Flood Risk Assessment

For permitted development class MA prior approval application

Premium House, Worthing, BN11 2BJ

Revised 27/07/2023

Additional revisions 24/08/2023, scroll to end, to address the following comment by the EA:

The Flood Risk Assessment (FRA) needs to demonstrate that the finished floor level of the first floor is above the modelled flood level of a 0.5% Annual Exceedance Probability (AEP) event with the climate change adjustment for 2125. Guidance for these levels can be found at Flood risk assessments: climate change allowances - GOV.UK (www.gov.uk). Data for these modelled flood levels are provided in a product 4 pack and should be referred to within the FRA.

Introduction

This Flood Risk Assessment (FRA) has been prepared in accordance with the requirements of the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (PPG). The NPPF outlines how the planning system should help to minimise vulnerability and provide resilience to the impacts of climate change. This FRA therefore takes into account the updated Climate Change Allowances (updated 27 May 2022).

This FRA will demonstrate that the proposed development will be safe and will not increase the risk of flooding in the surrounding area.

Proposal

Prior approval for the conversion of existing commercial premises to residential use, under PD rights (Class MA). 4 Flats / floor are proposed at 1st, 2nd, 3rd and 4th floors with access and non-habitable use at ground floor level.

Flood Risk

The Government's Flood Maps for Planning indicates that part of the site is situated within Flood Zone 3 which means that the land and property have a high probability of flooding (Refer to Figure 1).

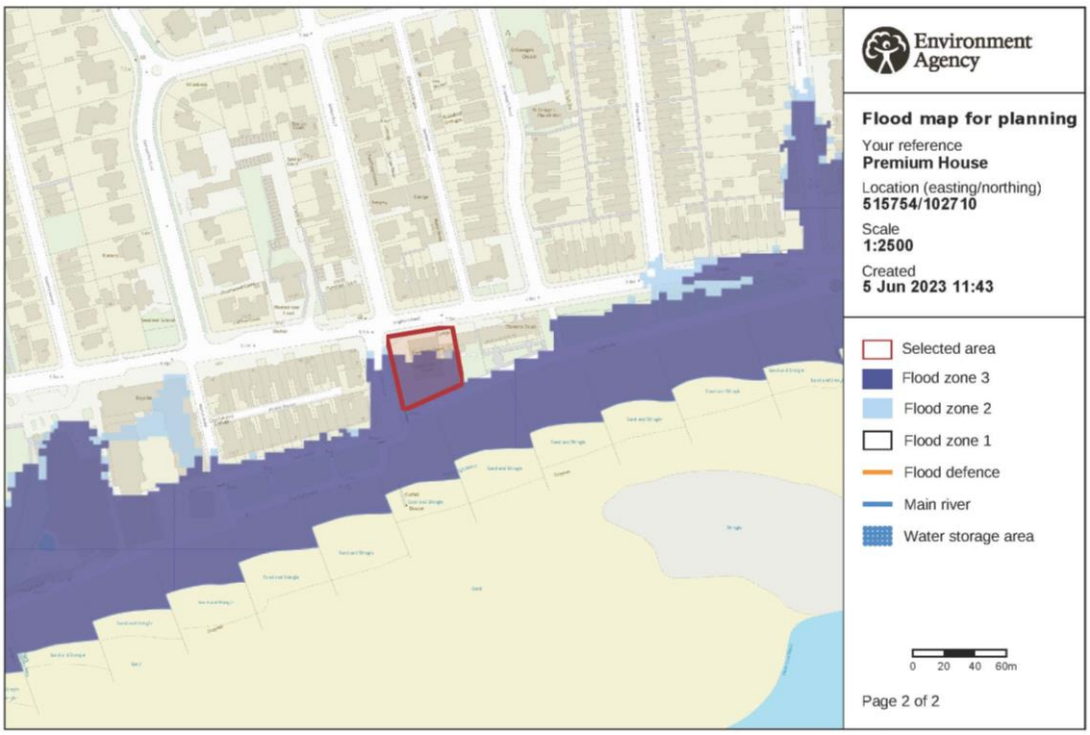

Figure 1 - Government's Flood Risk Maps for Planning for Premium House, BN11 2BJ

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Further to this, the site is situated in an area classified as 'low risk' of flooding from surface water (refer to Figure 2) and at 'low risk' of flooding from the sea (refer to Figure 3).



Figure 2 - Government's Flood Maps for Planning – Surface Water Flooding



Figure 3 - Government's Flood Maps for Planning – Flood extent from the sea

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The proposals consist of:

- Alterations and the conversion of the upper floors from commercial to accommodate a total of 16no. residential flats.
- Associated works to ground floor areas for access and ancillary use.
- No external changes

Residential development is classified as "More Vulnerable". Whilst the proposed change of use in technical terms would result in a change from a 'less vulnerable' use (office) to a 'more vulnerable' use (residential dwellings), this would only be from first floor upwards and therefore there would be no increased risk of any form of flooding to the proposed residential areas. The ground floor areas will be non-habitable accommodation (access only) and therefore not considered at risk in terms of flooding.

Climate Change Allowances

The Environment Agency's Guidance on Flood Risk Assessments (Climate Change Allowances) identifies that allowances for climate change must be made within flood risk assessments to help provide resilience to flooding and coastal change. Climate change allowances are predictions of anticipated change for:

- peak river flow
- peak rainfall intensity
- sea level rise
- offshore wind speed and extreme wave height

Peak River Flow Allowances

As identified within the Guidance, peak river flow allowances show the anticipated changes to peak flow by river basin district. As the site is not situated within close proximity to a river or any 'river basin district' as identified in Table 1, this allowance is not considered relevant to the proposals.

Peak Rainfall Intensity Allowance

As identified within the Guidance, increased rainfall affects river levels and land and urban drainage systems. As set out above, the site is not situated within close proximity to a river therefore the increased rainfall to river levels is not relevant to the proposals.

In terms of land and urban drainage systems, the Guidance states that drainage systems should be designed to make sure there is no increase in the rate of runoff discharge from the site for the upper end allowance (as identified in Table 2 of the Guidance).

The scheme does not increase the rate of runoff discharge from the site, when compared to the existing scenario with respect of hard surface areas, and is identified as within an area classified as 'low risk' of flooding from surface water (refer to Figure 2).

The proposals do not seek to amend the existing floor levels and seek the conversion to habitable use to upper floors only. Therefore, there would not be an increased rate of runoff discharged from the site for the upper end allowance.

Nonetheless, the peak rainfall intensity allowance is noted as follows:

For BN11 2BJ

Adur and Ouse Management Catchment peak rainfall allowances

For 3.3% annual exceedance rainfall events		
Epoch	Central Allowance	Upper End Allowance
2050s	20%	35%
2070s	20%	40%

For 1.0% annual exceedance rainfall events		
Epoch	Central Allowance	Upper End Allowance
2050s	20%	45%
2070s	25%	45%

Assuming worst case climate change scenarios and the residential change of use to have a lifetime of 100 years, the upper end allowance, for 2070s, is used.

According to the long term flood risk maps (gov.uk) there could be up to 300mm of flooding around the building. In a worst case scenario, (upper end allowance 2070s) of 45% this could increase the surface water flood depth to 435mm. As the Ground Floor FFL is approx. 450mm above external ground (where shown to be flood risk) it is not considered to be at additional risk of flooding due to client change allowances for surface water flooding.

At the ground floor the areas are considered 'less vulnerable' and at the first floor and above the uses as habitable space are considered 'more vulnerable'. However In all cases there is:

- No increase in flood risk elsewhere, other than that inherent in the existing building as there are no changes to the existing external scenario
- The proposed development will be safe from surface water flooding as all habitable spaces are on the first floor and above (FFL a minimum of 4.6m from external ground and 10.30m min AOD).

Sea Level Allowances

The Guidance sets out the anticipated sea level rise in Table 1 and requires FRA's to consider whether it is appropriate to apply high++ allowances in addition to the sea level rise allowances in Table 1.

As previously set out, the residential flats would be situated on first floor and above which are at a sufficient height to not be at detrimental risk from flooding.

Table 1: 'sea level allowances…' notes the following for our location:

South East – Upper End				
2000 to 2035 (mm)	2036 to 2065 (mm)	2066 to 2095 (mm)	2096 to 2125 (mm)	Cumulative rise 2000 to 2125 (m)
242	339	474	546	1.60m

Therefore with a sea level increase, at the upper end of 1.60m, the proposed development is not at risk of sea level flooding to habitable spaces.

H++ scenario – under the 'credible maximum scenario' of 1.9m sea level rise, the proposed development is not at risk of sea level flooding to habitable spaces.

Coastal erosion – it is considered beyond the scope of this prior approval application to comment on coastal erosion matters as there is no change to the existing scenario of the building and costal erosion is a matter for the local authority.

Access to the apartments would be from the ground floor via an existing dedicated access. This access immediately leads to a staircase to gain access to the first floor, a lift is also available and a secondary stair in the event of a fire.

During a flood event, two options exist for occupants; evacuate or remain in the property. It will be recommended to all future occupiers that where possible during a flood event, to remain in the building as all the residential flats are located on first floor and above.

The Environment Agency operates a flood warning system (Flood Warnings Direct) and it will be recommended that all future occupiers subscribe to this service.

Future occupiers will also be encouraged to produce their own Flood Plan tailored to their individual needs and circumstances. It will be the freeholder / landlord responsibility to ensure Flood Plans are in place.

To conclude, it is considered that the proposed conversion and extensions would not be at risk from anticipated sea level rise and even when considering the H++ scenario there is no risk of sea level flooding to the habitable spaces.

Offshore wind speed and extreme wave height allowance

The offshore wind speed and extreme wave height allowance has been considered within this FRA and are considered to be aligned with the Environment Agency's coastal models.

Based on Table 2: 'offshore wind speed and extreme wave height allowance…' it is noted to allow for a 10% increase in wind speed and wave height.

It is important to take into account storm surge when considering flooding from the sea at this site. Referencing the 'costal design sea levels – coastal flood boundary extreme sea levels (2018)' it can be seen that extreme sea levels are calculated to be around 4.2m AOD (for Newhaven, East Sussex, the closest monitoring site).

Based on Table 1, sea level rise, cumulative 2000 to 2125. It can be deduced that a worst case sea level rise from 2018 to 2125 will be 1475mm (aka 1600mm total – (6.9mm/yr x 18 yrs)

This would be a upper end storm surge of = 5.675m AOD (4.2m + 1.475m)

Taking into account a further 10% increase in wave height would present us with approx. = 6.25m AOD

To reiterate, the existing FFLs are:

- Ground floor FFL = +5.78m AOD
- First floor FFL = +10.33m AOD

Therefore, there is a not risk to the ground floor areas of storm surge flooding in the worst-case climate change scenarios, however wave heights may come above the ground floor FFL. It is re-iterated that there are no habitable spaces proposed at ground floor level and the accommodation to first floor and above is not at additional risk.

0.5% Annual Exceedance Probability (AEP) event with the climate change adjustment for 2125.

Based on the 'Modelled Flood Outlines' the site appears to be within the 0.5% AEP (2115). We can confirm that the First Floor FFL (+10.33m AOD) is above the modelled flood level of a 0.5% Annual Exceedance Probability (AEP) event with the climate change adjustment for 2115, for this location, which is 5.27m AOD for tidal undefended (worst case). It is noted that the Product 4 data provided is slightly out of date and gives the Modelled Flood Levels (mAOD) for 0.5% AEP for 2115. We have therefore used the climate change allowances/ Table 1/ 2096 to 2125, which states a yearly increase of 18.2mm sea level rise for south east upper end. Therefore this would give a sea level of 5.452m AOD for 2125. This is still well below the first floor FFL of +10.33m AOD where it is proposed to have habitable spaces.

Conclusions

To conclude, the proposed conversion will not increase the risk of flooding elsewhere.

Residents will be afforded an area of safe refuge during a flood event, should worst case scenarios result in flooding to the ground floor areas. It will be recommended for the freeholder to subscribe to the Environment Agency's flood warning system and residents will be encouraged to produce their own Flood Plan.

It is therefore considered that the proposal is acceptable with respect to flooding.