Scottish Widows Property Authorised Contractual Scheme

Proposed Ancillary A3/A5 McDonalds Drive-Thru

Victoria Retail Park, Victoria Road, South Ruislip

Flood Risk & Drainage Assessment

May 2018

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1.0 Introduction

1.1 Purpose of this report

Scottish Widows Property Authorised Contractual Scheme 1 have commissioned WYG Engineering Ltd to undertake a Flood Risk & Drainage Assessment in respect of a proposed development on an existing car park within the Victoria Retail Park adjacent to Victoria Road in South Ruislip.

This report has been prepared to accompany the detailed planning application for the proposed development as outlined in Section 1.2.

1.2 Proposed Development

A full planning application is being submitted for approval for the development of a Drive Through pod unit, associated car parking, infrastructure and landscaping.

Appendix A includes the proposed site layout for the development site.

1.3 Requirement for a Flood Risk Assessment

The application site is located entirely within Flood Zone 2 (i.e. land assessed as having an annual probability of river or sea flooding between 1 in 100 (1% Annual Exceedance Probability (AEP) and 1 in 1000 (0.1% AEP) in any one year. Therefore, in accordance with the National Planning Policy Framework (NPPF) and the National Planning Practice Guide (Flood Risk & Coastal Change) (NPPG), a Flood Risk Assessment is required to support the planning application.

1.4 Scope of the Flood Risk & Drainage Assessment

The FRA will be undertaken in accordance with the guidelines of the Environment Agency Flood Risk Assessment (FRA) Guidance https://www.gov.uk/guidance/flood-risk-assessment-in-flood-zones-2-and-3.

In line with the PPG, the FRA will also consider other potential sources of flood risk, such as sewers, overland flow routes, groundwater flooding, reservoir flooding, and minor watercourses not shown on EA flood map.

The FRA will also establish a management regime for surface water runoff from the site such that flood risk to adjoining areas is not exacerbated and where possible improved. If not managed properly, surface water runoff from the site could potentially lead to increases in flood risk to other areas or the development itself. Given that the application seeks full planning permission, an indicative surface water drainage strategy will be included in which potential measures for draining surface water will be discussed. This will have a specific focus on implementing SUDs strategies, where viable.

1.5 Limitations of this report

This report has been prepared by WYG Engineering on behalf of Scottish Widows Property Authorised Contractual Scheme 1 in connection with the scope of the report as described in Section 1.4 above and takes into account the particular instructions and requirements set out in our fee proposal and the acceptance. It is not intended for and should not be relied on by any third party and no responsibility is undertaken to any third party.

WYG Engineering accepts no duty or responsibility (including in negligence) to any party other than the Scottish Widows Property Authorised Contractual Scheme 1 and disclaims all liability of any nature whatsoever to any such party in respect of this report.

2.0 Site Description

2.1 Existing Site

The application site covers an area of approximately 0.17 ha and is located within the Victoria Retail Park in South Ruislip. The nearest postcode is HA4 0LN and the site's grid reference is TQ 11928 85509. Figure 1 below shows the site boundary and location.

The site is classified as brownfield as it is already developed, being used for car parking purposes. It is bounded by Victoria Road to the north and by the existing retail park to the east, south and west.

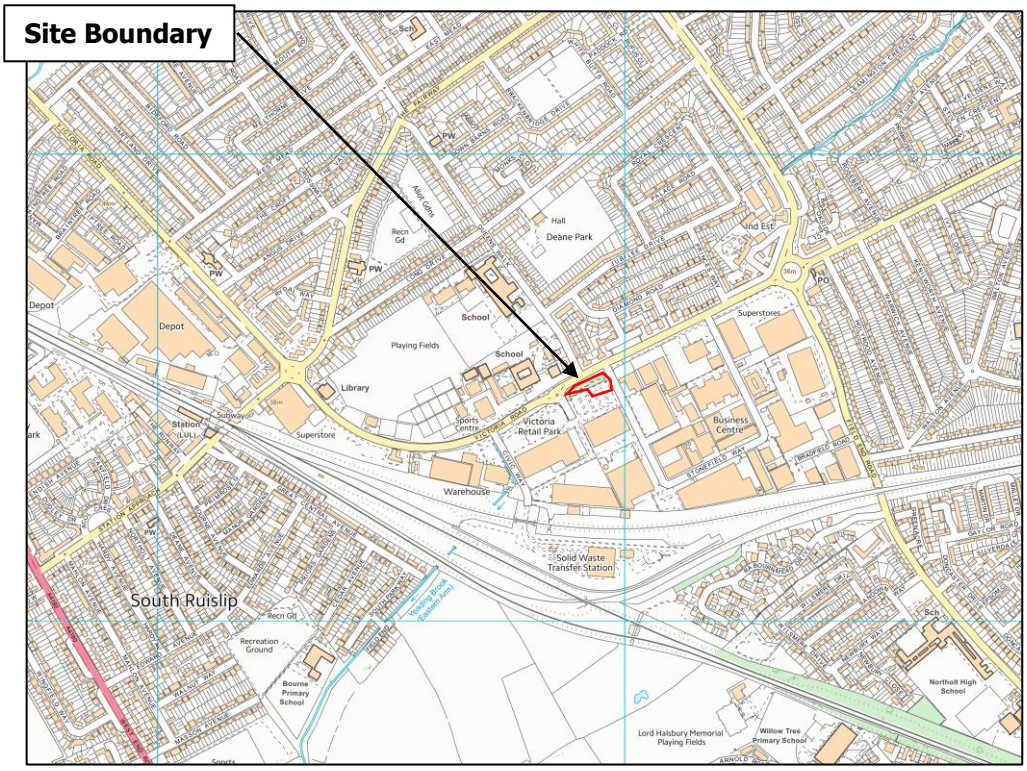

Figure 1 – Site Location & Boundary Plan

A review of the topographical survey of the site indicated that the ground levels fall from south to north. The highest level within the site is 34.93m AOD at the south eastern corner of the site, and the lowest level is 33.66m AOD at a point at the north western corner of the site near Victoria Road.

Appendix B includes the topographical survey of the site.

2.2 Existing Drainage

2.2.1 Main Rivers

The nearest Main River to the application site (as listed in the Flood Map for Planning) is the Yeading Brook, which is culverted and flows east under Victoria Road.

2.2.2 Ordinary & Manmade Watercourses

There are no ordinary watercourses within the application site.

2.2.3 Sewers

Public Sewers

Thames Water sewer records indicate the presence of a 225mm diameter foul flow alongside the eastern and northern boundaries of the site. This foul sewer drains to a 375mm diameter foul sewer at the opposite side of Victoria Road.

There is also a 1219mm diameter foul sewer under Victoria Road which acts as a Harrow Branch Sewer.

Private Sewers

The utility survey included details of the drainage system of the site. The existing drainage system serves the store to the south and the car park; and it is divided into two surface water sub – catchments, east and west. Road gullies collect surface water runoff generated by the existing car park and convey it to two 600mm diameter surface water sewers that begin in the north eastern and the north western parts of the site (each sewer drains a sub – catchment). It is believed that both of these sewers discharge to the culverted section of Yeading Brook within Victoria Road.

A copy of the Thames Water Sewer Records and the utility survey is included in Appendix C.

3.0 Flood Risk

3.1 Fluvial Flood Risk

Fluvial flood risk is the risk arising from rivers and watercourses.

A floodplain is the area that would naturally be affected by flooding if a river rises above its banks. In England, floodplains are divided into flood zones (FZ) for planning purposes. These areas show the extent of the natural floodplain area at risk of inundation if there were no flood defences or certain other manmade structures and channel improvements. They are divided as follows:

- Flood Zone 3 shows the land having a 1 in 100 or greater annual probability of river flooding.
- Flood Zone 2 shows the additional extent of an extreme flood from rivers. It is land having between a 1 in 100 and 1 in 1,000 annual probability of river or sea flooding.
- Flood Zone 1 is the area of land where flooding from rivers and the sea is very unlikely

An extract of the flood map for planning is included in Figure 2 below, it can be seen that the site is entirely within defended Flood Zones 2 and 3 and therefore it is considered that the southern part of the site would be at risk of flooding in an undefended scenario.

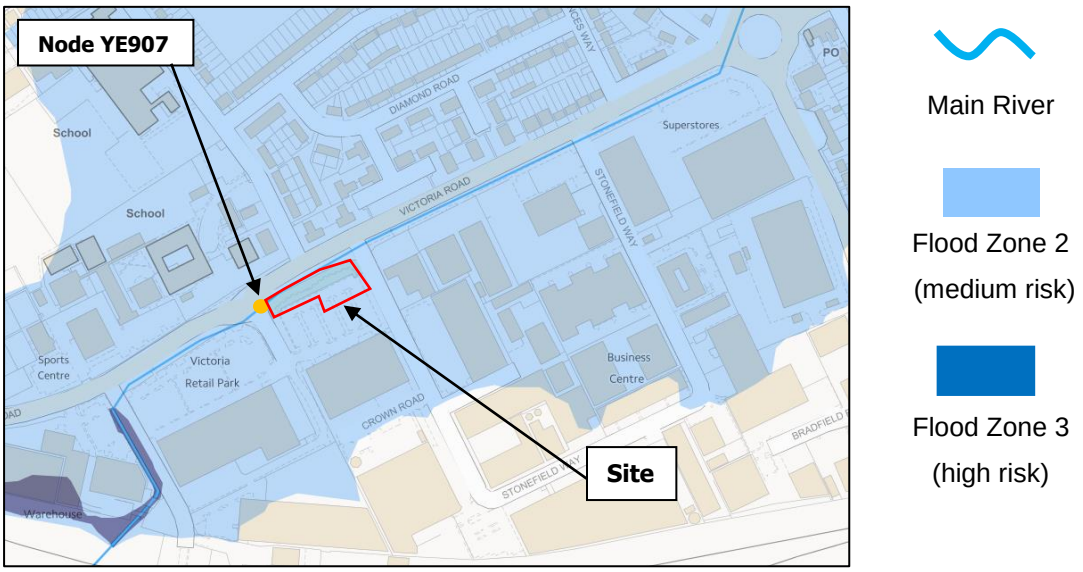

Figure 2 - Environment Agency Flood Map for Planning (March 2018)

3.1.1 EA Flood Data Review

Flood Data was obtained from the EA to inform this report. The data included information on modelled flows and levels and the defences associated with Yeading Brook. Table 1 below shows the defended flood levels for a range of return periods for the node indicated in Figure 2.

Table 1 – Defended Modelled Levels (m AOD)

1 in 10 year	1 in 20 year	1 in 50 year	1 in 100 year	1 in 100 year + 20% CC	1 in 1000 year
33.79	33.96	34.05	34.16	34.33	35.34

A comparison of the site's topographical survey with the EA's flood indicates that the grassed area within the site is at a lower level than the flood levels. However, the adjacent car parking is at approximately 34.4m AOD then it can be demonstrated that all of the site is in FZ2, but just above the 1 in 100 plus 20% CC flood level.

The data provided by the EA is included in Appendix D.

Existing Flood Defences

According to the data provided by the EA, there is an embankment alongside the left bank of the culverted reach of the brook that provides a standard of protection of 100 years. The culvert itself is a concrete box culvert with a capacity to convey flows up to the 1 in 200 year return period event.

Historic Flooding

The data provided by the EA also included a plan showing the extent of flooding caused by historic flood events. The site was not affected by the 1999 or the 2007 flood events.

Climate Change

The EA published in 2016 updated climate change allowances to be used in flood risk assessments. For the Thames Catchment, it is recommended to use the 'central' (+15%) allowance for river flows in FZ 2 for 'Less Vulnerable' developments with a lifetime that extends until the year 2069.

The data provided by the EA does not include this allowance and therefore a 20% allowance has been used to inform this report.

3.2 Surface Water & Overland Flows

3.2.1 Updated Flood Map for Surface Water

Surface water flooding occurs where high rainfall events exceed the natural drainage capacity in an area (i.e. sewer system and/or watercourse), leading to flooding.

An extract of the National Updated Flood Map of Surface Water is shown in Figure 3, where it can be seen that the car parking area is at medium risk of flooding from surface water. In reviewing the SW flood mapping it should be noted that these maps do not include the presence of any artificial drainage systems, (i.e. car park drainage and culverted section of Yeading Brook) and therefore provides an over estimate of the actual surface water flooding risk.

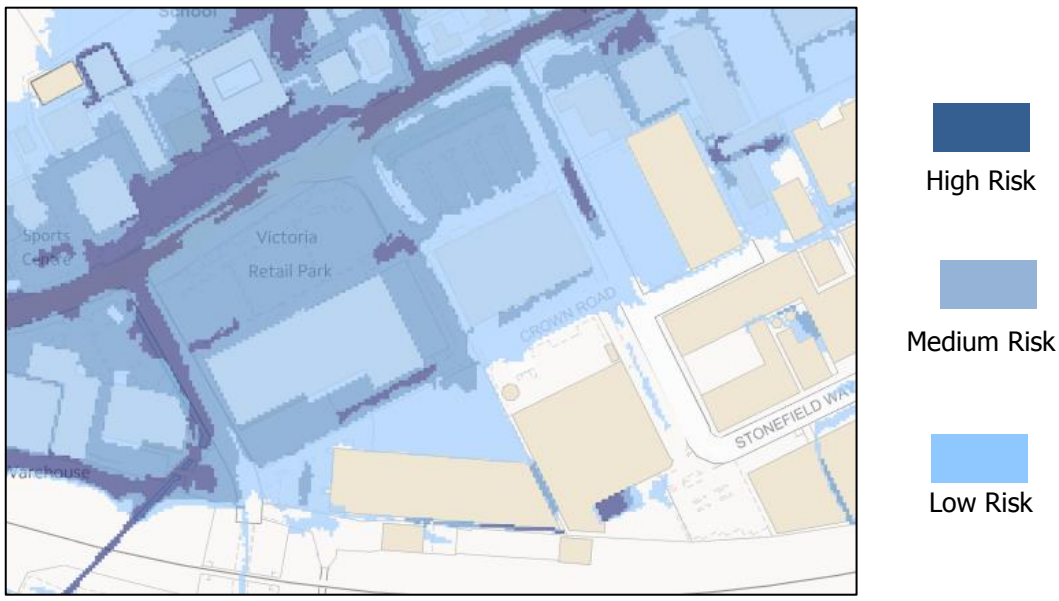

Figure 3 - Extract from the Updated Flood Map for Surface Water (Dec 17)

3.2.2 Hillingdon Surface Water Management Plan (SWMP)

The Hillingdon SWMP dated 2013 indicates that the site is within a Critical Drainage Area (CDA 027). It indicates that sewer flooding was recorded on 7 different occasions within the 'HA4 0' postcode area, which includes the site.

The SWMP identifies 'Local Flood Risk Zones' (LFRZ) within the CDAs. The site is located both within a CDA and a LFRZ as there is an overland flow path on Victoria Road. The SWMP indicates that depths of surface water flooding within Victoria Road are expected to reach up to 0.7m during the 1 in 100 year return period rainfall event. Additionally, Figure 24 shows that the hazard rating during this rainfall event is 'moderate' at the site location.

The SWMP includes an action plan that indicates that funding was secured to reduce flood risk within CDA 027; however, no further details of this project have been provided.

3.2.3 Hillingdon Local Flood Risk Management Strategy (LFRMS) & Flood Investigations

The Hillingdon LFRMS dated 2016 indicates that surface water flooding was recorded within the retail park in 2015. The S19 flood investigation reports available on the council's website were reviewed to inform this report. It is indicated that Victoria Road flooded on the 28th of July 2014 and the 23rd of June 2016 due to surface water; although these events did not cause flooding near the Victoria Retail Park in South Ruislip.

3.3 Groundwater Flooding

The SWMP indicates that the site is not located within an area where there is potential for elevated groundwater. Therefore, it is considered that the risk of flooding from groundwater is low.

3.4 Reservoir Flooding

Although the probability of a catastrophic dam failure is considered to be extremely low, the consequence of such an event would be severe. A review of the EA online maps of 'Risk of Flooding from Reservoirs' identified that the site is not at risk of flooding as a result of reservoir failure.

3.5 Sewer Flooding

The SFRA and the SWMP identify that the site is inside a CDA; and therefore, it is considered that there is limited drainage capacity within the area. However, the existing site is within a retail park served by private sewers and therefore it is considered that the risk of flooding from the private sewers of the retail park is low.

3.6 Hillingdon Strategic Flood Risk Assessment (SFRA)

The review of the SFRA Level 1 dated 2008 identified the following issues:

- Flooding from sewers was recorded in 164 properties between 1998 and 2008; and
- Yeading Brook caused flooding in 1958, 1977 and 2007.

3.7 Summary of Flood Risk

Based on the above, it can be seen that the site is at medium to low risk of flooding from Yeading Brook, and at medium risk of flooding from surface water and being inside a CDA. It is considered that the site is at low risk of flooding from sewers, reservoir failure and groundwater.

It will be essential to ensure that no increase in flood risk occurs downstream of the site or on adjacent areas as a result of the development and this matter is discussed in more detail within Section 4.

4.0 Development Proposals

4.1 Proposed Development

A full planning application is being submitted for the development of a Drive Through pod unit, associated car parking, infrastructure and landscaping.

A copy of the proposed site layout plan is included in Appendix A.

4.2 Sequential & Exception Tests

One of the aims of NPPF is to steer development away from zones of high flood risk towards Flood Zone 1. The proposed development components are classified as 'Less Vulnerable' in accordance with Table 2 of the PPG (Flood Risk & Coastal Change). Given that the site is entirely within FZ 2, the proposed development is acceptable on flood risk terms subject to passing the sequential test in accordance with Table 3 of the PPG (Flood Risk & Coastal Change). No exception test is required.

4.2.1 Sequential Test

The site is located in Flood Zone 2 and therefore a sequential test is required. However, the site is located within an existing retail park and the proposed development is also for retail uses. Therefore, it is considered that the sequential test is passed.

4.2.2 Exception Test

As the proposed development is designated as being "Less Vulnerable" then in accordance with Table 3 of the PPG it is not required to pass the Exception Test.

4.3 Local Planning Policies

4.3.1 Hillingdon Borough Council

The Borough of Hillingdon Local Plan Part 2 – Development Management Policies dated October 2015 includes policy DMEI 9 that indicates that new developments may need to contribute towards flood risk management schemes; and policy DMEI 10 also indicates that developments in CDAs will need to restrict runoff rates to pre – development runoff rates, and that SUDs should be incorporated when possible.

4.3.2 Borough of Hillingdon Local Flood Risk Management Strategy (LFRMS)

A review was undertaken of the council's LFRMS dated 2016. The document provides a background in flood risk within the county and it sets out regional strategies to manage flood risk. It includes an objective that aims to make sure that new development takes account of the existing flood risk. One of the actions that the LLFA will undertake to achieve this goal is to secure contributions from new developments towards flood risk management schemes.

4.4 Development & Flood Risk

4.4.1 Flood Risk to the Development

As discussed in Section 3.7, the site is at medium to low risk of flooding from Yeading Brook, and at medium risk of flooding from surface water. It is considered that the site is at low risk of flooding from sewers, reservoir failure and groundwater.

4.4.1.1 Proposed Flood Mitigation & Resilience Measures

The site is at risk of flooding from events that exceed the 1 in 100 year return period plus a 20% allowance for climate change. Therefore, it is proposed to raise Finished Floor Levels (FFLs) above the 1 in 100 year plus 20% CC level (34.33m AOD) to 34.75m AOD to provide mitigation. Additionally, it is proposed to provide flood resilience measures 600mm above the FFL (to 35.35m AOD) to enable a quick return to a 'normal' situation in the event of a flood. The flood resilience measures include, but are not limited to raised power outlets, raised air bricks, provision of non – return valves in waste pipes and vent pipes, etc.

The measures above will provide mitigation and resilience against both surface water & fluvial flood risk.

4.4.2 Flood Risk Arising from the Development

In accordance with the requirements of the NPPF and the PPG, it is essential and required that the development of the site does not increase the risk of flooding off site.

The DEFRA Non-Statutory Technical Standards for Sustainable Drainage require that the rate of surface water runoff from brownfield sites must not exceed the greenfield runoff rate from the site.

Therefore, on site attenuation will be provided within the application site to ensure that the proposed surface water drainage system does not exacerbate flood risk outside of the extent of the proposed development for all storm events up to and including the 1 in 100 plus 40% allowance for climate change storm event.

4.4.2.1 Assessment of Floodplain Storage Volumes

As the site is entirely in FZ 2 no compensatory storage is required.

4.5 Assessment of Pre and Post Development Areas & Rates

4.5.1 Existing & Proposed Development Areas

The application site covers an area of 0.17 ha and is currently brownfield, being used for car parking purposes.

Table 2 below shows the pre and post development permeable and impermeable areas for the application site and is based on the proposed site layout plan contained within Appendix A.

Table 2 – Pre and Post Development areas for the application site

Status	Impermeable Area (m^2)	Permeable Area (m^2)
Pre development	815	915
Post development	1,380	350

It should be noted that the above figures are based on the proposed layout.

The design of the drainage system is required to consider climate change. Guidance issued by the Environment Agency (February 2016) provides rainfall intensity allowances to be considered in an FRA (Table 2). Assuming that the development lifetime will extend to 2117, the applicable 'central' allowance is 20% and the upper end 40%.

4.5.2 Existing & Proposed Discharge Rates

The proposed development falls partly within greenfield land and partly within the existing car park. In line with the requirements set by the Borough of Hillingdon, discharge rates from the proposed development will be restricted to the pre development greenfield rate.

Table 3 below summarises the greenfield & proposed discharge rates, which have been calculated using the FEH Method as indicated by Hillingdon LLFA. Appendix E includes the greenfield runoff calculations.

Table 3 – Existing & Proposed Discharge Rates (l/s)

Status	1 in 1 year	1 in 30 year	1 in 100 year	1 in 100 year + 40% CC
Greenfield	0.63	1.7	2.3	N/A
Post Development	2.1	2.4	2.8	3.0

In accordance with the requirements of the Hillingdon LLFA, the discharge rates out of the application site should not exceed the greenfield runoff rates. However, it is not practicable to reduce discharge rates to the Qbar rate of 0.74 l/s. A rate of 3 l/s has been adopted as a minimum to avoid constant blockages of the outfall.

4.6 Proposed Surface Water Mitigation

4.6.1 Surface Water Runoff Mitigation

In order to ensure that surface water runoff from the site does not cause an increase in flood risk the management of runoff has been considered via a sequential approach, in line with Building Regulations. The following options for the disposal of surface water runoff were considered, in order of preference:

i) A soakaway or some other infiltration system;

ii) A watercourse or tidal outfall;

iii) A sewer.

4.6.1.1 Discharge to soakaways

Borehole records near the application site are available in the BGS website. These show the presence of London clays and therefore infiltration is not considered feasible at this location.

4.6.1.2 Discharge to a watercourse

Yeading Brook flows under Victoria Road and it is proposed to discharge surface water runoff from the proposed development to the brook via the existing 600mm diameter surface water sewer connection.

4.6.1.3 Discharge to a sewer

It is not proposed to discharge the surface water flow to an off site sewer.

4.6.2 Proposed Surface Water Drainage Strategy

As the application seeks full planning permission, a detailed drainage scheme has been designed in support of the application.

Surface water runoff from the impermeable areas will be collected by rainwater pipes and road gullies and conveyed to the proposed surface water drainage network. A flow control device will be fitted at the outfall to restrict flows to 3 l/s. The new drainage system will discharge to the existing private sewer draining the retail park that drains to the culverted section of Yeading Brook.

4.6.3 Required Attenuation

Attenuation will be provided by underground storage and a dry swale to make sure that no flooding takes place during any rainfall event up to and including the 1 in 100 year return period event plus a 40% allowance for climate change. Table 4 below summarises the required attenuation for key storm events.

Table 4 – Post Development Indicative Attenuation Requirements

Impermeable Area (ha)	Discharge Rate (l/s)	1 in 30 year Volume (m^3)	1 in 100 year + 40% CC Volume (m^3)
0.14	3.0	16.1	23.8

Alternatively, the different SUDs elements that could be implemented as part of the proposed development are described in Section 5 below.

Appendix G includes the supporting drainage calculations. Appendix F includes a preliminary drainage layout. Appendix I includes the completed proforma required by Hillingdon LLFA that summarises all the figures shown above.

4.7 Overland Flow Routes

To provide mitigation against surface water flows in exceedance of the 1 in 100 years plus 40% allowance for climate change storm event occur or a failure of the site surface water drainage system occurs, roads will provide overland flood routes for surface water.

4.8 Flood Evacuation Procedure & Flood Evacuation Plan

As the proposed development is located within Flood Zone 2, then a Flood Evacuation Plan shall be prepared to ensure the safe evacuation of the building in the event of a Flood Warning.

The operator shall sign up to the Environment Agency's 24 hour flood warning service and in the event of the warning implement the procedures as set out within the Flood Evacuation Plan.

4.9 Future Maintenance

The drainage system serving the site will not be adopted as it will be under private land. Therefore, the management company that undertakes all the maintenance tasks required by the site will also undertake the maintenance tasks required by the drainage system.

4.10 Residual Risk

If the above mitigation measures are provided as part of the development, it is considered that the primary residual failure would be as a result of some type of failure of the site drainage system during the life of the development. Regular, ongoing maintenance will therefore be required to ensure that the capacity of the system is maintained as it has been designed.

In addition, as discussed above there remains a residual risk of a storm event that exceeds the capacity of the drainage system, as events beyond the 1 in 100 year plus 40% allowance for climate change storm event will not be catered for explicitly.

5.0 Sustainable Drainage

5.1 Review of SUDs options

In order to comply with the national guidelines and policies set by the Environment Agency and the Non-Statutory Technical Standards for Sustainable Drainage and the London Plan, the design of the surface water drainage system should seek to maximise the use of SUDS techniques.

This section reviews the suitability of the different SUDs elements available for the application site.

As stated previously, where it is possible, it is proposed to incorporate a fully compliant SUDs drainage system to deal with the discharge of surface water from the proposed development.

5.2 The SUDs Management Train

The overarching principles of a SUDs system are to minimise the impacts arising from the development on the quantity and quality of the development surface water run-off, whilst at the same time replicating the natural drainage from the site before development.

SUDS key objectives are to minimise the impacts from the development on the quantity and quality of run-off and to maximise amenity and biodiversity opportunities.

The accepted SUDS management train consists of three elements

- Source Control: Water butts, green roofs, filter drains, pervious surfaces, swales.
- Site Control: Swales, ponds, wetlands, infiltration devices.
- Regional Control: Basins, ponds, wetlands and reservoirs.

The following is an illustration of the SUDs principles and how they may be applied to a development via a SUDS Management Train.

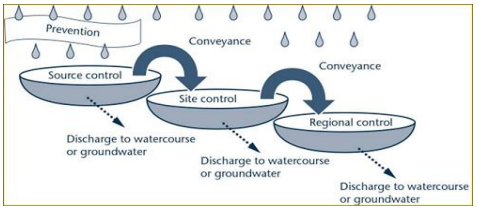

Table 5 - Review of SUDs Options

Type of SUDS		Description	Applicability to the Site
Source Control	Water butts	Small storage tanks on each individual housing plot	This is not appropriate for the site.
	Rain water harvesting	Recycling of water from roofs and impermeable areas.	This could be appropriate for the site.
	Green roofs	Vegetated roofs that reduce runoff and remove pollutants.	This could be appropriate for the site.
	Pervious surfaces	Surfaces that allow surface water inflow into underlying surfaces.	This is not appropriate for the site.
	Rain Gardens	Shallow depressions with free draining soil and planted with vegetation that withstands occasional flooding	This could be appropriate for the site.
Site & Regional Control	Filter drains	Linear drains or trenches filled with granular material that allow infiltration to the surrounding ground.	This is not appropriate for the site.
	Swales	Vegetated channels to convey store and treat runoff.	This is appropriate for the site.
	Basins and ponds	Shallow areas of open space that temporarily hold water and collect silt.	This is not appropriate for the site.
	Infiltration basin	Shallow depression that stores runoff before it infiltrates into the subsoil.	This is not appropriate for the site.
	Infiltration devices	Generally granular trenches or soakaways that store water and allow infiltration to the surrounding ground.	This is not appropriate for the site.

5.3 Proposed SUDs Principles

The proposed drainage design includes a dry swale as a SuDS feature. It will be located within the landscaping areas and it will provide some of the required attenuation volume.

The dry swale will consist of a small swale underlain by a filter trench. A perforated pipe will go through the base of the trench to allow the surface water to drain back into the system.

5.4 Water Quality

In accordance with The SUDs Manual, the effectiveness removing pollutants varies depending on the SUDs element. The proposed development for a drive through does not include any car parking areas, and therefore there is a low risk of hydrocarbons reaching the proposed drainage network. The only pollutants that are expected to be conveyed by the runoff are suspended solids from the hardstanding areas.

The section of filter drain that water will pass through will provide treatment to surface water runoff before it is discharged to Yeading Brook.

5.5 Future SUDs maintenance

A management company will perform the maintenance tasks required by the elements of the drainage scheme. Table 6 below shows the maintenance requirements of each of the proposed SUDs elements for the scheme.

Table 6 - Maintenance tasks and frequency required

SUDs element	Maintenance Task	Recommended Frequency
Underground Tank	- Remove debris from catchment surface - Remove sediment from pre treatment structures - Inspect inlets and outlets - Survey inside of the tank	- Every 12 months - Every 5 years
Dry Swale	- Remove litter and debris - Cut grass & vegetation management - Inspect inlets, outlets and structures - Remove sediments from inlet and outlet - Remove sediments from main basin - Repair erosion and other damages - Relevel surfaces	- Monthly - Monthly in Spring and Summer or as required - Every 12 months - As required

As part of the proposed planning conditions, it is anticipated that full details together with a copy of the proposed inspection and maintenance plan for the SUDS and Drainage elements shall be provided and approved by the Planning Authority.

6.0 Conclusions & Recommendations

This report has identified the following conclusions:

1. The development site is shown on the EA Statutory Flood Maps for Planning as being entirely within Flood Zone 2.
2. The site is in a Critical Drainage Area as indicated by the Hillingdon SWMP.
3. The site is classified as brownfield as it is located on an existing car park.
4. The proposed development is classified as 'Less Vulnerable' according to Table 2 of the PPG (Flood Risk & Coastal Change).
5. As the site is in Flood Zone 2, a sequential test should be provided in accordance with Table 3 of the PPG (Flood Risk & Coastal Change). No exception test is required due to the 'less vulnerable' nature of the site.
6. The site is located within a retail park and therefore it is considered that the sequential test is passed.
7. The land falls from south to north.
8. The nearest main river to the application site (as listed on the EA Flood Map for Planning) is the Yeading Brook which flows culverted under Victoria Road.
9. The application site is considered to be at medium low risk of flooding from rivers and at medium risk of flooding from surface water and overland flows on Victoria Road. The site is at low risk of flooding from sewers, groundwater, and reservoir failure.
10. Finished floor levels at the restaurant will be set at level of 34.75m (i.e. raised 400mm above the 1 in 100 year plus 20% climate change allowance level of 34.33m) to provide suitable flood protection mitigation.
11. Flood resilience measures will be provided 600mm above the FFL and will consist of solid floors, electrical sockets set 600mm above FFL, solid construction and flood resilient materials used on all ground floor units and non return valves fitted to all drainage connections to ensure that in the event of a flood that the building can be brought back into operation as soon as possible.
12. The existing Qbar rate of discharge is estimated to be 0.74 l/s.

13. It is proposed to discharge surface water run off from the site to Yeading Brook at a rate of 3 l/s via the existing outfall from the surface water sewer serving the retail park.

14. Underground attenuation and a dry swale will provide the required attenuation volume to make sure that no flooding takes place during any rainfall event up to and including the 1 in 100 year plus 40% climate change event.

Based on the above, the following recommendations are made:

1. On completion, a regular inspection & maintenance regime is to be provided together with details of who will be responsible for the inspection and maintenance of the proposed SUDs components.

2. The operator is signed up to the EA 24 hour flood warning alert system and has a flood evacuation plan in place setting out the evacuation and re-occupation procedures to be followed in the event of a flood or flood warning.

3. In order to establish the level of funding to be made to support the local flood risk mitigation measures as required by Hillingdon Borough Council Planning Policy DEMI, then discussions should be held with the Planning Authority to establish the mechanism and and quantum of the contribution required.