Tidal Flood Risk and Development on Canvey Island

Advice for small developments of less than 10 dwellings

This guidance note has been jointly produced by Castle Point Borough Council and the Environment Agency to assist applicants in understanding how tidal flood risk needs to be considered for planning applications on Canvey Island.

Why does flood risk need to be considered?

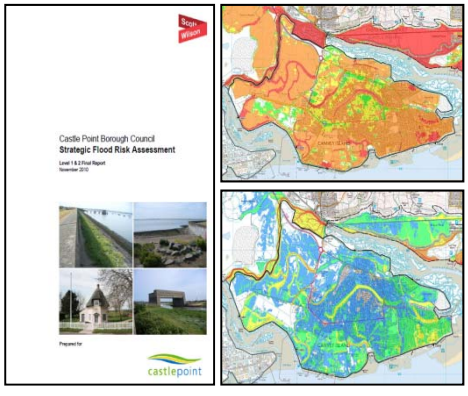
Flooding can threaten lives and cause substantial damage to properties. Whilst it cannot be wholly prevented, its impacts can be avoided and reduced through good planning and management.

The National Planning Policy Framework (NPPF) and its supporting Technical Guidance Document set out the Government's national policy on development in areas at risk of flooding. It seeks, wherever possible, to **avoid inappropriate development** in areas at risk of flooding. Where it can be demonstrated that development is required in these areas, the NPPF seeks to ensure it will be **safe** over the lifetime of the development and will **not increase flood risk elsewhere** and where possible, **reduce flood risk** overall.

What is the tidal flood risk on Canvey Island?

Most of Canvey Island lies at or below the mean tide level in the adjacent Thames estuary making it potentially vulnerable to tidal flooding. In response to this a system of raised flood defences and barriers have been constructed to protect the island. Whilst these defences currently provide a very high standard of flood protection, the island remains at risk should the **flood defences fail** or in the event of a tide high enough to **overtop** them. Although the chance of either of these events occurring is very low, the **consequences** to people on Canvey could be very high. Proposals for development must therefore ensure these risks, known as residual risks, are effectively managed onsite so that future occupants and users can remain safe.

Castle Point Borough Council produced a **Strategic Flood Risk Assessment** (SFRA) in 2010 which provides detailed information on the nature of the flood risk on Canvey Island should there be a failure in the flood defences. The SFRA includes maps showing the expected flood depths, flood hazards and time to inundation for particular levels of flooding set out in the NPPF. This information is available for you to view and use from Castle Point Borough Councils website. A link to this is provided at the end of this factsheet.



The future of the flood defences on Canvey Island has been considered in the Environment Agency's **Thames Estuary 2100 (TE2100) plan**. This plan sets out recommended policies and preferred options for the defences over the next 100 years and advises that they should be maintained and upgraded to ensure that the protection currently provided does not reduce in the future through the impacts of climate change and sea level rise. Future flood defence improvements will be able to go ahead provided that both national and local sources of funding are

available and that the benefits of the improvement works significantly outweigh the costs of building and maintaining them.

The TE2100 plan also recommends that a programme is agreed to improve flood warning, resilience and emergency planning and local flood protection. It suggests vulnerable housing is replaced by more resilient designs with a second storey for refuge when opportunities arise.

What flood risk information needs to support your planning application?

Your planning application will most likely need to pass the NPPF Flood Risk Sequential and Exception Tests and be supported by two documents: a site specific Flood Risk Assessment (FRA) and a Flood Response Plan (FRP).

Sequential and Exception Test: These tests establish the principle of developing your proposed site and should therefore be discussed with the planning department at Castle Point Borough Council before you produce your FRA and FRP.

Flood Risk Assessment: Your FRA will need to provide detailed information on the nature of flood risk in and around your site. To establish this you will need to compare a GPS topographical survey of your site to the flood levels resulting from a defence failure. You do not need to commission your own breach modelling to get the flood levels as this work has already been done as part of the Castle Point Borough Council SFRA (2010). Once you have this information your FRA will need to demonstrate how flood risk will be managed, such as flood evacuation or refuge procedures and the use of flood resilient construction.

The flow chart on the next page gives you step-by-step guidance on preparing this document.

Please note: Your FRA may also need to consider **other forms of flood risk** such as fluvial, surface water and groundwater. Please speak with the planning department at Castle Point Borough Council for further advice on this.

Flood Response Plan: This document should detail the proposed emergency response and evacuation procedures that you consider necessary to ensure that future occupants or users of your development can remain safe. The FRP should use the findings of your FRA and advise occupants on what to do (and what not to do) in response to an advanced warning of flooding and, additionally, the actions that they should take to remain safe if flooding has started to affect the area around the development without warning. You should discuss your proposals with the Castle Point Borough Council's Emergency Planning representative and the Emergency Services to ensure that your site Flood Response Plan integrates with and compliments the wider emergency plans for Canvey Island.

What is Castle Point Borough Council's role?

Castle Point Borough Council is the **decision maker**. The Planning Department needs to consider all planning matters, including those related to flood risk, before deciding whether or not to grant planning permission. Castle Point Borough Council's Emergency Planning representatives are important consultees and will provide guidance to the planning department on the proposed flood **emergency response and evacuation** procedures. These procedures, along with the design of the development, will help the Council to determine whether the development is considered to be safe for its future occupants and users.

What is the Environment Agency's role?

The Environment Agency is a statutory consultee for applications in areas of flood risk. Its advice, as well as that of the Castle Point Borough Council's emergency planning representatives, will help inform the final decision made by the Council. It will review your FRA and provide **technical, independent advice** to the Council on the documents compliance with the NPPF and with the recommendations provided in the SFRA.

How to undertake a Flood Risk Assessment

FLOOD RISK ASSESSMENT OPTION 1

This option will produce a more accurate FRA as you will use site specific flood risk information. You will however need to purchase this information from Castle Point Borough Councils SFRA consultants, details of which are provided below.

1. DATA GATHERING:

(a) Obtain the following site specific flood risk information for your site and around its boundaries from the Council's SFRA consultants. This should be recorded in your FRA:

- modelled flood **depth**
- modelled flood **hazard rating**
- modelled **time** until inundation

You will need this information for both the **design** (1 in 200) and **extreme** events (1 in 1000) **including climate change**.

(b) Get a **GPS verified topographical survey** of your site completed. This should include points across the site including where the building is going to be located.

FLOOD RISK ASSESSMENT OPTION 2

A FRA produced using this option will be based on the 'worst case' scenario, which may mean you are required to over-mitigate the flood risk, for example by building your development with higher floor levels than may actually be required. The flood data required is however freely available on the Council's website so this is the cheapest option as it does not require any additional modelling.

1. DATA GATHERING:

(a) Obtain flood risk information for your site using the following SFRA maps and record it in your FRA:

- **figure B3**: the 200YR+CC flood depth in a breach
- **figure B4**: the 1000YR+CC flood depth in a breach
- **figure C3**: the hazard rating in the 200YR+CC event
- **figure C4**: the hazard rating in the 1000YR+CC event
- **Appendix D**: you will need to identify which breach is closest to your site and record the time to inundation zone that your site lies within for both the 200Yr+CC and 1000Yr+CC events.

(PLEASE NOTE: +CC means with the addition of climate change)

(b) Get a **topographical (site level) survey** of your site completed using a GPS device. You will most likely need a surveyor to complete this for you. This should include points across the site including where the building is going to be located.

2. ESTABLISHING THE RESIDUAL FLOOD RISK TO YOUR SITE:

Using your flood risk information and the topographical survey you will now be able to establish the hazards which can be expected on and around your site:

To calculate the flood depth in the building:

The flood depth that can be expected within the building would be the sum of:

(ground level in location of proposed building in mAOD
ADD
flood depth for 200YR+CC event in metres)

MINUS

(ground level in location of proposed building in mAOD
ADD
proposed floor level height above site level in metres)

We recommend that you also apply a 300mm (0.3m) freeboard to the calculated flood depth if the aspiration is to prevent water entering the dwelling in a flood event. Freeboard accounts for uncertainties involved in flood modelling as well as post-construction ground settlement or wind or vehicular wave action/wakes on a body of floodwater.

A positive result means water would flow inside the building to that depth; a negative result means your floor levels would be above the flood level to that depth.

This calculation should then be repeated with the 1000YR+CC level. Both calculations should be recorded in your FRA.

Please note: For FRA Option 2 you will need to use the worst case flood depths in the calculation. For example, if your site is shown in the SFRA to be in an area with depths of 1.5m – 2.0m then your calculations will need to be based on 2.0m.

3. PROPOSALS TO MANAGE THE RESIDUAL FLOOD RISK TO YOUR SITE:

Finally, you will now need to explain how you intend to manage the residual flood risk. This should include consideration of the following:

- Proposed levels for ground and first floors
- The ability for people to access refuge areas above the anticipated flood levels
- Where refuges will be required to keep people safe, you should show how the buildings will be structurally capable of sustaining those refuge areas if subjected to floodwater loadings and forces
- The use of Flood Resilient or Flood Resistant construction methods to help facilitate the rapid recovery of the buildings following a flood.
- Production of a Flood Response Plan to help future residents / building users take appropriate actions for responding to flooding and remaining safe should a flood ever occur.

Do replacement dwellings need to be considered in the same way?

If your application is proposing to replace an existing dwelling then your FRA should demonstrate how flood risk will be reduced. The following points should be addressed and, where they cannot be met, justification provided as to why this is the case.

1) **No intensification** (i.e. no additional planning units) of occupation of the site as this would not represent a 'replacement' dwelling. There should also be no increase to the level of risk to occupants.
2) The **Sequential Approach**, which requires you to direct the most vulnerable aspects of the development to the parts of the site with the lowest food risk, should be applied within the site as far as practicable. Opportunities to make space for water should be incorporated, including setting back development from defences or watercourses on or near to the site.
3) Opportunities that exist for a **safe or improved access/evacuation route** should be incorporated in the redevelopment, where possible.
4) Provision of **flood management and evacuation plan** by the applicant to the satisfaction of the Council.
5) Raising the **finished floor level** above the 1 in 200 year return period flood level, including allowances for climate change and freeboard, where practical. If this is shown to be not to be appropriate (see below) designing buildings to incorporate **flood resilience and resistance measures** to these levels.
6) Ideally there should be **refuge**. This should be above the 1 in 1000 year return period flood level including climate change and freeboard allowances.
7) If the replacement building is on a single storey with no refuge above, the floor levels should ideally be set above the 1 in 1000 year return period level including allowances for climate change and freeboard.
8) The building must be capable of withstanding the expected pressures and weight of water acting upon the building. This is vital if the building is required to sustain a refuge area for residents during a flood event.

Is a FRA required for extensions and minor developments?

The NPPF Technical Guidance document defines minor development as:

- Minor non–residential extensions: Industrial/Commercial/Leisure etc. extensions with a footprint less than 250m²;
- Alterations: development that does not increase the size of buildings e.g. alterations to external appearance.
- 'Householder' development: e.g. sheds, garages, games rooms etc. within the curtilage of the existing dwelling in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling e.g. subdivision of houses into flats.

You should speak with the Council Planning Department to confirm which definition your application falls within. You will not need to prepare a detailed FRA for any of these categories. A **standard proforma** is available on the Environment Agency's Flood Risk Standing Advice web pages which can be submitted with your application.

Useful links:

National Planning Policy Framework - http://www.communities.gov.uk/publications/planningandbuilding/nppf

Castle Point Borough Council SFRA - http://www.castlepoint.gov.uk/main.cfm?menuID=11908 (document CP094)

URS-Scott Wilson Ltd (SFRA consultants) – 020 7798 5000

Environment Agency Flood Risk Standing Advice - http://www.environment-agency.gov.uk/research/planning/82584.aspx

Thames Estuary 2100 Plan - http://www.environment-agency.gov.uk/research/library/consultations/106100.aspx

Improving the Flood Performance of New Buildings: flood resilient construction - http://www.communities.gov.uk/publications/planningandbuilding/improvingflood

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