



**Bruce Grove Youth Space,
London N17 6RA**

Sustainable Drainage Strategy

		Remarks:	Draft				
Revision	P1	Prepared by:	Mike Ash MEng (Hons)	Checked by:	Harry Hunter BEng (Hons)	Approved by:	Harry Hunter BEng (Hons)
Date:	06/01/2023	Signature		Signature		Signature	

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One

Executive Summary

Elliott Wood Partnership Ltd have been appointed to produce a Sustainable Drainage Strategy in support of the proposed redevelopment of the site at Bruce Grove Youth Centre, London N17 6RA.

The national grid reference for the site is 533686E, 190224N. The proposed development comprises the internal refurbishment of the existing youth space building as well as remodelled landscaping to front forecourt and rear landscaped gardens.

Thames Water sewer records show that the offsite sewer network consists of both surface and foul water sewers. Records show a 1524x1066mm diameter foul water sewer and a 375mm diameter surface water sewer beneath Bruce Grove.

Surface water runoff from the proposed development will be managed through the use of permeable paving, restricting the peak discharge rate to 0.1l/s in the 1-in-100 year + 40% climate change allowance storm event.

All foul drainage at ground floor and above will drop to below ground within the building, where it will drain via gravity to the existing external network. The external network is to be retained in its entirety.

It is proposed that surface water be discharged from the site via the existing 150mm diameter connection to the Thames Water surface water sewer beneath Bruce Grove.

Two

Introduction

Elliott Wood Partnership Ltd have been appointed to provide a Sustainable Drainage Strategy to support the planning application for the proposed redevelopment of Bruce Grove Youth Space, London N17 6RA.

The purpose of this report is to explain the approach taken with regards to the below ground drainage strategy. It evaluates the selection of SuDS devices and highlights how the drainage disposal hierarchy has been followed.

This report has been prepared in accordance with the GOV.UK *Sustainable Drainage Systems: Non-statutory Technical Standards*, *London Local Plan 2021*, and the *London Borough of Haringey Local Plan*.

Three

Existing Site Conditions

3.1 Site Location

The site is located in Bruce Grove in the London Borough of Haringey. The site is bound by private residential properties to the northwest, the A10 to the northeast and private developments from the southeast to the southwest. The closest London Overground station is Bruce Grove which is approximately 180m southeast of the site. The site is located within the Tottenham High Road Historic Corridor, which is comprised of five conservation areas; the site is located in the Bruce Grove Conservation Area.

The site centred at OS grid reference is 533686E, 190224N and the total site boundary area is approximately 3706m² (0.3706ha).



Figure 1: Site Location

3.2 Existing Development

The existing site is comprised of a terraced building of two and three floors, to the rear of this building is the two-storey youth space building. The rest of the site is a mixture of soft and hard landscaping and a multi-use sports area.

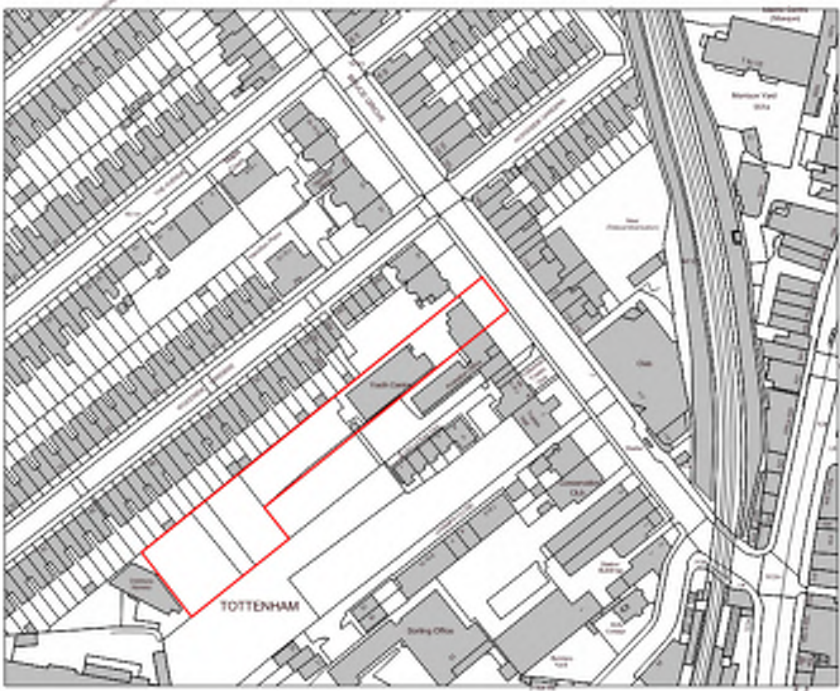


Figure 2: Existing Site Location Plan

Table 1: Break down of the existing areas

Location	Area (m²)
No.10 Bruce Grove	160
Front Forecourt	183
Youth Space Building	431
Hard Landscaping Around Youth Space Building	390
MUGA	782
Asphalt Adjacent to MUGA	121
Total	2067

3.3 Topography

A topographical survey was undertaken by The Survey Association in April 2022.

A brick wall encloses the external areas and defines the site perimeter outside of the building footprint. Levels inside of the brick wall show that the site falls

generally in a north-easterly direction with levels beginning at 17.22mAOD at the southwestern most point (multi use games area) and 13.94mAOD (kerb before site entrance).

The topographical survey can be found in **Appendix A**.

Four

Underlying Geology

The underlying geology of the area is recorded by the British Geological Survey (BGS) maps. These indicate that the ground conditions on the site consist of bedrock deposits of London Clay Formation and with no superficial deposits recorded. In the absence of any site-specific geological data, the findings of publicly available boreholes in the local area are outlined in **Table** below and can be reasonably expected on site. The boreholes nearest to site indicate that groundwater was struck at approximately 3.6m depth, however it is recommended that this is confirmed via on-site investigations.

Table 2: Anticipated Ground Conditions

Soil Type	Depth BGL (m)
Made Ground	0-1
Soft Brown Sandy Clay	1-2.4
Light Brown Sandy Clay	2.4-3.5
Sand and Gravel	3.5-6

Five

Existing Drainage

5.1 Existing Public Sewers

Public sewer records have been obtained from Thames Water. An extract of the asset plan is shown in **Figure 3** below.

The records show that the area is served by a network of foul and surface water sewers. The records show a 1524x1066mm diameter foul water sewer located under Bruce Grove which runs from northwest to southeast. A 375mm diameter surface water sewer is located under Bruce Grove that runs in parallel to the foul water sewer.

Refer to **Appendix B** for Thames Water asset records.



Figure 3: Extract from Thames Water Sewer Records

5.2 Existing Private Drainage

A CCTV survey of the existing private drainage network was undertaken by G.O. Drainage in August 2022. The survey shows the site to be served by separate foul and surface water networks. These networks discharge into the foul and surface water sewers beneath Bruce Grove, near Thames Water manholes 7203 and 7204

The CCTV survey is included within **Appendix C**.

5.3 Existing Surface Water Run-off Rates

Despite the total site area being approximately 3706m², it's a mixture of permeable and impermeable areas. For the purposes of calculating the existing surface water run off rates, only the positively drained areas will be included, bringing the calculable total site area to approximately 2048m².

The surface water runoff rates for the existing site have been calculated using the Modified Rational Method equation below (based on CIRIA C697) and are shown in **Table 3**:

$$Q = 2.78Ci.A$$

Where *Q* = Existing peak runoff (l/s), *C* = non-dimensional runoff coefficient=1.0, *i* = Rainfall intensity (see table 1) and *A* = total catchment area being drained=0.2048ha

Table 3: Existing Surface Water Runoff Rates for the total site area

Return Period	Rainfall Intensity (mm/hr)	Existing run-off (l/s)
1yr	31.74	17.6
30yr	79.87	44.3
100yr	101.88	56.6

Note that the rainfall intensities used in the above and below calculations have been based on average rainfall intensities for a 15-minute storm using the Wallingford Procedure. The calculations will be included in **Appendix D**.

The forecourt area of the development site is to be considered in isolation to the rest of the site as this area forms part of the SuDS Strategy. The existing runoff rates for this area of the site are provided in **Table 4** below:

Table 4: Existing Surface Water Runoff Rates for the Front Forecourt

Return Period	Rainfall Intensity (mm/hr)	Existing run-off (l/s)
1yr	31.74	1.6
30yr	79.87	4.0
100yr	101.88	5.1

Six

Proposed Development

The proposed development comprises the internal refurbishment of the existing youth space building as well as remodelled landscaping to front forecourt and rear landscaped gardens.

The proposed ground floor layout is shown in **Figure 4**.



Figure 4: Landscape plan of the Proposed Development

Proposed site plans are located in **Appendix E**.

The development proposals will reduce the overall site impermeable area by 33m² over the existing impermeable area, as can be seen in the breakdown in **Table 5**.

Table 5: Break down of the proposed areas

Location	Area (m ²)
No.10 Bruce Grove	160
Front Forecourt	168
Youth Space Building	431
Hard Landscaping Around Youth Space Building	457
MUGA	782
Shed	36
Total	2034

Seven

Proposed Drainage

7.1 SuDS Hierarchy

The surface water drainage system has been designed in accordance with the requirements of Planning Practice Guidance (PPG) and the London Borough of Haringey Local Plan. The following drainage hierarchy has therefore been considered:

- 1) Rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation).
- 2) Rainwater infiltration to ground at or close to source.
- 3) Rainwater attenuation in green infrastructure features for gradual release (for example blue/green roofs, rain gardens).
- 4) Rainwater discharge direct to a watercourse (unless not appropriate).
- 5) Controlled rainwater discharge to a surface water sewer or drain.
- 6) Controlled rainwater discharge to a combined sewer.

7.2 Sustainable Drainage Technique Appraisal

7.2.1 Appraising the use of Rainwater Harvesting

Water butts on site can be used to store rainwater for later irrigation of the soft landscaping on site. This will also limit the need for intrusive works below ground. Low flow appliances will be installed to reduce the building's demand on potable water.

7.2.2 Appraising the use of Infiltration Techniques

In order to comply with Building Regulations, infiltration techniques such as soakaways must not be installed within 5m of a building or highway. There is insufficient space on site to implement infiltration techniques such as a soakaway whilst meeting this requirement.

The geology on site is London Clay bedrock formation, which is not a stratum which lends itself to effective infiltration techniques. As such, infiltration techniques are not proposed for this development.

7.2.3 Appraising the use of Open Water Features

Open water features are deemed not to be feasible due to the lack of space on site.

7.2.4 Appraising the use of above and below ground attenuation

A blue roof system restricts surface water at the rainwater outlets and provides temporary attenuation at roof level through the use of a layer of geocellular crate. The existing buildings on site all have pitched roofs which are to be retained in the post development situation. As such, blue roofs are not deemed feasible for this development.

The development proposals are isolated to the internal refurbishment of the Youth Space building and minor landscape works to the rear of the youth space building, as well as to the front courtyard. Due to the majority of works comprising the internal refurbishment of the youth space building, extensive

ground works are not expected as part of the development. The introduction of below ground attenuation would require the breaking out and reconstruction of the entire surface water drainage network in order to facilitate the attenuation and therefore is not deemed feasible for the scale of this development.

7.2.5 Appraising the use of permeable surfaces

The proposed development has approximately 168m² of external hardstanding area at the front of the site. Permeable paving will be utilised to provide attenuation storage for run-off from these paved areas. The introduction of permeable paving will help control surface water runoff at source and provide attenuation and filtration of runoff on these areas.

The permeable paving is proposed where it will provide the greatest benefit. The parking area to the front is where all on site vehicle manoeuvres will occur and the introduction of permeable paving will provide a betterment to surface water by treating runoff at source through interception and filtration.

The landscaping proposals to the rear of the site will reduce the overall impermeable area and will therefore reduce the offsite surface water discharge rate and runoff volume.

7.2.6 SuDS evaluation summary

The evaluation of SuDS is demonstrated in Table 6 below.

Table 6: Evaluation of SuDS techniques

SuDS Technique	Y/N	Comment
Rainwater reuse	Y	Rainwater butts will be implemented for rainwater reuse through irrigation of the soft landscaping. Low flow appliances will also be installed.
Open Water features	N	The confined nature of the development makes open water features unfeasible.
Infiltration devices (i.e. Soakaways)	N	The underlying ground conditions are not conducive to infiltration, nor is there sufficient area on site to introduce a soakaway i.e. a 5m offset from buildings or site boundaries cannot be achieved..
Blue Roofs	N	Blue roofs are not proposed for the site as there is insufficient flat roof space.
Green Roofs	N	Green roofs are not proposed for the site as there is insufficient flat roof space.
Permeable Surfaces	Y	It is proposed to utilise permeable surfaces at the front of the site, beneath the car park.
Tanked systems	N	The intrusive level of works required to introduce a tank on site is not considered commensurate with the proposed works occurring.

7.3 Greenfield Runoff Rates

The London Borough of Haringey SuDS Design Requirements state that surface water runoff should be reduced to greenfield runoff where feasible. Greenfield runoff rates for the developable site area have been calculated

using the IH124 method and are shown in Table 7 below. Refer to Appendix F for calculations.

Table 7: Greenfield Runoff Rates (from HR Wallingford online tool)

Return Period	Greenfield Runoff Rate (l/s)
1 in 1 year	0.31
1 in 30 years	0.84
1 in 100 years	1.17
Q _{bar}	0.37

7.4 Proposed Discharge Rates and Attenuation Volumes

The greenfield runoff rates for the developable site area are prohibitively low. Where the 1-in-100-year greenfield runoff rate cannot be met for all storm events up to and including the 1-in-100-year event + 40% climate change allowance, runoff rates will be reduced as close to this rate as possible in line with Policy DM25 of the Haringey Development Management DPD.

The proposed water butts are excluded from the attenuation calculations as this SuDS technique will not offer any storage volume should a storm event occur when they are already at capacity.

As discussed earlier in this report, the forecourt area to the front of the site is to be considered in isolation to the rest of the development. Due to the development proposals resulting in an overall reduction in impermeable area, it is not proposed to introduce attenuation to the existing buildings, access routes or MUGA.

It is proposed that an area of permeable paving will be incorporated for the hard paved area to the front of the site, currently denoted as having an accessible parking bay. Flow rates from the permeably surfaced area have been calculated using MicroDrainage Source Control and are presented in Appendix G. It is therefore proposed that runoff from this area be restricted via an orifice plate to control the runoff rate to 0.1l/s.

The supply shed and workshop area offer a reduction in impermeable areas to the asphalt hard paved area which is currently located adjacent to the MUGA. It is therefore proposed to connect RWP's from these areas to the existing surface water drainage network to mimic the existing arrangement.

The surface water runoff rate comparison for the front forecourt area are presented in Table 8.

Table 8: Post Development Runoff Improvement

Return Period	Existing Runoff Rate (l/s)	Proposed Runoff Rate (l/s)	Percentage Betterment
1 in 1 year	1.6	0.1	93.75%
1 in 30 year	4.0	0.1	97.50%
1 in 100 year	5.1	0.1	98.04%
1 in 100 year + 40% Climate Change	7.1	0.1	98.59%

The Haringey Development Management DPD requirements state where the 1-in-100-year greenfield runoff rate cannot be met for all storm events, runoff rates must be reduced as far as possible. As can be seen the proposed SuDS strategy reduces surface water runoff in excess of 98% for the area of proposed external works for all storm events up to and including the 1:100yr + 40%CC storm event. This, coupled with the overall reduction in impermeable area for the development site will reduce flood risk both on site and downstream. While surface water runoff rates could be further reduced through the introduction of wider reaching and more comprehensive SuDS measures, this would require structural interventions to the fabric of the site not commensurate with that of the proposed works. The solution presented is light touch to reduce this scheme's overall carbon contribution and there has been no change in use and the overall impermeable area has been reduced.

7.4.1 Proposed Surface Water Outfall

It is proposed that surface water be discharged from the site via the existing 150mm diameter connection to the Thames Water surface water sewer beneath Bruce Grove.

A pre-planning enquiry was submitted to Thames Water to confirm the capacity of the downstream sewer network beneath Bruce Grove. Thames Water are yet to confirm there is sufficient capacity in the existing network to serve the proposed development, however as the impermeable area is reduced and overall discharge rate reduced, no issues are foreseen. Thames Water correspondence is included in Appendix B.

Refer to Appendix H for the London Borough of Haringey SuDS proforma.

Refer to Appendix G for the proposed below ground drainage layout.

Eight

Foul Drainage

All foul drainage at ground floor and above will drop to below ground within the building, where it will drain via gravity to the existing external network. The external network is to be retained in its entirety.

Nine

Maintenance Requirements

All SuDS will be maintained by the building management company for the lifetime of the development in accordance with the SuDS Manual as summarised below. Maintenance requirements for the blue roof will be supplied by the specialist manufacturer.

Permeable Paving

Regular inspection and maintenance is important for the effective operation of pervious pavements. Maintenance responsibility for a pervious pavement and its surrounding area should be placed with an appropriate responsible

organisation. The facility should be inspected regularly, preferably during and after heavy rainfall to check effective operation and to identify any areas of ponding.

Pervious surfaces need to be regularly cleaned of silt and other sediments to preserve their infiltration capability. Experience in the UK is limited, but advice issued with permeable precast concrete paving has suggested a minimum of three surface sweepings per year. Manufacturers' recommendations should always be followed.

A brush and suction cleaner, which can be a lorry-mounted device or a smaller precinct sweeper, should be used and the sweeping regime should be as follows:

- End of winter (April) – to collect winter debris.
- Mid-summer (July/August) – to collect dust, flower and grass-type deposits.
- After autumn leaf fall (November).

Care should be taken in adjusting vacuuming equipment to avoid removal of jointing material. Any lost material should be replaced.

Operation and maintenance requirements for permeable paving are described below.

Table 6: Permeable Paving Maintenance Requirements

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Brushing and vacuuming.	Three times/year at end of winter, mid-summer, after autumn leaf fall, or as required based on site-specific observations of clogging or manufacturers' recommendations.
	Stabilise and mow contributing and adjacent areas.	As required.
Occasional maintenance	Removal of weeds.	As required.
	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving.	As required.
Remedial actions	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users.	As required.
	Rehabilitation of surface and upper sub-structure.	As required (if infiltration performance is reduced as a result of significant clogging).
	Initial inspection.	Monthly for three months after installation
Monitoring	Inspect for evidence of poor operation and/or weed growth. If required take remedial action.	3-monthly, 48 h after large storms.
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually.
	Monitor inspection chambers.	Annually.

Gullies / Linear channels

Inspection and removal of debris from silt trap once a year; preferably after leaf fall in the autumn.

Drainage pipes, manholes and silt traps

Inspect manholes & silt traps for build-up of silt and general debris once a year; preferably after leaf fall in the autumn. If silt/debris is building up, then clean with jetting lorry / gully sucker and inspect pipe – repeat cleaning if required. If the pipes to be jetted are plastic then a high flow, low pressure setting should be used so that the pipes are not damaged.

Pumping stations

Pumping stations are to be maintained in accordance with the pump supplier/maintenance company requirements and in accordance with British Standards (BS EN 12056-4) i.e. inspections every quarter.

Unusual / unresolved problems

If the drainage system is still holding water following cleaning with a jetter, or the jetting of the system removes excessive amounts of debris this may indicate greater issues within the system. A CCTV survey is likely to be required and further advice should be sought from a drainage engineer.

NOTE: Manhole covers can be heavy and suitable lifting equipment / procedures should be used. Where possible, personnel should not enter manholes to carry out maintenance.

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Conclusion

Following the advice and guidance provided by the London Borough of Haringey, a SuDS strategy has been produced for the planning application associated with Bruce Grove Youth Centre, London.

The SuDS Hierarchy has been followed in order to employ the most suitable and practicable SuDS techniques to improve surface water run off management within the site. Areas of permeable paving have been proposed, which will have a positive impact on water quality and contribute to the attenuation strategy for the site.

The foul drainage internally will drain to the proposed below ground network before draining to the existing external network. The foul drainage will drain via gravity to the Thames Water foul water sewer beneath Bruce Grove.

The proposed development will restrict surface water run off to a peak discharge of 0.1l/s. This provides a betterment on existing of over 98.59% for the 1 in 100-year event + 40% climate change.

It is proposed that foul and surface water discharge will outfall from the site via the existing 150mm diameter surface water outfall to the surface water public sewer beneath Bruce Grove.

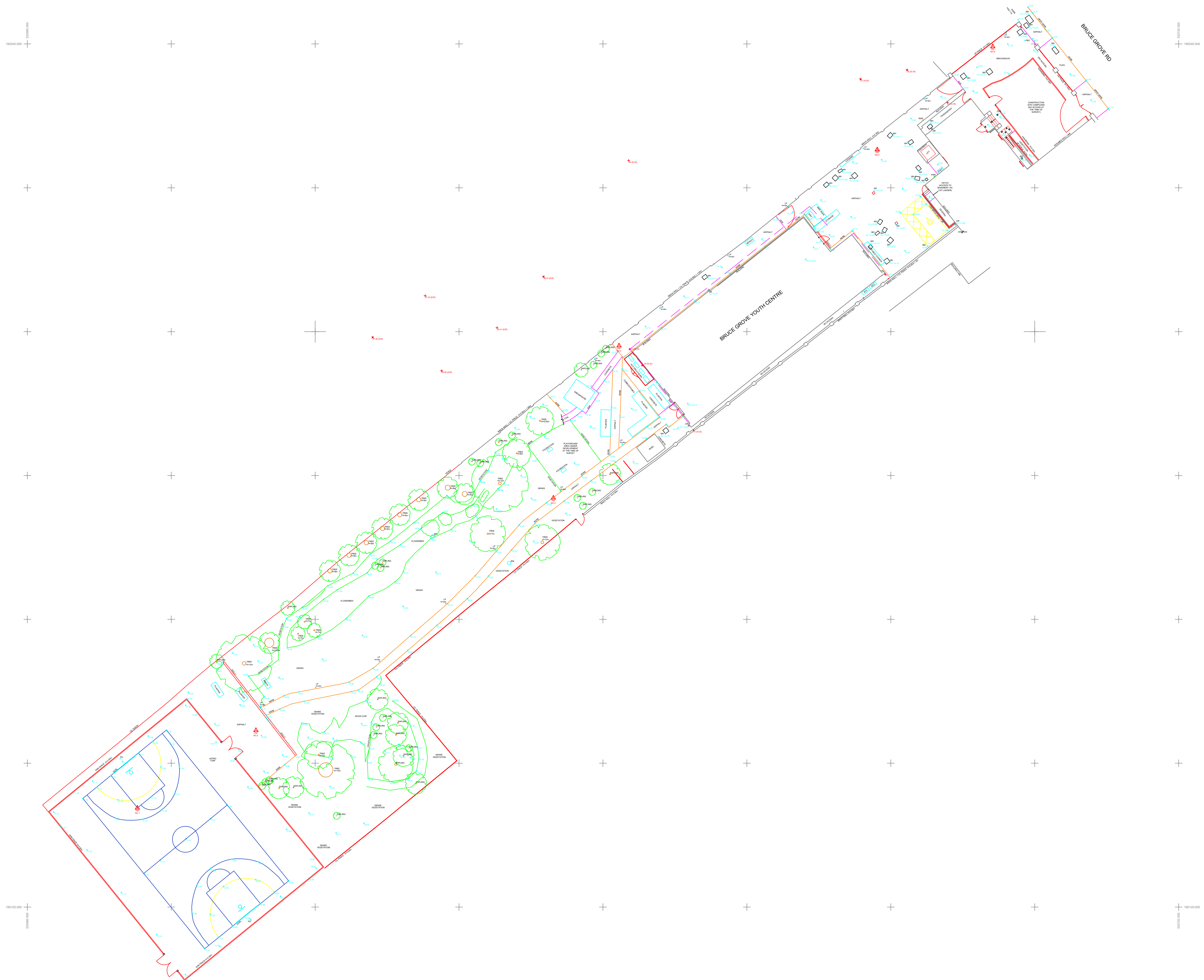


elliottwood

Appendices

engineering a better society

A Topographic Survey



This drawing should only be used for its original purpose. CADS accepts no responsibility for this drawing if supplied to any other party than the original client. Neither is responsibility accepted if the drawing or any part of it is reproduced or transmitted by electronic or other means without the prior written consent of CADS.

Whilst every effort has been made to correctly identify species of trees on site, we advise that an arborologist be consulted before any final decisions are made.

Drainage information has been visually inspected and measured from the surface, therefore should be treated as approximate only.

Please note: all dimensions to be checked on site by contractors prior to commencement of works.



**THE SURVEY
ASSOCIATION**

Legends:



 PERMANENT MARKER CO-ORDINATES				
MARKER	EASTING	NORTHING	LEVEL	TYPE
1	533575.298	190133.772	17.141	Line corner (exp)
2	533591.772	190144.573	16.876	Survey Nail
3	533633.106	190178.885	15.774	Survey Nail
4	533642.232	190198.036	15.137	Survey Nail
5	533678.117	190225.289	15.075	Survey Nail
6	533694.173	190239.635	14.273	Survey Nail

Site Survey Information:

Fieldwork dates:- 28/03/2022 - 30/03/2022
Instrumentation:- Leica RTK GNSS rover and TS15
Surveyors:- AE
Checked:- AE/IT

Survey Method:-

Source of control data:	Hexagon SmartNet network
Local control extended by:	Control network
Detail surveyed by:	AE

Co-ordinate System:-

Projection: No projection, k=1.000000
(Ground distances)

Horizontal and vertical datum: Coordinates and orientation coincident with OSGB36(15) on nodal point:

X = 533634.840m
Y = 190185.817m
Z = 15.841m

Level Data		Fence Types	
Spot Levels	+ 99.75	B/W	Barbed Wire
Eaves / Rodges	+ 99.75 (E) / (R)	C/B	Close Boarded
		C/C	Corrugated Iron
		C/L	Chain Link
Trees		C/P	Chestnut Palling
Trees Are Drawn To Scale On		I/R	Iron Railing
The Survey, Descriptions Should		P/P	Panel Fence
Only Be Used As A Guide		P/R	Post & Rail
		P/W	Post & Wire
Beech 6h		S/P	Steel Palisade
Type Height		W/W	Welded Wire Mesh

Abbreviations

[illegible]

EV.	DATE	BY	DESCRIPTION
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CADS
C A Design Services Limited
The Design Centre, Hewett Road, Capton Hall,
Great Yarmouth, Norfolk NR31 0NN
Tel: 01493 440444 www.cadesignservices.co.uk
Registered in England No. 1595687

PULSE CONSULT

BRUCE GROVE YOUTH CENTRE
10 BRUCE GROVE, LONDON
N17 6RA

TLE

EXISTING SITE PLAN

DRAWN BY AE	DATE APR 2022	SCALE 1/250	SHEET NO. A1
CHECKED BY AE/IT	DATE APR 2022	APPROVED BY CDS	DATE APR 2022

DRAWING No.	REV
73865 SPSURVEY	0

B Thames Water Asset Records and Correspondence

Asset location search



Property Searches

Elliott Wood Partnership
55 Whitfield Street
LONDON
W1T 4AH

Search address supplied 2
Bruce Grove
London
N17 6RA

Your reference 2220299

Our reference ALS/ALS Standard/2022_4766364

Search date 21 December 2022

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.



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

Search address supplied: 2, Bruce Grove, London, N17 6RA

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 0800 009 4540, or use the address below:

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

Email: searches@thameswater.co.uk

Web: 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

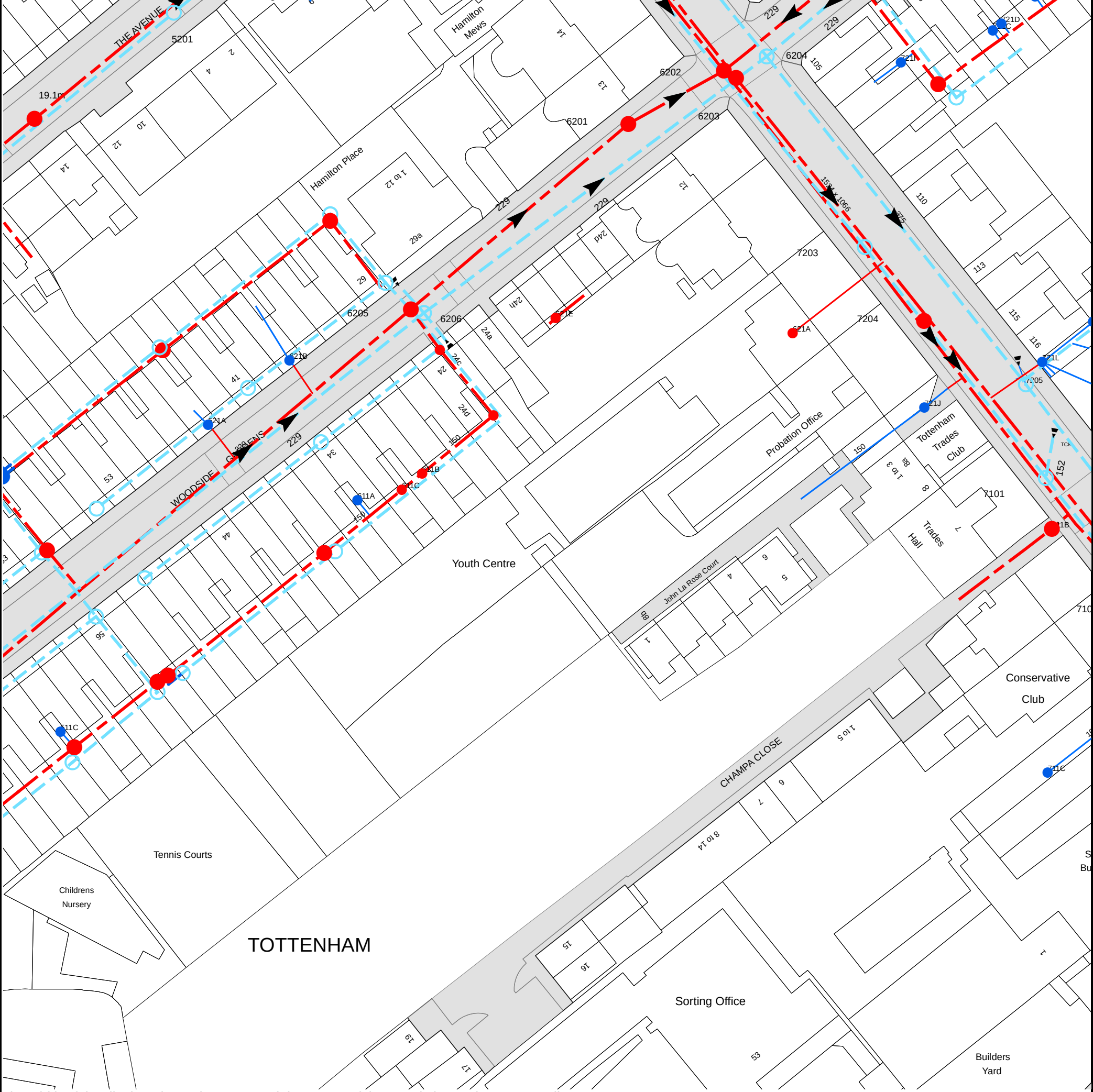
Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

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



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 533648,190186
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
711B	n/a	n/a
721K	n/a	n/a
72YT	n/a	n/a
72YX	n/a	n/a
721C	n/a	n/a
721D	n/a	n/a
721E	n/a	n/a
7203	13.83	12.37
62WZ	n/a	n/a
62XQ	n/a	n/a
6201	15.42	12.84
6203	14.82	6.8
6202	14.91	12
721I	n/a	n/a
6204	14.85	12.74
51XY	n/a	n/a
61ZX	n/a	n/a
61ZY	n/a	n/a
611A	n/a	n/a
611C	n/a	n/a
7101	12.59	11.32
611B	n/a	n/a
62XS	n/a	n/a
521A	n/a	n/a
62XW	n/a	n/a
721J	n/a	n/a
52XV	n/a	n/a
7205	13	11.1
721L	n/a	n/a
621B	n/a	n/a
62WX	n/a	n/a
621A	n/a	n/a
7204	13.07	6.56
621E	n/a	n/a
6206	16.68	15.03
6205	16.77	14.68
62XP	n/a	n/a
51WS	n/a	n/a
51XS	n/a	n/a
51WY	n/a	n/a
511C	n/a	n/a
51YP	n/a	n/a
51YW	n/a	n/a
51ZQ	n/a	n/a
51WT	n/a	n/a
51XW	n/a	n/a
51XZ	n/a	n/a
51YV	n/a	n/a
52XW	n/a	n/a
52XT	n/a	n/a
51XX	n/a	n/a
5202	19.2	15.73
5201	18.45	17.44
711C	n/a	n/a
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.		



Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

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

Other Sewer Types (Not operated and maintained by Thames Water)

	Sewer
	Culverted Watercourse
	Proposed
	Decommissioned Sewer
	Content of this drainage network is currently unknown
	Ownership of this drainage network is currently unknown

Sewer Fittings

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

	Air Valve
	Water
	Dam Chase
	Vent
	Fitting

Operational Controls

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

	Ancillary
	Drop-Pipe
	Control Valve
	Weir

End Items

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

	Inlet
	Outfall
	Undefined End

Other Symbols

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

	Change of Characteristic Indicator
	Public / Private Pumping Station
	Invert Level
	Summit

Areas

Lines denoting areas of underground surveys, etc.

	Agreement
	Chamber
	Operational Site

Ducts or Crossings

Ducts may contain high-voltage cables. Please check with Thames Water.

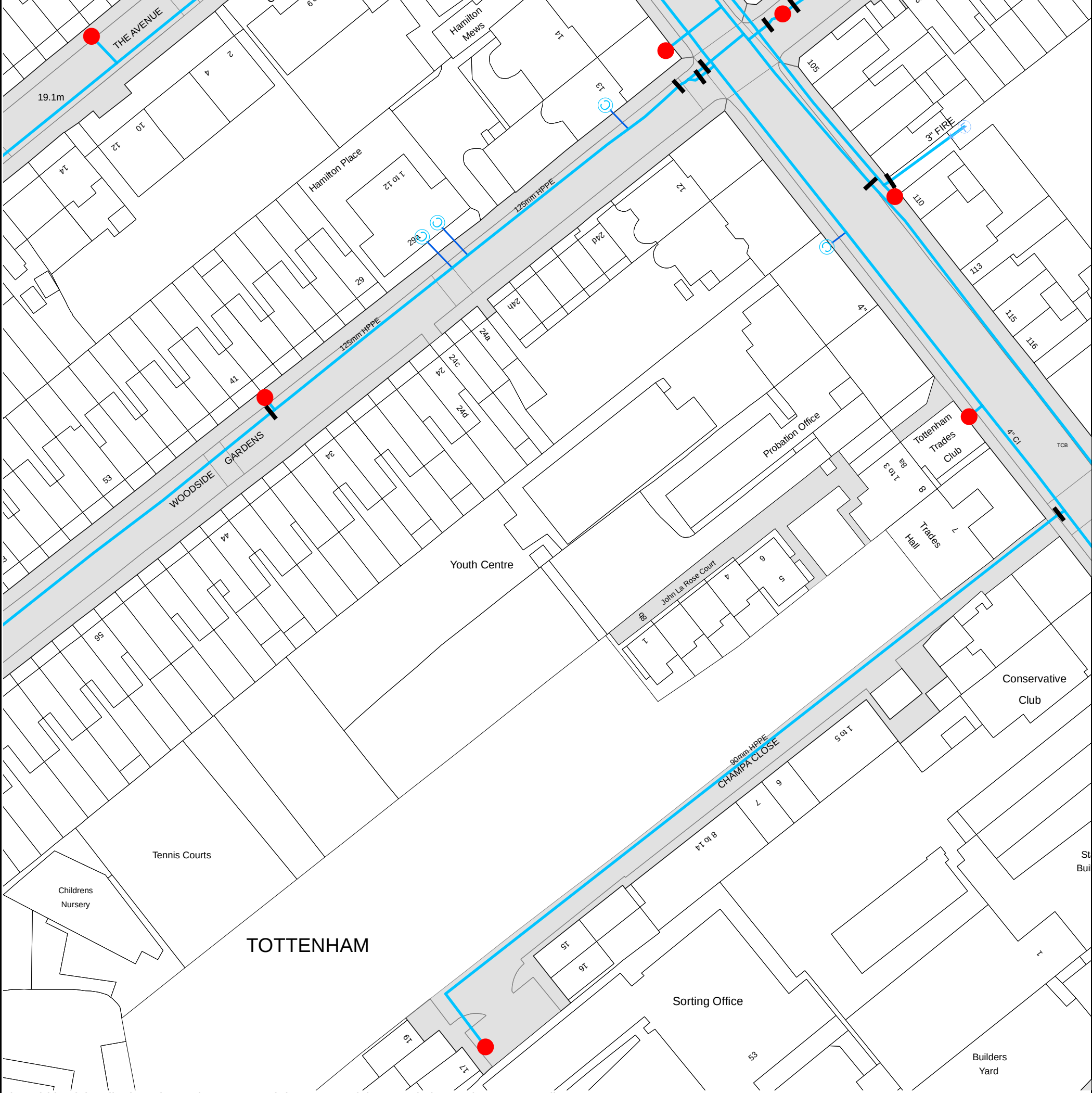
	Caseament
	Conduit Bridge
	Subway
	Tunnel

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plan are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

5) 'h' or 'v' on a manhole indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 509 4542.



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 533648, 190186.

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Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

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

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 6")
600mm and bigger (24" plus)	1300mm (4')

Valves

-  General Purpose Valve
-  Air Valve
-  Pressure Control Valve
-  Customer Valve

Hydrants

-  Single Hydrant

Meters

-  Meter

End Items

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

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

Operational Sites

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

Other Symbols

-  Data Logger
-  **Casement:** Ducts may contain high voltage cables. Please check with Thames Water.

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

-  **Other Water Company Main:** Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
-  **Private Main:** 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.

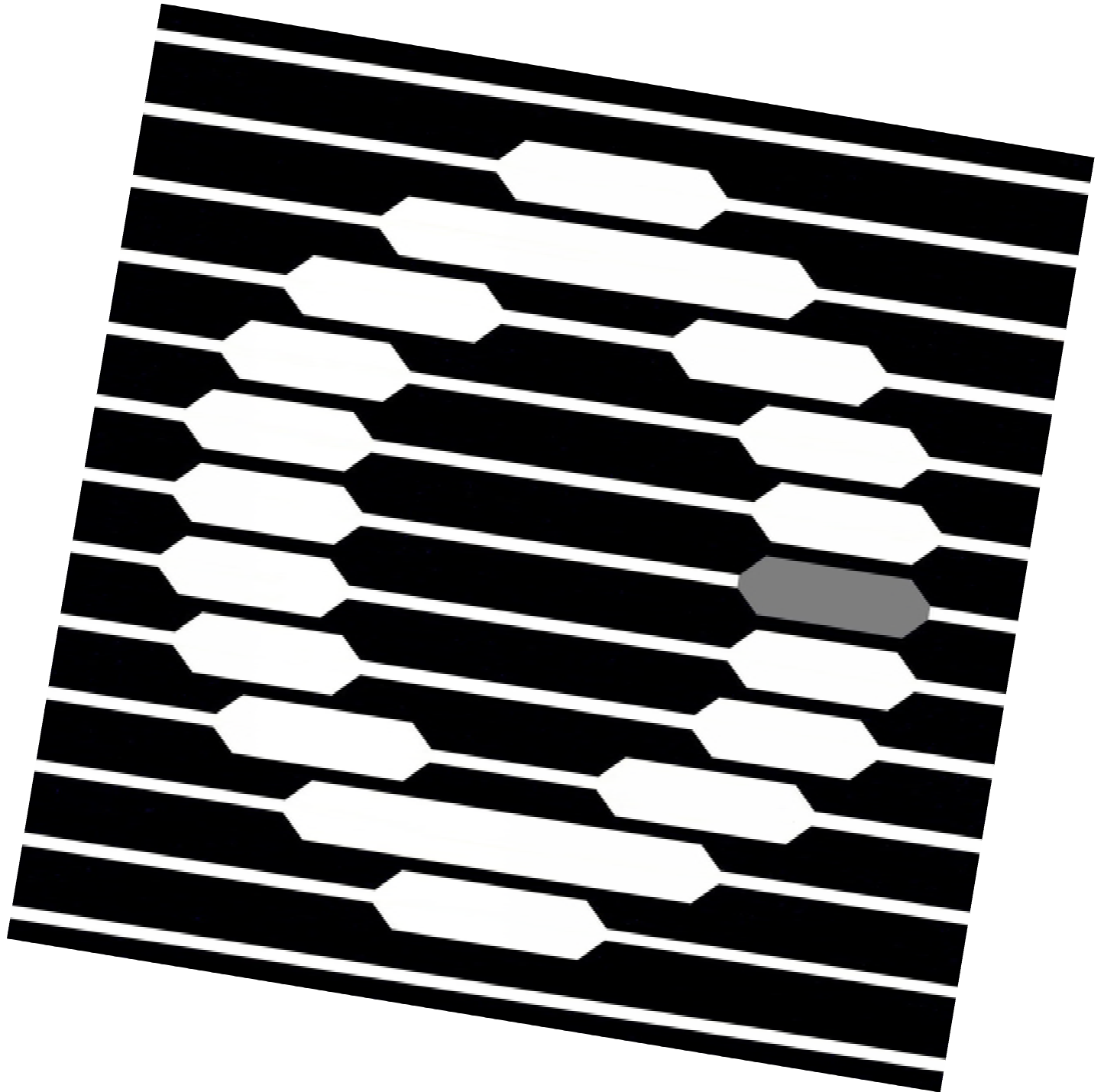
If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria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

Ways to pay your bill

Credit Card	BACS Payment	Telephone Banking	Cheque
Call 0800 009 4540 quoting your invoice number starting CBA or ADS / OSS	Account number 90478703 Sort code 60-00-01 A remittance advice must be sent to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW. or email ps.billing@thameswater.co.uk	By calling your bank and quoting: Account number 90478703 Sort code 60-00-01 and your invoice number	Made payable to ' Thames Water Utilities Ltd ' Write your Thames Water account number on the back. Send to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW or by DX to 151280 Slough 13

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

G.O. DRAINAGE SERVICES LTD



CV.02483 BRUCE GROVE YOUTH CENTRE



G.O. DRAINAGE SERVICES LTD



53 PREMIER AVENUE GRAYS RM16 2SJ TEL:01375 373302 MOB:07792 815977 E-MAIL: godrainage@aol.com

CCTV SURVEY HEADER SHEET

CLIENT.

ELLIOTTWOOD PARTNERSHIP LLP
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
241 THE BROADWAY
LONDON
SW19 1SD

LOCATION.

BRUCE GROVE YOUTH CENTRE
LONDON
N17 6RA

JOB NO.

CV.02483

SEWER USE.

FOUL + SURFACE DRAINAGE

WEATHER.

DRY

DATE.

11/08/22

OPERATOR.

GO

CLEANED.

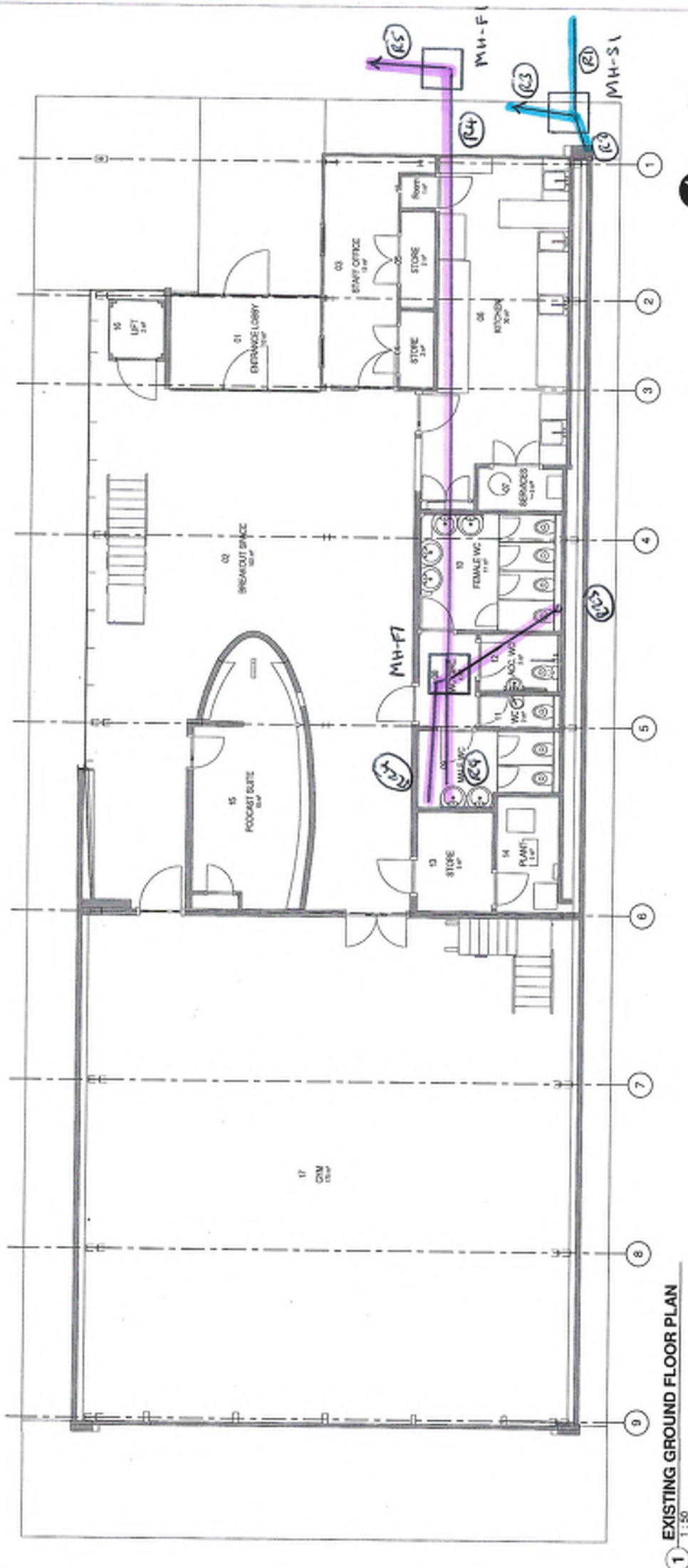
NO

ORDER NO.

E-MAIL KARL @ ELLIOTTWOOD

TOTAL LENGTH SURVEYED.

194.6 metres



1 EXISTING GROUND FLOOR PLAN

08/24/2



1:50

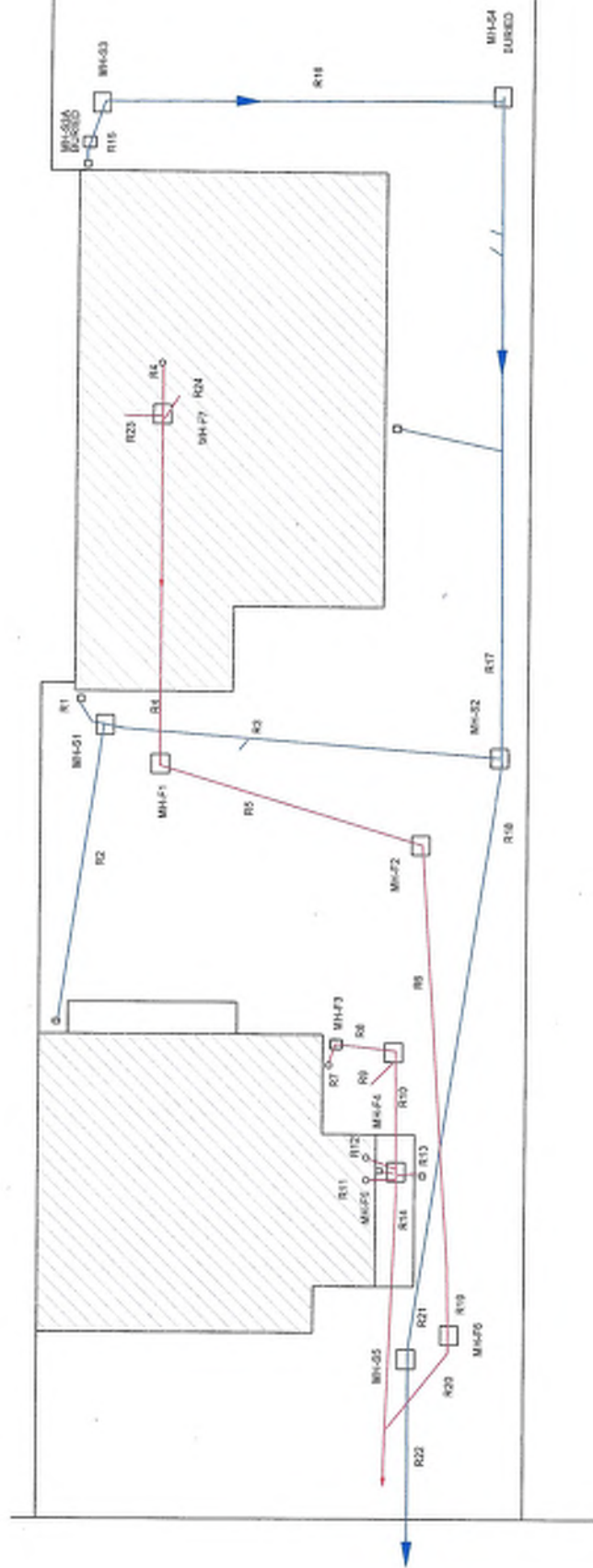
dcd

BRUCE GROVE
YOUTH SPACE

EXISTING PLAN - GROUND FLOOR

DATE	11/08	SCALE	A1	PROJECT	BRUCE GROVE YOUTH SPACE
DRAWN BY	ALP	CHECKED BY	ALP	PROJECT NO.	ALP-08-08-08-001
DATE	11/08	SCALE	A1	PROJECT	BRUCE GROVE YOUTH SPACE

G.O. DRAINAGE SERVICES **DIAGRAMMATIC LAYOUT OF DRAINAGE SYSTEM** **NOT TO SCALE**





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MANHOLE SURVEY

CLIENT. ELLIOTTWOOD	LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA
DATE 11/08/22	JOB. CV.2483

MANHOLE NO.F1

COVER 660X660mm

CHAMBER 1050mm



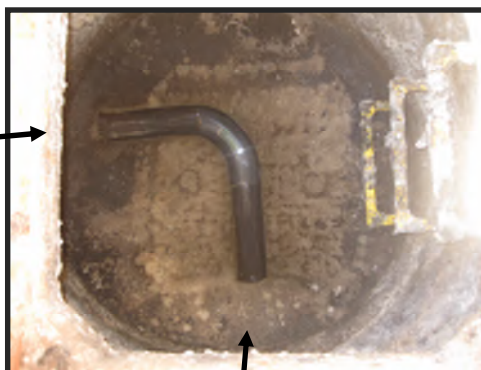
C100 PVC
DEPTH 1210mm

C100 PVC
DEPTH 1220mm

MANHOLE NO.F2

COVER 660X660mm

CHAMBER 1050mm



C100 PVC
DEPTH 1470mm

C100 PVC
DEPTH 1480mm

MANHOLE NO.F3

COVER 320X320mm

CHAMBER 290mm



C100 PVC
DEPTH 730mm

C100 PVC
DEPTH 740mm



MANHOLE SURVEY

CLIENT. ELLIOTTWOOD	LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA
DATE 11/08/22	JOB. CV.2483

MANHOLE NO.F4

COVER 650X500mm

CHAMBER 600X480mm

C100 PVC
DEPTH 1330mm

C100 PVC
DEPTH 1330mm



C100 PVC
DEPTH 1400mm

MANHOLE NO.F5

COVER 620X470mm

CHAMBER 600X460mm

C100 PVC
DEPTH 1020mm

C100 PVC
DEPTH 580mm

C100 PVC
DEPTH 1130mm

C100 PVC
DEPTH 1440mm

C150 VC
DEPTH 1450mm



C100 PVC
DEPTH 840mm

MANHOLE NO.F6

COVER 680X680mm

CHAMBER 1050mm

C100 VC
DEPTH 1160mm



C100 PVC
DEPTH 1150mm



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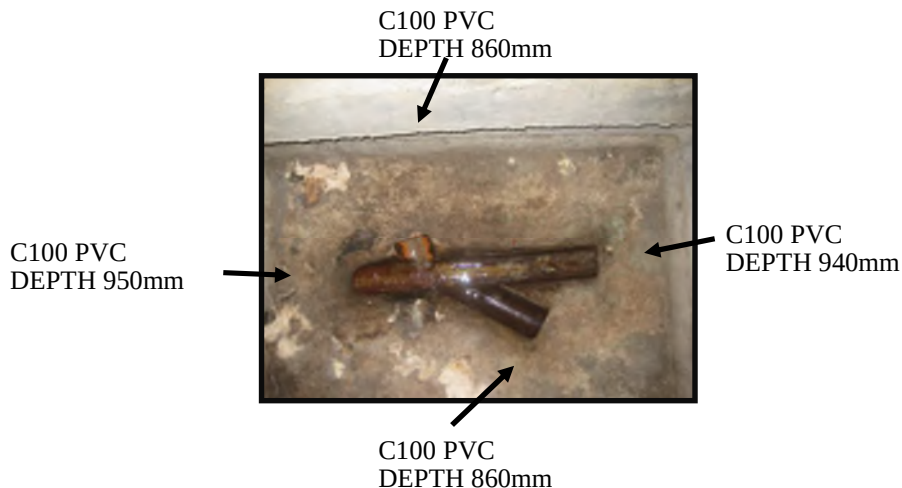
MANHOLE SURVEY

CLIENT. ELLIOTTWOOD	LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA
DATE 11/08/22	JOB. CV.2483

MANHOLE NO.F7

COVER 980X680mm

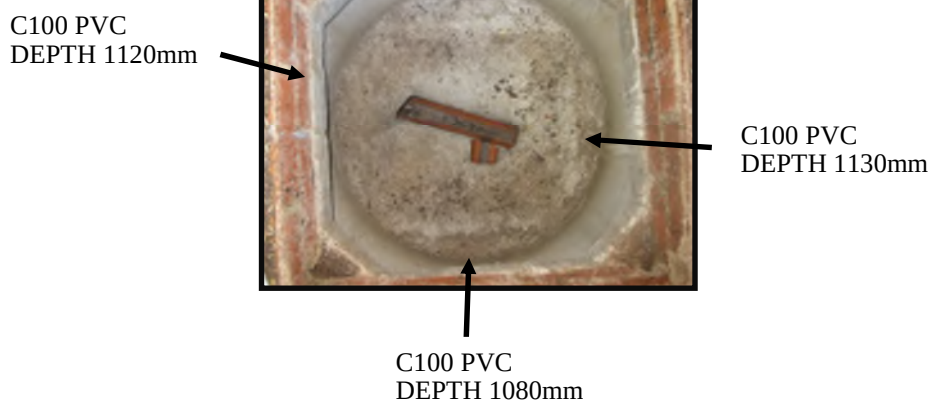
CHAMBER 1000X700mm



MANHOLE NO.S1

COVER 660X660 mm

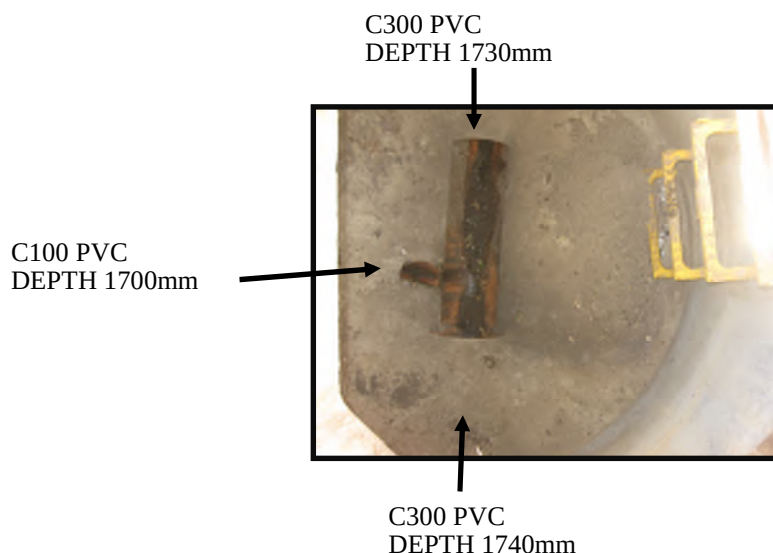
CHAMBER 900mm



MANHOLE NO.S2

COVER 660X660mm

CHAMBER 1050mm





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MANHOLE SURVEY

CLIENT. ELLIOTTWOOD	LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA
DATE 11/08/22	JOB. CV.2483

MANHOLE NO.S3

COVER 660X660mm

CHAMBER 900mm

C150 PVC
DEPTH 830mm



C150 PVC
DEPTH 840mm

MANHOLE NO.S5

COVER 680X680mm

CHAMBER 1050mm

C300 PVC
DEPTH 1420mm



C150 PVC
DEPTH 1440mm



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	01	11/08/22	SURFACE	1080mm	UPSTREAM	100mm	PVC	DRY	NO	GO	1

START

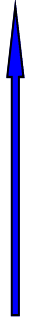
FINISH

ST. MANHOLE No. S1 CONNECTION- 1 FH. GULLY

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-S1

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
010.7	LU	LINE OF DRAIN DEVIATES UP (SHARP)
010.9	FH	FINISH OF SURVEY (GULLY)



GULLY

END OF RUN NO.01



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	02	11/08/22	SURFACE	1120mm	UPSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. S1 CONNECTION- 2 FH. GULLY

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-S1

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
001.0	LU	LINE OF DRAIN DEVIATES UP (SHARP)
001.8	LR	LINE OF DRAIN DEVIATES RIGHT (SLIGHT)
002.4	LD	LINE OF DRAIN DEVIATES DOWN (SHARP)
002.4	FH	FINISH OF SURVEY (GULLY)

END OF RUN NO.02

GULLY



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	03	11/08/22	SURFACE	1130mm	DOWNSTREAM	100mm	PVC	DRY	NO	GO	1

START

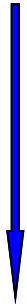
FINISH

ST. MANHOLE No. S1 CONNECTION- X FH. MANHOLE NO.S2

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-S1

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
005.0	JN	JUNCTION AT 02 O'CLOCK,DIAMETER 100mm
011.3	JN	JUNCTION AT 01 O'CLOCK,DIAMETER 100mm
012.6	MH	MANHOLE NO.S2
012.6	FH	FINISH OF SURVEY



MH-S2

END OF RUN NO.03



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	04	11/08/22	FOUL	1210mm	UPSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F1 CONNECTION- 1

FH. UPSTREAM

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F1



000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
003.2	JN	JUNCTION AT 09 O'CLOCK,DIAMETER 100mm
004.4	JN	JUNCTION AT 09 O'CLOCK,DIAMETER 100mm
0070	JN	JUNCTION AT 09 O'CLOCK,DIAMETER 100mm
007.3	JN	JUNCTION AT 09 O'CLOCK,DIAMETER 100mm
009.2	JN	JUNCTION AT 09 O'CLOCK,DIAMETER 100mm
009.5	JN	JUNCTION AT 09 O'CLOCK,DIAMETER 100mm
013.0	JN	JUNCTION AT 03 O'CLOCK,DIAMETER 100mm
016.9	MH	MANHOLE NO.F7
017.5	REM	GENERAL REMARK (END OF CHAMBER)
021.0	LU	LINE OF DRAIN DEVIATES UP (SHARP)
021.0	FH	FINISH OF SURVEY

END OF RUN NO.04

U/ST



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	05	11/08/22	FOUL	1220mm	DOWNSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F1 CONNECTION- X

FH. MANHOLE NO.F2

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F1

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
008.4	LL	LINE OF DRAIN DEVIATES LEFT (SLIGHT)
008.4	WL	WATER LEVEL 10%
009.8	WL	WATER LEVEL 05%
009.8	MH	MANHOLE NO.F2
009.8	FH	FINISH OF SURVEY



MH-F2

END OF RUN NO.05



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	06	11/08/22	FOUL	1480mm	DOWNSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No.F2

CONNECTION- X

FH. DOWNSTREAM

CHAINAGE

CODE

OBSERVATION

MH-F2

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
004.5	WL	WATER LEVEL 20%
007.0	WL	WATER LEVEL 40%
007.2	CU	CAMERA UNDER WATER
008.3	SA	SURVEY ABANDONED DUE TO ABOVE



END OF RUN NO.06

D/ST



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	07	11/08/22	FOUL	730mm	UPSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F3 CONNECTION- 1

FH. SOIL VENT PIPE

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F3

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.3	LU	LINE OF DRAIN DEVIATES UP (SHARP)
000.3	FH	FINISH OF SURVEY (SOIL VENT PIPE)



END OF RUN NO.07

SVP



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	08	11/08/22	FOUL	740mm	DOWNSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F3 CONNECTION- X

FH. MANHOLE NO.F4

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F3

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
004.9	LD	LINE OF DRAIN DEVIATES DOWN (SHARP)
005.7	MH	MANHOLE NO.F4
005.7	FH	FINISH OF SURVEY



END OF RUN NO.08

MH-F4



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	09	11/08/22	FOUL	1330mm	UPSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F4 CONNECTION- 1 FH. UPSTREAM

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F4

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.3	LU	LINE OF DRAIN DEVIATES UP (SHARP)
001.4	FH	FINISH OF SURVEY



END OF RUN NO.09

U/ST



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	10	11/08/22	FOUL	1400mm	DOWNSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F4 CONNECTION- X

FH. MANHOLE NO.F5

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F4

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
003.3	MH	MANHOLE NO.F5
003.3	FH	FINISH OF SURVEY



END OF RUN NO.10

MH-F5



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	11	11/08/22	FOUL	1020mm	UPSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F5

CONNECTION- 1

FH. SOIL VENT PIPE

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F5

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
001.3	LU	LINE OF DRAIN DEVIATES UP (SHARP)
001.3	FH	FINISH OF SURVEY (SOIL VENT PIPE)



SVP

END OF RUN NO.11



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	12	11/08/22	FOUL	1130mm	UPSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F5 CONNECTION- 3

FH. SOIL VENT PIPE

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F5

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.3	LU	LINE OF DRAIN DEVIATES UP (SHARP)
000.3	FH	FINISH OF SURVEY (SOIL VENT PIPE)



END OF RUN NO.12

SVP



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	13	11/08/22	FOUL	840mm	UPSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F5 CONNECTION- 5 FH. GULLY

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F5

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
001.3	LD	LINE OF DRAIN DEVIATES DOWN (SHARP)
001.3	FH	FINISH OF SURVEY (GULLY)



GULLY

END OF RUN NO.13



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	14	11/08/22	FOUL	1450mm	DOWNSTREAM	150mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F5 CONNECTION- X

FH. DOWNSTREAM

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F5

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
006.5	CU	CAMERA UNDER WATER
006.5	SA	SURVEY ABANDONED DUE TO ABOVE



END OF RUN NO.14

D/ST



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	15	11/08/22	SURFACE	840mm	UPSTREAM	150mm	PVC	DRY	NO	GO	1

START

FINISH

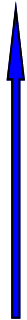
ST. MANHOLE No. S3

CONNECTION- 1

FH. UPSTREAM

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-S3



000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.4	SC	DIMENSION OF DRAIN CHANGES TO 100mm
001.8	RM	ROOTS MASS 10%
001.8	MH	MANHOLE NO.S3A BURIED
002.2	REM	GENERAL REMARK (END OF CHAMBER)
002.2	LU	LINE OF DRAIN DEVIATES UP (SHARP)
003.3	LD	LINE OF DRAIN DEVIATES DOWN (SHARP)
003.3	FH	FINISH OF SURVEY (GULLY)

END OF RUN NO.15

U/ST



INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	16	11/08/22	SURFACE	840mm	DOWNSTREAM	150mm	PVC	DRY	NO	GO	1

START

FINISH

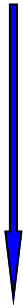
ST. MANHOLE No. S3 CONNECTION- X

FH. MANHOLE NO.S4

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-S3

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.4	R	ROOTS FINE
012.4	MH	MANHOLE NO.S4 BURIED
012.4	FH	FINISH OF SURVEY



MH-S4

END OF RUN NO.16



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	17	11/08/22	SURFACE	1740mm	UPSTREAM	225mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. S2 CONNECTION- 2

FH. UPSTREAM

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-S2

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
029.1	JN	JUNCTION AT 11 O'CLOCK,DIAMETER 100mm
030.6	JN	JUNCTION AT 11 O'CLOCK,DIAMETER 100mm
030.6	FH	FINISH OF SURVEY

END OF RUN NO.17

U/ST



INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	18	11/08/22	SURFACE	1740mm	DOWNSTREAM	300mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. S2 CONNECTION- X

FH. DOWNSTREAM

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-S2

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
006.0	LR	LINE OF DRAIN DEVIATES RIGHT (SLIGHT)
020.0	DES	SETTLED DEPOSITS FINE 10%
020.0	LR	LINE OF DRAIN DEVIATES RIGHT (SLIGHT)
020.0	FH	FINISH OF SURVEY

D/ST

END OF RUN NO.18



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	19	11/08/22	FOUL	1150mm	UPSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F6

CONNECTION- 1

FH. UPSTREAM

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F6

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
005.0	WL	WATER LEVEL 30%
006.0	CU	CAMERA UNDER WATER
017.0	WL	WATER LEVEL 10%
020.3	MH	MANHOLE NO.F2
020.3	FH	FINISH OF SURVEY

END OF RUN NO.19

U/ST



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	20	11/08/22	FOUL	1150mm	DOWNSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F6 CONNECTION- X

FH. DOWN STREAM

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F6



000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.4	LR	LINE OF DRAIN DEVIATES RIGHT (SLIGHT)
002.9	LR	LINE OF DRAIN DEVIATES RIGHT (SLIGHT)
002.9	LD	LINE OF DRAIN DEVIATES DOWN (SHARP)
004.7	WL	WATER LEVEL 30%
005.0	CU	CAMERA UNDER WATER
005.0	SA	SURVEY ABANDONED DUE TO ABOVE

END OF RUN NO.20

D/ST



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	21	11/08/22	SURFACE	1430mm	UPSTREAM	300mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. S5 CONNECTION- 1

FH. UPSTREAM

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-S5

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.6	DES	SETTLED DEPOSITS FINE 10%
003.0	LL	LINE OF DRAIN DEVIATES LEFT (SLIGHT)
004.5	FH	FINISH OF SURVEY OVERLAP COMPLETED



END OF RUN NO.21

U/ST



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	22	11/08/22	SURFACE	1440mm	UPSTREAM	150mm	PVC	DRY	NO	GO	1

START

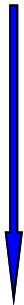
FINISH

ST. MANHOLE No. S5 CONNECTION- X

FH. MAIN SEWER

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-S5



000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
001.8	LL	LINE OF DRAIN DEVIATES LEFT (SLIGHT)
003.0 S1	DES	SETTLED DEPOSITS FINE 10% START
010.0 F1	DES	SETTLED DEPOSITS FINE 10% END
011.7	FH	FINISH OF SURVEY

END OF RUN NO.22

MAIN SEWER



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	23	11/08/22	FOUL	860mm	UPSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F7 CONNECTION- 1

FH. SOIL VENT PIPE

CHAINAGE	CODE	OBSERVATION
----------	------	-------------

MH-F7

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
003.4	LU	LINE OF DRAIN DEVIATES UP (SHARP)
003.4	FH	FINISH OF SURVEY (SOIL VENT PIPE)



END OF RUN NO.23

SVP



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INSPECTION REPORT

CLIENT. ELLIOTTWOOD

LOCATION. BRUCE GROVE YOUTH CENTRE N17 6RA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.2483	24	11/08/22	FOUL	860mm	UPSTREAM	100mm	PVC	DRY	NO	GO	1

START

FINISH

ST. MANHOLE No. F7 CONNECTION- 3 FH. GULLY

CHAINAGE CODE OBSERVATION

MH-F7

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
003.2	LL	LINE OF DRAIN DEVIATES LEFT (SLIGHT)
004.6	LD	LINE OF DRAIN DEVIATES DOWN (SHARP)
004.6	FH	FINISH OF SURVEY (GULLY)



GULLY

END OF RUN NO.24



SUMMARY AND RECOMMENDATIONS

CLIENT.	ELLIOTTWOOD	LOCATION.	BRUCE GROVE YOUTH CENTRE N17 6RA
DATE	11/08/22	JOB.	CV.2483

RUN NO.01 NO WORK NEEDED

RUN NO.02 NO WORK NEEDED

RUN NO.03 NO WORK NEEDED

RUN NO.04 NO WORK NEEDED

RUN NO.05 NO WORK NEEDED

RUN NO.06 BELLY IN PIPE

RUN NO.07 NO WORK NEEDED

RUN NO.08 NO WORK NEEDED

RUN NO.09 NO WORK NEEDED

RUN NO.10 NO WORK NEEDED

RUN NO.11 NO WORK NEEDED

RUN NO.12 NO WORK NEEDED

RUN NO.13 NO WORK NEEDED

RUN NO.14 NO WORK NEEDED

RUN NO.15 NO WORK NEEDED

RUN NO.16 NO WORK NEEDED

RUN NO.17 NO WORK NEEDED

RUN NO.18 NO WORK NEEDED

RUN NO.19 BELLY IN PIPE

RUN NO.20 CAMERA UNDERWATER

RUN NO.21 NO WORK NEEDED

RUN NO.22 NO WORK NEEDED

RUN NO.23 NO WORK NEEDED

RUN NO.24 NO WORK NEEDED

DRAIN & PIPEWORK CCTV SURVEYS

-

**DRAINS
PIPEWORK
CULVERTS**

**DUCTS
CHUTES
CHIMNEY FLUES
TANKS**

HIGH PRESSURE WATER JETTING

-

**SEWER & DRAIN BLOCKAGES
DESCALING
SILT REMOVAL
ROOT CUTTING
GREASE REMOVAL**

-



G.O. DRAINAGE SERVICES LTD



D Existing Surface Water Runoff Rate Calculations

Modified Ration Method for Brownfield Runoff

Project Number: 2220299
Project Name: Bruce Grove Youth Centre
Date: 21/12/2022

Area (Ha) 0.1187

$Q = 2.78 * C_v * C_r * I * A$

Q = flow rate (l/s)
Cv = Volumetric Runoff Coefficient
Cr = Routing Coefficient
I - Rainfall intensity
A = Area (Ha)

Storm Return Period	Existing Discharge (L/S)
1yr	10.2
30yr	25.7
100yr	32.8
100yr+40%	45.9

Under summer rainfall conditions Cv ranges from 0.6 - 0.9, for fully impermeable areas value of 0.75 should be used.

The routing coeffcieint varies between 1 and 2 and accounts for the effect of rainfall characterisitcs and catchment shape on the peak runoff magnitude.
The SuDS manual reccoomends a fixed value for Cr of 1.3 for design.

Rainfall intensity is calculated following Walling Procedure Volume 4 and is as follows:

1.0 Determination of M5-60 min and r

60 minute, 5 year storm (M5-60) has a rainfall depth 20.000
Ratio r 0.4

2.0 Determination of M5-D

M5-D = Z1 (M5-60min)
Z1 is taken from A3.a or A.3b for values between 0.12 and 0.45 and for durations between 5 minutes and 48 hours read to 0.01.

Assuming 1yr 15min, 30yr 15 min, 100yr 15min

Z1 0.64
M5-15 12.8 mm

3.0 Determination of MT-D

MT-D is obtained from the relationship:
MT-D = Z2(M5-D)

Taken from Table A1 for 1yr return period 15min storm
Z2 = 0.62
M1-15= 7.9

Taken from Table A1 for 30yr return period 15min storm
Z2= 1.56
M30-15= 20.0

Taken from Table A1 for 100yr return period 15min storm
Z2= 1.99
M100-15= 25.5

4 Determination of point rainfall intensities

i= 31.744 mm/hr i= 79.872 mm/hr i= 101.888 mm/hr

5 Application of areal reduction factor

From chart A4 where area is greater than 1km2
ARF= 1

Average 1yr intensity 31.7 Average 30yr intensity 79.9 Average 100yr intensity 101.9 Average 100yr+40% intensity 142.6

Modified Ration Method for Brownfield Runoff

Project Number: 2220299
Project Name: Bruce Grove Youth Centre
Date: 21/12/2022

Area (Ha) 0.0183

$Q = 2.78 * C_v * C_r * I * A$

Q = flow rate (l/s)
Cv = Volumetric Runoff Coefficient
Cr = Routing Coefficient
I - Rainfall intensity
A = Area (Ha)

Storm Return Period	Existing Discharge (L/S)
1yr	1.6
30yr	4.0
100yr	5.1
100yr+40%	7.1

Under summer rainfall conditions Cv ranges from 0.6 - 0.9, for fully impermeable areas value of 0.75 should be used.

The routing coeffcieint varies between 1 and 2 and accounts for the effect of rainfall characterisitcs and catchment shape on the peak runoff magnitude.
The SuDS manual reoomends a fixed value for Cr of 1.3 for design.

Rainfall intensity is calculated following Walling Procedure Volume 4 and is as follows:

1.0 Determination of M5-60 min and r

60 minute, 5 year storm (M5-60) has a rainfall depth 20.000
Ratio r 0.4

2.0 Determination of M5-D

M5-D = Z1 (M5-60min)
Z1 is taken from A3.a or A.3b for values between 0.12 and 0.45 and for durations between 5 minutes and 48 hours read to 0.01.

Assuming 1yr 15min, 30yr 15 min, 100yr 15min

Z1 0.64
M5-15 12.8 mm

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Taken from Table A1 for 1yr return period 15min storm
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M1-15= 7.9

Taken from Table A1 for 30yr return period 15min storm
Z2= 1.56
M30-15= 20.0

Taken from Table A1 for 100yr return period 15min storm
Z2= 1.99
M100-15= 25.5

4 Determination of point rainfall intensities

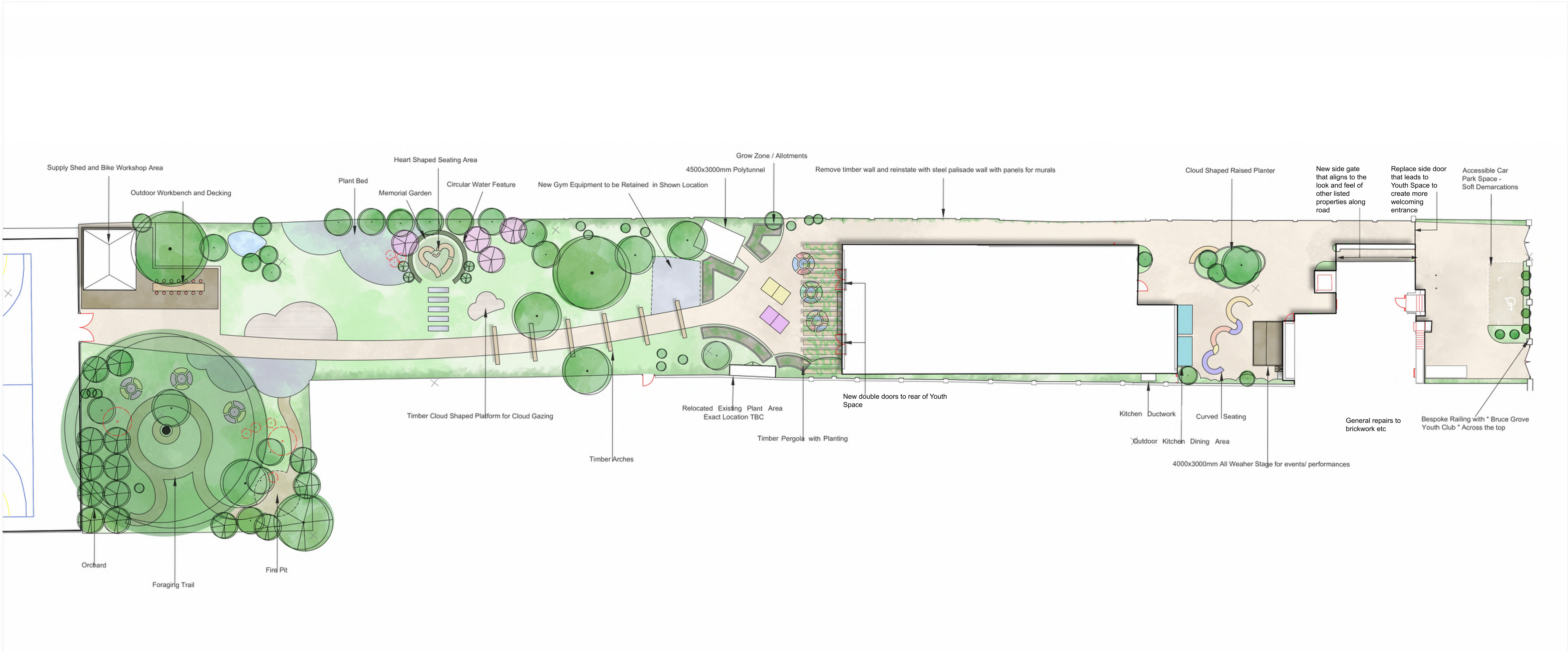
i= 31.744 mm/hr i= 79.872 mm/hr i= 101.888 mm/hr

5 Application of areal reduction factor

From chart A4 where area is greater than 1km2
ARF= 1

Average 1yr intensity 31.7 Average 30yr intensity 79.9 Average 100yr intensity 101.9 Average 100yr+40% intensity 142.6

E Proposed Development Plans



RIBA STAGE 3

0 5 10 m

REVISION	DATE	DESCRIPTION	ARCHITECT	PARTNER
S0 P1	22/06/22	LANDSCAPE GA DESIGN	CM	CH
S0 P2	24/06/22	CHANGES AFTER DTM	CM	CH
S0 P3	06/07/22	REVISED WITH M+E CHANGES	CM	CH
S0 P4	02/08/22	STAGE 3 DRAFT ISSUE	CM	CH

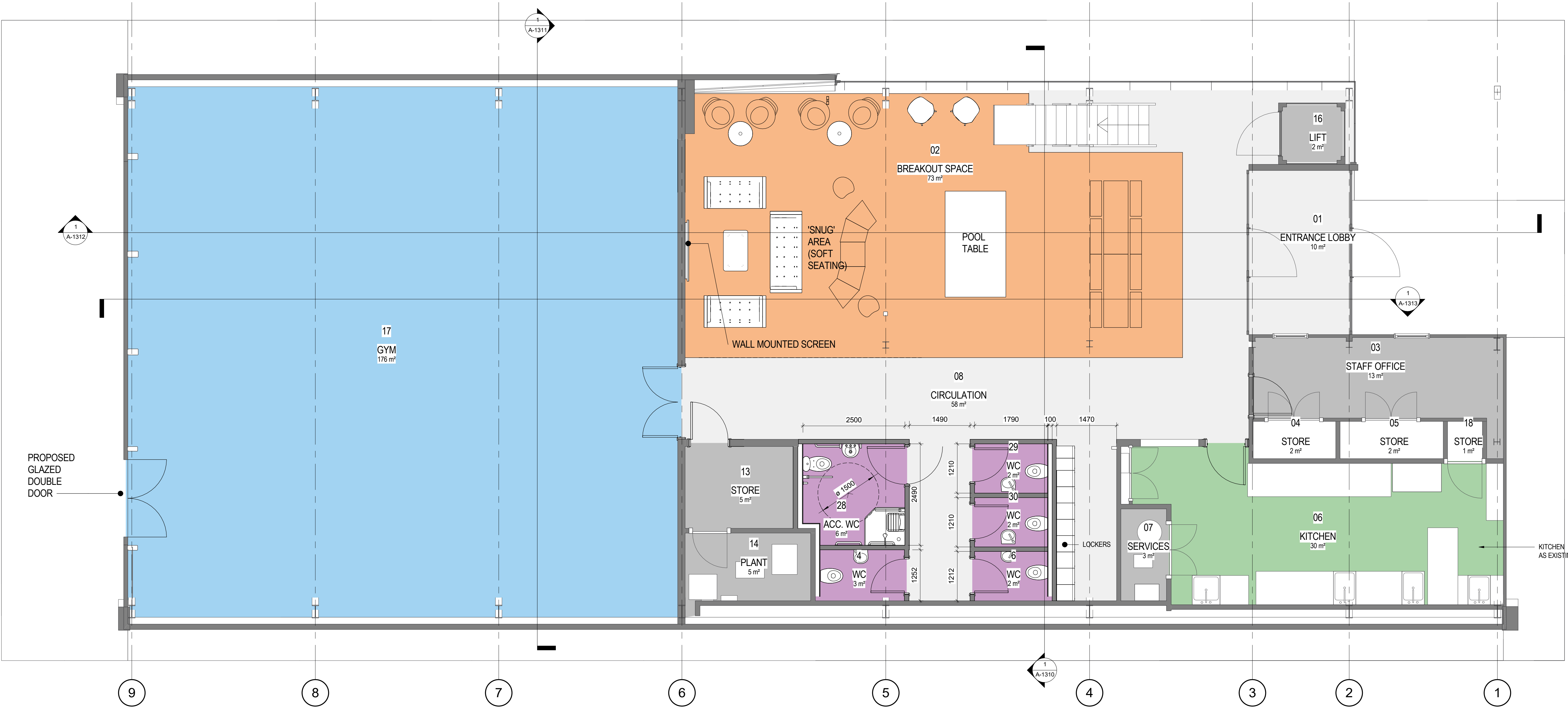


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JOB TITLE:
**BRUCE GROVE
YOUTH CENTRE**

DRAWING TITLE:
**LANDSCAPE
GENERAL ARRANGEMENT**

SCALE: 1:200		DRAWING SHEET SIZE: A1	
JOB CODE: 001550	DRAWING NUMBER: ADP-00-00-DR- L-1902		REVISION: S0 P4



1 PROPOSED GROUND FLOOR PLAN
1 : 50

Department Legend

- ANCILLARY
- BREAKOUT SPACE
- CIRCULATION
- SPECIALIST SPACE
- SPORTS
- WC

REVISION		DATE	DESCRIPTION	ARCHITECT	PARTNER
1	18.05.22	WIP ISSUE		LS	ADP
2	23.06.22	Stage 02 Issue		LS	ADP
3	09.08.22	Issued to SE for review		LS	ADP
4	07.09.22	STAGE 03 DRAFT ISSUE		LS	ADP

adp

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JOB TITLE: BRUCE GROVE YOUTH SPACE		
DRAWING TITLE: PROPOSED GROUND FLOOR PLAN		
SCALE: 1 : 50	DRAWING SHEET SIZE: A1	
JOB CODE: 001550	DRAWING NUMBER: ADP-00-00-DR- A-1050	REVISION: 4

F Greenfield Runoff Rate Calculations

Calculated by:	Mike Ash
Site name:	Bruce Grove Youth Centre
Site location:	N17 6RA

Site Details

Latitude:	51.59509° N
Longitude:	0.0715° W
Reference:	111902830
Date:	Dec 22 2022 10:19

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

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	.23
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Methodology

Q _{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

Default Edited

SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

Default Edited

SAAR (mm):	623	623
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

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

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

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

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

(3) Is SPR/SPRHOST ≤ 0.3?

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

Greenfield runoff rates

Default Edited

Q _{BAR} (l/s):	0.37	0.37
1 in 1 year (l/s):	0.31	0.31
1 in 30 years (l/s):	0.84	0.84
1 in 100 year (l/s):	1.17	1.17
1 in 200 years (l/s):	1.37	1.37

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksubs.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksubs.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

G Microdrainage Source Control Calculations

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Innovyze	Source Control 2020.1.3	

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 E Outflow (l/s)	Max Volume (m³)	Status
1440 min Winter	14.110	0.210	0.0	0.1	0.1	11.1	Flood Risk
2160 min Winter	14.103	0.203	0.0	0.1	0.1	10.7	Flood Risk
2880 min Winter	14.093	0.193	0.0	0.1	0.1	10.2	Flood Risk
4320 min Winter	14.074	0.174	0.0	0.1	0.1	9.2	Flood Risk
5760 min Winter	14.055	0.155	0.0	0.1	0.1	8.2	Flood Risk
7200 min Winter	14.039	0.139	0.0	0.1	0.1	7.3	Flood Risk
8640 min Winter	14.024	0.124	0.0	0.1	0.1	6.6	Flood Risk
10080 min Winter	14.011	0.111	0.0	0.1	0.1	5.9	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
1440 min Winter	4.471	0.0	9.5	1298
2160 min Winter	3.197	0.0	15.1	1624
2880 min Winter	2.518	0.0	15.3	2100
4320 min Winter	1.796	0.0	14.7	2980
5760 min Winter	1.413	0.0	17.5	3816
7200 min Winter	1.172	0.0	17.7	4680
8640 min Winter	1.006	0.0	17.8	5448
10080 min Winter	0.884	0.0	17.8	6248

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Rainfall Details

Rainfall Model	FSR	Ratio R	0.450		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)	20.000	Cv (Summer)	0.750		Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.018

Time (mins)	Area
From:	To: (ha)
0	4 0.018

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241 The Broadway London SW19 1SD																										
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Innovyze	Source Control 2020.1.3																									
<u>Model Details</u> Storage is Online Cover Level (m) 14.250 <u>Porous Car Park Structure</u> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.00000</td> <td>Width (m)</td> <td>11.0</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>1000</td> <td>Length (m)</td> <td>16.0</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>48.9</td> <td>Slope (1:X)</td> <td>0.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>5</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>3</td> </tr> <tr> <td>Invert Level (m)</td> <td>13.900</td> <td>Cap Volume Depth (m)</td> <td>0.300</td> </tr> </table> <u>Orifice Outflow Control</u> Diameter (m) 0.009 Discharge Coefficient 0.600 Invert Level (m) 13.900			Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	11.0	Membrane Percolation (mm/hr)	1000	Length (m)	16.0	Max Percolation (l/s)	48.9	Slope (1:X)	0.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	13.900	Cap Volume Depth (m)	0.300
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©1982-2020 Innovyze																										

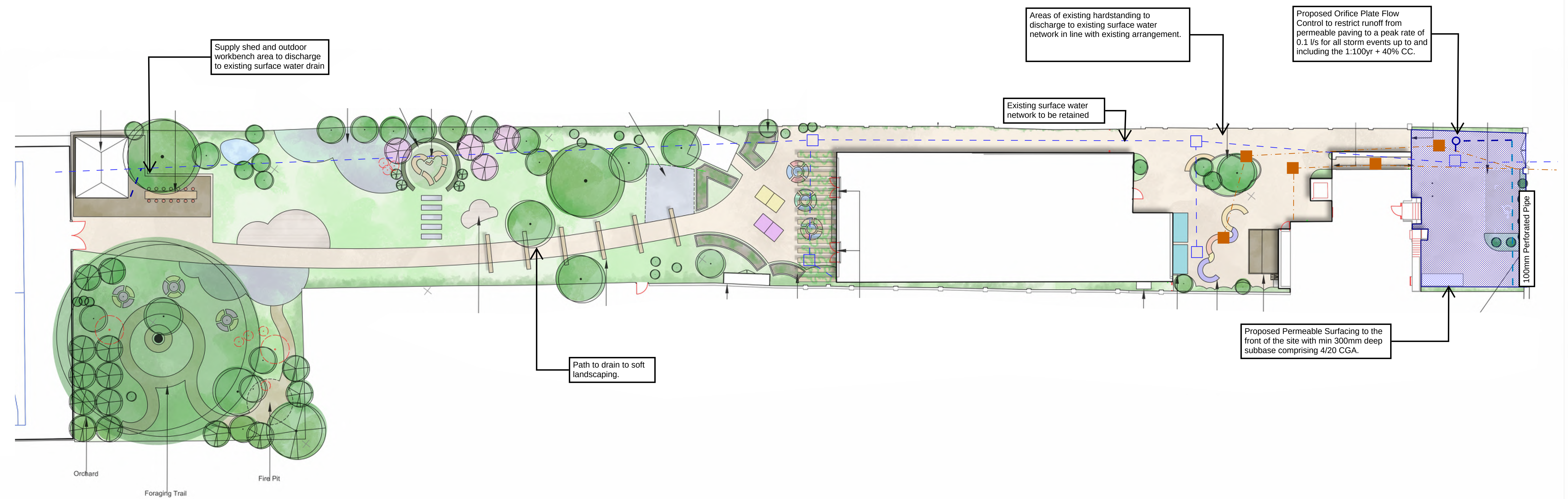
1. Project & Site Details	Project / Site Name (including sub-catchment / stage / phase where appropriate)	Bruce Grove Youth Centre
	Address & post code	Bruce Grove Youth Centre, London, N17 6RA
	OS Grid ref. (Easting, Northing)	E 533686 N 190224
	LPA reference (if applicable)	
	Brief description of proposed work	Internal refurbishment of youth centre as well as other buildings on site, remodelled landscaping.
	Total site Area	3706 m ²
	Total existing impervious area	2067 m ²
	Total proposed impervious area	2034 m ²
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	No
	Existing drainage connection type and location	Assumed Manhole/Junction connection to surface/foul water networks beneath
	Designer Name	Mike Ash
	Designer Position	Civil Engineer
Designer Company	Elliott Wood Partnership	

2. Proposed Discharge Arrangements	2a. Infiltration Feasibility		
	Superficial geology classification	None recorded	
	Bedrock geology classification	London Clay Formation	
	Site infiltration rate	3x10 ⁻⁸	m/s
	Depth to groundwater level	3.6	m below ground level
	Is infiltration feasible?	No	
	2b. Drainage Hierarchy		
		Feasible (Y/N)	Proposed (Y/N)
	1 store rainwater for later use	Y	Y
	2 use infiltration techniques, such as porous surfaces in non-clay areas	Y	Y
	3 attenuate rainwater in ponds or open water features for gradual release	N	N
	4 attenuate rainwater by storing in tanks or sealed water features for gradual release	N	N
	5 discharge rainwater direct to a watercourse	N	N
	6 discharge rainwater to a surface water sewer/drain	Y	Y
	7 discharge rainwater to the combined sewer.	N	N
2c. Proposed Discharge Details			
Proposed discharge location	the surface water sewer beneath Bruce Grove		
Has the owner/regulator of the discharge location been consulted?	No		

3. Drainage Strategy	3a. Discharge Rates & Required Storage				
		Greenfield (GF) runoff rate (l/s)	Existing discharge rate (l/s)	Required storage for GF rate (m ³)	Proposed discharge rate (l/s)
	Qbar	0.37			
	1 in 1	0.31	1.6	47	0.1
	1 in 30	0.84	4	90	0.1
	1 in 100	1.17	5.1	111	0.1
	1 in 100 + CC			167	0.1
	Climate change allowance used		40%		
	3b. Principal Method of Flow Control		Orifice Plate		
	3c. Proposed SuDS Measures				
		Catchment area (m ²)	Plan area (m ²)	Storage vol. (m ³)	
	Rainwater harvesting	0		0	
	Infiltration systems	0		0	
	Green roofs	0	0	0	
	Blue roofs	0	0	0	
	Filter strips	0	0	0	
	Filter drains	0	0	0	
	Bioretention / tree pits	0	0	0	
	Pervious pavements	176	176	52.8	
	Swales	0	0	0	
	Basins/ponds	0	0	0	
	Attenuation tanks	0		0	
	Total	176	176	52.8	

4. Supporting Information	4a. Discharge & Drainage Strategy	Page/section of drainage report
	Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Page 2
	Drainage hierarchy (2b)	Page 3
	Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Page 4
	Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Page 3
	Proposed SuDS measures & specifications (3b)	Page 3
	4b. Other Supporting Details	Page/section of drainage report
	Detailed Development Layout	Appendix E
	Detailed drainage design drawings, including exceedance flow routes	Appendix I
	Detailed landscaping plans	Appendix E
	Maintenance strategy	Page 5
	Demonstration of how the proposed SuDS measures improve:	
	a) water quality of the runoff?	Page 3
	b) biodiversity?	Page 3
	c) amenity?	Page 3

| Proposed Below Ground Drainage Layout



This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
Do not scale from this drawing.

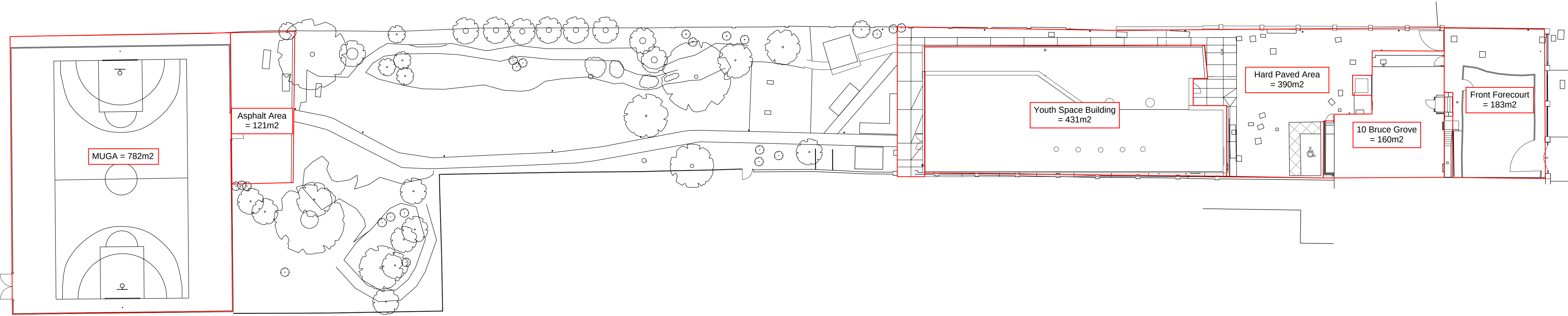
Key	
	Orifice Plate Flow Control
	Existing Surface Water Manhole
	Existing Surface Water Drainage
	Proposed Surface Water Drainage
	Perforated Pipe Laid Flat
	Existing Foul Water Drainage
	Permeable Surfacing

Drawing title				
Proposed SuDS Strategy				
scale (s)		date		drawn
1:200		January 2023		MAS
rev	date	by	chk	description
P1	06/01/23	MAS	HHu	Preliminary

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Project					
Bruce Grove Youth Space					
Drawing status		Status Revision			
Preliminary		S2 P1			
Project no.	Originator Zone	Level	Type	Role	drw no.
2220299-EWP-ZZ-00-SK	-C	-0003			



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P1	05.01.23	HH	HH	Preliminary
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Drawing title
Existing Impermeable Areas Plan

scale (s)	date	drawn
1:250@ A1	January 2023	HHu

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Project
Bruce Grove Youth Space

Drawing status	Status	Revision
Preliminary	S2	P1

Project no.	Originator	Zone	Level	Type	Role	drg no.
2220299-EWP-ZZ-XX-SK						C-0001



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P1	05.01.23	HH	HH	Preliminary
rev	date	by	chk	description

Drawing title
Proposed Impermeable Areas
Plan

scale (s)	date	drawn
1:200@ A1	January 2023	HHu

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Project Bruce Grove Youth Space				
Drawing status Preliminary		Status Revision S2 P1		
Project no.	Originator	Zone	Level	Type
2220299-EWP-ZZ-XX-SK	-C-0002			



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