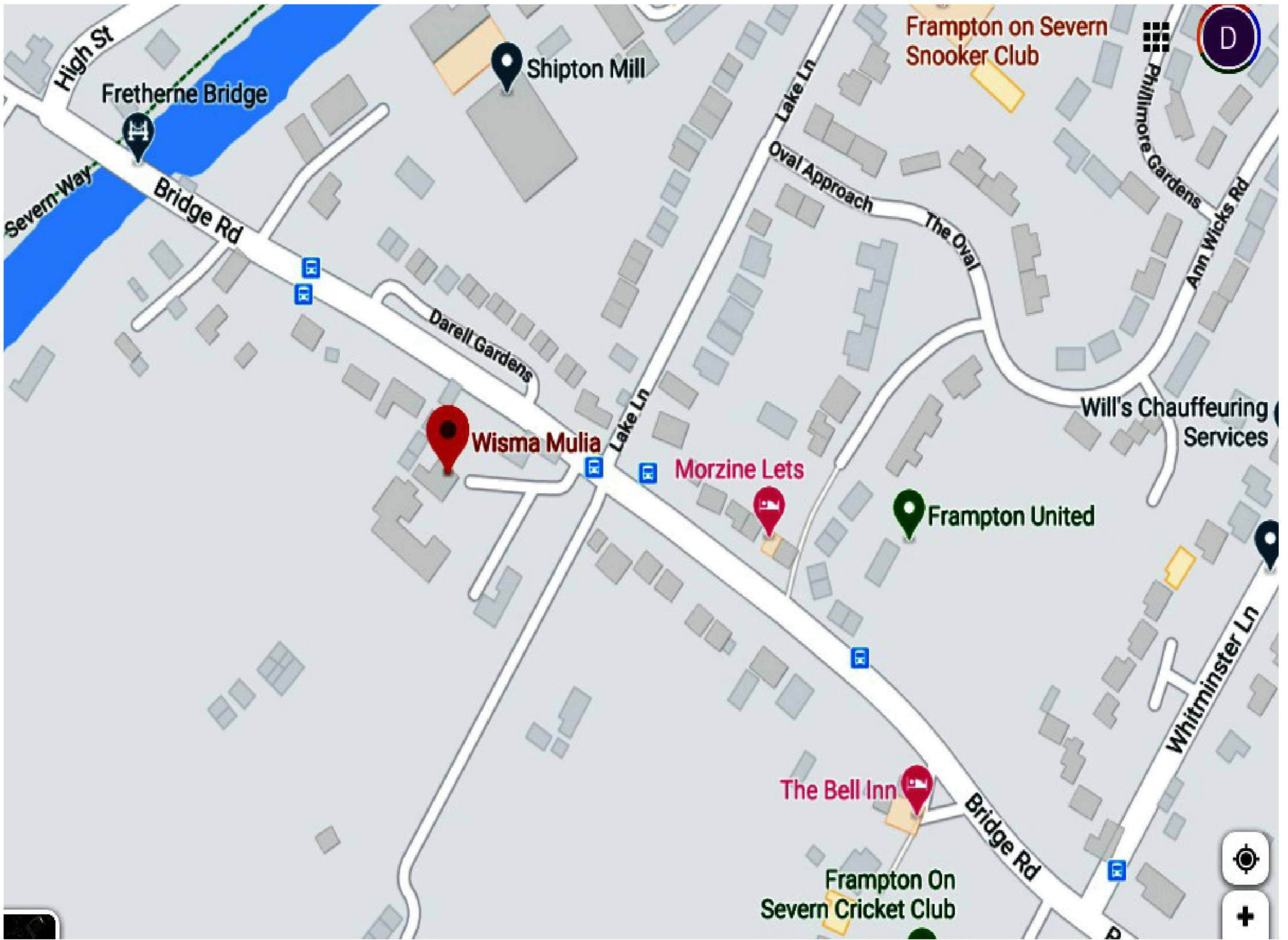


FLOOD RISK ASSESSMENT

PROPOSED MINOR DEVELOPMENT :

Wisma Mulia Bridge Road Frampton on Severn Gloucestershire GL2 7HE

Dated : 21 May 2020



GEOGRAPHICAL LOCATION

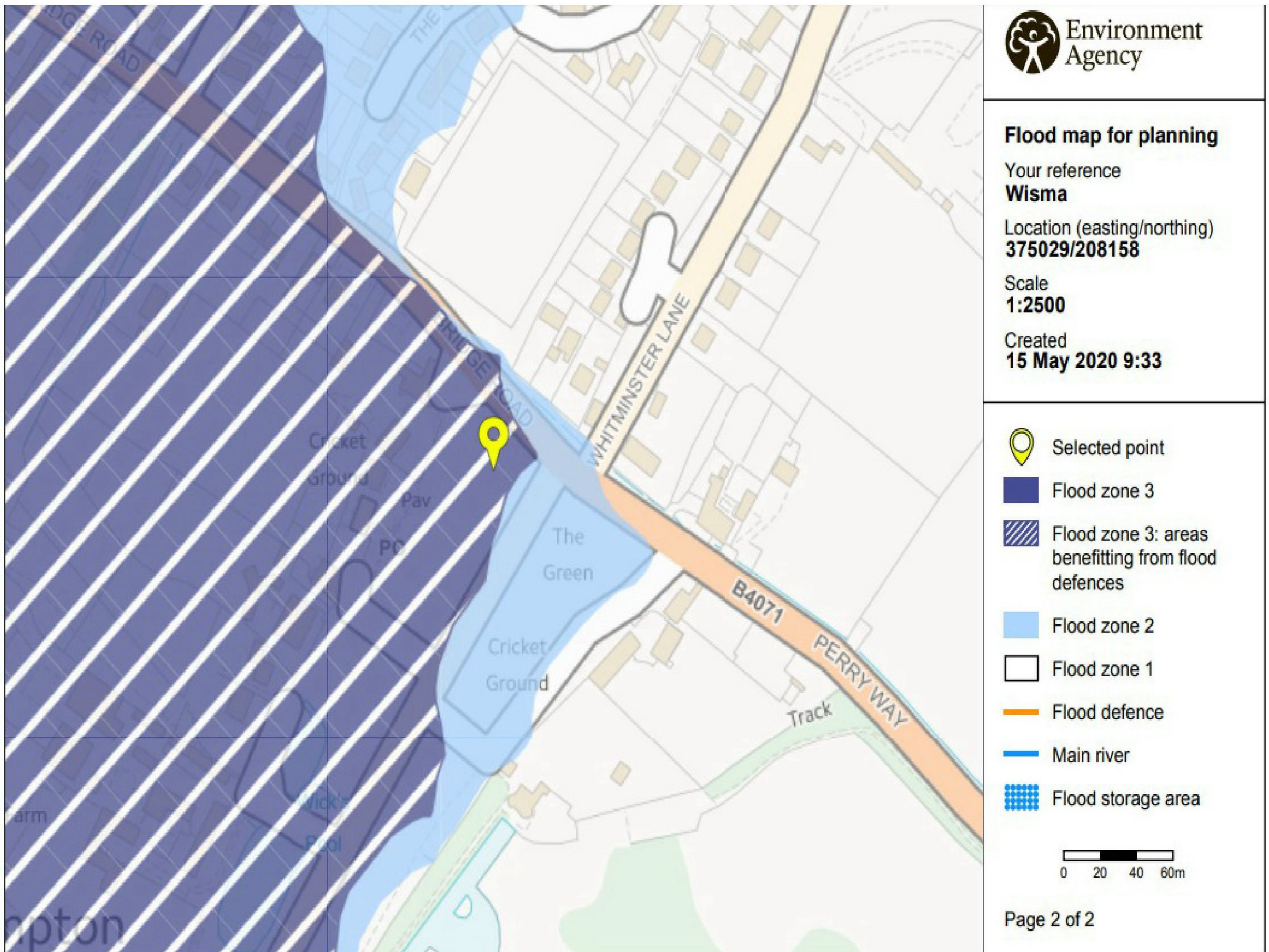
Flood map for planning

Your reference
Wisma

Location (easting/northing)
375029/208158

Created
15 May 2020 9:33

Your selected location is in flood zone 3 – an area with a high probability of flooding that benefits from flood defences.



LATEST FLOOD MAPPING SUPPLIED BY THE ENVIRONMENT AGENCY.

River Severn Model Node Point Map centred on GL2 7HE created 04/05/2020 [our ref. 168437]



1: 15000



SHOWS FRAMPTON ON SEVERN IN FLOOD ZONE 1 .

PROPOSED SINGLE STOREY RESIDENTIAL UNIT AT WISMA MULIA BRIDGE ROAD FRAMPTON ON SEVERN GLOUCESTERSHIRE GL2 7HE

FLOOD RISK ASSESSMENT / DESK TOP STUDY

This report is compiled to accompany a planning application for the above. Detailed plans are within the application.

It works to the criteria within the National Planning Policy Framework (NPPF) and the Environment Agency (EA) Advisory Notes to local authorities.

Wisma Mulia is a not- for- profit residential home established in 1970. It is seeking to create a new unit of minor proportions within the site to be used as a single bed unit of one storey.

The site lies close to residential and commercial development in the village of Frampton on Severn. The application land has not been the subject of historical flooding. This is officially recognised.

Possible Source(s) of flooding .

These are from the Lower Severn Estuary upon which the flood modelling is based and to a limited extent possibly from the regulated waterway , the Sharpness to Gloucester Canal .

Likelihood of Flooding and Flooding History

Information received from the EA indicates the application site is within Flood Zone 3 and Node points have been supplied to determine the possible level of flood with regard to the site .But this mapping does not include the presence of flood defences along the Severn.

Levels

The proposed development lies within a curtilage of approximately 0.075 ha. and has access to the north onto Bridge Road.

The general level of the application site is 9.42 AOD with the equivalent Bridge Road level of 9.72 AOD. The damp course level of the residential property to the west of the application site is 9.70 AOD

The pre-dominant risk to the site is from tidal influences emanating from the Lower Severn.

Subsequent to an earlier FRA the planning authority has notified the Environment Agency that it considers the site qualifies under the sequential test .Under the “more vulnerable” classification in \NPPF residential usage is allowed subject to the exception test being considered .This is covered in this report

The general level of the application site is 9.42 AOD with the equivalent Bridge Road level of 9.72 AOD. The damp course level of the residential property to the west of the application site is 9.70 AOD. The pre-dominant risk to the site is from tidal influences emanating from the Lower Severn Estuary.

In the flood level information provided by the EA the possible levels of flooding on site – in a worst case scenario – are based on the 1 in 200 year tidal level plus the level for climate change . These are 9.90mAOD and 10.42m(AOD) respectively.

However this has been changed by virtue of EA guidelines of February 2006.

Calculations have been carried out to meet these guidelines These give a new flood level of 10.03 AOD.

Severn Estuary.

In the Product 4 information pack it is stated in the accompanying letter it states “There is currently no additional detailed modelling information available in this location in respect of a breach of any flood defence.”

With freeboard allowance of 300mm this could mean that the proposed building would have to be set at a level of up to 10.72 which would be a metre above the ground floor level of the existing properties on site .

This is a matter for consideration by the planning authority on the basis of the difference between the existing and proposed floor levels .Such flood levels would amount to “danger for most” as set out in Table 13.1 of the DEFRA Technical Report FD2320

However its worth repeating that on the basis of the SFRA mapping this site has never flooded including the major floods of 2007 and 1947 and in any year before , during or after those events .

Also comments have been received from the EA which puts the worst case scenario into perspective .

Background to the Flood Risk

The site does have protection from Severn Estuary Flood Defences but these could be subject to overtopping in the 1 in 200 year tidal event .

The level of flood defences around “Arlingham Bend” on the Severn are at 10.00 metres and the EA have revised overtopping levels at 10.67m . It has been accepted that the level of risk in Arlingham is “moderate” On the basis of this the flood risk to Frampton would be “low” for the reasons as stated inn this FRA.

From previous modelling analysis it has been calculated that any inundation would take something like an hour and half to reach Arlingham so the progress and velocity of flood flow would certainly be slow and low respectively .

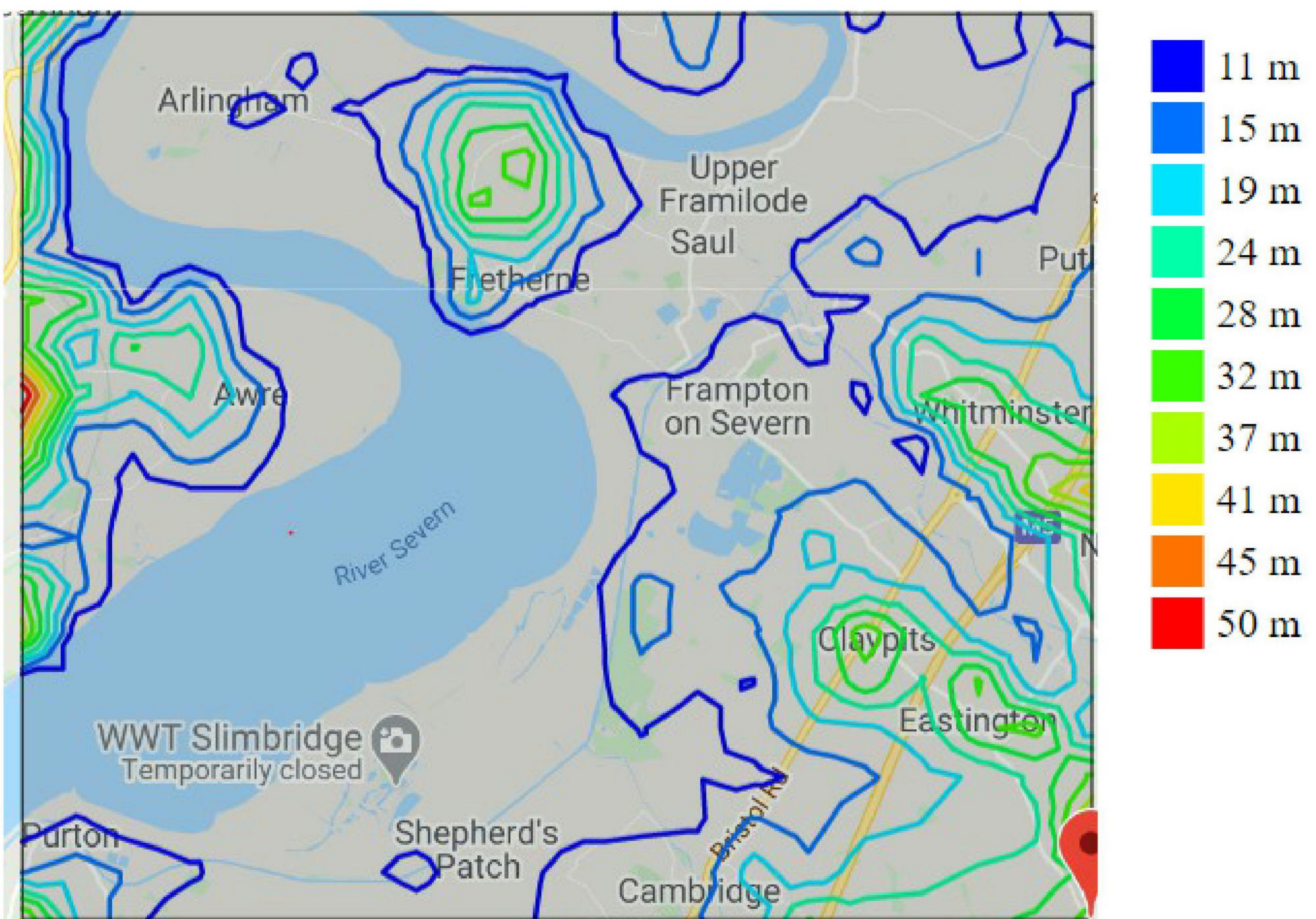
The same applies to Frampton on Severn because of the topography involved .

This is confirmed by the EA which in its response states that in a breach scenario the volume of water entering the flood cell (in which Frampton is located) would be significantly less than in comparison to the parameters which are used to define its flood map extents where no defences are present .

In the response the EA comments “As such it is likely that the depth and extent of flooding could be less than shown on our maps”

Because of this it was considered to check the topography on a wider scale. This shows that between Arlingham and Frampton on Severn there is an expanse of higher land which would act as a natural barrier to the progression of any flood water from the Arlingham loop .

See mapping below .



The mapping shows Frampton at 11m AOD. But the higher land at 28mAOD straddles the Arlingham loop forming a natural barrier to the progression of any flooding.

So a combination of man made defences and the natural topography forms a double barrier to any spread of flooding reaching Frampton on Severn.

This is totally consistent with the fact that there is no history of flooding at the site under assessment. Arlingham is nearly three and a half miles from Frampton on Severn. as the

crow flies. The overtopping levels at Arlingham loop have been revised to be put at 10.67AOD which is matched by the on site levels.

Flood mapping does rely , of course , on a certain amount of assumption and surmise.

The wide spread contour mapping offers a substantial and patent reason why Frampton on Severn has a long history of why it ha never flooded .

This is borne out by recent flooding across the country when two storms swept the country earlier this year which produced flood levels the highest since records began. They were biblical in their proportions.

Again the flood defences held firm with no breaches and no overtopping.

The Gloucester- Sharpness Canal

This must be considered secondary to the flood threat from the Severn . Investigations have been made with the lead management of the |Canal Trust which has the responsibility for this waterway .

The canal is 15 miles along and has water level sensors along its length . These trigger flood regulation procedures at a certain pre-ordained depth on a central control system . In the Frampton area is it confirmed that the channel is contained within sheet pile embankments and the maintenance level is assessed as good . It is also confirmed that in the event of a breach the flood risk would be put at “low”.

In fact in 2007 the Canal was used as a flood relief system when Gloucester was threatened with flooding. This operation saved hundreds of houses from flooding.

The resultant conclusion from this FRA is that in a worst case scenario inundation of the site under assessment would be relatively lengthy (hours rather than minutes) if it happened at all.

Safe ingress/egress

“Dry access” to the site has always been anecdotally maintained, and there are records available which indicate this point, from local sources, the local SFRA, and therefore safe access has always been established, for the area as a whole.

However the worst case scenario would show that unless occupants of Wisma Mulia were not warned of a possible inundation then dry ingress,egress would not be achievable

It is for this reason that it is recommended that the only safe way of dealing with a possible flood and affording protection to occupants is by flood evacuation and emergency procedures .

Flood Evacuation/Emergency Procedures

In order to take account of the possible extent of flood risk as indicated, it would be proposed, in view of the circumstances as regards such risk, that the proposed dwelling, the subject of this assessment, be a subscriber to the EA Flood Watch initiative,

However in the FRAs we compile all over the country we make it clear that there is only one method of safe evacuation. That is to get out when the escape route is still dry .

The Floodline initiative may give occupants of the site a misconception as to how long they should stay on site before going. We consider that the sight of advancing floodwater can create panic particularly to the old and infirm and children as well. Better to go at the first warning when everything can be done in a controlled and orderly manner and in the dry.

If the flood waters do not actually reach the site then nothing is lost . But there is a big gain in terms of safety. It will also show the evacuation plan works and will give everybody concerned the confidence of knowing the site owners value their safety.

We have used this methodology on many occasions for FRAs throughout the country . We have had no objections from the local authorities involved in all the FRAs recommending this form of early evacuation.

LA Emergency contingency departments have agreed with these measures as being constructive in saving lives.

This will ensure in the event of any modelled flooding that adequate time is available to vacate the site, given that adequate notice would be given if the River Severn, 1 kilometre away overtopped. A similar procedure should be adopted in the event of a breach of the Gloucester to Sharpness Canal. This in existence already.

Off-site Implications

Consideration should be given to the surface water run-off from the site and in view of the extent of any hard surface proposed for this assessment, an attenuation scheme based on a SUDS scenario will need to be agreed with the local authority, and the subject of agreement with them. This may comprise an area of permeable surfacing material to the parking and patio areas which will have a sealed or filtration base, which will achieve a partial Greenfield run-off.

This will achieve a betterment of that which currently persists; given the land is almost 50% permeable (Early Jurassic) comprising the Lias Group: mudstone and limestone. This aspect should be conditioned and be the subject of on site porosity testing according to the BRE Digest criteria.

Groundwater Consideration

On the basis of the site permeability provided above this is not considered to be a

problem . Neither have there been any such incidents historically .

Sewer Problems

There are no records of such a problem existing in this area .

Compensation

The nature of this proposed development does not materially affect a meaningful reduction in the flood plain capacity, on account of the proposed attenuation measures. It is also considered that the historic record of the site not having flooded should be a telling factor.

Artificial Source threat.

Apart the threat from the canal has been covered already in this report no other artificial sources of flooding exist in the locality.

Finished ground floor level

With a final flood level of 10.03AOD the final floor levels is below that at 9.64.AOD as shown in the plans.

It is therefore recommended that the finished floor level is raised a further 400mm to 10.04AOD which is considered appropriate in this case. There is actually little evidence to show the actual flood level would be anything but low , if any at all.

Were it to be raised any higher than that it would not comply with building regulations for elevations and ceiling heights

Flood Resilience Measures

As a precaution the following should be carried out:

Both the inside and outside of the proposed works should be coated in flood resilience material t 400mm above the ground floor level.

The electrical wiring should drop from the ceiling to sockets 400m above ground floor level

All drainage and water and waste pipes would be fitted with 'non-return valves' to prevent the ingress of contaminated water back into the building.

No metal piping should be used under the extension to abort future corrosion.

The mortar mix should include flood protective material.

The ground floor should be of concrete in preference to wood.

Air brick covers should be available at times of possible flooding.

The covers should be taken off immediately when flooding is over to aid drying out

Any entry doors should be floodproof.

Surface Water threat

According to EA mapping the threat is low

Reservoir Threat

None shown in EA mapping

Sustainable drainage

The BGS mapping for superficial and bedrock strata shows that there are historic levels of river terrace deposits of sand , silt , gravel mixed with some deposits of clay. This is considered to be conducive to soakaways being used from a small proposed building.

However ground tests to BRE regulations should be carried out at the site for permeability and the presence of groundwater.



A borehole sunk near the site shows that a clay layer was found 10 feet below ground level and no water was above that level . This is common when a clay layer is discovered because it has the effect of “capping” any groundwater underneath the clay layer and prevents its rise to ground level .

See bore hole scan below

Well made by <u>Cadbury Bros. Ltd. (local staff)</u>					
Information from <u>ditto. (see W6/198/34 data 11.3.98)</u>					
<u>Additional notes in space overleaf.</u>					
(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS		DEPTH	
		Feet	Ins.	Feet	Ins.
	If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far				
	Top soil.	1	6		
	Gravel.	8	0	9	6
g.	Clay.	10	0	19	6

CONCLUSION

A thorough investigation over a wide area has been carried out with regard to the performance of the River Severn in the area specific to this site. A picture has been built up to look into the question as to why the village of Frampton has never flooded.

The fact of the matter is that Frampton is actually protected by two defences. The river defences and a high embankment which straddles the Arlingham Loop to a height of 30m

Certain irregularities in the mapping have led to the EA saying that flood level heights may be less than those shown in the mapping. This point was made when this company did another FRA at Arlingham where we queried the flood mapping modelled levels. The EA said the flood threat would be low. We were successful with our FRA.

Between Arlingham and Frampton lies the embankment, an even greater barrier to the flood pathway from Arlingham.

There has to be a reason why Frampton has never flooded and I consider our answer to this lies in the two defences as outlined.

I have done all the calculations and I submit that the modelling should be reviewed to consider the issues raised in this FRA.

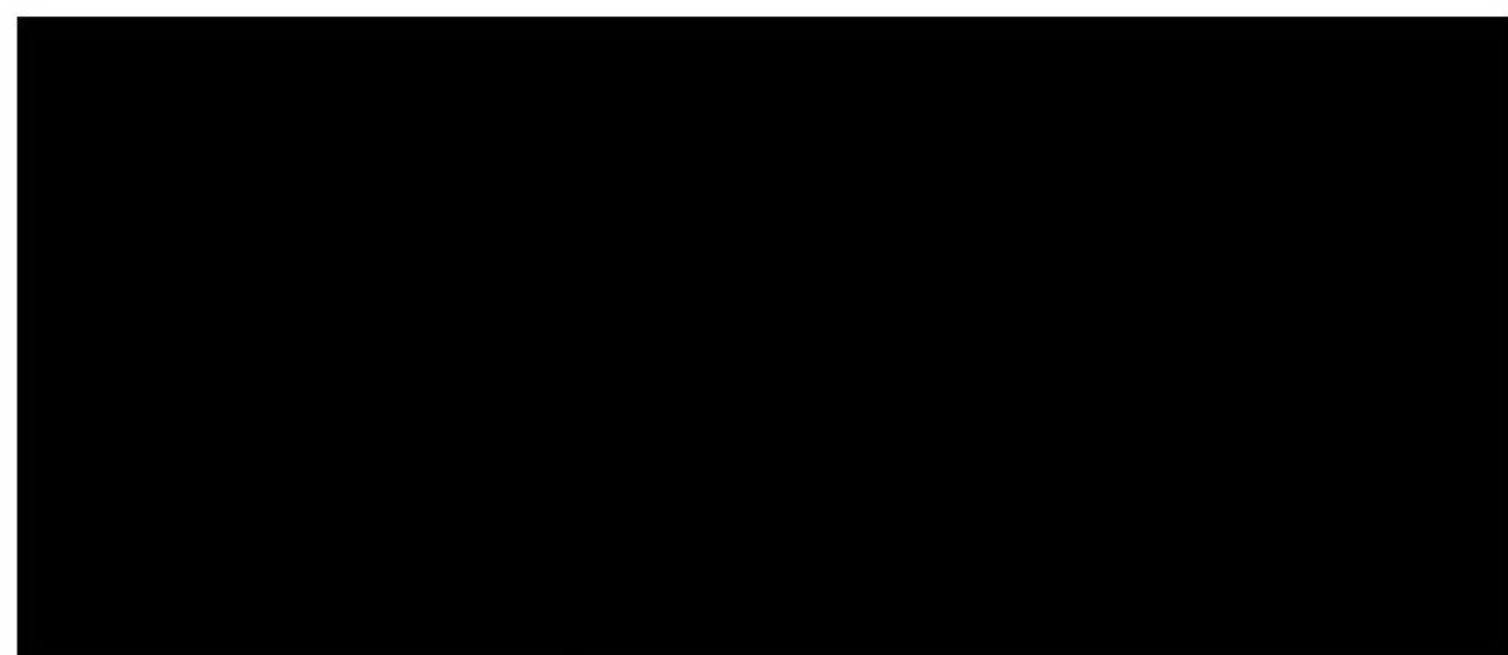
Meanwhile we also consider that with the evidence to hand, obviously not considered within the modelled mapping, the floor level of the property under assessment should be put at 9.64AOD in an area that hasn't flooded even with the cataclysmic storms since, and including, the year 2007.

This opinion has been formed by a company that due to its headquarters in Gloucester has carried out many FRAs in this area of the Severn. This report has been compiled on calling

on background knowledge over the last twenty years over a very wide area.

This report has been written under the criteria within NPPF and the EA Advisory Notes to local authorities.

Signed



Managing Director.