JD1: 466

CLAREMONT
PLANNING CONSULTANCY

Planning Policy Team
South Cambridgeshire District Council
Cambourne
Cambridgeshire
CB23 6EA

5 November 2019

Dear Sir/Madam

ADDITIONAL FLOOD MODELLING INFORMATION PERTAINING TO LAND AT BANNOLD ROAD, WATERBEACH SUBMITTED TO THE GREATER CAMBRIDGE CALL FOR SITES 2019

On behalf of Southern & Regional Developments ('S&R'), Claremont Panning Consultancy are submitting additional technical information in support of the site at Bannold Road, Waterbeach. It is acknowledged that the site currently is thought to experience environmental constraints that require assessment to ensure its developability. In particular, there are flooding concerns that are recognised through current Environment Agency (EA) flood modelling that deems the entire site as affected by Flood Zone 3. Southern & Regional Developments have engaged WSP to undertake hydraulic modelling of the site (in accordance with agreed methodology the EA) to clarify the extent of flood risk over the site and it has been established that the current model is not accurate in the actual areas of highest risk. This assessment is appended to this letter and commended to the Council for additional consideration of the site.

Under current modelling conditions, part of the site is considered to be affected by Flood Zone 3. This deems it at risk to 1 in 100 year flood event from the sea and/or river sources. It is recognised that the site benefits from flood defences along the banks of the Cam. In its current context, the developability of part of the site is an issue, as dwellings within Flood Zones 3a would only be permissible if the site were to pass the exception test, with no development considered whatsoever within Flood Zone 3b which regarded as functional flood plain. Although residential development in Flood Zones 1 and 2 are deemed "more vulnerable," these zones are sequentially preferable, with development always directed to Flood Zone 1 where appropriate and/or possible.

A more accurate assessment of the hydraulic modelling over the site has established that the current modelling utilised by the Environment Agency is not wholly representative of the potential fluvial flood risk over the site. It is considered that whilst there remains some areas of Flood Zone 3 and therefore areas of high risk of fluvial flooding, the renewed modelling suggests that a substantial area of the site remains within Flood Zone 1. Following re-assessment of the modelling using a defended scenario, along with an additional 35% risk factor added to the calculation to recognise increase risk associated with climate change, approximately 7.3ha of the site is deemed as developable. The new modelling therefore demonstrates that the site is suitable to accommodate development. Furthermore, development willbe directed towards the west of the site which is away from those areas that are at the highest fluvial flood risk..

Given the wider development pressures within Greater Cambridge, it is vital that sites such as that under the control of Southern and Regional are given due and accurate consideration for

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development as the site is unconstrained by other designations, environmental or otherwise and in the context of the reduced area of flood risk, it is considered that the site should be a location for new for residential development at Waterbeach. The site at Bannold Road demonstrates a robust relationship with the settlement edge of the village and is a sustainable location in terms of access to its services as well as to its mainline rail station. Whilst the site is primarily constrained in the east, these considerations are able to be mitigated through landscaping and through a carefully considered layout that can respond to these flood risks. **No development will be proposed in the areas of flood risk.**

With the principal of development established generally at Waterbeach through the establishment of a broad location of a new settlement to the north of the village, there is clear evidence that Waterbeach is regarded as a sustainable location to accommodate such strategic development and therefore it is justified to seek additional development opportunities elsewhere within the existing urban fringe. Whilst the site falls within the Green Belt, there is a clear opportunity to establish a new defensible Green Belt boundary to the eastern edge of Waterbeach, taking full advantage of the railway line as a new physical element that strongly indicates the edge of the village and of the Green Belt beyond to the east. Any layout proposed on the site would make best use of the railway line in the east as this new boundary and strengthen it as a line through the provision of robust landscaping to create a new buffer and soften the edge of the development before it abuts the hard line of the railway.

The identification of the strategic allocation at Waterbeach New Town is a positive step in terms of the development plan in delivering to meet the identified need of the wider District, as well as for Greater Cambridge, but caution must be applied in terms of assurance and guarantee of delivery of such large sites. The NPPF recognises the value of strategic sites in Paragraph 72, but in part d. emphasises that realistic lead-in times must be incorporated into a spatial strategy to ensure that the delivery of these sites remains practical in realising the housing trajectory. As such, the importance of small and medium sized sites must not be overlooked and the NPPF at paragraph 68 states that these sites can robustly contribute to housing numbers given their relatively rapid build out times. The site at Bannold Road, Waterbeach can demonstrate this important contribution and therefore overlooking a site such as this would be in contravention with the guidance of the NPPF. Development of the site would be complementary to the strategic development at Waterbeach, rather than act in prejudice of it and can act as a valuable contributor to the housing supply of Greater Cambridge if, for a reason beyond the control of the District, the strategic allocation's delivery was to be delayed.

Liaison with the Environment Agency to ensure accurate modelling is implemented at the strategic level over the site is ongoing. This also includes measures to mitigate the impacts of any breaches in the local flood defences, as this will have implications on the extent of flood risk over the site. But, it is considered that through discussions with the Environment Agency, mitigation strategies to ensure that these risks can be overcome will be put into place.

WSP has a high degree of confidence that the outcome of their work with the EA will be a formal recognition of the scenario they have modelled. This information is being supplied to you now as we wish to ensure that you do not unfavourably assess this site (under your call for sites) as a flood risk on the basis of bad information. it would be wrong to assess this site unfavourably against others on the basis that part of it may flood as most of the site is not at risk of flooding and any area that is would not be proposed for any residential development.

In the event that you wish to query (or simply discuss) this report then please contact me.

Yours sincerely,

[redacted]

Katherine Else MRTPI Bsc Hons PG Dip
Managing Director

[redacted]

wsp

Land off Bannold Road, Waterbeach

FLOOD RISK: TECHNICAL NOTE

TN01
OCTOBER 2019

CONFIDENTIAL

Land off Bannold Road, Waterbeach

FLOOD RISK: TECHNICAL NOTE

TECHNICAL NOTE (RV3) CONFIDENTIAL

PROJECT NO. 70048792

OUR REF. NO. TN01

DATE: OCTOBER 2019

Land off Bannold Road, Waterbeach

FLOOD RISK: TECHNICAL NOTE

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QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Draft for Comment	First Issue	Updated following Client comments	Updated following Client comments
Date	September2019	September 2019	October 2019	October 2019
Prepared by	Marcus Woodward	Marcus Woodward	Marcus Woodward	Alison Caldwell
Signature				
Checked by	Alison Caldwell	Alison Caldwell	Alison Caldwell	James Berryman
Signature				
Authorised by	Simon Purcell	Simon Purcell	Simon Purcell	Simon Purcell
Signature				
Project number	70048792	70048792	70048792	70050606
Report number	TN01	TN01	TN01	TN01
File reference	70048792TN01 Rv0	70048792TN01 Rv1	70048792TN01 Rv2	70050606 TN01 Rv3

CONTENTS

EXECUTIVE SUMMARY

This High Level Technical Note has been prepared, on behalf of Landhold Capital, to support the planning representation for a proposed development at 'Site off Bannold Road, Waterbeach, South Cambridgeshire (Post Code: CB25 9JT), with regards to fluvial flood risk only.

Reference to the Environment Agency (EA) Flood Map for Planning identifies the Site to lie within Flood Zones 1, 2 and Defended Flood Zone 3, with Formal Flood Defences forming the banks of the River Cam.

A site-specific hydraulic modelling study has been undertaken which demonstrates the entirety of the Site to be at no risk of fluvial flooding in the 1 in 100 year 'defended' scenario, with approximately 6.9ha of the Site located outside of the 1 in 1000 year 'defended' scenario maximum fluvial extent

Based on the site-specific modelling undertaken, it may be considered that the EA Flood Map for Planning is largely representative of the potential fluvial flood risk to the Site, when considering both 'defended' and 'undefended' scenarios.

With respect to areas appropriate for development, in accordance with 'best-practice,' a minimum area of approximately 7.3ha is considered suitable for residential development as it is located outside of the maximum flood extents of the 1 in 100 year plus 35% climate change event.

In accordance with best practice, active consultation has been undertaken with the EA to inform the site-specific hydraulic modelling, with liaison ongoing with respect to the findings.

1. SITE SETTING

1.1.1. WSP UK Ltd. has been appointed by Landhold Capital to undertake a site-specific fluvial hydraulic modelling study to support the planning representation for the proposed development at the 'Site off Bannold Road, Waterbeach, South Cambridgeshire (Post Code: CB25 9JT),' hereafter referred to as the Site.

1.2. LOCATION

1.2.1. The Site, comprising approximately 14.5ha, is located off Bannold Road, Waterbeach, South Cambridgeshire, CB25 9JT. It lies approximately 325m to the west of the River Cam, on the eastern extent of the town of Waterbeach. The Site is bound to the north by Bannold Road, to the east by the railway line, to the south by Burgess Road, and to the west by existing development.

1.2.2. A Site location plan is shown in Figure 1-1.

Figure 1-1 - Site location

2. FLOOD ZONES

2.1.1. The following sections summarises the currently identified Flood Zones, in accordance with the Environment Agency (EA) Flood Map for Planning and the Site-Specific Hydraulic Modelling Study.

2.1.2. With respect to Flood Zones, these are defined, by the EA, in the following manner:

- Flood Zone 1 is land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%)
- Flood Zone 2 is land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year
- Flood Zone 3 is land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year

2.2. FLOOD MAP FOR PLANNING

2.2.1. Reference to the EA Flood Map for Planning identifies the Site to lie within Flood Zones 1, 2 and Defended Flood Zone 3, with Formal Flood Defences forming the banks of the River Cam.

2.2.2. The EA Flood Map for Planning is reproduced as Figure 2-1.

Figure 2-1 - Environment Agency Flood Map for Planning

2.3. SITE-SPECIFIC MODELLING

2.3.1. In accordance with best practice, active consultation has been undertaken with the EA with regard to the potential fluvial flood risk to the Site. Through acceptance of a Model Scoping Note (ref. 70048792 SN001 Rv1), it was agreed with the EA to undertake a site-specific modelling study to enhance

understanding of the potential fluvial flood risk. This study included assessment of 'defended,' 'undefended' and 'breach' scenarios, which will be submitted, for review to the EA.

2.3.2. Based on the site-specific hydraulic modelling completed to date, the 1 in 100 Year and 1 in 1000 Year modelled extents in the 'defended' and 'undefended' scenarios are shown in Figure 2-2 and Figure 2-3 respectively.

Figure 2-2 – 'Defended' Scenario Results

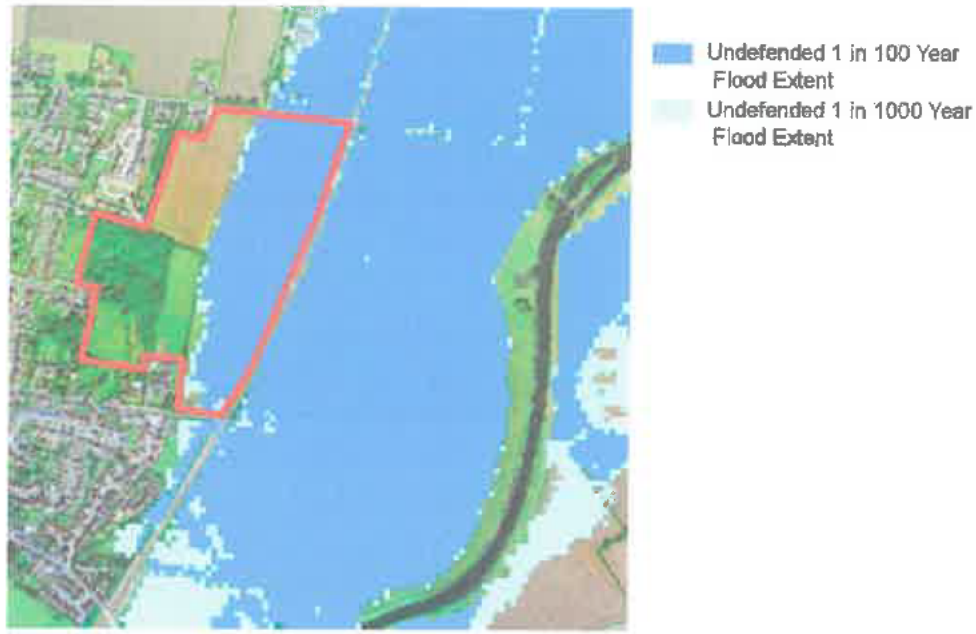

Figure 2-3 – 'Undefended' Scenario Results

2.3.3. Assuming that the 1 in 100 year and 1 in 1,000 year events are equivalent to Flood Zones 3 and 2 respectively, and allowing for the presence of Formal Flood Defences on the River Cam, the site-specific modelling demonstrates the respective Flood Zones to be as shown in Figure XXXX.

2.3.4. It should be noted that the removal of formal flood defences is considered to be highly unlikely and breaches in formal flood defences is considered to be 'rare.' Given this, the residual risk of fluvial flooding in the 1 in 100 year and 1 in 1,000 year scenarios, may be considered to be low.

2.4. COMPARISON OF EA FLOOD MAP FOR PLANNING AND SITE-SPECIFIC MODELLING

2.4.1. Through the site-specific modelling outputs, an assumed equivalent Flood Map for Planning illustrating the modelled Flood Zones and areas benefitting from defences is shown in Figure 2-4.

Figure 2-4 – Modelled Equivalent Flood Map for Planning

2.4.2. Given the nature of the modelled outputs, it may be considered that the EA Flood Map for Planning is largely representative of the potential fluvial flood risk to the Site.

3. PLANNING CONTEXT

3.1. NATIONAL PLANNING POLICY FRAMEWORK 2019

3.1.1. The Updated National Planning Policy Framework (NPPF), first published in 2012 and most recently in February 2019, sets out the Government's national policies for flood risk management in a land use planning context within England.

3.1.2. Paragraph 155 of the NPPF states "Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere."

3.1.3. The guidance further states that local planning authorities should '*ensure that flood risk is not increased elsewhere.*' Allocation and planning of development should therefore be considered against a risk based search sequence as provided by the supporting Planning Practice Guidance (PPG).

3.2. PLANNING PRACTICE GUIDANCE

3.2.1. The publicly available Planning Practice Guidance (PPG) advises how to take account of and address the risks associated with flooding and coastal change in the planning process, in accordance with the NPPF.

3.2.2. The site-specific modelling undertaken demonstrates the western are of the Site to be located within Flood Zone 1, with the remainder identified to be within Defended Flood Zone 3 and Flood Zone 2. As it is currently proposed to develop the Site for residential purposes, the proposed use would be classified as 'More Vulnerable,' in accordance with PPG Table 2. Further to this, PPG Table 3 identifies which Flood Zones may be considered appropriate for the proposed development. As shown in Table 2, which comprises PPG Table 3, the western area of the Site, approximately 6.9ha, is located outside of the extents of Defended Flood Zone 3 and is considered appropriate for residential purposes in accordance with PPG and the NPPF.

Table 1 - Flood Vulnerability and Flood Zone Compatibility (PPG Table 3)

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Fluvial Flood Zone	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test Required	✓	✓
	Zone 3a	Exception Test Required	✓	×	Exception Test Required	✓
	Zone 3b	Exception Test Required	✓	×	×	×

3.2.3. PPG requires assessment of climate change to demonstrate how a development will be managed for its lifetime. Further to this, it is considered 'best-practice' to locate all development outside of the maximum extents of the 1 in 100 Year plus 35% Climate Change allowance. The site-specific hydraulic modelling in the 1 in 100 Year plus 35% Climate Change allowance for the 'defended'

scenario is shown in Figure 3-1. This demonstrates that approximately 7.3ha of the Site is outside of the maximum modelled flood extent.

Figure 3-1 - 1 in 100 Year plus Climate Change Maximum Flood Extent in 'Defended' Scenario and Identified Potential Developable Land Area.

4. CONCLUSIONS & RECOMMENDATIONS

4.1. CONCLUSIONS

4.1.1. The EA Flood Map for Planning identifies that the Site lies within Flood Zones 1, 2 and 'Defended' Flood Zone 3, with Formal Flood Defences forming the banks of the River Cam.

4.1.2. The site-specific modelling identifies the entirety of the Site to be at no risk of fluvial flooding in the 1 in 100 year 'defended' scenario, with approximately 7.3ha shown to be outside of the 1 in 100 year plus 35% climate change 'defended' scenario maximum fluvial extent and approximately 6.9ha of the Site outside of the 1 in 1000 year 'defended' scenario maximum fluvial extent.

4.1.3. Based on the site-specific modelling undertaken, it may be considered that the EA Flood Map for Planning is largely representative of the potential fluvial flood risk to the Site, when considering both 'defended' and 'undefended' scenarios.

4.1.4. With respect to areas appropriate for development, it is considered 'best-practice' to locate all development outside of the extents of the 1 in 100 year plus 35% climate change extent. Given this, a minimum area of approximately 7.3ha is considered suitable for residential development.

4.2. RECOMMENDATIONS

4.2.1. Given the site-specific modelling undertaken to date, it is recommended that active liaison with the EA is undertaken.

4.2.2. Further to this, measures may be integrated within the proposed development to enhance the resilience and mitigate the potential residual fluvial flood risk from a potential breach, pending acceptance by the EA. Given this, it is recommended to undertake active liaison with the EA to determine the most appropriate measures, if any, to be implemented. These may include, but are not exclusive to, protection and integration of primary flow routes, potential ground re-profiling or elevated finished floor levels, implementation of flood resilient design and active maintenance and inspection of the Formal Flood Defence.

LIMITATIONS OF THIS TECHNICAL NOTE

WSP has prepared this Note in accordance with the instructions of Landhold Capital for their specific use. Any person who uses any information contained herein do so at their own risk.

The conclusions and recommendations contained herein are limited by the availability of background information and the planned use for the Site.

Third party information has been used in the preparation of this report, which WSP assumes is correct at the time of writing. Whilst all reasonable checks have been made on data sources and the accuracy of the data, WSP does not accepts no liability for third-party data.

As previously noted, a site-specific hydraulic modelling study is currently ongoing. The preliminary outputs are considered to be sufficient to demonstrate that the Site is appropriate for development. Further modelling will be undertaken at an appropriate stage, if required.

The general limitations of this Technical Note are that:

- A number of sources have been used to compile this report, which WSP has relied upon; WSP is unable to guarantee the accuracy of the information that has been provided by others.
- WSP have been appointed to undertake a site-specific hydraulic modelling study which is ongoing at the time of production of this Note. It should be noted that preliminary outputs from this study have been used within this Note, which are indicative and may be considered subject to change.
- Fluvial flooding is a natural process. Natural processes are inherently random, therefore the outputs produced by the baseline model, or any forthcoming models, cannot be considered to be a definitive representation of a single flood event. Fluid flow within rivers and on floodplains is governed by a set of complex physical processes. Hydraulic modelling requires the necessary simplification of these processes into mathematical models, thereby it may only be considered to be a simplified representation of a single flood event.
- At this stage, the preliminary hydraulic modelling undertaken to date does not include any representation of the proposed development.

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