

Flood Risk Assessment

For the proposed re-development at
Waterperry Court, Middleton Road,
Banbury, OX16 4QD

Prepared by

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Contents

| | |
|---|-----------|
| Contents | i |
| List of Figures | ii |
| 1 Executive Summary | 1 |
| 2 Introduction | 2 |
| 2.1 Site location | 2 |
| 2.2 Proposed development description | 2 |
| 3 Policies | 2 |
| 3.1 National Planning Policy Framework (NPPF) | 3 |
| 3.1.1 Paragraph 158 - Sequential test | 3 |
| 3.1.2 Paragraph 163 | 3 |
| 3.2 EA Guidance on More Vulnerable development | 4 |
| 4 Flood risk analysis | 6 |
| 4.1 Sequential test | 6 |
| 4.2 Sources of potential flooding | 6 |
| 4.2.1 Flood risk from sea and rivers | 6 |
| 4.2.2 Defences | 7 |
| 4.2.3 Flood risk from sewer and highway drains | 7 |
| 4.2.4 Flood risk from groundwater | 7 |
| 4.2.5 Flooding risk from surface water | 8 |
| 4.2.6 Flood risk from infrastructure failure | 8 |
| 4.2.7 Impact on flood risk elsewhere | 9 |
| 4.2.8 Generation of Runoff | 9 |
| 4.3 Flood risk vulnerability and flood zone “compatibility” | 10 |
| 5 Levels | 10 |
| 5.1 Floor level data | 10 |
| 5.2 Flood level data | 11 |
| 5.2.1 Establishing a stage to discharge relationship from EA data | 11 |
| 5.2.2 Applying revised climate change figures | 12 |
| 5.3 Free board | 12 |
| 5.4 Basement floor usage | 12 |
| 5.5 Residual Risks | 12 |
| 5.5.1 Flood warning scheme | 12 |
| 5.5.2 Safe access and egress | 13 |

| | |
|--------------------------------|-----------|
| 5.5.3 Flood Plans | 13 |
| 6 Conclusions | 14 |
| References | 15 |

Appendix

| | |
|---|-----------|
| A Section level data | 16 |
| B Proposal plans | 19 |
| C Emergency flood plan (example) | 22 |
| D EA data provided for the site | 24 |

List of Figures

| | |
|--|----|
| 1 Site location plan | 2 |
| 2 Site location relative to flood zone | 6 |
| 3 Site location relative to flood zone | 7 |
| 4 Site location relative to surface water flood risk area | 8 |
| 5 Site location relative to reservoir failure flood risk | 9 |
| 6 Flood risk vulnerability and flood zone compatibility ^[2] | 10 |
| 7 Stage-Discharge relation ship using EA data | 11 |
| 8 Safe access routes | 13 |

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1 Executive Summary

- A. The proposal is a change of use of an existing commercial unit to self contained flats. The vulnerability classification of the building changes from “Less Vulnerable” to “More Vulnerable”.
- B. The site lies, in part, in defended Flood Zones 2 and 3.
- C. Safe access and egress routes are immediately available and the site will be signed up to flood warning schemes.
- D. The re-development does not impact on flood risk elsewhere.
- E. The re-development of the site to domestic is considered acceptable as long as the mitigation, warning and evacuation procedures can be maintained over the lifetime of the development.

2 Introduction

2.1 Site location

The project is at Waterperry Court, Middleton Road, Banbury, OX16 4QD, see Figure 1.

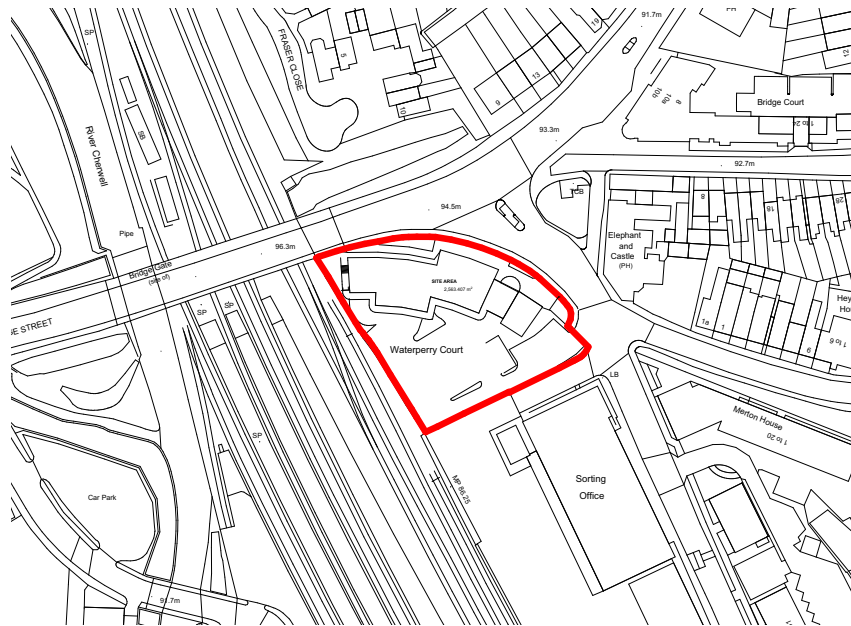


Figure 1: Site location plan (Source: Client)

2.2 Proposed development description

The proposal is a change of use of the existing commercial building into self contained flats (proposal plans at Appendix B).

3 Policies

In preparation for this Flood Risk Assessment (FRA), National Planning Policy Framework^[3] and British Standards on Assessing and Managing Flood Risk^[1] were reviewed, and their related policies were referred to in this report.

Furthermore, the Environment Agency have been consulted in order to establish the flood zone of the proposed site.

In addition, planning policies from the local authority were also reviewed including its Strategic Flood Risk Assessment.

Some of key planning policies and comments are summarised as below.

3.1 National Planning Policy Framework (NPPF)

A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

3.1.1 Paragraph 158 - Sequential test

The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability 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 from any form of flooding.

3.1.2 Paragraph 163

When determining planning applications, local planning authorities should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where, informed by a site-specific flood risk assessment following the Sequential Test, and if required the Exception Test, 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 resilient and resistant;
- it incorporates sustainable drainage systems, 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, as part of an agreed emergency plan.

3.2 Environment Agency Guidance on More Vulnerable development up to 1ha in size in Flood Zone 3

The Sequential Test is applied by the Local Planning Authority (LPA) to planning applications within this category. Details of the sequential test are set out in paragraph 101 of the NPPF. The Sequential Test does not apply to Change of Use applications.

Planning applications must be accompanied by a site-specific Flood Risk Assessment (FRA). The FRA should include information listed below:

- Flood level for the 1 in 100 annual probability river flood (1%); or 1 in 200 annual probability sea flood (0.5%) in any year (including an allowance for climate change) in relation to Ordnance Datum (Newlyn)
- Average ground level of the site in relation to Ordnance Datum (Newlyn)
- Finished floor level of lowest habitable room in relation to Ordnance Datum (Newlyn)
- 1 in 1000 annual probability (0.1%) in any year flood level including an allowance for climate change where this information is available.
- To indicate that surface water will be managed in accordance with the following standards:
 - Specific requirements for managing surface water set out in an adopted Strategic Flood Risk Assessment and/or Surface Water Management Plan produced by the Local Planning Authority.
 - Surface water run-off will be controlled to ensure no flooding of property and no increase in surface water run-off from the site to a watercourse or receiving water body compared to the existing pre-application run-off rate in a 1 in 100 year storm event (1% chance in any one year) plus an appropriate allowance for climate change (Flood risk Practice Guide paragraphs 5.51 and 5.54)
 - Meets the requirements of Approved Document Part H of Building Regulations 2012.

- Flood resilience and resistance: to indicate that flood resilience/resistance and emergency escape measures/procedures have been incorporated where possible. This applies to any part of the building (e. g. basements), that are situated below the 1 in 100 annual probability river flood (1%); or 1 in 200 annual probability sea flood (0.5%) level in any year (including an allowance for climate change).
- Other sources of flooding (not rivers or the sea): to indicate that the SFRA has been referred to and that the recommendations regarding other sources of flooding have been incorporated into the application.

All flood management measures will need to be supported by plans and drawings that form part of the FRA.

4 Flood risk analysis

4.1 Sequential test

This is an existing building hence the sequential test is deemed to have been passed.

4.2 Sources of potential flooding

Flood risk from various sources at the site is analysed in this section. It is concluded that sources of major flooding risk at the site are fluvial from a tributary of the River Cherwell.

4.2.1 Flood risk from sea and rivers

Flooding can occur from the sea due to a particularly high tide or surge, or combination of both.

The site is not at risk from tidal flooding.

Flooding can also take place from flows that are not contained within the channel due to high levels of rainfall in the catchment.

With reference to the Environment Agency Flood Mapping data, Figures 2 and 3, the proposed site lies in an area classed as Flood Zones 2 and 3. This means that the proposed site has high probability from river flooding (greater than a 1 in 100 annual probability of river flooding in any year).

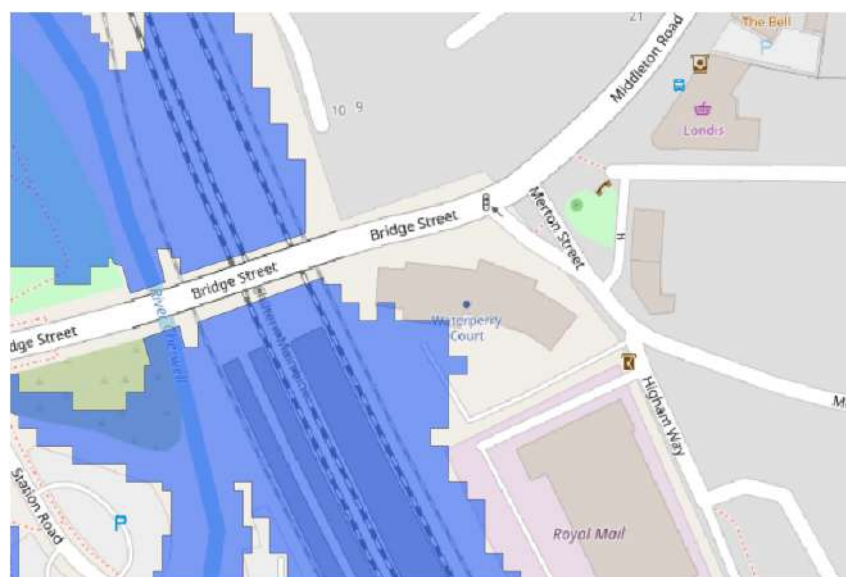


Figure 2: Site location relative to flood zone 3, an area with between a 1 in 100 and 1 in 1000 annual probability of flooding in any one year (Source: EA online flood data).



Figure 3: Site location relative to flood zone 2, an area with a greater than 1 in 1000 annual probability of flooding in any one year (Source: EA online flood data).

4.2.2 Defences

With reference to the EA provided data, as at Appendix D, the site is noted to be protected to the 1 in 200yr standard by the Banbury Flood Alleviation Scheme.

4.2.3 Flood risk from sewer and highway drains

Flooding occurs when combined, foul or surface water sewers and highway drains are temporarily over-loaded due to excessive rainfall or due to blockage.

There is no documented evidence of flood risk from highway drainage or sewage networks at the proposed site.

Hence, the risk of sewer and highway flooding to the site can be considered to be Low.

4.2.4 Flood risk from groundwater

Groundwater flooding occurs when water levels in the ground rise above surface levels. It is most common in low-lying areas underlain by permeable rock (aquifers), usually due to extended periods of wet weather.

With reference to SFRA from the Council, the flood risk from ground water in the area is low. The site has no documented evidence of flood risk from ground water however this may manifest as surface water flooding.

4.2.5 Flooding risk from surface water

Flooding occurs when combined, foul or surface water drains are temporarily overloaded due to excessive rainfall or due to blockage.

The site is in an area at a High risk from surface water flooding, Figure 4 with flood depths to 900mm for the 1 in 100yr event.

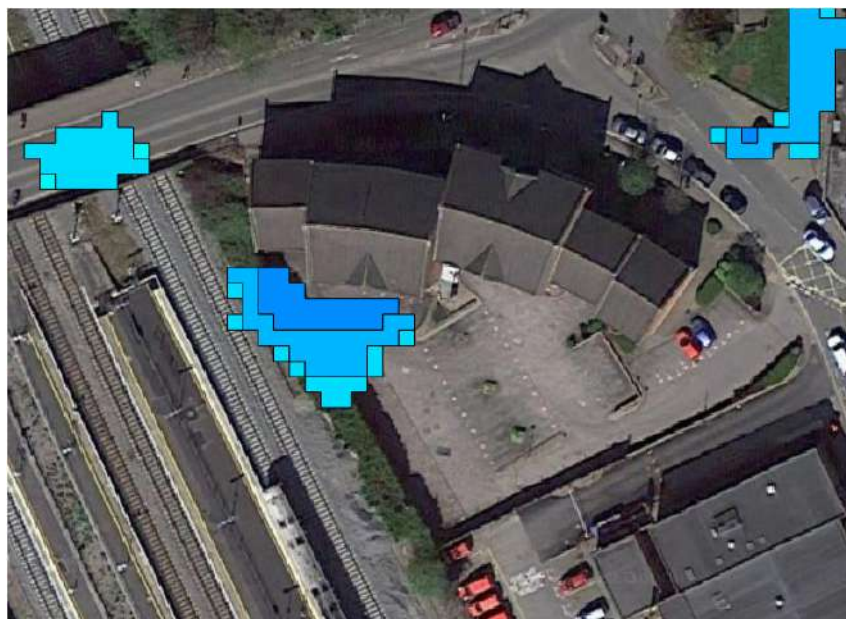


Figure 4: Site location relative to 1 in 100yr surface water flood risk area (Sources: EA RoSWF data overlain on Google mapping)

4.2.6 Flood risk from infrastructure failure

Flooding occurs because of canals, reservoirs, industrial processes, burst water mains or failed pumping stations.

The site is at risk from reservoir failure, as at Figure 5 with flood depths, relative to ground level, of over 2m.

The EA however consider the relative risk of reservoir flooding to be Low.

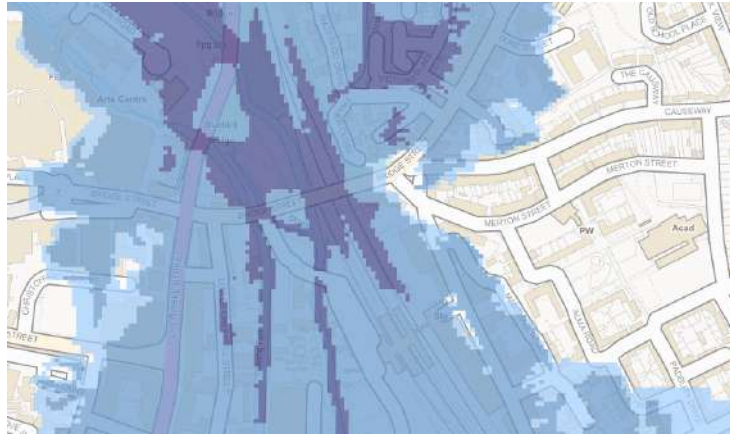


Figure 5: Site location relative to reservoir failure flood risk. The darker blue areas indicate flood depths greater than 2m in the event of reservoir failure. (Source: EA online flood mapping)

4.2.7 Impact on flood risk elsewhere

Since the re-development is a Change of Use to an existing building the situation is being made no worse than before. Compensatory measures are therefore not required.

4.2.8 Generation of Runoff

The post-development surface water run-off volume will not increase when compared to the pre-development level because there are no planned changes to impermeable/permeable areas.

4.3 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.

Figure 6: Flood risk vulnerability and flood zone compatibility^[2]

With reference to Figure 6, the proposed re-development of the site changes the vulnerability classification of the building from “Less Vulnerable” to “More Vulnerable”. This is still considered to be appropriate development subject to a site specific FRA.

5 Levels

5.1 Floor level data

Refer to site level survey at Appendix A. Levels are found to be:

External ground levels down to 89.48m AOD

Lowest internal habitable ground floor level: 92.60m AOD

All other levels for higher floors are as shown at Appendix A

5.2 Flood level data

Flood level data as provided by the EA for the nearest node (1.016), see Appendix D and for nodes on the site itself, flood point 2. These data do not include revised climate change allowances.

For this site, being in the Thames River basin district, the Higher Central Allowance is considered appropriate to guide development and the Upper End allowance for sensitivity testing.

Climate change allowances of +35% & +70% (Higher Central and Upper End to 2115) are now to be applied to the data.

5.2.1 Establishing a stage to discharge relationship from EA data

Using the data as provided by the EA a stage discharge relationship was generated, Figure 7. From this it is possible to add revised climate change allowances following the “intermediate” approach. These can then be adjusted relative to the provided site nodal data, at EA Flood Point 2, to arrive at revised flood levels relative to the site.

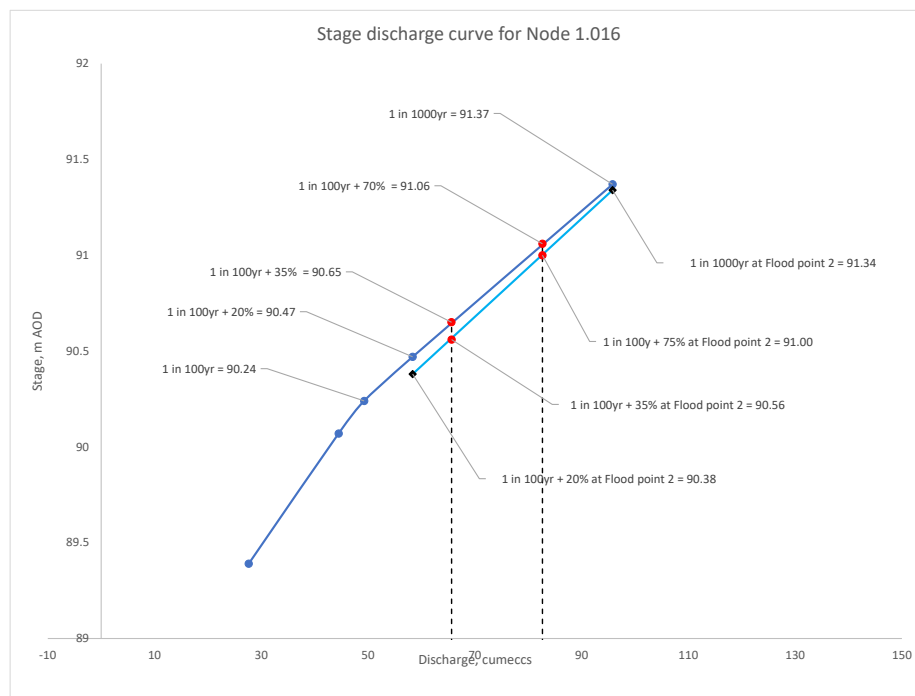


Figure 7: Stage-Discharge relation ship using EA data. Points are also plotted for the given flood point 2 nodes from which relative flood levels are established at the site.

5.2.2 Applying revised climate change figures

It is now possible to fit revised climate change allowances:

The 100yr Higher Central allowance is + 35% and the Upper End is 70%

The 1 in 100yr + 35% flow is found to be 65.6 cumecs giving an “in channel” flood level of 90.65m AOD.

The provided nodal data at “flood point 2” for the 1in 100yr + 20% and the 1 in 1000yr are used to establish the relationship between “in channel” flood levels and the relative flood levels at the site.

The 1 in 100yr + 35% CC allowance flood level at the site is found to be **90.56m AOD**

For sensitivity the 1 in 100 + 70% = $82.7\text{m}^3\text{s}^{-1}$ giving an “in channel” flood level of 91.06m AOD, see Figure 7, and site flood levels of **91.0m AOD**.

These flood levels take no account for the 1 in 200yr defences in place in line with EA requirements for assessment of flood risk.

5.3 Free board

Given this site is in flood zone 3 and the proposal is for single storey accommodation, the minimum freeboard of 600mm is appropriate.

Hence minimum FFL should be no lower than $90.56 + 0.6 = 91.16\text{m AOD}$

The lowest habitable floor level proposed is 92.6m AOD hence OK.

For sensitivity testing, this lowest floor level provides a 1.6m freeboard over the 1 in 100yr +70% flood event.

The floor levels also provide 1.26m freeboard over the modelled 1 in 1000yr event.

5.4 Basement floor usage

The use of the basement for non-habitable use, i.e. garages, is considered to be acceptable.

5.5 Residual Risks

5.5.1 Flood warning scheme

Since it has been established that the site is sited in an area with, an albeit low, possibility of flooding, the individual dwellings on the development must be signed up to

the E.A. “Flood Warnings Direct”. This is a free service providing flood warnings by phone, text or email. See <https://www.fws.environment-agency.gov.uk/app/olr/home>, or call the E.A. on 0845 988 1188 for full information.

5.5.2 Safe access and egress

The NPPF stipulates that, where required, safe access and escape routes should be available to/from new developments in flood risk areas. Access routes should be such that occupants can safely access and exit the building in design flood conditions.

With reference to the site levels plans at Appendix A, the lowest level for a front main entrance/exit door is 93.7m AOD which is 2.7m above design 1 in 100yr +35% flood levels.

The safest exit route from the site is West along Merton Street and then West along The Causeway as Figure 8.

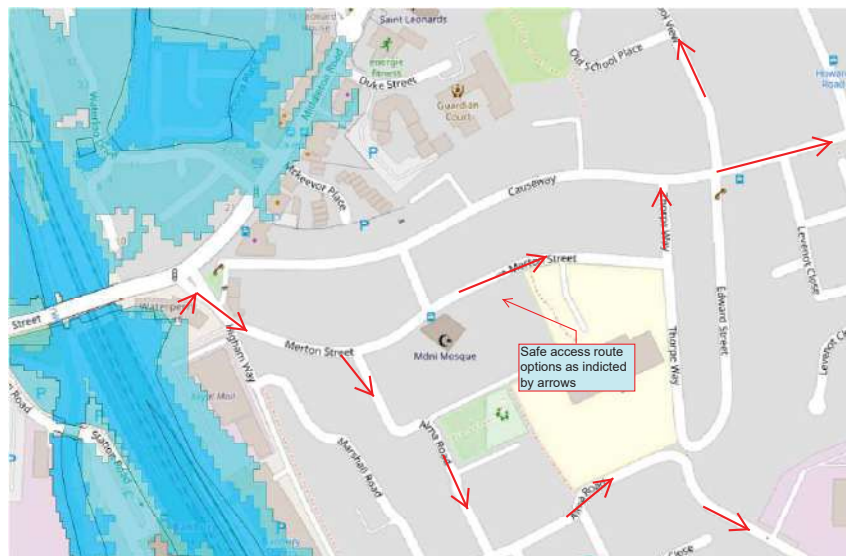


Figure 8: Safe access routes

The domestic flood plans will provide details of these exit routes from the local area.

5.5.3 Flood Plans

It is widely recommended that households are “reasonably prepared” to deal with a flooding incident. Hence the developer will provide a Flood Plan (in line with the EA guidance) for this development (See Appendix C for an example). The plan will

provide guidance on emergency response procedures in the event of flooding to the site. This will:

- Provide details of who to contact and how (insurers, energy suppliers, immediate family and friends etc.);
- Provide details of how to turn off gas, electricity and water mains supplies;
- Provide details of designated safe egress routes out of the building and out of the local area at risk;
- Provide details of E.A. Flood warning codes;
- Provide details of local radio stations;
- Provide a check list of essential items.

It is also suggested that such a plan could be saved securely on smartphones, webmail or in the cloud so that residents can access it anywhere they can use their phone or computer.

6 Conclusions

- The site lies in Flood Zones 2 and 3.
- The building benefits from defences sufficient to defend against the 1 in 200yr flood event.
- Safe and dry access and egress is immediately available.
- The individual dwellings on the development will be signed up to the E.A. "Flood Warnings Direct".

It is therefore considered that the conversions to domestic accommodation is acceptable.

Signed:



Dr. R. D. Saunders CEng, C. Build E, MCABE, BEng(Hons), PhD

Date: 26th October, 2020

References

- [1] BSI. BS 8533:2011. Technical report, 2011.
- [2] Department for Communities and Local Government. Technical guidance to the national planning policy framework. 2018.
- [3] Ministry of Housing, Communities and Local Government. National planning policy framework. 2019.

A Section level data



PROPOSED NORTH ELEVATION - SCALE 1:100 @ A1

**SAFETY, HEALTH AND
ENVIRONMENTAL HAZARD
INFORMATION BOX**

THE HAZARD INFORMATION BOX IS A REQUIREMENT OF THE HSE. THE BOX IS TO BE USED TO PROVIDE INFORMATION ON THE HAZARD OF THE PROJECT AND TO PROVIDE INFORMATION ON THE HAZARD OF THE PROJECT. THE BOX IS TO BE USED TO PROVIDE INFORMATION ON THE HAZARD OF THE PROJECT AND TO PROVIDE INFORMATION ON THE HAZARD OF THE PROJECT.

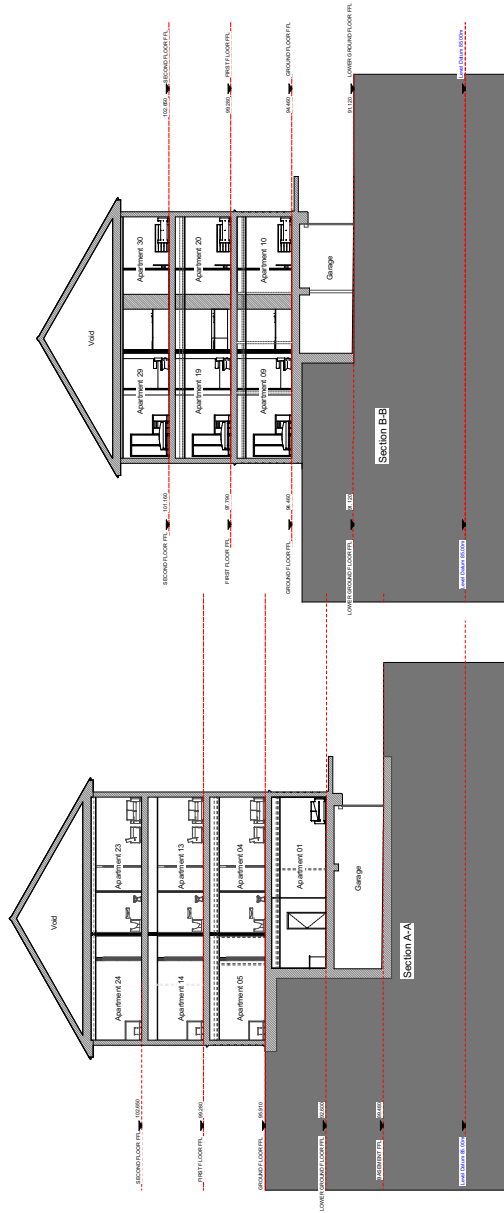
NOTES:
Consultation is part of the design process. All relevant stakeholders should be consulted at an early stage in the design process. The design team will be responsible for providing the information required for the hazard information box. The design team will be responsible for providing the information required for the hazard information box.

ADDITIONAL INFORMATION:
This is a preliminary drawing. It is not intended for construction. It is not intended for construction. It is not intended for construction.

DATE: 15/10/2020
DESIGNED BY: [Name]
CHECKED BY: [Name]

PLANNING ISSUE
MAS
MATERIALS MANAGEMENT SYSTEMS
MATERIALS MANAGEMENT SYSTEMS
MATERIALS MANAGEMENT SYSTEMS

PROJECT: [Project Name]
CLIENT: [Client Name]
DATE: [Date]
SCALE: [Scale]



PROPOSED SECTIONS A-A & B-B - SCALE 1:100 @ A1

SAFETY, HEALTH AND INFORMATION BOX

- indicates Existing Structure
- indicates new internal partitions

THE ARCHITECT HAS TAKEN THE NECESSARY PRECAUTIONS TO THE WORK. THE TYPE OF WORK IS LIMITED TO THE DESIGN OF THE BUILDING AND THE PREPARATION OF THE DRAWINGS. THE ARCHITECT IS NOT RESPONSIBLE FOR THE CONSTRUCTION OF THE BUILDING OR FOR THE SAFETY OF THE WORKERS OR THE PUBLIC.

NOTES:
 1. Consult the relevant planning and building regulations.
 2. The drawings are for information only and do not constitute a contract.
 3. All dimensions are in millimeters unless otherwise stated.
 4. The drawings are subject to change without notice.
 5. The drawings are the property of the architect and shall remain his/her property.

GENERAL NOTES:
 1. The drawings are for information only and do not constitute a contract.
 2. All dimensions are in millimeters unless otherwise stated.
 3. The drawings are subject to change without notice.
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| No. | Description | Date |
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| 1 | Issue for Information | 10/10/2020 |

PLANNING ISSUE

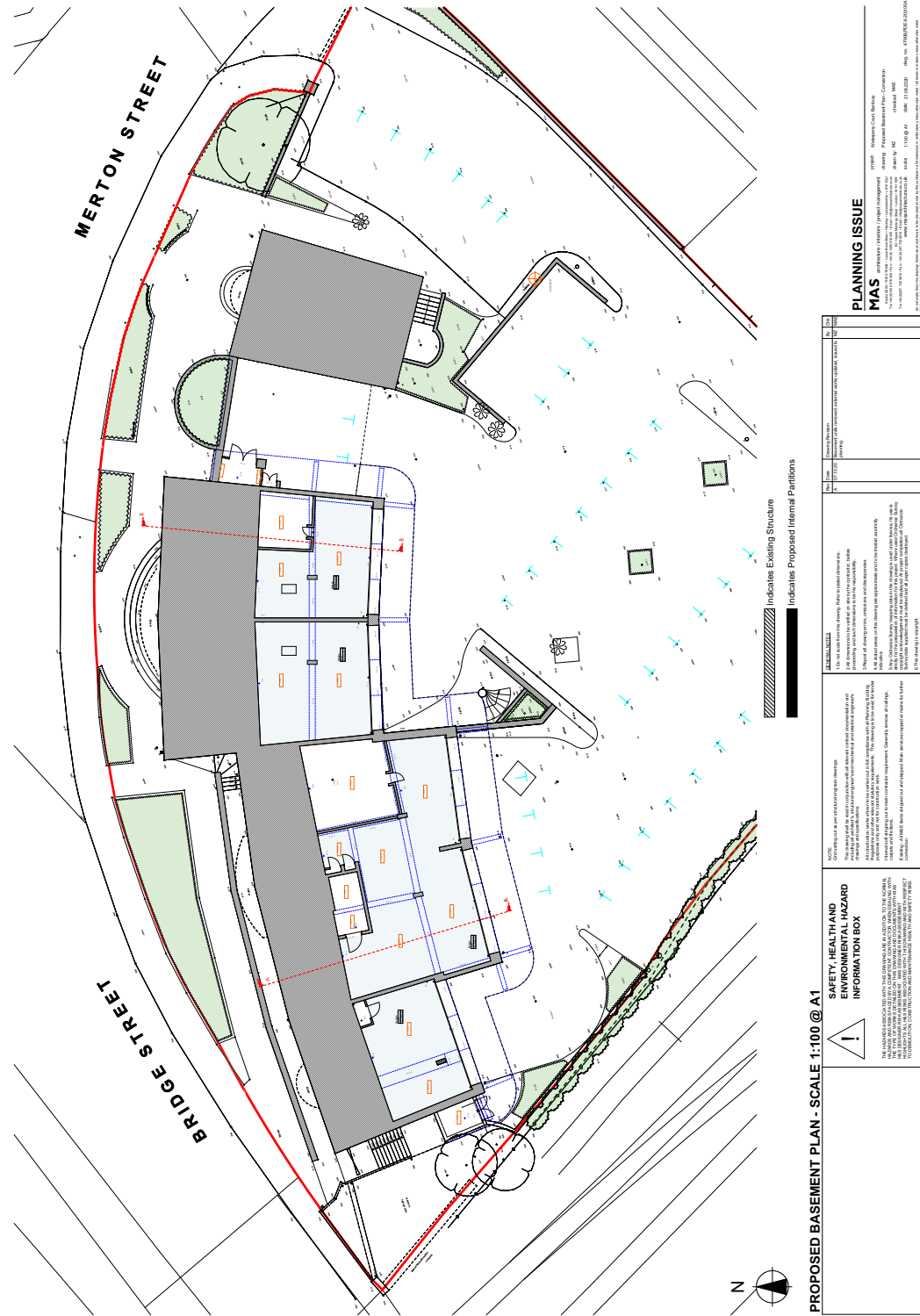
MAS
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 PROJECT: PROPOSED SECTIONS A & B-B CONVERSION
 ADDRESS: 110/112, 110/114, 110/116, 110/118, 110/120, 110/122, 110/124, 110/126, 110/128, 110/130, 110/132, 110/134, 110/136, 110/138, 110/140, 110/142, 110/144, 110/146, 110/148, 110/150, 110/152, 110/154, 110/156, 110/158, 110/160, 110/162, 110/164, 110/166, 110/168, 110/170, 110/172, 110/174, 110/176, 110/178, 110/180, 110/182, 110/184, 110/186, 110/188, 110/190, 110/192, 110/194, 110/196, 110/198, 110/200, 110/202, 110/204, 110/206, 110/208, 110/210, 110/212, 110/214, 110/216, 110/218, 110/220, 110/222, 110/224, 110/226, 110/228, 110/230, 110/232, 110/234, 110/236, 110/238, 110/240, 110/242, 110/244, 110/246, 110/248, 110/250, 110/252, 110/254, 110/256, 110/258, 110/260, 110/262, 110/264, 110/266, 110/268, 110/270, 110/272, 110/274, 110/276, 110/278, 110/280, 110/282, 110/284, 110/286, 110/288, 110/290, 110/292, 110/294, 110/296, 110/298, 110/300, 110/302, 110/304, 110/306, 110/308, 110/310, 110/312, 110/314, 110/316, 110/318, 110/320, 110/322, 110/324, 110/326, 110/328, 110/330, 110/332, 110/334, 110/336, 110/338, 110/340, 110/342, 110/344, 110/346, 110/348, 110/350, 110/352, 110/354, 110/356, 110/358, 110/360, 110/362, 110/364, 110/366, 110/368, 110/370, 110/372, 110/374, 110/376, 110/378, 110/380, 110/382, 110/384, 110/386, 110/388, 110/390, 110/392, 110/394, 110/396, 110/398, 110/400, 110/402, 110/404, 110/406, 110/408, 110/410, 110/412, 110/414, 110/416, 110/418, 110/420, 110/422, 110/424, 110/426, 110/428, 110/430, 110/432, 110/434, 110/436, 110/438, 110/440, 110/442, 110/444, 110/446, 110/448, 110/450, 110/452, 110/454, 110/456, 110/458, 110/460, 110/462, 110/464, 110/466, 110/468, 110/470, 110/472, 110/474, 110/476, 110/478, 110/480, 110/482, 110/484, 110/486, 110/488, 110/490, 110/492, 110/494, 110/496, 110/498, 110/500, 110/502, 110/504, 110/506, 110/508, 110/510, 110/512, 110/514, 110/516, 110/518, 110/520, 110/522, 110/524, 110/526, 110/528, 110/530, 110/532, 110/534, 110/536, 110/538, 110/540, 110/542, 110/544, 110/546, 110/548, 110/550, 110/552, 110/554, 110/556, 110/558, 110/560, 110/562, 110/564, 110/566, 110/568, 110/570, 110/572, 110/574, 110/576, 110/578, 110/580, 110/582, 110/584, 110/586, 110/588, 110/590, 110/592, 110/594, 110/596, 110/598, 110/600, 110/602, 110/604, 110/606, 110/608, 110/610, 110/612, 110/614, 110/616, 110/618, 110/620, 110/622, 110/624, 110/626, 110/628, 110/630, 110/632, 110/634, 110/636, 110/638, 110/640, 110/642, 110/644, 110/646, 110/648, 110/650, 110/652, 110/654, 110/656, 110/658, 110/660, 110/662, 110/664, 110/666, 110/668, 110/670, 110/672, 110/674, 110/676, 110/678, 110/680, 110/682, 110/684, 110/686, 110/688, 110/690, 110/692, 110/694, 110/696, 110/698, 110/700, 110/702, 110/704, 110/706, 110/708, 110/710, 110/712, 110/714, 110/716, 110/718, 110/720, 110/722, 110/724, 110/726, 110/728, 110/730, 110/732, 110/734, 110/736, 110/738, 110/740, 110/742, 110/744, 110/746, 110/748, 110/750, 110/752, 110/754, 110/756, 110/758, 110/760, 110/762, 110/764, 110/766, 110/768, 110/770, 110/772, 110/774, 110/776, 110/778, 110/780, 110/782, 110/784, 110/786, 110/788, 110/790, 110/792, 110/794, 110/796, 110/798, 110/800, 110/802, 110/804, 110/806, 110/808, 110/810, 110/812, 110/814, 110/816, 110/818, 110/820, 110/822, 110/824, 110/826, 110/828, 110/830, 110/832, 110/834, 110/836, 110/838, 110/840, 110/842, 110/844, 110/846, 110/848, 110/850, 110/852, 110/854, 110/856, 110/858, 110/860, 110/862, 110/864, 110/866, 110/868, 110/870, 110/872, 110/874, 110/876, 110/878, 110/880, 110/882, 110/884, 110/886, 110/888, 110/890, 110/892, 110/894, 110/896, 110/898, 110/900, 110/902, 110/904, 110/906, 110/908, 110/910, 110/912, 110/914, 110/916, 110/918, 110/920, 110/922, 110/924, 110/926, 110/928, 110/930, 110/932, 110/934, 110/936, 110/938, 110/940, 110/942, 110/944, 110/946, 110/948, 110/950, 110/952, 110/954, 110/956, 110/958, 110/960, 110/962, 110/964, 110/966, 110/968, 110/970, 110/972, 110/974, 110/976, 110/978, 110/980, 110/982, 110/984, 110/986, 110/988, 110/990, 110/992, 110/994, 110/996, 110/998, 110/1000.



PROPOSED SOUTH ELEVATION - SCALE 1:100 @ A1

| | | | |
|--|---|---|---|
| <p>SAFETY, HEALTH AND ACCIDENT INFORMATION BOX</p> <p>!</p> <p>THE DRAWING IS SUBJECT TO THE DRAWING BEING IN ACCORDANCE WITH THE NORMAL PRACTICE OF THE INDUSTRY. THE DRAWING IS NOT TO BE USED FOR ANY OTHER PURPOSE WITHOUT THE WRITTEN PERMISSION OF THE ARCHITECT. THE ARCHITECT IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY ARISING FROM THE USE OF THIS DRAWING.</p> | <p>NOTES:</p> <p>Construction is per the approved design.</p> <p>The drawing is subject to the drawing being in accordance with the normal practice of the industry. The drawing is not to be used for any other purpose without the written permission of the architect. The architect is not responsible for any damage to persons or property arising from the use of this drawing.</p> <p>All work is to be done in accordance with the relevant building regulations and codes of practice. The architect is not responsible for any damage to persons or property arising from the use of this drawing.</p> <p>The drawing is subject to the drawing being in accordance with the normal practice of the industry. The drawing is not to be used for any other purpose without the written permission of the architect. The architect is not responsible for any damage to persons or property arising from the use of this drawing.</p> | <p>ADDITIONAL:</p> <p>On the site of the drawing, there is a listed building. The drawing is subject to the drawing being in accordance with the normal practice of the industry. The drawing is not to be used for any other purpose without the written permission of the architect. The architect is not responsible for any damage to persons or property arising from the use of this drawing.</p> <p>The drawing is subject to the drawing being in accordance with the normal practice of the industry. The drawing is not to be used for any other purpose without the written permission of the architect. The architect is not responsible for any damage to persons or property arising from the use of this drawing.</p> | <p>PLANNING ISSUE</p> <p>MAS</p> <p>ARCHITECT: INNIVISION DESIGN LTD PROJECT: PROJECT NAME ADDRESS: ADDRESS DATE: DATE</p> |
|--|---|---|---|

B Proposal plans



SAFETY, HEALTH AND ENVIRONMENTAL HAZARD INFORMATION BOX

!

THE DRAWING SUBJECTS THIS CONSTRUCTION AS A DESIGN, TO THE NORMAL LEVEL OF CARE AND SKILL OF THE DESIGNER. THE DESIGNER DOES NOT GUARANTEE, WARRANT OR REPRESENT THAT THE DESIGN IS FREE FROM ERRORS OR OMISSIONS. THE DESIGNER ACCEPTS NO LIABILITY FOR ANY LOSS OR DAMAGE, INCLUDING ECONOMIC LOSS, ARISING FROM ANY USE OF THE DRAWING. THE DRAWING IS THE PROPERTY OF INNVISION DESIGN AND WILL REMAIN THE PROPERTY OF INNVISION DESIGN WHETHER OR NOT THE DRAWING IS REPRODUCED OR COPIED.

PROPOSED BASEMENT PLAN - SCALE 1:100 @ A1

| | | | |
|-----|------------------------|----------|----|
| NO. | DESCRIPTION | DATE | BY |
| 1 | Issue for planning | 11/10/20 | AS |
| 2 | Issue for construction | 11/10/20 | AS |
| 3 | Issue for planning | 11/10/20 | AS |
| 4 | Issue for construction | 11/10/20 | AS |

PLANNING ISSUE

MAS

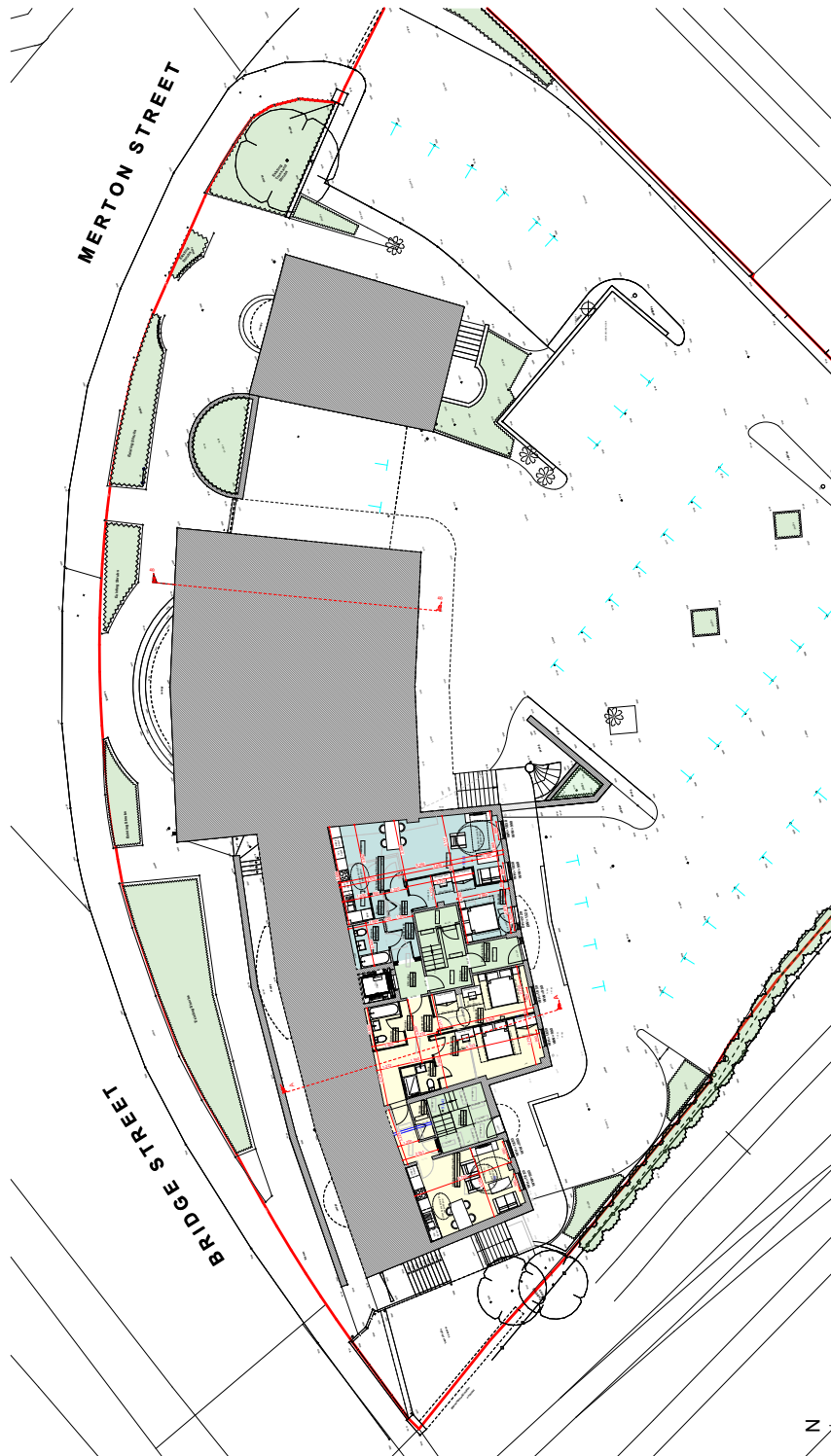
MAS - MASSING AND SHEDDING (M&S) - 11/10/20

MAS - MASSING AND SHEDDING (M&S) - 11/10/20

MAS - MASSING AND SHEDDING (M&S) - 11/10/20

MAS - MASSING AND SHEDDING (M&S) - 11/10/20

MAS - MASSING AND SHEDDING (M&S) - 11/10/20



Indicates Existing Structure
 Indicates Proposed Internal Partitions

PROPOSED LOWER GROUND FLOOR PLAN - SCALE 1:100 @ A1

SAFETY, HEALTH AND ENVIRONMENT HAZARD INFORMATION BOX

! WARNING

THIS DRAWING HAS BEEN PREPARED BY THE ARCHITECT IN ACCORDANCE WITH THE NORMS AND STANDARDS OF THE ARCHITECTURAL PROFESSION. THE ARCHITECT HAS CONDUCTED VISUAL CHECKS OF THE DRAWING AND HAS FOUND IT TO BE ACCURATE AND COMPLETE. THE ARCHITECT HAS CONDUCTED VISUAL CHECKS OF THE DRAWING AND HAS FOUND IT TO BE ACCURATE AND COMPLETE. THE ARCHITECT HAS CONDUCTED VISUAL CHECKS OF THE DRAWING AND HAS FOUND IT TO BE ACCURATE AND COMPLETE.

NOTES:

1. CONSULT WITH THE ARCHITECT FOR ANY CHANGES TO THE PLAN.

2. ALL WORK TO BE COMPLETED IN ACCORDANCE WITH THE ARCHITECT'S SPECIFICATIONS.

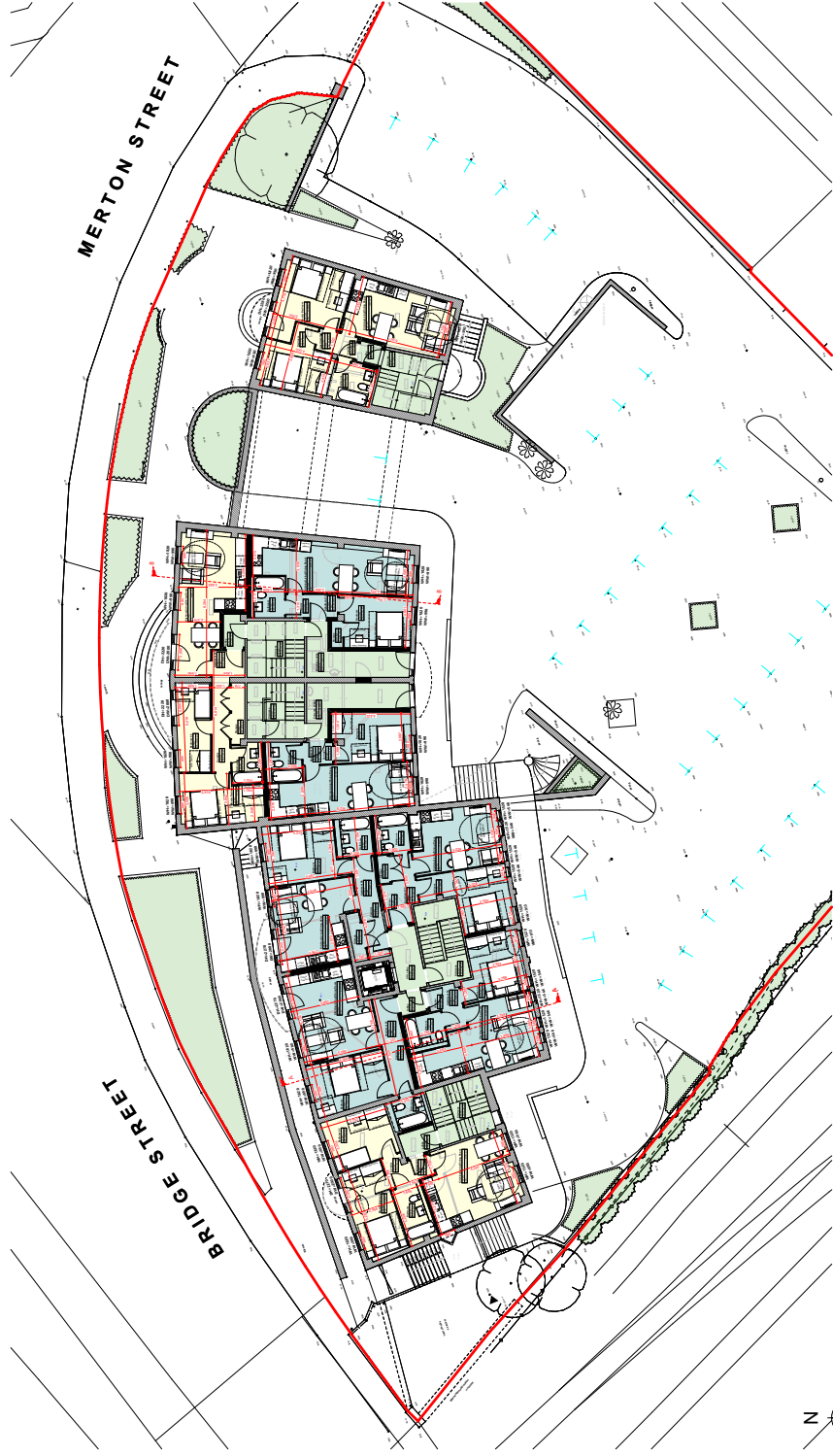
3. THE ARCHITECT HAS CONDUCTED VISUAL CHECKS OF THE DRAWING AND HAS FOUND IT TO BE ACCURATE AND COMPLETE.

| NO. | DESCRIPTION | DATE | BY |
|-----|-------------------|----------|----|
| 1 | ISSUED FOR PERMIT | 11/03/20 | MM |
| 2 | ISSUED FOR PERMIT | 11/03/20 | MM |

PLANNING ISSUE

MAS

ARCHITECT: INNIVISION DESIGN LTD
 PROJECT: PROPOSED LOWER GROUND FLOOR PLAN - CONWAY
 DRAWING NO: 110320
 DATE: 11/03/20



 Indicates Existing Structure
 Indicates Proposed Internal Partitions

PROPOSED GROUND FLOOR PLAN - SCALE 1:100 @ A1

| No. | Date/Version | Description |
|-----|--------------|--------------------|
| 1 | 10/03/20 | Issue for planning |
| 2 | 10/03/20 | Final design |
| 3 | 10/03/20 | Final design |
| 4 | 10/03/20 | Final design |

NOTES

- 1. All construction to be carried out in accordance with the Building Regulations and relevant Building Acts.
- 2. All work to be carried out in accordance with the relevant British Standards.
- 3. All materials to be used in accordance with the relevant British Standards.
- 4. All work to be completed by the date shown on this drawing.
- 5. All work to be carried out in accordance with the relevant Building Acts and Regulations.
- 6. All work to be carried out in accordance with the relevant Building Acts and Regulations.
- 7. All work to be carried out in accordance with the relevant Building Acts and Regulations.
- 8. All work to be carried out in accordance with the relevant Building Acts and Regulations.

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PLANNING ISSUE
MAS (MARTIN AND SONS) (LIMITED) ENGINEERS
 PROJECT: [Address]
 DRAWING NO.: [Number]
 DATE: [Date]
 SCALE: [Scale]

C Emergency flood plan (example)

Personal flood plan



Environment Agency

Name

Let us know when you've completed your flood plan by calling Floodline on **0345 988 1188**. This will help us learn more about how people are preparing for flooding.

Are you signed up to receive flood warnings?
 If not call Floodline on 0345 988 1188 to see if your area receives free flood warnings.

| General contact list | Company name | Contact name | Telephone |
|-------------------------------------|--------------------|--------------|---------------|
| Floodline | Environment Agency | | 0345 988 1188 |
| Electricity provider | | | |
| Gas provider | | | |
| Water company | | | |
| Telephone provider | | | |
| Insurance company and policy number | | | |
| Local council | | | |
| Local radio station | | | |
| Travel/weather info | | | |

Key locations

| Service cut-off | Description of location |
|-----------------|-------------------------|
| Electricity | |
| Gas | |
| Water | |


Who can help/who can you help?

| Relationship | Name | How can they/you help? |
|---------------------|------|------------------------|
| Relative | | |
| Friend or neighbour | | |

Be prepared for flooding. Act now

Personal flood plan

What can I do NOW?



Environment Agency

Put important documents out of flood risk and protect in polythene

Check your insurance covers you for flooding

Look at the best way of stopping floodwater entering your property

Make a flood plan and prepare a flood kit

Find out where you can get sandbags

Identify who can help you/who you can help

Identify what you would need to take with you if you had to leave your home

Understand the flood warning codes

What can you do if a flood is expected in your area?

| Actions | Location |
|---|----------|
| <p>Home</p> <ul style="list-style-type: none"> ● Move furniture and electrical items to safety ● Put flood boards, polythene and sandbags in place ● Make a list now of what you can move away from the risk ● Turn off electricity, water and gas supplies ● Roll up carpets and rugs ● Unless you have time to remove them hang curtains over rods ● Move sentimental items to safety ● Put important documents in polythene bags and move to safety | |
| <p>Garden and outside</p> <ul style="list-style-type: none"> ● Move your car out of the flood risk area ● Move any large or loose items or weigh them down | |
| <p>Business</p> <ul style="list-style-type: none"> ● Move important documents, computers and stock ● Alert staff and request their help ● Farmers move animals and livestock to safety | |
| <p>Evacuation - Prepare a flood kit in advance</p> <ul style="list-style-type: none"> ● Inform your family or friends that you may need to leave your home ● Get your flood kit together and include a torch, warm and waterproof clothing, water, food, medication, toys for children and pets, rubber gloves and wellingtons | |

There are a range of flood protection products on the market to help you protect your property from flood damage. A directory of these is available from the **National Flood Forum** at www.bluepages.org.uk

Be prepared for flooding. Act now

D EA data provided for the site



Product 4 (Detailed Flood Risk) for Middleton Road, Banbury, OX16 4QD Our Ref: THM189269

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 XY coordinate locations, unique identifiers, and levels and flows for *defended* scenarios;
- ii) Flood defence locations unique identifiers and attributes; (supplied separately)
- 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>

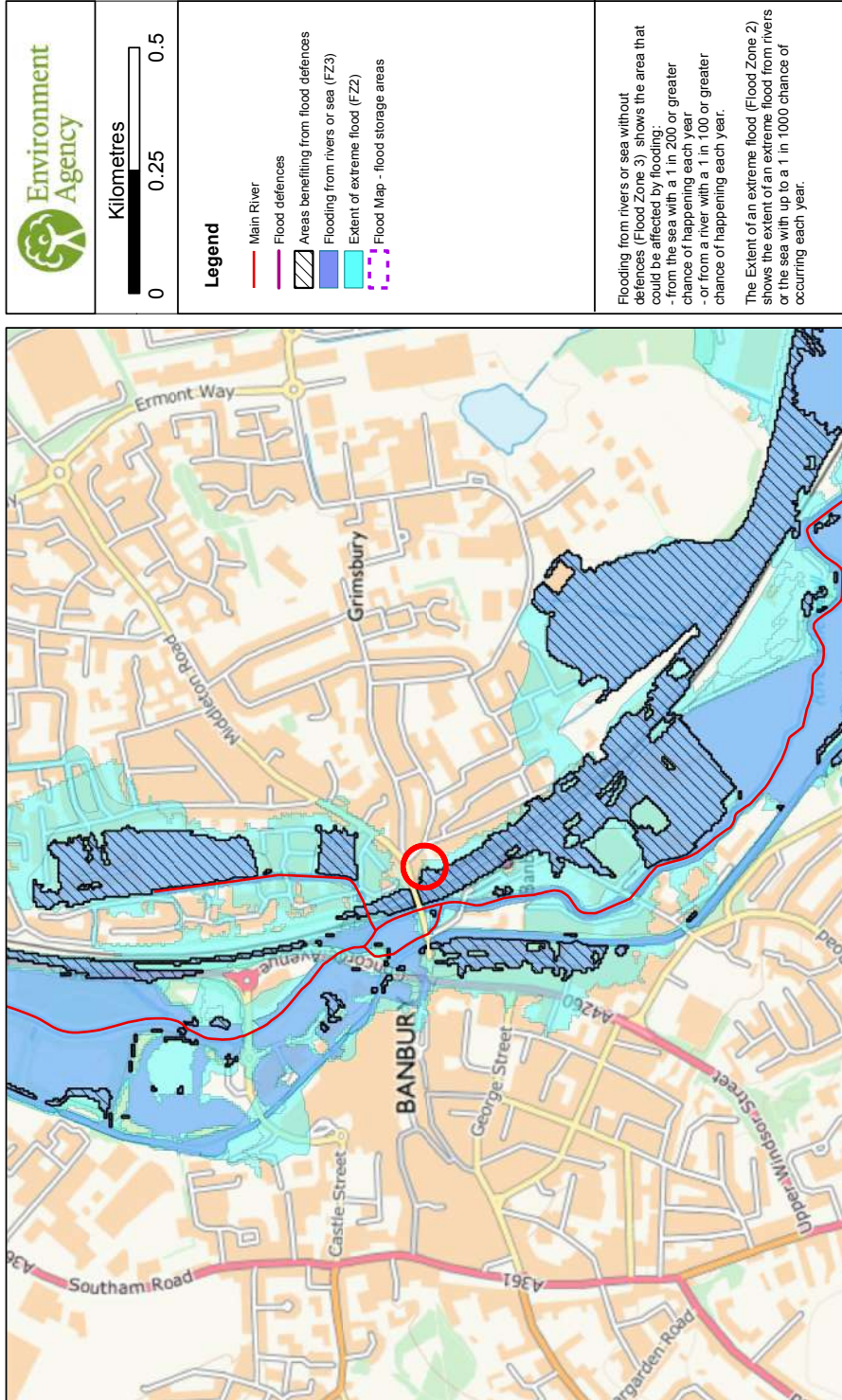
If you would like advice from us regarding your development proposals you can complete our pre application enquiry form which can be found at:

<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: enquiries_THM@environment-agency.gov.uk

www.environment-agency.gov.uk

**Flood Map for Planning centred on Middleton Road, Banbury, OX16 4QD
Created on 16/10/2020 REF: THM189269**



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THM189269

Defence information

Defence Location: **Banbury FAS**

Description:

This location is offered protection from the Banbury Flood Alleviation Scheme. This consists of a large flood storage area to the north west of the town, as well as various bunds and walls throughout the town. These are maintained by the Environment Agency and some private owners. The site will be offered up to 1 in 200 year protection (0.5% chance of occurring annually). There are no other planned defences in this area.

Model information

Model: **Cherwell (Banbury) 2015**

Description: The information provided is taken from the River Cherwell modelling study completed in September 2015 for the Banbury Flood Alleviation Scheme As-Constructed investigations. The study was carried out using SIS-TUFLOW software. The model covers the River Cherwell from Cropredy to Kings Sutton and the lower section of the Hanwell Brook in Banbury.

Model design runs:

Undersized: 1 in 5 / 20% Annual Exceedance Probability (AEP), 1 in 20 / 5% AEP; 1 in 100 / 1% AEP; 1 in 100+20% / 1% AEP plus 20% increase in flows, 1 in 200 / 0.5% AEP and 1 in 1000 / 0.1% AEP

Defended: 1 in 5 / 20% AEP, 1 in 20 / 5% AEP; 1 in 100 / 1% AEP; 1 in 100+20% / 1% AEP plus 20% increase in flows, 1 in 200 / 0.5% AEP and 1 in 1000 / 0.1% AEP

Mapped Outputs:

1 in 5 / 20% AEP, 1 in 20 / 5% AEP; 1 in 100 / 1% AEP, 1 in 200 / 0.5% AEP and 1 in 1000 / 0.1% AEP

Model accuracy:

Levels \pm 250mm

THM189269

Modelled in-channel flood flows and levels

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:

| Node label | Model | Flood Levels (mAOD) | | | | | | | |
|--------------------------|-------------------------|---------------------|----------|---------|--------|--------|---------------------------------|----------|-------|
| | | Easting | Northing | 20% AEP | 5% AEP | 1% AEP | 1% AEP (+20% increase in flows) | 0.1% AEP | |
| 061_14_2015_001MD_3_0082 | Cherwell (Barbury) 2015 | 446143 | 240777 | 89.33 | 89.34 | 89.34 | 89.34 | 89.78 | 90.18 |
| 061_14_2015_001MD_3_003 | Cherwell (Barbury) 2015 | 446099 | 240723 | 89.30 | 89.30 | 89.30 | 89.30 | 89.77 | 90.18 |
| 061_14_2015_001RC_1_016d | Cherwell (Barbury) 2015 | 446074 | 240623 | 89.39 | 90.08 | 90.26 | 90.26 | 90.50 | 91.44 |
| 061_14_2015_001RC_1_016 | Cherwell (Barbury) 2015 | 446084 | 240595 | 89.39 | 90.07 | 90.47 | 90.47 | 90.50 | 91.37 |
| 061_14_2015_001RC_1_015 | Cherwell (Barbury) 2015 | 446089 | 240528 | 89.28 | 89.94 | 90.12 | 90.34 | 90.34 | 91.29 |
| | | | | | | | | | |
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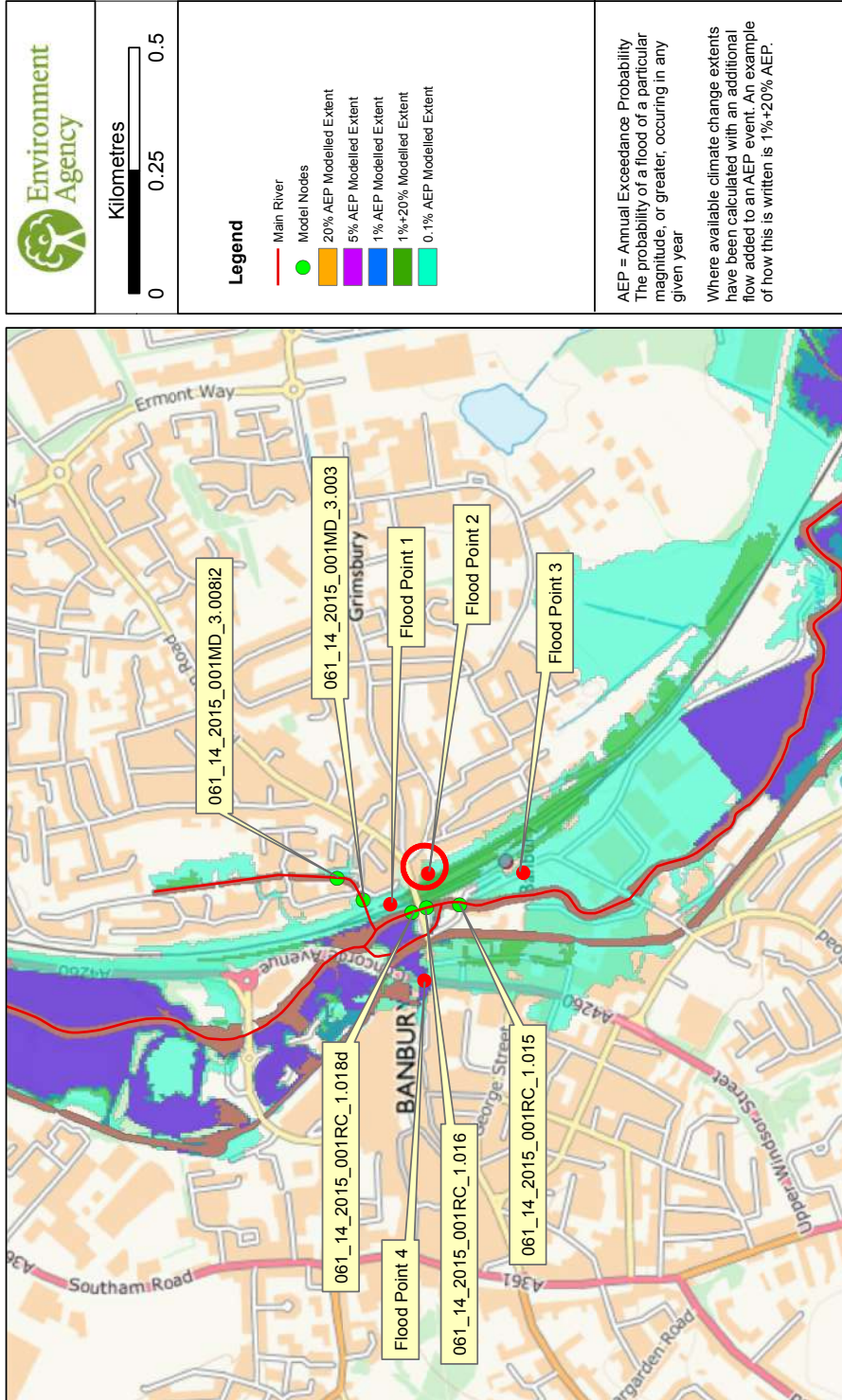
| Node label | Model | Flood Flows (m³/s) | | | | | | | |
|--------------------------|-------------------------|--------------------|----------|---------|--------|--------|---------------------------------|----------|-------|
| | | Easting | Northing | 20% AEP | 5% AEP | 1% AEP | 1% AEP (+20% increase in flows) | 0.1% AEP | |
| 061_14_2015_001MD_3_0082 | Cherwell (Barbury) 2015 | 446143 | 240777 | 1.40 | 1.42 | 1.58 | 1.69 | 1.74 | 1.74 |
| 061_14_2015_001MD_3_003 | Cherwell (Barbury) 2015 | 446099 | 240723 | 1.64 | 1.59 | 1.56 | 1.56 | 1.62 | 1.58 |
| 061_14_2015_001RC_1_016d | Cherwell (Barbury) 2015 | 446074 | 240623 | 27.63 | 44.48 | 49.26 | 58.35 | 58.35 | 95.80 |
| 061_14_2015_001RC_1_016 | Cherwell (Barbury) 2015 | 446084 | 240595 | 27.63 | 44.48 | 49.26 | 58.35 | 58.35 | 95.80 |
| 061_14_2015_001RC_1_015 | Cherwell (Barbury) 2015 | 446089 | 240528 | 26.38 | 46.22 | 51.06 | 60.55 | 60.55 | 92.81 |
| | | | | | | | | | |
| | | | | | | | | | |
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Note:

Due to changes in guidance on the allowances for climate change, the 20% increase in river flows should no longer 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 Middleton Road, Banbury, OX16 4QD
Created on 16/10/2020 REF: THM189269**



Modelled floodplain flood levels

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

| 2D grid cell reference | Model | Easting | Nothing | flood levels (mAOD) | | | | |
|------------------------|-------------------------|---------|---------|---------------------|---------|---------|---------------------------------|----------|
| | | | | 20% AEP | 5% AEP | 1% AEP | 1% AEP (+20% increase in flows) | 0.1% AEP |
| Flood Point 1 | Cherwell (Banbury) 2015 | 446,090 | Nothing | No data | No data | No data | No data | 91.4358 |
| Flood Point 2 | Cherwell (Banbury) 2015 | 446,149 | 240,58 | No data | No data | No data | 90.38 | 91.3424 |
| Flood Point 3 | Cherwell (Banbury) 2015 | 446,155 | 240,396 | No data | No data | No data | No data | 90.9045 |
| Flood Point 4 | Cherwell (Banbury) 2015 | 445,931 | 240,600 | No data | 90.93 | 90.93 | 90.93 | 91.4181 |
| | | | | | | | | |
| | | | | | | | | |
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| | | | | | | | | |

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

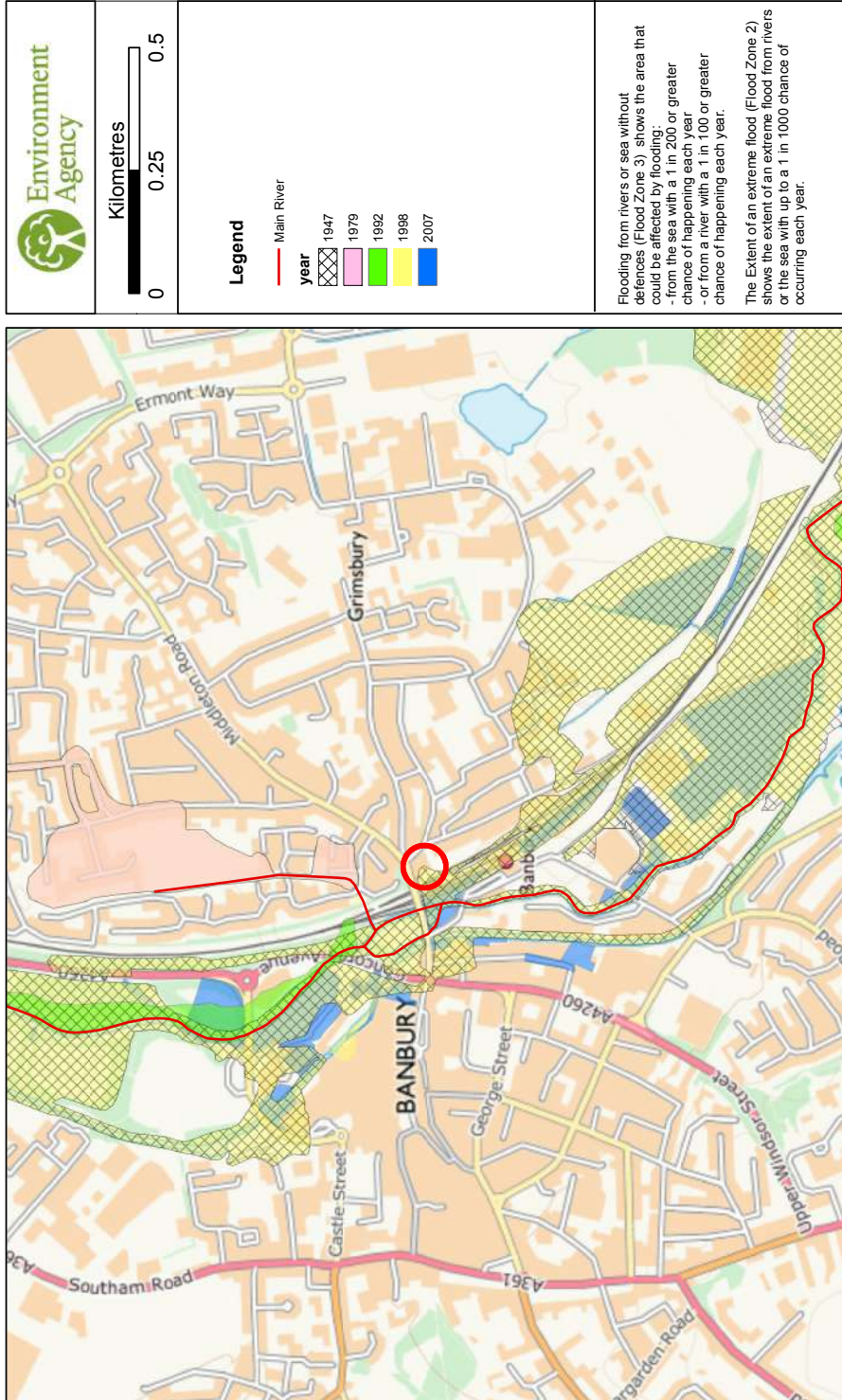
Note:

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/food-risk-assessments-climate-change-allowances>

**Historic Flood Map centred on Middleton Road, Banbury, OX16 4QD
Created on 16/10/2020 REF: THM189269**



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Historic flood data

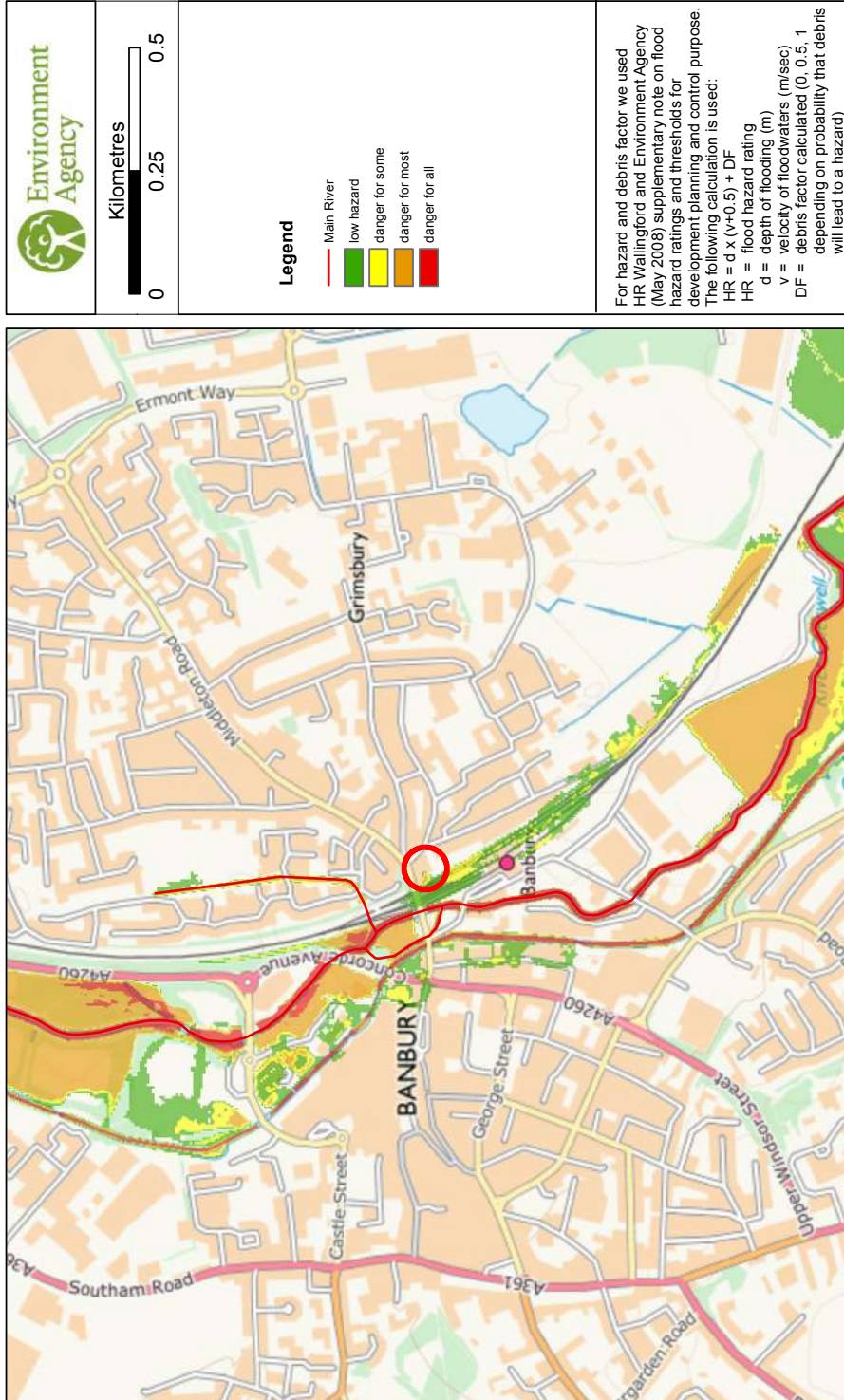
Our records show that the area of your site has been affected by flooding. Information on the floods that have affected your site is provided in the table below:

| Flood Event Code | Flood Event Name | Start Date | End Date | Source of Flooding | Cause of Flooding |
|------------------|----------------------------|------------|------------|--------------------|--|
| EA0619470300444 | 06MarchSpring1947 | 01/01/1947 | 12/12/1947 | main river | channel capacity exceeded (no raised defences) |
| EA0619790200111 | 06FebruaryWinter1979 | 01/01/1979 | 12/12/1979 | main river | channel capacity exceeded (no raised defences) |
| EA06198209000281 | 06SeptemberAutumn1982 | 01/01/1992 | 12/12/1992 | main river | channel capacity exceeded (no raised defences) |
| EA0619980400097 | 06AprilEaster1998 | 01/04/1998 | 30/04/1998 | main river | channel capacity exceeded (no raised defences) |
| ea061142605 | Banbury CP - 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 Middleton Road, Banbury, OX16 4QD
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Hazard Mapping (for the 1%+20% climate change scenario)

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:

$$HR = d \times (v+0.5) + DF$$

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 | Green | Very low hazard - Caution |
| 0.75 to 1.25 | Yellow | Danger for some - includes children, the elderly and the infirm |
| 1.25 to 2.0 | Orange | Danger for most - includes the general public |
| More than 2.0 | Red | 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

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