



**PROPOSED CHANGE OF
USE AT NUMBER 523
SEVEN SISTERS ROAD,
TOTTENHAM, HARINGEY**

FLOOD RISK ASSESSMENT

JANUARY 2023

REPORT REF: 3126/RE/01-23/01

Evans Rivers and Coastal Ltd

T: 07896 328220

E: Enquiries@evansriversandcoastal.co.uk

W: www.evansriversandcoastal.co.uk

CONTRACT

Evans Rivers and Coastal Ltd has been commissioned by Eade Planning Ltd to carry out a flood risk assessment for a proposed change of use at number 523 Seven Sisters Road, Tottenham, Haringey.

QUALITY ASSURANCE, ENVIRONMENT AND HEALTH AND SAFETY

Evans Rivers and Coastal Ltd operates a Quality Assurance, Environmental, and Health and Safety Policy.

This project comprises various stages including data collection; depth analysis; and reporting. Quality will be maintained throughout the project by producing specific methodologies for each work stage. Quality will also be maintained by providing specifications to third parties such as surveyors; initiating internal quality procedures including the validation of third party deliverables; creation of an audit trail to record any changes made; and document control using a database and correspondence log file system.

To adhere to the Environmental Policy, data will be obtained and issued in electronic format and alternatively by post. Paper use will also be minimised by communicating via email or telephone where possible. Documents and drawings will be transferred in electronic format where possible and all waste paper will be recycled. Meetings away from the office of Evans Rivers and Coastal Ltd will be minimised to prevent unnecessary travel, however for those meetings deemed essential, public transport will be used in preference to car journeys.

The project will follow the commitment and objectives outlined in the Health and Safety Policy operated by Evans Rivers and Coastal Ltd. All employees will be equipped with suitable personal protective equipment prior to any site visits and a risk assessment will be completed and checked before any site visit. Other factors which have been taken into consideration are the wider safety of the public whilst operating on site, and the importance of safety when working close to a water source and highway. Any designs resulting from this project and directly created by Evans Rivers and Coastal Ltd will also take into account safety measures within a "designers risk assessment".

Report carried out by:

Rupert Evans, BSc (Hons), MSc, CEnv, C.WEM, MCIWEM, PIEMA

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1. INTRODUCTION

1.1 Project Scope

1.1.1 Evans Rivers and Coastal Ltd has been commissioned by Eade Planning Ltd to carry out a flood risk assessment for a proposed change of use at number 523 Seven Sisters Road, Tottenham, Haringey.

1.1.2 Specifically, this assessment intends to:

- a) Review any literature and guidance specific to this area such as the SFRA;
- b) Assess the risks to people and property and propose mitigation measures accordingly;
- c) Review existing evacuation and warning procedures for the area;
- d) Carry out an appraisal of flood risk from all sources as required by NPPF;
- e) Report findings and recommendations.

1.1.3 This assessment is carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) dated 2021. Other documents which have been consulted include:

- DEFRA/EA document entitled *Framework and guidance for assessing and managing flood risk for new development Phase 2 (FD2320/TR2)*, 2005;
- Communities and Local Government 2007. *Improving the Flood Performance of New Buildings*. HMSO.
- CIRIA C790B – *Guidance on the code of practice for property flood resilience* dated 2020.
- DEFRA/EA document entitled *The flood risks to people methodology (FD2321/TR1)*, 2006;
- EA *Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose*, 2008;
- National Planning Practice Guidance – Flood Risk and Coastal Change.
- UK Government's climate change allowances guidance.
- London Borough of Haringey Surface Water Management Plan (SWMP) dated 2011.
- Haringey Council Strategic Flood Risk Assessment (SFRA) dated 2015.
- Greater London Authority – London Plan 2021.

2. DATA COLLECTION

2.1 To assist with this report, the data collected included:

- Ordnance Survey 1:10,000 street view map obtained via Promap (Evans Rivers and Coastal Ltd OS licence number 100049458).
- British Geological Survey, *Online Geology of Britain Viewer*.
- 1:250,000 *Soil Map of South East England* (Sheet 6) published by Cranfield University and Soil Survey of England and Wales 1983.
- 1:625,000 *Hydrogeological Map of England and Wales*, published in 1977 by the Institute of Geological Sciences (now the British Geological Survey).
- Filtered LIDAR data at 1m resolution.

3. SITE CHARACTERISTICS

3.1 Existing Site Characteristics and Location

- 3.1.1 The site is located at number 523 Seven Sisters Road, Tottenham, Haringey. The approximate Ordnance Survey (OS) grid reference for the site is 533026 188438 and the location of the site is shown on Figure 1.

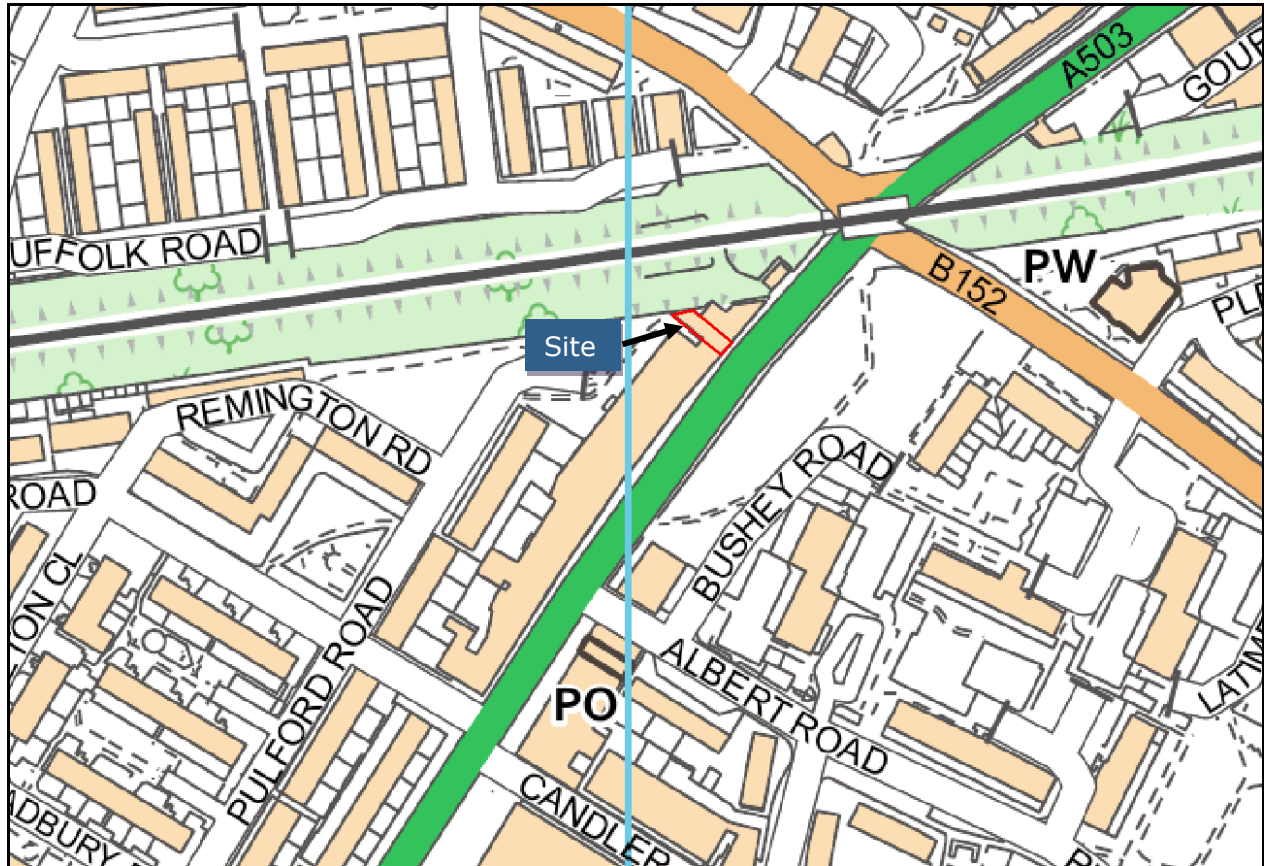


Figure 1: Site location plan (Source: Ordnance Survey)

- 3.1.2 The site comprises number 523 which consists of a three-storey building with commercial uses on the ground floor and residential uses above. The existing site layout can be seen on Drawing Number SSR.523.EX.PR.201. Access into the site is from Seven Sisters Road adjacent to the south eastern frontage.
- 3.1.3 Filtered LIDAR data at 1m resolution has been obtained in order to determine and illustrate the topography across the site and surrounding area (Figure 2).
- 3.1.4 The survey data indicates that the ground floor level is set at 11.65m AOD.



Figure 2: Filtered LIDAR survey of the site and surrounding area combined with OS (where low ground is denoted by blue and green colours and higher ground is denoted by red and yellow colours)

3.2 Site Proposals

- 3.2.1 It is the Client's intention to change the use of the ground floor to a residential use. The proposed layout can be seen on Drawing Number SSR.523.EX.PR.201.
- 3.2.2 Paragraph 33 (ID 7-033-20140306) of the NPPF Planning Practice Guidance (NPPG) states that the Sequential Test does not apply to change of use applications.

4. SOURCES OF FLOODING

4.1 Fluvial

- 4.1.1 The Environment Agency Flood Map (Figure 3) and Map 9 of the SFRA shows that the site is located within the NPPF Flood Zone 1, 'Low Probability' which comprises land as having less than a 1 in 1000 year annual probability of fluvial or tidal flooding (i.e. an event more severe than the extreme 1 in 1000 year event). NPPF states that all uses of land are appropriate in this zone.

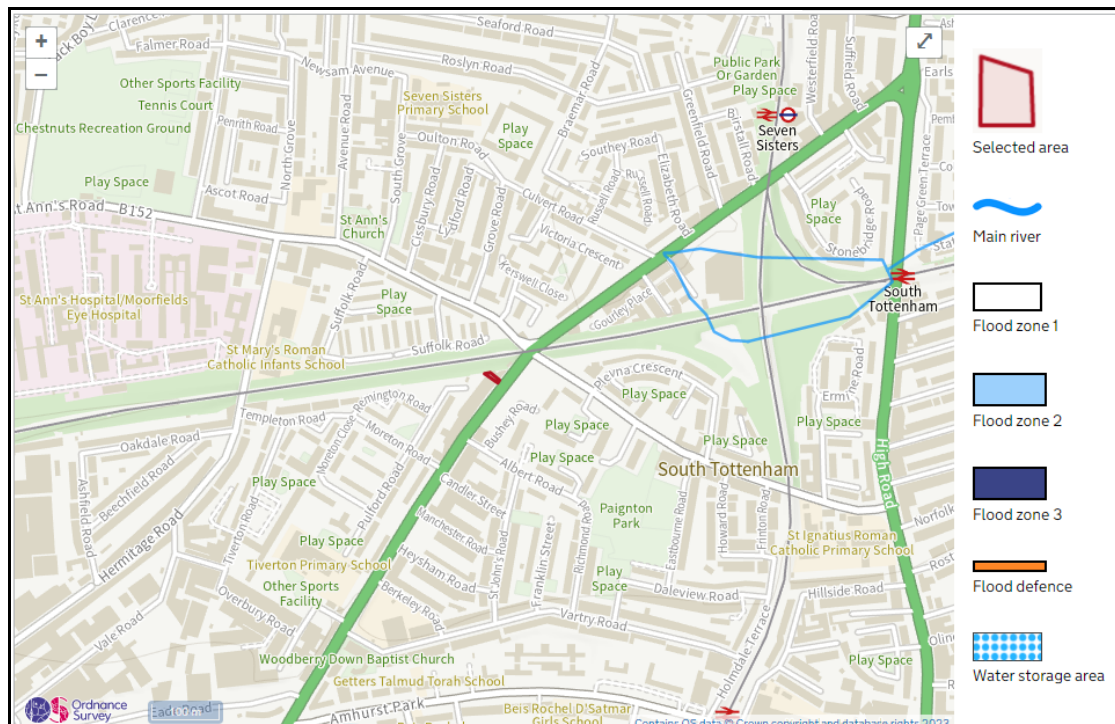


Figure 3: Environment Agency Flood Map for Planning

4.2 Groundwater Flooding

- 4.2.1 In order to assess the potential for groundwater flooding during higher return period rainfall events, the Jacobs/DEFRA report entitled *Strategy for Flood and Coastal Erosion Risk Management: Groundwater Flooding Scoping Study*, published in May 2004, was consulted, together with the guidance offered within the document entitled *Groundwater flooding records collation, monitoring and risk assessment (ref HA5)*, commissioned by DEFRA and carried out by Jacobs in 2006.

Soil and Geology at the Site

- 4.2.2 The British Geological Survey's *Online Geology of Britain Viewer* indicates that the soils beneath the site comprise London Clay.

Groundwater Flooding Potential at the Site

- 4.2.3 There have been no recorded groundwater flood events across the area between 2000 and 2003, as indicated by the Jacobs study.
- 4.2.4 Table 3-4 of the SWMP indicates that the site has not been affected by groundwater flooding in the past.

- 4.2.5 It is considered that the less permeable soil types and building footprint will confine the water table and reduce the risk of groundwater flooding to acceptable levels.

4.3 Surface Water Flooding and Sewer Flooding

- 4.3.1 Surface water and sewer flooding across urban areas is often a result of high intensity storm events which exceed the capacity of the sewer thus causing it to surcharge and flood. Poorly maintained sewer networks and blockages can also exacerbate the potential for sewer flooding. Surface water flooding can also occur as a result of overland flow across poorly drained rural areas.
- 4.3.2 The Section 19 Flood Investigation Report for the borough carried out in January 2022, indicates that the site was not affected during the 2021 flood events.
- 4.3.3 The SWMP shows that the site is located within the Critical Drainage Area (CDA) Group4_057. The SWMP states that surface water flows in the natural valley and ponds in low-lying areas such as those around the site.
- 4.3.4 The Agency's Surface Water Flooding Map (Figure 4 and 5) indicates that the site is at risk during low to high surface water flood events (i.e. between a 1 in 1000 year chance and events greater than 1 in 30 years).
- 4.3.5 It is generally accepted that the low risk flood event (i.e. between 1 in 1000 years and 1 in 100 years) on the Agency's map is used as a substitute for the climate change 1 in 100 year event to provide a worst-case scenario.



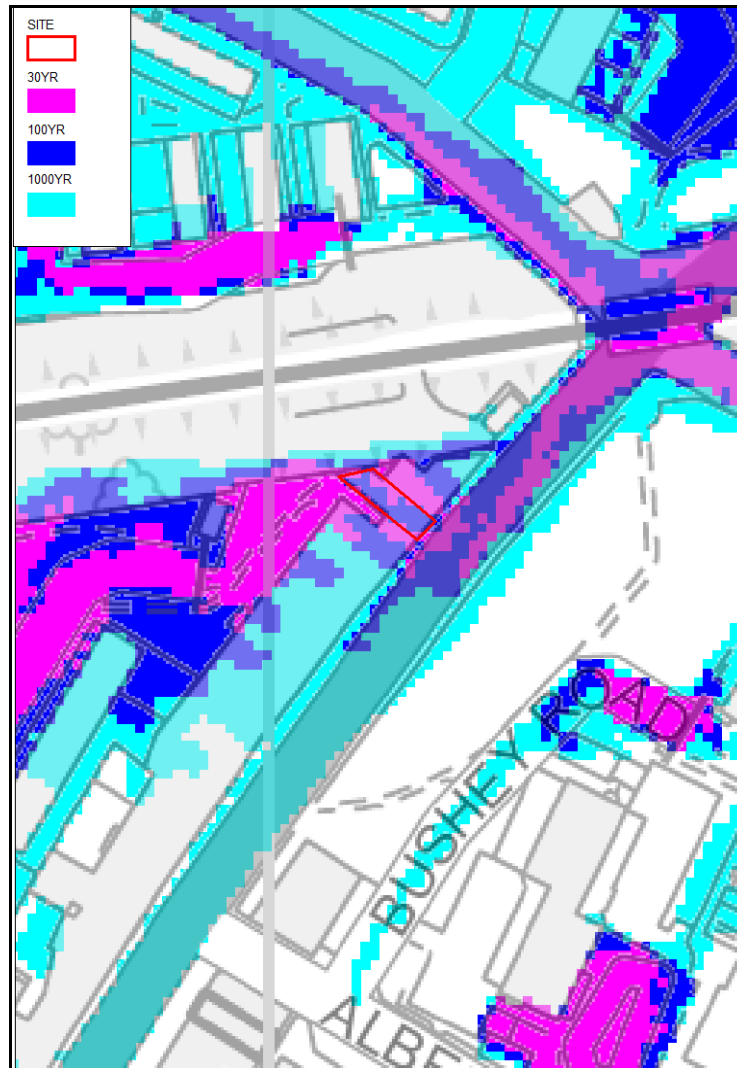


Figure 5: Environment Agency Surface Water Flooding Map (Source: Environment Agency, 2023)

4.3.6 Further more detailed data has been obtained via the Data.gov.uk site (<https://environment.data.gov.uk/DefraDataDownload/?Mode=rofs>). The flood extent, depth and hazard GIS *shape file* was downloaded from Data.gov.uk (for tile TQ_38).

4.3.7 During the low risk event (i.e. between 1 in 1000 years and 1 in 100 years/climate change 1 in 100 year event) the map confirms that the depth across the site would be between 0.30-0.60m. The flood level could therefore be up to 12.25m AOD.

Surface Water Flood Risk Mitigation

4.3.8 It has been established that the low risk (1000yr/100yr plus climate change) surface water flood level is up to 12.25m AOD.

4.3.9 It is not practical to avoid the surface water flood risk by raising floor levels above the flood depth.

4.3.10 The DEFRA/EA document entitled *Improving the Flood Performance of New Buildings*, dated 2007, suggests that there is some damage to buildings if the depth differential

between the outside and inside water levels exceeds 0.6m. Severe damage can occur if this reaches 1m even if the buildings are flood proofed.

- 4.3.11 In order to reduce the differential depth to safe limits across the ground floor level, it is proposed that a *Water Entry Strategy* is adopted.

Water Entry Strategy

- 4.3.12 In accordance with the ODPM guidance document *Preparing for Floods* and the DEFRA/EA document entitled *Improving the Flood Performance of New Buildings*, a *Water Entry Strategy* in this case aims to allow floodwater to enter the building and flood resilience techniques are incorporated to reduce the consequences of flooding.
- 4.3.13 Durable fittings which are not affected by floodwater could be used internally (e.g. plastic or stainless steel units). Wood fittings should be avoided; however sacrificial fittings can be installed which can then be replaced easily after the flood. There should be gaps behind the fittings to promote drainage and drying.
- 4.3.14 It may be practical to raise electrical sockets above the flood depth. However, the supply of electricity should be turned off in the event of a flood. Wiring for communications should also be insulated to prevent damage.
- 4.3.15 It is recommended that after the event, a structural survey is carried out in order to assess any damage due to prolonged periods of flood water exposure. The CIRIA guidance document (C623) entitled *Standards for the repair of buildings following flooding* outlines the various approaches.

Reducing Vulnerability to the Hazard

- 4.3.16 Flood Warnings for surface water flooding do not currently exist, however, the occupants should sign up to the Met Office weather warning system <https://www.metoffice.gov.uk/public/weather/warnings>.
- 4.3.17 There are additional ways in which the residents can reduce the risk themselves. The occupants should develop a *Family Flood Plan*. Further guidance is offered in the Environment Agency's guidance document entitled *What to do before, during and after a flood*.

Table 1: Flood Event Action Plan

Alert	Level Definition	Action	Responsibility
Yellow: be aware	Yellow warnings can be issued for a range of weather situations.	Monitor flood risk through media.	Occupants
	Many are issued when it is likely that the weather will cause some low level impacts, including some disruption to travel in a few places.	Locate family members and inform them of risk. If away from the site make assessment on risk if considering returning to site (i.e. how long it will take to return etc).	
	Other yellow warnings are	Check flood kit, check	

	issued when the weather could bring much more severe impacts to many people but the certainty of those impacts occurring is much lower. It is important to read the content of yellow warnings to determine which weather situation is being covered by the yellow warning.	occupants, check pets – BE PREPARED in case the situation gets worse.	
Amber: be prepared	There is an increased likelihood of impacts from severe weather, which could potentially disrupt your works plans. This means there is the possibility of travel delays, road and rail closures, power cuts and the potential risk to life and property.	Monitor weather through media and local observations. Consider advice given from authorities including Council, Environment Agency and emergency services. Begin to implement Flood Plan. Check insurance, Check flood kit, Check Pets.	Occupants
Red: Take Action	Dangerous weather is expected and, if you haven't already done so, you should take action now to keep yourself and your works force safe from the impact of the severe weather.	Follow advice given by Emergency Services, Environment Agency and Council. Maintain communication through the media.	Occupants

	It is very likely that there will be a risk to life, with substantial disruption to travel, energy supplies and possibly widespread. You should avoid travelling, where possible, and follow the advice of the emergency services and local authorities.	Occupants can evacuate themselves if they feel unsafe providing that they make a judgement in relation to any external flood hazard. Take flood kit, occupants and pets with you. People who do not evacuate should reside across building.	
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Safe Access/Egress

- 4.3.18 The EA surface water flood map on Figure 5 shows that Seven Sisters Road adjacent to the site has a low to high surface water flood risk.
- 4.3.19 The flood hazard is calculated based on different combinations of floodwater depth and velocity, and subsequently by using the hazard equation as cited in the DEFRA/EA R&D Document *Framework and guidance for assessing and managing flood risk for new development Phase 2 (FD2320/TR2)*. The numerical hazard rating is then categorised into four degrees of flood hazard in accordance with *FD2320/TR2*, shown on Table 2 below.

Table 2: Hazard to people categories (based on *FD2320/TR2*)

Hazard Rating	Degree of Flood Hazard	Description
< 0.75	Very low hazard	Caution "Flood zone with shallow flowing water or deep standing water"
0.75 – 1.25	Danger for Some	Dangerous for some (i.e. children) "Danger: Flood zone with deep or fast flowing water"
1.25 – 2.0	Danger for Most	Dangerous for most people (i.e. general public) "Danger: Flood zone with deep fast flowing water"
> 2.0	Danger for All	Dangerous for all "Extreme danger: flood zone with deep fast flowing water"

- 4.3.20 By reviewing the flood hazard GIS *shape file* (for tile TQ_38) downloaded from Data.gov.uk (<https://environment.data.gov.uk/DefraDataDownload/?Mode=rofs>) it can be seen that the hazard to people leaving the site would be *Dangerous for Most* for 40m, *Dangerous for Some* for 14m then *Very low*.
- 4.3.21 People should make a judgment on leaving or accessing the site before, during or after the event in relation to any external flood hazard.

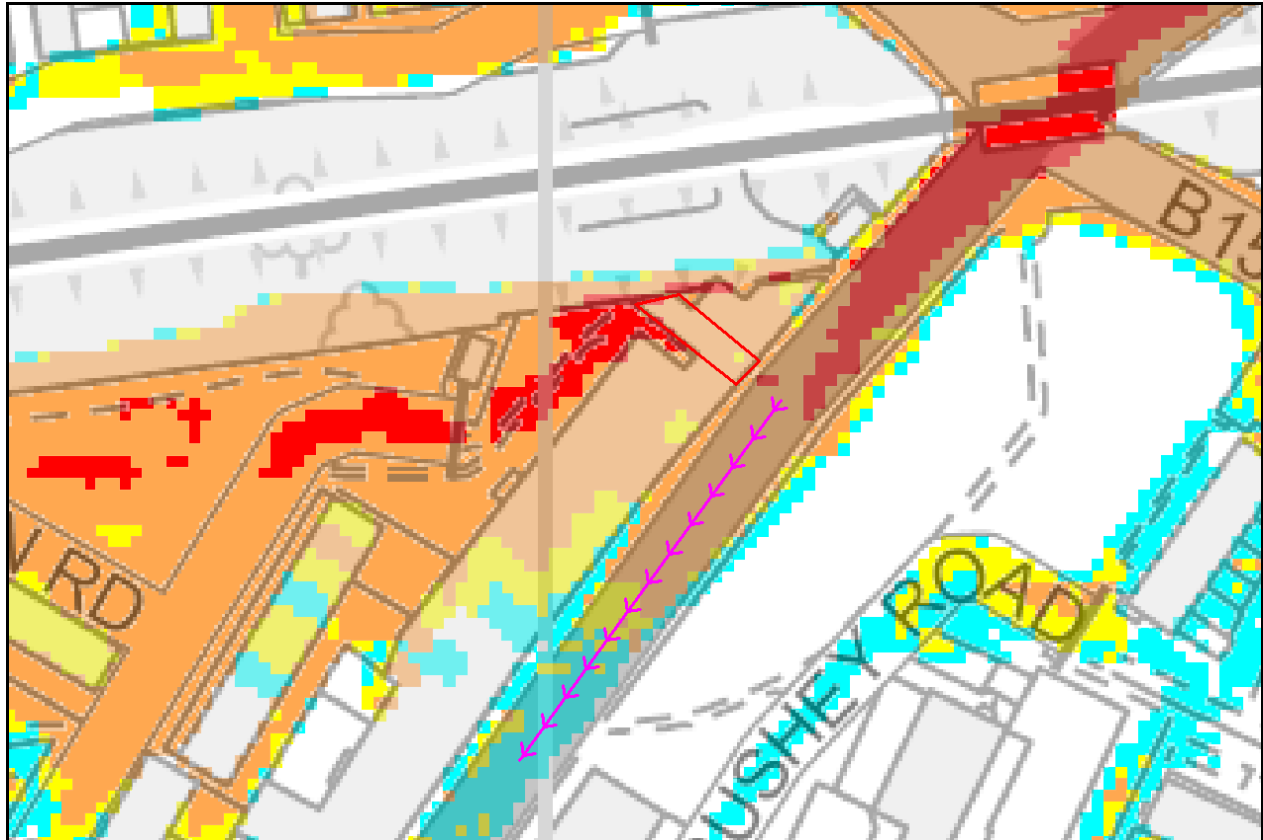


Figure 6: Preferred evacuation route with hazard (see Table 2 above for hazard classification)

4.4 Reservoirs, Canals And Other Artificial Sources

- 4.4.1 The failure of man-made infrastructure such as flood defences and other structures can result in unexpected flooding. Flooding from artificial sources such as reservoirs, canals and lakes can also occur suddenly and without warning, leading to high depths and velocities of flood water which pose a safety risk to people and property.
- 4.4.2 The Environment Agency's "Risk of flooding from reservoirs" map indicates that the site is not at risk of flooding from such sources.

5. CONCLUSIONS

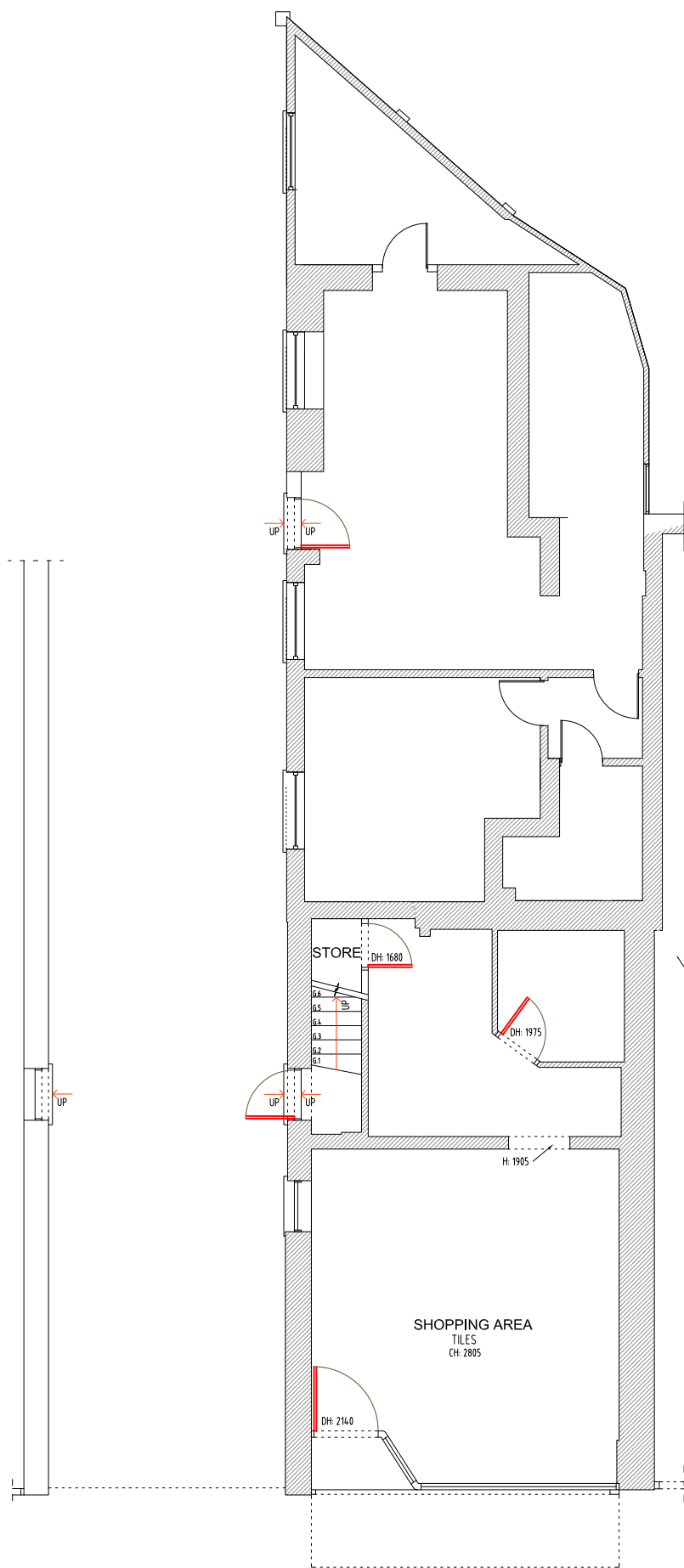
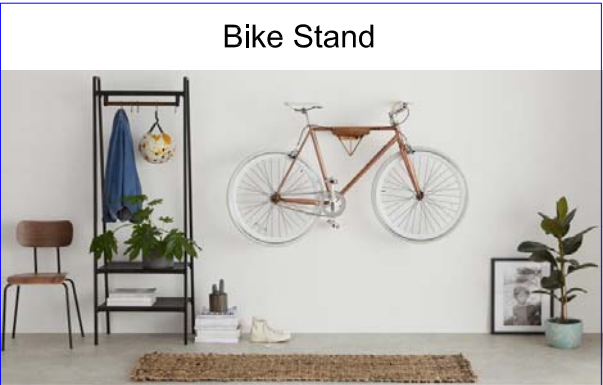
- It is the Client's intention to change the use of the ground floor to a residential use. The survey data indicates that the ground floor level is set at 11.65m AOD.
- The site is located within Flood Zone 1.
- There is a low groundwater flood risk and low risk from reservoirs.
- The site is located across low to high surface water flood risk areas. A more detailed analysis of the flood risk has been undertaken using the Data.gov.uk GIS data. The low risk (1000yr/100yr plus climate change) flood level has been estimated to be up to 12.25m AOD. The ground floor could be affected by a flood depth of up to 0.60m during the worst-case low risk event.
- A *Water Entry Strategy*, as discussed further in the aforementioned DEFRA/EA document, can be adopted above the ground floor level up to the depth of 0.60m in order to reduce the differential depth to safe limits
- A flood response strategy is outlined in this report. The mitigation measures will not only protect the site during flood events but will ensure that the occupants can respond effectively during the event thus relying less on Category 1 responders.

6. BIBLIOGRAPHY

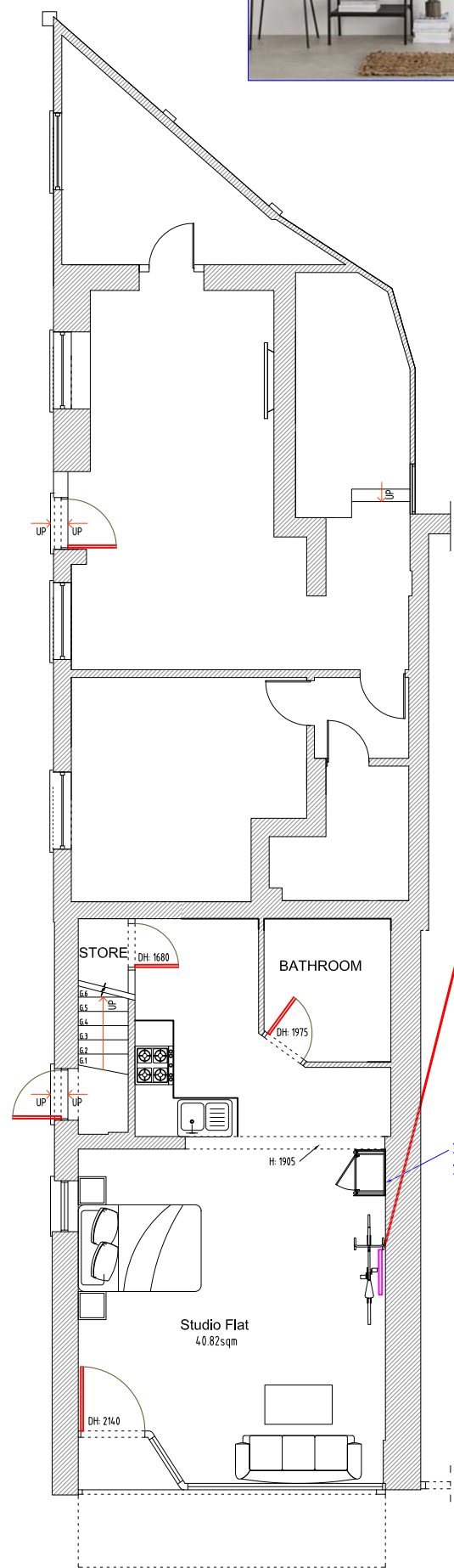
- i. Association of British Insurers 2012. *Guidance on Insurance and Planning in Flood Risk Areas for Local Planning Authorities in England*.
- ii. CIRIA 2005. *Standards for the repair of buildings following flooding, Report 623*. CIRIA.
- iii. CIRIA 2000. *Groundwater Control – design and practice, Report 515*. CIRIA.
- iv. Cobby, D., et al. 2009. *Groundwater flood risk management: advances towards meeting the requirements of the EU Floods Directive*. Journal of Flood Risk Management.
- v. Communities and Local Government 2012. *National Planning Policy Framework*.
- vi. Communities and Local Government 2007. *Improving the Flood Performance of New Buildings*. HMSO.
- vii. DEFRA/EA 2007. *Public Response to Flood Warning, Flood and Coastal Defence R&D Programme, R&D Technical Report SC020116*. Environment Agency.
- viii. DEFRA/EA 2006. *Flood Risks to People, Phase 2, R&D Technical Report FD2321/TR1, Flood and Coastal Defence R&D Programme*. Water Research Council.
- ix. DEFRA/EA 2006a. *Flood Risks to People, Phase 2, R&D Technical Report FD2321/TR2, Flood and Coastal Defence R&D Programme*. Water Research Council.
- x. DEFRA/EA 2005. *Framework and guidance for assessing and managing flood risk for new development, Phase 2, Flood and Coastal Defence R&D Programme, R&D Technical Report FD2320/TR2*. Water Research Council.
- xi. DEFRA/EA 2005a. *Flood Warning for Vulnerable Groups: A review of the literature, Flood and Coastal Defence R&D Programme*. Environment Agency.
- xii. DEFRA/Jacobs 2006. *Groundwater flooding records collation, monitoring and risk assessment (ref HA5)*.
- xiii. DEFRA/Jacobs 2004. *Strategy for Flood and Coastal Erosion Risk Management: Groundwater Flooding Scoping Study (LDS), Final Report, Volumes 1 and 2*.
- xiv. Environment Agency 2008. *Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose – Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1*.
- xv. Geological Society of London 2006. *Groundwater and Climate Change*. Geoscientist magazine, Volume 16, No 3.
- xvi. Institute of Geological Sciences 1977. *Hydrogeological Map of England and Wales, 1:625,000*. NERC.
- xvii. NERC 2009. *Flood Estimation Handbook [CD-ROM], Version 3*. Institute of Hydrology.

- xviii. NERC 1975. *Flood Studies Report (FSR)*. Institute of Hydrology.
- xix. Newman, A.P. 2004. *Protecting groundwater with oil-retaining pervious pavements: historical perspectives, limitations and recent developments*. Quarterly Journal of Engineering Geology and Hydrogeology.
- xx. ODPM 2003. *Preparing for Floods*. London: ODPM.
- xxi. Pratt, C., Wilson, S., and Cooper, P. 2002. *Source control using constructed pervious surfaces; hydraulic, structural and water quality performance issues, Report C582*. London: CIRIA.
- xxii. Soil Survey of England and Wales 1983. *Soil Map of Eastern England (Sheet 4)*, 1:250,000. Cranfield University.
- xxiii. UK Groundwater Forum. *Groundwater Resources and Climate Change*. http://www.groundwateruk.org/Groundwater_resources_climate_change.aspx [accessed 05/10/2016].

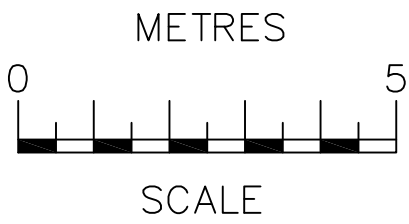
DRAWINGS



Existing Ground Floor



Proposed Ground Floor



 OCC Building A 105 Eade Road London N4 1TJ Tel: (020) 8150 1820 info@ajplans.co.uk	Project: 523 Seven Sisters Road, London N15 6EP	
	Title: EXISTING & PROPOSED Floor Plans	
NOTES The contractors are to check all the dimensions, levels, drain runs and general condition of the site before works commence. All works are to be carried out in accordance with current Building Regulations, British Standards, Code of Practice and Local Authority Requirements. Do not scale of from this drawing.	Date: 02.11.22	Scale: 1:100 @ A3
	Dwg. No. SSR.523.EX.PR.201	Rev:

