FLOOD RISK ASSESSMENT & SUDS REPORT FOR

151 STATION ROAD, WEST DRAYTON, UB7 7NG

DOCUMENT NUMBER: C3753-R1-REV-B

PREPARED BY

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CONTENTS

APPENDICES

1. SITE DETAILS

Site Name	151 Station Road
Site Address	151 Station Road, West Drayton, UB7 7NG
Purpose of Development	Residential
Existing Land Use	Brownfield
County	Greater London
Country	England
Local Planning Authority	London Borough of Hillingdon

1.1 Site Location

The location of the project site is shown in Figure 1 overleaf, and on the location plan provided in Appendix A.

Figure 1- Location of Project Site

1.2 Proposed Development

The following report has been written to accompany the planning application for the Demolition of the existing bungalow and outbuildings and construction of five houses, with associated entrance road, car parking and landscaping facilities.

1.3 Geology of The Area

According to the British Geological Survey, the superficial deposit at the site is of the Langley Silt Member, consisting of clay and silt, as shown in Figure 2 below. The bedrock at the area consists of the clay, silt and sand, and is part of the London Clay formation, as shown in Figure 3 below.

Figure 2 - Superficial Deposits at the site. (Source: British Geological Survey website (contains British Geological Survey materials © NERC2026).

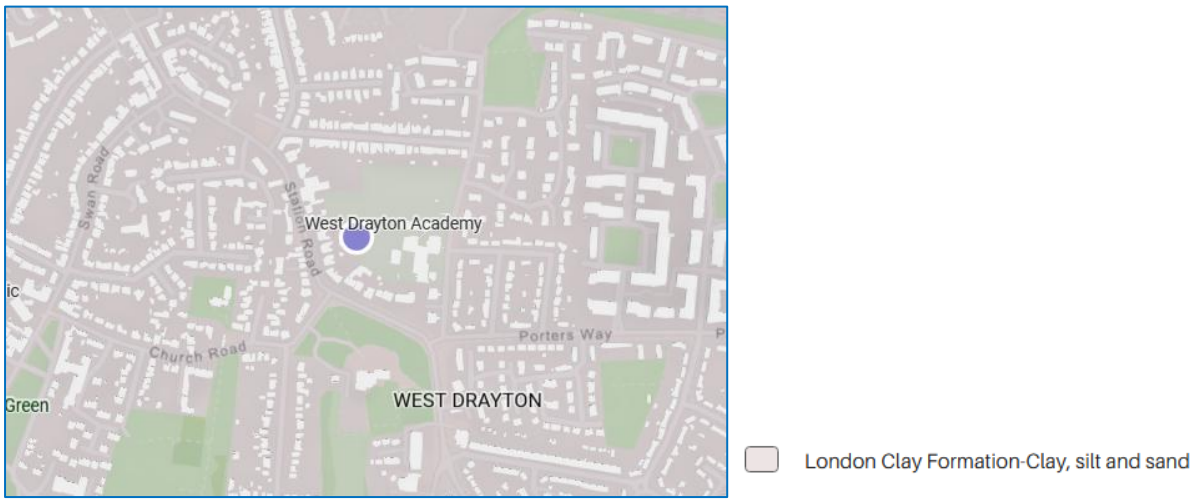

Figure 3 - Bedrock at the site. (Source: British Geological Society Website (contains British Geological Survey materials © NERC2026).

2. PLANNING POLICIES

2.1 National Planning Policies

- National Planning Policy Framework (December 2024)

- National Planning Practice Guidance Suite (August 2022)

2.2 Local Planning Policy

The report has been written in conjunction with the following local planning policies:

- London Borough of Hillingdon Local Plan, adopted November 2012 - 2026.

- London Borough of Hillingdon Local Flood Risk Management Strategy (June 2024).

- West London Strategic Flood Risk Assessment;

- The London Plan (2021), Policy S1 12, which states:

A Current and expected flood risk from all sources (as defined in paragraph 9.2.12) 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.

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.

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.

D Developments Plans and development proposals should contribute to the delivery of the 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.

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.

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.

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.

- The London Plan, Policy SI 13 Sustainable drainage, which states:

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.

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.

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.

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.

- The London Local Plan, Core Strategic Policy CS 18 Flood Risk, which states:

A. Minimising river flooding risk, requiring development in the City Flood Risk Area to seek opportunities to deliver a reduction in flood risk compared with the existing situation:

1. applying the sequential test and exception test as set out in the NPPF and Planning Practice Guidance and requiring Flood Risk Assessments to be submitted, in support of all planning applications in the City Flood Risk Area (Environment Agency Flood Zones 2 and 3 and surface water flood risk hotspots) and for major development proposals elsewhere;
2. protecting and enhancing existing flood defences along the riverside, particularly those identified as fair or poor in the current City of London SFRA. Development adjacent to the River Thames must be designed to allow for maintenance of flood defences.

B. Reducing the risks of flooding from surface water throughout the City, ensuring that development proposals minimise water use and reduce demands on the combined surface water and sewerage network by applying the London Plan drainage hierarchy.

C. Reducing rainwater run-off, through the use of suitable Sustainable Drainage Systems (SuDS), such as green roofs and rainwater attenuation measures throughout the City.

D. Ensuring that wider flood defences afford the highest category of protection for the City, participating in the development and implementation of the Environment Agency's Thames Estuary 2100 project.

E. Reviewing and updating the City of London's Strategic Flood Risk Assessment at least every 5 years or more frequently if circumstances require, to ensure that changes in flood risk are identified and suitable responses implemented.

- The London Local Plan, Policy DM 18.1 Development in the City Flood Risk Area, which states:

  - Where development is proposed within the City Flood Risk Area evidence must be presented to demonstrate that:

    - the site is suitable for the intended use (see table 18.1), in accordance with Environment Agency and Lead Local Flood Authority advice;

    - the benefits of the development outweigh the flood risk to future occupants;

- the development will be safe for occupants and visitors and will not compromise the safety of other premises or increase the risk of flooding elsewhere.

- Development proposals, including change of use, must be accompanied by a site-specific flood risk assessment for:

    1. all sites within the City Flood Risk Area as shown on the Policies Map; and

    2. all major development elsewhere in the City.

- Site-specific flood risk assessments must address the risk of flooding from all sources and take account of the City of London Strategic Flood Risk Assessment. Necessary mitigation measures must be designed into and integrated with the development and may be required to provide protection from flooding for properties beyond the site boundaries, where feasible and viable.

- Where development is within the City Flood Risk Area, the most vulnerable uses must be located in those parts of the development which are at least risk. Safe access and egress routes must be identified.

- For minor development outside the City Flood Risk Area, an appropriate flood risk statement may be included in the Design and Access Statement.

- Flood resistant and resilient designs which reduce the impact of flooding and enable efficient recovery and business continuity will be encouraged.

- The London Local Plan, Policy DM 18.2 Sustainable drainage systems (SuDS), which states:

  A. The design of the surface water drainage system should be integrated into the design of proposed buildings or landscaping, where feasible and practical, and should follow the SuDS management train and London Plan drainage hierarchy.

  B. SuDS designs must take account of the City's archaeological heritage, complex underground utilities, transport infrastructure and other underground structures, incorporating suitable SuDS elements for the City's high density urban situation.

  C. SuDS should be designed, where possible, to maximise contributions to water resource efficiency, biodiversity enhancement and the provision of multifunctional open spaces.

- The London Local Plan, Policy DM 18.3 Flood Protection and climate change resilience, which states:

A. Development must protect the integrity and effectiveness of structures intended to minimise flood risk and, where appropriate, enhance their effectiveness.

B. Wherever practicable, development should contribute to an overall reduction in flood risk within and beyond the site boundaries, incorporating flood alleviation measures for the public realm, where feasible.

3. FLOOD RISK

The possible causes of flooding set out in NPPF are considered in this section in relation to flood risk to the site itself and the effects of the development of the site on the flood risk elsewhere.

3.1 Flood Zones

The Environment Agency has developed a flood risk map, shown below, which shows the relative risk of flooding for different return periods. Flood zones assume that no defences are present and so where these do exist they are only indicative of the potential for flooding.

The proposed development site lies within a Flood Zone 1 of the Environment Agency's flood risk map, as shown below. Land located within Flood Zone 1 extents is at low risk of flooding, having an associated annual probability of flooding of less than 1 in 1000.

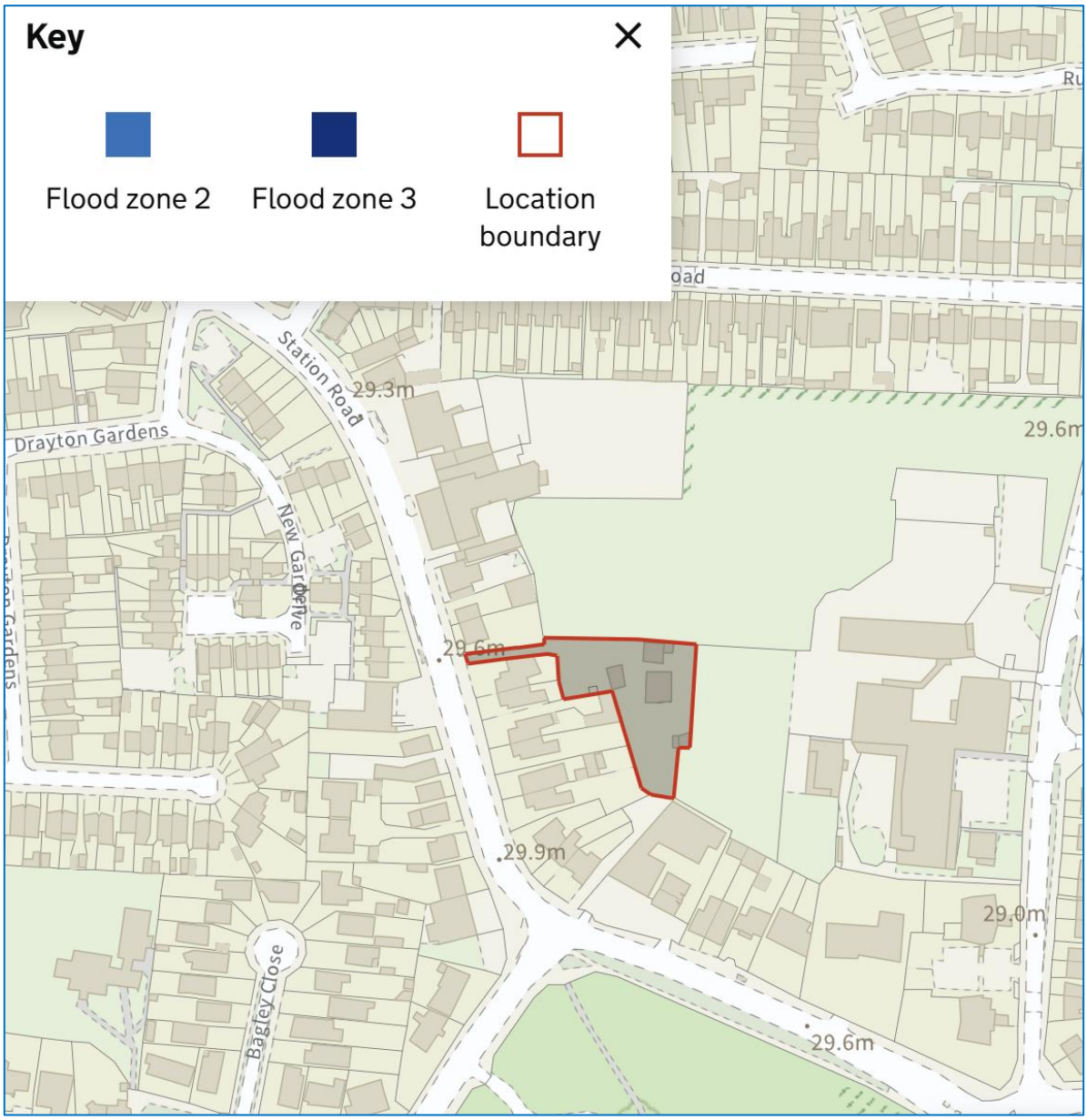

Figure 4 – Environment Agency Flood Map for flooding extent from rivers and sea for the proposed development

3.2 Flooding from Land (Overland Flow)

The proposed development site is shown to be at a medium risk of surface water flooding as can be seen from the Environment Agency's flood maps shown below and overleaf.

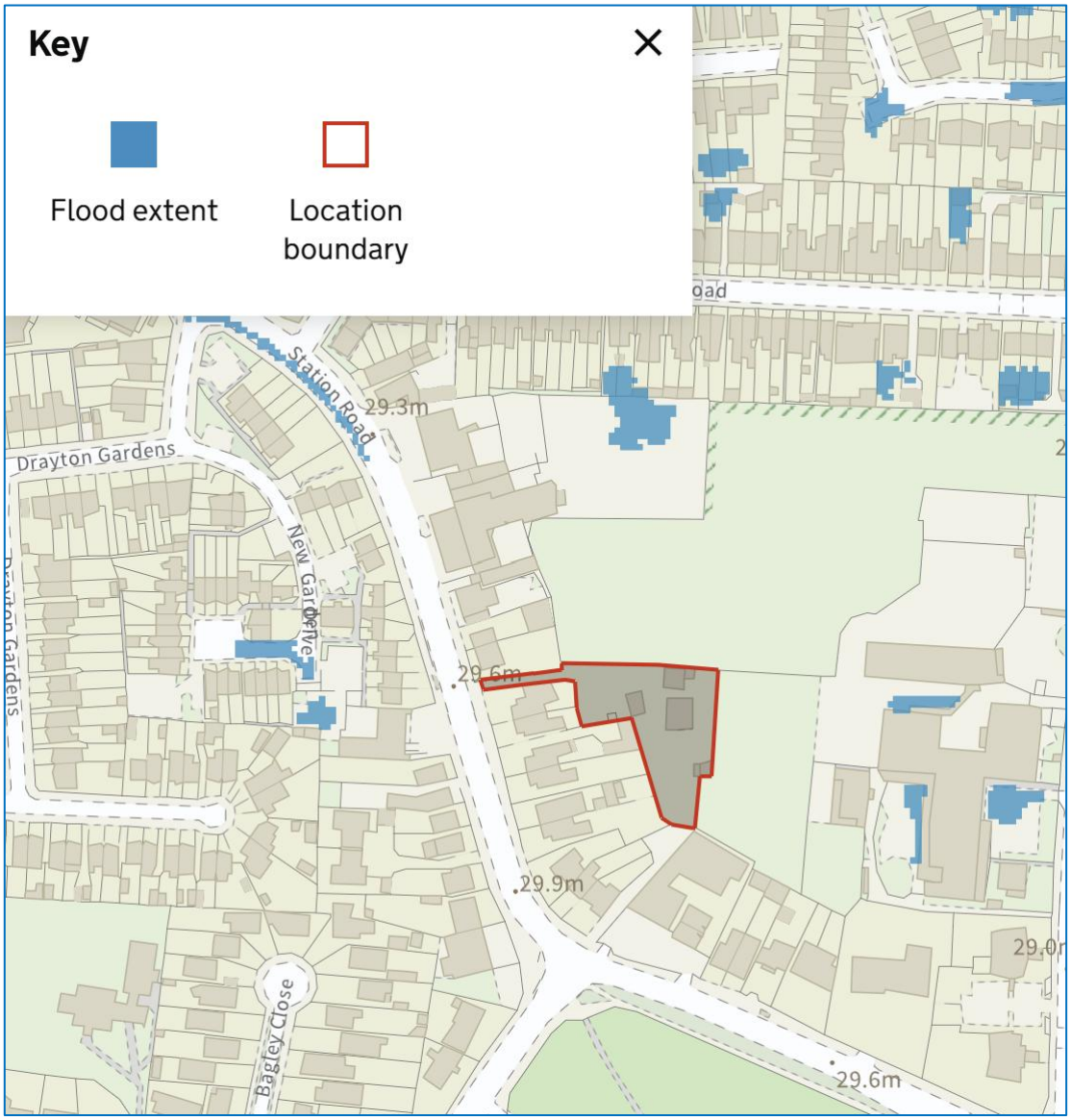

Figure 5 – Environment Agency Surface Water Flood Map (1 in 30 year) for the proposed development.

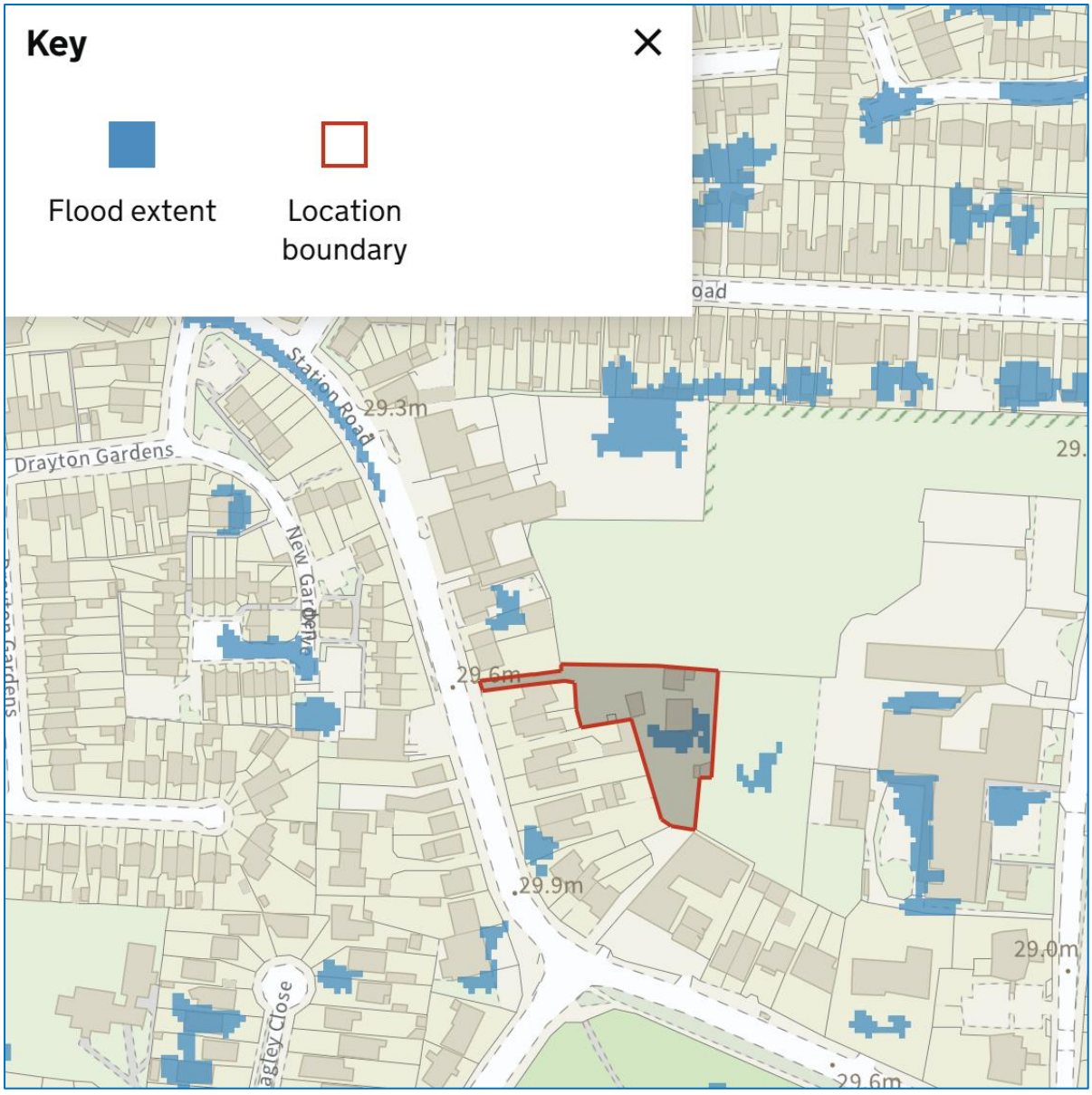

Figure 6 – Environment Agency Surface Water Flood Map (1 in 100 year) for the proposed development.

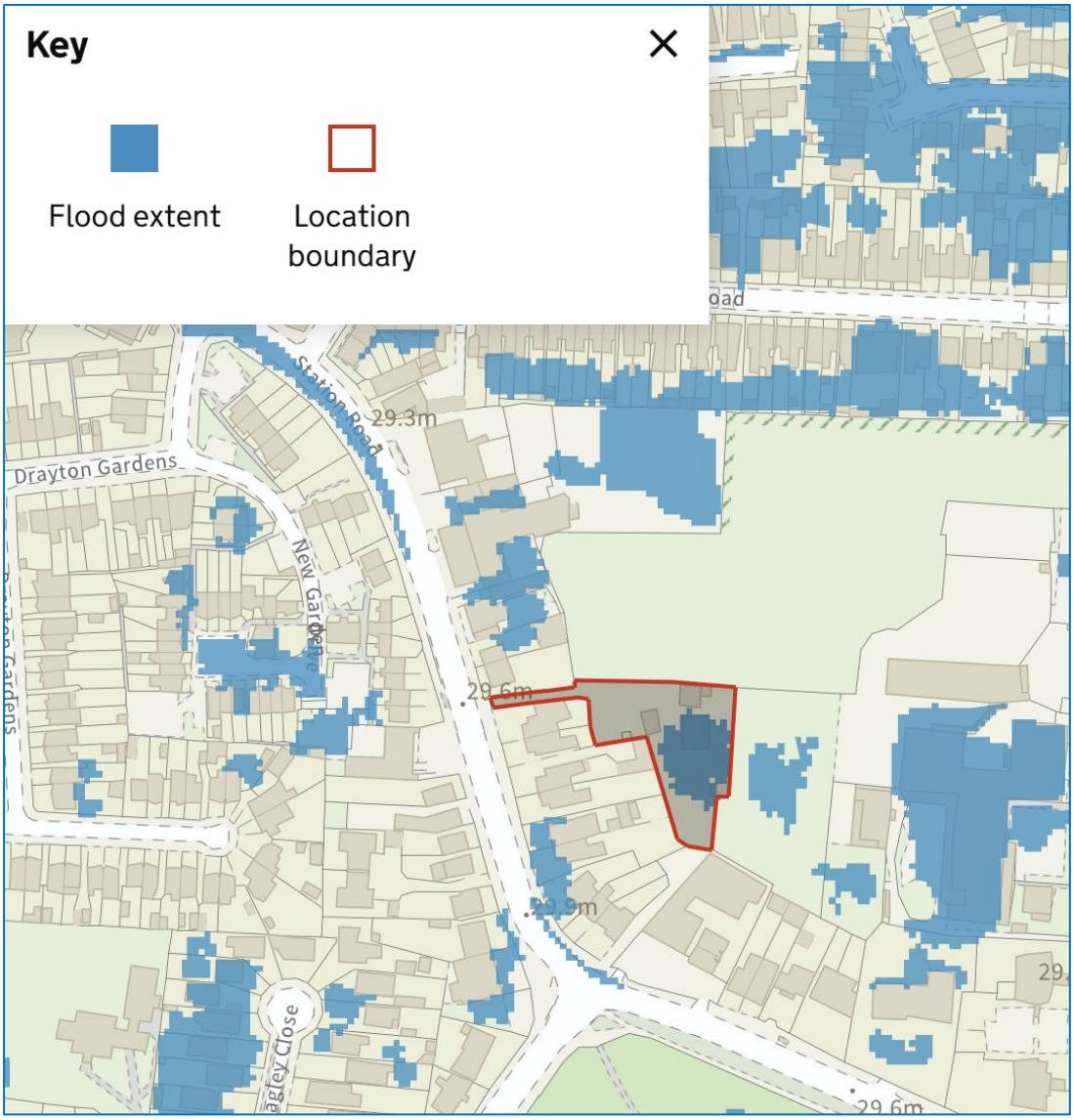

Figure 7 – Environment Agency Surface Water Flood Map (1 in 1000 year) for the proposed development.

To obtain further information on the risk and flood depths to be expected on site, DEFRA Pluvial Flood data has been obtained, and overlaid on to the proposed development site plan. These plans (C3753-02/03) can be found within Appendix A of this report.

From the extracted DEFRA data, we can conclude that there are areas throughout the site at a low risk of flooding of up to depths of 200mm, with greater risks to the proposed dwellings at the north of the site. As per DEFRA's flood risk guidance, areas at low risk of flooding have an annual chance of less than 1:100 but greater than or equal to 1:1000.

To avoid any risk of flooding to the proposed development, we have proposed that the minimum FFL for the properties shall be raised by 150mm above the exterior ground levels, however these cannot be raised any further due to planning height restrictions.

Therefore, together with the levelling of the ground, no flood water should enter the dwellings during an extreme pluvial storm event, resulting in no risk of life for any residents within their respective properties.

However, to ensure that any future flood risk developments for the proposals have been accounted for, various resilience measures will be incorporated into the fabric of the proposed dwellings. Fixtures and fittings will be put in place to ensure that if any flood water does enter the ground floor during an unlikely flood event, these measures will ensure drying and cleaning is simpler, and that the structural integrity of the building is not compromised, and ultimately, they will reduce the time required until the properties can be re-occupied.

The resilience measures to be adopted, are as follows:

- Self-closing air bricks to be used;

- Electricity consumer unit and mains connection point to be located 500mm above the FFL of each dwelling, with all feeds to go down the building from the ceiling;
- Non return valves to be used in drainage design to prevent back up of flow;
- Adequate sealing of joints between the internal units required to prevent any penetration of water behind fittings;
- Walls will have closed-cell cavity insulation;
- The construction of the ground floor slab to be waterproofed, and the finished surfaces of the ground floor of all properties are to be waterproof;
- Flood barriers or flood proof doors are to be used for each dwelling;

Additionally, residents will be provided with a copy of this flood risk assessment in order to understand the risks associated with access and egress from the site during a severe pluvial flooding event. As the predicted pluvial flood depth is only up to 200mm, and much less once the ground has been levelled, there will be no danger to life when accessing or egressing the dwellings.

However, it is essential that any safe access and egress routes are planned in advance and that residents do not put themselves at risk by walking through flood water, which, has the potential to knock them off their feet, where possible. It also imperative that

residents are made aware of the hidden dangers of raised flood water, such as blown manholes.

3.3 Flooding from Groundwater

The West London Strategic Flood Risk Assessment identifies the proposed development site to have a 50% to 75% susceptibility to groundwater flooding, as shown overleaf. The contractor will need to be undertake long term groundwater monitoring so they are made aware if any over pumping maybe required during the construction process.

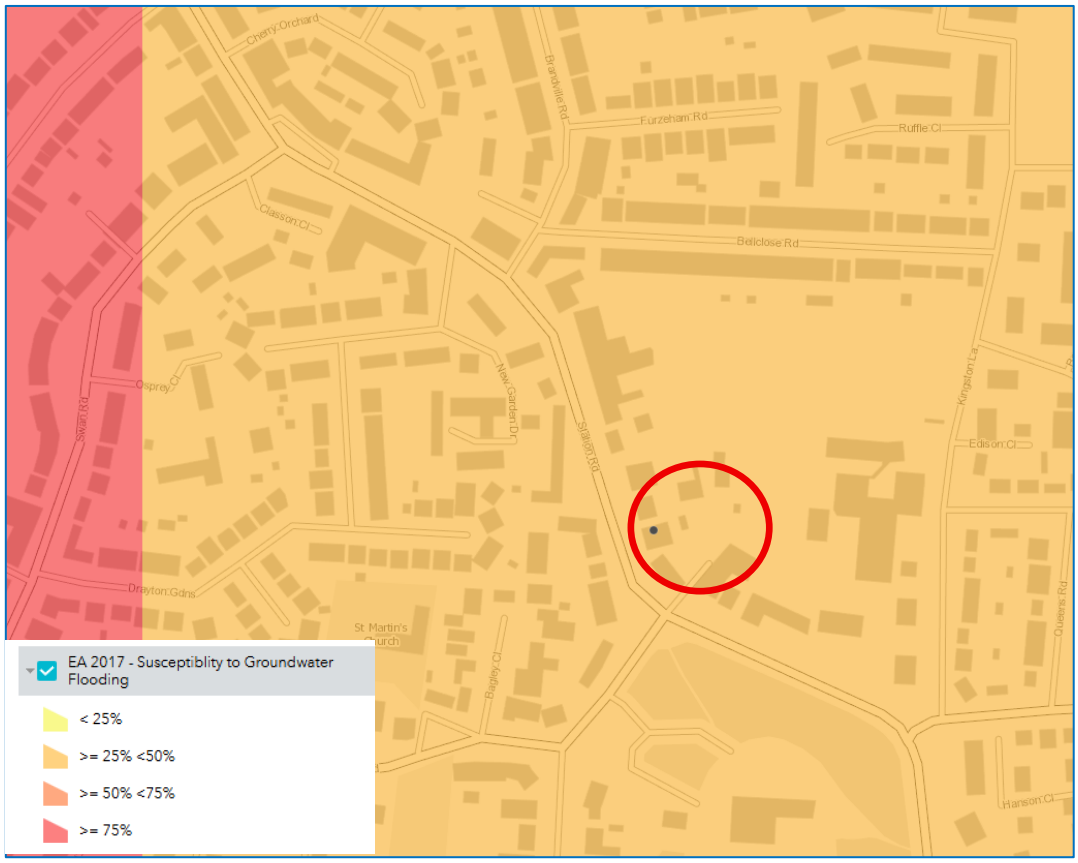

Figure 8 - BGS Groundwater Flood Map, Extracted from the SFRA

3.4 Flooding from Sewers

The West London Strategic Flood Risk Assessment mapping shows that there have been no incidents of sewer flooding within the vicinity of the site. Therefore, it is considered unlikely that there is any risk of flooding of the site due to surcharge of sewers.

Additionally, the proposed SUDs solution as shown in Section 5, shows that the peak rate of surface water runoff leaving the proposed development site, will be restricted to 0.871 l/s, therefore the proposed development will not increase any surface water leaving the existing site, and not increase flood risk at the site or elsewhere.

3.5 Flooding from Reservoirs, Canals or Other Artificial Sources

There is no risk of flooding to this site from any reservoirs, canals or other artificial sources in the vicinity, of the site. This can also be confirmed by the Environment Agency's Flood map shown overleaf.

Figure 9 – Environment Agency Flood Map from reservoirs for the proposed development

4. SUSTAINABLE URBAN DRAINAGE SYSTEMS

The total site area is 1893m^2, and the impermeable areas of the site prior to development are also 882m^2. Following the proposed development at the site, the impermeable areas will increase to 1052m^2, comprising the roof areas of the proposed dwellings, as well as the contributing hardstanding areas.

The pre and post development surface water runoff calculations showing the peak flow rate leaving the site can be found in Appendix B.

Surface water arising from a developed site should, as far as practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account.

Reducing the rate of surface water discharge from Urban Sites is one of the most effective ways of reducing and managing flood risk.

Traditional piped surface water systems work by removing the surface water from our developments as quickly as possible, however this can cause various adverse impacts:

- Increased downstream flooding, and sudden rises in flow rates and water levels in local water courses.

- Reduction in groundwater levels dry weather flows in watercourses.

- Reduce amenity and adversely affect biodiversity due to the surface water run-off containing contaminants such as oil, organic matter and toxic materials.

SuDS are defined as a sequence of management principles and control structures designed to drain surface water in a more sustainable fashion than conventional piped drainage techniques. SuDS should utilise the environmental, ecological and social benefits.

These include:

- Protection and enhancement of water quality – As well as providing on-site attenuation, SuDS treat the water, resulting in an improved quality of water leaving the site. This is achieved when the water passes through the fine soils and the roots of specially selected plants, pollutants washed of the hard landscaping by rainfall will be safely removed before the water reaches the natural water course.

- A sympathetic approach to the environmental setting by providing the opportunities to create habitats for flora and fauna in urban watercourses and open spaces.

- Meeting the amenity and social needs of the local community and residents in the creation of attractive green spaces.

The various types of SuDS include:

Permeable paving	
Soakaways;	
Swales and basins;	
Bioretention/ rain gardens;	
Green roofs and rainwater re-use;	
Infiltration trenches and filter drains	
Ponds and wetlands	

Preferably a combination of these techniques should be used as part of the surface water management train, and it is important for all stakeholders; such as developers, architects, landscape architects and engineers, to work together at the planning stage in order to determine a feasible solution.

The SuDS management train is shown in Figure 9 below, this has been followed when proposing the proposed Sustainable Urban Drainage Systems for this site.

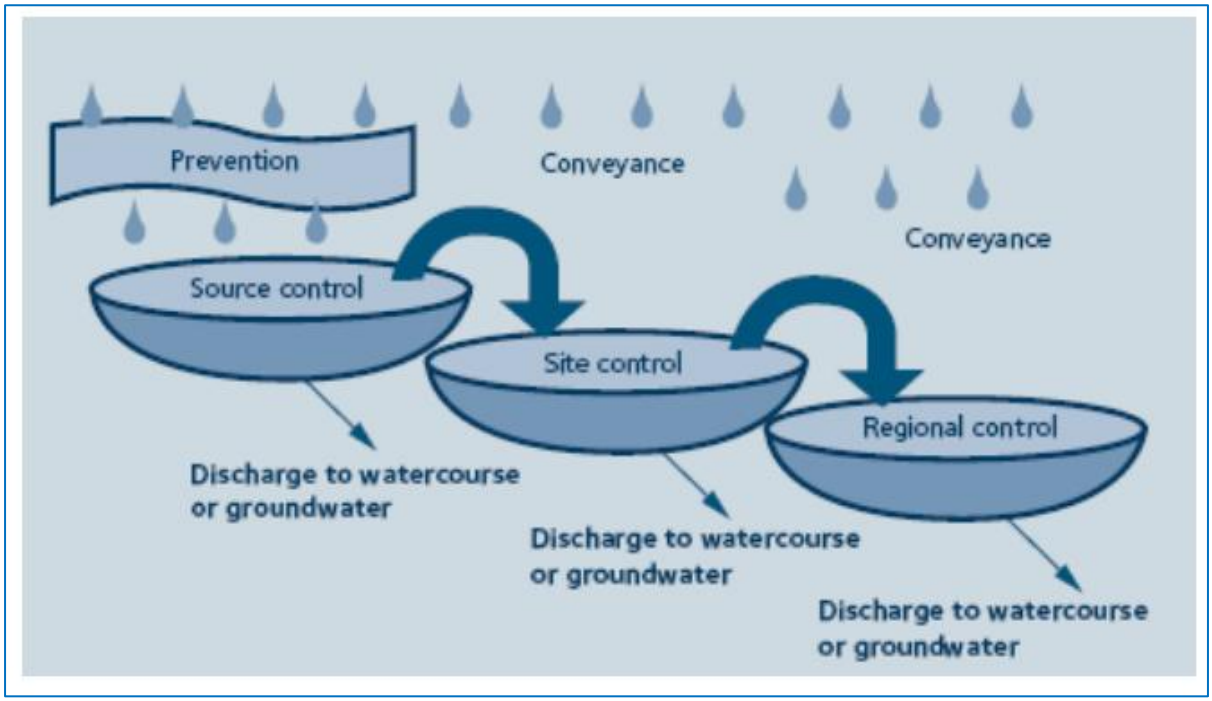

Figure 10 – SuDS Management Train

5. PROPOSED SuDS SOLUTION

The preferred method of dealing with surface water run off would be to treat and deal with it at source through soakaways. However, due to the existing ground conditions this was determined to be unfeasible.

In order to ensure that the SuDS management train has been considered fully, a rainwater harvesting tank will be provided for each dwelling, where possible, to ensure that rainwater re-use is promoted and also to provide source control.

Additionally, all new hardstanding areas will be formed of a permeable paving in order to deal with as much of the surface water at the source, with the surface water runoff from all areas sloping greater than 1:20 to be caught by slot drains. A significant area of attenuating gravel subbase has been proposed in the car parking areas of the dwellings to the south, as can be seen in the plans provided in Appendix A.

The remaining surface water runoff will be collected in a below ground, crate-style attenuation tank, before discharging at a controlled rate to the nearby Surface Water Sewer. Hydrograph storage calculations were carried out for a 1 in 100 year storm event plus 45% climate change, using a peak flow rate of 0.871 l/s leaving the site, and these show that a net storage of 77.1m^3 of storage is required. This can be seen as provided in the plans within Appendix A, along with all supporting runoff calculations in Appendix B of this report.

We believe the Sustainable Urban Drainage System hierarchy has been considered fully with respect to the type of development.

6. TIMESCALE AND MAINTENANCE OF DRAINAGE WORKS

All drainage works shall be completed prior to first occupation and there shall be no adoption of any of the drainage works within the site, and a management company will be formed to be responsible for overseeing the long-term maintenance of the communal drains.

The following outline maintenance strategy sets out recommended timescales for maintenance of the proposed drainage works, in line with CIRIA SuDS Design Guide:

- Regular inspection will comprise the inspection and cleaning of catchment, gutters, filters and tanks to reduce the likelihood of contamination, this is recommended to be carried out every 3 to 6 months.

- Any flow control device should be checked every 3 months for the accumulation of debris/ silt, in order to ensure that there are no blockages.

- The catchpit chamber and flow control to the attenuation tank should be checked and cleaned every 3 months for the accumulation of debris/ silt, in order to ensure that there are no blockages.

- Jet washing of permeable surfaces should be undertaken every 3 to 6 months in order to ensure that the system works properly

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations or clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this is the most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving.	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material.	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48hr after large storms in six months
	Inspect slit accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 1: Operation and maintenance requirements for pervious pavements.

Maintenance schedule	Required action	Typical Frequency
Regular maintenance	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdraw devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank, inlets, outlets, gutters. Withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/ or replacement of any filters	Three monthly (or as required)
Remedial actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

Table 2: Operation and maintenance requirement for RWH systems.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockages by sediment, algae or other matter: remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/ or internal forebays	Annually, or as required
Remedial actions	Repair/ rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that the are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Table 3: Operation and maintenance requirements for attenuation storage tanks.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect from surface and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then 6 monthly intervals
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	Orifice plates within plastic chambers or vortex controls to be jetted from the surface after heavy rainfall events to remove any debris or silt	As required
	Empty catchpits upstream of SuDS features to ensure no debris is passed downstream	3 months or as required
Remedial actions*	In the event of a blockage, a vortex flow control can be removed from the chamber via the lifting cabled located at the access, this will be cleaned at surface level and reinstalled into its original location	As required
	In the event of a blockage, the orifice plate should be jetted from surface, and if blockage is not cleared the orifice plate can be removed by removing fixing bolts. These fixing bolts should be checked and replaced if needed.	As required
Monitoring	Following installation it is important that any extraneous materials i.e. building materials: granular backfill, in-situ pour concrete etc are removed from the unit and the new flow control chamber is fully jetted down	Upon installation
	Inspect/check chamber channel for any debris or silt build-up. Upstream chambers should be checked at the same time as these monitoring works to ensure network is operating at full capacity.	Annually

Table 4: Operation and maintenance requirements for flow control chambers

*All Remedial Works should be carried out by a competent and certified contractor, with no access to chambers or removal of parts to be undertaken by homeowners

If upstream network of flow control chamber is regularly maintained, little maintenance is required within the chamber as there are no moving parts

7. CONCLUSIONS

The site is at very low risk from flooding from ground water, reservoir, fluvial or tidal flooding. However, there are areas of the site showing risk of pluvial flooding of depths up to 200mm, in naturally low lying areas of the existing site. Therefore, the proposed FFL will be raised by 150mm from existing ground levels, and further mitigation and resilience measures have been proposed in order to ensure that there is no risk to life from an extreme pluvial flooding event.

The proposals will not impact on any known flood flow route or flood storage area.

A suitable Sustainable Urban Drainage systems solution has been proposed, which follows the SuDS hierarchy. All components of the SuDS management train have been considered and utilised and this proposed development will greatly reduce the surface water run off leaving the site and therefore reduce flood risk at the site and elsewhere.