

Planning Statement

SuDS Strategy

Antill road

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Contents

Introduction	1
Policy Summary	2
Site Overview	5
Flood Risk	9
SuDS: Overview	16
SuDS: Site Specific Evaluation	18
Conclusions	33
Appendix A: Environment Agency Flood Map	34
Appendix B: Local Sewer System	35
Appendix C: Haringey SuDS Proforma	36
Appendix D: Detailed Drawings	37

Introduction

SuDS Strategy

Antill Road

About the scheme

Eight Associates has been appointed to develop a sustainable drainage systems (SuDS) strategy for the proposed development at Antill Road, London, N15 4AS. The site is located within the London Borough Haringey.

The proposed project consists of the development of new two storey house on an existing site at Antill Road to provide a new residential dwelling. The total gross internal floor area of the whole scheme is approximately 97m².

The aspiration for the scheme is to significantly improve the existing site and its immediate environment by providing an efficient and inclusive development, which meets the policy recommendations of the London Borough of Haringey.

Aim of this study

The purpose of this report is to develop a SuDS strategy for the proposed development at Antill Road. The report will evaluate the suitability of the development site for incorporation of SuDS within development proposals. Specific SuDS components will be recommended based on their suitability to manage surface water runoff within the constraints of the development site.

Policy Summary

SuDS Strategy

Antill Road

National planning policy

The National Planning Policy Framework (NPPF)¹ requires that all local planning authorities ensure that proposed developments do not increase the potential for flood risk on a site. The NPPF not only requires that flood risk is minimised, but that the development is appropriately flood resilient, giving priority to the use of sustainable drainage systems (SuDS).

As a result of this, all new developments should utilise SuDS unless there are practical reasons for not doing so. The proposed site should ensure runoff rates are sufficiently managed and not increased as a result of the development, with the aim of achieving greenfield runoff rates where feasible.

Local policy

The London Plan

The London Plan recognises the requirements outlined in national policy, whilst also addressing the need for drainage design to consider other aspects in addition to reducing flood risk. In addition, the London Plan recognises the need for developments to be adaptable to the potential future impacts of climate change, including the expectation of wetter winters, drier summers and increasing frequency of natural hazard events such as flooding.

Policy 5.13 (Sustainable Drainage) of the London Plan, along with the supporting Sustainable Design and Construction Supplementary Planning Guidance 2014 and Non-Statutory Technical Standards for Sustainable Drainage Systems 2015 outline the SuDS requirements that new developments are expected to address. Unless there are practical reasons for not doing so, new developments should aim to utilise all opportunities to minimise post-development surface water runoff, as close to greenfield runoff rates as practically possible. The minimum expectation for major developments is to achieve at least 50% attenuation of pre-development surface water runoff. SuDS should be used to address strategic objectives across policy areas such as water use efficiency and quality, biodiversity, amenity and recreation. In addition, SuDS should be considered for developments using the sustainable drainage hierarchy (Figure 1).

The Draft London Plan

The draft London Plan (August 2018) is the upcoming strategic plan for London, which aims to shape the planning process over the 32 London Boroughs and the City of London for the next 20–25 years. On its adoption, the new London Plan is expected to require compliance with the following in relation to flood risk and SuDS

Policy SI13 Sustainable Drainage

- 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.
- 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 in line with the drainage hierarchy
- Development proposals for impermeable paving should be refused where appropriate, including on small surfaces such as front gardens and driveways.

¹ The National Planning Policy Framework (2012) Department for Communities and Local Government

Policy Summary

SuDS Strategy

Antill Road

Local policy

London Borough of Haringey

In accordance with national planning policy, the London Borough of Haringey requires that all new developments implement SuDS, where appropriate, to reduce flood risk within the urban environment. In addition, all SuDS designs must make arrangements for ongoing maintenance over the lifetime of the development. The development should consider calculations of run-off rates, water storage capacity proposals and include a management & maintenance plan for all SuDS.

Haringey Strategic Flood Risk Assessment (SFRA)

National planning policy requires that local planning authorities undertake a SFRA (Level 1 and Level 2) to assess flood risk across the borough, inform planning decisions including those related to SuDS proposals, and support the strategic spatial planning policies in the local development plans. JBA Consulting, on behalf of the London Borough of Haringey, published a Level 1 and Level 2 SFRA in February 2015.

Policy Summary

SuDS Strategy

Antill Road

The sustainable drainage hierarchy

Both national and local policy refers to the sustainable drainage hierarchy (Figure 1). This reflects recommendations outlined within the best practice SuDS Manual, published by CIRIA. This should be followed when specifying and installing SuDS strategies on development sites.

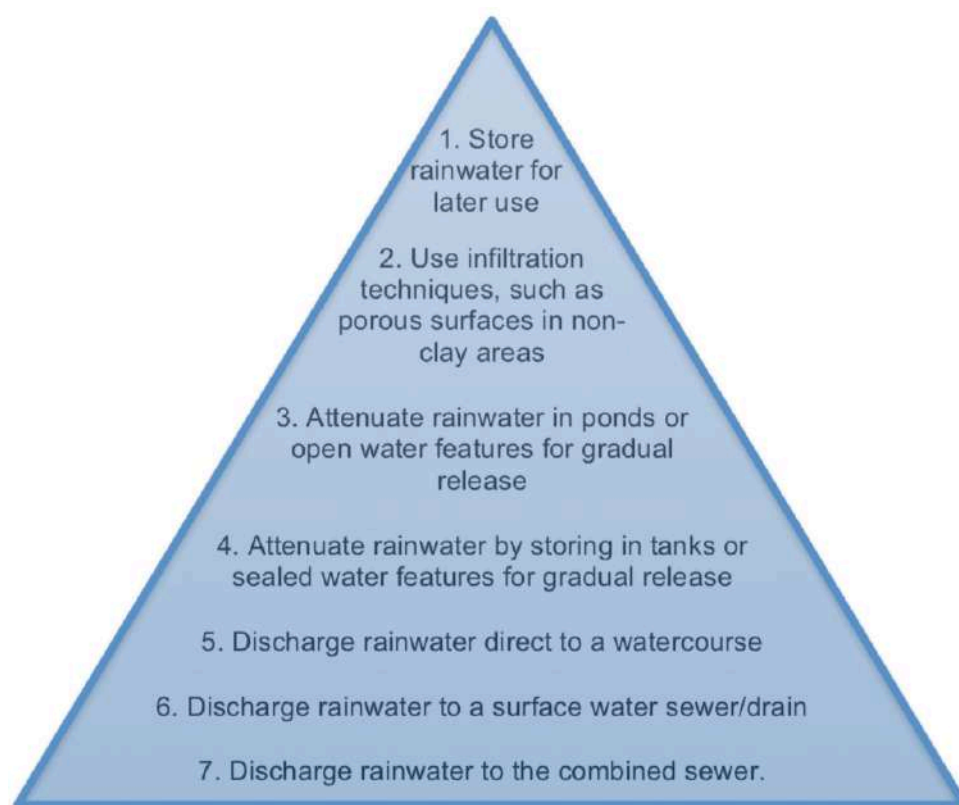


Figure 1: Sustainable drainage hierarchy (London Plan)

Site Overview

SuDS Strategy

Antill Road

Site location

The Antill Road (N15 4AS) site is located on Antill Road with High Road (A10) towards the west (Figure 2). The surrounding area is densely populated and highly urbanised. Transport infrastructure in the vicinity of the development includes the local road network and railway network, including Seven Sisters Station (approximately 550m southwest of the site). There are not any large green spaces within the immediate vicinity of the site.

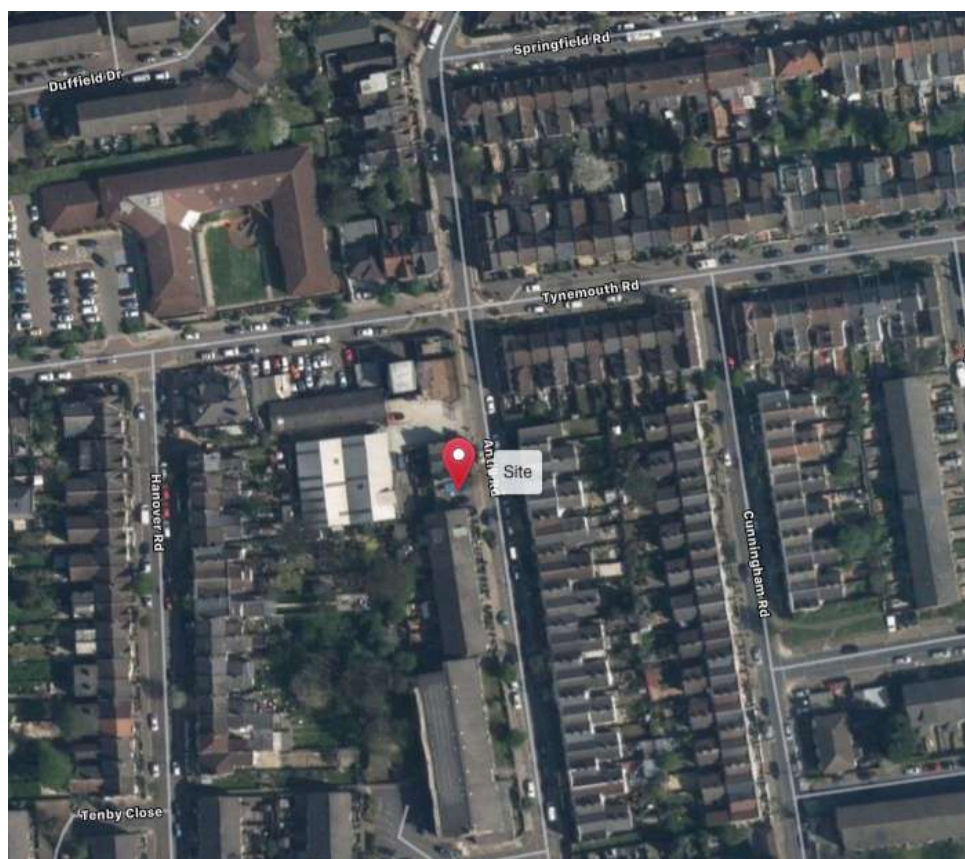


Figure 2: Map showing location of development site

Site Overview

SuDS Strategy

Antill Road

Site description

Details of the existing surface water drainage network on the site are not known but it is anticipated that surface water runoff from the existing hardstanding drains at an uncontrolled rate of site. The information provided by the design team indicates that there are currently no dedicated sustainable drainage systems (SuDS) on site.

The underlying geological characteristics of the surrounding area have been determined using the British Geological Survey's 'Geology of Britain Viewer'²:

- Bedrock geology – London Clay Formation (clay, silt and sand).
- Superficial geology – Enfield Silt Member (clay and silt).

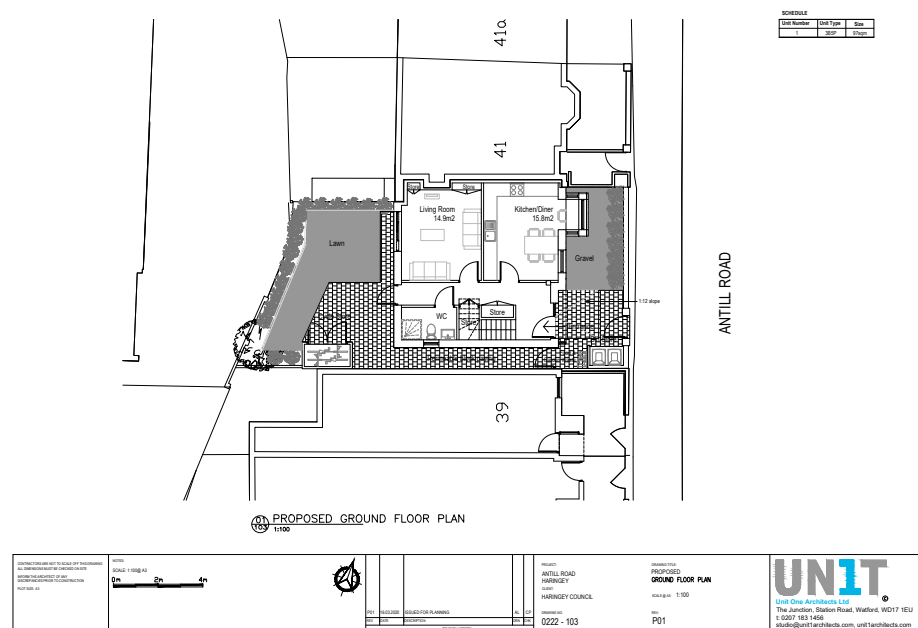


Figure 3: Aerial image of development site

² British Geological Survey 'Geology of Britain Viewer'. Accessed from; <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Site Overview

SuDS Strategy

Antill Road

Site topography

A topographic survey has been produced for the site which illustrates that the site is relatively flat (Figure 4). However, the site does have a slight decline from west to east, with the lowest point being at the southeast corner of the site (7.88 mAOD). Based on the information provided, the existing site appears to be entirely hard landscaping (131.8m²).

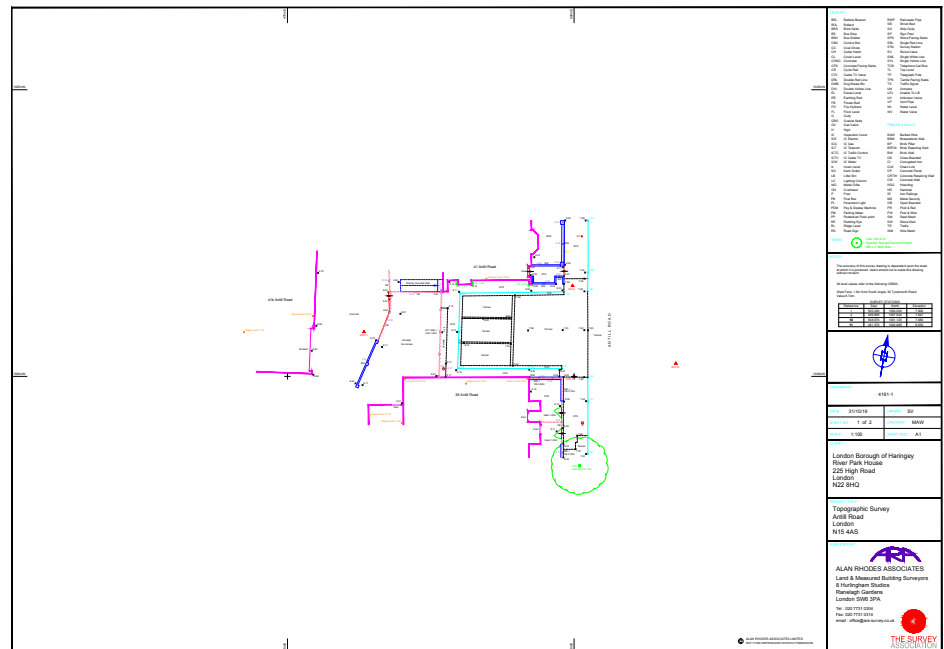


Figure 4: Topography of development site.

Development proposals

The development proposals comprise the demolition of the existing hardstanding at the Antill Road site and construction of a new two-storey building on the existing site to provide a three-bedroom house. The total gross internal floor area of the whole scheme is approximately 97m². An elevation of the proposed development is shown in Figure 5.

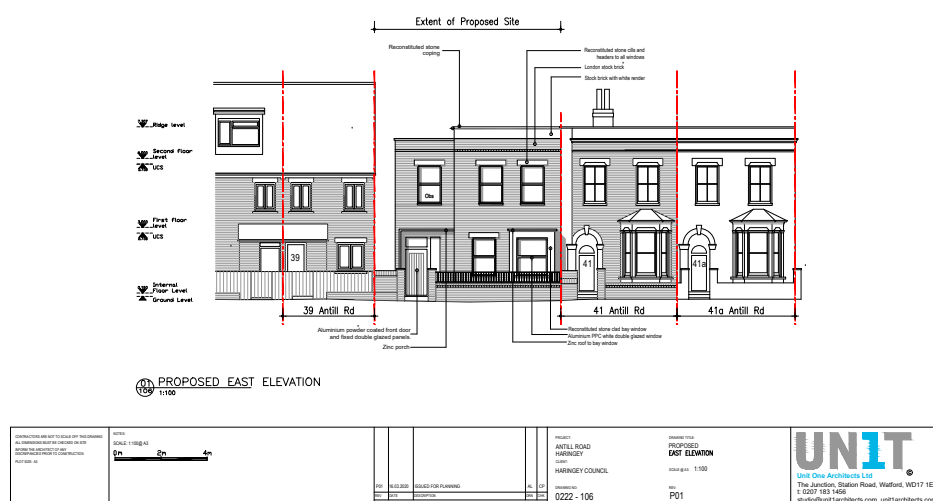
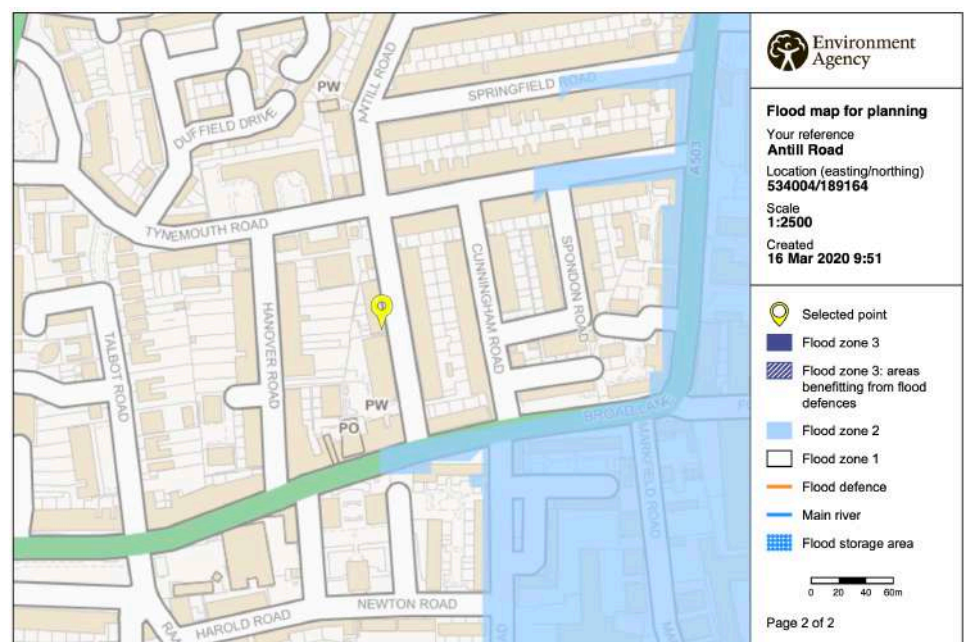


Figure 5: Proposed development elevation

Flood Risk SuDS Strategy Antill Road

Annual probability of flooding

The Environment Agency's Flood Map for Planning³ confirms that the site is in flood zone 1; 'an area with a low probability of flooding' (Figure 6). Flood zone 1 comprises areas assessed as having a 1% AEP (1 in 100 years) or less annual probability of flooding from rivers and the sea. As the development site is less than 1 hectare and is located in flood zone 1, a site-specific flood risk assessment (FRA) is not required, provided the site is not affected by other sources of flooding. The full Environment Agency Flood Map for Planning report is given in Appendix A.



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Figure 6: Environment Agency Flood Map for Planning

The Haringey SFRA report and SFRA Web Map⁴ been reviewed. The data indicates that the site is at low risk of flooding from groundwater, sewer and other artificial sources, with the risk of flooding from surface water between medium and high. There is a risk of flooding posed reservoirs to the east of the site. Neither the SFRA nor the Environment Agency data includes historical recorded flood events in the vicinity of the development site.

³ Environment Agency: Flood Map for Planning. Accessed from; <https://flood-map-for-planning.service.gov.uk/>

⁴ West London SFRA Web Map. Accessed from;

https://www.haringey.gov.uk/sites/haringeygovuk/files/2014s1700_haringeycouncil_sfra_v4_0_issue.pdf

Flood Risk SuDS Strategy Antill Road

Flood risk from rivers and sea

In accordance with Environment Agency's Risk of Flooding from Rivers and the Sea mapping tool⁵, the development site has a very low risk of flooding from rivers and the sea (Figure 7). The annual probability of flooding from the rivers and the sea is less than 1 in 1,000 (<0.1% AEP).



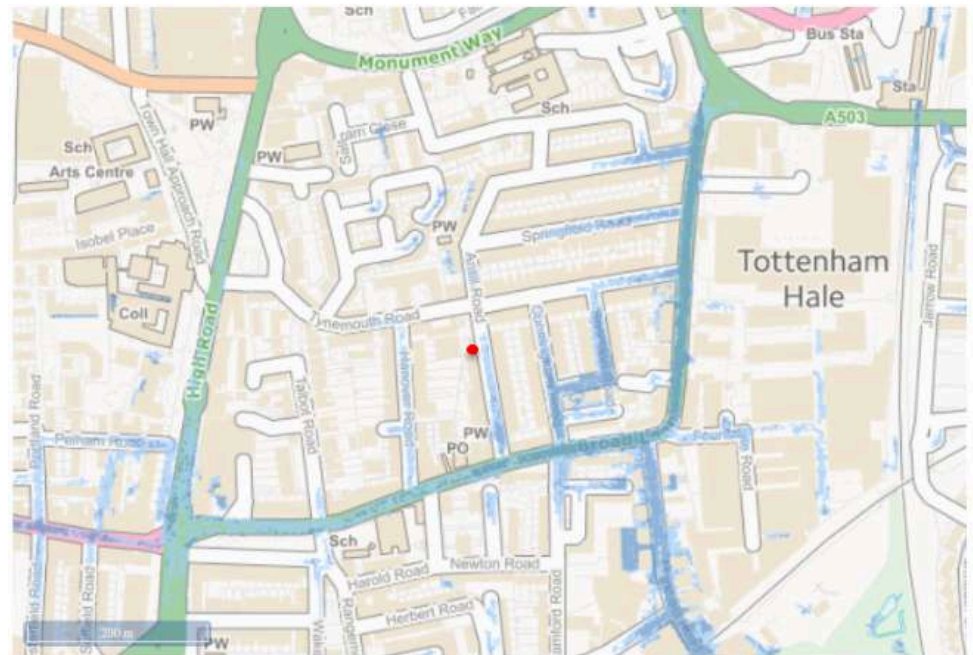
Figure 7: Environment Agency Risk of Flooding from Rivers and the Sea map (red dot indicates site)

⁵ Environment Agency: Risk of Flooding from Rivers and the Sea map. Accessed from; <https://flood-warning-information.service.gov.uk/long-term-flood-risk/>

Flood Risk SuDS Strategy Antill Road

Surface water (pluvial)

In accordance with the Environment Agency's Risk of Flooding from Surface Water mapping tool⁶, the development site is primarily at low to medium of flooding from surface water (pluvial) sources, where flood depths are expected to be within 0.3m to 0.9m (Figure 8). Whilst the London Borough of Haringey Surface Water Management Plan identifies the potential flood depths as between 0.1m and 0.25m in the 1 in 100-year scenario. No historical surface water flooding incidences have been identified at the site.



Surface water flood risk: water depth in a medium risk scenario

Flood depth (millimetres)

● Over 900mm ● 300 to 900mm ● Below 300mm

Figure 8: Environment Agency Risk of Flooding from Surface Water map.

⁶ Environment Agency: Risk of Flooding from Surface Water map. Accessed from; <https://flood-warning-information.service.gov.uk/long-term-flood-risk/>

Flood Risk SuDS Strategy Antill Road

Surface water (pluvial)

Whilst the London Borough of Haringey Surface Water Management Plan identifies the potential flood depths as between 0.1m and 0.25m in the 1 in 100-year scenario. No historical surface water flooding incidences have been identified at the site.

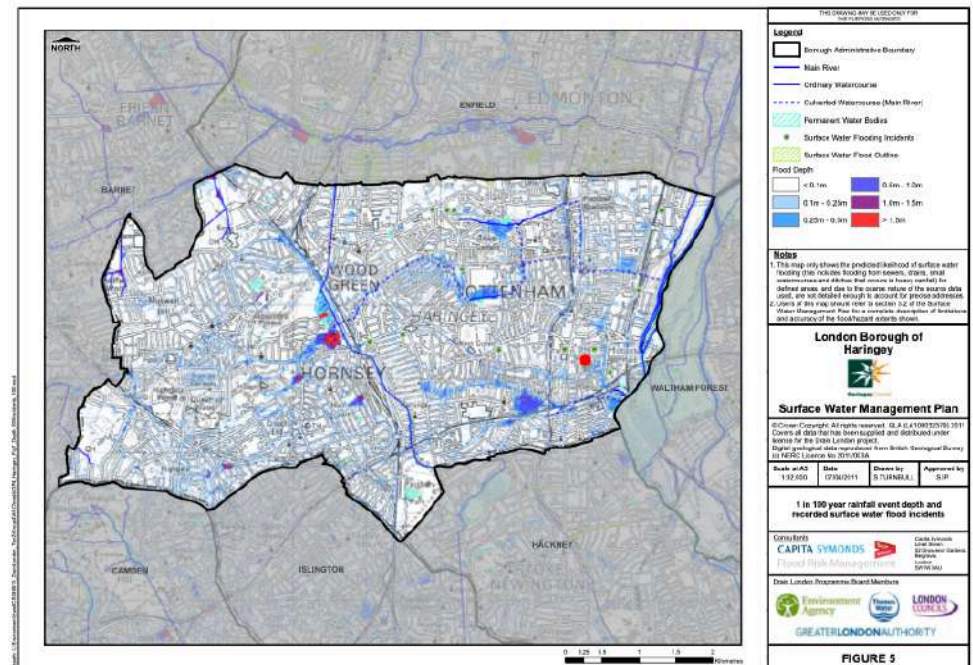


Figure 9: London Borough of Haringey Surface Water Management Plan surface water flood levels and historic flood events (red dot indicates site)

Flood Risk SuDS Strategy Antill Road

Reservoirs

In accordance with the Environment Agency's Risk of Flooding from Reservoirs mapping tool, the site has been noted as being located within an area at risk of flooding from reservoirs⁷ (Figure 9). In the event of an uncontrolled release of water from the collection of reservoirs to the east of the development site, the development could be at risk of flooding up to 2m.

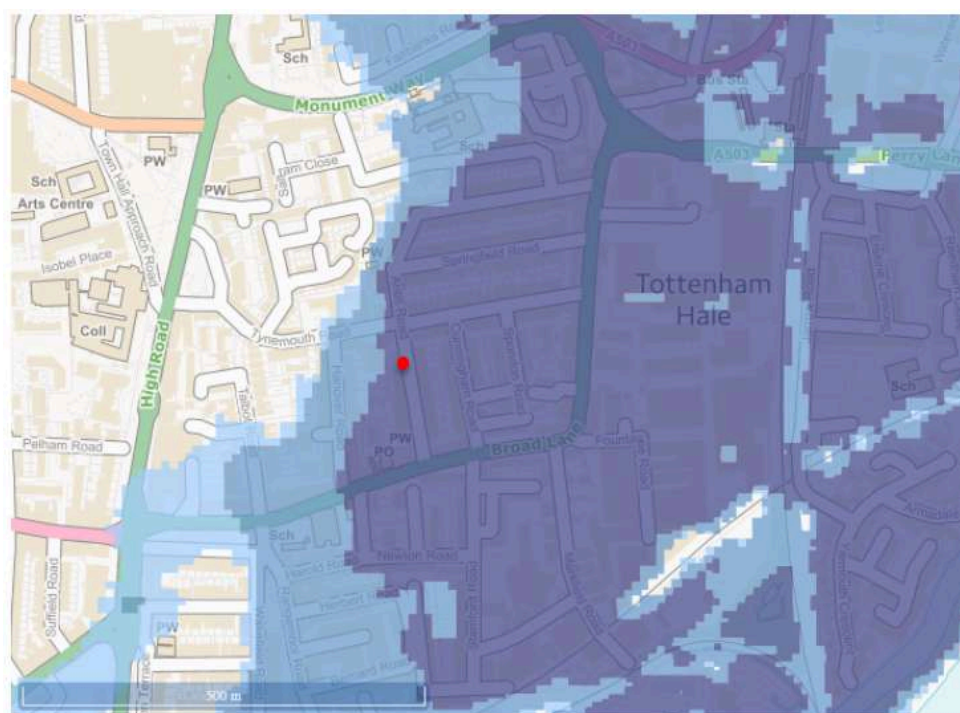


Figure 9: Flood risk from reservoirs (red dot indicates site)

⁷ Environment Agency: Risk of Flooding from Reservoirs map. Accessed from: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/>

Flood Risk SuDS Strategy Antill Road

Development vulnerability

National and local planning policy requires that all developments should consider the vulnerability of building users when carrying out flood risk assessments. In accordance with current Environment Agency guidance and the National Planning Policy Framework (NPPF) 2018, areas of the proposed development are considered to be 'more vulnerable' – private residential units (above ground level).

The sequential test

Planning policy and the NPPF typically requires that new developments must undertake a sequential test, if they are located in Flood Zone 2 or 3, or if a sequential test has not already been carried out for a development of the same type at the development site. However, a development is not required to undertake a sequential test if one has already been carried out for the same type of development at the site; the development is a minor development; the development involves the change of use; or is located in Flood Zone 1 (provided there are no other flooding issues in the area).

The development is a major development and is located in Flood Zone 1, therefore a sequential test is not required.

The exception test

Planning policy requires that new developments must undertake an exception test, if they meet the specific flood risk vulnerability and Flood Zone classifications outlined in Table 1, in order to confirm that the site and its users are safe if the site is at risk of flooding.

Table 1: Flood risk vulnerability and Flood Zone 'compatibility' for the exception test

Flood Zones	Flood risk vulnerability classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✓	Exception test required	✓	✓	✓
Flood Zone 3a	Exception test required	X	Exception test required	✓	✓
Flood Zone 3b	Exception test required	X	X	X	✓

✓ Development permitted

X Development not permitted

As the site is considered 'more vulnerable' but is within Flood Zone 1, the proposed development may proceed without an exception test being carried out, see Table 1.

Flood Risk SuDS Strategy Antill Road

Conclusions

The development site is located in Flood Zone 1 and therefore is not required to undertake the sequential test or exception test. The risk of flooding to the development site, from specific common sources of flooding, has been assessed. The risk from the respective sources of flooding is as follows:

- Rivers and the sea – very low risk.
- Pluvial (surface water) – primarily medium risk, although there are areas at high risk adjacent to the southern and eastern site boundaries, where flood depths could be up to 0.9m.
- Reservoir – medium to high, in the event of a flood from reservoirs to the east of the site flood levels could be as high as 2m.

The overall risk of flooding to the site is considered to be low to medium. However, there is a risk of surface water flooding at the site and appropriate measures should be adopted to mitigate flood risk to the proposed development, in accordance with the sequential, risk-based stages of the flood management hierarchy set out in the British Standard 8533:2017 'Assessing and managing flood risk in development – Code of practice'. A sustainable drainage systems (SuDS) strategy should also be adopted, to ensure that the proposals do not increase the risk surface water flooding to the surrounding area.

SuDS: Overview

SuDS Strategy

Antill Road

Introduction to SuDS

Sustainable drainage systems (SuDS) are drainage systems designed to maximise the opportunities and benefits that can be secured from surface water management. SuDS are considered to be environmentally beneficial due to their ability to manage water and flood risk within the urban and built up environment and take account of water quality by minimising water pollution, whilst also providing the opportunities for improvements in biodiversity and amenity space for the local community.

SuDS are able to replicate the natural environment, capturing rainfall and slowing down water at its source, whilst having the ability to allow water to infiltrate and provide water storage, to slow down runoff into streams and rivers.

The SuDS Manual highlights the importance of SuDS design providing a number of benefits to the sustainability of the site (see Figure 9). In addition to slowing down water runoff and reducing flood risk, SuDS can also protect the ecology and natural hydrological systems on and surrounding the site; prevent water pollution to allow the system to be resilient for future change; create biodiverse green spaces to contribute to habitat connectivity and supporting local biodiversity; and provide a social place for the local community that can enhance the visual character of a space in a safe environment.

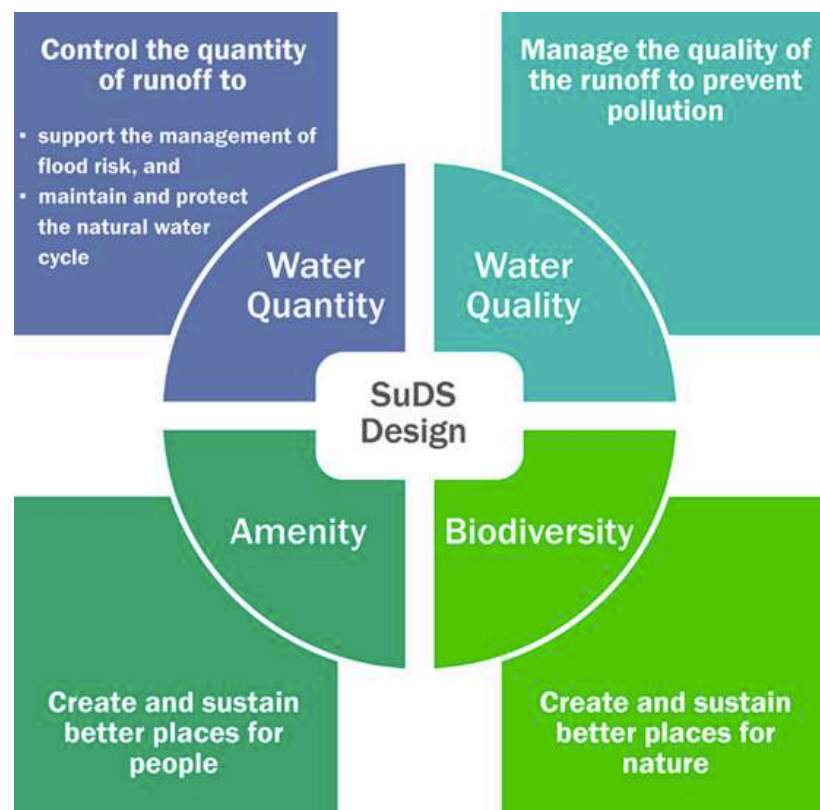


Figure 9: The four pillars of SuDS design (The SuDS Manual)

SuDS: Overview

SuDS Strategy

Antill Road

The SuDS Manual & methodology

The SuDS Manual is published guidance by CIRIA, written by a series of experts, and based on existing guidance and research in the UK and internationally. The CIRIA guidelines within the SuDS Manual⁸, and UKSuDS⁹ tools have been used to as a guideline for the evaluation of SuDS suitability and to develop a SuDS strategy for the development. Additional guidance is provided by the Susdrain website¹⁰ and the Non-Statutory Technical Standards for Sustainable Drainage Systems 2015.

SuDS best practice principles

To comply with current best practice, the drainage system should:

- i. Manage runoff at or close to its source;
- ii. Manage runoff at the surface;
- iii. Be integrated with public open space areas and contribute towards meeting the objectives of the urban plan;
- iv. Be cost-effective to operate and maintain.

The drainage system should endeavour to ensure that, for any particular site:

- i. Natural hydrological processes are protected through maintaining interception of an initial depth of rainfall and prioritising infiltration, where appropriate;
- ii. Flood risk is managed through the control of runoff peak flow rates and volumes discharged from the site;
- iii. Stormwater runoff is treated to prevent detrimental impacts to the receiving water body as a result of urban contaminants.

In addition, it is desirable to maximise the amenity and ecological benefits associated with the drainage system where there are appropriate opportunities. SuDS are green infrastructure components and can provide health benefits and reduce the vulnerability of developments to the impacts of climate change.

⁸ CIRIA (2015) The SuDS Manual (C753)

⁹ HR Wallingford: UKSuDS. Accessed from; www.ukSuDS.com

¹⁰ Susdrain. Accessed from; <http://www.susdrain.org/>

SuDS: Site Specific Evaluation SuDS Strategy Antill Road

Infiltration suitability

The infiltration suitability of the site is assumed to be low at the site. The underlying geology at the site may be relatively impermeable which would limit the effectiveness of a proposed infiltration SuDS scheme.

Source protection zones

An assessment of the Environment Agency's groundwater Source Protection Zones (SPZs) within the vicinity of the development site has been undertaken (Figure 10). The site is within outer zone 2 SPZ, therefore, if suitable, infiltration to the ground would be likely to be acceptable providing suitable mitigation measures are in place if required to prevent an impact on water quality from the proposed or historical land use and contaminated land. Any works should be undertaken in accordance with the contaminated land specialists' recommendations.



Figure 10: Source Protection Zones map

SuDS: Site Specific Evaluation SuDS Strategy Antill Road

Surface water features

The presence of potential surface water, foreshore and tidal water features in proximity to the site has been determined (Figure 11). The map shows there are no surface water features within 250m of the development site, therefore, discharge to a surface water feature is unlikely to be appropriate.

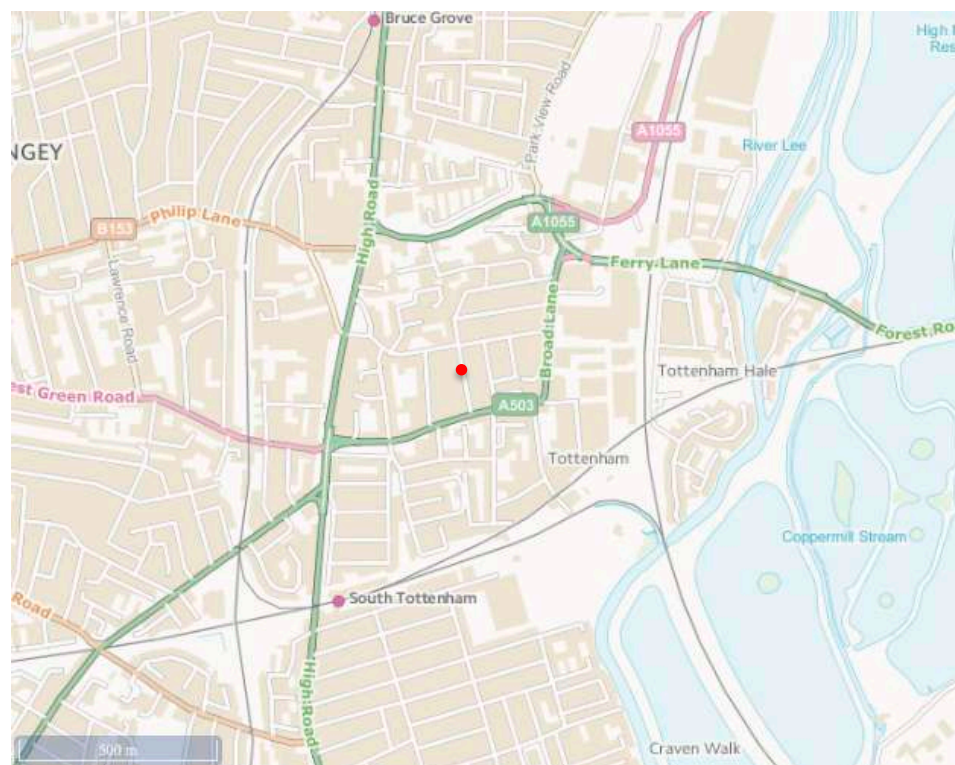


Figure 11: Surface Water Features map

SuDS: Site Specific Evaluation SuDS Strategy Antill Road

Sewer features

The location of sewer features in proximity to the site has been confirmed with a Local Sewer System (see Appendix B). The site is within 100m of a public surface water sewer, therefore discharge from the site to the local surface water sewer is likely to be appropriate (see Figure 12). The surface water sewer within Anthill Road is to be utilised.

Detailed analysis of the connections and condition of the public sewer systems should be undertaken by the future structural or drainage engineer, which may be confirmed by CCTV survey, and/or by consultation with the local sewerage undertaker. Confirmation of the sewer invert will be required to ensure that surface water can be discharged via gravity. Verification of the capacity of the public sewer and permission to connect and discharge to the sewer should be obtained from the local sewerage undertaker.

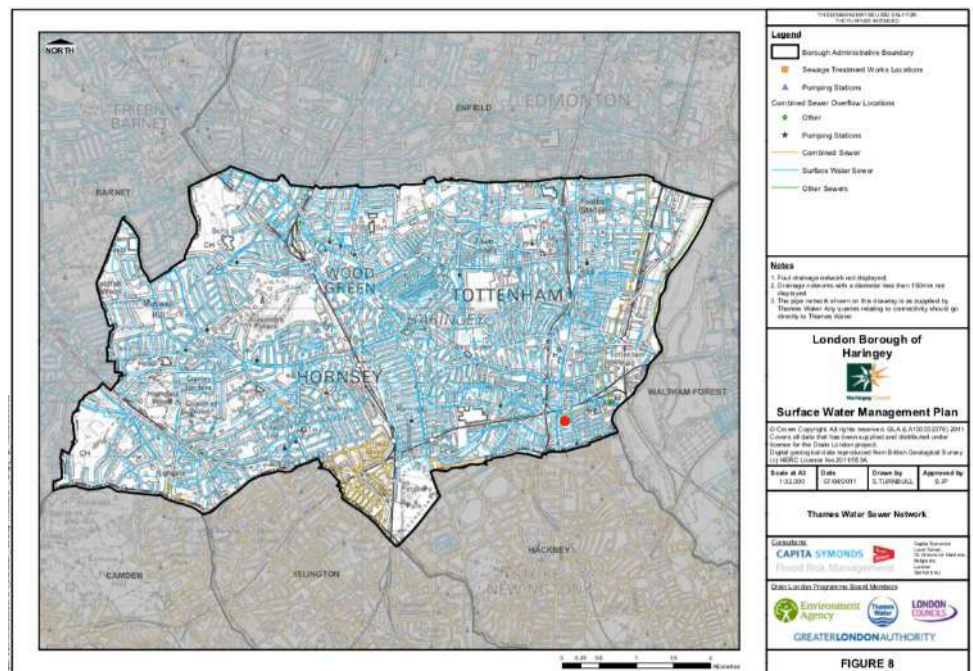


Figure 12: Map of sewer features in relation to the development site

SuDS: Site Specific Evaluation

SuDS Strategy

Antill Road

Sustainable drainage systems

There are a number of sustainable drainage systems (SuDS) that can be implemented on sites, when considering the constraints of the location, including the topology, geology and density of the space. The potential for the use of different SuDS components is evaluated in this report. Typical SuDS components include:

- Rainwater harvesting systems;
- Infiltration systems;
- Pervious paving;
- Attenuation storage tanks.

Suitability for methods of discharge from site

Infiltration

In accordance with the sustainable drainage hierarchy (see page 3), infiltration should be prioritised as the method of controlling surface water runoff, where possible. It is unlikely that the site conditions are suitable for infiltration (see page 15). Furthermore, due to constraints for space at the site, there is insufficient space for implementation of infiltration SuDS components. This does not include upgraded soft landscaping.

Watercourse

It is unlikely that discharge to a watercourse will be a viable option for discharge from site, as there are no surface water features located within 100m of the site.

Surface water sewer

There is a public surface water sewer within 100m of the site, therefore discharge to the local surface water sewer is proposed.

Combined sewer

There is a public surface water sewer within 100m of the site, which is preferred to discharge to a public combined sewer, in accordance with the sustainable drainage hierarchy. Therefore, discharge to a combined sewer is not proposed.

Hydraulic design

Local planning policy requires that peak runoff rates and volumes are no greater than they were pre-development. A SuDS strategy will be proposed which limits the rate of discharge to no greater than the pre-development peak runoff rates and where feasible, will limit the discharge volume to pre-development runoff volumes. Note that on small-scale urban sites, where there are significant constraints on the SuDS components, which may be implemented, the reduction of runoff volume in particular, may be difficult to achieve.

SuDS: Site Specific Evaluation SuDS Strategy Antill Road

Water quality and hazard classification

Current best practice takes a risk-based approach to managing discharges of surface runoff to the receiving environment. The potential for runoff to transport pollutants from the site to neighbouring areas should be considered.

The proposed building footprint covers approximately 48.5m^2 . The remaining site area, approximately 66m^2 , is to be used to provide new amenity space, which involves upgrading the existing hard landscaping to provide new soft landscaping and planters which will provide a natural drainage through infiltration. The new landscaping proposals include 16m^2 of rear lawn and 10m^2 of gravel in the front garden that provide an area for water to drain.

Pervious pavers are also incorporated into the amenity space, amounting to approximately 40m^2 . As such the amount of run-off from the site is expected to be reduced and water quality to be significantly increased.

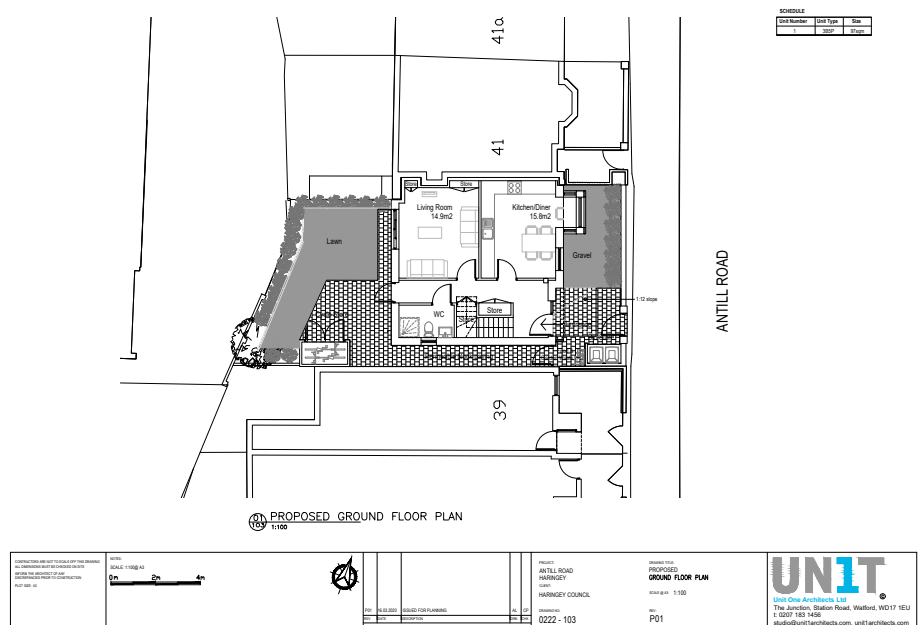


Figure 13: Plan of proposed site

SuDS: Component Evaluation

SuDS Strategy

Antill Road

SuDS component feasibility

The site conditions and development proposals have been assessed for their suitability for different SuDS components. The following SuDS components are considered for the proposed development and are recommended based on their feasibility for the site.

Each SuDS component has been assessed under three broader categories. There are key criteria for each category on which the SuDS component is evaluated. The key criteria have been given a weighting based on a tick-system, an example representation of this is shown below:

✓✓✓✓✓ = 3 scored out of a possible 5

The weighting of each of the criteria within the categories is shown below:

- Local area and site impact (maximum score of 10):
 - Local planning policy priority = ✓✓
 - Space required for component = ✓✓✓
 - Applicability with development design = ✓✓
 - Compatibility with geological conditions and flood risk = ✓✓✓
- Multi-beneficial design principles (maximum score of 10):
 - Water quantity = ✓✓✓✓
 - Water quality = ✓✓
 - Amenity = ✓✓
 - Biodiversity = ✓✓
- Capital cost, operation and maintenance (maximum score of 5):
 - Capital cost of component = ✓✓
 - Regular maintenance requirements = ✓✓
 - Impact of remedial actions = ✓

Key comments on each of the criteria and the corresponding score will be provided in a table (example below) for each of the SuDS components. The score for each of the criteria will be summed and each of the technologies will then be ranked. The assessment of each technology is undertaken on the following pages.

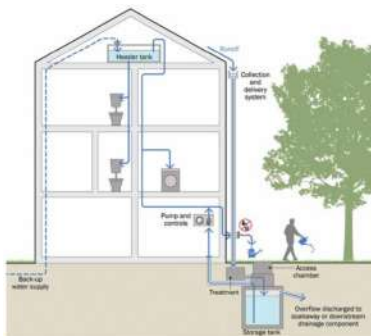
SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
<i>Example component</i>	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓

SuDS: Component Evaluation

SuDS Strategy

Antill Road

SuDS component feasibility (continued)



Rainwater harvesting system

A rainwater harvesting system collects and stores rainwater for use in a development. Systems range from small-scale rainwater storage butts for irrigation, to large-scale systems to serve non-potable (and in some cases, potable) uses within a building. Rainwater harvesting systems intercept surface water from roofs and can be designed to reduce the runoff volume of a development, via recycling and reuse to meet water demand on-site.

SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Rainwater harvesting system	✓✓✓✓✓ ✓✓✓✓✓ Policy priority. Space required for storage tank(s). Residential use likely to meet demand. Ground/flood compatible.	✓✓✓✓✓ ✓✓✓✓✓ Control runoff volumes from roofs. Treatment for internal non-potable use. No direct amenity or biodiversity benefits.	✓✓✓✓✓ Relatively high capital cost. Regular maintenance and inspection required.



Green roof

A green roof is a roof of a building that is covered with a growing medium and vegetation, planted over a waterproofing membrane. Green roofs intercept rainfall and may facilitate flow control, attenuation and treatment of surface water. Green roofs may be particularly beneficial in high-density, urbanised areas, where there are otherwise limited opportunities for incorporating SuDS in landscaping. Green roofs provide additional benefits for biodiversity and reducing the urban heat island effect.

SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Green roof	✓✓✓✓✓ ✓✓✓✓✓ Policy priority. Some roof areas may be feasible. Small roof area reduces benefits of incorporating green roof. Not significant enough area to justify green roof. Structural and added cost.	✓✓✓✓✓ ✓✓✓✓✓ Runoff rate/volume control only for small rainfall events. Limited treatment functions provided. Significant biodiversity benefits provided.	✓✓✓✓✓ High capital cost compared to proposals. Regular maintenance and inspection required.

SuDS: Component Evaluation

SuDS Strategy

Antill Road

SuDS component feasibility (continued)



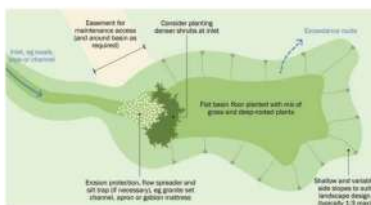
Infiltration system

Infiltration system types include:

- Soakaway – sub-surface storage structure (typically rubble-filled voids beneath lawns) that stores runoff from a single house or development and allows for efficient infiltration into adjacent soil.
- Infiltration trench – trench filled with permeable granular material, designed to promote infiltration of water to the ground.

Infiltration systems should be located at least 5m from all buildings and roads and at least 3m from the site boundary. The viability of infiltration should be validated with site investigations confirming groundwater levels (which should remain a minimum of 1m below the base of any infiltration systems) and infiltration rates (in accordance with BRE Digest 365).

SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Infiltration system	✓✓✓✓✓ ✓✓✓✓✓ Policy priority. Must be 5m from buildings/roads. Infiltration capacity and ground water levels must be verified.	✓✓✓✓✓ ✓✓✓✓✓ Excellent runoff rate/volume control. Limited treatment functions provided. No direct amenity or biodiversity benefits.	✓✓✓✓✓ Relatively low capital cost. Regular maintenance and inspection required. Pre-treatment sediment removal required.



Infiltration basin

An infiltration basin is a vegetated basin or depression, which is designed to promote infiltration and is typically dry, except in periods of heavy rainfall.

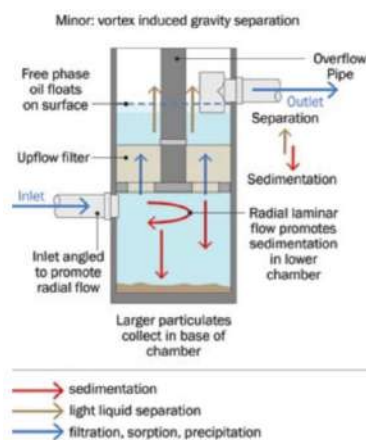
SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Infiltration basin	✓✓✓✓✓ ✓✓✓✓✓ Policy priority. Significant space requirement. Infiltration capacity and ground water levels must be verified.	✓✓✓✓✓ ✓✓✓✓✓ Excellent runoff rate/volume control. Limited treatment functions provided. Good amenity benefits. Good biodiversity benefits.	✓✓✓✓✓ Relatively low capital cost. Regular maintenance and inspection required.

SuDS: Component Evaluation

SuDS Strategy

Antill Road

SuDS component feasibility (continued)



Proprietary treatment system

A proprietary treatment system is a manufactured product that removes specified pollutants from surface water runoff. They are often useful where site constraints preclude the use of other methods. System types include:

- Treatment channels.
- Hydrodynamic or vortex separators.
- Proprietary filtration systems.
- Oil separators.
- Multi-process systems.

SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Proprietary treatment system	✓✓✓✓✓ ✓✓✓✓✓ Small space requirement. Ground/flood compatible.	✓✓✓✓✓ ✓✓✓✓✓ Treatment functions provided. May be combined with flow rate control. No direct amenity or biodiversity benefits.	✓✓✓✓✓ Moderate capital cost. Regular maintenance and inspection required. Pre-treatment may be required.



Filter strip

Filter strips are gently sloping, vegetated strips of land that treat runoff by filtering and promoting the settlement of pollutants, commonly installed in proximity to impermeable surfaces (for instance roads and car parks). They may be used as a pre-treatment component before swales, bioretention systems and trenches or a treatment component (where the flow path length across the strip is sufficient).

SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Filter strip	✓✓✓✓✓ ✓✓✓✓✓ Significant space requirement. Best-suited for use adjacent to large impermeable surfaces.	✓✓✓✓✓ ✓✓✓✓✓ Limited runoff rate/volume control. Moderate treatment functions provided. Moderate amenity benefits. Moderate biodiversity benefits.	✓✓✓✓✓ Relatively low capital cost. Infrequent maintenance and inspection required. May provide pre-treatment function.

SuDS: Component Evaluation

SuDS Strategy

Antill Road

SuDS component feasibility (continued)



Filter drain

Filter drains are shallow trenches, filled with stone or gravel, and constructed slightly below the adjacent ground surface. Filter drains are typically most effective when installed alongside impermeable areas such as roads and car parks, to attenuate water runoff in a storm event, whilst also providing a treatment function.

SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Filter drain	✓✓✓✓✓ ✓✓✓✓✓ Best-suited for use adjacent to large impermeable surfaces. Compatible with contaminated land/ high groundwater levels.	✓✓✓✓✓ ✓✓✓✓✓ Limited runoff rate/volume control. Good treatment functions provided. No direct amenity or biodiversity benefits.	✓✓✓✓✓ Relatively low capital cost. Regular maintenance and inspection required. Risk of blockages/ pollutant build up.



Swale

Swales are linear vegetated drainage features that convey and attenuation surface water, along with in some instances facilitating infiltration and providing pollutant control by allowing settlement. Swales intercept rainfall and may facilitate flow control and volume reduction (via infiltration, where viable), along with conveying water to the on-site drainage network. Check dams and berms can also be installed along a swale to incorporate attenuation storage, and promote settling and infiltration.

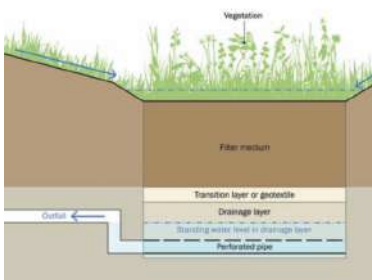
SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Swale	✓✓✓✓✓ ✓✓✓✓✓ Moderate space requirement. Compatible with contaminated land/ high groundwater levels (if lined).	✓✓✓✓✓ ✓✓✓✓✓ Good runoff rate/volume control. Moderate treatment functions provided. Good amenity benefits. Good biodiversity benefits.	✓✓✓✓✓ Relatively low capital cost. Regular maintenance and inspection required. Inlets, culverts and outlets need to be cleared.

SuDS: Component Evaluation

SuDS Strategy

Antill Road

SuDS component feasibility (continued)



Bioretention system

Bioretention systems are shallow vegetated landscaped depressions, which are typically under drained and constructed with engineered soils. Bioretention systems are typically referred to as rain gardens, when constructed on a small scale, without engineered soils. Bioretention systems intercept rainwater (typically at least the first 5mm) and facilitate flow control and volume reduction (via infiltration, where viable) from frequent and smaller rainfall events, along with filtering sediment and pollutants from surface water. Plant species that are tolerant to inundations should be selected to optimise performance of the system.

SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Bioretention system	✓✓✓✓✓ ✓✓✓✓✓ Small space requirement. Compatible with contaminated land/ high groundwater levels (if lined).	✓✓✓✓✓ ✓✓✓✓✓ Moderate runoff rate/volume control. Good treatment functions provided. Moderate biodiversity benefits.	✓✓✓✓✓ Relatively low capital cost. Regular maintenance and inspection required.



Pervious paving

Pervious paving may be used for the construction of otherwise impermeable surfaces (i.e. roads (typically with speeds less than 30 mph), car parks, patios and pedestrian pathways), with materials that allow infiltration to a subsurface medium, from where water may be infiltrated to the ground or piped to the surface water drainage network. Pervious paving includes:

- Porous paving – paving that infiltrates water across the entire surface.
- Permeable paving – paving that infiltrates water through the gaps between solid blocks.

SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Pervious paving	✓✓✓✓✓ ✓✓✓✓✓ Compatible with hard landscaping proposals. Compatible with contaminated land/ high groundwater levels (if lined).	✓✓✓✓✓ ✓✓✓✓✓ Good runoff rate/volume control. Good treatment functions provided. Low direct amenity or biodiversity benefits.	✓✓✓✓✓ Relatively low capital cost. Regular maintenance and inspection required. Risk of clogging with poor maintenance.

SuDS: Component Evaluation

SuDS Strategy

Antill Road

SuDS component feasibility (continued)



Attenuation storage

Attenuation storage may be provided to temporarily store runoff volumes prior to discharge from the site. An attenuation storage structure may be located under external landscaping areas, or within a proposed building. Runoff from the roof and any other impermeable surfaces may be collected and stored in the structure. Examples include:

- Geocellular storage structure (typically modular plastic units).
- Oversized concrete, plastic or corrugated steel pipes.
- Precast or in situ concrete panel structures and tanks.
- Glass-reinforced plastic (GRP) tanks.

SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Attenuation storage	✓✓✓✓✓ ✓✓✓✓✓ Large sub-surface space required (compatible beneath landscaping). May be compatible with high groundwater levels.	✓✓✓✓✓ ✓✓✓✓✓ Excellent runoff rate/volume control. No direct treatment functions provided. No direct amenity or biodiversity benefits.	✓✓✓✓✓ Relatively high capital cost. Regular maintenance and inspection required. Accessibility and maintainability key.

Detention basin

A detention basin is a surface storage basin or depression, that provides flow control through attenuation of surface water runoff. Detention basins are normally dry and in certain situations the land may also function as a recreational facility. However, basins can also be mixed, including both a permanently wet area for wildlife or treatment of the runoff and an area that is usually dry to cater for flood attenuation. They also facilitate some settling of particulate pollutants.



SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Detention basin	✓✓✓✓✓ ✓✓✓✓✓ Large space required. May be compatible with high and vulnerable groundwater (if lined).	✓✓✓✓✓ ✓✓✓✓✓ Moderate runoff rate/volume control. Moderate treatment functions provided. Good amenity benefits. Moderate biodiversity benefits.	✓✓✓✓✓ Relatively low capital cost. Limited maintenance and inspection required.

SuDS: Component Evaluation

SuDS Strategy

Antill Road

SuDS component feasibility (continued)



Pond/wetland

Ponds and wetlands can provide attenuation storage and treatment functions for surface water, at varying scales, along with promoting the ecological benefits of SuDS. A pond can perform the role of a retention pond or a detention pond. Wetlands comprise shallow ponds and marshy areas, covered almost entirely in aquatic vegetation. Wetlands detain flows for an extended period to allow sediments to settle, and to remove contaminants by facilitating adhesion to vegetation and aerobic decomposition. They also provide significant ecological benefits.

SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance
Pond/wetland	✓✓✓✓✓ ✓✓✓✓✓ Policy priority when aligned with biodiversity objectives. Large space required. May be compatible with high and vulnerable groundwater (if lined).	✓✓✓✓✓ ✓✓✓✓✓ Good runoff rate/volume control. Good treatment functions provided. Excellent amenity benefits. Excellent biodiversity benefits.	✓✓✓✓✓ Relatively high capital cost due to large size. Moderate maintenance and inspection required. Vegetation management required.

SuDS: Component Evaluation

SuDS Strategy

Antill Road

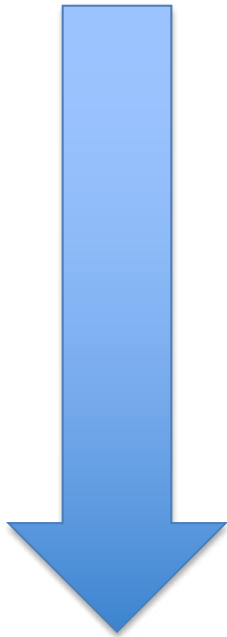
SuDS component evaluation

Table 2: SuDS component evaluation matrix

SuDS component	Local area and site impact	Multi-beneficial design principles	Capital cost, operation and maintenance	Total score	Proposed	Rationale
Rainwater harvesting system	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	14 out of 25	Yes	Small-scale water butt for irrigation
Green roof	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	14 out of 25	No	Insufficient suitable roof space. Benefits limited to small area. High cost compared to proposals.
Infiltration system	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	13 out of 25	No	Infiltration potential not clear and insufficient space
Infiltration basin	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	17 out of 25	No	Infiltration potential not clear and insufficient space
Proprietary treatment system	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	13 out of 25	No	Low pollution hazard
Filter strip	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	12 out of 25	No	Insufficient space
Filter drain	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	13 out of 25	No	Insufficient space
Swale	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	15 out of 25	No	Insufficient space
Bioretention system	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	17 out of 25	No	Insufficient space
Pervious paving	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	15 out of 25	Yes	The amenity space will have paving that could be pervious
Attenuation storage	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	12 out of 25	No	Capital cost is large for project scale
Detention basin	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	14 out of 25	No	Insufficient space
Pond/wetland	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓ ✓✓✓✓✓	✓✓✓✓✓	14 out of 25	No	Insufficient space

SuDS: Site Specific Evaluation SuDS Strategy Antill Road

SuDS recommendations



The development proposals comprise the demolition of the existing hardstanding at Antill Road and redevelopment of the entire site, therefore there is the opportunity for a site-wide integrated SuDS design as part of the development proposals. Options for the management of surface water runoff and specific SuDS components have been evaluated based on their suitability and preference in accordance with the sustainable drainage hierarchy. The following is proposed for the development:

1. *Store rainwater for later use* – Proposed: small-scale rainwater storage butt (up to approximately 200 litres capacity), designed for irrigation purposes will be included in the development. This may be served by a downpipe from the roof (either connected or disconnected from the drainage network).
2. *Use infiltration techniques, such as porous surfaces* – Proposed: infiltration potential assumed to be low for the site. New soft landscaping has been proposed, amassing to 16m² in the rear garden and gravel in the front garden amassing to 10m². Moreover, there is pervious paving has been proposed in the remaining amenity area amounting to approximately 40m². In the event that infiltration rates are too low the water from the pervious paving can be directed to the surface water sewer.
3. *Attenuate rainwater in ponds or open water features for gradual release* – Not proposed: insufficient space and lack of suitable areas on the site.
4. *Attenuate rainwater by storing in tanks or sealed water features for gradual release* – Not proposed: the limited site area means that there is insufficient space for storage tanks or sealed water features.
5. *Discharge rainwater direct to a watercourse* – Not proposed: no watercourses within 100m of the site.
6. *Discharge rainwater to a surface water sewer/drain* – Proposed: there is a public surface water sewer within 100m of the site, which may be suitable for the discharge of surface water from site. The surface water sewer within Antill Road is to be utilized.
7. *Discharge rainwater to the combined sewer* – Not proposed: There is also a surface water sewer within 100m of the site, therefore discharge to the combined sewer is not proposed.

Conclusions

SuDS Strategy

Antill Road

Conclusions

An integrated SuDS strategy has been proposed for the development. The suitability of SuDS components within the development proposals has been evaluated. Alongside any landscaping proposals, the following specific SuDS components are recommended as part of an integrated SuDS design, in accordance with the sustainable drainage hierarchy:

- Improved existing hard landscaping, new soft landscaping and planters amassing to approximately have been proposed in the amenity space which provide an increase in green spaces compared to the pre-development site. In total 16m² of soft landscaping has been proposed in the rear garden and 10m² of gravel in the front garden. Approximately 40m² of pervious paving is also proposed in the amenity space. In the event that infiltration rates are too low the water from the pervious paving can be directed to the surface water sewer. This along with the upgraded front and rear gardens provides an area of 66m² of upgraded landscaping, which is a significant improvement compared to the existing site.
- A small-scale rainwater storage butt (up to approximately 200 litres capacity) served by a downpipe from the roof (either connected or disconnected from the drainage network)
- Surface water to be discharged at controlled rate (to achieve a 50% betterment against the pre-development runoff rates) from the site to the local public surface water sewer.

The impact of SuDS proposals on the post-development site will somewhat reduce surface water runoff from the existing site which is entirely hardstanding. The proposals will at a minimum ensure the site does not increase the surface water run-off from the site. Run-off quality is also expected to increase as a result of the proposals as the existing site is largely used for storage or waste.

It is recommended that all proposed SuDS technologies are designed in accordance with the SuDS Manual (CIRIA, 2015) and will require the adoption of robust maintenance and management plans to ensure they maintain their effectiveness over the development's lifetime.

Appendix A: Environment Agency Flood Map SuDS Strategy Antill Road

Flood map for planning

Your reference
Antill Road

Location (easting/northing)
534004/189164

Created
16 Mar 2020 9:51

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

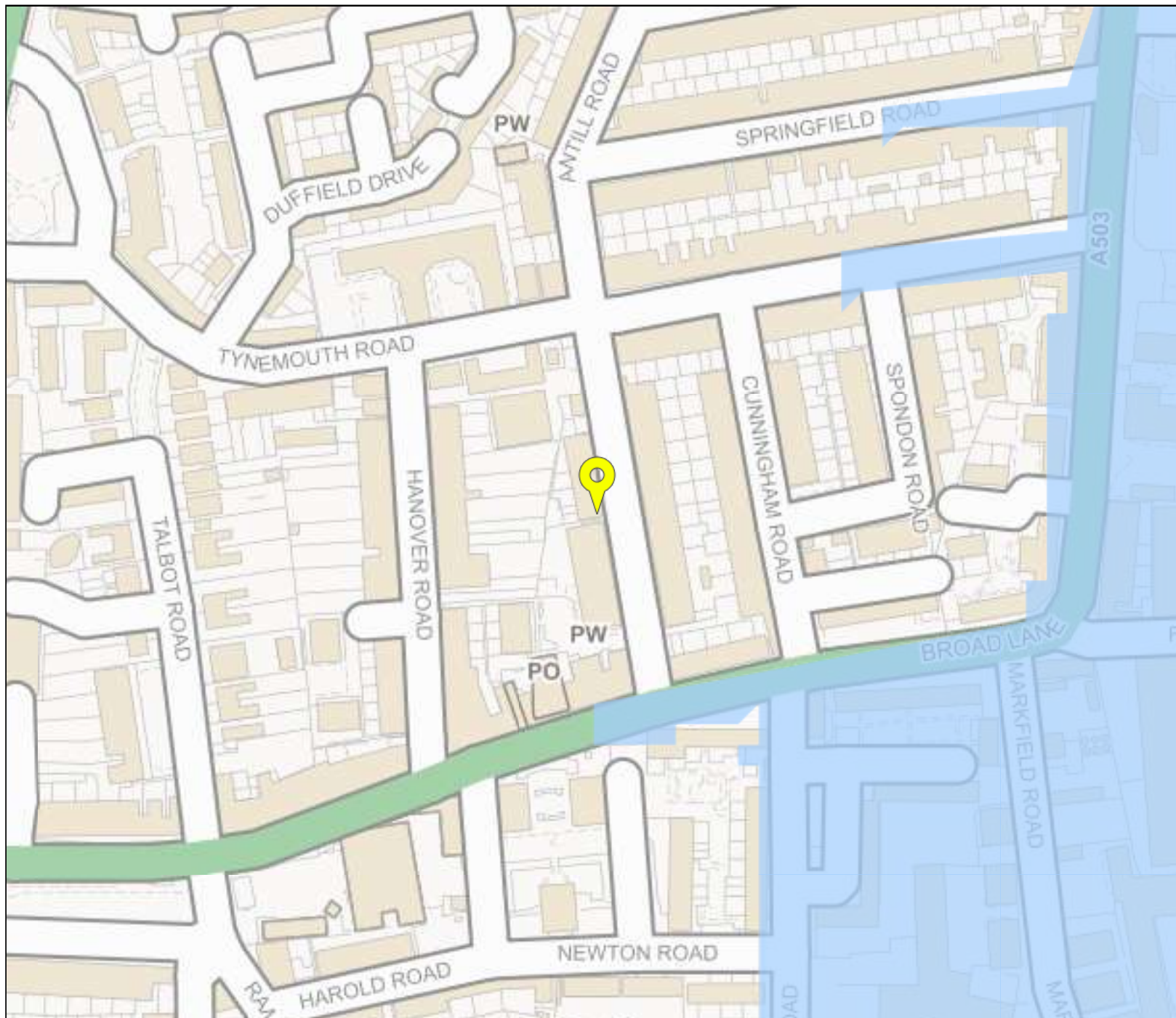
- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

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<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



Flood map for planning

Your reference
Antill Road

Location (easting/northing)
534004/189164

Scale
1:2500

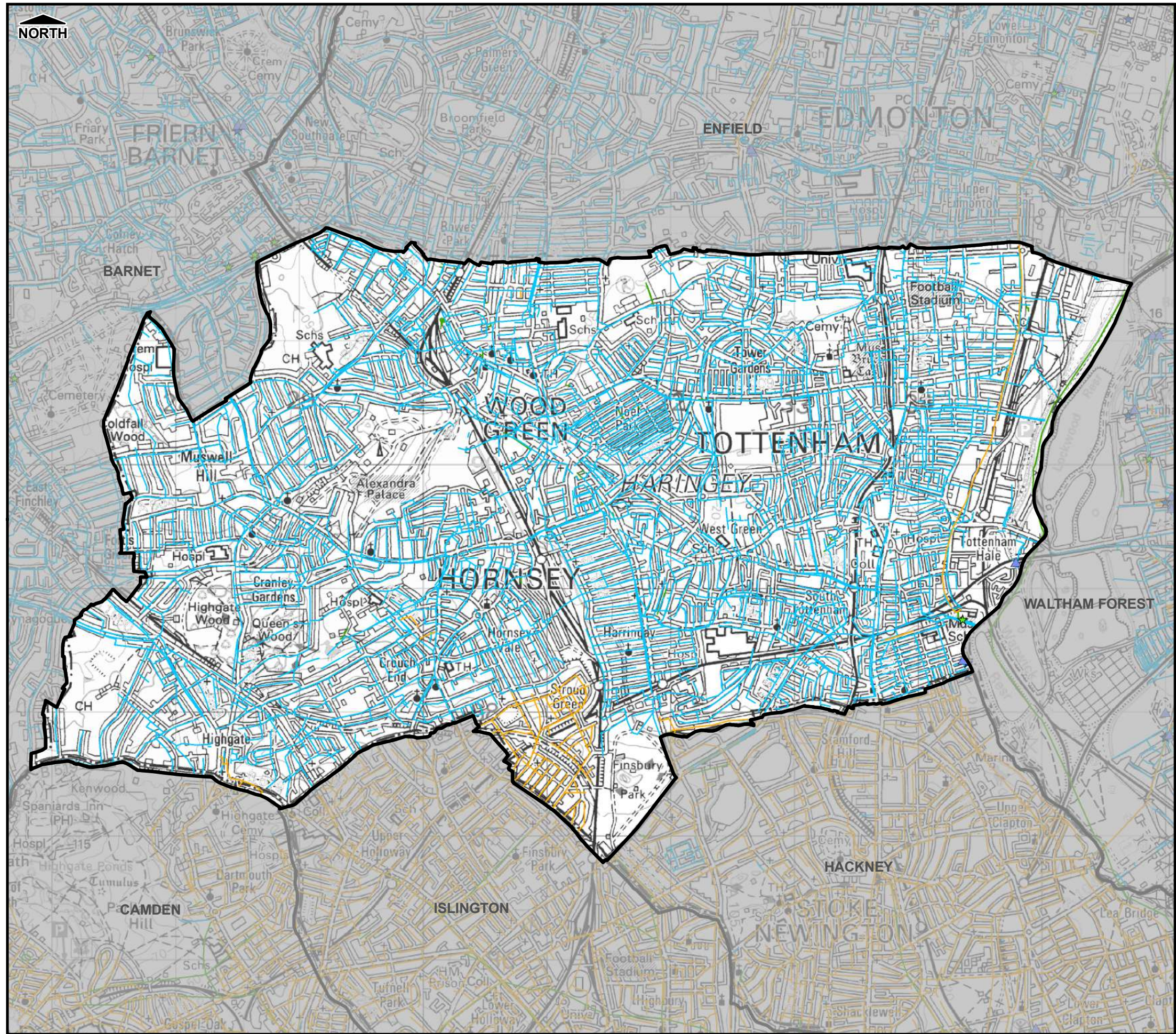
Created
16 Mar 2020 9:51

-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefiting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area

0 20 40 60m

Appendix B: Local Sewer System SuDS Strategy Antill Road

Filepath: L:\Environment\zwet\CS046913_DrainLondon_Tier2\Group4\ARC\mxd\GP4_Haringey_Fig9_TWSEwerNetwork.mxd



THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED

Legend

- Borough Administrative Boundary
- Sewage Treatment Works Locations
- Pumping Stations
- Combined Sewer Overflow Locations
 - Other
 - Pumping Stations
- Combined Sewer
- Surface Water Sewer
- Other Sewers

Notes

1. Foul drainage network not displayed;
2. Drainage networks with a diameter less than 150mm not displayed.
3. The pipe network shown on this drawing is as supplied by Thames Water. Any queries relating to connectivity should go directly to Thames Water.

London Borough of Haringey



Surface Water Management Plan

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Covers all data that has been supplied and distributed under license for the Drain London project.
Digital geological data reproduced from British Geological Survey
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Scale at A3	Date	Drawn by	Approved by
1:32,000	07/04/2011	S.TURNBULL	S.IP

Thames Water Sewer Network

Consultants

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

Drain London Programme Board Members



FIGURE 8

Appendix C: Haringey SuDS Proforma SuDS Strategy Antill Road

1. Project & Site Details	Project / Site Name (including sub-catchment / stage / phase where appropriate)	Antill Road
	Address & post code	Antill Road Road, Tottenham, London, N15 4AS
	OS Grid ref. (Easting, Northing)	E 533996 N 189205
	LPA reference (if applicable)	
	Brief description of proposed work	Development of a new two bedroom house with a GIA of 93m2. The existing site is entirely hardstanding concrete slab.
	Total site Area	132 m ²
	Total existing impervious area	132 m ²
	Total proposed impervious area	90 m ²
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	No
	Existing drainage connection type and location	N/A
	Designer Name	Ben Shirbini
	Designer Position	Sustainability Consultant
	Designer Company	Eight Associates

2. Proposed Discharge Arrangements	2a. Infiltration Feasibility		
	Superficial geology classification	Enfield Silt Member (clay and silt)	
	Bedrock geology classification	London Clay Formation (clay, silt and sand)	
	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	N	N
	5 discharge rainwater direct to a watercourse	N	N
	6 discharge rainwater to a surface water sewer/drain	Y	Y
	7 discharge rainwater to the combined sewer.	N	N
	2c. Proposed Discharge Details		
	Proposed discharge location	Antill Road	
Has the owner/regulator of the discharge location been consulted?	TBC		

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)
	Q _{bar}			
	1 in 1			
	1 in 30			
	1 in 100			
	1 in 100 + CC			
	Climate change allowance used		40%	
	3b. Principal Method of 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	0	0	0
	Filter strips	0	0	0
	Filter drains	0	0	0
	Bioretention / tree pits	0	0	0
	Pervious pavements	41	41	0
	Swales	0	0	0
	Basins/ponds	0	0	0
	Attenuation tanks	0		0
	Total	41	41	0

4. Supporting Information	4a. Discharge & Drainage Strategy	Page/section of drainage report
	Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	page 17 - assumed low
	Drainage hierarchy (2b)	page 3, page 30
	Proposed discharge details (2c) – utility plans correspondence / approval from owner/regulator of discharge location	page 19 and 31
	Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	
	Proposed SuDS measures & specifications (3b)	page 30 to 32
	4b. Other Supporting Details	Page/section of drainage report
	Detailed Development Layout	Page 5, 18 and appendix D
	Detailed drainage design drawings, including exceedance flow routes	tbc
	Detailed landscaping plans	tbc
	Maintenance strategy	n/a
	Demonstration of how the proposed SuDS measures improve:	
	a) water quality of the runoff?	page 22 to 30
	b) biodiversity?	page 22 to 30
	c) amenity?	page 22 to 30

Appendix D: Detailed Drawings

SuDS Strategy

Antill Road



01
002

EXISTING SITE PLAN

1:200



CONTRACTORS ARE NOT TO SCALE OFF THIS DRAWING
ALL DIMENSIONS MUST BE CHECKED ON SITE
INFORM THE ARCHITECT OF ANY
DISCREPANCIES PRIOR TO CONSTRUCTION
PLOT SIZE: A3

NOTES:

REV	DATE	DESCRIPTION	DRN	CHK
A02	20.01.2020	ISSUED FOR COMMENT	AL	CP
A02	05.12.2019	ISSUED FOR PRE-APP	AL	CP
A01	24.10.2019	ISSUED FOR PRE-APP	AL	CP
REVISION HISTORY				

PROJECT:
ANTILL ROAD
HARINGEY
CLIENT:
HARINGEY COUNCIL

DRAWING NO:
0222 - 002

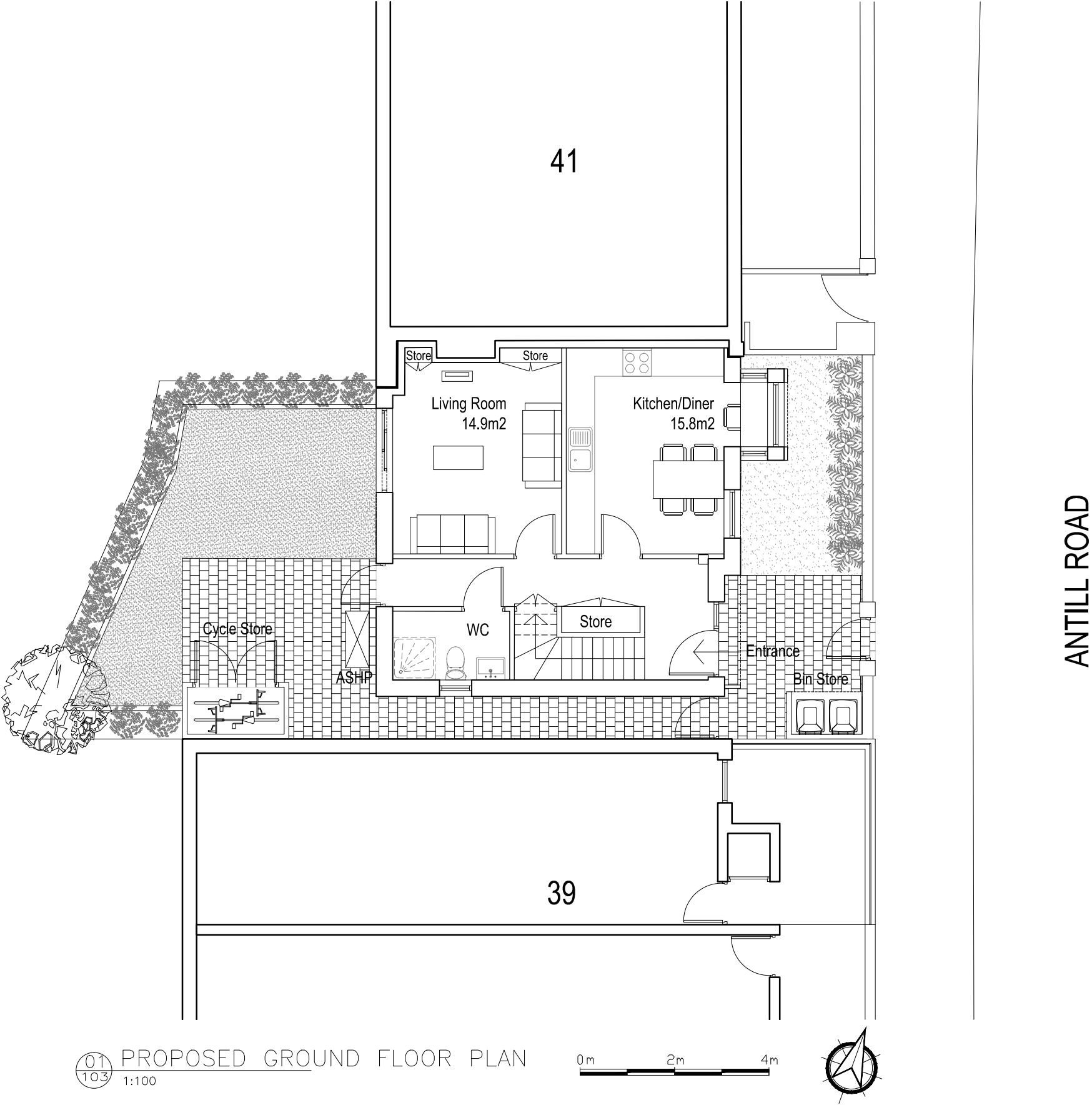
DRAWING TITLE:
EXISTING
SITE PLAN

SCALE @ A3: 1:200

REV:
A03

UNIT ©
Unit One Architects Ltd
The Junction, Station Road, Watford, WD17 1EU
t: 0207 183 1456
studio@unit1architects.com, unit1architects.com

SCHEDULE		
Unit Number	Unit Type	Size
1	3B5P	97sqm



01
103
PROPOSED GROUND FLOOR PLAN
1:100

0 m 2 m 4 m



CONTRACTORS ARE NOT TO SCALE OFF THIS DRAWING ALL DIMENSIONS MUST BE CHECKED ON SITE INFORM THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION PLOT SIZE: A3	NOTES: SCALE: 1:100@ A3	A06 A05 A04 A03 A02 A01	20.01.2020	ISSUED FOR COMMENT	AL	CP	
			06.01.2020	ISSUED FOR COMMENT - POST PRE-APP	AL	CP	
			05.12.2019	ISSUED FOR PRE-APP	AL	CP	
			21.11.2019	ISSUED FOR COMMENT	AL	CP	
			05.11.2019	ISSUED FOR COMMENT	AL	CP	
			24.10.2019	ISSUED FOR PRE-APP	AL	CP	
			REV	DATE	DESCRIPTION	DRN	CHK
			REVISION HISTORY				