



Residential Redevelopment  
Barrie House, St Edmund's Terrace,  
London

**SuDS Assessment**

For  
Marek Wojciechowski Architects

## Document Control Sheet

SuDS Assessment

Barrie House, 29 St. Edmund's Terrace, NW8 7QH

Marek Wojciechowski Architects

This document has been issued and amended as follows:

Date	Issue	Prepared by	Approved by
03/01/18	Draft	GM	NJ
04/01/18	Final	HB	NJ

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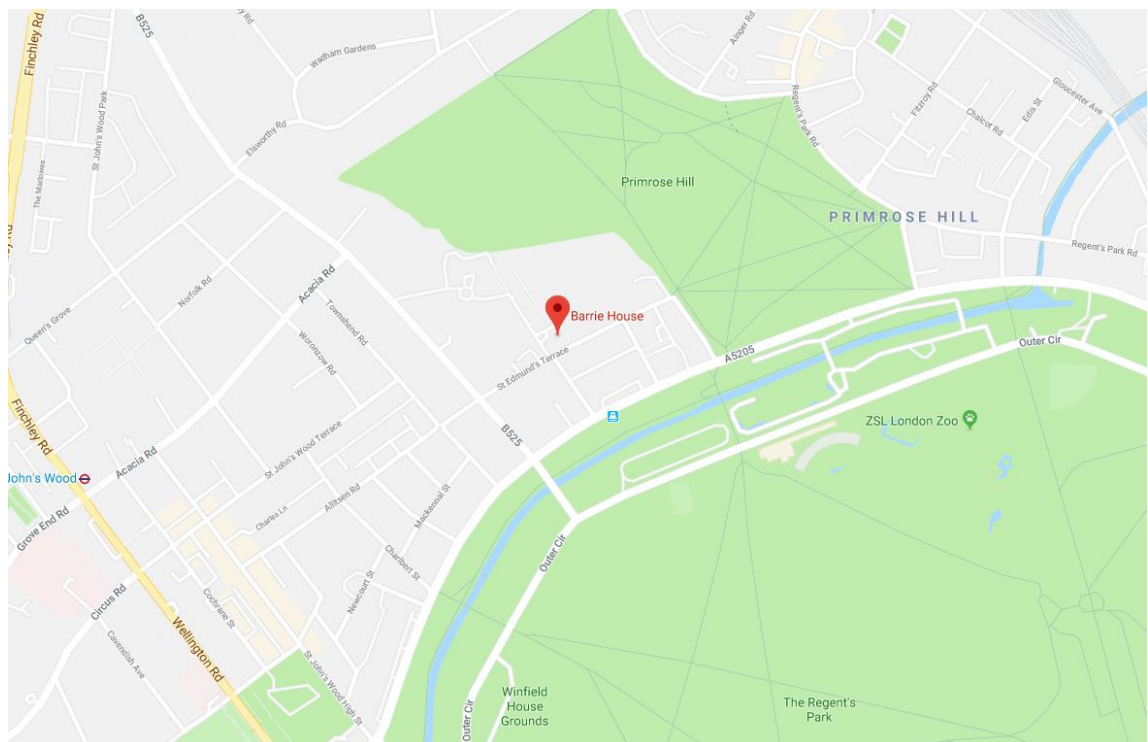
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## 1.0 Introduction

- 1.1 This SuDS Assessment has been prepared by Motion to accompany a full planning application for a proposed residential redevelopment at Barrie House, 29 St Edmunds Terrace, Camden Town.
- 1.2 The proposed development site is centred around grid reference TQ27501 83581 and the development area is located approximately 800m east of St Johns Wood Station and 1km south west of Chalk Farm LUL Station.
- 1.3 The site area is 2245m<sup>2</sup> (0.2245 Ha) according to MWA Drawing 16033-P-21. Approximately 50% of the site is currently hardstanding, with green areas bordering the development along the northern and eastern boundary along St Edmunds Terrace.
- 1.4 Figure 1 below shows the site location.



## 2.0 Existing Site

### Current Development Layout

- 2.1 The development site currently consists of an eight storey residential building separated into 3 residential apartments on each floor, along with associated parking spaces and green areas.
- 2.2 The development site is bound in the north and east by residential flats, in the south by St Edmunds Terrace and in the west by Broxwood Way. Barrow Hill Reservoir borders the site to the north-east. See **Appendix A** for a red line plan map of the proposed development site.

### Current Permeable and Impermeable Material Separations on Site

- 2.3 The site totals approximately 2245m<sup>2</sup> (0.245Ha) of total area and is currently a mix of:
- Approximately 321m<sup>2</sup> Roof area;
  - Approximately 696m<sup>2</sup> of carriageway and parking areas;
  - Approximately 100m<sup>2</sup> of paved pathways; and
  - Approximately 1,128m<sup>2</sup> of grass and planted areas.
- 2.4 Taking into account the existing connections to the public Thames Water (TW) combined drainage sewers, as well as the borehole records as attached in **Appendix B**, it can be seen that infiltration of surface water within the site boundary is extremely unlikely.
- 2.5 The British Geological Survey maps and borehole records indicate a vast mass of clayey composite underlying the proposed development area.

### Existing Drainage Regime – Surface Water

- 2.6 It is understood that Barrie House is served by an existing surface water drainage system that discharges all of the surface water into the Thames Water combined sewer system, manhole reference 4518 located along Broxwood Way. The Thames Water asset plans can be seen in **Appendix C**.

### Existing Drainage Regime – Foul Water

- 2.7 As above, Barrie House is served by an existing foul water drainage system that discharges into the Thames Water combined sewer system, into manhole reference 4518 located along Broxwood Way. Manhole 4518 has a specified cover level of 43.1 and no recorded invert level.

### 3.0 Proposed Development, Existing and Proposed Run-off Rates

#### Proposed Development

- 3.1 The development proposals comprise the following:
- The demolition of the existing two-storey porters lodge;
  - Proposed 9xC3 residential units; and
  - Redevelopment of existing car park to accommodate proposed 3 storey extension adjoining Barrie House, over basement, ground, 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> floor levels, to create 9x self-contained flats.
- 3.2 The proposed development layout can be seen in **Appendix D**.
- 3.3 Camden Council LLFA has been contacted to request pre-development information and guidance, and this report will be updated once a response has been received.

#### Existing Surface Water Run-Off Rates

- 3.4 As part of the SuDS Assessment produced for the site, an appropriate brownfield run-off rate must be calculated, in order that an initial estimate of required attenuation storage may be made for the 1 in 30 year and 1 in 100 year storms, in order that the requirements to store those events might be met.
- 3.5 In order to estimate the brownfield runoff rate from a given area, it is first necessary to estimate the rate of rainfall on the site for the storm events under consideration.
- 3.6 Average rainfall intensities from a variety of storm durations were sampled from TRRL Report LR595 – Estimating rainfall for drainage calculations in the UK – by C. P. Young.
- 3.7 Table 3.1 and 3.2 below shows the storm duration for the 1 in 30 year and 1 in 100 year events respectively:

Storm Duration (mins)	Intensity (mm/hr)
15	69.3
30	47.6
60	30.3
120	18.7
180	14.1
240	11.5
360	8.7
480	7.1
600	6

Table 3.1 1 in 30-year event

Storm Duration (mins)	Intensity (mm/hr)
15	97.2
30	70.5
60	47.8
120	30.2
180	22.7
240	18.5
360	13.9
480	11.3
600	9.6

Table 3.2 1 in 100-year event

- 3.8 It is also essential to calculate the impermeable and permeable areas so as to accurately estimate the run-off rates using the Modified Rational Method.

3.9 Permeable and Impermeable areas can be seen in table 3.3 below.

Section	Area (m <sup>2</sup> )	Area (Ha)	Cv (Volumetric Run-off )	Cr (Dimensionless Routing Coefficient)
Roof	321	0.0321	0.9	1.3
Tarmac & Brick Setts	796	0.0796	0.75	1.3
Green Space	1128	0.1128	0.15	1.3

Table 3.3 Permeable and Impermeable Areas

3.10 Table 1.3 above also shows the Volumetric Run-off coefficient (Ciria SuDS Manual C753) for the different sections as well as the routing coefficient. Both Cv and Cr multiplied will give a dimensionless figure for C (Run-off coefficient) that will be used to calculate the existing brownfield run-off rates as shown below:

$$Q = 2.78 C i A$$

where:

Q = design event peak rate of runoff (l/s)

C = non-dimensional runoff coefficient which is dependent on the catchment characteristics

$$C = C_V C_R$$

where C<sub>V</sub> = volumetric runoff coefficient

C<sub>R</sub> = dimensionless routing coefficient

i = rainfall intensity for the design return period (in mm/hr) and for a duration equal to the "time of concentration" of the network

A = total catchment area being drained (ha)

Note: 2.78 is a conversion factor to address the rainfall unit being in mm/hr.

3.11 The tabulated results for C can be seen in table 3.4 below:

Section	Run-off coefficient C (Cv x Cr)
Roof	1.17
Tarmac & Brick Setts	0.975
Green Space	0.325

Table 3.4 Run-off Coefficient

3.12 The existing Runoff rate has been calculated for the 1 in 30 year 15 minute storm event, as well as the 1 in 100 15 minute event. The results can be seen below:

Storm Duration (mins)	Event	Outflow (l/s)
15	30 Year	28.73
15	100 Year	41.02

Table 3.5 Discharge (l/s) 1 in 30-year and 1 in 100 year events

### Surface Water Outflows from the Proposed Development

3.13 It is proposed that the surface water generated from the proposed development attenuated and discharge at a rate far reduced from existing.

3.14 ICP SuDS method (Microdrainage) has been used to calculate the greenfield run-off rate for the entire site in line with the London Plan, with the greenfield rate being 0.3l/s. A practical minimum discharge rate of 5l/s has been adopted for the proposed drainage strategy as flow restriction devices are prone to blockages at flows less than this.

- 3.15 All surface water generated on site will be subject to filtration through layers of permeable paving, as well as attenuation prior to discharge. This is in line with The London Plan's suggested surface water disposal strategy.
- 3.16 As the surface water outfalls into a combined drainage network, it will be drained within a separate system and combined at the final manhole prior to its outfall into the Thames Water combined system along Broxwood Way.

### **Foul Water Flows from Proposed Development**

- 3.17 The following calculations have been extracted from Sewers for Adoption (SfA) 7<sup>th</sup> Edition:

SfA specified 4000l/dwelling/day of foul water.

9 residential units + 24 existing residential units

$4000 \times 36 = 132,000 \text{ l/day}$

$132,000 \div 24 = 5500 \text{ l/h}$

$5500 \div 60 = 91.7 \text{ l/m}$

$91.7 \div 60 = \mathbf{1.5 \text{ l/s}}$

- 3.18 The total peak flow from the proposed residential development plus the existing 24 residential units is 1.5l/s.
- 3.19 As the foul water outfalls into a combined drainage network, it will be drained within a separate system and combined at the final manhole prior to its outfall into the Thames Water combined system along Broxwood Way.
- 3.20 A capacity check should be undertaken with Thames Water to confirm that the system within the wider area can accommodate the additional flows. This is to be confirmed at the detailed design stage.



## 4.0 Flood Mitigation Measures and SuDS Incorporation

- 4.1 Sustainable Drainage Systems (SuDS) are essential in managing the surface water run-off from a new development site. This surface water management strategy will ensure that no additional risk is produced to the development as well as neighbouring developments.
- 4.2 SuDS systems will aid in the initial filtration of the surface water whilst also discharging into the appropriate location at a rate far reduced from the original brownfield site run-off rate.

### Applied Drainage Hierarchy to Viable SUDs Methods

- 4.3 Figure 4.1 below shows the SuDS drainage hierarchy from the Ciria SuDS Manual C753.

**The SUDS Hierarchy**

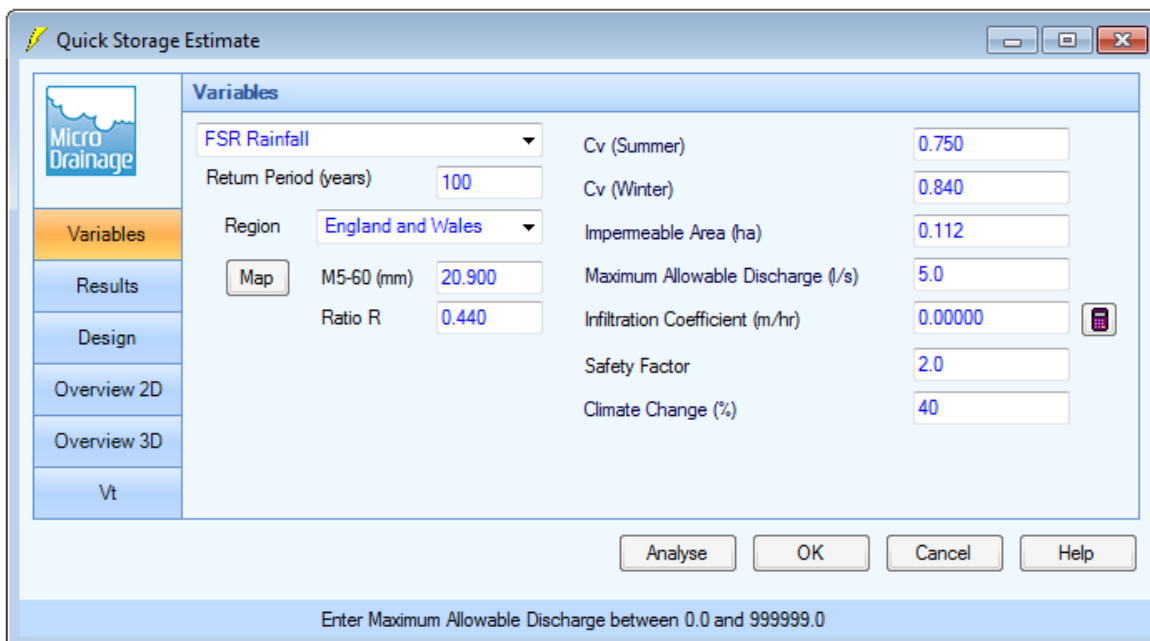
<i>Most Sustainable</i>	<b>SUDS technique</b>	<b>Flood Reduction</b>	<b>Pollution Reduction</b>	<b>Landscape &amp; Wildlife Benefit</b>
	<b>Living roofs</b>	✓	✓	✓
	<b>Basins and ponds</b> - Constructed wetlands - Balancing ponds - Detention basins - Retention ponds	✓	✓	✓
	<b>Filter strips and swales</b>	✓	✓	✓
	<b>Infiltration devices</b> - soakaways - infiltration trenches and basins	✓	✓	✓
	<b>Permeable surfaces and filter drains</b> - gravelled areas - solid paving blocks - porous paviers	✓	✓	
<i>Least Sustainable</i>	<b>Tanked systems</b> - over-sized pipes/tanks - storms cells	✓		

Figure 4.1 SuDS Hierarchy - Ciria C753

- 4.4 Figure 4.1 above details the sustainability level of each of the SuDS techniques, as well as the SuDS system suitability within 3 general criteria areas:
- Flood Reduction;
  - Pollution Reduction; and
  - Landscape and Wildlife Benefit.
- 4.5 Ideally, any designed SuDS system should be multi-functioning, fulfilling as many of the criteria areas as possible.

### Storage Volume Calculations

- 4.6 The storage required to attenuate the surplus surface water, as well as the locations available and the topography of the site largely dictate the structure of the SuDS system that is to be designed.
- 4.7 The site is currently developed (brownfield) with the proposed design remaining largely hardstanding. There is ample opportunity to incorporate an effective and sustainable multi-functioning SuDS system.
- 4.8 Figures 4.2 and 4.3 below show the required amounts of attenuation needed on site to cater for the 1 in 100-year event + 40% climate change.

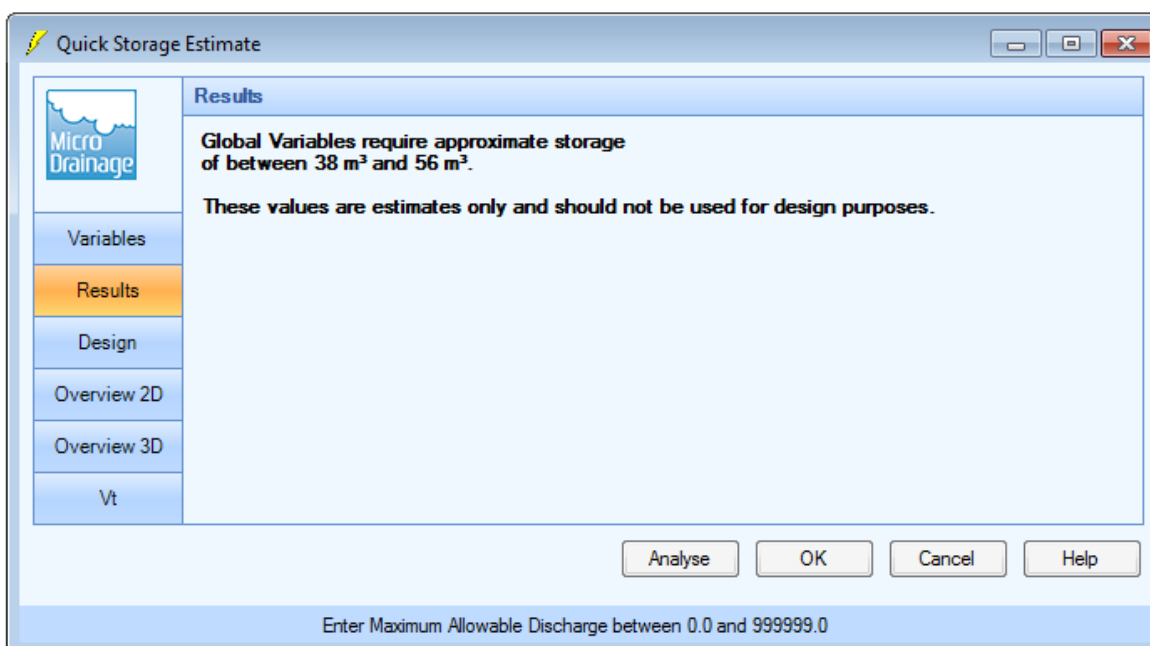


Variables	
FSR Rainfall	Cv (Summer) 0.750
Return Period (years) 100	Cv (Winter) 0.840
Region England and Wales	Impermeable Area (ha) 0.112
Map M5-60 (mm) 20.900	Maximum Allowable Discharge (l/s) 5.0
Ratio R 0.440	Infiltration Coefficient (m/hr) 0.00000
	Safety Factor 2.0
	Climate Change (%) 40

Buttons: Analyse, OK, Cancel, Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

Figure 4.2 Storage Calculation Parameters



**Results**

**Global Variables require approximate storage of between 38 m<sup>3</sup> and 56 m<sup>3</sup>.**

**These values are estimates only and should not be used for design purposes.**

Buttons: Analyse, OK, Cancel, Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

Figure 4.3 Storage Calculation Output

- 4.9 Figures 4.2 and 4.3 above show that an upper limit of 56m<sup>3</sup> of attenuation should be provided so as to cater for the 1 in 100 year +40% CC event.
- 4.10 A practical minimum discharge rate of 5l/s has been adopted, in line with the London Plan, providing a significant reduction in peak flow rates from the proposed development.

### Likely Methods of Attenuation

- 4.11 Taking into account the volume of storage required and the current masterplan, the ideal method of attenuation would encompass all three SuDS design criteria.

- 4.12 Referring back to table 4.1 above, the following SuDS devices would offer the needed flood and pollution control, as well as providing ample green space and encouraging biodiversity.
- 4.13 The SuDS system has been designed to adhere to the London Plan SuDS strategy, reducing peak flow rates of surface water.

### Permeable Paving System

- 4.14 Pervious surfaces provide a surface suitable for pedestrian and/or vehicular traffic, while allowing rainwater to infiltrate through the surface and into underlying layers.
- 4.15 The water can be temporarily stored before infiltration to the ground, reused, or discharged to a watercourse or other drainage system. Surfaces with an aggregate sub-base can provide good water quality treatment.
- 4.16 The advantages of the Permeable paving system can be seen below:
- Reduced peak flows to watercourses reducing the risk of flooding downstream;
  - Reduced effects of pollution in runoff on the environment;
  - Can be used in high density developments with a range of surface finishes that accept surface waters over their area of use;
  - Reduced need for deep excavations for drainage, which can have significant cost benefits;
  - Flexible and tailored solution that can suit the proposed usage and design life;
  - Lined systems can be used where infiltration is not desirable, or where soil integrity would be compromised;
  - Allows dual use of space, so no additional land take;
  - Removes need for gully pots and manholes;
  - Eliminates surface ponding and surface ice; and
  - Often very resilient to a lack of maintenance.
- 4.17 As all SuDS systems, there are disadvantages in the use of permeable paving, these can be seen below:
- Cannot be used where large sediment loads may be washed / carried onto the surface;
  - In the UK, our current practice is to implement permeable paving on highways with low traffic volumes and speeds generally less than 30 mph; and
  - Risk of long term clogging if poorly maintained.

### Cellular Attenuation Systems

- 4.18 Cellular Storage Crates are suitable for attenuation and are designed to resist compression loads, so they can be located in more convenient locations within public access areas that provide many benefits.
- 4.19 The benefits can be seen below:
- Modular and flexible
  - Dual usage (i.e. infiltration and/or storage)
  - High void ratios (up to 96%) providing high storage volume capacity
  - Lightweight, easy to install and robust
  - Capable of managing high flow events

- Can be installed beneath trafficked or non-trafficked areas (providing structural performance is proven to be sufficient)
- Long-term physical and chemical stability
- Can be installed beneath public open spaces, e.g. play areas.

4.20 As all SuDS systems, there are disadvantages in the use of attenuation crates, these can be seen below:

- No water quality treatment or amenity provision
- Performance can be difficult to monitor
- Can be difficult to maintain

## 5.0 Drainage Strategy for Proposed Development

### Location of SuDS Features

- 5.1 SuDS features should be integrated into the initial masterplan as early as possible, so as to accommodate for space, ease of access, maintenance and regular inspections.
- 5.2 The attenuation is to be located beneath the proposed car-parking spaces providing ease of access for maintenance whilst also allowing for a gravity draining system.
- 5.3 Permeable Paving has been specified for all internal walkways.

### Drainage Strategy

- 5.4 The drainage strategy has been designed to act as a multi-functioning SuDS chain that will collect, filter and discharge excess surface water run-off at a desirable rate of 5l/s for the whole site.
- 5.5 The existing Thames Water manhole can be seen on the Drainage Strategy drawing in **Appendix E**.
- 5.6 The surface water will be attenuated beneath the car parking spaces adjacent to Broxwood Way. 56m<sup>3</sup> of attenuation has been provided so as to cater for the 1 in 100 year +40% CC event.
- 5.7 Surface water from the roofs will be drained into the permeable paving for conveyance purposes. The permeable paving will be lined and will incorporate perforated collection pipes at the base of the sub-base layer so as to collect and route the surface water.
- 5.8 A control will be fitted to the attenuation so as to limit the flows from the attenuation tank to 5l/s.
- 5.9 An additional manhole will be located further down the run that will combine the foul and surface water prior to final discharge into the Thames Water combined sewer manhole reference 4518, giving a combined peak flow rate of 6.6l/s for surface water and foul.

## 6.0 Maintenance Schedule for SuDS

- 6.1 As with all drainage systems, regular maintenance is essential so as to insure the continued efficiency of the system.

### Permeable Paving Maintenance

- 6.2 Table 6.13 below shows a maintenance schedule for permeable paving:

Maintenance Schedule	Required Action	Typical Frequency
<b>Regular Maintenance</b>	Brushing and vacuuming (standard cosmetic sweep over whole surface).	Once a year, after autumn leaf fall, or reduced frequency as required, based on site specific observations of clogging or manufacturer's recommendations - pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment.
<b>Occasional Maintenance</b>	Stabilise and mow contributing and adjacent areas.	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying.	As required - once per year on less frequently used pavements
<b>Remedial Actions</b>	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised within 50mm of the level of the paving.	As requires
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to structural performance or a hazard to users, and replace lost jointing material.	As required
	Rehabilitation of surface and upper substructure by remedial sweeping.	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
<b>Monitoring</b>	Initial inspection	Monthly for 3 months after installation.
	inspect for evidence of poor operation and/or weed growth - if required, take remedial action.	Three-monthly, 48h after large storms in first 6 months.
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor inspection chambers	Annually

### Cellular Storage Maintenance

Maintenance Schedule	Required Action	Typical Frequency
<b>Regular Maintenance</b>	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
<b>Remedial Actions</b>	Repair/rehabilitate inlets, outlets, overflows and vents	Annually, or as required
<b>Monitoring</b>	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

- 6.1 Chapter 32 of the Ciria C753 SuDS manual details the operation and maintenance of permeable paving and cellular storage tanks, and these maintenance and operation considerations should be implemented into a regular maintenance plan so as to ensure the efficiency and viability of the drainage system.

## 7.0 Summary

- 7.1 Barrie House is a brownfield redevelopment with the construction of one additional three storey building housing 9 self contained units in place of the existing porters lodge, with an additional 3 self contained units within the lower ground floor of the existing structure.
- 7.2 The entirety of the site lies within Flood Zone 1 and is not subject to flooding from rivers and seas, artificial drainage systems and reservoirs.
- 7.3 The proposed development will incorporate SuDS systems designed to replicate the natural water cycle in the form of permeable paving and cellular storage tanks.
- 7.4 The drainage strategy designed reduces the run-off for the 100 year event from the existing rate of 41.02l/s to 5l/s as the practical minimum.
- 7.5 The surface water will attenuate within cellular storage crates beneath the parking area. A control will be fitted to the tank to limit the discharge to 5l/s.
- 7.6 The maximum storage needed across the site is 56m<sup>3</sup> and this has been provided within the cellular storage tanks. Storage above the 1 in 100 year event is provided within the permeable paving sub-base but this has not currently been factored in to the design.
- 7.7 The final manhole post-attenuation crates will combine the foul and surface water prior to final discharge to the Thames Water combined sewer at manhole reference 4518.
- 7.8 This SuDS assessment has demonstrated that there will be no increase in flood risk to the site or to neighbouring developments owing to the redevelopment of Barrie House, and as such issues of flooding and drainage should not constraint the granting of planning permission.



## **Appendix A**

Site Location Plan







## **Appendix B**

BGS Borehole Records

WELL BORING at *Corner of Osmondale Tce & Albert Rd, St. John's Wood.* County

Geol. map

1 in. map New Series

6 in. map

Made by

TQ 28 SE

Date

Sunk

feet.

Bored

feet.

Communicated by *L.C.C.*

Height above Ordnance Datum *124.98*

Rest level of water

Yield

*(38-10-)*

Quality (with copy of analysis on separate sheet)

C 28

*7 N.W. TQ/28 SE/35  
2775.8355  
256*

GEOLOGICAL FORMATION	NATURE OF STRATA	THICKNESS		DEPTH	
		Feet	Inches	Feet	Inches
	<i>Macadam</i>	-	8	-	8(0-20-)
	<i>Made Gravel</i>	2	-	2	8(0-81-)
	<i>Town clay.</i>	37	-	33	8(10-20-)
	<i>Blue clay.</i>	44	6	78	2(23-28-)
	<i>Unbottomed</i>				

276-142 206 TQ 28 SE 1409  
 GROUND LEVEL: 164.6 A.O.D. 50.14m  
 NOMINAL B.H. DIA.: 6" Casing to 140ft  
 DATE OF BORING: 21 Feb. to 14 March '60 N.A.R. 2755. P.360

# BOREHOLE No. 27

GROUNDWATER		SAMPLE DEPTH	B.H.	DEPTH 0'-0"	R.L.	DESCRIPTION OF STRATA
LEVEL	DATE					
						Fairly firm fissured brown clay becoming stiffer with increasing depth
				34'-0" + 130.8 10.32m + 39.75m		
						Stiff grey - blue fissured clay
				39'-0" + 11.02m 39.32m + 10.32m		
						Medians boulder

## REMARKS:

No water in borehole.

## SAMPLES

Undisturbed  
 Disturbed

## SCALE:

1" to 1'-0"

**METROPOLITAN WATER BOARD**

**MAIN IN TUNNEL BETWEEN THAMES AND  
 LEA VALLEYS.**

SOILS No.  
 S/371

DRWG. No.  
 S/R/526

GEORGE WIMPEY & CO. LTD, CENTRAL LABORATORY, SOUTHALE.

## **Appendix C**

Thames Water Record Plans

# Asset location search



## Property Searches

motion  
GUILDFORD  
GU1 4AU

**Search address supplied** Flat 1  
Barrie House  
29  
St. Edmunds Terrace  
London  
NW8 7QH

**Your reference** MWBARR

**Our reference** ALS/ALS Standard/2017\_3707052

**Search date** 12 December 2017

### Keeping you up-to-date

Knowledge of features below the surface is essential in every development. The benefits of this not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility for any commercial or residential project.

An asset location search provides information on the location of known Thames Water clean and/or wastewater assets, including details of pipe sizes, direction of flow and depth. Please note that information on cover and invert levels will only be provided where the data is available.



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



[searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)  
[www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



0845 070 9148



**Search address supplied:** Flat 1, Barrie House, 29, St. Edmunds Terrace, London, NW8 7QH

Dear Sir / Madam

**An Asset Location Search is recommended when undertaking a site development.** It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

### Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

Thames Water Utilities Ltd  
Property Searches  
PO Box 3189  
Slough  
SL1 4WW

Email: [searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)

Web: [www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



## Waste Water Services

**Please provide a copy extract from the public sewer map.**

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

## Clean Water Services

**Please provide a copy extract from the public water main map.**

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

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

pressure test to be carried out for a fee.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

### **Payment for this Search**

A charge will be added to your suppliers account.

### Further contacts:

#### Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

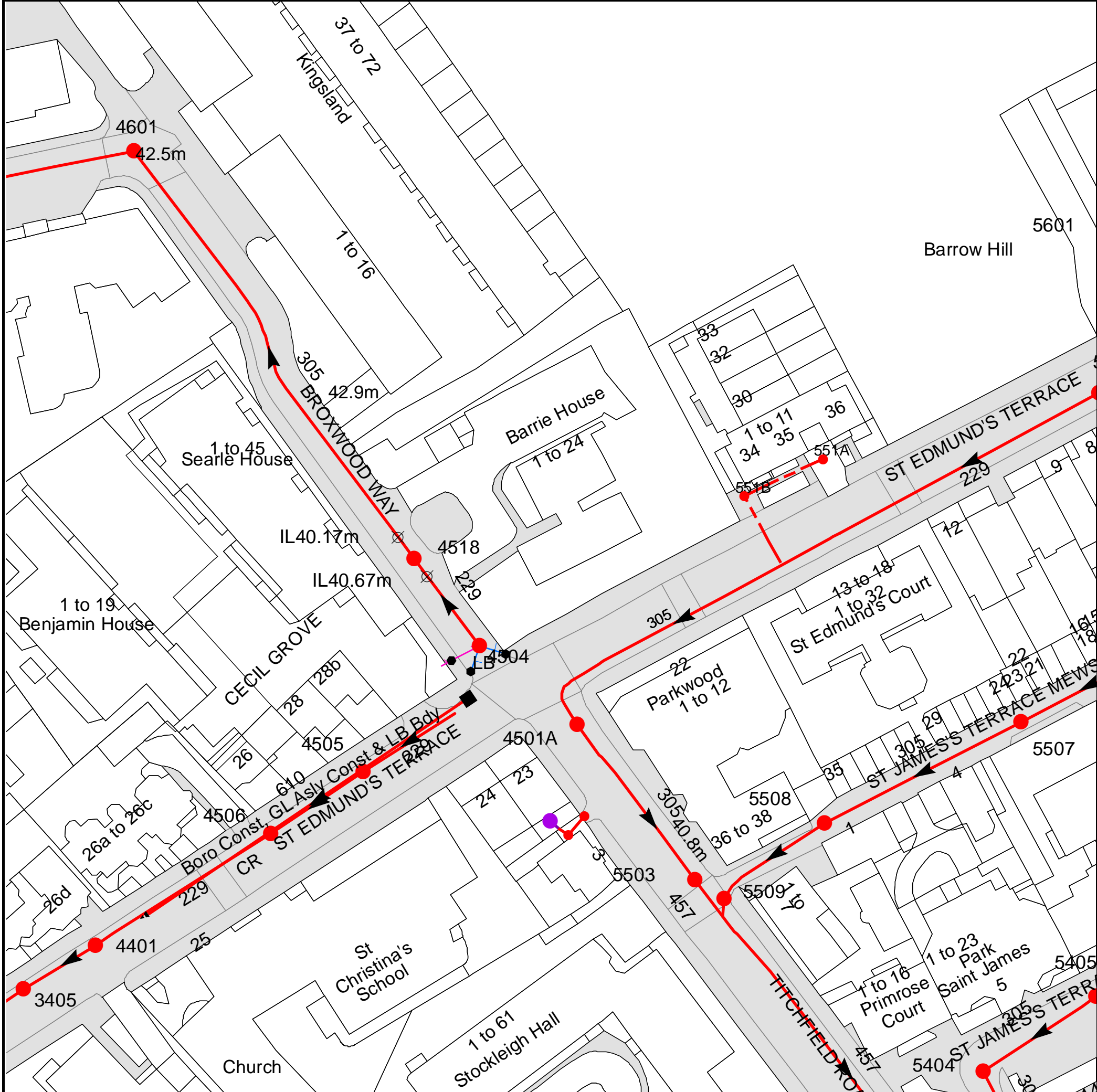
Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)

#### Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 527491,183571

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.

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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
3405	38.37	37.29
4401	38.74	37.71
4601	42.87	38.62
4506	39.76	38.52
4505	40.57	39.27
4518	43.1	n/a
4504	42.26	40.95
451A	n/a	n/a
45AF	n/a	n/a
4501A	42.16	39.08
45AG	n/a	n/a
5503	40.4	37.83
5509	40.24	38.21
551B	n/a	n/a
551A	n/a	n/a
5508	40.97	39.12
5507	41.65	39.96
5405	39.59	36.15
5404	39.04	35.72
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.		



# ALS Sewer Map Key

## Public Sewer Types (Operated & Maintained by Thames Water)

	<b>Foul:</b> A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	<b>Surface Water:</b> A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	<b>Combined:</b> A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Trunk Surface Water
	Trunk Foul
	Storm Relief
	Trunk Combined
	Vent Pipe
	Bio-solids (Sludge)
	Proposed Thames Surface Water Sewer
	Proposed Thames Water Foul Sewer
	Gallery
	Foul Rising Main
	Surface Water Rising Main
	Combined Rising Main
	Sludge Rising Main
	Proposed Thames Water Rising Main
	Vacuum

### Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.

## Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve
	Dam Chase
	Fitting
	Meter
	Vent Column

## Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Control Valve
	Drop Pipe
	Ancillary
	Weir

## End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Outfall
	Undefined End
	Inlet

## Other Symbols

Symbols used on maps which do not fall under other general categories

	Public/Private Pumping Station
	Change of characteristic indicator (C.O.C.I.)
	Invert Level
	Summit

### Areas

Lines denoting areas of underground surveys, etc.

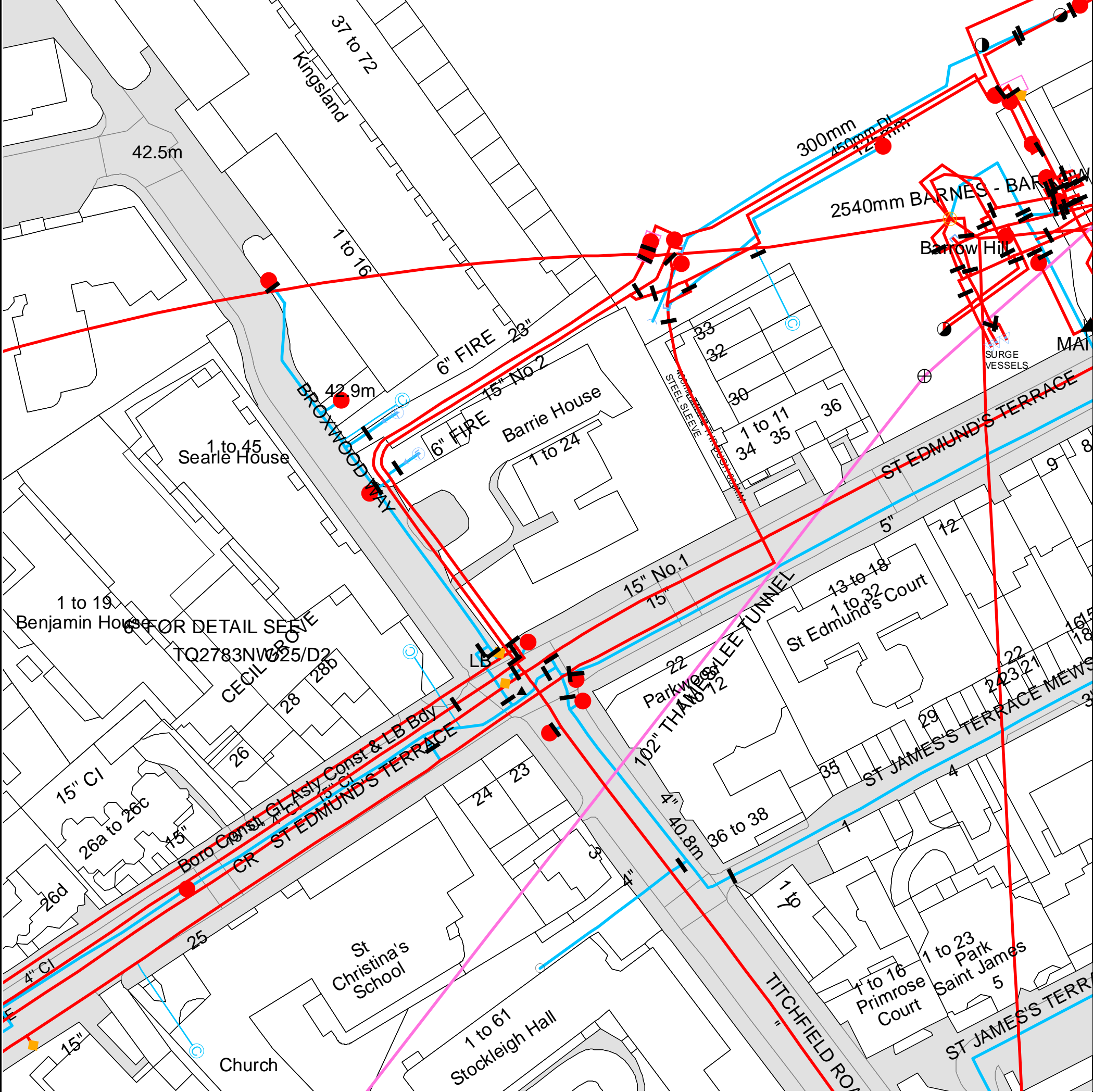
	Agreement
	Operational Site
	Chamber
	Tunnel
	Conduit Bridge

## Other Sewer Types (Not Operated or Maintained by Thames Water)

	Foul Sewer
	Surface Water Sewer
	Combined Sewer
	Gully
	Culverted Watercourse
	Proposed
	Abandoned Sewer

- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.





The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 527491, 183571.  
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.

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## ALS Water Map Key

### Water Pipes (Operated & Maintained by Thames Water)

4"	<b>Distribution Main:</b> The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
16"	<b>Trunk Main:</b> A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.
3" SUPPLY	<b>Supply Main:</b> A supply main indicates that the water main is used as a supply for a single property or group of properties.
3" FIRE	<b>Fire Main:</b> Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
3" METERED	<b>Metered Pipe:</b> A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.
	<b>Transmission Tunnel:</b> A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.
	<b>Proposed Main:</b> A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

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

### Valves

	General Purpose Valve
	Air Valve
	Pressure Control Valve
	Customer Valve

### Hydrants

	Single Hydrant
--	----------------

### Meters

	Meter
--	-------

### End Items

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

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

### Operational Sites

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

### Other Symbols

	Data Logger
--	-------------

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

	<b>Other Water Company Main:</b> Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
	<b>Private Main:</b> Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.



## Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL's terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

## Ways to pay your bill

Credit Card	BACS Payment	Telephone Banking	Cheque
Call <b>0845 070 9148</b> quoting your invoice number starting CBA or ADS / OSS	Account number <b>90478703</b> Sort code <b>60-00-01</b> A remittance advice must be sent to: <b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.</b> or email <a href="mailto:ps.billing@thameswater.co.uk">ps.billing@thameswater.co.uk</a>	By calling your bank and quoting: Account number <b>90478703</b> Sort code <b>60-00-01</b> and your invoice number	Made payable to ' <b>Thames Water Utilities Ltd</b> ' Write your Thames Water account number on the back. Send to: <b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW</b> or by DX to <b>151280 Slough 13</b>

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.



## **Search Code**

### **IMPORTANT CONSUMER PROTECTION INFORMATION**

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

#### **The Search Code:**

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

#### **The Code's core principles**

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

#### **Complaints**

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if he finds that you have suffered actual loss as a result of your search provider failing to keep to the Code.

**Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.**

#### **TPOs Contact Details**

The Property Ombudsman scheme  
Milford House  
43-55 Milford Street  
Salisbury  
Wiltshire SP1 2BP  
Tel: 01722 333306  
Fax: 01722 332296  
Email: [admin@tpos.co.uk](mailto:admin@tpos.co.uk)

You can get more information about the PCCB from [www.propertycodes.org.uk](http://www.propertycodes.org.uk)

**PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE**

## **Appendix D**

Development Proposals





Key Plan, Scale 1:250

Legend

Proposed key

Site boundary

Existing structure / earth

Existing structure not part of this application

Line of demolished building

New Structure

Proposed notes:

11 Natural stone paving to terrace	11 Profiled anodised aluminium cladding
12 Natural stone paving on permeable base	12 Profiled anodised aluminium window reveal
13 Resin bonded gravel	13 Brickwork
14 Resin bonded gravel to car parking space	14 Portland scabb stone
15 Existing bin store relocated	15 Portland stone coping
16 Proposed bin store (2no, 1000 litre curbside + 2no, 240 litre wheeled bins)	16 Double glazed window with anodised aluminium frame
17 Proposed bike store (8 cycles internal & 4 external)	17 Anodised aluminium balustrade
18 Handing border	18 Structural low iron glass
19 Pedestrian pathway	19 Anodised aluminium fix
20 Dwarf wall to site boundary	20 To existing residents' parking bays related to shown
21 Pedestrian access gate	21 ADU smoke outlet
22 Sliding vehicle access gate	22 Existing access ledge to be demolished
23 Vehicle one way system	23 Anodised aluminium building
24 Lightwell	24 Anodised aluminium building
25 Sedum green roof	25 Clear glass glazing to 1.7m above finished floor level
26 Lift overrun	26 Clear glass balustrade
	27 Attenuated Acoustic Enclosure

Rev - 04/03/18 Issued for Planning

# PLANNING

Project No. 16033

Client Kalemister Ltd.

Date November 2017

Scale 1:200 @ A2/ 1:400 @ A4

Project Barrie House, 29 St. Edmunds Terrace

Drawing Title: Proposed Ground Floor Plan

Drawing No. P\_21 Rev. -

Drawn: MW Approved: TMC Signed:



66-68 Margaret Street W1W 8SR T: 020 7580 9336 www.mw-a.co.uk

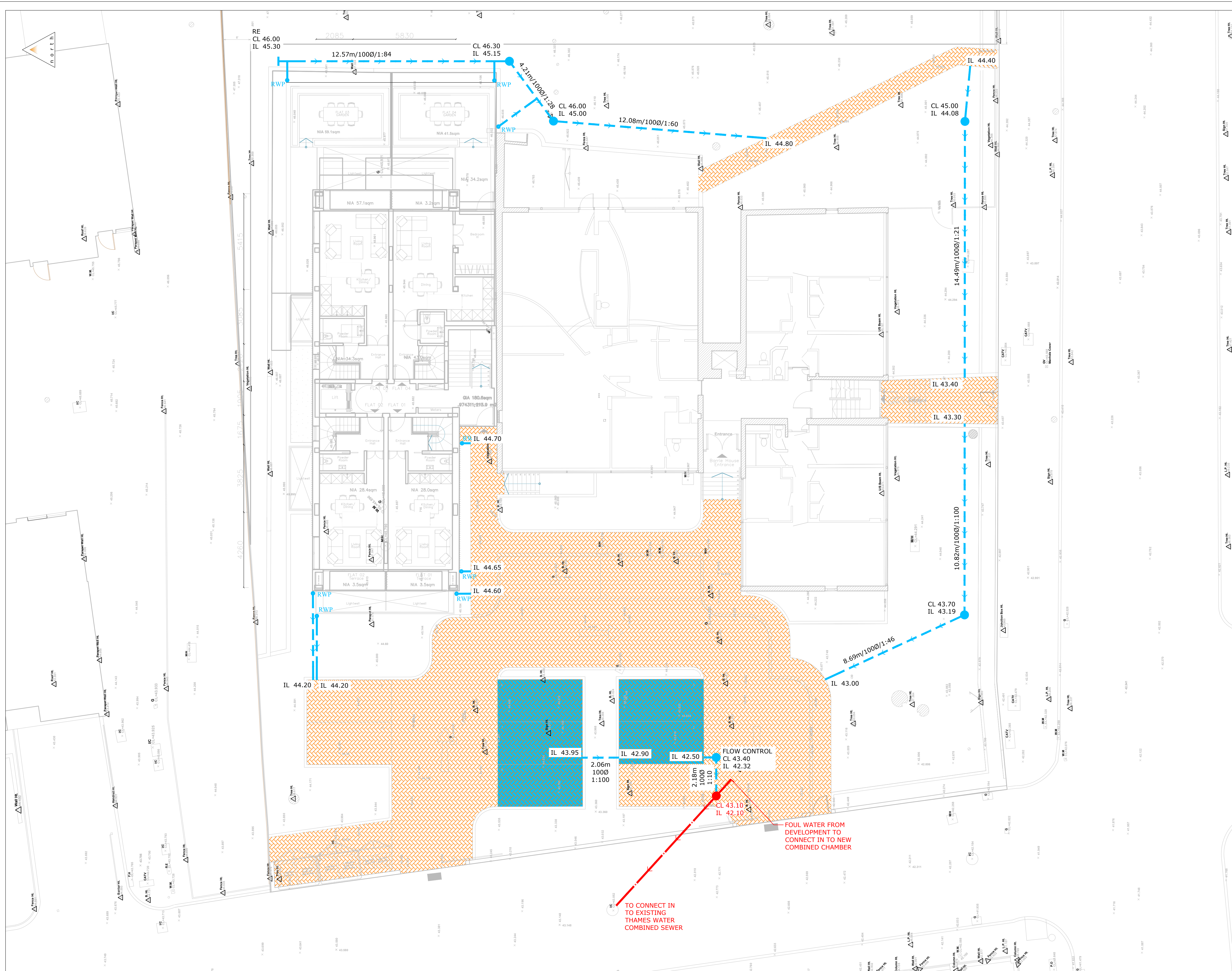
Copyright Marek Wojciechowski Architects Limited. No implied license exists. This drawing should not be used to calculate areas for the purposes of valuation. All dimensions to be checked on site by the contractor and such dimensions to be their responsibility. Do not scale drawings. All work must comply with relevant British Standards and Building Regulations requirements. Drawing errors and omissions to be reported to the architect.



## **Appendix E**

Drainage Strategy





Notes

- All levels and dimensions are to be checked on site before any work commences. All dimensions are in metres unless stated otherwise.
- This drawing has been based upon survey information supplied by Marek Wojciechowski Architects Ltd. and Motion cannot guarantee the accuracy of the data provided

Legend

- Proposed Combined Sewer
- Proposed Private Surface Water Sewer
- Pipe Length (m) / Ø (mm) / Gradient
- Surface Water Inspection Chamber
- Foul Inspection Chamber
- Rodding Eye
- Rain Water Pipe
- Permeable Paving
- Permeable Paving over 1m Deep Cellular Storage

B Permeable Paving Amended	SR	SR	NJ	04-01-18
A Layout Amended	SR	SR	NJ	04-01-18
Revision Notes:	Dm	Chk	App	Date

Drawing Status: DRAFT



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Client:  
Marek Wojciechowski Architects Ltd.

Project:  
Barrie House, 29 St. Edmund's Terrace

Title:  
Drainage Strategy

Scale: 1:100	Size: A1	Date: 2018-01-03
Drawn:SR	Chk'd: GM	App'd:NJ

Drawing: 170910-300	Revision: B
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