WEBB YATES ENGINEERS

Flood Risk Assessment

B1299 Aldi Stores Limited, Sturlas Way, Waltham Cross

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REVISION HISTORY

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1.INTRODUCTION

Webb Yates Engineers have been appointed by Aldi Stores Ltd to undertake a Flood Risk Assessment (FRA) for the development associated with Aldi Stores Limited, Sturlas Way, Waltham Cross. The FRA is to support a planning application for the proposed development.

An FRA has been required for this specific site as the proposed development lies within flood zone 1 and the site area is greater than 1.0 ha.

This study considers the issues relating to flood risk and drainage associated with the development proposals. The purpose of this assessment is to assess how the development proposal affects flood risk both to the site and the surrounding areas and ensure the development will be safe for its lifetime taking into account the vulnerability of its users. This will be in accordance with national guidance and local guidance provided by Broxbourne Borough Council.

This document has been prepared with reference to:

- National Planning Policy Framework (NPPF) March 2012
- National Planning Practice Guidance (NPPG) March 2014
- Sustainable Drainage Systems: Non-Statutory technical standards for sustainable drainage systems March 2015
- Assessing and Managing Flood Risk in Development Code of Practice BS8533:2011
- Sewers for Adoption 7th Edition October 2012
- Environment Agency (EA) Flood Maps (https://flood-map-for-planning.service.gov.uk/)
- Defra's MAGIC Map (https://magic.defra.gov.uk/MagicMap.aspx
- Level 1 Strategic Flood Risk Assessment prepared for Broxbourne Borough Council by Halcrow Group Ltd and published in December 2007

2. GENERAL DESCRIPTION OF SITE

The site is located off the Sturlas Way, Waltham Cross, vehicular access is via an entrance on Sturlas Way. The site has an approximate National Grid Reference of 535905, 200736 and a postcode of EN8 7BF. A map and aerial photograph are provided below. The site covers an area of approximately 15,607m^2.

The site is rectangular in shape and is currently part of a retail area with one large retail building with associated car parking on the site. On the north boundary is the A121 Winston Churchill Way, on the east boundary is Sturlas Way, on the south boundary are residential properties along Ruthven Avenue and on the west boundary are further residential properties along Leven Drive and Leven Close.

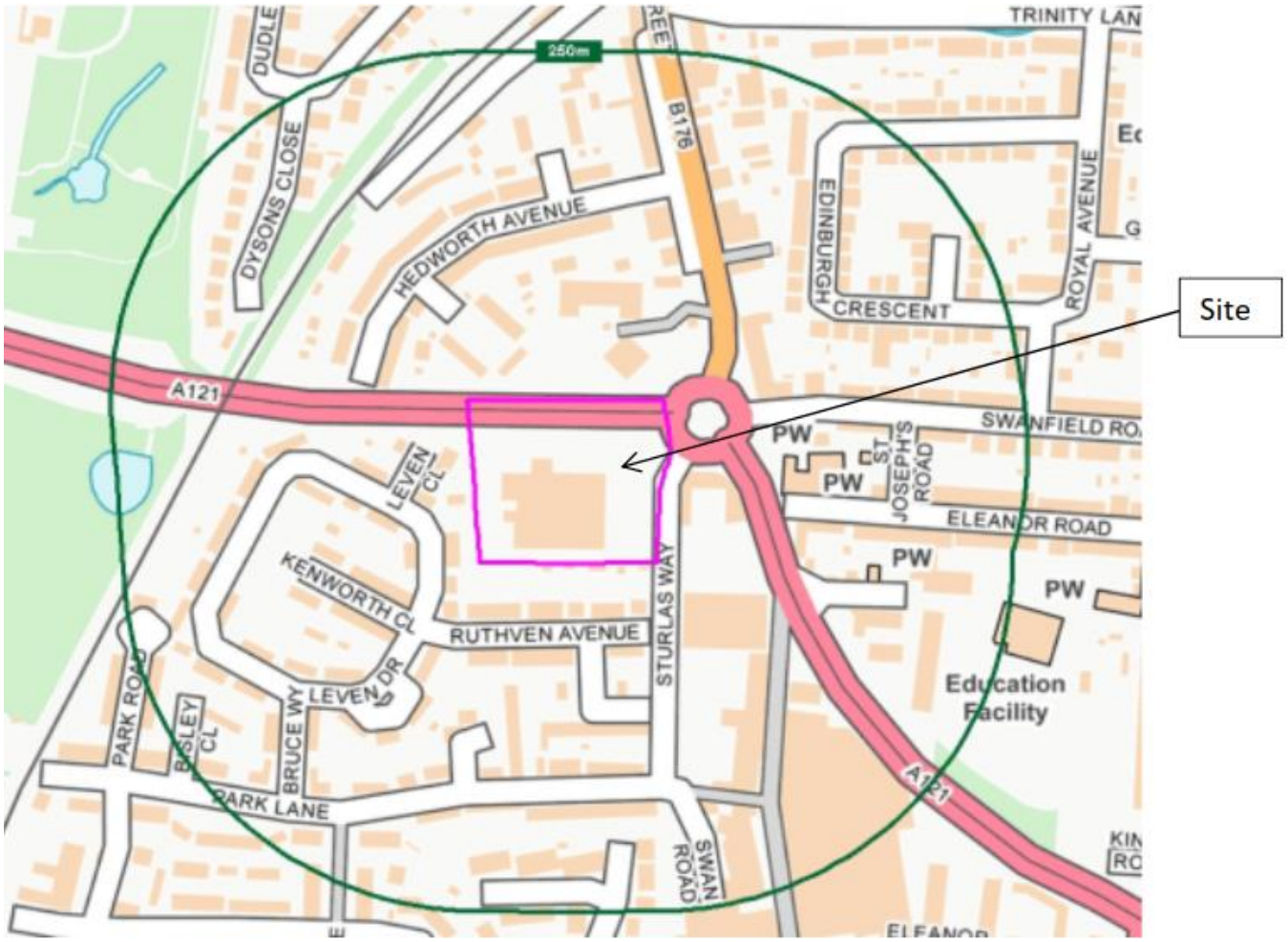

Figure 1 Site Location Map

Figure 2 Site Aerial Photograph

3.SITE CONTEXT

3.1. Geology

The BGS Superficial Geology map (1:50,000) for the site indicates that the underlain by Sand and Gravel, namely Kempton Park Gravel Member.

The BGS Superficial Geology map (1:50,000) for the site indicates that the site is underlain by Clay, Silt and Sand, namely London Clay Formation.

The BGS Superficial Geology map (1:50,000) for the site indicated that no data was found including a 50m buffer.

3.2. Hydrology

There are no surface water features present on the site, however, there is one feature within 1-250m of the site.

There are no Surface Water Abstraction Licences within 0-500m of the site.

There is potential for ground water flooding at the surface and the risk is listed as Low to Moderate.

There are no records of pollution incidents listed on site.

3.3. Hydrogeology

The Environment Agency Groundwater Vulnerability Map for the area indicates the presence of a underlying Secondary A aquifer and a Principal Aquifer on site. The Environment Agency's Groundwater Protection Policy describes Secondary A Aquifers as 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

3.4. Existing Flood Defences

The SFRA identified no existing flood defences around the proposed site.

3.5. Historic Flooding

The SFRA identifies that there are 3 flooding incidents recorded by Thames Water within the EW8 8 postcode based on data exported 16/03/2016.

The SFRA Figure 5.5 identifies one point of historic flooding close to the proposed site, as reported by Hertfordshire County Council Highways, Operations and Strategy Unit. This flooding was classified as "footway flooded".

4. PLANNING POLICY AND GUIDANCE

4.1. National Planning Policy Framework and Planning Practice Guidance

The revised National Planning Policy Framework (NPPF), published in Feb 2019, sets out the UK Government's planning policies for England, and how these are expected to be implemented. The Planning Practice Guidance (PPG) provides advice on how to account for and address the risks associated with flooding. It was first published in 2014 and is updated on a regular basis to meet the changes in the NPPF.

The NPPF aims to steer development away from areas at high risk of flooding. In order to achieve this, development types are classified according to vulnerability. The "Flood Risk and Coastal Change" chapter of the PPG details acceptable compatibility between flood zones and development types and is based on revised NPPF technical guidance (see tables below).

The NPPF states that a site-specific Flood Risk Assessment is required to identify and assess the risks of all forms of flooding to and from the development for all developments greater than 1.0 (ha) in flood zone. The Flood Zone definitions are provided in the "Flood risk and Coastal Change" chapter of the PPG, indicated below;

Table 1. Flood Zone Definition

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Source: Planning Practice Guidance, Flood Risk and Coastal Change

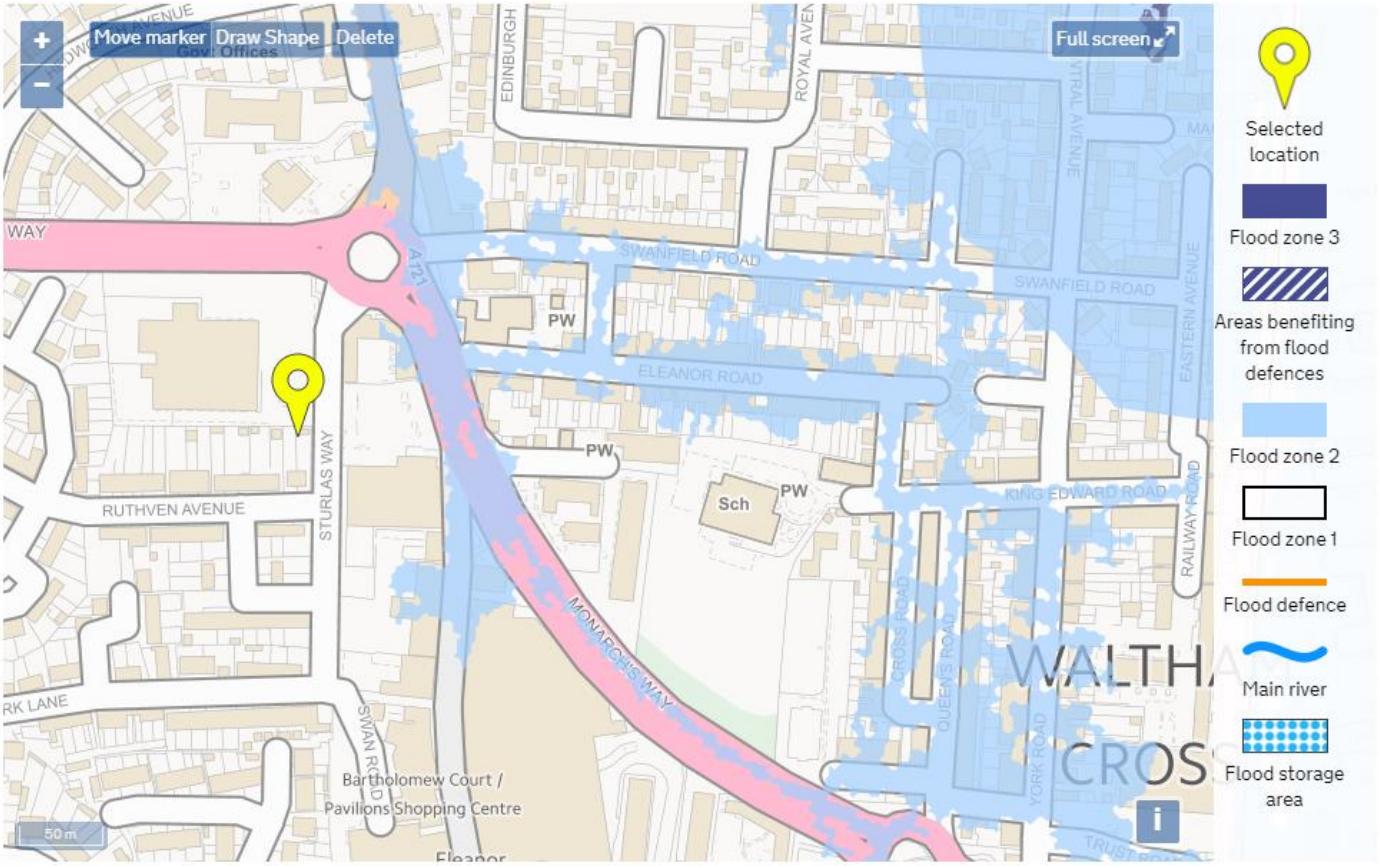

Figure 3: Government Long term flood risk assessment for locations in England map showing Flood Zones [https://flood-map-for-planning.service.gov.uk/]

In accordance with the NPPF, as the site area is greater than 1.0 ha and is completely within Flood Zone 1, a site-specific FRA is required.

The sequential test is passed by the proposed works as there is no major change is purpose and there is no proposed increase in the impermeable area of the existing site.

5. POTENTIAL SOURCES OF FLOODING

5.1. Flooding from Rivers and the Sea

Fluvial flooding occurs when the capacity of a watercourse is exceeded such that water overtops the channel.

Figure 4: EA Online Flood Map from Sea and Rivers (Source: https://flood-map-for-planning.service.gov.uk).

The risk of flooding from rivers or seas is classified as **Very Low**, based on Figure 4.

Very low risk means that each year this area has a chance of flooding of less than 0.1%.

5.2. Flooding from Groundwater

The Areas Susceptible to Groundwater Flooding (AStGWF) is a strategic scale map showing ground water flood areas on a 1km square grid . This data shows the proportion of each 1km grid square where geological and hydrogeological condition show that ground water might emerge. It does not show the likelihood of ground water flooding occurring and does not take account of the chance of flooding from ground water rebound . This data set covers a large area of land , and only isolated locations within the overall susceptible area are actually likely to suffer the consequences of ground water flooding

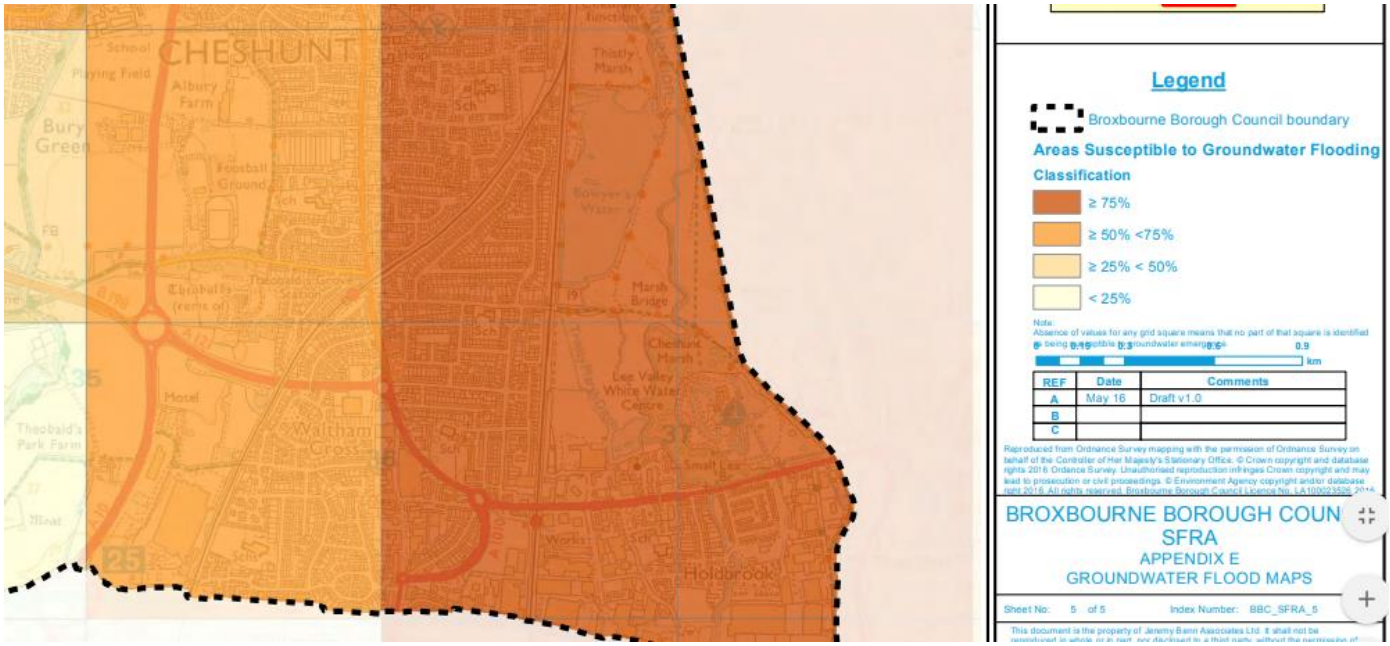

Figure 5 Groundwater flooding map (Broxbourne SFRA except)

5.3. Flooding from Sewers

There are no known existing sewers on site and there are no historical flooding records to indicate flooding from adjacent sites. Therefore, the risk of flooding from sewers is considered **Negligible.**

5.4. Flooding from Surface Water

Flooding from surface water maps provided by the Environment Agency have been used to assess the effects of flooding from pluvial effects.

Figure 6: EA Online Surface Water Flood Map (Source: https://flood-warning-information.service.gov.uk/long-term-flood-risk/map).

The site is identified as **Very Low** risk of flooding from surface water.

5.5. Flooding from Reservoirs, Canals and Other Artificial Sources

Figure 7: EA Online Flooding from Reservoirs Map (https://flood-warning-information.service.gov.uk/long-term-flood-risk/map).

The 'Risk of flooding from reservoirs' map, produced by the Environment Agency (Figure 7) indicates that there is a **Negligible Risk** of flooding from this source at the location of the Proposed Development. There are no other known sources of flood risk that would pose a risk to the development site.

5.6. Climate change

In accordance with the NPPF guidance, the effects of climate change should be included within the assessment of future flood risk. As the site area is less than 5 km^2, the site is classified as 'small' and therefore the climate change allowances in NPPF Technical Guidance Table 2 are appropriate. This table has been included below for reference.

Table 2: Table showing climate change allowances (Extract from NPPF Technical Guidance, Table 2)

Table 2: peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

Based on these values the hydraulic drainage design for the proposed drainage network has been modelled for a range of rainfall intensities up to and including ones for a 1 in 100 year event plus 40% allowance for climate change.

6. DRAINAGE STRATEGY

6.1. Existing Drainage

The existing site appears to be 100% impermeable with rainwater currently draining away from the existing building and car park via a combination of rainwater downpipes and gullies. The existing system is believed to be freely discharging and there are no records of on-site public sewer or private drain flooding.

6.2. Surface Water Strategy

With the proposed redevelopment, the inclusion of SuDS is a key consideration and it is a legal requirement to have SuDS included which aim to reduce the amount of surface run-off which is occurring.

The Building Regulations Requirement H3 stipulates that rainwater from roofs and paved areas is carried away from the surface to discharge to one of the following (listed in order of priority):

a) *an adequate soakaway or some other adequate infiltration system,*
b) *a watercourse, or where that is not practicable,*
c) *a sewer.*

The design of the surface water system shall be implemented following the drainage hierarchy and SuDS management train as suggested by the SuDS Manual 2015.

As there is no change in hardstanding areas between the existing and the proposed development there will be no increase in flood potential offsite.

7.CONCLUSION

The site area is within "Flood Zone 1" so has a less than 1 in 1000 year risk from flooding due the sea or river sources. Since the overall site is larger than 1.0 ha, this report has been generated to assess the site specific risk of flooding from a variety of sources.

As the site is not in a flood plain there are no flood storage requirements. Also as the proposed development does not increase the impermable footprint of the site there is no increase in the existing flood risk off the site from the existing condition.