

FLOOD RISK ASSESSMENT REPORT
SUPPORTING HOUSEHOLDER PLANNING APPLICATION

**HERIOTS
WOKINGHAM ROAD
HURST
WOKING10 OR0HAM
RG10 0RX**

Prepared for

Mr S Holdstock
Heriots
Wokingham Road
Hurst
Wokingham
RG10 0RX

Prepared by

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Flood Risk Assessment Report Text 22 Nov 24	2
Floor plans proposed	11
Published flood mapping 50	12

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1. INTRODUCTION

- 1.1. Simon Jones-Parry, a chartered civil engineer, prepared this report for Mr S Holdstock, who is the owner of Heriots, Wokingham Road, Hurst, RG10 0RX. It supports Mr Holdstock's planning application to Wokingham Borough Council to permit alterations to Heriots. The application is retrospective.
- 1.2. Planning application drawing 2432/01 Revision A, copy appended, shows existing floor plans of the dwelling at the Heriots land holding. Red edging depicts the principal alterations for which planning consent is sought. Relevant development in terms of flood risk is the single storey garden room on the west side of the dwelling and the single storey link structure between the two storey part of the cottage and a curtilage building.
- 1.3. National Planning Policy Framework (NPPF) requires that the application is supported by a flood risk assessment because Flood Map for Planning classifies the curtilage of the dwelling at Heriots, depicted by red edging on mapped flood risk and topography drawing 0, appended, as Flood Zone 2. Flood Zone 2 comprises land having an estimated risk of fluvial (or tidal) flooding having a frequency (risk of flooding) between once in one hundred years, also described as a 0.1% annual exceedance probability (AEP), and one in one thousand years
- 1.4. The Flood Risk and Coastal Change section of the on line Planning Practice Guidance (PPG) which describes how NPPF should be interpreted and what should be done to comply with it, advises that the type of householder development done at Heriots is "minor development".
- 1.5. Paragraph 051 of this section of the PPG advises about minor developments raising flood risk issues:

"Minor developments are unlikely to raise significant flood risk issues unless:

- they would have an adverse effect on a watercourse, floodplain or its*

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flood defences;

- *they would impede access to flood defence and management facilities; or*
- *where the cumulative impact of such developments would have a significant effect on local flood storage capacity or flood flows.*

“Even minor developments can affect flood risk within or beyond the property, particularly in areas susceptible to flooding. Applications for minor development involving extensions or additions should still meet the requirements to provide a site-specific flood risk assessment (as per footnote 55 of the National Planning Policy Framework). A pragmatic approach should be taken to the scope and level of detail of the assessment – a shorter, simpler assessment is likely to be sufficient in most such cases. As a minimum, the assessment needs to show that the development will be safe for its users for the intended lifetime of the development, without increasing flood risk elsewhere, and be sufficiently flood resistant and resilient to the level and nature of the flood risk.

“The Environment Agency’s [advice on flood risk assessment](#) is helpful for ensuring extensions or alterations are designed and constructed to conform to any flood protection already incorporated in the property, and include flood resilience measures in the design”.

1.6. Heriots is a Grade II listed dwelling described by the Historic England list entry as *“Cottage. Early C17, 3 timber framed bays, colourwashed brick infilling, tile roof. Large chimney with bread oven on east gable. 2 storeys. C20 casement windows irregular and entrance door under gabled porch on south front. Large C20 extension on north. Interior: most original timbers visible, with braces, and chamfered joists with stopped ends.”* The listing has two principal impacts on flood risk and drainage. First all adaptations to the dwelling and its curtilage to minimise flood risk and deal with drainage must conserve or enhance the significance of the building. Second, the PPG advises that the applicant should follow the Historic England guidance contained in “Flooding and Historic Buildings 2nd Edition”, published in 2015.

1.7. Because the oldest part of Heriots was built in the early Seventeenth Century, it is very likely that land that was not known to flood was chosen for its location.

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2. MAPPED RISK OF FLOODING

- 2.1. Drawing 50, appended, based on a 1:10,000 scale Ordnance Survey Open Map plan with the red and blue lines of the planning application superimposed, shows contours, mapped risk of fluvial flooding, mapped risk of surface water flooding, and surface geology.
- 2.2. Flood Map for Planning classifies the eastern part of the site, including the footprint of the dwelling, as Flood Zone 2. This classification is not based on hydrological and hydraulic modelling, but on a record of the extent of a past flood held by the Environment Agency.
- 2.3. Wokingham Borough Council's most recent Level 1 Strategic Flood Risk (SFRA) Assessment, published in 2020, includes maps of recorded fluvial and spot flooding recorded. These maps are small scale and suggest that flooding of the site took place in 1991 but has not occurred since. However the highway to the east of the site is shown to have flooded more recently. The SRRA maps do not show the record of flooding which is the basis of the local Flood Zone 2.
- 2.4. In contrast the Surface Water Flood Map showing the estimated extent of of 0.1% AEP surface water flooding advises that the majority of the site is generally flood free.
- 2.5. The site is not mapped as at risk of breach of reservoir flooding. Nor is it mapped as at risk of flooding from any other man made water bodies.
- 2.6. Bedrock under the site is clay of the London Clay Formation, with no superficial deposits being mapped on the site.
- 2.7. There is a an abstracted aquifer present below the London Clay formation, and the site is classified as Source Protection Zone 3.

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- 2.8. The combination of local topography and the presence of the London Clay Formation means that the site is not at risk of groundwater flooding. This is confirmed by the SFRA.

3. LOCAL LAND DRAINAGE

- 3.1. A main river designated watercourse located at the rear of the verge on the eastern side of Wokingham Road supplies the local land drainage outfall. An ordinary watercourse is present at the back of the western verge of Wokingham Road. The latter watercourse is culverted alongside Heriots.
- 3.2. The winter water level in the main river watercourse permanently is very high, apparently exacerbated by an extended period of no essential maintenance having been done to the watercourse. Today the hydraulic capacity of the watercourse is extremely poor. The high water level is causing the culvert alongside Heriots to be flooded too.
- 3.3. A second main river designated watercourse is present just beyond Mr Holdstock's north western ownership boundary.
- 3.4. As subsoil is clay of the London Clay Formation, ground permeability is low, which normally would mean that surface water is discharged direct to watercourse. However Mr Holdstock advised that rainwater collected from the roof of Heriots is discharged to soakaways.
- 3.5. As evidenced by the contours shown on drawing 50, the area around Heriots is very flat, but the land has a general fall in a northerly direction.

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4. TRUE RISK OF FLOODING TO THE HOUSEHOLDER DEVELOPMENT

4.1. The part of the development which could be affected by flooding comprises the 24 square metre plan area garden room and the 20 square metre plan area link structure joining the 1980s extension to a garage. These two extension would have qualified as permitted development had Heriots not been a listed building and had the link structure roof been 0.3 m lower. In those circumstances no flood risk assessment could have been required.

4.2. It is clear that locally land drainage is poor, hampered by the high water level in and poor conveyance in the main river watercourse on the eastern side of Wokingham Road.

4.3. Mr Holdstock purchased Heriots in December 2010. He advised that although he has witnessed static flooding of his land on more than one occasion, the worst occurring in April 2023, in his experience the area within the planning application red line has not flooded. The area in which he experienced flooding is shown by the Surface Water Flood Map to be at risk of flooding in a 1% AEP event but not in a 3.33% AEP event.

4.4. Flooding of Mr Holdstock's land appears to surface water held up because it is unable to drain away to the watercourse rather than water already flowing along the watercourse channels or their flood plains flowing onto the land. Therefore the flooding of Mr Holdstock's land should be classified as surface water flooding rather than fluvial flooding. However from a practical perspective this is academic..

4.5. Table 1, below, shows pertinent site levels as measured on 18 October 2024.

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<u>Location</u>	<u>Level (m to local datum)</u>	<u>Height above April 23 flood level</u>
Ground floor level of original dwelling	10.00 (approximately 37.9 m AOD)	0.30
Ground floor level of new garden room and link structure	10.00	0.30
Ground level outside garden room	9.88	0.18
Level of April 2023 flood	9.70	0.00
Well water level	9.34	-0.36

Table 1: Site levels

4.6. Referring to Table 1, the floor level of the two extensions are 0.30 metres above the highest flood level observed in the last 14 years. They are the same as those at the original part of the dwelling and at the 1980s extension.

4.7. It is likely that the flooding experienced in April 2023 was more an event more frequent than 3.33% AEP, even though the Surface Water Flood Map suggests that it should be less frequent. This points to the Surface Water Flood Map underestimating the frequency of local flooding. The probable reason is that this Flood Map underestimated the conveyance of the main river on the eastern side of Wokingham Road.

4.8. The most salient question for this report to answer is if internal flooding of Heriots will or will not occur if in the design event, this being the worst 1% AEP event occurring in the lifetime of the development taking into account climate change related changes in that lifetime. The prediction of this report is that internal flooding is unlikely to occur. The reasoning is because the locality is very flat, the catchment area is small, and there is a huge volume of local storage below the finished floor level compared to the amount of run off which would fill it.

4.9. If more certainty is required, a detailed watercourse survey and hydrological and hydraulic modelling would have to be undertaken. These things are beyond the

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scope of the planning application.

5. SAFE ACCESS IN DURING FLOOD EVENTS

- 5.1. Flooding of Wokingham Road has the potential to be both deep and long lasting. The 0.1% AEP Surface Water Flood Map suggests that flooding along the route of Wokingham Road has potential to be hazardous to most people. However in a situation such as this where the dwelling exists already and no additional bedrooms are proposed, safe access is not an issue for planning because the development will not increase the resident population at Heriots.

6. FLOOD DAMAGE MITIGATION

- 6.1. The garden room and link structure have been built with tile floor coverings over solid concrete slabs. New walls at low level are of brick and blockwork. Plaster is gypsum. The garden roof has a timber framed French doors and a pair of timber framed floor to ceiling windows. Electrical outlets are set high to meet current Building Regulations.
- 6.2. Whereas the risk of internal flooding is high enough to recommend that new building works use flood damage resilient and quick drying materials exclusively at low level, the gypsum plaster does not comply with this specification. However the other construction materials do comply.
- 6.3. It would be more sustainable to change the gypsum plaster to a flood damage resilient material if and when it were to be damaged by flood water rather than have such work stipulated by a grant of planning consent today.

7. MAINTAINING FLOOD CONVEYANCE AND FLOOD STORAGE

- 7.1. The development will have no impact on flood conveyance as local flooding will be static. Although the development has the potential to remove a maximum of five

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cubic metres of storage from the climate changed 1% AEP flood plain, this is a tiny volume compared to the total flood plain storage. The adverse effect of this loss of storage does not justify undertaking flood compensation works even though Mr Holdstock has the ability to achieve compensation by altering levels on other parts of his land.

8. SURFACE WATER DRAINAGE

8.1. New roofs have been drained to existing underground rainwater drainage pipes, which Mr Holdstock believes are connected to soakaways. A check was made on drainage connections to the well; none were seen. It is possible that roof water in fact is connected directly or indirectly to the watercourse on the western side of Wokingham Road. However no camera survey of the culvert there has been undertaken and no covers on the culvert are visible. Therefore existence of pipe connections from Heriots to that watercourse, either from the 17th Century era dwelling or from the 1980s extension, remains uncertain.

8.2. Rainwater collected from the new roofs covering the 44 square metres of extensions will increase run off to the existing drainage system compared to the development prior to the development. This could lead to premature flooding of the drainage system affecting areas. However the extra roof area will not affect flood levels during an extreme event as rainfall on the “green field” ground would have contribute an identical floodwater volume as the roofs over the extensions because the ground would be saturated. This fact also means that the development would not contribute to cumulative impact on flooding from a number of other similar developments in the area, not that such similar developments are predicted to take place.

8.3. If performance of the drainage system serving the dwelling at Heriots becomes problematic, mitigation could be achieved, for instance by adding rainwater butts filled from downpipes by automatic flow diverters.

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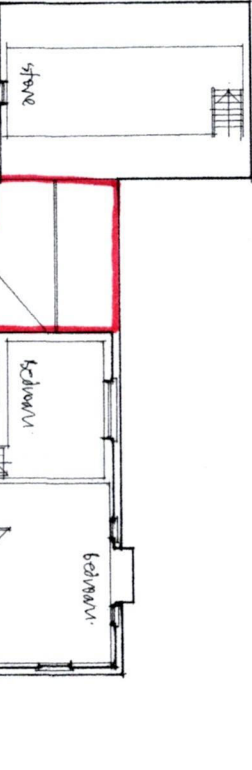
9. IMPACT ON WATERCOURSE MAINTENANCE

9.1. The development as proposed would not hamper watercourse maintenance. It is not located within eight metres of the main river watercourse on the eastern side of Wokingham Road, so no Environment Agency permit is required under main river bye laws.

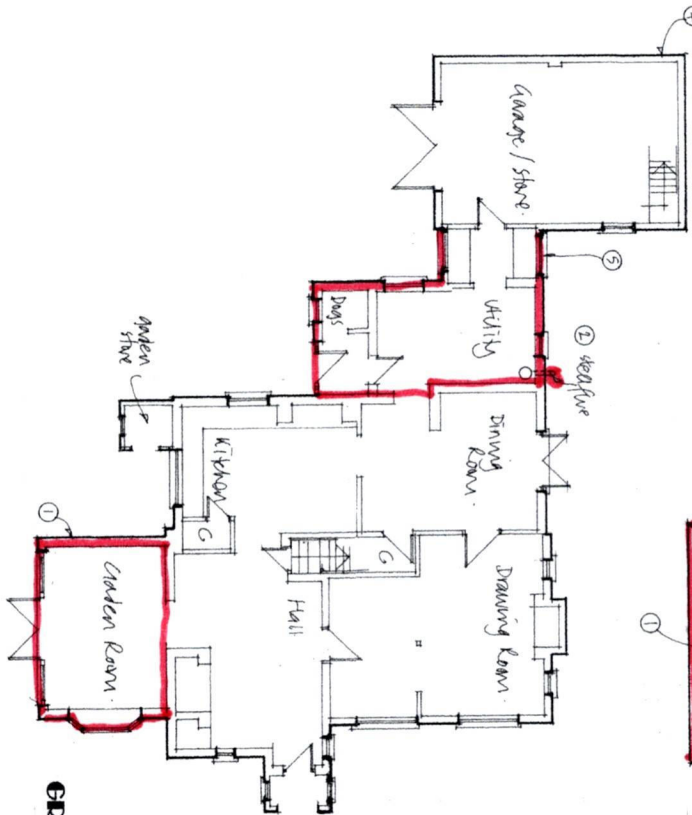
10. CONCLUSION

10.1. This report meets the requirement for flood risk assessment of the development as set out by NPPF. The development as built meets planning policy on flood risk as amplified by Paragraph 051 of the PPG. In particular the development would not have an adverse effect on a watercourse, floodplain or its flood defences, it would not impede access to flood defence and management facilities, and the cumulative impact of the developments with other householder developments in the area would not have a significant effect on local flood storage capacity or flood flows. The development will be safe for its users for the intended 100 year lifetime of the development, without increasing flood risk elsewhere, and be sufficiently flood resistant and resilient to the level and nature of the flood risk.

REVISED
A. Attached notes added



FIRST FLOOR



GROUND FLOOR

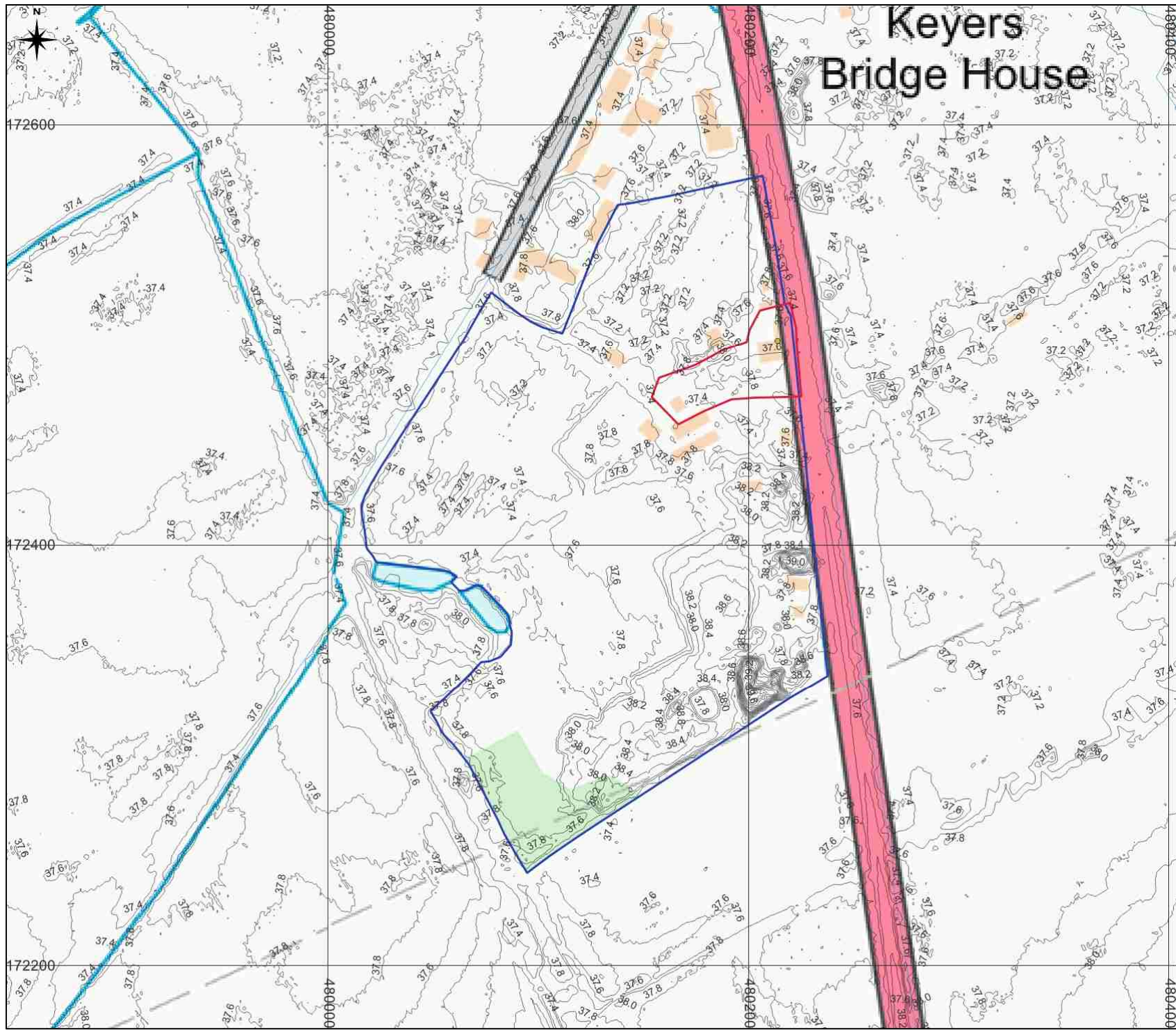


EXISTING FLOOR PLANS
1:200

1. ERECTION OF SINGLE STOREY EXTENSION
2. STEEL FLUE
3. REPLACEMENT OF TRIPLE WINDOWS WITH FRENCH DOORS
4. CLADDING OF BUILDING IN BLACK TIMBER (AS SHOWN)
5. LINK EXTENSION TO CURTILAGE LISTED OUTBUILDING
6. ENLARGEMENT OF FIRST FLOOR ELEMENT OVER KITCHEN

HERIOTS

Heriots Architecture Ltd			
Orchard End Hazley Bottom Healey Wetley Rothwell Leeds LS27 8LU Tel 01252 840026			
Job Title Heriots Worshipful Room 1st Flr Worshipful RCD 10 DEX			
Client Mr S Heddick			
Drawing Title Existing Floor plans			
Scale As shown	Dwg Size A2	Rev A	
Dwg No 2402/01			



TOPOGRAPHY

PLANNING APPLICATION BOUNDARY
PLANNING BLUE LINE

Grid Elevation
The Flood Hazard Rating is calculated using the following equation:

$$FHR = 0.4 \times V + 0.3 \times D$$

where:

- FHR = Flood Hazard Rating
- V = Depth of Flooding (m)
- D = Volume of Flooding (m³/m²)
- DF = debris factor calculated using Table 3.1

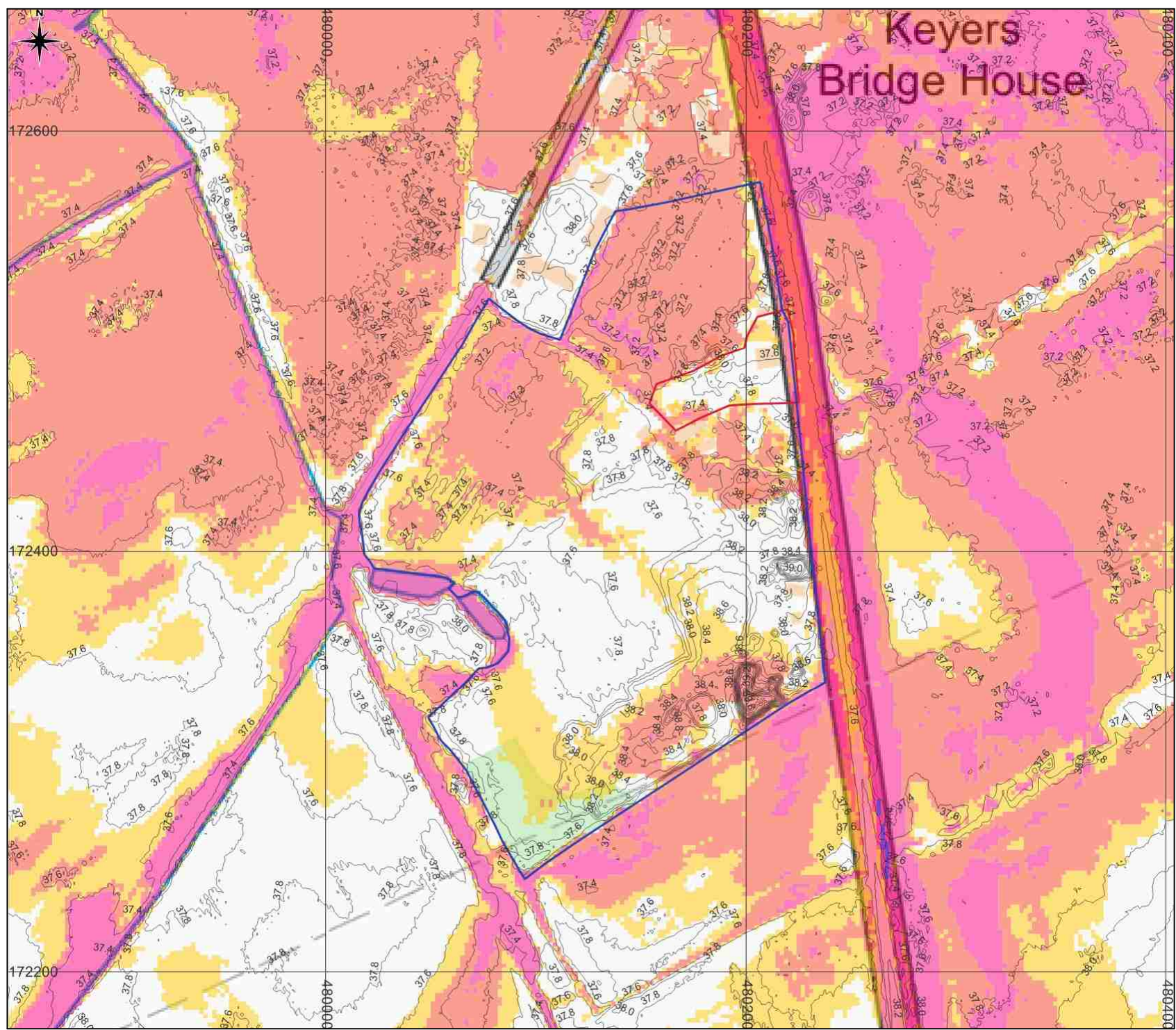
Table 3.1: Debris factor values for different flood depths, velocities and debris loadings

Flood Depth (m)	Velocity (m/s)	Debris Loading (kg/m²)	Debris Factor (DF)
0.1	0.25	0.1	0.1
0.1	0.25	0.2	0.2
0.1	0.25	0.3	0.3
0.1	0.25	0.4	0.4
0.1	0.25	0.5	0.5
0.1	0.25	0.6	0.6
0.1	0.25	0.7	0.7
0.1	0.25	0.8	0.8
0.1	0.25	0.9	0.9
0.1	0.25	1.0	1.0

Source: Environment Agency Flood Hazard Rating (FHR) Method

METHOD BY WHICH ENVIRONMENT AGENCY CALCULATES
SW FLOOD HAZARD RATING

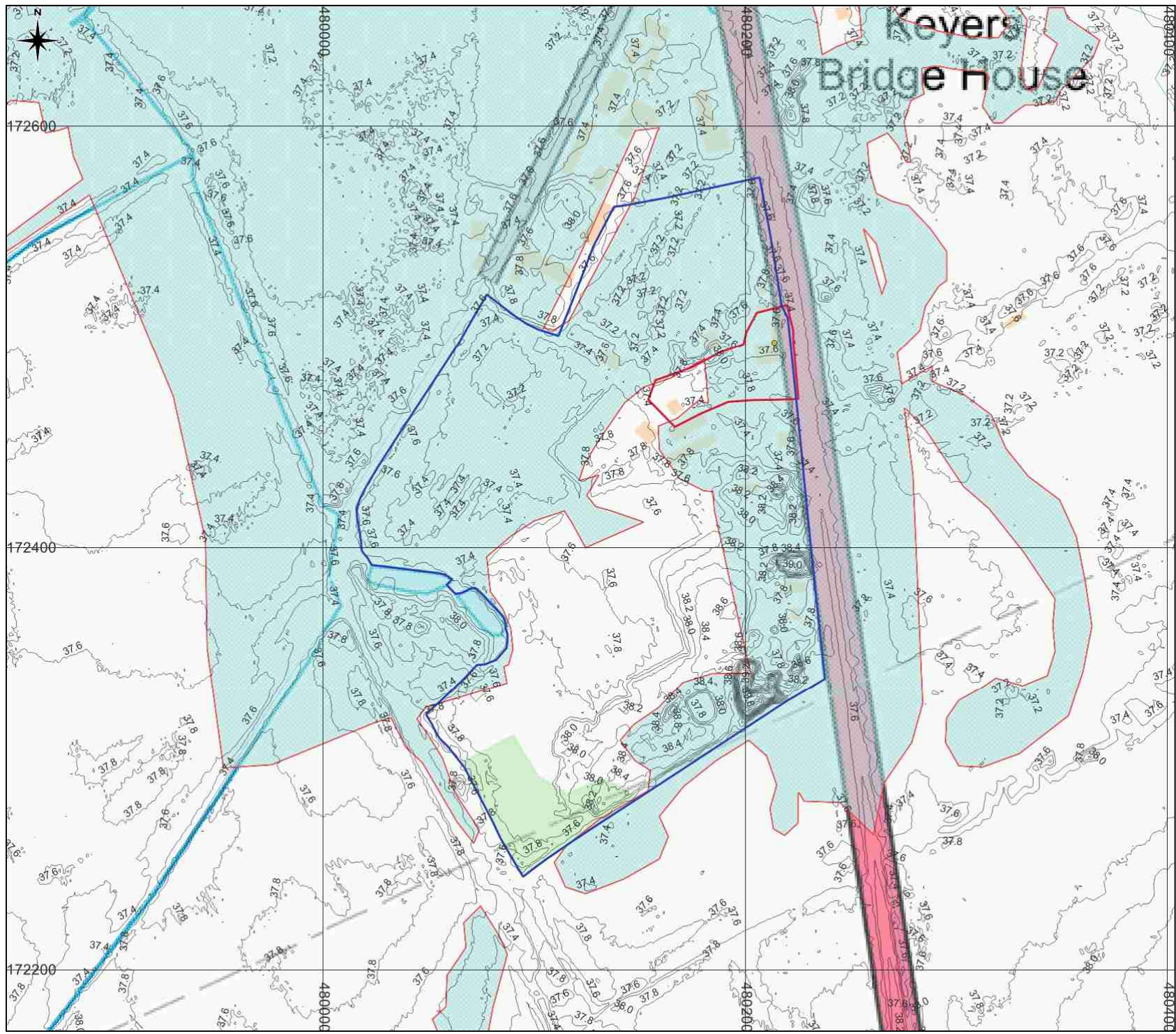
NB WHEREAS GUIDANCE FOR USE OF DEBRIS
FACTORS IS AS SET OUT IN TABLE 3.1, THE RISK OF
SURFACE WATER FLOODING MAP USES A DEBRIS
FACTOR OF 0.5 FOR VELOCITIES NOT EXCEEDING
0.25 M/S, AND A FACTOR OF 1.0 FOR VELOCITIES
EXCEEDING 0.25 M/S.



PUBLISHED RISK OF SURFACE
WATER FLOODING 0.1% AEP
HAZARD CLASSIFICATIONS AND
FLOOD EXTENTS.

UNCLASSIFIED HAZARD, 0.1-0.75,
GENERALLY NEGLIGIBLE DANGER
CLASS 1 HAZARD, 0.75-1.25,
DANGER FOR SOME
CLASS 2 HAZARD, 1.25-2.00,
DANGER FOR MOST
CLASS 3 HAZARD, > 2.00, DANGER
FOR ALL

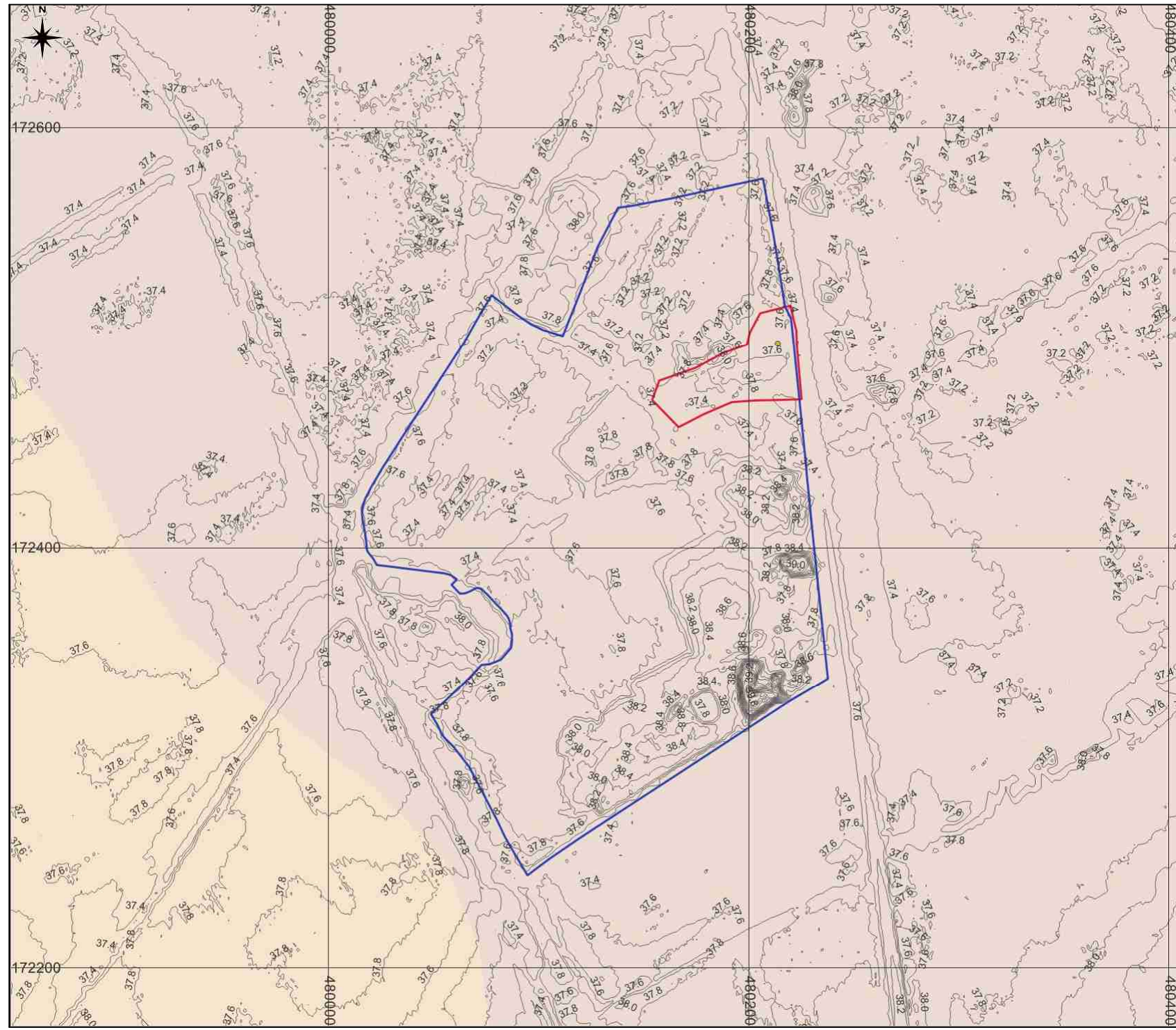
PLANNING APPLICATION BOUNDARY
PLANNING BLUE LINE



FLOOD MAP FOR PLANNING
FLOOD ZONES AND MAP OF
HISTORICAL FLOOD EXTENT
THERE IS NO RISK OF RESERVOIR FLOODING
MAPPED IN THE VICINITY OF THE SITE

FLOOD ZONE 3
FLOOD ZONE 2
RECORDED EXTENT OF HISTORICAL
FLOOD

PLANNING APPLICATION BOUNDARY
PLANNING BLUE LINE



PUBLISHED SURFACE
GEOLOGY
(LONDON CLAY FORMATION BEDROCK
EXTENDS BENEATH THE KEMPTON PARK
GRAVEL FORMATION)

LONDON CLAY FORMATION - CLAY,
SILT AND SAND BEDROCK
KEMPTON PARK GRAVEL MEMBER - SAND
AND GRAVEL SUPERFICIAL DEPOSITS

PLANNING APPLICATION BOUNDARY
PLANNING BLUE LINE

NOTES

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE FLOOD RISK ASSESSMENT FOR HOUSEHOLDER DEVELOPMENT AT HERIOTS.
- MAPPED FLOOD RISK AND GEOLOGICAL DATA SHOWN ON THIS DRAWING WAS DOWNLOADED FROM ENVIRONMENT AGENCY AND BGS WMS SERVERS ON 20 NOVEMBER 2024.
- THE METHOD USED BY THE ENVIRONMENT AGENCY TO DEFINE THE RISK OF SURFACE WATER FLOODING MAP IS SET OUT IN THE APRIL 2019 VERSION OF THE 2013 ENVIRONMENT AGENCY PUBLICATION "WHAT IS THE RISK OF FLOODING FROM SURFACE WATER MAP".
- CONTOURS SHOWN ON THIS DRAWING ARE COMPUTED FROM CURRENT OPEN GOVERNMENT LIDAR ONE METRE DIGITAL TERRAIN MODEL AND REPRESENT GROUND LEVELS.
- "AEP" IS THE ACRONYM FOR "ANNUAL EXCEEDANCE PROBABILITY".



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MR S HOLDSTOCK

HOUSEHOLDER DEVELOPMENT
HERIOTS, WOKINGHAM ROAD,
HURST, RG10 0RX

MAPPED FLOOD RISK AND
SURFACE GEOLOGY

Scale
1:2,500@A1

Date
20/11/24

Drawing Nr
50