Drainage Strategy

Battersea Park Road

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Version History

This report has been prepared by Apex Consulting Engineers with all reasonable skill, care and diligence, within the best practice and guidance current at the time of issue, within the scope of works which have been agreed with the client.

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The report is written in the context of the development proposals submitted to Apex Consulting Engineers by the Client as part of the appointment. Any changes to the development proposals may necessitate significant revisions to this report.

Revision	Date	Notes	Prepared by	Checked by	Approved by
001	06/04/2022	First Issue	George Boden	Ben Mincher	Lee Fisher
002	25/04/2022	Revised to include comments from planning consultant	George Boden	Ben Mincher	Lee Fisher
003	29/04/2022	Appendix A updated to suit latest site location plan	Ben Mincher	Lee Fisher	Lee Fisher
004	22/03/2023	Revised for a new planning submission to suit updated architectural plans	B. Mincher	G. Boden	L. Fisher
005	27/03/2023	Revised to suit updated architectural plans	B. Mincher	G. Boden	L. Fisher
006	14/04/2023	Appendix E updated to suit the latest Drainage plans.	B. Mincher	G. Boden	G. Boden
007	15/01/2024	Section 3 guidance updated to refer to latest policies.	B. Mincher	G. Boden	G. Boden

Contents

1.0 Introduction

This report is prepared in accordance with instructions from Watkin Jones Group to support a full planning application to Wandsworth Borough Council for a new development at 41-49 (Bookers) and 49-59 (BMW) Battersea Park Road, Nine Elms, London, SW8 5AL.

2.0 Scope and Objectives

The purpose of the report is to determine the means of collection and discharge of the foul and surface water from the proposed development and to ensure the volume of surface water runoff from the development is reduced, therefore, reducing flood risk elsewhere. The report will also consider the use and efficiency of Sustainable Drainage Systems (SuDS) and how they can be potentially implemented on the site.

With regard to the site-specific flood risk, a separate Flood Risk Assessment has been undertaken (ref. 956-ACE-ZZ-XX-RP-C-1002) which should be read in conjunction with this report when assessing the overall flood risk for the development.

3.0 Planning Policy and Guidance

National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG)

The National Planning Policy Framework (NPPF) 2023 and its associated technical guidance (replacing NPPF in 2021) sets out the Government's planning policies for England and how these are expected to be applied. The purpose of the policy is to contribute to the achievement of sustainable development and states that priority should be given to sustainable drainage and discusses the impact of new development on flood risk. The NPPF maintains strong policy on avoiding and managing flood risk, based on local planning authorities preparing local plans and deciding planning applications and granting planning permissions.

London Plan (March 2021)

The London Plan is the overall strategic plan for London, setting out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years. Policies SI 5, SI 13, G5 and G6 are aimed at ensuring that sustainable drainage techniques are utilised wherever practical for new developments. The London Sustainable Drainage Action Plan compliments this policy by providing a long-term plan on managing rainwater across London.

London Borough of Wandsworth Local Plan

The Planning and Compulsory Purchase Act 2004 and National Planning Policy Framework (NPPF) require local planning authorities to produce a Local Plan, setting out a spatial strategy and policies and proposals for the development and other use of land within their borough. The Wandsworth Local Plan Core Strategy and Development Management Policies Document (adopted July 2023), with particular reference to Policy LP10 and LP12 state all new developments should implement the principles of Sustainable Drainage Systems (SuDS) over and above what would be covered by policy within the NPPF. The local plan also includes the Site Specific Allocations Document which includes the existing Booker Wholesale site (Policies Map reference number 97).

London Borough of Wandsworth Local Flood Risk Management Strategy (LFRMS)

Wandsworth Council is the Lead Local Flood Authority for the London Borough of Wandsworth. The LFRMS formalises the flood risk management priorities that delivers the greatest benefit to the people, property and environment of Wandsworth. The LFRMS outlines the preferred surface water management strategy for the London Borough of Wandsworth and includes consideration of flooding from sewers, drains, groundwater and runoff from land, small watercourses and ditches that occurs as a result of heavy rainfall.

4.0 Site Description

4.1 Location

The existing site area is approximately 0.81ha in size and comprises an irregular shaped parcel of developed land located in the Nine Elms area within the London borough of Wandsworth. The site is bound by Battersea Park Road to the north and New Covent Garden Market Access Road to the east. To the south lies a new development undergoing construction at present with southwestern railway lines at a higher elevation. Sleaford Street is located to the west of the site with apartments beyond.

Approximately 3018m^2 in the northwest is occupied by an existing Booker Wholesale warehouse and approximately 1191m^2 in the southeast was occupied by an existing BMW car showroom (now demolished) with access gained from New Covent Garden Market. The remaining site area comprises predominantly asphalt hardstanding with associated car parking (approximately 3437m^2) and an area of soft landscaping to the north western boundary (approximately 451m^2). There is an existing retaining wall along the eastern boundary as the road drops down towards the towards the viaduct.

The 6 figure National Grid Reference (NGR) for the approximate centre of the site is TQ293772. A location plan is included within Appendix A.

4.2 Topography

Site ground levels within the existing car park vary with levels ranging from a maximum level of +4.673m AOD located in the north western corner of the site and a minimum level of +3.336m towards the centre of the site. The Booker warehouse unit has a Finished Floor Level of 4.400m AOD with a general fall towards the western edge of the BMW garage. Sleaford Street has a gradient of 1 in 71 and New Covent Garden Access Road a gradient of 1 in 100, with both roads sloping from northwest to southeast. A topographical survey is included within Appendix C.

4.3 Watercourses

The nearest receiving watercourse is the River Thames, a main river approximately 330m to the north of the site.

4.4 Existing Sewerage

According to the Thames Water sewer records included within Appendix D, there are public sewers located within the site and adjacent roads. There is a 1905mm diameter combined trunk sewer which runs in a northerly direction through the site under the existing Booker Wholesale unit. A CCTV survey of this sewer is included within Appendix H. There is a 1600mm diameter combined sewer (Main Line) running in an easterly direction located within Battersea Park Road. There is also a 300mm diameter combined sewer shown within Sleaford Street with a connection into Battersea Park Road.

The utility survey included within Appendix D indicates there is existing private foul and surface water drainage within the existing car park which indicates outfalls into the trunk sewer.

4.5 Geology

According to the British Geological Survey (BGS) Geology of Britain Viewer, the site is located on the London Clay Formation (clay and silt) at the bedrock with Alluvium (clay, silt, sand and peat) superficial deposits.

A preliminary ground investigation report has been undertaken by Tier Environmental (ref. TE1439GIR dated 7th March 2021) where exploratory holes have been undertaken for the site. Made Ground was encountered extensively across site and with the top layer comprising of predominantly asphalt recorded between 0.04m – 0.15m thick. Granular and cohesive made ground was encountered across the site at depths of up to 5m below ground level (bgl) with the potential for other deep pockets of made ground across the site to be high.

Superficial deposits were recorded as medium dense to dense orange gravelly medium to coarse sand. These are likely part of the Kempton Park Gravel Formation and were proven to the maximum drilled depth of 5.45m bgl. Cohesive soils were encountered in a trial pit located towards the centre of the site that consisted of orange, brown, very gravelly, sandy clay at 2.65-3.10m bgl.

4.6 Proposed Development

The site has previously been granted planning application (ref: 2015/6813) for a mixed-use development including residential uses and was approved on the 28th March 2019. The new proposal is for an Application for Full Planning Permission for: Demolition of existing building and construction of three new buildings, together comprising Residential (Use Class C3) and Student Accommodation (Sui Generis) along with Commercial, Business and Service (Use Class E) and/or Local Community and Learning (Class F) floorspace. Associated works include hard and soft landscaping, car parking and new vehicular access / servicing, and other ancillary works. Proposed site plans are included within Appendix B.

5.0 Foul Sewerage Proposals

5.1 Design Guidance

The foul drainage system will be designed in accordance with the following documents:

- BS EN 752:2008 Drain and sewer systems outside buildings
- BS EN 10256-2:2000 Gravity drainage systems inside buildings
- Building Regulations Part H: Drainage and waste disposal

In the event that sewers are to be adopted, the design will conform to guidance provided in the latest Water UK Design and Construction Guidance (DCG) Code for Adoption.

5.2 Foul Strategy

The foul sewerage for the proposed development will consist of a new dedicated below ground foul drainage network that will collect the foul water from the proposed development. The preferred method of foul disposal is discharge to the 300mm combined sewer within Sleaford Street. The preferred connection point will be to the existing manhole (reference 2205) within the public highway. A survey of this manhole will be required to obtain the connection level from the development.

5.3 Proposed Foul Flows

The foul drainage system has been sized based on the British Water Code of Practice – *Table Flows and Loads 4*, which provides a table of loadings with the total daily sewage load from properties. The following rates have been used:

- Student Accommodation 100l/person/day
- Residential Accommodation 150l/person/day

The calculation assumes all student accommodation units are to have a 'worst-case' full occupancy per each of the 762 student rooms. The total number of people based on full occupancy is therefore 1524.

Total foul discharge rate = **152400 l/day**
Average discharge rate = **1.76 l/s**
Peak discharge rate = **10.58 l/s**

The maximum people occupying the affordable and shared ownership residential will be 199 based on a total of 55 mixed sized units.

Total foul discharge rate = **29850 l/day**
Average discharge rate = **0.35 l/s**
Peak discharge rate = **2.07 l/s**

Based upon the above analysis the proposed development's daily average foul discharge rates are unlikely to exceed 2l/s. Taken as a peak, this could be as high as 12.65l/s when diurnal flows are accounted for. Nevertheless, Thames Water have confirmed the public sewerage network can accommodate the flows from the development.

Refer to Appendix F for the foul flow calculation and Appendix B for the accommodation schedule.

5.4 Approvals

At the detailed design stage, consent to discharge foul drainage from the proposed development to the public sewerage system will form an obligation in a Section 106 agreement with Thames Water under the Water Industry Act 1991.

A pre-development enquiry has been made to Thames Water to examine the availability of the public sewers and has been included within Appendix I. Thames Water made the following statement:

"As long as the above policy is adhered to and all surface water run-off generated on the site is removed from the combined sewers in the vicinity of the site then we can confirm that the existing combined sewer network does have sufficient capacity to accommodate the proposed foul water discharge from the proposed development."

All relevant authorities will be kept informed regarding the design of the proposed foul system. It is standard practice for detailed drainage design for foul systems to be subject to the approval of the local planning authority subsequent to the grant of planning permission and this will be sought from Wandsworth Borough Council at the appropriate time.

6.0 Surface Water Proposals

6.1 Design Guidance

The surface water drainage system will be designed in accordance with the following documents:

- BS EN 752:2008 Drain and sewer systems outside buildings
- BS EN 10256-2:2000 Gravity drainage systems inside buildings
- Building Regulations Part H: Drainage and waste disposal
- CIRIA C522 document 'Sustainable Drainage Systems – Design Manual for England and Wales'
- CIRIA C753 document 'The SuDS Manual'
- London Borough of Wandsworth Local Policy DMS 6
- London Plan Policies SI 5, SI 13

In the event that sewers are to be adopted, the design will conform to guidance provided in the latest Water UK Design and Construction Guidance (DCG) Code for Adoption.

6.2 Discharge Hierarchy

There are six possible options to discharge the surface water runoff in accordance with the SuDS hierarchy defined within Policy SI 13 of the London Plan:

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 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

<u>Rainwater Re-use</u>

The development proposes the use of green roofs. A green roof is partially or completely covered with vegetation and a growing medium, planted over a waterproofing membrane. These systems can also include irrigation systems where rainfall is restricted at the outlet and held in a surface water drainage reservoir beneath the planting to provide irrigation.

The London Plan 2021 supports urban greening through Policy G5 which encourages 'green roofs, green walls and nature-based sustainable drainage' in major development proposals. The development will look to incorporate these features whilst providing irrigation from stored rainwater. There will be mains cold water top-up in the event that there isn't enough rainwater available.

Infiltration to Ground

Infiltration methods such as soakaways are potentially feasible on account of permeable ground conditions at the surface. However, if any clay layers below the sand and gravel were to be encountered, it will restrict the depth of soakaways. The Preliminary Ground Investigation Report (Ref. TE1439GIR) indicates an average of 2.1m deep made ground across the site with groundwater encountered at an average depth of 3.74m in six out of the thirteen exploratory holes.

According to the DEFRA Magic Maps the site is located within a Zone 1 Source Protection Zone (SPZ) which may limit the use of soakaways to roof water only as per the Environment Agency's guidance.

Wandsworth Borough Council also objected to the use soakaways in the extant permission in 2015 (application ref. 2015/6813).

Given the existing ground conditions and the urban nature of the site, infiltration-based drainage systems are unlikely to be feasible.

Rainwater attenuation in green infrastructure features

Green roofs are proposed as part of the development as described above. Green SuDS features such as ponds can be designed to control flow rates by storing water and releasing it slowly after a heavy storm event. Given the site layout has a limited external courtyard area, an open water feature would require a high land uptake with perceived health and safety risks if the feature was not fenced and isolated. Open water features are not considered as a primary source of attenuation for the development. However, permeable paving is proposed in addition to green roofs.

Discharge to a Watercourse

The nearest receiving watercourse is the River Thames, a main river approximately 330m to the north of the site. The costs and disruption associated with installing the new infrastructure required to outfall direct to the river is considered impracticable and uneconomical. Therefore, it has not been considered within the outfall options for the site.

Discharge to a Surface Water Sewer

According to the Thames Water sewer records, the nearest public surface water sewer is located approximately 115m northeast of the site. This is a new surface water tank sewer that has been built through a Thames Water capital scheme that links a multitude of sites in central Battersea capturing all surface water runoff before discharging all flows to the river. The head manhole of the surface water sewer is located North of the Covent Garden Flower Market and runs through a number of development sites and into a new pumping station built on Ponton Road which pumps the flow from this new sewer around the new US Embassy to the river.

Although it is Thames Water's standard response for all developments in this area for surface water to discharge directly to the river or to the new surface water sewer, given the third-party land constraints it is deemed far more practicable to discharge surface water to the combined sewer on Sleaford Street by restricting to greenfield rates and therefore providing a significant betterment over the existing runoff rates. Discussions held with Thames Water suggest it is likely they would accept the proposals to the combined sewer subject to LLFA approval. A pre-development enquiry and correspondence is included within Appendix I.

Discharge to a Combined Sewer

The sewer records identify a 300mm diameter combined sewer within Sleaford Street which runs parallel to the site towards Battersea Park Road. This is the proposed method of surface water disposal from site with a preferred connection point to existing manhole 2505. Although this will not completely remove all surface water flows from the Low Level Sewer No.1 (Main Line) (as highlighted a priority within the pre-development enquiry response), this will provide a significant reduction in flows from the site.

6.3 Pre and Post Development Discharge Rates

Policy DMS 6 of the Wandsworth Core Strategy states that developments should incorporate soft landscaping and permeable surfaces into all new residential and non-residential developments. The introduction of impermeable surfaces inherently alters the rainfall-runoff relationship of a site, increasing the rate and volume of surface water runoff from a development and increasing the flood risk. The redevelopment of this site will have an increase in the level of permeability; the existing impermeable area can is taken as 7646m^2 (94% of total site area), whereas the proposed impermeable area is 5760m^2 (72% of total site area). The total proposed area of external soft landscape offered in the new development is 2271m^2 (approximately 28% of the total site area). Refer to Appendix B for the landscaping masterplan.

In lieu of existing detailed drainage calculations from the existing site, the Modified Rational Method (Volume 4) has been used to calculate runoff from existing developed areas. The Modified Rational Method uses the following formula to calculate peak runoff:

Q = 2.78 x Cv x Cr x i x A

Where: **Q** = Flow Rate (l/s)
Cv = Volumetric Runoff Coefficient
Cr = Routing Coefficient
i = Rainfall Intensity (mm/hr)
A = Area (ha),

The current site has an impermeable area of 0.76ha.

Under summer rainfall conditions, Cv ranges from 0.6-0.9, with the lower values representative of rapidly drainage soils and higher values of heavy clay soils. For fully impermeable areas an average Cv value of 0.75 has been used.

The routing coefficient Cr varies between 1 and 2 and accounts for the effect of rainfall characteristics and catchment shape on the peak runoff magnitude. The SuDS Manual (CIRIA c697) recommends a fixed value for Cr of 1.3 for design.

Rainfall Intensity has been calculated based on rainfall statistics obtained from FSR maps and a check from maps contained within the Wallingford Procedure Volume 4. These are as follows:

Determination of i

60 minute, 5 year (M5-60) = 20.6mm
r = 0.437
D = 5 minute
T = 1 year return period
Z1 = 0.39

M5-5 = 0.39 x 20.6 = 8.03mm

MT-D = 0.61 x 8.03 = 4.898mm

i = MT-D/D(hrs) = 4.898/(0.083) = **59.01 mm/hour**

Q = 2.78 x 0.75 x 1.3 x 59.01 x 0.76 = **121.56 l/s (1 year event)**

The discharge rates for the pre development runoff in litres per second are summarised in the table below:

Return Period	Existing Runoff (l/s)
1 year	122
30 year	305
100 year	381

Post Development Attenuated Rate

The discharge from the site will be reduced from the current discharge rates to ensure that there is a betterment to the surrounding surface water environment. The London Plan (Policy SI 13) states that development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible.

A greenfield run-off calculation has been included within Appendix F and is summarised in the table below. It is understood that there are flow control devices that can limit flows to less than 5l/s. However, a risk-based approach should always be considered to find a practical solution where the downstream flooding vs the risk of blockage is assessed i.e. if the risk of downstream flooding is less likely than the risk of blockage then higher flow rates and larger openings should be used. Given the proposed discharge rate is significantly better (95%) than the existing pre-development 1 in 1 year (122l/s), the likelihood of downstream flooding has also been reduced.

The greenfield run-off rate Q_{BAR} for the site is calculated at 1.26l/s. There are a variety of industry guidance documents applied at national and regional levels, however they are not always consistent in terms of their stance on minimum flow rates or minimum flow control sizes. Where the design of the upstream system will prevent some debris entering the system i.e. permeable pavements, this does not mitigate all blockage risk where there is run-off from other hard surfaces. Limiting the discharge rate to 1.26l/s is considered unreasonable with a requirement of an 18mm orifice diameter. An orifice closer to 50mm is considered more appropriate.

Therefore, with consideration to the above, it is requested that the discharge rate is to remain in line with the original approved extant permission and the calculated Q_{BAR} of 1.26 l/s is to be rounded up to 5 l/s.

Return Period	Existing Runoff (l/s)
Q_{BAR}	1.26
1 year	1.07
30 year	2.89
100 year	4.01

6.4 Sustainable Drainage Systems (SuDS)

Surface water runoff should be controlled as near to its source as possible through a sustainable drainage approach to surface water management. SuDS are an approach to managing surface water runoff which seeks to mimic natural drainage systems and retain water on or near the site. SuDS offer significant advantages over conventional piped drainage systems in reducing flood risk by attenuating the rate and quantity of surface water run-off from a site, promoting groundwater recharge, and improving water quality and, amenity and ecological value.

The Ministry for Housing, Communities and Local Government (MHCLG) published a proposal to strengthen existing planning policy SuDS. To this effect, they expect local planning policies and decisions on planning applications relating to major development - 10 dwellings or more, or equivalent non-residential or mixed development as set out in planning regulations and paragraph 165 of the National Planning Policy Framework, to ensure that SuDS for the management of surface run-off are put in place, unless demonstrated to be inappropriate.

It is necessary to identify the most appropriate method of controlling and discharging surface water. The SuDS techniques in Table 6.4.1 below assesses suitability for the proposed development using the selection process defined in CIRIA C753 The SuDS Manual.

SuDS Category	SuDS Technique	Viability	Explanation
Infiltration/Filtration	Infiltration Trenches	×	Ground conditions suggest the use of infiltration systems are likely to be unfeasible.
	Infiltration Basins	×	Ground conditions suggest the use of infiltration systems are likely to be unfeasible.
	Soakaways	×	Ground conditions suggest the use of infiltration systems are likely to be unfeasible.
	Bioretention/Filter Strips	×	Ground conditions suggest the use of infiltration systems are likely to be unfeasible.
Source Control	Green Roof/Living wall	✓	Included within the development. The landscape architect is to advise of all size and locations.
	Permeable Paving	✓	A Type C (non-infiltration) permeable resin will be used within the hardstanding areas. Although an outfall to combined sewer is proposed, the permeable paving will provide a level of treatment.
	Rainwater Harvesting	×	Potential inefficiencies due to the roof areas in comparison to the number of people. There is no significant demand for non-potable water on site throughout its design life.
Conveyance	Swales	×	Not considered appropriate due to the sloping nature of the site with limited run-off from paved areas to provide the benefits of a swale.
	Filter Drains	✓	Potentially feasible in certain areas of the site. However, these are usually bets placed at the edge of roads to capture highway runoff.
	Rain Gardens/Tree Pits/Rills	✓	Additional SuDS planting techniques such as tree pits and rain gardens will be confirmed at detailed design.
Retention/Detention	Detention Basin/Retention Pond	×	Not considered appropriate due to the volume requirements and nature of the development.
	Geo-cellular Storage	✓	Geo-cellular storage is proposed for the site to accommodate the require attenuation volumes from site. The modular flexibility and high void ratios make it an ideal choice to provide storage.

Table 6.4.1: Summary of the SuDS options appraisal

6.5 Surface Water Attenuation Requirements

Hydraulic calculations using Microdrainage have been included within Appendix E and show a requirement of 264m^3 to accommodate the 1 in 100-year storm event plus 40% climate change, which can readily be achieved within the site boundary.

6.6 Water Quality

Although the drainage principles proposed will conform to the basic level of treatment control as a minimum by using more traditional techniques such as silt traps, additional SuDS features can provide another treatment stage.

The water quality benefits of green roofs and are associated with the removal of sediment and buoyant materials, but levels of nutrients, heavy metals, toxic materials and oxygen-demanding materials may also be significantly reduced.

Tree pits and additional tree planting will also draw large amounts of water up through the soil with their leaves catching and slowing down rainwater before it reaches the ground. Tree roots can also absorb pollutants from soil and soil-water.

Pollutants can be retained on the surface of permeable pavements (especially where there is little or no fall), before being carried through to the laying course and sub-base layers during a rainfall event, where they can be trapped and degraded over time. CIRIA, the leading body in the research for SuDS, states that 60-95% of suspended solids and 70-90% of hydrocarbons can be removed by permeable pavements in this way.

As per the CIRIA SuDS Manual Table 26.2 ‘Pollution hazard indices for different land use classification table’, the pollution hazard level for residential roofs is considered ‘Very low’ and the pollution hazard level for the rest of the site is considered ‘Low’. The treatment provided on site will be adequate and exceeds the pollution hazard indices for suspended solids, metals and hydrocarbons as shown in Table 26.3 ‘Indicative SuDS mitigation indices for discharges to surface waters table’.

6.7 Approvals

At the detailed design stage, consent to discharge surface water drainage from the proposed development to the public sewerage system will form an obligation in a Section 106 agreement with Thames Water under the Water Industry Act 1991.

A pre-development enquiry has been made to Thames Water to examine the availability of the public sewers (see Appendix I). Although it is the standard response for all new developments in the Battersea to discharge into the strategic surface water sewer over the combined sewers, Thames Water were open to agreeing a connection to the combined sewer subject to a significant betterment in runoff rates and LLFA approval.

Thames Water require a deed of easement agreement for any structure within 3m of the existing trunk sewer crossing the site. The proposed site layout has taken this into consideration and kept all foundations and building extents outside of the required easement. An impact assessment will be submitted to Thames Water to prove the development will not impact their asset. Drawing 956-ACE-00-XX-DR-C-8030_P2_BUILD OVER AGREEMENT PLAN AND SECTIONS included within Appendix E shows the relationship between the asset and proposed foundations. Thames Water had no objection in principle to this drawing.

All relevant authorities will be kept informed regarding the design of the proposed foul system. It is standard practice for detailed drainage design for foul systems to be subject to the approval of the local planning authority subsequent to the grant of planning permission and this will be sought from Wandsworth Borough Council at the appropriate time.

7.0 Exceedance Events

7.1 Managing Exceedance

Below ground conveyance such as pipes cannot be built large enough for all types of extreme storm events. As a result, there will be times when surface water runoff will exceed the capacity of sewer networks. This can occur when the receiving drainage system becomes overloaded or when the outfall is restricted due to flood levels in the receiving water. The drainage system will be designed to cater for the following storm events:

- No surcharging in the 1 in 1 year rainfall event
- No flooding in the 1 in 30 year rainfall event
- No flooding (or minimal and contained on site) in the 1 in 100 year rainfall event plus a climate change allowance of 40%.

The drainage system will ensure that so far as is reasonably practicable, flows resulting from rainfall in excess of a 1 in 100 year rainfall event are managed in conveyance routes that minimise the risks to people and property.

7.2 Pathways and Conveyance

The proposed habitable rooms will be located at first floor and above with only commercial at ground floor which will reduce the risk of flooding to 'more vulnerable' development during exceedance events. The topography of the proposed site will ensure surface pathways are linked together in the same way a conventional drainage system works to effectively convey these flows. The proposed pathways will have sufficient draining gradients towards landscaping in the courtyard areas with small depressions to hold water on site.

Neighbouring properties are not considered to be at risk from the site's surface water drainage system during an exceedance event. The overland flood exceedance routes are shown on the Drainage Strategy Layout included within Appendix E.

8.0 Conclusions

Surface and foul water will discharge by gravity to the existing combined manhole located in Sleaford Street through a single lateral connection from site.

The surface water discharge rate for the site will conform to a minimum practical greenfield run-off rate of 5 l/s, provided through a flow control device. This provides significant betterment to the pre-development rates.

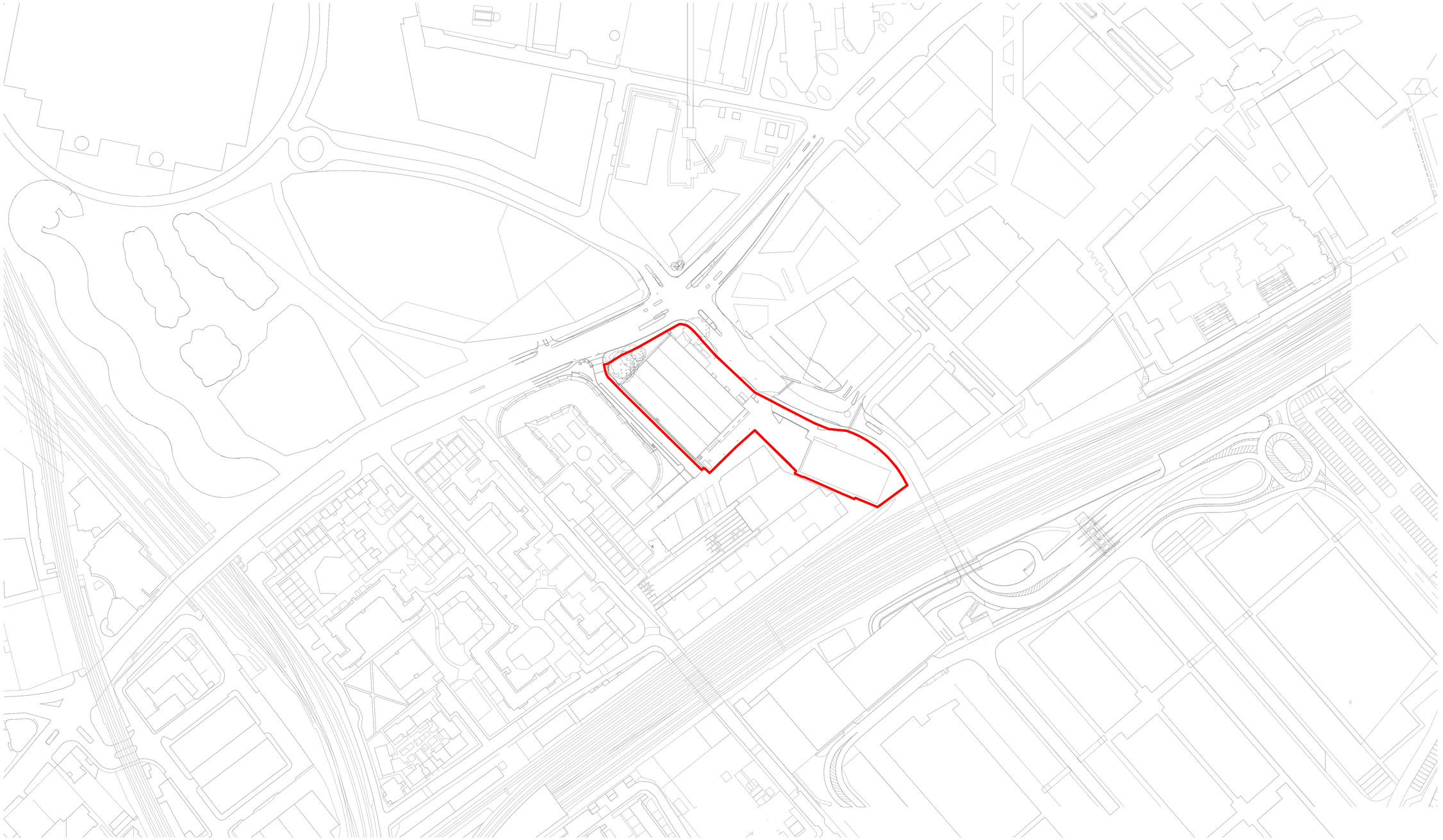
The surface water drainage system will require an approximate storage volume of 264m^3 to adequately cater for the 1 in 100 year plus 40% Climate Change.

The development will use SuDS attenuation techniques where possible including permeable paving and green roofs. Additional SuDS features will be looked at as the design progresses.

Overland flooding for storm events exceeding the worst case 1 in 100 year event + 40% climate change will be retained on site within landscaped areas by incorporating engineered topography.

With regard to the drainage principles highlighted within this report, the site is suitable for the proposed use and in accordance with the relevant planning policies. Subject to the implementation of this Drainage Strategy, the development may be occupied safely and adequately drained while reducing flood risk overall.

Appendix A – Location Plan



Notes & Key

DIMENSIONS NOT TO BE SCALED FROM THIS DRAWING. CONTRACTORS TO NOTIFY ARCHITECTS OF SITE VARIATIONS AFFECTING INFORMATION ON THIS DRAWING. THIS DRAWING IS COPYRIGHT OF GLENN HOWELLS ARCHITECTS.

AREAS GIVEN ON THIS SCHEDULE ARE INDICATIVE, A SPECIALIST SURVEYOR SHOULD BE ENGAGED IF DEFINITIVE AREAS ARE REQUIRED. AREAS EASURED IN ACCORDANCE WITH RICS "CODE OF MEASURING PRACTICE - 6TH EDITION".

ALL MEASUREMENTS HAVE BEEN TAKEN IN CAD SOFTWARE IN M² (SQFT ARE PROVIDED ONLY WHERE SPECIFICALLY LABELLED). CONVERSION TO SQFT IS ACHIEVED BY MULTIPLYING M² BY 10.764.

FIGURES EXCLUDE ROOF TERRACES, BALCONIES, DECK AMENITY, AND OTHER NON HABITABLE ROOMS. STUDIO AREAS INCLUDE EN-SUITE AND WALL CONSTRUCTION, BUT EXCLUDE EN-SUITE RISER.

Site Application Boundary

RED LINE BOUNDARY IS INDICATIVE AND BASED ON OS INFORMATION, SUBJECT TO FINAL CONFIRMATION FROM WATKIN JONES REGARDING ITS RELATIONSHIP WITH THE LAND REGISTRY BOUNDARY.

GLENN HOWELLS ARCHITECTS TAKES NO RESPONSIBILITY FOR THE LOCATION OF LEGAL BOUNDARIES INDICATED IN THIS DRAWING.

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Revisions

Date	Rev	By	Details
29/04/2022	P01	JA	Issued for Planning
24/03/2023			Draft

DRAFT-

Project

41-59 Battersea Park Road

Client

Watkin Jones

Drawing Title

Site Location Plan

Drawing No.	Revision
2278-GHA-ZZ-ZZ-DR-A-05001	**P01**

Scale	Date	Checked
Scale - 1 : 1250@A1	APR.22	RK

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London Birmingham glennhowells.co.uk

Appendix B – Proposed Site Plans

BATTERSEA PARK ROAD

NCGM ACCESS ROAD

SLEAFORD STREET

Unit 1 Use Class E
88.5

Commercial Bin Store
14.0

Cycle Store
102.3

Circulation
27.1

Entrance Lobby
12.7

Circulation
6.2

Bin Store
42.1

Bulk Waste
10.1

Unit 2 BoH
82.2

Unit 2 Use Class F
99.0

Unit 3 Use Class E
90.8

Staff Welfare
10.5

W/C
6.4

Commercial Bin Store
14.8

Reception
9.1

Lift Lobby
15.1

Student Entrance
75.6

BoH Corridor
7.1

Telecomms
8.9

Bin Store
36.8

Switchroom
23.6

Cycle Store
97.8

Cycle Store
113.1

Unit 4 Use Class E
97.4

Entrance Lobby
158.4

Reception
16.0

Staff Welfare
28.3

Post Room
14.2

Toilet
8.2

Lift Lobby
55.5

Study
46.4

Laundry
16.0

Lobby
30.0

Games Room
62.3

Cycle Store
37.1

Corridor
25.6

Lobby
31.4

Stu Bin Store
58.6

Cycle Store
89.5

Corridor
48.8

Lift Lobby
39.7

Substation
21.7

Cycle Store
96.7

Cycle Store
96.7

Cycle Store
51.2

Switchroom
17.4

Store
13.8

Generator

Bulky Waste
32.7

BoH Corridor
7.4

Wet Riser Tank Room
64.7

Telecomm
15.7

Heating & Cooling Plantroom
75.9

Cold Water / Sprinkler Tank
61.0

Notes & Key

DIMENSIONS NOT TO BE SCALED FROM THIS DRAWING. CONTRACTORS TO NOTIFY ARCHITECTS OF SITE VARIATIONS AFFECTING INFORMATION ON THIS DRAWING. THIS DRAWING IS COPYRIGHT OF GLENN HOWELLS ARCHITECTS.

AREAS GIVEN ON THIS SCHEDULE ARE INDICATIVE, A SPECIALIST SURVEYOR SHOULD BE ENGAGED IF DEFINITIVE AREAS ARE REQUIRED. AREAS EASURED IN ACCORDANCE WITH RICS "CODE OF MEASURING PRACTICE - 6TH EDITION".

ALL MEASUREMENTS HAVE BEEN TAKEN IN CAD SOFTWARE IN M² (SQFT ARE PROVIDED ONLY WHERE SPECIFICALLY LABELLED). CONVERSION TO SQFT IS ACHIEVED BY MULTIPLYING M² BY 10.764.

FIGURES EXCLUDE ROOF TERRACES, BALCONIES, DECK AMENITY, AND OTHER NON HABITABLE ROOMS. STUDIO AREAS INCLUDE EN-SUITE AND WALL CONSTRUCTION, BUT EXCLUDE EN-SUITE RISER.

Planning Application Boundary

RED LINE BOUNDARY IS INDICATIVE AND BASED ON OS INFORMATION, SUBJECT TO FINAL CONFIRMATION FROM WATKIN JONES REGARDING ITS RELATIONSHIP WITH THE LAND REGISTRY BOUNDARY.

GLENN HOWELLS ARCHITECTS TAKES NO RESPONSIBILITY FOR THE LOCATION OF LEGAL BOUNDARIES INDICATED IN THIS DRAWING.

N

METRES
@ 1: 250

0 2.5 5.0 10.0 25.0

m

01 02 03

Revisions

Date	Rev	By	Details
29/04/2022	P01	JA	Issued for Planning
22/03/2023		SI	DRAFT ISSUE

DRAFT-

Project
41-59 Battersea Park Road

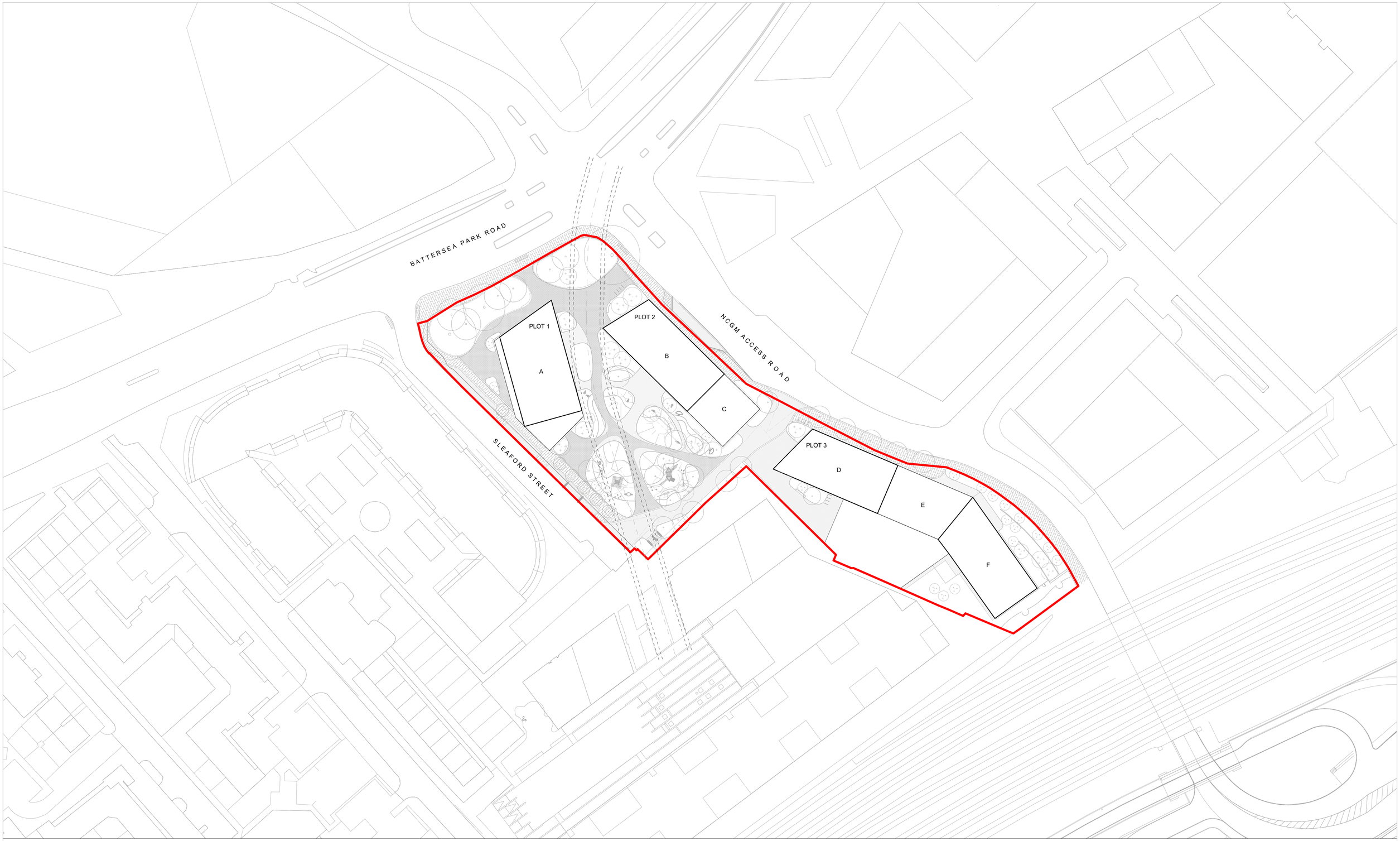
Client
Watkin Jones

Drawing Title
L00 GA Ground Floor Plan

Drawing No.	Revision
2278-GHA-ZZ-00-DR-A-05100	**P01**

Scale	Date	Checked
Scale - 1 : 250@A1	APR.22	AS

Glenn Howells Architects
London Birmingham glennhowells.co.uk



Notes & Key

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Site Application Boundary

Sewer Easement

TOPOGRAPHICAL SURVEY BASED ON DRAWING:
CSE-AC119_001 - Booker, Battersea - Topo Survey RevB

RED LINE BOUNDARY IS INDICATIVE AND BASED ON OS INFORMATION, SUBJECT TO FINAL CONFIRMATION FROM WATKIN JONES REGARDING ITS RELATIONSHIP WITH THE LAND REGISTRY BOUNDARY.

GLENN HOWELLS ARCHITECTS TAKE NO RESPONSIBILITY FOR THE LOCATION OF LEGAL BOUNDARIES INDICATED ON THIS DRAWING.

METRES @ 1: 500

0 5.0 10.0 20.0 50.0

m

N

Revisions

Date	Rev	By	Details
29/04/2022	P01	JA	Issued for Planning
24/03/2023			Draft

DRAFT-

Project
41-59 Battersea Park Road

Client
Watkin Jones

Drawing Title
Proposed Site Plan

Drawing No. **2278-GHA-ZZ-ZZ-DR-A-05011** Revision **P01**

Scale Scale - 1 : 500@A1 Date APR.22 Checked RK

Glenn Howells Architects
London Birmingham glennhowells.co.uk

HARDWORKS

PT.1 **NATURAL STONE PAVING**
Location: Building Entraces
Spec: European sourced granite pavers.
Colour:Buff Mix
Size: W: 200 x L: 400 x D: 80 mm

PT.2 **NATURAL STONE SETTS (Access road)**
Spec: European sourced granite pavers.
Colour: Buff Mix
Size: W: 200 x L: 100 x D: 100 mm

PT.3 **PARKING BAY**
Location: for parking bays and laybays
Spec: Cornish DeLank Granite
Size: W:150 x L:300
Colour: Grey
Bond: Stretcher course

PT.4 **ADOPTED STREET PAVEMENT**
Location: to Battersea Park Road frontage
Spec: Cornish DeLank Granite
Size: W:600 x L:900
Colour: Grey
Bond: Stretcher course

PT.4A **ADOPTED SIDED STREETS PAVEMENT**
Location: to side streets (Sleaford Road and NGMA Road)
Spec: Cornish DeLank Granite
Size: W:300 x L:600
Colour: Grey
Bond: Stretcher course

PT.5 **RESIN BOUND PERMEABLE SURFACING**
Location: Sitewide
Material: Resin bound permeable aggregate
Colour: Buff

PT.6 **BONDED RUBBER MULCH**
Location: Playground area
Material: Tiger mulch
Colour: Earth tone

PT.7 **GRAVEL MAINTENANCE STRIP**
Location: between facade and planting beds
Material: Silver Grey Granite, 20mm nominal particle size
Depth: 50mm

PT.9 **TACTILE PAVING**
Location: Road Crossings
Material: Granite blister paving

B1 **TIMBER BENCH B1**
Location:Sitewide
Product: Rough&Ready Curved Benches
Material: Galvanised steel and Timber
Size: W: 500 x L: variable mm
Supplier: Streetlife or similar approved

CS **CYCLE STAND C1**
Location: Sitewide
Product: CorTen Bicycle Racks
Material: Untreated weathering steel
Size: W: 700 x H: 750 mm
Supplier: Streetlife or similar approved

TP **TREE SURROUND**
Location: to side streets (Sleaford Road and NGMA Road)
Size (overall): W:1812 x L:1812 mm
Material: Granite setts 75mm coursed x random length (150-300mm) x 90mm thick.
-Additional Notes: To adoptable and Nine Elms Public Realm Surface Material Standards.

BUG HOTEL
Location: In native mix planting areas.
Colour/material: Untreated timber frame, containing mix of timber, bamboo, straw and stone
Size: 1200mm (l) x 1200mm (w) x TBC (h)

RW **RETAINING WALL**
Location: to NGMA Road terraces

EXISTING RETAINING WALL
Location: to NGMA Road terraces

FENCE WITH GATE
Location: to NGMA Road terraces
Spec: Fence to include at least one gap at ground level, to allow movement of hedgehogs between native planting mix areas.

STEPS
Location: Connection between the site and the Phase 4A
Colour/material: Granite buff steps with contrasting nosing inlay. Compliant handrails to both sides with central handrail.

Kerbs and Edges

KT.1 **NATURAL STONE UPSTAND KERB**
Location: To adoptable and Nine Elms Public Realm Surface Material Standards.
Material: Cornish DeLank granite laid to 125mm upstand
Size: W:300 X L:900 X D:300mm
Colour:Grey

KT.2 **NATURAL STONE FLUSH KERB**
Location: To adoptable and Nine Elms Public Realm Surface Material Standards.
Material: Cornish DeLank granite laid to 0Amm upstand
Size: W:300 X L:900 X D:300mm
Colour:Grey

E.1 **STEEL EDGING**
Location: Between pavement and green islands or between different types of pavements. Placed flush or at variable heights according to the use
Material: Corten Steel
Size: W: variable X L:300 X D:100mm
Colour: Corten

E.2 **RAISED PLANTER EDGE**
Location: To Battersea Park Road existing trees
Material: Finished in natural limestone, with cladding and coping
Colour: Buff

NOTES:
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6. This drawing must be read with the relevant specification clauses and detail drawings.
7. Order of construction and setting out to be agreed on site.

KEY

Planning Application Boundary

SOFTWORKS

Existing Trees
Subject to arboricultural management & maintenance works.
To be retained and protected to BS5837

Feature Tree Planting
Location: Sitewide
Spec: 2m clear stem, min 70cm girth

Speciment Tree Planting - Large
Location: Sitewide
Spec: 2m clear stem, min 50cm girth

Speciment Tree Planting - Medium
Location: Sitewide
Spec: 2m clear stem, 30-35 cm girth, columnar form

Multi-stem Tree Planting
Location: Sitewide
Spec: Multi-stem, min 3 stems, 4-6m high

LAWN
Location: To the glade
Amenity turf

SW.1 **SOFTWORKS TYPE 1: WOODLAND FLOOR SHADE MIX**
Location: to Battersea Park Road frontage
Woodland floor, perennial planting to include evergreen and pollinator species

SW.2 **SOFTWORKS TYPE 2: SHADE MIX**
Location: Sitewide
Shade mix. Shrubs and groundcover planting: native and non-native mix

SW.3 **SOFTWORKS TYPE 3: SHRUB AND HERBACEOUS**
Location: To the inner glade
Sensory mix with a focus on flowering perennials and scented plants.

SW.3A **SOFTWORKS TYPE 3A: SHRUB AND HERBACEOUS**
Location: To the glade edges
Sensory mix with a focus on shrubs and scented plants.

SW.4 **SOFTWORKS TYPE 4: SCREENING HEDGE**
Location: To 4A Phase edging
Mixed native species hedging to be maintained at 1.2 height

SW.5 **SOFTWORKS TYPE 5: CLIMBING MIX**
Location: To 4A Phase edging
Instant green screen. To include climbing plants

DRAFT

Revision	Date	Description	Drawn	Apprvd.
P01	XX-02-23	Issue for planning	GG	HV

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Client Watkin Jones & Son Limited

Project Battersea Park Road

Drg Title Groundfloor General Arrangement Plan
Sheet 01 of 02

Created on	Created by	Approved by
21.12.22	LF	HV

Scale	Size	Workstage
1:200	A1	PLANNING

Drg No.	Suitability	Revision
3082-PLA-XX-XX-DR-L00-0002	S1	P01

HARDWORKS

PT 1 **NATURAL STONE PAVING**
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Spec: European sourced granite pavers.
Colour:Buff Mix
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Spec: European sourced granite pavers.
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Size: W: 200 x L: 100 x D: 100 mm

PT 3 **PARKING BAY**
Location: for parking bays and laybays
Spec: Cornish DeLank Granite
Size: W:150 x L:300
Colour: Grey
Bond: Stretcher course

PT 4 **ADOPTED STREET PAVEMENT**
Location: to Battersea Park Road frontage
Spec: Cornish DeLank Granite
Size: W:600 x L:900
Colour: Grey
Bond: Stretcher course

PT 4A **ADOPTED SIDED STREETS PAVEMENT**
Location: to side streets (Sleaford Road and NGMA Road)
Spec: Cornish DeLank Granite
Size: W:300 x L:600
Colour: Grey
Bond: Stretcher course

PT 5 **RESIN BOUND PERMEABLE SURFACING**
Location: Sitewide
Material: Resin bound permeable aggregate
Colour: Buff

PT 6 **BONDED RUBBER MULCH**
Location: Playground area
Material: Tiger mulch
Colour: Earth tone

PT 7 **GRAVEL MAINTENANCE STRIP**
Location: between facade and planting beds
Material: Silver Grey Granite, 20mm nominal particle size
Depth: 50mm

B1 **TIMBER BENCH B1**
Location:Sitewide
Product: Rough&Ready Curved Benches
Material: Galvanised steel and Timber
Size: W: 500 x L: variable mm
Supplier: Streetlife or similar approved

CS **CYCLE STAND C1**
Location: Sitewide
Product: CorTen Bicycle Racks
Material: Untreated weathering steel
Size: W: 700 x H: 750 mm
Supplier: Streetlife or similar approved

TP **TRIP RAIL SURROUND**
Location: to side streets (Sleaford Road and NGMA Road)
Size (overall): W:1812 x L:1812 mm
Material: Granite setts 75mm coursed x random length (150-300mm) x 90mm thick.
-Additional Notes: To adoptable and Nine Elms Public Realm Surface Material Standards.

RW **RETAINING WALL**
Location: to NGMA Road terraces

EXISTING RETAINING WALL
Location: to NGMA Road terraces

FENCE WITH GATE
Location: to NGMA Road terraces
Spec: Fence to include at least one gap at ground level, to allow movement of hedgehogs between native planting mix areas.

BUG HOTEL
Location: In native mix planting areas.
Colour/material: Untreated timber frame, containing mix of timber, bamboo, straw and stone
Size: 1200mm (l) x 1200mm (w) x TBC (h)

STEPS
Location: Connection between the site and the Phase 4A
Colour/material: Granite buff steps with contrasting nosing inlay. Compliant handrails to both sides with central handrail.

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Location: Sitewide
Spec: 2m clear stem, min 70cm girth

Specimen Tree Planting - Large
Location: Sitewide
Spec: 2m clear stem, min 50cm girth

Specimen Tree Planting - Medium
Location: Sitewide
Spec: 2m clear stem, 30-35 cm girth, columnar form

Multi-stem Tree Planting
Location: Sitewide
Spec: Multi-stem, min 3 stems, 4-6m high

LAWN
Location: To the glade
Amenity turf

pollinator species

SW 2 **SOFTWORKS TYPE 2: SHADE MIX**
Location: Sitewide
Shade mix. Shrubs and groundcover planting: native

SW 3 **SOFTWORKS TYPE 3: SHRUB AND HERBACEOUS**
Location: To the inner glade
Sensory mix with a focus on flowering perennials and scented plants

SW 3A **SOFTWORKS TYPE 3A: SHRUB AND HERBACEOUS**
Location: To the glade edges
Sensory mix with a focus on shrubs and scented plants.

SW 4 **SOFTWORKS TYPE 4: SCREENING HEDGE**
Location: To 4A Phase edging
Mixed native species hedging to be maintained at 1.2 height

SW 5 **SOFTWORKS TYPE 5: CLIMBING MIX**
Location: To 4A Phase edging
Instant green screen. To include climbing plants

SW 6 **SOFTWORKS TYPE 6: WILDLIFE MIX**
Location: To the NCGA Road terraces
Herbaceous and groundcover planting, native and non-native mix

SW 7 **SOFTWORKS TYPE 6: WILDLIFE BORDER**
Location: To southern border
Native hedgerow mix to include evergreen and pollinator species

DRAFT

Revision	Date	Description	Drawn	Apprvd.
P01	XX-02-23	Issue for planning	GG	HV

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Client Watkin Jones & Son Limited

Project Battersea Park Road

Drg Title Groundfloor General Arrangement Plan
Sheet 02 of 02

Created on	Created by	Approved by
21.12.22	LF	HV

Scale	Size	Workstage
1:200	A1	PLANNING

Drg No. 3082-PLA-XX-XX-DR-L00-0003
Suitability S1
Revision P01

GLENN HOWELLS ARCHITECTS

BATTERSEA PARK ROAD AREA SCHEDULE PLOT 1

MEASURED AREAS

	External wall thickness	Internal Structure	Ancillary Spaces	Demountable Partitions
Net usable Area	Excluded	Excluded	Excluded	Excluded
Net Internal Area (NIA)	Excluded	Excluded	Excluded	Included
Gross Internal Area (GIA)	Excluded	Included	Included	Included
Gross External Area (GEA)	Included	Included	Included	Included

ABBREVIATIONS

in

Clst - Bedroom
Stud - Studio Bedroom
Acc Stud - Disabled Studio Bedroom
Acc Clst - Disabled Cluster Bedroom
Living - Cluster Living Areas
Cycl - Student Cycle Storage
Amnty - Student Amenity
Comm- Commercial & Community
Plnt - MEP Plant Space + Associated Circulation
Rfse - Refuse Store

MEASURED AREAS

No. 1100 l Eurobins for recycling

* This is an estimated requirement

NOTES

Areas given on this schedule are indicative, a specialist surveyor should be engaged if definitive areas are required
Areas measured in accordance with RICS "Code of Measuring Practice – 6th Edition"

All areas measured to finished face of wall/column at 1000mm above FFL

All measurements have been taken in CAD software in m2 (sqft are provide only where specifically labeled)

Conversion to sqft is achieved by multiplying m2 by 10.764

Figures exclude roof terraces, balconies, deck amenity and other non habitable rooms
Studio areas include en-suites and wall construction

REVISION HISTORY

REV	DATE	NOTE
XX	09/03/2023	Design Freeze Issue

SUMMARY AREAS + UNITS SCHEDULE

Plot 01 - Core - A

	Total Areas			Tenure				Non-Lettable Area								
	Total	Total		Social Rent	Intermediate Rent	Total		Commercial Space (Class E)	Community Space (Class F)	Entrance	Cycles	Residential Refuse	Commercial Refuse	Plant	Circulation	Total
Floor	GIA sqm	GEA* sqm		NIA sqm	NIA sqm	NIA sqm	NIA/GIA %	NIA sqm	NIA sqm	NIA sqm	NIA sqm	NIA sqm	NIA sqm	NIA sqm	NIA sqm	NIA sqm
0	578	646						91	181	13	100	52	14	0	47	**498**
M1	289	364												207		**207**
1	547	612		416	0	**416**	76%									
2	547	612		416	0	**416**	76%									
3	547	612		416	0	**416**	76%									
4	459	527		341	0	**341**	74%									
5	459	527		341	0	**341**	74%									
6	459	527		159	182	**341**	74%									
7	459	527		0	341	**341**	74%									
8	459	527		0	341	**341**	74%									
9	459	527		0	341	**341**	74%									
10	459	527		0	341	**341**	74%									
11	431	527		0	315	**315**	73%									
RL																
TOTAL	**6,152** sqm	**7,062** sqm		**2,089** sqm	**1,863** sqm	**3,951** sqm	**64%** %	**91** sqm	**181** sqm	**13** sqm	**100** sqm	**52** sqm	**14** sqm	**207** sqm	**47** sqm	**704** sqm

Apartment Types

	1B2P				1B2P Accessible		2B3P				2B4P			2B4P Accessible		3B5P				3B5P Accessible	4B6P	
	Type A	Type B	Type B	Type C	Type D	Type E	Type A	Type B	Type A	Type B	Type A	Type A	Type B	Type C	Type D	Type A	Type B	Type C	Type C	Type B	Type A	
	SR 51.1 sqm	SR 54.3 sqm	IR 54.3 sqm	IR 51.4 sqm	IR 56.3 sqm	IR 55.6 sqm	SR 65.8 sqm	SR 62.3 sqm	IR 65.8 sqm	IR 62.3 sqm	SR 70.8 sqm	IR 70.8 sqm	IR 70.0 sqm	SR 76.7 sqm	IR 81.4 sqm	SR 89.9 sqm	SR 94.0 sqm	SR 88.2 sqm	IR 88.2 sqm	SR 96.0 sqm	SR 103.9 sqm	**Total**
																						0
1											1						1			1	1	5
1														1		1	1				1	5
1														1		1	1				1	5
		1					1	1			1							1				5
		1					1	1			1							1				5
			1						1	1	1							1				5
			1						1	1		1							1			5
			1						1	1		1							1			5
				1	1	1							1		1				1			5
3	**2**	**5**	**1**	**1**	**1**		**2**	**2**	**5**	**5**	**4**	**4**	**1**	**2**	**1**	**2**	**3**	**3**	**4**	**1**	**3**	**65**

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GLENN HOWELLS ARCHITECTS

BATTERSEA PARK ROAD AREA SCHEDULE PLOT 2

MEASURED AREAS

	External wall thickness	Internal Structure	Ancillary Spaces	Demountable Partitions
Net usable Area	Excluded	Excluded	Excluded	Excluded
Net Internal Area (NIA)	Excluded	Excluded	Excluded	Included
Gross Internal Area (GIA)	Excluded	Included	Included	Included
Gross External Area (GEA)	Included	Included	Included	Included

ABBREVIATIONS

=
Clstr - Bedroom
Stud - Studio Bedroom
Acc Stud - Disabled Studio Bedroom
Acc Clstr - Disabled Cluster Bedroom
Living - Cluster Living Areas
Cycl - Student Cycle Storage
Amnty - Student Amenity
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Plnt - MEP Plant Space + Associated Circulation
Rfse - Refuse Store

MEASURED AREAS

No. 1100 l Eurobins for recycling

* This is an estimated requirement

NOTES

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Conversion to sqft is achieved by multiplying m2 by 10.764

Figures exclude roof terraces, balconies, deck amenity and other non habitable rooms
Studio areas include en-suites and wall construction

REVISION HISTORY

REV	DATE	NOTE
XX	09/03/2023	Design Freeze Issue

SUMMARY AREAS + UNITS SCHEDULE

Plot 02 - Cores - B/C

	Total Area		Lettable Area			Non-Lettable Area									
	Total GIA	Total GEA*	Studio NIA	Total NIA	NIA/GIA	Retail Unit 1 NIA	Retail Unit 2 NIA	Amenity NIA	FoH NIA	Cycles NIA	Student Refuse NIA	Commercial Refuse NIA	Plant NIA	Circulation NIA	Total NIA
Floor	sqm	sqm	sqm	sqm	%	sqm	sqm	sqm	sqm	sqm	sqm	sqm	sqm	sqm	sqm
0	658	738	0	**0**	0.0%	91	97	76	25	171	40	15	46	15	**576**
1	658	738	381	**381**	57.9%								102	58	**160**
2	658	738	465	**465**	70.7%									69	**69**
3	658	738	465	**465**	70.7%									69	**69**
4	658	738	465	**465**	70.7%									69	**69**
5	658	738	465	**465**	70.7%									69	**69**
6	658	738	465	**465**	70.7%									69	**69**
7	446	507	0	**0**	0.0%			287						41	**328**
8	446	507	297	**297**	66.6%									47	**47**
9	446	507	297	**297**	66.6%									47	**47**
10	446	507	297	**297**	66.6%									47	**47**
11	446	507	297	**297**	66.6%									47	**47**
12	446	507	297	**297**	66.6%									47	**47**
13	446	507	297	**297**	66.6%									47	**47**
14	446	507	297	**297**	66.6%									47	**47**
15	446	507	297	**297**	66.6%									47	**47**
16	446	507	236	**236**	53.0%			66						41	**106**
RL															
TOTAL	**9,066**	**10,236**	**5,321**	**5,321**	**58.70%**	**91**	**97**	**429**	**25**	**171**	**40**	**15**	**148**	**878**	**1,894**
	sqm	sqm	sqm	sqm	%	sqm	sqm	sqm	sqm	sqm	sqm	sqm	sqm	sqm	sqm

Room Types

	Studio Bedrooms		Acc. Studios Beds	Adaptable Studio Beds		Totals			
	Type A 21.0 sqm	Type B 23.5 sqm	Type A 34.8 sqm	Type A 23.9 sqm	Type B 26.0 sqm	Studio	Acc. Studio	Adap. Studio	Total
0									
1	13	1	1	1	1	**14**	**1**	**2**	17
2	17	1	1	1	1	**18**	**1**	**2**	21
3	17	1	1	1	1	**18**	**1**	**2**	21
4	17	1	1	1	1	**18**	**1**	**2**	21
5	17	1	1	1	1	**18**	**1**	**2**	21
6	17	1	1	1	1	**18**	**1**	**2**	21
7						**0**	**0**	**0**	0
8	9	1	1	1	1	**10**	**1**	**2**	13
9	9	1	1	1	1	**10**	**1**	**2**	13
10	9	1	1	1	1	**10**	**1**	**2**	13
11	9	1	1	1	1	**10**	**1**	**2**	13
12	9	1	1	1	1	**10**	**1**	**2**	13
13	9	1	1	1	1	**10**	**1**	**2**	13
14	9	1	1	1	1	**10**	**1**	**2**	13
15	9	1	1	1	1	**10**	**1**	**2**	13
16	9	1		1		**10**	**0**	**1**	11
TOTAL	**179**	**15**	**14**	**15**	**14**	**194**	**14**	**29**	**237**
						82%	6%	12%	

Total GIA (exc comm)	**8,877**		**Total Amenity (sqm)**	**429**
GIA per Bed	**37.5**		**Amenity Per Bedspace (sqm)**	**1.81**

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GLENN HOWELLS ARCHITECTS

BATTERSEA PARK ROAD AREA SCHEDULE PLOT 3

MEASURED AREAS

	External wall thickness	Internal Structure	Ancillary Spaces	Demountable Partitions
Net usable Area	Excluded	Excluded	Excluded	Excluded
Net Internal Area (NIA)	Excluded	Excluded	Excluded	Included
Gross Internal Area (GIA)	Excluded	Included	Included	Included
Gross External Area (GEA)	Included	Included	Included	Included

ABBREVIATIONS

Clstr - Bedroom
Stud - Studio Bedroom
Acc Stud - Disabled Studio Bedroom
Acc Clstr - Disabled Cluster Bedroom
Living - Cluster Living Areas
Cycl - Student Cycle Storage
Amnty - Student Amenity
Comm -Commercial & Community
Plnt - MEP Plant Space + Associated Circulation
Rfse - Refuse Store

MEASURED AREAS

No. 1190 Eurobins for recycling

* This is an estimated requirement

NOTES

Areas given on this schedule are indicative, a specialist surveyor should be engaged if definitive areas are required
Areas measured in accordance with RICS "Code of Measuring Practice - 6th Edition"

All areas measured to finished face of wall/column at 1000mm above FFL
All measurements have been taken in CAD software in m2 (sqft are provide only where specifically labeled)
Conversion to sqft is achieved by multiplying m2 by 10.764
Figures exclude roof terraces, balconies, deck amenity and other non habitable rooms
Studio areas include en-suites and wall construction

REVISION HISTORY

REV	DATE	NOTE
XX	09/03/2023	Design Freeze Issue

SUMMARY AREAS + UNITS SCHEDULE

Plot 03 - Cores - D/E/F

Floor	Total GIA sqm	Total GEA* sqm	Cluster NIA sqm	Total NIA sqm	NIA/GIA %	Living NIA sqm	FoH NIA sqm	Amenity NIA sqm	Retail Unit NIA sqm	Plant NIA sqm	Cycles NIA sqm	Refuse NIA sqm	Circulation NIA sqm	Total NIA sqm
0	1585	1729			0.0%		67	336		311	371	103	175	1363
1	1003	1129	452	**452**	45.1%	149								149
2	1133	1259	530	**530**	46.7%	184								184
3	1133	1259	530	**530**	46.7%	184								184
4	1133	1259	530	**530**	46.7%	184								184
5	1133	1259	530	**530**	46.7%	184								184
6	1133	1259	530	**530**	46.7%	184								184
7	818	935	0	**0**	0.0%	0		550						550
8	818	935	357	**357**	43.7%	126								126
9	818	935	357	**357**	43.7%	126								126
10	818	935	357	**357**	43.7%	126								126
11	818	935	357	**357**	43.7%	126								126
12	818	935	357	**357**	43.7%	126								126
13	818	935	357	**357**	43.7%	126								126
14	818	935	357	**357**	43.7%	126								126
15	818	935	357	**357**	43.7%	126								126
16	818	935	357	**357**	43.7%	126								126
17	818	935	357	**357**	43.7%	126								126
18	818	935	357	**357**	43.7%	126								126
19	419	478	181	**181**	43.2%	65								65
20	419	478	181	**181**	43.2%	65								65
21	419	478	181	**181**	43.2%	65								65
RL														
TOTAL	**19,327** sqm	**21,807** sqm	**7,573** sqm	**7,573** sqm	**39.18%** %	**2,644** sqm	**67** sqm	**886** sqm	**0** sqm	**311** sqm	**371** sqm	**103** sqm	**175** sqm	**4,557** sqm

Room Types

Kitchen Living Dining Rooms

	Core D					Core F		
	Type 01 29.2 sqm	Type 02 29.8 sqm	Type 03 30.2 sqm	Type 04 30.4 sqm	Type 05 33.7 sqm	Type 06 24.5 sqm	Type 07 30.0 sqm	Type 08 35.0 sqm
	1	1				1	1	1
			1	1	1	1	1	1
			1	1	1	1	1	1
			1	1	1	1	1	1
			1	1	1	1	1	1
			1	1	1	1	1	1
			1	1			1	1
			1	1			1	1
			1	1			1	1
			1	1			1	1
			1	1			1	1
			1	1			1	1
			1	1			1	1
			1	1			1	1
			1	1			1	1
			1	1			1	1
							1	1
							1	1
1	**1**		**16**	**16**	**5**	**6**	**20**	**20**

Cluster Bedrooms

	Core D		Core F
	Type A 13.9 sqm	Type B 15.8 sqm	Type A 13.9 sqm
	10	1	18
	15		18
	15		18
	15		18
	15		18
	15		18
	11		13
	11		13
	11		13
	11		13
	11		13
	11		13
	11		13
	11		13
	11		13
			13
			13
206	**1**		**290**

Acc. Cluster Bedr

Core D	
Type A 23.6 sqm	Type B 23.7 sqm
1	1
2	1
2	1
2	1
2	1
2	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
11	**17**

Cluster Types

5-Bed Clusters	6-Bed Clusters	7-Bed Clusters	Total
1	2	2	**5**
1	4	1	**6**
1	4	1	**6**
1	4	1	**6**
1	4	1	**6**
1	4	1	**6**
	3	1	**4**
	3	1	**4**
	3	1	**4**
	3	1	**4**
	3	1	**4**
	3	1	**4**
	3	1	**4**
	3	1	**4**
	3	1	**4**
	3	1	**4**
	1	1	**2**
	1	1	**2**
	1	1	**2**
6	**58**	**21**	**85**

Totals

Cluster	Acc. Cluster	Totals
29	2	31
33	3	36
33	3	36
33	3	36
33	3	36
33	3	36
0	0	0
24	1	25
24	1	25
24	1	25
24	1	25
24	1	25
24	1	25
24	1	25
24	1	25
24	1	25
24	1	25
24	1	25
13	0	13
13	0	13
13	0	13
497	**28**	**525**
95%	5%	
100%		

Total GIA	**19,327**	**Total Amenity (sqm)**	**886**
GIA per Bed	**36.8**	**Amenity Per Bedspace (sqm)**	**1.69**

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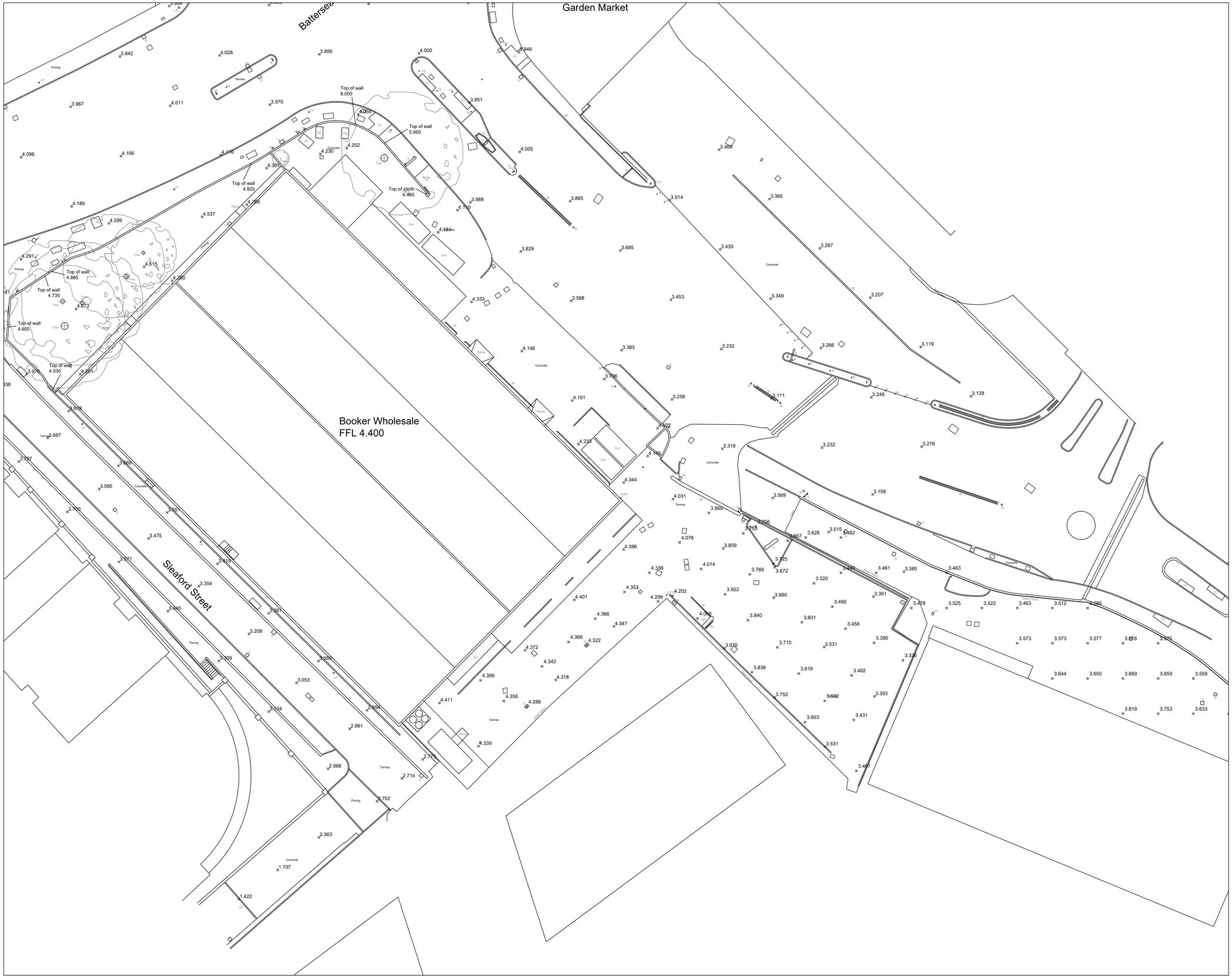
Appendix C – Topographical Survey



Notes:

Drawing provided for information only, all measurements to be checked on site prior to construction

Site Surveyed 28-09-21

Key:

Bl - Bollard
Bn - Bin
Br - Barrier
Bsh - Bus Shelter
Bst - Bus Stop
CB - Concrete Block
Con - Container
G - Road Gully
PC - Pedestrian Crossing
PL - Planters
RWP - Rain Water Pipe
S - Sign
SB - Speed Bump
Shl - Shelter
TB - Telecoms/Electric Box
TC - Tactile Paving
TS - Traffic Signal

Rev.		Date	By
A	First issue	10-10-21	AC
B	Additional spot levels added	12-10-21	AC

C-SE
Survey & Engineering
Andrew@c-se.co.uk
077085 36503

Drawing Title: Topo Survey

Site: Booker Wholesale, Battersea

Scale:	250:1@A1	Drawing No.	Rev.B
Drawn By: A.C.	Date: 12-10-21	AC119 - 001	

Appendix D – Existing Sewer Records

CommercialDW
Multisite Drainage & Water Enquiry

Thames Water Property Searches

Tier Consult
Unit 3 Acres Hill Lane, Unit 3 Acres
Hill Lane
Acres Hill Business Park
Sheffield
S9 4LR

Search address supplied	MULTISITESEARCH, 41 - 49, Battersea Park Road, London, SW8 5AL
Your reference	956-Booker Wholesale
Our reference	CDWS/CDWS/4/2020_4320932
Received date	7 December 2020
Search date	10 December 2020

Keeping you up-to-date

Commercial Drainage and Water Enquiry

The Commercial Drainage and Water Enquiry is specifically designed for those purchasing or leasing land or commercial property.

With comprehensive information regarding water and sewerage services and infrastructure assets, combined with appropriate guarantees for commercial property and land transactions, the Commercial Drainage and Water Enquiry mitigates risk and provides peace of mind for commercial property professionals and their advisers.

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

0845 070 9148

COMMERCIALDW
DRAINAGE AND WATER ENQUIRY

Search address supplied: MULTISITESEARCH, 41 - 49, Battersea Park Road, London, SW8 5AL

Any new owner or occupier will need to contact Thames Water on 0800 316 9800 or log onto our website www.thameswater.co.uk and complete our online form to change the water and drainage services bills to their name.

The following records were searched in compiling this report: - the map of public sewers, the map of waterworks, water and sewer billing records, adoption of public sewer records, building over public sewer records, the register of properties subject to internal foul flooding, the register of properties subject to poor water pressure and the drinking water register. Thames Water Utilities Ltd (TWUL) holds all of these.

TWUL, trading as Property Searches, are responsible in respect of the following:-

(i) any negligent or incorrect entry in the records searched

(ii) any negligent or incorrect interpretation of the records searched

(iii) any negligent or incorrect recording of that interpretation in the search report

(iv) and compensation payments

Please refer to the attached Terms & Conditions.

Maps, Wayleaves, Easements, Manhole Cover and Invert levels

1.1 Where relevant, please include a copy of an extract from the public sewer map.

A copy of an extract of the public sewer map is included, showing the public sewers, disposal mains and lateral drains in the vicinity of the properties.

1.2 Where relevant, please include a copy of an extract from the map of waterworks.

A copy of an extract from the map of waterworks is included, showing water mains, resource mains or discharge pipes in the vicinity of the properties.

1.3 Wayleaves & Easements

Is there a wayleave/easement agreement giving Thames Water the right to lay or maintain assets or right of access to pass through private land in order to reach the Company's assets?

No.

1.4 Manhole

On the copy extract from the public sewer map, please show manhole cover, depth and invert levels where the information is available.

Details of any manhole cover and invert levels applicable to this site are enclosed.

Drainage

2.1 Does foul water from the properties drain to a public sewer?

Records indicate that foul water from all of the properties drains to a public sewer.

2.2 Does surface water from the properties drain to a public sewer?

Records indicate that surface water from all of the properties drains to a public sewer.

2.3 Is a surface water drainage charge payable?

Records confirm that a surface water drainage charge is applicable for the following properties:
41 - 49, Battersea Park Road, London, SW8 5AL
Workshop Rear Of, 41 - 49, Battersea Park Road, London, SW8 5AL

2.4 Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the properties?

The public sewer map included indicates that there is a public sewer, disposal main or lateral drain within the boundaries of the property. However, from the 1st October 2011 there may be additional public sewers, disposal mains or lateral drains which are not recorded on the public sewer map but which may further prevent or restrict development of the property.

2.4.1 Does the public sewer map indicate any public pumping station or any other ancillary apparatus within the boundaries of the property?

The public sewer map included indicates that there is no public pumping station within the boundaries of the property.

2.5 Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the properties?

The public sewer map included indicates that there is a public sewer within 30.48 metres (100 feet) of a building within the property.

2.5.1 Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?

The public sewer map included indicates that there is no public pumping station within 50 metres of any buildings within the property.

2.6 Are any sewers or lateral drains serving or which are proposed to serve the properties the subject of an existing adoption agreement or an application for such an agreement?

Records confirm that Foul sewers serving the development, of which the property forms part are not the subject of an existing adoption agreement or an application for such an agreement.

The Surface Water sewer(s) and/or Surface Water lateral drain(s) are not the subject of an adoption agreement.

2.7 Has a sewerage undertaker approved or been consulted about any plans to erect a building or extension on the properties over or in the vicinity of a public sewer, disposal main or drain?

There are no records in relation to any approval or consultation about plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain. However, the sewerage undertaker might not be aware of a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain.

2.8 Is the building which is or forms part of the properties, at risk of internal flooding due to overloaded public sewers?

The property is not recorded as being at risk of internal flooding due to overloaded public sewers.

From the 1st October 2011 most private sewers, disposal mains and lateral drains were transferred into public ownership It is therefore possible that a property may be at risk of internal flooding due to an overloaded public sewer which the sewerage undertaker is not aware of. For further information it is recommended that enquiries are made of the vendor.

2.9 Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.

The nearest sewage treatment works is ROYALHILL(GREENWICH)STW which is 8.973 kilometres to the east of the property.

Water

3.1 Are the properties connected to mains water supply?

Records indicate that all of the properties are connected to the mains water supply.

3.2 Are there any water mains, resource mains or discharge pipes within the boundaries of the properties?

The map of waterworks indicates that there are water mains, resource mains or discharge pipes within the boundaries of the property.

3.3 Is any water main or service pipe serving or which is proposed to serve the properties the subject of an existing adoption agreement or an application for such an agreement?

Records confirm that water mains or service pipes serving all of the properties are not the subject of an existing adoption agreement or an application for such an agreement.

3.4 Are the properties at risk of receiving low water pressure or flow?

Records confirm that the property is not recorded on a register kept by the water undertaker as being at risk of receiving low water pressure or flow.

3.5 What is the classification of the water supply for the property?

The water supplied to the property has an average water hardness of 106.1mg/l calcium which is defined as HARD by ThamesWater.

3.6 Please include details of the location of any water meter serving the properties.

Records indicate that the following properties are served by a water meter, which is located within the property.
41 - 49, Battersea Park Road, London, SW8 5AL
Workshop Rear Of, 41 - 49, Battersea Park Road, London, SW8 5AL

Charging

4.1.1 – Who is responsible for providing the sewerage services for the property?

Thames Water Utilities Limited, Clearwater Court, Reading, RG1 8DB is the sewerage undertaker for the area.

4.1.2 – Who is responsible for providing the water services for the property?

Thames Water Utilities Limited, Clearwater Court, Reading, RG1 8DB is the water undertaker for the area.

4.2 Who bills the properties for sewerage services?

If you wish to know who bills the sewerage services for this property then you will need to contact the current owner. For a list of all potential retailers of sewerage services for the property please visit www.open-water.org.uk

4.3 Who bills the properties for water services?

If you wish to know who bills the water services for this property then you will need to contact the current owner. For a list of all potential retailers of water services for the property please visit www.open-water.org.uk

4.4 Is there a meter installed at this property?

Records indicate that there is a meter installed at the following properties:
41 - 49, Battersea Park Road, London, SW8 5AL
Workshop Rear Of, 41 - 49, Battersea Park Road, London, SW8 5AL

4.5 Trade Effluent Consent

Are there any trade effluent consents relating to this site/property for disposal of chemically enhanced waste?

The following properties do not have a trade effluent consent:
41 - 49, Battersea Park Road, London, SW8 5AL

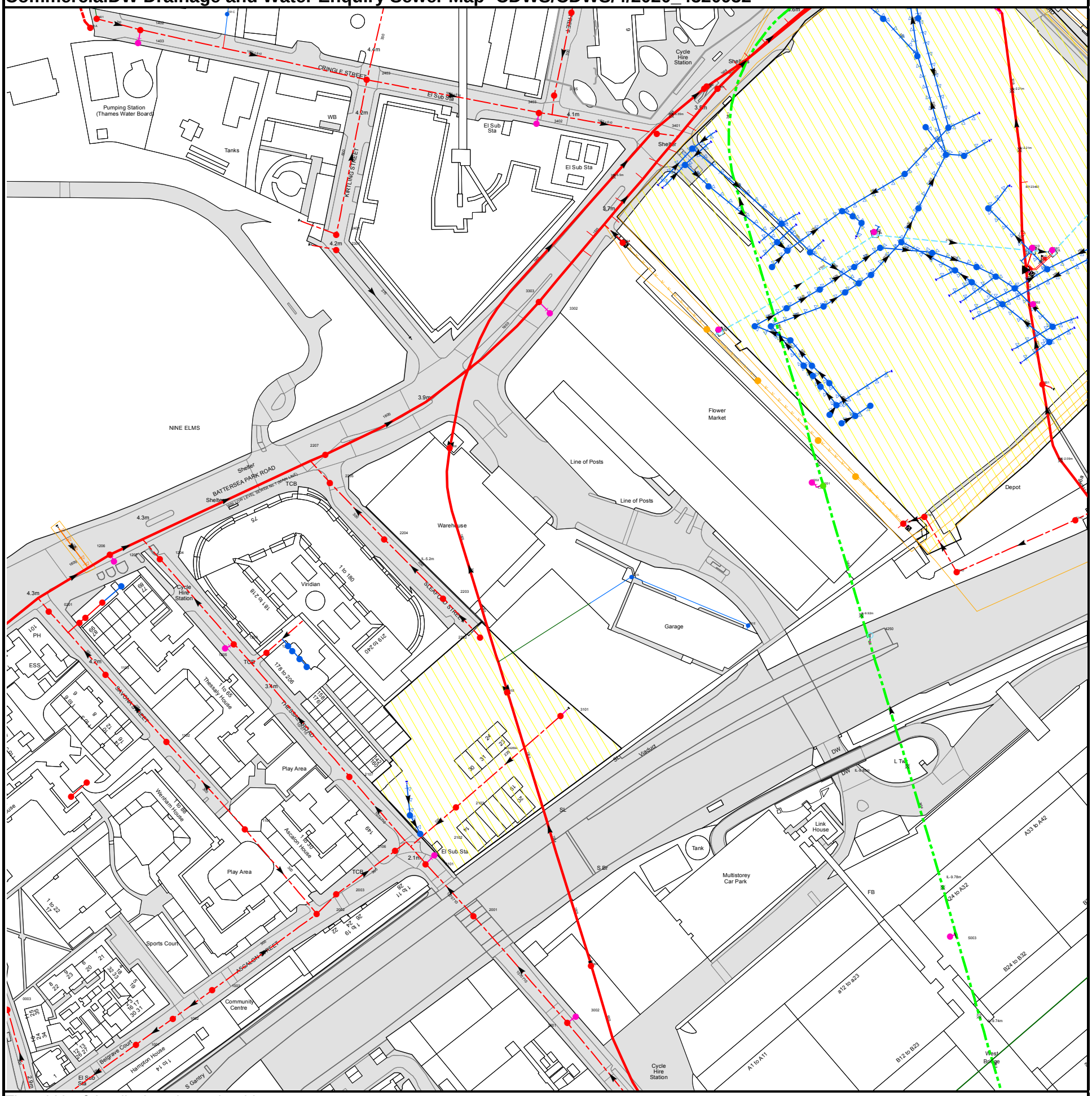
The following properties do have a trade effluent consent. For further information regarding Trade Effluent consents please contact: Trade Effluent Control, Crossness STW, Belvedere Road, Abbey Wood, London SE2 9AQ.
Workshop Rear Of, 41 - 49, Battersea Park Road, London, SW8 5AL

Payment for this Search

A charge will be added to your suppliers account.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information.

CommercialDW Drainage and Water Enquiry Sewer Map- CDWS/CDWS/4/2020_4320932



The width of the displayed area is 500m

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

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
3303	3.67	-2
3302	3.67	-2
431C	n/a	n/a
431B	3.91	-.12
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
2203	3	-.29
2306	4.13	-5.27
2103	n/a	n/a
2202	2.67	-.18
3102	2.48	-5.13
3101	2.23	.13
321A	n/a	n/a
421E	n/a	n/a
4202	3.73	n/a
4201	n/a	n/a
1202	n/a	n/a
22BE	n/a	n/a
22BD	n/a	n/a
22BC	n/a	n/a
22BB	n/a	n/a
2207	3.94	-1.92
2205	4.04	-.84
2107	2.77	-1.35
2204	3.58	-.56

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.

Sewer Key - Commercial Drainage and Water Enquiry

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: 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

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

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.

2) All measurements on the plans are metric.

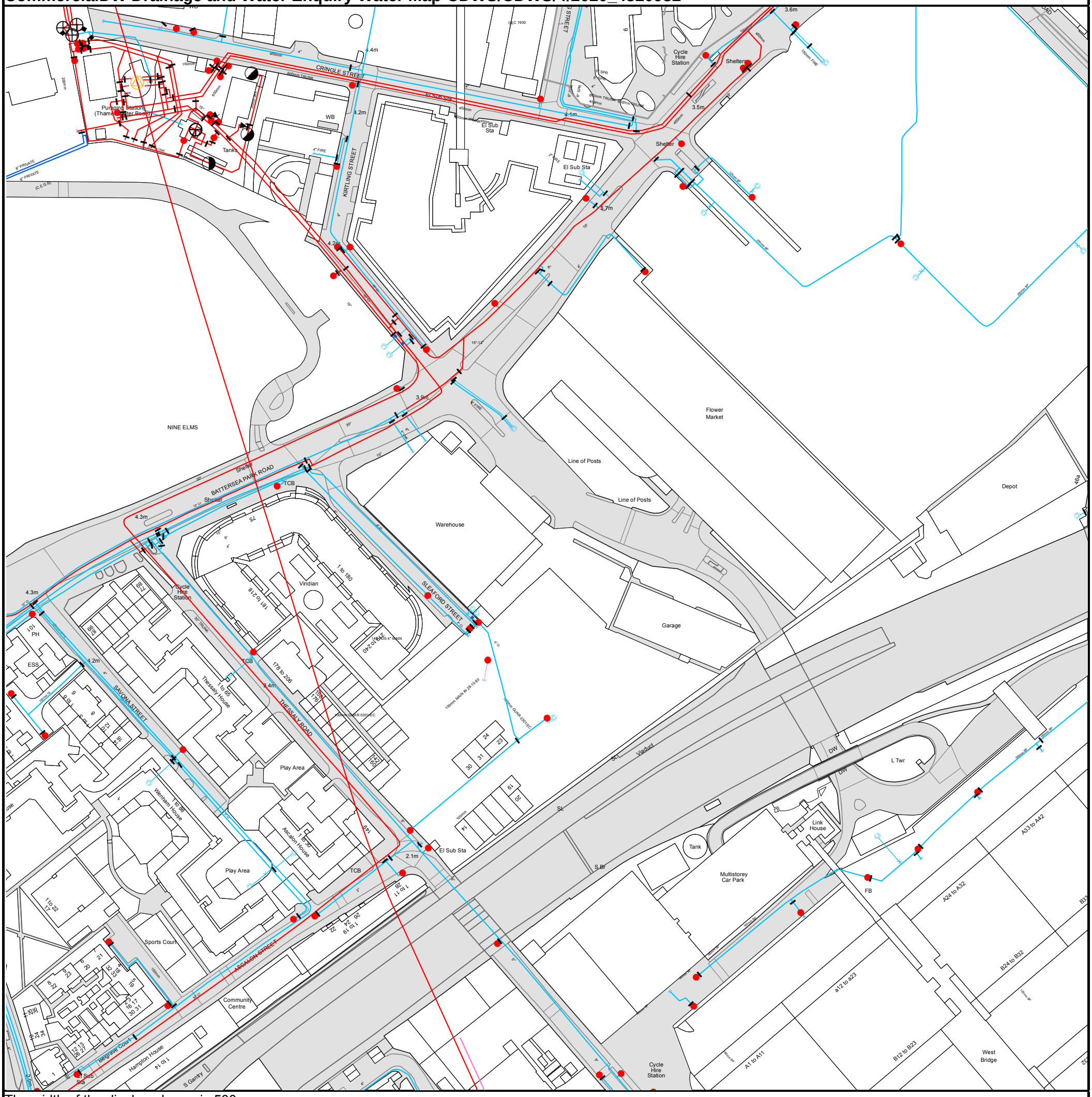
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

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.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. 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 Searches on 0118 925 1504.

CommercialDW Drainage and Water Enquiry Water Map-CDWS/CDWS/4/2020_4320932



The width of the displayed area is 500m

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.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

Waterworks Key - Commercial Drainage and Water Enquiry

Water Pipes (Operated & Maintained by Thames Water)

4"

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

16"

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.

3" SUPPLY

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

3" FIRE

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

3" METERED

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' 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)

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: Indiates 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.

For your guidance:

- Thames Water Property Searches Complaints Procedure:
  - Thames Water Property Searches offers a robust complaints procedure. Complaints can be made by telephone, in writing, by email (searches@thameswater.co.uk) or through our website (www.thameswater-propertysearches.co.uk)

As a minimum standard Thames Water Property Searches will:

- endeavour to resolve any contact or complaint at the time of receipt. If this isn't possible, we will advise of timescales;
- investigate and research the matter in detail to identify the issue raised (in some cases third party consultation will be required);
- provide a response to the customer within 10 working days of receipt of the complaint;
- provide compensation, if no response or acknowledgment that we are investigating the case is given within 10 working days of receipt of the complaint;
- keep you informed of the progress and, depending on the scale of investigation required, update with new timescales as necessary;
- provide an amended search, free of charge, if required;
- provide a refund if we find your complaint to be justified; take the necessary action within our power to put things right.

If you want us to liaise with a third party on your behalf, just let us know.

If you are still not satisfied with the outcome provided, we will refer the matter to a Senior Manager, for resolution, who will respond again within 5 working days.

If you remain dissatisfied with our final response you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). Further information can be obtained by visiting www.tpos.co.uk or by sending an email to admin@tpos.co.uk

Question 1.1

For your guidance:

- The Water Industry Act 1991 defines Public Sewers as those which Thames Water have responsibility for. Other assets and rivers, watercourses, ponds, culverts or highway drains may be shown for information purposes only.
- 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.
- Assets other than public sewers may be shown on the copy extract, for information.

Question 1.2

For your guidance:

- The “water mains” in this context are those, which are vested in and maintainable by the water company under statute.
- Assets other than public water mains may be shown on the plan, for information only.
- Water companies are not responsible for private supply pipes connecting the property to the public water main and do not hold details of these. These may pass through land outside of the control of the seller, or may be shared with adjacent properties. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
- 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.

Question 2.1

For your guidance:

- Water companies are not responsible for any private drains that connect the property to the public sewerage system and do not hold details of these. The property owner will normally have sole responsibility for private drains serving the property. These may pass through land outside the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
- If foul water does not drain to the public sewerage system, the property may have private facilities in the form of a cesspit, septic tank or other type of treatment plant.
- An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

Question 2.2

For your guidance:

- Sewerage Undertakers are not responsible for any private drains that connect the property to the public sewerage system, and do not hold details of these.
- The property owner will normally have sole responsibility for private drains serving the property. These private drains may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
- In some cases, 'Sewerage Undertakers' records do not distinguish between foul and surface water connections to the public sewerage system.
- At the time of privatisation in 1989, Sewerage Undertakers were sold with poorly-kept records of sewerage infrastructure. The records did not always show which properties were connected for surface water drainage purposes. Accordingly, billing records have been used to provide an answer for this element of the drainage and water search.
- Due to the potential inadequacy of 'Sewerage Undertakers' infrastructure records with respect to surface water drainage, it is the customer's responsibility to inform the Sewerage Undertaker that they do not receive the surface water drainage service. If on inspection, the buyer finds that surface water from the property does not drain to a public sewer, then the property may be eligible for a rebate of the surface water drainage charge. If you wish to know who bills the sewerage services for this property then you will need to contact the current owner. For a list of all potential retailers of sewerage services for the property please visit www.open-water.org.uk.
- If surface water from the property does not drain to the public sewerage system, the property may have private facilities in the form of a soakaway or private connection to a watercourse.
- An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

Question 2.3

For your guidance:

- If surface water from the property drains to a public sewer, then a surface water drainage charge is payable.
- Where a surface water drainage charge is currently included in the property's water and sewerage bill but, on inspection, the buyer finds that surface water from the property does not drain to a public sewer, then the property may be eligible for a rebate of the surface water drainage charge. If you wish to know who bills the sewerage services for this property then you will need to contact the current owner. For a list of all potential retailers of sewerage services for the property please visit www.open-water.org.uk.

Question 2.4

For your guidance:

- Thames Water has a statutory right of access to carry out work on its assets. Employees of Thames Water or its contractors may, therefore, need to enter the property to carry out work.
- Please note if the property was constructed after 1st July 2011 any sewers and/or lateral drain within the boundary of the property are the responsibility of the householder.
- The approximate boundary of the property has been determined by reference to the Ordnance Survey Record or the map supplied.
- The presence of a public sewer running within the boundary of the property may restrict further development. The Company has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the Company, or its contractors, needing to enter the property to carry out work.
- 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.

Question 2.4.1

For your guidance:

- Private pumping stations installed before 1st July 2011 will be transferred into the ownership of the sewerage undertaker.
- From the 1st October 2016 private pumping stations which serve more than one property have been transferred into public ownership but may not be recorded on the public sewer map.
- The approximate boundary of the property has been determined by reference to the Ordnance Survey Record or the map supplied.
- The presence of a public pumping station within the boundary of the property may restrict further development. The company has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the company, or its contractors, needing to enter the property to carry out work.
- 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.

Question 2.5

For your guidance:

- From the 1st October 2011 there may be additional lateral drains and/or public sewers which are not recorded on the public sewer map but are also within 30.48 metres (100 feet) of a building within the property.
- The presence of a public sewer within 30.48 metres (100 feet) of the building(s) within the property can result in the local authority requiring a property to be connected to the public sewer.
- The measurement is estimated from the Ordnance Survey record, between the building(s) within the boundary of the property and the nearest public sewer.
- 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.

Question 2.5.1

For your guidance:

- Private pumping stations installed before 1st July 2011 will be transferred into the ownership of the sewerage undertaker.
- From the 1st October 2016 private pumping stations which serve more than one property have been transferred into public ownership but may not be recorded on the public sewer map.
- The presence of a public pumping station within 50 metres of the building(s) within the property can result in the local authority requiring a property to be connected to the public sewer.
- The measurement is estimated from the Ordnance Survey record, between the building(s) within the boundary of the property and the nearest public sewer.
- 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.

Question 2.6

For your guidance:

- Any sewers and/or lateral drains within the boundary of the property are not the subject of an adoption agreement and remain the responsibility of the householder. Adoptable sewers are normally those situated in the public highway.
- This enquiry is of interest to purchasers who will want to know whether or not the property will be linked to a public sewer.
- Where the property is part of a very recent or ongoing development and the sewers are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains and sewers for which they will hold maintenance and renewal liabilities.
- Final adoption is subject to the developer complying with the terms of the adoption agreement under Section 104 of the Water Industry Act 1991 and meeting the requirements of 'Sewers for Adoption' 6th Edition.

Question 2.7

For your guidance:

- From the 1st October 2011 most private sewers, disposal mains and lateral drains were transferred into public ownership and the sewerage undertaker may not have been approved or consulted about any plans to erect a building or extension on the property over or in the vicinity of these.
- Buildings or extensions erected over a sewer in contravention of building controls may have to be removed or altered.

Question 2.8

For your guidance:

- For reporting purposes buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- A sewer is "overloaded" when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- "Internal flooding" from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- "At Risk" properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company's reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water Utilities Ltd on Tel: 0800 316 9800 or website www.thameswater.co.uk

Question 2.9

For your guidance:

- The nearest sewage treatment works will not always be the sewage treatment works serving the catchment within which the property is situated.
- The sewerage undertaker's records were inspected to determine the nearest sewage treatment works.
- It should be noted that there may be a private sewage treatment works closer than the one detailed above that has not been identified.
- As a responsible utility operator, Thames Water Utilities Ltd seeks to manage the impact of odour from operational sewage works on the surrounding area. This is done in accordance with the Code of Practice on Odour Nuisance from Sewage Treatment Works issued via the Department of Environment, Food and Rural Affairs (DEFRA). This Code recognises that odour from sewage treatment works can have a detrimental impact on the quality of the local environment for those living close to works. However DEFRA also recognises that sewage treatment works provide important services to communities and are essential for maintaining standards in water quality and protecting aquatic based environments. For more information visit www.thameswater.co.uk

Question 3.1

For your guidance:

- The Company does not keep details of private supplies. The situation should be checked with the current owner of the property.

Question 3.2

For your guidance:

- The boundary of the property has been determined by reference to the plan supplied. Where a plan was not supplied, the Ordnance Survey Record was used. If the Water undertaker mentioned in Question 4.1.2 is not Thames Water Utilities Ltd the boundary of the property has been determined by the Ordnance Survey.
- The presence of a public water main within the boundary of the property may restrict further development within it. Water companies have a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of the Company, or its contractors, needing to enter the property to carry out work.

Question 3.3

For your guidance:

- This enquiry is of interest to purchasers who will want to know whether or not the property will be linked to the mains water supply.

Question 3.4

For your guidance:

- "Low water pressure" means water pressure below the regulatory reference level, which is the minimum pressure when demand on the system is not abnormal.
- Water Companies are required to include in the Regulatory Register that is presented annually to the Director General of Water Services, properties receiving pressure below the reference level, provided that allowable exclusions do not apply (i.e. events which can cause pressure to temporarily fall below the reference level)
- The reference level of service is a flow of 9 litres/minute at a pressure of 10metres / head on the customer's side of the outside stop valve (osv). The reference level of service must be applied on the customer's side of a meter or any other company fittings that are on the customer's side of the main stop tap. The reference level applies to a single property. Where more than one property is served by a common service pipe, the flow assumed in the reference level must be appropriately increased to take account of the total number of properties served. For two properties, a flow of 18 litres/minute at a pressure of 10metres/head on the customers' side of the osv is appropriate. For three or more properties the appropriate flow should be calculated from the standard loadings provided in BS806-3 or the Institute of Plumbing handbook.
- **Allowable exclusions** The Company is required to include in the Regulatory Register properties receiving pressure below the reference level, provided that allowable exclusions listed below do not apply.
- **Abnormal demand:** This exclusion is intended to cover abnormal peaks in demand and not the daily, weekly or monthly peaks in demand, which are normally expected. Companies should exclude from the reported figures properties which are affected by low pressure only on those days with the highest peak demands. During the report year companies may exclude, for each property, up to five days of low pressure caused by peak demand.
- **Planned maintenance:** Companies should not report low pressures caused by planned maintenance. It is not intended that companies identify the number of properties affected in each instance. However, companies must maintain sufficiently accurate records to verify that low-pressure incidents that are excluded because of planned maintenance are actually caused by maintenance.
- **One-off incidents:** This exclusion covers a number of causes of low pressure; mains bursts; failures of company equipment (such as pressure reducing valves or booster pumps); firefighting; and action by a third party. However, if problems of this type affect a property frequently, they cannot be classed as one-off events and further investigation will be required before they can be excluded.
- **Low-pressure incidents of short duration:** Properties affected by low pressure, which only occur for a short period, and for which there is evidence that incidents of a longer duration would not occur during the course of the year, may be excluded from the reported figures.
- Please contact your water undertaker mentioned in Question 4.1.2 if you require further information on water pressure.

Question 3.5

For your guidance:

- Water hardness can be expressed in various indices for example the hardness settings for dishwashers are commonly expressed in Clark's degrees, but check with the manufacturer as there are also other units. The following table shows the normal ranges of hardness.

Thames Water Hardness Category	Calcium (mg/l)	Calcium Carbonate (mg/l)	English Clarke degrees	French degrees	General/ German degrees
Soft	0 to 40	0 to 100	0 to 7	0 to 10	0 to 5.6
Medium	41 to 80	101 to 200	8 to 14	11 to 20	5.7 to 11.2
Hard	Over 80	Over 200	Over 14	Over 20	over 11.2

- Please contact your water undertaker mentioned in Question 4.1.2 if you require further information on water hardness.

Question 3.6

For your guidance:

- Where a meter does not serve the property and the customer wishes to consider this method of charging, they should contact the current owner if they wish to know who bills the water services for this property. For a list of all potential retailers of water services for the property please visit www.open-water.org.uk.

Question 4.4

For your guidance:

- The Water Industry Act 1991 Section 150, The Water Resale Order 2001 provides protection for people who buy their water or sewerage services from a person or company instead of directly from a water or sewerage company. Details are available from the Office of Water Services (OFWAT) website is www.ofwat.gov.uk.
- The Company may install a meter at the premises where a buyer makes a change of use of the property or where the buyer uses water for:
  - Watering the garden other than by hand (this includes the use of sprinklers).
  - Automatically replenishing a pond or swimming pool with a capacity greater than 10,000 litres.
  - A bath with a capacity in excess of 230 litres.
  - A reverse osmosis unit
- Where a meter does not serve the property and the customer wishes to consider this method of charging, they should contact the current owner if they wish to know who bills the sewerage and water services for this property. For a list of all potential retailers of sewerage and water services for the property please visit www.open-water.org.uk.

Question 4.5

For your guidance:

- If a Trade effluent consent applies to the premises which are the subject of this search, it is for the applicant to satisfy itself as to the suitability of the consent for its client's requirements. The occupier of any trade premises in the area of a sewerage undertaker may discharge any trade effluent proceeding from those premises into the undertaker's public sewers if he does so with the undertaker's consent. If, in the case of any trade premises, any trade effluent is discharged without such consent or other authorisation, the occupier of the premises shall be guilty of an offence.
- Please note any existing consent is dependent on the business being carried out at the property and will not transfer automatically upon change of ownership.
- For further information regarding Trade Effluent consents please contact: Trade Effluent Control, Crossness STW, Belvedere Road, Abbey Wood London SE2 9AQ.

Customer and Clients are asked to note these terms, which govern the basis on which this CommercialDW Drainage & Water Enquiry is supplied

Definitions

'Client' means the person, company or body who is the intended recipient of the Report with an actual or potential interest in the Property.
'Company' means a water service company or their data service provider producing the Report.
'Customer' means the person, company, firm or other legal body placing the Order, either on their own behalf as Client, or, as an agent for a Client.
'Order' means any request completed by the Customer requesting the Report.
'Property' means the address or location supplied by the Customer in the Order.
'Report' means the drainage and/or water report prepared by The Company in respect of the Property.
'Thames Water" means Thames Water Utilities Limited registered in England and Wales under number 2366661 whose registered office is at Clearwater Court, Vastern Road, Reading, Berks, RG1 8DB;

Agreement

1 Thames Water agrees to supply the Report to the Customer and the Client subject to these terms. The scope and limitations of the Report are described in paragraph 2 of these terms. Where the Customer is acting as an agent for the Client then the Customer shall be responsible for bringing these terms to the attention of the Client. The Customer and Client agree that the placing of an Order for a Report indicates their acceptance of these terms.

The Report

2. Whilst Thames Water will use reasonable care and skill in producing the Report, it is provided to the Customer and the Client on the basis that they acknowledge and agree to the following:-

2.1 The information contained in the Report can change on a regular basis so Thames Water cannot be responsible to the Customer and the Client for any change in the information contained in the Report after the date on which the Report was produced and sent to the Client.

2.2 The Report does not give details about the actual state or condition of the Property nor should it be used or taken to indicate or exclude actual suitability or unsuitability of the Property for any particular purpose, or relied upon for determining saleability or value, or used as substitute for any physical investigation or inspection. Further advice and information from appropriate experts and professionals should always be obtained.

2.3 The information contained in the Report is based upon the accuracy, completeness and legibility of the address and other information supplied by the Customer or Client.

2.4 The Report provides information as to the location and connection of existing services and should not be relied on for any other purpose. The Report may contain opinions or general advice to the Customer and the Client and Thames Water cannot ensure that any such opinion or general advice is accurate, complete or valid and accepts no liability therefore.

2.5 The position and depth of apparatus shown on any maps attached to the Report are approximate, and are furnished as a general guide only, and no warranty as to its correctness is given or implied. The exact positions and depths should be obtained by excavation trial holes and the maps must not be relied on in the event of excavation or other works made in the vicinity of apparatus shown on any maps.

Liability

3 Thames Water shall not be liable to the Client for any failure, defect or non-performance of its obligations arising from any failure of, or defect in any machine, processing system or transmission link or anything beyond Thames Water's reasonable control or the acts or omissions of any party for whom Thames Water are not responsible.

3.1 Where the Customer sells this report to a Client (other than in the case of a bona fide legal adviser recharging the cost of the Report as a disbursement) Thames Water shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) be liable for any loss or damage whatsoever and the Customer shall indemnify Thames Water in respect of any claim by the Client.

3.2 Where a report is requested for an address falling within a geographical area where Thames Water and another Company separately provide Water and Sewerage Services, then it shall be deemed that liability for the information given by Thames Water or the Company as the case may be will remain with Thames Water or the Company as the case may be in respect of the accuracy of the information supplied. Where Thames Water is supplying information which has been provided to it by another Company for the purposes outlined in this agreement Thames Water will therefore not be liable in any way for the accuracy of that information and will supply that information as agent for the Company from which the information was obtained.

3.3 Except in respect of death or personal injury caused by negligence, or as expressly provided in these Terms:

3.3.1 The entire liability of Thames Water or the Company as the case may be in respect of all causes of action arising under or in connection with the Report (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) shall not exceed £2,000,000 (two million pounds); and

3.3.2 Thames Water shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) be liable for any loss of profit, loss of goodwill, loss of reputation, loss of business or any indirect, special or consequential loss, damage or other claims, costs or expenses;

Copyright and Confidentiality

4. The Customer and the Client acknowledge that the Report is confidential and is intended for the personal use of the Client. The copyright and any other intellectual property rights in the Report shall remain the property of Thames Water or the Company as the case may be. No intellectual or other property rights are transferred or licensed to the Customer or the Client except to the extent expressly provided

4.1 The Customer or Client is entitled to make copies of the Report but is not permitted to copy any maps contained in, or attached to the Report

4.2 The maps contained in the Report are protected by Crown Copyright and must not be used for any purpose outside the context of the Report.

4.3 The Customer and Client agree (in respect of both the original and any copies made) to respect and not to alter any trademark, copyright notice or other property marking which appears on the Report.

Payment

5. Unless otherwise stated all prices are inclusive of VAT. The Customer shall pay for the price of the Report specified by Thames Water, without any set off, deduction or counterclaim.

5.1 Unless payment has been received in advance, Customers shall be invoiced for the agreed fee once their request has been processed. Any such invoice must be paid within 14 days. Where the Customer has an account with Thames Water, payment terms will be as agreed with Thames Water.

5.2 No payment shall be deemed to have been received until Thames Water has received cleared funds.

5.3 If the Customer fails to pay Thames Water any sum due Thames Water shall be entitled but not obliged to charge the Customer interest on the sum from the due date for payment at the annual rate of 2% above the base lending rate from time to time of Natwest Bank, accruing on a daily basis until payment is made. Thames Water reserves the right to claim interest under the Late Payment of Commercial Debts (Interest) Act 1998.

5.4 Thames Water reserves the right to increase fees on reasonable prior written notice at any time.

Cancellations or Alterations

6. Once an Order is placed, Thames Water shall not be under any obligation to accept any request to cancel that Order and payment for the Order shall still be due upon completion of the Report. In cases where an error has been made in the original Order (e.g. the Customer has supplied an incorrect address), the Customer will need to place a second Order, detailing the correct information, and shall be liable to pay a second charge in accordance with clause 5 above.

Delivery

7. On receiving your order the reports will be posted to you within 10 working days from receipt.

7.1 Delivery is subject to local post conditions and regulations. All items should arrive within 12 working days, but Thames Water cannot be held responsible should delays be caused by local post conditions, postal strikes or other causes beyond the control of Thames Water.

General

8. If any provision of these terms is or becomes invalid or unenforceable, it will be taken to be removed from the rest of these terms to the extent that it is invalid or unenforceable. No other provision of these terms shall be affected.

8.1 These terms shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts.

8.2 Nothing in this notice shall in any way restrict the Customer or Clients statutory or any other rights of access to the information contained in the Report.

These Terms & Conditions are available in larger print for those with impaired vision.

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 TWUL 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. TWUL 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 TWUL's discretion for increased administration costs.

A copy of TWUL'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.

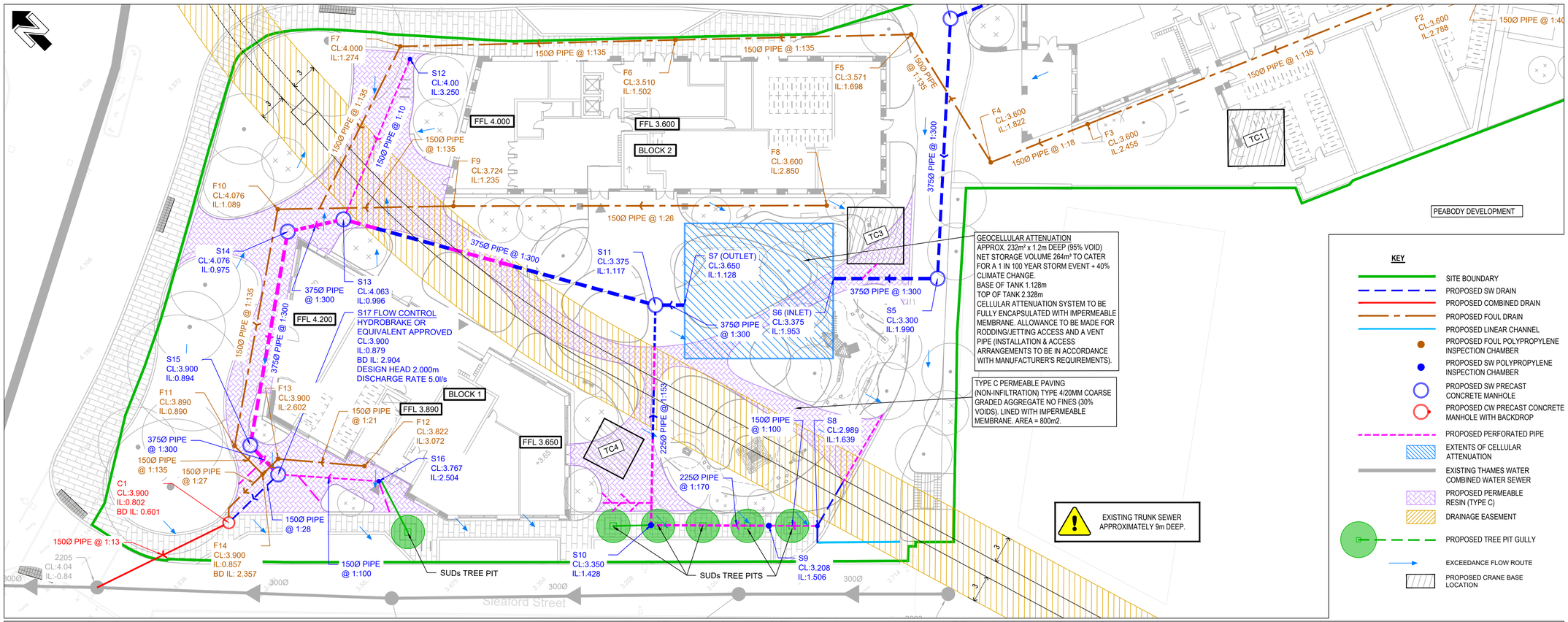
If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

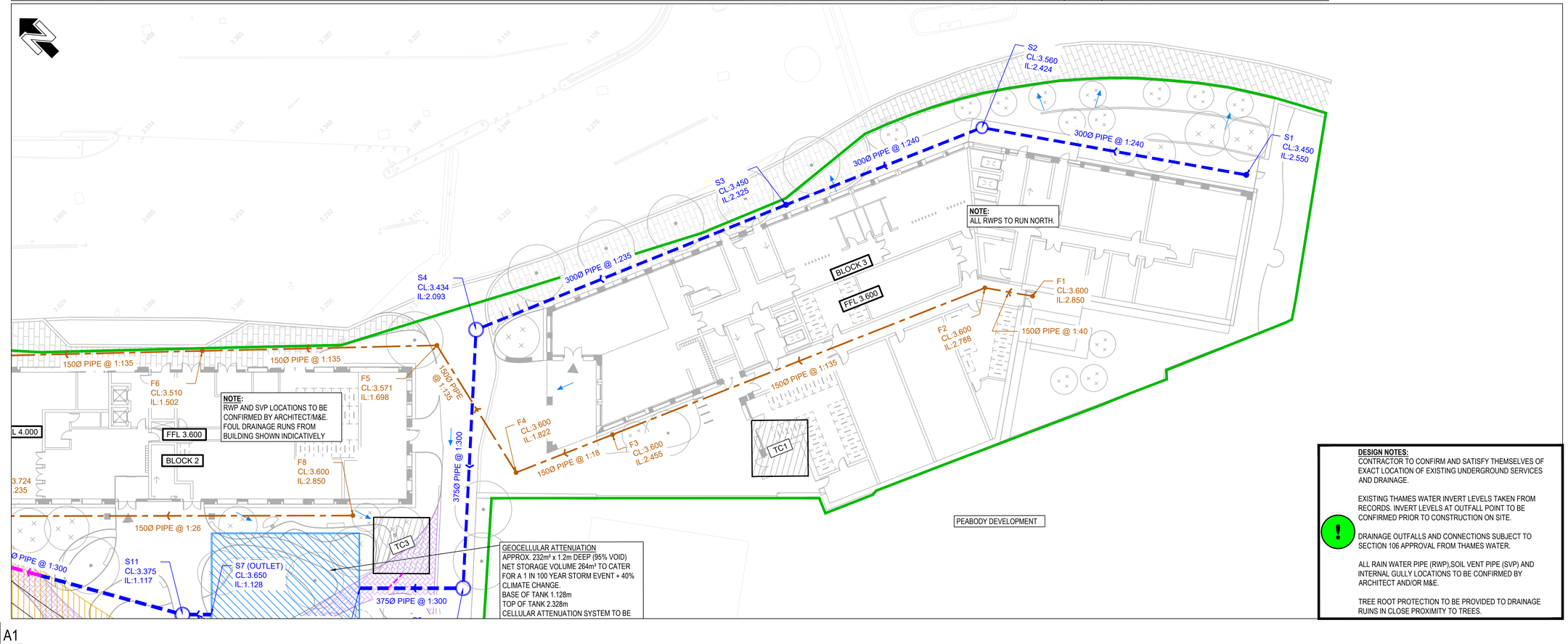
If the goods or services covered by this invoice falls under the regulation of the Water Industry Act 1991, and you remain dissatisfied you can refer your complaint to CC Water on 0845 039 2837 (it will cost you the same as a local call) or write to them at 11 Belgrave Road, London SW1V 1RB.

Ways to pay your bill

By Post – Cheque only, made payable to 'Thames Water Utilities Ltd' writing your Thames Water account number on the back. Please fill in the payment slip below and send it with your cheque to Thames Water Utilities Ltd., PO Box 223, Swindon SN38 2TW	**By BACS Payment** direct to our bank on account number 90478703, sort code 60-00-01 may be made. A remittance advice must be sent to Thames Water Utilities Ltd., PO Box 223, Swindon SN38 2TW. Or fax to 01793 424599 or email: cashoperations@thameswater.co.uk	**Telephone Banking** By calling your bank and quoting your invoice number and the Thames Water`s bank account number 90478703 and sort code 60-00-01	**By Swift Transfer** You may make your payment via SWIFT by quoting **NWBKGB2L** together with our bank account number 90478703, sort code 60-00-01 and invoice number

Appendix E – Drainage Drawings





DESIGN NOTES:
CONTRACTOR TO CONFIRM AND SATISFY THEMSELVES OF EXACT LOCATION OF EXISTING UNDERGROUND SERVICES AND DRAINAGE.

EXISTING THAMES WATER INVERT LEVELS TAKEN FROM RECORDS. INVERT LEVELS AT OUTFALL POINT TO BE CONFIRMED PRIOR TO CONSTRUCTION ON SITE.

DRAINAGE OUTFALLS AND CONNECTIONS SUBJECT TO SECTION 106 APPROVAL FROM THAMES WATER.

ALL RAIN WATER PIPE (RWP),SOIL VENT PIPE (SVP) AND INTERNAL GULLY LOCATIONS TO BE CONFIRMED BY ARCHITECT AND/OR M&E.

TREE ROOT PROTECTION TO BE PROVIDED TO DRAINAGE RUINS IN CLOSE PROXIMITY TO TREES.

Notes

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS TOGETHER WITH THE APPROPRIATE SPECIFICATIONS.
- IT IS THE CONTRACTORS RESPONSIBILITY TO CHECK ALL DIMENSIONS ON SITE. DIMENSIONS MUST NOT BE SCALED FROM THIS DRAWING. ANY DISCREPANCIES TO BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT IN WRITING.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- ALL LEVELS ARE IN METRES, UNLESS NOTED OTHERWISE

GENERAL NOTES:

1. THE WORKS SHALL BE IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS, NATIONAL BUILDING SPECIFICATION (NBS) BUILDING REGULATIONS PART H & VOLUME 1 OF THE MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS DRAWINGS, ARCHITECTS DRAWINGS, MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS.
3. THE LOCATION, LINE & LEVEL OF ALL KNOWN EXISTING BURIED SERVICE MAINS AND DRAINAGE PIPEWORK INDICATED ON THE DRAWINGS ARE APPROXIMATE AND FOR GUIDANCE PURPOSES ONLY. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE THEIR EXACT LINE & LEVEL BY WAY OF HAND EXCAVATED TRIAL PITS, PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION WORKS ON SITE. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN THE STRUCTURAL INTEGRITY OF ALL ABOVE AND BELOW GROUND SERVICE MAINS / DRAINAGE INSTALLATIONS.
4. THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.
5. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.
6. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE MITIGATION OF ALL OCCURRENCES OF GROUND WATER DURING THE CONSTRUCTION PERIOD.
7. THE CONTRACTOR SHALL MAKE ALLOWANCE FOR RAISING / LOWERING ALL EXISTING ACCESS COVERS & FRAMES TO SUIT NEW FINISHED LEVELS.
8. CONTRACTOR TO CONFIRM THE CONDITION OF THE EXISTING PIPES BEFORE REUSE. ANY PIPES THAT ARE BROKEN SHOULD BE LINED, REPAIRED OR REPLACED. ANY PIPES THAT ARE BLOCKED SHOULD BE CLEARED.
9. ALL SOFT / HARD PAVED AREAS AFFECTED BY THE WORKS SHALL BE FULLY REINSTATED UPON COMPLETION OF THE WORKS. ALL SURFACE MARKINGS DAMAGED BY THE WORKS SHALL BE FULLY REINSTATED.
10. 10. ALL SURPLUS EXCAVATED MATERIAL SHALL BE DISPOSED OF OFF SITE.
11. ALL LEVELS ARE TO ORDNANCE DATUM.
12. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE DRAINAGE STRATEGY REPORT 956-ACE-ZZ-XX-RP-C-1001 001.
13. THIS DRAWING IS A PRELIMINARY DRAINAGE STRATEGY AND LAYOUT ONLY. FURTHER DETAILS SHOULD BE CONFIRMED AT THE DETAILED DESIGN STAGE.
14. EXISTING SEWERS ARE SHOWN INDICATIVELY AND NEED TO BE CONFIRMED AT DETAILED DESIGN.
15. PIPE RUNS FROM BUILDINGS NOT SHOWN FOR CLARITY. CONSEQUENTLY NUMBER AND LOCATIONS OF PPICS SHOWN INDICATIVELY.
16. EXTERNAL WORKS DETAILS TO BE CONFIRMED BY LANDSCAPE ARCHITECT.
17. ALLOWANCE TO BE MADE FOR SLOT DRAINS, FACADE DRAINAGE AND GULLIES.

DRAINAGE DESIGN BASED ON THE FOLLOWING DRAWINGS:
'3082-PLA-XX-XX-DR-L00-0001-GENERAL ARRANGEMENT PLAN' (PLANIT IE)
'TOPO SURVEY DRAWING No. AC119-001' (C-SE SURVEY & ENGINEERING)

Rev	Date	By	Description	Appd
P04	27.03.23	BM	UPDATED TO SUIT COMMENT RECEIVED FROM LANDSCAPE ARCHITECT.	GB
P03	22.03.23	BM	UPDATED TO SUIT THE LATEST PLANS.	GB
P2	31.03.22	BM	EXTENTS OF PERMEABLE PAVING UPDATED TO MATCH LATEST LA PLANS. TANK REPOSITIONED TO SUIT CRANE BASE LOCATIONS. DRAWING NUMBER CHANGED.	GB
P1	11.02.22	BM	FIRST ISSUE	GB

PRELIMINARY

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Client
WATKIN JONES GROUP

Architect
GLENN HOWELLS ARCHITECTS

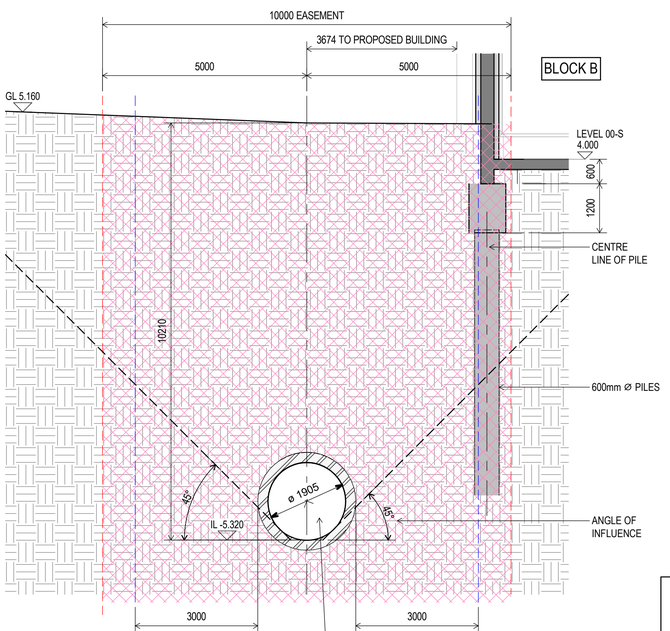
Project
BATTERSEA PARK ROAD
NINE ELMS
LONDON

Title
DRAINAGE STRATEGY LAYOUT

Scale	Drawn	Revision
1:250 @A1	BM	P04
Date	Checked	
08.02.2022	GB	

956-ACE-ZZ-XX-DR-C-8000

A1

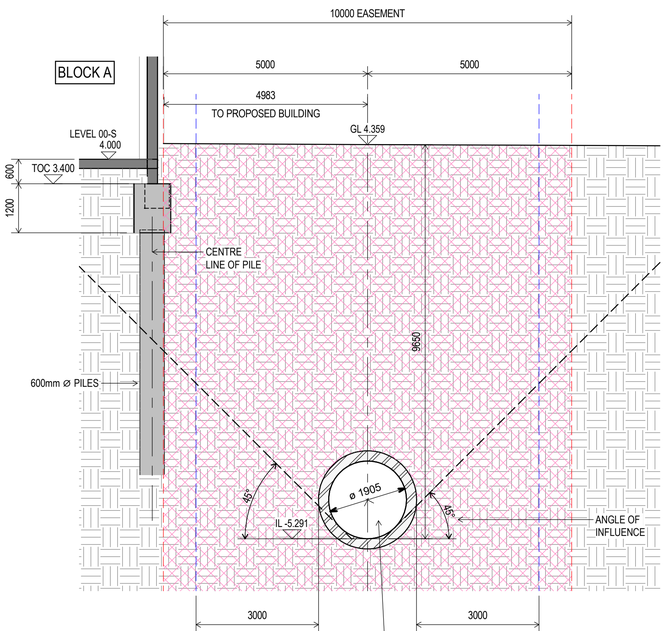


SECTION A-A

1 : 75

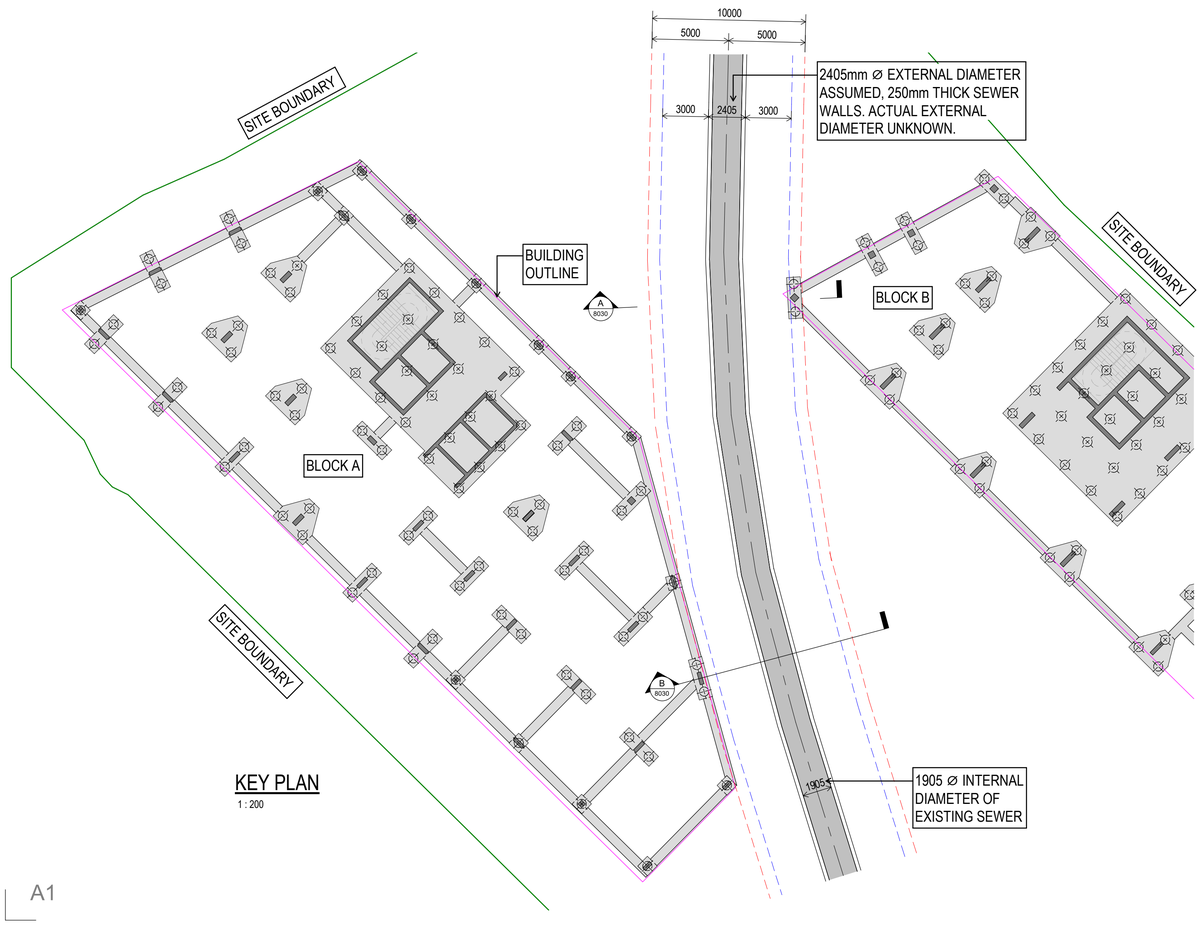
EASEMENT LEGEND

- 3m DEED OF EASEMENT EXTENTS
- 10m EASEMENT FROM SEWER CENTRELINE SHOWN FOR CLARITY



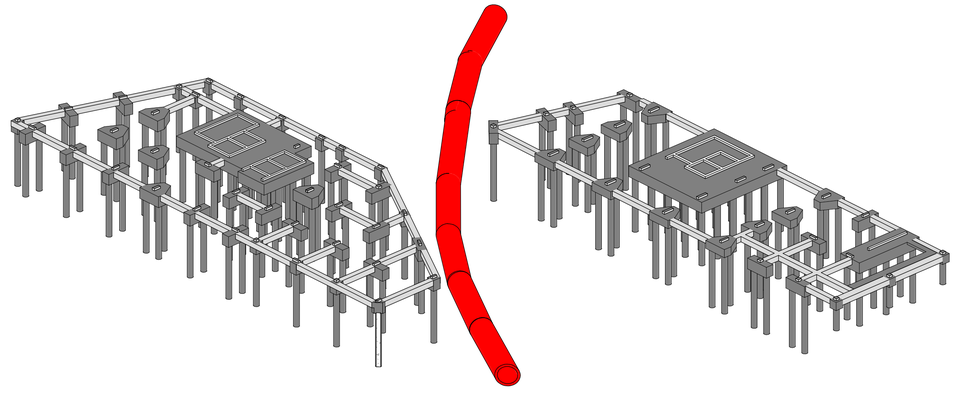
SECTION B-B

1 : 75



KEY PLAN

1 : 200



3D VIEW ON THAMES WATER SEWER

THAMES WATER SEWER SETTING OUT TAKEN FROM SURVEY DRAWING CSE-AC119_003-Booker, BATTERSEA - UTILITIES SURVEY REV B.

Notes

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS TOGETHER WITH THE APPROPRIATE SPECIFICATION.
- IT IS THE CONTRACTORS RESPONSIBILITY TO CHECK ALL DIMENSIONS ON SITE. DIMENSIONS MUST NOT BE SCALED FROM THIS DRAWING. ANY DISCREPANCIES TO BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT IN WRITING.
- ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
- ALL LEVELS ARE IN METRES, UNLESS NOTED OTHERWISE.

PILE NOTES

1. ALL PILES TO BE UNIFORMLY REINFORCED AROUND CIRCUMFERENCE THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PILE DESIGN AND SHALL BE RESPONSIBLE FOR ESTIMATING ANY ADDITIONAL ECCENTRICITIES AND FORCES ARISING FROM THE INSTALLATION OF THE PILES ABOVE THE CUT DOWN LEVEL. ALL PILES TO BE DESIGNED TO ACCOMMODATE SUCH FORCES AS INDICATED ON PILE INSTALLATION & ECCENTRICITIES DETAIL ON THIS DRAWING.
2. PILE DESIGN FORCES SHALL BE THE WORSE CASE COMBINATION OF THOSE SHOWN ON PILE FORCES & COMBINATIONS DETAIL ON THIS DRAWING.
3. REFER TO DRAWING FOR WORKING LOADS TO PILES.
4. A FULL TENSION AND COMPRESSION ANCHORAGE IS TO BE PROVIDED BETWEEN THE PILES AND THE ASSOCIATED PILE CAP FOUNDATIONS.
5. THE PILING CONTRACTOR IS TO SUBMIT FULL DETAILS OF PILING DESIGN FOR APPROVAL PRIOR TO COMMENCEMENT OF PILING WORKS.
6. PILES TO BE SPACED A MINIMUM OF 3 TIMES THE PILE DIAMETER.
7. PILE DESIGN SHOULD ALLOW FOR TEMPORARY LOCAL EXCAVATIONS FOR PILE CAPS. DEPTH 750mm BELOW PILING MAT LEVEL
8. ALL CONCRETE WORKS SHALL FULLY COMPLY WITH THE REQUIREMENTS OF BS 8110, BS EN 206-1 2000 AND THE NATIONAL STRUCTURAL CONCRETE SPECIFICATION FOR BUILDING CONSTRUCTION (LATEST EDITION)
9. GROUND WATER TO BE MANAGED TO REDUCE THE RISK OF GROUND WATER DRAW DOWN RESULTING IN DIFFERENTIAL SETTLEMENT OF NEIGHBOURING BUILDING.
10. MAN ENTRY INTO ANY EXCAVATION SHOULD BE AVOIDED. SHOULD IT PROVE NECESSARY, THE RISK SHOULD BE ASSESSED AND MITIGATED.
11. THE MAIN CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, INSTALLATION AND MAINTENANCE OF ALL TEMPORARY WORKS TO PROVIDE AND MAINTAIN ITS STABILITY TO ALL ADJACENT BUILDINGS, ROADWAYS AND EXISTING SERVICES OF THE ADJACENT AREAS AND STATUTORY AUTHORITIES.
12. THE ENGINEER IS TO BE NOTIFIED IN WRITING, IMMEDIATELY OF ANY DISCREPANCIES , FOR CLARIFICATION OF DETAILS.
13. PILING TO BE IN ACCORDANCE WITH ICE SPECIFICATION FOR PILING.
14. PILE STATIC LOAD TESTING TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE ICE SPECIFICATION FOR PILING, TAKING ACCOUNT OF THE LEVEL OF RISK RELATED TO THE CHARACTERISTICS OF THE PILING WORKS. A MINIMUM OF 2 WORKING PILE TESTS TO BE UNDERTAKEN. 100% INTEGRITY TESTING, 1% STATIC LOAD TESTED

⚠ DETAILED DESIGN AND SETTING OUT TO BE AGREED WITH THAMES WATER

⚠ PILE DESIGN TO INCLUDE AN ASSESSMENT OF THE POTENTIAL IMPACT OF THE SEWER INCLUDING SOIL STRESS ANALYSIS CALCULATIONS RESULTING FROM THE PILING OPERATION

⚠ PILING CONTRACTOR TO BE MADE AWARE OF SEWER LOCATION AND REQUIRED DEPTH OF PILES

Rev	Date	By	Description	Appd
P2	31.03.2022	LHR	UPDATED IN LINE WITH REVISED ARCHITECTS MODEL AND NEW UTILITIES SURVEY	LF
P1	28.01.2022	SDB	FIRST ISSUE	LF

PRELIMINARY

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Client

WATKIN JONES GROUP

Architect

GLENN HOWELLS ARCHITECTS

Project

BOOKER WHOLSESALE SITE, NINE ELMS, LONDON

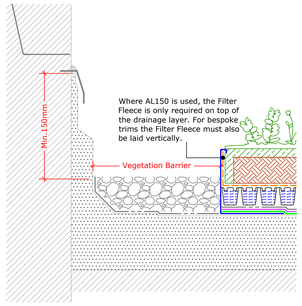
Title

BUILD OVER AGREEMENT
PLAN AND SECTIONS

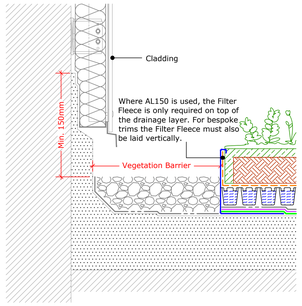
Scale	Drawn	Revision
As indicated@A1	SDB	P2
Date	Checked	
JANUARY 2022	LF	

956-ACE-00-XX-DR-C-8030

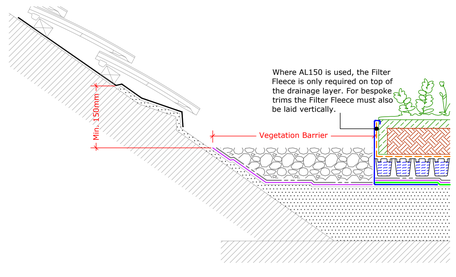
A1



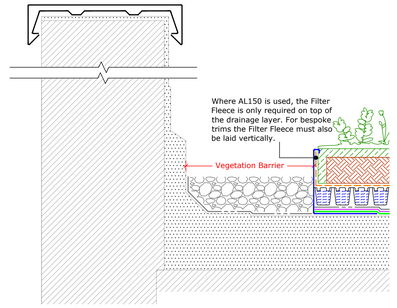
Upstand
(Drg.No: D0901/03-00W_0-4Deg_201-ExtInt-S-DB_001)



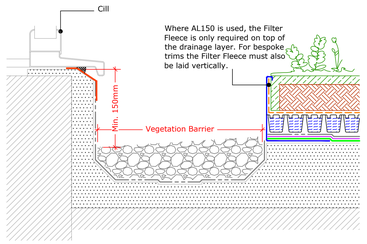
Upstand to Vertical Cladding or Slates/Tiles
(Drg.No: D0901/03-00W_0-4Deg_201-ExtInt-S-DB_002)



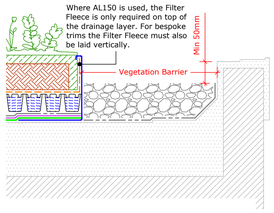
Upstand to Pitched Roof
(Drg.No: D0901/03-00W_0-4Deg_001-ExtInt-S-DB_004)



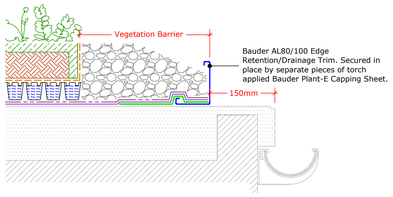
Upstand to Parapet
(Drg.No: D0901/03-00W_0-4Deg_203-ExtInt-S-DB_001)



Internal Gutter to Clerestory Window
(Drg.No: D0901/03-00W_0-4Deg_206-ExtInt-S-DB_003)

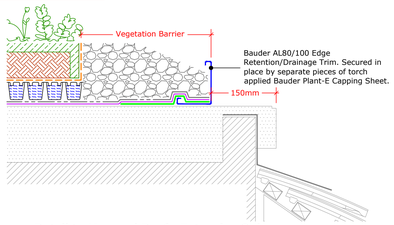


Perimeter Kerb
(Drg.No: D0901/03-00W_0-4Deg_002-ExtInt-S-DB_001)

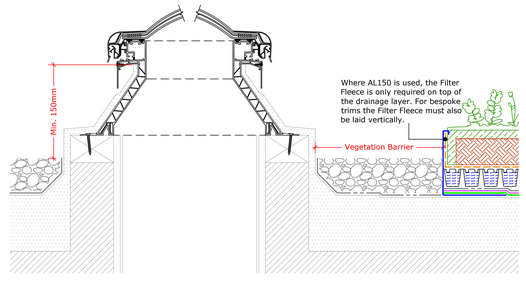


External Gutter
(Drg.No: D0901/03-00W_0-4Deg_006-ExtInt-S-DB_005)

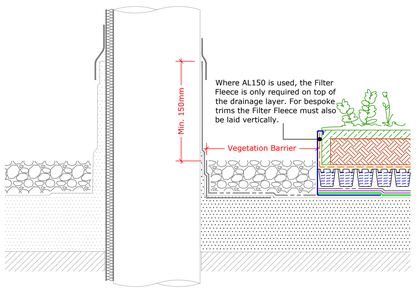
For Sedum XF300 Blanket or Wildflower XF118 Blanket
See Alternative Detail Shown



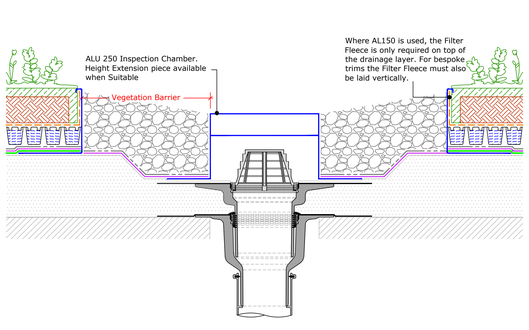
Detail to Mansard Roof - Extensive Only
(Drg.No: D0901/03-00W_0-4Deg_006-ExtInt-S-DB_006)



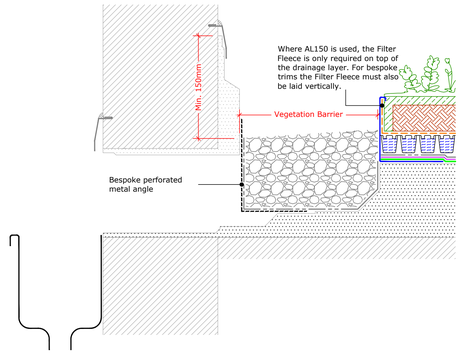
Upstand to Bauder Rooflight - Euroglaze
(Drg.No: D0901/03-00W_0-4Deg_008-ExtInt-S-DB_001)



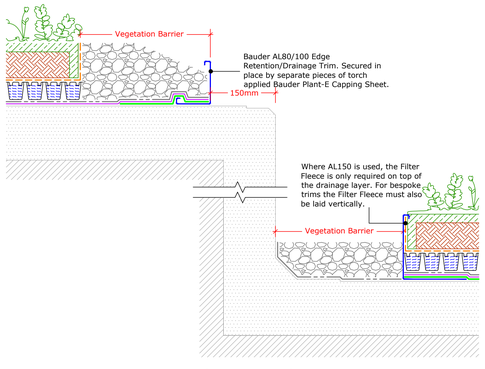
Upstand to Hot Flue or Cold Pipe
(Drg.No: D0901/03-00W_0-4Deg_007-ExtInt-S-DB_002)



Bauder Outlet - Compact
(Drg.No: D0901/03-00W_0-4Deg_006-ExtInt-S-DB_001)

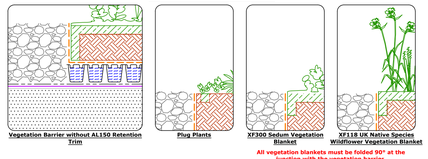


Upstand - Lead Chute
(Drg.No: D0901/03-00W_0-4Deg_206-ExtInt-S-DB_002)

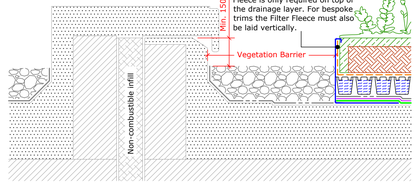


Change In Levels
(Drg.No: D0901/03-00W_0-4Deg_210-ExtInt_001)

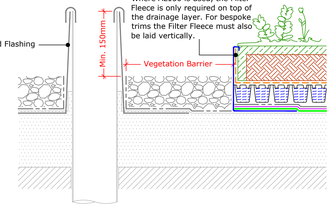
Vegetation Termination Detail



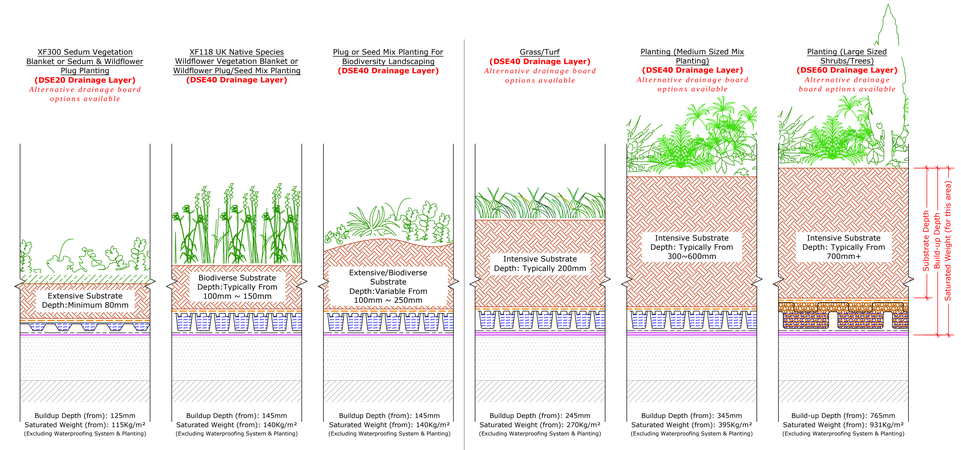
All vegetation blankets must be folded 90° at the junction with the vegetation barrier.



Twin Kerb Expansion Joint
(Drg.No: D0901/03-00W_0-4Deg_204-ExtInt-S-DB_001)



Soil Vent Pipe
(Drg.No: D0901/03-00W_0-4Deg_007-ExtInt-S-DB_001)



Extensive Soft Landscaping

Intensive Soft Landscaping

Substrate Based Landscape Options
(Heights and weight loadings may vary, allowance must be made for any fully established planting / vegetation and landscaping)

Key

(Vegetation type is indicative only. Refer to the specification for the correct vegetation to be Used)

- Extensive / Biodiverse Substrate
- DES40 Drainage Board (Refer to the specification for the correct board to be used)
- Bauder Filter Fleece
- Bauder Protection Mat
- Bauder PE Foil - Not required on Single Ply Systems
- Additional Bauder Capping Sheet / Membrane to secure the metal trim (Refer to the Specification for the correct option)
- Bauder Waterproofing System. (Refer to the spectic Bauder waterproofing details drawings for further information.)
- Deck / Substrate
- Vegetation barrier **Minimum 80mm deep & 300mm wide. Width must be increased to at least 500mm when positioned adjacent to opening rooflights, windows or door openings. In accordance with both gro green and fll roof codes.**
- AL150 Edge / Drainage trim. Secured in place by separate pieces of torch applied Bauder Plant-E Capping Sheet. For vegetation/substrate build-up depths greater than 150mm, a bespoke perforated edge/drainage trim is required.

IMPORTANT NOTE:
This drawing shows alternative details. For the correct solution to be used, refer to the project specific specification.

IMPORTANT NOTES:
1. This detail is suitable for the following Bauder Systems:
   Bauder Total Green Roof System
   Bauderflex Green
   Thermofol and Thermoplan (Excluding Intensive)
2. **This Drawing Shows Alternative Options. For the Correct Solution to be Used, Refer to the Project Specific Specification.**
3. Do not scale to ascertain dimensions.
4. All dimensions to be checked and verified on site prior to commencement of work.
5. This drawing is to be read in conjunction with the specification and associated drawings.
6. This detail is a guideline only, representing typical detailing conditions and illustrate the correct application of the above Bauder System. It may be necessary to modify this detail to suit specific project design constraints and conditions.
7. Refer to the Bauder Specification for the product description and method of application. For clarity the method of attachment has not been shown.
8. Provision should be made by the installer for mechanically fixing the top

Rev	Date	Description	Drawn By
--	--	-------------	--

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Extensive/Intensive Green Roof System (0°-4° Slope)

Scale:	Drawing Number	Rev:
1:5 @ A2	D0901/03-00W_0-4Deg_200-ExtInt-S-DB_001	
Drawn: PCH	Checked By: CR	Approved By: NB	Date: Aug 2017

Appendix F – Drainage Calculations

Print | Close Report

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	George Boden
Site name:	Battersea Park Road
Site location:	London

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.

Site Details

Latitude:	51.47957° N
Longitude:	0.13957° W
Reference:	1697533761
Date:	Apr 19 2022 17:22

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 0.81

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):	610	610
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):	1.26	1.26
1 in 1 year (l/s):	1.07	1.07
1 in 30 years (l/s):	2.89	2.89
1 in 100 year (l/s):	4.01	4.01
1 in 200 years (l/s):	4.7	4.7

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	20.600	Add Flow / Climate Change (%)	0
Ratio R	0.437	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	200	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	30.193	0.126	239.6	0.049	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.001	23.677	0.099	239.2	0.090	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	37.562	0.157	239.2	0.066	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	30.969	0.103	300.7	0.088	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.004	11.114	0.037	300.4	0.038	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.005	17.234	0.000	0.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.006	3.219	0.011	292.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S2.000	5.422	0.058	93.5	0.040	5.00	0.0	0.600	o	150	Pipe/Conduit	
S2.001	13.181	0.078	169.0	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.002	24.601	0.161	152.8	0.031	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.007	36.180	0.121	299.0	0.033	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.000	19.404	2.029	9.6	0.050	5.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	72.61	5.50	2.550	0.049	0.0	0.0	0.0	1.01	71.5	9.6
S1.001	70.36	5.89	2.424	0.139	0.0	0.0	0.0	1.01	71.6	26.5
S1.002	67.09	6.51	2.325	0.205	0.0	0.0	0.0	1.01	71.5	37.2
S1.003	64.70	7.00	2.093	0.293	0.0	0.0	0.0	1.04	114.8	51.3
S1.004	63.89	7.18	1.990	0.331	0.0	0.0	0.0	1.04	114.9	57.3
S1.005	57.42	8.84	1.128	0.331	0.0	0.0	0.0	0.17	19.1«	57.3
S1.006	57.24	8.89	1.128	0.331	0.0	0.0	0.0	1.05	116.4	57.3
S2.000	75.17	5.09	1.639	0.040	0.0	0.0	0.0	1.04	18.4	8.1
S2.001	73.78	5.31	1.506	0.061	0.0	0.0	0.0	1.00	39.9	12.2
S2.002	71.45	5.69	1.428	0.092	0.0	0.0	0.0	1.06	42.0	17.8
S1.007	55.35	9.47	1.117	0.456	0.0	0.0	0.0	1.04	115.1	68.4
S3.000	75.10	5.10	3.250	0.050	0.0	0.0	0.0	3.28	57.9	10.2

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.008	6.376	0.021	303.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.009	24.240	0.081	300.0	0.029	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.010	4.500	0.015	300.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S4.000	11.279	1.128	10.0	0.041	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.011	7.727	0.278	27.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.012	16.394	1.291	12.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.008	55.03	9.58	0.996	0.506	0.0	0.0	0.0	1.03	114.3	75.4
S1.009	53.85	9.96	0.975	0.535	0.0	0.0	0.0	1.04	115.0	78.0
S1.010	53.64	10.04	0.894	0.535	0.0	0.0	0.0	1.04	115.0	78.0
S4.000	75.35	5.06	2.232	0.041	0.0	0.0	0.0	3.20	56.6	8.4
S1.011	75.30	5.07	0.879	0.000	5.0	0.0	0.0	1.92	33.9	5.0
S1.012	74.68	5.16	0.601	0.000	5.0	0.0	0.0	2.84	50.2	5.0

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S1	3.450	0.900	Open Manhole	600	S1.000	2.550	300				
S2	3.560	1.136	Open Manhole	1200	S1.001	2.424	300	S1.000	2.424	300	
S3	3.450	1.125	Open Manhole	600	S1.002	2.325	300	S1.001	2.325	300	
S4	3.434	1.341	Open Manhole	1500	S1.003	2.093	375	S1.002	2.168	300	
S5	3.300	1.310	Open Manhole	1500	S1.004	1.990	375	S1.003	1.990	375	
S6	3.375	2.247	Open Manhole	1500	S1.005	1.128	375	S1.004	1.953	375	825
S7	3.650	2.522	Open Manhole	1500	S1.006	1.128	375	S1.005	1.128	375	
S8	2.989	1.350	Open Manhole	450	S2.000	1.639	150				
S9	3.208	1.702	Open Manhole	600	S2.001	1.506	225	S2.000	1.581	150	
S10	3.350	1.922	Open Manhole	600	S2.002	1.428	225	S2.001	1.428	225	
S11	3.375	2.258	Open Manhole	1500	S1.007	1.117	375	S1.006	1.117	375	
								S2.002	1.267	225	
S12	4.000	0.750	Open Manhole	450	S3.000	3.250	150				
S13	4.063	3.067	Open Manhole	1500	S1.008	0.996	375	S1.007	0.996	375	
								S3.000	1.221	150	
S14	4.076	3.101	Open Manhole	1500	S1.009	0.975	375	S1.008	0.975	375	
S15	3.900	3.006	Open Manhole	1500	S1.010	0.894	375	S1.009	0.894	375	
S16	3.767	1.535	Open Manhole	450	S4.000	2.232	150				
S17	3.900	3.021	Open Manhole	1500	S1.011	0.879	150	S1.010	0.879	375	
								S4.000	1.104	150	225
SC1	3.900	3.299	Open Manhole	1200	S1.012	0.601	150	S1.011	0.601	150	
S2205	4.040	4.730	Open Manhole	1500		OUTFALL		S1.012	-0.690	150	

No coordinates have been specified, layout information cannot be produced.

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	300	S1	3.450	2.550	0.600	Open Manhole	600
S1.001	o	300	S2	3.560	2.424	0.836	Open Manhole	1200
S1.002	o	300	S3	3.450	2.325	0.825	Open Manhole	600
S1.003	o	375	S4	3.434	2.093	0.966	Open Manhole	1500
S1.004	o	375	S5	3.300	1.990	0.935	Open Manhole	1500
S1.005	o	375	S6	3.375	1.128	1.872	Open Manhole	1500
S1.006	o	375	S7	3.650	1.128	2.147	Open Manhole	1500
S2.000	o	150	S8	2.989	1.639	1.200	Open Manhole	450
S2.001	o	225	S9	3.208	1.506	1.477	Open Manhole	600
S2.002	o	225	S10	3.350	1.428	1.697	Open Manhole	600
S1.007	o	375	S11	3.375	1.117	1.883	Open Manhole	1500
S3.000	o	150	S12	4.000	3.250	0.600	Open Manhole	450
S1.008	o	375	S13	4.063	0.996	2.692	Open Manhole	1500
S1.009	o	375	S14	4.076	0.975	2.726	Open Manhole	1500
S1.010	o	375	S15	3.900	0.894	2.631	Open Manhole	1500
S4.000	o	150	S16	3.767	2.232	1.385	Open Manhole	450
S1.011	o	150	S17	3.900	0.879	2.871	Open Manhole	1500
S1.012	o	150	SC1	3.900	0.601	3.149	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	30.193	239.6	S2	3.560	2.424	0.836	Open Manhole	1200
S1.001	23.677	239.2	S3	3.450	2.325	0.825	Open Manhole	600
S1.002	37.562	239.2	S4	3.434	2.168	0.966	Open Manhole	1500
S1.003	30.969	300.7	S5	3.300	1.990	0.935	Open Manhole	1500
S1.004	11.114	300.4	S6	3.375	1.953	1.047	Open Manhole	1500
S1.005	17.234	0.0	S7	3.650	1.128	2.147	Open Manhole	1500
S1.006	3.219	292.6	S11	3.375	1.117	1.883	Open Manhole	1500
S2.000	5.422	93.5	S9	3.208	1.581	1.477	Open Manhole	600
S2.001	13.181	169.0	S10	3.350	1.428	1.697	Open Manhole	600
S2.002	24.601	152.8	S11	3.375	1.267	1.883	Open Manhole	1500
S1.007	36.180	299.0	S13	4.063	0.996	2.692	Open Manhole	1500
S3.000	19.404	9.6	S13	4.063	1.221	2.692	Open Manhole	1500
S1.008	6.376	303.6	S14	4.076	0.975	2.726	Open Manhole	1500
S1.009	24.240	300.0	S15	3.900	0.894	2.631	Open Manhole	1500
S1.010	4.500	300.0	S17	3.900	0.879	2.646	Open Manhole	1500
S4.000	11.279	10.0	S17	3.900	1.104	2.646	Open Manhole	1500
S1.011	7.727	27.8	SC1	3.900	0.601	3.149	Open Manhole	1200
S1.012	16.394	12.7	S2205	4.040	-0.690	4.580	Open Manhole	1500

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.012	S2205	4.040	-0.690	0.000	1500	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0	Number of Offline Controls 0	Number of Time/Area Diagrams 0
Number of Online Controls 1	Number of Storage Structures 1	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.600	Storm Duration (mins)	30
Ratio R	0.437		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S17, DS/PN: S1.011, Volume (m³): 5.9

Unit Reference	MD-SHE-0092-5000-2000-5000
Design Head (m)	2.000
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	92
Invert Level (m)	0.879
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	5.0	Kick-Flo®	0.816	3.3
Flush-Flo™	0.398	4.1	Mean Flow over Head Range	-	3.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.9	0.800	3.4	2.000	5.0	4.000	6.9	7.000	9.0
0.200	3.8	1.000	3.6	2.200	5.2	4.500	7.3	7.500	9.3
0.300	4.1	1.200	3.9	2.400	5.4	5.000	7.7	8.000	9.6
0.400	4.1	1.400	4.2	2.600	5.6	5.500	8.0	8.500	9.9
0.500	4.1	1.600	4.5	3.000	6.0	6.000	8.4	9.000	10.2
0.600	4.0	1.800	4.8	3.500	6.5	6.500	8.7	9.500	10.4

Storage Structures for Storm

Tank or Pond Manhole: S7, DS/PN: S1.006

Invert Level (m) 1.128

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	232.0	1.200	232.0	1.201	0.0

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	20.600
Region	England and Wales	Ratio R	0.437
Cv (Summer)	0.750		
Cv (Winter)	0.840		

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status ON
Inertia Status ON

Profile(s) Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S1.000	S1	15 Winter	1	+0%	100/15 Winter	100/15 Winter			2.617	-0.233
S1.001	S2	15 Winter	1	+0%	100/15 Winter				2.533	-0.191
S1.002	S3	15 Winter	1	+0%	100/15 Winter				2.456	-0.169
S1.003	S4	15 Winter	1	+0%	100/15 Winter				2.247	-0.221
S1.004	S5	15 Winter	1	+0%	100/15 Winter				2.167	-0.198
S1.005	S6	15 Winter	1	+0%	1/15 Winter				1.507	0.004
S1.006	S7	120 Winter	1	+0%	30/30 Winter				1.319	-0.184
S2.000	S8	15 Winter	1	+0%	30/15 Winter				1.704	-0.085
S2.001	S9	15 Winter	1	+0%	30/15 Winter				1.582	-0.149
S2.002	S10	15 Winter	1	+0%	30/15 Winter				1.516	-0.137
S1.007	S11	30 Winter	1	+0%	30/15 Winter				1.328	-0.164
S3.000	S12	15 Winter	1	+0%					3.287	-0.113
S1.008	S13	30 Winter	1	+0%	30/15 Winter				1.338	-0.033
S1.009	S14	30 Winter	1	+0%	30/15 Winter				1.340	-0.010
S1.010	S15	30 Winter	1	+0%	1/15 Winter				1.338	0.069
S4.000	S16	15 Winter	1	+0%	100/180 Winter				2.266	-0.116
S1.011	S17	30 Winter	1	+0%	1/15 Winter				1.338	0.309
S1.012	SC1	480 Winter	1	+0%					0.631	-0.120

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.000	0.11			7.1	OK	1
S1.001	S2	0.000	0.28			18.1	OK	
S1.002	S3	0.000	0.39			25.7	OK	
S1.003	S4	0.000	0.35			35.3	OK	
S1.004	S5	0.000	0.45			39.2	OK	
S1.005	S6	0.000	1.12			39.2	SURCHARGED	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.006	S7	0.000	0.08			6.8	OK	
S2.000	S8	0.000	0.39			5.9	OK	
S2.001	S9	0.000	0.25			8.5	OK	
S2.002	S10	0.000	0.32			12.5	OK	
S1.007	S11	0.000	0.09			9.7	OK	
S3.000	S12	0.000	0.14			7.4	OK	
S1.008	S13	0.000	0.10			7.1	OK	
S1.009	S14	0.000	0.08			7.7	OK	
S1.010	S15	0.000	0.05			4.2	SURCHARGED	
S4.000	S16	0.000	0.12			6.1	OK	
S1.011	S17	0.000	0.14			4.1	SURCHARGED	
S1.012	SC1	0.000	0.09			4.1	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	20.600
Region	England and Wales	Ratio R	0.437
Cv (Summer)	0.750		
Cv (Winter)	0.840		

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S1.000	S1	15 Winter	30	+0%	100/15 Winter	100/15 Winter			2.691	-0.159
S1.001	S2	15 Winter	30	+0%	100/15 Winter				2.670	-0.054
S1.002	S3	15 Winter	30	+0%	100/15 Winter				2.619	-0.006
S1.003	S4	15 Winter	30	+0%	100/15 Winter				2.454	-0.014
S1.004	S5	15 Winter	30	+0%	100/15 Winter				2.365	0.000
S1.005	S6	240 Winter	30	+0%	1/15 Winter				1.754	0.251
S1.006	S7	240 Winter	30	+0%	30/30 Winter				1.753	0.250
S2.000	S8	15 Winter	30	+0%	30/15 Winter				1.806	0.017
S2.001	S9	240 Winter	30	+0%	30/15 Winter				1.769	0.038
S2.002	S10	240 Winter	30	+0%	30/15 Winter				1.770	0.117
S1.007	S11	240 Winter	30	+0%	30/15 Winter				1.771	0.279
S3.000	S12	15 Winter	30	+0%					3.310	-0.090
S1.008	S13	240 Winter	30	+0%	30/15 Winter				1.815	0.444
S1.009	S14	240 Winter	30	+0%	30/15 Winter				1.827	0.477
S1.010	S15	240 Winter	30	+0%	1/15 Winter				1.834	0.565
S4.000	S16	15 Winter	30	+0%	100/180 Winter				2.287	-0.095
S1.011	S17	240 Winter	30	+0%	1/15 Winter				1.834	0.805
S1.012	SC1	960 Winter	30	+0%					0.631	-0.120

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.000	0.26			17.1	OK	1
S1.001	S2	0.000	0.72			45.7	OK	
S1.002	S3	0.000	0.99			65.8	OK	
S1.003	S4	0.000	0.88			89.9	OK	
S1.004	S5	0.000	1.15			99.3	OK	
S1.005	S6	0.000	0.61			21.1	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.006	S7	0.000	0.28			23.0	SURCHARGED	
S2.000	S8	0.000	0.93			14.0	SURCHARGED	
S2.001	S9	0.000	0.11			3.9	SURCHARGED	
S2.002	S10	0.000	0.15			6.0	SURCHARGED	
S1.007	S11	0.000	0.18			19.1	SURCHARGED	
S3.000	S12	0.000	0.33			18.2	OK	
S1.008	S13	0.000	0.22			16.3	SURCHARGED	
S1.009	S14	0.000	0.12			11.7	SURCHARGED	
S1.010	S15	0.000	0.10			7.6	SURCHARGED	
S4.000	S16	0.000	0.29			14.9	OK	
S1.011	S17	0.000	0.14			4.1	SURCHARGED	
S1.012	SC1	0.000	0.09			4.1	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	20.600
Region	England and Wales	Ratio R	0.437
Cv (Summer)	0.750		
Cv (Winter)	0.840		

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S1.000	S1	15 Winter	100	+40%	100/15 Winter	100/15 Winter			3.451	0.601
S1.001	S2	15 Winter	100	+40%	100/15 Winter				3.434	0.710
S1.002	S3	15 Winter	100	+40%	100/15 Winter				3.284	0.659
S1.003	S4	360 Winter	100	+40%	100/15 Winter				2.887	0.419
S1.004	S5	360 Winter	100	+40%	100/15 Winter				2.885	0.520
S1.005	S6	360 Winter	100	+40%	1/15 Winter				2.884	1.381
S1.006	S7	360 Winter	100	+40%	30/30 Winter				2.882	1.379
S2.000	S8	360 Winter	100	+40%	30/15 Winter				2.885	1.096
S2.001	S9	360 Winter	100	+40%	30/15 Winter				2.885	1.154
S2.002	S10	360 Winter	100	+40%	30/15 Winter				2.884	1.231
S1.007	S11	360 Winter	100	+40%	30/15 Winter				2.882	1.390
S3.000	S12	15 Winter	100	+40%					3.335	-0.065
S1.008	S13	360 Winter	100	+40%	30/15 Winter				2.879	1.508
S1.009	S14	360 Winter	100	+40%	30/15 Winter				2.878	1.528
S1.010	S15	360 Winter	100	+40%	1/15 Winter				2.875	1.605
S4.000	S16	360 Winter	100	+40%	100/180 Winter				2.875	0.493
S1.011	S17	360 Winter	100	+40%	1/15 Winter				2.874	1.845
S1.012	SC1	360 Winter	100	+40%					0.634	-0.117

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.850	0.55			35.8	FLOOD	1
S1.001	S2	0.000	1.19			75.9	FLOOD RISK	
S1.002	S3	0.000	1.70			112.3	FLOOD RISK	
S1.003	S4	0.000	0.25			25.0	SURCHARGED	
S1.004	S5	0.000	0.33			28.2	SURCHARGED	
S1.005	S6	0.000	0.80			27.9	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.006	S7	0.000	0.28			22.9	SURCHARGED	
S2.000	S8	0.000	0.25			3.7	FLOOD RISK	
S2.001	S9	0.000	0.16			5.7	SURCHARGED	
S2.002	S10	0.000	0.21			8.1	SURCHARGED	
S1.007	S11	0.000	0.18			18.8	SURCHARGED	
S3.000	S12	0.000	0.61			33.1	OK	
S1.008	S13	0.000	0.21			15.6	SURCHARGED	
S1.009	S14	0.000	0.12			11.7	SURCHARGED	
S1.010	S15	0.000	0.10			8.1	SURCHARGED	
S4.000	S16	0.000	0.07			3.5	SURCHARGED	
S1.011	S17	0.000	0.17			5.0	SURCHARGED	
S1.012	SC1	0.000	0.11			5.0	OK	

Battersea Park Road

Calculation of Flow Rate (using British Water Code of Practice - Flows and Loads - 4)
Affordable & Residential

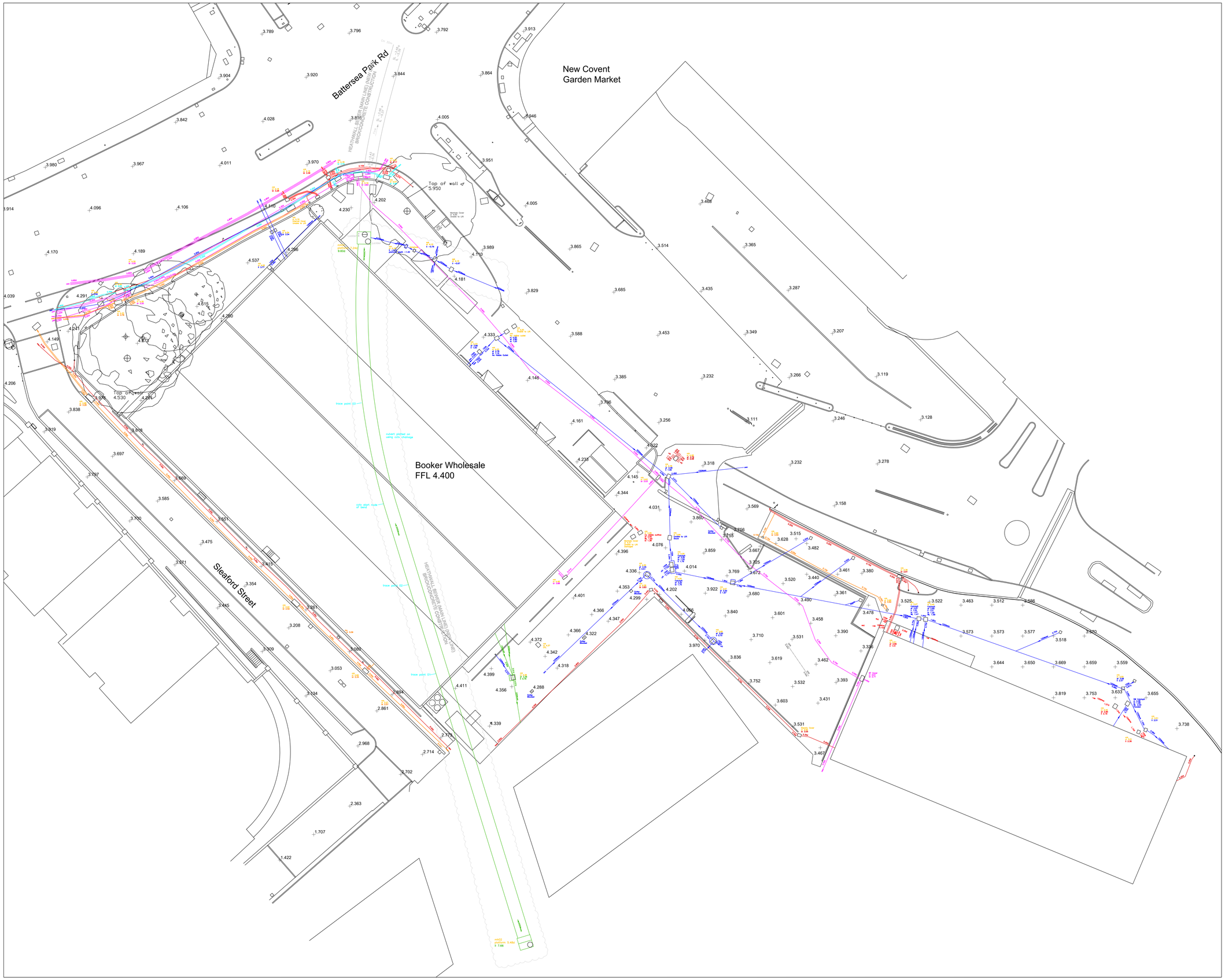
Proposed:	**No.**	**Flow rate (l/day)**	**Total (l/day)**	
Total occupancy per room (No. of people)	199	150	29850	
Offices per 100m2	0	750	0	
Restaurant	0	30	0	
Staff - full time	0	90	0	
Staff - part ime	0	45	0	
Laundry	off-site			
Domestic washing machines	**0**	800	0	
	Total		29850	l/day
		$Q_{average}$ =	0.35	l/s
		Q_{peak} =	2.072916667	l/s

Battersea Park Road

Calculation of Flow Rate (using British Water Code of Practice - Flows and Loads - 4)
Student Accommodation

Proposed:	**No.**	**Flow rate (l/day)**	**Total (l/day)**	
Total occupancy per room (No. of people)	1524	100	152400	
Offices per 100m2	0	750	0	
Restaurant	0	30	0	
Staff - full time	0	90	0	
Staff - part ime	0	45	0	
Laundry	off-site			
Domestic washing machines	**0**	800	0	
	Total		152400	l/day
		$Q_{average}$ =	1.76	l/s
		Q_{peak} =	10.58333333	l/s

Appendix H – CCTV Survey



Notes:

Service covers indicated where visible.

Pipe inverts / details surveyed from surface inspection only.

Generally damaged covers and covers within highways will not be lifted

Tree species should be confirmed by tree specialist if critical.

Overhead cables are indicated using remote survey methods and are subject to seasonal variation, and should be treated as approximate.

Service covers located under parked vehicles/mobile structures may be omitted.

Buried service covers will not be indicated.

All drainage has been lifted and rodded where possible. Unable to survey a number manholes due to damaged/corroded covers or blockage.

Heathwall mainline sewer CCTV survey carried out 02-03-22, see report for details. Trace points are shown indicative only, the above ground conditions did not allow an uninterrupted trace, sewer position has been plotted from the chainage measurements and the curve start/end as captured during the survey, and is therefore indicative only. Internal diameter shown, outer construction is unknown

See also: drawing CSE-AC119_001 - Booker, Battersea - Topo Survey RevB

Utilities Survey Notes :-

(ht) - height
Ø - diameter
- pea trap
a/g - above ground
ain - assumed route
av - air valve
bb - bellsha beacon
bd - back drop
bl - bed level
bold - bollard
bs - base/side of shaft
bt - telecom
c/b fence - closeboard fence
cbox - control box
catv - cable television
cl - cover level
con - conifer
cr - cable riser
cws - combined water sewer
d/chan - drainage channel
ejb - electric junction box
elec - electric
ext - end of trace
ep - electric pole
fb - flood barrier
ff/ed - finished bed
fh - fire hydrant
fl - floor level
fs - fire switch
fws - foul water sewer
g - gully
g/run - gully run
gr - gas riser
h/chestnut - horse chestnut
h/thorn - hawthorn
ic - inspection cover
il - invert level
ill - illuminated
int - interceptor
lp - lamp post
mh - manhole cover
mkr - marker
o/h - over head

ol - off lot
osa - off survey area
OSBM - ordnance survey bench mark
p & r fence - post & rail fence
pd - pit depth
pr - pipe riser
ptg - pipe to ground
pts - pipe to surface
rk - rodding eye
ret wall - retaining wall
rs - road sign
sc - cast iron water pipe
sch/birch - silver birch
s/p - safety paving
sap - sapling
sec fence - security fence
sf - soffit level within manhole
sfc - soil filled chamber
sl - spot light
sp - soil pipe
st - stop tap
sv - stop valve
svp - soil vent pipe
swg - storm water sewer
TBM - temporary bench mark
tel - telecom records
tf - threshold level
toc - top of cap
top - top of pipe
tot - top of tank
tp - telecom pole
ts - traffic signal
t/s - trench scar
u/s - underside
ufl - unable to lift
utr - unable to rod
uts - unable to survey
utt - unable to trace
vb - vent breaker
wfc - water filled chamber
wl - water level
wm - water meter
wp - waste pipe
wr - water riser

UTISTY SURVEY KEY :-

HATCHED AREA
BOREHOLE
CPT
TRIAL PIT
HAND PIT
WINDOW SAMPLE

ELECTRIC CABLE
WATER PIPE
FOUL SEWER
STORM SEWER
COMBINED SEWER
DUCTS
CABLE TELEVISION
DATA CABLE
TELECOM CABLE
GAS PIPE
UNIDENTIFIED SERVICE
OTHER
CCTV
TRAFFIC LIGHT
OFFSET FIL
VENT
FUEL PIPE
GAUGE LINES
PIPE
ASSUMED ROUTE
TAKEN FROM RECORDS

Disclaimer :-

Electromagnetic techniques have been used in the location of underground services. The results are not infallible and trial excavations should be carried out to confirm service identification, positions and particularly depths, where these are critical.
The completeness of the underground services information cannot be guaranteed.
This method of survey does not differentiate between live and dead services, and as such all services should be treated as live.
This survey drawing does not include the location of all public services that may cross the site, therefore the relevant service drawings should be obtained from the appropriate utility company and used in conjunction with this drawing.
Private service pipes and cables in highways are not shown, but there presence should be anticipated.
Additional below ground structures or obstructions not shown on this drawing may be present.
Reference should be made to historical plans and as-built drawings.
Excavations in the vicinity of services should be carried out with due diligence ref: HSG47 document avoiding dangers from underground services.
Please note that factors such as ground conditions, proximity of other utilities, material and method of construction have an influence on the quality of the data collected on site.
It should be noted that even an appropriate and professionally executed survey may not be able to achieve a 100% detection rate.*

A	First Issue	29-11-21	AC
B	Updated as clouded	14-03-22	AC

C-SE
Survey & Engineering
Andrew@c-se.co.uk
077085 36503

Drawing Title
Utilities Survey

Site
Booker Wholesale
Battersea

Scale:	Drawing No.	Rev.B
200:1@A0	AC119 - 003	
Drawn By: A.C.	Date: 14-03-22	

Drainage Report

Prepared For

C.SE

Site

Booker Battersea

41-49 Battersea Park Road, Nine Elms

London

SW8 5AL

MIDLAND SURVEY

Sam Downes

cctv@midlandsurvey.co.uk

01926810811

Total Defects for Project

0 0 0 0 0

Total DRB Grades for Project

4 0 0

U07417 - CCTV Survey Report : 10/03/22

Name :	MIDLAND SURVEY
Contact :	Ryan Pearson
Location :	Cromwell House, Westfield Road
Town :	Southam
Region :	Warwickshire
Postcode :	Cv47 0jh
Email :	cctv@midlandsurvey.co.uk
Contact Number :	01926810811
Surveyor :	Sam Downes
Valid Certification No :	

Client Information

Name :	C.SE
Contact :	Andrew Cosgrove
Location :	
Town :	
Region :	
Postcode :	
Tel :	
Mobile :	
Email :	andrew@c-se.co.uk
Fax :	

Site Information

Name :	Booker Battersea
Contact :	
Location :	41-49 Battersea Park Road, Nine Elms
Town :	London
Region :	
Postcode :	SW8 5AL
Tel :	
Mobile :	
Email :	
Fax :	

Total Defects for Project

0 0 0 0 0

Total DRB Grades for Project

4 0 0

Overview

Section: 1 **From: mh02 ds** **To: trace point**	DRB Grade A	**Structural Grade: 0** **Service Grade: 0** **DRB Grade: A** **Pipe Size: 2000** **Material: Concrete** **Use: Combined**
Section: 2 **From: trace point 01** **To: trace point 02**	DRB Grade A	**Structural Grade: 0** **Service Grade: 0** **DRB Grade: A** **Pipe Size: 2000** **Material: Concrete** **Use: Combined**
Section: 3 **From: trace Point 02** **To: trace point 03**	DRB Grade A	**Structural Grade: 0** **Service Grade: 0** **DRB Grade: A** **Pipe Size: 2000** **Material: Concrete** **Use: Combined**
Section: 4 **From: trace point 03** **To: mh01**	DRB Grade A	**Structural Grade: 0** **Service Grade: 0** **DRB Grade: A** **Pipe Size: 2000** **Material: Concrete** **Use: Combined**

Total Defects for Project

0 0 0 0 0

Total DRB Grades for Project

4 0 0

Scores

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh02 ds	trace point	2000	Concrete	0	0	0	0	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
trace point 01	trace point 02	2000	Concrete	0	0	0	0	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
trace Point 02	trace point 03	2000	Concrete	0	0	0	0	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
trace point 03	mh01	2000	Concrete	0	0	0	0	0

Total Defects for Project

0 0 0 0 0

Total DRB Grades for Project

4 0 0

Site: 41-49 Battersea Park Road, Nine Elms , London

Section 1

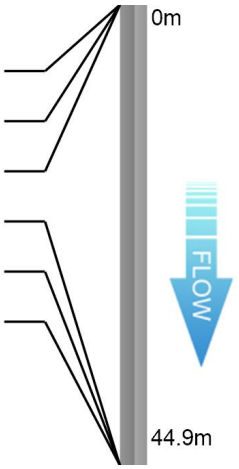
Client:	Location (Street Name):	City/Town/Village	Cust Job Ref.	Surveyors Name:	Date:
C.SE	41-49 Battersea Park Road, Nine Elms	London		Sam Downes	10/03/2022

Start Node Ref:	mh02 ds	Finish Node Ref:	trace point	Direction:	D	Height/Dia:	2000
Start Node Depth:	0.00	Finish Node Depth:	0.00	Use:	C	Shape:	C
Start Node Coordinate:		Finish Node Coordinate:		Material:	CO	Cleaned	N

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	Remarks
A				D	N	44.9	

Structural Peak Grade	0	Operational Grade	0	DRB Grade	A

Position	Code	Description	CD	Pic	Video Ref
00.0	MH	Start node type, manhole		0_0	0:00:00
00.0	WL	S1 Water level 10%	S1	0_1	0:00:09
00.0	REM	S2 General remark	S2	0_2	0:00:00
44.9	REM	F2 General remark	F2		0:00:00
44.9	WL	F1 Water level 10%	F1	0_-	0:00:09
44.9	BRF	Finish node type, major connection without manhole		0_9	



Total Defects for section

0 0 0 0 0

DRB Grade for Section

A

Descriptive Report with Remarks and Observation Images

Section 1

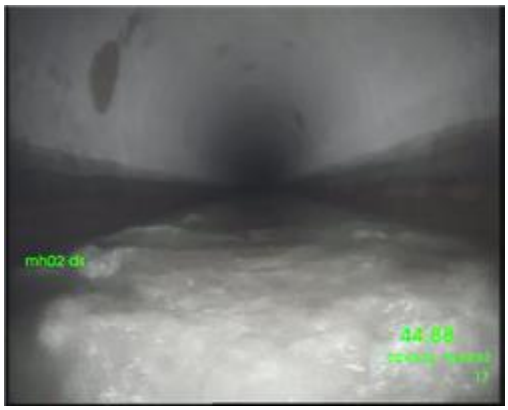
Pos	Video Ref	Code	Cont.	Description	Image
00.0m	0:00:00	MH		Start node type, manhole, reference mh02 ds mh02 ds	Image Provided - Ref: 0_0 
00.0m	0:00:09	WL	S1	Water level 0m - 44.9m: 10% Height/Diameter	Image Provided - Ref: 0_1 
00.0m	0:00:00	REM	S2	General remark 0m - 44.9m Bottom 20% Of Sewer Is Made Out Of Brick	Image Provided - Ref: 0_2 
44.9m	0:00:00	REM	F2	General remark Defect End Bottom 20% Of Sewer Is Made Out Of Brick	
44.9m	0:00:09	WL	F1	Water level Defect End: 10% Height/Diameter	

Total Defects for section

0 0 0 0 0

DRB Grade for Section

A

Pos	Video Ref	Code	Cont.	Description	Image
44.9m		BRF		Finish node type, major connection without manhole, reference trace point Survey Stopped For Trace Point	Image Provided - Ref: 0_9999 

Total Defects for section

0 0 0 0 0

DRB Grade for Section

A

Site: 41-49 Battersea Park Road, Nine Elms , London

Section 2

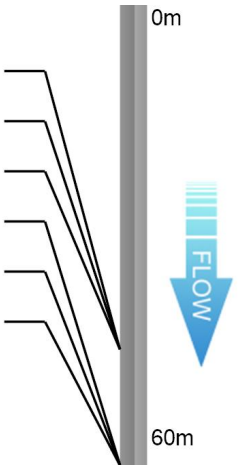
Client:	Location (Street Name):	City/Town/Village	Cust Job Ref.	Surveyors Name:	Date:
C.SE	41-49 Battersea Park Road, Nine Elms	London		Sam Downes	10/03/2022

Start Node Ref:	trace point 01	Finish Node Ref:	trace point 02	Direction:	D	Height/Dia:	2000
Start Node Depth:	0.00	Finish Node Depth:	0.00	Use:	C	Shape:	C
Start Node Coordinate:		Finish Node Coordinate:		Material:	CO	Cleaned	N

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	Remarks
A				D	N	60	

Structural Peak Grade	0	Operational Grade	0	DRB Grade	A

Position	Code	Description	CD	Pic	Video Ref
44.9	BR	Start node type, major connection without manhole		1_0	0:00:00
44.9	WL	S1 Water level 10%	S1	1_1	0:00:00
44.9	REM	S2 General remark	S2	1_2	0:00:00
59.9	WL	F1 Water level 10%	F1	1_-	0:00:00
60.0	REM	F2 General remark	F2		0:00:00
60.0	BRF	Finish node type, major connection without manhole		1_9	



Total Defects for section

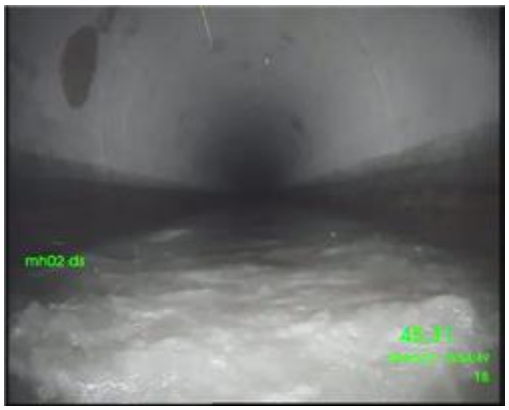
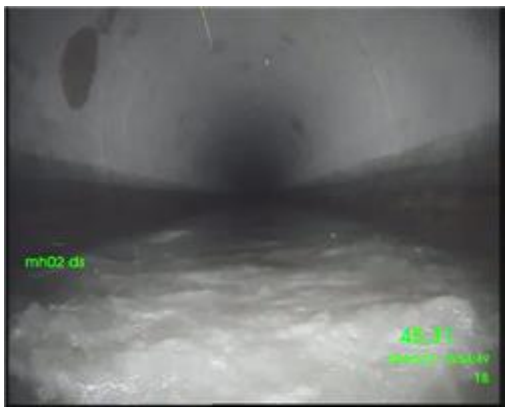
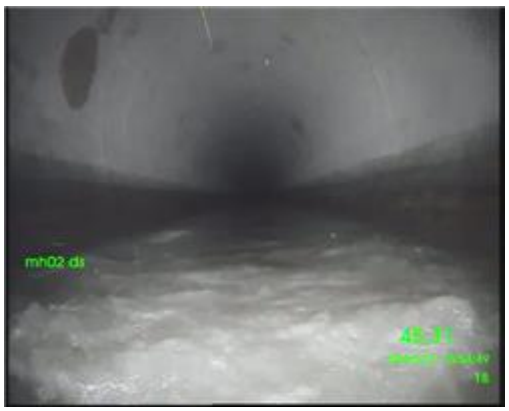
0 0 0 0 0

DRB Grade for Section

A

Descriptive Report with Remarks and Observation Images

Section 2

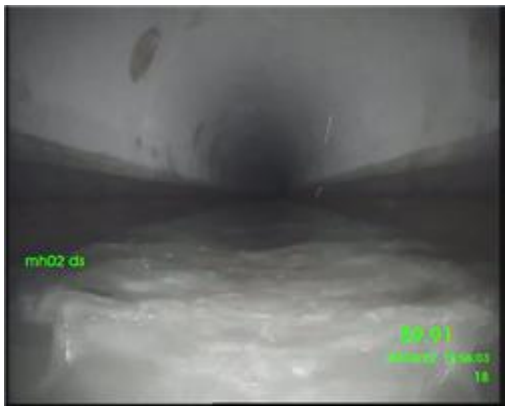
Pos	Video Ref	Code	Cont.	Description	Image
44.9m	0:00:00	BR		Start node type, major connection without manhole, reference trace point 01 trace point 01	Image Provided - Ref: 1_0 
44.9m	0:00:00	WL	S1	Water level 44.9m - 59.91m: 10% Height/Diameter	Image Provided - Ref: 1_1 
44.9m	0:00:00	REM	S2	General remark 44.9m - 60m Bottom 20% Of Sewer Is Made Out Of Brick	Image Provided - Ref: 1_2 
59.9m	0:00:00	WL	F1	Water level Defect End: 10% Height/Diameter	
60.0m	0:00:00	REM	F2	General remark Defect End Bottom 20% Of Sewer Is Made Out Of Brick	

Total Defects for section

0 0 0 0 0

DRB Grade for Section

A

Pos	Video Ref	Code	Cont.	Description	Image
60.0m		BRF		Finish node type, major connection without manhole, reference trace point 02 Survey Stopped For Tracing Out Point 2	Image Provided - Ref: 1_9999 

Total Defects for section

0 0 0 0 0

DRB Grade for Section

A

Site: 41-49 Battersea Park Road, Nine Elms , London

Section 3

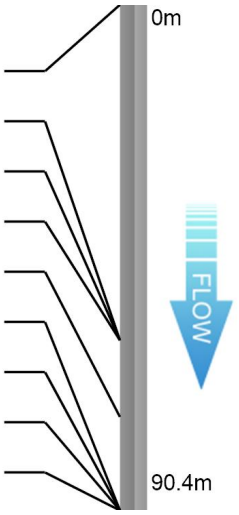
Client:	Location (Street Name):	City/Town/Village	Cust Job Ref.	Surveyors Name:	Date:
C.SE	41-49 Battersea Park Road, Nine Elms	London		Sam Downes	10/03/2022

Start Node Ref:	trace Point 02	Finish Node Ref:	trace point 03	Direction:	D	Height/Dia:	2000
Start Node Depth:	0.00	Finish Node Depth:	0.00	Use:	C	Shape:	C
Start Node Coordinate:		Finish Node Coordinate:		Material:	CO	Cleaned	N

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	Remarks
A				D	N	90.4	

Structural Peak Grade	0	Operational Grade	0	DRB Grade	A

Position	Code	Description	CD	Pic	Video Ref
00.0	BR	Start node type, major connection without manhole		2_0	0:00:00
60.0	WL	S1 Water level 10%	S1	2_1	0:00:00
60.0	REM	General remark		2_2	0:00:00
60.0	REM	S2 General remark	S2	2_4	0:00:00
73.7	LR	S3 Line of drain/sewer deviates right	S3	2_3	0:01:05
90.4	REM	F2 General remark	F2	2_-	0:00:00
90.4	LR	F3 Line of drain/sewer deviates right	F3	2_-	0:01:05
90.4	WL	F1 Water level 10%	F1	2_-	0:00:00
90.4	MHF	Finish node type, manhole			



Total Defects for section

0 0 0 0 0

DRB Grade for Section

A

Descriptive Report with Remarks and Observation Images

Section 3

Pos	Video Ref	Code	Cont.	Description	Image
00.0m	0:00:00	BR		Start node type, major connection without manhole, reference trace Point 02 trace Point 02	Image Provided - Ref: 2_0 
60.0m	0:00:00	WL	S1	Water level 60m - 90.4m: 10% Height/Diameter	Image Provided - Ref: 2_1 
60.0m	0:00:00	REM		General remark Start Point Is 60m From Trace Point 2	Image Provided - Ref: 2_2 

Total Defects for section

0 0 0 0 0

DRB Grade for Section

A

Pos	Video Ref	Code	Cont.	Description	Image
60.0m	0:00:00	REM	S2	General remark 60m - 90.4m Bottom 20% Of Sewer Is Made Out Of Brick	Image Provided - Ref: 2_4 
73.7m	0:01:05	LR	S3	Line of drain/sewer deviates right 73.7m - 90.4m	Image Provided - Ref: 2_3 
90.4m	0:00:00	REM	F2	General remark Defect End Bottom 20% Of Sewer Is Made Out Of Brick	
90.4m	0:01:05	LR	F3	Line of drain/sewer deviates right Defect End	
90.4m	0:00:00	WL	F1	Water level Defect End: 10% Height/Diameter	
90.4m		MHF		Finish node type, manhole, reference trace point 03 Survey Ends At trace point 3	

Total Defects for section

0 0 0 0 0

DRB Grade for Section

A

Site: 41-49 Battersea Park Road, Nine Elms , London

Section 4

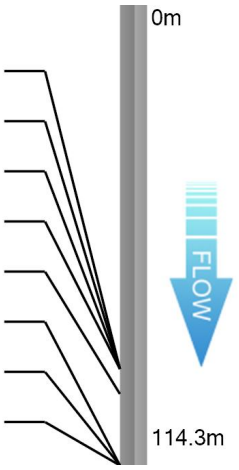
Client:	Location (Street Name):	City/Town/Village	Cust Job Ref.	Surveyors Name:	Date:
C.SE	41-49 Battersea Park Road, Nine Elms	London		Sam Downes	10/03/2022

Start Node Ref:	trace point 03	Finish Node Ref:	mh01	Direction:	D	Height/Dia:	2000
Start Node Depth:	0.00	Finish Node Depth:	0.00	Use:	C	Shape:	C
Start Node Coordinate:		Finish Node Coordinate:		Material:	CO	Cleaned	N

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	Remarks
A				D	N	114.3	

Structural Peak Grade	0	Operational Grade	0	DRB Grade	A

Position	Code	Description	CD	Pic	Video Ref
90.4	BR	Start node type, major connection without manhole		3_0	0:00:00
90.4	WL	S1 Water level 10%	S1	3_1	0:00:00
90.4	REM	S2 General remark	S2	3_2	0:00:00
90.4	LR	S3 Line of drain/sewer deviates right	S3	3_3	0:00:00
96.6	LR	F3 Line of drain/sewer deviates right	F3	3_-	0:00:00
114.3	REM	F2 General remark	F2	3_-	0:00:00
114.3	WL	F1 Water level 10%	F1	3_-	0:00:00
114.3	MHF	Finish node type, manhole		3_9	



Total Defects for section

0 0 0 0 0

DRB Grade for Section

A

Descriptive Report with Remarks and Observation Images

Section 4

Pos	Video Ref	Code	Cont.	Description	Image
90.4m	0:00:00	BR		Start node type, major connection without manhole, reference trace point 03 trace point 03	Image Provided - Ref: 3_0 
90.4m	0:00:00	WL	S1	Water level 90.4m - 114.3m: 10% Height/Diameter	Image Provided - Ref: 3_1 
90.4m	0:00:00	REM	S2	General remark 90.4m - 114.3m Start Point Is 60m From Trace Point 2	Image Provided - Ref: 3_2 

Total Defects for section

0 0 0 0 0

DRB Grade for Section

A

Pos	Video Ref	Code	Cont.	Description	Image
90.4m	0:00:00	LR	S3	Line of drain/sewer deviates right 90.4m - 96.6m	Image Provided - Ref: 3_3 
96.6m	0:00:00	LR	F3	Line of drain/sewer deviates right Defect End	
114.3 m	0:00:00	REM	F2	General remark Defect End Start Point Is 60m From Trace Point 2	
114.3 m	0:00:00	WL	F1	Water level Defect End: 10% Height/Diameter	
114.3 m		MHF		Finish node type, manhole, reference mh01 mh01	Image Provided - Ref: 3_9999 

Appendix I – Correspondence

George Boden

Apex Consulting Engineers
Unit 3, Acres Hill Business Park
Acres Hill Lane
Sheffield
South Yorkshire
S9 4LR

Your account number
DS6084652

Developer.services@thameswater.co.uk

0800 009 3921 - Helpdesk

2nd June 2021

Pre Development Enquiry

Site Address: Former Booker Wholesale site, 49-59 Battersea Park Road

Development Details: 307 flats

Dear Mr. Boden

I write in relation to the above site concerning the proposed development here. We have completed the assessment of your application, in relation to sewer capacity.

An Integrated Water Management Study was completed in August 2014 on behalf of the GLA for the region surrounding the proposed development. This highlighted that the main trunk combined sewer in the area (Low Level No.1) runs a minimum of 40% full 24hrs a day and is at capacity during peak times. Any additional flows from regeneration in this area will cause additional flooding and spills to the River Thames unless all surface water run-off is removed from the combined network.

Therefore the policy for this area has been adopted to allow additional foul water flows from new developments/increased population as long as all surface water flows are removed from the combined sewer network. This policy and approach has been supported by the GLA, Wandsworth and Lambeth LAs and implemented via planning conditions. The current Nine Elms Partnership are supportive of this policy and have had some early discussions with various developers in this area.

The policy states that all surface water should be removed from the system and taken directly to the river or to a new surface water tank sewer that has been built through a Thames Water capital scheme that links a multitude of sites in central Battersea capturing all surface water run off before discharging all flows to the River

The head manhole of the new surface water sewer is located North of the Covent Garden Flower Market (adjacent to the Booker Wholesale site) and runs through a number of development sites and into a new pumping station built in the centre of the scheme on Ponton Rd which pumps the flow from this new sewer around the new US Embassy to the river.

In summary, developments around the Gyratory have several options to meet Thames Water policy of no surface water flows to combined sewers as follows;

1. Take surface water flows directly to the River Thames. Sewers built to do this can be built by the developer and offered for adoption to Thames Water or the developer can request that Thames Water build it on their behalf by making a Section 98 Sewer Requisition application.

2. Take surface water flows to the new Thames Water surface water sewer. Again this may be constructed by the developer themselves or they can seek Thames Water construct this on their behalf as per Item 1 above.

3. Numerous developers working collaboratively with Thames Water to construct one sewer to serve numerous sites, which would save costs, driving efficiency and reducing disruption.

Therefore, considering the above we can confirm the following;

Foul Water

As long as the above policy is adhered to and all surface water run-off generated on the site is removed from the combined sewers in the vicinity of the site then we can confirm that the existing combined sewer network does have sufficient capacity to accommodate the proposed foul water discharge from the proposed development.

Surface Water

Please note that discharging surface water to the public sewer network should only be considered after all other methods of disposal have been investigated and proven to not be viable. In accordance with the Building Act 2000 Clause H3.3, positive connection to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. The disposal hierarchy being: 1st Soakaways; 2nd Watercourses; 3rd Sewers.

In this case by ‘Sewers’ this would mean the new dedicated surface water tank sewer currently being constructed as mentioned above.

Generally when redeveloping existing sites, policy 5.13 of the London Plan and Policy 3.4 of the Supplementary Planning Guidance (Sustainable Design And Construction) states that every attempt should be made to use flow attenuation and SUDS/storage to reduce the surface water discharge from the site as much as possible.

If they are consulted as part of any planning application, Thames Water Planning team would ask to see why it is not practicable to attenuate the flows to Greenfield run-off rates i.e. 5l/s/hectare of the total site area.

Please note that the Local Planning Authority and the Lead Local Flood Authority may comment on surface water discharge under the planning process.

Source Protection Zone

The development site boundary falls within a Source Protection Zone for groundwater abstraction. These zones may be at particular risk from polluting activities on or below the land surface. To prevent pollution, the Environment Agency and Thames Water (or other local water undertaker) will use a tiered, risk-based approach to regulate activities that may impact groundwater resources, this may potentially affect your drainage or surface water strategies where infiltration systems are proposed. The applicant is encouraged to read the Environment Agency's approach to groundwater protection (available at https://www.gov.uk/government/publications/groundwater-protection-position-statements) and may wish to discuss the implications for their development with a suitably qualified environmental consultant.

Therefore, although we would encourage the use of soakaways, the proximity of the site to the abstraction zone may preclude their use in this case depending upon the Environment Agency's assessment of the risk involved.

Please Note

There are existing public sewer crossing the site. Please submit a 'Buildover or close to' application to apply for building over the sewer. This application is available at **https://developers.thameswater.co.uk/Developing-a-large-site/Apply-and-pay-for-services/Wastewater-services/Building-over-or-near-a-sewer/Planning-and-carrying-out-your-work**.

All connection requests are subject to a full Section 106 (Water Industry Act 1991) application before the Company can confirm approval to the connection itself. Please also note that capacity in the public sewerage system cannot be reserved.

Note on trunk sewers: Connecting directly to Trunk sewers can be complex and dangerous, which means we often refuse permission. In this case, you will need to find an alternative sewer or method of discharge. Please contact the Sewer Connections team through our Helpdesk on 0800 009 39 21 for further information.

If Thames Water permits a connection to the trunk sewer, we will insist on carrying out the connection ourselves under Section 107 of the Water Industry Act. We would advise for you to apply as soon as possible.

The discharge of non-domestic effluent is not permitted until a valid trade effluent consent has been issued by Thames Water. If anything other than domestic sewage is discharged into the public sewers without the above agreement an offence is committed and the applicant will be liable to the penalties contained in Section 109(1) (WIA 1991).

Applicants should contact Trade Effluent prior to seeking a connection approval, to discuss trade effluent consent and conditions of discharge. A Trade Effluent reference number should be obtained and included in the relevant box of the attached application form. The address for Trade Effluent is - Thames Water Utilities Limited, Waste Water Quality, Crossness Sewage Treatment

Works, Belvedere Road, Abbeywood, London. SE2 9AQ. Alternatively you can telephone them on 020 8507 4321.

The views expressed by Thames Water in this letter are in response to this pre development enquiry at this time and do not represent our final views on any future planning applications made in relation to this site.

Yours sincerely

Jonathan Shildrick
Development Engineer

George Boden

From: DEVELOPER.SERVICES@THAMESWATER.CO.U <DEVELOPER.SERVICES@THAMESWATER.CO.UK>
Sent: 02 June 2021 11:36
To: George Boden
Subject: Wastewater Pre-Planning Enquiry for BOOKER WHOLESALE, WANDSWORTH, SW8 5AL (TW ref. DS6084652)
Attachments: PPLA Enq for Booker Wholesale,49-59 Battersea Park Rd.pdf

Dear Mr Boden,

I write further to your Pre-Planning Enquiry application in relation to the above site.

Further to consulting with our Asset Planners, I have now received their comments and I can therefore attach our formal response to your application.

Further to the comments made on the attached, we would be interested in knowing the Lead Local Flood Authority's position on the ability of discharging the new development's surface water flows to the new surface water sewer North of the site as mentioned in my letter.

In regards to the existing sewer crossing the site, as the existing building was previously located above this, we may consider the new development to be built over this. Please submit a 'buildover or close to' application to discuss this further with our Buildover team.

Regards

Jonathan Shildrick BSc
Development Engineer
Sewer Adoptions Team
Developer Services
Helpdesk: 0800 009 3921
Clearwater Court, Vastern Road, Reading, RG1 8DB
Find us online at developers.thameswater.co.uk

Original Text

From: George Boden <George.Boden@apexconsulting.co.uk>

To: developer.services@thameswater.co.u <developer.services@thameswater.co.uk>

CC: Lee Fisher <Lee.Fisher@apexconsulting.co.uk>

Sent: 25.05.21 16:42:46

Subject: BOOKER WHOLESALE, WANDSWORTH, SW8 5AL

Good afternoon,

Please find attached pre-planning enquiry form for a proposed development on the former Booker Wholesale site in the Nine Elms.

Our main objective is to establish an appropriate outfall for the surface and foul water from site. Please note soakaways will not be considered for reasons of objection as outlined by the LPA in the previous planning submission ref. 2015/6813.

Thames Water asset records show a 1905mm brick sewer through the site. Are you able to advise on a minimum dimension for an easement so we can make sure the design is compliant from an early stage?

I look forward to hearing from yourselves.

Kind regards

George Boden

Civil Engineer | Apex Consulting Engineers

Unit 3, Acres Hill Business Park, Acres Hill Lane, Sheffield, S9 4LR

t: 0114 241 9360 | e: George.Boden@apexconsulting.co.uk | w: apexconsulting.co.uk

George Boden

From: James Mayfield <James.Mayfield@thameswater.co.uk>
Sent: 25 January 2022 12:22
To: George Boden
Cc: Chan, Micheala; Alex Birgauan
Subject: RE: Battersea Park Road - Services crossing trunk sewer
Attachments: Specifications-for-sewers-over-375mm-diameter.pdf

George,

Monday works. Should I put a meeting in for 3.00?

If you build more than 3.0m from the outside edge (not the centre line) of the sewer, you will not need to enter into a BO agreement with a Deed of Easement. Anything within 3.0m will require a BO agreement. This applies to any part of the structure not just the foundations.

I have attached the TW specification for BO3's. Not any clearance must include piling and survey tolerances/errors.

Kind regards,

James Mayfield
Project Engineer – Developer Services, Major Projects

Mobile: 07747 642 662
james.mayfield@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB

From: George Boden <George.Boden@apexconsulting.co.uk>
Sent: 25 January 2022 12:06
To: James Mayfield <James.Mayfield@thameswater.co.uk>
Cc: Chan, Micheala <micheala.chan@arcadis.com>; Alex Birgauan <Alex.Birgauan@thameswater.co.uk>
Subject: RE: Battersea Park Road - Services crossing trunk sewer

James,

Is Monday afternoon good?

For the time being, are you able to advise of any easement widths because this will dictate architectural/foundation layouts being drawn up at the moment, or provide a brief summary?

We have assumed a 10m easement from the centreline of the sewer with all piling outside of this zone. However, some of the buildings may be cantilevered so a build near agreement maybe required?

Kind regards

George Boden
Civil Engineer | Apex Consulting Engineers
Unit 3, Acres Hill Business Park, Acres Hill Lane, Sheffield, S9 4LR
t: 0114 241 9360 | m: 07706340759 | e: George.Boden@apexconsulting.co.uk | w: apexconsulting.co.uk

From: James Mayfield <James.Mayfield@thameswater.co.uk>
Sent: 25 January 2022 11:47
To: George Boden <George.Boden@apexconsulting.co.uk>
Cc: Chan, Micheala <micheala.chan@arcadis.com>; Alex Birgauan <Alex.Birgauan@thameswater.co.uk>
Subject: RE: Battersea Park Road - Services crossing trunk sewer

Hi George,

Today is my first day back after a week of annual leave and tomorrow morning is full booked. Are you available next week?

Kind regards,

James Mayfield
Project Engineer – Developer Services, Major Projects

Mobile: 07747 642 662
james.mayfield@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB

From: George Boden <George.Boden@apexconsulting.co.uk>
Sent: 25 January 2022 11:41
To: James Mayfield <James.Mayfield@thameswater.co.uk>
Cc: Chan, Micheala <micheala.chan@arcadis.com>; Alex Birgauan <Alex.Birgauan@thameswater.co.uk>
Subject: RE: Battersea Park Road - Services crossing trunk sewer

Hi James,

Are you able to make this afternoon or tomorrow morning?

If not I am available Thursday morning or all day Friday.

Kind regards

George Boden

Civil Engineer | Apex Consulting Engineers

Unit 3, Acres Hill Business Park, Acres Hill Lane, Sheffield, S9 4LR

t: 0114 241 9360 | m: 07706340759 | e: George.Boden@apexconsulting.co.uk | w: apexconsulting.co.uk

---

From: James Mayfield <James.Mayfield@thameswater.co.uk>
Sent: 25 January 2022 11:38
To: George Boden <George.Boden@apexconsulting.co.uk>
Cc: Chan, Micheala <micheala.chan@arcadis.com>; Alex Birgauan <Alex.Birgauan@thameswater.co.uk>
Subject: RE: Battersea Park Road - Services crossing trunk sewer

Hi George,

I think it might be easier to setup a short MS Teams call. Please let me when works for you this week.

Kind regards,

James Mayfield
Project Engineer – Developer Services, Major Projects

Mobile: 07747 642 662
james.mayfield@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB

From: George Boden <George.Boden@apexconsulting.co.uk>
Sent: 20 January 2022 15:42
To: James Mayfield <James.Mayfield@thameswater.co.uk>
Subject: Battersea Park Road - Services crossing trunk sewer

Hi James,

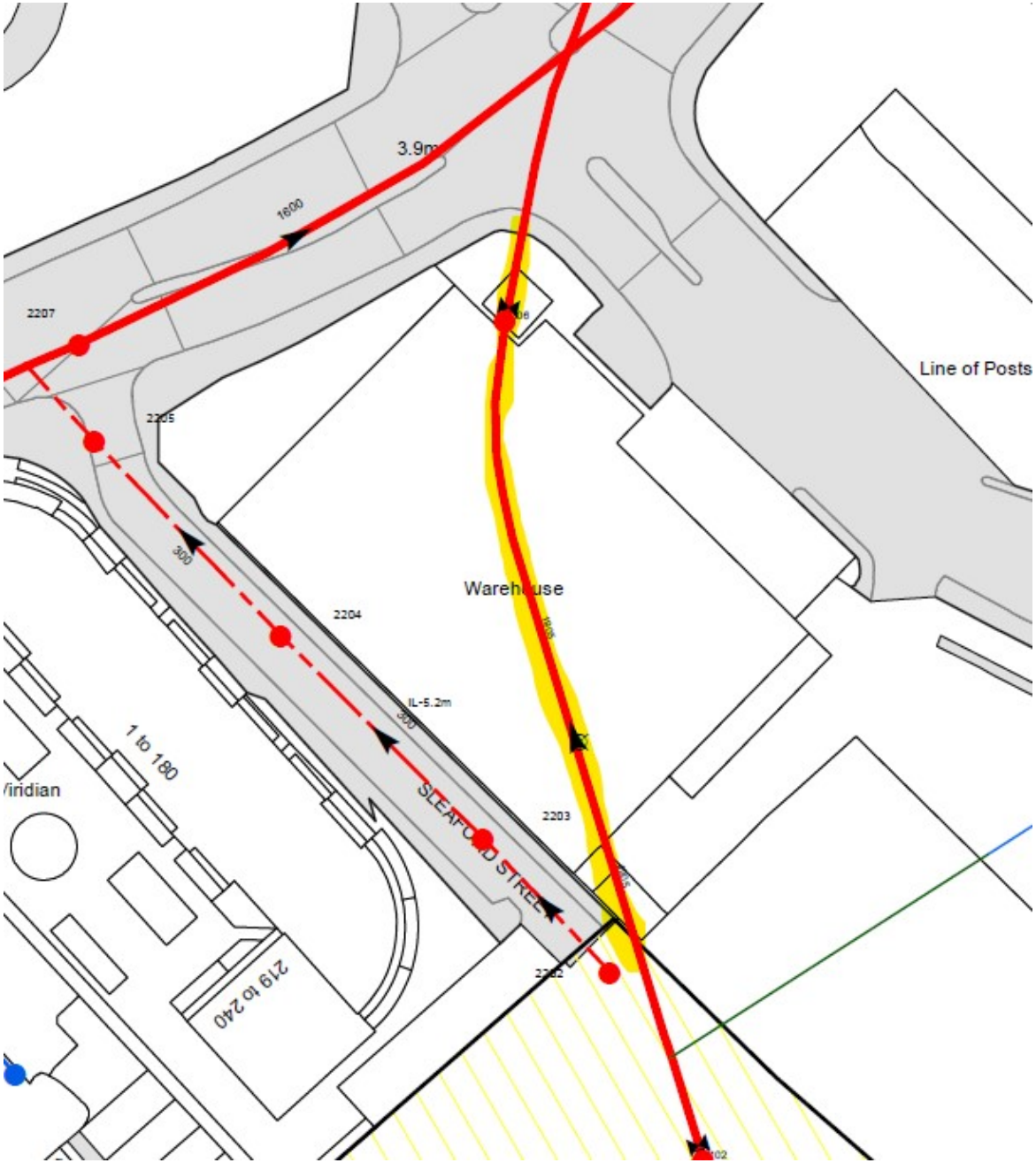
I was wondering if you could advise on Thames Waters stance on proposed services crossing sewers.

Specifically, there is a 1905mm trunk combined sewer running through the site at approximately 9m deep. We will have proposed services such as district heating crossing this. Are there any specific requirements needed to satisfy Thames Water?

It would also be good to get an understanding on the easement width for this sewer, given it already runs underneath the existing Booker Wholesale warehouse.

Please give me a call if it's easier to discuss.

Kind regards


3.9m
1600
2207
Line of Posts
2205
300
2204
Warehouse
IL-5.2m
300
1 to 180
Viridian
SLEAFORD STREET
2203
219 to 240

George Boden

Civil Engineer | Apex Consulting Engineers

Unit 3, Acres Hill Business Park, Acres Hill Lane, Sheffield, S9 4LR

t: 0114 241 9360 | m: 07706340759 | e: George.Boden@apexconsulting.co.uk | w: apexconsulting.co.uk

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George Boden

From: Chan, Micheala <micheala.chan@arcadis.com>
Sent: 18 February 2022 15:12
To: George Boden
Cc: Natalie De Sousa; James Mayfield
Subject: X2039/1758 | 41-49 Battersea Park Road, SW8 5AL

Hi George,

The permeable paving detailed below is acceptable. Please note, however, that as part of a buildover agreement, should Thames Water need to dig down to the sewer, the permeable paving will not be reinstated.

On a separate note, have you had any luck obtaining the required details to raise the invoice for this scheme?

Customer Name:
Customer Address:
Street & City:
Post Code:
Contact Name:
Email:
Work number:
Mobile:

Kind regards,
Micheala

Micheala Chan
Asset Protection – Civil Engineer
micheala.chan@arcadis.com

Clearwater Court, Vastern Road, Reading, RG1 8DB
Find us online at developers.thameswater.co.uk

From: George Boden <George.Boden@apexconsulting.co.uk>
Sent: 17 February 2022 11:16
To: James Mayfield <James.Mayfield@thameswater.co.uk>; Chan, Micheala <micheala.chan@arcadis.com>
Cc: Natalie De Sousa <natalie.desousa@exteriorarchitecture.com>
Subject: X2039/1758 | 41-49 Battersea Park Road, SW8 5AL

> You don't often get email from george.boden@apexconsulting.co.uk. Learn why this is important

Hi James/Micheala,

I understand from our meeting that drainage attenuation was discussed and it was noted to be kept outside of the 3m easement of the trunk sewer.

We are proposing a Type C (non-infiltration) permeable paving system across the hard standing areas of the site where it will be collected from the sub-base through a pipe. A typical build-up for most areas will consist of:

80mm block paving
50mm bedding sand
150mm CGA sub-base
Impermeable membrane

Would Thames Water have any objection to these proposals over the trunk sewer given the minimal build up and 9m+ sewer depth?

Please give me a call if you want to discuss

Kind regards

George Boden
Civil Engineer | Apex Consulting Engineers
Unit 3, Acres Hill Business Park, Acres Hill Lane, Sheffield, S9 4LR
t: 0114 241 9360 | m: 07706340759 | e: George.Boden@apexconsulting.co.uk | w: apexconsulting.co.uk

Appendix J – Drainage Operation & Maintenance Plan

BATTERSEA PARK ROAD– Operations and Maintenance Plan

1.0 General Information			
Site ID	Booker Wholesale, Nine Elms, London		
Site location and co-ordinates (GIS if appropriate)	X:529386, Y:177217		
Elements forming the SuDS scheme	Geo-Cellular Tank, Vortex Flow Control Device, Catchpits/Inspection Chambers, Permeable Paving and Tree pit		
Inspection frequency	Minimum 12 months		
Authorities	Wandsworth Borough Council Thames Water		
Type of development	Residential	Drawing Reference(s):	956-ACE-ZZ-XX-DR-8000_P05_DRAINAGE STRATEGY
Responsible party for maintenance of SuDS features	To be confirmed by client.		

2.0 Inspection Checklist	Inspection Date Details	Y/N	Action Required	Date Completed	Inspection Date Details	Y/N	Action Required	Date Completed
General Inspection								
Is there any evidence of erosion, channelling, ponding (where not desirable) or other poor hydraulic performance?								
Is there any evidence of accidental spillages, oils, poor water quality, odours, nuisance insects?								
Have any health and safety risks been identified to either the public or maintenance operatives?								
Is there any deterioration in the surface of permeable or porous surfaces (e.g. rutting, spreading of blocks or signs of ponding water)?								

Inspection Checklist	Inspection Date Details	Y/N	Action Required	Date Completed	Inspection Date Details	Y/N	Action Required	Date Completed
Silt/Sediment Accumulation								
Is there any sediment accumulation at inlets (or other defined accumulation zones such as the surface of filter drains or infiltration basins and within proprietary devices)? If yes, state depth (mm) and extent Is removal required? If yes, state waste disposal requirements and confirm all waste management requirements have been complied with (consult Environment Agency or SEPA).								
Is surface clogging visible (potentially problematic where water has to soak into the underlying construction or ground)?								
System Blockages/Litter Build Up								
Is there evidence of litter accumulation in the system? If yes, is this a blockage risk?								
Is there any evidence of any other clogging/blockage of outlets or drainage paths?								

Inspection Checklist	Inspection Date Details	Y/N	Action Required	Date Completed	Inspection Date Details	Y/N	Action Required	Date Completed
Infrastructure								
Are any check dams or weirs in good condition?								
Is there evidence of any accidental damage to the system (e.g. wheel ruts?)								
Is there any evidence of cross connections or other unauthorised inflows?								
Is there any evidence of tampering with the flow control?								
Is there any evidence of tampering with the Attenuation Systems?								
Are gullies/channels/kerb drainage clear of debris/detritus?								
Are there any other matters that could affect the performance of the system in relation to the design objectives for hydraulic, water quality, biodiversity, and visual aspects? (Specify)								
Other Observations								
Information appended (e.g. photos)								

Inspection Checklist	Inspection Date Details	Y/N	Action Required	Date Completed	Inspection Date Details	Y/N	Action Required	Date Completed
Suitability of Current Maintenance Regime								
1. Continue as current 2. Increase maintenance 3. Decrease maintenance								
Next Inspection								
Proposed date for next inspection								

3.0 Maintenance Specification		Frequency
	Regular Maintenance	
1	Litter management	
1.1	Pick up all litter in SuDS and Landscape areas and remove from site	12 visits monthly
2	Grass Maintenance	
2.1	Mow all grass verges, paths and amenity at 35-50mm with 75mm max. Leaving grass in situ	As required or monthly
3	Hard Surfaces	
3.1	Sweep all paving regularly. Sweep and suction brush paving in autumn after leaf fall.	1 visit
	Occasional Tasks	
4	Inspection and Control Chambers	
4.1	Annual inspection, remove silt and check free flow	1 visit
	Remedial Work	
5	Inspect SuDS system regularly to check for damage or failure. Undertake remedial work as required.	As required

4.0 Sustainable Drainage Maintenance Specification		
1.0	**General Requirements**	Frequency
	Maintenance activities comprise: • Regular maintenance • Occasional tasks • Remedial work	
	Generally: • Litter – collect all litter or other debris and remove from site at each site visit. • Avoid – use of weedkillers and pesticides to prevent chemical pollution. De-icing agents wherever possible to allow bio-remediation of pollutants in permeable surfaces. • Protect – all permeable, porous and infiltration surfaces from silt, sand, mulch and other fine particles. • Exclusions – maintenance of pumps, etc.	Monthly

Drainage/SuDs Component	Maintenance Tasks	Frequency	Actions or Remedial Work
2.0 GEO-CELLULAR, CONTROLS, PUMPS AND INSPECTION CHAMBERS **<u>NOTES</u>** **Inlets and outlets structures must be free from obstruction at all times.** **Flow control structures to be accessible and easy to maintain.**	• Inspect and identify any areas that are not operating correctly. If required, take remedial action. • Debris removal from catchment surface (where it may cause risks to performance).	Monthly for 3 months, then annually Monthly	Repair any physical damage if necessary and allow for jetting if blockages/silt build-up found.

Drainage/SuDs Component	Maintenance Tasks	Frequency	Actions or Remedial Work
Refer to manufacturers maintenance guide for any specific guidance relating to the drainage systems i.e. attenuation and pump systems.	• Inspect all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually	
	• Remove sediment from pre-treatment structures (e.g. upstream silt-traps or vortex flow control upstream) and geo-cellular system where required.	Annually and after leaf fall in Autumn/heavy storm events	
	• Inspect and document the presence of wildlife.	Annually	
	• Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required	
	• All drainage to be CCTV surveyed following construction	Following construction	

Drainage/SuDs Component	Maintenance Tasks	Frequency	Actions or Remedial Work
3.0 Planting and existing vegetation **Ornamental Trees - All ornamental planting to be kept weed free and pruned using secateurs to keep the shrubs to an agreed and reasonable size.** **Native Trees and Shrubs – All native planting to be allowed to grow freely removing overhanging branches as required.**	**Amenity Grass** Mow all grass verges, paths and amenity grass at 3550mm with 75mm max. All cuttings to remain in situ. **Rough grass** Mow at 75-100mm but not to exceed 150mm. All cuttings to wildlife piles. **Ornamental tree & shrub planting.** Weed all shrub beds as detailed spec as necessary. Cut back planting from lights, paths and visibility sight lines in late autumn and as necessary. Cut hedges slightly tapered back from base with flat top at specified height. Do not mulch planting adjacent to permeable/ porous paving surfaces. Remove stakes and ties from trees when no longer needed for support and within 3 years of planting. Protect from strimmer damage and remove	When Required	Replace trees and shrubs which fail in the first five years after planting. Carry out tree surgery as necessary.

Drainage/SuDs Component	Maintenance Tasks	Frequency	Actions or Remedial Work
	competitive growth until well established. **Native trees & shrub planting.** Prune to shape in year 1. Protect trees from strimmer damage and remove competitive growth until well established. Remove stakes and ties from trees when no longer needed for support and within 3 years from planting. **Existing trees.** Check existing trees for safety.		

Drainage/SuDs Component	Maintenance Tasks	Frequency	Actions or Remedial Work
4.0 Permeable Paving	Inspect silt accumulation rates and establish appropriate brushing frequencies. Inspect for evidence of poor operation and/or weed growth – if required, take remedial action. Brushing and vacuuming (standard cosmetic sweep over whole surface) Stabilise and mw contributing and adjacent areas. Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying.	Annually Three-monthly, 48 hours after large storms in first six months. Once a year, after autumn leaf fall, or reduced frequency as required. As required. As required.	Remedial works to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to user, and replace lost jointing material. Rehabilitation of surface and upper substructure by remedial sweeping. Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised within 50mm of the level of the paving.

5.0 Spillage – Emergency Action

Most spillages on development sites are of compounds that do not pose a serious risk to the environment if they enter the drainage in a slow and controlled manner with time available for natural breakdown in a treatment system. Therefore, small spillages of oil, milk or other known organic substances should be removed where possible using soak mats as recommended by the Environment Agency with residual spillage allowed to bio-remediate in the drainage system.

In the event of a serious spillage, either by volume or of unknown or toxic compounds, then isolate the spillage with soil, turf or fabric and block outlet pipes from chamber(s) downstream of the spillage with a bung(s). (A bung for blocking pipes may be made by wrapping soil or turf in a plastic sheet or close woven fabric.). Contact the Environment Agency immediately.

Appendix K – Wandsworth SuDS ProForma

The London Sustainable Drainage Proforma

Introduction

This proforma is intended to accompany a drainage strategy prepared for a planning application where required by national or local planning policy. It should be used to summarise the key outputs from the strategy to allow assessing officers at the Lead Local Flood Authority (LLFA) to quickly assess compliance with sustainable drainage (SuDS) planning

The proforma is divided into 4 sections, which are intended to be used as follows:

1. Site and project information - Provide summary details of the development, site and drainage
2. Proposed discharge arrangement – Summarise site ground conditions to determine potential for infiltration. Select a surface water discharge method (or mix of methods) following the hierarchical approach set out in the London Plan.
3. Drainage strategy – Prioritise SuDS measures that manage runoff as close to source as possible and contribute to the four main pillars of SuDS; amenity, biodiversity, water quality and water quantity.
4. Supporting information – Provide cross references to the page or section of the drainage strategy report where the detailed information to support each element can be found. This may be more than one reference for each

Policy

Drainage strategies for developments in the London Borough of Wandsworth need to comply with the following policies on SuDS:

1. London Borough of Wandsworth Local Plan policy DMS 6.
2. London Plan policy 5.13 and draft New London Plan policy SI13
3. The National Planning Policy Framework (NPPF)

Technical Guidance

- Post-development surface water discharge rate should be limited to greenfield runoff rates. Proposals for higher discharge rates should be agreed with the LLFA ahead of submission of the Planning Application. Clear evidence should be provided with the Planning Application to show why greenfield rates cannot be achieved.
- Greenfield runoff rate is the runoff rate from a site in its natural state, prior to any development. This should be calculated using one of the runoff estimation methods set out in Table 24.1 of CIRIA C753 The SuDS Manual.
- Attenuation storage volumes required to reduce post-development discharge rates to greenfield rates should be calculated using one of the runoff estimation methods set out in Table 24.1 of CIRIA C753 The SuDS Manual.
- 'CC' refers to climate change allowance from the current Environment Agency guidance.
- An operation and maintenance strategy for proposed SuDS measures should be submitted with the Planning Application and include the details set out in section 32.2 of CIRIA C753 The SuDS Manual. The manual should be site-specific and not directly reproduce parts of The SuDS Manual.
- Other useful sources of guidance are:
  - The London Borough of Wandsworth flood risk advice
  - The London Plan Sustainable Design and Construction SPG
  - DEFRA non-statutory technical standards for sustainable drainage
  - Environment Agency climate change guidance
  - CIRIA C753 The SuDS Manual

GREATER**LONDON**AUTHORITY

1. Project & Site Details

Project / Site Name (including sub-catchment / stage / phase where appropriate)	Battersea Park Road, Nine Elms, London
Address & post code	41 to 49 Battersea Park Road, SW8 5AL
OS Grid ref. (Easting, Northing)	E 529337
	N 177239
LPA reference (if applicable)	
Brief description of proposed work	Demolition of existing building and construction of three new buildings comprising Residential and student accommodation
Total site Area	8100 m^2
Total existing impervious area	7646 m^2
Total proposed impervious area	5760 m^2
Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	Site located within Flood Zone 3. However, benefits from existing flood defences. Therefore, the actual flood risk posed to the site is low.
Existing drainage connection type and location	Foul and Surface water drainage outfalls into a 1905mm combined trunk sewer.
Designer Name	George Boden
Designer Position	Associate
Designer Company	Apex Consulting Engineers

2. Proposed Discharge Arrangements

2a. Infiltration Feasibility

Superficial geology classification	Alluvium (clay, silt, sand and peat)
Bedrock geology classification	London Clay Formation (clay and silt)
Site infiltration rate	m/s
Depth to groundwater level	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	N	N
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	Y	Y
5 discharge rainwater direct to a watercourse	N	N
6 discharge rainwater to a surface water sewer/drain	N	N
7 discharge rainwater to the combined sewer.	Y	Y

2c. Proposed Discharge Details

Proposed discharge location	Existing manhole within Sleaford Street
Has the owner/regulator of the discharge location been consulted?	Yes

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	1.26			
1 in 1	1.07	122	84	5
1 in 30	2.89	305	168	5
1 in 100	4.01	381	214	5
1 in 100 + CC			307	5
Climate change allowance used		40%		
3b. Principal Method of Flow Control		New Vortex Flow Control Device		

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	800	800	0
Swales	0	0	0
Basins/ponds	0	0	0
Attenuation tanks	4960		264
Total	**5760**	**800**	**264**

4. Supporting Information

4a. Discharge & Drainage Strategy	*Page/section of drainage report*
Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Section 4.5 Page 7, Section 6.2 Page 11
Drainage hierarchy (2b)	Section 6.2 Page 11
Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Appendix E, Appendix I
Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Appendix F
Proposed SuDS measures & specifications (3b)	Section 6.4 Pg 15-16 & Appendix E
4b. Other Supporting Details	*Page/section of drainage report*
Detailed Development Layout	Appendix B
Detailed drainage design drawings, including exceedance flow routes	Appendix E
Detailed landscaping plans	Appendix B
Maintenance strategy	Appendix J
Demonstration of how the proposed SuDS measures improve:	Section 6.6 Page 17
a) water quality of the runoff?	
b) biodiversity?	
c) amenity?	

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