Logika CONSULTANTS

Flood Risk Assessment: Twickenham Film Studio

January 2021

Experts in Environmental Solutions

Document Control

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Job Number	LJ1009

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Document Status and Review Schedule

Report No.	Date	Status	Reviewed by
LJ1009A/1/F1	7 January 2021	Final	Toby Gibbs (Managing Director)

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1 Introduction

1.1 Logika Consultants Ltd were commissioned by Twickenham Studios London Limited to undertake a Flood Risk Assessment (FRA) and accompanying Drainage Strategy in relation to Twickenham Studios (hereafter referred to as 'the Site') located in the London Borough of Richmond upon Thames).

1.2 This report has been authored by Sophie McCabe, a flood risk and drainage engineer with 14 years' experience, and a Chartered Member of the Institute of Water and Environmental Management (C.WEM).

Site Description

1.3 The Site (Figure 1) is approximately 0.9ha in size, and currently comprises an existing film studio with associated buildings. It is bound by a railway line to the west and Arlington Road to the north. The Barons and Kelvin Drive are located to the east, and St Margaret's Road is located to the south. The Site is located at postcode TW1 2AW.

Figure 1: Site Location

Key

Site Location

A Blocks

Source: https://www.google.com/maps

1.4 The topographic survey (Appendix 1) indicates that the Site slopes towards the centre from both the north and south. Land in the south falls from approximately 8.00m Above Ordnance Datum (AOD) adjacent to St Margaret's Road to 5.52m AOD to the north of Block F. Levels in the north of the Site fall from approximately 6.00m AOD adjacent to Arlington Road, towards the centre and Block F.

Development Proposals

1.5 The scheme proposals are included in Appendix 2. The development comprises:

"Erection of a new block ("Block A") at the front corner of the site together with the partial demolition of Block C and the construction of a two storey extension, the construction of an additional storey and external stair and lift core access to Block E, the construction of an additional storey above Block H and the refurbishment and modernisation of all existing blocks within the site".

1.6 The external areas of the site would be lightly resurfaced where needed, with no intrusive works proposed.

1.7 The development use would be retained as a film studio, with staging areas, dressing rooms, prop stores, cinema, and associated offices. A café would be included within Block A which would be accessible to the public.

2 Planning Policy and Guidance

National Planning Policy Framework

2.1 The National Planning Policy Framework[1] (NPPF), last revised in February 2019 states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

2.2 The NPPF states that when determining planning applications, Local Planning Authorities (LPA) should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific FRA. Development should only be allowed in areas at risk of flooding where it can be demonstrated that:

- Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- The development is appropriately flood resistant and resilient;
- Any residual risk can be safely managed; and
- Safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

2.3 Major developments should incorporate Sustainable Drainage Systems (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

2.4 The Planning Practice Guidance (PPG)[2] provides additional guidance to LPAs to ensure effective implementation of the NPPF planning policies when assessing development in areas at risk of flooding.

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

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

[2] Ministry of Housing, Communities and Local Government, March 2014. Planning Practice Guidance

SuDS. Referencing information provided by the EA, the PPG provides advice on taking account of climate change, setting out recommended contingency allowances for net sea level rise and peak rainfall intensities, which should be increased by between 5% and 105% from now until the year 2115. It also advises on flood resilience and resistance measures when dealing with the residual risks remaining after applying the sequential approach and mitigating actions.

2.6 The PPG provides advice on flood risk vulnerability and flood zone compatibility. The following flood zones refer to the probability of river and sea flooding, without the presence of defences:

- **Zone 1: low probability**, less than 1 in 1000 annual probability of river or sea flooding (<0.1%) in any year;
- **Zone 2: medium probability**, between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% to 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% to 0.1%) in any year;
- **Zone 3a: high probability**, 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability flooding from the sea (>0.5%) in any year; and
- **Zone 3b: functional floodplain**, where water flows or is stored in times of flood, identification should take account of local circumstances but would typically flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme 1 in 1000 (0.1%) flood.

2.7 Table 2 of the PPG splits flood risk vulnerability into five classifications. The compatibility of these development uses within each Flood Zone is set out in Table 3 of the PPG:

- **Essential Infrastructure**: essential transport and utility infrastructure, wind turbines;
- **Highly Vulnerable**: emergency services (those required to be operational during flooding), basement dwellings;
- **More Vulnerable:** residential dwellings, hospitals, schools, hotels, drinking establishments;
- **Less Vulnerable**: retail, offices, storage and distribution, leisure, restaurants; and
- **Water-Compatible Development**: docks, marinas, wharves.

Non-statutory Technical Standards for Sustainable Drainage Systems

2.8 The Non-Statutory Technical Standards for Sustainable Drainage Systems[3] was published in March 2015 and is the current guidance for the design, maintenance, and operation of SuDS.

2.9 The Standards set out that the peak runoff rate should be as close as is reasonably practicable to the greenfield rate and should never exceed the pre-development runoff rate.

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

2.10 The Standards state that drainage systems should be designed so that flooding does not occur on any part of a 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. Pumping should only be used when it is not reasonably practicable to discharge by gravity.

2.11 DEFRA commissioned research to ascertain whether updating the Standards could help deliver SuDS which provide multiple benefits. Standards 1 to 6 were updated based upon feedback received, and consultation closed in November 2020.

London Plan and London Plan Supplementary Planning Guidance

2.12 The London Plan[4] published in March 2016 sets out the Mayor's policies for development in London.

2.13 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 main 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.

2.14 The London Plan Supplementary Planning Guidance[5] (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. the 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

2.15 A draft new London Plan[6] was published in November 2017 with the 'Intend to Publish' version submitted in December 2019. The Secretary of State and Mayor are currently discussing and undertaking final amendments to the updated London Plan for publication. At the time of writing this FRA, the Draft London Plan was not yet approved.

Although only holding limited weight as it is not yet adopted, it is important to note that the most favourable form of surface water management in the drainage hierarchy has been amended within the draft to read 'rainwater use as a resource (for example rainwater harvesting, blue roofs for

[4] Mayor of London Plan, March 2016. The London Plan

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

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

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 small surfaces such as front gardens and driveways.

London Borough of Richmond Upon Thames Strategic Flood Risk Assessment

2.16 The LBRT Strategic Flood Risk Assessment (SFRA)[7] was published in September 2020 and provides a strategic overview of all forms of flood risk throughout the borough, allowing for the impacts of climate change. The report delivers the planning and flood risk requirements as defined by the NPPF, and allows utilisation of the latest data to better assess flood risk in the Borough. The report also sets out future policy recommendations. Information regarding groundwater and surface water flooding is included within Chapter 3.

London Borough of Richmond Upon Thames Surface Water Management Plan

2.17 The Surface Water Management Plan (SWMP)[8] was delivered as part of the Drain London project by LBRT. The report describes predicted and historic flooding from various sources which may impact upon surface water flood risk, including sewers, drains, groundwater, alongside runoff from land, small watercourses, and ditches.

2.18 The SWMP identified seven Critical Drainage Areas (CDAs) in the Borough, which includes CDA 002: St Margaret's within which the Site lies.

2.19 The findings of the SWMP aim to provide advice to the Council regarding local planning policy issues, and guidance to developers on how best to manage surface water flood risk. Information from the SWMP regarding surface water flooding is included within Chapter 3 of this report.

London Borough of Richmond Upon Thames Preliminary Flood Risk Assessment

2.20 The Preliminary Flood Risk Assessment[9] (PFRA) was prepared by LBRT as part of the Drain London project, in response to the Flood Risk Regulations 2009. The PFRA provides a high level summary of significant flood risk, taking climate change into account. Flood risk from surface water runoff, groundwater, sewers, and ordinary watercourse are considered. Flood risk information related to the Site is included in Chapter 3.

[7] London Borough of Richmond Upon Thames, September 2020. Strategic Flood Risk Assessment – Level 1

[8] London Borough of Richmond Upon Thames, June 2011. Surface Water Management Plan

[9] London Borough of Richmond Upon Thames, May 2011. Preliminary Flood Risk Assessment

London Borough of Richmond Upon Thames Local Plan

2.21 A new Local Plan is currently being prepared, which will be adopted in spring 2024. Until prepared the 2018 Local Plan[10] (also adopted March 2020) remains current policy, looking ahead to 2033.

2.22 The Local Plan aims for a sustainable future, which encourages development to be fully resilient to climate change in order to minimise the vulnerability of people and property.

2.23 Policy LP 17 relates to Green Roofs and Walls. Policy states that green and/or brown roofs should be incorporated within all major developments where technically feasible, and subject to considerations of visual impact. If a green/brown roof is not feasible, LBRT will expect green walls to be incorporated. The Local Plan states that the incorporation of green roofs can reduce surface water runoff volumes and rates, and reduce flash flooding. These are encouraged and supported on renovations, conversions, and extensions.

2.24 Policy LP 21 of the Local Plan relates to Flood Risk and Sustainable Drainage. Policy states that developments should avoid or minimise contributing to all sources of flood risk and must not increase flood risk elsewhere. Climate change should also be taken into account.

2.25 An FRA will need to ensure that on-site attenuation is provided where feasible for fluvial and surface water flooding where sites lie within the 1 in 100 year flood extent.

2.26 SuDS should be incorporated to reduce runoff to the greenfield rate where feasible. When not feasible, discharge must be restricted to 50% of the exiting rate.

2.27 Policy LP 23 relates to Water Resources and Infrastructure. Policy requires sufficient capacity (or confirmation that extra capacity can be provided) in the public sewerage network to facilitate development.

Sequential and Exception Tests

2.28 The EA's Flood Map for Planning shows that the Site is located within Flood Zone 1 and is therefore considered to be at a low risk of tidal and fluvial flooding. It is recognised that areas of Flood Zone 2 lie to the northeast of the Site, however due to the Site's location within Flood Zone 1 the Sequential Test is deemed to have been satisfied. As the Site is located within Flood Zone 1 the Exception Test is not required.

Scope of Report

2.29 This report assesses the potential effects of tidal, fluvial, groundwater, pluvial and artificial sources of flooding upon the Development, in line with national and local planning policy. The management

[10] London Borough of Richmond Upon Thames, July 2010. Local Plan

of surface water runoff is also assessed, and a strategy to effectively manage runoff whilst working within the Site-specific constraints is proposed, so as not to increase flood risk elsewhere.

3 Sources of Potential Flooding

Tidal and Fluvial

3.1 The nearest watercourse to the Site is the River Thames, located approximately 430m to the northeast at its closest point. The primary source of flood risk to the Site is surge tides resulting from a combination of extreme high tides and meteorological influences.

3.2 The EA Flood Map for Planning (Figure 2) shows that the Site is located in Flood Zone 1, denoting a low probability of tidal and fluvial flooding. This has been confirmed by the EA (Appendix 3). Areas of Flood Zone 2 abut the site to the north and east, and Flood Zones 2 and 3 are located to the west, beyond the railway line. However, the adjacent floodplain benefits from the Thames Tidal defences, as seen in Figure 2 hatched in dark blue and white. Therefore, the periphery areas of the Site are protected assuming normal operation of the River Thames defences, and the site is at a low risk of tidal and fluvial flooding.

Figure 2: Environment Agency Flood Map for Planning

Key

Site Location

Source: https://flood-map-for-planning.service.gov.uk/

3.3 The River Crane is located approximately 500m to the west of the Site. However, as can be seen in the Flood Zone map, the associated floodplain of the River Crane does not reach the Site, remaining to the west of St Margaret's Road.

3.4 Figure 1 of the LBRT PFRA (Appendix 4) show that an area to the immediate northeast of the site has been subject to historic fluvial flooding. This is presumed to correlate with the historic flood outline as shown on the Flood Zone maps which denote the defended Flood Zone 2 extent.

3.5 Although the Thames Tidal defences are privately owned and under the responsibility of the riparian owners, the EA has powers to enforce repairs to be undertaken, as necessary, at the expense of the riparian owner. This provides assurance that any required remediation works would be undertaken, and that the immediate vicinity of the Site would continue to be protected from tidal flooding from the River Thames up to the year 2100, confirming a low risk of flooding in a climate change scenario.

Breach

3.6 Although the Proposed Development would be protected for the 1000 year plus climate change event over its lifetime, it is necessary to assess the residual risk of flooding due to a theoretical failure of the flood defences, termed breach.

3.7 The EA undertook hydraulic breach modelling in 2017 as part of their Thames Upriver Breach Inundation Modelling Study. The interrogated results show that the Site would not be affected in the present day (2005) breach scenario, however mapping (Figure 3) shows that the future (2100) breach extents would very slightly encroach in the Site's north eastern corner.

Figure 3: Flood Risk from Breach in the Thames Tidal Defences

Source: Environment Agency Thames Tidal Upriver Breach Modelling 2017

Key

Site Location

Breach Flood Extent

Xm AOD Breach Flood Level

3.8 The western breach flow route stops to the west of the adjacent railway and does not encroach upon the Site. Table 2 sets out the maximum breach extent and adjacent lowest existing ground level in relation to the north eastern flow route. This indicates that in the unlikely event of a breach in the defences, flood water would not impact the development and the Site would remain dry.

Table 1: Breach Flood Levels and Ground Levels

Location	Breach Flood Level	Ground Floor FFL
Eastern Site boundary	4.095m AOD	6.200m AOD
Northern Site boundary	5.645m AOD	5.730m AOD

3.9 Furthermore, all development at the Site comprises ‘less vulnerable’ development, and no basements are proposed. The probability of tidal flooding to the development is low as the Site lies just outside an adjacent Flood Zone, and the River Thames flood defences would protect the immediate vicinity assuming normal operation. Breach flood water would only reach the periphery of the Site and would not enter the development. As a result, the residual risk to users of the Site in the unlikely event of a breach in the defences is also considered to be low.

Pluvial

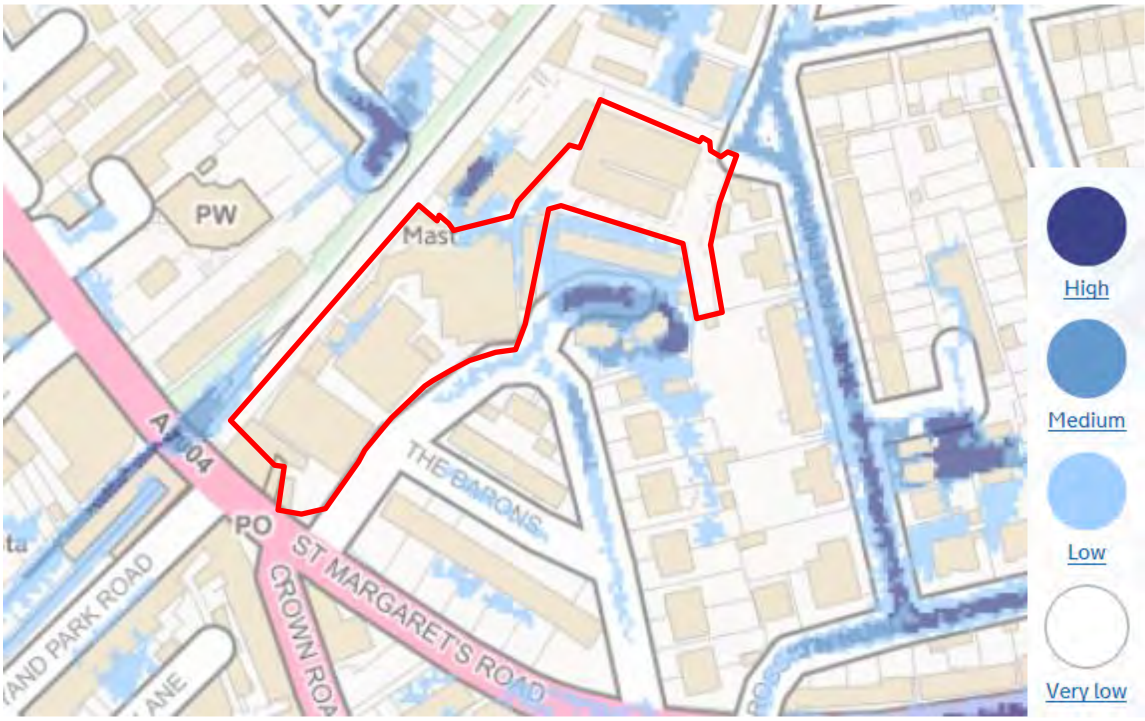
3.10 Pluvial flooding occurs when natural and engineered systems lack capacity to manage the volume of rainfall. Pluvial flooding can occur in urban areas during an extreme, high intensity, low duration summer rainfall event which overwhelms the local surface water drainage systems. This flood water would then be conveyed via overland flow routes based on local topography.

Overland Surface Water Flow

3.11 Figure 3.8.2a of the SWMP shows that the Site is located within CDA Group 002: St Margaret’s, however identifies that the Site itself is not generally at risk of surface water flooding in a 1 in 100 year event. Some extremely small areas are noted between 0.1m and 0.25m in the central area of the Site, however Figure 3.8.2b shows that there is a very low flood hazard. Since this mapping was produced, the EA have provided updated mapping (as discussed below). The SWMP mapping is therefore considered to be superseded.

3.12 The EA’s Risk of Flooding from Surface Water map (Figure 4) indicates that the majority of the Site is at a very low risk (<0.1% annual probability) of surface water flooding. There are some areas of low (between 0.1% and 1% annual probability), in the centre of the site, with medium (between 3.3% and 1% annual probability), and high risk (>3.3% annual probability) areas located to the northwest and southeast, outside of the Site itself.

Figure 4: Flood Risk from Surface Water



Key

Site Location

Source: https://flood-warning-information.service.gov.uk

3.13 In a medium risk scenario (1 in 30 to 1 in 100 year event) no flooding is noted on the Site itself. Flood depths to the northwest and southeast are noted to be between 300mm and 900mm, however are not shown to encroach within the Site. The topographic survey (Appendix 1) shows that Kelvin Drive to the southeast falls away from the Site towards the northeast, therefore this is not anticipated to be of issue to the proposed development.

3.14 The SFRA indicates (Figure G, Appendix 5) that during a 1 in 100 year plus climate change event, the Site would not be at risk of surface water flooding, and Figure 1 of the PFRA (Appendix 4) shows that there has been no historic surface water flooding on the Site. The risk of flooding from overland surface water flows is therefore considered to be low.

3.15 The development generally comprises refurbishment, with some upwards extension. In these areas there would be no increase in building footprint. Some new build elements are proposed (Blocks A, C, and E). These new buildings are not located within the EA's surface water flood extent, even in a 1 in 1000 year event. As a result, there would be no impact on overland flow routes in the area and no increase in flood risk elsewhere.

Sewer

3.16 Sewer flooding is typically caused by heavy rainfall or blockages in the existing sewer network. Figure I of the SFRA (Appendix 5) and Figure 3 of the PFRA (Appendix 4) indicate that there have been no sewer flooding incidents based on Thames Water's DG5 register, however Figure J of the SFRA (Appendix 5) shows that there has been a blocked gully incident to the northeast of the Site.

3.17 Thames Water have confirmed (Appendix 6) that they have no recorded incidents of surcharged sewers at the Site.

3.18 The presence of kerbs along the surrounding highways would encourage any potential flood water from surcharged sewers to be retained within the highway. The risk of flooding from surcharged sewers is low.

Groundwater

3.19 Groundwater flooding occurs when water emerges from the ground when the water table is high following heavy rainfall, and is generally associated with porous sub-surface geology.

The geology beneath the Site (Table 3) has been established through review of the online British Geological Survey (BGS) borehole records in the vicinity of the Site.

Table 2: Existing Site Geology

Stratum	Estimated Thickness of Stratum	Description	Hydrological Significance
Made Ground	0.3m		Unproductive
Kempton Park Gravel	7.4m	Brown clayey sand, with some gravel. Coarse sand and gravel at depth	Secondary A Aquifer*
London Clay	Undefined	Stiff grey-brown clay	Unproductive

* Permeable layers capable of supporting water supplies at a local rather than strategic scale

3.20 The London Clay would act as an aquiclude, preventing groundwater at depth with the Chalk Aquifer from rising to the surface. There is however the potential for perched groundwater to be present within the Kempton Park Gravel Formation. Borehole record TQ17SE109 located to the northeast of the Site noted perched groundwater within the sand and gravel at 2.6m below ground level.

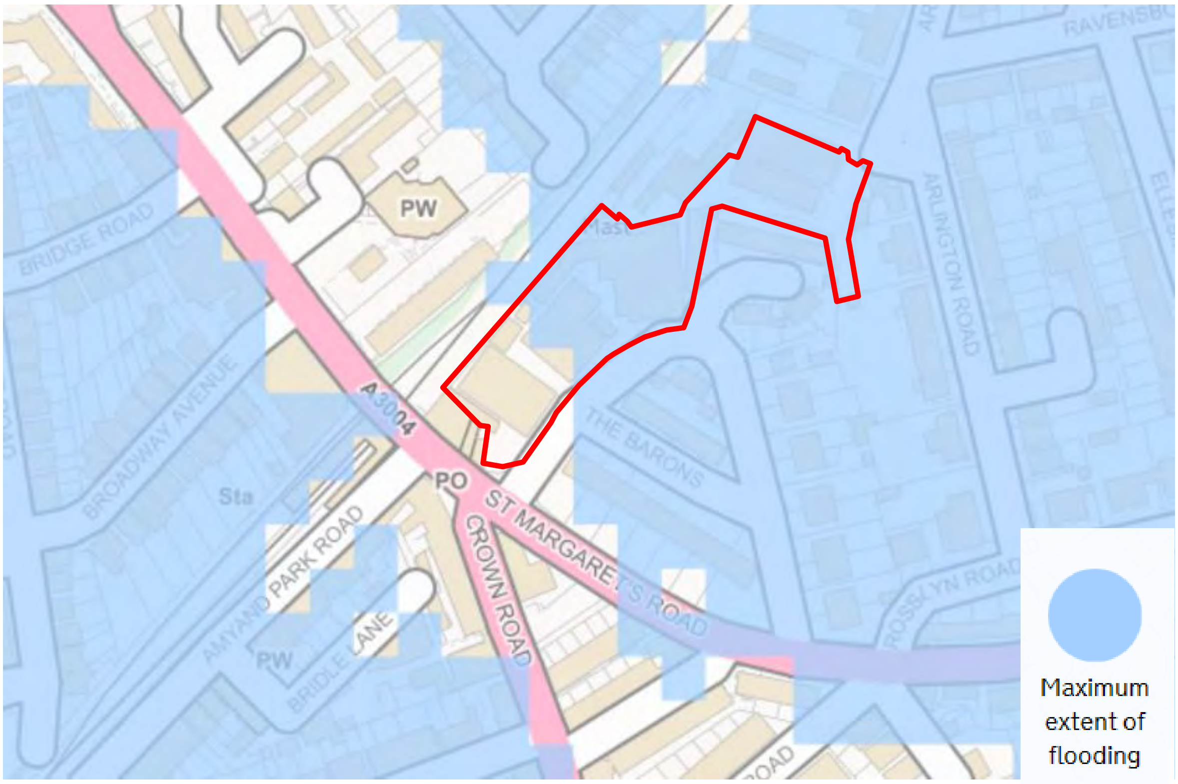
3.21 Figure E of the SFRA (Appendix 5) shows that the Site is located within an area potentially at risk of groundwater flooding at surface, which is mirrored in Figure 2 of the PFRA (Appendix 4) which shows that the Site is underlain by permeable superficial deposits. However, Figures D and Figure K of the SFRA (the latter also referred to as Figure 1 of the LFRMS, Appendix 5) show that there have been no historic records of groundwater flooding at the Site, the nearest being approximately 340m to the southeast. The predominantly impermeable nature of the Made Ground would prevent any significant amount of groundwater rising from the Kempton Park Gravel superficial deposits towards the surface.

3.22 There are no basements currently at the Site, and none are proposed as part of the development. Therefore, there would be no impact on or alteration to the existing groundwater regime beneath the Site. The risk of groundwater flooding to the Site is considered low, and there would be no impact on groundwater levels elsewhere.

Artificial Sources

3.23 The EA Flood Risk from Reservoir mapping shows the largest area that may be affected by flooding if a reservoir were to fail. The EA note that this is a worst-case prediction, and any flood event is extremely unlikely to happen and is unlikely to be this large. The EA mapping (Figure 5) shows that the northern and central parts of the Site could be subject to flooding due to a failure of the Queen Mary reservoir, which is located approximately 9.6km to the west of the Site.

Figure 5: Environment Agency Flood Risk from Reservoir Flooding



Source: *https://flood-warning-information.service.gov.uk*

Key

Site Location

3.24 All large reservoirs must be inspected and supervised by reservoir panel engineers, to ensure that the embankments are maintained to a high standard. The risk of reservoir flooding to the Site is therefore considered to be low and is not generally considered a constraint to development.

3.25 There are no other artificial bodies of water in the vicinity of the Site. The risk of flooding from artificial sources is therefore considered to be low.

Summary

3.26 The Site has a low risk of flooding from tidal, fluvial, pluvial, groundwater and artificial sources. It is also important to assess the potential for the development to increase flood risk to others through increasing surface water runoff from the Site. This is discussed in Chapter 4.

4 Surface Water Drainage

Existing Drainage

4.1 Thames Water sewer records (Appendix 6) indicate the presence of surface water and foul public sewers beneath the highways surrounding the Site. These are summarised in Table 3.

Table 3: Existing Public Sewers

Location	Sewer
St Margaret's Road	225mm surface water sewer
The Barons	225mm surface water sewer, with a connection into the Site 225mm foul sewer, with a connection into the Site (emanating from St Margaret's Road)
Arlington Road	Foul sewer, unknown diameter

4.2 The topographic survey (Appendix 1) identifies gullies and inspection chambers on-Site, denoting a positive drainage network connecting to the receiving Thames Water sewers network. A CCTV survey would be undertaken following grant of planning permission but before construction works commence to confirm the condition and location of existing connections, which would be re-used where feasible.

Surface Water Discharge Location

4.3 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[11], BS EN 12056 – Gravity Drainage Systems Inside Buildings[12], and Approved Document H of Building Regulations[13].

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

1. Discharge to ground;
2. Discharge to surface water body;
3. Discharge to a surface water sewer; and
4. Discharge to a combined sewer.

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

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

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

Discharge to Ground

4.5 The development generally comprises refurbishment, with some upward extension. Three small new-build elements are proposed. The retained buildings, and new-build elements cover the majority of the Site. As a result there is insufficient space to achieve the 5m required offset between a soakaway features and the building footprint. The potential for infiltration drainage is therefore precluded.

Discharge to Surface Water Body

4.6 There are no watercourses in close proximity to the Site, precluding the potential to discharge to a surface water body.

Discharge to Surface Water Sewer

4.7 Surface water sewers are present within The Barons which are anticipated to receive existing runoff from the Site. These connections would be retained post development, and it is proposed that surface water runoff would discharge to the public surface water sewers as per the existing situation.

Discharge to Combined Sewer

4.8 As the Site is expected to discharge to the adjacent surface water sewers, there would be no need to discharge to combined sewers. The full extent of the existing drainage network would be confirmed as part of detailed design proposals and following the grant of planning permission.

Sustainable Drainage Systems

4.9 The most sustainable way to drain surface water runoff is through the use of SuDS, which need to be considered in relation to Site-specific constraints.

4.10 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 can improve water quality, and provide biodiversity and amenity benefits.

4.11 A variety of SuDS are available to reduce or temporarily hold back the discharge of surface water runoff. In order to adhere to the SuDS hierarchy, the constraints and opportunities for various SuDS have been assessed in Table 4. Justification is provided as to why certain features have been deemed feasible or unfeasible for use in this development.

Table 4: 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 on existing and new buildings across the Site	✓

Device	Description	Constraints/Comments	✓/✗
Infiltration devices & Soakaways (source control)	Store runoff and allow water to percolate into the ground via natural infiltration	The density of the retained buildings precludes the potential for infiltration	✗
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 external areas of the Site would be lightly resurfaced, with no intrusive works. This precludes the potential to replace with pervious materials	✗
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 is not possible within the retained buildings, but would be considered within new build areas as the scheme develops post planning	✓
Swales (permeable conveyance)	Broad shallow channels that convey / store runoff, and allow infiltration (ground conditions permitting)	Space constraints within the Site and retained buildings preclude 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 density of the retained buildings and refurbished nature of the majority of the Site (i.e. no intrusive works in external areas) precludes the potential for infiltration	✗
Filter Strips (permeable conveyance)	Wide gently sloping areas of grass or dense vegetation that remove pollutants from runoff from adjacent areas.	The density of the retained buildings precludes the potential for filter strips	✗
Infiltration basins (end of pipe treatment)	Depressions in the surface designed to store runoff and allow infiltration through the base	The density of the retained buildings precludes the potential for 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 density of the retained buildings and refurbished nature of the majority of the Site (i.e. no intrusive works in external areas) precludes the potential for bioretention areas. However, planters would be considered post planning as the scheme design develops	✓
Dry ponds (end of pipe treatment)	Depressions in the surface designed to store runoff without infiltration through the base	The density of the retained buildings precludes the potential for ponds	✗

Device	Description	Constraints/Comments	✓/✗
Attenuation underground (end of pipe treatment)	Oversized pipes or geo-cellular/sectional tanks designed to store water below ground level	In order to provide sufficient attenuation, tanks are required. To increase the sustainability values, this would comprise 'blue roofs'	✓

Green Roofs

4.12 Green roofs provide a bio-diverse habitat in addition to providing amenity and water quality benefits, capturing rainwater, and naturally slowing the rate of runoff.

4.13 Green roofs would be retrofitted to the majority of blocks as part of the development, including existing/refurbished Blocks B, G, and the proposed upwards extensions on Blocks E and H. Due to structural constraints of the existing buildings, planting on these Blocks would comprise sedum matting with the exception of Block H where the existing structure means a slightly deeper substrate could be incorporated. Green roofs would also be incorporated within new build elements on Blocks A, C, and E (Appendix 2). This would comprise sedum matting on Block E due to the very limited footprint, however could comprise a deeper substrate on Blocks A and C.

External Planting

4.14 As the design develops post planning, the potential for planters would be considered within the external areas to soften the existing hardstanding on the Site. These features would naturally capture rainwater and reduce the rate of runoff.

Rainwater Harvesting

4.15 The inclusion of rainwater harvesting decreases the demand on potable water. 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 strategy.

4.16 It would not be feasible to incorporate rainwater harvesting within the existing/refurbished Blocks. However, the potential to incorporate rainwater harvesting for both internal and external uses within new build Blocks A and C would be further developed post planning, as the scheme proposals develop.

Proposed Surface Water Drainage Strategy

4.17 The London Plan and the LBRT Local Plan ideally require developments to restrict surface water runoff to the greenfield runoff rate. Any drainage strategy needs to be commensurate with the nature of the respective application, to ensure that it is feasible to construct.

4.18 The development generally comprises refurbishment of the existing buildings, with all downpipes and existing underground drainage networks remaining as existing. External areas are constrained by existing retained services, with only minor resurfacing proposed and no intrusive works.

4.19 It would therefore not be feasible to provide formal attenuation for the retained buildings, which would continue to drain as existing. However, to ensure that betterment is provided, green roofs are proposed on all refurbished buildings (Appendix 2). This would naturally reduce the rate of runoff, provide water quantity benefits, alongside biodiversity enhancement.

4.20 However, where new build elements are proposed formal attenuation would be provided where feasible to meet policy requirements. The 1 in 100 greenfield runoff rate has been calculated based on the IoH124 method (Appendix 7), resulting in a respective discharge rate of 9.1 l/s/ha. The existing discharge rate has been calculated using the Modified Rational Method, resulting in a rate of 123.0 l/s/ha.

4.21 The increased footprint of Block E measures 22m^2. Calculations show that the natural rate of runoff from this area would generally be less than 0.1 l/s when taking all storm durations into account. It is therefore not deemed practical to provide a formal restriction for this area. However, a green roof is proposed which would naturally capture and store rainwater, reducing the rate of runoff and promoting evapotranspiration.

4.22 MicroDrainage Source Control module (Appendix 7) has been used to establish the required attenuation volume to restrict flows to the greenfield runoff rate for the 1 in 100 year event, including a 40% allowance for climate change. However, as the proposed areas of built developed are relatively small this would result in an extremely small outfall control being required which has an increased potential for blockage. In line with LBRT policy, any orifice should be a minimum of 20mm to reduce the potential for blockage and therefore this is the size that would be adopted. The resulting calculations are seen in the Table 5 below.

Table 5: Proposed Discharge Rates and Attenuation Required

Block	Area (m^2)	Existing Rate (l/s)	Greenfield Rate (l/s)	Proposed Rate (l/s)*	Reduction over Existing Rate (%)	Attenuation Required (m^3)
Block A	264	3.2	0.2	0.3	90	20
Block C	140	1.7	0.1	0.3	82	9

* based on an orifice restriction of 20mm

4.23 The strategy would provide a reduction in surface water runoff rates over the existing situation, aiming to achieve the greenfield runoff rate as far as feasible given the Site specific constraints.

4.24 The attenuation volumes for each Block would be provided through 150mm deep geo-cellular attenuation tanks located on the roof, beneath green roofs (Appendix 8). This would ensure a gravity connection to the receiving on-site drainage network, which ultimately connects into the Thames Water surface water sewers in the surrounding highways. A CCTV survey would be undertaken following the grant of planning permission to confirm the location and condition of the existing connections, and if required new connections would be made in consultation with Thames Water. The final drainage strategy would be confirmed at the detailed design stage once surveys have been undertaken.

4.25 As required by LBRT, the respective existing and proposed discharge rates for the 1 in 1, 30 and 100 year return periods are set out in Table 6. This shows that the proposed strategy provides a reduction in runoff rates during all storm events. In reality there would be a greater reduction in runoff, due to the additional green roofs retrofitted on existing buildings. This provides significant betterment over the existing situation.

Table 6: New Build Combined Discharge Rate for Return Periods

Return Period	Existing Rate (l/s)	Proposed Rate (l/s)	Reduction %
1 in 100	4.9	0.6	87
1 in 30	3.7	0.6	83
1 in 1	1.0	0.6	40

4.26 A Pre-Planning Enquiry has been submitted to Thames Water to confirm that the existing public sewer network has the capacity to accommodate the proposed surface water flows, but considering the proposed reduction, this is not anticipated to be an issue.

4.27 The potential requirement to divert any on-site private drainage networks to facilitate the new Blocks would be confirmed post planning, following completion of a CCTV survey.

Exceedance Routes

4.28 In the unlikely event of a severe blockage in the local drainage system or a storm greater than the 1 in 100 year plus 40% climate change design storm, the proposed drainage system could exceed its capacity and overflow. These exceedance flow routes and flooded areas must be managed to minimise risks to the development and adjacent areas.

4.29 In an exceedance event, flood water would back up at the flow restriction point. To ensure that the respective Blocks are not flooded internally overflows would be incorporated to direct excess surface water to the external areas of the Site. Based on local topography exceedance flows would continue east and enter the adjacent highway, The Barons, as seen in Figure 6. The newly proposed ground floor FFLs are set above the external ground levels, encouraging floodwater to flow away from the proposed buildings. The risk to the development is therefore considered to be low.

Figure 6: Exceedance Flood Flow Routing

<u>Key</u>

Exceedance Flow Route

Block A

Block C

Water Quality

4.30 Appropriate treatment would be incorporated into the drainage system to ensure that the quality of water discharged is acceptable. According to the CIRIA SuDS Manual[14], the pollution hazard level of roofs is 'low'. It is considered that treatment for this low level of pollution would be achieved through the incorporation of green roofs, which provide filtration as rainwater slowly drains through the soil medium.

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[14] CIRIA C753, 2015. The SuDS Manual

4.31 The on-Site drainage networks and SuDS would be privately managed and maintained, ensuring they remain fit for purpose and function appropriately. Exact maintenance responsibilities would be confirmed with the management company/operator appointed post-planning. Table 7 outlines what maintenance is anticipated for the proposed SuDS features, in line with guidance from the CIRIA SuDS Manual.

Table 7: Maintenance Plan for SuDS

SuDS and Task	Frequency
Green Roof	
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)
Attenuation Tank/Blue Roof	
Inspect and identify any areas that are not operating 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 (blue roof), 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 of as required
Rainwater Harvesting	
Inspect harvesting tank for debris/blockages.	Annually 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, BS EN 12056 – Gravity Drainage Systems Inside Buildings, and Approved Document H of Building Regulations.

5.2 The existing and proposed foul discharge rate has been calculated using the water consumption method (Appendix 9). The existing Site comprises various Blocks which include stages, theatres, office, canteen, bar areas and storage/ancillary uses. The existing peak foul flow rate is 4.6 l/s.

5.3 The proposed Site would comprise refurbishment of the existing buildings, and additional areas of office, storage and café uses. The proposed peak foul flow rate is 6.0 l/s.

5.4 Foul water from the proposed development would discharge as existing into the foul sewer network beneath The Barons and Arlington Road, re-using existing connections where feasible. A CCTV survey would be undertaken following grant of planning permission to confirm the condition and location of the existing connections and to determine the exact location of any new connections into the existing network (be that on Site or into the Thames Water sewers). If 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.

5.5 A Pre-Planning Enquiry has been submitted to Thames Water to confirm that the existing public sewer network has the capacity to accommodate the proposed foul flows.

6 Conclusion

6.1 The Site lies within a Critical Drainage Area as defined by LBRT's SWMP. However, EA mapping shows that the Site itself is generally at a very low risk of surface water flooding, with small areas in the centre of the Site at a low risk of flooding (1 in 100 to 1 in 1000 year event). The majority of buildings would be retained as existing, in particular through the centre of the Site, and there would be no change in flow routes caused by the new development. Where new build elements are proposed FFLs would be set above the level of the external surfaces. The risk of surface water flooding is considered low.

6.2 The risk of flooding from tidal, fluvial, groundwater and artificial sources has been assessed and found to be low.

6.3 In line with the London Plan and the LBRT Local Plan, surface water runoff would be restricted as close to the greenfield runoff rate as feasible. It would not be feasible to restrict runoff from the refurbished Blocks on the Site. However, green roofs are proposed on most retained buildings, and therefore runoff would naturally be decreased alongside improving water quality and biodiversity.

6.4 The new build elements are relatively small and given their size it would not be possible to fully restrict to the greenfield rate. In line with LBRT guidance a minimum orifice restriction of 20mm would be used to reduce the potential for blockage. A green roof would be proposed on the additional footprint of Block E, as this area is too small to formally restrict. It has been calculated for the new build areas of Blocks A and C that the existing runoff rate of 4.9 l/s would be restricted to 0.6 l/s, providing an 87% reduction over the existing situation in the 1 in 100 year event.

6.5 Attenuation would be provided within high-level geo-cellular tanks on the respective Block roofs. It is assumed that surface water would be discharged into the on-Site private sewer network, before discharging into the public surface water sewer beneath The Barons. Existing connections would be re-used where feasible, which would be confirmed with a CCTV survey post planning.

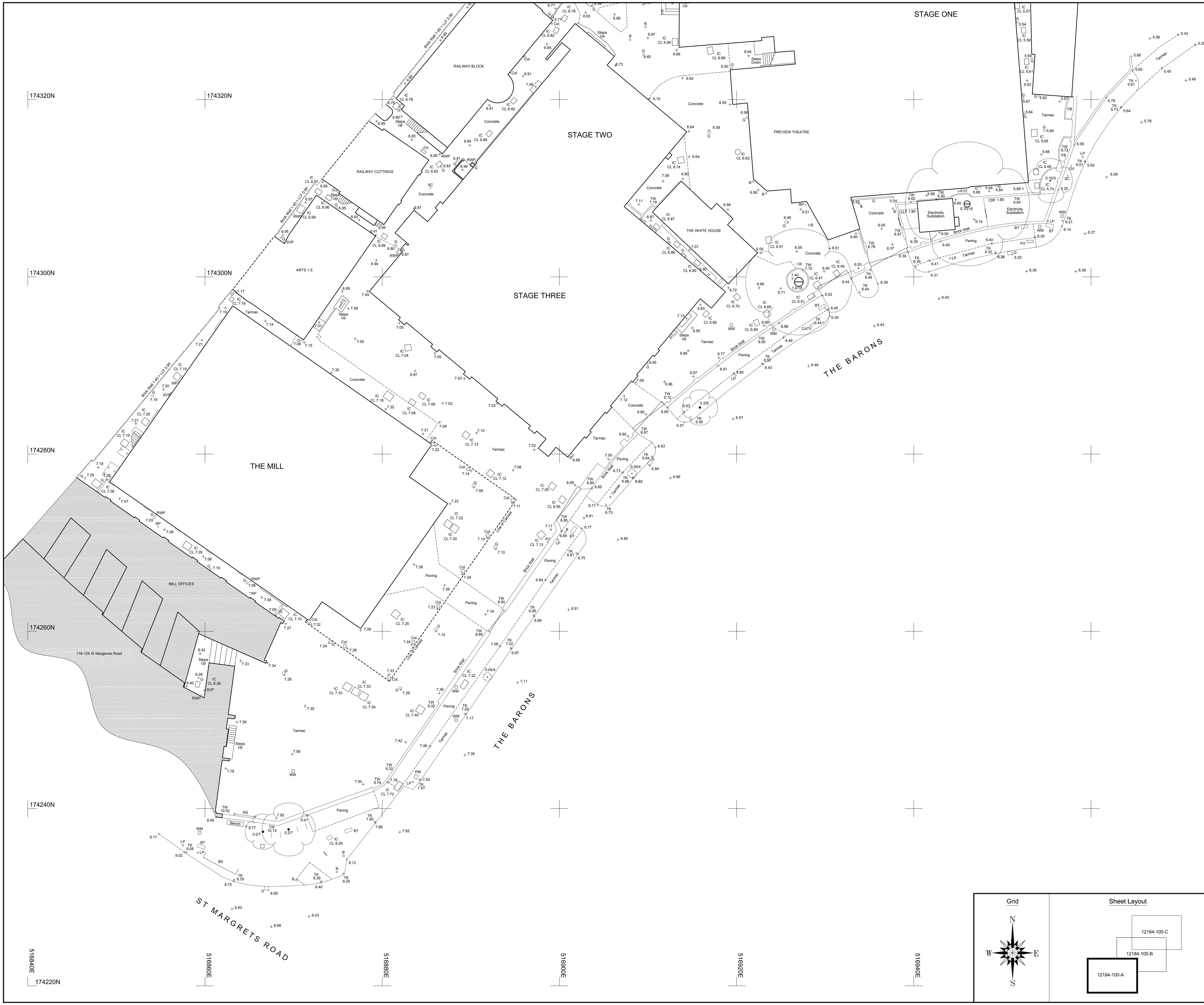
6.6 The potential for pollution from the roof is low as per CIRIA SuDS guidance. However, appropriate treatment would be achieved through the incorporation of green roofs. The potential for rainwater harvesting within the new build elements would be further developed post planning. The on-Site drainage network and SuDS would be privately managed and maintained for the lifetime of the development, ensuring they remain fit for purpose and function appropriately. Exact management responsibilities would be defined post planning.

6.7 The existing Site comprises various Blocks which include stages, theatres, office, canteen, bar areas and storage/ancillary uses. The proposed Site would comprise refurbishment of the existing buildings, and additional areas of office, storage and café uses. The existing and proposed peak foul flow rate have been calculated at 4.6 l/s and 6.0 l/s respectively. A Pre-Development Enquiry has been submitted to Thames Water to confirm there is sufficient capacity in the receiving sewer network.

6.8 This report demonstrates that the development has a low risk of flooding from tidal, fluvial, pluvial, groundwater and artificial sources, and would not increase flood risk elsewhere. It is considered that the information provided within this report satisfies the requirements of the NPPF and local policy.

7 Appendices

A1 Topographic Survey



LEGEND

BANKING (Top / Bottom) — SLOPING MASONRY
BUSHES & HEDGES — STILE
MARSH — WALL (Width drawn to scale)
TREES 3T / 0.2 / 6 (No of Trunks, Dia of Bole, Height of Tree) — BUILDING
NOTE:- SPREADS AND HEIGHTS ARE INDICATIVE ONLY — OPEN SIDED BUILDING
GATES (Single, Double) — GLASS ROOFED
RETAINING WALL (RTW) — CONTOURS

ABBREVIATIONS (WHERE APPLICABLE)

AIR VALVE	AV	LETTER BOX	LB
BED LEVEL	BL	MANHOLE	MH
BELISHA BEACON	BB	MARKER	MKR
BOLLARD	B	NOTICE BOARD	NB
BRITISH TELECOM BOX	BTB	NAME PLATE	NP
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BRICKWORK	BKWK	PARKING METER	PM
BUS STOP	BS	RIDGE LEVEL	RID
CABLE TV	CATV	ROAD SIGN	RS
COVER LEVEL	CL	RODDING EYE	RE
CABLE MARKER	CM	RETAINING WALL	RTW
CONCRETE POST	CP	SLUICE VALVE	SV
DOWN PIPE	DP	STOP COCK	SC
EAVES LEVEL	EAV	SOFFIT LEVEL	SOF
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EARTH ROD	ER	TELEPHONE CALL BOX	TCB
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GAS VALVE	GV	UNABLE TO LIFT	UTL
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GULLY OUTLET	GO	VENT PIPE	VP
GATE STOP	GS	WATER METER	WM
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INVERT LEVEL	IL	WASH OUT	WO
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FLOOR TO CILL	F-C	INTERWOVEN FENCE	IWF
FALSE CEILING	FC	IRON RAILING FENCE	IRF
FLOOR TO CEILING HEIGHT	1234	LARCH LAP FENCE	LLF
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REV.	NOTES	DWN	DATE
A	Location of rear of 116-124 St Margarets Road Added,	RLH	09/2012

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RICS

SCALE
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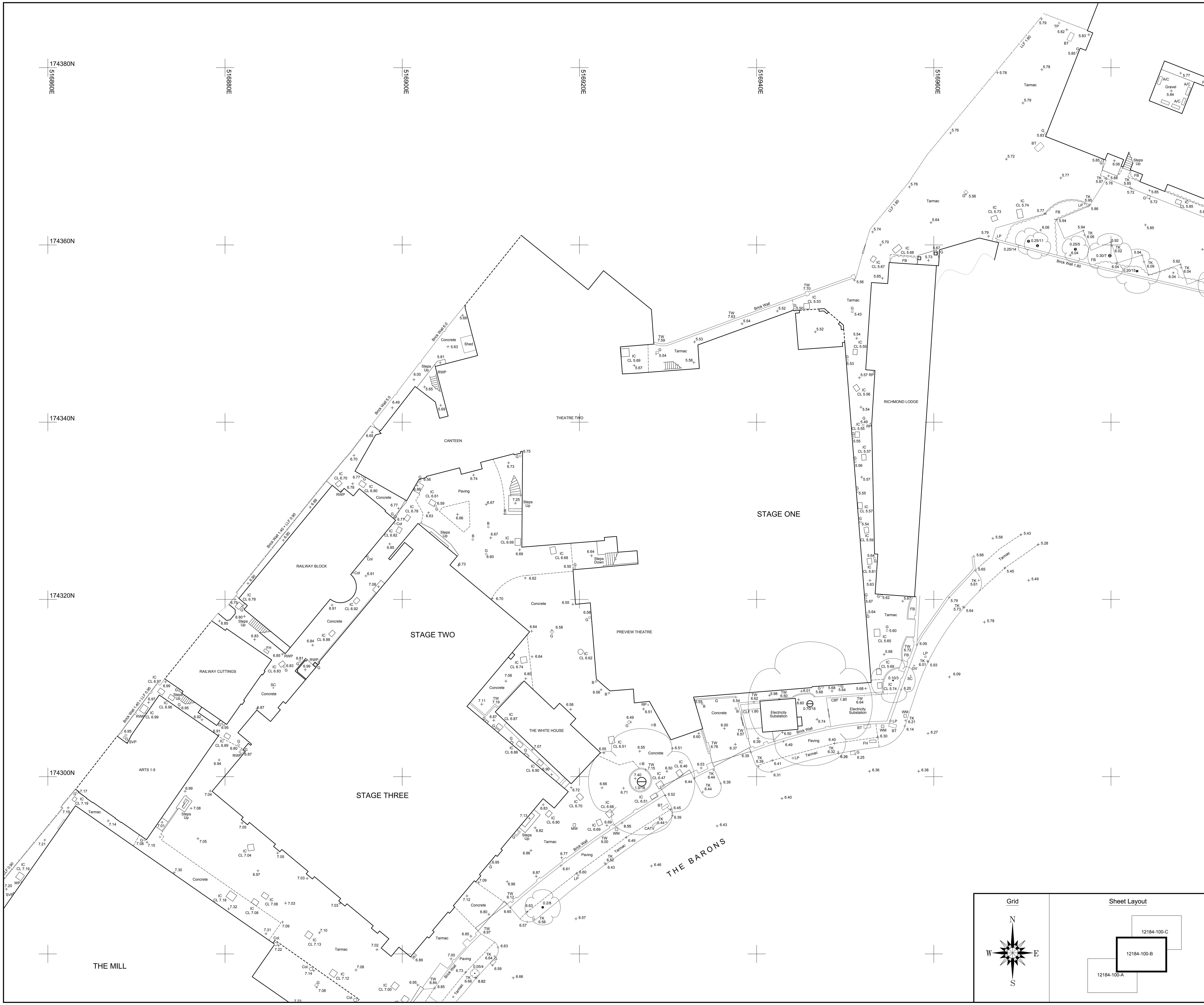
TWICKENHAM FILM STUDIOS, TW1 2AW

TOPOGRAPHICAL SURVEY

Job No	Rev	Drawing Number
12/184	A	12/184/100-A

Date : Aug 2012.



LEGEND

BANKING	Top / Bottom	SLOPING MASONRY	
BUSHES & HEDGES		STILE	
MARSH		WALL Width drawn to scale	0.23w
TREES 3T / 0.2 / 6 (No of Trunks / Dia of Bole / Height of Tree)		BUILDING	
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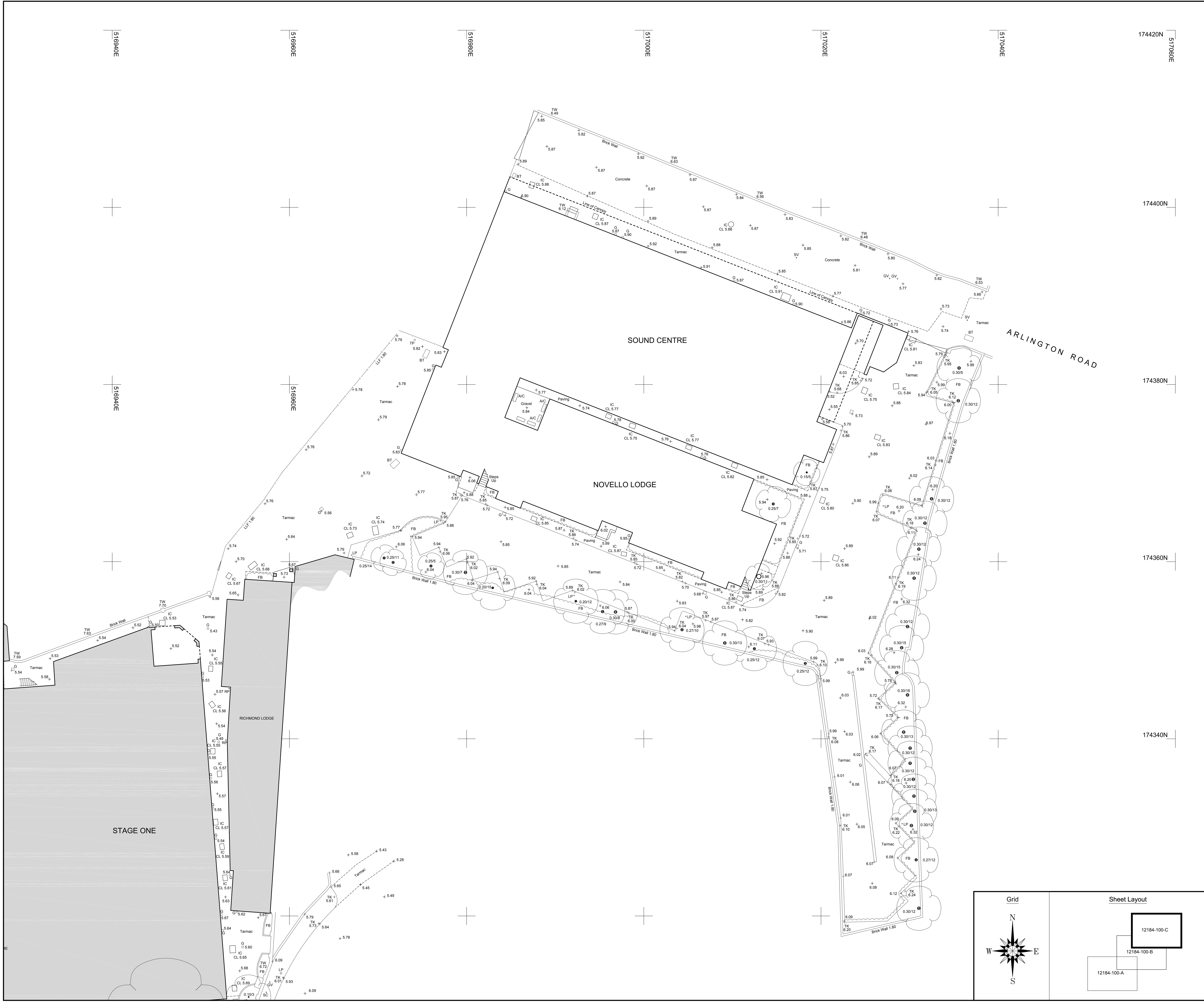

Grid

Sheet Layout

N S W E

12184-100-C
12184-100-B
12184-100-A

LEGEND

BANKING (Top / Bottom) · SLOPING MASONRY · BUSHES & HEDGES · STILE · MARSH · WALL (Width drawn to scale) · TREES 3T / 0.2 / 6 (No of Trunks, Dia of Bole, Height of Tree) · BUILDING · OPEN SIDED BUILDING · GLASS ROOFED · GATES (Single, Double) · RETAINING WALL (RTW) · CONTOURS

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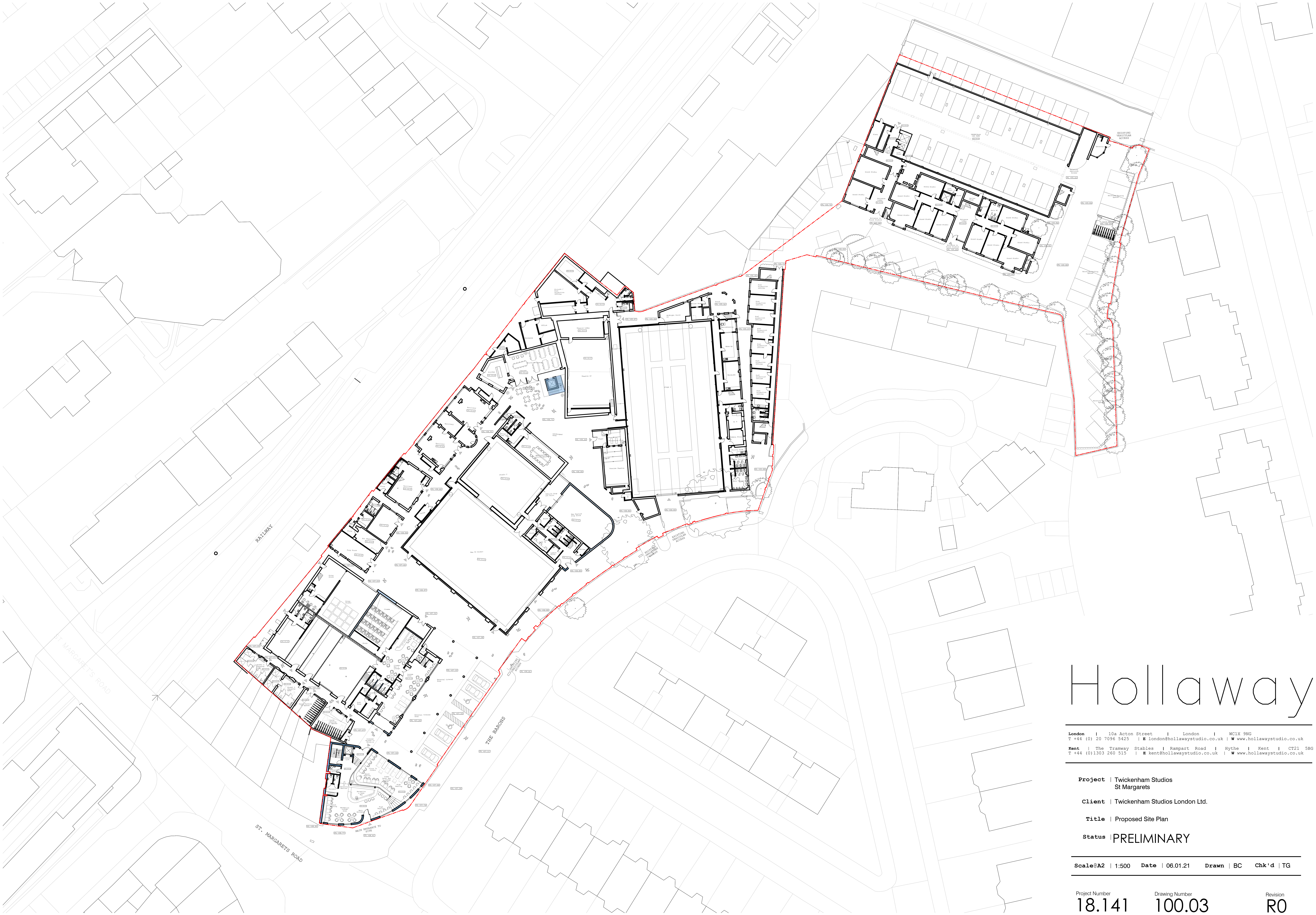
TWICKENHAM FILM STUDIOS, TW1 2AW

TOPOGRAPHICAL SURVEY

Job No	Rev	Drawing Number
12/184	A	12/184/100-C

Date : Aug 2012.

A2 Development Proposals



Hollaway

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Project | Twickenham Studios
St Margarets

Client | Twickenham Studios London Ltd.

Title | Proposed Site Plan

Status | PRELIMINARY

Scale@A2 | 1:500 **Date** | 06.01.21 **Drawn** | BC **Chk'd** | TG

Project Number
18.141
Bim Number

Drawing Number
100.03

Revision
R0

1:500 @A2

0 5 10 20 30M

Site Boundary

Proposed New Build/Alterations

KEY PLAN
N.T.S

Proposed New Build/Alterations

Existing Trees to be removed

1:200 @A3

0 1 2 4 6 8 10M

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Project | Twickenham Studios
St Margarets

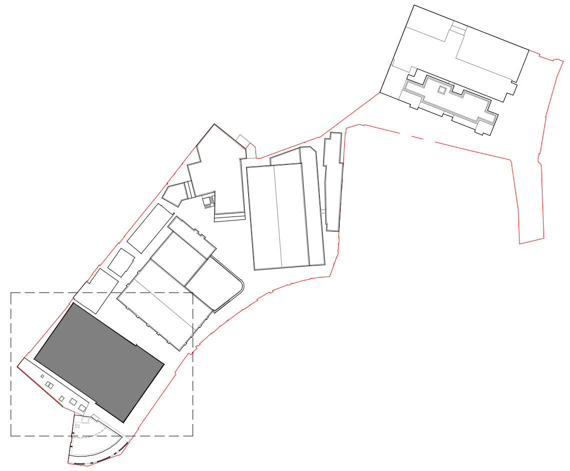
Client | Twickenham Studios London Ltd.

Title | Block A - Proposed Roof Plan

Status | PRELIMINARY

Scale@A3 | 1:200 **Date** | 15.12.20 **Drawn** FK | **Chk'd** LC |

Project Number	Drawing Number	Revision
18.141	200.04	R0



KEY PLAN
N.T.S

1:200 @A3

0 1 2 4 6 8 10M

Proposed New Build/Alterations

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Project | Twickenham Studios St Margarets

Client | Twickenham Studios London Ltd.

Title | Block B - Proposed Roof Plan

Status | PRELIMINARY

Scale@A3 | 1:200 Date | 21.12.20 Drawn | FK Chk'd | LC

Project Number 18.141

Drawing Number 210.04

Revision R0

1:200 @A3

0 1 2 4 6 8 10M

Proposed New Build/Alterations

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Project | Twickenham Studios
St Margarets

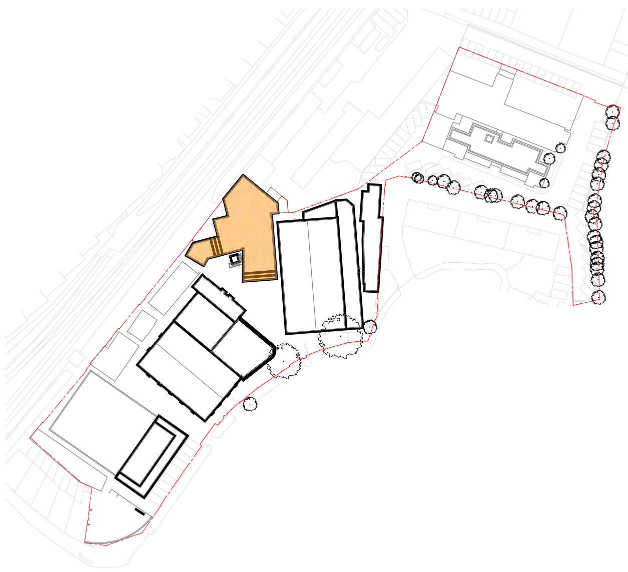
Client | Twickenham Studios London Ltd.

Title | Block C & D - Proposed Roof Plan

Status | PRELIMINARY

Scale@A3 | 1:200 **Date** | 21.12.20 **Drawn** | FK **Chk'd** | LC

Project Number	Drawing Number	Revision
18.141	220.03	R0



KEY PLAN
N.T.S

Proposed New Build/Alterations

1:200 @A3

0 1 2 4 6 8 10M

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Project | Twickenham Studios
St Margarets

Client | Twickenham Studios London Ltd.

Title | Block E - Proposed Roof Plan

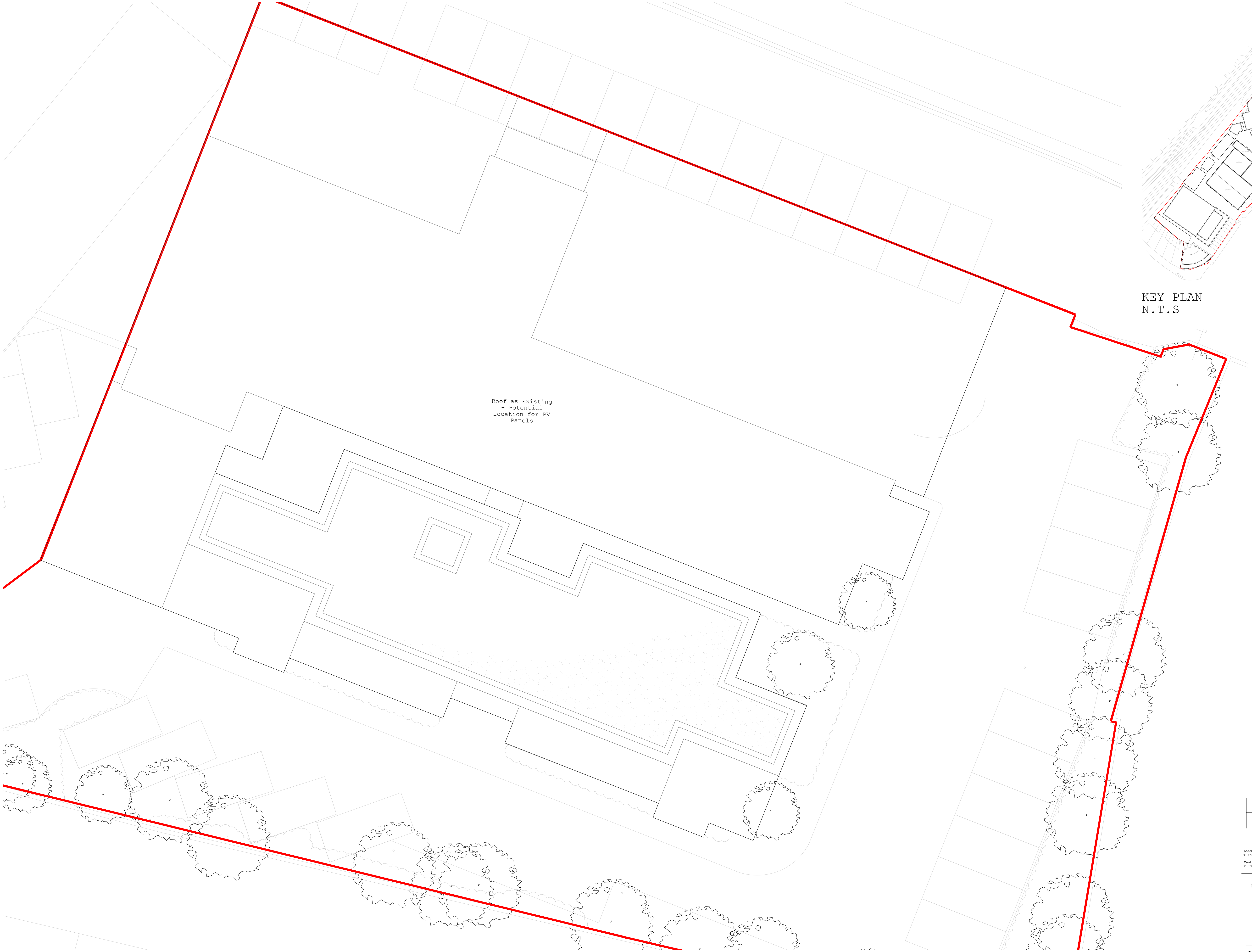
Status | PRELIMINARY

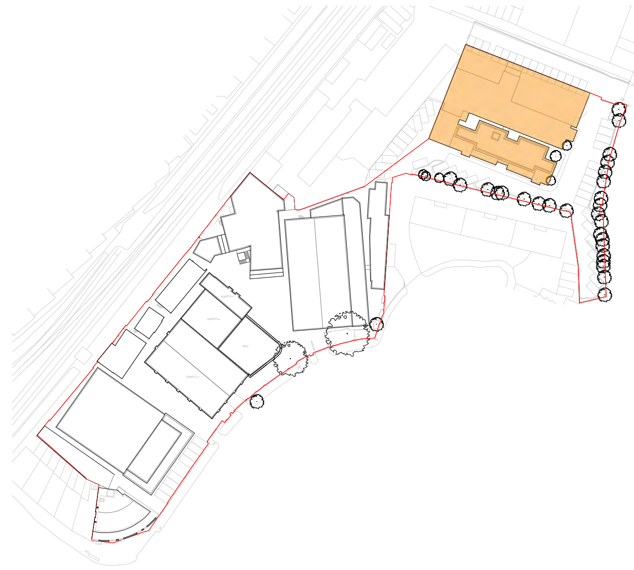
Scale@A3 | 1:200 **Date** | 06.01.21 **Drawn** | FK **Chk'd** | LC

Project Number 18.141

Drawing Number 240.02

Revision R0





KEY PLAN
N.T.S

1:200 @A3

0 1 2 4 6 8 10M

Proposed New Build/Alterations

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Project | Twickenham Studios St Margarets

Client | Twickenham Studios London Ltd.

Title | Block H - Proposed Roof Plan

Status | PRELIMINARY

Scale@A3 | 1:200 **Date** | 15.12.20 **Drawn** FK | **Chk'd** LC |

Project Number 18.141

Drawing Number 250.04

Revision R0

Project:	Twickenham Studios
Reference:	18.141

Accommodation Schedule	
Issued:	***05.01.2021***
Revision:	***A***

Issued For:	***Draft***

BLOCK B				**Demolition**	
		Existing GIA		GIA	
		sqm	*sqft*	*sqm*	*sqft*
Ground		707	7609		
	Storage	140	1507		
First		697	7502		
Second		266	2863		
Third	Rooftop Bar	148	1593		
	TOTAL AREA	1958	21074	0	0

BLOCK C				**Demolition**	
		Existing GIA		GIA	
		sqm	*sqft*	*sqm*	*sqft*
Ground	Stages and Ancillary	901	9697		
	White House	52	560	52	560
First		168	1808		
Second		83	893		
	TOTAL AREA	1204	12959	52	560

BLOCK D				**Demolition**	
		Existing GIA		GIA	
		sqm	*sqft*	*sqm*	*sqft*
Ground		316	3401		
First		270	2906		
	TOTAL AREA	586	6307		

BLOCK E				**Demolition**	
		Existing GIA		GIA	
		sqm	*sqft*	*sqm*	*sqft*
Ground		572	6156		
First		340	3659		
	TOTAL AREA	912	9816	0	0

BLOCK F				**Demolition**	
		Existing GIA		GIA	
		sqm	*sqft*	*sqm*	*sqft*
Ground		1072	11538		
First		256	2755		
	TOTAL AREA	1328	14293	0	0

BLOCK G				**Demolition**	
		Existing GIA		GIA	
		sqm	*sqft*	*sqm*	*sqft*
Ground		196	2110		
First		176	1894		
	TOTAL AREA	372	4004	0	0

BLOCK H				**Demolition**	
		Existing GIA		GIA	
		sqm	*sqft*	*sqm*	*sqft*
Ground		481	5177		
	Undercroft Car Park	725	7803		
First		1210	13023		
Second		584	6286		
Third		460	4951		
	TOTAL AREA	3460	37240	0	0

	Existing GIA		Demolished GIA		GIA REMAINING	
	sqm	*sqft*	*sqm*	*sqft*	*sqm*	*sqft*
TOTAL AREA	9820	105693	52	560	9768	105133

Please note, the existing GIA areas give a total area, and are calculated to the inside face of the existing external walls for each floor plate, and includes all internal walls, structures, circualtion spaces etc.

Please note, the proposed GIA areas are calculated to the inside face of the external walls for each labelled space, whether grouped or individual NIA spaces, and includes all internal walls, structures, circualtion spaces etc.

ANCILLARY FACILITIES
This includes dressing rooms, wardrobe/cosume rooms, make-up and hair, art department, meeting rooms and productions offices.

05.01.2021 - Draft Schedule of Accommodation

BLOCK A								
			GIA Remaining		New Build GIA		TOTALS	
	Proposed Use	**Existing Use**	*sqm*	*sqft*	*sqm*	*sqft*	*sqm*	*sqft*
Ground	Café/Reception	N/A			240	2583	240	2583
First	Offices	N/A			242	2605	242	2605
Second	Offices	N/A			242	2605	242	2605
Third	Offices	N/A			180	1937	180	1937
	TOTAL AREA		0	0	904	9730	**904**	**9730**

BLOCK B								
			GIA Remaining		New Build GIA		TOTALS	
	Proposed Use	**Existing Use**	*sqm*	*sqft*	*sqm*	*sqft*	*sqm*	*sqft*
Ground	Foyer	Reception	156	1679	10	108	166	1787
	Cinema	Prop Store	93	1001			93	1001
	Foley Studio	Prop Store	93	1001			93	1001
	Foley Offices	Offices	51	549			51	549
	Existing Offices/Storage	-	280	3014			280	3014
	Cycle Storage	Storage	140	1507			140	1507
First	Foley Offices	Offices	52	560			52	560
	Existing Offices	-	644	6931			644	6931
Second	Exising offices	-	266	2863			266	2863
Third	Existing Rooftop Bar	-	148	1593			148	1593
	TOTAL AREA		1923	20697	10	108	**1933**	**20805**

BLOCK C								
			GIA Remaining		New Build GIA		TOTALS	
	Proposed Use	**Existing Use**	*sqm*	*sqft*	*sqm*	*sqft*	*sqm*	*sqft*
Ground	Stage 2	-	183	1970			183	1970
	Stage 3 - TV Studio	Film Stage	520	5597			520	5597
	Ancillary/Dressing Rooms	-	82	883	6	65	88	947
	Meeting/Dining Space	Meeting Space	78	840			78	840
	New Prop Store	N/A			99	1066	99	1066
First	Office/Green Room	Offices	85	915			85	915
	Ancillary/Dressing Rooms	-	66	710	6	65	72	775
	New Prop Store (Double Height)	N/A					0	0
Second	Office/Green Room	Apartments	83	893			83	893
	TOTAL AREA		1097	11807	111	1195	**1208**	**13002**

BLOCK D								
			GIA Remaining		New Build GIA		TOTALS	
	Proposed Use	**Existing Use**	*sqm*	*sqft*	*sqm*	*sqft*	*sqm*	*sqft*
Ground	Art Department (Building 1)	-	114	1227			114	1227
	Ancillary/Production Offices (Building 2)	-	63	678			63	678
	Ancillary/Production Offices (Building 3)	-	138	1485			138	1485
First	Art Department (Building 1)	-	114	1227			114	1227
	Ancillary/Production Offices (Building 2)	-	44	474			44	474
	Ancillary/Production Offices (Building 3)	-	111	1195			111	1195
	TOTAL AREA		584	6286	0	0	**584**	**6286**

BLOCK E								
			GIA Remaining		New Build GIA		TOTALS	
	Proposed Use	**Existing Use**	*sqm*	*sqft*	*sqm*	*sqft*	*sqm*	*sqft*
Ground	Canteen (60sqm) and Store (15sqm)	-	103	1109			103	1109
	Kitchen (28sqm)	-						
	Grading Theatre 02 (incl. Store)	-	154	1658			154	1658
	Grading Theatre Lobby	-	39	420			39	420
	Refurbished Picture Post/Production Offices (184sqm)	-	184	1980			184	1980
	Circulation	-	41	441			41	441
First	Canteen and store	Store Room	91	979			91	979
	Grading Theatre Mezzannine	-	45	484			45	484
	Refurbished Picture Post/Production Offices (168sqm)	-	168	1808			168	1808
Second	New lightweight roof extension for additional Picture post offices	N/A			477	5134	477	5134
	TOTAL AREA		825	8879	477	5134	**1302**	**14013**

BLOCK F - To Remain								
			GIA Remaining		New Build GIA		TOTALS	
	Proposed Use	**Existing Use**	*sqm*	*sqft*	*sqm*	*sqft*	*sqm*	*sqft*
Ground	Preview Theatre and projection room (71)	-	1005	10817			1005	10817
	Stage 1 (708sqm)	-						
	Ancillary (226sqm)	-						
First	Ancillary/Post Production Offices	-	256	2755			256	2755
	TOTAL AREA		1261	13572	0	0	**1261**	**13572**

BLOCK G - To Remain								
			GIA Remaining		New Build GIA		TOTALS	
	Proposed Use	**Existing Use**	*sqm*	*sqft*	*sqm*	*sqft*	*sqm*	*sqft*
Ground	Post Production Offices	-	196	2110			196	2110
First	Post Production Offices	-	176	1894			176	1894
	TOTAL AREA		372	4004	0	0	**372**	**4004**

BLOCK H - Sound Studios to Remain, with lightweight roof extension								
			GIA Remaining		New Build GIA		TOTALS	
	Proposed Use	**Existing Use**	*sqm*	*sqft*	*sqm*	*sqft*	*sqm*	*sqft*
Ground	Sound Studios	-	481	5177			481	5177
	Undercroft Car Park	-	725	7803			725	7803
First	Sound Studios	-	1210	13023			1210	13023
Second	Sound Studios	-	584	6286	7	75	591	6361
	Lightweight roof extension for new sound studio offices	N/A			231	2486	231	2486
Third	Sound Studios	-	460	4951			460	4951
	TOTAL AREA		3460	37240	238	2562	**3698**	**39802**

	GIA REMAINING		New Build GIA		TOTAL AREA	
	sqm	*sqft*	*sqm*	*sqft*	*sqm*	*sqft*
TOTAL AREA PROPOSED SITE	9522	102485	1740	18728	**11262**	**121213**

	Existing GIA		Demolished GIA		GIA REMAINING	
	sqm	*sqft*	*sqm*	*sqft*	*sqm*	*sqft*
TOTAL AREA EXISTING SITE	9820	105693	52	560	9768	105133