

# Flood Risk Assessment

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*Site:*

Mill Green Road, Spalding PE11 3PU

*Applicant:*

Houghton Produce Ltd

*Prepared by:*

Mr R Cole of Origin Design Studio Ltd

*Checked by:*

Mr R Cole of Origin Design Studio Ltd

*Revision:*

A01 – 12<sup>th</sup> October 2023

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## Introduction

Origin Design Studio Ltd have been appointed by Houghton Produce Ltd to prepare a Flood Risk Assessment to accompany a planning application to South Holland District Council (SHDC) for a residential development.

The site is contained within in flood zone 3 and this is the basis upon which a Flood Risk Assessment is required. The approach to flood risk is set out in the National Planning Policy Framework (NPPF), refer to Appendix A with more local planning policy set out in the South East Lincolnshire Local Plan (SELLP), refer to Appendix B. This Flood Risk Assessment assesses the site in accordance with the policy requirements of the NPPF and the SELLP. The site is located in the district of Welland and Deepings Internal Drainage Board.

## The Site

The site is located at Fengate, Pinchbeck, Spalding. The site is located adjacent to the road and runs westerly from the junction with Mill Green Road. The site has a number of agricultural buildings on it and an existing residential dwelling. This includes 3 barns, 2 modern portal framed buildings and a traditional brick built barn. The farmhouse is located to the eastern side of the site.



Figure 1 - Aerial Image of Site ([www.google.com/maps](http://www.google.com/maps))

## Findings

### Risk of Flooding from River and Seas

#### Flood Zone

The site is contained within a Flood Zone 3. Flood Zone 3 shows the area at risk of flooding for an undefended flood event with: a 1% or greater probability of flooding from rivers or 0.5% or greater probability of flooding from the sea.



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Figure 2 - Flood zone map (the site is marked with a red line).

#### Historic Flooding

The Environment Agency do not have any information about historical flooding near to the site, refer to Appendix E.

#### Sequential & Exception Test

The proposed development is residential and will result in 4No. two storey dwellings new build dwellings. Therefore, flood risk is considered on this basis.

Developments need a sequential test when the development is in flood zone 2 or 3 and a sequential test hasn't already been done for a development of the type planned on the proposed site.

The purpose of the sequential test is to direct development to land of lower flood risk. The sequential test compares the proposed development site with other available sites to find out which has the lowest flood risk.

The residential use is classified as “more vulnerable” in accordance with Table 2 – Flood Risk Vulnerability Classification.

| 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               | ✓*               |

Key:

✓ Development is appropriate

X Development should not be permitted.

Figure 3 - Table 3 – Flood Risk Vulnerability and Flood Zone Compatibility ([www.gov.uk](http://www.gov.uk))

In accordance with Table 3 where a site is located in a Flood Zone 3 with a vulnerability classification of “more vulnerable” development is considered to be compatible providing the exception test is satisfied. Therefore, the development will need to pass both a sequential test and exception test.

In this case the scheme should be viewed in light of a fallback position under Class Q of the GPDO that could result in a development of up to 5 dwellings.

Here the new build scheme is for 4 No two storey dwellings. This is one less dwelling which would result from a potential Class Q application. This is considered to provide flooding betterment.

Notwithstanding the above, the requirement for a sequential test requires reference to Section 8.1.4 of the SFRA which states that:

*“However, as mentioned in the Introduction above, the majority of the Boston Borough area and large parts of the South Holland district lie within Flood Zone 3. For this reason, and for the reason*

*outlined in 8.1.2 above, it is therefore necessary to use the refined flood risk information (Hazard and Depth maps) to assist with the application of the Sequential Test.”*

The Residual Flood Hazard Map, refer to Figure 4 shows the site does not have a hazard classification. Consequently this would therefore pass the sequential test despite being in a Flood Zone 3. Based on the information above it is considered that the sequential test is passed and the exception test is passed.

### Site Levels

A topographical survey, refer to Appendix C, shows that levels on the road are +3.09mAOD. On site levels are generally flat and vary from around +3.44mAOD on parts of the northern perimeter to +2.77mAOD at its lowest in the southeast corner of the site. Levels around the existing building (to be demolished for new housing) average around +3.30mAOD.

### Calculating the Flood Level

Where possible all habitable floors should be above the flood level. Where the accommodation is proposed to be two storeys the 1 in 100/200-year flood level plus climate change will be used to ensure habitable floors are above the flood level. In the case where a single storey building is proposed habitable floors should be above the 1 in 1000-year flood level plus climate change. In both cases a safe point of refuge can be established and therefore provide protection to the inhabitants of the building.

In this case it is proposed to create a 4No. two-storey dwellings and therefore the 1 in 100/200 flood level plus climate change is to be used. To determine the flood level the fluvial and tidal sources will be looked at to determine the worst case and an appropriate floor level.

### Tidal Flood Sources

The site is not at risk from tidal sources of flooding.

### Fluvial Flood Sources

The site is at risk of fluvial flooding from main rivers. The main risk to the site is the River Glen located some 1100m to the north of the site. The site is protected by fluvial flood defences and these consist of earth embankments. They are in a fair condition and provide protection against flood event with a 1% chance occurring in any year. Given the site is protected by adequate defences, namely the embankment of the river the site is potentially at risk from overtopping and or a residual risk of breaching of the defences.

Data from the Environment Agency includes in channel data for the River Glen, refer to Appendix D. It does not contain Hazard mapping for modelled breaches which may affect the site. It includes a flood map suggesting the site does not flood from overtopping, refer to Appendix D.

The South Holland Strategic Flood Risk Assessment includes modelling for a residual flood hazard across the district. An extract of the 1:100-year fluvial flood map including climate change can be seen below in Figure 4. The red dot indicates the site and the map shows the site does not flood in this scenario.

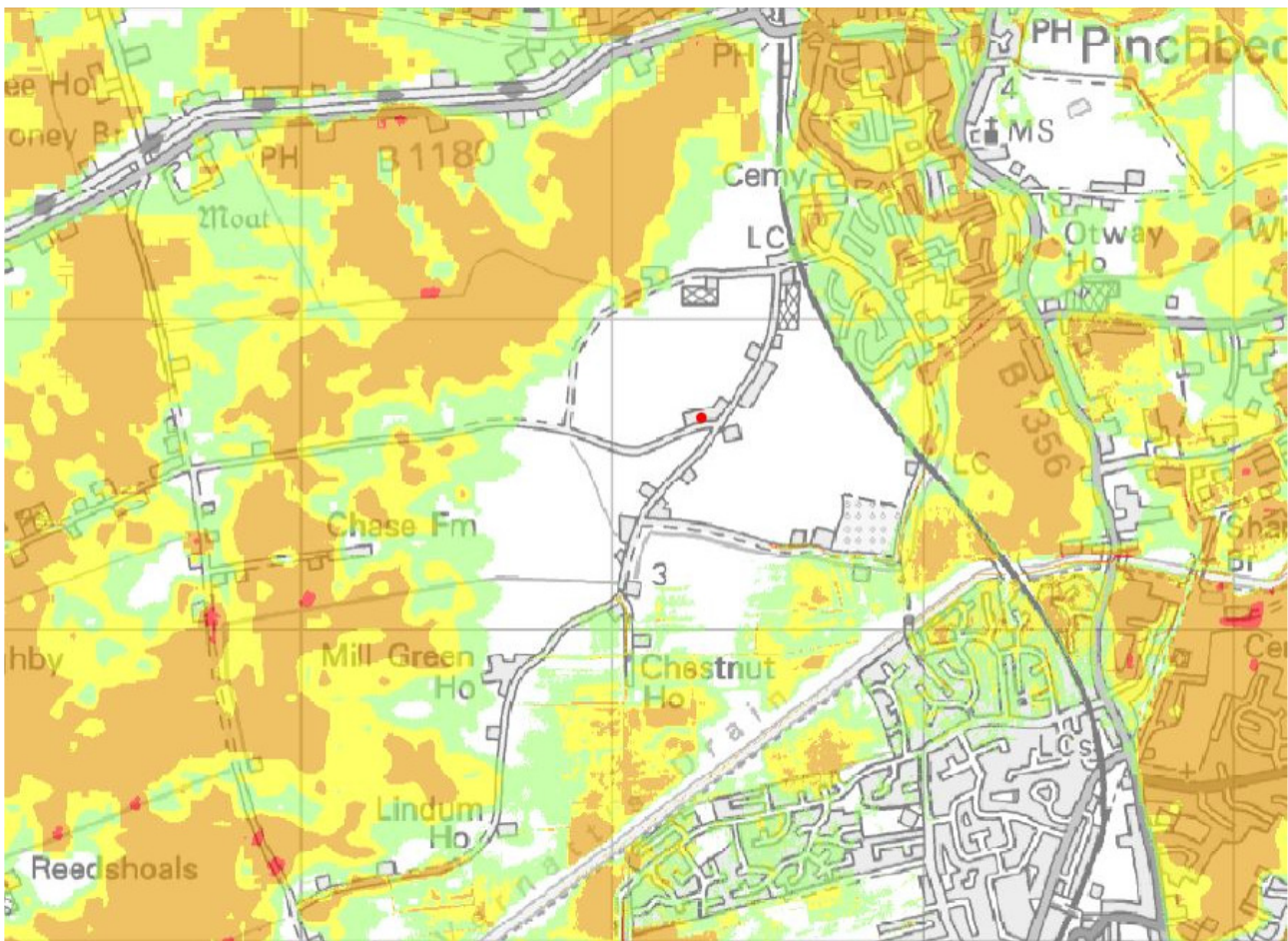


Figure 4 - Residual Flood Hazard Map 2115 1% Fluvial/0.5% Tidal

Global warming is now recognised that it is likely to affect the frequency and severity of extreme events such as both tidal and fluvial flooding. The climate change allowances in the NPPF Guidance were updated on the 19th February 2016 and again on 17th December 2019. The site lies within the Welland Catchment and allowances for climate change should be made on the following basis. For a worst-case scenario, the site shall be considered to be in a Flood Zone 3a and the use classification is 'more vulnerable' therefore Peak River flows use the higher central and upper end to assess a range of allowances.

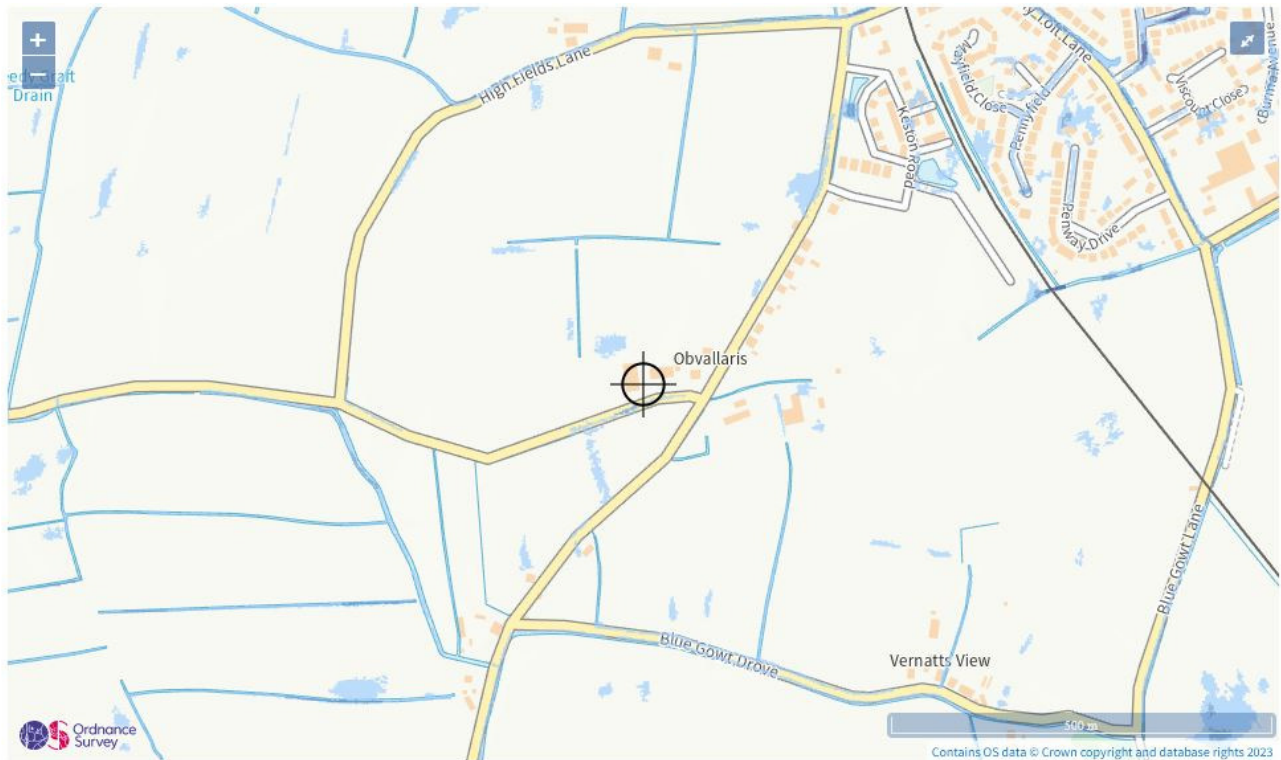
The adjustments for peak flows can be seen in the table below in Figure 5. The National Planning Practice Guidance recommends for 'more vulnerable' developments in the flood zones 2 and 3a the Central allowance for design should be undertaken. In this case the central allowance requires for design 17% climate is included for the 2115 scenario. Therefore, for simplicity, for design a 17% increase to peak flow will be used to determine the 1 in 100-year flood level plus climate change and the design will be tested for sensitivity using a 53% increase to peak flows for the 1 in 100-year event. It is assumed the SFRA already includes a 20% increase for climate change and therefore is presumed to be a worst case.

| <b>River basin district</b> | <b>Allowance category</b> | <b>Total change anticipated for the '2020s' (2015 to 2039)</b> | <b>Total change anticipated for the '2050s' (2040 to 2069)</b> | <b>Total change anticipated for the '2080s' (2070 to 2115)</b> |
|-----------------------------|---------------------------|----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|
| Welland                     | Upper                     | 22%                                                            | 26%                                                            | 53%                                                            |
|                             | Higher                    | 10%                                                            | 10%                                                            | 28%                                                            |
|                             | Central                   | 5%                                                             | 4%                                                             | 17%                                                            |

Figure 5 - Table 1 peak river flow allowances by river basin district (use 1961 to 1990 baseline)

## Risk of Flooding from Surface Water

The risk of flooding from surface water is very low on the site. The following map shows the Environment Agency's Risk of Flooding from Surface Water map:



Extent of flooding from surface water

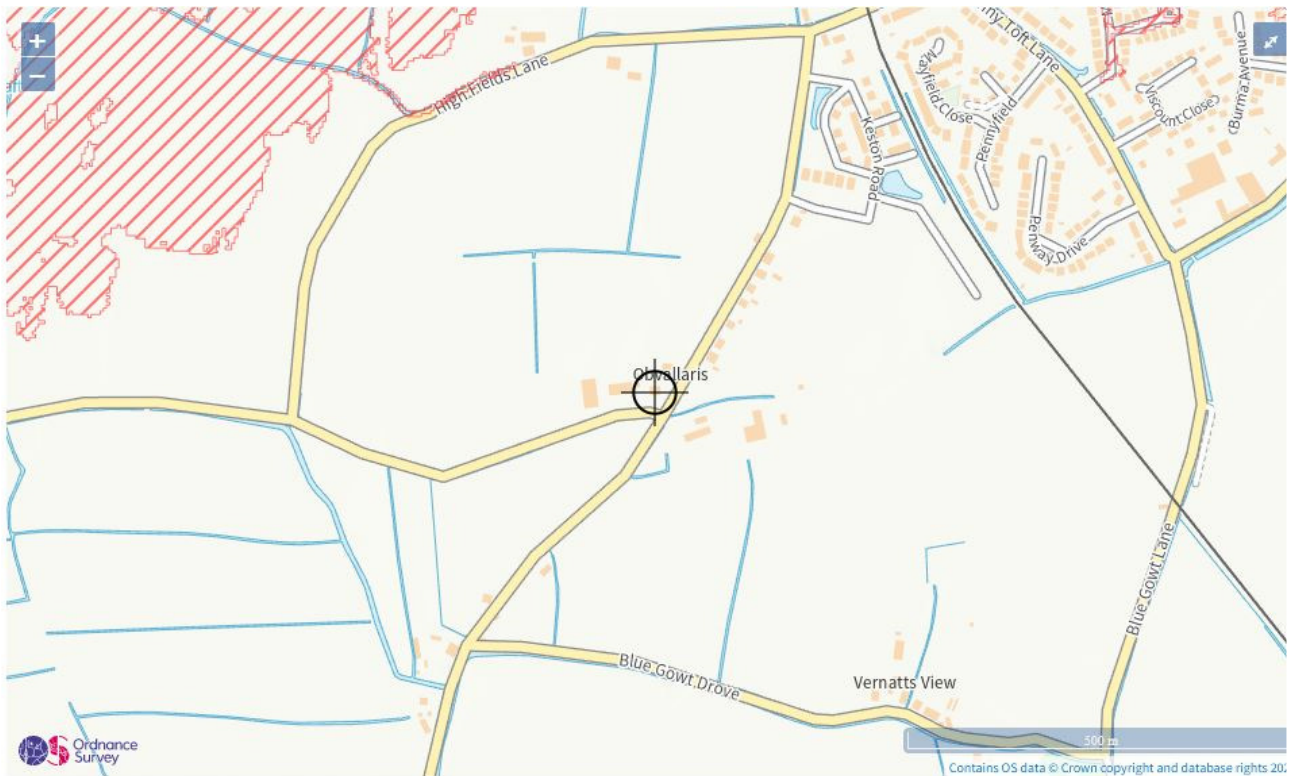
● High 
 ● Medium 
 ● Low 
   Very low 
 ⊕ Location you selected

Figure 6 - Surface Water Flood Map ([www.gov.uk](http://www.gov.uk))

The site does not suffer from surface water flooding. No further action is required.

## Risk of Flooding from Reservoirs

There is no risk of flooding from reservoirs when river levels are normal or when there is flooding from rivers. The following map shows this on the Environment Agency's Risk of Flooding from Reservoirs map:



Maximum extent of flooding from reservoirs:

Figure 7 - Reservoir Flood Map ([www.gov.uk](http://www.gov.uk))

No further action is required.

## Risk of Flooding from Sewers

There are no known public surface water and foul water sewers that currently exist on the site that are known to suffer from sewer surcharging. All new infrastructures to service the dwellings shall be appropriately designed to the relevant standards to ensure failures do not present a problem.

## Safe Access & Egress

The proposed ground floor level will be above the predicted worse case flood level. The site will be a dry island and therefore in times of flooding will provide a safe refuge from flooding. The roads leading away from the site may not be passable based on the SFRA's Residual Flood Map shown in Figure 4.

## Setting the floor level & Flood Mitigation

Standing advice requires finished floor levels (FFL) should be a minimum of whichever is higher of 300mm above the:

- Average ground level of the site
- Adjacent road level to the building
- Estimated river or sea flood level

In this case the calculated 1 in 100-year flood level plus climate change does not lead to flood depths onsite. Therefore, it is considered a floor level set at 150mm above existing ground levels will provide sufficient protection from the design event.

As the site is located in a Flood Zone 3 it should register for advanced flood warnings. It would also be prudent to ensure the property is constructed using flood resilient construction up to 300mm above the finished floor level in case the site is affected by more extreme events than the design event i.e. 1:1000 year plus climate change.

## Conclusion

The proposed development is for 4No. two-storey dwellings. The site is contained within a Flood Zone 3.

The site is not at risk of tidal flooding but is at risk from fluvial flooding. The site is protected by adequate fluvial flood defences which are maintained by the Environment Agency. A residual risk to breaching of these defences exist.

The residential use falls within "more vulnerable" uses of land in Table 2 Flood Risk Vulnerability Classification and Table 3 shows that developments of this nature are appropriate in flood zone 3 subject to passing the Sequential Test and Exception Test.

In this case the proposed scheme should be viewed in the light of a fallback and the residual flood hazard map that shows the site has no hazard. It is considered the scheme provides a level of flooding betterment by providing one less unit a 'Change of Use' scheme could result in. Therefore, it is considered this scheme passes the Sequential Test and Exception Test.

As there is no flood depth on site for the design scenario the floors will be set at 150mm above existing ground levels. However constructing using flood resilient construction to 300mm above the finished floor level would be prudent.

At the detailed design stage of the development advice contained in "Improving the Flood Performance of New Buildings - Flood Resilient Construction" should be followed. Further to this the property will register to Floodline to receive advance warning of potential flooding.

New foul and surface water drains will be designed to the relevant standards.

## Appendices

### Appendix A – National Planning Policy Framework

#### PLANNING AND FLOOD RISK

159. 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.
160. Strategic policies should be informed by a strategic flood risk assessment, and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.
161. All plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:
  - a) applying the sequential test and then, if necessary, the exception test as set out below;
  - b) safeguarding land from development that is required, or likely to be required, for current or future flood management;
  - c) using opportunities provided by new development to reduce the causes and impacts of flooding (where appropriate through the use of natural flood management techniques); and
  - d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.
162. The aim of the sequential test is to steer new development to areas with the lowest risk of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.
163. If it is not possible for development to be located in zones with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed, in line with the Flood Risk Vulnerability Classification set out in Annex 3.

164. The application of the exception test should be informed by a strategic or site-specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. For the exception test to be passed it should be demonstrated that:
- a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
  - b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.
165. Both elements of the exception test should be satisfied for development to be allocated or permitted.
166. Where planning applications come forward on sites allocated in the development plan through the sequential test, applicants need not apply the sequential test again. However, the exception test may need to be reapplied if relevant aspects of the proposal had not been considered when the test was applied at the plan-making stage, or if more recent information about existing or potential flood risk should be taken into account.
167. When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment<sup>55</sup>. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:
- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
  - b) the development is appropriately flood resistant and resilient;
  - c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
  - d) any residual risk can be safely managed; and
  - e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.
168. Applications for some minor development and changes of use<sup>56</sup> should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 55.
169. Major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:

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<sup>55</sup> A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

<sup>56</sup> This includes householder development, small non-residential extensions (with a footprint of less than 250m<sup>2</sup>) and changes of use; except for changes of use to a caravan, camping or chalet site, or to a mobile home or park home site, where the sequential and exception tests should be applied as appropriate.

- a) take account of advice from the lead local flood authority;
- b) have appropriate proposed minimum operational standards;
- c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
- d) where possible, provide multifunctional benefits.

## Appendix B – South East Lincolnshire Local Plan

### POLICY 4: APPROACH TO FLOOD RISK

Development proposed within an area at risk of flooding (Flood Zones 2 and 3 of the Environment Agency's flood map or at risk during a breach or overtopping scenario as shown on the flood hazard and depths maps in the Strategic Flood Risk Assessment) will be permitted, where:

1. It can be demonstrated that there are no other sites available at a lower risk of flooding (i.e. that the sequential test is passed). The sequential test will be based on a Borough or District wide search area of alternative sites within the defined settlement boundaries, unless local circumstances relating to the catchment area for the development justify a reduced search area, i.e. there is a specific need for the development in that location. The sequential test is not required for sites allocated in the Local Plan, minor development or change of use (except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site).
2. It can be demonstrated that essential infrastructure in FZ3a & FZ3b, highly vulnerable development in FZ2 and more vulnerable development in FZ3 provide wider sustainability benefits to the community that outweigh flood risk.
3. The application is supported with a site-specific flood risk assessment, covering risk from all sources of flooding including the impacts of climate change and which:
  - a) demonstrate that the vulnerability of the proposed use is compatible with the flood zone;
  - b) identify the relevant predicted flood risk (breach/overtopping) level, and mitigation measures that demonstrate how the development will be made safe and that occupants will be protected from flooding from any source;
  - c) propose appropriate flood resistance and resilience measures (following the guidance outlined in the Strategic Flood Risk Assessment), maximising the use of passive resistance measures (measures that do not require human intervention to be deployed), to ensure the development maintains an appropriate level of safety for its lifetime;
  - d) include appropriate flood warning and evacuation procedures where necessary (referring to the County's evacuation routes plan), which have been undertaken in consultation with the authority's emergency planning staff;
  - e) incorporates the use of Sustainable Drainage Systems (SuDS) (unless it is demonstrated that this is not technically feasible) and confirms how these will be maintained/managed for the lifetime of development (surface water connections to the public sewerage network will only be permitted in exceptional circumstances where it is demonstrated that there are no feasible alternatives);
  - f) demonstrates that the proposal will not increase risk elsewhere and that opportunities through layout, form of development and green infrastructure have been considered as a way of providing flood betterment and reducing flood risk overall;
  - g) demonstrates that adequate foul water treatment and disposal already exists or can be provided in time to serve the development;
  - h) ensures suitable access is safeguarded for the maintenance of water resources, drainage and flood risk management infrastructure.

Development in all flood zones, and development over 1 hectare in size in Flood Zone 1, will need to demonstrate that surface water from the development can be managed and will not increase the risk of flooding to third parties.

Change of use of existing buildings will be supported providing they do not pose an increase in risk to people. Change of use that would result in self-contained ground floor residential accommodation in areas of hazard rating 'danger for some', 'danger for most' and 'danger for all' will not be supported. In these areas unrestricted access to a habitable room above the flood level and an emergency evacuation plan will be required.

Caravans, mobile homes and park homes intended for permanent residential use will not be permitted in areas at risk of flooding. Caravan, chalet, log cabin, camping and touring sites at risk of fluvial flooding where there is a 'danger for most' and 'danger for all' will not be permitted. Occupancy of caravan, chalet, log cabin, camping and touring sites at risk of tidal flooding will not be permitted to open between 1<sup>st</sup> November in any one year and the 14<sup>th</sup> March in the succeeding year.

No development will be permitted within a 50m buffer from the toe of the raised Witham Haven Banks (flood defences), as shown on the indicative Plan contained in Appendix 10, to allow access for construction and maintenance.

Flood risk management infrastructure shall be provided at the strategic level, where development opportunities allow, to reduce the hazard and probability of flooding.

## Appendix C – Topographical Survey



## Appendix D – Environment Agency Flood Data

Michael Orridge  
[michael@origindesignstudio.co.uk](mailto:michael@origindesignstudio.co.uk)

**Our ref:** CCN-2023-313393

**Date:** 15/06/2023

Dear Michael,

### **Provision of Flood Risk Information for Fengate Road, Spalding.**

Thank you for your request for our flood risk information for the above site. The information is set out below and attached. It is important you read any contextual notes on the maps provided.

If you are preparing a Flood Risk Assessment (FRA) for this site, please note this information may not be sufficient by itself to produce an adequate FRA to demonstrate the development is safe over its lifetime. Additional information may be required to carry out an appropriate assessment of all risk, such as consequence of a breach in defences.

We aim to review our information on a regular basis, so if you are using this data more than twelve months from the date of this letter, please contact us again to check it is still valid.

Please read the letter in full as the information covered has been updated in **June 2023**.

#### **1. Flood Map for Planning**

The attached map includes the current Flood Map for Planning for your area. The map indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring for fluvial (river) flooding. It also shows the extent of the Extreme Flood Outline which represents the extent of a flood with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

In some locations, such as around the fens and the large coastal floodplains, showing the area at risk of flooding assuming no defences may give a slightly misleading picture in that if there were no flood defences, water would spread out across these large floodplains. This flooding could cover large areas of land but to relatively shallow depths and could leave pockets of locally slightly higher land as isolated dry islands. It is important to understand the actual risk of the flooding to these dry islands, particularly in the event of defence failure.

The Flood Map for Planning also shows the location of formal raised flood defences and flood storage reservoirs. It represents areas at risk of flooding for present day only and does not take account of climate change.

The Flood Map for Planning only indicates the extent and likelihood of flooding from rivers or the sea. It should also be remembered flooding may occur from other sources such as surface water sewers, road drainage, etc.

## **2. Recorded Flood Outlines**

With regards to the history of flooding I can advise we do not have any records of flooding in this area. It is possible recent flooding may have occurred which we are currently investigating, therefore this information may be subject to change. It is possible other flooding may have occurred which other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist) have responsibility.

## **3. Schemes in the area**

There are no ongoing capital projects to reduce or sustain the current flood risk to this site.

## **4. Fluvial Flood Risk Information**

This site is considered to be at risk of flooding from main rivers.

The site may also be at risk from local ordinary watercourses for which other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist) have responsibility.

### **4.1 Fluvial Defence Information**

The existing fluvial defences reducing the risk of flooding from main river to this site consist of earth embankments. They are in fair condition and reduce the risk of flooding (at the defence) to a 1% (1 in 100) chance of occurring in any year. We inspect these defences routinely to ensure potential defects are identified.

### **4.2 Fluvial Modelled Levels and Flows**

Available modelled fluvial flood levels and flows for the model nodes shown on the attached map are set out in the data table attached. This data is taken from the model named on the data table, which is the most up-to-date model currently available.

Please note these levels are “in-channel” levels and therefore may not represent the flood level on the floodplain, particularly where the channel is embanked or has raised defences.

Our models may not have the most up to date climate change allowances. In time we will update our models for the latest allowances. You should refer to '[Flood risk assessments: climate change allowances](#)' to check if the allowances modelled are appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.

### **4.3 Fluvial Modelled Flood Extents**

Please find attached a map showing available modelled flood extents, taking into account flood defences, for your area. This data is taken from the model named on the map, which is the most up-to-date model currently available.

In some cases the flood extents shown may not be from main river, but may be from other sources such as IDB lowland drainage networks.

#### **4.4 Fluvial Hazard Mapping**

For certain locations we have carried out modelling to map the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from overtopping and / or breaching of defences at specific locations for a number of scenarios.

At present this information is available for fluvial flood risk in Northampton, Lincoln, Wainfleet and some isolated rural locations.

The number of locations we have this information for is expected to increase in time.

At present this site is not covered by any Environment Agency hazard mapping.

Detailed Hazard Mapping is available within the 2017 Update of South Holland Strategic Flood Risk Assessment. This can be downloaded via the following link:

<http://www.southeastlincslocalplan.org/water/>

#### **5. Tidal Flood Risk Information**

This site is not considered to be at risk from tidal flooding.

#### **6. Development Planning**

If you would like local guidance on preparing a flood risk assessment for a planning application, please contact our Sustainable Places team at [LNplanning@environment-agency.gov.uk](mailto:LNplanning@environment-agency.gov.uk). It will help if you mention this data request and attach your site location plan.

We provide free preliminary advice; additional/detailed advice, review of draft FRAs and meetings are chargeable at a rate set to cover our costs, currently £100 (plus VAT) per hour of staff time. Further details are available on our website at

<https://www.gov.uk/guidance/developers-get-environmental-advice-on-your-planning-proposals>.

General advice on flood risk assessment for planning applications can be found on GOV.UK at <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>

Climate change will increase flood risk due to overtopping of defences. Please note, unless specified otherwise, the climate change data included has an allowance for 20% increase in flow. Updated guidance on how climate change could affect flood risk to new development - 'Flood risk assessments: climate change allowances' was published on GOV.UK in **July 2021**. The appropriate updated climate change allowance should be applied in a Flood Risk Assessment.

You should also consult the Strategic Flood Risk Assessment produced by your local planning authority.

#### **7. Data Licence and Other Supporting Information**

We respond to requests for recorded information we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

This information is provided in accordance with the Open Government Licence which can be found here: <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Further information on flood risk can be found on the GOV.UK website at:  
<https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather>

## **8. Other Flood Risk Management Authorities**

The information provided with this letter relates to flood risk from main river or the sea. The Flood Map for Surface Water can be viewed at <https://www.gov.uk/check-long-term-flood-risk>

Additional information may be available from other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist).

I hope we have correctly interpreted your request. If you have any queries or would like to discuss the content of this letter further please contact Annabelle Webster using the email address below and quoting our CCN reference number above.

Yours sincerely,

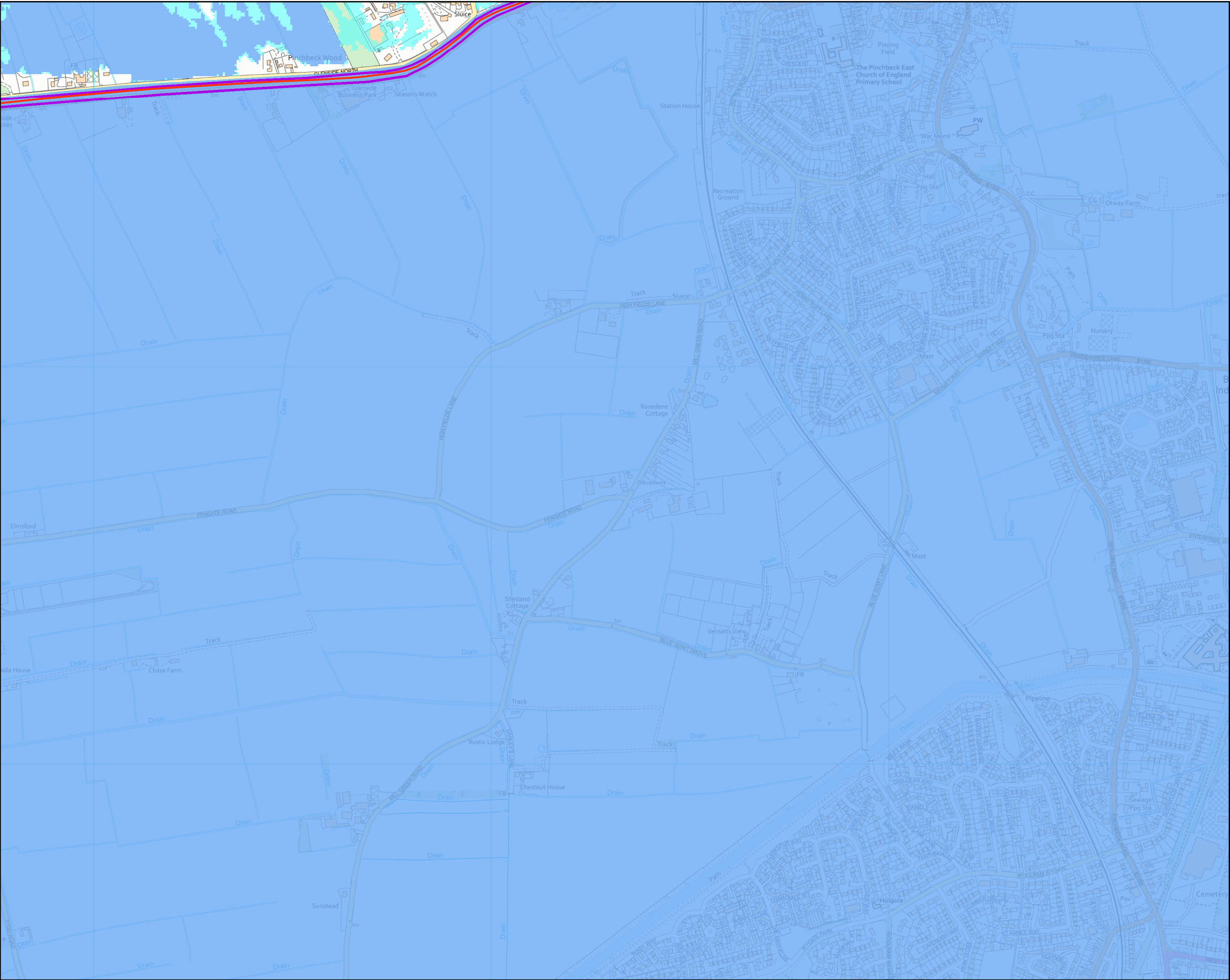


020 302 53535

**for Alastair Windler**  
**Welland and Nene Partnerships and Strategic Overview Team Leader**  
e-mail [PSOWN@environment-agency.gov.uk](mailto:PSOWN@environment-agency.gov.uk)

Enc.  
Flood Map for Planning  
Recorded Flood Event Outlines Map  
Modelled Node Points Map  
Modelled Fluvial Levels and Flows Data Sheet  
Modelled Flood Extent Maps

# Flood Map centred on TF 23311 24687 - created June 2023 [Ref: CCN-2023-313393]



Scale 1:10,000



- Legend**
- Main Rivers
  - Raised Defences
  - Flood Storage Areas
  - Areas at Risk of Flooding from Rivers or the Sea
  - Extreme Flood Outline

Dark blue shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:

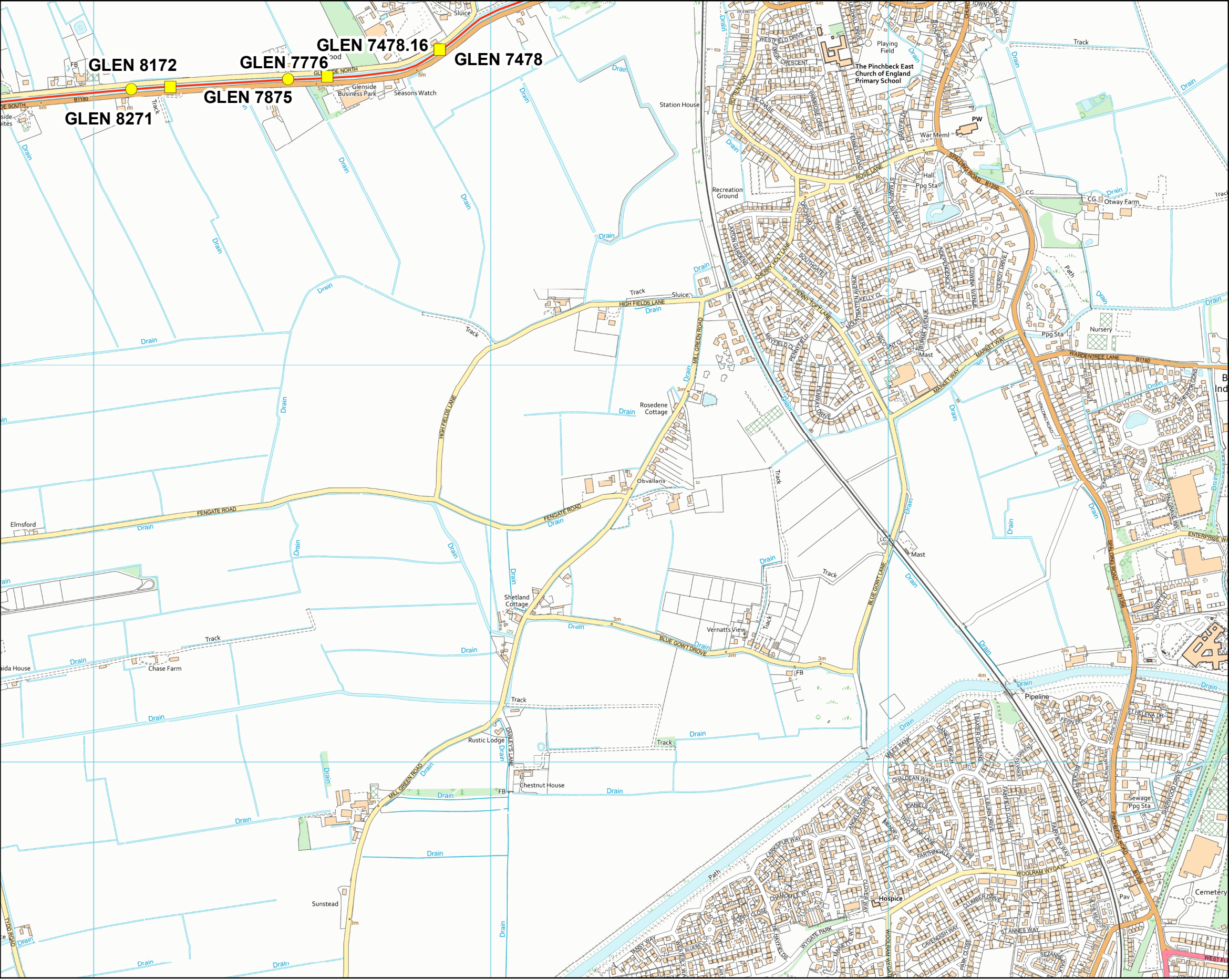
- from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year.
- or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.

Light blue shows the extent of the Extreme Flood Outline, which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Sites outside the two extents, but behind raised defences, may be affected by flooding if the defences are overtopped or fail.

Created by the Partnerships and Strategic Overview Team, Kettering

# Modelled Node Points Map centred on TF 23311 24687 - created June 2023 [Ref: CCN-2023-313393]



Scale 1:10,000

## Legend

- Model Nodes - Flows
- Model Nodes - Levels
- Main Rivers

Dark blue shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:

- from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year.
- or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.

Light blue shows the extent of the Extreme Flood Outline, which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Sites outside the two extents, but behind raised defences, may be affected by flooding if the defences are overtopped or fail.

Created by the Partnerships and Strategic Overview Team, Kettering

**Datasheet [Ref: CCN-2023-313393]**
**Model Name: Welland Catchment Strategic**
**Model Date: 2016**

## Fluvial Flood Levels (mODN)

The fluvial flood levels for the model nodes shown on the attached map are set out in the table below. They are measured in metres above Ordnance Datum Newlyn (mODN).

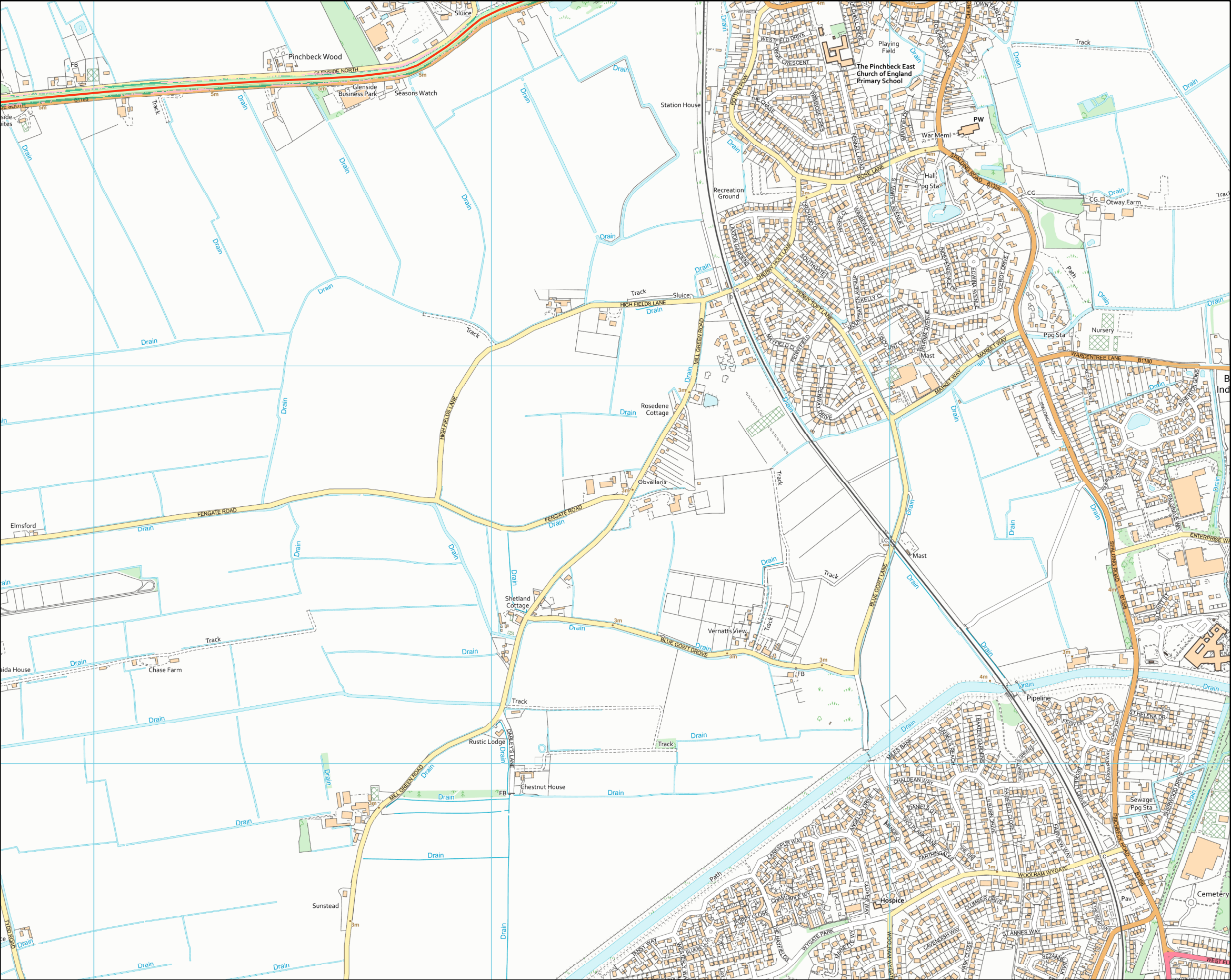
| Node Label | Easting | Northing | Annual Exceedance Probability - Maximum Water Levels (mODN) |                 |                  |                 |                    |                 |                    |                  |                                               |                    |                     |                                                  |
|------------|---------|----------|-------------------------------------------------------------|-----------------|------------------|-----------------|--------------------|-----------------|--------------------|------------------|-----------------------------------------------|--------------------|---------------------|--------------------------------------------------|
|            |         |          | 50%<br>(1 in 2)                                             | 20%<br>(1 in 5) | 10%<br>(1 in 10) | 5%<br>(1 in 20) | 3.33%<br>(1 in 30) | 2%<br>(1 in 50) | 1.33%<br>(1 in 75) | 1%<br>(1 in 100) | 1%<br>(1 in 100)<br>inc 20%<br>Climate Change | 0.5%<br>(1 in 200) | 0.1%<br>(1 in 1000) | 0.1%<br>(1 in 1000)<br>inc 20%<br>Climate Change |
| GLEN 7478  | 522872  | 325795   | 4.05                                                        | 4.19            | 4.26             | 4.33            | 4.36               | 4.39            | 4.41               | 4.43             | 4.89                                          | 4.52               | 4.75                | 5.05                                             |
| GLEN 7875  | 522490  | 325719   | 4.07                                                        | 4.21            | 4.29             | 4.35            | 4.39               | 4.42            | 4.44               | 4.46             | 4.91                                          | 4.55               | 4.81                | 5.09                                             |
| GLEN 8271  | 522095  | 325694   | 4.08                                                        | 4.22            | 4.30             | 4.37            | 4.41               | 4.44            | 4.47               | 4.49             | 4.93                                          | 4.59               | 4.86                | 5.12                                             |

## Fluvial Flood Flows (m³/s)

The fluvial flood flows for the model nodes shown on the attached map are set out in the table below. They are measured in metres cubed per second (m³/s).

| Node Label   | Easting | Northing | Annual Exceedance Probability - Maximum Flows (m³/s) |                 |                  |                 |                    |                 |                    |                  |                                               |                    |                     |                                                  |
|--------------|---------|----------|------------------------------------------------------|-----------------|------------------|-----------------|--------------------|-----------------|--------------------|------------------|-----------------------------------------------|--------------------|---------------------|--------------------------------------------------|
|              |         |          | 50%<br>(1 in 2)                                      | 20%<br>(1 in 5) | 10%<br>(1 in 10) | 5%<br>(1 in 20) | 3.33%<br>(1 in 30) | 2%<br>(1 in 50) | 1.33%<br>(1 in 75) | 1%<br>(1 in 100) | 1%<br>(1 in 100)<br>inc 20%<br>Climate Change | 0.5%<br>(1 in 200) | 0.1%<br>(1 in 1000) | 0.1%<br>(1 in 1000)<br>inc 20%<br>Climate Change |
| GLEN 7478.16 | 522872  | 325795   | 25.54                                                | 29.11           | 30.75            | 32.82           | 33.42              | 34.25           | 34.97              | 35.47            | 42.95                                         | 38.46              | 48.06               | 56.88                                            |
| GLEN 7776    | 522589  | 325726   | 25.40                                                | 29.03           | 30.65            | 32.71           | 33.31              | 34.14           | 34.86              | 35.37            | 42.73                                         | 38.33              | 48.07               | 56.87                                            |
| GLEN 8172    | 522194  | 325701   | 25.28                                                | 28.90           | 30.51            | 32.59           | 33.19              | 34.01           | 34.72              | 35.22            | 42.48                                         | 38.17              | 48.07               | 56.87                                            |

Modelled Flood Extents (with defences) Model: Welland Glen (2016)  
centred on TF 23311 24687 - created June 2023 [Ref: CCN-2023-313393]



Scale 1:10,000



- Legend**
- Main Rivers
  - 3.33% (1 in 30) fluvial event
  - 1% (1 in 100) fluvial event
  - 1% (1 in 100) inc 20% climate change fluvial event
  - 0.1% (1 in 1000) fluvial event
  - 0.1% (1 in 1000) inc 20% climate change fluvial event

Created by the Partnerships and Strategic Overview Team,  
Kettering