

APPENDIX 8.1A FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY



The Beehive Redevelopment, Cambridge Railway Pensions Nominees Limited

Flood Risk Assessment & Drainage Strategy

August 2024

Waterman Infrastructure & Environment Limited

Pickfords Wharf, Clink Street, London, SE1 9DG

www.watermangroup.com



Client Name: Railway Pension Nominees Limited
Document Reference: WIE17469-110-R-1-1-4-FRADS_Project Otter
Project Number: WIE17469-110

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

Issue	Date	Prepared by	Checked by	Approved by
P01	02.08.24	Daniel Hontanosas (Flood Risk Consultant)	Gurveer Jutte (Civil Engineer)	Cameron Paton (Technical Director)

Comments	First draft for Client Team / Legal Review
-----------------	--

P02	16.08.24	Gurveer Jutte (Civil Engineer)	Gurveer Jutte (Civil Engineer)	Cameron Paton (Technical Director)
-----	----------	-----------------------------------	-----------------------------------	---------------------------------------

Comments	Final report for Outline Application
-----------------	--------------------------------------

Disclaimer

This report has been prepared by Waterman Infrastructure & Environment Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

Contents

1. Introduction.....	6
Context	6
Site Location	6
Existing Site Features.....	7
Topography.....	7
Local Hydrology	7
Existing Flood Defences	7
Geology & Hydrogeology.....	7
2. Planning Policy and Guidance.....	8
National Planning Policy Framework.....	8
Planning Practice Guidance	8
Water Industry Act	9
Non-statutory Technical Standards for Sustainable Drainage Systems	9
Cambridge Local Plan	9
Cambridgeshire Flood and Water SPD	11
Cambridgeshire Sustainable Design & Construction SPD	11
Sustainable Drainage : Cambridge Design and Adoption Guide	11
Surface Water Planning Guidance	11
Greater Cambridge Strategic Flood Risk Assessment (SFRA).....	11
Cambridgeshire Preliminary Flood Risk Assessment (PFRA)	11
3. Development Proposals and Planning Context	12
Development Proposals	12
Flood Zone Classification	12
Strategic Flood Risk Assessment Classification	13
Functional Floodplain Appraisal	13
Flood Risk Vulnerability	14
Flood Risk Compatibility	14
Sequential Test and Exception Test.....	14
4. Technical Assessment of Flood Risk.....	15
Assessment Methodology	15
Fluvial & Tidal Flooding	15
Surface Water Flooding & Overland Flow	16
Groundwater Flooding	21
Sewer & Water Main Flooding.....	22
Flooding from Canals and Artificial Sources	24
Flooding from Reservoirs	24
Flood Risk to Off-Site Areas	24
5. Proposed Flood Management Measures	26

Finished Floor Levels & Level Differentials	26
Lower Ground Floor Threshold Levels	26
Flood Resilience	26
Overland Flow Mitigation	26
Flood Storage or Conveyance Compensation	27
Safe Route of Access and Egress	27
Residual Risk	27
6. Surface Water Drainage Strategy	28
Existing Drainage Regime	28
Existing Site Surface Water Runoff Assessment	30
Drainage Hierarchy	31
Sustainable Drainage Systems	32
Climate Change Allowances	33
Proposed Catchment Areas and Maximum Discharge Rate	34
Summary of Design Parameters and Results	35
Outfall Details	38
Non-Technical Summary	38
Exceedance Routes	39
7. Water Quality Management Train and Simple Index Assessment	41
8. Proposed Foul Water Drainage Strategy	44
9. Phasing Plan	45
10. Drainage and SuDS Maintenance Plan	46
11. Statutory Consultations	50
Anglian Water Developer Services	50
Cambridgeshire County Council (Lead Local Flood Authority)	50
12. Conclusions	52
13. References	53

Figures

Figure 1: Site Location	6
Figure 2: Flood Map for Planning	12
Figure 3: SFRA Flood Risk Constraints Map Extract	13
Figure 4: SFRA Historic Flooding Map Extract	15
Figure 5: SFRA Modelled Climate Change Extents Map Extract	16
Figure 6: Surface Water Flood Extents	17
Figure 7: Surface Water Flood Depth (Medium Risk Scenario)	19
Figure 8: Surface Water Flood Velocity (Medium Risk Scenario)	19
Figure 9: Surface Water Flood Depth (Low Risk Scenario)	20
Figure 10: Surface Water Flood Velocity (Low Risk Scenario)	20

Figure 11: Groundwater Flooding Potential	21
Figure 12: Public Sewer Records Extract (North)	23
Figure 13: Public Sewer Records Extract (South)	23
Figure 14: Reservoir Flood Risk (Floodwater Depth).....	24
Figure 15: Climate change allowances for the Site (EA, 2024).	34
Figure 16: Extract of proposed catchment layout.	35
Figure 17: Extract of proposed surface water layout.	37
Figure 18: Exceedance flow paths following topography of site and directed towards soft landscaping areas away from building premises.	40
Figure 19: Phasing plan	45

Tables

Table 1: Private Surface Water Sewer Outfalls	28
Table 2: Private Foul Water Sewer Outfalls	29
Table 3: Existing Site Brownfield Runoff Analysis	30
Table 4: Greenfield runoff rates summary.....	31
Table 5: Drainage Hierarchy	31
Table 6: Sustainable Drainage Techniques	32
Table 7 Summary of design and modelling parameters.	36
Table 8 Summary of stormwater controls (SuDS) and design volumes.	37
Table 9: Pollution hazard indices for different land use classifications (CIRIA, 2015).....	41
Table 10: Indicative SuDS mitigation indices for discharge to surface water (CIRIA, 2015)...42	
Table 11: Summary of simple index approach assessment for roofs and highway catchments.	43
Table 12: Maintenance schedule for piped drainage and manholes (CIRIA, 2015).	46
Table 13: Flow control device maintenance schedule (CIRIA, 2015).	47
Table 14: Maintenance schedule for bioretention systems (CIRIA, 2015).....	47
Table 15: Maintenance schedule for permeable paving systems (CIRIA, 2015).....	48
Table 16: Maintenance schedule for green and blue roofs.....	48
Table 17: Summary of LLFA response and design updates.....	50

Appendices

- A. Existing Site Plans
- B. Topographical Survey
- C. Development Proposals
- D. Existing Drainage Drawings
- E. Existing Drainage Calculations
- F. Proposed Drainage Arrangements
- G. Proposed Drainage Modelling Summary

- H. Statutory Authority Consultations
- I. LLFA Surface Water Drainage Pro-Forma

Executive Summary

Waterman was commissioned by Railway Pension Nominees Limited to prepare a Flood Risk Assessment incorporating a Surface Water Drainage Strategy to support the proposed redevelopment of the Beehive Centre, Coldham's Lane, Cambridge, for a new local centre, open space and employment (office and laboratory) floorspace.

Flood risk has been assessed in line with BS8533 and best practice. In accordance with NPPF and its associated PPG, all potential sources of flooding to the Site have been considered.

Review of published material indicates that the Site has not been subject to historical flooding.

The Site lies remote from Main Rivers and Ordinary Watercourses and is categorised within an area at very low probability of flooding (Flood Zone 1) from Main Rivers and the Sea.

No significant risk of flooding at the Site from emergent groundwater, surface water, sewers, or reservoir breach has been established based upon published documents and consideration of the local topography and setting.

Localised areas at risk of flooding from surface water and overland flow can be adequately managed by maintaining level differentials between finished ground floor levels and adjacent external levels, and by careful management of surface water runoff across the Proposed Development.

The Site would be expected to remain at low risk of flooding in the future throughout the lifetime of the Proposed Development taking into account anticipated climate change effects.

Safe routes of vehicular and pedestrian access and egress would also be available via Coldham's Lane and adjacent footpaths over the lifetime of the Proposed Development.

Surface water runoff from the Proposed Development will be managed sustainably at source, utilising a suite of SuDS measures and water quality enhancements integrated within the hard and soft landscape.

Post-development, there is a material overall reduction in flow rates and flow volumes to the receiving sewer networks providing a nett betterment to the receiving systems in line with national and local policy objectives.

The FRA demonstrates that the residual flood risks are manageable over the lifetime of the Proposed Development. The proposals are deemed to be 'safe' and sustainable in flood risk terms and in line with the requirements of local and national policies and guidance.

1. Introduction

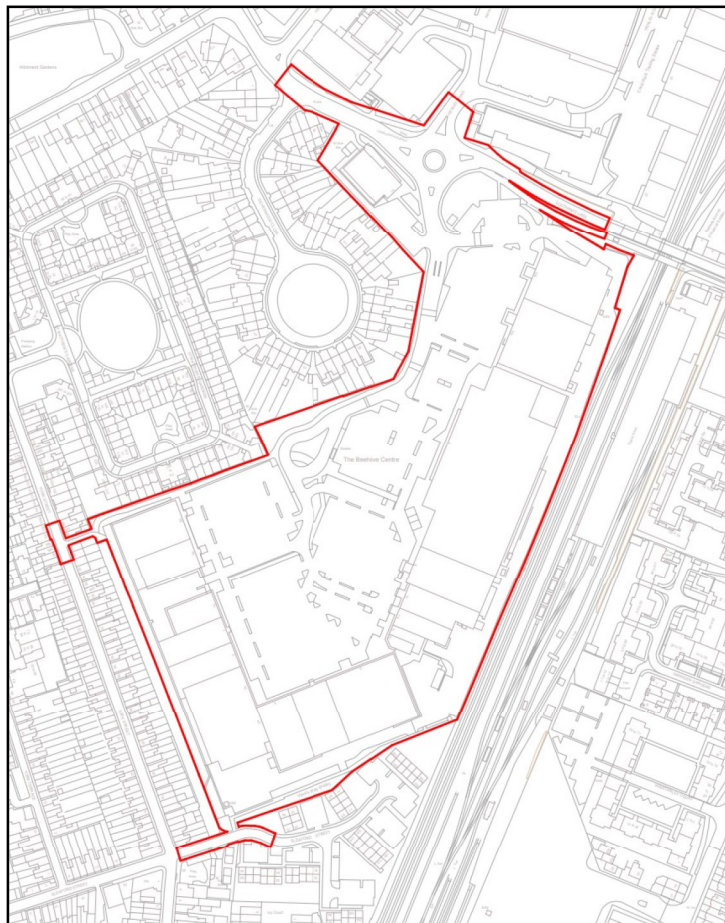
Context

- 1.1. Waterman was commissioned by Railway Pension Nominees Limited (“the Applicant”) to prepare a Flood Risk Assessment (FRA) incorporating a Drainage Strategy (DS) to support an outline planning application for the proposed redevelopment of the Beehive Centre, Coldham’s Lane, Cambridge (hereafter referred to as “the Site”).
- 1.2. This report assesses the potential effects of tidal, fluvial, pluvial, groundwater and artificial sources of flooding upon the Proposed Development, in line with national and local planning policy. In addition, the management of foul flows and surface water runoff is also assessed, so as not to have a detrimental effect to the Site or its surroundings.

Site Location

- 1.3. The Site address is The Beehive Centre, Coldham’s Lane, Cambridge CB1 3ET (approx.), centred at National Grid Reference (NGR) 546625, 258550. Refer to Site Location Plan in Figure 1. The Site falls under the jurisdiction of Greater Cambridge Shared Planning Service, encompassing Cambridge City Council (CCC).

Figure 1: Site Location



Existing Site Features

- 1.4. The Site Area covers 7.85 hectares (ha) and comprises a mid-sized retail park with mixed uses and associated ground level at-grade car parking. Refer to Existing Site Plans in Appendix A.
- 1.5. The Site is accessed via Coldham's Lane which forms its northern boundary. The Site is bounded by the railway line to the east, by York Street and Sleaford Street to the south, and by existing residential areas to the west.

Topography

- 1.6. Topographical information for the Site and locale indicates that ground levels are circa 14.0m AOD along the southern boundary, sloping to circa 12.2m AOD along the southern edge of the retail park. Ground levels fall in a north easterly direction across the car park to circa 9.5m AOD at the Coldham's Lane junction. The lowest point of the Site lies at circa 9.0m AOD at the north eastern corner before levels rise to Coldham's Lane along the north eastern boundary.
- 1.7. Adjacent off-site levels to the south along York Street and Sleaford Street are elevated above the Site with levels of circa 14.0m AOD. Adjacent off-site levels to the north along Coldham's Lane are elevated above the Site with levels of circa 9.5m - 13.6m AOD along the footpath between the northern and north eastern site extents. Topographical information is included as Appendix B.
- 1.8. Off-site levels generally continue to fall in a north easterly direction away from the Site.

Local Hydrology

- 1.9. The Site falls within the natural surface water drainage catchment of a tributary of Coldham's Brook and River Cam, which flows in a northerly direction circa 250m to the north east of the Site, via Barnwell Lake, into the River Cam which flows circa 500m to the north west of the Site.

Existing Flood Defences

- 1.10. The Site does not benefit from, nor rely upon, the presence of formal fluvial flood defences.

Geology & Hydrogeology

- 1.11. Historical mapping records the Site as undeveloped or in use as allotments up until the 1960's, whereby various warehouses, a dairy, builders' yards, and a bakery were developed. The northern half of the Site was redeveloped in the 1980's into the existing Beehive Retail Centre layout, with the remainder of the Site being developed by 1994.
- 1.12. The Site's geology comprises tarmac / concrete hardstanding overlying Made Ground (up to 2.5m thick). The weathered base of the West Melbury Marly Chalk Formation lies beneath the Made Ground across the majority of the Site, up to 6.6m thick) whilst River Terrace Gravels (4.6m thick) are anticipated beneath the south western areas of the Site only. Both are underlain by Gault Clay Formation (>35.8 thick) and Lower Greensand Formation.
- 1.13. Gault Clay is unproductive strata, whilst the West Melbury Marly Chalk Formation and Lower Greensand Formation are designated Principal Aquifer.
- 1.14. Surface water abstractions are not recorded on the Site or immediate locale. Environment Agency (EA) mapping indicates that the Site is not located within a Groundwater Source Protection Zone (SPZ).

2. Planning Policy and Guidance

National Planning Policy Framework

- 2.1. The National Planning Policy Frameworkⁱ (NPPF) states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.
- 2.2. The NPPF states that when determining planning applications, Local Planning Authorities (LPA) should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific Flood Risk Assessment. Development should only be allowed in areas at risk of flooding where it can be demonstrated that:
- Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
 - The development is appropriately flood resistant and resilient;
 - It incorporates Sustainable Drainage Systems (SuDS), unless there is clear evidence that this would be inappropriate;
 - Any residual risk can be safely managed; and
 - Safe access and escape routes are included where appropriate.

Planning Practice Guidance

- 2.3. The Planning Practice Guidance (PPG)ⁱⁱ provides additional guidance to LPAs to ensure effective implementation of the planning policies set out within the NPPF regarding development in areas at risk of flooding.
- 2.4. PPG states that developers and LPAs should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of SuDS. Referencing EA guidance, the PPG provides recommended contingency allowances for climate change over the anticipated lifetime of development. It also advises on flood resilience and resistance measures when dealing with the residual risks remaining after applying the sequential approach and mitigating actions.
- 2.5. The PPG also includes advice on flood risk vulnerability and flood zone compatibility. The following flood zones refer to the probability of river and sea flooding, without the presence of defences:
- Zone 1 - low probability: less than 1 in 1000 annual probability of river or sea flooding (<0.1%) in any year;
 - Zone 2 - medium probability: between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% to 0.1%) or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% to 0.1%) in any year;
 - Zone 3a - high probability: 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability flooding from the sea (>0.5%) in any year; and
 - Zone 3b - the functional floodplain: where water has to flow or be stored in times of flood; identification should take account of local circumstances but would typically flood with an annual probability of 1 in 30 (3.3%) or greater in any year or is designed to flood in an extreme 1 in 1,000 (0.1%) flood.

2.6. Flood risk vulnerability is split into five classifications in Table 2 of the PPG, as follows, and the compatibility of these within each Flood Zone is set out in Table 3 of the PPG:

- Essential Infrastructure, e.g. essential transport and utility infrastructure, wind turbines;
- Highly Vulnerable, e.g. emergency services (those required to be operational during flooding), basement dwellings;
- More Vulnerable, e.g. residential dwellings, hospitals, schools, hotels, drinking establishments;
- Less Vulnerable, e.g. retail, offices, storage and distribution, leisure, restaurants; and
- Water-Compatible Development, e.g. docks, marinas, wharves.

Water Industry Act

2.7. Anglian Water is the local Sewerage Undertaker and provides sewerage services under the guidance of the Water Industry Act 1991.

2.8. Under Section 106 of the Water Industry Act, the developer currently maintains the automatic right to 'communicate' with the public foul water sewer system.

Non-statutory Technical Standards for Sustainable Drainage Systems

2.9. The Non-statutory Technical Standards for Sustainable Drainage Systemsⁱⁱⁱ was published in March 2015 and is the current guidance for the design, maintenance and operation of SuDS.

2.10. For previously developed land, the Standards set out that the peak runoff rates should be as close as is reasonably practicable to the greenfield rate but should never exceed the pre-development runoff rate.

2.11. The standards also set out that the drainage system should be designed so that flooding does not occur on any part of the Site for a 1 in 30 year rainfall event, and that no flooding of a building (including basement) would occur during a 1 in 100 year rainfall event.

2.12. It is also noted within the standards that pumping should only be used when it is not reasonably practicable to discharge by gravity.

Cambridge Local Plan

2.13. Cambridge Local Plan 2018 Policy 31 : Integrated Water Management and the Water Cycle

Development will be permitted provided that:

a. surface water is managed close to its source and on the surface where reasonably practicable to do so;

b. priority is given to the use of nature services;

c. water is seen as a resource and is re-used where practicable, offsetting potable water demand, and that a water sensitive approach is taken to the design of the development;

d. the features that manage surface water are commensurate with the design of the development in terms of size, form and materials and make an active contribution to making places for people;

e. surface water management features are multi-functional wherever possible in their land use;

- f. any flat roof is a green or brown roof, providing that it is acceptable in terms of its context in the historic environment of Cambridge (see Policy 61: Conservation and Enhancement of Cambridge's Historic Environment) and the structural capacity of the roof if it is a refurbishment. Green or brown roofs should be widely used in large scale new communities;*
- g. there is no discharge from the developed site for rainfall depths up to 5 mm of any rainfall event;*
- h. the run-off from all hard surfaces shall receive an appropriate level of treatment in accordance with Sustainable Drainage Systems guidelines, SUDS Manual (CIRIA C753), to minimise the risk of pollution;*
- i. development adjacent to a water body actively seeks to enhance the water body in terms of its hydromorphology, biodiversity potential and setting;*
- j. watercourses are not culverted and any opportunity to remove culverts is taken; and*
- k. all hard surfaces are permeable surfaces where reasonably practicable, and having regard to groundwater protection.*

2.14. Cambridge Local Plan 2018 Policy 32: Flood Risk

Potential flood risk from the development

Development will be permitted providing it is demonstrated that:

- a. the peak rate of run-off over the lifetime of the development, allowing for climate change, is no greater for the developed site than it was for the undeveloped site;*
- b. the post-development volume of run-off, allowing for climate change over the development lifetime, is no greater than it would have been for the undeveloped site. If this cannot be achieved then the limiting discharge is 2 litre/s/ha for all events up to the 100-year return period event;*
- c. the development is designed so that the flooding of property in and adjacent to the development would not occur for a 1 in 100 year event, plus an allowance for climate change and in the event of local drainage system failure;*
- d. the discharge locations have the capacity to receive all foul and surface water flows from the development, including discharge by infiltration, into water bodies and into sewers;*
- e. there is a management and maintenance plan for the lifetime of the development, which shall include the arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime; and*
- f. the destination of the discharge obeys the following priority order:*
 - firstly, to ground via infiltration;*
 - then, to a water body;*
 - then, to a surface water sewer.*

Discharge to a foul water or combined sewer is unacceptable.

Potential flood risk to the development

Development will be permitted if an assessment of the flood risk is undertaken following the principles of the National Planning Policy Framework (2012) and additionally:

For a previously developed site:

Opportunities should be taken to reduce the existing flood risk by the positioning of any development so that it does not increase flood risk elsewhere by either displacement of flood water or interruption of flood flow routes, and it employs flood resilient and resistant construction including appropriate boundary treatment and has a safe means of evacuation.

Cambridgeshire Flood and Water SPD

- 2.15. The Cambridgeshire Flood and Water Supplementary Planning Document (SPD) supplements policy found in the Local Plan and provides guidance on the use of Sustainable Drainage Systems (SuDS) within new developments. It was endorsed by Cambridgeshire County Council (CCoC) in its capacity as Lead Local Flood Authority (LLFA). The SPD is supported by further LLFA guidance on surface water management.

Cambridgeshire Sustainable Design & Construction SPD

- 2.16. Consideration has also been given in preparing this planning application to the Sustainable Design and Construction SPD issued by CCoC in June 2007.

Sustainable Drainage : Cambridge Design and Adoption Guide

- 2.17. Sustainable Drainage : Cambridge Design and Adoption Guide provided by CCoC, sets out the design and adoption requirements that CCoC will be looking for, in order to ensure a smooth and satisfactory adoption process.

Surface Water Planning Guidance

- 2.18. CCoC published their Surface Water Planning Guidance in April 2024 helping to steer SuDS provision and policy requirements for major developments.

Greater Cambridge Strategic Flood Risk Assessment (SFRA)

- 2.19. Greater Cambridge Shared Planning Service's Level 1 Strategic Flood Risk Assessment (SFRA)^{iv} was published in July 2021 and aims to provide a robust assessment of flood risk across the region from all potential sources of flooding.

Cambridgeshire Preliminary Flood Risk Assessment (PFRA)

- 2.20. The Cambridgeshire PFRA^v was adopted in March 2011. This document has been prepared to help CCoC meet their duties to manage local flood risk and deliver the requirements of the Flood Risk Regulations 2009 in their role as a LLFA.

3. Development Proposals and Planning Context

Development Proposals

- 3.1. The Applicant is seeking outline planning permission for the redevelopment of the Beehive Centre. The Proposed Development consists of:

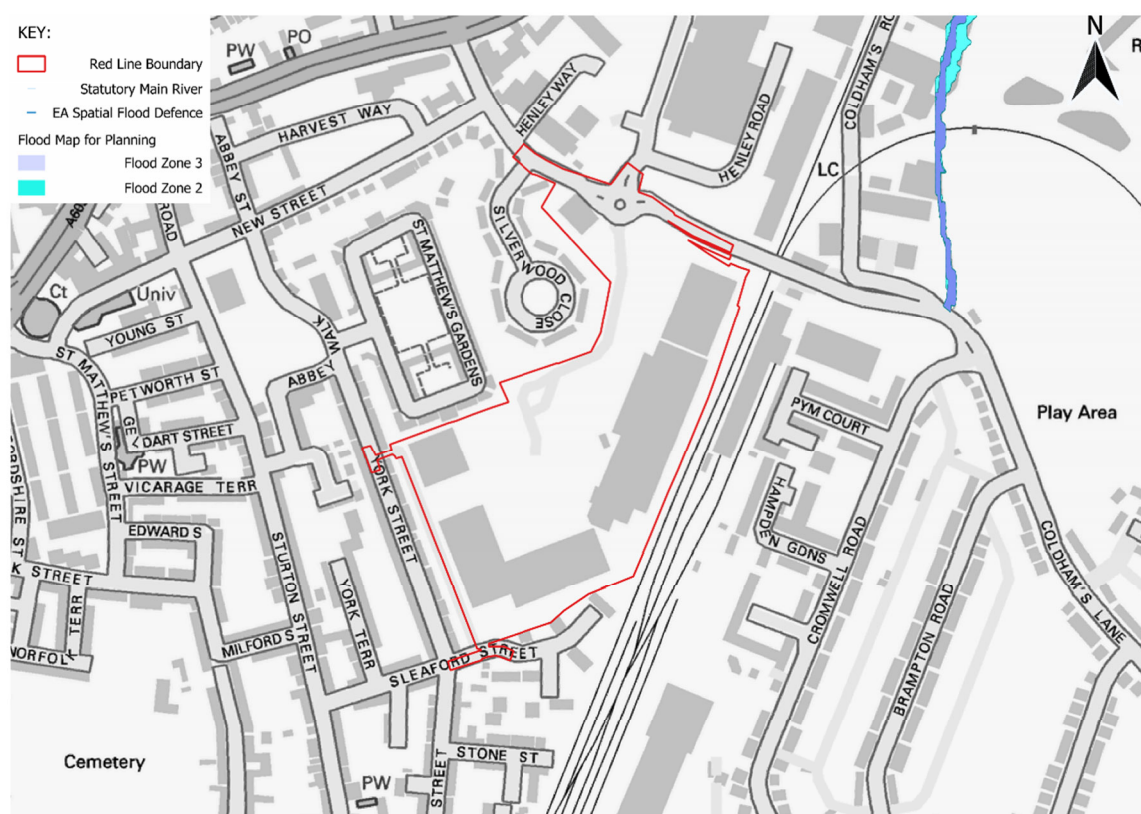
'the demolition and redevelopment of the Beehive Centre, including in Outline Application form for the demolition and redevelopment for a new local centre (E (a-f), F1(b-f), F2(b,d)), open space and employment (office and laboratory) floorspace (E(g)(i)(ii) to the ground floor and employment floorspace (office and laboratory) (E(g)(i)(ii) to the upper floors; along with supporting infrastructure, including pedestrian and cycle routes, vehicular access, car and cycle parking, servicing areas, landscaping and utilities.'

- 3.2. An Illustrative Masterplan and Development Proposals are presented in Appendix C. Lower ground floors are proposed beneath selected buildings to provide car parking, cycle storage plant rooms, servicing, and general storage. In flood risk planning terms these are categorised as lower ground floors rather than basements owing to being accessible via internal stair cores or lifts.
- 3.3. Target date for commencement of construction is Spring 2026.

Flood Zone Classification

- 3.4. Based on the Flood Map for Planning (reproduced at Figure 2), the Site lies within Flood Zone 1 (low probability of flooding).

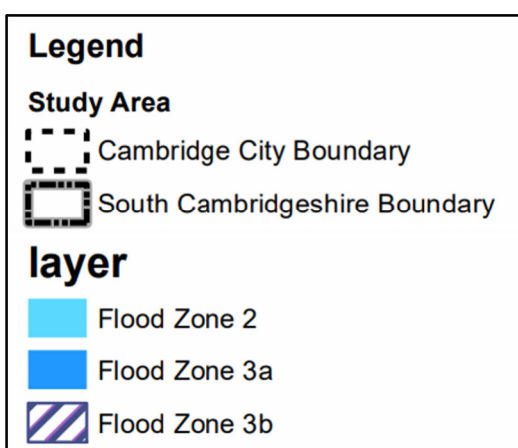
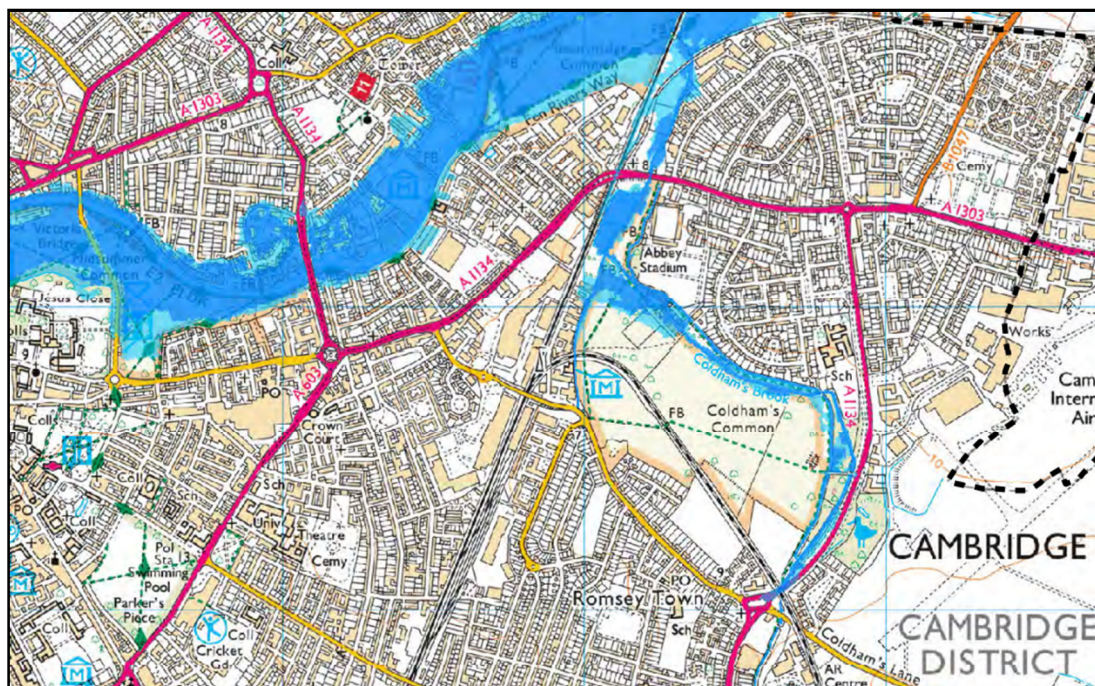
Figure 2: Flood Map for Planning



Strategic Flood Risk Assessment Classification

- 3.5. Appendix D1 of the Level 1 SFRA confirms that the Site lies in Flood Zone 1. Refer to mapping extract in Figure 3.

Figure 3: SFRA Flood Risk Constraints Map Extract



Functional Floodplain Appraisal

- 3.6. Appendix D1 and Appendix D6 of the Level 1 SFRA clearly confirms that the Site is located outside the functional floodplain (i.e. Flood Zone 3b) associated with Main Rivers.

Flood Risk Vulnerability

- 3.7. NPPF Table 2: *Flood risk vulnerability classification* identifies that offices, laboratory and local centre uses would be considered a 'Less Vulnerable' use, which represents no uplift from the 'Less Vulnerable' classification that applies to the currently consented retail use and car parking.

Flood Risk Compatibility

- 3.8. NPPF Table 3: *Flood risk vulnerability and flood zone 'compatibility'* (replicated below) confirms that the proposed development is appropriate for 'Less Vulnerable' uses in Flood Zone 1 without the need to satisfy the Exception Test. Refer to green highlighted cells.

Flood Risk Vulnerability and Flood Zone Compatibility

Flood Risk Vulnerability Classification (NPPF Table 2)		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (NPPF Table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test Required	✓	✓
	Zone 3a	Exception Test Required	✓	x	Exception Test Required	✓
	Zone 3b (functional floodplain)	Exception Test Required	✓	x	X	x
Key:		✓	Development is appropriate	x	Development should not be permitted	

Sequential Test and Exception Test

- 3.9. PPG paragraph 027 provides an overview on the application of the Sequential Test to individual planning applications.
- 3.10. NPPF requires an applicant, where appropriate, to apply the Sequential Test in order to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed.
- 3.11. NPPF paragraph 162 states:

"The aim of the Sequential Test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The Strategic Flood Risk Assessment will provide the basis for applying this test. A sequential approach should be used in areas known to be at risk now or in the future from any form of flooding."

- 3.12. The Site lies in Flood Zone 1, and built development is proposed in areas of lowest surface water flood risk, and it is not possible for development to be located in zones with a lower risk of flooding. The Site, therefore, satisfies the Sequential Test and does not require the Exception Test to be applied.

4. Technical Assessment of Flood Risk

Assessment Methodology

- 4.1. This report has also been prepared in accordance with the advice and requirements prescribed in current best practice documents relating to management of flood risk in development set out in BS8533^{vi} and the EA's National Standing Advice on Development and Flood Risk.
- 4.2. BS8533 and PPG guidance sets out that FRAs should consider climate change effects upon non-residential development proposals over a 75 year lifetime of development.

Fluvial & Tidal Flooding

Historic Flooding

- 4.3. Based upon published records, there is no history of fluvial flooding incidents at or immediately adjacent to the Site. Appendix D7 of the Level 1 SFRA only indicates one incident of flooding several hundred metres to the north of the Site. Refer to mapping extract in Figure 4.

Figure 4: SFRA Historic Flooding Map Extract

