TABLE OF CONTENTS

APPENDICES

ROBIN SWAILES DESIGN

MONSON

Structural Engineering
Roads & Car Parks
Traffic & Flood Risk Assessments
Water & Drainage Engineering
Technical Audits & Assessments

75 BOTLEY ROAD
OXFORD
OX2 0BU

BUILDING REFURBISHMENT
(inc outbuilding)

FLOOD RISK ASSESSMENT

Issue:	**A**
Date:	**16th August 2019**
Author:	**J. Finch**
Verified by	**L.G. Leslie**
Job No:	**9000U job 2**

Registered No. FS 37624

Broadway Chambers, High Street, Crowborough, East Sussex TN6 1DF (Registered Office) Tel: (01892) 601370

MONSON ENGINEERING LIMITED Registered in England & Wales No. 2739278

1.00 Introduction

1.01 Monson Engineering have been requested to provide a Flood Risk Assessment for the Proposed application for the demolition of existing garage, erection of a single storey outbuilding situated at No. 75 Botley Road, Oxford, OX2 0BU.

1.02 This site is situated within Flood Zone 3 and is therefore required to have a flood risk assessment submitted to the local planning authority to support the planning application.

1.03 This Flood Risk Assessment will conform to Planning Practice Guidance – Flood Risk & Coastal Change (2016), the National Planning Policy Framework and Technical Guidance in relation to flood risk which was also published in 2018.

2.00 Development Description and Location

2.01 The development proposal is for the Demolition of existing garage, erection of a single storey outbuilding to be used as garden outbuilding/storage to the east elevation, relocation of bin and cycle stores for 75A to the front elevation. The application site is situated in the Borough of Oxford, approximately 1 mile from the city centre. The proposed application site is shown in the location plans in the appendices.

2.02 The flood risk vulnerability classification for this type of development in this location is considered as Less Vulnerable which is defined in Table 2 of the Technical Guidance to the National Planning Policy Framework.

2.03 As set out in the National Planning Policy Framework, the aim of the Sequential Test is to direct new development to areas with the lowest probability of flooding, However, it should be noted this application is for the Demolition of existing garage, erection of a single storey outbuilding to be used as garden outbuilding/storage on the same footprint of an existing garage structure, therefore cannot be directed elsewhere.

2.04 The starting point to the Sequential Test is the Flood Zones, which can be seen in Appendix B. The map clearly shows Zones 2 and 3, whereas Zone 1 is the remainder of the land not hatched.

2.05 These flood zones refer to the probability of river and coastal flooding, ignoring the presence of any existing flood defences.

2.06 The Strategic Flood Risk Assessment for the Borough of Oxford refines the information on the probability of flooding and also takes into account other sources of flooding which have been assessed in section 3.01.

2.08 The proposed development is situated within Zone 3, and is classified as Less Vulnerable in accordance with Table 2 of the Technical Guidance to the National Planning Policy Framework.

2.09 Following an assessment of Table 3 of the Technical Guidance to the National Planning Policy Framework, it states that development is appropriate in this situation and therefore the Exception Test is not required, as seen in the table below:

Table 3: Flood risk vulnerability and flood zone 'compatibility'

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	×	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	×	×	×

Key: ✓ Development is appropriate.
× Development should not be permitted.

3.00 Definition of the Flood Hazard

3.01 For the preparation of this Flood Risk Assessment it is necessary to consider all of the potential sources of flooding and how this may affect the site. A checklist has been provided below to help identify these areas which can be discussed in greater detail in this section.

Possible Source of Flooding	Applicable to this Site?
Fluvial Flooding from nearby rivers or streams	☑
Coastal Flooding	☒
Surface Water Runoff from the Site, Adjacent or Nearby Land	☒
Flooding from Surface Water Sewers	☒
Flooding from Foul Water Sewers	☒
Flooding from Reservoirs	☑
Flooding from Groundwater	☑
Flooding from other Sources	☒

3.02 The Strategic Flood Risk Assessment Maps located in the appendices recognises some of the above as possible flood sources for the proposed application site.

3.03 Fluvial Flooding from nearby rivers has been identified as a risk, as the Bulstake Stream runs approximately 170 metres to the West of the Application Site and the Osney Ditch running approximately 235m to the East. This has been identified on the flood maps for planning as being Flood Zone 3a. It should be noted that although the Product 4 information has been obtained from the Environment Agency which highlights potential flood levels in each of the climate change events, the proposals are predominantly for the demolition of existing garage, erection of a single storey outbuilding to be used as garden outbuilding/storage, therefore not requiring the same level of protection as a residential or other type of occupied building.

3.04 There is no coastal risk of flooding to the proposed site.

3.05 Surface water flooding maps have been checked (also contained in the appendices) and there is no risk of surface water flooding to the dwelling identified from off-site sources. The flooding shown in the Surface Water maps are restricted to Botley Road and Oatlands Road Highway only. Any on-site flood mitigation is dealt with by regular maintenance of the existing drainage system.

3.06 The SFRA and SWMP for the area did recognise some risk of foul sewer flooding incidents, due to historical occurrences in the area, however recent searches with Thames Water in the Earl Street area (280m away at the same elevation) indicate there is no surcharging or overloading of public sewers in the area.

3.07 When checking the flood maps for planning in relation to reservoir flooding, it identifies a breach risk that would cause water to primarily follow the route of the watercourses, taking a long route around to the application site, giving a lengthy travel time and therefore time to evacuate in good time.

3.08 Historical Boreholes in the area have been checked and ground water levels have been recorded at between 2.5m – 1.5m below ground level in this area. Groundwater flooding has also been recorded nearby to the East of the application site. The site it underlain by the Oxford Clay Formation, which is covered in this area by alluvial deposits. Groundwater is able to fluctuate quickly in the alluvium and should therefore be considered in the flood mitigation measures.

3.09 There are no other sources on or off site that are thought to be a flood risk at this site.

4.00 Probability

4.01 The proposed development is situated within Zone 3 which can be seen in the Flood Map for Planning, contained in the appendices.

4.02 The Borough Council for this area have prepared a Strategic Flood Risk Assessment which refines the information provided by the Environment Agency and gives an overview of the flood risk in the district.

4.03 Based on the Information provided in both the Flood Maps for Planning and the Strategic Flood Risk Assessment, the probability of a flood event may be taken as Zone 3a – High Probability, as it has a 1 in 100 annual probability or greater of river flooding, ignoring the presence of the existing flood defences that are currently in place.

5.00 Climate Change

5.01 More recent guidelines have been published by the Environment Agency for new flood risk assessments, which suggests regional climate changes. This publication is located in the appendices.

6.00 Detailed Development Proposals

6.01 The development proposal is for the Demolition of existing garage, erection of a single storey outbuilding to be used as garden outbuilding/storage to the east elevation, relocation of bin and cycle stores for 75A to the front elevation. The application site is situated in the Borough of Oxford, approximately 1 mile from the city centre. The proposed application site is shown in the location plans in the appendices.

7.00 Flood Risk Management Measures

7.01 In order to effectively manage any site specific flood risk, it is sometimes necessary to introduce mitigation measures to help eliminate or reduce the impact of flooding. This application is for the demolition of existing garage, erection of a single storey outbuilding to be used as garden outbuilding/storage. It is therefore unlikely that this structure will require any specific flood protection measures, however the property owner may wish to consider the below as potential options.

7.02 The EA state that PLP (property level protection) measures can be the most effective in mitigating both the ingress of water to a property and help to minimise damage should water get in.

7.03 Property owner could install external flood resilience doors or portable door barriers to access point.

7.04 Electrical circuitry in the new building should be installed at a minimum of 500mm above the design flood, in accordance with the guidance set out by the environment agency. The design flood for the 1% AEP + 70% climate change for the nearest node is 57.49mAOD, therefore the electrical circuitry should be set at 57.99mAOD or above.

7.05 Property owner should sign up to the EA's flood line to receive information and flood warnings by email and text. So that safe access and egress can be planned, prior to rising floodwater approaching the property, should it be necessary.

8.00 Off Site Impacts

8.01 There are no foreseen residual impacts to neighbouring properties or the surrounding area in relation to flood risk as a result of the proposed development scheme

9.00 Residual Risks

9.01 There are no additional residual flood risks to the property following the implementation of the flood risk management measures.

10.00 Conclusion

10.01 Monson Engineering have been requested to provide a Flood Risk Assessment for the Proposed application for the Demolition of existing garage, erection of a single storey outbuilding situated at No. 75 Botley Road, Oxford, OX2 0BU.

10.02 This site is situated within Flood Zone 3 and is therefore required to have a flood risk assessment submitted to the local planning authority to support the planning application.

10.03 The development proposal is for the Demolition of existing garage, erection of a single storey outbuilding to be used as garden outbuilding/storage to the east elevation, relocation of bin and cycle stores for 75A to the front elevation. The application site is situated in the Borough of Oxford, approximately 1 mile from the city centre. The proposed application site is shown in the location plans in the appendices.

10.04 The flood risk vulnerability classification for this type of development in this location is considered as Less Vulnerable which is defined in Table 2 of the Technical Guidance to the National Planning Policy Framework.

10.05 The proposed development is situated within Zone 3 which can be seen in the Flood Map for Planning, contained in the appendices.

10.06 Based on the Information provided in both the Flood Maps for Planning and the Strategic Flood Risk Assessment, the probability of a flood event may be taken as Zone 3a – High Probability, as it has a 1 in 100 annual probability or greater of river flooding, ignoring the presence of any existing flood defences that are in place.

10.07 In order to effectively manage any site specific flood risk, it is sometimes necessary to introduce mitigation measures to help eliminate or reduce the impact of flooding. This application is for the demolition of existing garage, erection of a single storey outbuilding to be used as garden outbuilding/storage. It is therefore unlikely that this structure will require any specific flood protection measures, however the property owner may wish to consider the below as potential options.

10.08 Electrical circuitry in the new building should be installed at a minimum of 500mm above the design flood, in accordance with the guidance set out by the environment agency. The design flood for the 1% AEP + 70% climate change for the nearest node is 57.49mAOD, therefore the electrical circuitry should be set at 57.99mAOD or above.

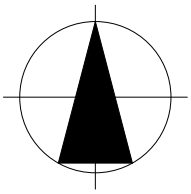
10.09 There are no residual foreseen flood risks to the development or occupants following the implementation of the flood risk management measures based on the information assessed.

10.12 On the basis of the findings of this report, it is recommended that no objections should be raised to the development proposals on the grounds of flood risk.

Appendix A Site Location Plans

01 Site Location Plan 1:1250

N



Robin Swailes DESIGN & DEVELOPMENT

NOTES

Revision

rev.:	A	19/06/2018

PROJECT NAME

75 Botley Road

PROJECT CODE

75BOR

It shall be read in conjunction with all other associated project information including models, specifications, schedules and related consultants documents. Do not scale from documents. All dimensions to be checked on site. Immediately report any discrepancies, errors or omissions on this document to the Originator. If in doubt ASK.

Address

75 Botley Road
Oxford
OX2 0EZ

SCALE BAR

0 12.5 25 37.5 50

TITLE

Site Location Plan

Date 07/06/2018

Drawing No P-00 A

Appendix B Flood Maps for Planning

Flood map for planning

Your reference	Location (easting/northing)	Created
Botley Road	**449882/206194**	**12 Aug 2019 20:44**

Your selected location is in flood zone 3, an area with a high probability of flooding.

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see www.gov.uk/guidance/flood-risk-assessment-standing-advice)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Environment Agency

Flood map for planning

Your reference
Botley Road

Location (easting/northing)
449882/206194

Scale
1:2500

Created
12 Aug 2019 20:44

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m

GOV.UK

Long term flood risk information

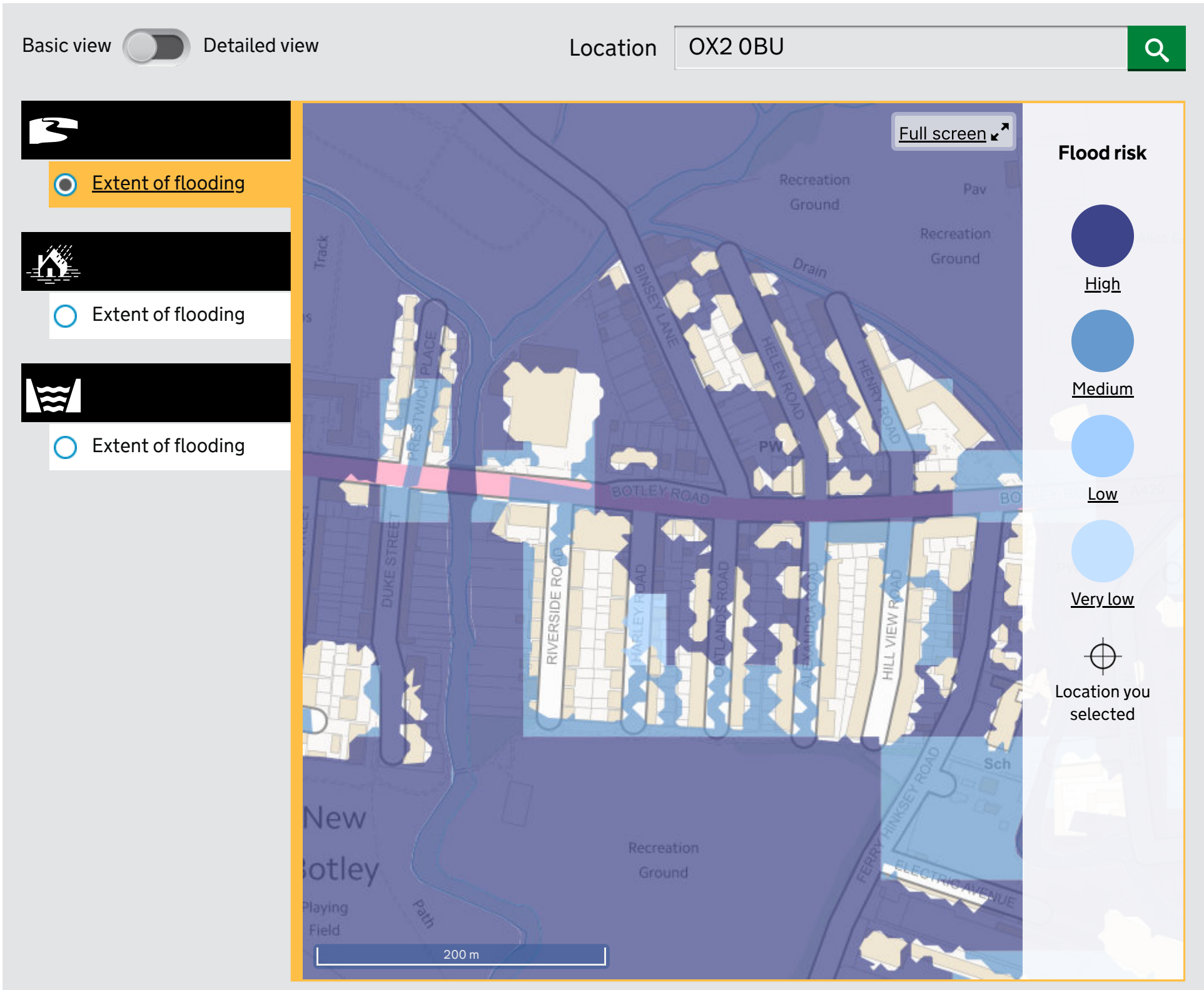
Learn more about flood risk

Select the type of flood risk information you're interested in. The map will then update.

You can learn more about the ways we describe flood risk. Alternatively select a legend item or feature from the map for an explanation of that flood risk.

'Detailed view' shows more technical information.

> All information, particularly the likelihood of surface water flooding, is a general indicator of an area's flood risk. As such it is not suitable for identifying whether an individual property will flood. This service uses computer models to assess an area's long term flood risk from rivers, the sea, surface water and some groundwater. It does not include flood risk from sources such as blocked drains and burst pipes.



- Accuracy of surface water flood risk information

View the flood risk information for another location

GOV.UK

Long term flood risk information

Learn more about flood risk

Select the type of flood risk information you're interested in. The map will then update.

You can learn more about the ways we describe flood risk. Alternatively select a legend item or feature from the map for an explanation of that flood risk.

'Detailed view' shows more technical information.

> All information, particularly the likelihood of surface water flooding, is a general indicator of an area's flood risk. As such it is not suitable for identifying whether an individual property will flood. This service uses computer models to assess an area's long term flood risk from rivers, the sea, surface water and some groundwater. It does not include flood risk from sources such as blocked drains and burst pipes.

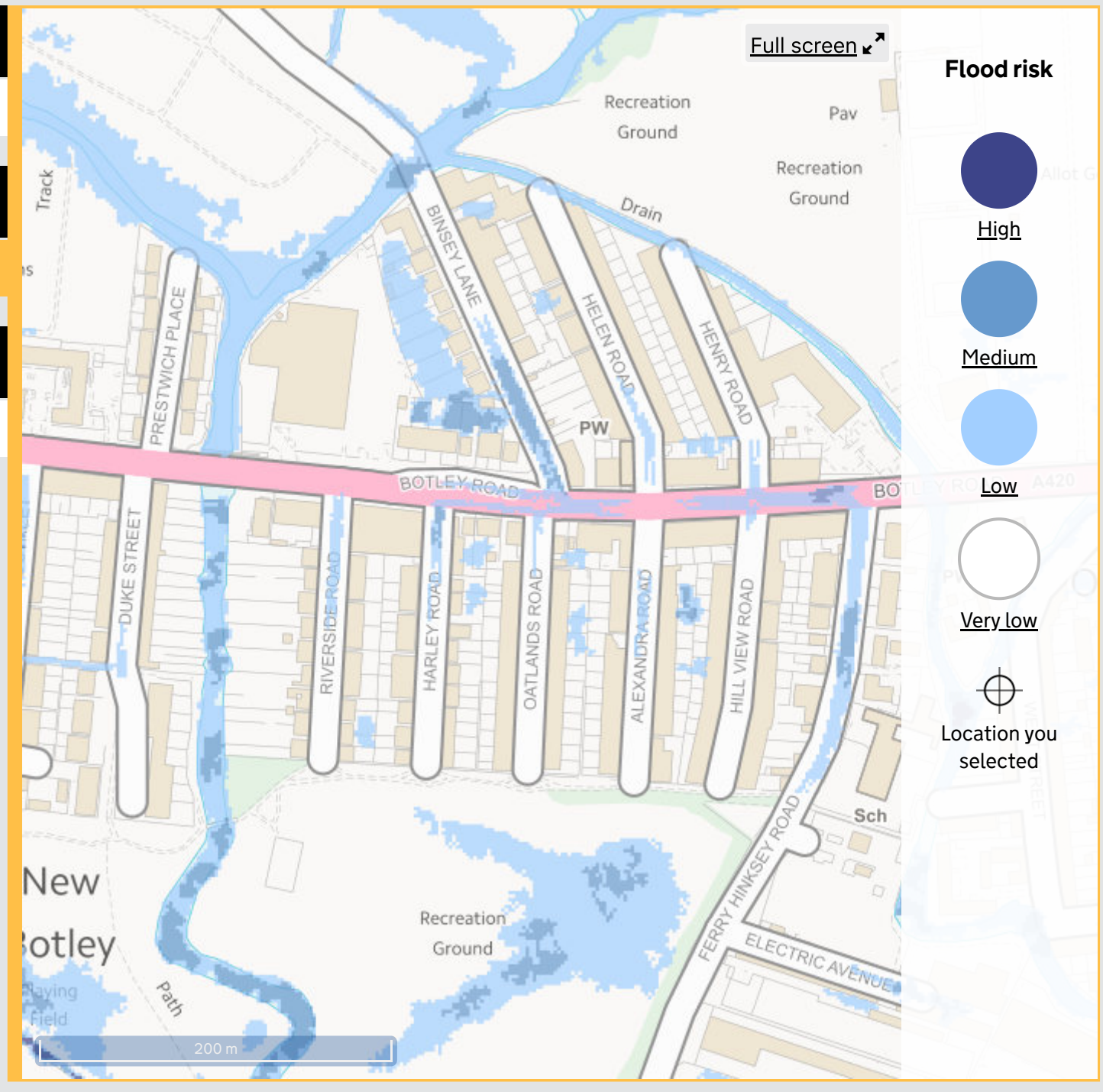
Basic view Detailed view

Location OX2 0BU

Extent of flooding

Extent of flooding

Extent of flooding



- Accuracy of surface water flood risk information

View the flood risk information for another location

GOV.UK

Long term flood risk information

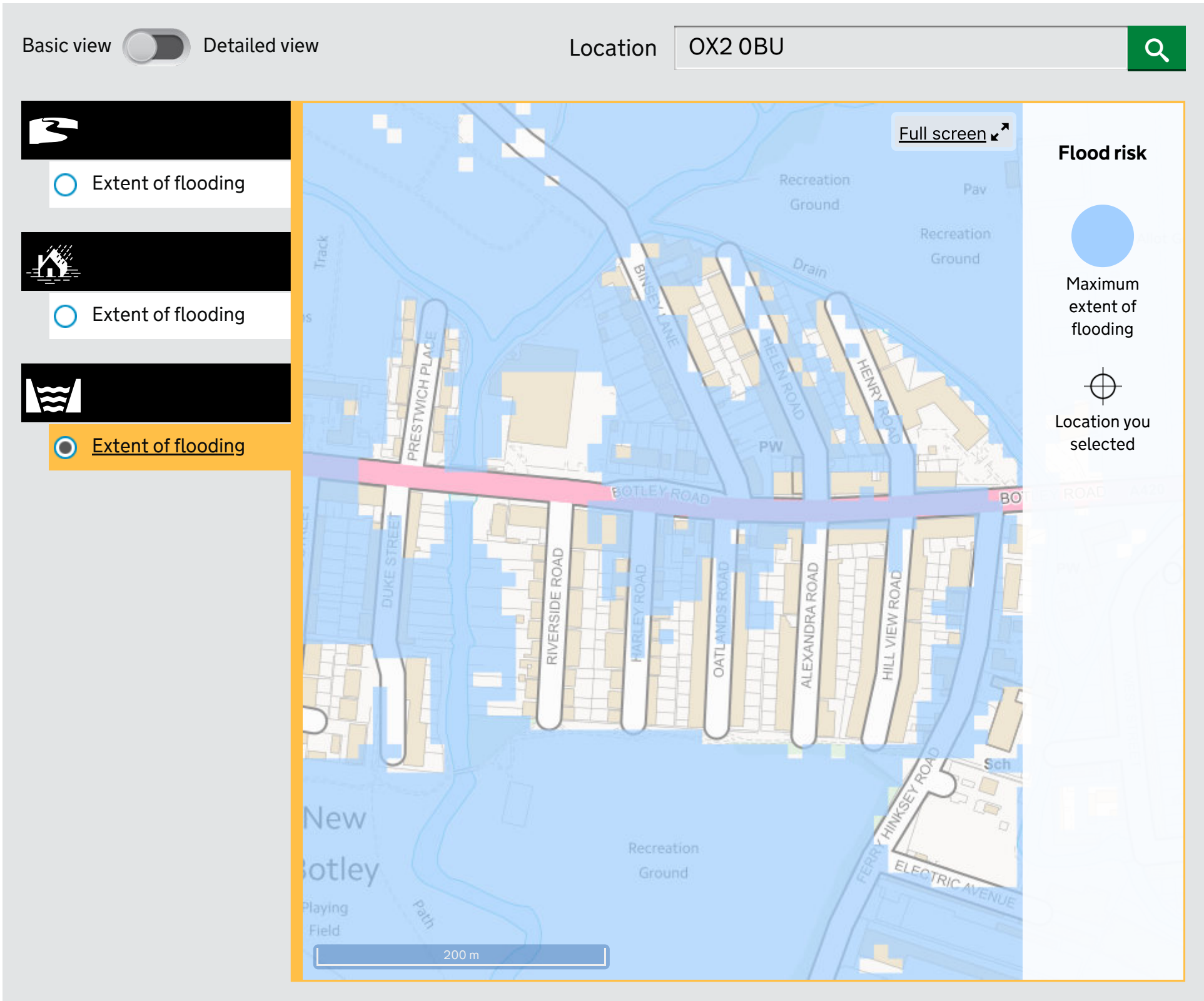
Learn more about flood risk

Select the type of flood risk information you're interested in. The map will then update.

You can learn more about the ways we describe flood risk. Alternatively select a legend item or feature from the map for an explanation of that flood risk.

'Detailed view' shows more technical information.

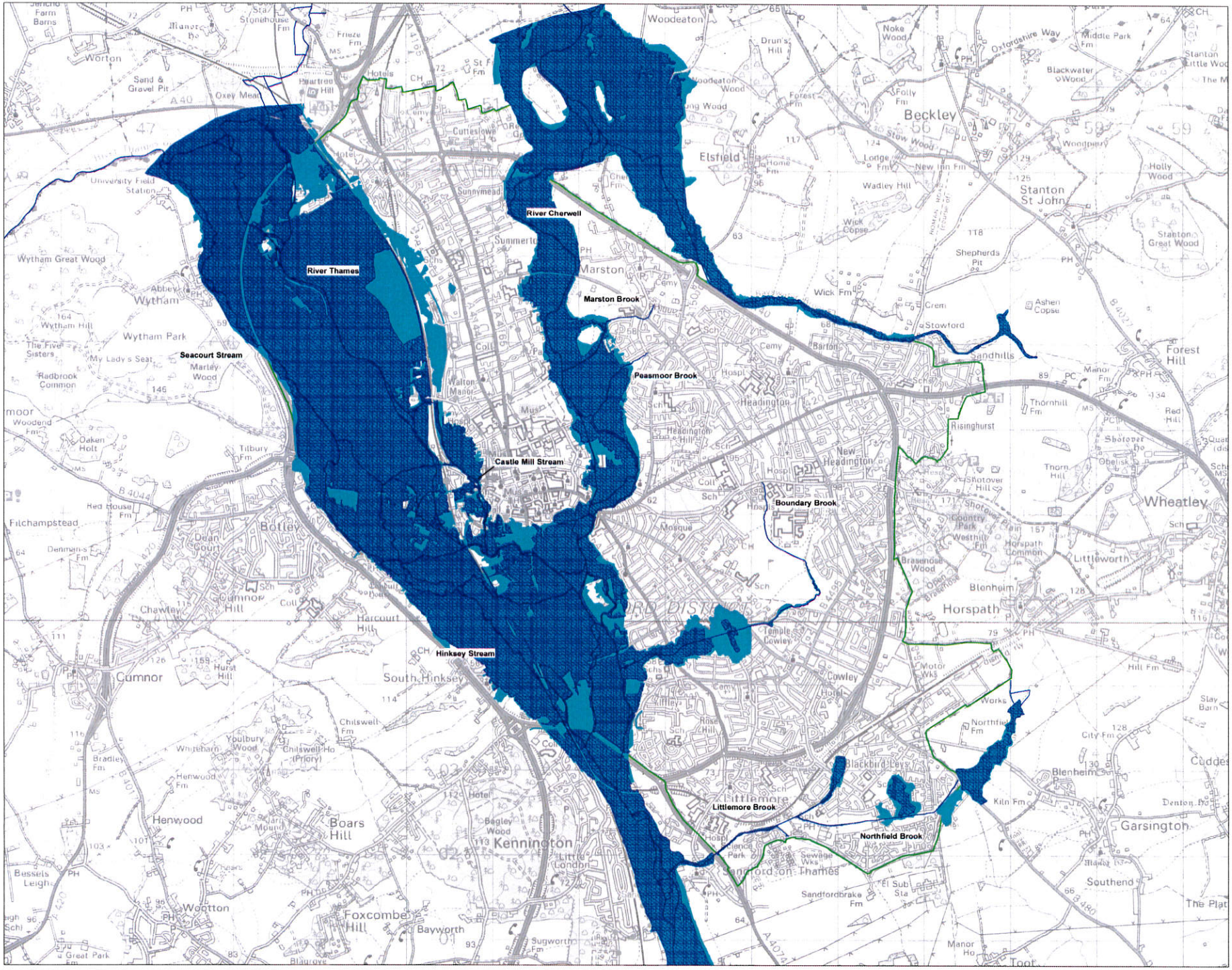
> All information, particularly the likelihood of surface water flooding, is a general indicator of an area's flood risk. As such it is not suitable for identifying whether an individual property will flood. This service uses computer models to assess an area's long term flood risk from rivers, the sea, surface water and some groundwater. It does not include flood risk from sources such as blocked drains and burst pipes.



- Accuracy of surface water flood risk information

View the flood risk information for another location

Appendix C SFRA Maps



Legend

—	River Centreline
☐	Study Boundary
■	100 Year with Climate Change Flood Extent (1000 Year Flood Extent)
▦	100 Year Flood Extent

Notes:

The flood extents have been trimmed outside of the study boundary

SCALE: NTS

N

Project Title:

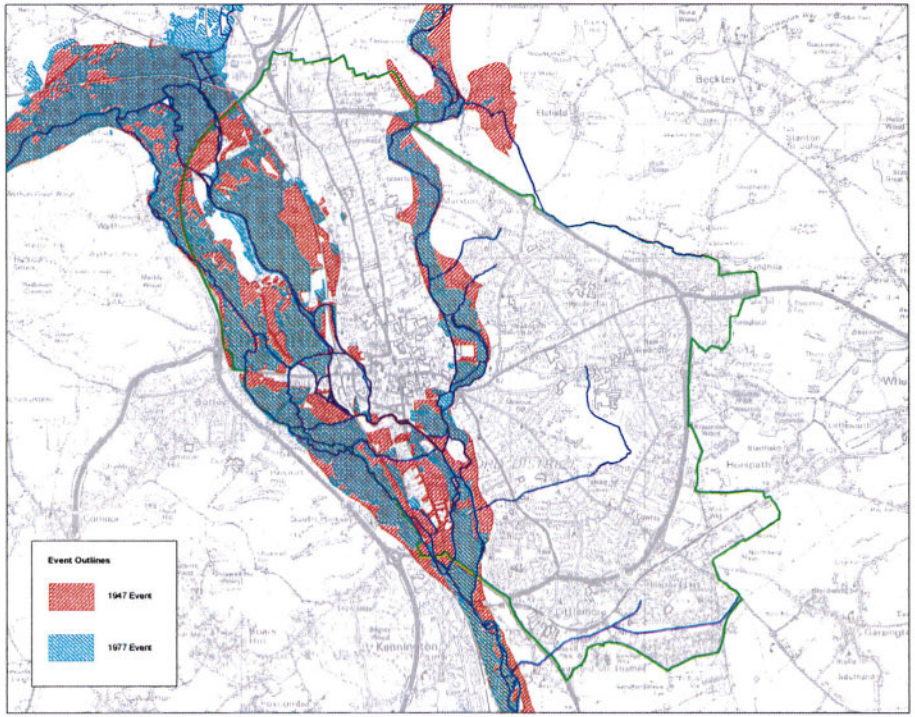
Oxford City SFRA - March 2011

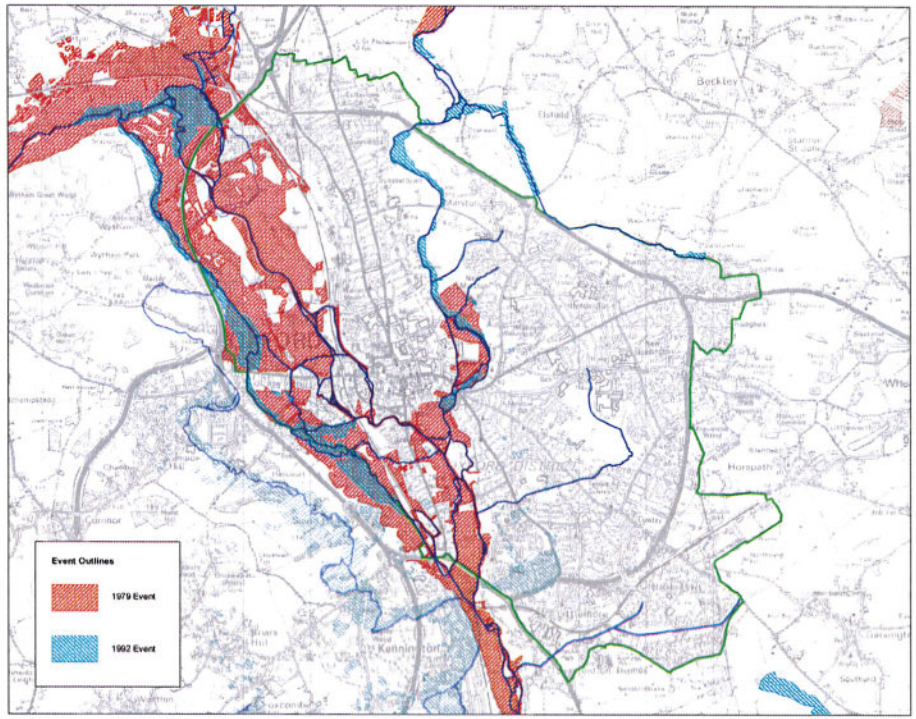
Figure Title:

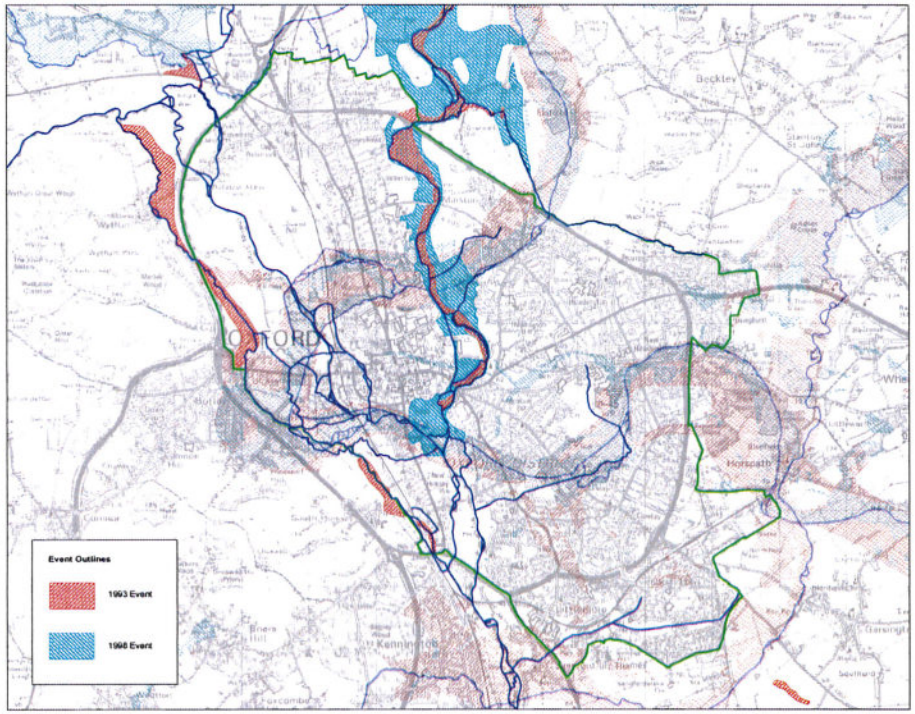
1% Annual Probability (1 in 100 Year) and 1% Annual Probability (1 in 100 Year) with Climate Change Flood Extents

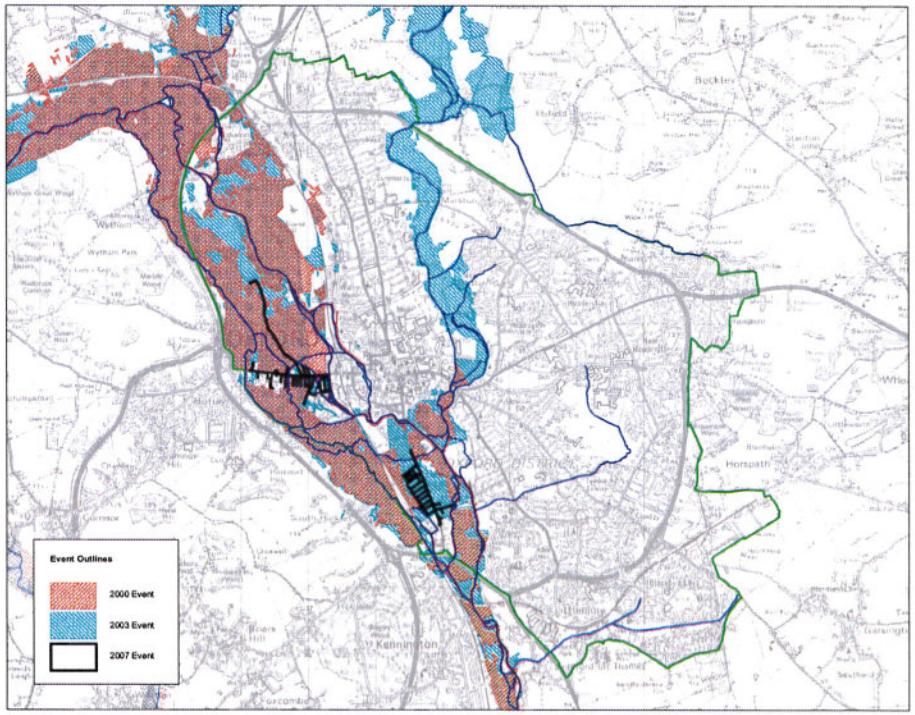
Document Reference:	Figure Number:
5093353/62/DWG/005	Appendix E

ATKINS









Legend

- River Centreline
- Study Boundary

SCALE: NTS

N

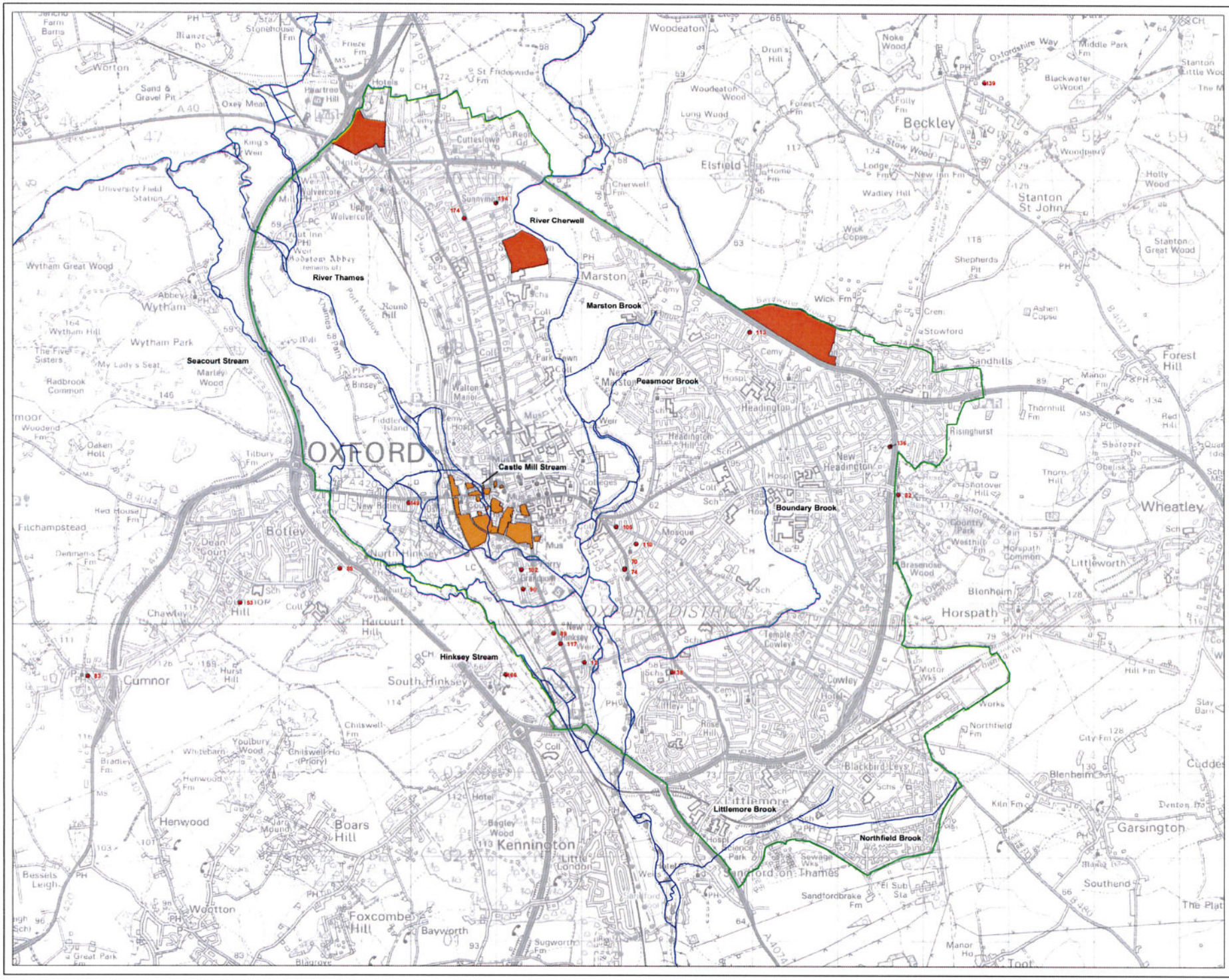
Project Title:
Oxford City SFRA - March 2011

Figure Title:
Historical Flood Outlines

Document Reference: 5093363/62/DWG/003

Figure Number: Appendix C

ATKINS


River Cherwell
River Thames
Marston Brook
Seacourt Stream
Peasmoor Brook
Castle Mill Stream
Boundary Brook
Hinksey Stream
Littlemore Brook
Northfield Brook
OXFORD
OXFORD DISTRICT
Marston
Beckley
Elsfield
Stanton St John
Wytham
Botley
Cumnor
South Hinksey
Kennington
Littlemore
Sandford on Thames
Horspath
Wheatley
Garsington
Forest Hill
Headington
New Headington
Cowley
Blackbird Leys
Boars Hill
Foxcombe Hill
Wootton
Bayworth
Southend
Woodeaton
Stowford
Sandhills
Risinghurst
Littleworth
Blenheim
Northfield Fm
Kiln Fm
Denton Ho
Sandfordbrake Fm
Sewage Wks
Manor Ho
Toot
Legend
River Centreline
Study Boundary
Strategic Development Sites
Indicative Sites within the West End
Ground Water Flooding Incidents (Labelled with call reference number)
SCALE: NTS
N
Project Title:
Oxford City SFRA - March 2011
Figure Title:
Registered Groundwater Flooding Incidents
Document Reference:
5093353/62/DWG/002
Figure Number:
Appendix B
Reproduced from the Ordnance Survey map with the permission of the Controller of Her Majesty's Stationery Office (HMSO). © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Oxford City Council: LA100019348 2010.
ATKINS

Appendix D Product 4 Information

Product 4 (Detailed Flood Risk) for OX2 0EZ
Our Ref: THM126903

Product 4 is designed for developers where Flood Risk Standing Advice FRA (Flood Risk Assessment) Guidance Note 3 Applies. This is:

i) "all applications in Flood Zone 3, other than non-domestic extensions less than 250 sq metres; and all domestic extensions", and

ii) "all applications with a site area greater than 1 ha" in Flood Zone 2.

Product 4 includes the following information:

Ordnance Survey 1:25k colour raster base mapping;
Flood Zone 2 and Flood Zone 3;
Relevant model node locations and unique identifiers (for cross referencing to the water levels, depths and flows table);
Model extents showing *defended* scenarios;
FRA site boundary (where a suitable GIS layer is supplied);
Flood defence locations (where available/relevant) and unique identifiers; (supplied separately)
Flood Map areas benefiting from defences (where available/relevant);
Flood Map flood storage areas (where available/relevant);
Historic flood events outlines (where available/relevant, not the Historic Flood Map) and unique identifiers;
Statutory (Sealed) Main River (where available within map extents);

A table showing:

i) Model node X/Y coordinate locations, unique identifiers, and levels and flows for *defended* scenarios.

ii) Flood defence locations unique identifiers and attributes; (supplied seperately)

iii) Historic flood events outlines unique identifiers and attributes; and

iv) Local flood history data (where available/relevant).

Please note:

If you will be carrying out computer modelling as part of your Flood Risk Assessment, please request our guidance which sets out the requirements and best practice for computer river modelling.

This information is based on that currently available as of the date of this letter. You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements have been made. Should you re-contact us after a period of time, please quote the above reference in order to help us deal with your query.

This information is provided subject to the enclosed notice which you should read.

This letter is not a Flood Risk Assessment. The information supplied can be used to form part of your Flood Risk Assessment. Further advice and guidance regarding Flood Risk Assessments can be found on our website at:

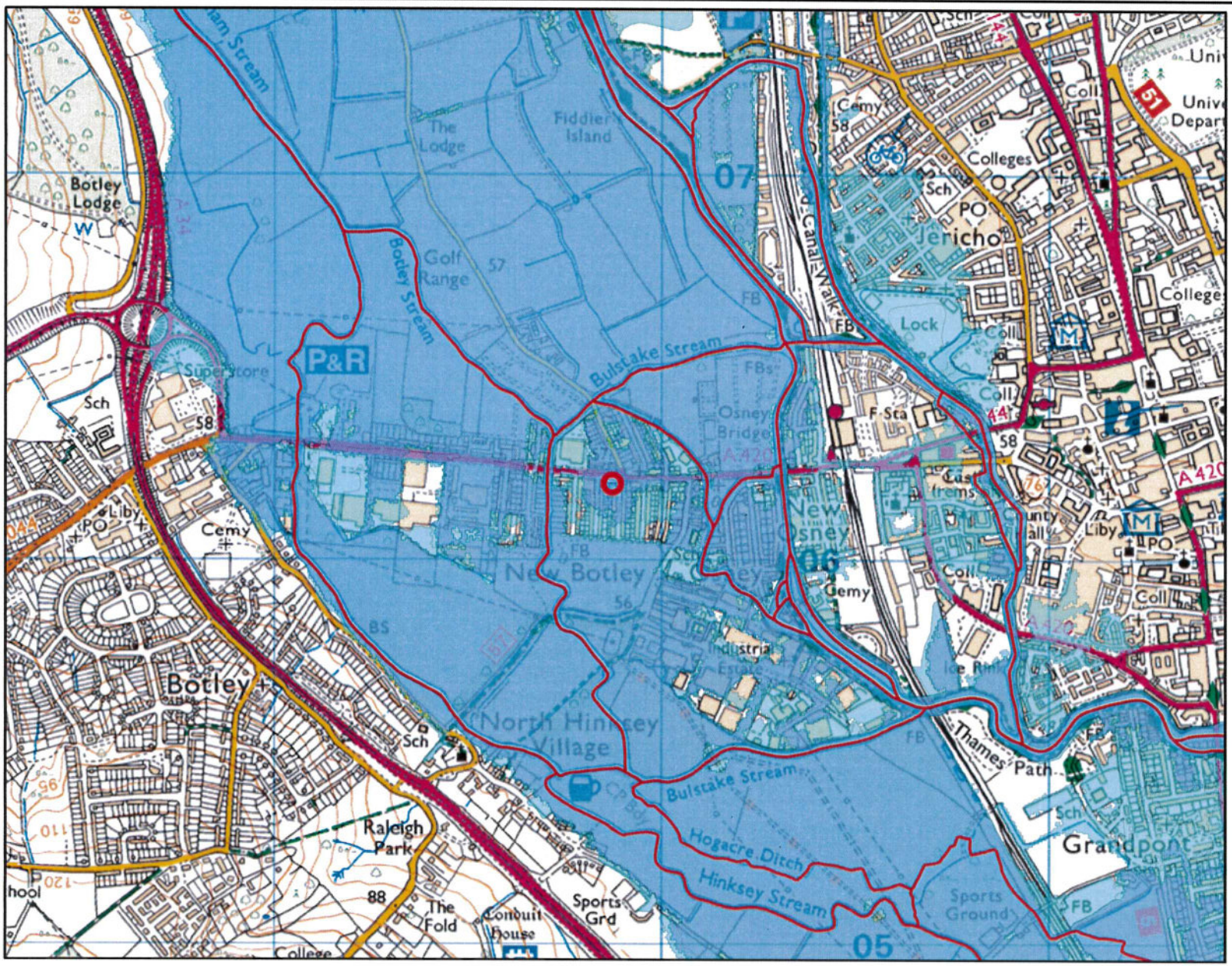
https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities

If you would like advice from us regarding your development proposals you can complete our pre application enquiry form which can be found at:

https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

Red Kite House, Howbery Park, Wallingford, Oxon OX10 8BD
Customer services line: 08708 506 506
Email: WTenquiries@environment-agency.gov.uk

Flood Map for Planning centred on OX2 0EZ
Created on 4/6/19 REF: THM126903



Environment Agency

Kilometres

0 0.35 0.7

Legend

- Main River
- Flood defences
- Areas benefiting from flood defences
- Flooding from rivers or sea (FZ3)
- Extent of extreme flood (FZ2)
- Flood Map - flood storage areas

Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Defence information

THM126903

Defence Location:	No defences on Main River
Description:	This location is not currently protected by any formal defences and we do not currently have any flood alleviation works planned for the area. However we continue to maintain certain watercourses and the schedule of these can be found on our internet pages.

Model information

THM126903

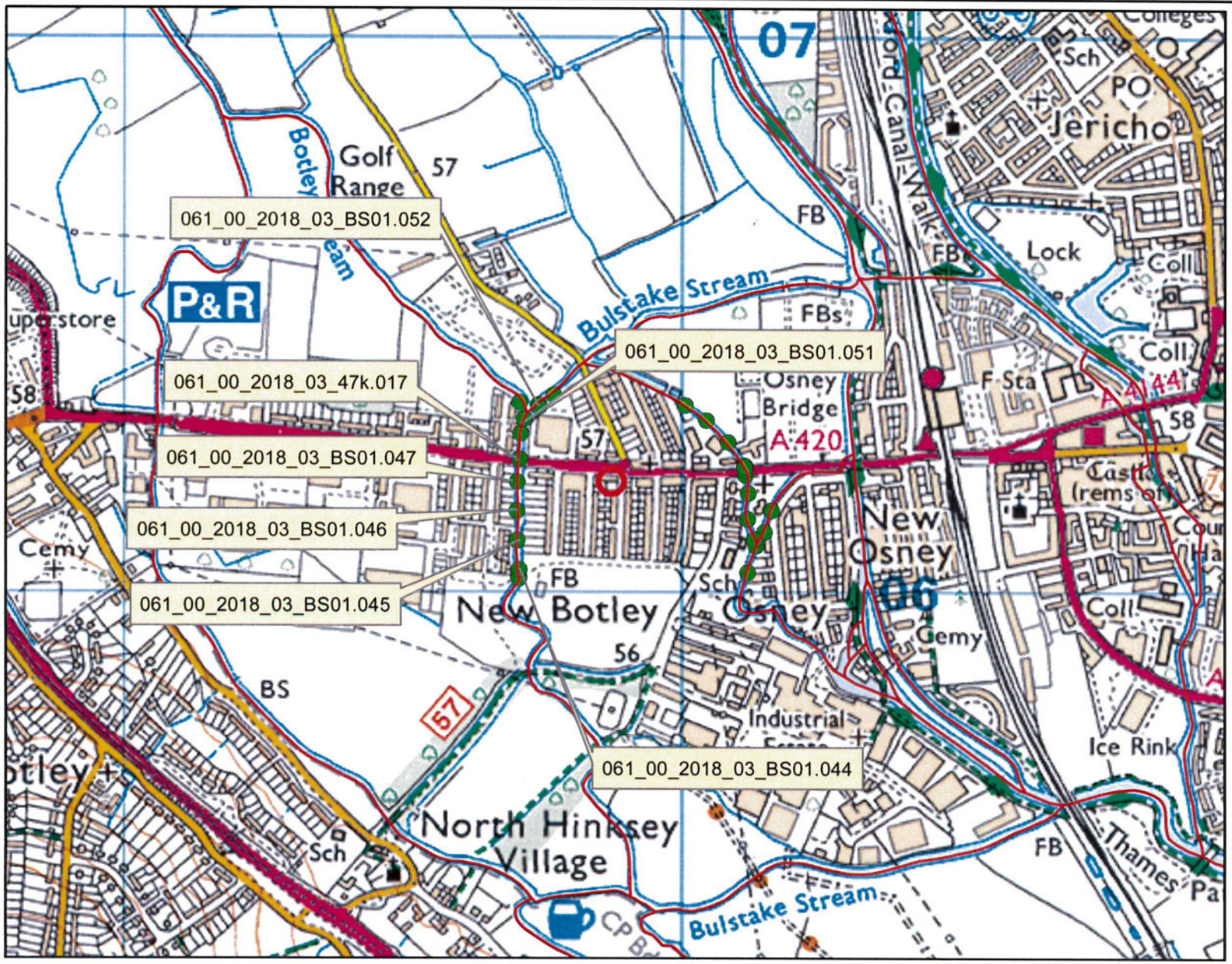
Model: Thames (Eynsham to Sandford) 2018

Description: The information provided is from the Oxford Flood Alleviation Scheme mapping completed in March 2018. The project included updating the existing (2014) hydraulic model to support development of the outline FAS design. The study was carried out using 1D-2D modelling software (Flood modeller-Tuflow).

Model design runs:
1 in 2/ 50% AEP; 1 in 5 / 20% AEP; 1 in 10/ 10% AEP; 1 in 20 / 5% AEP; 1 in 50/ 2% AEP; 1 in 75 / 1.3% AEP; 1 in 100 / 1% AEP, 1 in 100+25% / 1% + 25% AEP with climate change; 1 in 100+35% / 1% + 35% AEP with climate change; 1 in 100+70% / 1% + 70% AEP with climate change; 1 in 200/ 0.5% AEP and 1 in 1000 / 0.1% AEP.

Mapped outputs:
1 in 2/ 50% AEP; 1 in 5 / 20% AEP; 1 in 10/ 10% AEP; 1 in 20 / 5% AEP; 1 in 50/ 2% AEP; 1 in 75 / 1.3% AEP; 1 in 100 / 1% AEP, 1 in 100+25% / 1% + 25% AEP with climate change; 1 in 100+35% / 1% + 35% AEP with climate change; 1 in 100+70% / 1% + 70% AEP with climate change; 1 in 200/ 0.5% AEP and 1 in 1000 / 0.1% AEP.

Node Map centred on OX2 0EZ
Created on 4/6/19 REF: THM126903



Environment Agency

Kilometres

0 0.25 0.5

Legend

Main River

Model Nodes

AEP = Annual Exceedance Probability
The probability of a flood of a particular magnitude, or greater, occuring in any given year

Where available climate change extents have been calculated with an additional flow added to an AEP event. An example of how this is written is 1%+20% AEP.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Modelled in-channel flood flows and levels

THM126903

The modelled flood levels and flows for the closest most appropriate model node points for your site that are within the river channel are provided below:

				Flood Levels (mAOD)							
Node label	Model	Easting	Northing	20% AEP	5% AEP	1% AEP	1% AEP (+20% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP
061_00_2018_03_BS01.052	Thames (Eynsham to Sandford) 2018	449745	206333	56.98	57.23	57.42	0.00	57.57	57.63	57.82	57.66
061_00_2018_03_47k.017	Thames (Eynsham to Sandford) 2018	449710	206239	56.91	57.14	57.31	0.00	57.44	57.50	57.69	57.52
061_00_2018_03_BS01.047	Thames (Eynsham to Sandford) 2018	449706	206197	56.89	57.10	57.24	0.00	57.34	57.39	57.49	57.40
061_00_2018_03_BS01.046	Thames (Eynsham to Sandford) 2018	449705	206145	56.75	56.99	57.14	0.00	57.25	57.30	57.41	57.32
061_00_2018_03_BS01.045	Thames (Eynsham to Sandford) 2018	449706	206092	56.68	56.90	57.05	0.00	57.16	57.21	57.33	57.22
061_00_2018_03_BS01.044	Thames (Eynsham to Sandford) 2018	449709	206040	56.65	56.85	56.99	0.00	57.10	57.16	57.30	57.17
061_00_2018_03_BS01.051	Thames (Eynsham to Sandford) 2018	449719	206311	56.98	57.23	57.42	0.00	57.56	57.63	57.81	57.65

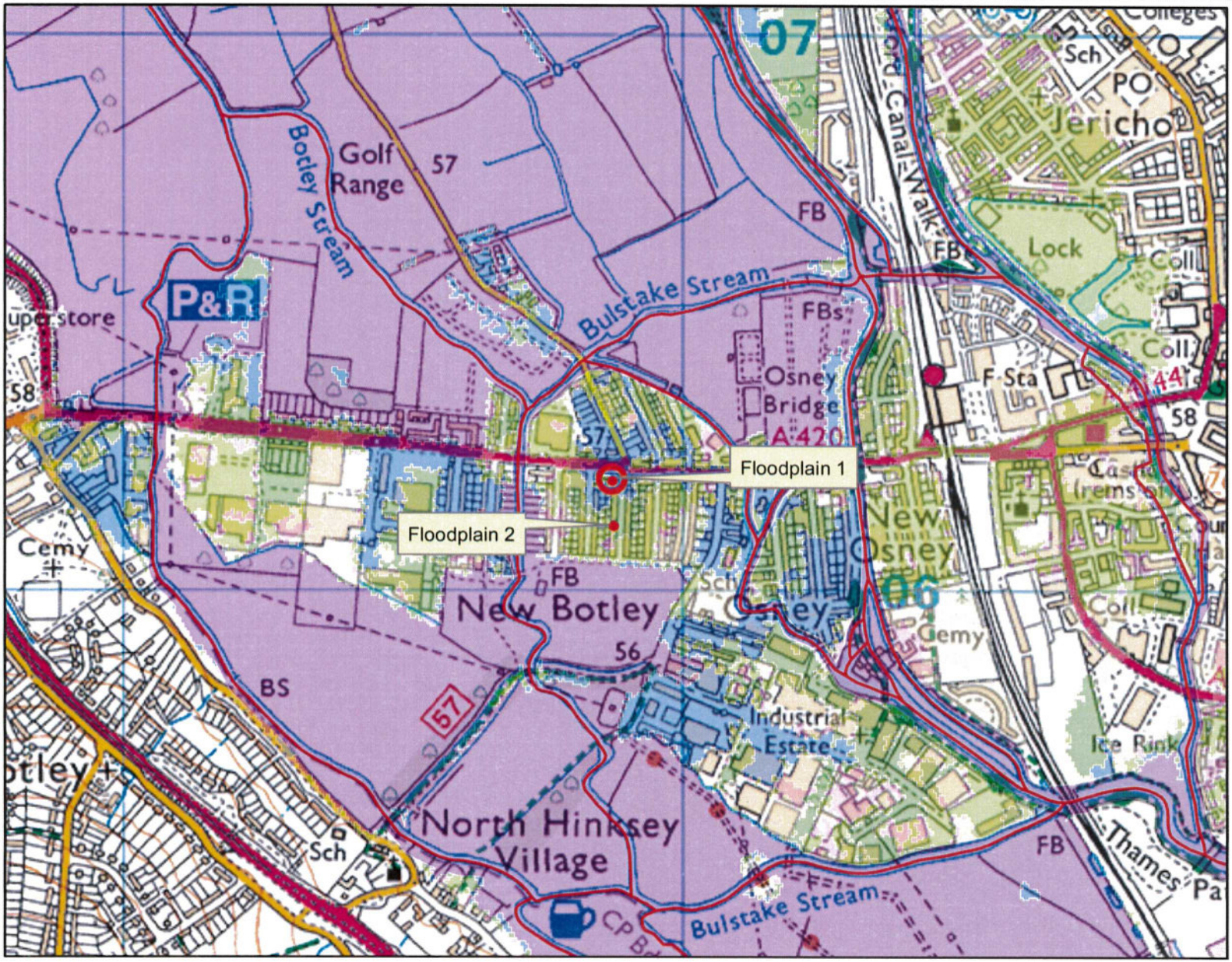
				Flood Flows (m3/s)							
Node label	Model	Easting	Northing	20% AEP	5% AEP	1% AEP	1% AEP (+20% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP
061_00_2018_03_BS01.052	Thames (Eynsham to Sandford) 2018	449745	206333	17.40	22.66	26.82	0.00	30.39	31.87	33.56	32.19
061_00_2018_03_47k.017	Thames (Eynsham to Sandford) 2018	449710	206239	36.97	50.15	61.19	0.00	69.52	73.81	79.54	75.06
061_00_2018_03_BS01.047	Thames (Eynsham to Sandford) 2018	449706	206197	36.97	50.15	61.19	0.00	69.52	73.81	79.54	75.06
061_00_2018_03_BS01.046	Thames (Eynsham to Sandford) 2018	449705	206145	34.51	41.72	46.79	0.00	51.79	54.56	58.49	55.36
061_00_2018_03_BS01.045	Thames (Eynsham to Sandford) 2018	449706	206092	33.75	42.70	47.80	0.00	51.95	53.95	57.36	55.08
061_00_2018_03_BS01.044	Thames (Eynsham to Sandford) 2018	449709	206040	33.08	43.67	50.33	0.00	54.63	56.55	58.17	56.76
061_00_2018_03_BS01.051	Thames (Eynsham to Sandford) 2018	449719	206311	36.97	50.15	61.19	0.00	68.92	72.49	76.03	73.39

Note:

Due to changes in guidance on the allowances for climate change, the 20% increase in river flows should no longer to be used for development design purposes. The data included in this Product can be used for interpolation of levels as part of an intermediate level assessment.

For further advice on the new allowances please visit
https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Detailed FRA Map centred on OX2 0EZ
Created on 4/6/19 REF: THM126903



Environment Agency

Kilometres

0 0.25 0.5

Legend

- Main River
- 20% AEP Flood Outline
- 5% AEP Flood Outline
- 1% AEP Flood Outline
- 1%+25% CC AEP Flood Outline
- 1%+35% CC AEP Flood Outline
- 1%+70% CC AEP Flood Outline
- 0.1% AEP Flood Outline

AEP = Annual Exceedance Probability
The probability of a flood of a particular magnitude, or greater, occuring in any given year

Where available climate change extents have been calculated with an additional flow added to an AEP event. An example of how this is written is 1%+20% AEP.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Modelled floodplain flood levels

THM126903

The modelled flood levels for the closest most appropriate model grid cells for your site are provided below:

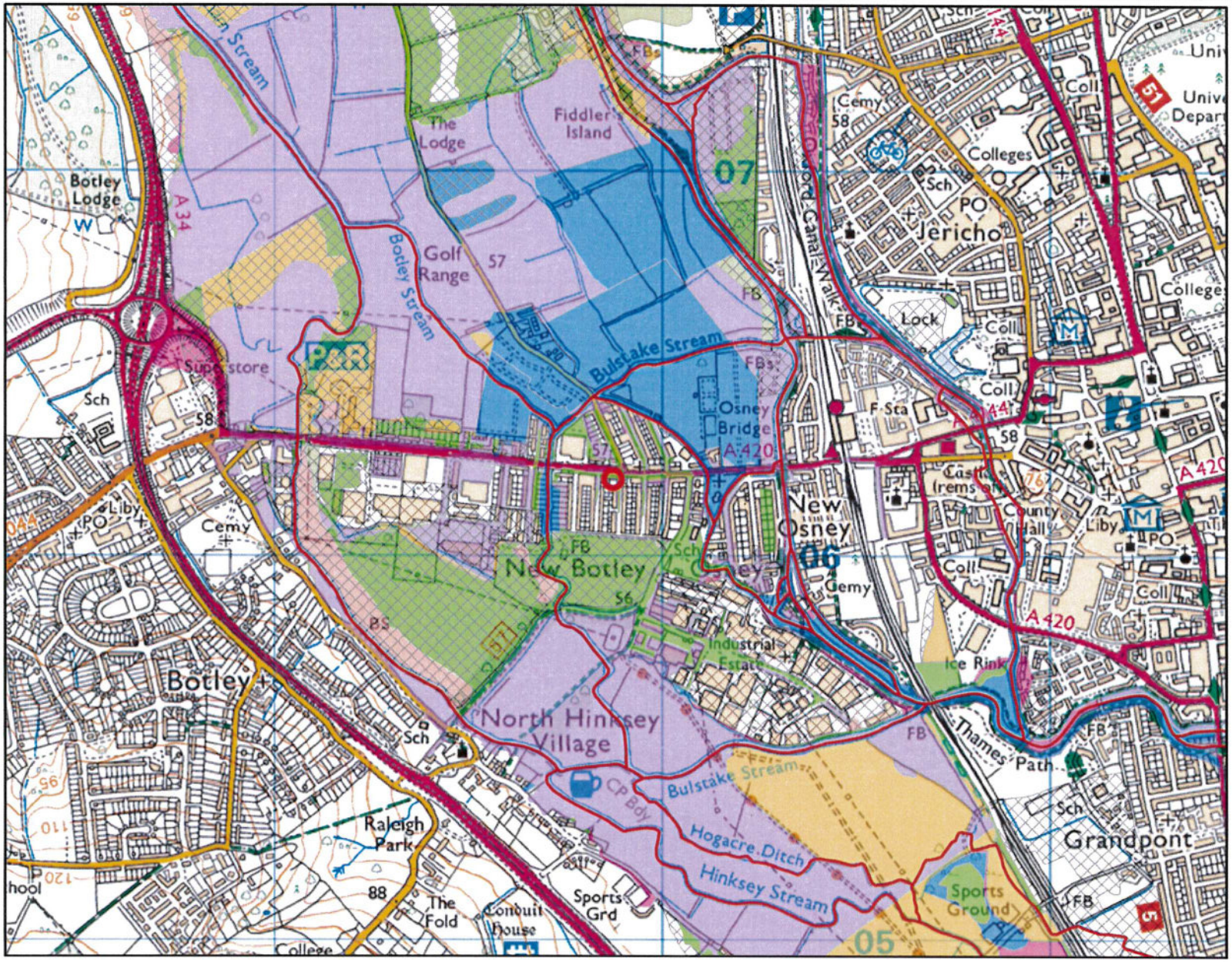
				flood levels (mAOD)						
2D grid cell reference	Model	Easting	Northing	20% AEP	5% AEP	1% AEP	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP
Floodplain 1	hames (Eynsham to Sandford) 201	449,874	206,196	no data	57.19	57.36	57.52	57.58	57.70	57.60
Floodplain 2	hames (Eynsham to Sandford) 201	449,87	206,116	no data	no data	57.36	57.51	57.57	57.67	57.58

This flood model has represented the floodplain as a grid.
The flood water levels have been calculated for each grid cell.

Note:
Due to changes in guidance on the allowances for climate change, the 20% increase in river flows should no longer to be used for development design purposes. The data included in this Product can be used for interpolation of levels as part of an intermediate level assessment.

For further advice on the new allowances please visit
https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Historic Flood Map centred on OX2 0EZ
Created on 4/6/19 REF: THM126903



Environment Agency

Kilometres

0 0.35 0.7

Legend

Main River

year

- 1947
- 1977
- 1979
- 1992
- 2000
- 2002
- 2007
- 2008

Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Historic flood data

THM126903

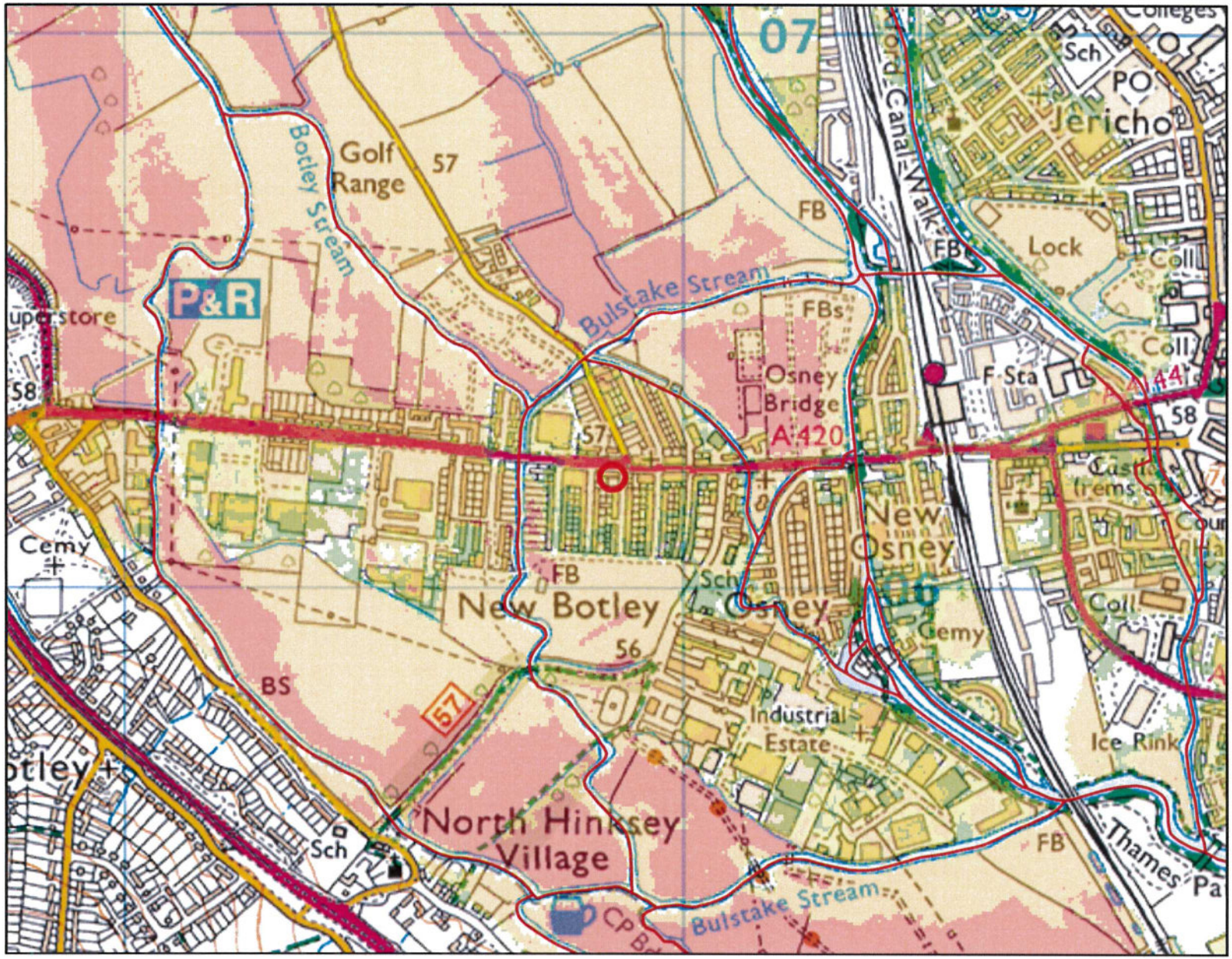
Our records show that the area of your site has been affected by flooding.
Information on the floods that have affected your site is provided in the table below:

Flood Event Code	Flood Event Name	Start Date	End Date	Source of Flooding	Cause of Flooding
EA0620030102156	06JanuaryNewYear2003	23/12/2002	12/01/2003	main river	channel capacity exceeded (no raised defences)
ea061161935	Oxford_Fluvial Water	19/07/2007	29/07/2007	main river	channel capacity exceeded (no raised defences)

Please note the Environment Agency maps flooding to land not individual properties. Floodplain extents are an indication of the geographical extent of a historic flood. They do not provide information regarding levels of individual properties, nor do they imply that a property has flooded internally.

Start and End Dates shown above may represent a wider range where the exact dates are not available.

Hazard Map centred on OX2 0EZ
Created on 4/6/19 REF: THM126903



Environment Agency

Kilometres

0 0.25 0.5

Legend

- Main River
- Very low hazard
- Danger for some
- Danger for most
- Danger for all

For hazard and debris factor we used HR Wallingford and Environment Agency (May 2008) supplementary note on flood hazard ratings and thresholds for development planning and control purpose. The following calculation is used:

HR = d x (v+0.5) + DF

HR = flood hazard rating
d = depth of flooding (m)
v = velocity of floodwaters (m/sec)
DF = debris factor calculated (0, 0.5, 1 depending on probability that debris will lead to a hazard)

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Hazard Mapping

THM126903

Hazard Mapping methodology:

To calculate flood hazard with the debris factor we have used the supplementary note to Flood Risk to People Methodology (see below).
The following calculation is used:

HR = d x (v+0.5) + DF

Where HR = flood hazard rating
d = depth of flooding (m)
v = velocity of floodwaters (m/sec)
DF = debris factor calculated (0, 0.5, 1 depending on probability that debris will lead to a hazard)

The resultant hazard rating is then classified according to:

Flood Hazard	Colour	Hazard to People Classification	
Less than 0.75		Very low hazard	- Caution
0.75 to 1.25		Danger for some	- includes children, the elderly and the infirm
1.25 to 2.0		Danger for most	- includes the general public
More than 2.0		Danger for all	- includes the emergency services

REF: HR Wallingford and Environment Agency (May 2008) Supplementary note of flood hazard ratings and thresholds for development planning and control purpose – Clarification of the Table 113.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1

Red Kite House, Howbery Park, Wallingford, Oxon OX10 8BD
Customer services line: 08708 506 506
Email: WTenquiries@environment-agency.gov.uk

Appendix E Flood Risk & Climate Change

Thames Area Climate Change Allowances

Guidance for their use in flood risk assessments

Jan 2017

We recently updated our national guidance on climate change allowances for Flood Risk Assessments. The following information provides additional local guidance which applies to developments within our Thames area boundary.

Climate change allowances - overview

The National Planning Practice Guidance refers planners, developers and advisors to the Environment Agency to our guidance on considering climate change in Flood Risk Assessments. We updated this guidance in February 2016 and it should be read in conjunction with this document to inform planning applications, local plans, neighbourhood plans and other projects. It provides:

- Climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height
- A range of allowances to assess fluvial flooding, rather than a single national allowance
- Advice on which allowances to use for assessments based on vulnerability classification, flood zone and development lifetime

Updated climate change allowances guidance:

https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

National Planning Practice Guidance:

http://planningguidance.communities.gov.uk/

Assessing climate change impacts on fluvial flooding

Table A below indicates the level of technical assessment of climate change impacts on fluvial flooding appropriate for new developments depending on their scale and location (flood zone). Please note that this should be used as a guide only. Ultimately, the agreed approach should be based on expert local knowledge of flood risk conditions, local sensitivities and other influences.

Applicants and consultants may contact the Environment Agency at the pre-planning application stage to confirm the assessment approach on a case-by-case basis. We provide standard guidance free of charge or bespoke advice for a fee for developments for which we are a statutory consultee. If your development is instead covered by Flood Risk Standing Advice, we recommend you contact the relevant Local Planning Authority for their guidance and confirmation of the assessment approach. Flood Risk Standing Advice can be found here:

https://www.gov.uk/flood-risk-assessment-local-planning-authorities

Table A defines three possible approaches to account for flood risk impacts due to climate change in new development proposals:

1. **Basic -** Developer can add an allowance to the 'design flood' (i.e. 1% annual probability) peak levels to account for potential climate change impacts. The allowance should be derived and agreed locally by Environment Agency teams.
2. **Intermediate -** Developer can use existing modelled flood and flow data to construct a stage-discharge rating curve, which can be used to interpolate a flood level based on the required peak flow allowance to apply to the ‘design flood’ flow.
3. **Detailed -** Perform detailed hydraulic modelling, through either re-running Environment Agency hydraulic models (if available) or construction of a new model by the developer.

Table A – Indicative guide to assessment approach

Vulnerability classification	Flood zone	Assessment by development type		
		Minor	Small-Major	Large-Major
Essential infrastructure	Zone 2	Detailed		
	Zone 3a	Detailed		
	Zone 3b	Detailed		
Highly vulnerable	Zone 2	Intermediate/Basic	Intermediate/Basic	Detailed
	Zone 3a	Not appropriate development		
	Zone 3b	Not appropriate development		
More vulnerable	Zone 2	Basic	Basic	Intermediate/Basic
	Zone 3a	Basic	Detailed	Detailed
	Zone 3b	Not appropriate development		
Less vulnerable	Zone 2	Basic	Basic	Intermediate/Basic
	Zone 3a	Basic	Basic	Detailed
	Zone 3b	Not appropriate development		
Water compatible	Zone 2	None		
	Zone 3a	Intermediate/Basic		
	Zone 3b	Detailed		

Definitions of terms in Table A

Minor

1-9 dwellings/less than 0.5 ha; office/light industrial under 1ha; general industrial under 1 ha; retail under 1 ha; travelling community site between 0 and 9 pitches.

Small-Major

10 to 30 dwellings; office/light industrial 1ha to 5ha; general industrial 1ha to 5ha; retail over 1ha to 5ha; travelling community site over 10 to 30 pitches.

Large-Major

30+ dwellings; office; light industrial 5ha+; general industrial 5ha+; retail 5ha+; gypsy/traveller site over 30+ pitches; any other development that creates a non-residential building or development over 1000 sqm.

Further info on vulnerability classifications:

http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-zone-and-flood-risk-tables/table-2-flood-risk-vulnerability-classification/

Further info on flood zones:

http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-zone-and-flood-risk-tables/table-2-flood-risk-vulnerability-classification/

Specific local considerations

Where the Environment Agency and the applicant or their consultant has agreed that a basic level of assessment is appropriate, the figures in Table B below can be used as an allowance for potential climate change impacts on peak design (i.e. 1% annual probability) fluvial flood level rather than undertaking detailed modelling.

Table B – Local allowances for potential climate change impacts

Watercourse	Central	Higher central	Upper
Thames	500mm	700mm	1000mm

Use of these allowances will only be accepted after discussion with the Environment Agency.

Fluvial food risk mitigation

Please use the national guidance to find out which allowances to use to assess the impact of climate change on flood risk.

For planning consultations where we are a statutory consultee and our Flood Risk Standing Advice does not apply, we use the following benchmarks to inform flood risk mitigation for different vulnerability classifications.

These benchmarks are a guide only. We strongly recommend you contact us at the pre-planning application stage to confirm this on a case-by-case basis. Please note you may be charged for pre-planning advice.

For planning consultations where we are not a statutory consultee or where our Flood Risk Standing Advice does apply, we recommend local planning authorities and developers use these benchmarks but we do not expect to be consulted.

Essential Infrastructure

For these developments, our benchmark for flood risk mitigation is for it to be designed to the **upper end** climate change allowance for the epoch that most closely represents the lifetime of the development, including decommissioning.

Highly Vulnerable

For these developments in flood zone 2, the **higher central** climate change allowance is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **upper end** allowance.

More Vulnerable

For these developments in flood zone 2, the **central** climate change allowance is our minimum benchmark for flood risk mitigation. In flood zone 3 the **higher central** climate change allowance is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** (in flood zone 2) and the **upper end** allowance (in flood zone 3).

Water Compatible or Less Vulnerable

For these developments, the **central** climate change allowance for the epoch that most closely represents the lifetime of the development is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** to inform built in resilience, particularly in flood zone 3.

Further info on our Flood Risk Standing Advice:

https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities

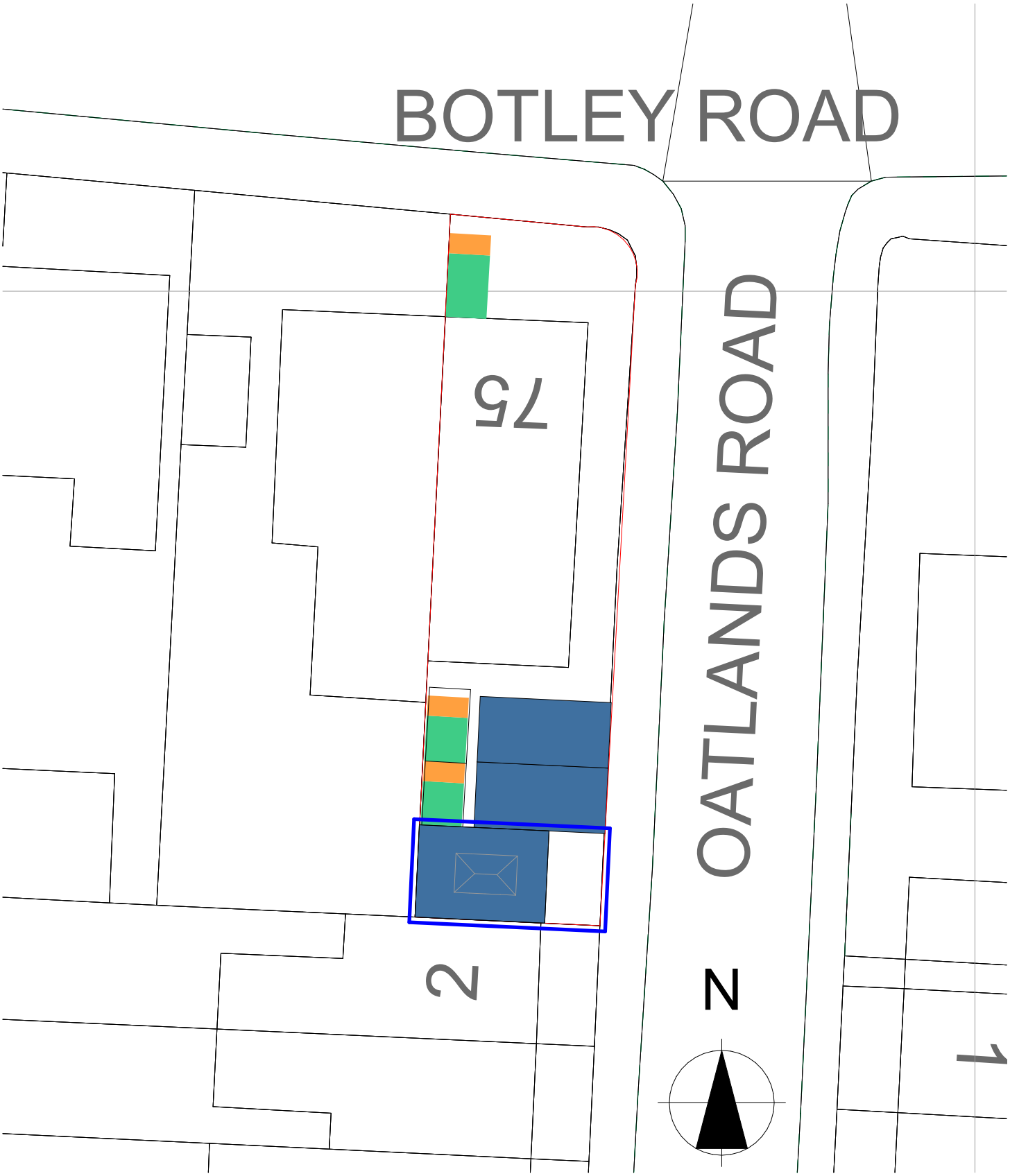
There may be circumstances where local evidence supports the use of other data or allowances. Where you think this is the case we may want to check this data and how you propose to use it.

For more information

Please contact our Thames area Customers and Engagement team:

Enquiries_THM@environment-agency.gov.uk

Appendix F Development Proposals



01 Block Plan 1:200

Robin Swailes DESIGN & DEVELOPMENT

NOTES

- bike storage
- car parking
- bin storage
- subject of planning submission

Details of cycle storage, amenity space and refuse storage are indicated on floor plans

Revision

- Revision A - 15/03/2019
- Revision B - 19/03/2019
- Revision C - 30/07/2019
- Revision D - 08/08/2019

PROJECT NAME

75 Botley Road

PROJECT CODE

75BOR

It shall be read in conjunction with all other associated project information including models, specifications, schedules and related consultants documents. Do not scale from documents. All dimensions to be checked on site. Immediately report any discrepancies, errors or omissions on this document to the Originator. If in doubt ASK.

Address

75 Botley Road
Oxford
OX2 0EZ

SCALE BAR

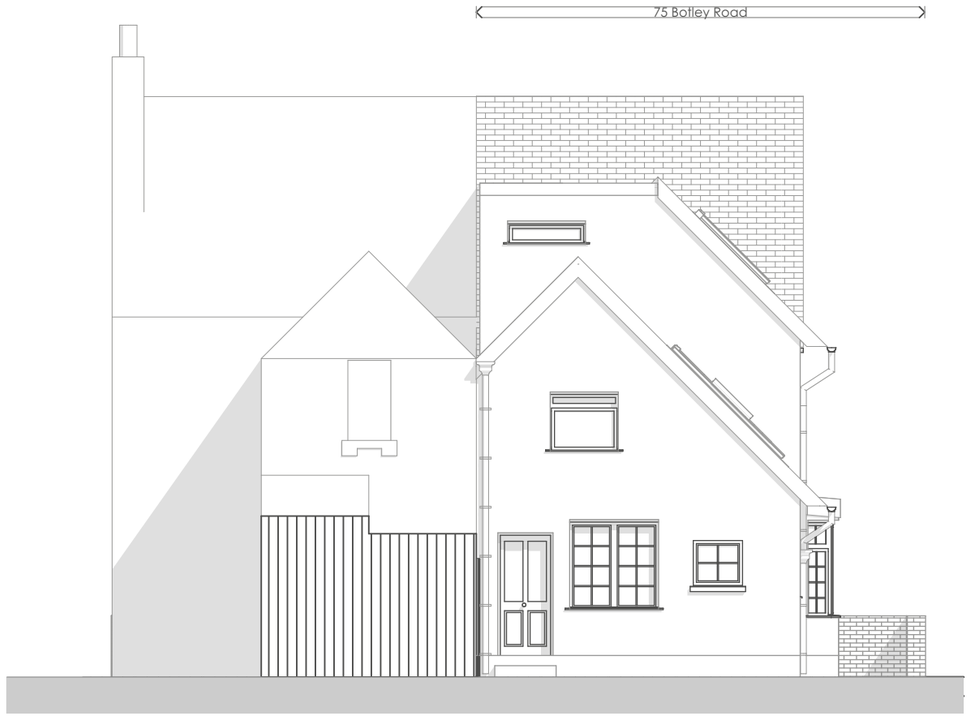
0 2 4 6 8

TITLE

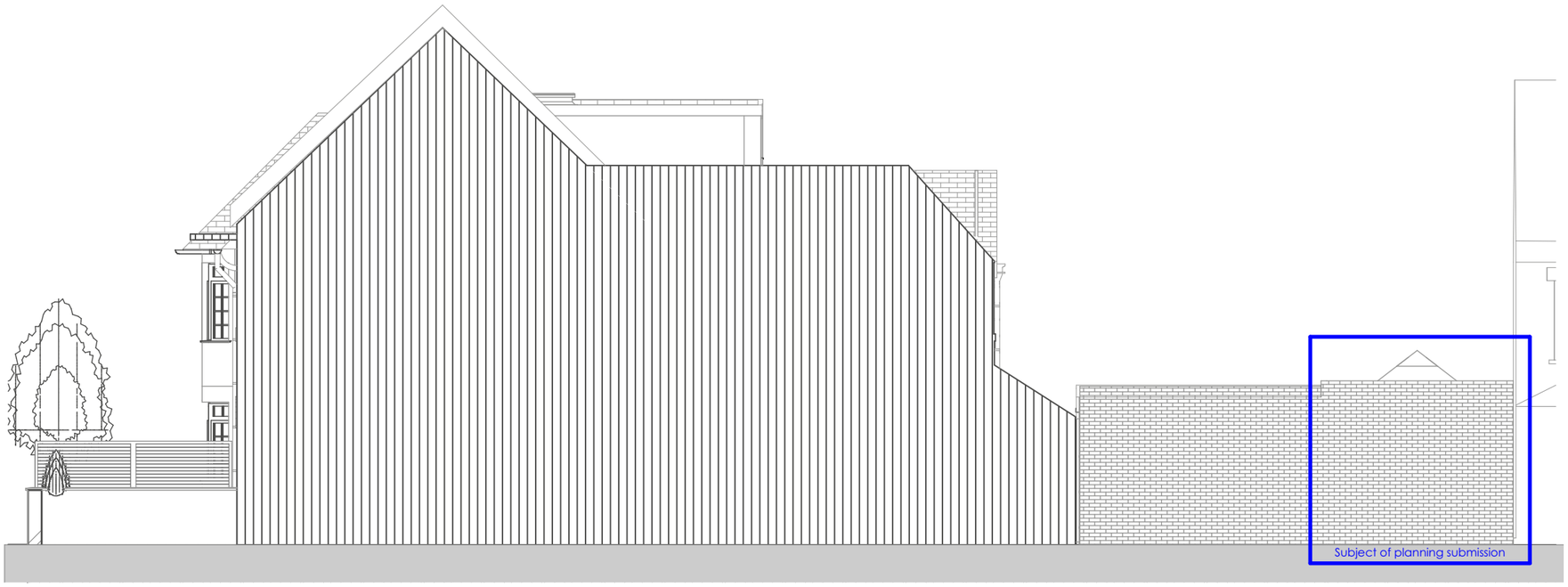
Block Plan

Date 18/06/2018

Drawing No P-03 D



E-03 South Elevation 1:100



E-04 West Elevation 1:100

SCALE BAR

0 1 2 3 4 5

Robin Swailes DESIGN & DEVELOPMENT

It shall be read in conjunction with all other associated project information including models, specifications, schedules and related consultants documents. Do not scale from documents. All dimensions to be checked on site. Immediately report any discrepancies, errors or omissions on this document to the Originator. If in doubt ASK.

NOTES

ADDRESS

75 Botley Road
Oxford
OX2 0EZ

PROJECT NAME

75 Botley Road Refurbishment

PROJECT CODE

75BOR

TITLE

Proposed Elevations

E-04 West Elevation, E-03 South Elevation

Revision

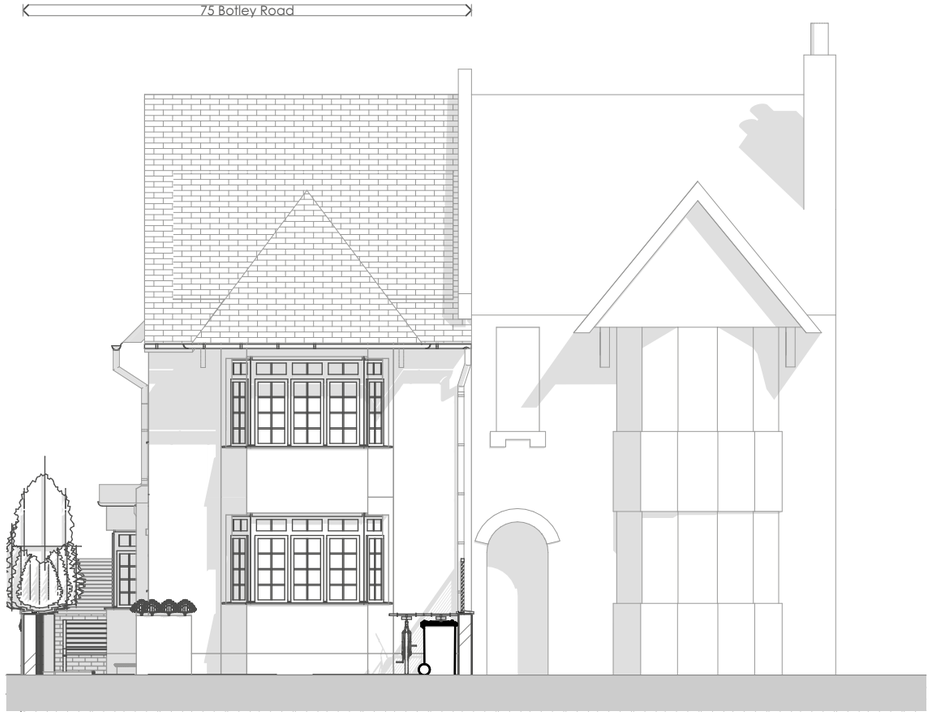
rev.:	A	19/06/2018
rev.:	B	12/07/2018
rev.:	C	22/03/2019
rev.:	D	08/08/2019

Date	06/06/2018	
Scale	1:100	@ A3

Drawing No

P-13 D

E-01 East Elevation 1:100



E-02 North Elevation 1:100

SCALE BAR

0 1 2 3 4 5

It shall be read in conjunction with all other associated project information including models, specifications, schedules and related consultants documents. Do not scale from documents. All dimensions to be checked on site. Immediately report any discrepancies, errors or omissions on this document to the Originator. If in doubt ASK.

NOTES

ADDRESS

75 Botley Road
Oxford
OX2 0EZ

PROJECT NAME

75 Botley Road Refurbishment

PROJECT CODE

75BOR

TITLE

Proposed Elevations

E-02 North Elevation, E-01 East Elevation

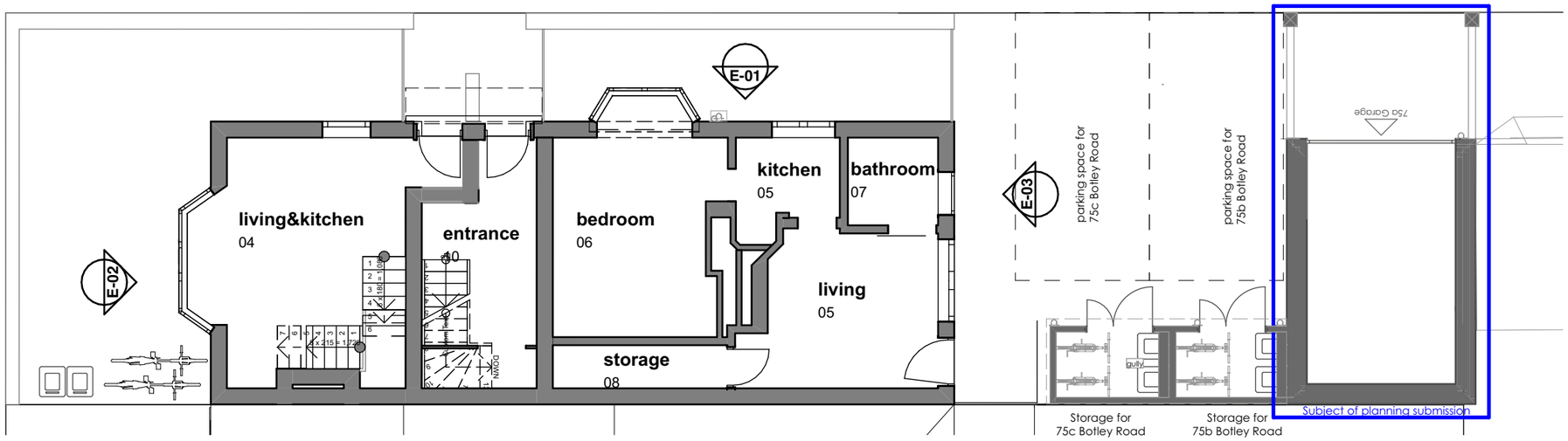
Revision

rev.:	C	23/07/2018
rev.:	D	15/03/2019
rev.:	E	19/03/2019
rev.:	F	22/03/2019
rev.:	G	30/07/2019
rev.:	H	08/08/2019

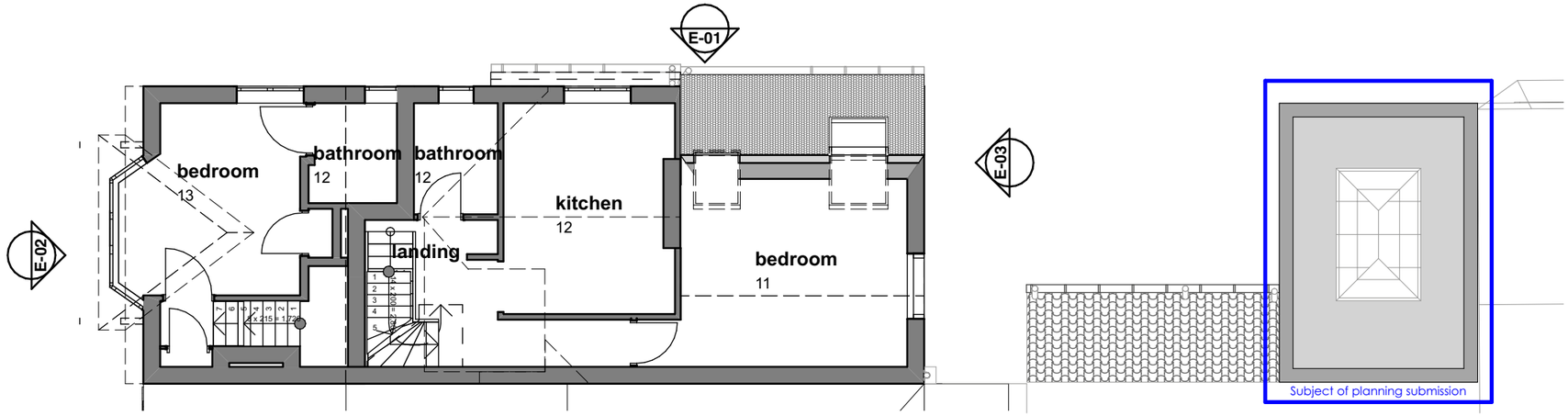
Date	06/06/2018	
Scale	1:100	@ A3

Drawing No

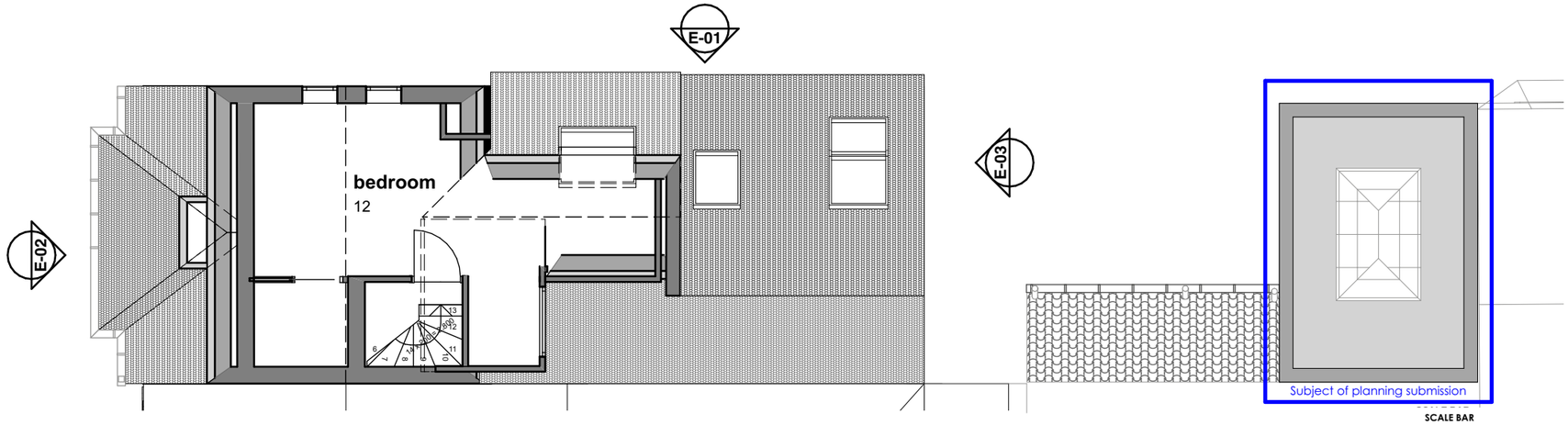
P-12 H



GF-Ground Floor 1:100



01-First Floor 1:100



LF-Loft 1:100

SCALE BAR

0 1 2 3 4 5

Robin Swailes DESIGN & DEVELOPMENT

It shall be read in conjunction with all other associated project information including models, specifications, schedules and related consultants documents. Do not scale from documents. All dimensions to be checked on site. Immediately report any discrepancies, errors or omissions on this document to the Originator. If in doubt ASK.

NORTH

NOTES

ADDRESS

75 Botley Road
Oxford
OX2 0EZ

PROJECT NAME

75 Botley Road Refurbishment

PROJECT CODE

75BOR

TITLE

Proposed Floor Plans

GF-Ground Floor, 01-First Floor, LF-Loft

Revision

rev.:	B	12/07/2018
rev.:	C	23/07/2018
rev.:	D	13/03/2019
rev.:	E	19/03/2019
rev.:	F	30/07/2019
rev.:	G	08/08/2019

Date	06/06/2018	
Scale	1:100	@ A3

Drawing No

P-02 G