PRICE & MYERS

26 Christchurch Hill
London, NW3 1LG

Civil Engineering
Sustainable Drainage Strategy Report

Prepared by:	**Yousuf Azizi BSc (Hons)**
Reviewed by:	**Tom Spawton MEng**
Job Number:	**24496**

Date	Revision	Notes/Amendments/Issue Purpose
April 2020	1	To discharge Planning Condition 6

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Contents

Appendices:

Acronyms	
AOD	Above Ordnance Datum
CIRIA	Construction Industry Research and Information Association
EA	Environment Agency
FRA	Flood Risk Assessment
NPPF	National Planning Policy Framework
PPG	Planning Practice Guidance
SFRA	Strategic Flood Risk Assessment
TW	Thames Water

1 Introduction

Price & Myers have been commissioned to undertake a Sustainable Drainage (SuDS) Strategy Report for the proposed development at 26 Christchurch Hill, Hampstead, London.

This Sustainable Drainage Strategy Report has been carried out in accordance with guidance from the Environment Agency (EA), the London Borough of Camden (LBC) Strategic Flood Risk Assessment (SFRA 2014) and CIRIA documents.

This report includes a detailed SuDS assessment in order to discharge Planning Condition 6 of the London Borough of Camden Planning Decision Notice, reference: 2016/5974/P.

2 Site Description and Location

The site has approximate OS coordinates of 526630/186043 at Grid Reference TQ2663086043. The site address is 26 Christchurch Hill, London, NW3 1LG, located in the London Borough of Camden.

The site occupies an area of approximately 793m^2 (0.079 ha) and is located on the northeast side of Christchurch Hill, immediately to the southeast of the crossroads junction with Well Road.

The main house is a detached 2-storey structure that is a Grade II listed building positioned in the centre of the site. There is also a single-storey structure fronting Well Road and annexed to the main house that is used as a studio.

The main house is surrounded by front and rear gardens. The north-western end is laid with lawn, whilst the central portion is covered in concrete paving and the south eastern half is covered in artificial grass. The gardens have a number of large trees and shrubs surrounding the perimeter of the property.

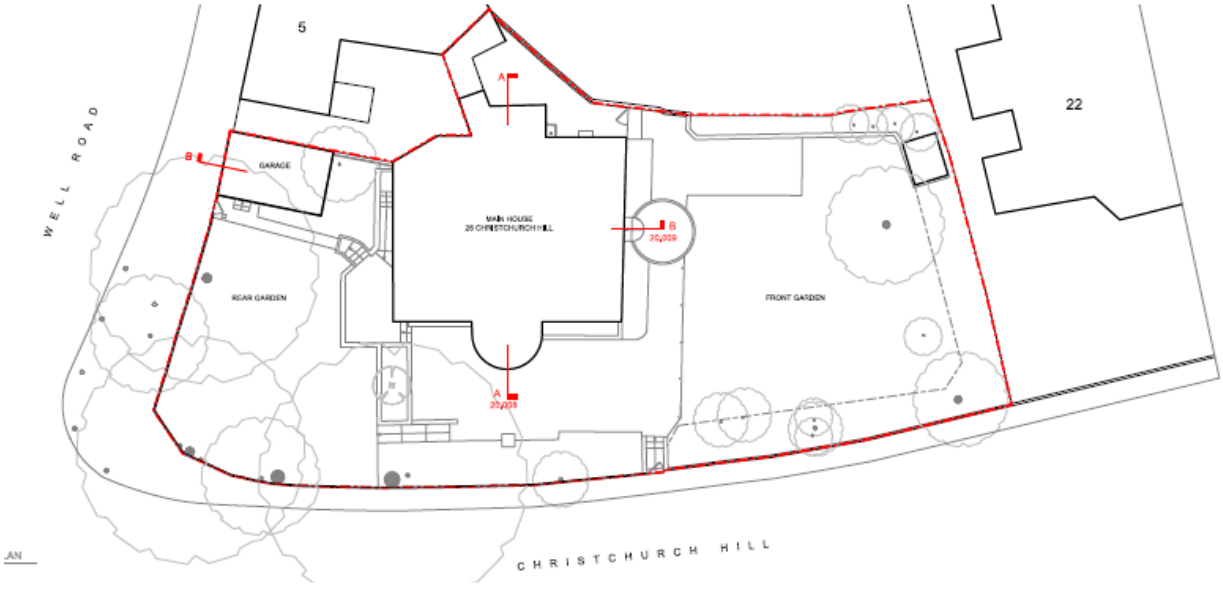


Figure 2.1: Existing site, showing site boundary

2.1 Existing Drainage

A drainage CCTV survey carried out by Kenclean shows that the site's foul and surface water currently discharge into the Thames Water public sewer located in Christchurch Hill via a combined drainage network.

The drainage CCTV survey drawing can be found in Appendix A.

3 Development Proposal

The development proposals include the construction of a basement level below the north-western half of the house, extending out beneath the north-western part of the garden.

The total impermeable area from the developed site will be approximately 210m^2.

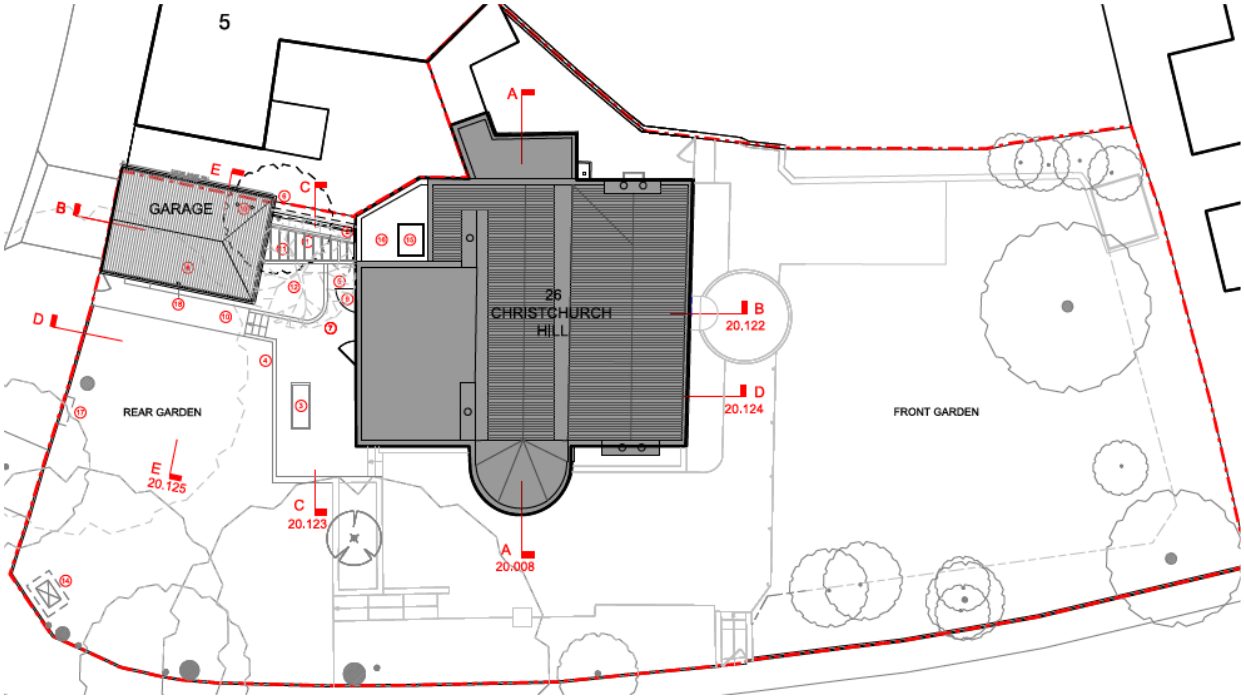


Figure 3.1: Proposed site layout

4 Pre-commencement Condition 6

The following planning condition was included within the London Borough of Camden planning decision notice, reference 2016/5974/P.

6. The development hereby approved shall not be commenced, other than for site clearance. preparation and demolition, until details of a surface water drainage scheme for the site, prepared with reference to the London Plan policy 5.13 'SuDS hierarchy' to minimise the rate of surface water run-off

from the site aiming by reasonable endeavours to achieve the greenfield run off rate, shall be submitted to and approved by the local planning authority in consultation with Thames Water. The development shall not be implemented other than in complete accordance with the surface water drainage scheme that has been approved.

Reason: To reduce the rate of surface water run-off from the buildings and limit the impact on the storm-water drainage system in accordance with Policies C81, (302, C03 of the London Borough of Camden Local Plan 2017.

5 SuDS Assessment

In accordance with the London Plan, EA guidelines, the SFRA, and CIRIA documents, surface water run-off should be managed as close to its source as possible. The London Plan states that all new developments should aim to reduce run-off to greenfield rates "utilising SuDS unless there are practical reasons for not doing so".

The possibility of implementing SuDS at the site was assessed using a hierarchy of preferred surface water management methods. The following paragraphs discuss the various methods in order of that hierarchy and evaluate the site's suitability for each method.

5.1 Store Rainwater for Later Use

Rainwater harvesting promotes the storage and re-use of rainwater collected from roofs and hard surfaced areas. This type of system contributes to the reduction of run-off rates and volumes within a development.

The capacity of rainwater harvesting systems to attenuate rainwater depends on the water use within the building. If there is no activity in the building and the harvester is full, no attenuation will be provided during a subsequent storm event. In the worst-case scenario, the rainwater harvester will provide no attenuation.

Therefore, it is not proposed to incorporate any rainwater harvesting within the development proposals.

5.2 Infiltration

The SuDS Manual describes infiltration systems, such as soakaways, as a means of facilitating the discharge of the surface water to the ground and ultimately recharging groundwater.

A site-specific Desk Study and Basement Impact Assessment carried out by GEA (ref:J15236) revealed that the site is underlain by Made Ground to a depth of 1.2m, overlaying the Claygate Member which comprises of '*clayey sandy silt with pockets and lenses of fine sand, pockets of silty clay and fine selenite*'. This ground strata is not suitable for infiltration techniques as it contains cohesive soils such as clay which are known to have very poor porosity properties.

Therefore, it is not proposed to incorporate any infiltration systems within the development proposals.

5.3 Attenuation

The proposed surface water run-off from the development should be controlled as close to the source as possible. In order to do this, the SFRA states that developers should aim to achieve 'Greenfield' run-off rates where practicable. Therefore, attenuation to Greenfield run-off rates is the next preferred SuDS option. Attenuation techniques include green roofs, ponds, swales, permeable paving systems and underground storage tanks.

The SuDS manual states that "the hydraulic performance of green roofs during extreme events tends to be fairly similar to standard roofs". This means that green roofs will reduce the run-off rates in small storm event such as the annual and the 1 in 2-year events. However, these systems provide no attenuation benefits in high storm events such as the 1 in 30-year and 1 in 100-year storms which are considered in the design of surface water drainage systems. The benefits of these systems therefore cannot be considered in the design of any attenuation systems. Therefore, green roofs are not proposed to form part of the SuDS strategy for the site.

Ponds and swales require a large amount of ground level space. Therefore, due to the nature of the development and the insufficient space on site, they are not considered practical for this development.

Therefore, an underground geo-cellular tank is proposed to attenuate surface water run-off discharged from the site by storing water and releasing it slowly with the use of a hydro-brake flow control.

The Greenfield run-off rate was found using the IH124 Method, which gave a run-off rate for the 1 in 100-year storm event of 0.28 l/sec. However, such a low flow rate will require a very small flow control device which will be prone to blockages. In accordance with Building Regulations Part H, pipes should have a minimum internal diameter of 75mm to avoid the risk of blockages. Calculations using MicroDrainage software (attached in Appendix B) have shown that a peak flow rate of 2.5 l/s is required to achieve an internal opening within the flow control of 75mm. The MicroDrainage calculations show that an attenuation volume of $5m^3$ is required to restrict surface water run-off rates to 2.5 l/s, up to the 1 in 100-year rainfall event, plus a 40% climate change allowance.

The below ground drainage layouts (drawings 24496-601_2 and 24496-602_2) showing the proposed drainage arrangements, can be found in Appendix C.

5.4 Discharge to Watercourse / Surface Water Sewer / Combined Sewer

There are no watercourses in close proximity to the site.

It is proposed to discharge the attenuated surface water into the existing public sewer located in Christchurch Hill via the existing combined manhole located within the site boundary.

6 Surface Water Maintenance Strategy

The successful implementation and operation of a SuDS system depends on a robust and clear maintenance strategy being implemented. The following measures should form part of the site's proposed management plan.

The SuDS will be maintained by the client and will form part of the overall maintenance regime for the site.

SUDS Element	Maintenance		
	Maintenance Schedule	Required Action	Typical Frequency
Attenuation Tank	Monitoring / Inspections	Inspect all inlets, outlets, vents, overflows and control structures to ensure they are working as they should	Annually or after severe storms
	Regular Maintenance	Inspect and identify any elements that are not operating correctly.	Monthly for three months, then Half yearly or as required.
		Remove sediments / debris from catch pits / gullies and control structures	Annually, after severe storms or as required
	Remedial Actions	Repair inlets, outlets, vents, overflows and control structures.	As required

Table 6.1 SUDS Maintenance Strategy as taken from the CIRIA SUDS Manual

Effective SuDS design must assess all foreseeable risks during construction and maintenance. These must be mitigated during the detailed design stages where effective design will aim to avoid, reduce and mitigate risks.

This process will also require input from the Principal Contractor who will ensure the construction of SuDS components are carried out in a safe and sustainable manner.

7 Conclusions

The site occupies an area of approximately 793m^2 (0.079 ha). The proposals include creating a lower ground level at the front of the house and a double level portion directly beneath the existing studio.

The drainage CCTV survey shows that the site's foul and surface water currently discharge into the Thames Water public sewer located in Christchurch Hill via a combined drainage network.

Local geology shown on the British Geological Survey (BGS) maps, indicates that the ground is underlain by Claygate Member comprising of clay, silt and sand which is not suitable for infiltration techniques as it contains cohesive soils such as clay which are known to have very poor porosity properties. Therefore, infiltration systems such as soakaways are not included within the development proposals.

Attenuation will therefore be provided to control the surface water run-off. MicroDrainage calculations have shown that an attenuation volume of 5m^3 is required to restrict surface water run-off rates to 2.5 l/s, up to the 1 in 100-year rainfall event, plus a 40% allowance for climate change.

It is proposed to discharge the attenuated surface water into the existing public sewer located in Christchurch Hill via the existing combined manhole located within the site boundary.

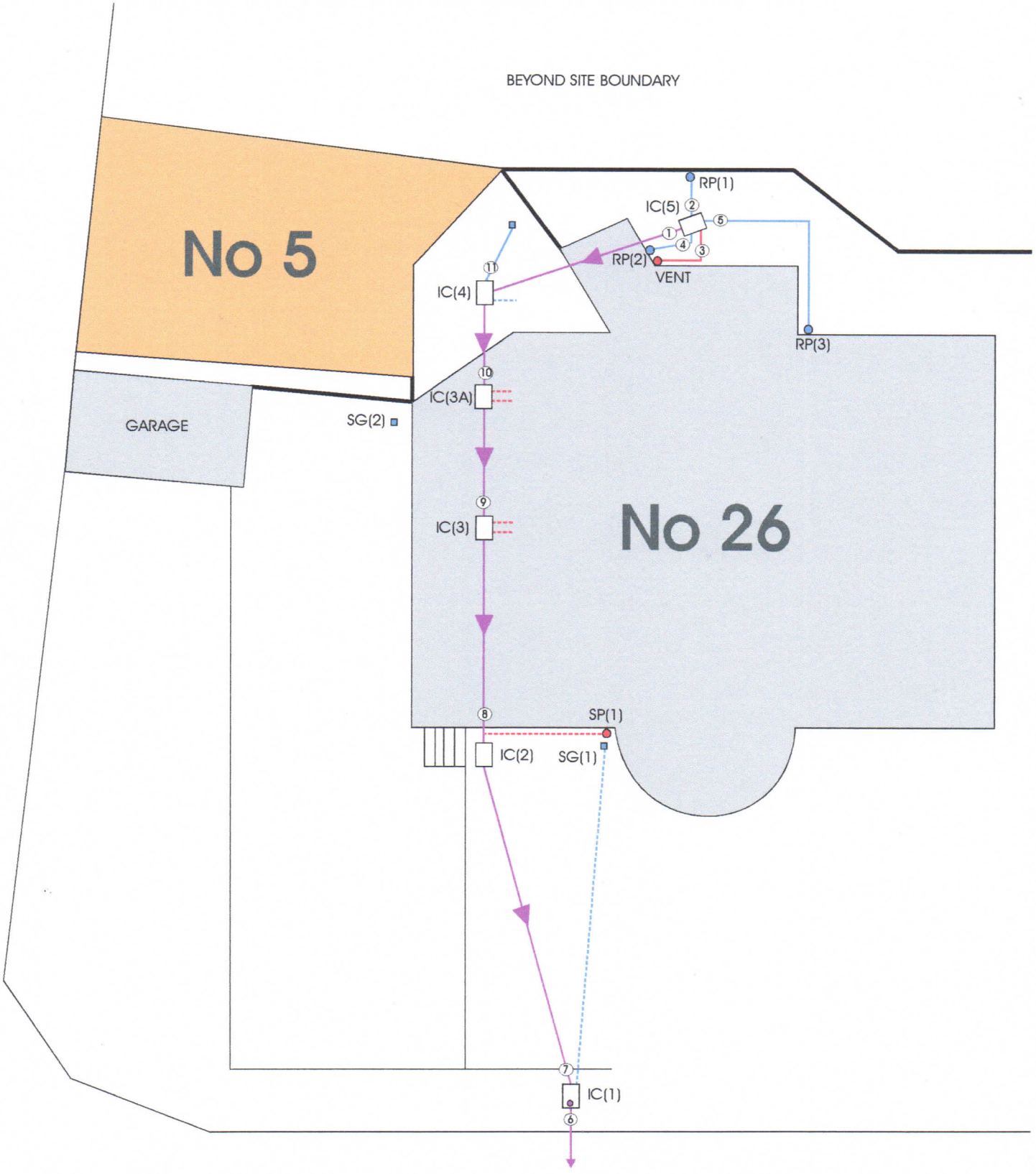
Appendix A
Drainage CCTV Survey Drawing

KENCLEAN CCTV Drain Surveys

117 Squirrels Heath Road,Harold Wood,Essex. RM3 OLR
Telephone: 01708 720232 Mobile:07810 350571

Client: Price & Myers LLP	Date: 02-04-19
Site Address: 26 Christchurch Hill, London, NW3 1LG	Job No: A830CHRI
Detail: Drainage Layout	Scale: N.T.S.
Surface —— Foul —— Combined ——	CCTV Run No ①

THIS INFORMATION CONCERNING SEWERS OR DRAINS IS CORRECT AS FAR AS IS KNOWN
HOWEVER KENCLEAN ACCEPTS NO RESPONSIBILITY FOR ANY INACCURACIES



Appendix B
Calculations

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

Half Drain Time : 19 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	101.937	0.437	0.0	2.5	2.5	4.2	O K
30 min Summer	101.978	0.478	0.0	2.5	2.5	4.5	O K
60 min Summer	101.948	0.448	0.0	2.5	2.5	4.3	O K
120 min Summer	101.841	0.341	0.0	2.5	2.5	3.2	O K
180 min Summer	101.746	0.246	0.0	2.5	2.5	2.3	O K
240 min Summer	101.678	0.178	0.0	2.4	2.4	1.7	O K
360 min Summer	101.604	0.104	0.0	2.2	2.2	1.0	O K
480 min Summer	101.575	0.075	0.0	1.9	1.9	0.7	O K
600 min Summer	101.561	0.061	0.0	1.6	1.6	0.6	O K
720 min Summer	101.552	0.052	0.0	1.4	1.4	0.5	O K
960 min Summer	101.542	0.042	0.0	1.1	1.1	0.4	O K
1440 min Summer	101.531	0.031	0.0	0.8	0.8	0.3	O K
2160 min Summer	101.523	0.023	0.0	0.6	0.6	0.2	O K
2880 min Summer	101.518	0.018	0.0	0.5	0.5	0.2	O K
4320 min Summer	101.513	0.013	0.0	0.3	0.3	0.1	O K
5760 min Summer	101.509	0.009	0.0	0.3	0.3	0.1	O K
7200 min Summer	101.507	0.007	0.0	0.2	0.2	0.1	O K
8640 min Summer	101.505	0.005	0.0	0.2	0.2	0.0	O K
10080 min Summer	101.504	0.004	0.0	0.2	0.2	0.0	O K
15 min Winter	102.074	0.574	0.0	2.5	2.5	4.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	149.574	0.0	5.9	15
30 min Summer	96.841	0.0	7.6	24
60 min Summer	59.609	0.0	9.4	42
120 min Summer	35.419	0.0	11.1	74
180 min Summer	25.774	0.0	12.2	104
240 min Summer	20.452	0.0	12.9	134
360 min Summer	14.770	0.0	14.0	190
480 min Summer	11.713	0.0	14.8	248
600 min Summer	9.778	0.0	15.4	308
720 min Summer	8.433	0.0	15.9	368
960 min Summer	6.673	0.0	16.8	490
1440 min Summer	4.791	0.0	18.1	734
2160 min Summer	3.434	0.0	19.5	1100
2880 min Summer	2.710	0.0	20.5	1444
4320 min Summer	1.938	0.0	22.0	2176
5760 min Summer	1.526	0.0	23.1	2872
7200 min Summer	1.268	0.0	24.0	3584
8640 min Summer	1.089	0.0	24.7	4352
10080 min Summer	0.958	0.0	25.3	5024
15 min Winter	149.574	0.0	6.6	16

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
30 min Winter	102.498	0.998	0.0	2.5	2.5	5.3	Flood Risk
60 min Winter	102.042	0.542	0.0	2.5	2.5	4.8	O K
120 min Winter	101.831	0.331	0.0	2.5	2.5	3.1	O K
180 min Winter	101.699	0.199	0.0	2.4	2.4	1.9	O K
240 min Winter	101.622	0.122	0.0	2.2	2.2	1.2	O K
360 min Winter	101.569	0.069	0.0	1.8	1.8	0.7	O K
480 min Winter	101.553	0.053	0.0	1.4	1.4	0.5	O K
600 min Winter	101.544	0.044	0.0	1.2	1.2	0.4	O K
720 min Winter	101.538	0.038	0.0	1.0	1.0	0.4	O K
960 min Winter	101.531	0.031	0.0	0.8	0.8	0.3	O K
1440 min Winter	101.523	0.023	0.0	0.6	0.6	0.2	O K
2160 min Winter	101.517	0.017	0.0	0.4	0.4	0.2	O K
2880 min Winter	101.513	0.013	0.0	0.3	0.3	0.1	O K
4320 min Winter	101.508	0.008	0.0	0.2	0.2	0.1	O K
5760 min Winter	101.505	0.005	0.0	0.2	0.2	0.0	O K
7200 min Winter	101.504	0.004	0.0	0.2	0.2	0.0	O K
8640 min Winter	101.502	0.002	0.0	0.1	0.1	0.0	O K
10080 min Winter	101.501	0.001	0.0	0.1	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	96.841	0.0	8.5	26
60 min Winter	59.609	0.0	10.5	46
120 min Winter	35.419	0.0	12.5	78
180 min Winter	25.774	0.0	13.6	108
240 min Winter	20.452	0.0	14.4	136
360 min Winter	14.770	0.0	15.6	188
480 min Winter	11.713	0.0	16.5	248
600 min Winter	9.778	0.0	17.2	308
720 min Winter	8.433	0.0	17.8	368
960 min Winter	6.673	0.0	18.8	488
1440 min Winter	4.791	0.0	20.3	736
2160 min Winter	3.434	0.0	21.8	1088
2880 min Winter	2.710	0.0	22.9	1424
4320 min Winter	1.938	0.0	24.6	2200
5760 min Winter	1.526	0.0	25.8	2936
7200 min Winter	1.268	0.0	26.8	3592
8640 min Winter	1.089	0.0	27.7	4392
10080 min Winter	0.958	0.0	28.4	5088

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Shortest Storm (mins)	15
Ratio R	0.431	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.021

Time (mins) From:	To:	Area (ha)
0	4	0.021

Model Details

Storage is Online Cover Level (m) 102.780

Cellular Storage Structure

Invert Level (m) 101.500 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	10.0	10.0	0.501	0.0	17.0
0.500	10.0	17.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0075-2500-1000-2500
Design Head (m)	1.000
Design Flow (l/s)	2.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	75
Invert Level (m)	101.485
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.5
Flush-Flo™	0.307	2.5
Kick-Flo®	0.627	2.0
Mean Flow over Head Range	-	2.2

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)
0.100	2.1	1.200	2.7	3.000	4.1	7.000	6.2
0.200	2.4	1.400	2.9	3.500	4.5	7.500	6.4
0.300	2.5	1.600	3.1	4.000	4.7	8.000	6.6
0.400	2.5	1.800	3.3	4.500	5.0	8.500	6.8
0.500	2.4	2.000	3.4	5.000	5.3	9.000	7.0
0.600	2.1	2.200	3.6	5.500	5.5	9.500	7.1
0.800	2.3	2.400	3.7	6.000	5.7		
1.000	2.5	2.600	3.9	6.500	6.0		

HR Wallingford
Working with water

Greenfield runoff estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	
Site name:	26 Christchurch Hill
Site location:	26 Christchurch Hill

This is an estimation of the greenfield runoff rate limits that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", W5-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site coordinates

Latitude:	51.55907° N
Longitude:	0.17468° W

Reference:	
Date:	2019-07-04 14:48

Methodology	IH124

Site characteristics

Total site area (ha)	0.0197

Methodology

Qbar estimation method	Calculate from SPR and SAAR
SPR estimation method	Calculate from SOIL type

	Default	Edited
SOIL type	4	4
HOST class	---	---
SPR/SPRHOST	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm)	660	660
Hydrological region	6	6
Growth curve factor: 1 year	0.85	0.85
Growth curve factor: 30 year	2.3	2.3
Growth curve factor: 100 year	3.19	3.19

Notes:

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

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

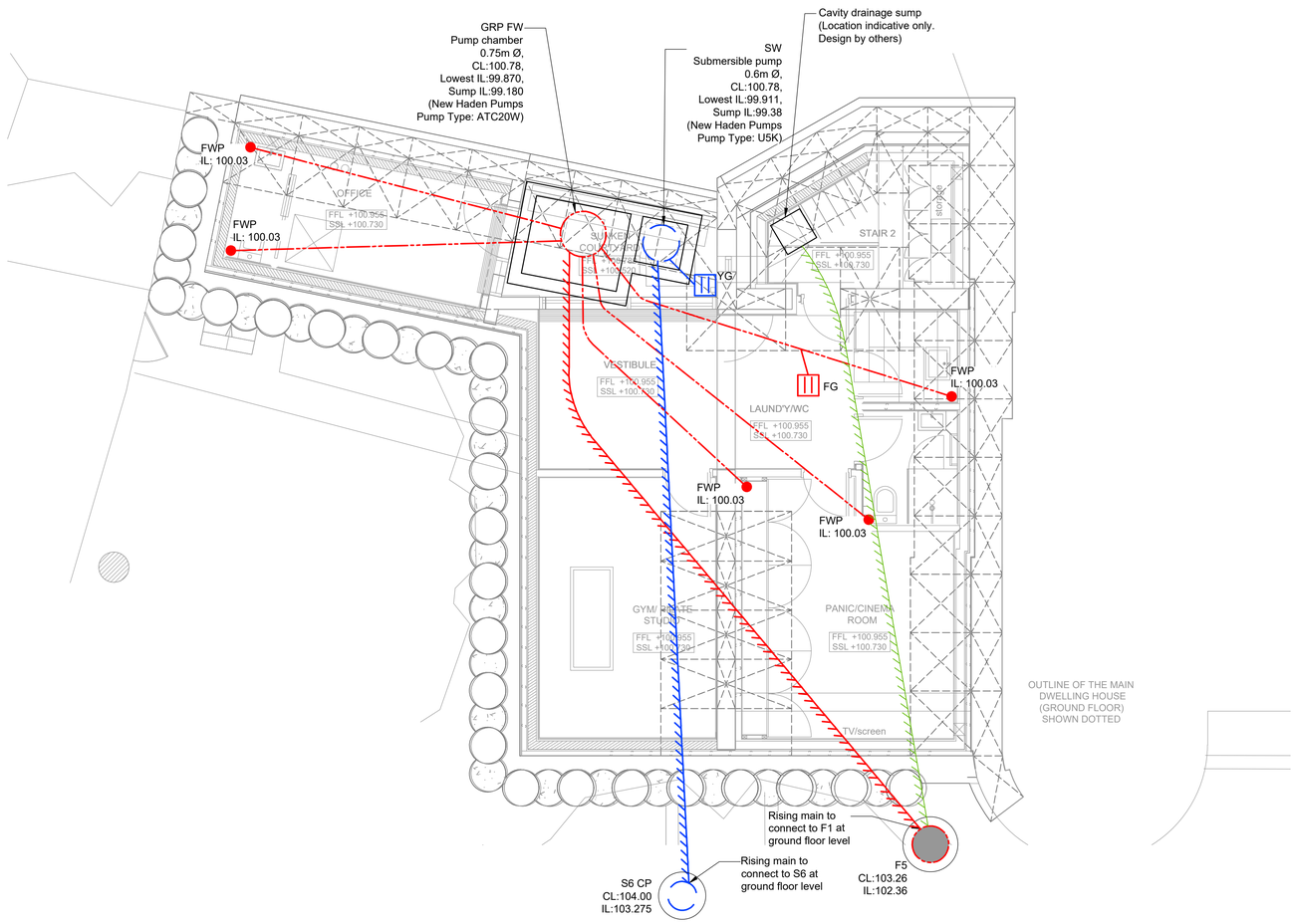
Where flow rates are less than 5.0 l/s consents are usually set at 5.0l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set in which case blockage work must be addressed by using appropriate drainage elements

(3) Is SPR/SPRHOST ≤ 0.3?

Greenfield runoff rates

	Default	Edited
Qbar (l/s)	0.09	0.09
1 in 1 year (l/s)	0.08	0.08
1 in 30 years (l/s)	0.2	0.2
1 in 100 years (l/s)	0.28	0.28

Appendix C
Below Ground Drainage Layout



Notes :

1. This drawing is to be read in conjunction with all relevant Architect's, Engineer's and specialists' drawings and specifications.
2. Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check that this drawing has been printed to the intended scale this bar should be 50mm long @ A1 or 25mm long @ A3.
3. Health & Safety :
   All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".
4. Cast iron pipes to be used below slab.

DRAINAGE LEGEND

New FW Drain	
Foul Water Rising Main (Route TBC by M&E Engineer)	
New SW Drain	
Surface Water Rising Main (Route TBC by M&E Engineer)	
Cavity Drain Rising Main (Route TBC by specialist)	

DRAINAGE KEY

FWP	Foul Waste Pipe
F1	Pumping Station Manhole Chamber
YG	Yard Gully
FG	Floor Gully

ABBREVIATIONS

IL	- Invert Level
CL	- Cover Level
FWP	- Foul water pipe

Ver	Date	Drawn	Eng	Amendment
2	17.04.20	PJ	YA	Issued for Tender
1	16.12.19	PJ	AC	Issued for Tender

26 CHRISTCHURCH HILL, LONDON, NW3 1LG

BELOW GROUND DRAINAGE LAYOUT BASEMENT

Status
FOR TENDER
NOT FOR CONSTRUCTION

Drawn PJ	Eng AC
Scales 1:50 at A1	1:100 at A3
Drawing No 24496-601	Ver 2

PRICE&MYERS
Consulting Engineers
37 Alfred Place London WC1E 7DP
T 020 7631 5128 F 020 7462 1390
E mail@pricemyers.com www.pricemyers.com

Existing connection from neighbouring property to connect to combined sewer diversion

Ex YG

EX RWP

S1
CL:104.04
IL:103.44

F1
CL:104.04
IL:102.85

Existing combined Sewer shown indicatively as per drainage CCTV survey report and drawing.

Ex RWP

Ex FWP

Ø100mm
1:40 Fall

Ø100mm
1:11 Fall

Ex RWP

F2
CL:103.28
IL:102.65

S2
CL:103.29
IL:102.69

EXISTING STUDIO WALL TO BE RETAINED

GARAGE
FFL +106.140
SSL + 106.000

Ex FWP

STAIR LANDING
RM.02
FFL +103.570
SSL + 103.540

RAISED LANDING
RM.04
FFL +104.130

LANDING
RM.03
FFL +103.570
SSL +103.540

FWP's to run at high level in the basement and connect to F1

RWP

YG

RWP

Existing drainage running within proposed basement footprint to be demolished. Location of existing connections to this network to be identified prior to construction.

Exact location TBC on site

EX FWP

F3
CL:103.10
IL:102.31

Ø100mm
1:28 Fall

Ø100mm
1:17 Fall

S4
CL:105.16
IL:104.56

CHILDREN PLAYROOM
RM.05
FFL +104.130
SSL +104.080

YG

EXTERNAL RATIO
RM.01
FFL +103.970
SSL +103.790

Route TBC, as existing slab to be broken out for proposed run

Proposed drainage diversion. Subject to Thames Water approval.

Ø100mm
1:20 Fall

Pipe running at high level in the basement. Route and details TBC by M&E Engineer.

FWP

YG

Pipe running at high level in the basement

Pipe running at high level in the basement. Route and details TBC by M&E Engineer.

S3 (CP)
CL:102.89
IL:102.29

Ø100mm
1:40 Fall

F5
CL:103.26
IL:102.36

ATTENUATION TANK
5m x 2m x 0.5m deep
Total Volume:5m³

S5
CL:104.83
IL:104.23

Ø100mm
1:4 Fall

S6 (CP)
CL:104.00
IL:103.27

Ø100mm
1:6 Fall

CL:102.78
Top of tank: 102.00
IL of tank: 101.50

Ø100mm
1:4 Fall

Ø100mm
1:7 Fall

F4
CL:102.70
IL:102.10

Ø100mm
1:10 Fall

FCMH1
Flow restricted 2.6 l/s
CL=103.07
IL=101.485
Ref: MD-SHE-0077-2600-1000-2600

ExMH
CL:103.32
IL:101.29

Thames Water Section 106 Agreement required to discharge the surface and foul water to the existing combined sewer

Ex Ø100mm pipe

Notes :

1. This drawing is to be read in conjunction with all relevant Architect's, Engineer's and specialists' drawings and specifications.
2. Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check that this drawing has been printed to the intended scale this bar should be 50mm long @ A1 or 25mm long @ A3.
3. Health & Safety: All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".
4. Cast iron pipes to be used below slab, clay pipes to be used elsewhere.
5. Existing drainage taken from drainage CCTV survey carried out by KENCLEAN (ref: AB/ab/A830CHRI).
6. Below ground drainage design is subject to M&E Engineer/Architects above ground drainage proposals.

DRAINAGE LEGEND

New FW Drain	
New SW Drain	
New Combined Sewer	
Existing Combined Drain	
To be abandoned/ demolished	
Drainage at high level to M&E Engineers design	

DRAINAGE KEY

RWP	Rainwater Down Pipe
FWP	Foul Waste Pipe
YG	Yard Gully
S1	Surface Water Chamber
F1/C1	Foul/Combined Water Chamber
FCMH1	Flow Control Chamber (SW only)
	Attenuation Tank

ABBREVIATIONS

IL	- Invert Level
CL	- Cover Level
CP	- Catch Pit
RA	- Rodding Access

HEALTH & SAFETY

List of site specific or unusual hazards relevant to the drawing: (Must be read in conjunction with the CDM risk register.)

Excavations	Excavation for manholes Contractor to ensure adequate edge protection to excavations for workers and plant and to ensure sides of excavations are sufficiently stable or shored up. Contractor to restrict access into areas where excavations are being carried out.
Sewer Connections	Working with live sewers Extra care must be taken when dealing with live sewers to ensure there is no adverse effect to the existing drainage.
Existing Services	Working alongside/near existing services. Extra care must be taken when working/digging near existing services. A survey should be carried out prior to works commencing to determine the exact location of existing services.

Ver	Date	Drawn	Eng	Amendment
2	28.04.20	YA	YA	Minor amendments
1	16.12.19	PJ	AC	Issued for Tender

26 CHRISTCHURCH HILL, LONDON, NW3 1LG

BELOW GROUND DRAINAGE LAYOUT GROUND FLOOR

Status
FOR TENDER
NOT FOR CONSTRUCTION

Drawn PJ	Eng AC
Scales 1:50 at A1	1:100 at A3
Drawing No 24496-602	Ver 2

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