PROPOSED SKATE RAMP ON LAND SOUTH OF FERNIE CLOSE, NEWBOROUGH, PE6 7RH

FLOOD RISK ASSESSMENT

View of site looking south from Fernie Close

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This flood risk assessment has been prepared solely to support the planning application for a proposed development at Fernie Close, Newborough. The author has made every effort to provide an accurate assessment of the flood risk but accepts no liability should the information be found to be incorrect or incomplete, or if it is used for any other purposes other than for which it was originally commissioned.

Introduction

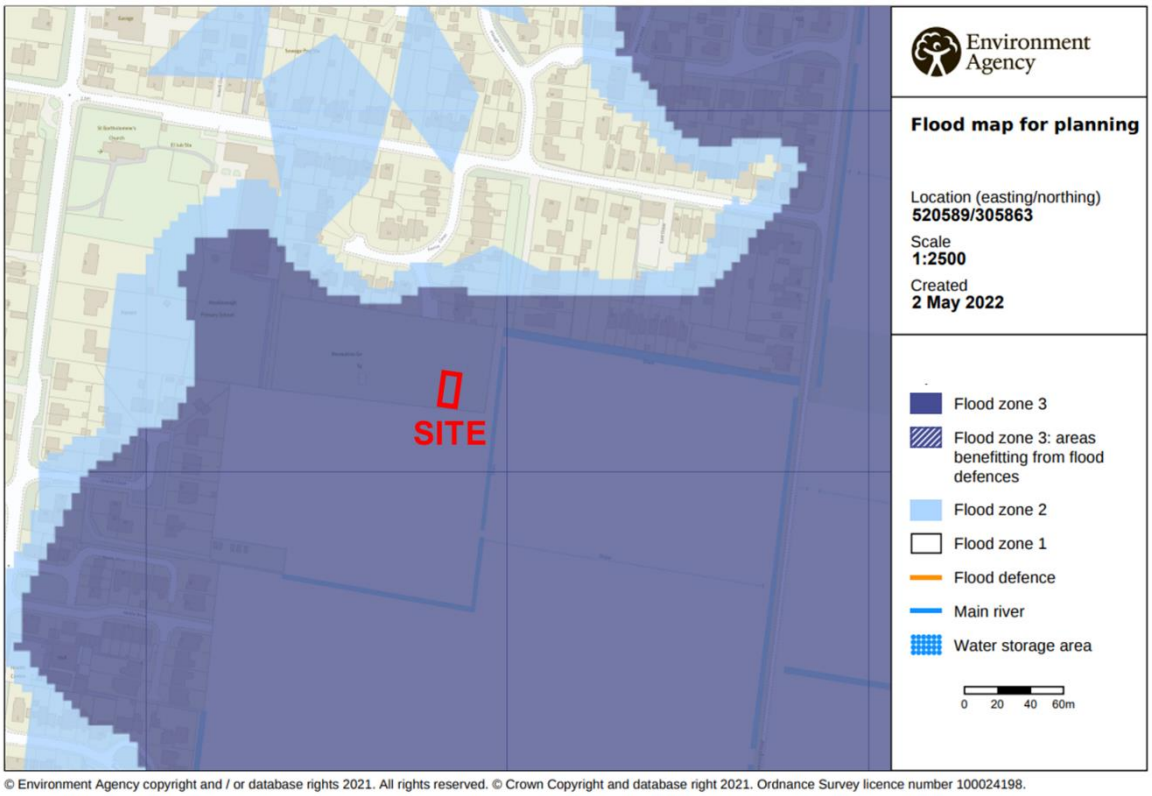
A planning application (Reference No 22/00463/FUL) has been submitted to Peterborough City Council to construct a skate ramp on land south of Fernie Close, Newborough, Peterborough, PE6 7RH. The site is at present part of a recreation ground south of Fernie Close. The Council has requested a flood risk assessment should be carried out for the application to be valid.

The site is within Flood Zone 3 as shown on the Environment Agency's Flood Zone map. The flood zone maps do not take into account existing flood defences.

The Planning Application requires a flood risk assessment to be carried out as specified in the Practice Guidance to the National Planning Policy Framework Development and Flood Risk. The site is within a defended area as specified in the Peterborough City Council's Strategic Flood Risk Assessment (PCC SFRA) map and is located in the North Level Internal Drainage Board District.

Environment Agency (EA) Flood Zones

The map below is taken from the Environment agency website and shows the flood zones in this area.



It can be seen that the houses in Fernie Close are in flood zones 1 and 2 and the recreation ground is within flood zone 3.

Application Site

The site is located on the south eastern side of the village of Newborough. The National Grid Reference of the site is 520589, 305863.

The position and extent of the site is shown on the plan at the end of this document.

As the site is within a defended area the proposed development can be considered to be within Flood Zone 3(a) as defined in Table 1 of the Technical Guidance.

The section which gives examples of Water-Compatible Development in the flood risk vulnerability classification in Table 2 of the Guidance is reproduced below.

Water-compatible development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

It can be seen that amenity open space, outdoor sports and recreation are within this category.

Table 3 of the Guidance is shown below:

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓*

Therefore it can be seen that for “Water-Compatible development” the sequential test only needs to be applied to the development.

Sequential Test

The aim of the Sequential Test, as set out in the Planning Practice Guidance, is to ensure that a sequential approach is followed to steer new development to areas with the lowest probability of flooding. The flood zones as defined in the Strategic Flood Risk Assessment for the area provide the basis for applying the Test. The aim is to steer new development to Flood Zone 1 (areas with a low probability of river or sea flooding). Where there are no reasonably available sites in Flood Zone 1, local planning authorities in their decision making should take into account the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone 2 (areas with a medium probability of river or sea flooding), applying the Exception Test if required. Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 (areas with a high probability of river or sea flooding) be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.

There are no suitable alternative sites for this development within the central area of Newborough which are within Flood Zones 1 or 2.

The principle of outdoor sport and recreation has been accepted on this site with the approval at some time in the past for the field to be used for recreation.

Therefore I consider that the sequential test has been passed.

Existing Flood Alleviation Measures

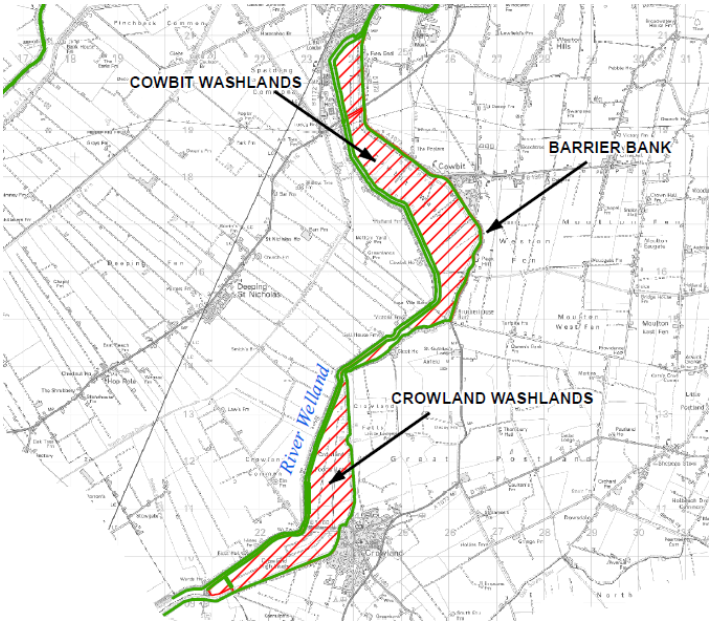
The site is within a defended flood plain, as defined in Appendix 1 of the Environment Agency's "Policy and Practice for the Protection of Flood Plains", which is considered to be passive until such time that a flood greater than the defences can withstand occurs. The likelihood of flooding occurring due to overtopping or failures of the defences is considered to be very low.

The site is located approximately 22 km south of the tidal section of the River Welland, which has a tidal defence bank which is maintained by the Environment Agency.

The site is located approximately 2.8km south of the bank of the River Welland.

The internal watercourses in the area are maintained by North Level IDB.

The section of the River Welland from south of Crowland to the southern outskirts of Spalding has two washlands located on the east side of the River, called Crowland Washlands and Cowbit Washlands. These areas are designed to alleviate very high flows in the River Welland. When the water level in the River Welland reaches a level of approximately 5.00m OD large syphons are activated which discharge excess water onto the Washes. The Barrier Bank is located on the east side of the Washes to contain the water in the Washlands and is the main flood defence bank on the east side of the river.



Existing Ground Levels

The level of the central area of Newborough is approximately 2.30m ODN, and Fernie Close is at approximately the same level. The recreation ground is approximately 750mm below the level of Fernie Close with an approximate level of 1.5m ODN.

Potential Sources of Flooding

The potential sources of flooding to the site are:-

1. Failure or overtopping of the Barrier Bank
2. High water levels in IDB drainage channels.

1. Overtopping of the Barrier Bank.

The Barrier Bank is the eastern bank of the Crowland Washes. The Washes are only flooded in extreme conditions (around 1 in 50 years) and are used the rest of the time as agricultural land. There are two syphons which operate automatically to allow water to flood on to the Washes and alleviate high water levels in the River Welland. When this occurs the level of water in the washes will quickly rise to approaching 5.00m OD.

If a breach occurred in the Barrier Bank in this scenario then flood water would flow south eastwards towards the development site, which is 2.8km from the site.

There are no maps available at the present time advising of the predicted depth of flooding that would occur if a breach occurred in the south eastern bank of the River Welland. However it is considered that the maximum depth could be between 300mm and 500mm, depending on the scenario.

2. Flooding from IDB Drain

The watercourse on the northern side of the recreation ground is an IDB maintained piped drain called Allotment Drain. The water level in this drain and other IDB channels in the Newborough area are controlled by Newborough Pumping Station,

which discharges the water into the River Welland 4.0km north west of the development site.

IDB drains were designed to provide at least a 1 in 10 year standard of service with a freeboard of at least 900mm. This normally provides at least a 1 in 50 year standard of service against overtopping and in many cases a 1 in 100 year standard at the present time.

North Level IDB have a policy of monitoring standards of protection in all their catchments and will carry out improvements to pumping stations, sluices and drainage channels to ensure they do not fall due to higher run-offs predicted with climate change.

It is unlikely that any failure of assets such as pumping stations, sluices or drainage channels would lead to overtopping of the watercourse because North Level IDB have an excellent maintenance regime and monitor all assets with a modern telemetry system.

Extent of known Flooding

During the preparation of this assessment, no evidence was discovered of this area of land or any of the adjoining properties having been flooded in the past.

Probabilities and Trends of Flooding

The probability of this development flooding from Environment Agency main river is very low. In an extreme event any effect on this location would not be sudden and there would be time for residents to take precautionary measures to limit the impact of any flooding that may occur.

Residual Risk – Extreme Events

The residual risk from extreme events is very low on this site. The major risk to the site is from a breach or overtopping of the fluvial defences.

The risk of this happening in this case is low and the hazard from any flooding is also low.

Climate Change

The risk of flooding will increase in the future due to climate change. The Environmnet Agency used an allowance of 20% for increased flows in the studies that were carried before 2016. The EA issued new guidance on recommended contingency allowances for predicted sea rises, fluvial flows and rainfall intensities on 19th February 2016. Details of the allowances in the most recent Strategic Flood Risk Assessment are shown in Appendix A of this report (pages 10 and 11).

Conclusions

The major risk to the site is from a breach in the south bank of the River Welland. The risk of this happening at the present time is low as the banks have at least a 1 in 100 year standard of protection at the present time. However in the future the risk will

increase with climate change as the Environment Agency predict increases in fluvial flows over the next one hundred years.

The risk of flooding to the building from IDB drains can be considered low, as the IDB drainage channels will provide between a 1 in 50 year and 1 in 100 year standard of protection against flooding.

The proposed development is not in a functional flood plain as defined by PPS 25.

The structure to be erected will not be seriously damaged by flooding which could be up to 500mm in depth.

Any flooding that could occur following a breach in the south bank of the River Welland would occur very slowly and if anyone is on the site they would be able to walk into Fernie Close where the land levels are higher and stay safe.

Many hours before the above scenario occurred the Environment Agency would have issued a series of flood warnings and it is likely that residents in some areas of Newborough would be considering evacuating from the area. In this scenario it is hard to imagine that anybody would still be using the Skate Ramp.

Therefore it can be concluded that no people would be at risk from any flooding that may occur in the future and the skate park structure would not be adversely affected by the low level flooding.

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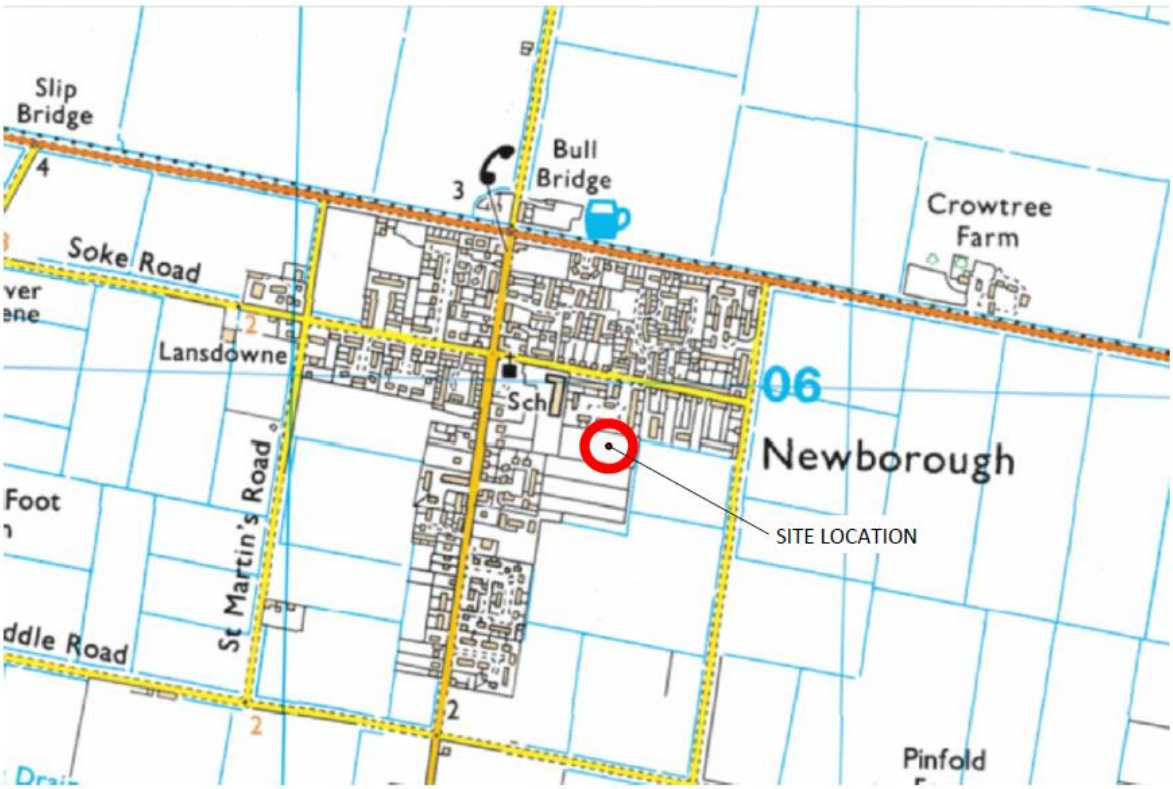
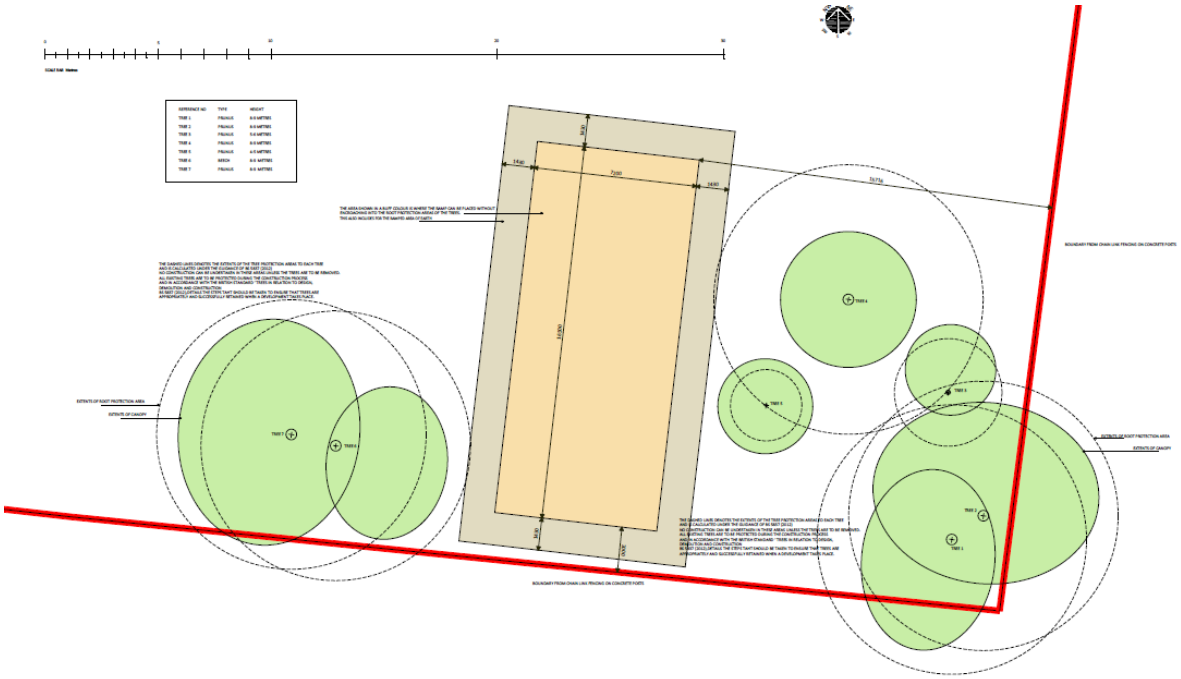
19th May 2022

LOCATION PLAN



PLAN OF IDB DRAINS

BLOCK PLAN OF PROPOSED DEVELOPMENT



VIEW OF PROPOSED SKATE RAMP

APPENDIX A CLIMATE CHANGE

Royal Haskoning DHV produced the Peterborough Level 1 Strategic Flood Risk Assessment issued in January 2018 for Peterborough City Council. This document contains the climate change allowances that were included in this document. The details in this document are reproduced below.

Climate Change

The NPPF (paragraph 99) clearly emphasises the need for addressing climate change impacts to deal with the increased and new risks of flooding within the lifetime of planned development. The Environment Agency's online document *Flood risk assessment: climate change allowances*[7], first published in February 2016 and subjected to regular updates, provides advice on predictions of anticipated change for peak river flow, peak rainfall, sea level rise and offshore wind speed and extreme wave height to support the NPPF. These changes need to be accounted for when demonstrating how flood risk will be managed now and over the development's lifetime. The latest version used for this report is the 12 April 2016 update.

The allowances are based on climate change projections and different scenarios of carbon dioxide (CO2) emissions to the atmosphere. There are different values for peak river flow and peak rainfall intensity for different epochs or periods of time over the next century - 2015 to 2039, 2040 to 2069 and 2070 to 2115. The expected lifespan of the development determines the range to be considered in each case. The 2070 to 2115 epoch is the assumed default for all residential and most other developments. Where developers seek to use other epochs, they should discuss and agree this with the Environment Agency or the Council.

Peak river flow allowances

The peak river flow allowances show the anticipated changes to peak flow by river basin district. The range of allowances is based on percentiles. A percentile is a measure used in statistics to describe the proportion of possible scenarios that fall below an allowance level, e.g. the 50th percentile is the point at which half of the possible scenarios for peak flows fall below it and half fall above it. The application of each category is advised upon flood risk vulnerability classification for the type of development and flood zone[8] over the lifetime of the proposed development.

Peterborough is located within the Anglian River Basin District. The applicable peak river flow allowances are included in **Table 4.1** below, with further explanation on which allowance to use when in **Table 4.2**:

Table 4.1: Peak river flow allowances for Anglian River Basin District

Allowance category	Percentile	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	90th	25%	35%	65%
Higher central	70th	15%	20%	35%
Central	50th	10%	15%	25%

Table 4.2: Climate change allowances, which to use when

	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
In flood zone 2	Higher central & Upper end	Higher central & Upper end	Central & Higher central	Central	No allowance
In flood zone 3a	Upper end	Development should not be permitted	Higher central & Upper end	Central & Higher central	Central
In flood zone 3b	Upper end	Development should not be permitted	Development should not be permitted	Development should not be permitted	Central

Where the development type requires the assessment of more than one climate change allowance category, the results of both assessments should be displayed clearly within the site specific FRA. Clear justification for the choice of climate change allowance category for the setting of finished floor levels final site layout should be provided. If (exceptionally) development is considered appropriate when not in accordance with flood zone vulnerability categories, then it would be appropriate to use the upper end allowance.

Peak rainfall intensity allowance

Increased rainfall affects river levels and land and urban drainage systems. The guidance informs that for flood risk assessments and strategic flood risk assessments it is required to assess both the central and upper end allowances to understand the range of impact all across England. **Table 4.3** shows the Peak rainfall intensity allowances in small and urban catchments:

Table 4.3: Peak rainfall intensity allowance in small and urban catchments

Allowance category	Percentile	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	90th	10%	20%	40%
Central	50th	5%	10%	20%

Sea level rise

The city of Peterborough itself is not directly impacted by sea level rise or offshore wind speed and extreme wave heights. This is because Dog in a Doublet Sluice situated to the east of the city is the upper tidal limit of the River Nene and is some 45km from the sea. However, land to the north of the Nene and to the east of the Dog in the Doublet Sluice may be affected by sea level rise due to the increased risk of overtopping or breaching the defences of the Nene on its northern side thereby affecting the Peterborough Fens Area. The adjacent Nene Washes (to the south of the river and within Fenland District) presently provide an important role in managing fluvial flooding during times when high river flows coincide with high tides and the River Nene is unable to discharge freely into the tidal section.

The high++ climate change allowances for peak river flood flow and mean sea level should also be used in assessments for developments that are very sensitive to flood risk and with lifetimes beyond the end of the century. This includes infrastructure projects or developments that significantly change existing settlement patterns such as urban extensions and new settlements.