Flood Risk Assessment

Land South of Broadland Gate, adjacent to Postwick Interchange, Norwich

Monte Blackburn Ltd and Pigeon Investments Ltd

Project No: 16325

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1.0 INTRODUCTION

1.1 This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. The FRA has been produced on behalf of Euro Garages in respect of a planning application for the proposed development at Broadlands Gate, Postwick, Norwich.

Table 1.1 - Site Summary

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Broadlands Gate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Yarmouth Road, Postwick, Norwich</td>
</tr>
<tr>
<td>NGR (approx.)</td>
<td>E 629101 N 308467</td>
</tr>
<tr>
<td>Development Type</td>
<td>Mixed use</td>
</tr>
<tr>
<td>NPPF Vulnerability</td>
<td>Less</td>
</tr>
<tr>
<td>EA Flood Zone</td>
<td>Site is in Flood Zone 1</td>
</tr>
<tr>
<td>EA Office</td>
<td>East Anglia</td>
</tr>
<tr>
<td>Local Planning Authority</td>
<td>Norfolk County Council</td>
</tr>
</tbody>
</table>

Sources of Data

1.2 The report is based on the following information:

(i) Site Layout Plan (Appendix A)
(ii) Existing Site Layout Plan (Appendix B)
(iii) Environment Agency information
(iv) North Norfolk District Council Strategic Flood Risk Assessment

Existing Site

1.3 The site is currently Greenfield with a temporary vehicle storage facility located on the west of the area, the site is located to the East of Norwich close to the village of Postwick. The land is bounded to the south by the A1042 and to the north by the A47; a site location plan is included as Figure 1.1 for reference.

1.4 The site is within the surface water catchment area of the River Yare, 500m to the south.
The proposed development site is 2.05Ha and the development comprises of a mixed use scheme with petrol filling station, food retail units and HGV parking area.

**Flood Risk Planning Policy**

*National Planning Policy Framework*

1.6 The NPPF\(^1\) sets out the Government’s national policies on different aspects of land use planning in England in relation to flood risk. Planning Practice Guidance is also available online\(^2\).

1.7 The Planning Practice Guidance sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where possible, and stresses the importance of preventing increases in flood risk off site to the wider catchment area.

1.8 The Planning Practice Guidance also states that alternative sources of flooding, other than fluvial (river flooding), should also be considered when preparing a Flood Risk Assessment.

1.9 This Flood Risk Assessment is written in accordance with the NPPF and the Planning Practice Guidance.

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\(^1\) National Planning Policy Framework, CLG, March 2012

Flood Zones

1.10 The Flood Zone Map for Planning has been prepared by the Environment Agency. This identifies areas potentially at risk of flooding from fluvial or tidal sources. An extract from the mapping is included as Figure 1.2.

![Flood Zone Map](image)

**Figure 0.1 - Environment Agency Flood Zone Mapping**

1.11 The site is shown to be entirely within Flood Zone 1 (low Probability). Flood Zone 1 is defined as land assessed as having less than a 0.1% annual probability of flooding.

1.12 Table 2 of the Planning Practice Guidance classifies land use. Under these classifications the proposed extension is considered to be ‘Less Vulnerable’ to the potential impacts of flooding.

1.13 Table 3 of the Planning Practice Guidance identifies that any development which is ‘Less’ vulnerable is considered appropriate within Flood Zone 2, subject to suitable mitigation measures.

<table>
<thead>
<tr>
<th>Flood Risk Vulnerability Classification</th>
<th>Essential Infrastructure</th>
<th>Water Compatible</th>
<th>Highly Vulnerable</th>
<th>More Vulnerable</th>
<th>Less Vulnerable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood Zone 1</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Flood Zone 2</td>
<td>✓</td>
<td>✓</td>
<td>EXCEPTION TEST REQUIRED</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Flood Zone 3a</td>
<td>EXCEPTION TEST REQUIRED</td>
<td>✓</td>
<td>x</td>
<td>EXCEPTION TEST REQUIRED</td>
<td>✓</td>
</tr>
<tr>
<td>Flood Zone 3b</td>
<td>EXCEPTION TEST REQUIRED</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>
Other Relevant Policy and Guidance

Strategic Flood Risk Assessment

1.14 The Broadland District Council Council Strategic Flood Risk Assessment³ (SFRA) was prepared to review flood risks on a much wider scale to assess the potential for new development within the study area. The SFRA was used as an evidence base for Local Development Frameworks for each Local Planning Authority.

1.15 The SFRA therefore aims to bring together all available flood risk information for a variety of sources to provide a robust assessment. The SFRA therefore is useful for this site-specific FRA by highlighting available data and instances of known flooding in the area. Although written under the guidance of Planning Policy Statement 25, the SFRA is still considered to include relevant information.

³ JBA(2006); Strategic Flood Risk Assessment, Broadland District Council
2.0 POTENTIAL SOURCES OF FLOOD RISK

2.1 The table below identifies the potential sources of flood risk to the site, and the impacts which the development could have in the wider catchment prior to mitigation. These are discussed in greater detail in the forthcoming section. The mitigation measures proposed to address flood risk issues and ensure the development is appropriate for its location are discussed within Section 3.0.

Table 2.1 - Pre-Mitigation Sources of Flood Risk

<table>
<thead>
<tr>
<th>Flood Source</th>
<th>Potential Risk</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Fluvial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tidal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groundwater</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reservoirs and water bodies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sewers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pluvial runoff</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Fluvial Flood Risk

2.2 The site is shown to be located entirely within Flood Zone 1 (Low Probability).

Flood Risk from Reservoirs & Large Water bodies

2.3 Reservoir failure flood risk mapping has been prepared by the Environment Agency, this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst case scenario and is only intended as a guide. An extract from the mapping is included as Figure 2.1.
2.4 Mapping demonstrates the site and possible access routes are far removed from the flood extent associated with flooding from large reservoirs. As such, the risk posed from this source is considered high. Mitigation measures to address the residual risk posed are discussed within Section 3.0 of this report.

**Flood Risk from Sewers**

2.5 Sewer records show no public sewers are located in the vicinity of the site therefore it is considered to have low risk of flooding from sewer.

**Pluvial Flood Risk**

2.6 Risk of flooding from surface water mapping has been prepared by the Environment Agency, this shows the potential flooding which could occur when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. An extract from the mapping is included as Figure 2.2.
Mapping indicates no pluvial flooding in the site area therefore the development is considered low risk in terms of pluvial flooding.

**Drainage Strategy**

**Surface Water Drainage**

NPFF requires that surface water arising from a developed site should as far as practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to redevelopment. Opportunities to reduce the surface water run-off and the associated flood risk should be identified and climate should be taken into account.

Building Regulations (Part H), NPFF and Environment Agency advice notes require the consideration of sustainable drainage techniques for new developments. Surface water drainage should be considered in accordance with a prescribed hierarchy aimed at minimising the impact of the development. Surface water flows should be designed to discharge to:

- Infiltration based systems e.g. soakaways / porous pavements.
- Watercourses
- Surface water sewers
- Combined water sewers
Designers should evaluate drainage options in accordance with this hierarchy.

2.10 On-site percolation test in accordance to BRE 365 will need to be carried out to prove the viability of soakaways for the development. However it is known that adjacent developments have utilised infiltration techniques for surface water drainage and due to the lack of suitable watercourses/sewers as an alternative and in line with the SuDs hierarchy it is assumed a similar approach can be used on this development, subject to testing on site.

**Foul Water Drainage**

2.11 As with surface water, no adopted sewers are evident close to the development based on the sewer records received from Anglian Water. The development will require a foul connection as infiltration techniques cannot be used for the foul due to the dense site layout and also the type of development being proposed, i.e. petrol stations and hotels are deemed not suitable for foul infiltration drainage.

2.12 Based on the above it is likely that a requisition sewer and pumping will be needed to provide the development with an appropriate foul drainage provision. Further liaison with Anglian Water is to be progressed to determine the scope of works required to provide this off site connection.
3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. The FRA has been produced on behalf of Euro Garages in respect of a planning application for the proposed mixed use development at Broadlands Gate, Postwick, Norwich.

3.2 This report demonstrates that the proposed development is not at flood risk.

3.3 In compliance with the requirements of National Planning Policy Framework, the development could proceed. Moreover, the development will not increase flood risk to the wider catchment area subject to a suitable management of surface water runoff discharging from the site.

PREPARED BY

Andy Dyson

On Behalf of Topping Engineers
Appendix A

Development Proposals
Appendix B

Existing Site Plan
Drainage Strategy

The site is located in Flood Zone 1 but is over 1ha, therefore Topping Engineers have produced a site specific Flood Risk Assessment.

Ground conditions are expected to be viable for the use of soakaways, however testing will be undertaken to prove the exact infiltration rate. Ground conditions are shown to be sandy gravels from the geology maps. The site is location in Groundwater protection Zone 3 and therefore suitable protection measures are shown to deal with pollution risk by way of petrol/oil interceptors and the petrol station external area drainage to foul sewer with forecourt interceptor.

For the purposes of this strategy it is assumed infiltration will be viable and a percolation rate of 5x10^-5m/s has been assumed which is a conservative estimate for such ground types.

Based on the infiltration rate private soakaways have been designed as indicated on the layout for the development surface water flows to accommodate flows up to 1m/100 years plus climate change.

No foul water assets are located nearby and foul drainage via infiltration will not be viable due to the proposed site use and the site layout being too constrained in terms of suitable landscaped area for locating a drainage field. It is assumed a reprocessing sewer and pumping will be required for the development subject to further liaison with Anglian Water to determine the scope of any off site drainage works required.