

# Boddingtons Planning

## **Flood Risk Assessment Willow Marina, Willow Lane, Wargrave**

### **Erection of marquee for temporary period**

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## **1.0 INTRODUCTION**

1.1. Boddingtons Planning has prepared this Flood Risk Assessment (FRA), on the instruction of Val Wyatt Marine.

1.2. The Report supports the erection of a marquee on the boat storage area to provide cover for the overwintering of boats and to allow some work to be carried out in dry conditions. There are no sides on the marquee

1.3. The requirements and policies of Wokingham Borough Council (WBC) and the Environment Agency (EA) have been taken into account when considering flood risk at the Site.

1.4. The purposes of the Report are:

- to confirm that the proposed development will not be subject to unacceptable flood risk or to show that flood risk can be managed acceptably.
- to demonstrate that the proposed development will not increase risk of flooding elsewhere.

1.5. The Report presents an assessment of flood risk in accordance with the National Planning Policy Framework (NPPF)2019 and its supporting Planning Practice Guidance (PPG), April 2015, both published by the Department of Communities and Local Government.

1.6. The NPPF and supporting PPG provide guidance on how flood risk should be considered during planning and development processes. The requirement to protect both new and established development from increased risk of flooding forms an essential part of the guidance.

1.7. Wokingham Borough Council is the Local Planning Authority (LPA), controlling flood risk and water environment issues, through policies and guidance presented in the WBC Local Flood Risk Assessment (LFRA), April 2015 and the Strategic Flood Risk Assessment (SFRA), February 2012.

1.8. WBC, in its role as Lead Local Flood Authority (LLFA), are a statutory consultee for all major applications. In terms of Flood Risk Vulnerability Classification the use for Boat Storage will remain the same.

## **2.0 THE SITE**

### **Location**

2.1. The Site is located on land to the east of The River Thames and to the west of Wargrave Road. Existing vehicular access is via Willow Lane of the A321 Wargrave Road. The Site comprises a Marina with 120 moorings. There are two existing buildings on the site housing boat related businesses. A 'house boat'

has been located on the site to provide office space for the Marina. The site extends to approximately 1.3ha.

2.2. To the north, south and east is predominately open farmland and the village of Wargrave is to the south east. To the North West are other residential and business properties. The A321 runs north south to the west of the site.

2.3. The Ordnance Survey national grid reference for the approximate centre of the Site is 478492E and 179320N. The Site location plan is presented as Figure 1.

#### Topography

2.4. No topographical survey was provided for this site.

#### Geology and Hydrogeology

##### Geology

2.5. British Geological Survey (BGS) mapping indicates that the superficial deposits beneath the Site are Alluvium - Clay, Silt, Sand and Gravel.

2.6. The bedrock geology beneath the Site comprises primarily Seaford Chalk Formation and Newhaven Chalk Formation (undifferentiated). The BGS map is reproduced as Figure 2.

2.7. Soilscape information indicates that the soil underlying the Site comprises loamy and clayey floodplain soils with naturally high groundwater.

2.8. The EA bedrock map indicates that the Site lies within a Principal Aquifer, as presented in Figure 3.

##### Ground Investigation

2.9. An intrusive ground investigation has not been undertaken on this site.

##### Hydrogeology

2.10. The EA Groundwater Vulnerability Map shows that the Site is within a Major Aquifer High Groundwater Vulnerability Zone, as shown at Figure 4.

2.11. The WBC SFRA map documents of the area around the Site confirm that there is no historical record of groundwater flooding

##### Watercourses

2.12. The nearest main river is The River Thames, which lies immediately to the west

of the Site. This river conveys surface water runoff from the wider catchment in a north westerly direction, eventually discharging into the sea, 70km to the east.

##### Existing Drainage

2.13. Asset plans have not been obtained for this site as the existing infrastructure is not being altered as part of the application.

2.14. The SFRA map documents of the area around the Site confirm that there are no known sewer flooding problems. The local SFRA map documents are reproduced as Appendix A.

### **Environmentally Sensitive Areas**

2.15. There are no Environmentally Sensitive areas in proximity of the Site.

## **3.0 DEVELOPMENT PROPOSALS**

3.1. The development proposals as shown on the Block Plan presented in Appendix B comprise a change of use of part of an existing building from office (B1) to café/shop (A3).

3.2. The building is located within a marina and as such falls under the classification use of 'Sui Generis'.

3.3. The Café and shop will be operated seasonally during the spring / summer months.

### **Site Access**

3.4. Current vehicular access to the Marina is via Willow Lane off the A321 Wargrave Road.

### **Vulnerability Classification**

3.5. Table 2 of the PPG provides a detailed list of the types of development falling into the vulnerability classifications. This list provides guidance on the various uses and their subsequent flood risk vulnerability classification.

3.6. The Site uses fall within the Water Compatible criteria, as the site is a Marina.

## **4.0 FLOOD RISK ASSESSMENT**

### **Fluvial Flooding**

4.1. Flood Zones shown on the UK Government flood maps for planning service are the main constraints used to inform the LPA when to consult the EA and LLFA on flood risk in development control decisions.

4.2. The Flood Zones refer to the probability of flooding and this varies depending on the source of flooding being fluvial or coastal. Flood Zones 1, 2 and 3 refer to low, medium and high risk of flooding. These zones for fluvial risks of flooding correspond to the Annual Exceedance Probabilities (AEP) of less than 0.1%, in the range of 0.1-1% and greater than 1% in any given year, respectively.

4.3. The Flood Zones, as described in the PPG, indicate the probability of flooding without the presence of defences and significant manmade structures such as bridges, culverts, and rail or motorway embankments. They show areas that

may be at risk from flooding and where further investigation in the form of a Flood Risk Assessment should be used to ascertain the probable risk of flooding on site.

4.4. An extract from the Flood Map (for the Site) is presented as Figure 5. This indicates that the Site is entirely located within Flood Zone 3 (High probability) defined as:

“Flood Zone 3 – Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.”

Therefore, the proposed change to the existing development is considered to be at high risk of fluvial flooding.

### **Existing Modelled Flood Data**

4.5. Product 4 (detailed flood risk) data was obtained for the site from the EA and is reproduced at Appendix C.

4.6. The modelled flood levels presented within the Product 4 data were taken from the ‘Thames (Whitchurch – Henley) Flood Mapping Study’ which was completed in August 2000. The flood levels for a range of return periods at the closest most appropriate model node point are presented in Table 1 (below).

### **Floodplain Flow Conveyance and Storage Capacity**

4.7. The Site is located within Flood Zone 3b – ‘the functional floodplain’ as indicated in the Product 4 data. As the footprint of the existing building is to remain unaltered, there will be no additional loss of flood storage or flood flow conveyance.

### **Coastal Flooding**

4.8. The Site lies over 70km from English Channel and is not located within the tidal reaches of The River Thames at risk of coastal flooding as indicated on the Government flood maps.

### **Safe Access**

4.9. The Site is located within an area at high risk from fluvial flooding. The access arrangements have not changed due to the development. Willow Lane is the main means of access and will flood. Therefore, access to the development will be restricted during these times.

4.10. Flooding in this location has a long lead-in due to the flood waters coming from the upstream catchment. Any flood warnings will give sufficient time to make safe the site and evacuate.

4.11. When flood waters are evident the site will not be accessed by the public.

Climate Change

4.12. EA Climate Change Allowances for Flood Risk Assessments were updated in February 2016. This advice updates previous climate change allowances to support the NPPF.

4.13. The climate change allowances include predictions of anticipated change for peak river flows by river basin district.

4.14. The River Thames is situated within the Thames River Basin District. Peak river flow allowances for the Thames River Basin are presented in Table 3.

River Basin District	Allowance Category	Total potential change anticipated for the '2020s' (2015-2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Thames	Upper end	25%	35%	70%
	Higher Central	15%	25%	35%
	Central	10%	15%	25%

**Table 3: Peak River Flow allowances for River Thames Basin**

4.15. The EA have produced guidance for use in flood risk assessment in the Thames Area which defines possible approaches to account for flood risk impacts due to climate change in development proposals.

4.16. Table A of the guidance states that the 'Basic' approach is considered to be the Appropriate method in this instance which allows an allowance to be added to the design flood (1%AEP) to account for the potential climate change impacts.

4.17. Table B of the guidance provides local allowance for potential climate change impacts. For 'less vulnerable' development in sensitive locations, the higher central climate change allowance should be used to inform built in resilience measures in FZ 3. Therefore, 700mm will be added to the 1%AEP modelled flood level to determine the impact of climate change on the change of use application.

Node Label	Grid Ref:	1%AEP	Flood Depths (m)	1%AEP
06100_MN_072	478440,179200	34.17		34.87

**Table 4: Climate change flood levels**

4.18. This increases the potential depth of flooding at the site to 1.47m

## **]Groundwater Flooding**

4.19. Groundwater flooding occurs where groundwater levels rise sufficiently to intersect the ground surface and flow onto low-lying areas. Generally, groundwater flooding may be a problem where developments are over permeable soils or rocks.

4.20. The WBC SFRA map documents of the area around the Site confirm that there is no historical record of groundwater flooding and that the AStGWF map suggests the area is mostly in the lowest category of risk of groundwater flood emergence.

### **Surface Water Flooding**

4.21. Surface Water Flooding occurs when the intensity of rainfall exceeds ground infiltration. Typically, this happens where the ground surface is impermeable, such as roads and paved areas within urban development and where there are impermeable soils, such as clay.

4.22. The risk of flooding from surface water runoff is greater in locations that are situated adjacent to sloping land, within natural valleys and/or are within local depressions.

4.23. The Government map 'Flood risk from surface water' shows that the Site lies primarily within an area at low risk of surface water flooding.

4.24. The surface water flood map is reproduced as Figure 6.

4.25. The WBC SFRA's FMfSW indicates a potential flow path, shown to the west edge of the Site for the 1000yr map along with other small areas of ponding.

## **Flooding from Infrastructure Failure**

4.26. Where infrastructure retains, transmits or controls the flow of water, flooding may occur if there is a structural, hydraulic, geotechnical, mechanical or operational failure. There are three main categories of infrastructure associated with this mechanism of flooding:

- Failure of infrastructure designed to store or carry water (e.g. dam break, canal leak, burst water mains).
- Failure of infrastructure designed to protect an area from flooding (e.g. breached flood defences, flap valve or penstock failure, pumping station failure).
- Failure of a pipe, bridge or culvert due to blockage.

4.27. The Site is adjacent to the River Thames, there are no formal flood defences in this location. Therefore the risk of flooding from this mechanism of flooding is considered low.

## **Historical Flooding**

4.28. The WBC SFRA historic flooding map FMfsSW shows a history of surface water flooding at the Site.

4.31. Information contained within the Product 4 data supplied by the EA, indicates that there have been 6no. recorded flood events at the Site the latest of which was in the winter 2013/2014.

## **Sequential and Exception Tests**

4.32. The Site is classified as Flood Zone 3. As the development proposals involve a change of use within the same vulnerability classification 'less vulnerable' the sequential and exception tests are not required.

## **5.0 FLOOD MITIGATION**

5.1. The development proposals comprise the erection of a marquee for the winter months to cover existing boat storage

### **Flood Awareness, Warning and Evacuation**

5.2. The site has an existing storage classification. The existing process will continue

5.3. The proposed use as café/shop is intended to be used during the summer season when the risk of flooding is lower.

5.4. The operators of the café/shop will be committed to the flood warning service, Floodline, provided by the EA.

5.5. If and when flood warnings are received from the above service, the café/shop will be made safe, removing furniture and perishable goods to a place above the flood level and closing the building to employees and clients.  
Flood Resilience

5.6. The site is located within FZ3 with a modelled 1%AEP climate change flood level of 34.87m AOD which could represent a depth of flooding within the building of 1.47m.

## **CONCLUSIONS**

6.1 This Report presents an assessment of flood risk in accordance with the guidelines set out in the NPPF and it's supporting PPG, as well as the policies of WBC, and the EA.

6.2. The report confirms that the Site is suitable for the proposals and complies with the policies of the EA.

### **Flood Risk**

6.3. The Government Flood Maps indicate that the Site is at a high risk of fluvial



flooding, and a low risk of surface and reservoir water flooding.

6.4. The SFRA indicates that there have been historical surface water flood events at, or in proximity of the Site.

6.5. The Report demonstrates that the proposed development will remain at a high risk of flooding due to the nature of the site. The café and shop will operate during the summer season. To mitigate against the effects of flooding, flood resilient techniques will be used to fit out the café and shop.

6.6. Although the Site is located within FZ3, the proposals will not increase the Built footprint of the site and will therefore not increase the loss of floodplain storage or conveyance and will therefore not create an unacceptable increase in flood risk elsewhere. The boat storage that currently occupies the site will remain unchanged

6.7. In summary, the proposed development is located on an area at high risk of flooding but the proposals will not increase the risk of flooding elsewhere.

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6.8. With regard to the above, it is concluded that the proposed development complies with WBC, EA, and NPPF guidance.