KUDOS ROADSHOW LTD

GRANVILLE HOUSE, UXBRIDGE

FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY

REPORT REF. 2502850-ACE-XX-XX-RP-C-0301A

MARCH 2026

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REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
-	DRAFT	LE	JS	DRAFT	06.06.2025
-	FINAL	LE	JS	CC	10.06.2025
A	Amended Layout	LE	LB	CC	04.03.2026

Distribution

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1. INTRODUCTION

1.1. Ardent Consulting Engineers (hereafter referred to as "Ardent") has been commissioned by Kudos Roadshow Ltd to undertake a Flood Risk Assessment (FRA) and Drainage Strategy for the proposed commercial development at Granville House, Uxbridge (hereafter referred to as 'the Site').

1.2. This FRA supports a planning application for the provision of a new warehouse building with associated parking and servicing in the existing carpark at Granville House.

1.3. This FRA has been written with specific reference to the requirements of the National Planning Framework (NPPF – December 2024) and the Planning Practice Guidance (March 2014 – flood risk section updated in August 2022).

Site Location

1.4. The development site is located at Granville House, Wallingford Road, Uxbridge, UB8 2RW. The total site area is 0.26 ha and is centred approximately at Ordnance Survey grid reference TQ049832 (504954mE, 183211mN). The site is located in the London Borough of Hillingdon. Refer to *Figure 1-1* below for the site Location Plan.

1.5. The development site comprises two plots, the existing Granville House warehouse building and car park to the south and proposed warehouse building to the north to be built on part of the existing car park. The site is located approximately 1.15m southwest of the town centre of Uxbridge. Wallingford Road is located to the east, Cowley Mill Road to the north and the Grand Union Canal forms the eastern boundary of the site.

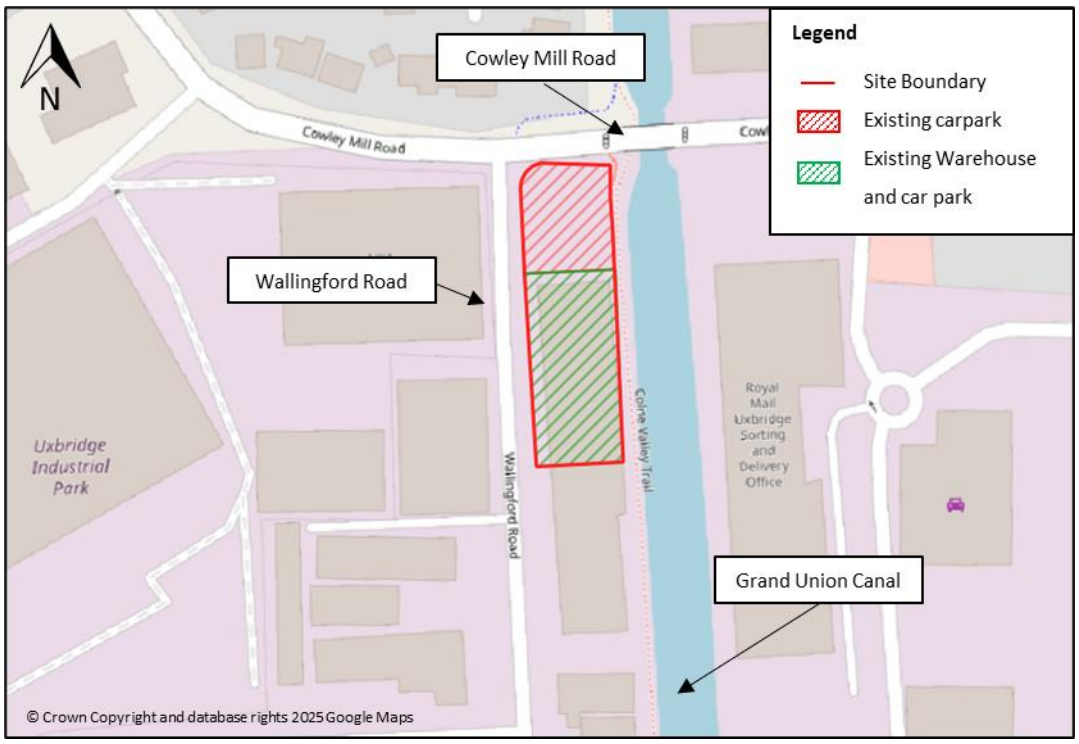

Figure 1-1: Site Location Plan

Development Proposals

1.6. The proposals are for the provision of a new warehouse building (approx. ground floor GIA 206m^2, total GIA 526m^2) with associated parking and servicing areas part of the existing carpark at Granville House. The proposed warehouse has been designed to be situated within Flood Zone 1. Refer to *Figure 1-2* and *Figure 1-3* below and **Appendix A** for the development layout plans.

1.7. The commercial development is classified as having an overall 'Less Vulnerable' classification within the NPPF.

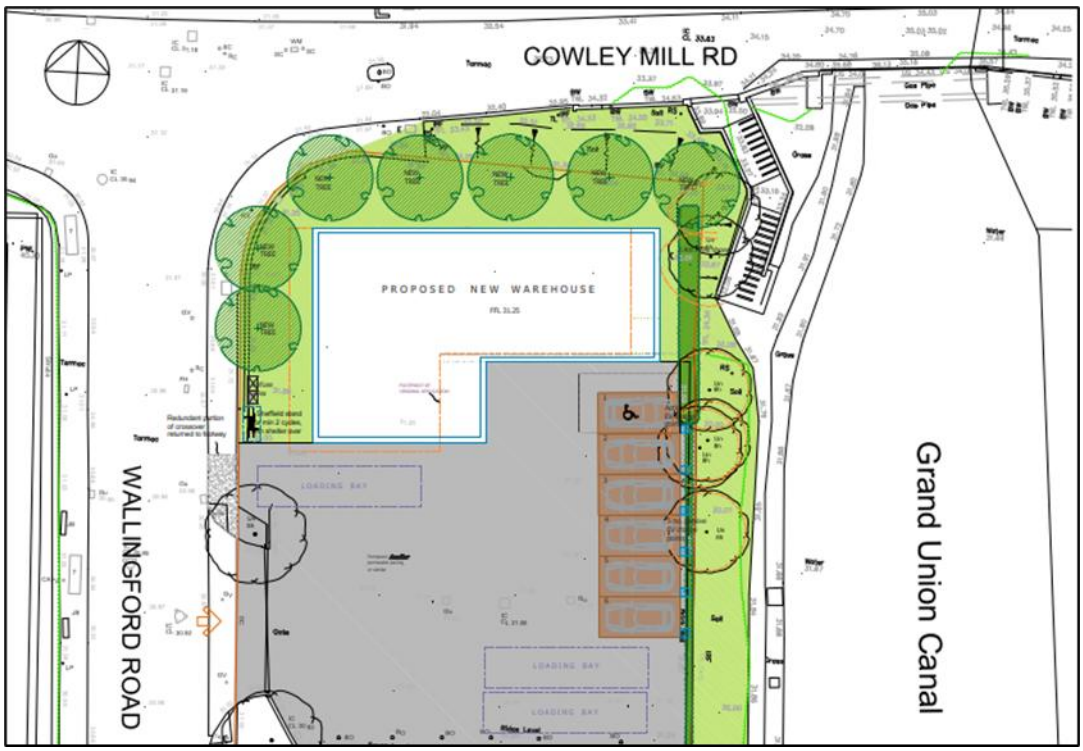

Figure 1-2 - Development Proposals Ground floor

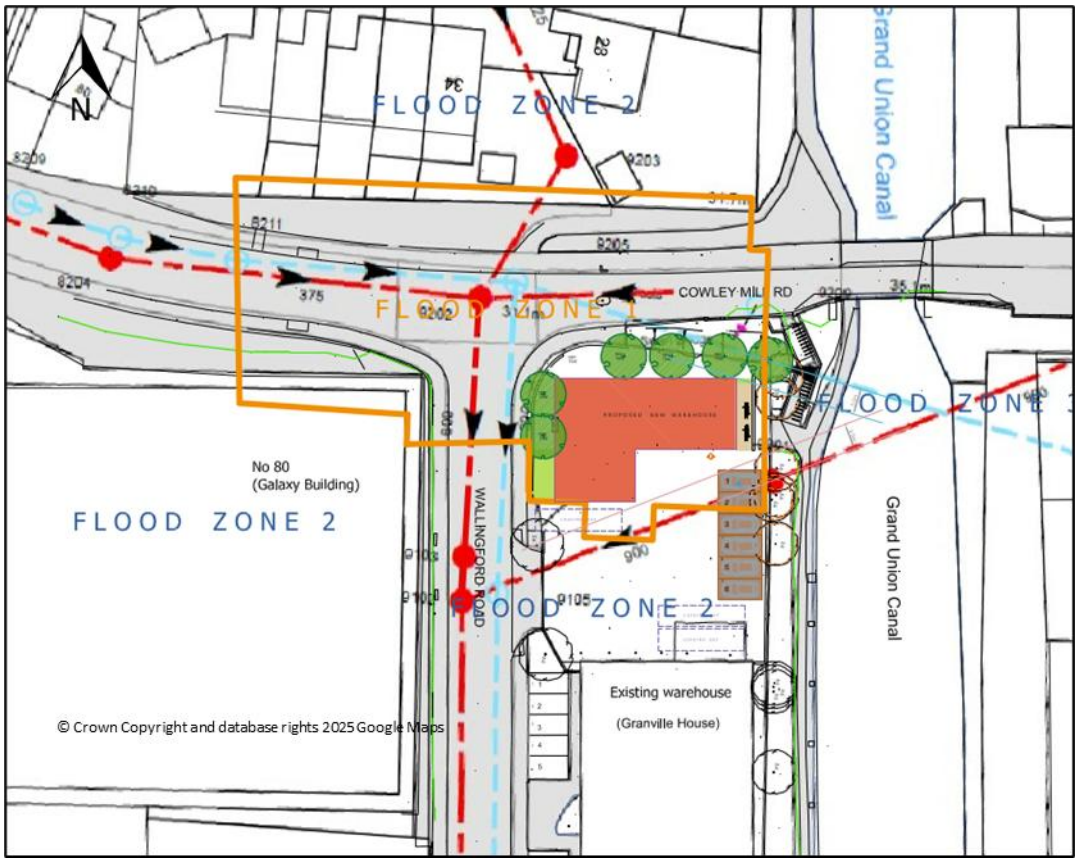

Figure 1-3: Proposed Development and Flood Zones

2. POLICY CONTEXT

National Planning Policy Framework

2.1. The National Planning Policy Framework (NPPF) was introduced on 27 March 2012. This document was revised most recently in December 2024 (and further in February 2025); where paragraphs 170 to 182 inclusive establish the Planning Policy relating to flood risk management.

2.2. It states all plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – to avoid where possible, flood risk to people and property. They should do this and manage residual risk, by:

- applying the sequential test, and if necessary, the exception test;
- safeguarding land from development that is required for current and future flood management;
- using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and
- where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development including housing, to more sustainable locations.

2.3. The NPPF states that a Flood Risk Assessment is required "*A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.*"

2.4. The Planning Practice Guidance (PPG) provides the methodology required to undertake the Sequential and Exception Tests

National Planning Policy Guidance: Flood Risk and Coastal Change (2025)

2.5. The Planning Practice Guidance (PPG) on Flood Risk and Coastal Change provides detailed advice to support the implementation of the National Planning Policy Framework (NPPF) regarding development in areas of flooding or coastal change. Key aspects of the PPG include:

- Defining the Flood Risk Zones including Flood Zones 1 (low risk), 2 (medium risk) and 3 (high risk) and outlining flood risk reduction measures.
- Taking flood risk into account in the preparation of strategic policies.
- Setting out the criteria for when new developments require a site-specific flood risk assessment to ensure that flood risk is assessed and where necessary, mitigated against.
- Guidance on the sequential approach to the location of development, as well as when developments should undertake the Sequential Test, prioritising development in areas of lower flood risk. If there are no suitable sites in these areas, the Exception Test must be applied, ensuring that flood risk can be managed and that the development has wider sustainability benefits.
- The role of the Environment Agency and Lead Local Flood Authorities in assessing planning applications.
- Addressing residual flood risk, including guidance on emergency plans.
- Addressing sustainability and climate change adaptation. Where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long term, seeking opportunities to relocate development, including housing, to more sustainable locations.

Flood and Water Management Act (2010)

2.6. The Flood and Water Management Act places a duty on all flood risk management authorities to co-operate with each other. The act also provides lead local flood authorities and the Environment Agency with a power to request information required in connection with their flood risk management functions.

2.7. The Flood and Water Management Act 2010 defines clearer roles and responsibilities for the implementation of sustainable drainage (SuDS) in developments, by requiring drainage systems to be approved against a set of draft national standards.

Sustainable Drainage Systems - Non-statutory technical standards for sustainable drainage systems- June 2025

2.8. The National Standards for sustainable drainage systems (SuDS) were published in June 2025 which supersede the Non-statutory Technical Standards for SuDS.

This document sets out seven standards that are complementary and the delivery of each standard should support delivery of the other standards.

2.9. There may be specific circumstances or constraints, such as the type or size of a development that mean it is not possible to deliver one or more of the standards. In these circumstances the opportunity to meet the standard shall be maximised and justification be developed in consultation with the approving body, who may agree to a departure.

2.10. The standards should be used in conjunction with the Planning Practice Guidance (PPG).

2.11. The Local Planning Authority (LPA) may set local requirements for planning permission that have the effect of more stringent requirements than these non-statutory technical standards.

2.12. In addition, SuDS should be designed in accordance with CIRIA 753 SuDS Manual, which represents current best practice.

West London Level 1 Strategic Flood Risk Assessment (SFRA, 2018)

2.13. The West London Boroughs of Barnet, Brent, Ealing, Harrow, Hillingdon and Hounslow commissioned the production of a joint Level 1 SFRA. The overarching aim of the SFRA is to provide the evidence base for ensuring development is steered away from areas identified most at risk from various flood sources, reducing the risk of flooding to its residents and buildings.

2.14. The SFRA states that the greatest risk from flooding within the study area arises from pluvial and tidal sources with many urban areas within the study area shown to be at risk in the 1% AEP for fluvial and 0.5% AEP for tidal when considering allowance for climate change.

2.15. Where development cannot be located in Flood Zone 1 the respective council will need to apply the Sequential Test to land use allocations and, where necessary, the Exception Test. In addition, it allows a planning authority to:

- Prepare appropriate policies for the management of flood risk;
- Inform the sustainability appraisal so that flood risk is taken account of, when considering options and in the preparation of strategic land use policies;

- Identify the level of detail required for site-specific Flood Risk Assessments (FRAs);and,
- Determine the acceptability of flood risk in relation to emergency planning capability.

2.16. With regards to SuDS, the SFRA recommends that priority is given to utilising surface water infiltration drainage techniques wherever possible. This is due to the presumption that infiltration techniques are viable over most of the study area due to generally permeable soils. However, each site should confirm that the presumption is correct and that the use of infiltration drainage will not increase the risk of groundwater flooding.

2.17. The SFRA states that SUDS techniques will be required for all proposed land allocations unless suitable facilities can be provided at a suitable adjacent downstream location. The attenuation of flows to the undeveloped condition discharge, less a minimum betterment of 5%, should be the norm. The techniques employed will depend on the individual circumstances. Developers should consult with the Environment Agency at an early stage about their SuDS proposals, to ensure that they are adopting the most effective methods for their site.

Climate Change Allowances

2.18. The Planning Practice Guidance states that to allow for the predicted impacts of climate change on Peak River Flow Allowances, consideration should be given to the catchment within which the Site is located. The Site is located within the Colne Management Catchment and as such the following allowances detailed in **Table 2-1** are applicable to the Site.

Table 2-1: Colne Management Catchment Peak River Flow Allowances

	Central	Higher	Upper
2020s	10%	16%	30%
2050s	8%	16%	38%
2080s	21%	35%	72%

2.19. For 'less vulnerable' development the Planning Practice Guidance states that the central allowance should be used. Therefore, under the NPPF, an allowance of 21% would achieve the policy requirements in assessing the flood risk associated with the development.

2.20. The Planning Practice Guidance states that to allow for the predicted impacts of climate change on surface water runoff within the Colne Management Catchment, the following increases detailed in **Table 2-2** below to rainfall intensity should be allowed for. For development with a lifetime beyond 2100, the upper end allowances should be used.

Table 2-2: Colne Management Catchment Peak Rainfall Allowances

	Central	**Upper**
3.3% annual exceedance rainfall event		
2050s	20%	35%
2070s	25%	35%
1% annual exceedance rainfall event		
2050s	20%	40%
2070s	25%	40%

2.18. Therefore, under the NPPF an allowance of 40% for the effects of climate change for the 1% annual exceedance rainfall event would achieve the policy requirements in designing the drainage elements for the proposed residential redevelopment.

3. BASELINE CONDITIONS

Topography

3.1. A topographical survey was carried out by JasPlanServices in February 2025; a summary of the survey is presented below and included in full within **Appendix B**.

3.2. Levels across the site and car park areas are generally flat at around 31mAOD, levels are highest at the watercourse at approx. 31.6mAOD and lower in Wallingford Road to the west to a low point of circa 30.92mAOD.

Hydrology

3.3. The Grand Union Canal runs along the sites eastern boundary and falls within the River Brent catchment, and is a designated EA main river, which flows north to south adjacent to the site.

3.4. The River Colne, an EA main river, flows approximately 430m west of the site and Fray's River (a tributary of the River Colne) runs approximately 260m east of the site.

Existing Sewers

3.5. An extract of Thames Water sewer records is provided in *Figure 3-1* below, a full copy is included in **Appendix C**.

3.6. The plan shows foul and surface water sewers run along Wallingford Road to the west and Cowley Mill Road to the north. It is proposed to drain the surface water to the existing 300mm surface water sewer network (Manhole 9106) at a depth of 29.20mAOD in Wallingford Road. There is a 900mm diameter combined water public sewer running through the site, however no buildings are proposed to be built above the sewer. This 900mm diameter sewer is position 3m from the new proposed building footprint, therefore at detailed design it is recommended to undertake a build over/close application with Thames Water.

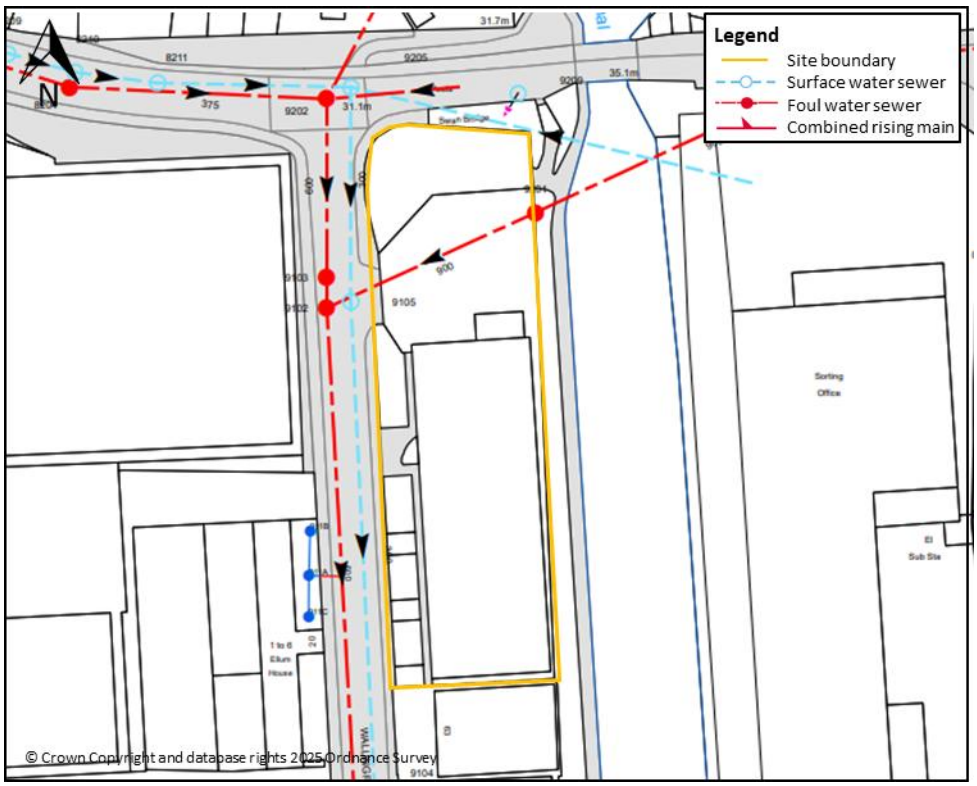

Figure 3-1: Asset Mapping

Ground Conditions

3.7. According to the British Geological Survey (BGS) online datasets, the bedrock geology of the Site consists of the London Clay Formation (Clay) and superficial Alluvium deposits (Clay, Silt, Sand and Peat) refer to *Figure **3-2*** and *Figure **3-3*** below.

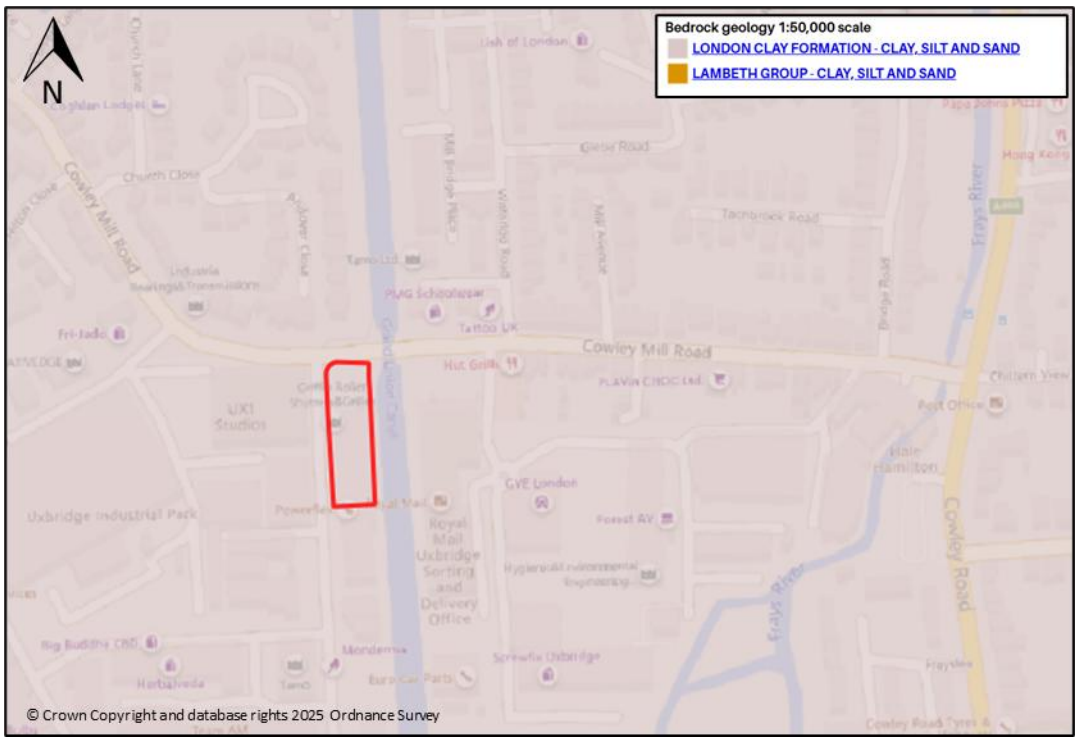

Figure 3-2: BGS Geology Maps (Bedrock Geology)

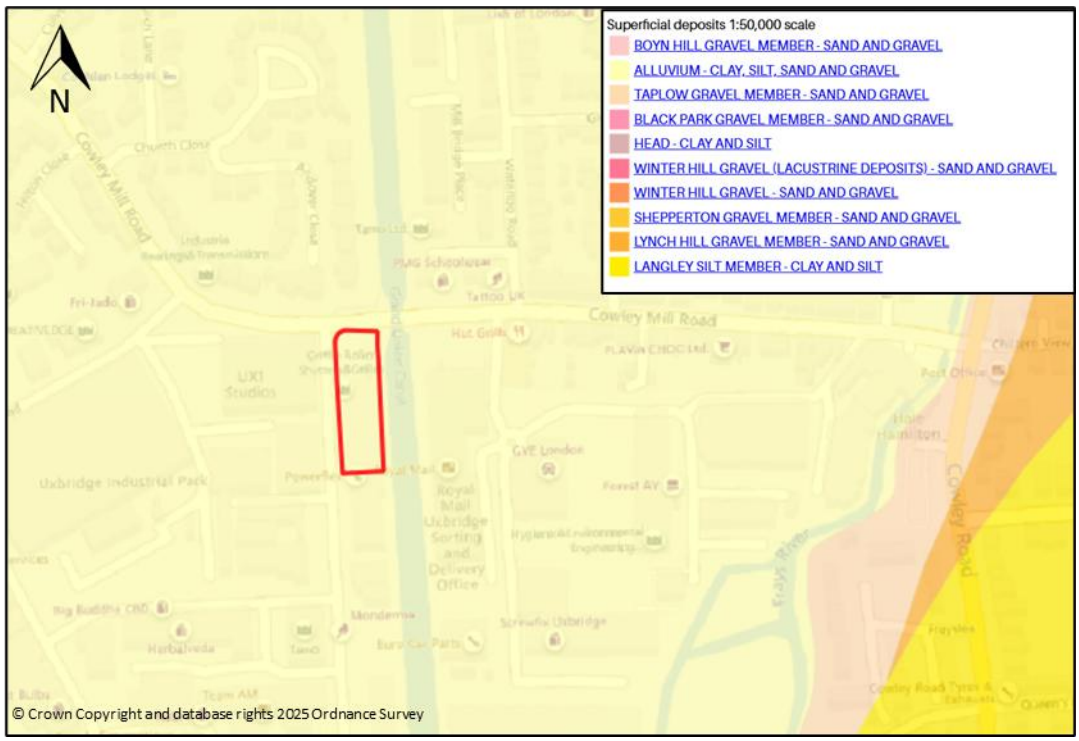

Figure 3-3: BGS Geology Maps (Superficial Geology)

3.8. It was noted that the bedrock geology is classified as a Secondary Aquifer, defined as *layers of rock or drift deposits that have high intergranular and/or*

fracture permeability - meaning they usually provide a high level of aquifer storage. The site is not located within a Groundwater Source Protection Zone.

4. SOURCES OF FLOODING

4.1. The NPPF requires flood risk from the following sources to be assessed, each of which are assessed separately below:

- Tidal sources (flooding from the sea);
- Fluvial sources (river flooding);
- Pluvial sources (flooding resulting from overland flows);
- Groundwater sources;
- Sewer flooding;
- Artificial sources, canals, reservoirs etc.; and,
- It also requires the risk from increases in surface water discharge to be assessed (surface water management).

Flood Zone Designations

4.2. Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. The NPPF Planning Practice Guidance defines Flood Zones as follows:

- **Flood Zone 1: Low Probability**. Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b)
- **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. (Land shown in light blue on the Flood Map)
- **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. (Land shown in dark blue on the Flood Map)
- **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).

Fluvial Flooding – EA Modelled Flood Levels

4.3. The Environment Agency's Flood Map for Planning indicates that the majority of the Site is located within Flood Zone 2. Flood risk data and site-specific flood maps were obtained from the Environment Agency. The Lower Colne hydraulic model and study (Mott MacDonald 2012) were provided and used to inform flood risk at the site.

4.4. The model includes the 1 in 100 year flood event with a 20% allowance for climate change. Whilst the current climate change allowance at the site is 21%, use of the Lower Colne modelling is considered reasonable given the nature and scale of the development. As shown in *Figure 4-1* below, the predicted flood extents are not shown to reach the development site. The modelled flood level at the nearest node within the adjacent watercourse is 31.79m AOD during the 1 in 100-year plus climate change event. There is an existing retaining wall/vegetated embankment along the eastern boundary of the site between the site and the watercourse. Site levels in this area are elevated above the modelled flood level, with a minimum of 32.00m AOD where the proposed development is located, and 31.90m AOD at the south-eastern boundary adjacent to the existing warehouse..

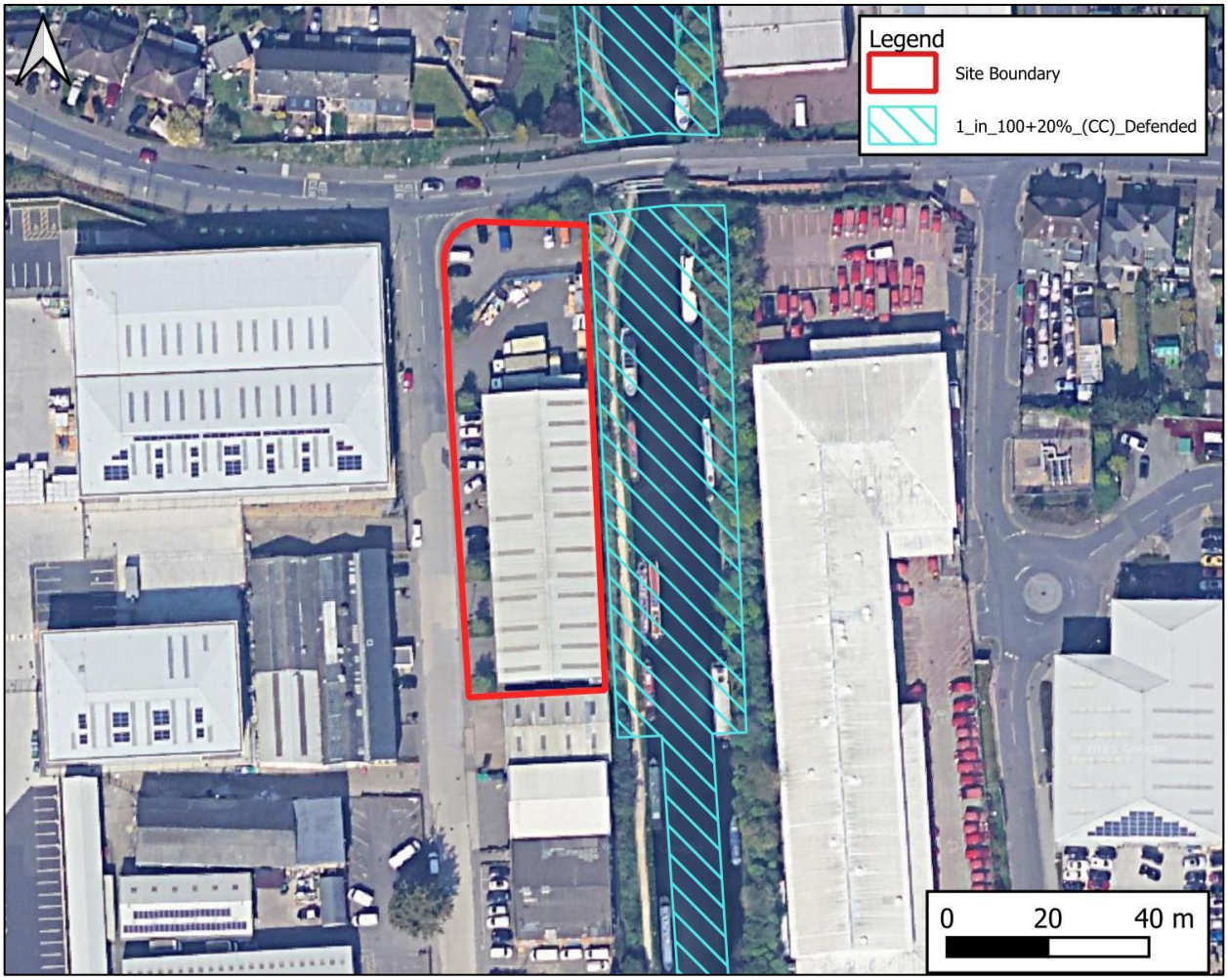

Figure 4-1: 1 in 100 year + CC Modelled Flood Extent

4.5. There is a residual risk of flooding in the 1 in 1000 year defended and undefended events, levels recorded in the watercourse for the node in closest proximity to the site:

- 1 in 1000 year defended = 31.87mAOD
- 1 in 1000 year undefended = 31.89mAOD

4.6. Residual fluvial flood risk will be mitigated by the flood resistance measures detailed in **Section 5**, fluvial flood risk is therefore considered low.

Pluvial Flooding

4.7. The Environment Agency's Risk of Flooding from Surface Water map dataset, displayed below in *Figure **4-2*** shows that the development site is in an area that has a 'very low' risk of flooding (<0.1% AEP). There are certain areas shown as being at 'low' (1% AEP) in Wallingford Road west of the site.

4.8. The proposed site layout and surface water drainage strategy will be designed to minimise surface water flood risk across the site. It will ensure that no surface water flooding occurs across the site for events up to and including the 1-in-100-year return period plus 45% allowance for climate change as described in **Section 5** of this report. Therefore, the risk of pluvial flooding is assessed as 'negligible'.

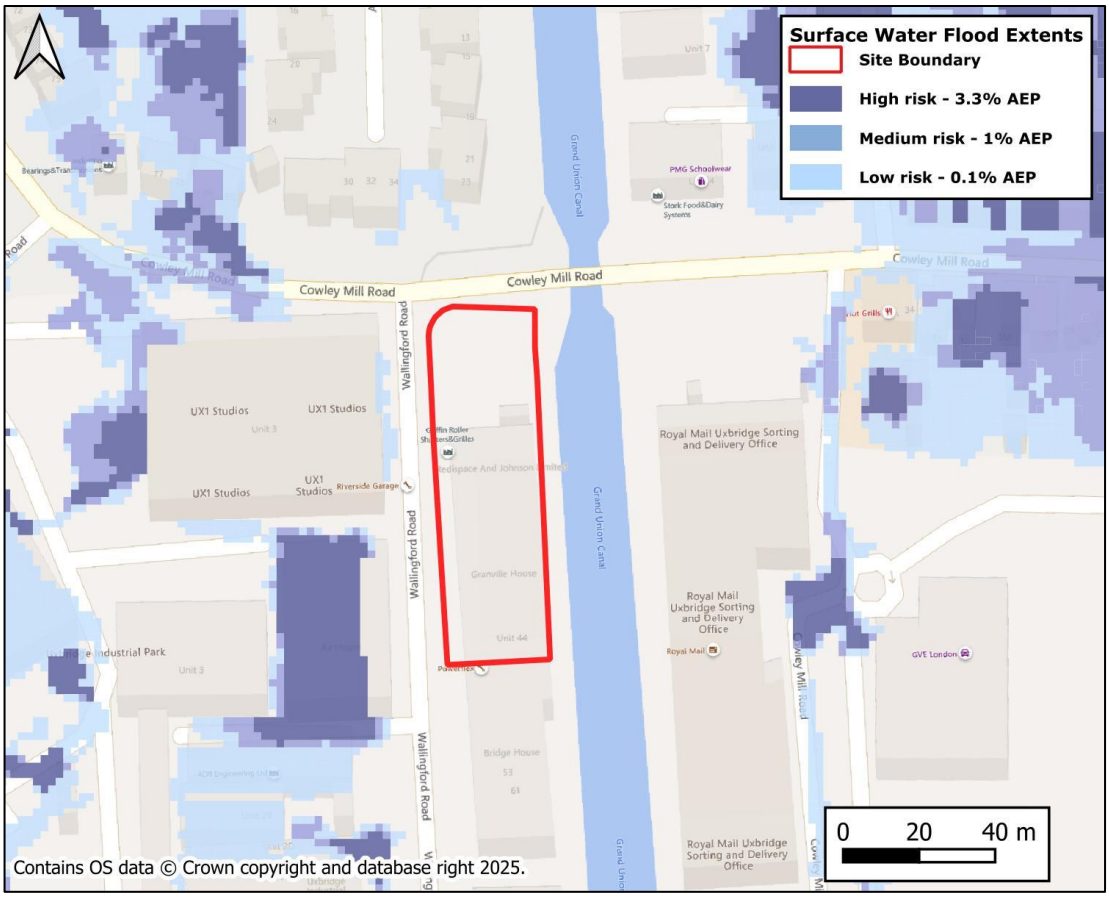

Figure 4-2: Environment Agency Flood Map for Surface Water

Groundwater

4.9. The EA long term flood risk dataset states that flooding from groundwater is unlikely in this area.

4.10. A historic borehole is recorded by BGS east of the site (TQ08SE3/A-C) to a depth of 12.19m and recorded topsoil for a depth of 0.1m, followed by sandy clay and gravel for 1.2m, gravel and sand to a depth of 2.1m, brown clay to a depth of 3.5m and blue clay up to a depth of 8.22m. Groundwater was struck at a depth of 1.37m. Refer to **Appendix D** for a copy of borehole records.

4.11. The development does not involve any below ground construction such as basements and, as such, the groundwater flood risk to the site is therefore considered to be 'low'.

Sewer Flooding

4.12. The West London SFRA *Figure 10A: Sewer Flooding* shows the site to be in an area with 0 recorded flood incidents, therefore the sewer flooding is considered 'negligible'.

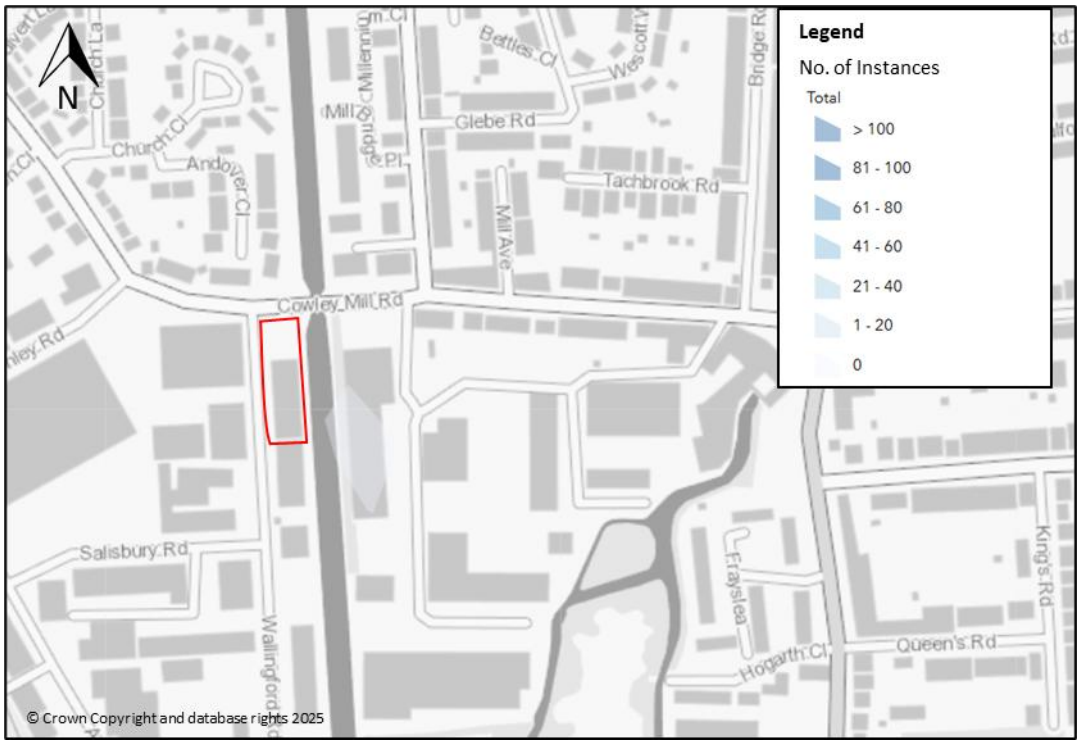

Figure 4-3: West London SFRA – Sewer Flooding

Artificial Sources

4.13. According to the Environment Agency's Flood risk from reservoirs map, the site is not in an area at risk of flooding from a reservoir breach. Flood risk from Grand Union Canal is accounted for in the fluvial flood risk section, and there are no other artificial sources within the vicinity of the development. The site is therefore considered to be at 'Inegligible' risk of flooding from artificial sources.

5. FLOOD RISK MANAGEMENT

5.1. This site-specific flood risk assessment aims to demonstrate that 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.

5.2. As identified in the previous section, the Site is at residual risk of fluvial flooding from the Grand Union Canal. As such, in line with the PPG, given that the risk cannot be avoided, measures to control, mitigate and manage the risk must be proposed. These measures are therefore detailed below.

Finished Floor Levels

5.3. As identified in **Section 4,** There is a residual risk of flooding at the site in the 1 in 1000 year events:

- 1 in 1000 year defended = 31.87mAOD
- 1 in 1000 year undefended = 31.89mAOD

5.4. Finished floor levels for the ground floor are proposed at 31.25mAOD and first floor levels are proposed at 33.35mAOD, meaning safe refuge is available for site users at all times.

Safe Access and Egress

5.5. Safe access and egress are required to enable the evacuation of people from the development and provide the emergency services with access to the development during times of flood.

5.6. Safe refuge is available for site users at higher levels above the fluvial flood level (100yr CC = 31.79m AOD). This means that site users would find safe refuge within the development at all times. The proposed first floor finished floor level is at 33.35m AOD, which is significantly higher than the 100 year plus climate change and residual flood levels.

5.7. It is proposed that the site users would be signed up to the EA warning systems which would inform them of an impending flood event allowing them to evacuate. If time allows and following the advice of the emergency services, residents should be informed to move their cars, the Site occupiers can evacuate the Site north along Cowley Mill Road away from the flood extents.

Flood Resistance and Resilience

5.8. It is recommended that any development proposed below the Maximum Likely Water Level should incorporate flood resistance and/or resilience construction methods to minimise the potential damage that could be caused by flooding.

5.9. The development will be designed with resilient materials, with the ability to withstand hydro-static and hydro-dynamic forces on any proposed supports. All electrical, service and ventilation entry points should be located as high as reasonably practicable.

5.10. In areas at risk of frequent or prolonged flooding, the following flood resilience measures should be implemented:

- Use materials with either, good drying and cleaning properties, or sacrificial materials that can easily be replaced post-flood;
- Design for water to drain away after flooding;
- Design access to all spaces to permit drying and cleaning;
- Raise the level of electrical wiring, appliances and utility metres as high as reasonably practicable;
- Coat walls with internal cement based renders; apply tanking on the inside of all internal walls;
- Ground supported floors with concrete slabs coated with impermeable membrane; and
- Use plastic water resistant internal doors.

5.11. The following flood resistance measures could be implemented where appropriate/ feasible up to a flood depth of 600mm and should be permanent:

- Using materials and construction with low permeability;
- Built in flood doors and gates with waterproof seals.
- Fixtures and fittings should be raised to at least 900mm

6. SURFACE WATER DRAINAGE STRATEGY

Surface Water Management

6.1. The London Borough of Hillingdon Sustainable Drainage Proforma has been included in **Appendix E.**

6.2. DEFRA's Non-statutory technical guidance for Sustainable Drainage Systems and CIRIA Guidance C753 "The SuDS Manual" have been used to determine the appropriate SuDS Strategy, which considers the spatial and environmental constraints of the site.

6.3. Under the NPPF an allowance of 40% for the effects of climate change will achieve the policy requirements for the proposed development.

Drainage Hierarchy

6.4. Based on the Policy SI 13 (B) of the London Plan, surface water runoff should be disposed of according to the following hierarchy :

1. Store rainwater for later use (for example rainwater harvesting, blue roofs for irrigation);
2. Use infiltration techniques, such as porous surfaces in non-clay areas;
3. Rainwater attenuation in green infrastructure features for gradual release;
4. Discharge rainwater direct to a watercourse;
5. Controlled discharge to a surface water sewer/drain; and
6. Controlled discharge to the combined sewer.

Infiltration

6.5. As discussed in **Section 2** BGS data indicates that the site is underlain by the London Clay Formation (clay) and superficial Alluvium deposits (Clay, Silt, Sand and Peat). Although superficial ground conditions may allow for infiltration, the use of infiltration systems for the disposal of surface water on the site has been discounted due to underlying geology and the risk of mobilising pollutants within the made ground.

To a Surface Water Body

6.6. The site is bound by the Grand Union Canal along the eastern boundary. However the site topography would mean pumping would be required to discharge into the existing watercourse.

To a Surface Water Sewer, Highway Drain or Another Drainage System

6.7. There is an existing surface water sewer located west of the site within Wallingford Road, it is proposed to discharge into the existing Thames Water Sewer.

To a Combined Sewer

6.8. There are no combined sewers within the vicinity of the site and this option has therefore been discounted.

Existing Surface Water Drainage

6.9. The red line boundary area is approximately 0.257 ha. There are no changes proposed to the existing Granville House warehouse. The existing car park is drained via gullys which are presumed to discharge unattenuated into the Thames Water surface water sewer, located to the west of the site within Wallingford Road.

Existing Discharge Rates

6.10. The planning redline boundary equates to approximately 0.257 ha which is currently 100% impermeable. The developable area equates to 0.0821ha, with the two main impermeable areas being the warehouse roof (227m^2) and the proposed car park (594m^2) which gives a proposed total impermeable area of 821m^2 this will be used to inform existing and greenfield runoff rates for the development. Therefore, *Table* ***6-1*** below identifies both the greenfield and existing surface water discharge rates for the 1 in 1 year, 30 year and 100 year events.

6.11. Existing runoff rates from the site were determined using the Wallingford Procedure Rational Method for an assumed critical 5-minute storm. Refer to calculations in **Appendix F**.

Table 6-1: Existing and Greenfield Runoff Rates

Return Period Event	Brownfield (l/s)	Greenfield (l/s)
Q_1	11.59	0.3

Q_{30}	25.80	0.81
Q_{100}	32.84	1.1
Q_{bar}	-	-

Proposed Sustainable Drainage Systems (SuDS)

6.12. The constraints and opportunities for the use of SuDS techniques are appraised using the Management Train approach outlined in CIRIA C753 'The SuDS Manual' in *Table **6-2*** below.

Table 6-2: C753 SuDS Management Train

Type:	**Infiltration Devices** (Source Control)
Constraints:	The Site is a brownfield site and therefore the use of infiltration techniques would carry the risk of mobilising pollutants into the soil.
Opportunities:	Limited due to ground conditions and spatial constraints
Type:	**Lined Permeable Paving** (Source Control)
Constraints:	It is not possible to provide infiltrating permeable paving/permavoid due to site characteristics (as per infiltration devices above) but lined permeable paving could be considered for treatment and attenuation.
Opportunities:	Permeable paving wrapped in geo-membrane could be used to provide surface water attenuation and a stage of treatment before discharging into the drainage system.
Type:	**Rainwater Harvesting** (Source Control)
Constraints:	The benefits of rainwater harvesting on a specific design storm event cannot be quantified, due to the seasonal availability of storage within the structure.
Opportunities:	Opportunities in amenity areas to provide harvesting features such as rain gardens, raised planters and water butts exist. However, it is difficult to quantify contribution, and therefore not included within calculations as part of this surface water management strategy.
Type:	**Swales, etc.** (Permeable Conveyance)
Constraints:	In order to provide practicable attenuation benefits 1:3 side-slope swales tend to require a significant land requirement.
Opportunities:	None due to spatial constraints.
Type:	**Tree Pits/Rain gardens**
Constraints:	Subject to Landscape Architect's design.
Opportunities:	There may be opportunities to use landscaped space to incorporate tree pits.
Type:	**Green Roofs**
Constraints:	Subject to Architect's design.
Opportunities:	Compatible with type of development.
Type:	**Attenuation Tanks** (end of pipe treatment)
Constraints:	None.

Opportunities:	Should additional attenuation be required this could be achieved by use of geo-cellular storage attenuation.

6.13. The Site is located within an urbanised area and therefore there is no practicable space for incorporation of large above ground SuDS features such a ponds, basins or swales.

6.14. After consideration of the CIRIA C753 SuDS Management Train approach, the most viable SuDS options for this site is a solution utilising lined permeable paving. Refer to Drawing No. *2502850A-ACE-00-DR-C-0601B* in **Appendix G** for the proposed surface water drainage strategy.

Proposed Discharge Rates

6.15. In line with the West London SFRA, discharge rates from brownfield sites peak runoff rates must remain as close to greenfield runoff rates as possible (shown in *Table 6-1* above). It is therefore proposed to provide an outfall restricted to 1.1 l/s.

6.16. *Table* ***6-3*** below indicates the existing and proposed surface water runoff discharge rates for the site under various storm scenarios.

Table 6-3: Proposed Discharge Rates

	Return Period			
	1 in 1 year	**1 in 30 Year**	**1 in 100 year**	**1 in 100 year + 45% CC**
Pre Development (l/s)	11.59	25.80	32.84	-
Greenfield Rates (l/s)	0.3	0.81	1.1	-
Proposed post Development (l/s)	1.1	1.1	1.1	1.1
% Reduction from pre development	91	96	97	-

Proposed Surface Water Attenuation

6.17. In order to achieve the proposed discharge rate of 1.1 l/s, it is proposed that a total storage volume of approximately 52.92m^3 will be provided within the

proposed permeable paving. Causeway Flow modelling results show there is no flooding on the site for the 1 in 100 year including 40% climate change rainfall event. Causeway Flow modelling results are included in **Appendix H.**

6.18. The proposed rate of discharge and proposed connections are subject to approval by Hillingdon Borough Council.

Surface Water Quality

6.19. Based on the CIRIA753 Simple Index Treatment Method, residential development would have an associated pollution hazard level as 'Medium'. The recommended stage of treatment, in line with Tables 26.2 and 26.3 in the SuDS Manual, will be provided by the aforementioned permeable paving.

6.20. Please refer to **Appendix I** for copies of Tables 26.2 and 26.3, the pollution hazard and mitigation indices.

Long Term Storage

6.21. The proposed development will not result in an increase in impermeable area, as such the runoff generated by the developed area will be reduced. Therefore, there is no requirement for Long Term Storage.

Future Maintenance

6.22. A management company will be appointed to maintain communal areas, landscaping and shared SuDS throughout the development.

6.23. All maintenance will be in accord with the best practices and the CIRIA Manual C753. Please refer to **Appendix J** for an overview of the maintenance tasks required.

7. CONCLUSIONS

7.1. Ardent Consulting Engineers has been commissioned by Kudos Roadshow Ltd to undertake a Flood Risk Assessment and Drainage Strategy for the proposed residential development at Granville House, Uxbridge**.**

7.2. This FRA supports a planning application for the provision of a new warehouse building with associated parking and servicing over part of the existing carpark to the north of Granville House.

7.3. This FRA considers the current policy relating to flood risk, including the National Planning Policy Framework and local flood risk policy.

7.4. Although the southern part of the site comprising the existing warehouse building and parking /servicing areas falls within Flood Zone 2, the northern part of the site, comprising the proposed building, falls within Flood Zone 1. As such the Sequential and Exception Tests are not required.

7.5. Flood risk data and site-specific flood maps were obtained from the Environment Agency which confirmed the development units are not located within the flood extent for the 100 year + 20% climate change event. The site is in an area at residual risk of flooding in the 1 in 1000 year undefended event. Flood risk management measures have been recommended to ensure that, in line with the NPFF, the Site will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere.

7.6. Safe refuge will be available to all site users on the first floor and above. Finished floor levels for the ground floor are proposed at 31.25mAOD and first floor levels are proposed at 33.35mAOD, meaning safe refuge is available for site users at all times Flood resistant and resilient construction methods should be implemented.

7.7. All other sources of flood risk are assessed as low.

7.8. A sustainable drainage system has been designed to incorporate permeable paving. Storm water attenuation is provided for all storms up to and including the 1 in 100 year plus 40% allowance for climate change. It is proposed to discharge into the existing Thames Water surface water sewer, located to the east of site within Wallingford Road, at a controlled rate of 1.1 l/s.

7.9. A management company will be appointed to maintain communal spaces and SuDS throughout the life of development. All maintenance will be in accordance with the best practices and the CIRIA Manual C753.

7.10. In conclusion, this FRA demonstrates that the proposals are consistent with the aims of the NPPF and the Planning Practice Guidance to the NPPF along with the aims of the Strategic Flood Risk Assessment. The Site will not be at significant risk of flooding or increase the flood risk to others.