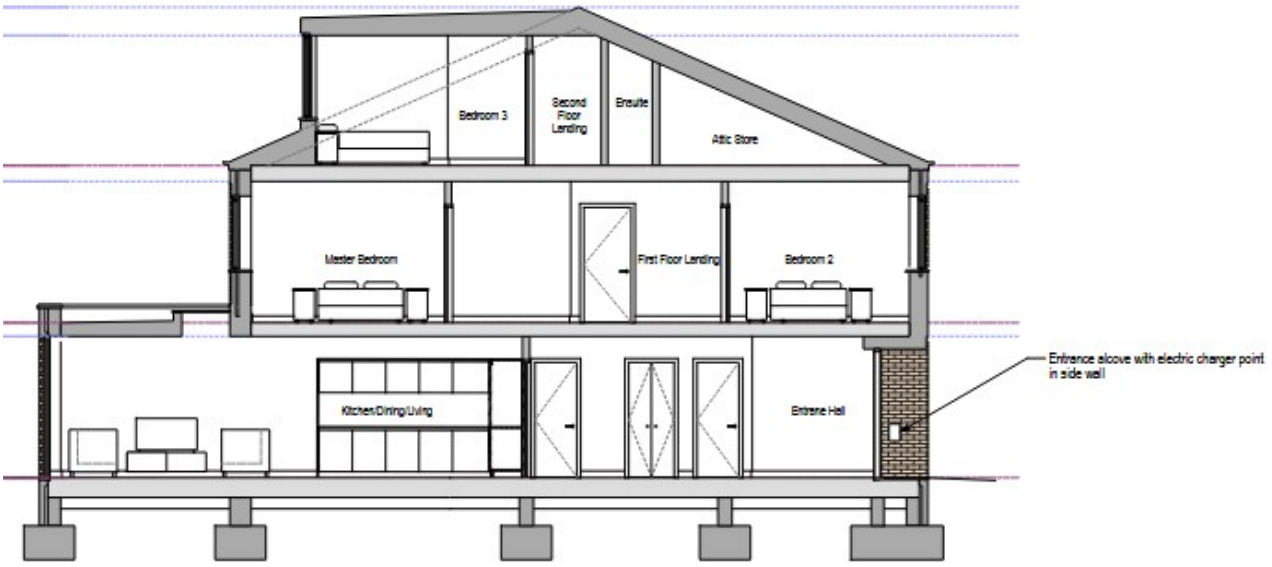
Southwest Elevation



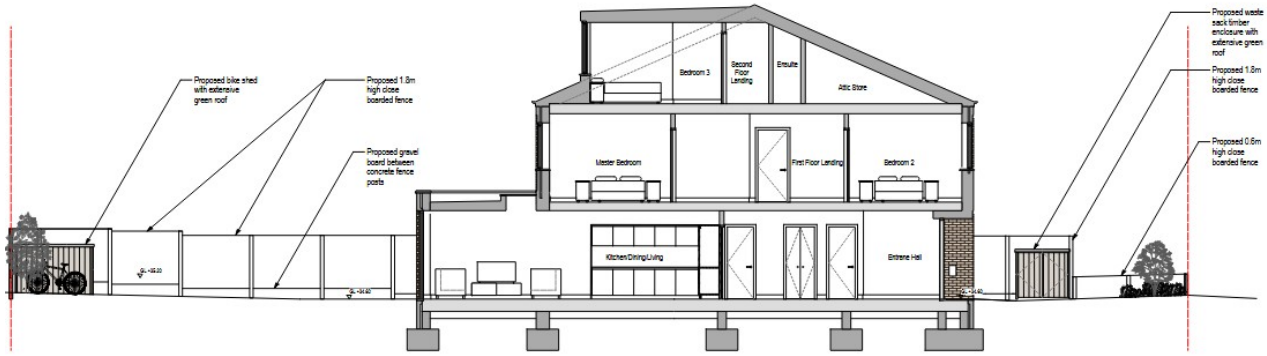
Northwest Elevation



Northeast Elevation



Section A-A



Site Section

1.2 Planning conditions

This report has been prepared in response to Planning Condition 9.

9 No development approved by this permission shall be commenced until a scheme for the provision of sustainable water management has been submitted to and approved in writing by the Local Planning Authority. The scheme shall clearly demonstrate that sustainable drainage systems (SUDS) have been incorporated into the designs of the development in accordance with the hierarchy set out in

accordance with Policy SI5 of the London Plan and will:

i. provide information about the design storm period and intensity, the method employed to delay and control the surface water discharged from the site and the measures taken to prevent pollution of the receiving groundwater and/or surface waters;
ii. include a timetable for its implementation; and
iii. provide a management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime.

The scheme shall also demonstrate the use of methods to minimise the use of potable water through water collection, reuse and recycling and will:
iv. provide details of water collection facilities to capture excess rainwater;
v. provide details of how rain and grey water will be recycled and reused in the development.
vi. provide details to confirm demonstrate water usage rates of no more than 105 litres/person/day.

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

REASON
To ensure the development does not increase the risk of flooding in accordance with Policy DMEI 10 of the Hillingdon Local Plan Part 2 (2020) and London Plan (2021) Policy SI5.

1.3 Earlier Surface Water Drainage report

The 2014 Report (Doc 3369-DR001) by Structa focused on surface water drainage and flood risk for a development on this site with similar impermeable area.

The methodology and recommendations of this report are carried forward and adapted to the current development proposal.

2.0 DESIGN STANDARDS

BSEN 16933	Drain and Sewer Systems outside buildings
BS8582	Code of Practice for surface water management for development sites
Building Regulations 2010	
BRE Digest 365	Soakaway Design

3.0 ENVIRONMENTAL PARAMETERS

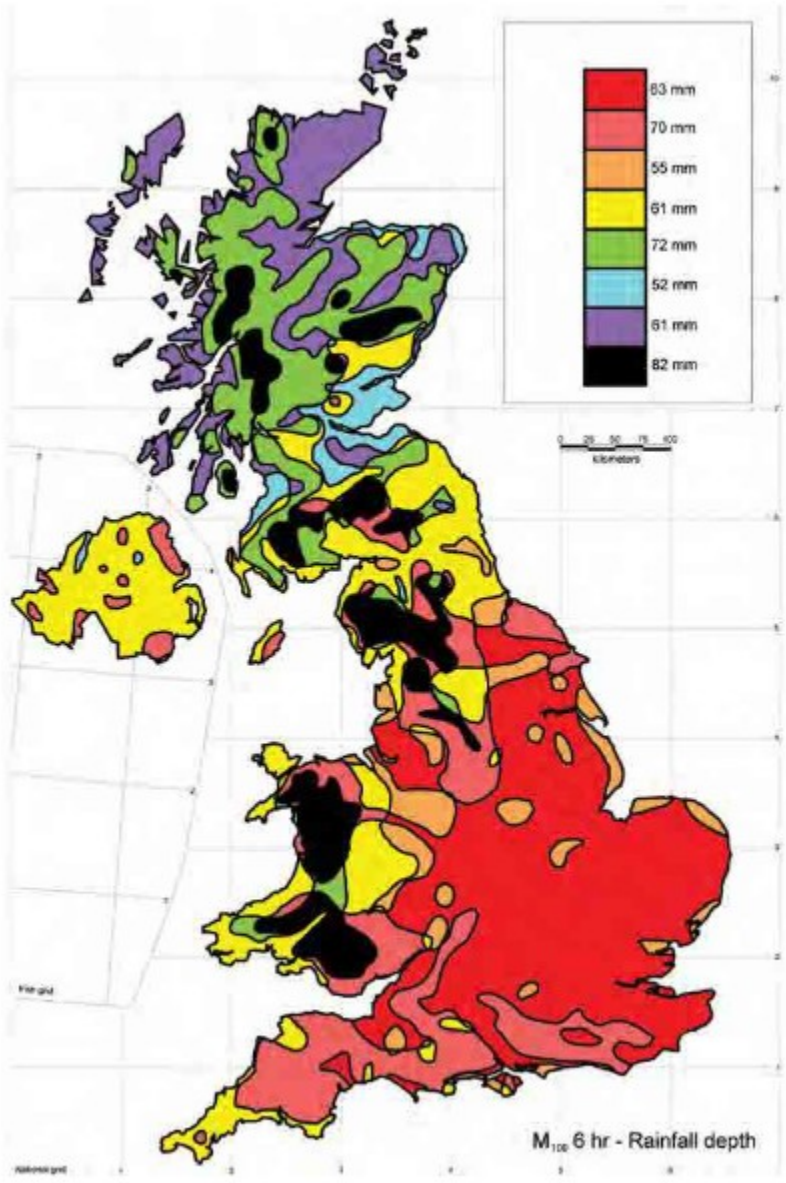


Figure 11.5 1 in 100 year, 6-hour rainfall depths for the UK

The environmental parameters used in the design are based on the figures set out in BRE Digest 365.

4.0 DESCRIPTION OF SCHEME

4.1 General approach

The rainwater at present on this vacant site permeates directly into the ground without flowing into the main public stormwater drain. With the new development a portion of the site (the roofs) will be impervious to rainfall. The rainfall from the impervious area will be collected and channeled into a soakaway. The objective of the design is to design a soakaway capable of accommodating all the rainfall from the impervious area without discharging into the public drain.

A site infiltration test will be conducted as a basis for soakaway design. In the event that the soakaway cannot accommodate all the rainwater discharge a connection will be made to the public drain. In this scenario the public drain connection will act as an overflow to the soakaway.

Soakaway design is in the following steps.

(1) For the impervious area (roofs) of the development, the rainfall discharge quantities are calculated for a range of storm durations.

(2) A trench is dug on site, filled with water and the time taken to permeate into the surrounding ground is recorded. Soil permeability is then computed from the results of this infiltration test.

(3) Using this information on soil permeability, for a range of storm durations the quantity of rainfall permeating into the ground is calculated. The soakaway is sized so that the rainfall discharge does not exceed the water quantity permeating into the ground.

4.2 Calculation of storm discharge quantities

The calculation follows BRE Digest 365 guidelines and the results are tabulated in Appendix A1. Salient figures are:

Impermeable area	219.35m^2
Water volume from design (100 yr) storm	18.85m^3

4.3 Calculation of soil permeability (infiltration test)

The soakaway design in this report is based on an assumed value for the infiltration factor. A procedure and methodology for computing the infiltration factor are contained in Appendix A2. After the site infiltration test the assumed value for the infiltration factor will be updated.

4.4 Soakaway design

A preliminary calculation is shown in Appendix A3. This is based on an estimated value for the infiltration factor. The soakaway design will be updated (if appropriate) after the site infiltration test to align with the actual infiltration factor.

4.5 Contingencies

From information on local soil conditions, it is expected that the infiltration test will show that the soakaway can accommodate all rainwater flow from the design storm. In the event that the infiltration factor is significantly lower than expected the soakaway can be made larger or a second parallel soakaway can be introduced.

If this is not adequate an overflow drain will connect to an additional front soakaway with overflow to the public drain in Edwards Avenue.

4.6 Rainwater harvesting

A water butt is recommended for each housing unit. This will reduce demands on water supply and the harvested rainwater will be used for watering gardens and cleaning patios.

5.0 IMPLEMENTATION

The drainage scheme is to be constructed by the building contractor as part of the development project for the three houses. Engineering design will be by Copsey Engineering. Design and construction are to comply with local Building Control requirements.

6.0 MANAGEMENT AND MAINTENANCE

After construction the new property owners will assume responsibility for management and maintenance. On handover, the developer will provide a copy of this document and copies of the drainage drawings showing inspection chambers and provisions for rodding access etc.

The following maintenance issues/requirements are identified.

Attenuation Crates

SUDS Element	Attenuation Crates	
Maintenance Issues	Debris entering storage causing blockage or siltation.	
Maintenance Period	Maintenance Task	Frequency
Regular	Inspect gutters, drainage system, silt traps and inlets to storage to identify any elements not working correctly.	Monthly for 3 months, then six monthly.
	Debris removal from gutters.	Annually in autumn after leaf fall.
	Remove sediment from silt traps.	Annually or as required.
Remedial Work	Clear or jet drainage systems if blocked ensuring debris is not jetted into storage.	As required.
	Repair gutters, drainage system, silt traps and inlets to storage.	As required.
	Clear out storage if it becomes blocked.	As required.
	Replace storage if it fails.	As required.

Control Structures

SUDS Element	Control Structures	
Maintenance Issues	Debris blocking control structure.	
Maintenance Period	Maintenance Task	Frequency
Regular	Inspect control chamber and remove any debris from control device.	Quarterly and following heavy rainfall.
Remedial Work	Repair or replace control device if it is damaged.	As required.

Permeable Paving

SUDS Element	Permeable Paving	
Maintenance Issues	Pervious surfaces are susceptible to silt blockage.	
Maintenance Period	Maintenance Task	Frequency
Regular	Surface brushing to reduce silt accumulation.	Monthly
	Brushing and jet wash in autumn after leaf fall.	Annually
	Mow grass edges to paving at 35-50mm and remove weeds and leaves.	As required
Occasional tasks	Jetting where silt has accumulated in joints or voids. Replace grit and vibrate surface to lock.	As required
Remedial Work	Where shrinkage or surface damage occurs, uplift paving, remove grit bedding layer and geotextile if present and reinstate to design profile.	As required

APPENDICES

A1 Calculation of storm discharge quantities

A2 Calculation of soil permeability (infiltration test)

A3 Soakaway design

APPENDIX A: CALCULATION OF STORM DISCHARGE QUANTITIES

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Plan area of high level roof	A1	=	176.85		
Plan area of low level roof	A2	=	42.5		First floor rear flat roof
Drainage (roof) area	A	= A1+A2 =	219.35	m^2	
Infiltration factor	f	=	0.000005	m/s	To be adjusted from site test results
Rainfall ratio r (Fig 1)	r	=	0.42		BRE Digest 365 Figure 1
M5-60 min factor	Z1	=	1		BRE Digest 365 Table 1
M5-60 min rainfall	M5-60	=	20	mm	
M10-60 min factor	Z2	=	1.5		BRE Digest 365 Table 2 (plus 30% increase for climate change)
M10-60 min rainfall	M10-60	=	30	mm	

Storm duration D	Z1	Z2	5 yr return	10 yr return
Min			mm	mm
10	0.53	1.59	10.6	16.81
15	0.64	1.61	12.8	20.63
30	0.81	1.59	16.2	25.69
60	1.00	1.50	20	29.90
120	1.20	1.61	24	38.69
240	1.42	1.59	28.4	45.04
360	1.57	1.57	31.4	49.39
600	1.74	1.55	34.8	53.84

Storm duration D	Z1	Z2	5 yr return	100 yr return
Min			mm	mm
10	0.53	2.48	10.6	26.32
15	0.64	2.54	12.8	32.45
30	0.81	2.60	16.2	42.12
60	1.00	2.64	20	52.78
120	1.20	2.61	24	62.71
240	1.42	2.56	28.4	72.73
360	1.57	2.52	31.4	79.19
600	1.74	2.47	34.8	85.96

APPENDIX B: CALCULATION OF SOIL PERMEABILITY

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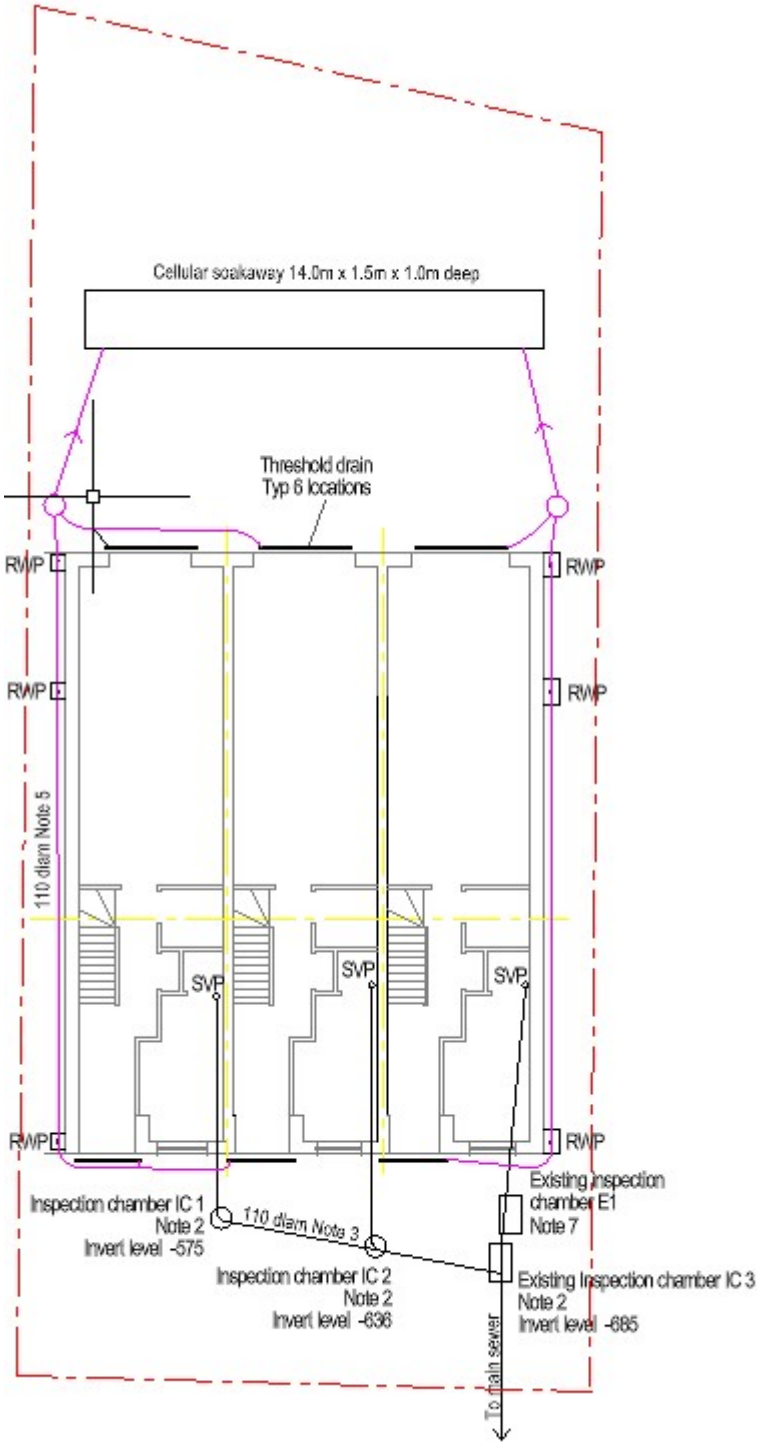
SOIL INFILTRATION RATE						
Effective depth of trial pit	De	=	1	m		
Width of trial pit	We	=	0.5	m		
Length of trial pit	Le	=	2	m		
Effective strorage volume in trial pit	V_{p25-75}	=	0.5	m^3		
Internal surface area up to 50% effective depth	a_{p50}	=	3.5	m^2		
Time for water level to fall from 75% to 25% of effective depth	t_{p25-75}	=	7.5	hours		
Soil infilration rate	f	=	$V_{p25-75}/a_{p50}*t_{p25-75}$	=	0.00000529	m/s

APPENDIX C: SOAKAWAY DESIGN

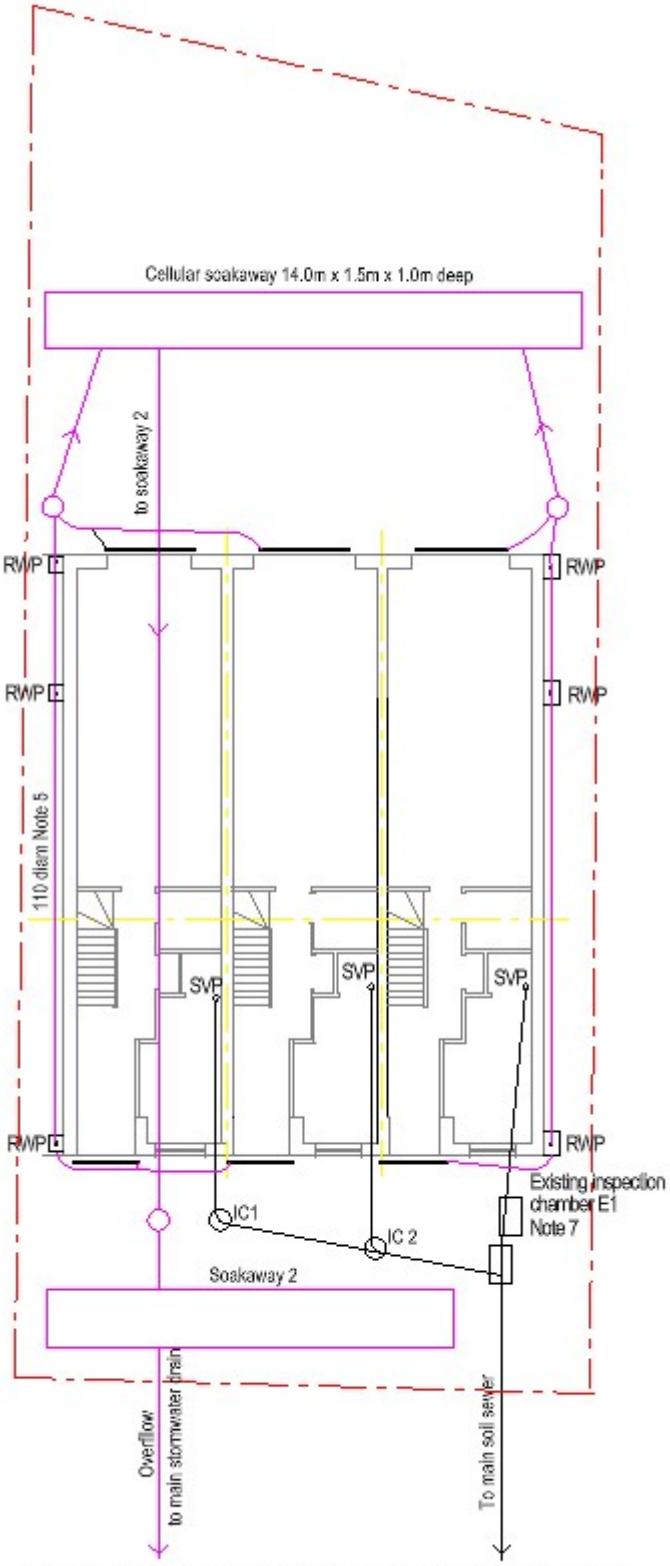
APPENDIX C: SOAKAWAY DESIGN

						Storm duration D	M100-D	Inflow I		
Inflow		I	=	A (M100-D)	m^3	Min	mm	m^3		
						10	26.32	5.77		
						15	32.45	7.12		
						30	42.12	9.24		
						60	52.78	11.58		
						120	62.71	13.76		
						240	72.73	15.95		
						360	79.19	17.37		
						600	85.96	18.85		
Length of soakaway trench		L	=	14	m					
Effective depth of soakaway trench		D	=	1	m					
Width of soakaway trench		W	=	1.5	m					
Soakaway perimeter surface area x 50%		A_{s50}	=	2Lx2Wx50%	=	15.5	m^2			
Outflow		O	=	A_{s50}xfxD	m^3	Storm duration D	Inflow I	Outflow O	Volume S	Time for 50% emptying
						Min	m^3	m^3	m^3	Hours
Storage volume required		S	=	I-O	m^3	10	5.77	0.05	5.73	10.26
						15	7.12	0.07	7.05	12.63
						30	9.24	0.14	9.10	16.31
						60	11.58	0.28	11.30	20.25
						120	13.76	0.56	13.20	23.65
						240	15.95	1.12	14.84	26.59
						360	17.37	1.67	15.70	28.13
						600	18.85	2.79	16.06	28.79
Storage volume provided based on 95% free volume (modular soakaway)		Sp	=	LxDxWx95%	=	19.95	m^3	> 16.06	OK	
Time for emptying half the storage		t_{s50}	=	Sx0.5/A_{s50}xf	=	28.79	hrs	> 24 hours	but considered acceptable	

APPENDIX D: SITE PLAN SHOWING DRAINAGE



SITE PLAN SHOWING DRAINAGE



SITE PLAN SHOWING CONTINGENCY RAINWATER DRAINAGE SYSTEM