Stag Brewery, Mortlake

Drainage Strategy

For Reselton Properties

July 2020

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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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Executive Summary

This Drainage Strategy has been prepared by Waterman Infrastructure & Environment ('Waterman IE') as a revised submission document to the Drainage Strategy (ref WIE10667-101-R-9-5-1-DS) submitted under Applications A, B and C (refs. 18/0547/FUL, 18/0548/FUL and 18/0549/FUL) ('the Applications'), in respect of the former Stag Brewery Site in Mortlake ('the Site') within the London Borough of Richmond Upon Thames ('LBRuT'). The Applications are for the comprehensive redevelopment of the Site. This document has been prepared on behalf of Reselton Properties Limited ('the Applicant'). A summary of the Applications is set out below:

- Application A – hybrid planning application for comprehensive mixed use redevelopment of the former Stag Brewery site consisting of:
  i. Land to the east of Ship Lane applied for in detail (referred to as 'Development Area 1' throughout); and
  ii. Land to the west of Ship Lane (excluding the school) applied for in outline (referred to as 'Development Area 2' throughout).
- Application B – detailed planning application for the school (on land to the west of Ship Lane).
- Application C – detailed planning application for highways and landscape works at Chalkers Corner.

This document replaces the Drainage Strategy submitted in February 2018, including the May 2019 Drainage Strategy Addendum to LBRuT. The May 2019 Drainage Strategy Addendum was submitted to incorporate changes to the drainage strategy as a result of discussions with the Greater London Authority and the LBRuT and small amendments to the scheme. This was submitted as part of the May 2019 Amendments. Further minor amendments are now proposed (to be submitted as part of the May 2020 Amendments). Compared to the original scheme, these comprise an increase in residential unit provision, an increase in affordable housing provision, an increase in height of some buildings, changes to some building layouts, reduction in size of the western basement, a sub-basement under Building 01, and other amendments including internal layouts and quantum and mix of uses across the Site.

The amended proposals comprise up to 1,250 residential units, flexible uses, office space, a school, a hotel, cinema, as well as associated car and cycle parking, private and public amenity space, and play space.

This amended Drainage Strategy has been produced to reflect amendments to the previously submitted scheme. The drainage strategy covers the Stag Brewery component of the Site (Applications A and B) (refer to Figure 1). Drainage associated with highways works at Chalkers Corner would be discharged to the sewer as existing unattenuated, and would continue to be managed by the highways authority. It is therefore considered to be appropriate and robust to focus the Drainage Strategy on the Stag Brewery Site herein.

Surface water runoff from the northeast of the Application A 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 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 (Application A and B) 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 28.5 l/s respectively.

The on-Site drainage networks and Sustainable Drainage Systems would be privately managed and maintained for the lifetime of the Development (Applications A and B), 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 and C sites.

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.

1. Introduction

1.1. This Drainage Strategy has been prepared by Waterman Infrastructure & Environment ('Waterman IE') as a revised submission document to the Drainage Strategy (ref WIE10667-101-R-9-5-1-DS) submitted under Applications A, B and C (refs. 18/0547/FUL, 18/0548/FUL and 18/0549/FUL) ('the Applications'), in respect of the former Stag Brewery Site in Mortlake ('the Site') within the London Borough of Richmond Upon Thames ('LBRuT'). The Applications are for the comprehensive redevelopment of the Site. This document has been prepared on behalf of Reselton Properties Limited ('the Applicant'). A summary of the Applications is set out below:

- Application A – hybrid planning application for comprehensive mixed use redevelopment of the former Stag Brewery site consisting of:
  i. Land to the east of Ship Lane applied for in detail (referred to as 'Development Area 1' throughout); and
  ii. Land to the west of Ship Lane (excluding the school) applied for in outline (referred to as 'Development Areas 2' throughout).
- Application B – detailed planning application for the school (on land to the west of Ship Lane).
- Application C – detailed planning application for highways and landscape works at Chalkers Corner.

1.2. The Applications were submitted in February 2018 to LBRuT. The Applications are related and were proposed to be linked via a Section 106 Agreement. In May 2019, a package of substitutions was submitted to LBRuT for consideration, which sought to address comment raised by consultees during determination. On 29 January 2020, the Applications were heard at LBRuT's Planning Committee with a recommendation for approval. This scheme is thereafter referred to as "the Original Scheme".

1.3. The Committee resolved to grant Applications A and B, and refuse Application C. The granting of Applications A and B was subject to the following:

a) Conditions and informative as set out in the officer's report, published addendum and agreed verbally at the meeting;
b) Amendments to the Heads of Terms and completion of a Section 106 Legal Agreement which was delegated to the Assistant Director to conclude;
c) No adverse direction from the Greater London Authority ('GLA'); and
d) No call in by the Secretary of State for Housing, Communities and Local Government.

1.4. The Applications have been referred to the GLA and the Mayor has given a direction that he will take over the determination of the Applications and act as local planning authority in relation to all three applications.

1.5. The Applicant has engaged with the GLA in respect to the proposed amendments to the scheme, referred to throughout this document as the 'Revised Scheme'. As a result of these discussions, a number of changes have been made to the scheme proposals which are summarised as follows:

a) Increase in residential unit provision from up to 813 units (this includes the up to 150 flexible assisted living and / or residential units) to up to 1,250 units;

b) Increase in affordable housing provision from up to 17% to up to 30%;

c) Increase in height for some buildings, of up to three storeys compared to the Original Scheme;

d) Change to the layout of Buildings 18 and 19, conversion of Block 20 from a terrace row of housing to two four storey buildings;

e) Reduction in the size of the western basement, resulting in an overall reduction in car parking spaces of 186 spaces, and introduction of an additional basement storey beneath Building 1 (the cinema);

f) Other amendments to the masterplan including amendments to internal layouts, re-location and change to the quantum and mix of uses across the Site, including the removal of the nursing home and assisted living in Development Area 2;

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

h) Associated highways works may be carried out on adopted highways land.

1.6. The submission documents have tested an affordable housing provision of up to 30%. However, it should be noted that the final affordable housing level is subject to further viability testing and discussions with the GLA.

1.7. Minor amendments have also been made to the road and pedestrian layouts for the school (Application B). No other amendments are proposed to Application B. No amendments are proposed to the physical works proposed under Application C, although alternative options within the highway boundaries for mitigating the highway impact of the amended proposals have been assessed within the relevant substitution documents for Applications A and B and are the subject of ongoing discussions with the GLA and TfL.

1.8. A more detailed summary is included within the Planning Statement Addendum and Design and Access Statement Addendum submitted with the Revised Scheme documents.

1.9. These changes are being brought forward as substitutions to Applications A, B and C (refs. 18/0547/FUL, 18/0548/FUL an 18/0549/FUL), which are related applications (to be linked via a Section 106 Agreement). It is important to note that no changes are proposed to the physical works proposed under Application C – the only change to this application is that the supporting documents (which include all documents submitted under Applications A and B) have been updated in the context of the proposed changes to the scheme as sought under Applications A and B. Application C was resolved to be refused by LBRuT at Committee on 29 January 2020. As a result, whilst the works proposed in Application C are still an available option, the Applicant has progressed alternative approaches for addressing and mitigating the impacts on surrounding highways, and these have been tested within the relevant substitution documents for Applications A and B. All of these options are subject to ongoing discussions and testing with TfL. They are all within the existing highway boundaries and if agreed would not, in themselves, require planning consent. Accordingly, Application C remains ‘live’ within this substitution package.

1.10. This document replaces the Drainage Strategy submitted in 2018, including the May 2019 Drainage Strategy Addendum. The May 2019 Drainage Strategy Addendum was submitted to incorporate changes to the drainage strategy as a result of discussions with the GLA and the LBRuT and small amendments to the scheme. This was submitted as part of the May 2019 Amendments. Further minor amendments are now proposed, as outlined above.

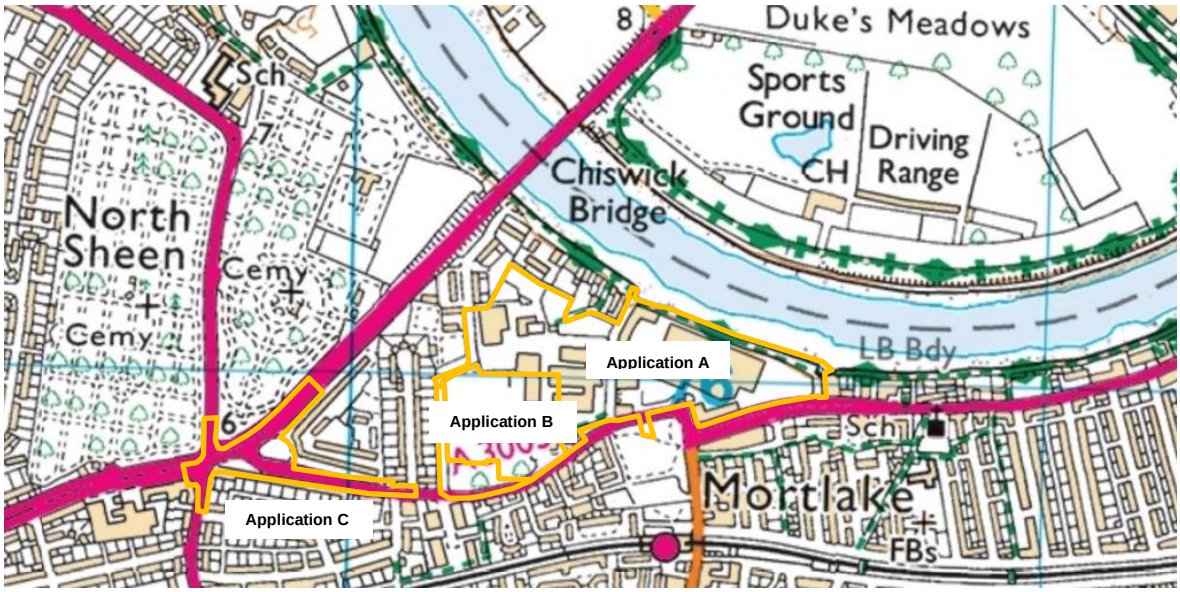
1.11. The LBRuT Committee Report[i] concluded no objects to the previous drainage strategy from the Lead Local Flood Authority, Greater London Authority, or Environment Agency. The changes to the scheme plans presented herein do not alter the principles of the drainage strategy, therefore the conclusions would remain the same.

1.12. This amended Drainage Strategy has been developed for Applications A and B only (hereafter referred to as 'the Site'). A separate Drainage Strategy for Application C was submitted to LBRuT in March 2018 (Ref: WIE10667-101-R.11.2.2). This report is considered to remain valid, with drainage associated with highways and surface water run-off would be discharged to the sewer as per the existing situation to be delivered in conjunction with the local highway authority.

Site Description

1.13. The Stag Brewery (Application A and B) Site 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.

Figure 1: Site Location



Key

Development Location

Source: www.bing.com/maps

Development Proposals

1.14. The amended proposals (Appendix A) comprise up to 1,250 residential units, flexible uses (to be used as restaurant/bar/retail/community/boathouse/financial and professional services and/or offices), office space, a school, a hotel, cinema, as well as associated car and cycle parking, private and public amenity space, and play space.

Scope of the Report

1.15. This report is an update to the previously submitted 2018 Drainage Strategy and May 2019 Drainage Strategy Addendum 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 NPPF and local policy.

2. Planning Policy and Guidance

National Planning Policy Framework

2.1. The National Planning Policy Framework[ii] (NPPF), last revised in February 2019 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)[iii] 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[iv] 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[v] published in March 2016 sets out the Mayor's policies for development in London.

2.10. The London Plan states that the frequency and consequence of fluvial, surface water and sewer flooding are likely to increase as a result of climate change and identifies SuDS as one of the key ways of ensuring that long-term flood risk is managed. Policy 5.13 promotes the use of SuDS to

reduce the contribution of climate change to flooding and seeks to ensure that surface water runoff is managed as close to its source as possible. Policy 5.11 specifically promotes the inclusion of roof, wall and site planting, where feasible.

2.11. The London Plan Supplementary Planning Guidance[vi] (SPG) entitled 'Sustainable Design and Construction', published in April 2014, provides further information on how to achieve the objectives of the London Plan. Regarding the control of surface water runoff, the SPG states:

- Developers should aim to achieve 100% attenuation of the site's undeveloped surface water runoff rate i.e. achieve greenfield runoff rates; and
- Where greenfield rates cannot be achieved, a minimum of 50% attenuation of the undeveloped sites surface water runoff is expected.

Draft New London Plan

2.12. A draft new London Plan[vii] was published in November 2017 with the 'Intend to Publish' version in December 2019. Accordingly, although only holding limited weight as it is not yet adopted, it is important to note that in Policy SI13 the most favourable form of surface water management in the drainage hierarchy has been amended to read 'rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)'. The draft policy further states that development proposals for impermeable surfacing should normally be resisted unless they can be shown to be unavoidable, including on small surfaces such as front gardens and driveways.

Water Industry Act

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

2.14. 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

2.15. LBRuT's adopted their Local Plan in 2018[viii]. 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.

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

2.17. 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
- 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 Stag Brewery Component of 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 strategy has been developed to reflect the comments from LBRuT and the GLA, and amendments to the scheme proposals. The changes to the 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 amended drainage strategy outlined below (bar the removal of the basement attenuation tanks) has been agreed and accepted by the GLA (Appendix D). The removal of the basement attenuation tanks removes the requirement for pumping and therefore provides a further sustainability benefit.

4.3. As noted previously, the potential highways works at Chalkers Corner is anticipated to comprise entirely highway land, with surface water run-off from the highway drainage discharging into the sewer as existing without attenuation. 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 Site only. Any existing highways within Application Boundary A would also discharge as existing.

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[x], BS EN 12056 – Gravity Drainage Systems Inside Buildings[xi], and Approved Document H of Building Regulations[xii].

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 Environment Risk Assessment by Waterman[xiii] (February 2018), 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 draft 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.

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).	✓

Device	Description	Constraints/Comments	✓/✗
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.	✗
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.	✓

Device	Description	Constraints/Comments	✓/✗
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 an 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 3200mm 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[xiv] 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 required by LBRuT (Appendix F).

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 2,667m^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. 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
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

Catchment	Area (ha)	Existing Rate (l/s)	Proposed Rate (l/s)	Attenuation (m^3)	Betterment (%)
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	2,667	64
Total*	**5.89**	**841**	**249**	**2,667**	**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[xv]. 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).
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.

SuDs and Task	Frequency
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 Willams 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 28.5 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. The impact on existing drainage infrastructure is as previously assessed in the 2018 Drainage Strategy and the May 2019 Drainage Strategy Addendum.

6.2. 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.

6.3. The 225mm diameter Thames Water foul sewer crossing the Site is proposed to be diverted as shown on the drainage plan in Appendix I. 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 (Applications A and B). 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

7.1. A Drainage Strategy was submitted in support of the initial planning application for the development in 2018. In May 2019, a Drainage Strategy Addendum was submitted to incorporate changes to the drainage strategy as a result of discussions with the GLA and LBRuT and small amendments to the scheme. This was submitted as part of the May 2019 Amendments. Further minor amendments are now proposed (to be submitted as part of the May 2020 Amendments). These comprise an increase in residential unit provision, an increase in affordable housing provision, an increase in height of some buildings, changes to some building layouts, reduction in size of the western basement, and other amendments including internal layouts and quantum and mix of uses across the Site.

7.2. This amended Drainage Strategy report is an update to the previously submitted 2018 Drainage Strategy and May 2019 Drainage Strategy Addendum to reflect the further amendments to the scheme.

7.3. As per the previous submission, the drainage strategy covers the Stag Brewery Site (Applications A and B) (refer to Figure 1). Drainage associated with highways and surface water run-off from the highway drainage associated with Chalkers Corner works (Application C) would be discharged to the sewer unattenuated as existing, with the drainage strategy to be developed in conjunction with the local highway authority at the detailed design stage..

7.4. As per the previous submission, surface water runoff from the northeast of the Application A 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.

7.5. 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 approach has been agreed with the GLA.

7.6. 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.

7.7. Foul flows from the Site (Application A and B) 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 28.5 l/s respectively.

7.8. The on-Site drainage networks and Sustainable Drainage Systems would be privately managed and maintained for the lifetime of the Development (Applications A and B), 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 and C sites.

7.9. This report confirms that as per the previous submitted reports, 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 NPPF, the London Plan, and the LBRuT Local Plan.

8. References

[i] London Borough of Richmond Upon Thames, January 2020. Planning Committee Public Document Pack.

[ii] Ministry of Housing, Communities and Local Government, February 2019. National Planning Policy Framework.

[iii] Ministry of Housing, Communities and Local Government, 2018. Planning Practice Guidance.

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

[v] Greater London Authority, March 2016. The London Plan: Spatial Development Strategy for Greater London consolidated with Alterations since 2011.

[vi] Mayor of London, April 2014. Supplementary Planning Guidance: Sustainable Design and Construction

[vii] London Plan Team, December 2019. Draft London Plan – Intend to Publish Version.

[viii] London Borough of Richmond upon Thames, July 2018: Local Plan As Adopted 3 July 2018.

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

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

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

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

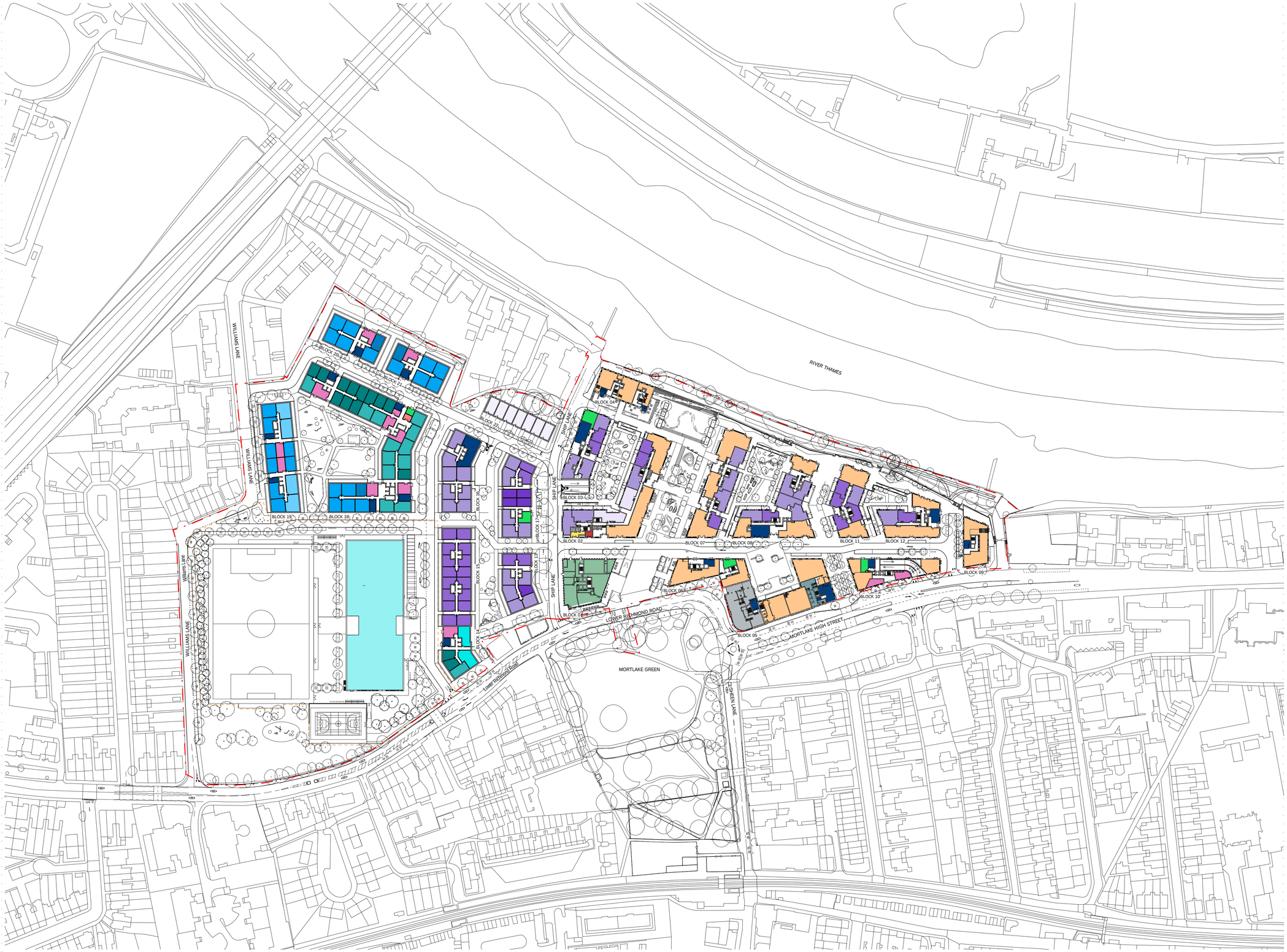
[xiii] Waterman Infrastructure & Environment Ltd, 2018. Preliminary Environmental Risk Assessment.

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

[xv] 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
- 3B4P
- 3B5P
- 4B8P
- 1B2P INT
- 2B3P INT
- 2B4P INT
- 3B5P INT
- 1B2P SR
- 2B3P SR
- 2B4P SR
- 3B5P 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
GLA SUBMISSION	06/04/20	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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Project

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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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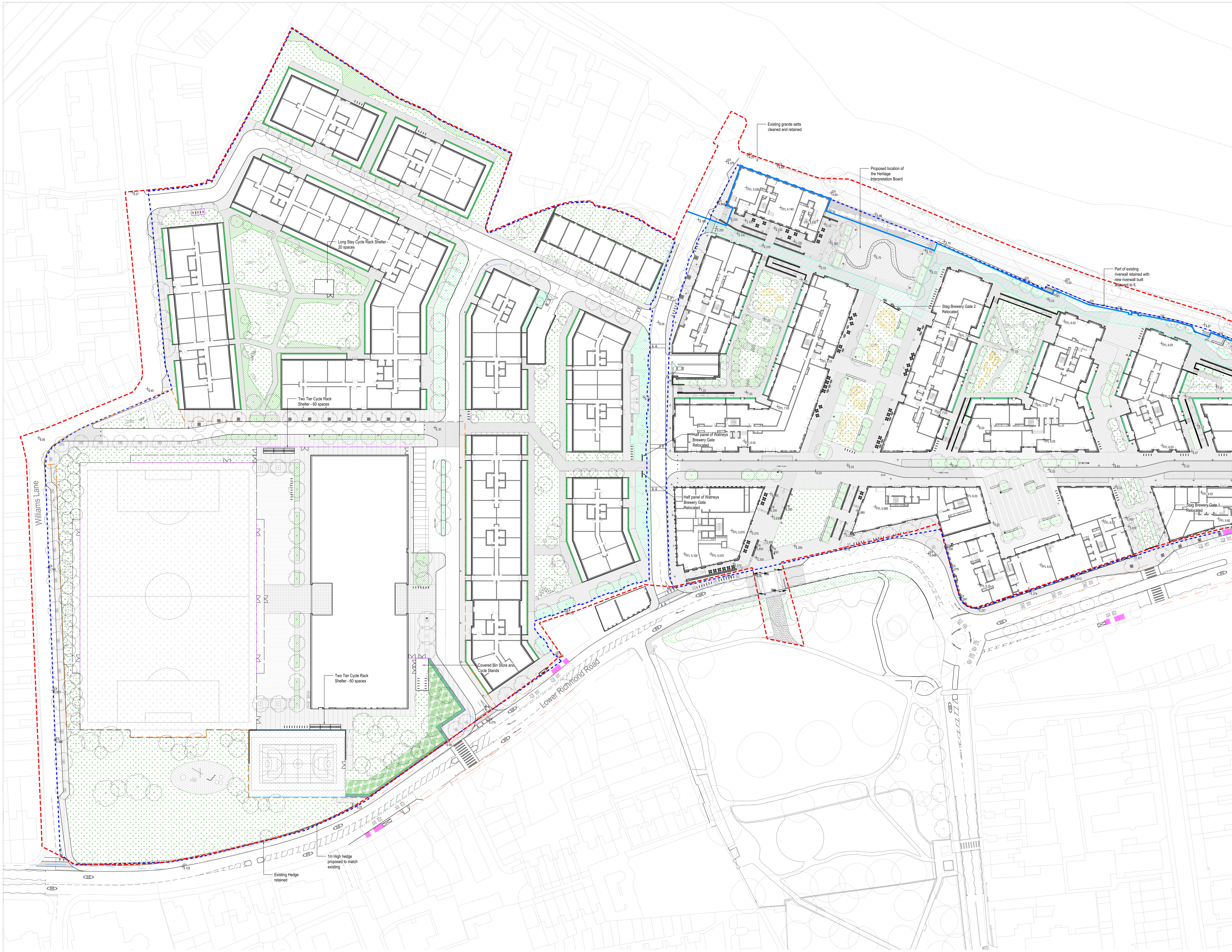

LEGEND

GENERAL

- Site Ownership Boundary
- Site Planning Application Boundary
- School Planning Application Boundary
- Existing Surface Level
- Proposed Surface Level
- Top of Wall Level
- Finished Floor Level (Internal)
- Stairs Up

PAVING

- Paving Type 1 — Stone slabs for footpath
- Paving Type 2 — Stone paving for shared surface
- Paving Type 3 — Stone setts for river terrace
- Paving Type 4 — Stone paving for courtyards
- Paving Type 5 — Stone flag paving for plazas and entrances
- Paving Type 6 — Small stone plank paving
- Paving Type 7 — Large stone plank paving
- Paving Type 8 — Resin bound gravel
- Paving Type 9 — Artificial stone flag paving
- Paving Type 10 — School road asphalt paving
- Paving Type 11 — Porous Macadam MUGA surfacing
- Paving Type 12 — 3G artificial grass
- Paving Type 13 — Rubber surfacing for playground
- Paving Type 14 — Macadam surfacing, Colour light green

STRUCTURES

- Fence Type 1 — 1.2m high fence for school
- Fence Type 2 — 3.0m high fence for school
- Fence Type 3 — 4.5m high twin bar super rebound fence for school
- Wall Type 1 — Concrete retaining wall
- Wall Type 2 — Brick retaining wall with balustrade
- Wall Type 3 — 1.1m Private terrace brick wall
- New Riverwall — Concrete wall with brick cladding and concrete coping with glass balustrade
- Masonry pier — Concrete masonry wall pier with brick cladding and concrete copping
- Existing Riverwall Retained — Sections of existing riverwall to match adjacent new riverwall height
- Gate Type 1 — Double door gate for school

FURNITURE

- Bollard Type 1 — Stainless steel bollard
- Seat Type 1 — Concrete bench
- Seat Type 2 — Concrete bench with timber top
- Cycle Stand Type 1 — Sheffield cycle hoop - galvanised steel
- Two Tier Cycle Shelter — 20 space per module
- Handrail Type 1 — Stainless Steel handrail
- Tree Surround Type 1 — Resin bound gravel
- Bin Type 1 — Stainless steel bin

FEATURE

- Metal Railway Track — For towpath to match existing railway track

LIGHTING

- Lighting Column (CA/1) — To lighting designer's details
- Lighting Column (CA/2) — To lighting designer's details
- Bespoke Lighting Mast (CA/3) — With spotlights, gobo projectors, WIFI, CCTV and banners. To lighting designer's details
- Bespoke Lighting Mast (CA/4) — With spotlights. To lighting designer's details
- Lighting Column (CA/5) — To lighting designer's details
- Sports Lighting Column (CA/6) — To lighting designer's details

PLANTING

- Short Mown Grass
- Planting Mix — Mixed perennial and evergreen planting
- Rain Garden Planting — Mixed low shrub planting - 1.2m high
- Low Shrub Planting — Mixed low shrub planting - 1.2m high
- Hedge Type 1 — 1.5m high hedge
- Existing Hedge — Maintained
- Meadow Planting — Mixed meadow planting
- Existing Trees to be Retained — Protected during all works
- Proposed Trees

rev	details	by	date
00	For Information	RM	12.08.2019
01	For Information	RM	13.08.2019
02	For Information	RM	13.09.2019
03	For Information	CL	23.09.2019
04	For Information	CL	26.09.2019
05	For Information	CL	25.10.2019
06	For Information	RM	27.03.2020
07	For Information	RM	02.04.2020

rev	details	by	date

Notes

1.0 Do not scale from drawing, use figured dimensions only
1.1 All dimensions to be checked onsite
1.2 This drawing to be read in conjunction with all other Gillespies drawings and specifications

N

Project title
STAG BREWERY

Drawing title
Landscape Site Wide General Arrangement

Drawing number
P10736-00-003-GIL-0101

Drawing Status: FOR INFORMATION
Revision: 07

Date	Scale	Drawn	Checked
02.04.2020	1:500 @ A0	RM	CL

Client
DARTMOUTH CAPITAL
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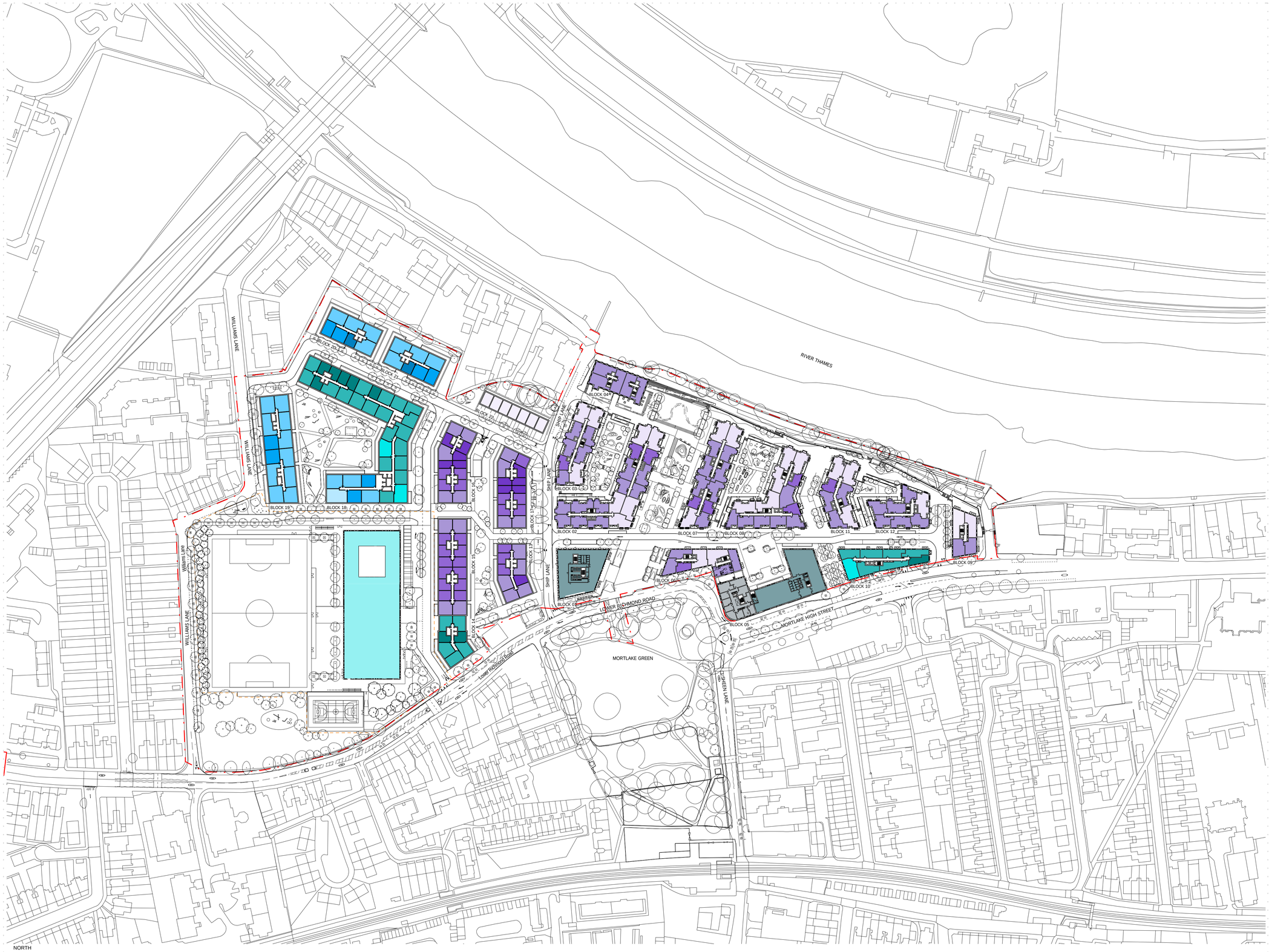

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- Studio
- 1B2P
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- 3B6P
- 4B7P
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- 1B2P INT
- 2B3P INT
- 2B4P INT
- 3B5P INT
- 3B6P INT
- 1B2P SR
- 2B4P SR
- 3B5P SR
- 3B6P SR
- 4B8P SR
- HOTEL
- OFFICE
- SCHOOL

Revision description	Date	Check	Rev
GLA SUBMISSION	06/04/20	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 MASTERPLAN TYPICAL FLOOR LEVEL

Drawn	Date	Scale
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- 2B3P
- 2B4P
- 3B4P
- 3B5P
- 4B8P
- BIKE STORE
- CAR PARK ENTRANCE
- CINEMA
- FLEXIBLE USE
- GAS METER ROOM
- HOTEL
- OFFICE
- REFUSE STORE
- SUBSTATION

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DRAFT GLA SUBMISSION	24/01/20	KH	B
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PROPOSED DEVELOPMENT AREA 01
GROUND LEVEL PLAN

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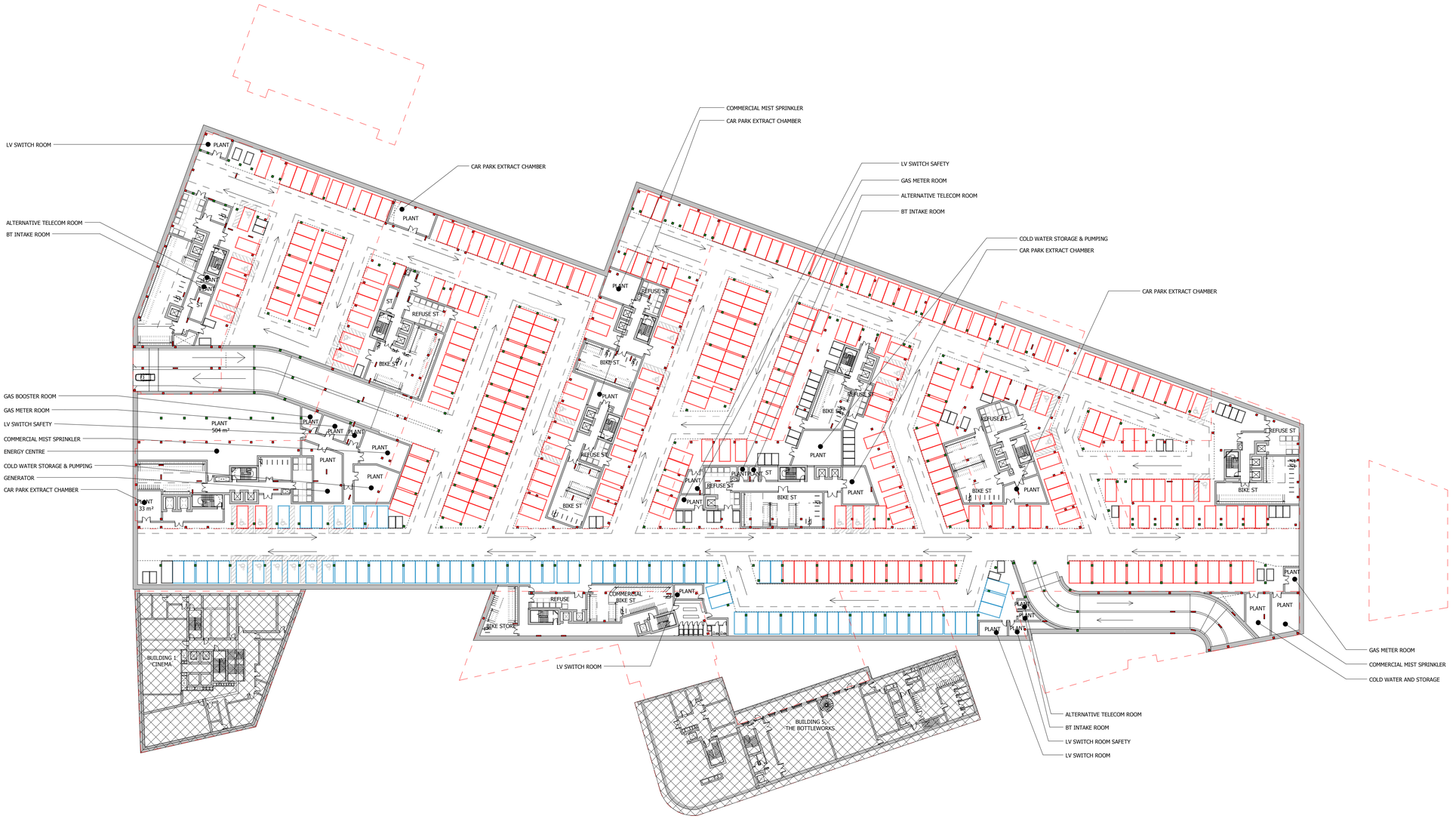

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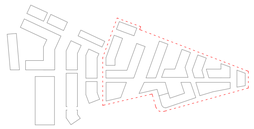

KEY

330 Residential Spaces

78 Commercial Spaces

56 Motorbike Spaces

1,215 Cycle Spaces

NORTH

0 5 10 25 50 m

Revision description	Date	Check	Rev
GLA SUBMISSION	01/04/20	BJ	C
DRAFT GLA SUBMISSION	24/01/20	KH	B
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PROPOSED DEVELOPMENT AREA 01
BASEMENT PLAN

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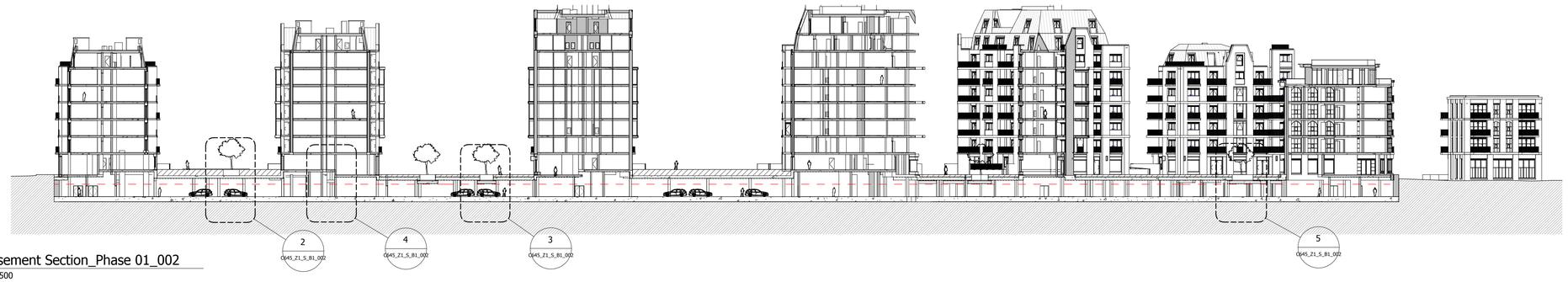

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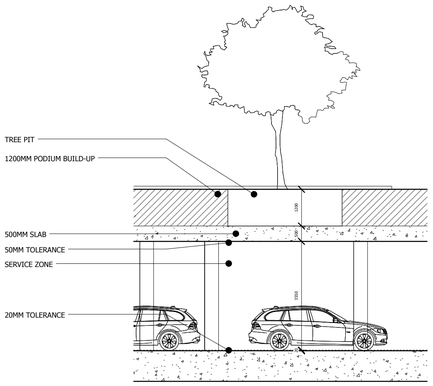

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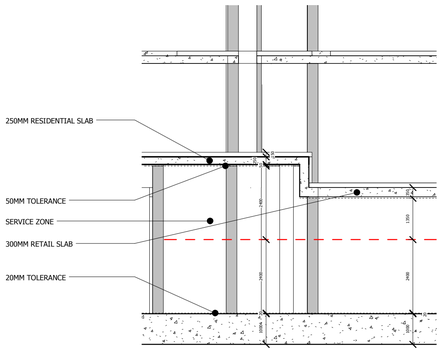

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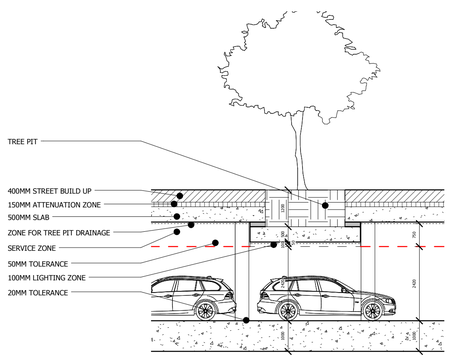
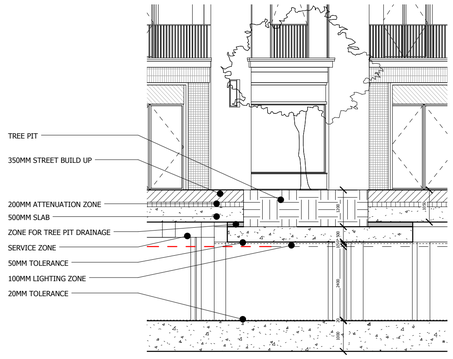
1 : 100



3 Basement Section_Development Area 01_Boulevard
1 : 100



5 Basement Section_Development Area 01_Main Street
1 : 100

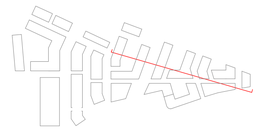
NORTH

0 5 10 25 50 m

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



Revision description	Date	Check	Rev
GLA SUBMISSION	01/04/20	BJ	A
PLANNING APPLICATION	29/03/18	BJ	-

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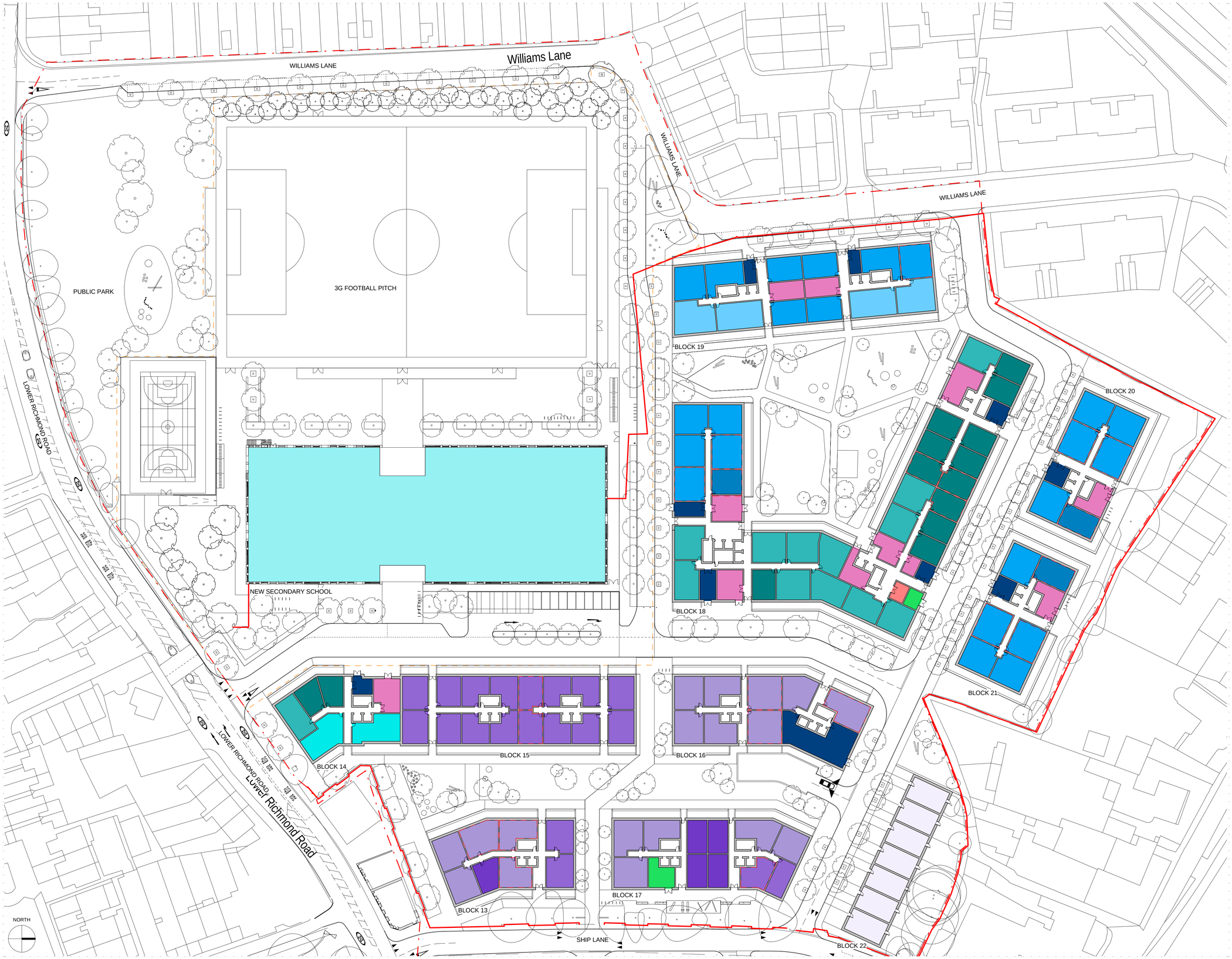
Project
Stag Brewery
Richmond

Drawing
PROPOSED DEVELOPMENT AREA 01
BASEMENT SECTION BB

Drawn	Date	Scale
KHO	29/03/18	As indicated@ A1 @ A3

Job Number	Drawing number	Revision
18125	C645_Z1_S_B1_002	A



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NORTH

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

NOTE:

WHEELCHAIR ACCESSIBLE UNIT / CONVERTIBLE UNIT

Studio	1B2P SR
1B2P	2B3P SR
2B3P	2B4P SR
2B4P	3B5P SR
4B8P	BIKE STORE
1B2P INT	LV SWITCHROOM
2B3P INT	REFUSE STORE
2B4P INT	SCHOOL
3B5P INT	SUBSTATION

Revision description	Date	Check	Rev
GLA SUBMISSION	06/04/20	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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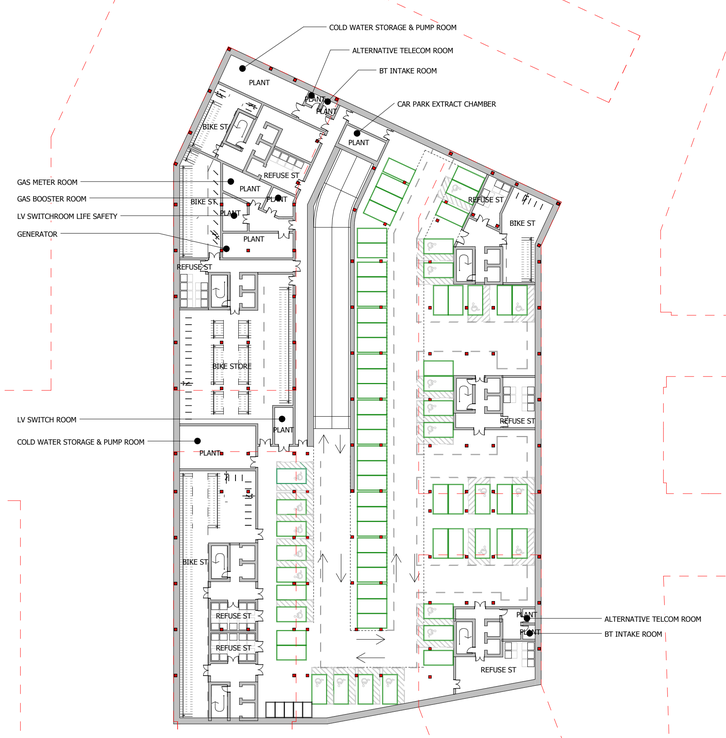
Drawing

PROPOSED DEVELOPMENT AREA 02
GROUND LEVEL PLAN

Drawn	Date	Scale
RKL	18/01/18	1 : 500 @ A1 1 : 1000 @ A3

Job Number	Drawing number	Revision
18125	C645_Z2_P_00_001	C



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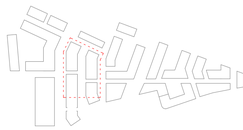
NORTH



KEY

70 Residential Spaces

5 Motorbike Spaces

762 Cycle Spaces

NORTH

0 5 10 25 50 m

Revision description	Date	Check	Rev
GLA SUBMISSION	01/04/20	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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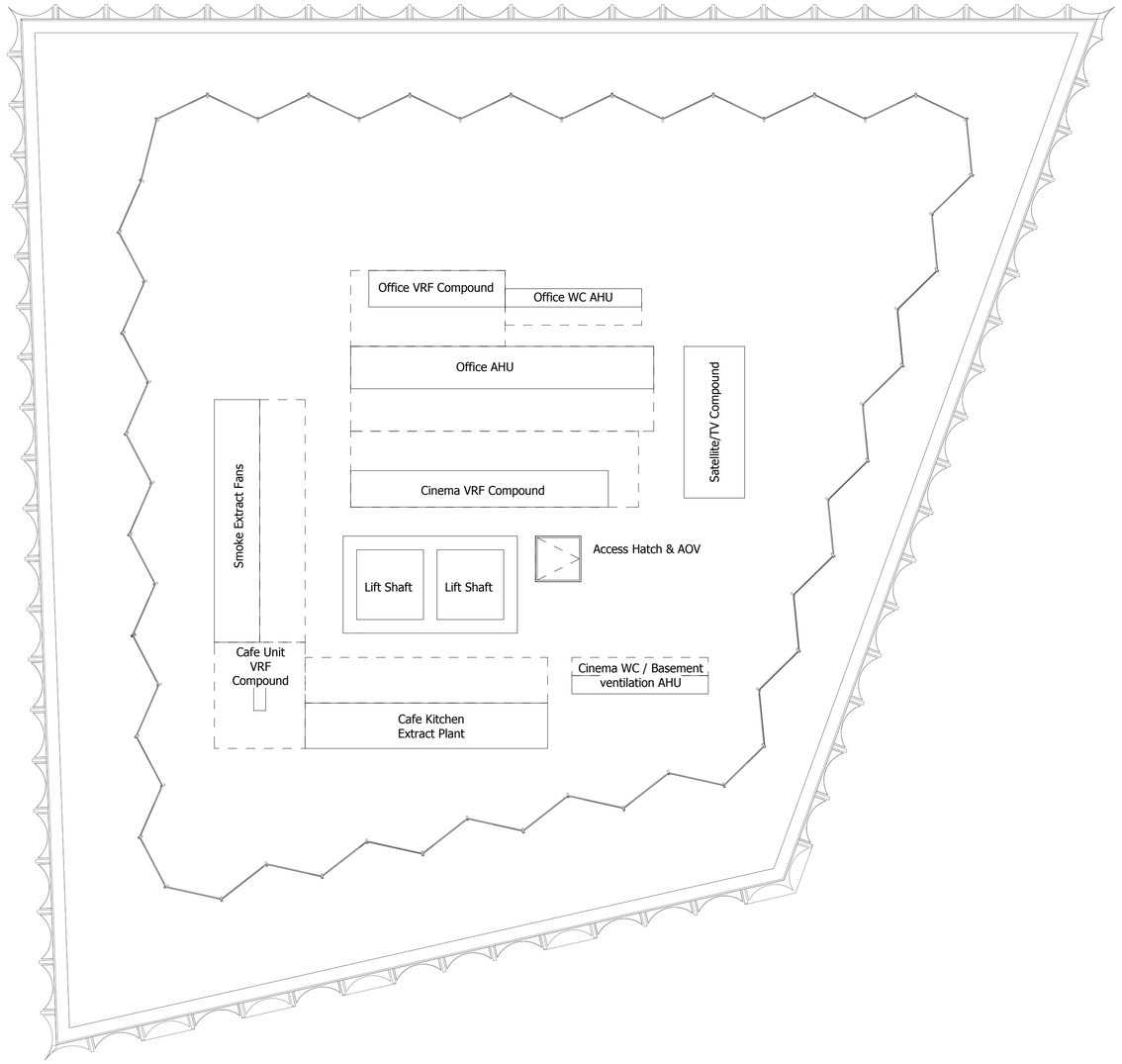
PROPOSED DEVELOPMENT AREA 02
BASEMENT PLAN

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

Job Number	Drawing number	Revision
18125	C645_Z2_P_B1_001	C



NORTH

0 1 2 5 10 m

NOTES:

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NORTH

B1

Revision description	Date	Check	Rev
GLA SUBMISSION	06/04/20	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

BUILDING 01 - PROPOSED ROOF PLAN

Drawn	Date	Scale
AJ	13/09/19	1 : 100 @ A1 1 : 200 @ A3

Job Number	Drawing number	Revision
18125	C645_B01_P_RF_001	C