FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
ELLIOT ROAD, MARCH

FINAL REPORT

ECL0730/MORTON & HALL CONSULTING LTD

DATE MARCH 2022

ELLINGHAM CONSULTING LTD
Email: tim@ellinghamconsulting.co.uk

CONTENTS

1.0 INTRODUCTION

This Flood Risk Assessment has been prepared in accordance with National Planning Policy Framework (NPPF) and supporting planning practice guidance (PPG) on Flood Risk and Coastal Change.

In areas at risk of flooding or for sites of 1 hectare or more, developers are required to undertake a site-specific Flood Risk Assessment to accompany an application for planning permission. This Flood Risk Assessment has been produced on behalf of Mr B Barratt in respect of a development that consists of one proposed dwelling at Elliot Road, March.

A planning application for the proposed development is to be submitted by Morton & Hall Consulting Ltd.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is situated on land off Elliot Road lying north of West End, March, PE15 8DH. The National Grid Reference of the site is 54078/29706.

The location of the site is shown on Figure 1.

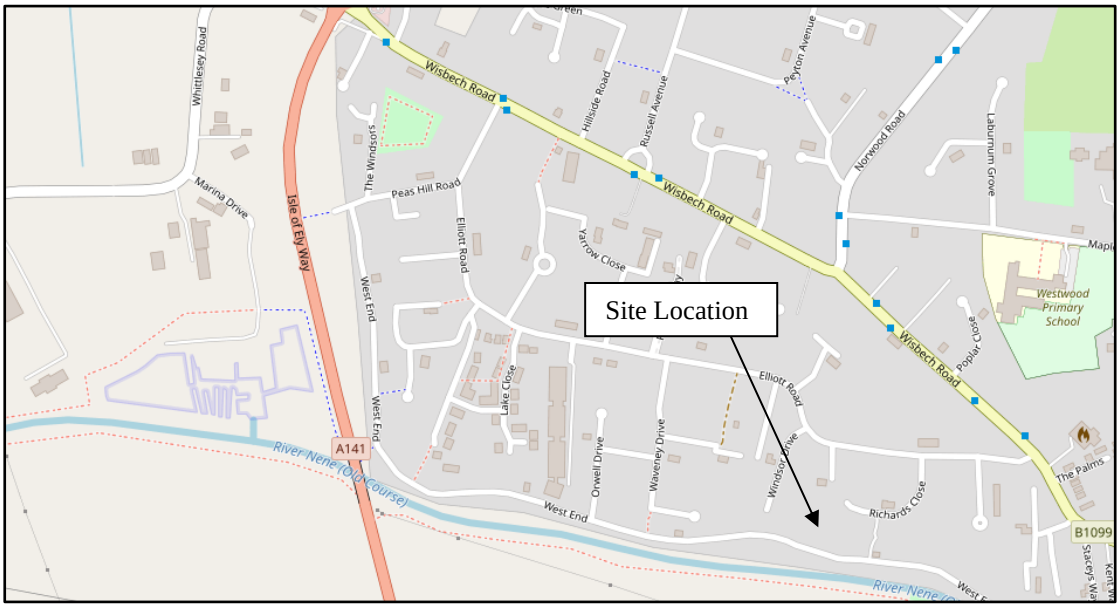


Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is an undeveloped area of land and an access track leading from Elliot Road. There are residential dwellings to the east and west of the site. The area of development is approximately 0.03 hectares.

Environment Agency LiDAR shows that the site is flat with typical ground levels between +1.4m OD and +1.5m OD. The access track through the site is at a level of +1.6m OD. Elliot Road and the northern end of the access to the site are at a level of +2.0m OD.

Surface water at the site naturally drains through soakaway. The River Nene (Old Course) is approximately 90m south of the site.

The online British Geological Survey maps indicate that the site is likely to be underlain by Ampthill Clay Formation mudstone. The bedrock is shown to be overlain with superficial deposits of Clay and Silt.

2.3 Proposed Development

The proposed development consists of one new dwelling. The dwelling will have two storeys. The proposed site plan is provided in Attachment 1.

2.4 Local Development Documents

The Fenland Local Development Plan is the adopted Local Plan for the district. Policy LP14 for Responding to Climate Change and Managing the Risk of Flooding in Fenland states the requirements for flood risk reduction.

The Fenland Level 1 Strategic Flood Risk Assessment (SFRA) was prepared in 2011.

The Cambridgeshire Flood and Water Supplementary Planning Document has been prepared by Cambridgeshire County Council (as the Lead Local Flood Authority) in conjunction with the other Cambridgeshire local planning authorities and other relevant stakeholders to support the implementation of flood risk and water related policies.

2.5 Flood Zones

An extract from the Environment Agency Flood Map for Planning is provided in Figure 2. The site is located within Flood Zone 3, an area with a high probability of flooding benefitting from defences, and Flood Zone 2, an area with a medium probability of flooding.

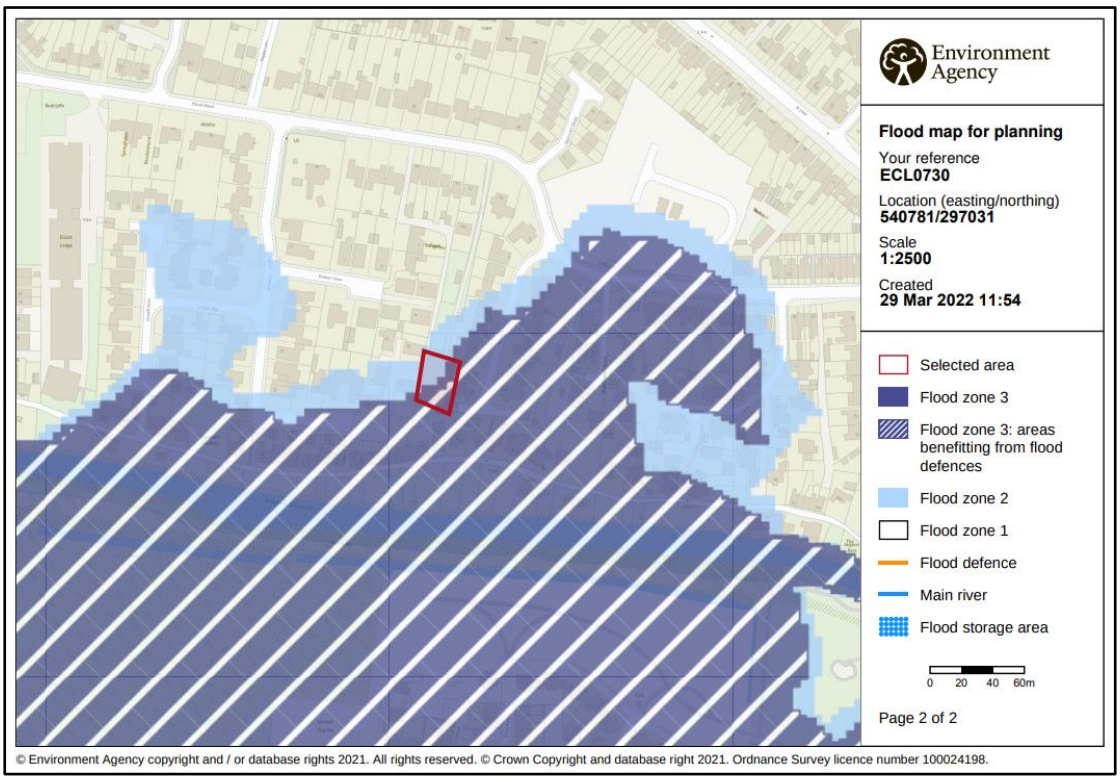


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site is within an area with a medium risk of flooding from rivers or the sea (annual probability between 1% and 3.3%);

- the site is within an area with a medium risk of surface water flooding (annual probability between 1% and 3.3%); and
- the site is not within an area at risk of reservoir flooding.

3.0 FLOOD RISK VULNERABILITY

3.1 The Sequential and Exception Test

The NPPF requires the application of a Sequential Test to ensure that new development is in areas with the lowest probability of flooding.

The Exception Test is a method to demonstrate and help ensure that flood risk to people and property will be managed, while allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available.

3.2 Vulnerability Classification

Table 2 of the PPG Flood Risk and Coastal Change categorises different types of uses and development according to their vulnerability to flood risk. The proposed develop is covered by the description of buildings used for dwellings and is classified as 'More Vulnerable'.

Table 3 of the PPG Flood Risk and Coastal Change sets out Flood Risk Vulnerability and flood zone 'compatibility'. The site is in Flood Zone 3 and the development is 'More Vulnerable' therefore it is necessary to complete the Exception Test.

PPG Flood Risk and Coastal Change defines that the lifetime of the development in terms of flood risk and coastal change is 100 years.

3.3 Application of the Sequential Test and Exception Test

It is for the Local Planning Authority, using the evidence provided and taking advice from the Environment Agency as appropriate, to consider whether an application passes the Sequential Test.

Large parts of Fenland District Council between the River Nene and River Great Ouse, around the towns of March and Chatteris, lie in Flood Zone 3. As such there are limited opportunities to undertake the development at an alternative site with a lower flood risk.

The site is protected by the Whittlesey Washes Barrier Bank and the Ouse Washes Barrier Bank which were not considered during the preparation of the Environment Agency Flood Maps. When the Whittlesey Washes Barrier Bank and the Ouse Washes Barrier Bank are considered, the site has a low probability of flooding and therefore the development passes the Sequential test.

The Exception Test requires consideration of the wider sustainability benefits of a development and that the development would be safe and residual risks managed.

The Fenland Local Plan defines the housing distribution for new dwellings across the District. March has a target of 4,200 new dwellings over the period from 2011 to 2031. The proposed development will contribute to this target.

Section 5 of this Flood Risk Assessment describes the flood mitigation measures and the management of the residual risks, demonstrating that this development will be safe and not increase flood risk elsewhere. The development is considered to pass the Exception Test.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The site is 5.5km from the Whittlesey Washes and 11.7km from the Ouse Washes. The site, and the Middle Level drainage area, which is located between these washlands, is protected by the Whittlesey Washes Barrier Bank and the Middle Level Barrier Bank. These defences are the responsibility of the Environment Agency.

There is a long-term strategy for the maintenance of the Environment Agency defences which is reviewed and updated periodically.

The site is within a residential area of March. Surface water runoff from developments in the surrounding area discharge under gravity to the River Nene (Old Course).

The River Nene (Old Course) is 90m south of the site. The River Nene (Old Course) is an embanked channel which, via the Middle Level Main Drain, flows to St Germans Pumping Station to discharge to the tidal River Great Ouse. The Middle Level Main Drain and St Germans Pumping Station are the responsibility of the Middle Level Commissioners.

Current maintenance standards of the Middle Level Commissioners and the Environment Agency's defences are generally good.

4.2 Sources of Flooding

The following potential sources of flooding have been identified during this assessment:

- surface water flooding;
- overtopping and/or breaching of the River Nene (Old Course) defences; and
- overtopping and/or breaching of the Whittlesey Washes Barrier Banks.

The probability of flooding from these sources is discussed in Section 4.3.

4.3 Probability of Flooding

The Environment Agency Long Term Flood Risk Maps indicate the probability and depth of surface water flooding. During:

- high risk (annual probability 3.3%) events the site is not at risk of surface water flooding;
- medium risk (annual probability 1%) events the site is at risk of surface water flooding with depths below 0.3m; and
- low risk (annual probability 0.1%) events the site is at risk with depths between 0.3m and 0.9m.

Overtopping or breaching of the River Nene (Old Course) is a low risk. The Middle Level maintained watercourses provide protection during the 1 in 100-year fluvial event and for "soft" defences the Commissioners provide a 0.9m freeboard above the maximum design water level. Based upon water levels provided by the MLC for sites upstream and downstream of the site the design maximum water level for the River Nene (Old Course) adjacent to the site is estimated to be +0.6m OD. This is 0.8m below the lowest part of the site and therefore the proposed development is not at risk.

The Whittlesey Washes Barrier Bank is located 5.5km from the development. The barrier bank is inspected and maintained in accordance with the standards of the Reservoirs Act. Between 2013 and 2015 the Environment Agency undertook a programme of improvement works to the strengthen the bank making it more resilient to the risk of a breach should an exceedance event occur. The risk of floodwater reaching the site during overtopping is very low.

4.4 Historic Flooding

During the preparation of this assessment, no evidence was discovered of the site being flooded. The major flood event of Easter 1998 gave rise to the highest ever recorded floodwater levels in the Middle Level System, but no property flooding occurred as a result of overtopping of embankments.

4.5 Climate Change and Residual Risk

Climate change is likely to impact the site through increased rainfall intensity and duration affecting the local drainage network and flood levels in the River Nene (Old Course).

An estimate of the 1% annual probability (1 in 100 chance each year) surface water event with an allowance for climate change can also be made from the 0.1% annual probability (1 in 1000 chance each year) event. The extent and depths of flooding during the 0.1% annual probability (1 in 1000 chance each year) event are shown in Figure 3.

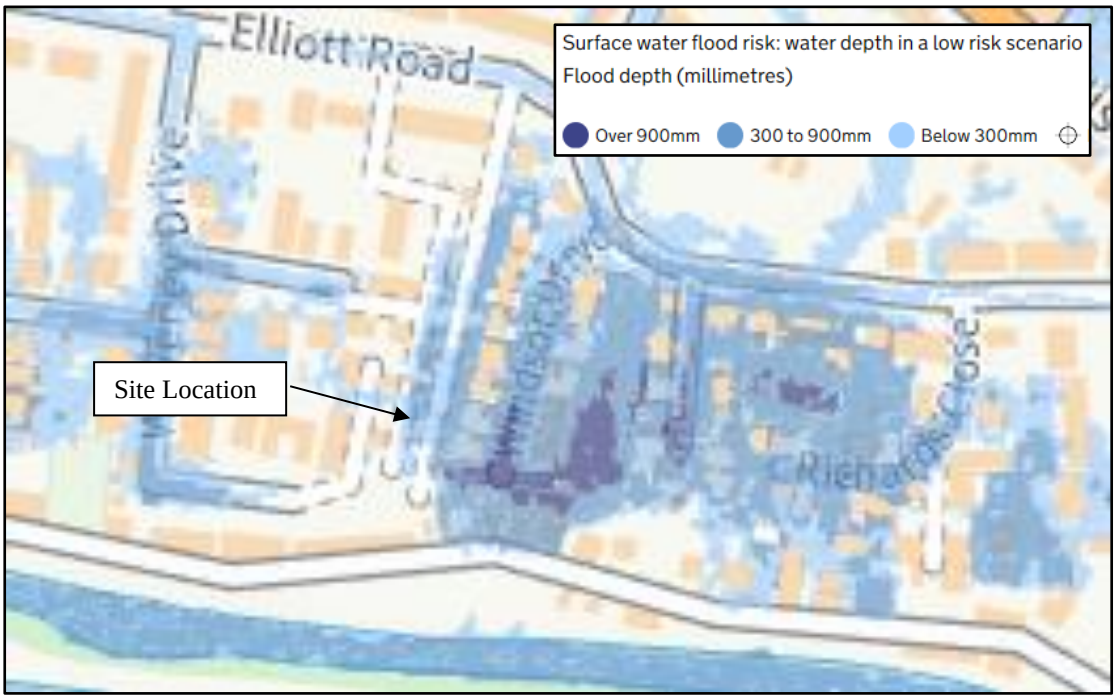


Figure 3 – Environment Agency Surface Water Flood Risk Map – 0.1% Annual Probability

Figure 3 shows that the maximum depth of surface water flooding on the access track is below 0.3m. Based upon the access track being up to 0.2m above site levels the maximum depth of surface water flooding is 0.5m

The protection provided by the Middle Level Commissioners watercourses during a flood with a 1% annual probability (1 in 100 chance each year) includes an allowance for climate change.

The works undertaken to the Whittlesey Washes Barrier Bank were designed to provide protection over the next 100 years.

In summary the existing systems and defences are appropriate for the design life of the development (i.e. 100 years).

There is a residual risk to the site should there be an exceedance event. In the event of a breach of the Whittlesey Washes Barrier Bank flood water would not affect land south of the Twenty Foot Drain and therefore March is not at risk.

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The Environment Agency Long Term Flood Risk Maps show that the site is at risk of surface water flooding. A depth of 0.5m has been estimated during the 1% annual probability (1 in 100 chance each year) with climate change event.

The probability of the site flooding from the Middle Level main river system or any Environment Agency system is less than 1% annual probability (1 in 100 chance each year) because of the standards of the existing flood defence systems. Over time there will be a gradual increase in risk to the site due to climate change. During the design life of the development the site is not at risk during the 1% annual probability (1 in 100 chance each year) event.

The proposed development increases the impermeable area and therefore there is an increased volume of surface water that has the potential to increase flood risk.

5.2 Mitigation Measures

Based upon the information available during the preparation of this flood risk assessment, it is recommended that the finished floor level of the dwelling is 0.5m above typical ground levels at the site. Furthermore, there should be 0.3m of flood resilient construction above finished floor level.

The developer should ensure that the eventual occupier of the dwelling is sufficiently aware of the risk of flooding, and the standard of the existing defences. The Environment Agency provides a Flood Warning Service which includes Flood Warning Codes and uses direct warning methods where the risks and impacts of flooding are high.

In addition to direct and indirect flood warnings, the Environment Agency operates a 24 hour a day Floodline Service providing advice and information on flooding. The occupier of the dwelling should register with the Floodline Direct Warnings Service to receive any future flood warnings.

It is recommended that surface water runoff is managed so that stormwater will not affect the adjoining land or increase the flood risk elsewhere.

6.0 CONCLUSIONS

As a result of the assessment, the following conclusions have been reached.

- The proposed development consists of one 2 storey residential dwelling at Elliot Road, March.

- The site is at risk of surface water flooding with depths up to 0.5m during the 1% annual probability (1 in 100 chance each year) event including climate change.

- The proposed development is in defended Flood Zone 3 and Flood Zone 2.

- The site benefits from defences on the River Nene which provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event including climate change.

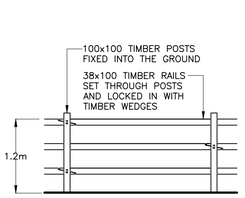
- It is recommended that the finished floor level of the dwelling is 0.5m above the surrounding ground levels with 0.3m of flood resilient construction above finished floor level.

- The development passes the Sequential Test and the Exception Test and is therefore suitable for the proposed location.

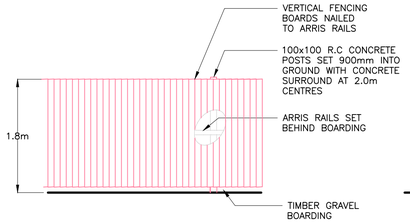
ATTACHMENT 1

EXISTING AND PROPOSED SITE PLANS

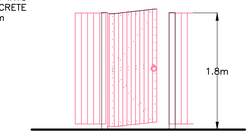
(DWG H8216/01)



TYPICAL POST AND RAIL FENCE DETAIL (1:50)



1.8m HIGH FENCE DETAIL (1:50)



GATE DETAIL (1:50)

EXISTING SITE PLAN (1:200)

PLOT SIZE = 292.37m²

REAR GARDEN = 124.02m² / 42.42%

DWELLING = 93.09m² / 31.8%

DRIVE / FRONT GARDEN = 75.26m² / 25.7%

PROPOSED SITE PLAN (1:200)

Please read, if in doubt ask. Change nothing without consulting the Engineers.

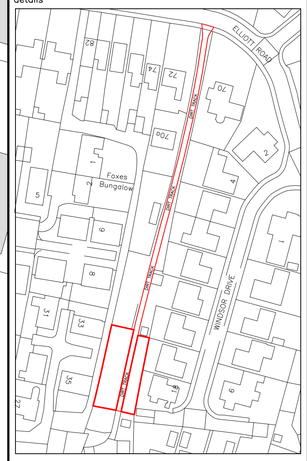
Contractor to check all dimensions on site before work starts or materials are ordered. If in doubt ask. All dimensions are in mm unless stated otherwise.

Where materials, products and workmanship are not fully specified they are to be of the standard appropriate to the works and suitable for the purpose stated in or reasonably to be inferred from the drawings and specification. All work to be in accordance with good building practice and BS 8000 to the extent that the recommendations define the quality of the finished work. Materials products and workmanship to comply with all British Standards and EOTA standards with, where appropriate, BS or EC marks.

All products and materials to be handled, stored, prepared and used or fixed in accordance with the manufacturers current recommendations.

The contractor is to arrange inspections of the works by the BCO (or NHBC) as required by the Building Regulations and is to obtain completion certificate and forward to the Engineer

All finishes, insulation and damp-proofing to architect's details



LOCATION PLAN (1:1250)

METERS
1:1250 0 10 20 30 40 50

N
W E
S

REVISIONS	DATE

MORTON & HALL CONSULTING LIMITED
CONSULTING STRUCTURAL ENGINEERS

1 Gordon Avenue,
March,
Cambridgeshire.
PE15 8AJ

Tel: 01354 655454
Fax: 01354 660467
E-mail: info@mortonandhall.co.uk
Website: www.mortonconsultingengineers.co.uk

LABC BUILDING EXCELLENCE AWARDS winner
Fenland District Council Building Design Awards
Building Excellence in Fenland

CLIENT
Mr B Barrett

PROJECT
Land off Elliot Road,
Lying North of West End
March, Cambridgeshire
PE15 8DH

TITLE
Existing & Proposed
Site Plans

DRAWN: G.Boreham	DATE OF ISSUE:
CHECKED:	
DATE: Mar 2022	DRAWING NUMBER: H8216/01
SCALE: As Shown	