



807 High Road, Tottenham

Flood Risk Assessment & Drainage Strategy

February 2024

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Client Name: High Road West (Tottenham) Limited
Document Reference: WIE20265-100-R-1-3-1-FRA
Project Number: WIE20265

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

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Executive Summary

Waterman Infrastructure & Environment Limited has been commissioned by F3 Architects LLP on behalf of High Road West (Tottenham) Limited, to undertake a Flood Risk Assessment (including Drainage Strategy) for the proposed development at 807 High Road, Tottenham.

- 1.1. No. 807 High Road is a medium scale commercial and residential development in the heart of Tottenham, just to the north west of the stadium. Planning consent was granted in September 2021 (HGY/2021/0441) to take down the existing High Road building, replacing it with an enhanced 4 storey brick building including a shop front and mansard. Behind this, a first floor podium level garden links the street facing block to a well-proportioned residential development consisting of 9no. Apartments.
- 1.2. The new proposal '*Full planning application for the demolition of existing buildings and the erection of a replacement building of up four storeys to include purpose-built student accommodation (Sui Generis) and flexible commercial, business and service uses (Class E), hard and soft landscaping, and associated works*' (Appendix B) seeks to supersede the approved 9no. residential units (refer to page 5 for planning details) with 25 student accommodation units, with a courtyard on the first floor, similar to the approved scheme.

The site is predominantly located within Flood Zone 1, denoting a low probability of flooding from tidal and fluvial sources. Flood Zone 2 borders the site to the east, which denotes a medium probability of river flooding (1 in 1000 year flood extent). This is flooding associated with the culverted Moselle watercourse which is classified as a main river by the Environment Agency and is approximately 50m to the south of the site running beneath High Road.

Based on Environment Agency flood levels within the culvert (50m to the south), it appears that flooding could reach the site and in theory flood the ground level to a depth of 0.41m and 1.0m in the 1 in 100 year plus 20% climate change and 1 in 1000 year scenarios respectively. The extent of flooding in the EA's mapping however does not show the 1 in 100 year plus 20% climate change reaching the Site and it is believed that there are some inconsistencies in the hydraulic modelling.

However, if the modelled flood levels are considered to be representative, the proposals at the ground floor are 'less vulnerable' commercial uses and in line with policy, it is acceptable for these areas to be subjected to flooding. All 'more vulnerable' student accommodation uses are located at the first floor, which is over 3m above the potential modelled flood levels. To be conservative, it is proposed that flood resilient measures (such as the raising of electrical sockets and providing flood resilient construction materials) would be provided at the ground floor.

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

The surface water greenfield runoff rate (Qbar) from the site has been calculated to be 0.2 l/s. In London Borough of Haringey's pre-application responses, they have indicated that for brownfield sites, runoff rates should not be more than three times greenfield rates which in this case would be 0.6 l/s. This rate is considered to be extremely low and given the arrangement of blue roofs and attenuation tank, it is unlikely that flow restrictors will be able to individually restrict runoff rates from the attenuation features to such low rates. On this basis, it is proposed that runoff rates will be restricted to 1.8 l/s (which is three times the 1 in 100 year greenfield rate of 0.6 l/s). This provides a

betterment of approximately 77% when compared to the existing discharge rate (7.8 l/s) and is considered to be as close to the greenfield runoff rate as is practicable whilst incorporating the proposed Sustainable Drainage Systems and ensuring gravity discharge.

In order to provide this restriction, a total attenuation volume of 43.2m³ is proposed in the form of blue roofs and a below ground geocellular tank. This has been calculated for the 1 in 100 year plus 40% climate change scenario.

Appropriate treatment would be incorporated into the drainage system to ensure that the quality of water discharged is acceptable. This would in part be achieved through the incorporation of green roofs, if required, hard engineered systems such as a biomat filtration system, downstream defender or other similar products could also be incorporated to ensure discharge is appropriately treated. This report sets out the principles of the Sustainable Drainage Systems scheme, and the final strategy would be confirmed at the detailed design stage.

The on-site drainage network and Sustainable Drainage Systems would be privately managed and maintained for the lifetime of the development, ensuring that they remain fit for purpose and function appropriately. The management company/operator would be appointed post-planning.

There will be a foul water flow increase compared to the existing building. As such a pre-development enquiry application should be submitted to Thames Water to confirm the status of the sewer capacity.

This report demonstrates that the proposed Development has a low probability of flooding from tidal, pluvial, groundwater and artificial sources and confirms that fluvial flood risk is managed appropriately in line with local and national policy. It also confirms that surface water runoff from the site can be managed sustainably to ensure that flood risk is not increased elsewhere. It is considered that the information provided within this report satisfies the requirements of the National Planning Policy Framework, London Plan and local policy.

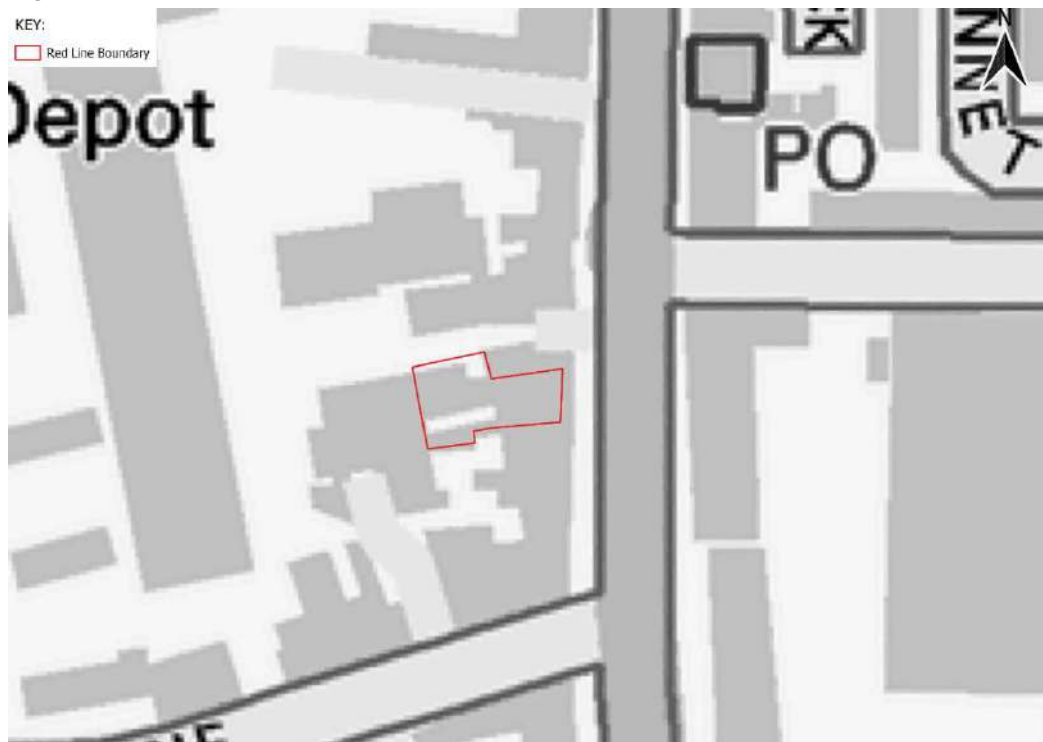
2. Introduction

- 2.1. Waterman Infrastructure & Environment Limited has been commissioned by F3 Architects LLP, on behalf of High Road West (Tottenham) Limited, to undertake a Flood Risk Assessment (FRA), including a Drainage Strategy, for the proposed development at 807 High Road, Tottenham (hereafter referred to as the 'Site').
- 2.2. An FRA is required under the National Planning Policy Frameworkⁱ (NPPF) for all developments over 1ha or where there is a risk of flooding. In this instance the Site is within the Environment Agency's (EA) Flood Zone 1 (Flood Zone 2 borders the Site to the east) but is also within the London Borough of Haringey's (LBH) Critical Drainage Area (CDA) 061 which groups together Local Flood Risk Zones (LFRZ). Sites falling within a CDA are required to provide further investigation into flood risk for planning, therefore a site-specific FRA is required.

Site Description

- 2.3. The Site is approximately 0.06 ha in size, and currently comprises a three storey building with occasional ground floor use by Tottenham Hotspur Football Club for meeting purposes and residential uses on the floors above. In addition, there are one and two storey outbuildings which front on to Percival Court.
- 2.4. The Site is bound to the north by a retail unit, to the east by A1010 High Road, to the south by a public house and to the west by a large storage/warehouse unit. The Site is centred on National Grid Reference 533849, 191456 and has approximate postcode N17 8ER, as shown in Figure 1.
- 2.5. The building survey (Appendix A) indicates that the existing ground floor Finished Floor Levels (FFL) vary from approximately 12.00m AOD in the east to 12.43mAOD in the south west. The survey also indicates that the levels at the footpath adjacent to the Site on High Road fall to the south from approximately 11.74m AOD to 11.71m AOD and that levels along Percival Court to the north of the Site fall to the east from approximately 12.62m AOD to 12.54m AOD.

Figure 1: Site Location



Development Proposals

- 2.6. No. 807 High Road is a medium scale commercial and residential development in the heart of Tottenham, just to the north west of the stadium. Planning consent was granted to take down the existing High Road building, replacing it with an enhanced 4 storey brick building including a shop front and mansard. Behind this, a first floor podium level garden links the street facing block to a well-proportioned residential development consisting of 9no. Apartments.
- 2.7. The new proposal '*Full planning application for the demolition of existing buildings and the erection of a replacement building of up four storeys to include purpose-built student accommodation (Sui Generis) and flexible commercial, business and service uses (Class E), hard and soft landscaping, and associated works*' (Appendix B) seeks to supersede the approved 9no. residential units (refer to page 5 for planning details) with 25 student accommodation units, with a courtyard on the first floor, similar to the approved scheme.

Scope of Report

- 2.8. 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 of foul and surface water runoff is also assessed, and a strategy to effectively manage runoff whilst working within the Site-specific constraints is proposed.

3. Planning Policy and Guidance

National Planning Policy Framework

- 3.1. The National Planning Policy Framework (NPPF, published in March 2012 and last updated in December 2023)¹, 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.
- 3.2. 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 Flood Risk Assessment. Development should only be allowed in areas at risk of flooding where it can be demonstrated that:
- 3.3. 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;
- 3.4. The development is appropriately flood resistant and resilient;
- 3.5. It incorporates Sustainable Drainage Systems (SuDS), unless there is clear evidence that this would be inappropriate;
- 3.6. Any residual risk can be safely managed; and
- 3.7. Safe access and escape routes are included where appropriate, as part of an agreed emergency plan.
- 3.8. Applications for some minor development and changes of use should not be subject to the Sequential or Exception Tests but should still meet the requirements for site-specific flood risk assessments.
- 3.9. 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;
 - 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.

Sequential and Exception Test

- 3.10. The aim of the Sequential Test is to steer new development to areas with the lowest risk of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding.
- 3.11. If it is not possible for development to be located in zones with a lower risk of flooding (taking into account wider sustainable development objectives), it may be necessary to demonstrate through the Exception Test that:
 - The development would provide wider sustainability benefits to the community that outweigh the flood risk; and

¹ [National Planning Policy Framework \(December 2023\)](#)

- The development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.
- 3.12. As the Site is predominantly within Flood Zone 1, the Sequential Test and the Exception Test are not considered to be required. Furthermore, the Site is noted within Tottenham's Area Action Plan as being within Site NT5: High Road West which is land allocated for comprehensive development including residential and leisure uses.
- 3.13. As the Site is located in Flood Zone 1 (bordering Flood Zone 2) the Exception Test is not required. In line with the NPPF, 'more vulnerable' development uses are acceptable in both Flood Zones 1 and 2.

Planning Practice Guidance

- 3.14. The Planning Practice Guidance (PPG, published in November 2016 and last updated in November 2023)² 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. An update to the PPG that affects site specific FRAs is in force from 25th August 2022. This includes the updates as follows:
- Flood Zone 3b is now defined as 1 in 30 (3% Annual Exceedance Probability (AEP)) rather than 1 in 20 (5% AEP) – this could restrict land available for development on policy grounds.
 - Lifetime of commercial development is now assumed at 75 years – this is likely to require an increase in climate change allowance.
 - The "design flood" now includes the 1 in 100 (1% AEP) pluvial/surface water flood event, which must also be accounted for when assessing access and egress routes.
 - Evacuation procedures need to consider the 1 in 1,000 (0.1% AEP) extreme flood.
 - Inclusion of a new "non-major" category of development that sits between minor/permitted and major.
- 3.15. The PPG also includes 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:
- Flood Zone 1: low probability – land having a less than 0.1% annual probability of river or sea flooding;
 - Flood Zone 2: medium probability – land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding;
 - Flood Zone 3a: high probability – land having a 1% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea; and
 - Flood Zone 3b: the functional floodplain – this zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise:
 - land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or
 - land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).

² [Planning practice guidance](#)

Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency.

- 3.16. Flood risk vulnerability is split into five classifications in Annex 3 of the NPPF as follows:
- Essential Infrastructure, e.g. essential transport and utility infrastructure, wind turbines;
 - Highly Vulnerable, e.g. emergency services (those required to be operational during flooding), basement dwellings;
 - More Vulnerable, e.g. residential dwellings, hospitals, schools, hotels, drinking establishments;
 - Less Vulnerable, e.g. car park, retail, offices, storage and distribution, leisure, restaurants; and
 - Water-Compatible Development, e.g. Flood control structures, docks, marinas, wharves

Non-statutory Technical Standards for Sustainable Drainage Systems

- 3.17. The Non-Statutory Technical Standards for Sustainable Drainage Systems³ was published in March 2015 and is the current guidance for the design, maintenance and operation of SuDS.
- 3.18. 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.
- 3.19. 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.
- 3.20. 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

- 3.21. The London Plan, published in March 2021⁴, sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years..
- 3.22. Policy SI.12 Flood Risk Management states that:
- 3.23. A) Current and expected flood risk from all sources across London should be managed in a sustainable and cost-effective way in collaboration with the Environment Agency, the Lead Local Flood Authorities, developers and infrastructure providers.
- 3.24. B) Development Plans should use the Mayor's Regional Flood Risk Appraisal and their Strategic Flood Risk Assessment as well as Local Flood Risk Management Strategies, where necessary, to identify areas where particular and cumulative flood risk issues exist and develop actions and policy approaches aimed at reducing these risks. Boroughs should cooperate and jointly address cross-boundary flood risk issues including with authorities outside London.
- 3.25. C) Development proposals should ensure that flood risk is minimised and mitigated, and that residual risk is addressed. This should include, where possible, making space for water and aiming for development to be set back from the banks of watercourses.
- 3.26. D) Developments Plans and development proposals should contribute to the delivery of the

³ [Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems \(March 2015\)](#)

⁴ [The London Plan 2021](#)

measures set out in Thames Estuary 2100 Plan. The Mayor will work with the Environment Agency and relevant local planning authorities, including authorities outside London, to safeguard an appropriate location for a new Thames Barrier.

- 3.27. E) Development proposals for utility services should be designed to remain operational under flood conditions and buildings should be designed for quick recovery following a flood.
- 3.28. F) Development proposals adjacent to flood defences will be required to protect the integrity of flood defences and allow access for future maintenance and upgrading. Unless exceptional circumstances are demonstrated for not doing so, development proposals should be set back from flood defences to allow for any foreseeable future maintenance and upgrades in a sustainable and cost-effective way.
- 3.29. G) Natural flood management methods should be employed in development proposals due to their multiple benefits including increasing flood storage and creating recreational areas and habitat.
- 3.30. Policy SI.13 Sustainable Drainage states that:
- 3.31. A) Lead Local Flood Authorities should identify – through their Local Flood Risk Management Strategies and Surface Water Management Plans – areas where there are particular surface water management issues and aim to reduce these risks. Increases in surface water run-off outside these areas also need to be identified and addressed.
- 3.32. B) Development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible. There should also be a preference for green over grey features, in line with the following drainage hierarchy:
- 1) rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
 - 2) rainwater infiltration to ground at or close to source
 - 3) rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
 - 4) rainwater discharge direct to a watercourse (unless not appropriate)
 - 5) controlled rainwater discharge to a surface water sewer or drain
 - 6) controlled rainwater discharge to a combined sewer.
- 3.33. C) 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.
- 3.34. D) Drainage should be designed and implemented in ways that promote multiple benefits including increased water use efficiency, improved water quality, and enhanced biodiversity, urban greening, amenity and recreation.

Haringey's Local Plan – Strategic Policies

- 3.35. Haringey's Local Plan⁵ was published in March 2013 (and updated in July 2017) and sets out the vision and key policies for the future development of the borough up to the year 2026.
- 3.36. Policy SP5 (Water Management and Flooding) sets out that all development within the borough will need to be water efficient during construction and operation and reduce all forms of flooding. The requirements relevant to this Site are summarised below;
- Improve the water environment, water quality and drainage systems;

⁵ [Haringey's Local Plan - Strategic Policies 2013 - 1026](#)

- Minimise water use and illustrate how development would contribute to general and flash flooding;
- Take account of flood risk vulnerability classification as set out in paragraph 100 of the NPPF, and will apply the NPPF Sequential Test and Exception Test;
- Implement measures to prevent (or mitigate as last resort) local surface water and downstream flooding;
- Implement SuDS from strategic to individual site level to improve water attenuation, quality and amenity; and
- Require higher resilience and levels of flood protection for critical infrastructure to ensure the protection of essential services such as water and power.

Haringey Development Management DPD

3.37. Haringey's Development Management DPD⁶ was adopted in July 2017 and gives effect to Haringey's spatial strategy and the key objectives of the Strategic Local Plan by supporting proposals that contribute to the delivery of sustainable development. The Development Management DPD sets out criteria against which planning applications are assessed. The following policies relating to flood risk and drainage are considered relevant to the proposed development.

Policy DM24 – Managing and Reducing Flood Risk

- All proposals for new development must avoid and reduce the risk of flooding to future occupants and not result in an increased risk of flooding;
- Sufficient evidence for the council to assess whether the requirements of the Sequential Test and Exception test (where required) have been satisfied; and
- All proposals for new development must manage and reduce surface water runoff and manage water and wastewater discharges.

Policy DM25 – Sustainable Drainage Systems

- All new development must seek to manage surface water as close to its sources as soon as possible in line with the London Plan drainage hierarchy;
- The councils will require SuDS to be sensitively incorporated into new development;
- Major development proposals will be required to reduce surface water flows to greenfield runoff rate for a 1 in 100 year critical storm, where this cannot be achieved justification must be provided to demonstrate that the runoff rate has been reduced as much as possible; and
- All development should include at least one 'at source' SuDS measure resulting in a net improvement in water quantity or quality.

Policy DM29 – On Site Management of Waste Water and Water Supply

- All new development must demonstrate that the local public sewer network has adequate capacity to serve the existing and proposed development. Where such capacity does not exist suitable alternatives for the discharge of surface or foul water must be made.

Haringey Council Level 2 Strategic Flood Risk Assessment

3.38. The Haringey Council Level 2 Strategic Flood Risk Assessment (SFRA)⁷ was published in February

⁶ [Haringey Development Management Plan \(DPD\) \(Adopted July 2017\)](#)

⁷ [Haringey Council Strategic Flood Risk Assessment \(February 2015\)](#)

2015 and updates and enhances the previously commissioned North London Level 1 SFRA and replaces the SFRA issued by the London Borough of Haringey in March 2013. The SFRA looks exclusively at flood risk within LBH. The primary objective of the SFRA is to be part of the evidence base support the Local Plan in order to inform the allocation of development within the borough.

- 3.39. Information from the SFRA regarding pluvial and groundwater flooding is included within Chapter 3 of this report.

London Borough of Haringey Surface Water Management Plan

- 3.40. The Haringey Council Surface Water Management Plan (SWMP)⁸ outlines the preferred surface water management strategy for LBH in the context of flooding from surface water flooding from sewers, drains, groundwater, and runoff from land, small watercourses and ditches which occurs due to heavy rainfall. The SWMP establishes a long-term action plan to manage surface water will have an influence over future capital investment, maintenance, public engagement and understanding, emergency planning and future developments.

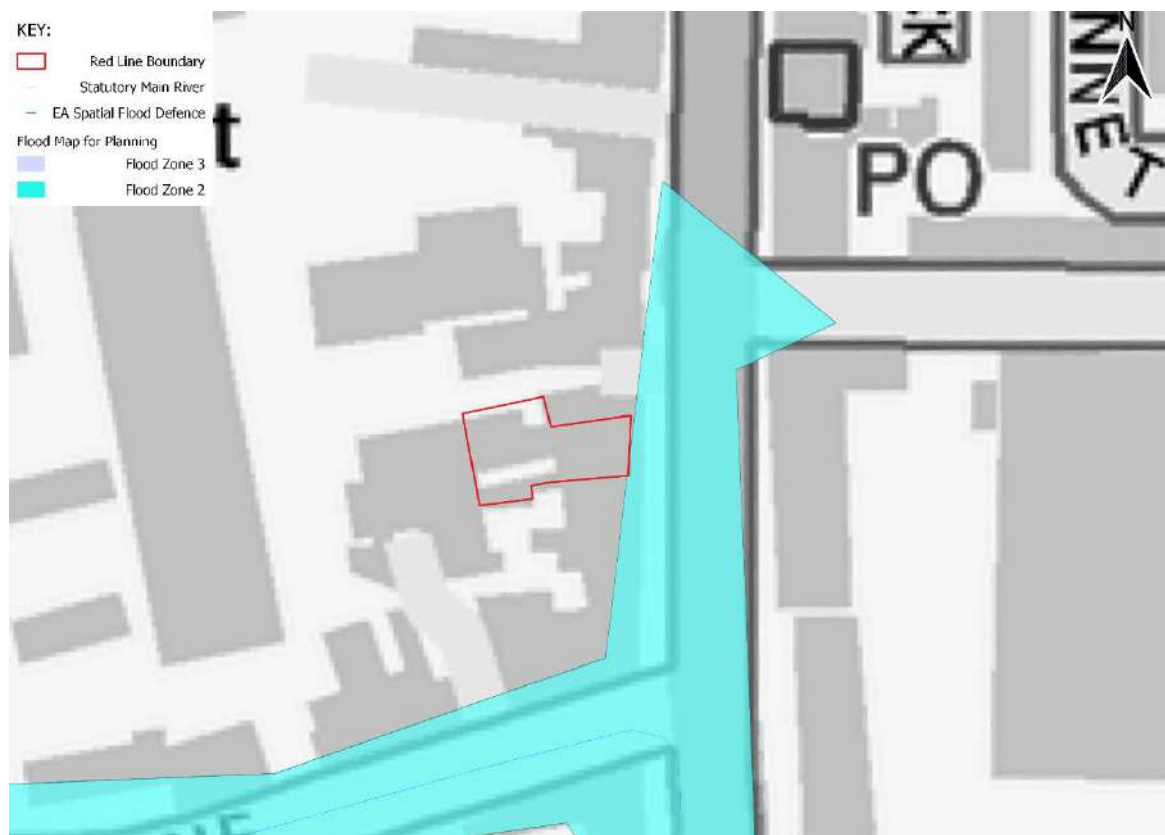
⁸ [London Borough of Haringey - Surface Water Management Plan](#)

4. Sources of Potential Flooding

Tidal and Fluvial

- 4.1. According to the EA's Flood Map for Planning (Figure 2), the Site is predominantly located within Flood Zone 1, denoting a low probability of flooding from tidal and fluvial sources. Flood Zone 2 borders the Site to the east, which denotes a medium probability of river flooding. This is flooding associated with the culverted Moselle watercourse which is classified as a main river by the EA and is approximately 50m to the south of the Site running beneath High Road.

Figure 2: Environment Agency Flood Map for Planning



- 4.2. Product 4 data provided by the EA (Appendix C) provides modelled flood levels for a number of scenarios at a number of modelled nodes along the Moselle Brook, Node MOC042a however is closest to the Site and has been used to assess the Site. The flood levels at this node are summarised in Table 1 below:

Table 1: EA Modelled Flood Levels

Model Node	1 in 100 year	1 in 100 year + 20% Climate Change	1 in 1000 year
MOC042a	11.34	12.12	12.71

- 4.3. Based on the Building Survey (Appendix A) and the development proposals (Appendix B), the following existing ground levels and proposed FFLs can be confirmed:
- The site levels adjacent to the Site along High Road are approximately 11.71m AOD
 - The lowest proposed FFL of the building is 11.71m AOD.
- 4.4. By comparing these levels with the flood levels, it appears that flooding could reach the Site and in theory flood the building in the 1 in 100 year plus 20% climate change and 1 in 1000 year scenarios. The extent of flooding in the EA's mapping however does not show the 1 in 100 year plus 20% climate change reaching the Site and it is believed that there are some inconsistencies in the hydraulic modelling.
- 4.5. The culverted watercourse is shown to run beneath White Hart Lane (to the south of the Site) before heading south at the junction with High Road (approximately 50m to the south of the Site). Based on Light detection and radar (LiDAR) data, levels fall south along High Road away from the Site and it is anticipated therefore that should surcharging occur, any subsequent flooding would be routed away from the Site.
- 4.6. Whilst the 20% climate change scenario was modelled by the EA, it is recognised that climate change allowances have since been updated based on a catchment specific scenario. The updated climate change allowance for this area is 35%.
- 4.7. Assessing more extreme climate change scenarios (i.e. 35%) was considered, however given that the Site predominantly lies in Flood Zone 1 (where no climate change assessments are normally required), assessing the Site against the 1 in 100 year plus 20% climate change scenario and the 1 in 1000 year scenario is considered to be appropriate to the scale and nature of the development. Furthermore, it is generally anticipated that the climate change scenario falls somewhere between the 1 in 100 and 1 in 1000 year flood extents (i.e. between Flood Zones 2 and 3). By assessing the 1 in 1000 year event (Flood Zone 2) this is therefore considered a conservative and robust approach with regards to flood risk.
- 4.8. As noted above, flood flow routes from the culverted Moselle Brook are expected to be to the south away from the Site. However, taking a highly conservative approach, if the modelled flood levels are considered to be representative, the ground floor would be subject to flood depths of 0.41m in the 1 in 100 year plus 20% climate change scenario and 1.0m in the 1 in 1000 year scenario. The proposals at the ground floor are 'less vulnerable' commercial uses and in line with policy, it is acceptable for these areas to be subjected to flooding. All 'more vulnerable' residential uses are located at the first floor, approximately 3.6m above the 1 in 100 year plus 20% climate change flood levels.
- 4.9. To be conservative, it is proposed that flood resilient measures (such as the raising of electrical sockets and providing flood resilient construction materials) would be provided at the ground floor.

Pluvial

- 4.10. Pluvial flooding (also known as surface water and sewer flooding) occurs when natural and engineered systems have insufficient capacity to deal with the volume of rainfall in a catchment. Pluvial flooding can sometimes occur in urban areas during extreme, high intensity, low duration summer rainfall events which overwhelm the local surface water drainage systems, or in rural areas

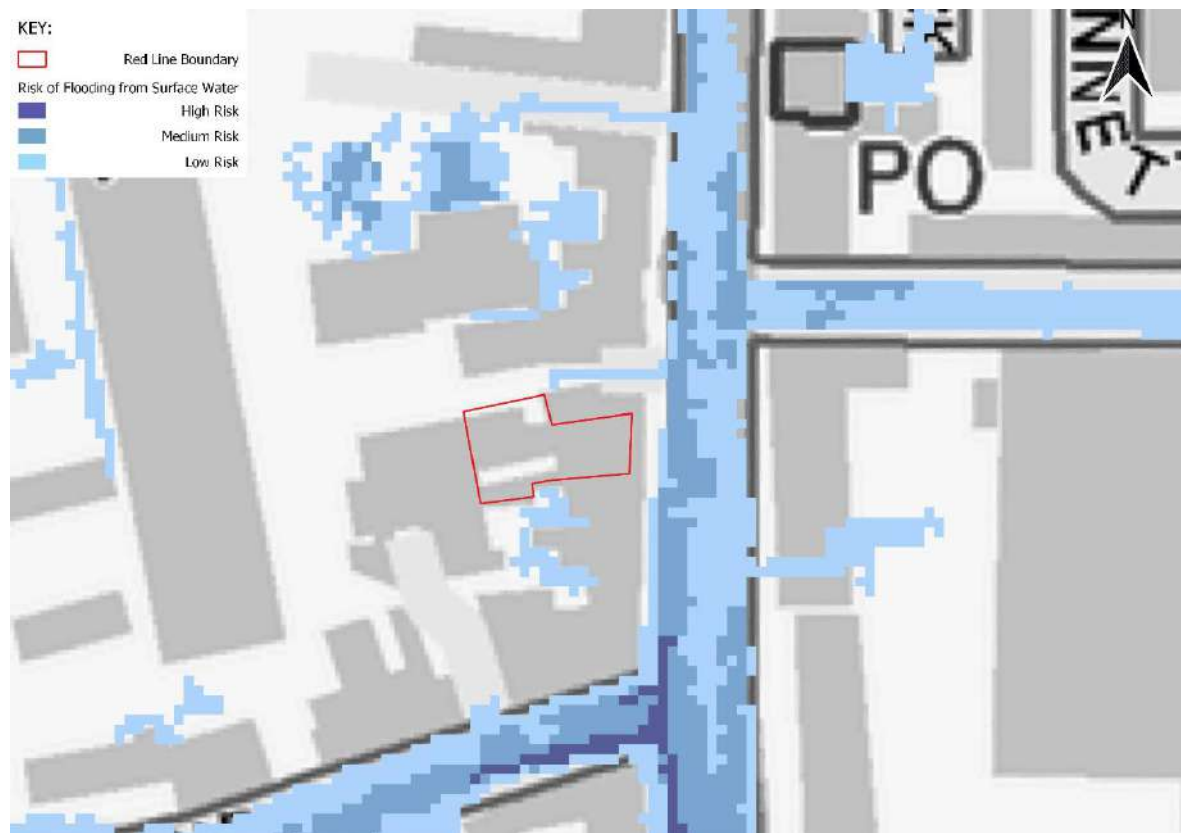
during medium intensity, long duration events where saturated ground conditions prevent infiltration into the subsoil. This flood water would then be conveyed via overland flow routes dictated by the local topography.

- 4.11. The Site falls within LBH's Critical Drainage Area CDA 061 (Appendix D), Tottenham High Road Area and Surrounding Halefield Road, Tottenham. This CDA was designated due to ponding of surface water on High Road and Halefield Road as a result of overland flows from the west.

Overland Surface Water

- 4.12. Review of the EA's Risk of Flooding from Surface Water map (Figure 3) indicates that the Site is predominantly at a 'very low' risk of surface water flooding (i.e. less than 1 in 1000 year annual probability).
- 4.13. It is worth noting however that High Road, to the east of the Site is shown to be at 'low' to 'medium' risk of surface water flooding. Further investigation on the EA mapping indicates that High Road could experience flooding below 300mm in the 'medium' risk scenario.

Figure 3: Risk of Flooding from Surface Water EA Map



- 4.14. The risk of flooding to the proposed site as a result of overland surface water flooding is considered to be low.

Sewer Flooding

- 4.15. Consultation with Thames Water (Appendix D) has confirmed that they do not hold records of sewer flooding at the Site.
- 4.16. Figure 9 of the SWMP (Appendix E) shows the number of recorded sewer flooding incidents across the borough by post code. This map shows that the post code area of the Site falls within 'N17 8' and has no recorded sewer flood records.
- 4.17. The risk of flooding to the Site from sewers is therefore considered to be low.

Groundwater

- 4.18. The Preliminary Risk Assessment⁹ (PRA) provides a summary of the underlying geology beneath the Site, which is summarised in Table 2 below.

Table 2: Preliminary Risk Assessment Site Geology

Stratum	Estimated Thickness	Typical Description
Hardstanding	0.5m	Concrete

⁹ Waterman Infrastructure & Environment Ltd, March 2020. *Preliminary Risk Assessment, 807 High Road, Tottenham, London*

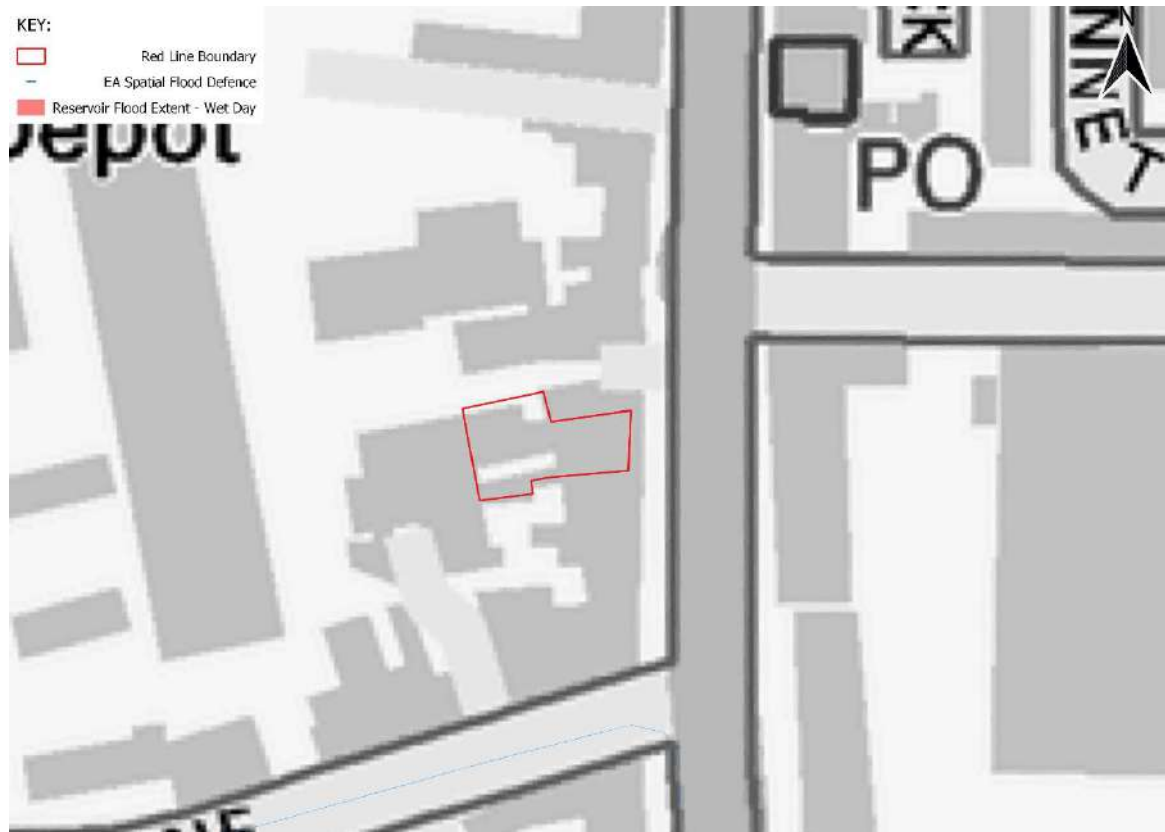
Stratum	Estimated Thickness	Typical Description
Made Ground	0.5m – 1.5m	Brown sandy clay with gravel, brick fragments and ash
Kempton Park Gravel Member	2.5m – 5m	Brown medium dense, sub-rounded fine to coarse gravel with coarse to medium sand with pockets of cobbles
London Clay Formation	At least 20m	Stiff brown clay with occasional pockets and partings of silts, fine sand and medium selenite gravels

- 4.19. Based on Figure 10 of the SWMP (Appendix E), the Site is located in an area with increased potential for elevated groundwater in the permeable superficial deposits (i.e. the Kempton Park Gravel Member).
- 4.20. Given that there are no proposals for a basement as part of the scheme, the risk of groundwater flooding to the Site and surrounding area is considered to be low.

Artificial Sources

- 4.21. The EA's Flood Risk from Reservoirs mapping indicates 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 unlikely to be this large.
- 4.22. EA mapping (Figure 4 below) shows that the majority of the Site would not be subject to flooding due to failure of any reservoir. There is a small area however to the south east of the Site which is shown to be affected by flooding, as indicated by the EA. However, this is considered to be the worst case scenario and the probability of this occurring is extremely small. For information, the flooding originates from the William Girling and King George V reservoirs which are located approximately 2.7km and 5km respectively from the Site.

Figure 4: Environment Agency Flood Risk from Reservoirs



- 4.23. There are no other artificial bodies of water in the vicinity of the Site, and the risk of flooding due to artificial sources is therefore considered to be low.

Summary

- 4.24. The Site is considered to be at a low risk of flooding from tidal, pluvial, groundwater and artificial sources.
- 4.25. The flood modelling mapping shows that the Site would not be affected in the 1 in 100 year plus 20% event, and would only border the 1 in 1000 year extent (Flood Zone 2). An assessment of the modelled flood levels and the proposed FFLs indicates that the ground floor level could be flooded in the 1 in 100 year plus 20% climate change and 1 in 1000 year scenarios. However, given the 'less vulnerable' uses at the ground floor, this is considered acceptable.
- 4.26. The potential for the development to increase flood risk through increasing surface water runoff is discussed in Chapters 4 and 5.

5. Drainage Strategy

Existing Site Drainage

- 5.1. Thames Water sewer records (Appendix D) indicate a number of public sewers at and in the vicinity of the Site. Table 1 provides a summary of the key sewers in the vicinity.

Table 3: Existing Thames Water Sewers

Location	Sewer
High Road	- A 610mm surface water sewer running from north to south beneath High Road - A 305mm foul water sewer running from north to south beneath High Road.

- 5.2. The total Site area within the red line boundary is 0.06ha and the existing Site is considered to be 100% impermeable. Using the Wallingford Procedure (Appendix F) the existing discharge rate has been calculated for the 100 year 60 minute event at 7.8 litres per second (l/s).
- 5.3. It is assumed that both surface water and foul discharges from the Site currently discharge to the Thames Water surface water and foul water sewers respectively.

Proposed Surface Water Discharge

- 5.4. 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 Buildings¹⁰, BS EN 12056 – Gravity Drainage Systems Inside Buildings¹¹, and Approved Document H of Building Regulations¹².
- 5.5. The proposed management of surface water on the Site has been assessed in line with London Plan Drainage Hierarchy and is summarised in Table 4 below, in descending order of preference.

Table 4: London Plan Drainage Hierarchy

London Plan Drainage Method	Comments
1. Store rainwater for later use	There are no constraints to the use of Rainwater Harvesting and this will therefore be utilised in the form of rainwater butts on the podium level
2. Use infiltration techniques, such as porous surfaces in non-clay areas	The Site is underlain by impermeable London Clay. Furthermore, the majority of the Site is taken up by the building itself and it is unlikely that sufficient offsets could be provided in line with Building Regulations to allow infiltration techniques to be possible. On this basis the management of surface water via infiltration is not considered to be feasible

¹⁰ British Standards Institution, April 2008. *BS EN 752:2008 – Drain and Sewer Systems Outside Buildings*

¹¹ British Standards Institution, September 2000. *BS EN 12056-2:2000 – Gravity Drainage Systems Inside Buildings*

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

3. Attenuate rainwater in ponds or open water features for gradual release	The Site is small, urban and is predominantly taken up by the building. The lack of open space therefore precludes the potential inclusion of ponds or open water features
4. Attenuate rainwater by storing in tanks or sealed water features for gradual release	The proposals are to provide attenuation in the form of blue roofs and below ground attenuation within the car parking areas at ground level. Discharge from these features will be restricted to be as close to the greenfield rate as is practicable. Further detail on the strategy is provided under heading 'Proposed Surface Water Drainage Strategy'
5. Discharge rainwater direct to a watercourse	The closest watercourse is the culverted Moselle Brooke which is approximately 50m to the south. Discharge directly to the watercourse is therefore not considered feasible however based on the Thames Water Assets, it appears that the existing public surface water sewers do discharge to this watercourse
6. Discharge rainwater to a surface water sewer/drain	As noted previously, surface water sewers run beneath High Road to the east of the Site. It is therefore proposed that surface water runoff from the Site would discharge to this sewer, as anticipated in the existing situation
7. Discharge rainwater to the combined sewer	As noted above, the proposals are to discharge surface water to a surface water sewer

5.6. The proposed drainage strategy will therefore consist of a combination of rainwater harvesting, attenuation utilising SuDS features where possible, and discharge to a surface water sewer.

Sustainable Drainage Systems

- 5.7. 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.
- 5.8. 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.
- 5.9. 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 of various SuDS features have been assessed in Table 5. Justification is provided as to why certain features have been deemed unfeasible for this development.

Table 5: Sustainable Drainage Techniques

Device	Description	Constraints/Comments	✓/✗
Green/Brown/Blue Roofs	Provide soft landscaping at roof level which reduces surface water runoff	Green roofs and planters would be provided at the podium level. Furthermore, blue roofs will be provided beneath the podium level to provide attenuation	✓
Infiltration devices & Soakaways (source control)	Store runoff and allow water to percolate into the ground via natural infiltration	The underlying geology and size of the Site preclude to 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 only external areas within the Site are the car parking spaces to the north. These lie directly adjacent to Percival Court and there is a requirement to tie in with the existing surfacing. Pervious surfaces are therefore not considered feasible	✗
Rainwater harvesting (source control)	Reduces the annual average rate of runoff from the site by reusing water for non-potable uses e.g. toilet flushing or water butts	Rainwater harvesting would be utilised in the form of rainwater butts at the podium level	✓
Swales (permeable conveyance)	Broad shallow channels that convey / store runoff, and allow infiltration (ground conditions permitting)	Due to spatial constraints, swales are not considered to be appropriate	✗
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)	Due to spatial constraints, filter drains are not considered to be appropriate	✗
Filter Strips (permeable conveyance)	Wide gently sloping areas of grass or dense vegetation that remove	Due to spatial constraints, filter strips are not	✗

Device	Description	Constraints/Comments	✓/✗
	pollutants from runoff from adjacent areas	considered to be appropriate	
Infiltration basins (end of pipe treatment)	Depressions in the surface designed to store runoff and allow infiltration through the base	Due to spatial constraints and the underlying geology, infiltration basins are not considered to be appropriate	✗
Bio-retention 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.	Due to spatial constraints, bio-retention systems/rain gardens are not considered to be feasible	✗
Detention Basins (end of pipe treatment)	Depressions in the surface designed to store runoff without infiltration through the base	Due to spatial constraints, detention basins are not considered to be appropriate	✗
Attenuation Underground (end of pipe treatment)	Oversized pipes or geo-cellular tanks designed to store water below ground level.	As well as the blue roof beneath the podium, a geocellular tank will be provided beneath the parking areas at the ground level	✓

Green Roofs

- 5.10. Green roofs would provide a bio-diverse habitat in addition to capturing rainwater and naturally slowing the rate of runoff. The location of these features is shown on the development proposals in Appendix B.

Blue Roofs

- 5.11. Blue roofs would be incorporated beneath the podium level and would provide attenuation in the form of shallow cellular units with restricted discharge rates from all outlets. The locations of blue roof features are shown in Appendix G.

Rainwater Harvesting

- 5.12. The inclusion of rainwater harvesting would decrease the demand for potable water and could be used for irrigation. 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 needed. Rainwater harvesting butts would be provided at the podium level for the purpose of irrigation of green spaces.

Attenuation Tank

- 5.13. In order to provide the required volume of attenuation a geocellular tank is proposed, to be sited beneath the Block B – entrance and the cycle Storage area at ground level (Appendix G).

Proposed Surface Water Drainage Strategy

- 5.14. The total Site area within the red line boundary is 0.06ha, with the proposed impermeable area set at 0.06ha.
- 5.15. The greenfield rate (Q_{bar}) from the Site has been calculated in line with the ICP SUDS method to give a runoff rate of 0.2 l/s (Appendix F). In LBH's pre-application responses, they have indicated that for brownfield sites, runoff rates should not be more than three times greenfield rates which in this case would be 0.6 l/s.
- 5.16. This rate is considered to be extremely low and given the arrangement of blue roofs and attenuation tank, it is unlikely that flow restrictors will be able to individually restrict runoff rates from the attenuation features to such low rates. On this basis, it is proposed that runoff rates will be restricted to 1.8 l/s (which is three times the 1 in 100 year greenfield rate of 0.6 l/s. This provides a betterment of approximately 77% when compared to the existing discharge rate (7.8 l/s) and is considered to be as close to the greenfield runoff rate as is practicable whilst incorporating the proposed SuDS features and ensuring gravity discharge.
- 5.17. As discussed previously, in order to provide this restriction, it is proposed that attenuation in the form of blue roofs and a below ground geocellular tank will be provided. The modelling of the attenuation features has been undertaken using the MicroDrainage Source Control Module for the 1 in 100 year event plus an allowance of 40% for climate change, which takes account of all storm durations. Additionally, in line with the LBH Sustainable Drainage Guide, consideration of runoff coefficients (C_v) has been made, given that the majority of the Site consists of building areas, the C_v for the whole Site has been set to be 0.95.
- 5.18. In undertaking the drainage calculations, the following assumptions have been made;
- A 10mm orifice has been provided from the blue roof resulting in a restricted rate of 0.1 l/s;
 - A hydropneumatic flow control has been used to restrict discharge from the Geocellular Tank to 1.7 l/s;
 - The maximum blue roof depth would be 200mm and would be in the form of stacked 50mm cellular storage crates (subject to detailed design and product used); and
 - A void ratio of 95% has been used for both the blue roofs and geocellular tank.
- 5.19. Table 6 below summarises the catchments, the proposed runoff rates and the subsequent attenuation required in order to restrict the total runoff from the Site to 1.8 l/s. See Appendix F for drainage calculations.

Table 6: Drainage Strategy Summary

Catchment	Impermeable Catchment Area (ha)	Proposed Surface Water Runoff (l/s)	Attenuation Required (m ³)
1 – To Blue Roof	0.015	0.1	16.2
2 – To Below Ground Geo-cellular Tank	0.045	1.7	27.0
Total	0.06	1.8	43.2

- 5.20. Where possible, it is proposed to utilise the existing drainage connections. However, no drainage survey is currently available and an indicative connection location to the Thames Water surface water sewer has been illustrated in Appendix G. The potential to utilise the existing connections would be confirmed at detailed design.
- 5.21. Appropriate treatment would be incorporated into the drainage system to ensure that the quality of water discharged is acceptable. This would in part be achieved through the incorporation of green roofs, if required, hard engineered systems such as a biomat filtration system, downstream defender or other similar products could also be incorporated to ensure discharge is appropriately treated. This report sets out the principles of the SuDS scheme, and the final strategy would be confirmed at the detailed design stage.
- 5.22. The on-Site drainage network and SuDS would be privately managed and maintained for the lifetime of the development, ensuring that they remain fit for purpose and function appropriately. The management company/operator would be appointed post-planning.

Sustainable Drainage Systems Management Plan

- 5.23. The PPG sets out the requirement for developers to consider the operation, management and maintenance of all SuDS proposed. The on-Site drainage networks and SuDS would be privately managed and maintained for the lifetime of the development, ensuring that they remain fit for purpose and function appropriately.
- 5.24. Post-construction, an on-Site management company would be responsible for the SuDS included within the Scheme. Table 7 presents an indicative maintenance schedule of the anticipated maintenance and repairs, in line with guidance from the CIRIA SuDS Manual.

Table 7: Sustainable Drainage Maintenance Regime

SuDS Feature/Task	Frequency
Green/Blue Roofs	
Inspect system to replace dead plants as required and ensure plants are sufficiently watered (during establishment period)	As required

SuDS Feature/Task	Frequency
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	Six monthly or as required (after severe storms)
Inspect system for debris and sediment build-up	Annually (and following poor performance)
Cleaning of tank, inlets, outlets, gutters, and roof drain filters of silts and other debris	Annually (and following poor performance)
Rainwater Harvesting	
Inspect system for debris and sediment build-up	Annually (and following poor performance)
Cleaning of tank, inlets, outlets, gutters, and roof drain filters of silts and other debris	Annually (and following poor performance)
Underground Attenuation	
Inspection of silt traps, manholes and pipework, and remove any sediment/debris	Quarterly or as required
Jetting of main structure to remove any sediment build up	Annually or as required
Hydro-brake Restrictor	
Sediment removal	As required
Inspect for damage and blockages	Monthly for first three months after fitting and thereafter at six monthly intervals

Proposed Foul Drainage Strategy

- 5.25. The proposed foul drainage system would be designed in accordance with BS EN 752 – Drain and Sewer Systems Outside of Buildings, BS EN 12056 – Gravity Drainage Systems Inside Buildings and Approved Document H of Building Regulations.
- 5.26. There will be a foul water flow increase compared to the existing building. As such a pre-development enquiry application should be submitted to Thames Water to confirm the status of the sewer capacity.
- 5.27. It is proposed to discharge foul flows from the Site into the Thames Water foul sewer located within High Road to the east, as per the existing situation.

6. Conclusions

- 6.1. The site is predominantly located within Flood Zone 1, denoting a low probability of flooding from tidal and fluvial sources. Flood Zone 2 borders the site to the east, which denotes a medium probability of river flooding (1 in 1000 year flood extent). This is flooding associated with the culverted Moselle watercourse which is classified as a main river by the Environment Agency and is approximately 50m to the south of the site running beneath High Road.
- 6.2. Based on Environment Agency flood levels within the culvert (50m to the south), it appears that flooding could reach the site and in theory flood the ground level to a depth of 0.41m and 1.0m in the 1 in 100 year plus 20% climate change and 1 in 1000 year scenarios respectively. The extent of flooding in the EA's mapping however does not show the 1 in 100 year plus 20% climate change reaching the Site and it is believed that there are some inconsistencies in the hydraulic modelling.
- 6.3. However, if the modelled flood levels are considered to be representative, the proposals at the ground floor are 'less vulnerable' commercial uses and in line with policy, it is acceptable for these areas to be subjected to flooding. All 'more vulnerable' student accommodation uses are located at the first floor, which is over 3m above the potential modelled flood levels. To be conservative, it is proposed that flood resilient measures (such as the raising of electrical sockets and providing flood resilient construction materials) would be provided at the ground floor.
- 6.4. The risk of flooding from tidal, pluvial, groundwater and artificial sources has also been assessed and found to be low.
- 6.5. The surface water greenfield runoff rate (Q_{bar}) from the site has been calculated to be 0.2 l/s. In London Borough of Haringey's pre-application responses, they have indicated that for brownfield sites, runoff rates should not be more than three times greenfield rates which in this case would be 0.6 l/s. This rate is considered to be extremely low and given the arrangement of blue roofs and attenuation tank, it is unlikely that flow restrictors will be able to individually restrict runoff rates from the attenuation features to such low rates. On this basis, it is proposed that runoff rates will be restricted to 1.8 l/s (which is three times the 1 in 100 year greenfield rate of 0.6 l/s). This provides a betterment of approximately 77% when compared to the existing discharge rate (7.8 l/s) and is considered to be as close to the greenfield runoff rate as is practicable whilst incorporating the proposed Sustainable Drainage Systems and ensuring gravity discharge.
- 6.6. In order to provide this restriction, a total attenuation volume of 43.2m³ is proposed in the form of blue roofs and a below ground geocellular tank. This has been calculated for the 1 in 100 year plus 40% climate change scenario.
- 6.7. Appropriate treatment would be incorporated into the drainage system to ensure that the quality of water discharged is acceptable. This would in part be achieved through the incorporation of green roofs, if required, hard engineered systems such as a biomat filtration system, downstream defender or other similar products could also be incorporated to ensure discharge is appropriately treated. This report sets out the principles of the Sustainable Drainage Systems scheme, and the final strategy would be confirmed at the detailed design stage.
- 6.8. The on-site drainage network and Sustainable Drainage Systems would be privately managed and maintained for the lifetime of the development, ensuring that they remain fit for purpose and function appropriately. The management company/operator would be appointed post-planning.

- 6.9. There will be a foul water flow increase compared to the existing building. As such a pre-development enquiry application should be submitted to Thames Water to confirm the status of the sewer capacity.
- 6.10. This report demonstrates that the proposed Development has a low probability of flooding from tidal, pluvial, groundwater and artificial sources and confirms that fluvial flood risk is managed appropriately in line with local and national policy. It also confirms that surface water runoff from the site can be managed sustainably to ensure that flood risk is not increased elsewhere. It is considered that the information provided within this report satisfies the requirements of the National Planning Policy Framework, London Plan and local policy.



APPENDICES

A. Building Survey

Appendices

807 High Road, Tottenham
Project Number: WIE20265

Document Reference: WIE20265-100-R-1-3-1-FRA

[illegible]

Note

This survey data has been prepared for the client detailed below to an agreed specification. Unless otherwise agreed in writing the liability of Xact Surveys Ltd is limited to the client or his appointed agent and does not extend to use beyond the limitations of the specification.

The survey is related to the existing Metrix Surveys Ltd topographic survey grid and datum. (Denslog No. 17043T-101.dan)

Grid: Survey is based on a modified Ordnance Survey National Grid (OSGB36), site centred at station Y4 with a scale factor of 1 applied.

Values have been derived via GPS using the OS active network and the OSTN15 transformation.

Level datum: Ordnance Datum Newlyn (ODN, using the OSGM15 geoid model)

Any critical dimensions should be verified on site prior to design and construction.

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Abbreviations (Where Applicable)

[illegible]

Surveyed by

XACT
SURVEYS

LAND AND BUILDING SURVEYORS

26 St Wilfreds Cottages

Ansley Lane
Old Arden

Old Ancy
Coventry

CV7 8FT

Tel: 01676 5411

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ARCHITECTURE + DESIGN

5 ROCHESTER MEWS
LONDON
NW1 9JB

SURVEY AT

807 HIGH ROAD
TOTTENHAM

TOTTENHAM
N17 8ER

GROUND FLOOR PL.

18020B-100

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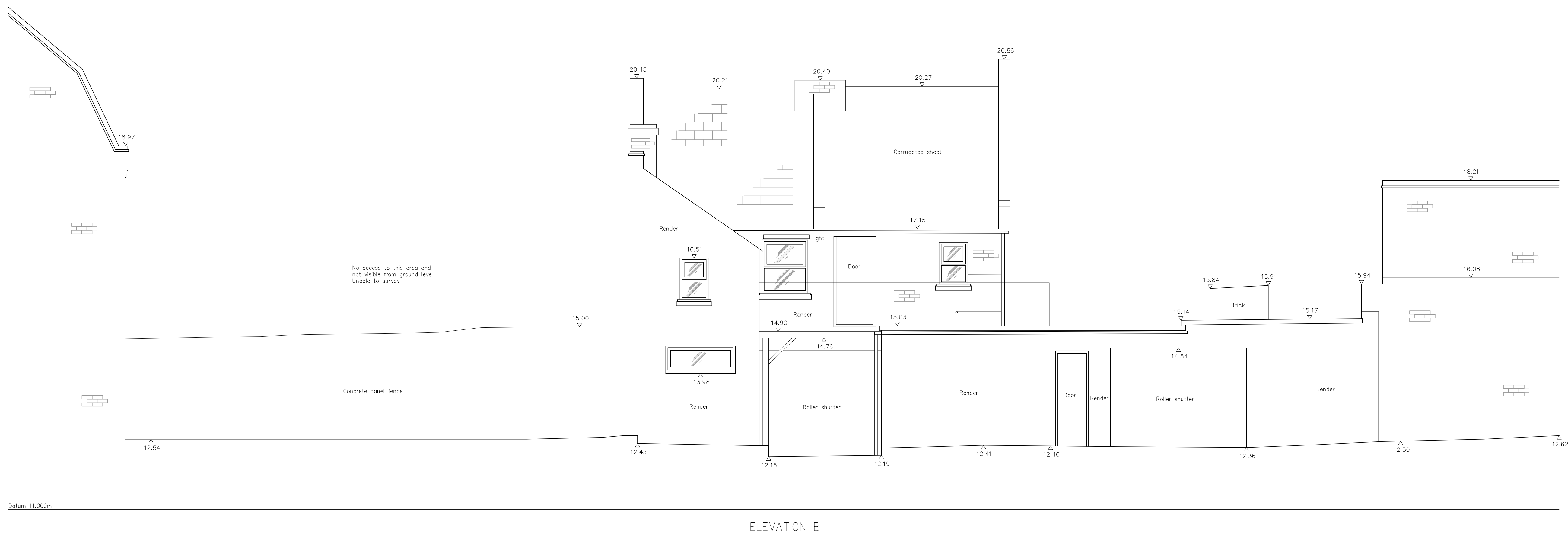
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Sheet: 1 of 1

	100
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ELEVATION A



ELEVATION B

Coordinate Table

Station	Eastings	Northings	Level	Description

Note

This survey data has been prepared for the client detailed below to an agreed specification. Unless otherwise agreed in writing the liability of Xact Surveys Ltd is limited to the client or his appointed agent and does not extend to use beyond the limitations of the specification.

The survey is related to the existing Metric Surveys Ltd topographic survey grid and datum. (Drawing No. 170431-101.dwg).

Grid: Survey is based on a modified Ordnance Survey National Grid (OSGB36), also centred at station Y4 with a scale factor of 1.00000.

Values have been derived via GPS using the OS active network and the OSN15 transformation.

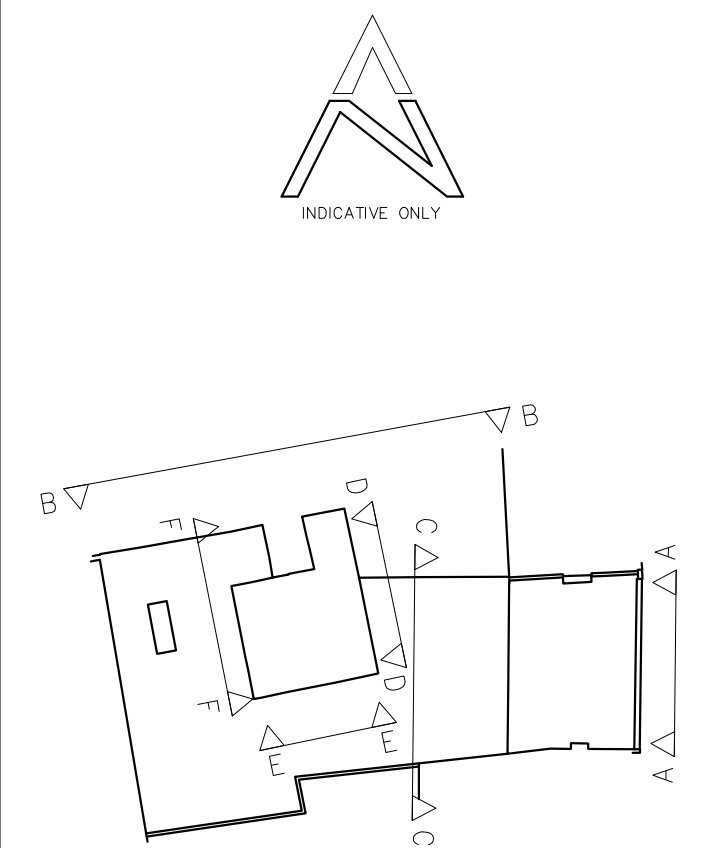
Local datum: Ordnance Datum Newlyn (ODN), using the OSN15 geoid model.

Any critical dimensions should be verified on site prior to design and construction.

Some elevation detail was not visible from ground level/flat roof or was not safely accessible from the roof. Therefore some detail is assumed or approximate and/or may be incomplete or omitted.

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Elevation Location Plan



Rev Suffix	Revision Details	Initial	Date

Surveyed by

XACT
SURVEYS

LAND AND BUILDING SURVEYORS

26 St Wilfreds Cottages

Ansley Lane

Old Arley

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Website: www.xactsurveys.co.uk

Client:

F3 ARCHITECTURE + DESIGN

5 ROCHESTER MEWS

LONDON

NW1 9JB

Job Title:

SURVEY AT

807 HIGH ROAD

TOTTENHAM

N17 8ER

Drawing Title:

ELEVATIONS

Drawing No:

18020B-104

Rev Suffix:

Drawn:

DR

Checked:

JD

Scale:

1:50

Date:

MAY 2018

Job No:

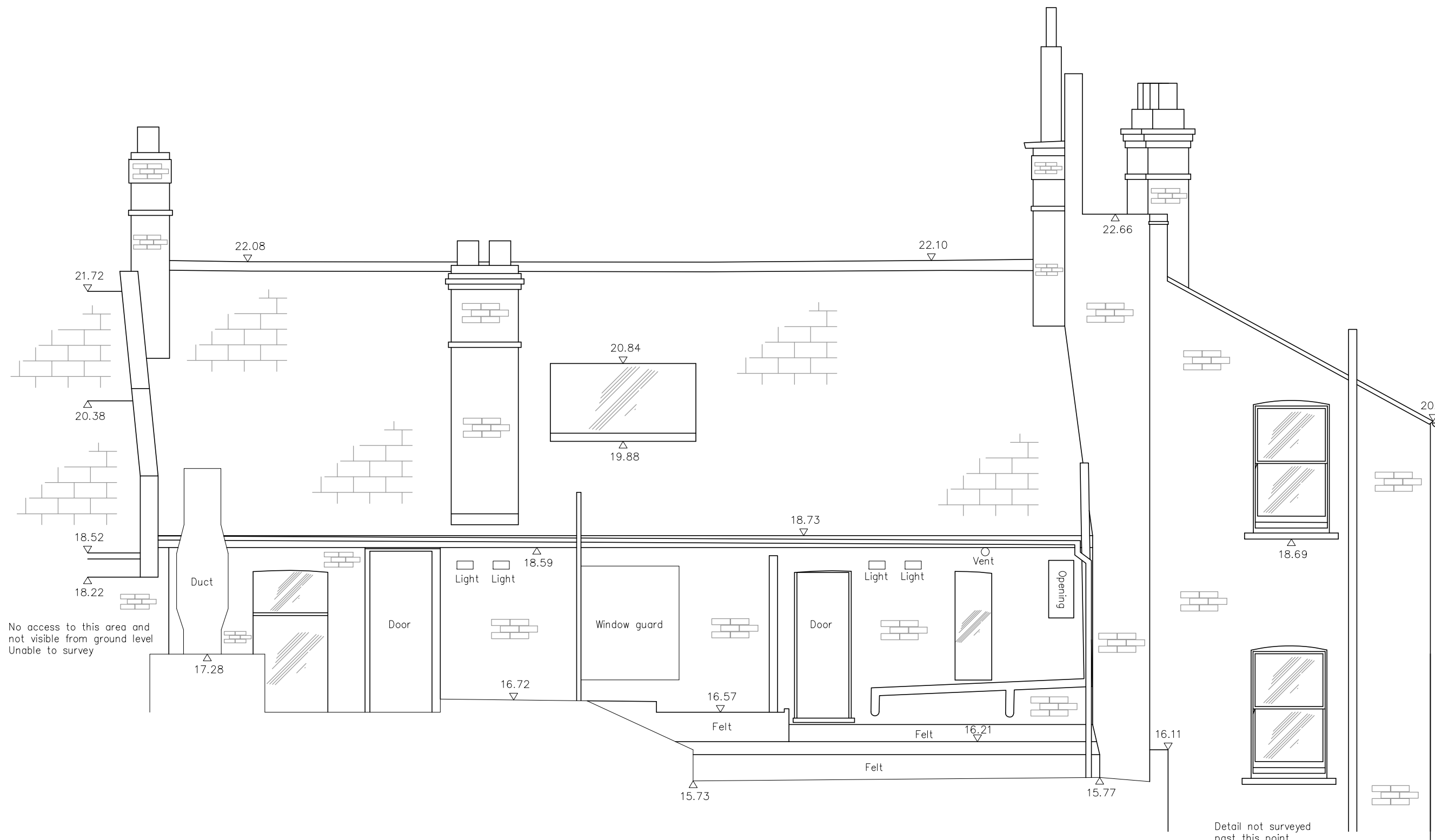
18020B

Sheet

1 of 2

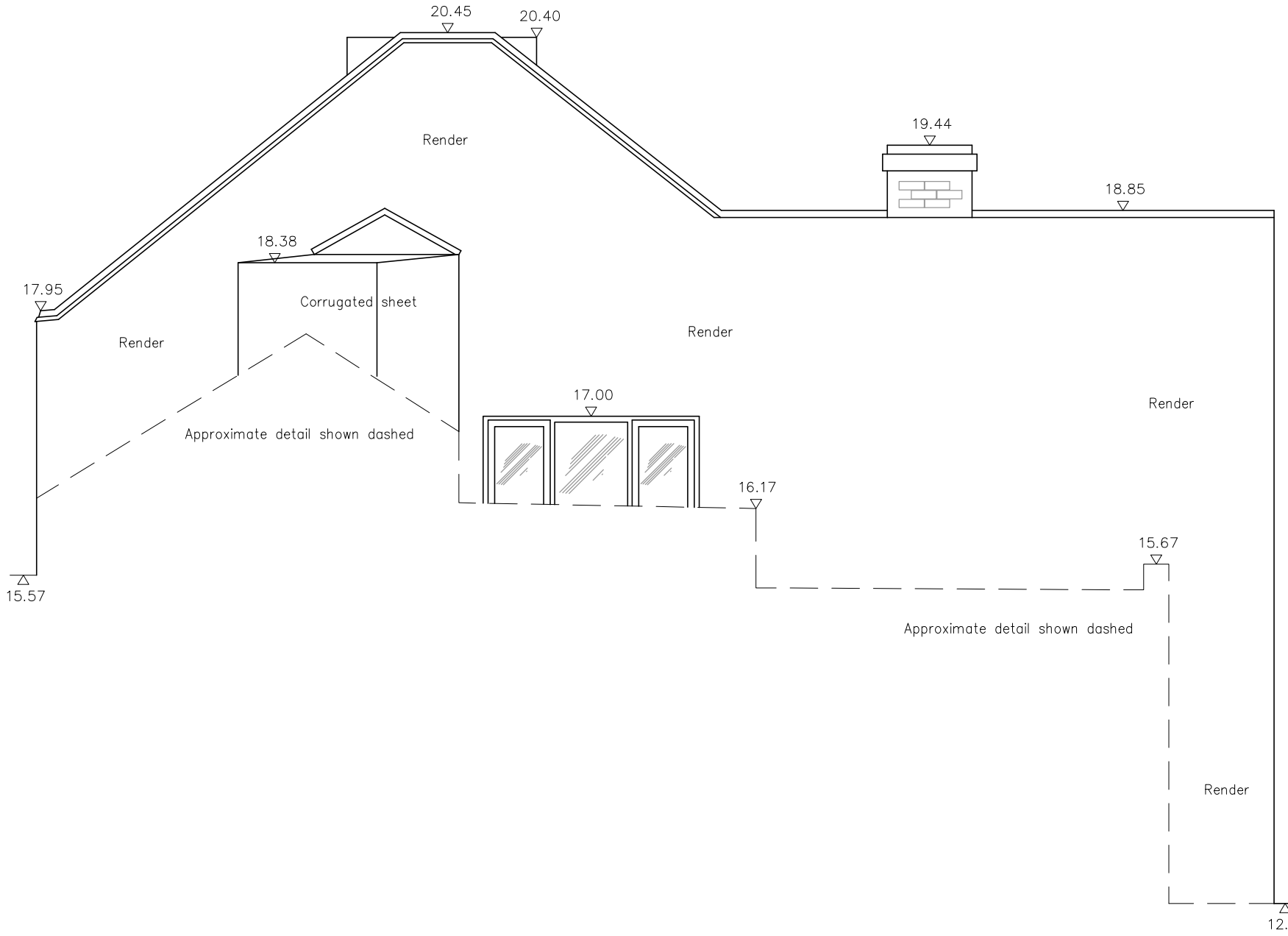
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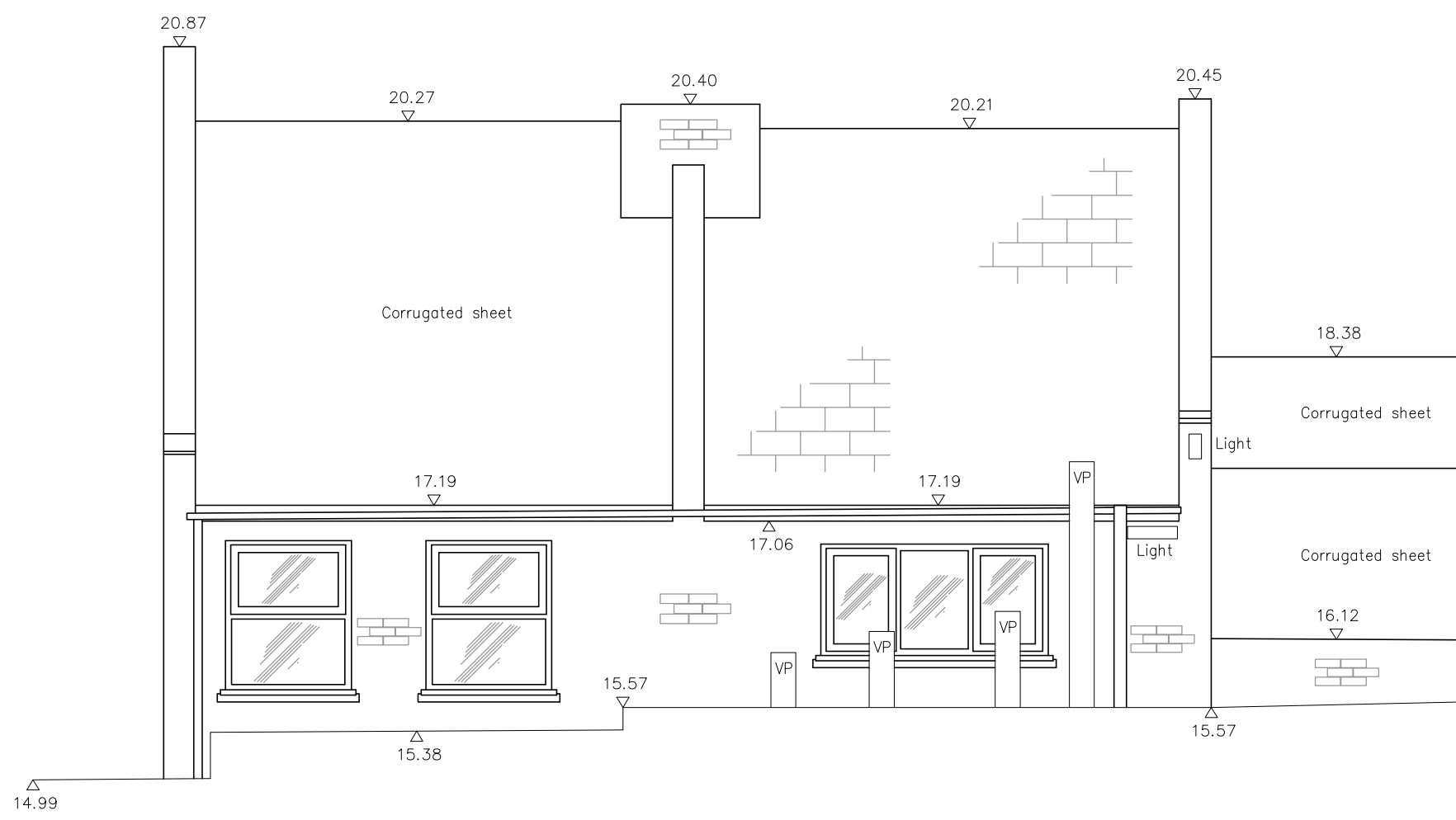
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ELEVATION C



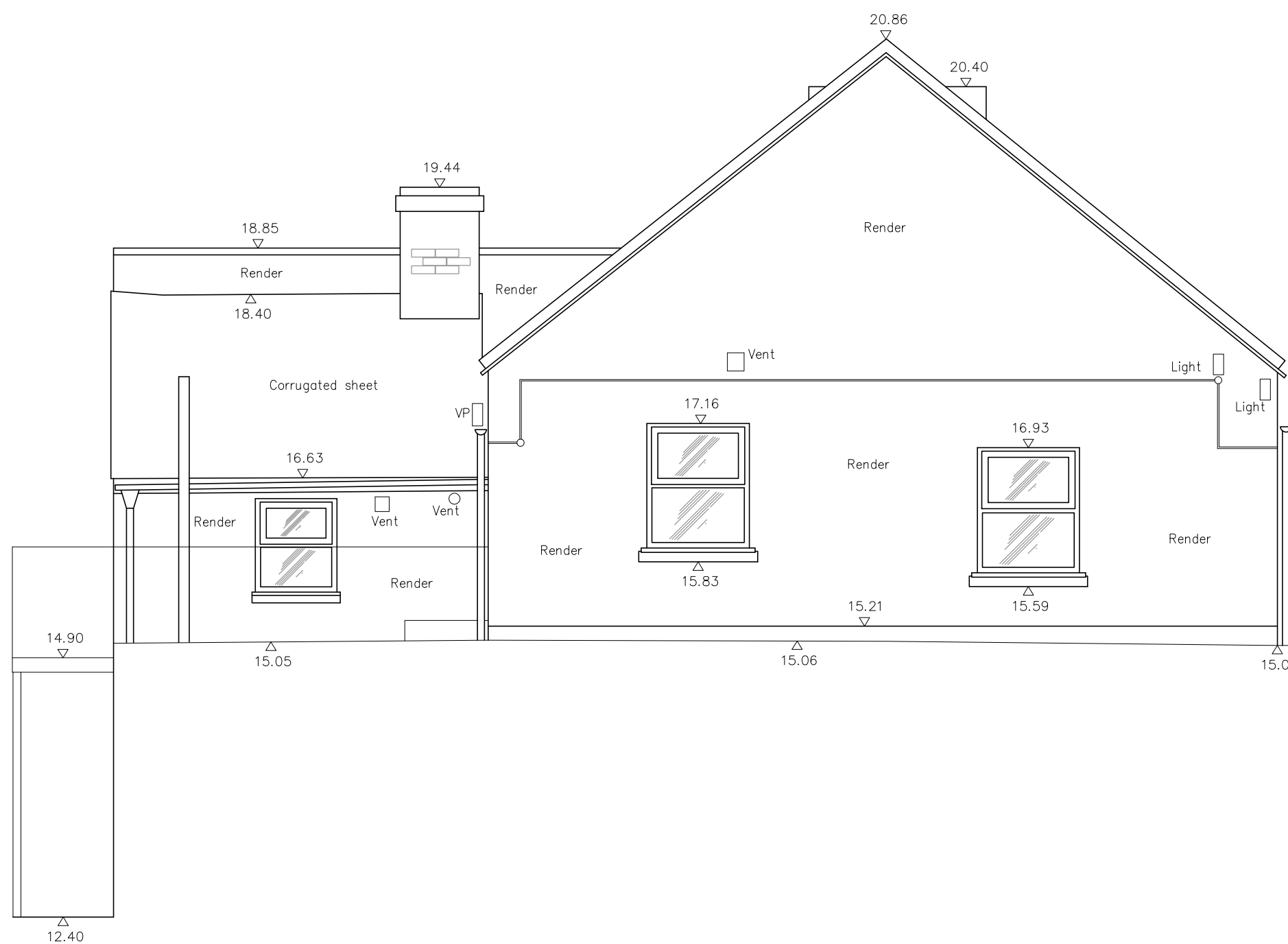
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ELEVATION D



Datum 11.000m

ELEVATION E



Datum 11.000m

ELEVATION F

Coordinate Table				
Station	Eastings	Northings	Level	Description

Note

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The survey is related to the existing Metric Surveys Ltd topographic survey grid and datum. (Drawing No. 170431-101.dwg).

Grid: Survey is based on a modified Ordnance Survey National Grid (OSGB36), also centred at station Y4 with a scale factor of 1 applied.

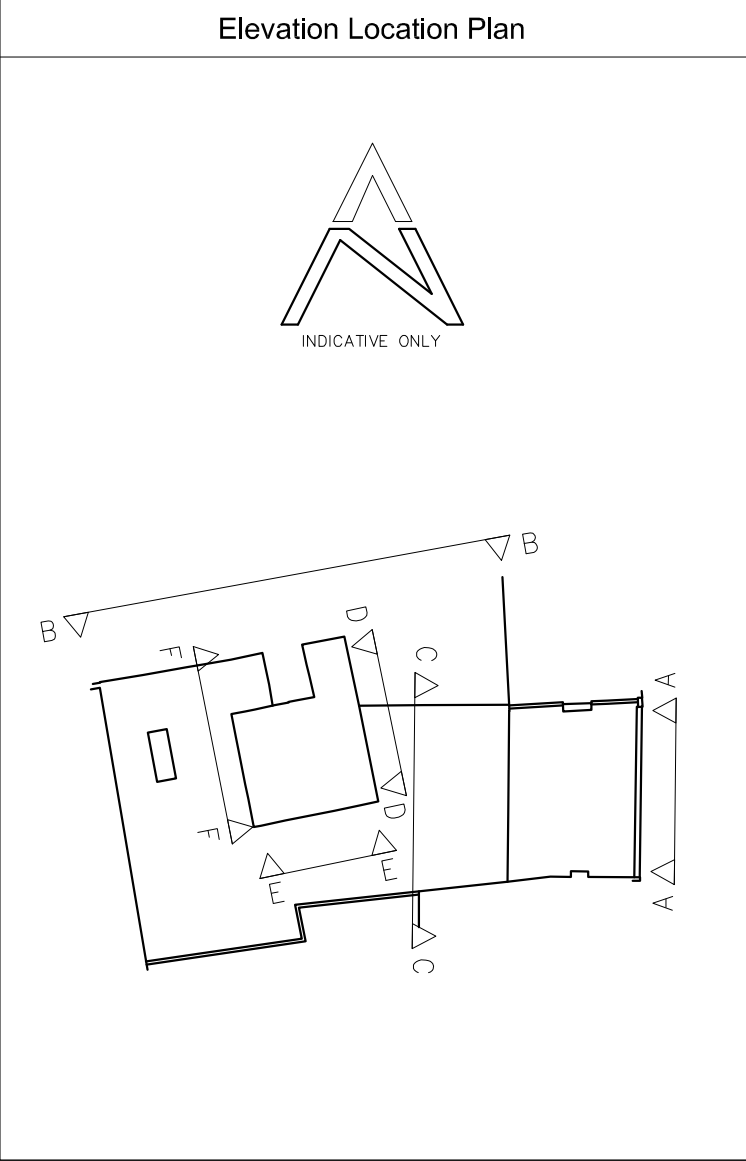
Values have been derived via GPS using the OS active network and the OSN15 transformation.

Local datum: Ordnance Datum Newlyn (ODN), using the OSGM15 geoid model).

Any critical dimensions should be verified on site prior to design and construction.

Some elevation detail was not visible from ground level/flat roof or was not safely accessible from the roof. Therefore some detail is assumed or approximate and/or may be incomplete or omitted.

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Rev Suffix	Revision Details	Initial	Date	
Surveyed by				
XACT SURVEYS LAND AND BUILDING SURVEYORS 26 St Wilfreds Cottages Ansley Lane Old Arley Coventry CV7 8FT Tel: 01676 541157 Email: info@xactsurveys.co.uk Website: www.xactsurveys.co.uk				
Client:	F3 ARCHITECTURE + DESIGN 5 ROCHESTER MEWS LONDON NW1 9JB			
Job Title:	SURVEY AT 807 HIGH ROAD TOTTENHAM N17 8ER			
Drawing Title:	ELEVATIONS			
Drawing No:	18020B-104			Rev Suffix:
Drawn: DR	Checked: JD	Scale: 1:50	Date: MAY 2018	
Job No: 18020B	Sheet	2 of 2	Sheet Size: A0	

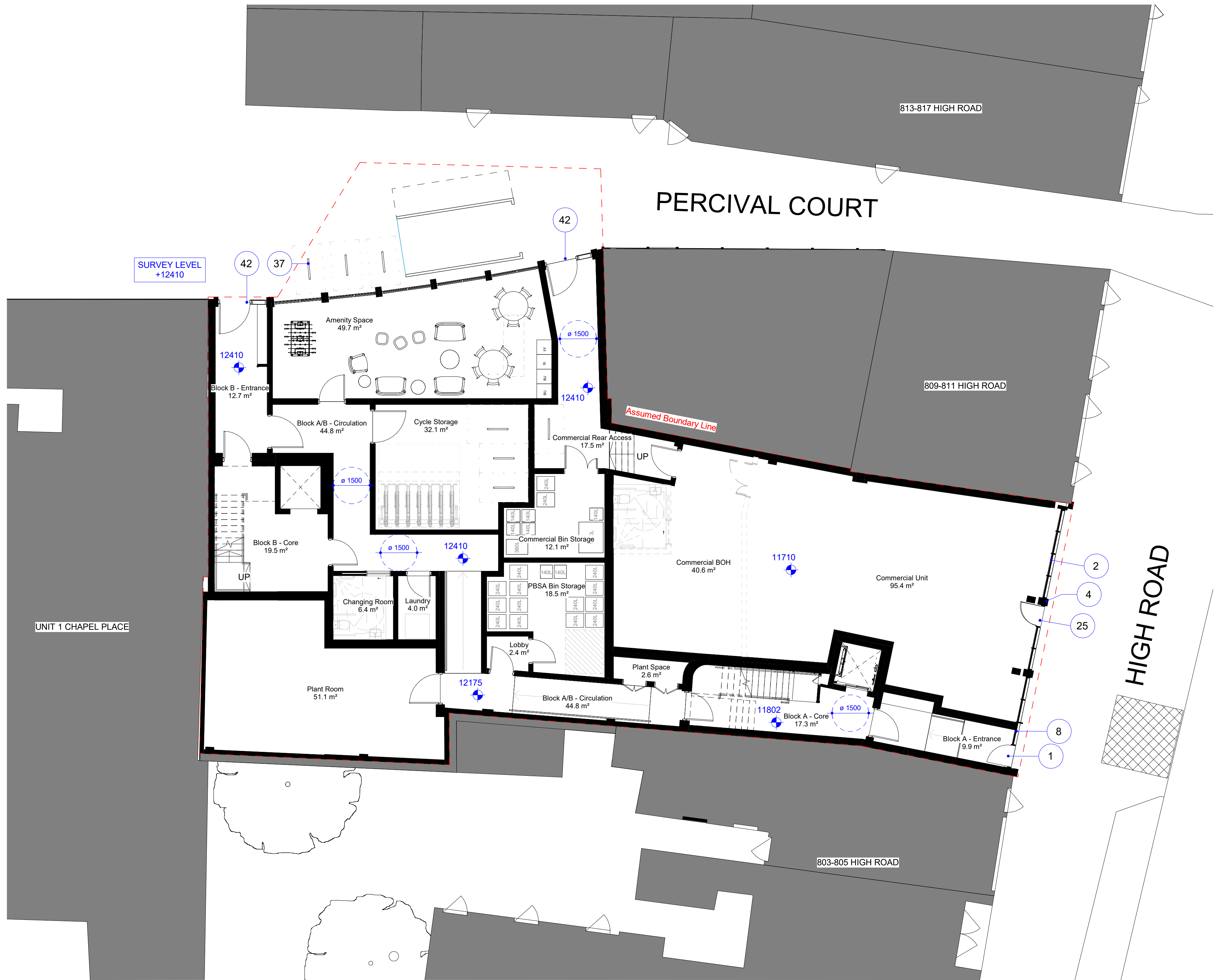


B. Development Proposals

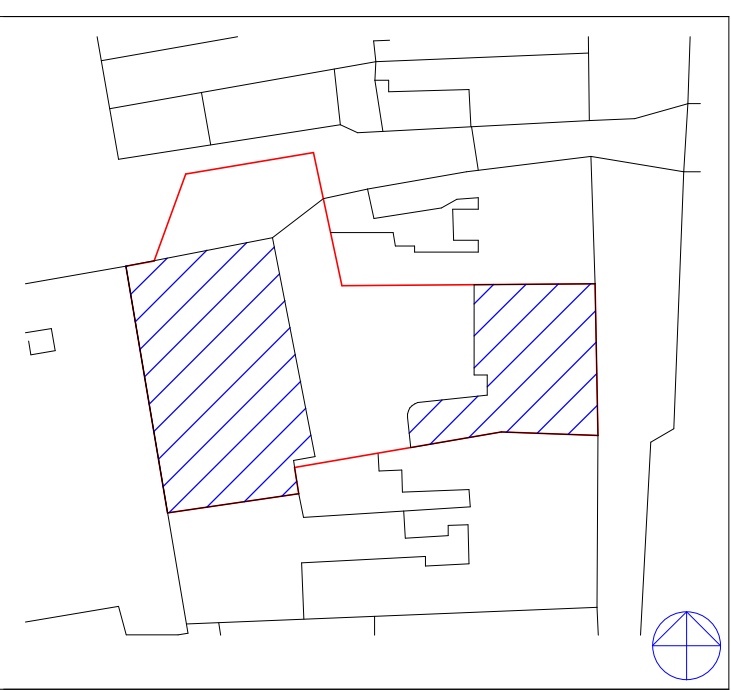
Appendices

807 High Road, Tottenham
Project Number: WIE20265

Document Reference: WIE20265-100-R-1-3-1-FRA



- MATERIAL KEY**
- 1) Painted timber door
 - 2) Painted timber framed glass shopfront
 - 3) Painted timber stall riser
 - 4) Painted pilaster
 - 5) Brick - similar to 801 High Road
 - 6) Composite stone lintel/column
 - 7) Refuge area
 - 8) Opaque glazed panel
 - 10) PPC metal doors
 - 11) Painted timber frame window
 - 12) Contrasting brick panel
 - 13) PPC aluminium window
 - 14) Opaque glass panel
 - 15) Planter boxes
 - 16) Painted metal vertical balustrade and handrail
 - 17) Brick guarding
 - 18) Brick parapet
 - 19) Composite stone coping/cornice
 - 20) Slate roof
 - 21) Standing seam metal finish
 - 22) Red brick lintel
 - 23) Soldier brick course
 - 24) Recess metal finish
 - 25) Painted timber door with glass panel
 - 26) New brick chimney feature to match existing finish
 - 27) Concealed gutter
 - 28) Rainwater pipes
 - 29) Lift Overrun
 - 30) Openable vent
 - 31) Area for PV
 - 32) Smoke Shaft Outlet
 - 33) New surface treatment to Percival Court
 - 34) Proposed External Lighting
 - 35) Infrastructure for active electric vehicle charger
 - 36) Indicative refuse collection point on the High Road
 - 37) Short stay commercial cycle parking
 - 38) Long stay commercial cycle parking
 - 39) Glass canopy
 - 40) Fluted aluminium panel
 - 41) Fixed aluminium glazing
 - 42) Door with fluted aluminium details
 - 43) Lightwell
 - 44) Brick recess



KEY PLAN

NOTES:
DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS, SPECIFICATIONS, DOCUMENTS AND CONSULTANT INFORMATION.
CAD DRAWINGS BASED ON SURVEY INFORMATION BY OTHERS; ALL DIMENSIONS TO BE SITE CHECKED.
M&E ITEMS SHOWN INDICATIVELY AND ARE SUBJECT TO FURTHER SITE INVESTIGATIONS AND END USER SPECIFICATION REQUIREMENTS.
INTERNAL FURNITURE LAYOUTS SHOWN FOR INDICATIVE PURPOSES ONLY.
LANDSCAPING/PUBLIC REALM SHOWN FOR INDICATIVE PURPOSES ONLY.

DATE	CHK	DESCRIPTION	STA.	NO.
28/02/2024	AB	FOR PLANNING	S4	P1P1
27/02/2024	AB	FOR PLANNING	S4	P10
20/02/2024	AB	FOR INFORMATION	S2	P9
14/02/2024	AB	FOR INFORMATION	S2	P8
01/02/2024	AB	FOR INFORMATION	S2	P7
28/01/2024	AB	FOR INFORMATION	S2	P6
19/01/2024	AB	FOR INFORMATION	S2	P5
14/12/2023	AB	FOR INFORMATION	S2	P4
09/12/2023	AB	FOR INFORMATION	S2	P3
21/11/2023	AB	FOR INFORMATION	S2	P2
18/10/2023	AB	FOR INFORMATION	S2	P1
DATE	CHK	DESCRIPTION	STA.	NO.

Architect

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project

807 HIGH ROAD PBSA
LONDON N17 8ER

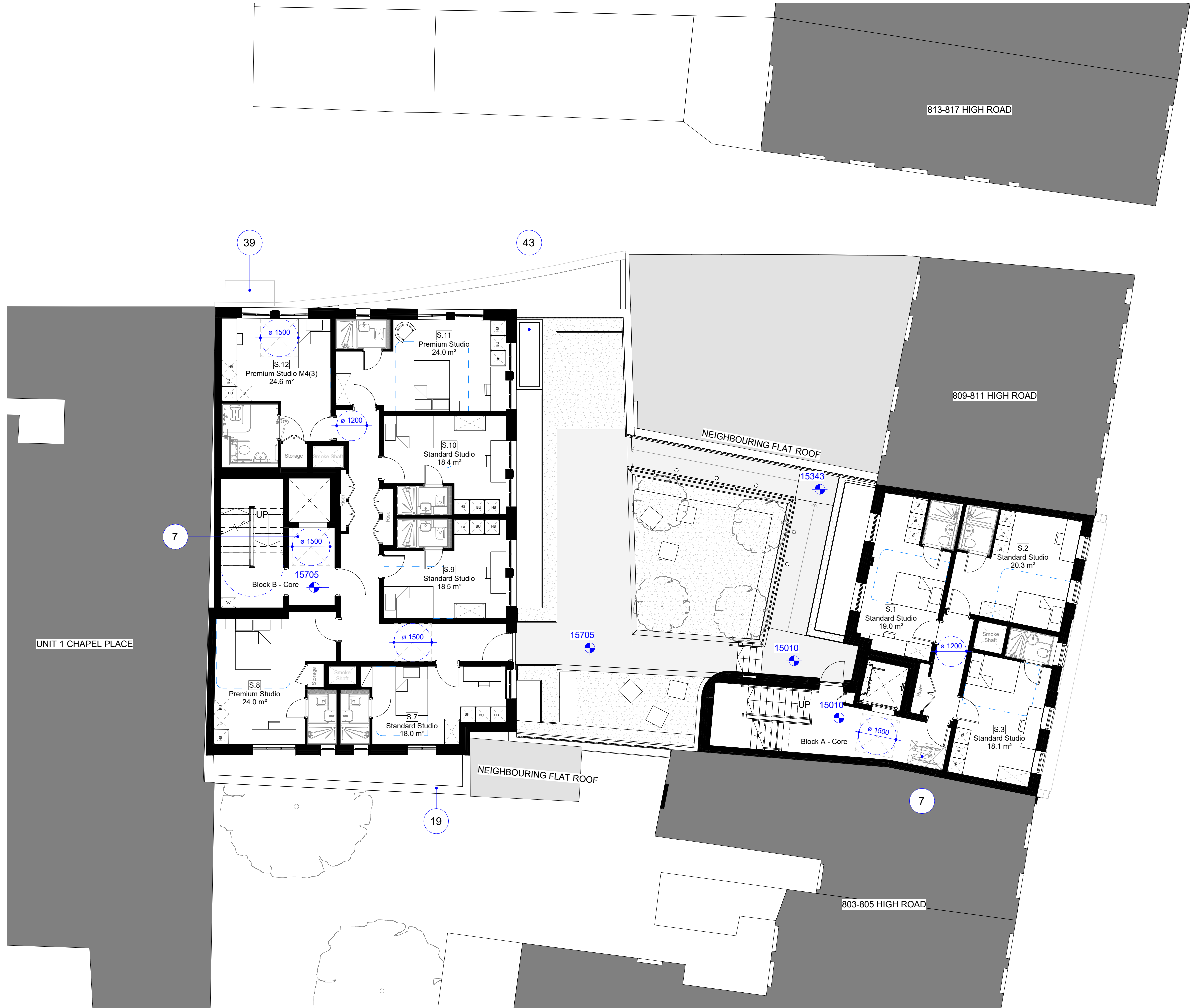
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PROPOSED GA PLAN L00

drawn by scale paper project no
RB 1 : 100 A1 230605

status revision
S4 - Suitable for stage approval S4.P1P1

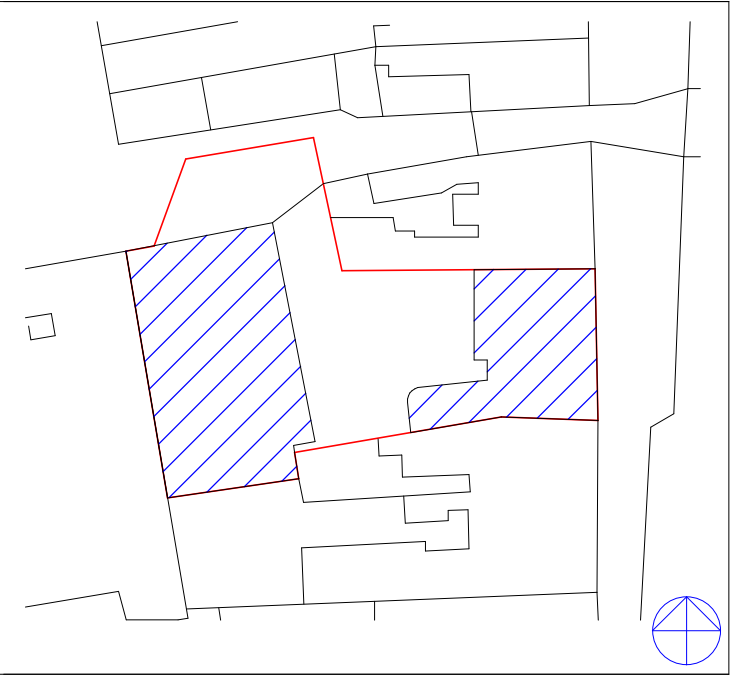
drawing no
807HR-F3A-XX-00-GA-A-0820





MATERIAL KEY

- 1) Painted timber door
- 2) Painted timber framed glass shopfront
- 3) Painted timber stall riser
- 4) Painted pilaster
- 5) Brick - similar to 801 High Road
- 6) Composite stone lintel/column
- 7) Refuge area
- 8) Opaque glazed panel
- 10) PPC metal doors
- 11) Painted timber frame window
- 12) Contrasting brick panel
- 13) PPC aluminium window
- 14) Opaque glass panel
- 15) Planter boxes
- 16) Painted metal vertical balustrade and handrail
- 17) Brick guarding
- 18) Brick parapet
- 19) Composite stone coping/cornice
- 20) Slate roof
- 21) Standing seam metal finish
- 22) Red brick lintel
- 23) Soldier brick course
- 24) Recess metal finish
- 25) Painted timber door with glass panel
- 26) New brick chimney feature to match existing finish
- 27) Concealed gutter
- 28) Rainwater pipes
- 29) Lift Overrun
- 30) Openable vent
- 31) Area for PV
- 32) Smoke Shaft Outlet
- 33) New surface treatment to Percival Court
- 34) Proposed External Lighting
- 35) Infrastructure for active electric vehicle charger
- 36) Indicative refuse collection point on the High Road
- 37) Short stay commercial cycle parking
- 38) Long stay commercial cycle parking
- 39) Glass canopy
- 40) Fluted aluminium panel
- 41) Fixed aluminium glazing
- 42) Door with fluted aluminium details
- 43) Lightwell
- 44) Brick recess



KEY PLAN

NOTES:

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DATE	CHK	DESCRIPTION	STA.	NO.
27/02/2024	AB	FOR PLANNING	S4	P10
20/02/2024	AB	FOR INFORMATION	S2	P9
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08/12/2023	AB	FOR INFORMATION	S2	P3
21/11/2023	AB	FOR INFORMATION	S2	P2
18/10/2023	AB	FOR INFORMATION	S9	P1

REVISION HISTORY

Architect



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project

807 HIGH ROAD PBSA
LONDON N17 8ER

title

PROPOSED GA PLAN L01

drawn by scale paper project no

RB 1 : 100 A1 230605

status revision

S4 - Suitable for stage approval S4.P10

drawing no

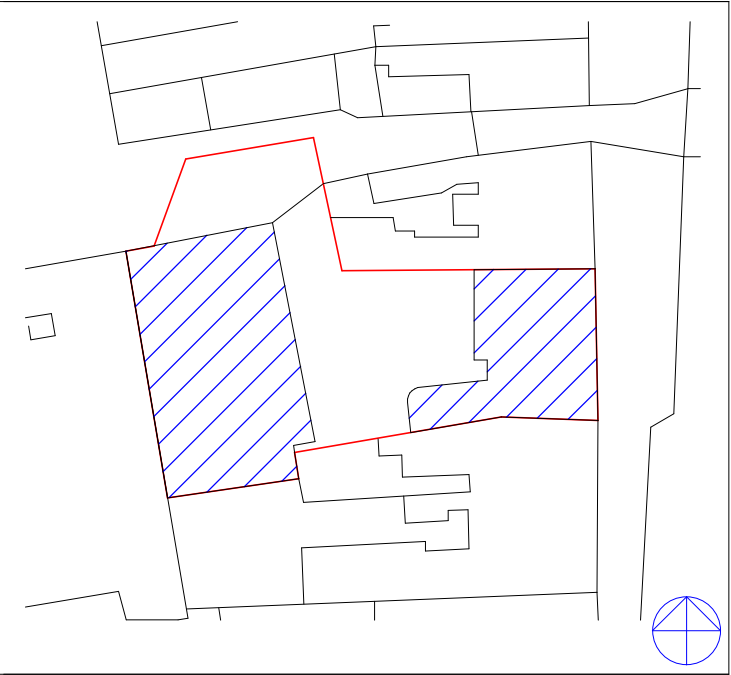
807HR-F3A-XX-01-GA-A-0821





MATERIAL KEY

- 1) Painted timber door
- 2) Painted timber framed glass shopfront
- 3) Painted timber stall riser
- 4) Painted pilaster
- 5) Brick - similar to 801 High Road
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- 39) Glass canopy
- 40) Fluted aluminium panel
- 41) Fixed aluminium glazing
- 42) Door with fluted aluminium details
- 43) Lightwell
- 44) Brick recess



KEY PLAN

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21/11/2023	AB	FOR INFORMATION	S2	P2
18/10/2023	AB	FOR INFORMATION	S9	P1
DATE	CHK	DESCRIPTION	STA.	NO.

REVISION HISTORY

Architect



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project

807 HIGH ROAD PBSA
LONDON N17 8ER

title
PROPOSED GA PLAN L02

drawn by	scale	paper	project no
RB	1 : 100	A1	230605

status	revision
S4 - Suitable for stage approval	S4.P9

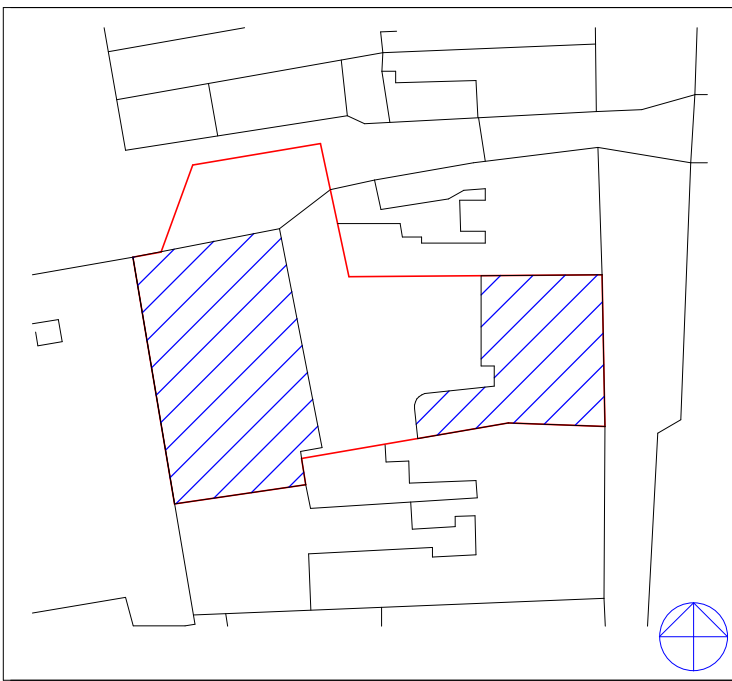
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807HR-F3A-XX-02-GA-A-0822





MATERIAL KEY

- 1) Painted timber door
- 2) Painted timber framed glass shopfront
- 3) Painted timber stall riser
- 4) Painted pilaster
- 5) Brick - similar to 801 High Road
- 6) Composite stone lintel/column
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- 43) Lightwell
- 44) Brick recess



KEY PLAN

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21/11/2023	AB	FOR INFORMATION	S2	P2
18/10/2023	AB	FOR INFORMATION	S9	P1
DATE	CHK	DESCRIPTION	STA.	NO.

REVISION HISTORY

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project

807 HIGH ROAD PBSA
LONDON N17 8ER

title

PROPOSED GA PLAN L03

drawn by scale paper project no

RB 1 : 100 A1 230605

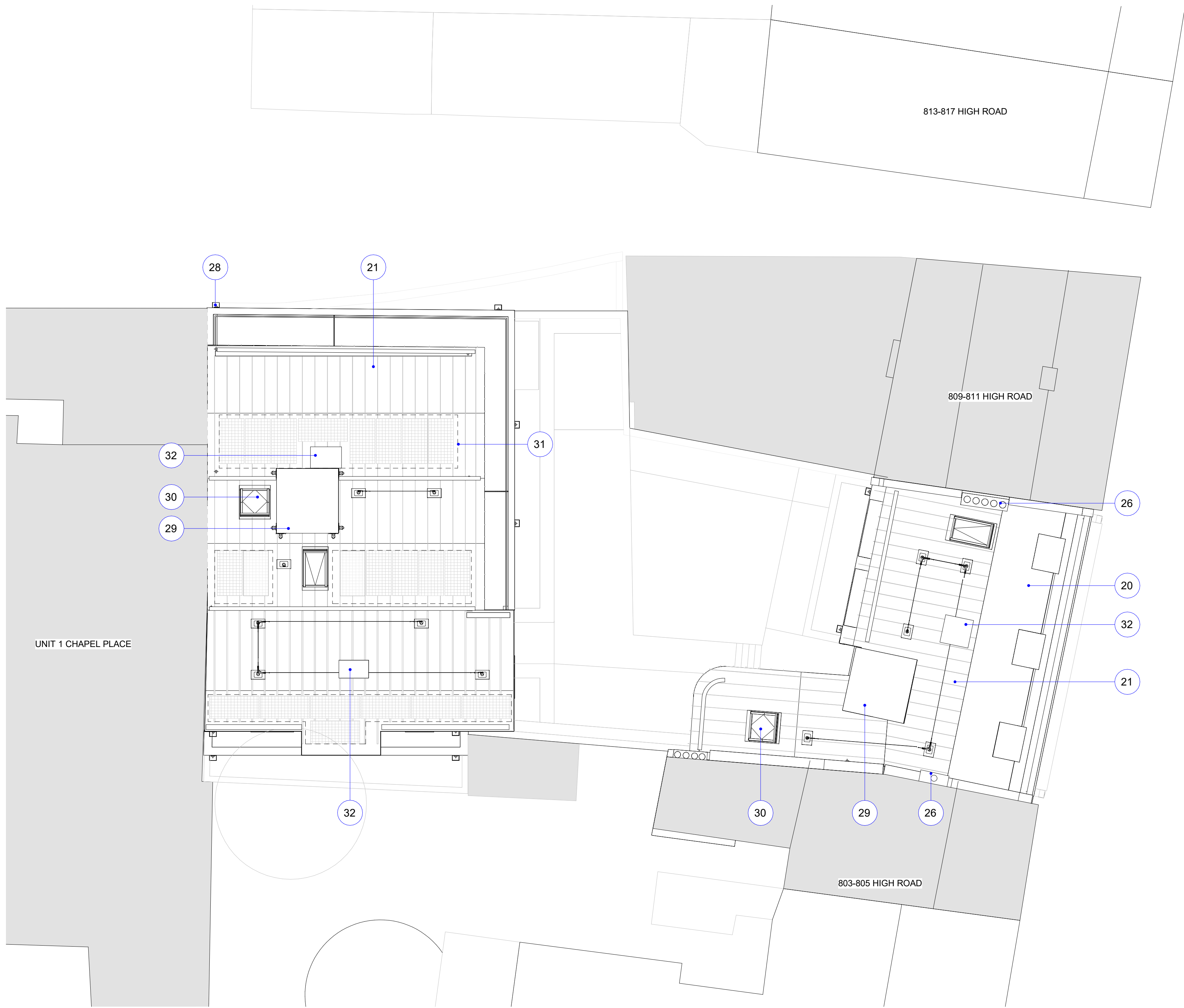
status revision

S4 - Suitable for stage approval S4.P9

drawing no

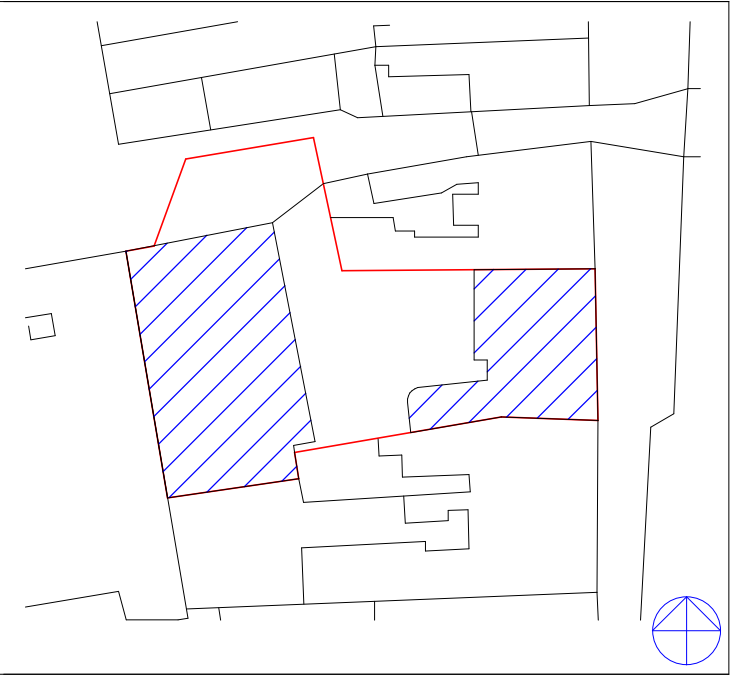
807HR-F3A-XX-03-GA-A-0823





MATERIAL KEY

- 1) Painted timber door
- 2) Painted timber framed glass shopfront
- 3) Painted timber stall riser
- 4) Painted pilaster
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- 39) Glass canopy
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- 41) Fixed aluminium glazing
- 42) Door with fluted aluminium details
- 43) Lightwell
- 44) Brick recess



KEY PLAN

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19/01/2024	AB	FOR INFORMATION	S2	P4
09/12/2023	AB	FOR INFORMATION	S2	P3
21/11/2023	AB	FOR INFORMATION	S2	P2
18/10/2023	AB	FOR INFORMATION	S2	P1

REVISION HISTORY

Architect



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project

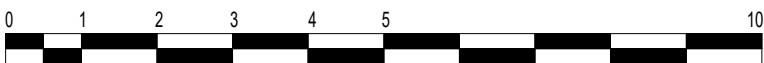
**807 HIGH ROAD PBSA
LONDON N17 8ER**

title
PROPOSED GA PLAN ROOF PLAN

drawn by scale paper project no
RB 1 : 100 A1 230605

status revision
S4 - Suitable for stage approval S4.P7

drawing no
807HR-F3A-XX-RF-EL-A-0824



C. Environment Agency Data

Appendices

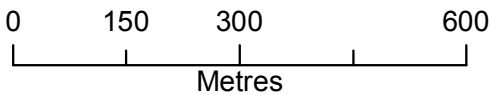
807 High Road, Tottenham
Project Number: WIE20265

Document Reference: WIE20265-100-R-1-3-1-FRA

Flood Map for Planning centred on: 807 High Road, London, N17 8ER - 16/12/2019 - HNL 153293 CB



Environment Agency
Alchemy,
Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE



Legend

- Main Rivers
- Site location

Flood Map for Planning

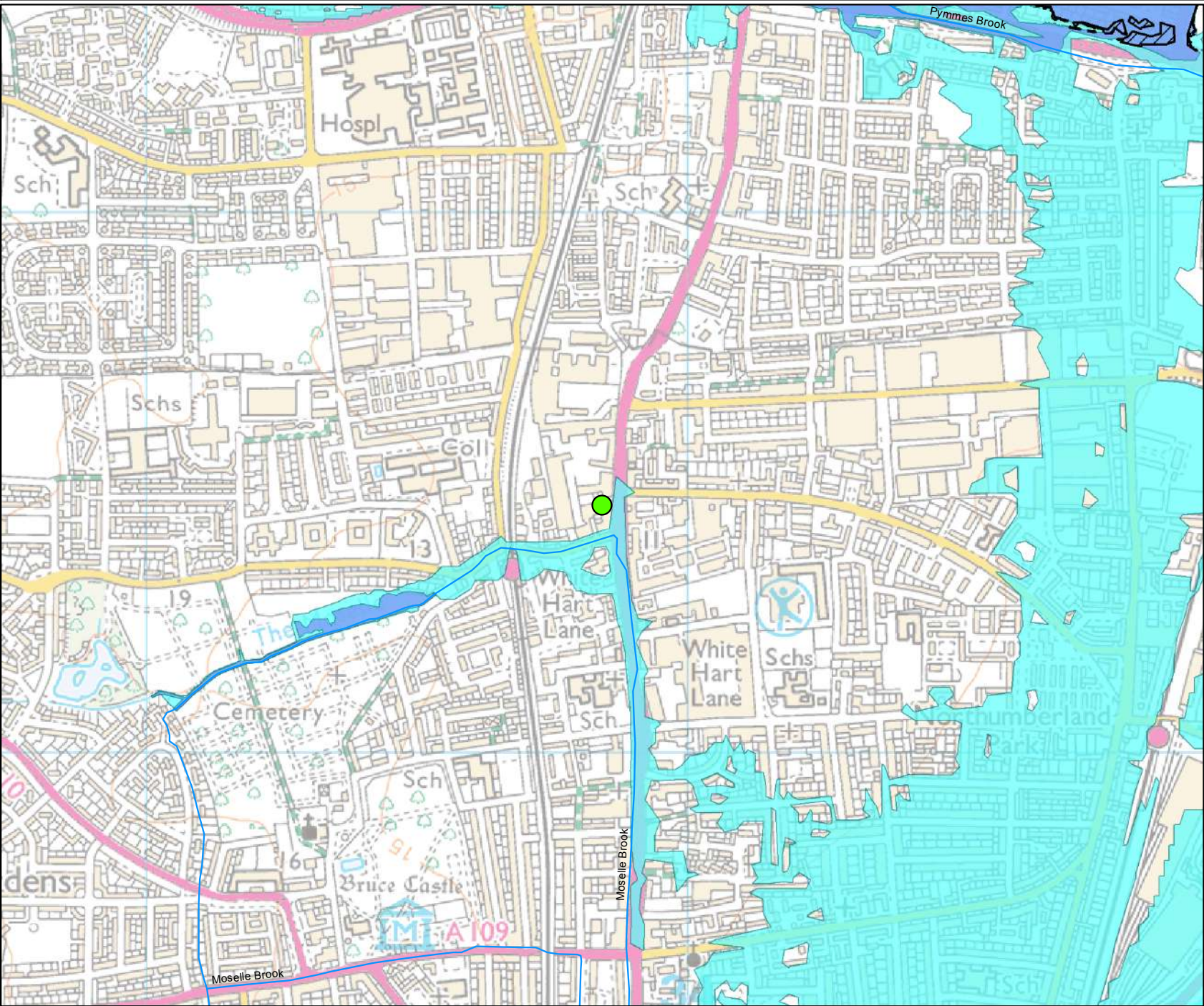
- Flood Storage Area
- Areas Benefiting from Flood Defences
- Flood Zone 3
- Flood Zone 2

Flood Map for Planning (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London

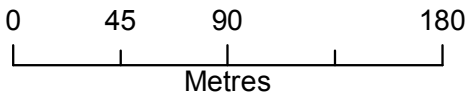


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Detailed FRA centred on: 807 High Road, London, N17 8ER - 16/12/2019 - HNL 153293 CB



Environment Agency
Alchemy,
Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE



Legend

- Main Rivers
- Site location

Defended Flood Outlines

- 1 in 5 (20%) Defended
- 1 in 20 (5%) Defended
- 1 in 100 (1%) Defended

The data in this map has been extracted from the River Lee Modelling & Mapping Study (Halcrow, 2010). This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment. Modelled outlines take into account catchment wide defences.

Flood risk data requests including an allowance for climate change will be based on the 1 in 100 flood plus 20% allowance for climate change, unless otherwise stated. You should refer to 'Flood risk assessments: climate change allowances' to check if this allowance is still appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.

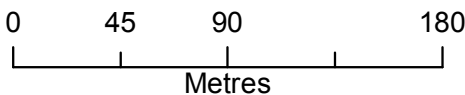
<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London





Environment Agency
Alchemy,
Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE



Legend

- Main Rivers
- Site location

Defended Flood Outlines

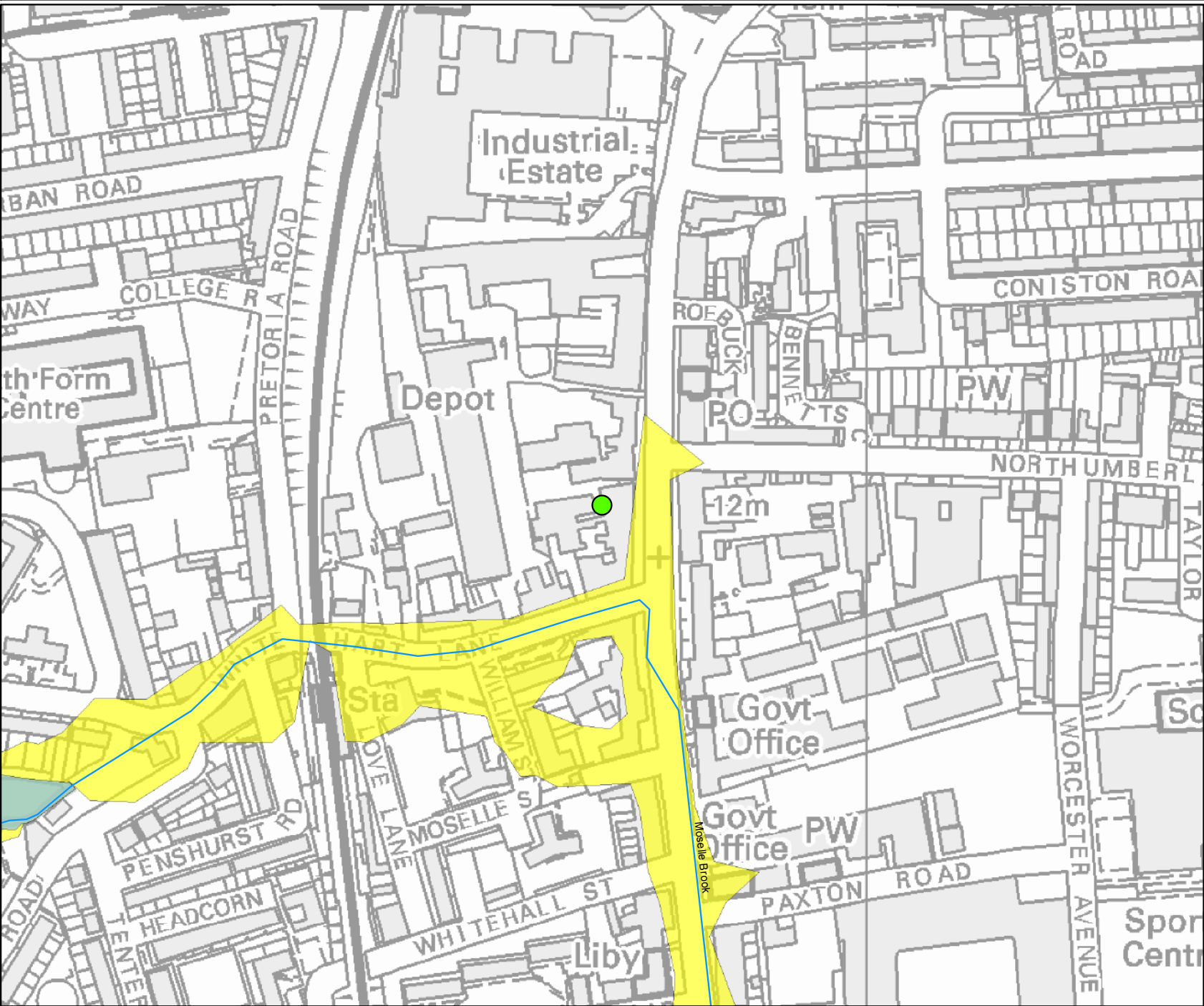
- 1 in 100+20% (CC) Defended
- 1 in 1000 (0.1%) Defended

The data in this map has been extracted from the River Lee Modelling & Mapping Study (Halcrow, 2010). This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment. Modelled outlines take into account catchment wide defences.

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<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

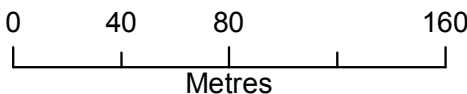
Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London



Detailed FRA centred on: 807 High Road, London, N17 8ER - 16/12/2019 - HNL 153293 CB



Environment Agency
Alchemy,
Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE



Legend

- Main Rivers
- Site location

1D Node Results

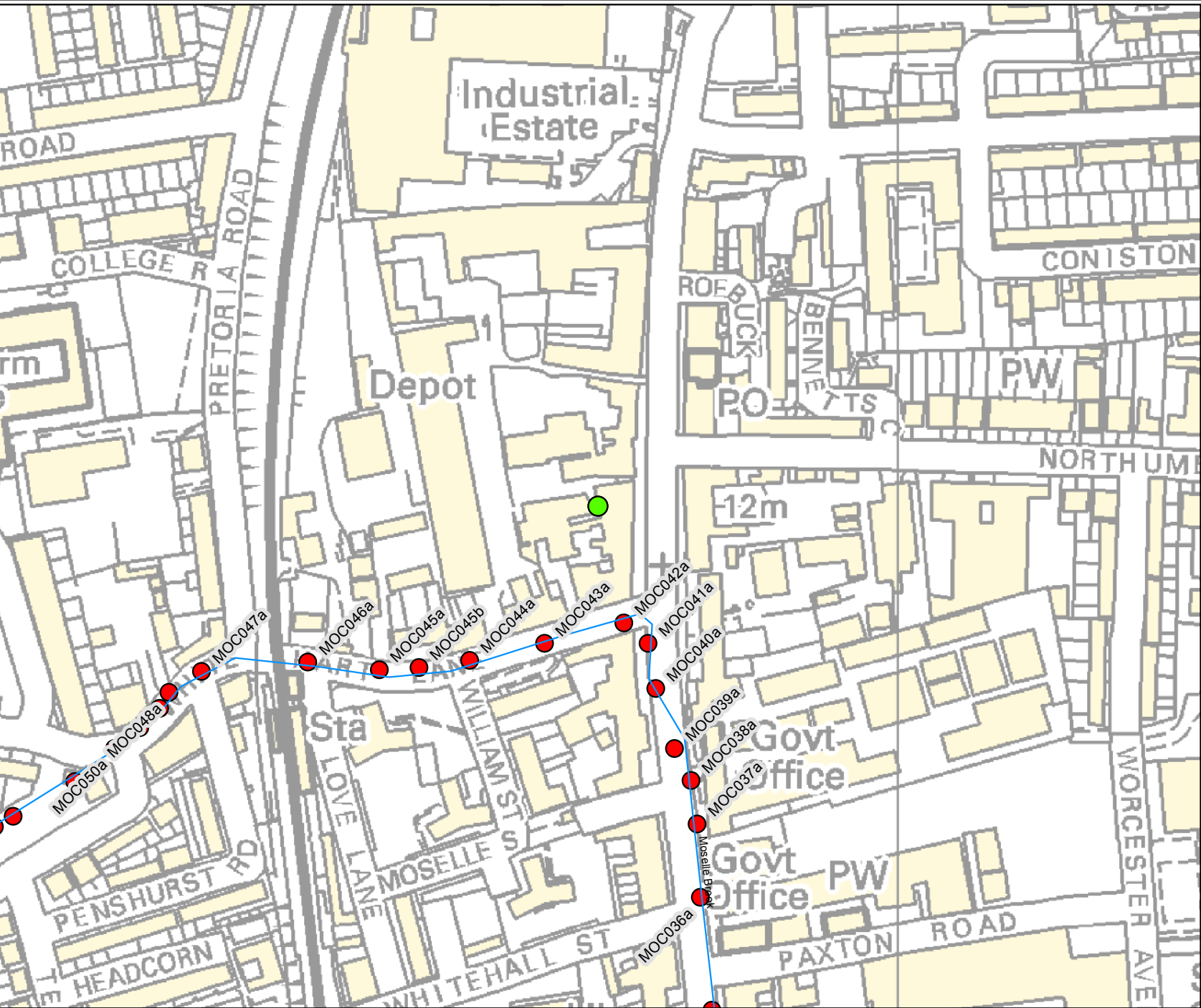
- Node Results

The data in this map has been extracted from the River Lee Modelling & Mapping Study (Halcrow, 2010). This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment. Modelled outlines take into account catchment wide defences.

Flood risk data requests including an allowance for climate change will be based on the 1 in 100 flood plus 20% allowance for climate change, unless otherwise stated. You should refer to 'Flood risk assessments: climate change allowances' to check if this allowance is still appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

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Environment Agency ref: HNL 153293 CB

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<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Caution:

This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment. Modelled outlines take into account catchment wide defences.

Each sub-model has been given a 'Model Confidence Limit' score (1-4) to give an indication of the level of confidence in the hydraulic model.

The confidence for this area is shown in the last column.

- 1 - Good Quality channel and floodplain survey and good calibration
- 2 - Old channel or floodplain survey or limited calibration
- 3 - Poor quality channel or floodplain survey

All flood levels are given in metres Above Ordnance Datum (mAOD)

All flows are given in cubic metres per second (cumecs)

MODELLED FLOOD LEVEL

Node Label	Easting	Northing	Return Period										Confidence
			2 yr	5 yr	10 yr	20 yr	25 yr	50 yr	100 yr	100 yr + 20%	200 yr	1000 yr	
MO.003	533504	191273	11.47	11.72	11.82	11.88	11.93	12.01	12.13	12.68	12.39	13.28	1
MO.002	533526	191285	11.41	11.66	11.77	11.83	11.88	11.96	12.08	12.66	12.36	13.26	1
MO.001	533533	191292	11.38	11.62	11.73	11.79	11.83	11.92	12.04	12.63	12.32	13.26	1
MOC052a	533543	191297	11.34	11.58	11.68	11.74	11.78	11.86	11.97	12.60	12.28	13.24	3
MOC051a	533575	191315	11.28	11.51	11.62	11.67	11.71	11.79	11.91	12.54	12.24	13.19	3
MOC050a	533595	191332	11.23	11.46	11.56	11.61	11.66	11.73	11.86	12.50	12.21	13.14	3
MOC050b	533608	191343	11.20	11.43	11.53	11.58	11.62	11.70	11.82	12.48	12.19	13.12	3
MOC049a	533619	191353	11.20	11.43	11.53	11.58	11.62	11.70	11.82	12.48	12.19	13.12	3
MOC048a	533623	191361	11.18	11.40	11.50	11.56	11.60	11.67	11.80	12.46	12.18	13.10	3
MOC047a	533640	191372	11.09	11.31	11.40	11.45	11.49	11.57	11.70	12.38	12.14	13.00	3
MOC046a	533695	191376	11.06	11.27	11.36	11.41	11.45	11.52	11.66	12.35	12.12	12.97	3
MOC045a	533732	191373	10.97	11.18	11.27	11.31	11.35	11.42	11.58	12.30	12.09	12.90	3
MOC045b	533752	191374	10.49	10.71	10.81	10.87	10.91	11.13	11.37	12.22	11.98	12.84	3
MOC044a	533779	191377	10.43	10.67	10.78	10.83	10.87	11.10	11.35	12.16	11.94	12.77	3
MOC043a	533817	191386	10.43	10.66	10.77	10.82	10.86	11.09	11.35	12.14	11.91	12.74	3
MOC042a	533858	191397	10.42	10.66	10.76	10.82	10.86	11.09	11.34	12.12	11.89	12.71	3
MOC041a	533871	191386	10.41	10.64	10.75	10.80	10.84	11.08	11.31	12.08	11.86	12.67	3
MOC040a	533875	191363	10.39	10.62	10.72	10.78	10.82	11.04	11.25	12.01	11.79	12.59	3
MOC039a	533884	191332	10.37	10.59	10.69	10.75	10.78	10.99	11.19	11.95	11.73	12.52	3
MOC038a	533893	191315	10.37	10.59	10.69	10.75	10.78	10.98	11.17	11.93	11.72	12.50	3
MOC037a	533896	191293	10.33	10.53	10.63	10.68	10.71	10.86	11.03	11.77	11.57	12.31	3
MOC036a	533898	191255	10.28	10.47	10.55	10.60	10.63	10.77	10.91	11.64	11.45	12.16	3
MOC035a	533904	191197	10.23	10.39	10.47	10.52	10.55	10.63	10.71	11.42	11.24	11.90	3

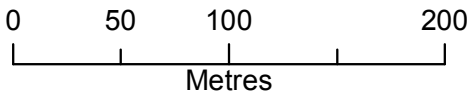
MODELLED FLOWS

Node Label	Easting	Northing	2 yr	5 yr	Return Period								Confidence
					010 yr	20 yr	25 yr	50 yr	100 yr	100 yr + 20%	200 yr	1000 yr	
MO.003	533504	191273	2.20	3.33	3.86	4.18	4.43	4.90	5.43	6.01	6.20	8.35	1
MO.002	533526	191285	2.19	3.33	3.86	4.18	4.43	4.90	5.43	5.96	6.19	8.36	1
MO.001	533533	191292	2.19	3.33	3.86	4.18	4.43	4.90	5.43	5.94	6.19	8.36	1
MOC052a	533543	191297	2.19	3.33	3.86	4.18	4.43	4.90	5.43	5.94	6.19	6.26	3
MOC051a	533575	191315	2.19	3.33	3.87	4.18	4.43	4.90	5.44	5.88	6.18	6.26	3
MOC050a	533595	191332	2.19	3.33	3.87	4.19	4.43	4.90	5.44	5.87	6.17	6.26	3
MOC050b	533608	191343	2.19	3.33	3.88	4.19	4.43	4.90	5.44	5.87	6.17	6.26	3
MOC049a	533619	191353	2.35	3.60	4.19	4.53	4.80	5.30	5.89	6.71	6.66	7.45	3
MOC048a	533623	191361	2.35	3.60	4.19	4.53	4.80	5.30	5.89	6.70	6.66	7.45	3
MOC047a	533640	191372	2.35	3.60	4.20	4.54	4.80	5.31	5.89	6.63	6.64	7.45	3
MOC046a	533695	191376	2.35	3.60	4.20	4.54	4.80	5.31	5.90	6.60	6.64	7.45	3
MOC045a	533732	191373	2.35	3.61	4.21	4.54	4.80	5.31	5.90	6.54	6.63	7.42	3
MOC045b	533752	191374	2.35	3.61	4.21	4.54	4.80	5.31	5.90	6.54	6.63	7.42	3
MOC044a	533779	191377	2.35	3.61	4.21	4.55	4.80	5.30	5.90	6.51	6.62	7.42	3
MOC043a	533817	191386	2.35	3.61	4.21	4.55	4.80	5.30	5.90	6.51	6.62	7.42	3
MOC042a	533858	191397	2.34	3.60	4.21	4.55	4.80	5.30	5.90	6.51	6.62	7.42	3
MOC041a	533871	191386	2.34	3.60	4.21	4.55	4.80	5.30	5.90	6.51	6.62	7.42	3
MOC040a	533875	191363	2.34	3.60	4.22	4.55	4.80	5.29	5.90	6.51	6.62	7.42	3
MOC039a	533884	191332	2.34	3.60	4.22	4.55	4.80	5.29	5.90	6.51	6.62	7.42	3
MOC038a	533893	191315	2.34	3.60	4.22	4.55	4.80	5.29	5.90	6.51	6.62	7.42	3
MOC037a	533896	191293	2.33	3.60	4.22	4.56	4.80	5.29	5.90	6.51	6.62	7.42	3
MOC036a	533898	191255	2.33	3.60	4.22	4.56	4.80	5.29	5.90	6.51	6.62	7.42	3
MOC035a	533904	191197	2.33	3.60	4.22	4.56	4.80	5.29	5.90	6.51	6.62	7.42	3

Structures and Defences centred on: 807 High Road, London, N17 8ER - 16/12/2019 - HNL 153293 CB



Environment Agency
Alchemy,
Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE



Legend

- Main Rivers
- Site location

NAFRA Structures

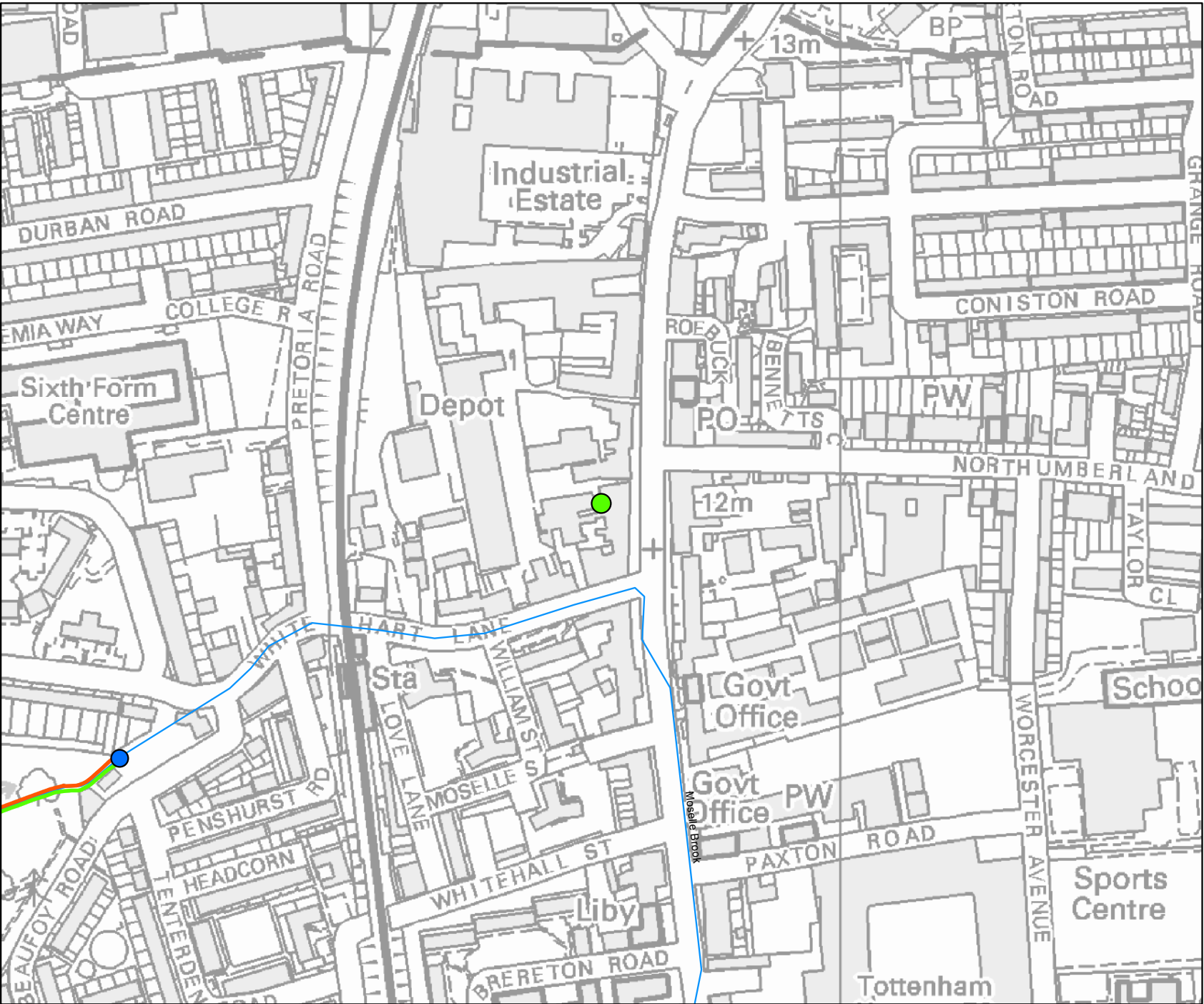
- 202294

NAFRA Defences

- 12840
- 12841

The following information on defences
has been extracted from the Asset
Information Management System
(AIMS)

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London



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Environment Agency ref: [HNL 153293 CB](#)

The following information on defences has been extracted from the Asset Information Management System (AIMS)

Defences

Asset ID	Asset Type	Asset Protection	Asset Comment	Asset Description	Design Standard of protection (years)	Downstream Crest Level	Upstream Crest Level	Condition of Defences (1=Good, 5 = Poor)
12841	high ground	fluvial	Concrete lined channel	Lined channel	5	14.62	13.72	3
12840	high ground	fluvial	Natural bank with concrete lined sections	Natural bank	5	14.87	15.92	3

Structures

Asset ID	Asset Type	Asset Protection	Asset Comment	Asset Description	Condition of Structures (1=Good, 5=Poor)
202294	screen	fluvial	MA - Wedges Yard Screen. Capital works planned. 3.5m wide steel screen inclined around 20degrees off the vertical. Concrete wing walls are placed at 0 degrees to the flow. EA responsible for regular cleaning (2-3 times/week). No barrier to top of screen. (O&M 53/64)	2 stage flat 50mm plate galvanised steel screen. Galvanised fabricated handrailing along steps on left bank	3



D. Thames Water Data

Appendices

807 High Road, Tottenham
Project Number: WIE20265

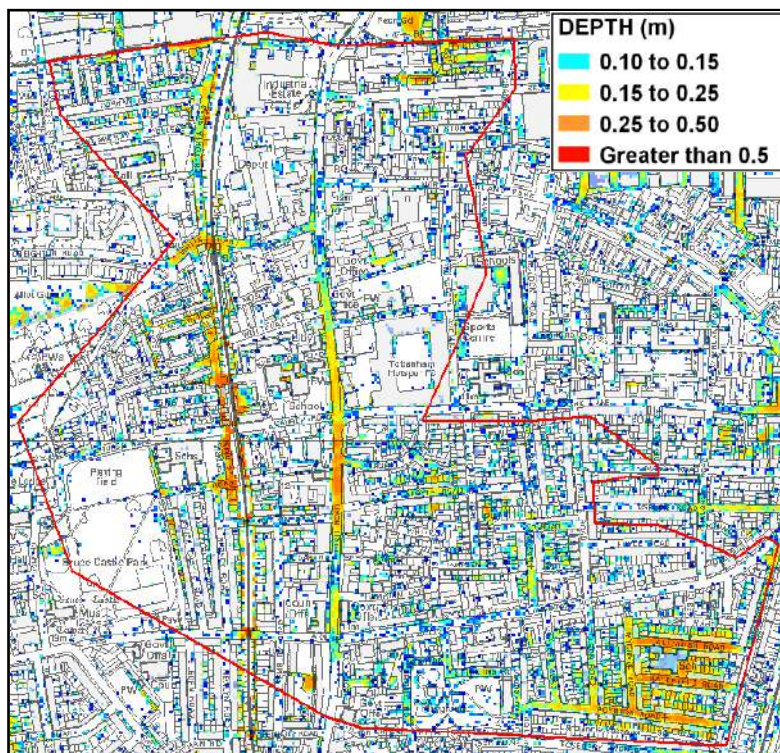
Document Reference: WIE20265-100-R-1-3-1-FRA

CDA: Group4_061

Location: Tottenham High Road and area surrounding Halefield Road, Tottenham.

Description: Surface water is observed to pond around Halefield Road as a result of overland flow from the west. Ponding water is also observed at the low point along Tottenham High Road. The largest depths of water occur along the roads with some residential properties and their back gardens flooded.

Validation: There is good correlation between the modelling results and the EA Surface Water Maps for both 30 year and 200 year event. There are no other supporting flood records in the area.

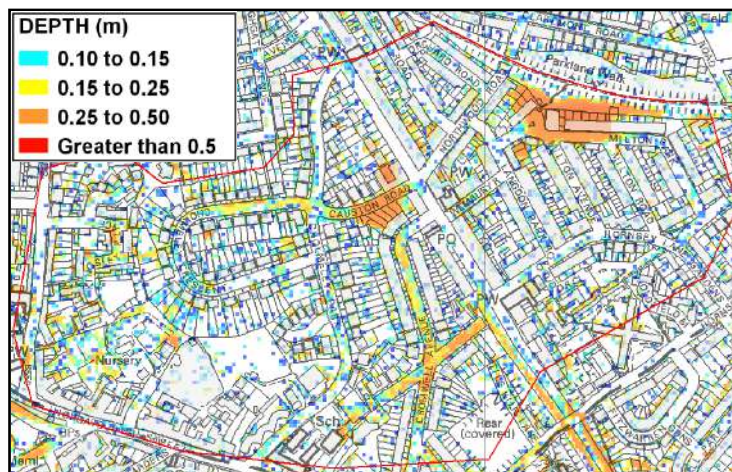


CDA: Group4_062

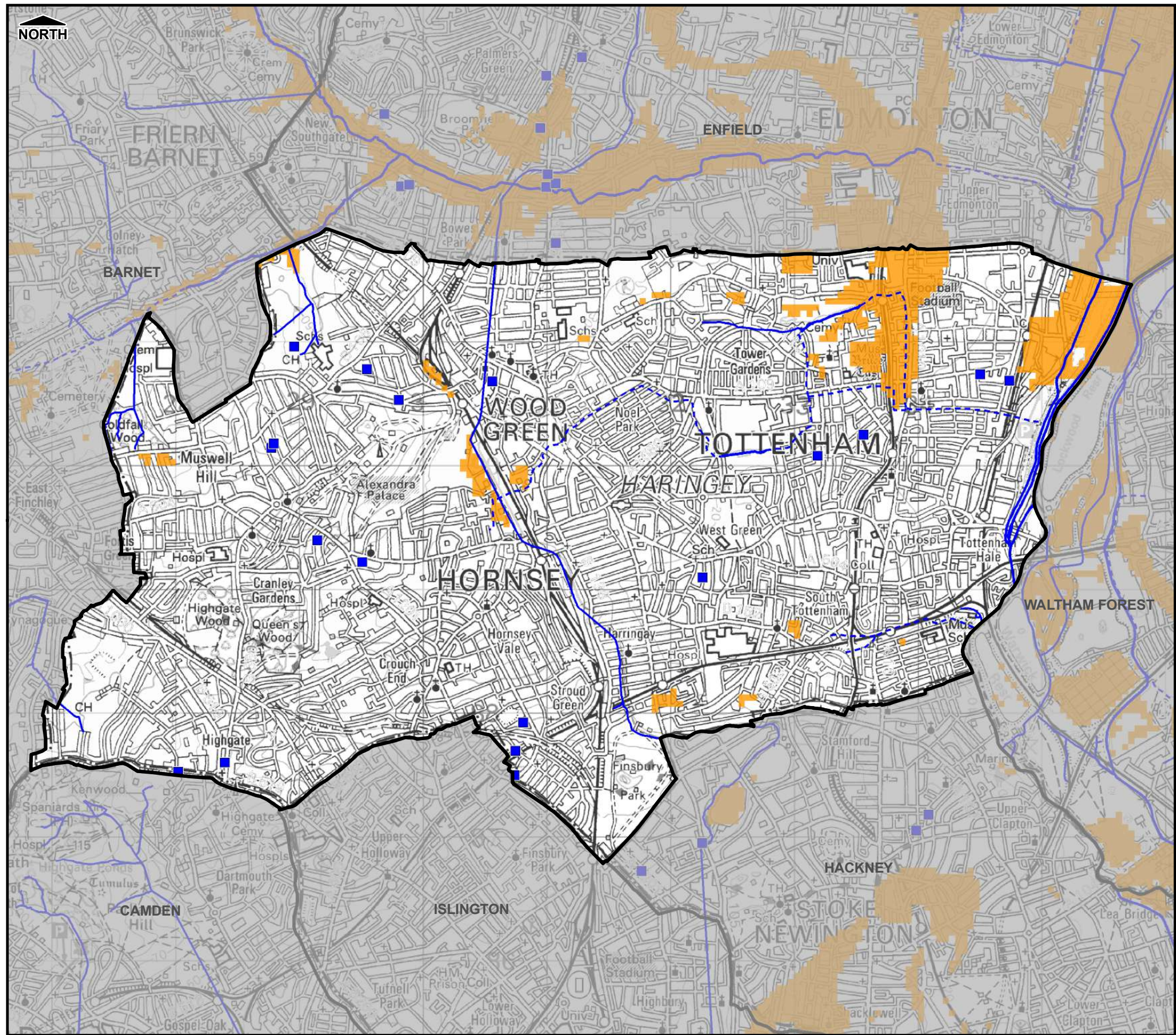
Location: Milton Park, Crouch End

Description: Surface water is observed to pond behind the Parkland Walk embankment resulting in flooding of Milton Park road and surrounding properties. A number of these properties contain basements. There is a significant health and safety risk to these residents.

Validation: There is a good correlation between the modelled results and the EA Surface Water Map for the 200 year event. The Drain London modelled results show a larger flood extent for the 30 year event. There are no other supporting flood records in the area.



Filepath: L:\Environment\zwet\CS046913_DrainLondon_Tier2\Group4\ARC\mxd\GP4_Haringey_Fig10_PotentialElevatedGWMap.mxd



THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED

Legend

Borough Administrative Boundary

Main River

Ordinary Watercourse

Groundwater Flood Incident (EA Records)

Increased Potential for Elevated Groundwater in Permeable Superficial Deposits

Culverted Watercourse (Main River)

Groundwater Flood Incident (Other Records)

Consolidated Aquifers

- Notes**
1. The increased Potential for Elevated Groundwater map shows those areas within the London Boroughs where there is an increased potential for groundwater to rise sufficiently to interact with the ground surface or be within 2 m of the ground surface. Such groundwater rise could lead to the following consequences:
 - flooding of basements of buildings below ground level;
 - flooding of buried services or other assets below ground level;
 - inundation of farmland, roads, commercial, residential and amenity areas;
 - flooding of ground floors of buildings above ground level; and
 - overflowing of sewers and drains.

2. Incident records shown are generally unconfirmed and may include issues such as water main bursts or non-groundwater related problems.

3. Areas not shown to have increased potential for elevated groundwater should be considered to have a low potential for elevated groundwater – Lack of information does not imply 'no potential' of elevated groundwater in that area.

4. Includes groundwater flood mapping provided by JBA Consulting. Copyright © Jeremy Benn Associates Limited 2008 - 2011, partially derived from data supplied by the Environment Agency

London Borough of Haringey

Haringey Council

Surface Water Management Plan

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Scale at A3 1:32,000	Date 07/04/2011	Drawn by S.TURNBULL	Approved by S.IP
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Increased Potential for Elevated Groundwater Map

Consultants

CAPITA SYMONDS

Scott Wilson

Flood Risk Management

Capita Symonds
Level Seven,
52 Grosvenor Gardens,
Belgravia,
London
SW1W 0AU

Drain London Programme Board Members

Environment Agency

Thames Water

LONDON COUNCILS

GREATER LONDON AUTHORITY

FIGURE 10

E. London Borough of Haringey Surface Water Management Plan Mapping

Appendices

807 High Road, Tottenham
Project Number: WIE20265

Document Reference: WIE20265-100-R-1-3-1-FRA

Asset location search



Property Searches

Waterman Infrastructure & Environment
Pickfords Wharf Pickfords Wharf

LONDON
SE1 9DG

Search address supplied Alabar
807
High Road
London
N17 8ER

Your reference WIE16362 - 807 High Road

Our reference ALS/ALS Standard/2019_4116881

Search date 26 November 2019

Keeping you up-to-date

Notification of Price Changes

From 1 September 2018 Thames Water Property Searches will be increasing the price of its Asset Location Search in line with RPI at 3.23%.

For further details on the price increase please visit our website: www.thameswater-propertysearches.co.uk
Please note that any orders received with a higher payment prior to the 1 September 2018 will be non-refundable.



Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13



searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk



0845 070 9148



Search address supplied: Alabar, 807, High Road, London, N17 8ER

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

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

Email: searches@thameswater.co.uk

Web: www.thameswater-propertysearches.co.uk

Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.



For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

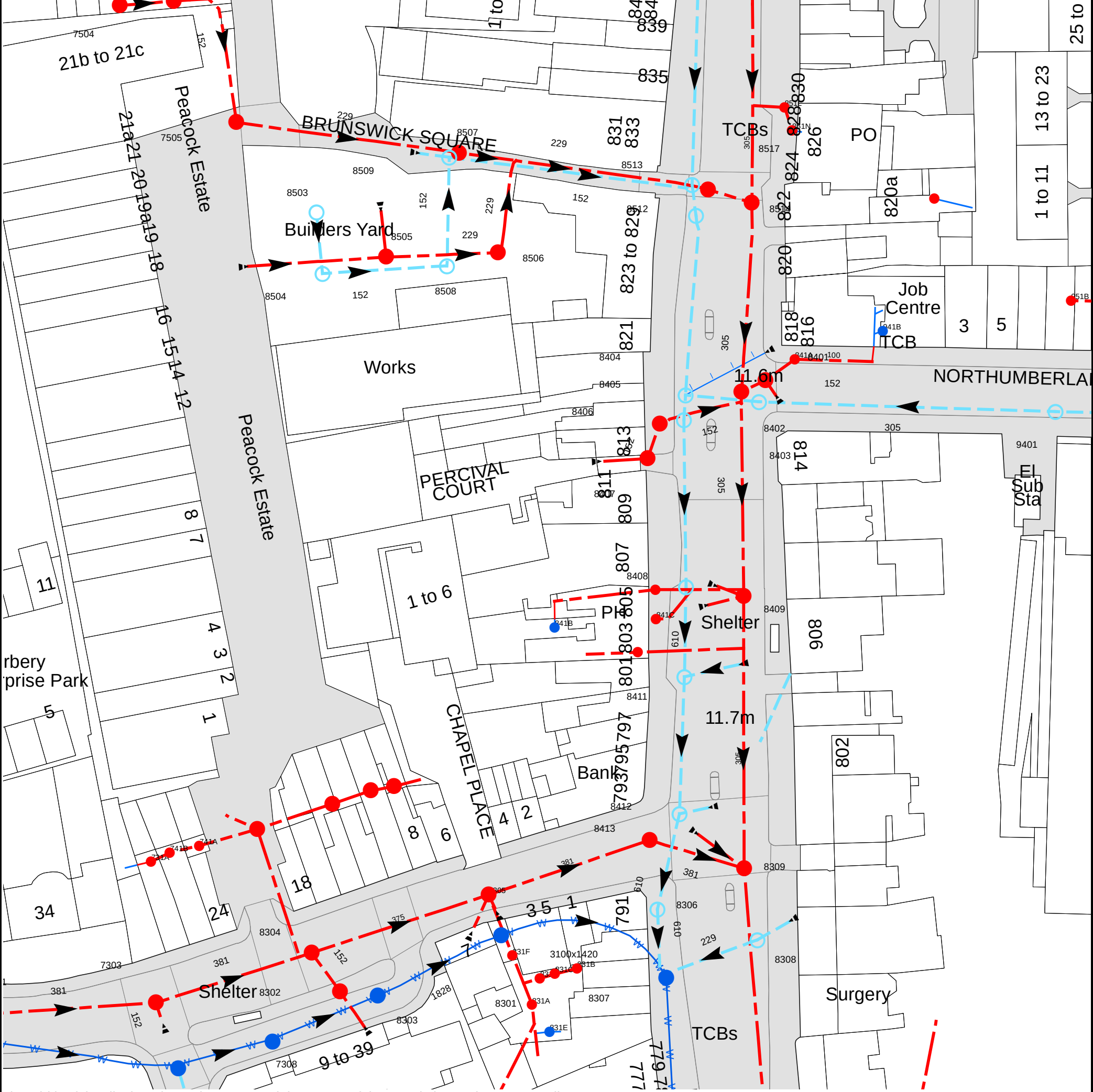
Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

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



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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
7505	13.25	12.28
851L	n/a	n/a
7504	n/a	n/a
7503	13.84	13.14
941B	n/a	n/a
951A	n/a	n/a
9401	11.53	10.22
951B	n/a	n/a
8411	11.34	9.8
8438	n/a	n/a
841B	n/a	n/a
841C	n/a	n/a
8409	11.52	9.02
8437	n/a	n/a
8408	11.41	9.83
8407	11.8	10.93
8406	11.61	10.65
8405	11.42	9.88
8402	11.55	n/a
8404	11.46	9.91
8403	11.52	9.2
8401	11.46	10.09
841A	n/a	n/a
8504	13.12	12.16
8508	12.79	12.05
8505	12.83	12.03
8506	12.81	11.83
8512	11.64	10.08
8503	12.89	12.42
8514	11.61	9.38
8517	11.53	10.47
8513	11.55	10.04
8509	12.94	11.61
8507	12.88	11.47
851N	n/a	n/a
7304	12.02	9.53
7308	11.88	9.47
831E	n/a	n/a
831A	n/a	n/a
7303	12.13	9.39
8303	11.77	9.4
8302	11.84	10.04
831D	n/a	n/a
8307	11.3	9.5
831C	n/a	n/a
831B	n/a	n/a
831F	n/a	n/a
8304	11.84	9.22
8308	11.25	10.42
8301	11.56	9.53
8306	11.37	9.64
8305	11.42	9.08
8309	11.43	8.76
731A	n/a	n/a
741B	n/a	n/a
741A	n/a	n/a
8413	11.35	8.37
7401	n/a	n/a
8412	11.35	9.75
8434	n/a	n/a
8435	n/a	n/a
8436	n/a	n/a
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.		



ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

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

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.

Sewer Fittings

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

	Air Valve
	Dam Chase
	Fitting
	Meter
	Vent Column

Operational Controls

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

	Control Valve
	Drop Pipe
	Ancillary
	Weir

End Items

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

	Outfall
	Undefined End
	Inlet

Other Symbols

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

	Public/Private Pumping Station
	Change of characteristic indicator (C.O.C.I.)
	Invert Level
	Summit

Areas

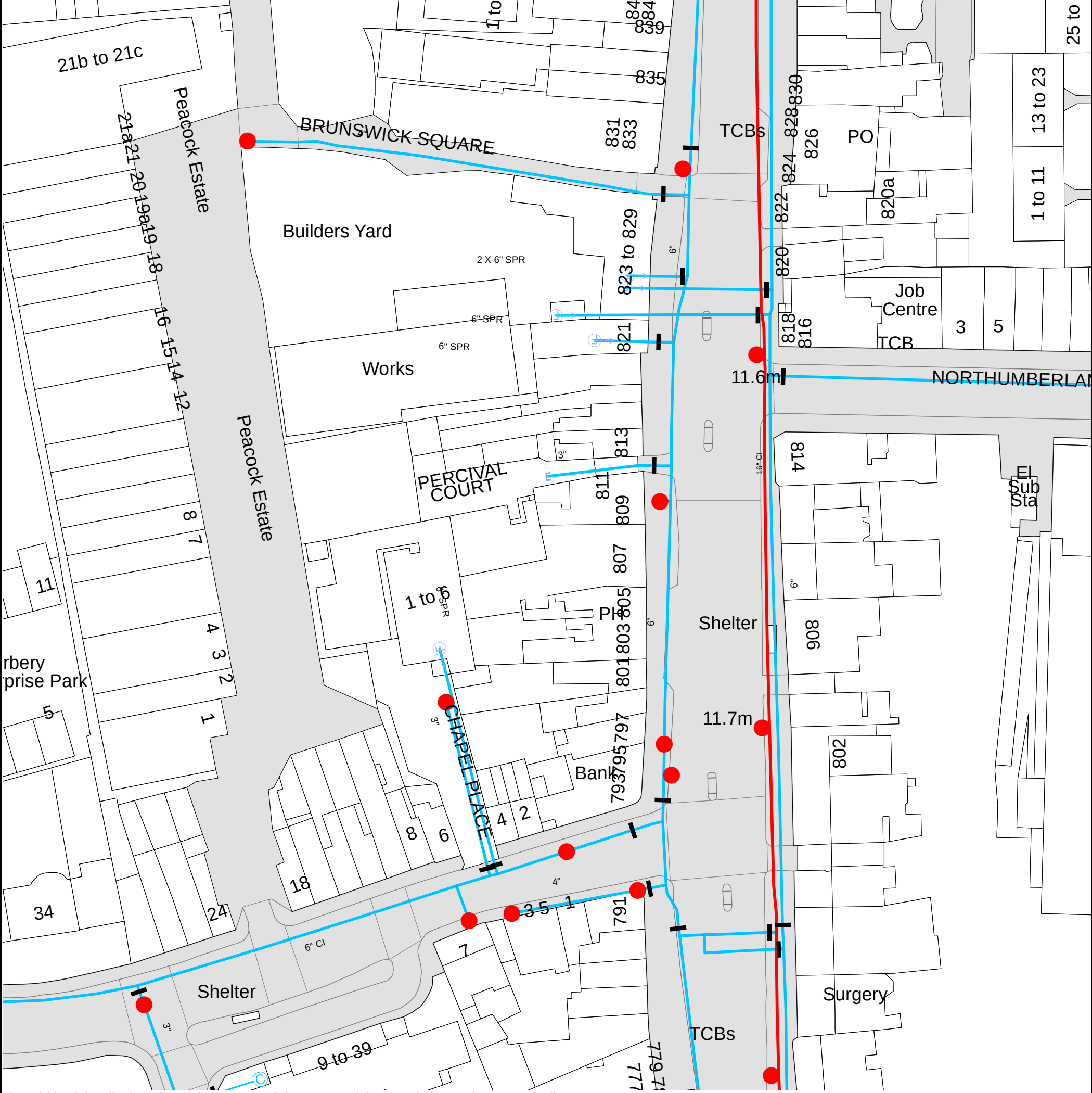
Lines denoting areas of underground surveys, etc.

	Agreement
	Operational Site
	Chamber
	Tunnel
	Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

	Foul Sewer
	Surface Water Sewer
	Combined Sewer
	Gully
	Culverted Watercourse
	Proposed
	Abandoned Sewer

- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 533846, 191457.
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

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

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

	General Purpose Valve
	Air Valve
	Pressure Control Valve
	Customer Valve

Hydrants

	Single Hydrant
--	----------------

Meters

	Meter
--	-------

End Items

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

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

Operational Sites

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

Other Symbols

	Data Logger
--	-------------

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

	Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
	Private Main: Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL's terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

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

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

Ways to pay your bill

Credit Card	BACS Payment	Telephone Banking	Cheque
Call 0845 070 9148 quoting your invoice number starting CBA or ADS / OSS	Account number 90478703 Sort code 60-00-01 A remittance advice must be sent to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW. or email ps.billing@thameswater.co.uk	By calling your bank and quoting: Account number 90478703 Sort code 60-00-01 and your invoice number	Made payable to ' Thames Water Utilities Ltd ' Write your Thames Water account number on the back. Send to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW or by DX to 151280 Slough 13

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



Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if the Ombudsman finds that you have suffered actual loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Web site: www.tpos.co.uk
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

Sewer Flooding

History Enquiry



Property
Searches

Waterman Infrastructure & Environment

Search address supplied Alabar
807
High Road
London
N17 8ER

Your reference WIE16362 - 807 High Road

Our reference SFH/SFH Standard/2019_4116882

Received date 26 November 2019

Search date 26 November 2019



Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13



searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk



0845 070 9148

Sewer Flooding

History Enquiry



Property
Searches

Search address supplied: Alabar,807,High Road,London,N17 8ER

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

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

- (i) any negligent or incorrect entry in the records searched;
- (ii) any negligent or incorrect interpretation of the records searched;
- (iii) and any negligent or incorrect recording of that interpretation in the search report
- (iv) compensation payments



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www.thameswater-propertysearches.co.uk



0845 070 9148

History of Sewer Flooding

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

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

For your guidance:

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



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DX 151280 Slough 13



searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk



0845 070 9148

F. Surface Water Drainage Calculations

Appendices

807 High Road, Tottenham
Project Number: WIE20265

Document Reference: WIE20265-100-R-1-3-1-FRA

CALCULATIONS

Company: WIE
 Sheet No: 1 of 1
 By: Craig Thwaites
 Checked:

Office: London
 Project No: WIE16362
 Date: 04.04.2018
 Date: 04.04.2018

Project Title: 807 High Road, Tottenham
 Calculations Title: Existing Surface Water Runoff Rate

LOCATION	CALCULATIONS	OPTIONS
	Calculations based on: Design and Analysis of urban storm drainage. The Wallingford Procedure, Volume 1 Principles methods and practice.	
	User Input Data	
	Total site area 0.060 ha	
	SAAR (From FEH) 626	
	Rainfall Intensity (From FEH) 46.7	
	PIMP (% impervious) 100 %	
	Soil Type 0.40	
	Very Low Runoff (well drained sandy, loamy or earthy peat soils) 0.15	
	Low Runoff (Very permeable soils (e.g. gravel, sand) 0.30	
	Moderate (Very fine sands, silts and sedimentary clays) 0.40	
	High Runoff (Clayey or loamy soils) 0.45	
	Very High Runoff (Soils of the wet uplands) 0.50	
Fig. 9.7	UCWI (From Figure 9.7 of Wallingford Method) 57	
Eqn. 13	Q_p (peak discharge) = $2.78 C_v CR i A$	
	Where: Q_p (Peak Discharge) i = rainfall intensity A = Total Area	
From FEH	Average rainfall Intensity (i) M100_60 is: 46.7 mm	
Eqn 7.20	$C_v = PR/100$	
Eqn 7.3	$PR = (0.829 PIMP) + (25.0 SOIL) + (0.078 UCWI) - 20.7$	
	PIMP (Percentage of catchment which is impervious) 100 %	
Page 52	Note: PIMP can not be less than 40% 40 %	
	Thus value of PIMP to be used 100 %	
	Soil: 0.40 UCWI: 57.49	
	PR = 76.68	
	Thus C_v = 0.77	
Sec 7.10	CR (Recommended for simulation and design) 1.3	
	Q_p for 1 in 100 year 60 minute duration = 7.8 l/s or 129.3 l/s/ha	

Waterman Group		Page 1
Pickfords Wharf Clink Street London, SE1 9DG		
Date 09/06/2020 14:29 File 200218_Blue Roof.SRCX	Designed by CSCT Checked by	
Innovyze		Source Control 2019.1
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 100 Soil 0.400 Area (ha) 0.060 Urban 0.000 SAAR (mm) 626 Region Number Region 6 Results 1/s QBAR Rural 0.2 QBAR Urban 0.2 Q100 years 0.6 Q1 year 0.2 Q30 years 0.4 Q100 years 0.6		
©1982-2019 Innovyze		

Waterman Group					Page 1																																																																																																																																																																																																																																																																																		
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 141 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (1/s)</th><th>Max Control (1/s)</th><th>Max Σ Outflow (1/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>9.690</td><td>0.490</td><td>0.0</td><td>1.7</td><td>1.7</td><td>16.5</td><td>O K</td></tr><tr><td>30 min Summer</td><td>9.808</td><td>0.608</td><td>0.0</td><td>1.7</td><td>1.7</td><td>20.5</td><td>Flood Risk</td></tr><tr><td>60 min Summer</td><td>9.889</td><td>0.689</td><td>0.0</td><td>1.7</td><td>1.7</td><td>23.2</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>9.979</td><td>0.779</td><td>0.0</td><td>1.7</td><td>1.7</td><td>26.3</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>9.996</td><td>0.796</td><td>0.0</td><td>1.7</td><td>1.7</td><td>26.8</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>9.991</td><td>0.791</td><td>0.0</td><td>1.7</td><td>1.7</td><td>26.7</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>9.952</td><td>0.752</td><td>0.0</td><td>1.7</td><td>1.7</td><td>25.4</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>9.899</td><td>0.699</td><td>0.0</td><td>1.7</td><td>1.7</td><td>23.6</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>9.842</td><td>0.642</td><td>0.0</td><td>1.7</td><td>1.7</td><td>21.7</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>9.785</td><td>0.585</td><td>0.0</td><td>1.7</td><td>1.7</td><td>19.7</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>9.653</td><td>0.453</td><td>0.0</td><td>1.7</td><td>1.7</td><td>15.3</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>9.459</td><td>0.259</td><td>0.0</td><td>1.7</td><td>1.7</td><td>8.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>9.327</td><td>0.127</td><td>0.0</td><td>1.6</td><td>1.6</td><td>4.3</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>9.284</td><td>0.084</td><td>0.0</td><td>1.4</td><td>1.4</td><td>2.8</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>9.259</td><td>0.059</td><td>0.0</td><td>1.0</td><td>1.0</td><td>2.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>9.249</td><td>0.049</td><td>0.0</td><td>0.8</td><td>0.8</td><td>1.6</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>9.243</td><td>0.043</td><td>0.0</td><td>0.7</td><td>0.7</td><td>1.5</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>9.239</td><td>0.039</td><td>0.0</td><td>0.6</td><td>0.6</td><td>1.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>9.237</td><td>0.037</td><td>0.0</td><td>0.5</td><td>0.5</td><td>1.2</td><td>O K</td></tr><tr><td>15 min Winter</td><td>9.690</td><td>0.490</td><td>0.0</td><td>1.7</td><td>1.7</td><td>16.5</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>166.280</td><td>0.0</td><td>17.7</td><td>18</td></tr><tr><td>30 min Summer</td><td>106.854</td><td>0.0</td><td>22.8</td><td>33</td></tr><tr><td>60 min Summer</td><td>65.327</td><td>0.0</td><td>27.9</td><td>62</td></tr><tr><td>120 min Summer</td><td>42.102</td><td>0.0</td><td>36.0</td><td>118</td></tr><tr><td>180 min Summer</td><td>31.993</td><td>0.0</td><td>41.0</td><td>148</td></tr><tr><td>240 min Summer</td><td>26.057</td><td>0.0</td><td>44.5</td><td>180</td></tr><tr><td>360 min Summer</td><td>19.169</td><td>0.0</td><td>49.2</td><td>248</td></tr><tr><td>480 min Summer</td><td>15.223</td><td>0.0</td><td>52.0</td><td>318</td></tr><tr><td>600 min Summer</td><td>12.648</td><td>0.0</td><td>54.1</td><td>386</td></tr><tr><td>720 min Summer</td><td>10.830</td><td>0.0</td><td>55.5</td><td>456</td></tr><tr><td>960 min Summer</td><td>8.425</td><td>0.0</td><td>57.6</td><td>580</td></tr><tr><td>1440 min Summer</td><td>5.847</td><td>0.0</td><td>60.0</td><td>808</td></tr><tr><td>2160 min Summer</td><td>4.033</td><td>0.0</td><td>62.1</td><td>1128</td></tr><tr><td>2880 min Summer</td><td>3.101</td><td>0.0</td><td>63.6</td><td>1472</td></tr><tr><td>4320 min Summer</td><td>2.154</td><td>0.0</td><td>66.3</td><td>2204</td></tr><tr><td>5760 min Summer</td><td>1.673</td><td>0.0</td><td>68.6</td><td>2936</td></tr><tr><td>7200 min Summer</td><td>1.387</td><td>0.0</td><td>71.1</td><td>3632</td></tr><tr><td>8640 min Summer</td><td>1.196</td><td>0.0</td><td>73.6</td><td>4400</td></tr><tr><td>10080 min Summer</td><td>1.061</td><td>0.0</td><td>76.2</td><td>5032</td></tr><tr><td>15 min Winter</td><td>166.280</td><td>0.0</td><td>17.7</td><td>18</td></tr></tbody></table>							Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m³)	Status	15 min Summer	9.690	0.490	0.0	1.7	1.7	16.5	O K	30 min Summer	9.808	0.608	0.0	1.7	1.7	20.5	Flood Risk	60 min 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480 min Summer	9.899	0.699	0.0	1.7	1.7	23.6	Flood Risk																																																																																																																																																																																																																																																																																
600 min Summer	9.842	0.642	0.0	1.7	1.7	21.7	Flood Risk																																																																																																																																																																																																																																																																																
720 min Summer	9.785	0.585	0.0	1.7	1.7	19.7	Flood Risk																																																																																																																																																																																																																																																																																
960 min Summer	9.653	0.453	0.0	1.7	1.7	15.3	O K																																																																																																																																																																																																																																																																																
1440 min Summer	9.459	0.259	0.0	1.7	1.7	8.7	O K																																																																																																																																																																																																																																																																																
2160 min Summer	9.327	0.127	0.0	1.6	1.6	4.3	O K																																																																																																																																																																																																																																																																																
2880 min Summer	9.284	0.084	0.0	1.4	1.4	2.8	O K																																																																																																																																																																																																																																																																																
4320 min Summer	9.259	0.059	0.0	1.0	1.0	2.0	O K																																																																																																																																																																																																																																																																																
5760 min Summer	9.249	0.049	0.0	0.8	0.8	1.6	O K																																																																																																																																																																																																																																																																																
7200 min Summer	9.243	0.043	0.0	0.7	0.7	1.5	O K																																																																																																																																																																																																																																																																																
8640 min Summer	9.239	0.039	0.0	0.6	0.6	1.3	O K																																																																																																																																																																																																																																																																																
10080 min Summer	9.237	0.037	0.0	0.5	0.5	1.2	O K																																																																																																																																																																																																																																																																																
15 min Winter	9.690	0.490	0.0	1.7	1.7	16.5	O K																																																																																																																																																																																																																																																																																
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																																																																																			
15 min Summer	166.280	0.0	17.7	18																																																																																																																																																																																																																																																																																			
30 min Summer	106.854	0.0	22.8	33																																																																																																																																																																																																																																																																																			
60 min Summer	65.327	0.0	27.9	62																																																																																																																																																																																																																																																																																			
120 min Summer	42.102	0.0	36.0	118																																																																																																																																																																																																																																																																																			
180 min Summer	31.993	0.0	41.0	148																																																																																																																																																																																																																																																																																			
240 min Summer	26.057	0.0	44.5	180																																																																																																																																																																																																																																																																																			
360 min Summer	19.169	0.0	49.2	248																																																																																																																																																																																																																																																																																			
480 min Summer	15.223	0.0	52.0	318																																																																																																																																																																																																																																																																																			
600 min Summer	12.648	0.0	54.1	386																																																																																																																																																																																																																																																																																			
720 min Summer	10.830	0.0	55.5	456																																																																																																																																																																																																																																																																																			
960 min Summer	8.425	0.0	57.6	580																																																																																																																																																																																																																																																																																			
1440 min Summer	5.847	0.0	60.0	808																																																																																																																																																																																																																																																																																			
2160 min Summer	4.033	0.0	62.1	1128																																																																																																																																																																																																																																																																																			
2880 min Summer	3.101	0.0	63.6	1472																																																																																																																																																																																																																																																																																			
4320 min Summer	2.154	0.0	66.3	2204																																																																																																																																																																																																																																																																																			
5760 min Summer	1.673	0.0	68.6	2936																																																																																																																																																																																																																																																																																			
7200 min Summer	1.387	0.0	71.1	3632																																																																																																																																																																																																																																																																																			
8640 min Summer	1.196	0.0	73.6	4400																																																																																																																																																																																																																																																																																			
10080 min Summer	1.061	0.0	76.2	5032																																																																																																																																																																																																																																																																																			
15 min Winter	166.280	0.0	17.7	18																																																																																																																																																																																																																																																																																			
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Waterman Group		Page 2					
Pickfords Wharf Clink Street London, SE1 9DG	807 High Road, Tottenham Below Ground Attenuation 1 in 100 year + 40% CC						
Date 01/06/2020 File 200218_Below Ground Tan...	Designed by C. Thwaites Checked by						
Innovyze		Source Control 2019.1					
<u>Summary of Results for 100 year Return Period (+40%)</u>							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	9.809	0.609	0.0	1.7	1.7	20.5	Flood Risk
60 min Winter	9.891	0.691	0.0	1.7	1.7	23.3	Flood Risk
120 min Winter	9.986	0.786	0.0	1.7	1.7	26.5	Flood Risk
180 min Winter	9.997	0.797	0.0	1.7	1.7	26.9	Flood Risk
240 min Winter	9.987	0.787	0.0	1.7	1.7	26.6	Flood Risk
360 min Winter	9.930	0.730	0.0	1.7	1.7	24.6	Flood Risk
480 min Winter	9.854	0.654	0.0	1.7	1.7	22.1	Flood Risk
600 min Winter	9.770	0.570	0.0	1.7	1.7	19.2	Flood Risk
720 min Winter	9.667	0.467	0.0	1.7	1.7	15.8	O K
960 min Winter	9.499	0.299	0.0	1.7	1.7	10.1	O K
1440 min Winter	9.327	0.127	0.0	1.6	1.6	4.3	O K
2160 min Winter	9.271	0.071	0.0	1.2	1.2	2.4	O K
2880 min Winter	9.256	0.056	0.0	0.9	0.9	1.9	O K
4320 min Winter	9.243	0.043	0.0	0.7	0.7	1.5	O K
5760 min Winter	9.237	0.037	0.0	0.5	0.5	1.2	O K
7200 min Winter	9.233	0.033	0.0	0.4	0.4	1.1	O K
8640 min Winter	9.231	0.031	0.0	0.4	0.4	1.0	O K
10080 min Winter	9.229	0.029	0.0	0.3	0.3	1.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
30 min Winter	106.854	0.0	22.8	32			
60 min Winter	65.327	0.0	27.9	60			
120 min Winter	42.102	0.0	36.0	116			
180 min Winter	31.993	0.0	41.0	154			
240 min Winter	26.057	0.0	44.5	188			
360 min Winter	19.169	0.0	49.2	266			
480 min Winter	15.223	0.0	52.0	342			
600 min Winter	12.648	0.0	54.1	418			
720 min Winter	10.830	0.0	55.5	484			
960 min Winter	8.425	0.0	57.6	590			
1440 min Winter	5.847	0.0	60.0	794			
2160 min Winter	4.033	0.0	62.1	1104			
2880 min Winter	3.101	0.0	63.6	1468			
4320 min Winter	2.154	0.0	66.3	2196			
5760 min Winter	1.673	0.0	68.6	2920			
7200 min Winter	1.387	0.0	71.1	3648			
8640 min Winter	1.196	0.0	73.6	4360			
10080 min Winter	1.061	0.0	76.2	5112			
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Pickfords Wharf Clink Street London, SE1 9DG	807 High Road, Tottenham Below Ground Attenuation 1 in 100 year + 40% CC	
Date 01/06/2020 File 200218_Below Ground Tan...	Designed by C. Thwaites Checked by	
Innovyze Source Control 2019.1		

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 533853 191473 TQ 33853 91473
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.950
Cv (Winter)	0.950
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.045

Time (mins)		Area
From:	To:	(ha)
0	4	0.045

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Waterman Group		Page 4
Pickfords Wharf Clink Street London, SE1 9DG	807 High Road, Tottenham Below Ground Attenuation 1 in 100 year + 40% CC	
Date 01/06/2020 File 200218_Below Ground Tan...	Designed by C. Thwaites Checked by	
Innovyze Source Control 2019.1		

Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 9.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	35.5	0.0	0.800	35.5	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0065-1700-0800-1700
Design Head (m) 0.800
Design Flow (l/s) 1.7
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 65
Invert Level (m) 9.200
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	1.7
Flush-Flo™	0.243	1.7
Kick-Flo®	0.506	1.4
Mean Flow over Head Range	-	1.5

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.5	1.200	2.0	3.000	3.1	7.000	4.6
0.200	1.7	1.400	2.2	3.500	3.3	7.500	4.8
0.300	1.7	1.600	2.3	4.000	3.6	8.000	4.9
0.400	1.6	1.800	2.5	4.500	3.8	8.500	5.1
0.500	1.4	2.000	2.6	5.000	3.9	9.000	5.2
0.600	1.5	2.200	2.7	5.500	4.1	9.500	5.4
0.800	1.7	2.400	2.8	6.000	4.3		
1.000	1.9	2.600	2.9	6.500	4.5		

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Waterman Group		Page 1	
Pickfords Wharf Clink Street London, SE1 9DG	807 High Road, Tottenham Blue Roof Attenuation 1 in 100 yr + 40% CC		
Date 01/06/2020 File 200218_Blue Roof.SRCX	Designed by C. Thwaites Checked by		
Innovyze	Source Control 2019.1		

Summary of Results for 100 year Return Period (+40%)							
Half Drain Time : 1723 minutes.							
Storm Event	Max Level	Max Depth	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m³)	Status
15 min Summer	9.873	0.073	0.0	0.1	0.1	5.9	Flood Risk
30 min Summer	9.893	0.093	0.0	0.1	0.1	7.5	Flood Risk
60 min Summer	9.913	0.113	0.0	0.1	0.1	9.2	Flood Risk
120 min Summer	9.944	0.144	0.0	0.1	0.1	11.7	Flood Risk
180 min Summer	9.962	0.162	0.0	0.1	0.1	13.1	Flood Risk
240 min Summer	9.974	0.174	0.0	0.1	0.1	14.1	Flood Risk
360 min Summer	9.988	0.188	0.0	0.1	0.1	15.2	Flood Risk
480 min Summer	9.995	0.195	0.0	0.1	0.1	15.7	Flood Risk
600 min Summer	9.997	0.197	0.0	0.1	0.1	16.0	Flood Risk
720 min Summer	9.998	0.198	0.0	0.1	0.1	16.1	Flood Risk
960 min Summer	9.997	0.197	0.0	0.1	0.1	15.9	Flood Risk
1440 min Summer	9.988	0.188	0.0	0.1	0.1	15.2	Flood Risk
2160 min Summer	9.976	0.176	0.0	0.1	0.1	14.2	Flood Risk
2880 min Summer	9.967	0.167	0.0	0.1	0.1	13.5	Flood Risk
4320 min Summer	9.951	0.151	0.0	0.1	0.1	12.2	Flood Risk
5760 min Summer	9.939	0.139	0.0	0.1	0.1	11.3	Flood Risk
7200 min Summer	9.930	0.130	0.0	0.1	0.1	10.5	Flood Risk
8640 min Summer	9.922	0.122	0.0	0.1	0.1	9.9	Flood Risk
10080 min Summer	9.916	0.116	0.0	0.1	0.1	9.4	Flood Risk
15 min Winter	9.873	0.073	0.0	0.1	0.1	5.9	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	166.280	0.0	3.7	19
30 min Summer	106.854	0.0	4.3	34
60 min Summer	65.327	0.0	7.9	64
120 min Summer	42.102	0.0	9.5	124
180 min Summer	31.993	0.0	10.4	184
240 min Summer	26.057	0.0	11.0	242
360 min Summer	19.169	0.0	11.6	362
480 min Summer	15.223	0.0	11.9	482
600 min Summer	12.648	0.0	12.0	602
720 min Summer	10.830	0.0	12.1	722
960 min Summer	8.425	0.0	12.0	960
1440 min Summer	5.847	0.0	11.6	1254
2160 min Summer	4.033	0.0	19.0	1604
2880 min Summer	3.101	0.0	18.9	1992
4320 min Summer	2.154	0.0	17.9	2812
5760 min Summer	1.673	0.0	22.7	3632
7200 min Summer	1.387	0.0	23.5	4464
8640 min Summer	1.196	0.0	24.2	5264
10080 min Summer	1.061	0.0	24.8	6048
15 min Winter	166.280	0.0	3.7	19

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Waterman Group			Page 2				
Pickfords Wharf Clink Street London, SE1 9DG		807 High Road, Tottenham Blue Roof Attenuation 1 in 100 yr + 40% CC					
Date 01/06/2020 File 200218_Blue Roof.SRCX		Designed by C. Thwaites Checked by					
Innovyze		Source Control 2019.1					
Summary of Results for 100 year Return Period (+40%)							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	9.893	0.093	0.0	0.1	0.1	7.5	Flood Risk
60 min Winter	9.913	0.113	0.0	0.1	0.1	9.2	Flood Risk
120 min Winter	9.944	0.144	0.0	0.1	0.1	11.7	Flood Risk
180 min Winter	9.962	0.162	0.0	0.1	0.1	13.1	Flood Risk
240 min Winter	9.974	0.174	0.0	0.1	0.1	14.1	Flood Risk
360 min Winter	9.988	0.188	0.0	0.1	0.1	15.2	Flood Risk
480 min Winter	9.995	0.195	0.0	0.1	0.1	15.8	Flood Risk
600 min Winter	9.998	0.198	0.0	0.1	0.1	16.0	Flood Risk
720 min Winter	9.999	0.199	0.0	0.1	0.1	16.1	Flood Risk
960 min Winter	9.998	0.198	0.0	0.1	0.1	16.0	Flood Risk
1440 min Winter	9.989	0.189	0.0	0.1	0.1	15.3	Flood Risk
2160 min Winter	9.975	0.175	0.0	0.1	0.1	14.2	Flood Risk
2880 min Winter	9.964	0.164	0.0	0.1	0.1	13.3	Flood Risk
4320 min Winter	9.946	0.146	0.0	0.1	0.1	11.8	Flood Risk
5760 min Winter	9.930	0.130	0.0	0.1	0.1	10.6	Flood Risk
7200 min Winter	9.918	0.118	0.0	0.1	0.1	9.6	Flood Risk
8640 min Winter	9.909	0.109	0.0	0.1	0.1	8.8	Flood Risk
10080 min Winter	9.901	0.101	0.0	0.1	0.1	8.1	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
30 min Winter	106.854	0.0	4.3	34			
60 min Winter	65.327	0.0	7.9	64			
120 min Winter	42.102	0.0	9.5	122			
180 min Winter	31.993	0.0	10.4	180			
240 min Winter	26.057	0.0	11.0	240			
360 min Winter	19.169	0.0	11.6	356			
480 min Winter	15.223	0.0	11.9	474			
600 min Winter	12.648	0.0	12.0	590			
720 min Winter	10.830	0.0	12.1	702			
960 min Winter	8.425	0.0	12.0	926			
1440 min Winter	5.847	0.0	11.6	1354			
2160 min Winter	4.033	0.0	19.0	1668			
2880 min Winter	3.101	0.0	18.9	2132			
4320 min Winter	2.154	0.0	17.9	3024			
5760 min Winter	1.673	0.0	22.7	3872			
7200 min Winter	1.387	0.0	23.5	4752			
8640 min Winter	1.196	0.0	24.2	5536			
10080 min Winter	1.061	0.0	24.8	6352			
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Pickfords Wharf Clink Street London, SE1 9DG	807 High Road, Tottenham Blue Roof Attenuation 1 in 100 yr + 40% CC	
Date 01/06/2020 File 200218_Blue Roof.SRCX	Designed by C. Thwaites Checked by	
Innovyze Source Control 2019.1		

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 533853 191473 TQ 33853 91473
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.950
Cv (Winter)	0.950
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.015

Time (mins)	Area
From: To:	(ha)
0	4 0.015

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Pickfords Wharf Clink Street London, SE1 9DG	807 High Road, Tottenham Blue Roof Attenuation 1 in 100 yr + 40% CC	
Date 01/06/2020 File 200218_Blue Roof.SRCX	Designed by C. Thwaites Checked by	
Innovyze Source Control 2019.1		

Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 9.800 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.96
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	84.3	0.0	0.200	84.3	0.0

Orifice Outflow Control

Diameter (m) 0.010 Discharge Coefficient 0.600 Invert Level (m) 9.800

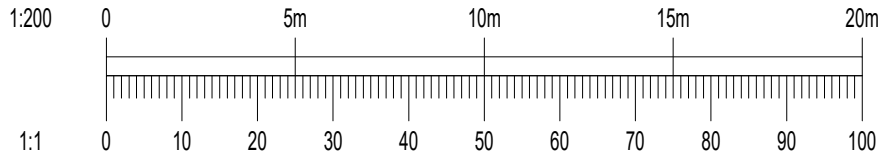
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G. Surface Water Drainage Strategy Drawings

Appendices

807 High Road, Tottenham
Project Number: WIE20265

Document Reference: WIE20265-100-R-1-3-1-FRA



This drawing should not be scaled. Dimensions to be verified on site.
Any discrepancies should be referred to the Engineer prior to work being put in hand.

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Pickfords Wharf, Clink Street, London SE1 9DG t 020 7928 7888 f 03333 444 501

GENERAL NOTES

NOTES

- DRAWING BACKGROUND BASED ON ROOF PLAN - PROPOSED BY F3 ARCHITECTS
- FOUL CONNECTIONS FROM CATCHMENTS TO UTILISE EXISTING CONNECTIONS WHERE POSSIBLE. CCTV DRAINAGE SURVEY IS TO BE UNDERTAKEN AT THE DETAILED DESIGN STAGE TO CONFIRM CONNECTIONS

KEY

- SITE BOUNDARY
- CATCHMENT 1 - TO BLUE ROOF (AREA = 0.015Ha)
- CATCHMENT 2 - TO BELOW GROUND TANK (AREA = 0.045Ha)

P01	09.06.20	FIRST ISSUE	CT
Rev	Date	Description	By

Amendments

Project	807 High Road, Tottenham
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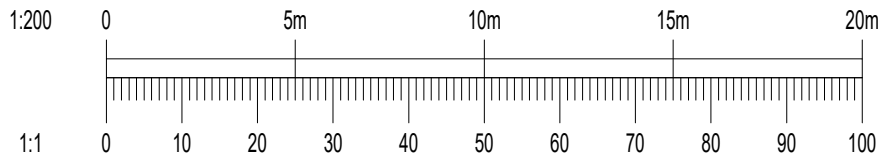
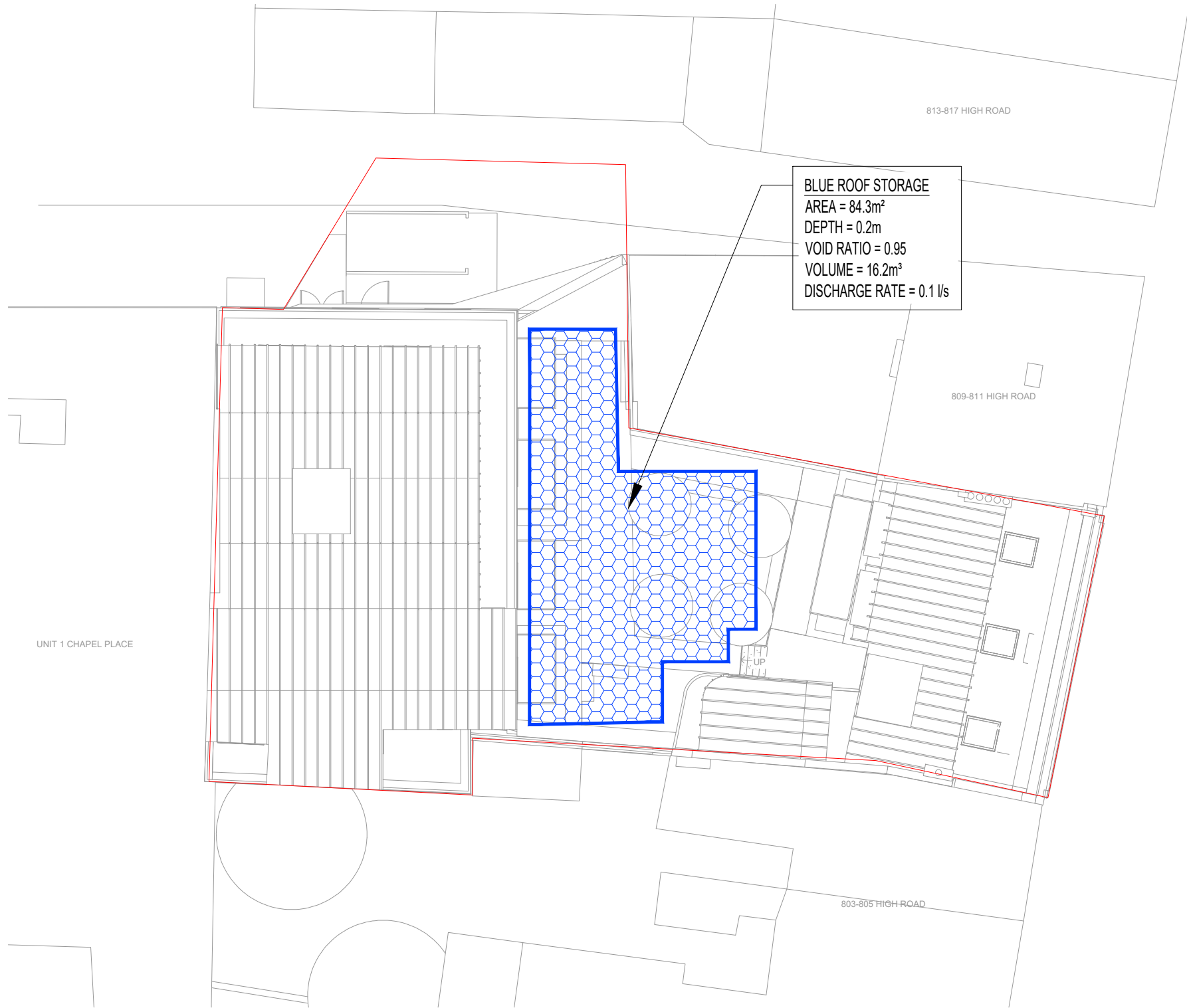
Title	DRAINAGE STRATEGY DRAINAGE CATCHMENTS
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Client	Tottenham Hotspur Football Club
--------	---------------------------------



Pickfords Wharf | Clink Street | London SE1 9DG
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mail@watermangroup.com www.watermangroup.com

Status				PRELIMINARY			
Designed By	CT	Checked By	SM	Waterman Ref	WIE16362		
Drawn By	CT	Date	JUNE 2020	Scales @ A3	AS SHOWN		
Project - Originator - Volume - Level - Type - Role - Number							Revision
16362-WIE-ZZ-ZZ-DR-D-1001							P01



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NOTES

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- FOUL CONNECTIONS FROM CATCHMENTS TO UTILISE EXISTING CONNECTIONS WHERE POSSIBLE. CCTV DRAINAGE SURVEY IS TO BE UNDERTAKEN AT THE DETAILED DESIGN STAGE TO CONFIRM CONNECTIONS

KEY

-  SITE BOUNDARY
-  BLUE ROOF ATTENUATION

P01	09.06.20	FIRST ISSUE	CT
Rev	Date	Description	By

Amendments

Project
807 High Road, Tottenham

Title
DRAINAGE STRATEGY
BLUE ROOF ATTENUATION

Client
Tottenham Hotspur Football Club



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16362-WIE-ZZ-ZZ-DR-D-1002	P01



KEY

- SITE BOUNDARY
- BELOW GROUND ATTENUATION
- PROPOSED SURFACE WATER SEWER
- PROPOSED FOUL WATER SEWER
- EXISTING TW SURFACE WATER SEWER
- EXISTING TW FOUL WATER SEWER

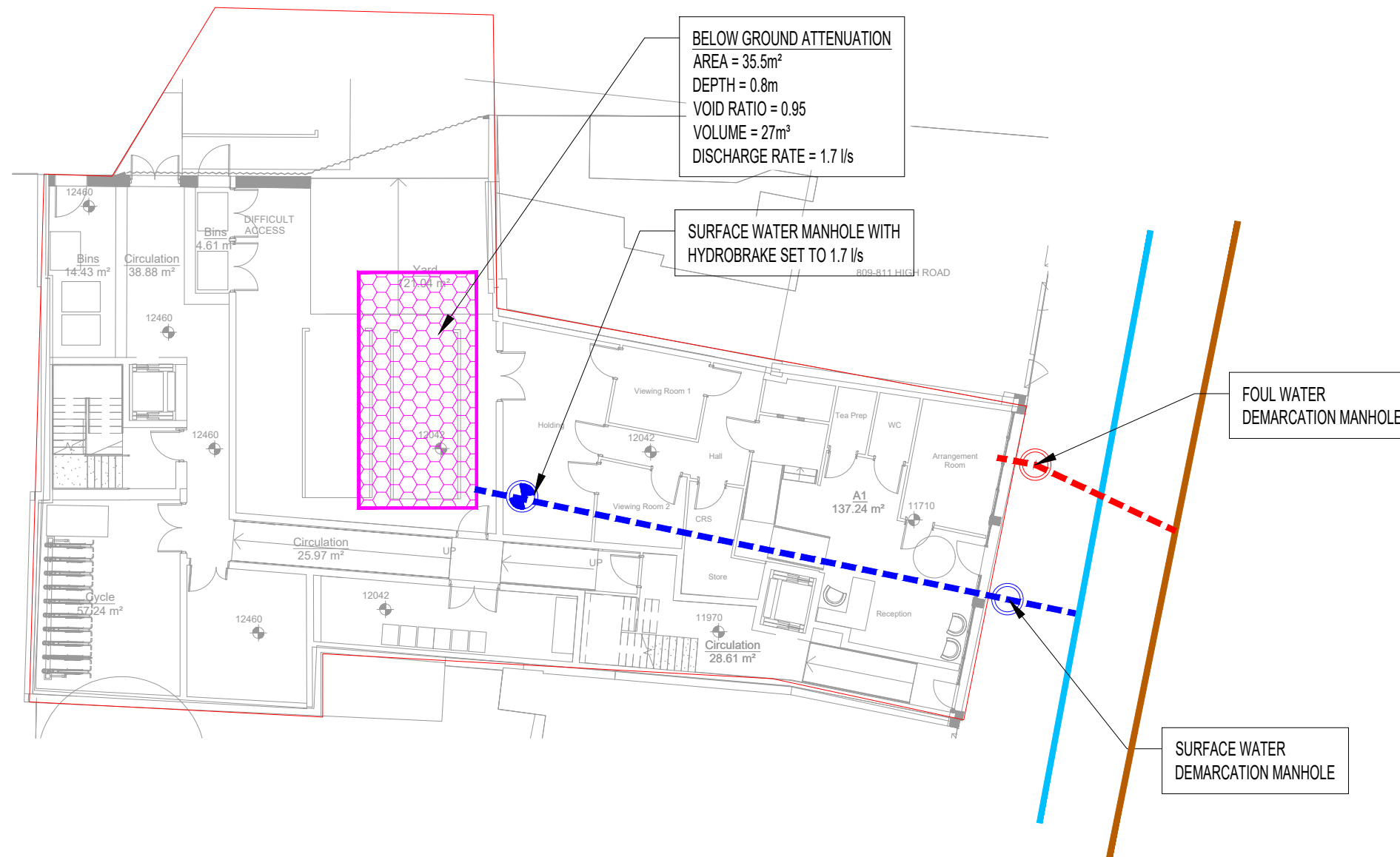
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- LOCATION OF DRAINAGE FEATURES TO BE CONFIRMED AT DETAILED DESIGN
- STATUTORY UNDERTAKERS TO BE CONTACTED AT DETAILED DESIGN TO DISCUSS SERVICES DIVERSIONS AND COORDINATION
- LOCATION OF THAMES WATER ASSETS INDICATIVE ONLY



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Amendments

Project
807 High Road, Tottenham

Title
BELOW GROUND ATTENUATION AND DRAINAGE STRATEGY

Client
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16362-WIE-ZZ-ZZ-DR-D-1003					P01



KEY

- SITE BOUNDARY
- BELOW GROUND ATTENUATION
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- PROPOSED FOUL WATER SEWER
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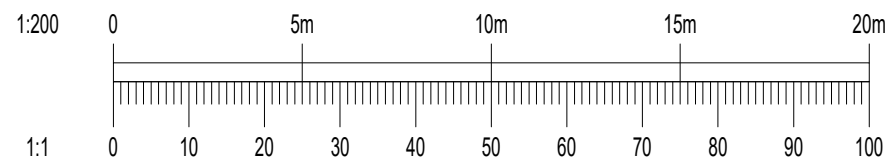
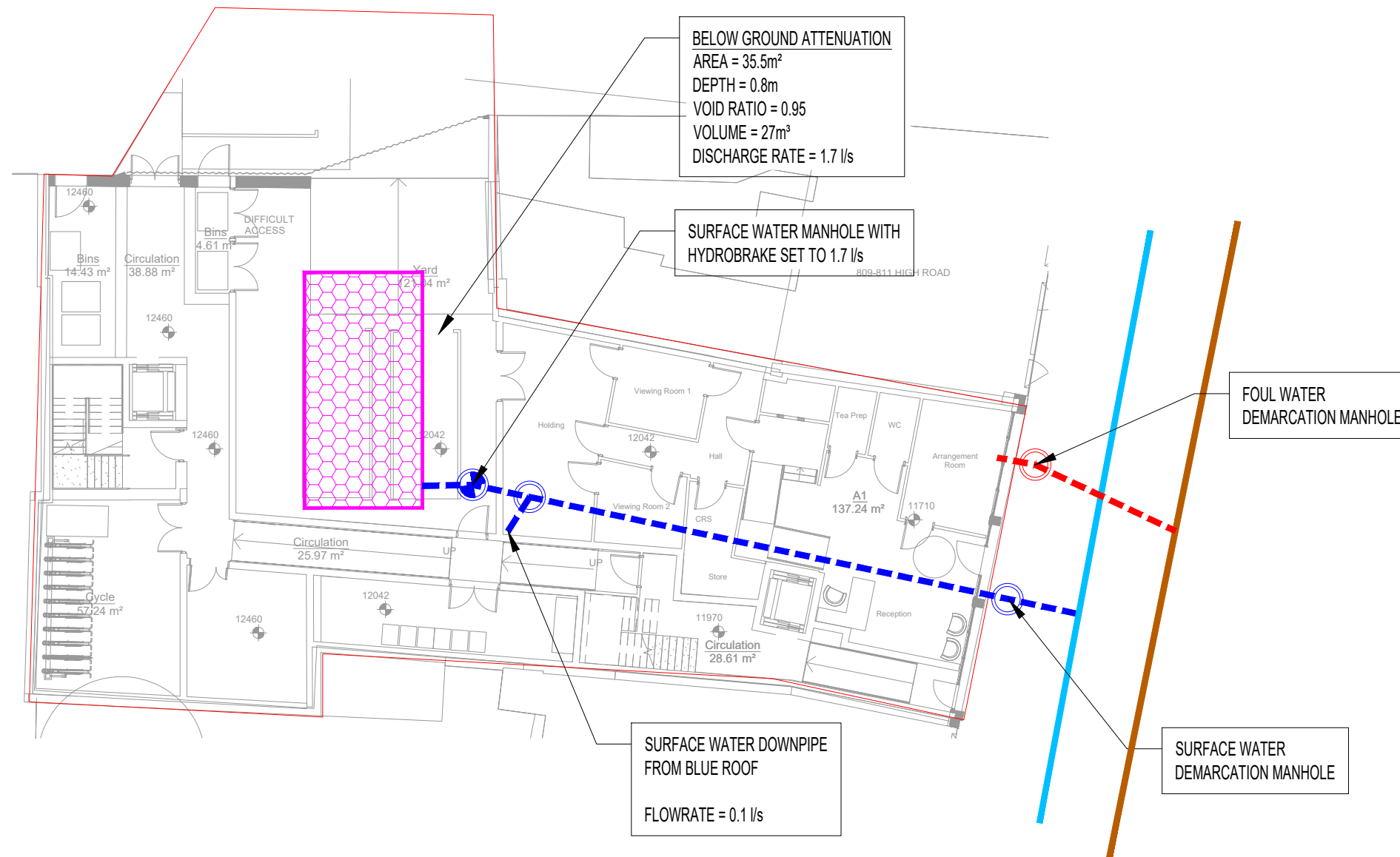
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H. Haringey SuDS Proforma

Appendices

807 High Road, Tottenham
Project Number: WIE20265

Document Reference: WIE20265-100-R-1-3-1-FRA

1. Project & Site Details	Project / Site Name (including sub-catchment / stage / phase where appropriate)	807 High Road, Tottenham
	Address & post code	807 High Road, Tottenham, London, N17 8ER, UK
	OS Grid ref. (Easting, Northing)	E 533849 N 191456
	LPA reference (if applicable)	
	Brief description of proposed work	2.6.10. 807 High Road is a medium scale commercial and residential development in the heart of Tottenham, just to the north west of the stadium. Planning consent was granted to take down the existing High Road building, replacing it with an enhanced 4 storey brick building
	Total site Area	0.06 m ²
	Total existing impervious area	0.06 m ²
	Total proposed impervious area	0.06 m ²
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	Site is in a Critical Drainage Area (CDA)
	Existing drainage connection type and location	assumed to be into Thames Water 610mm surface water sewer running from north to south beneath High Road
Designer Name		
Designer Position		

2. Proposed Discharge Arrangements	2a. Infiltration Feasibility		
	Superficial geology classification	Gravel	
	Bedrock geology classification	London Clay	
	Site infiltration rate	m/s	
	Depth to groundwater level	m below ground level	
	Is infiltration feasible?	No	
	2b. Drainage Hierarchy		
		Feasible (Y/N)	Proposed (Y/N)
	1 store rainwater for later use	Y	Y
	2 use infiltration techniques, such as porous surfaces in non-clay areas	N	N
	3 attenuate rainwater in ponds or open water features for gradual release	N	N
	4 attenuate rainwater by storing in tanks or sealed water features for gradual release	Y	Y
	5 discharge rainwater direct to a watercourse	N	N
	6 discharge rainwater to a surface water sewer/drain	Y	
	7 discharge rainwater to the combined sewer.	Y	N
2c. Proposed Discharge Details			
Proposed discharge location	surface water sewer running from north to south		
Has the owner/regulator of the discharge location been	accommodate the proposed surface water		

	Designer Company	
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	consulted?	
--	------------	--

3. Drainage Strategy	3a. Discharge Rates & Required Storage				
		Greenfield (GF) runoff rate (l/s)	Existing discharge rate (l/s)	Required storage for GF rate (m ³)	Proposed discharge rate (l/s)
	Q _{bar}	0.2			
	1 in 1	0.2			
	1 in 30	0.4			
	1 in 100	0.6	7.8		
	1 in 100 + CC			57.1	1.8
	Climate change allowance used		40%		
	3b. Principal Method of Flow Control		Hyrdobrake flow control		
	3c. Proposed SuDS Measures				
			Catchment area (m ²)	Plan area (m ²)	Storage vol. (m ³)
	Rainwater harvesting		0		0
	Infiltration systems		0		0
	Green roofs		0	0	0
	Blue roofs		150	0	0
	Filter strips		0	0	0
	Filter drains		0	0	0
	Bioretention / tree pits		0	0	0
	Pervious pavements		0	0	0
	Swales		0	0	0
	Basins/ponds		0	0	0
	Attenuation tanks		450		0
	Total		600	0	0

4. Supporting Information	4a. Discharge & Drainage Strategy	Page/section of drainage report
	Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Pages 15 and 17
	Drainage hierarchy (2b)	Pages 17 and 18
	Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Drainage Drawing in Appendix G; Thames Water correspondence in Appendix E
	Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Appendix F
	Proposed SuDS measures & specifications (3b)	Pages 17, 18 and 19: Drainage drawing in Appendix G
	4b. Other Supporting Details	Page/section of drainage report
	Detailed Development Layout	Page 4 and Appendix B
	Detailed drainage design drawings, including exceedance flow routes	Appendix G
	Detailed landscaping plans	Drainage Strategy drawing in Appendix
	Maintenance strategy	Pages 22 and 23
	Demonstration of how the proposed SuDS measures improve:	
	a) water quality of the runoff?	Page 22
	b) biodiversity?	
	c) amenity?	

UK and Ireland Office Locations

