APPENDIX 12.2
DRAINAGE STRATEGY

Stag Brewery, Mortlake

Drainage Strategy

For Reselton Properties

March 2022

Client Name:	Reselton Properties Limited
Document Reference:	WIE18671-104-R-11-2-2-DS
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Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2008, BS EN ISO 14001: 2004 and BS OHSAS 18001:2007)

Issue	Date	Prepared by	Checked by	Approved by
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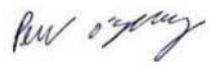

Comments

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Executive Summary

This Drainage Strategy has been prepared by Waterman Infrastructure & Environment ('Waterman IE') on behalf of Reselton Properties Limited ("the Applicant") in support of two linked planning applications ("the Applications") for the comprehensive redevelopment of the former Stag Brewery Site in Mortlake ("the Site") within the London Borough of Richmond upon Thames (LBRuT).

Following refusal of earlier application this 3rd iteration of the scheme seeks to respond directly to the Mayors reasons for refusal and in doing so also addresses a number of the concerns raised by the LBRuT. The amendments can be summarised as follows:

i. A revised energy strategy is proposed in order to address the London Plan (2021) requirements;

ii. Several residential blocks have been reduced in height to better respond to the listed buildings along the Thames riverfront and to respect the setting of the Maltings building, identified as a Building of Townscape Merit (BTM) by the LBRuT;

iii. Reconfiguration of layout of Buildings 20 and 21 has been undertaken to provide lower rise buildings to better respond to the listed buildings along the Thames riverfront; and

iv. Chalkers Corner light highways mitigation works.

The school proposals (submitted under 'Application B') are unchanged. The Applicant acknowledges LBRuT's identified need for a secondary school at the Site and the applications continue to support the delivery of a school. It is expected that the principles to be agreed under the draft Community Use Agreement (CUA) will be the same as those associated with the refused school application (LBRuT ref: 18/0548/FUL, GLA ref: GLA/4172a/07).

Overall, it is considered that together, the Applications respond successfully to the concerns raised and feedback provided by stakeholders in respect of the previous schemes and during pre-application discussions on the revised Proposed Development, whilst also retaining elements of the previous scheme which were supported by stakeholders, including third parties and decision makers.

The drainage strategy outlined in this report reflects the minor changes to the plans but follows the principles of and remains in line with the 2020 strategy approved by the GLA and LBRuT.

Surface water runoff from the northeast of the Site would discharge by gravity to the River Thames (adjacent to the northern boundary of the Site) via three outfalls. As the River Thames is tidal in this location, direct discharge to the river would be unrestricted. The area to discharge into the River Thames has been maximised using shallow geo-cellular conveyance channels, in order to relieve the Thames Water network of flows. Surface water runoff from the remainder of the Site would discharge via gravity to the Thames Water sewer network in the surrounding highways, maximising the attenuation volume within each drainage catchment to restrict surface water flows as much as possible.

Based on an area of 5.89ha currently draining into the Thames Water network, the existing discharge rate for the entire site (Applications A and B) was calculated to be 841 l/s. The incorporation of permeable paving, rain gardens, and underground attenuation tanks achieves a reduction of surface water flows to 249 l/s, equal to a combined 70% reduction compared to the

existing rate. This equates to a 64% reduction of Application A and 91% for Application B. This approach has been agreed with the Greater London Authority.

Appropriate treatment would be incorporated into the drainage system to ensure that the quality of water discharged is acceptable. This would be achieved through the incorporation of green roofs, permeable paving aggregate sub-base, rain gardens, and rainwater harvesting. A biomat filtration system within the attenuation tanks and downstream defenders or similar hard engineered solution would also be incorporated if deemed necessary at detailed design to ensure discharge is appropriately treated.

Foul flows from the Site would discharge by gravity the Thames Water sewer network. The existing and proposed foul discharge rates have been calculated using the water consumption method at 14.4l/s and 25.1 l/s respectively.

The on-Site drainage networks and Sustainable Drainage Systems would be privately managed and maintained for the lifetime of the Development, ensuring they remain fit for purpose and function appropriately. The management company / operator would be appointed post-planning. The school drainage system (Application B) would be delivered and maintained separately from the Application A site.

This report confirms that surface water runoff from the Site can be managed sustainably to ensure that flood risk is not increased elsewhere. It is considered that the information provided within this report satisfies the requirements of the National Planning Policy Framework (NPPF), the London Plan, and the London Borough of Richmond upon Thames Local Plan.

1. Introduction

1.1. This Drainage Strategy has been prepared by Waterman Infrastructure & Environment ('Waterman IE') on behalf of Reselton Properties Limited ("the Applicant") in support of two linked planning applications ("the Applications") for the comprehensive redevelopment of the former Stag Brewery Site in Mortlake ("the Site") within the London Borough of Richmond upon Thames (LBRuT).

Proposals

1.2. The Applications seek planning permission for:

Application A:

"Hybrid application to include the demolition of existing buildings to allow for comprehensive phased redevelopment of the site:

Planning permission is sought in detail for works to the east side of Ship Lane which comprise:

- *a) Demolition of existing buildings (except the Maltings and the façade of the Bottling Plant and former Hotel), walls, associated structures, site clearance and groundworks*
- *b) Alterations and extensions to existing buildings and erection of buildings varying in height from 3 to 9 storeys plus a basement of one to two storeys below ground*
- *c) Residential apartments*
- *d) Flexible use floorspace for:*
  - *i. Retail, financial and professional services, café/restaurant and drinking establishment uses*
  - *ii. Offices*
  - *iii. Non-residential institutions and community use*
  - *iv. Boathouse*
- *e) Hotel / public house with accommodation*
- *f) Cinema*
- *g) Offices*
- *h) New pedestrian, vehicle and cycle accesses and internal routes, and associated highway works*
- *i) Provision of on-site cycle, vehicle and servicing parking at surface and basement level*
- *j) Provision of public open space, amenity and play space and landscaping*
- *k) Flood defence and towpath works*
- *l) Installation of plant and energy equipment*

Planning permission is also sought in outline with all matters reserved for works to the west of Ship Lane which comprise:

a) *The erection of a single storey basement and buildings varying in height from 3 to 8 storeys*

b) *Residential development*

c) *Provision of on-site cycle, vehicle and servicing parking*

d) *Provision of public open space, amenity and play space and landscaping*

e) *New pedestrian, vehicle and cycle accesses and internal routes, and associated highways works"*

Application B:

"Detailed planning permission for the erection of a three-storey building to provide a new secondary school with sixth form; sports pitch with floodlighting, external MUGA and play space; and associated external works including landscaping, car and cycle parking, new access routes and other associated works"

1.3. Together, Applications A and B described above comprise the 'Proposed Development'.

Background to Submission

1.4. The current applications follow earlier planning applications which were refused by the Greater London Authority (GLA). The refused applications were for:

a) Application A – hybrid planning application for comprehensive mixed use redevelopment of the former Stag Brewery site consisting of:

i. *'Development* i. *Land to the east of Ship Lane applied for in detail (referred to as Area 1' throughout); and*

ii. *outline* ii. *Land to the west of Ship Lane (excluding the school) applied for in (referred to as 'Development Area 2' throughout).*

b) Application B – detailed planning application for the school (on land to the west of Ship Lane).

c) Application C – detailed planning application for highways and landscape works at Chalkers Corner.

1.5. The LBRuT (the Council) originally resolved to grant planning permission for Applications A and B but refuse Application C.

1.6. Following the LBRuT's resolution to approve the Applications A and B, the Mayor called-in the Applications and became the determining authority. The Mayor's reasons for calling in the Applications were set out in his Stage II letter (dated 4 May 2020) but specifically related to concerns regarding what he considered was a low percentage of affordable housing being proposed for the Site and the need to secure a highways solution for the scheme following the LBRuT's refusal of Application C.

1.7. Working with the Mayor's team, the Applicant sought to meaningfully respond to the Mayor's concerns on the Applications. A summary of the revisions to the scheme made and submitted to the GLA in July 2020 is as follows:

i. Increase in residential unit provision from up to 813 units to up to 1,250 units;

ii. Increase in affordable housing provision from (up to) 17%, to 30%;

iii. Increase in height for some buildings of up to three storeys;

iv. Change to the layout of Blocks 18 and 19, conversion of Block 20 from a terrace row of housing to two four storey buildings;

v. Reduction in the size of the western basement, resulting in an overall car parking spaces reduction of 186 spaces and introduction of an additional basement storey under Block 1;

vi. Internal layout changes and removal of the nursing home and assisted living in Development Area 2;

vii. Landscaping amendments, including canopy removal of four trees on the north west corner of the Site; and

viii. Alternative options to Chalkers Corner in order to mitigate traffic impacts through works to highway land only and allow the withdrawal of Application C.

1.8. The application was amended to reflect these changes.

1.9. Notwithstanding this, and despite GLA officers recommending approval, the Mayor refused the applications in August 2021.

1.10. The Mayor's reasons for refusal in respect of Application A were:

i. height, bulk and mass, which would result in an unduly obtrusive and discordant form of development in this 'arcadian' setting which would be harmful to the townscape, character and appearance of the surrounding area;

ii. heritage impact. The proposals, by reason of its height, scale, bulk and massing would result in less than substantial harm to the significance of several listed buildings and conservation areas in the vicinity. The Mayor considered that the less than substantial harm was not clearly and convincingly outweighed by the public benefits, including Affordable Housing, that the proposals would deliver;

iii. neighbouring amenity issues. The proposal, by reason of the excessive bulk, scale and siting of Building 20 and 21 in close proximity to the rear of neighbouring residential properties in Parliament Mews and the rear gardens of properties on Thames Bank, would result in an unacceptable overbearing an unneighbourly impact, including direct overlooking of private amenity spaces. The measures in the Design Code would not sufficiently mitigate these impacts; and

iv. no section 106 agreement in place.

1.11. Application B was also refused because it is intrinsically linked with Application A and therefore could not be bought forward in isolation.

The Proposed New Scheme

1.12. This 3rd iteration of the scheme (Appendix A) seeks to respond directly to the Mayor's reasons for refusal and in doing so also addresses number of the concerns raised by the LBRuT.

1.13. The amendments can be summarised as follows:

v. A revised energy strategy is proposed in order to address the London Plan (2021) requirements;

vi. Several residential blocks have been reduced in height to better respond to the listed buildings along the Thames riverfront and to respect the setting of the Maltings building, identified as a Building of Townscape Merit (BTM) by the LBRuT;

vii. Reconfiguration of layout of Buildings 20 and 21 has been undertaken to provide lower rise buildings to better respond to the listed buildings along the Thames riverfront; and

viii. Chalkers Corner light highways mitigation works.

1.14. The school proposals (submitted under 'Application B') are unchanged. The Applicant acknowledges LBRuT's identified need for a secondary school at the Site and the applications continue to support the delivery of a school. It is expected that the principles to be agreed under the draft Community Use Agreement (CUA) will be the same as those associated with the refused school application (LBRuT ref: 18/0548/FUL, GLA ref: GLA/4172a/07).

1.15. Overall, it is considered that together, the Applications respond successfully to the concerns raised by stakeholders in respect of the previous schemes and during pre-application discussions on the revised Proposed Development. As a result, it is considered that the scheme now represents a balanced development that delivers the principle LBRuT objectives from the site

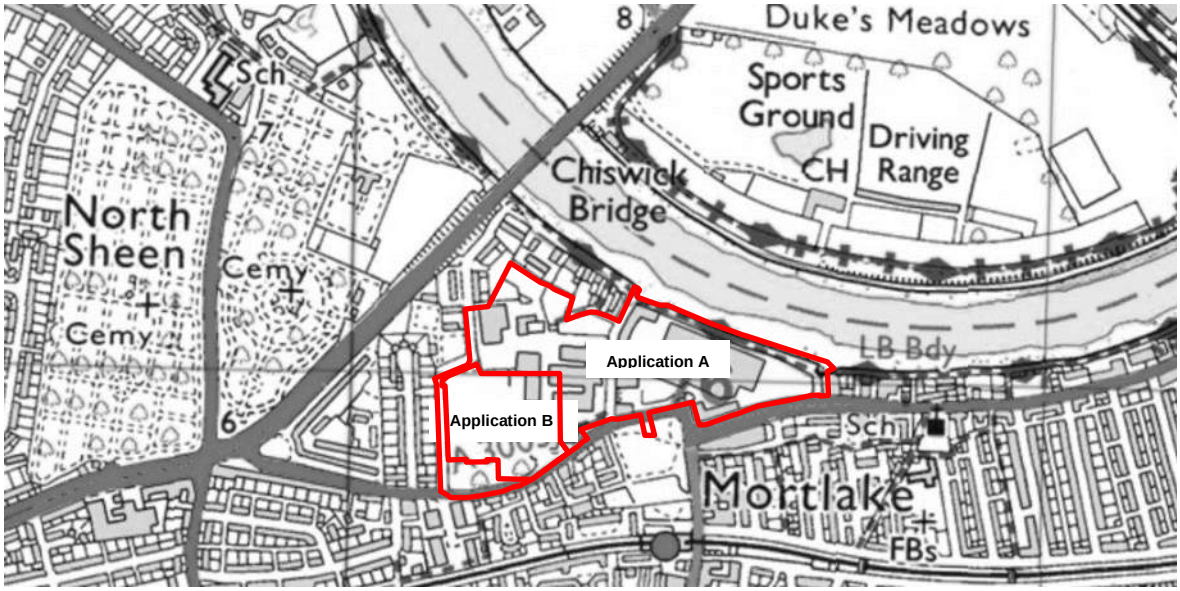
Site Description

1.16. The Site (Application A and B) comprises an approximately 9.25 ha parcel of land predominantly occupied by the former Stag Brewery. The former Stag Brewery Site is bounded by Lower Richmond Road to the south, the river Thames and the Thames Bank to the north, Williams Lane to the west and Bulls Alley (off Mortlake High Street) to the east. The Site is bisected by Ship Lane. The Site currently comprises a mixture of large scale industrial brewing structures, large areas of hardstanding and playing fields. The Site is centred on National Grid Reference 520380, 176003, as shown in Figure 1 overleaf.

Scope of the Report

1.17. This report follows the previously submitted 2018 Drainage Strategy, May 2019 Drainage Strategy Addendum and 2020 Drainage Strategy to reflect the further amendments to the scheme. The report assesses management of foul and surface water runoff from the Site, so as not to have a detrimental effect on the Site or its surroundings, in line with the National Planning Policy Framework (NPPF) and local policy.

Figure 1: Site Location



Key

Development Location

Source: www.bing.com/maps

2. Planning Policy and Guidance

National Planning Policy Framework

2.1. The National Planning Policy Framework[i] (NPPF), last revised in July 2021 is the current national policy on flood risk and drainage.

2.2. The NPPF states that when determining planning applications, Local Planning Authorities (LPA) should ensure that flood risk is not increased elsewhere. Major developments should incorporate SuDS unless there is clear evidence that this would be inappropriate. The systems used should:

- Take account of advice from the Lead Local Flood Authority (LLFA);
- Have appropriate proposed minimum operational standards;
- Have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
- Where possible, provide multifunctional benefits.

Planning Practice Guidance

2.3. The Planning Practice Guidance (PPG)[ii], last updated in June 2021 provides additional guidance to LPAs to ensure effective implementation of the planning policies set out within the NPPF regarding development in areas at risk of flooding.

2.4. The PPG states that developers and LPAs should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of SuDS.

Non-statutory Technical Standards for Sustainable Drainage Systems

2.5. The Non-statutory Technical Standards for Sustainable Drainage Systems[iii] was published in March 2015 and is the current guidance for the design, maintenance and operation of SuDS.

2.6. The standards set out that the peak runoff rates should be as close as is reasonably practicable to the greenfield rate, but should never exceed the pre-development runoff rate.

2.7. The standards also set out that the drainage system should be designed so that flooding does not occur on any part of the Site for a 1 in 30 year rainfall event, and that no flooding of a building (including basement) would occur during a 1 in 100 year rainfall event.

2.8. It is also noted within the standards that pumping should only be used when it is not reasonably practicable to discharge by gravity.

London Plan and London Plan Supplementary Planning Guidance

2.9. The London Plan[iv] sets out the Mayor's policies for development in London and was published in December 2020 and adopted in March 2021.

2.10. Policy SI 13 regarding Sustainable Drainage indicates 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. There should also be a preference for green over grey features. Furthermore,

the policy outlines a specific drainage hierarchy and indicates that permeable paving should be used unless there are robust justifications, these items are discussed in further detail under Section 4 of this report.

Water Industry Act

2.11. Thames Water is the local Sewerage Undertaker and provides sewerage services under the guidance of the Water Industry Act 1991.

2.12. Under Section 106 of the Water Industry Act, the developer currently maintains the automatic right to 'communicate' with the public foul water sewer system.

London Borough of Richmond Upon Thames Local Plan

2.13. LBRuT's adopted their Local Plan in 2018[v]. With regards to drainage, Policy LP21 'Flood Risk and Sustainable Drainage' states the following:

C. The Council will require the use of Sustainable Drainage Systems (SuDS) in all development proposals. Applicants will have to demonstrate that their proposal complies with the following:

1. A reduction in surface water discharge to greenfield run-off rates wherever feasible.

2. Where greenfield run-off rates are not feasible, this will need to be demonstrated by the applicant, and in such instances, the minimum requirement is to achieve at least a 50% attenuation of the site's surface water runoff at peak times based on the levels existing prior to the development.

2.14. LBRuT published a Planning Guidance Document – Delivering SuDS in Richmond[vi] in 2015, which provides further guidance on the implementation of SuDS.

2.15. It further states that to reduce the risk of surface water and sewer flooding, all development proposals in the borough that could lead to changes to or have impacts on, surface water runoff are required to follow the London Plan drainage hierarchy:

- Store rainwater for later use;
- Use infiltration techniques, such as porous surfaces in non-clay areas;
- Attenuate rainwater in ponds or open water features for gradual release to a watercourse;
- Attenuate rainwater by storing in tanks or sealed water features for gradual release to a watercourse;
- Discharge rainwater direct to a watercourse;
- Discharge rainwater to a surface water drain; and
- Discharge rainwater to a combined sewer.

3. Existing Drainage

3.1. Thames Water sewer records (Appendix B) indicate that several sewers are present in the vicinity of and crossing the Site, as indicated in Table 1.

Table 1: Existing Sewers Associated with the Site

Location	Sewer
Crossing through the north-west of the Site.	225mm diameter Thames Water foul sewer.
Within north-west of the Site.	Two Thames Water foul rising mains.
Along north-eastern boundary of the Site along Thames towpath.	686mm diameter combined Thames Water sewer.
West of the Site along Williams Lane.	900mm diameter Thames Water surface water sewer.
South of the Site along Lower Richmond Road.	600mm diameter Thames Water surface water sewer.
	750mm diameter and 225mm diameter Thames Water foul water sewer.
Centre of the Site along Ship Lane.	600mm diameter Thames Water surface water sewer.
	225mm diameter Thames Water foul water sewer.

3.2. Following review of the existing onsite drainage records for the Site (Appendix C) it is understood that existing drainage scenario is as follows:

- Existing foul flows discharge to the Thames Water sewer network;
- Existing surface water flows from the north-east of the Site discharge into the Thames via an existing outfall; and
- Existing surface water flows from the remainder of the Site discharge to the Thames Water sewer network at various connection points.

3.3. The existing drainage and connections would be confirmed by a CCTV drainage survey post planning.

4. Surface Water Drainage

4.1. Since the initial 2018 Drainage Strategy, the proposals have been developed to reflect the comments from LBRuT and the GLA. This latest Drainage Strategy incorporates the previous changes and comments and has now been updated to reflect the latest scheme proposals. The key changes since submission of the original strategy comprise:

1. The 3G sports pitch was removed from the surface water drainage catchment on the basis that it would drain freely (requested by the GLA);
2. Permeable paving extents and the rain garden added to the drainage strategy with attenuation volumes quantified to demonstrate a reduction in runoff beyond the 50% mark; and
3. Basement attenuation tanks removed from the west of Ship Lane due to the reduction in basement extent allowing the tanks to be provided closer to the surface. This allows for gravity drainage.

4.2. The drainage strategy outlined below, has been updated to reflect the minor changes to the plans but follows the principles of and remains in line with the 2020 strategy approved by the GLA and LBRuT. The GLA Stage 3 Hearing Report states in paragraph 615, *"The GLA flood risk and drainage officers consider the proposals acceptable subject to the mitigation recommended. The Council's Lead Local Flood Authority Officer raised no objection to the proposals. Subject to the recommended conditions, the proposal accords with the NPPF, London Plan Policies SI5, SI12 and SI13; and Richmond Council's Local Plan Policy LP 21."*

4.3. As with the previous submissions, all existing public highway areas/land within the application boundary would continue to drain as existing. Drainage design here will be addressed as part of wider highways drainage design under the responsibility of the highway authority. Accordingly, the proposed drainage strategy included herein covers the Stag Brewery area of the Site only.

4.4. The proposed surface water drainage system would be designed to convey surface water only, with foul water being discharged separately. The design would be in accordance with BS EN 752 – Drain and Sewer Systems Outside Buildings[vii], BS EN 12056 – Gravity Drainage Systems Inside Buildings[viii], and Approved Document H of Building Regulations[ix].

4.5. In line with Building Regulations and the PPG, the following hierarchy of surface water disposal should be adhered to, in decreasing order of preference.

i. Discharge to ground;
ii. Discharge to a surface water body;
iii. Discharge to a surface water sewer; and
iv. Discharge to a combined sewer.

Discharge to Ground

4.6. According to the Preliminary Risk Assessment by Waterman[x] (January 2022), the Site is underlain by clay, with the likelihood of high groundwater due to the Site's proximity to the River Thames. The report also states the possibility of contamination due to the previous industrial uses on Site. Therefore, the use of infiltration techniques is unlikely to be feasible for the majority of the Site.

4.7. As requested by the Greater London Authority (GLA) (Appendix D), it is proposed that the 3G sports pitch proposed in the south west of the Site would drain freely into the ground. This is subject to ground investigations, which would be undertaken during detailed design. If results show that infiltration is not feasible, then a tank or similar attenuation feature would be provided and surface water runoff from the pitch would be directed into the surrounding Thames Water network. The GLA agreed (Appendix D) that this approach satisfies their aspirations.

Discharge to a Surface Water Body

4.8. The second most sustainable option would be to discharge directly to a surface water body. Due to the proximity to the River Thames, the north-eastern part of the Site would discharge directly into the River.

4.9. An existing residential area lies between the western part of the Site and the River Thames. As such, there is no means to provide a connection directly into the Thames from the western or south-eastern part of the Site.

Discharge to a Sewer

4.10. Thames Water sewer records (Appendix B) indicate that several surface water sewers are present in the vicinity of the Site, which ultimately connect into the River Thames. The on-Site sewer records (Appendix C) indicate that the majority of the Site currently drains into the Thames Water surface water sewer network.

4.11. Areas of the Site where a direct connection into the River Thames is not feasible would instead connect to the Thames Water sewer network as per the existing situation.

Sustainable Drainage Systems

4.12. The most sustainable way to drain surface water runoff is through the use of Sustainable Drainage Systems (SuDS), which need to be considered in relation to Site-specific constraints.

4.13. SuDS mimic the natural drainage system and provide a method of surface water drainage which can decrease the quantity of water discharged, and hence reduce the risk of flooding. In addition to reducing flood risk, SuDS features improve water quality, and provide biodiversity and amenity benefits.

4.14. The potential for SuDS was considered throughout the design process with workshops being held by the design team to discuss the various constraints and opportunites for each of the SuDS devices. In line with the London Plan Policy SI13 “Sustainable Drainage”, rainwater harvesting and parmeable paving would be incorporated along with a number of other SuDS features, as outlined in Table 2 below. A completed LBRuT SuDS proforma for the Development is provided in Appendix J.

Table 2: Sustainable Drainage Techniques

Device	Description	Constraints/Comments	✓/✗
Green / brown roofs (source control).	Provide soft landscaping at roof level which reduces surface water runoff.	Green roofs are proposed throughout the Development (Appendix A).	✓
Infiltration devices & Soakaways (source control).	Store runoff and allow water to percolate into the ground via natural infiltration.	The underlying geology, high groundwater levels, and potential contamination risks preclude the potential for formal infiltration at this stage.	✗
Pervious surfaces (source control).	Storm water is allowed to infiltrate through the surface into a storage layer, from which it can either infiltrate and / or slowly release to sewers.	The underlying geology, high groundwater levels, and potential contamination risks preclude the potential for formal infiltration. However, lined permeable paving is proposed throughout the Development.	✓
Rainwater harvesting (source control).	Reduces the annual average rate of runoff from a site by reusing water for non-potable uses e.g. toilet flushing or water butts.	Rainwater harvesting butts are proposed throughout the Development. However, the reduction of surface water runoff cannot be quantified with certainty as this would be dependent on the demand for harvested rainwater.	✓
Swales (permeable conveyance).	Broad shallow channels that convey / store runoff, and allow infiltration (ground conditions permitting).	The underlying geology, high groundwater level, and potential contamination risks preclude the potential for formal infiltration. The tight urban nature of the Site precludes the inclusion of swales.	✗
Filter drains & perforated pipes (permeable conveyance).	Trenches filled with granular materials (which are designed to take flows from adjacent impermeable areas) that convey runoff while allowing infiltration (ground conditions permitting).	The underlying geology, high groundwater level, and potential contamination risks preclude the potential for formal infiltration.	✗
Filter Strips (permeable conveyance).	Wide gently sloping areas of grass or dense vegetation that remove pollutants from runoff from adjacent areas.	The underlying geology, high groundwater level, and potential contamination risks preclude the potential for formal infiltration.	✗
Infiltration basins (end of pipe treatment).	Depressions in the surface designed to store runoff and allow infiltration through the base.	The underlying geology, high groundwater level, and potential contamination risks preclude the potential for formal infiltration.	✗

Device	Description	Constraints/Comments	✓/✗
Bioretention Systems / Rain Garden (end of pipe treatment).	A shallow landscaped depression which allows runoff to pond temporarily on the surface before filtering through vegetation and underlying soils.	The underlying geology, high groundwater and potential contamination risks preclude the potential for formal infiltration. However, a lined rain garden is proposed along the green link in the eastern part of the Site.	✓
Dry ponds (end of pipe treatment)	Depressions in the surface designed to store runoff without infiltration through the base.	Due to the proposed basement extents, the incorporation of ponds would not be feasible.	✗
Attenuation underground (end of pipe treatment)	Oversized pipes or geo-cellular tanks designed to store water below ground level.	Due to the tight urban nature of the site, attenuation tanks are required to restrict runoff to the required rates.	✓

Green Roofs

4.15. Green roofs would provide a bio-diverse habitat in addition to capturing rainwater, naturally slowing the rate of runoff, and providing water quality benefits. The proposed locations for green roofs are shown on the development proposals in Appendix A.

Rainwater Harvesting

4.16. The inclusion of rainwater harvesting would decrease the demand on potable water, and could be used for irrigation of the proposed landscaping. However, it cannot be guaranteed that there would always be sufficient demand for recycled water to ensure an empty tank is available prior to a high intensity rainfall event, when the storage is most required. Therefore, rainwater harvesting has not been taken into account in the surface water runoff calculations presented later in the drainage strategy.

4.17. Including rainwater harvesting butts is a simple means to increase water efficiency and reduce the amount of surface water runoff. Rainwater harvesting butts are proposed throughout the Development.

Permeable Paving (Lined)

4.18. Permeable paving would provide water quality benefits as well as attenuating flows within the lined sub-base structure. The inclusion of lined permeable paving is proposed throughout the Development (as shown on the drainage strategy drawing, Appendix E). Rainwater would percolate through the granular sub-base prior to being attenuated in geo-cellular tanks located beneath.

Rain Gardens

4.19. Rain gardens are planted areas where surface water is directed into, providing primarily water quality benefits as the water percolates through the soil as well as some attenuation. Rain gardens are proposed along the eastern edge of the green link in the eastern part of the Site.

Underground Attenuation

4.20. Due to the constrained urban nature of the Site, lined geo-cellular attenuation tanks are required to significantly restrict surface water runoff. If deemend necessary during detailed design, these would include pollutant-intercepting biomats, which float on the water and are designed to intercept and treat any potential residual emulsified oils (residual hydrocarbons) that may be present within the surface water. These provide a sutainable solution as it is self-maintaining and 100% recyclable.

Proposed Surface Water Drainage Strategy

Discharge to River Thames

4.21. In line with the drainage hierarchy, it is proposed to discharge surface water runoff from the north-east part of the Site into the adjacent River Thames. Due to the tidal nature of the Thames in this location, LBRuT accept that surface water runoff can discharge to it unrestricted (Appendix F). In the existing situation, the majority of this area drains into the Thames Water network. The proposals therefore reduce contributing area discharging into the public sewer network compared to the existing situation.

4.22. It is important to include the potential for tide locking in the assessment, to ensure that if the outfall into the Thames becomes surcharged (i.e. if the water level in the river rises above the level of the outfall), any rain falling on the Site during this time would not cause flooding within the Development. For the purpose of this assessment the Mean High Water Spring Level (MHWS) of 4.13m AOD has been used (as indicated in the 2017 PLA Tide Table in Appendix G), plus a 1.1m for sea level rise over the next 100 years (in accordance with EA guidance). This gives a tide locking design level to be 5.23m AOD. At this design level, the outfall would be surcharged for 5.4 hours during a tidal surge (Appendix G includes tide locking calculations).

4.23. The north-east of the Site would discharge unrestricted into the River Thames via three outfalls; the existing outfall would be reused if possible subject to CCTV survey and detailed design.

4.24. A proposed single-level basement (including a sub-basement under Building 01) extends across the majority of the eastern part of the Site, restricting potential drainage routes to the River Thames and therefore the size of the catchment that could drain to the River Thames. In order to maximise the size of the catchment that could drain to the River Thames, a shallow channel system made up of permavoid tanks is proposed to convey surface water towards the River (note this is for conveyance, not attenuation).

4.25. The channels would be 150mm deep and 3,200mm in width (subject to detailed design) and laid flat above the ground floor slab. At the boundary of the basement the channels would be picked up by traditional below ground drainage and directed to the River Thames.

4.26. To ensure this system would work under storm conditions, a MicroDrainage network model has been developed. The worst-case scenario (longest channel with largest incoming catchment area) has been assessed and the potential for tide-locking has been incorporated in the analysis. The results (Appendix G) indicate no flooding for the 1 in 100 year plus 40% climate change storm event.

Discharge to Thames Water Sewers

4.27. It is proposed to discharge surface water runoff from the remaining areas of the Site (that cannot reach the River Thames directly) to the existing Thames Water network. The London Plan ideally requires developments to restrict surface water runoff to the greenfield rate. However, it states that where it can be justified that this volume cannot be incorporated within the development, 50% of the existing rate can be acceptable.

4.28. The area of the Site which currently drains into the Thames Water network is 5.89ha. This excludes the existing green area in the south-west of the Stag Brewery Site, to the south of the proposed school, as it would remain a green park area as part of the Development. By directing flows from the north-eastern part of the Stag Brewery Site directly to the River Thames, the area that drains into the Thames Water network is reduced to 4.82ha.

4.29. The greenfield runoff rate (Q100) has been calculated to be 9.2 l/s/ha (or 44.1 l/s for the the Site) (Appendix H). The existing runoff rate has been calculated for the 1 in 100 year 60 minute event using the Modified Rational Method. This gives an existing runoff rate off 841 l/s (Appendix H) for the Site.

4.30. The potential to restrict runoff to the greenfield runoff rate has been considered throughout the design process. However, the Site is spatially constrained by the proposed basement extents and level of the existing sewers. To restrict runoff to greenfield rates, the attenuation features would need to be considerably deeper to accommodate a larger volume. As a result, discharge to sewers by gravity would not be possible. Whilst avoiding pumping requirements, the attenuation volume available across the Site has been maximised through the incorporation of permeable paving with aggregate sub-base, rain gardens, and underground attenuation tanks, achieving a 70% reduction in surface water flows compared to the existing rate. A Briefing Note[xi] was prepared for the benefit of the GLA outlining this approach (which was submitted to support the previous applications, reference 18/0547/FUL and 18/0549/FUL), which the GLA subsequently agreed to (Appendix D). In addition, the proposed 70% betterment compared to the existing rate is above and beyond the 50% flow reduction originally required by LBRuT.

4.31. The Site has been split into 7 drainage catchments, mimicking the existing situation as much as practicable. The attenuation provision within each catchment has been maximised, achieving a total of 2,669m^3 across the Site (Table 3). MicroDrainage Source Control module (Appendix H) was used to calculate the runoff rate this attenuation can achieve, resulting in 249 l/s, which represents a 70% reduction of flows compared to the existing rate. This equates to a 64% reduction of Application A and 91% for Application B. Source Control includes for all storm durations and takes account of a 40% increase in rainfall intensity to account for climate change.

Table 3: Proposed Discharge Rates and Attenuation Provision

Catchment	Area (ha)	Existing Rate (l/s)	Proposed Rate (l/s)	Attenuation (m^3)	Betterment (%)
East part of the Site – 1	0.30	42.8	20.0	143	53
East part of the Site – 2	0.25	35.7	17.8	117	50

Catchment	Area (ha)	Existing Rate (l/s)	Proposed Rate (l/s)	Attenuation (m^3)	Betterment (%)
East part of the Site – 3	0.18	25.7	12.8	84	50
West part of the – School	1.31	187.0	16.0	992	91
West part of the Site – 4	1.07	152.7	76.2	499	50
West part of Site – 5	0.92	131.3	49.5	465	62
West part of the Site – 6	0.79	112.8	56.3	369	50
Sub-Total	4.82	688	249	2,669	64
Total*	**5.89**	**841**	**249**	**2,669**	**70**

*Includes area of the Site which is proposed to discharge unrestricted into the River Thames

4.32. The proposed geo-cellular tanks are proposed outside of the basement extent and below the extent of the proposed tree pits.

4.33. There is limited space for attenuation features to serve the proposed residential units in the north-west of the Site due to the road and pavements to be offered up for adoption. A proposed surface water sewer within the road would pick up surface water from the residential units and associated hardstanding areas and discharge into the Thames Water surface water sewer to the west. Attenuation would be provided by two offline attenuation tanks; surface water would back up into these tanks from the flow control structure prior to discharge into the public sewer.

4.34. Existing surface water connections into the surrounding public sewer network would be re-used where feasible, which would be determined following a CCTV survey during detailed design. Where new connections are required, these would be made to the public sewer system through a Section 106 Agreement with Thames Water, under the Water Industry Act 1991.

Water Quality

4.35. Appropriate treatment would be incorporated into the drainage system to ensure that the quality of water discharged is acceptable in line with the CIRIA SuDS Manual[xii]. This would be achieved through the incorporation of green roofs and permeable paving sub-base storage. A biomat filtration system, downstream defender, petrol interceptor and/or other hard engineered solution would also be incorporated if deemed necessary during detailed design to ensure discharge is appropriately treated. The GLA have confirmed (Appendix D) that the proposed SuDS provision is in line with their aspirations.

4.36. The extensive basement proposed as part of the Development includes mainly car parking. It is anticipated that any surface water within the basement would pass through a petrol interceptor prior to being pumped into the foul network; details and requirements are to be confirmed during detailed design.

Sustainable Drainage Systems Maintenance Plan

4.37. The on-Site drainage networks and SuDS would likely be privately managed and maintained for the lifetime of the Development, ensuring they remain fit for purpose and function appropriately. The management company / operator would be appointed post-planning.

4.38. The PPG sets out the requirement for developers to consider the operation, management and maintenance of all SuDS.

4.39. Post construction the on-Site management company (who would be appointed post-planning) would be responsible for the SuDS included in the scheme. Table 4 outlines what maintenance is anticipated for the proposed / potentially proposed SuDS features.

Table 4: Maintenance Plan for SuDS

SuDs and Task	Frequency
Green Roofs	
Inspect system to replace dead plants as required and ensure plants are sufficiently watered (during establishment period).	As required.
Inspect system to replace dead plants (post establishment period).	Annually (in autumn).
Remove nuisance and invasive vegetation, including weeds.	Six monthly or as required.
Inspect system to ensure substrate is not eroded and inlet / outlet drains are not blocked.	Annually or as required (after severe storms).
Rainwater Harvesting	
Inspect system for debris / blockages.	Annually or as required.
Permeable Paving	
Brushing and vacuuming.	Once a year.
Stabilise and mow contributing adjacent areas.	As required.
Removal of weeds or management using glyphosphase applied directly into the weeds.	As required.
Remediate any landscaping which, through.vegetation maintenance of soil slip, has been raised to within 50mm of the level of the paving.	As required.
Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material.	As required.
Rehabilitation of surface and upper substructure by remedial sweeping.	Every 10 to 15 years as required (if infiltration performance is reduced due to significant clogging).

SuDs and Task	Frequency
Initial inspection.	Monthly for three months after installation.
Inspect for evidence of poor operation and / or weed growth – if required, take remedial action.	Three-monthly, 48 hours after large storms in first six months.
Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually.
Monitor inspection chambers.	Annually.
Rain Garden	
Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain to determine if maintenance is necessary.	Quarterly.
Check operation of the underdrains by inspection of flows after rain.	Annually.
Assess plants for disease infection, poor growth, invasive species etc., an replace as necessary.	Quarterly.
Inspect inlets and outlets for blockage.	Quarterly.
Remove litter and surface debris and weeds.	Quarterly.
Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch.	As required.
Remove and replace filter medium and vegetation above.	As required by likely to be > 20 years.
Attenuation Tank	
Inspect and identify any areas that are not operation correctly. If required, take remedial action.	Monthly for 3 months, then annually.
Remove debris from catchment surface, where it may cause risks to performance.	Monthly.
For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter, remove and replace surface infiltration medium as necessary.	Annually.
Repair/rehabilitate inlets, outlet, and overflows and vents.	As required.
Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually.
Survey inside of tank for sediment build-up and remove if necessary.	Every 5 years or as required.

5. Foul Drainage

5.1. The proposed foul drainage would be designed in accordance with BS EN 752 – Drain and Sewer Systems Outside Buildings[vii], BS EN 12056 – Gravity Drainage Systems Inside Buildings[viii], and Approved Document H of Building Regulations[ix].

5.2. It is understood that foul flows from the existing Site discharge to the Thames Water foul network in the surrounding highways. It is proposed to mimic this scenario, with new connections into the sewers on Mortlake High Street, Lower Richmond Road, Ship Lane, and Williams Lane according to the proposed building layout. The indicative connection points are shown on the drainage layout (Appendix E).

5.3. The existing and proposed foul discharge rates have been calculated using the water consumption method at 14.4 l/s and 25.1 l/s respectively (Appendix I).

5.4. Thames Water have previously confirmed (Appendix B) that there is capacity for the proposed surface and foul flows, however the scheme has changed since then. The proposed flow rates have decreased for surface water and slightly increased for foul water, thus it is not anticipated that there would be an issue relating to capacity.

5.5. Existing connections would be re-used where feasible. Where new connections are required, these would be made to the public sewer system through an S106 Agreement with Thames Water, under the Water Industry Act 1991.

6. Impact on Existing Drainage Infrastructure

6.1. Easements to existing drainage infrastructure crossing the Site need to be allowed for to ensure it is not impacted upon. The Development complies with all necessary easements, and where these are not possible, appropriate diversions are proposed.

6.2. The 225mm diameter Thames Water foul sewer crossing the Site is proposed to be diverted as shown on the drainage plan in Appendix E. The two rising mains only service the existing uses within the Site (now redundant and dis-used) and are proposed to be abandoned as part of the Development. An easement of 4.0m is allowed for to the combined sewer along the north-eastern boundary of the Site to ensure it is not impacted upon as it conveys off-Site flows.

7. Conclusions

The drainage strategy outlined in this report reflects the minor changes to the plans but follows the principles of and remains in line with the 2020 strategy approved by the GLA and LBRuT.

Surface water runoff from the northeast of the Site would discharge by gravity to the River Thames (adjacent to the northern boundary of the Site) via three outfalls. As the River Thames is tidal in this location, direct discharge to the river would be unrestricted. The area to discharge into the River Thames has been maximised using shallow geo-cellular conveyance channels, in order to relieve the Thames Water network of flows. Surface water runoff from the remainder of the Site would discharge via gravity to the Thames Water sewer network in the surrounding highways, maximising the attenuation volume within each drainage catchment to restrict surface water flows as much as possible.

Based on an area of 5.89ha currently draining into the Thames Water network, the existing discharge rate was calculated to be 841 l/s. The incorporation of permeable paving, rain gardens, and underground attenuation tanks achieves a reduction of surface water flows to 249 l/s, equal to a 70% reduction compared to the existing rate. This equates to a 64% reduction of Application A and 91% for Application B. This approach has been agreed with the Greater London Authority.

Appropriate treatment would be incorporated into the drainage system to ensure that the quality of water discharged is acceptable. This would be achieved through the incorporation of green roofs, permeable paving aggregate sub-base, rain gardens, and rainwater harvesting. A biomat filtration system within the attenuation tanks and downstream defenders or similar hard engineered solution would also be incorporated if deemed necessary at detailed design to ensure discharge is appropriately treated.

Foul flows from the Site would discharge by gravity the Thames Water sewer network. The existing and proposed foul discharge rates have been calculated using the water consumption method at 14.4l/s and 25.1 l/s respectively.

The on-Site drainage networks and Sustainable Drainage Systems would be privately managed and maintained for the lifetime of the Development, ensuring they remain fit for purpose and function appropriately. The management company / operator would be appointed post-planning. The school drainage system (Application B) would be delivered and maintained separately from the Application A site.

This report confirms that surface water runoff from the Site (Applications A and B) can be managed sustainably to ensure that flood risk is not increased elsewhere. It is considered that the information provided within this report satisfies the requirements of the National Planning Policy Framework (NPPF), the London Plan, and the London Borough of Richmond upon Thames Local Plan.

8. References

[i] Ministry of Housing, Communities and Local Government, July 2021. National Planning Policy Framework.

[ii] Ministry of Housing, Communities and Local Government, June 2021. Planning Practice Guidance.

[iii] Department for Environment, Food and Rural Affairs, March 2015. Non-statutory technical standards for sustainable drainage systems.

[iv] Greater London Authority, March 2021. London Plan.

[v] London Borough of Richmond upon Thames, July 2018: Local Plan As Adopted 3 July 2018 and 3 March 2020.

[vi] London Borough of Richmond Upon Thames, February 2015. Planning Guidance Document – Delivering SuDS in Richmond.

[vii] British Standards Institution, April 2008. BS EN 752:2008 – Drain and Sewer Systems Outside Buildings.

[viii] British Standards Institution, September 2000. BS EN 12056-2:2000 – Gravity Drainage Systems Inside Buildings.

[ix] HM Government, 2010. The Building Regulations 2010: H, Drainage and Waste Disposal.

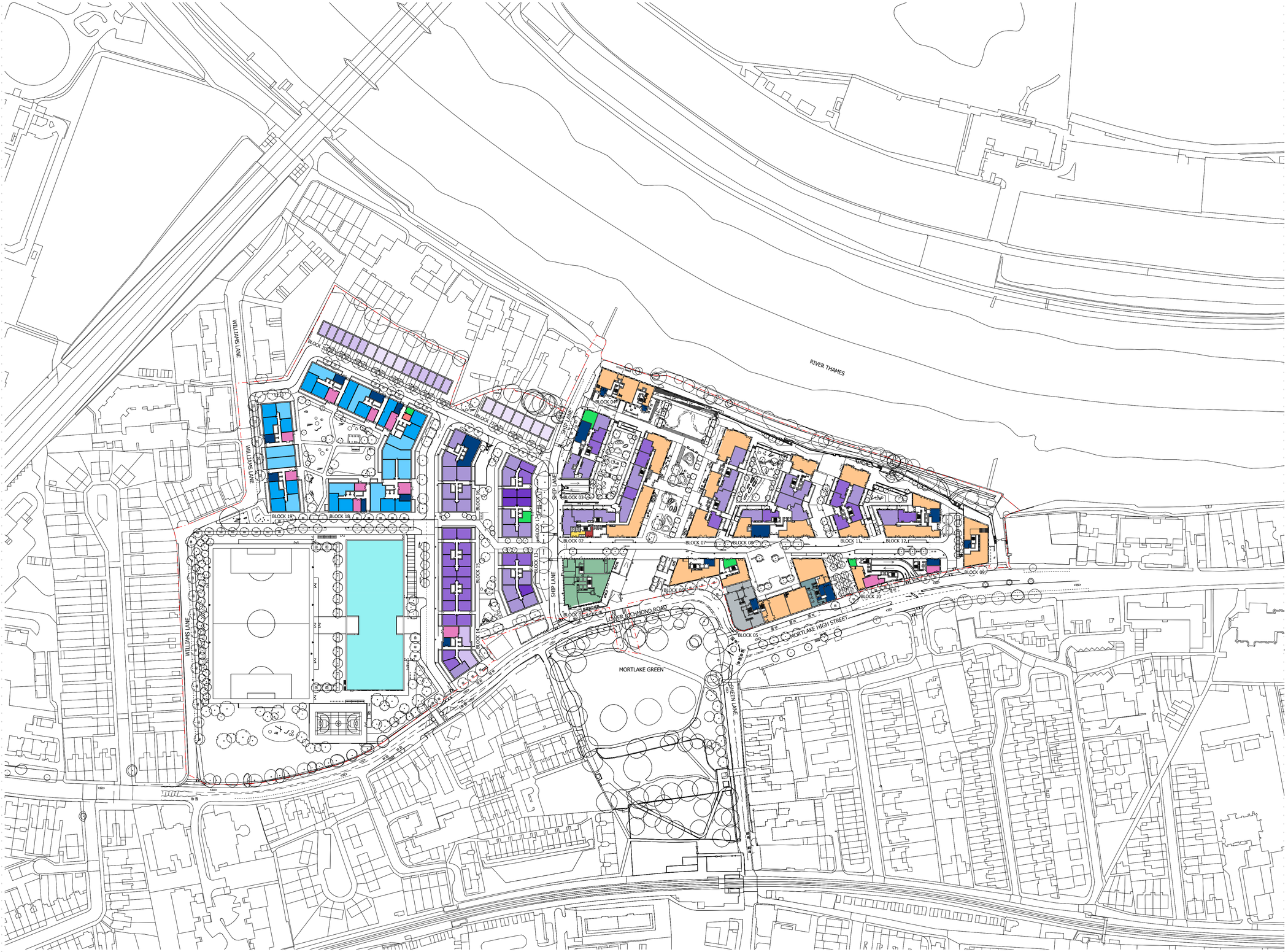
[x] Waterman Infrastructure & Environment Ltd, 2022. Preliminary Risk Assessment.

[xi] Waterman Infrastructure & Environment, 2019. Surface Water Drainage Update Briefing Note.

[xii] CIRIA C753, 2015. The SuDS Manual.

APPENDICES

A. Development Proposals



NOTES:

DO NOT SCALE FROM THIS DRAWING. ALL DIMENSIONS TO BE CHECKED ON SITE. ALL OMISSIONS AND DISCREPANCIES TO BE REPORTED TO THE ARCHITECT IMMEDIATELY.

NOTE: UNIT MIX AND LAYOUT FOR DEVELOPMENT AREA 2 IS INDICATIVE AT THIS STAGE

- Studio
- 1B2P
- 2B3P
- 2B4P
- 3B5P
- 3B6P
- 4B8P
- 2B3P SR
- 2B4P SR
- 3B5P SR
- 3B6P SR
- BIKE STORE
- CAR PARK ENTRANCE
- CINEMA
- FLEXIBLE USE
- GAS METER ROOM
- HOTEL
- LV SWITCHROOM
- OFFICE
- REFUSE STORE
- SCHOOL
- SUBSTATION

Revision description	Date	Check	Rev
LBRUT 2 APPLICATION	25/02/22	BJ	E
FINAL DRAFT HYBRID SUBMISSION	07/01/22	RKB	D
GLA SUBMISSION	27/04/20	BJ	C
DRAFT GLA SUBMISSION	24/01/20	KH	B
FINAL DRAFT PLANNING APPLICATION	21/10/19	KH	A
LEGAL REVIEW	13/09/19	KH	-

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Richmond

Drawing

PROPOSED MASTERPLAN
GROUND FLOOR LEVEL

Drawn	Date	Scale
TC	18/01/18	1 : 1250 @ A1 1 : 2500 @ A3

Job Number	Drawing number	Revision
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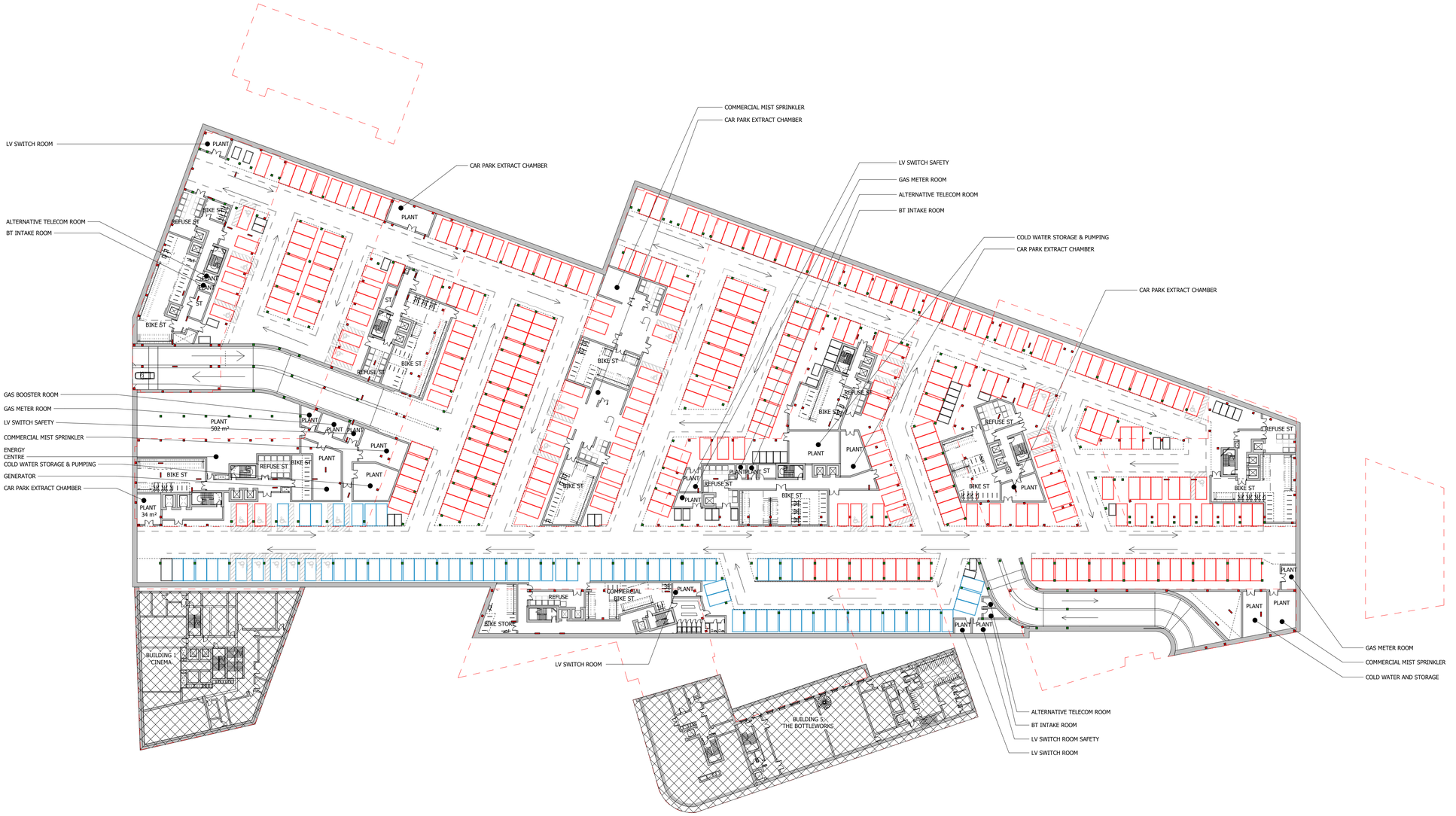
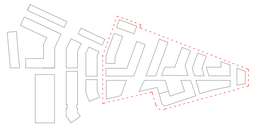


NOTES:

DO NOT SCALE FROM THIS DRAWING. ALL DIMENSIONS TO BE CHECKED ON SITE. ALL OMISSIONS AND DISCREPANCIES TO BE REPORTED TO THE ARCHITECT IMMEDIATELY.

NORTH



KEY

- 330 Residential Spaces
- 78 Commercial Spaces
- 43 Motorbike Spaces
- 1,098 Cycle Spaces

NORTH

0 5 10 25 50 m

Revision description	Date	Check	Rev
LBRUT 2 APPLICATION	04/02/22	BJ	E
DRAFT FINAL HYBRID SUBMISSION	19/01/22	RKB	D
GLA SUBMISSION	27/04/20	BJ	C
DRAFT GLA SUBMISSION	24/01/20	KH	B
FINAL DRAFT PLANNING APPLICATION	21/10/19	KH	A
LEGAL REVIEW	13/09/19	KH	-

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Drawing

PROPOSED DEVELOPMENT AREA 01
BASEMENT PLAN

Drawn	Date	Scale
RKL	06/09/19	1 : 500 @ A1 1 : 1000 @ A3

Job Number	Drawing number	Revision
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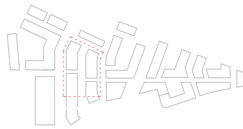
NOTES:

DO NOT SCALE FROM THIS DRAWING. ALL DIMENSIONS TO BE CHECKED ON SITE. ALL OMISSIONS AND DISCREPANCIES TO BE REPORTED TO THE ARCHITECT IMMEDIATELY.

NORTH



KEY

70 Residential Spaces

5 Motorbike Spaces

645 Cycle Spaces

NORTH

0 5 10 25 50 m

Revision description	Date	Check	Rev
DRAFT FINAL HYBRID SUBMISSION	19/01/22	RKB	D
GLA SUBMISSION	27/04/20	BJ	C
DRAFT GLA SUBMISSION	24/01/20	KH	B
FINAL DRAFT PLANNING APPLICATION	21/10/19	KH	A
LEGAL REVIEW	13/09/19	KH	-

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Drawing

PROPOSED DEVELOPMENT AREA 02
BASEMENT PLAN

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Job Number	Drawing number	Revision
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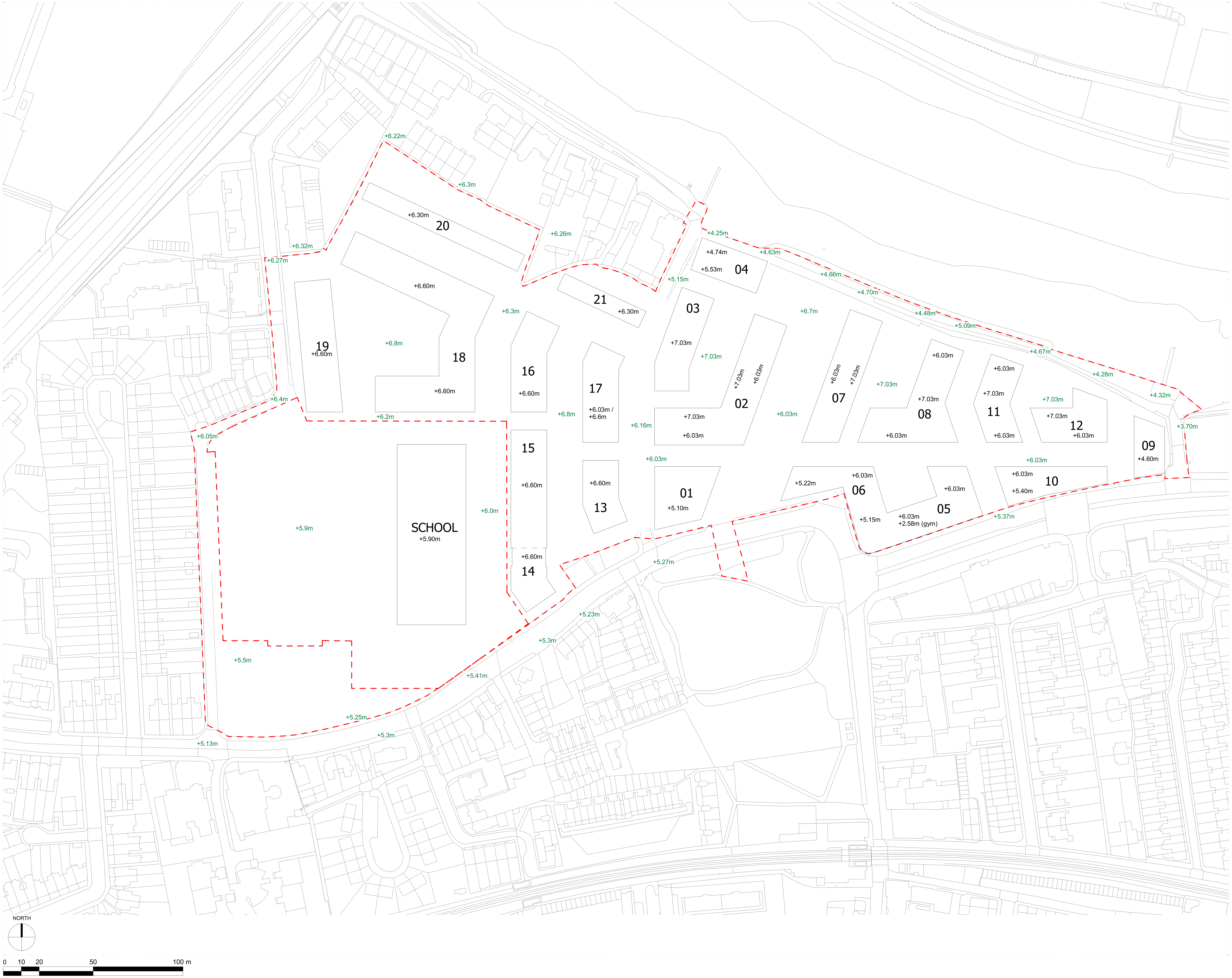

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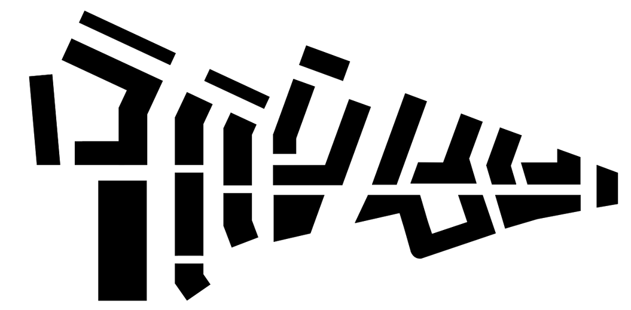
NORTH



PROPOSED SITE LEVELS

BLOCK DATUM (GROUND LEVEL)

13-21 BLOCK NUMBER

PLANNING APPLICATION BOUNDARY

Revision description	Date	Check	Rev
LBRUT 2 APPLICATION	25/02/22	BJ	E
FINAL DRAFT HYBRID SUBMISSION	12/01/22	RKB	D
GLA SUBMISSION	27/04/20	BJ	C
DRAFT GLA SUBMISSION	24/01/20	KH	B
FINAL DRAFT PLANNING APPLICATION	21/10/19	KH	A
LEGAL REVIEW	13/09/19	KH	-

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Drawing
PROPOSED BUILDING LEVELS - GROUND FLOOR

Drawn	Date	Scale
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Job Number	Drawing number	Revision
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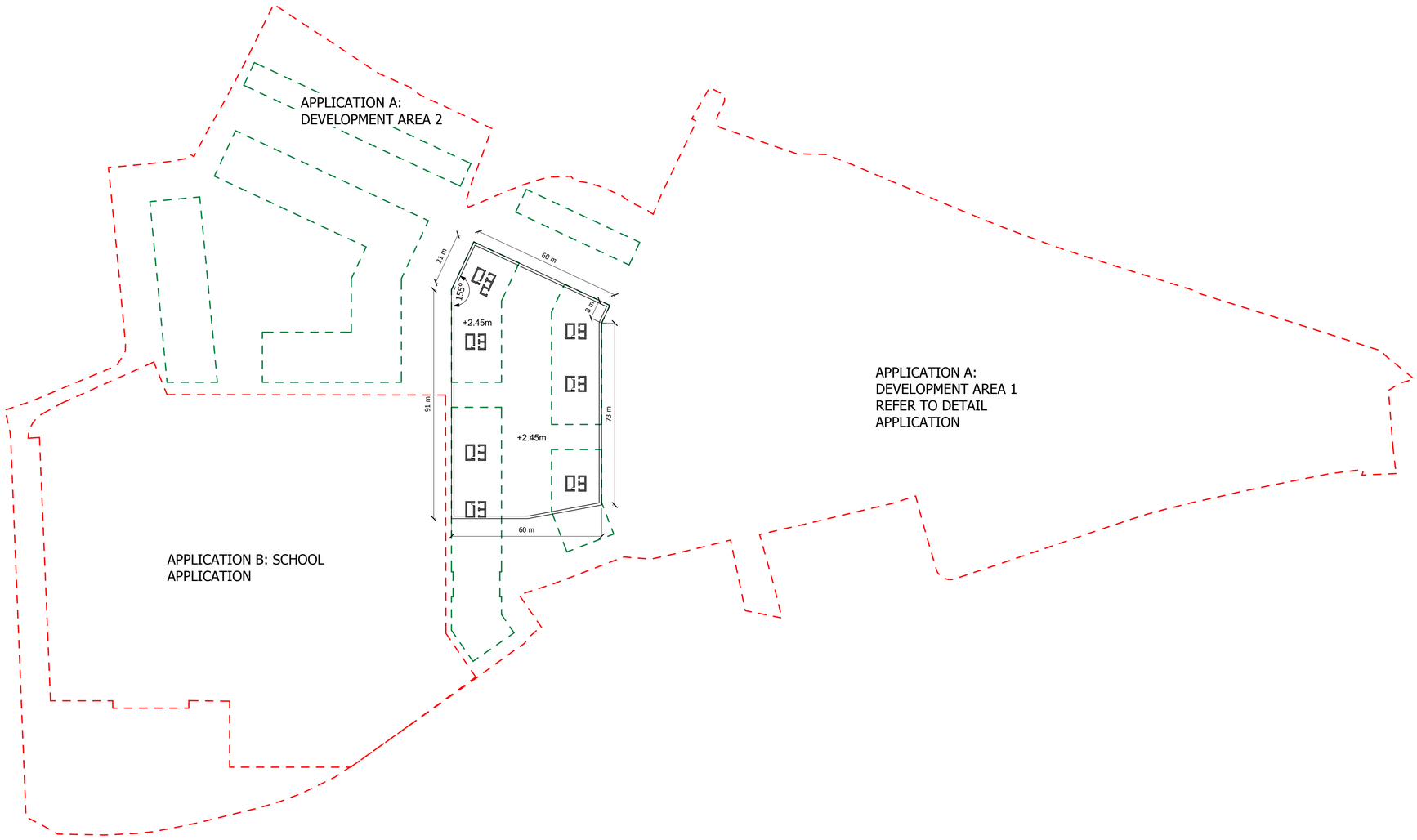

NOTES:

DO NOT SCALE FROM THIS DRAWING. ALL DIMENSIONS TO BE CHECKED ON SITE. ALL OMISSIONS AND DISCREPANCIES TO BE REPORTED TO THE ARCHITECT IMMEDIATELY.

NORTH

BLOCK ABOVE FOOTPRINT

PLANNING APPLICATION BOUNDARY

+2.45m MAXIMUM BASEMENT DEPTH

Revision description	Date	Check	Rev
LBRUT 2 APPLICATION	25/02/22	BJ	E
FINAL DRAFT HYBRID SUBMISSION	12/01/22	RKB	D
GLA SUBMISSION	27/04/20	BJ	C
DRAFT GLA SUBMISSION	24/01/20	KH	B
FINAL DRAFT PLANNING APPLICATION	21/10/19	KH	A
LEGAL REVIEW	13/09/19	KH	-

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PROPOSED BASEMENT MAXIMUM DEPTH AND EXTENT

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Job Number	Drawing number	Revision
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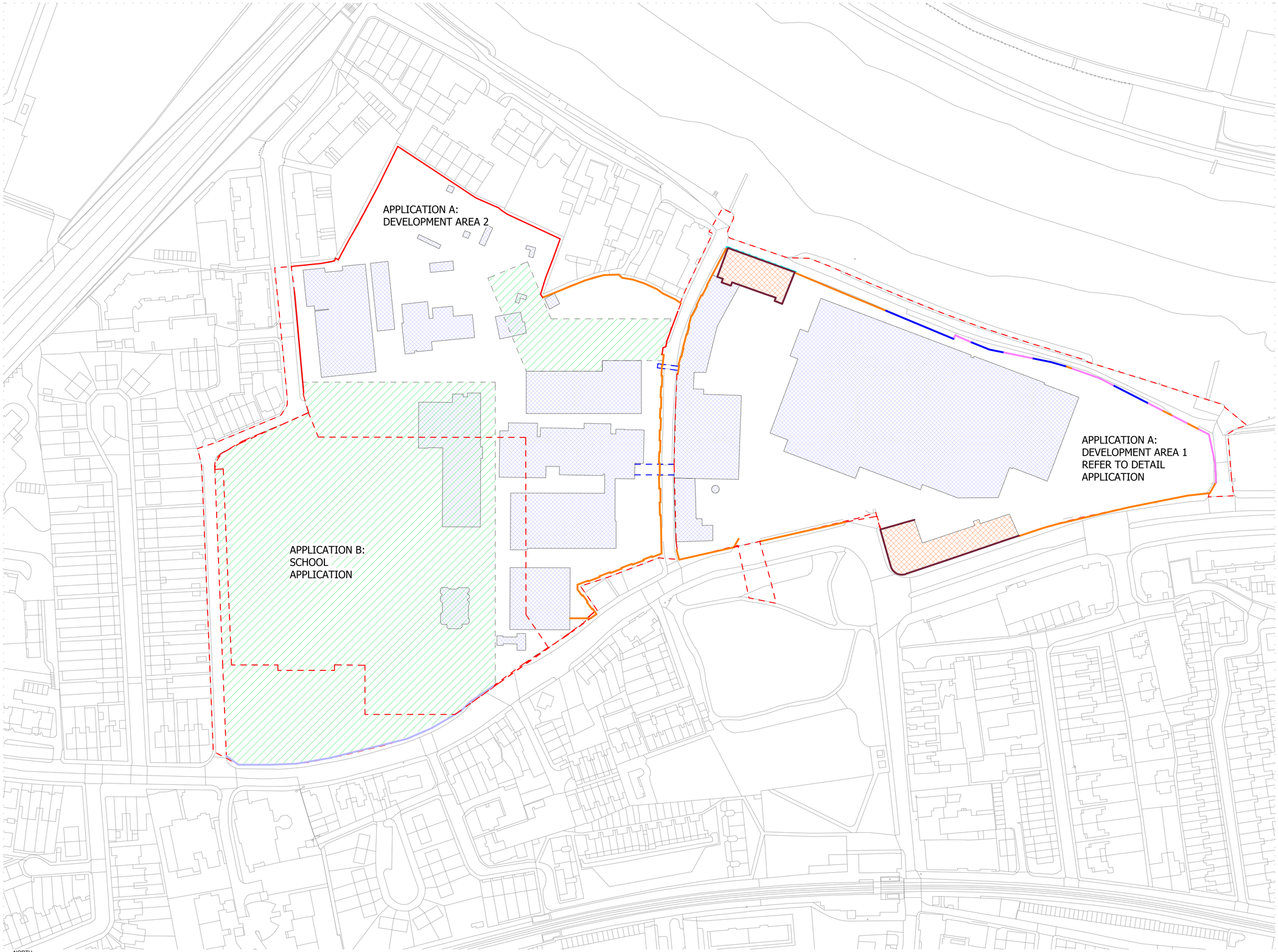

NOTES:

DO NOT SCALE FROM THIS DRAWING. ALL DIMENSIONS TO BE CHECKED ON SITE. ALL OMISSIONS AND DISCREPANCIES TO BE REPORTED TO THE ARCHITECT IMMEDIATELY.

NORTH

- TO BE DEMOLISHED
- PARTIAL FACADE RETENTION
- BRIDGE TO BE REMOVED
- PLANNING APPLICATION BOUNDARY
- EXISTING BUILDING TO BE RETAINED AS FLOOD DEFENCE WALL AND MODIFIED AS REQUIRED
- EXISTING WALL TO BE DEMOLISHED TO LEVEL +6.03m AND NEW GLASS BALUSTRADE ON RIVERWALL
- EXISTING WALL TO BE DEMOLISHED TO FINISH LEVEL +6.70m
- EXISTING WALL TO BE REMOVED
- EXISTING FENCE TO BE RETAINED
- MEMORIALS ON EXISTING WALL TO BE RELOCATED ON SITE
- ALL OTHER EXISTING WALL AND FENCES TO BE REMOVED
- FACADE TO BE RETAINED

Revision description	Date	Check	Rev
LBRUT 2 APPLICATION	25/02/22	BJ	E
FINAL DRAFT HYBRID SUBMISSION	12/01/22	RKB	D
GLA SUBMISSION	27/04/20	BJ	C
DRAFT GLA SUBMISSION	24/01/20	KH	B
FINAL DRAFT PLANNING APPLICATION	21/10/19	KH	A
LEGAL REVIEW	13/09/19	KH	-

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Drawing

DEMOLITION AND RETENTION PLAN

Drawn	Date	Scale
KHO	13/09/19	1 : 1000 @ A1 1 : 2000 @ A3

Job Number	Drawing number	Revision
18125	C645_Z2_P_PR_011	E

B. Thames Water Correspondence

Sewer Flooding
History Enquiry

Waterman Infrastructure & Environment

Search address supplied

Stag Brewing Co Ltd
The Stag Brewery
Mortlake
London
SW14 7ET

Your reference WIE10667

Our reference SFH/SFH Standard/2016_3238633

Received date **22 January 2016**

Search date **23 January 2016**

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0118 925 1504
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Sewer Flooding

History Enquiry

Search address supplied: Stag Brewing Co Ltd,The Stag Brewery,Mortlake,London,SW14 7ET

This search is recommended to check for any sewer flooding in a specific address or area

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

(iv) compensation payments

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0118 925 1504
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Sewer Flooding

History Enquiry

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- 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 on Tel: 0800 316 9800 or website www.thameswater.co.uk

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Asset Location Search Sewer Map - ALS/ALS Standard/2016_3238630

TQ2075NW

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 520250,175750

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 that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
4512	6.54	4.41
4601	6.78	4.11
46MK	n/a	n/a
46NE	n/a	n/a
46NL	n/a	n/a
4605	6.03	4.3
4604	5.92	2.97
4603	6.02	4.11
4602	5.92	2.18
46MN	n/a	n/a
46NH	n/a	n/a
46LN	n/a	n/a
461A	n/a	n/a
4508	6.77	5.28
4507	n/a	n/a
4506	6.76	5.22
4501	6.75	4.26
451B	n/a	n/a
451A	n/a	n/a
4502	6.44	3.91
4510	6.45	3.59
4511	6.34	3.37
4504	6.33	2.52
4503	6.45	2.92
4513	6.36	3.22
4505	n/a	2.86
4802	5.35	.8
4716	n/a	n/a
4706	6.33	4.22
4717	n/a	n/a
4707	n/a	n/a
4801	5.22	1.38
4708	n/a	n/a
4714	5.95	3.74
4718	n/a	n/a
4705	5.87	2.69
4713	5.79	1.65
4715	5.75	2.45
4711	6.05	2.52
4712	n/a	n/a
4703	5.84	1.98
4804	5.05	2.06
4803	4.95	n/a
4908	4.97	n/a
4905	5.03	2.59
4904	5.02	.89
4903	5.08	.89
4907	4.94	2.32
4902	4.86	1.96
4906	4.96	n/a
4901	4.93	2.36
35LH	n/a	n/a
35LJ	n/a	n/a
3502	6.37	5.2
3501	6.57	5.49
4509	5.71	5.46
351A	n/a	n/a
361A	n/a	n/a
3611	6.7	4.84
3610	6.8	4.74
3609	6.77	4.77
3604	6.76	4.09
46ME	n/a	n/a
3605	6.78	3.94
36LL	n/a	n/a
36LM	n/a	n/a
3603	n/a	n/a
36NC	n/a	n/a
36NL	n/a	n/a
36NK	n/a	n/a
36NH	n/a	n/a
36MM	n/a	n/a
361B	n/a	n/a
3802	5.33	3.22
39MJ	n/a	n/a
39NE	n/a	n/a
391A	n/a	n/a
38LK	n/a	n/a
38MK	n/a	n/a
38ML	n/a	n/a
39ND	n/a	n/a
39NK	n/a	n/a
3904	5.14	2.68
3907	5.99	1.99
39NJ	n/a	n/a
39NC	n/a	n/a
3902	4.98	3.64
3903	6	1.53
3906	5.17	2.03
3908	n/a	n/a
3905	5.19	2.25

Manhole Reference	Manhole Cover Level	Manhole Invert Level
3901	5.2	1.62
361C	n/a	n/a
3608	6.19	5.48
36MJ	n/a	n/a
36MH	n/a	n/a
36NF	n/a	n/a
36ML	n/a	n/a
361D	n/a	n/a
3602	5.82	3.69
3701	6.15	3.48
3702	6.16	4.58
271D	n/a	n/a
371B	n/a	n/a
2701	5.59	2.87
371A	n/a	n/a
371D	n/a	n/a
371C	n/a	n/a
1603	6.29	5.13
1506	6.76	5.16
1503	6.75	4.86
26MK	n/a	n/a
26ME	n/a	n/a
26LF	n/a	n/a
26LE	n/a	n/a
26LN	n/a	n/a
26LM	n/a	n/a
26LD	n/a	n/a
26LL	n/a	n/a
2601	6.27	4.87
2602	6.33	5.17
2510	6.72	4.76
2508	6.68	5.12
26HD	n/a	n/a
2502	6.83	5.04
2503	6.67	4.98
261A	n/a	n/a
26FN	n/a	n/a
2604	n/a	n/a
251B	n/a	n/a
251A	n/a	n/a
35MN	n/a	n/a
3607	6.32	4.48
3606	6.55	4.89
35NF	n/a	n/a
35MJ	n/a	n/a
3601	6.58	4.51
16NK	n/a	n/a
16ME	n/a	n/a
16LM	n/a	n/a
271A	n/a	n/a
271C	n/a	n/a
26MF	n/a	n/a
271B	n/a	n/a
27NM	n/a	n/a
26HM	n/a	n/a
26HL	n/a	n/a
2702	6.33	5.28
281A	n/a	n/a
261B	n/a	n/a
2703	5.61	2.87
2603	n/a	n/a
3804	4.67	4.08
3801	n/a	n/a
1809	5.06	3.86
1804	5.11	n/a
1805	5.12	2.35
1801	5.09	.25
2808	5.07	3.63
381D	n/a	n/a
2807	5.2	3.42
381C	n/a	n/a
381B	n/a	n/a
2803	5.26	2.16
2802	5.28	.38
381A	n/a	n/a
38NL	n/a	n/a
38NH	n/a	n/a
38NM	n/a	n/a
38NJ	n/a	n/a
2809	5.07	n/a
2805	5.19	2.78
2806	5.3	3.26
3803	4.87	3.65
38LM	n/a	n/a
2801	5.32	.44
38MM	n/a	n/a
2804	5.33	1.95
38LL	n/a	n/a
16JM	n/a	n/a
26KL	n/a	n/a
06NL	n/a	n/a
26KK	n/a	n/a
16LH	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
26KJ	n/a	n/a
1604	6.26	5.46
16LD	n/a	n/a
1601	6.28	4.59
26KD	n/a	n/a
16KM	n/a	n/a
26KC	n/a	n/a
16KJ	n/a	n/a
16MM	n/a	n/a
26JN	n/a	n/a
16KE	n/a	n/a
261C	n/a	n/a
1606	6.33	5.49
1602	6.34	5.24
26JJ	n/a	n/a
26JH	n/a	n/a
26JF	n/a	n/a
161A	n/a	n/a
16MN	n/a	n/a
16NG	n/a	n/a
26HN	n/a	n/a
16LN	n/a	n/a
0613	6.15	4.12
0606	n/a	n/a
0614	6.16	3.64
0506	n/a	n/a
0610	6.19	5.11
0517	n/a	n/a
0611	n/a	n/a
0604	6.15	3.68
0516	n/a	n/a
0504	6.97	4.62
0609	6.14	4.77
0515	6.78	3.96
0501	6.94	4.13
151A	n/a	n/a
151C	n/a	n/a
151B	n/a	n/a
16JJ	n/a	n/a
1508	6.71	4.9
1504	6.71	5.25
1502	6.89	5.09
16LL	n/a	n/a
1505	6.86	5.41
16MF	n/a	n/a
1605	6.3	5.42
09ND	n/a	n/a
09NM	n/a	n/a
09NJ	n/a	n/a
09NL	n/a	n/a
091A	n/a	n/a
0903	n/a	n/a
0904	5.55	3.51
0901	n/a	n/a
0902	5.59	1.67
09MN	n/a	n/a
19NE	n/a	n/a
19NL	n/a	n/a
19NM	n/a	n/a
19NF	n/a	n/a
19NH	n/a	n/a
19MK	n/a	n/a
19MJ	n/a	n/a
19MF	n/a	n/a
19MH	n/a	n/a
18ME	n/a	n/a
1901	n/a	n/a
0807	5.16	2.54
07NK	n/a	n/a
0804	5.18	1.83
0802	5.19	.09
0703	5.21	3.38
0701	5.18	2.31
0702	n/a	n/a
0605	6.1	2.99
0809	5.08	2.26
0808	5.06	2.47
07ML	n/a	n/a
07NE	n/a	n/a
0805	5.1	1.16
0801	5.15	.14
08NM	n/a	n/a
18NJ	n/a	n/a
18MN	n/a	n/a
18NK	n/a	n/a
18NC	n/a	n/a
18NL	n/a	n/a
18ND	n/a	n/a
18NM	n/a	n/a
1808	5.26	2.26
1807	5.17	2.41
1806	5	2.43
1802	5.16	.2

Manhole Reference	Manhole Cover Level	Manhole Invert Level
1803	5.03	2.03
05LD	n/a	n/a
05LE	n/a	n/a
07LK	n/a	n/a
07KN	n/a	n/a
08NE	n/a	n/a
08NC	n/a	n/a
0803	5.12	.01
07LM	n/a	n/a
07LD	n/a	n/a
071B	n/a	n/a
07NM	n/a	n/a
0806	5.16	2.62
071A	n/a	n/a
07ME	n/a	n/a
07LJ	n/a	n/a
0507	6.41	5.15
0503	6.36	4.68
0607	5.99	4.16
0608	6	4.7
25ML	n/a	n/a
25MN	n/a	n/a
35LD	n/a	n/a
35LE	n/a	n/a
35LF	n/a	n/a
2506	6.95	5.58
2501	6.76	5.28
2504	6.82	5.1
35LC	n/a	n/a
2507	6.79	5.15
2505	6.65	5.28
25MJ	n/a	n/a
35NK	n/a	n/a

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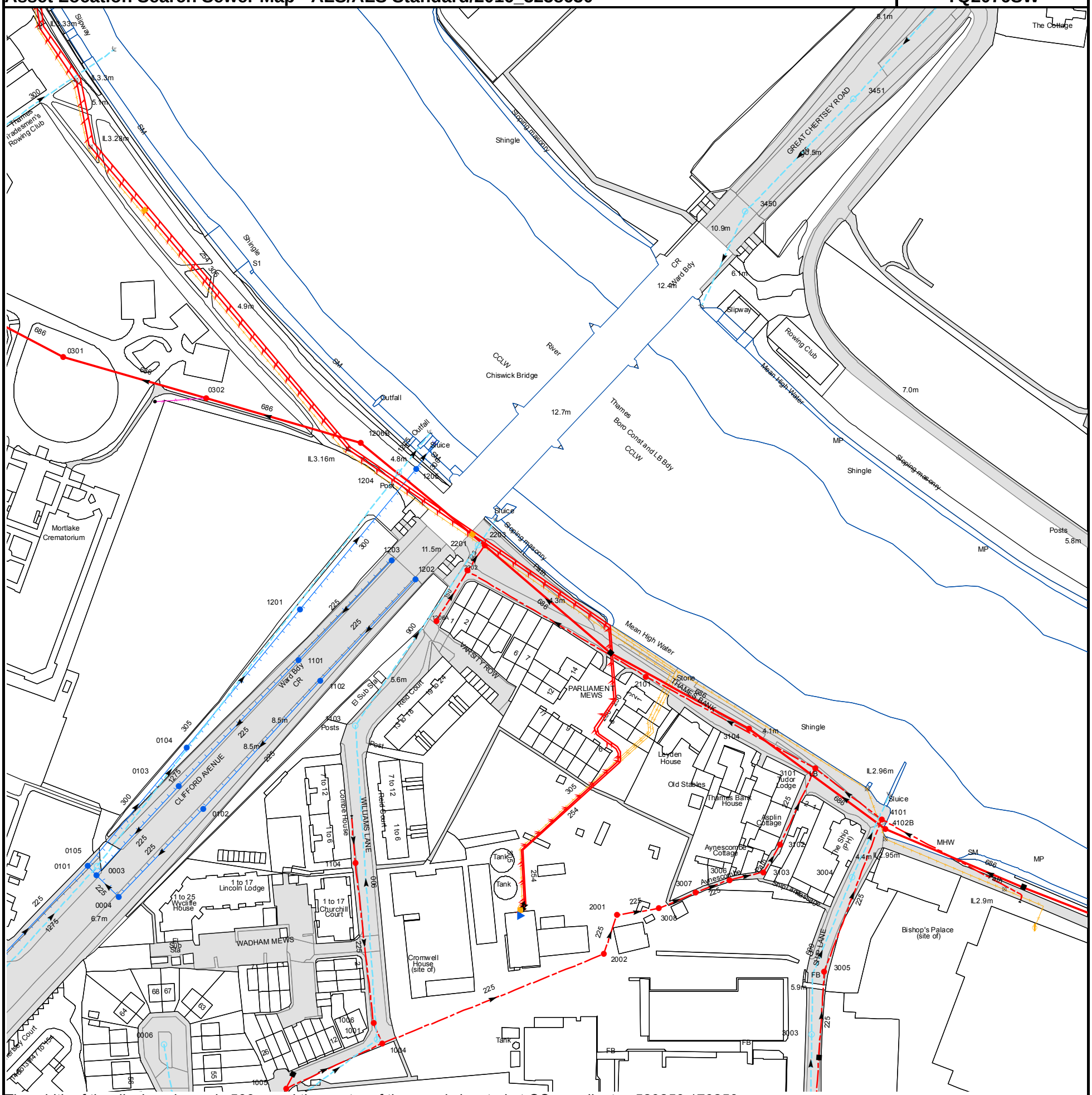
Asset Location Search Sewer Map - ALS/ALS Standard/2016_3238630

TQ2076SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 520250,176250

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 that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
3103	6.12	1.37
1104	5.93	4.19
3102	5.77	1.35
4102B	n/a	-4.73
4101	3.47	1.08
0102	n/a	n/a
0103	n/a	n/a
3101	4.14	.92
0104	n/a	n/a
3104	n/a	-4.82
1103	5.88	1.73
1102	n/a	n/a
2101	n/a	n/a
1101	n/a	n/a
1206A	5.06	4
1201	n/a	n/a
1202	n/a	n/a
2202	4.53	.29
1203	n/a	n/a
2201	n/a	n/a
2203	n/a	-4.99
1204	n/a	n/a
1205	4.62	2.02
1206B	n/a	-5.07
0302	n/a	-5.16
3450	10.79	1.9
3451	9.23	2.01
0003	n/a	n/a
0105	n/a	n/a
0101	n/a	n/a
0301	n/a	-5.24
2002	n/a	n/a
2001	n/a	n/a
3008	n/a	n/a
3007	6.65	1.7
3006	6.59	1.59
3003	6.06	2.01
3005	5.56	1.22
3004	4.81	1.77
0004	n/a	n/a
0006	5.52	4.54
1005	6.3	3.66
1006	6.3	1.96
1001	6.3	1.96
1004	6.26	2.79

Asset Location Search Sewer Map - ALS/ALS Standard/2016_3238630

TQ2075NE

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 520750,175750

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 that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
96MD	n/a	n/a
971E	n/a	n/a
96LF	n/a	n/a
96LE	n/a	n/a
96LL	n/a	n/a
96LM	n/a	n/a
96LN	n/a	n/a
96MC	n/a	n/a
96ME	n/a	n/a
9710	6.67	4.13
971F	n/a	n/a
9707	6.64	2.63
96LK	n/a	n/a
9601	6.12	2.72
97MJ	n/a	n/a
9609	6.31	4.48
9602	6.33	2.85
96KN	n/a	n/a
97MK	n/a	n/a
96KF	n/a	n/a
97MN	n/a	n/a
96LD	n/a	n/a
96LC	n/a	n/a
971G	n/a	n/a
851C	n/a	n/a
851D	n/a	n/a
851A	n/a	n/a
8503	6.32	4.8
8513	6.29	5.27
951D	n/a	n/a
951B	n/a	n/a
951C	n/a	n/a
961B	n/a	n/a
95NC	n/a	n/a
9603	6.17	4.47
9608	6.18	4.65
9604	6.14	4.4
9507	5.96	4.66
9510	5.92	4.84
95HH	n/a	n/a
951A	n/a	n/a
96NM	n/a	n/a
95HJ	n/a	n/a
9511	5.91	4.65
9501	6.01	2.93
95JC	n/a	n/a
8804	5.61	4.52
88MF	n/a	n/a
8801	5.95	2.33
88LM	n/a	n/a
88MK	n/a	n/a
88MM	n/a	n/a
88MN	n/a	n/a
8709	6.12	3.86
88MH	n/a	n/a
8705	6.09	2.51
88LN	n/a	n/a
9806	5.91	4.13
9805	5.91	3.33
9708	6.06	3.86
9702	6.14	2.54
9703	6.11	n/a
9709	5.94	4.62
9804	5.62	4.66
98KJ	n/a	n/a
98KE	n/a	n/a
98KC	n/a	n/a
9802	5.7	3.13
9801	5.44	2.75
8802	5.62	2.12
8910	5.9	4.51
8903	5.91	3.91
99MM	n/a	n/a
99MN	n/a	n/a
9905	5.4	4.49
891B	n/a	n/a
9902	5.43	n/a
9901	5.71	2.13
89ND	n/a	n/a
89NE	n/a	n/a
861A	n/a	n/a
871A	n/a	n/a
861C	n/a	n/a
861D	n/a	n/a
8711	6.83	4.51
8704	6.85	4.1
8701	6.37	4.24
87NH	n/a	n/a
8601	6.19	4.92
8611	6.14	4.94
97MM	n/a	n/a

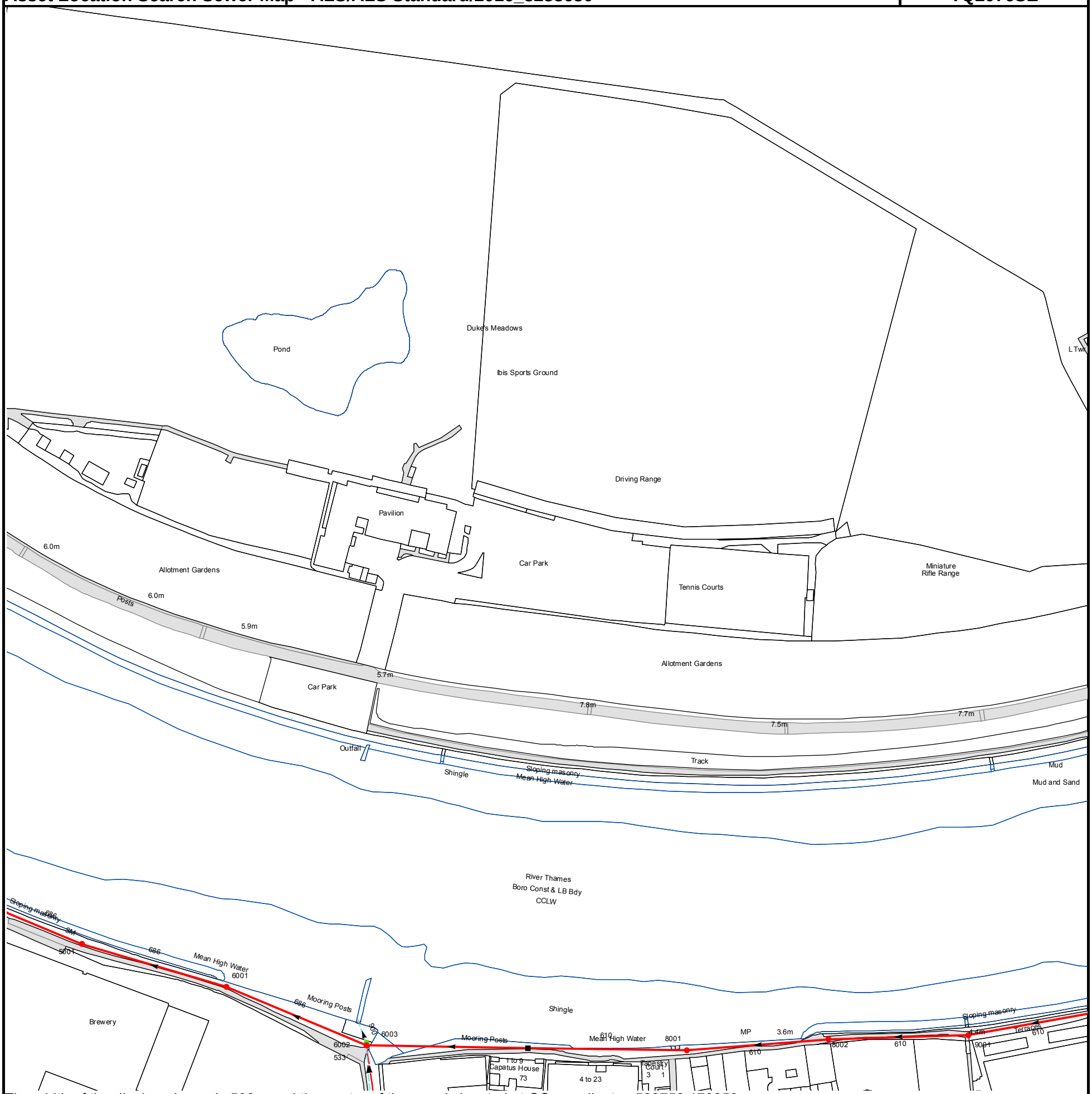
Manhole Reference	Manhole Cover Level	Manhole Invert Level
96MJ	n/a	n/a
96MK	n/a	n/a
961C	n/a	n/a
96ML	n/a	n/a
96MM	n/a	n/a
961A	n/a	n/a
971A	n/a	n/a
97MF	n/a	n/a
9605	6.24	5
971B	n/a	n/a
96KL	n/a	n/a
971C	n/a	n/a
971D	n/a	n/a
97MD	n/a	n/a
96KJ	n/a	n/a
96LH	n/a	n/a
7709	6.39	3.48
7706	6.29	3.83
77MK	n/a	n/a
77NF	n/a	n/a
77NC	n/a	n/a
77NH	n/a	n/a
7602	6.24	4.7
7601	6.39	4.58
7704	6.45	4.56
77MN	n/a	n/a
7703	6.89	4.35
7713	6.37	4.63
77KN	n/a	n/a
7621	n/a	n/a
7610	n/a	n/a
77MC	n/a	n/a
7708	6.18	3.64
7701	6.1	3.73
761A	n/a	n/a
761B	n/a	n/a
771A	n/a	n/a
8707	6.77	4.33
8706	6.16	1.91
8708	6.38	4.35
8602	6.35	4.39
8710	6.83	4.66
861B	n/a	n/a
7917	5.32	2.72
7916	5.32	2.75
7915	5.31	2.8
7910	n/a	2.98
7914	5.41	2.87
7913	5.07	3.02
7901	4.94	1.5
7904	5.06	2.39
7919	n/a	n/a
7805	n/a	n/a
7911	5.13	3.41
7918	5.14	2.67
791B	n/a	n/a
791A	n/a	n/a
7905	5.32	2.96
7912	5.21	3.71
781A	n/a	n/a
791C	n/a	n/a
781B	n/a	n/a
7902	5.37	1.76
7906	5.76	3.88
8911	n/a	n/a
8909	5.67	4.34
8904	5.68	2.08
8908	5.52	3.96
8905	5.55	1.97
891C	n/a	n/a
8901	5.61	1.86
7613	6.53	4.74
7614	6.39	5.01
8606	6.3	4.55
861E	n/a	n/a
7615	n/a	n/a
7604	n/a	n/a
66NH	n/a	n/a
66NL	n/a	n/a
8605	6.32	2.1
7605	n/a	n/a
8604	6.3	4.52
7606	n/a	n/a
7616	n/a	n/a
8610	6.29	4.09
7617	n/a	n/a
7618	6.11	5.01
76JF	n/a	n/a
76HC	n/a	n/a
7607	6.16	5.12
76MJ	n/a	n/a
7619	6.37	4.27
7608	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8603	6.25	4.44
8609	6.27	4.84
7622	n/a	n/a
7609	n/a	n/a
7620	6.3	4.27
6520	6.28	4.78
6506	6.31	5.29
65LM	n/a	n/a
65MK	n/a	n/a
65MM	n/a	n/a
65NE	n/a	n/a
65NC	n/a	n/a
6511	n/a	n/a
6512	n/a	n/a
7612	6.38	4.92
75NG	n/a	n/a
75NF	n/a	n/a
751B	n/a	n/a
75NH	n/a	n/a
7511	6.4	4.85
7510	6.39	4.86
7508	6.1	5.05
75NM	n/a	n/a
7507	6.51	5.34
75NL	n/a	n/a
77LF	n/a	n/a
6808	5.94	4.75
68LJ	n/a	n/a
78KN	n/a	n/a
6809	5.95	3.03
78LH	n/a	n/a
68JM	n/a	n/a
68JC	n/a	n/a
68LL	n/a	n/a
68MD	n/a	n/a
68JF	n/a	n/a
68JD	n/a	n/a
7804	n/a	n/a
7802	5.84	3.2
68MF	n/a	n/a
78NM	n/a	n/a
78ML	n/a	n/a
7801	5.67	3.09
7803	5.69	3.92
68LC	n/a	n/a
68KH	n/a	n/a
78ME	n/a	n/a
78NF	n/a	n/a
68ND	n/a	n/a
7806	n/a	n/a
6807	5.66	4.37
68MN	n/a	n/a
6907	5.38	2.03
69NK	n/a	n/a
68NH	n/a	n/a
6912	4.72	2.17
68MM	n/a	n/a
681B	n/a	n/a
68ML	n/a	n/a
6914	5.5	1.63
6915	5.27	1.67
6913	4.82	1.52
6917	4.57	1.51
69NC	n/a	n/a
6806	5.34	2.58
6918	4.6	1.82
6919	4.82	2.06
6805	5.36	3.72
6903	4.71	1.07
6803	5.3	3.44
6920	4.9	2.26
6921	4.91	3.31
6804	5.26	2.5
6908	4.96	2.33
68NM	n/a	n/a
78LM	n/a	n/a
7909	4.94	2.63
6707	6.05	4.43
6704	6.04	4.24
67KL	n/a	n/a
67LF	n/a	n/a
67LD	n/a	n/a
6703	5.93	4.58
67MJ	n/a	n/a
67ML	n/a	n/a
6708	5.92	4.26
6706	6.73	3.34
67MH	n/a	n/a
67MK	n/a	n/a
7712	6.05	3.64
77LH	n/a	n/a
77LK	n/a	n/a
7705	6.46	1.76

Manhole Reference	Manhole Cover Level	Manhole Invert Level
77LE	n/a	n/a
7710	6.73	3.44
7702	6.75	4.27
7711	6.78	4.67
76HK	n/a	n/a
76FF	n/a	n/a
7611	5.99	4.16
76FH	n/a	n/a
76NL	n/a	n/a
76NM	n/a	n/a
7603	6.02	4.9
65NM	n/a	n/a
55JL	n/a	n/a
6501	n/a	n/a
55JK	n/a	n/a
65KE	n/a	n/a
66LD	n/a	n/a
66LF	n/a	n/a
6604	6.22	5.14
6605	6.21	5.01
66LE	n/a	n/a
6606	6.26	4.81
6601	n/a	n/a
66LK	n/a	n/a
66LN	n/a	n/a
6608	n/a	n/a
66LJ	n/a	n/a
66LM	n/a	n/a
6602	n/a	n/a
6609	6.09	4.68
6603	6.08	4.75
6607	6.03	3.82
66ND	n/a	n/a
66LH	n/a	n/a
66LL	n/a	n/a
66MM	n/a	n/a
661B	n/a	n/a
661A	n/a	n/a
5514	6.58	5.12
55MN	n/a	n/a
65NL	n/a	n/a
65JJ	n/a	n/a
65JE	n/a	n/a
65HN	n/a	n/a
65HK	n/a	n/a
651B	n/a	n/a
6514	n/a	n/a
65HF	n/a	n/a
65KC	n/a	n/a
65JD	n/a	n/a
65HM	n/a	n/a
6516	6.27	5.28
65HJ	n/a	n/a
651A	n/a	n/a
6503	6.31	4.79
65HE	n/a	n/a
6515	6.33	5.14
6504	n/a	n/a
6521	6.31	4.13
6518	6.37	5.51
6505	6.36	4.54
6519	6.32	4.23
65KK	n/a	n/a
65LC	n/a	n/a
65LF	n/a	n/a
65MD	n/a	n/a
57NH	n/a	n/a
5803	n/a	1.33
5705	n/a	n/a
58LK	n/a	n/a
5704	6.83	3.79
581A	n/a	n/a
5718	6.57	5.16
5804	6.28	1.37
5717	6.88	4.38
57ML	n/a	n/a
5808	6.27	5.43
5806	6.21	4.15
5710	6.2	1.5
5712	6.26	5.22
5713	6.04	4.5
5706	6.04	3.81
67NM	n/a	n/a

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

Asset Location Search Sewer Map - ALS/ALS Standard/2016_3238630	TQ2076SE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 520750,176250

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 that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8002	n/a	-4.15
9001	n/a	-4.06
8001	n/a	-4.23
6003	3.64	.92
6002	n/a	-4.41
6001	n/a	-4.49
5001	n/a	-4.57

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

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

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 Insight on 0845 070 9148.

Asset Location Search Water Map - ALS/ALS Standard/2016_3238630

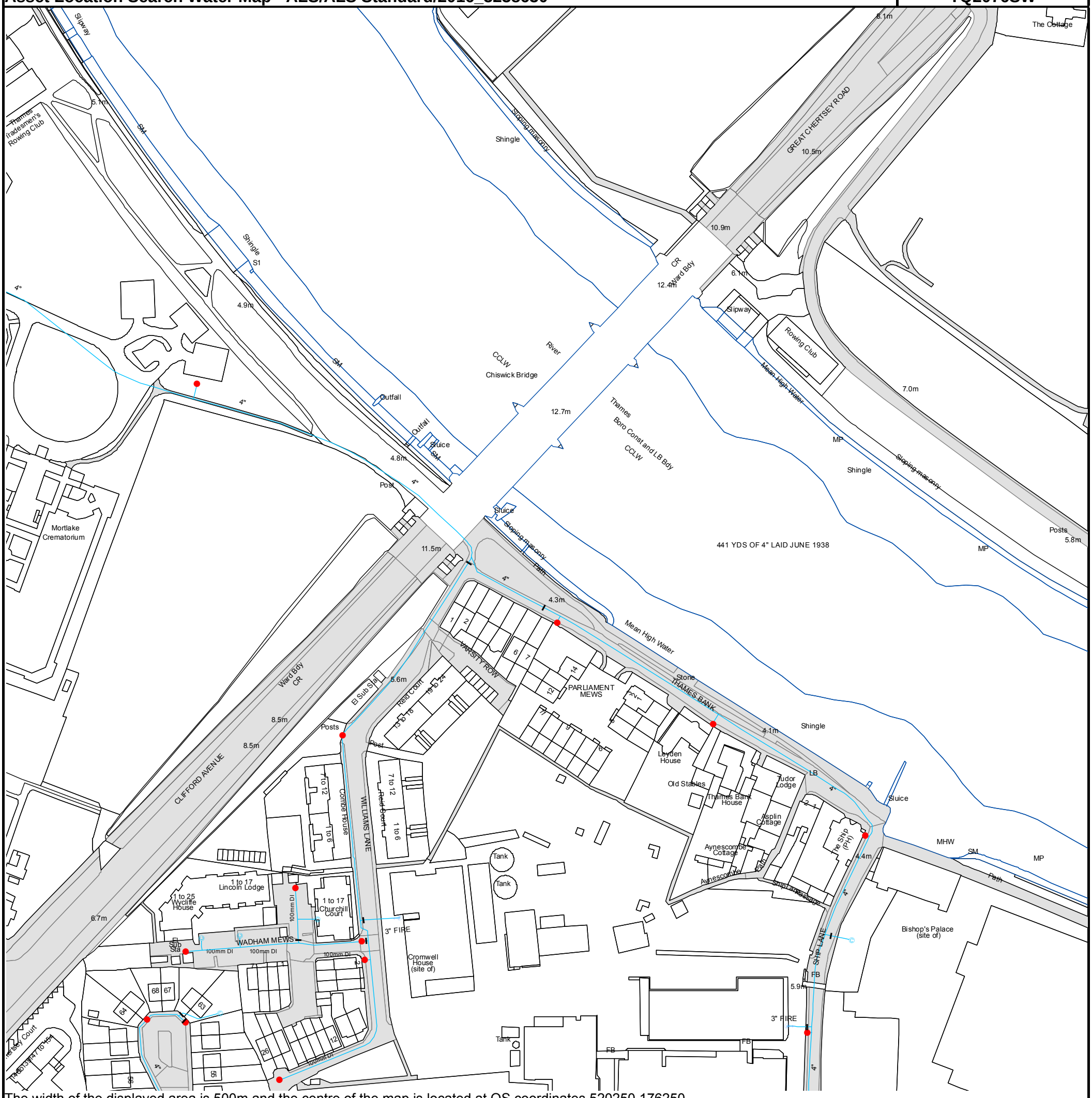
TQ2075NW

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 520250,175750

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

Asset Location Search Water Map - ALS/ALS Standard/2016_3238630

TQ2076SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 520250,176250

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

Asset Location Search Water Map - ALS/ALS Standard/2016_3238630

TQ2075NE

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 520750,175750

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

Asset Location Search Water Map - ALS/ALS Standard/2016_3238630	TQ2076SE

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 520750,176250

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

ALS Water Map Key

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.

Miss Nora Balboni
Pickfords Wharf
Clink Street
SE1 9DG

Our ref: DS6041473

0800 009 3921
Monday to Friday, 8am to 5pm

13 May 2018

Pre-planning enquiry: Confirmation of sufficient capacity

Dear Miss Balboni

Thank you for providing information on your development **Stag Brewery, Mortlake, SW14 7QR, OS grid ref. 520380, 176003.**

Redevelopment of the former Stag Brewery site to provide mix use development (Flats: 687, Primary School for 1200 pupils, Cinema: 475 seats, Sports Hall: 189 people, Hotel: 20 rooms, Car Home: 220 beds, Offices: 2424m^2, Warehouse: 5113m^2). Foul Water discharging by gravity into multiple outfalls. Surface Water to be attenuated and discharged by gravity and pump into multiple outfalls (50% betterment anticipated from existing sw run-off). Surface Water from the north-eastern part of the site discharging into the River Thames.

If your proposals progress in line with the details you've provided (drawings ref: WIE SA 92 0004 Rev A05, WIE SA 92 0005 Rev A05, WIE SA 92 0006 Rev A05, WIE SA 92 0007 Rev A05) we're pleased to confirm that there will be sufficient sewerage capacity to serve your development.

However, Thames Water has concerns with capacity to the West of the development based on the proposed flows and connection points. We request that the developer updates Thames Water in advance of building phases as they come forwards in order to ensure that any investigative or upgrade works can be carried out before development commences.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

Please note that you must keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient sewerage capacity.

What happens next?

Please make sure you submit your connection application, giving us at least 21 days' notice of the date you wish to make your new connection/s.

If you've any further questions, please contact me on 0203 577 8082.

Yours sincerely

Artur Jaroma

Thames Water

C. Onsite Drainage Records

GENERAL NOTES

LEGEND

- Trade Sewers
- Trade Connections to buildings (Unsurveyed)
- Foul Sewers
- Surface Water Sewers
- Gulley Connections
- Assumed Gulley Connections
- Redundant
- New, Stainless Steel

NOTE 1 : SHOWS TRADE TO FOUL FURTHER CLARIFICATION REQUIRED.
NOTE 2 : SHOWS SURFACE WATER TO FOUL FURTHER CLARIFICATION REQUIRED.
NOTE 3 : ASSUMED ROUTE TO SHIP LANE (TO BE CONFIRMED)

No.	DATE	DESCRIPTION OF REVISION OR ISSUE	BY	CK.	PROJ. ENGR. APPROVAL
D	3.12.04	TRADE SEWER AT TRASH COMPACTION ADDED	TR	ACJ	
C	17.11.04	SITE BOUNDARY UPDATED.	TR	ACJ	
B	14.10.04	SITE UPDATED. FILTER ROOM SURVEY ADDED	TR	ACJ	
A	4.10.04	SITE UPDATED. BOTTLING DRAINAGE ADDED	TR	ACJ	

PTS DRG. REF. P979/07/31

CONSULTANT

PENBORN TECHNICAL SERVICES
Garrett House, Mount Road
Brentford, Middlesex TW8 0QA
Tel. 020-8569-7979
Fax. 020-8568-1621
E-mail: pts@penborn.co.uk

PTS PROJ. REF.

ESR	
DESIGNED	
DRAWN	
CHECKED	
SCALE	1:500 @ A0
DATE	
KEY PLAN	

ANHEUSER–BUSCH COMPANIES

PROJ. BID

SITE PLAN SHOWING EXIST. SERVICES ALL SERVICES

BLDG. NAME | BLDG. No.

ENGINEER APPROVED | OWNER APPROVED

PLANT	BLDG. No.	DIV.	DWG. No.	REV.
STAG	O	M	1016	D

D. Greater London Authority Correspondence

Nora Balboni

From: Katherine Wood <Katherine.Wood@london.gov.uk>
Sent: 08 February 2019 17:12
To: Nora Balboni; Stuart McTaggart; Abby Crisostomo
Cc: Anna Gargan; Suzanne Robson
Subject: RE: Stag Brewery (GLA ref: 4172a/b) drainage strategy

Hi Nora,

Apologies, I should have confirmed with you that Stuart had reviewed this response and confirmed that it addressed outstanding issues on drainage.

Kind regards,

Katherine

Katherine Wood
Team Leader, Development Management
GREATER**LONDON**AUTHORITY
City Hall, The Queen's Walk, London SE1 2AA
020 7983 5743
www.london.gov.uk/what-we-do/planning
katherine.wood@london.gov.uk

From: Nora Balboni <nora.balboni@watermangroup.com>
Sent: 08 February 2019 17:07
To: Stuart McTaggart <Stuart.McTaggart@london.gov.uk>; Abby Crisostomo <Abby.Crisostomo@london.gov.uk>; Katherine Wood <Katherine.Wood@london.gov.uk>
Cc: Anna Gargan <AGargan@geraldeve.com>; Suzanne Robson <SRobson@geraldeve.com>
Subject: FW: Stag Brewery (GLA ref: 4172a/b) drainage strategy

Hi Stuart

Hope you are well. Have you had the chance to look at the Briefing Note?

Kind regards,

Nora Balboni
Flood Risk Engineer
Waterman Infrastructure & Environment Ltd

Pickfords Wharf | Clink Street | London SE1 9DG
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From: Nora Balboni
Sent: 08 January 2019 16:22
To: 'Stuart McTaggart' <Stuart.McTaggart@london.gov.uk>
Cc: 'Anna Gargan' <AGargan@geraldeve.com>; 'Abby Crisostomo' <Abby.Crisostomo@london.gov.uk>; 'Katherine Wood' <Katherine.Wood@london.gov.uk>; Ellen Smith <ellen.smith@watermangroup.com>; Donal O'Donovan

<donal.odonovan@watermangroup.com>; Harry Chetty <harry.chetty@watermangroup.com>
Subject: RE: Stag Brewery (GLA ref: 4172a/b) drainage strategy

Hi Stuart

Happy new year, I hope you had a great break.

Please find attached the Briefing Note outlining the amendments to the drainage strategy for the Stag Brewery development as per our agreements below.

Let me know if you have any queries.

Kind regards,

Nora Balboni
Flood Risk Engineer
Waterman Infrastructure & Environment Ltd

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From: Nora Balboni
Sent: 12 December 2018 09:24
To: Stuart McTaggart <Stuart.McTaggart@london.gov.uk>
Cc: Anna Gargan <AGargan@geraldeve.com>; Ellen Smith <ellen.smith@watermangroup.com>; Donal O'Donovan <donal.odonovan@watermangroup.com>; Abby Crisostomo <Abby.Crisostomo@london.gov.uk>; Katherine Wood <Katherine.Wood@london.gov.uk>
Subject: RE: Stag Brewery (GLA ref: 4172a/b) drainage strategy [Filed 12 Dec 2018 09:24]

Hi Stuart

Thank you for confirming.

As discussed, we will provide a Briefing Note which will cover the following:

- Amended drainage strategy plan to show permeable paving extents;
- Volume calculations to estimate the attenuation available within the permeable paving sub-base and rain garden feature to show that a restriction of surface water runoff beyond the minimum 50% requirement is achieved;
- Sports pitch in south-west of site removed from surface water calculations under the assumption that it would drain freely, subject to ground investigations during detailed design; and
- Summary of all SuDS included.

Kind regards,

Nora Balboni
Flood Risk Engineer
Waterman Infrastructure & Environment Ltd

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From: Stuart McTaggart <Stuart.McTaggart@london.gov.uk>
Sent: 11 December 2018 15:23
To: Nora Balboni <nora.balboni@watermangroup.com>
Cc: Anna Gargan <AGargan@geraldeve.com>; Ellen Smith <ellen.smith@watermangroup.com>; Donal O'Donovan <donal.odonovan@watermangroup.com>; Abby Crisostomo <Abby.Crisostomo@london.gov.uk>; Katherine Wood

<Katherine.Wood@london.gov.uk>
Subject: Re: Stag Brewery (GLA ref: 4172a/b) drainage strategy [Filed 12 Dec 2018 09:17]

Hi Nora,

To summarise our chat earlier:

1. The intent of the original drainage strategy was to show that it is possible within site constraints to meet the absolute minimum requirements of London Plan policy 5.13.
2. We would like to see that all efforts have been made to get as close to possible to the policy targets (i.e. greenfield runoff, drainage hierarchy, and a preference for SuDS with multiple benefits). We expect that on large sites such as this the policy targets should be able to be met in most cases.
3. Waterman will produce an addendum to the drainage strategy to more clearly show how the drainage will integrate SuDS with multiple benefits and identify an approximate maximum reduction in discharge rate. Where appropriate the reduction in discharge rate can be caveated with assumptions/risks that need confirmation during detailed design (e.g. infiltration rates of the subgrade below the 3G pitch).

Regards,

Stuart McTaggart
Flood Risk, Drainage & Water Policy Officer
Development, Enterprise & Environment
Greater London Authority
City Hall, The Queens Walk, London SE1 2AA

Email: stuart.mctaggart@london.gov.uk
Web: Greening London / Greater London Authority
Follow the GLA's Environment team on Twitter @LDN_Environment
Sign up to our e-newsletter

From: Nora Balboni <nora.balboni@watermangroup.com>
Sent: 04 December 2018 10:32
To: Stuart McTaggart <Stuart.McTaggart@london.gov.uk>
Cc: Anna Gargan <AGargan@geraldeve.com>; Ellen Smith <ellen.smith@watermangroup.com>; Donal O'Donovan <donal.odonovan@watermangroup.com>
Subject: RE: GLA Flood Feedback

Hi Stuart

Thanks for your comments. Please feel free to give me a call to discuss as I don't have your contact number.

We understand that developments should aim to achieve greenfield runoff rates, or as close as feasible. To endeavour to achieve this we took the following approach:

1. As per the drainage hierarchy, the amount of surface water that could be discharged into the River Thames was maximised by incorporating the innovative shallow conveyance channel system;

2. For the remaining site, where discharge into the Thames was not feasible due to levels or crossing third party land, as many tanks were incorporated as possible. The horizontal constraints for the tanks include the basement extent, proposed building outlines, and landscaping. The vertical constraints include the required soil depth for tree pits and achieving a gravity connection into the surrounding sewer network. London Borough of Richmond accepted the 50% restriction during pre-application consultation. Conscious that the constraints of the site preclude a greater reduction in runoff, Thames Water were consulted to ensure that the surrounding sewer network has sufficient capacity. Thames Water confirmed capacity for both surface and foul water flows. It is important to note that the surface water flows from the development are only conveyed within the Thames Water network for maximum of 350m before discharging into the River Thames.

We are keen to find a solution to reduce runoff further to find an agreeable solution. I would appreciate your thoughts on the following options:

- Allowing the proposed sports pitch to drain freely, i.e. excluding it from the surface water calculations and therefore reducing the size requirement for the tank beneath the MUGA pitch. Subject to levels I could explore the possibility of directing surface water from other areas into this tank, reducing the restriction beyond the 50% mark. In the current strategy we assumed that the pitch would need to be positively drained due to the underlying London Clay to avoid potential water logging beneath the pitch. However, if no other areas would drain towards the pitch, allowing it to free drain could be considered.

- We took a conservative approach when designing the current drainage strategy, assuming 100% impermeable proposed area (discounting the park area in the south eastern corner of the site). We did not quantify the attenuation available within the rain garden along the green link and within the permeable paving, to demonstrate the worst-case scenario that the minimum required restriction (i.e. 50%) can be achieved within the tanks themselves. I will do a quick calculation to demonstrate the additional attenuating volume that these features would hold, reducing the restriction beyond the 50% mark.

- Exploring further areas for incorporation of permeable paving.

- The current proposals do not include for blue roofs. However, green roofs are proposed throughout the development, which, although not quantifiable, provide a betterment to the surface water runoff regime.

Let me know whether you find the above agreeable, I will then amend the drainage strategy drawing to show the constraints to the attenuation volumes and incorporate any changes, and will re-issue for you to review.

Kind regards,

Nora Balboni
Flood Risk Engineer
Waterman Infrastructure & Environment Ltd

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From: Anna Gargan
Sent: 28 November 2018 16:51
To: 'Ellen Smith'; 'Nora Balboni'
Cc: Guy Duckworth; Susie Taylor; Neil Henderson
Subject: GLA Flood Feedback

Hi Ellen / Nora,

I hope you are well.

The GLA has provided the following response to Flood comments issued on 20 November 2018.

Please can you review and respond. The officer states that he is happy to speak with you directly.

Kind regards,
Anna

"I have reviewed the Applicant's second response to our Stage 1 comments. Following our previous response at the end of October the final point of contention appears to be the proposed discharge rate where the site will drain to the public sewer.

It is noted that the London Plan and DEFRA national guidance require a development to achieve as close to greenfield runoff rate as possible (approximately a >90% reduction from pre-development rates for a brownfield site). In this case the Applicant is proposing to reduce the discharge by 50%, well short of the policy requirements. The Applicant should calculate the greenfield runoff rate and provide calculations showing the attenuation storage required to meet this discharge rate. The Applicant should then seek to include additional attenuation storage to get as close to this value as possible. Our original comments suggested building the biodiverse roofs as green/blue roofs to provide additional storage and this has not been addressed to date. The Applicant should then provide a clear drawing or markup clearly showing the constraints to expanding attenuation storage if discharge at greenfield runoff rate is not proposed.

I am happy to discuss directly with the Applicant's consultant to resolve this if required.

Regards,

Stuart McTaggart
Flood Risk, Drainage & Water Policy Officer
Development, Enterprise & Environment
Greater London Authority
City Hall, The Queens Walk, London SE1 2AA

Email: stuart.mctaggart@london.gov.uk

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Planning Consultant

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E. Existing and Proposed Drainage Strategy Plan

TWMH1104
CL:
IL: -4.99

TWMH2201

225

TWMH1104
CL: 4.53
IL: 0.29

150

TWMH1206A
CL: 5.06
IL: 4.00

300

600

TWMH2101

TWMH1103
CL: 5.88
IL: 1.73

TWMH3104
CL:
IL: -4.82

TWMH3001
CL: 4.14
IL: 0.92

225

600

TWMH4101
CL: 3.47
IL: 1.08

TWMH4102B
CL:
IL: -4.73

TWMH1104
CL: 5.93
IL: 4.19

600

TWMH3002
CL: 5.77
IL: 1.35

ASSUMED CONNECTION TO THAMES WATER SEWER NETWORK

TWMH3003
CL: 6.12
IL: 1.37

TWMH3004
CL: 4.81
IL: 1.77

TWMH3006
CL: 6.59
IL: 1.59

TWMH3007
CL: 6.65
IL: 1.70

TWMH3008

TWMH2001

225

600

TWMH2002

225

TWMH3005
CL: 5.56
IL: 1.22

225

TWMH1006
CL: 6.30
IL: 1.96

TWMH1001
CL: 6.30
IL: 1.96

TWMH1004
CL: 6.26
IL: 2.79

TWMH3003
CL: 6.06
IL: 2.01

225

TWMH1005
CL: 6.30
IL: 3.86

600

TWMH1901

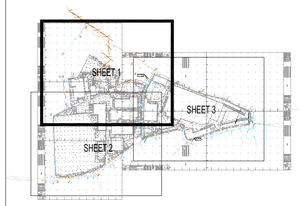
TWMH3007
CL: 5.99
IL: 1.99

LEGEND

- EXISTING PRIVATE SURFACE WATER SEWER
- EXISTING PRIVATE FOUL SEWER
- EXISTING PRIVATE COMBINED SEWER
- EXISTING PUBLIC SURFACE WATER SEWER
- EXISTING PUBLIC FOUL SEWER
- EXISTING PUBLIC COMBINED SEWER
- EXISTING PUBLIC RISING MAIN

NOTES

1) EXISTING DRAINAGE LAYOUT BASED ON THAMES WATER SEWER RECORDS AND PENBORN TECHNICAL SERVICES DRAWING (REF: P979/07/31).



Rev	Date	Description	By
A01	20.10.16	PRELIMINARY ISSUE	DO

Amendments

Project
STAG BREWERY

Title
EXISTING FOUL AND SURFACE WATER DRAINAGE LAYOUT
SHEET 1 OF 3

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Scales @ A1 work to figured dimensions only 1:500		Computer File No	WIE10667CSA920001.dwg

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1:500 0 10m 20m 30m 40m 50m
1:1 0 10 20 30 40 50 60 70 80 90 100