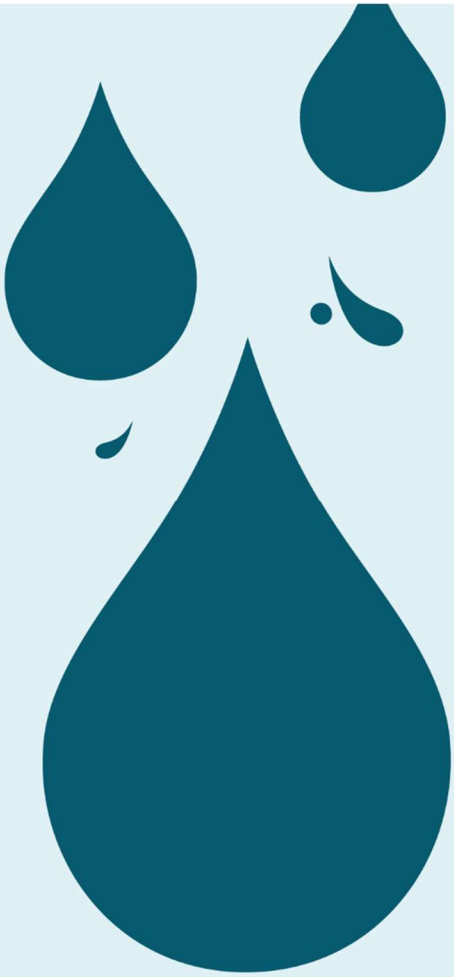
# Planning Guidance for Developers

## Flood Risk Modelling Technical Note



Hampshire County Council

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# Notice

This document and its contents have been prepared by Hampshire County Council and is intended solely as information for Local Planning Authorities and Developers in Hampshire and should be used in relation to surface water drainage strategies and flood risk assessments.

The County Council assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has **6** pages including the cover.

## Document history

| Revision | Purpose description | Originated | Reviewed | Authorised | Date |
|---|---|---|---|---|---|
| Rev 1.0 | Flood Risk Modelling | TC | SDH | SR | Dec 2025 |
| Rev 2.0 | Updated with new EA links | SDH | SDH | SR | Jun 2026 |
| Rev 3.0 | | | | | |



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# Contents



## Tables

# 1. Aims and Objectives

This technical note is for major planning applications where there are areas of surface water flooding on the site. It should be used in conjunction with Hampshire County Council's Planning Guidance. This document set out when flood modelling may be needed to support an application and what level of detail is required. Please note that this technical note relates to surface water flood modelling only and that any fluvial flood modelling should follow the Environment Agency's modelling guidance.

## 1.1. How to use this document

This document is written to provide more detailed support where needed on modelling surface water flooding. It should be used in conjunction with our Planning Guidance document.

## 1.2. Useful Datasets

There are several nationally available flood modelling extents for both fluvial and surface water flooding. These are high level and will not have the same level of detail as a site-specific model but are a good starting point for understanding the potential flooding risks to the site. Climate change allowances for both rainfall and watercourses can be viewed at the links below.

Flood risk mapping:

- Flood map for planning – https://flood-map-for-planning.service.gov.uk/
- Long term flood risk mapping – https://www.gov.uk/check-long-term-flood-risk

Climate change allowances:

- Peak rainfall allowances – https://environment.data.gov.uk/hydrology/climate-change-allowances/rainfall
- Using peak rainfall intensity allowances to assess surface water flood risk – https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#using-peak-rainfall-intensity-allowances-to-assess-surface-water-flood-risk

# 2. Flood Risk Modelling Guidance

If the proposed development is potentially impacted by surface water flood risk, as shown on the Risk of Flooding from Surface Water (RoFSW) mapping, a modelling exercise may be required. It is expected that development will be located in the lowest risk areas within a site. However, modelling may be required for the following scenarios:

- Locating buildings or infrastructure in flood risk areas
- Raising ground in flood risk areas
- Altering watercourse channels or overland flow routes
- Belief that the RoFSW map may not represent the actual flood risk

The table below sets out the recommended level of modelling required for various scenarios. The lower part of the table sets out the appropriate approach for the type of development, based on size, vulnerability and potential for off-site impacts.

**Table 1 – Flood modelling requirements**

| Example | Modelling requirements | |
|---|---|---|
| | Simple approach (1) | Complex approach |
| Overland flow route only | 2D model | 2D model |
| Ordinary watercourse only | 1D model | 1D/2D model |
| Overland flow route flows into ordinary watercourse | 1D/2D model | 1D/2D model |
| Ordinary watercourse flows into culvert | 1D model | 1D/2D model |
| Overland flow route flows into culvert | 1D/2D model | 1D/2D model |
| Ordinary watercourse diversion | 1D model | 1D/2D model |
| Overland flow route diversion | 2D model | 2D model |
| Overland flow route replaced by site drainage | Flow route sub-catchment entirely within site requires no modelling. Outside will fall into one of the other categories. | Flow route sub-catchment entirely within site requires no modelling. Outside will fall into one of the other categories. |
| Culverting an ordinary watercourse (2) | 1D model | 1D model |
| Ground raising in a flow path | Level for level/volume for volume flood storage (infill and mitigation in same flow path) | 2D model |
| Ground raising by a watercourse | Level for level/volume for volume flood storage (infill and mitigation in same flow path) | 1D model |
| Possible surface water drainage network/river/tidal interaction issues | 1D model with surcharged outfall | Integrated catchment model |

(1) – If the simple modelling approach fails to determine the suitability of development in that area, then a more complex modelling approach may be required to demonstrate that the development will be safe, e.g. 1D pipe model with excessive flows emerging from the pipe system may require a 2D model to demonstrate where these flows go.

(2) – Please note that culverting is not generally considered to be acceptable except for essential access.

**Table 2 – When to use a simple or complex modelling approach**

| | Less vulnerable - | More vulnerable + |
|---|---|---|
| **Major <1 ha** | Simple | Simple |
| **Major 1+ ha** | Simple | Complex |
| **Potential impact on upstream/downstream development** | Complex | Complex |

For outline planning, LIDAR may be used for modelling exercises, however for detailed planning a topographic survey must be used.

All modelling should be reviewed and approved by a suitably qualified and experienced professional. It is recommended that modelling is undertaken in accordance with current best-practice standards. The following non-exhaustive list of guidance documents (up to date at the time of writing) may be of use.

'River modelling: technical standards and assessment' https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment. This includes multiple sub-documents/guidance page links like those set out in the LIT 56326 document.

- River modelling standards: who they're for and how to use them, https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment/river-modelling-standards-who-theyre-for-and-how-to-use-them
- River modelling: technical standards and assessment: https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment
- Using modelling for flood risk assessments: https://www.gov.uk/guidance/using-modelling-for-flood-risk-assessments
- Hydraulic modelling: best practice (model approach), https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment/hydraulic-modelling-best-practice-model-approach
- Estimate flood flow from rainfall and river flow data (source), https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment/estimate-flood-flow-from-rainfall-and-river-flow-data-source#flood-hydrology-study
- Represent river channels, floodplains and pipe networks (pathway), https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment/represent-river-channels-floodplains-and-pipe-networks-pathway
- Represent buildings and infrastructure (receptor), https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment/represent-buildings-and-infrastructure-receptor
- LIT17132 v.4.3 – Benchmark for updating risk of flooding from surface water mapping.
- LIT56326 v.4 – EA river hydraulic modelling guidance.
- LIT8986/LIT8988 – Set out principles of RoFSW mapping.
- LIT11832 v.9 – Good practice for hydrological method statements and assessments.

Use river modelling guidance for ordinary watercourses and surface water guidance for overland flows.

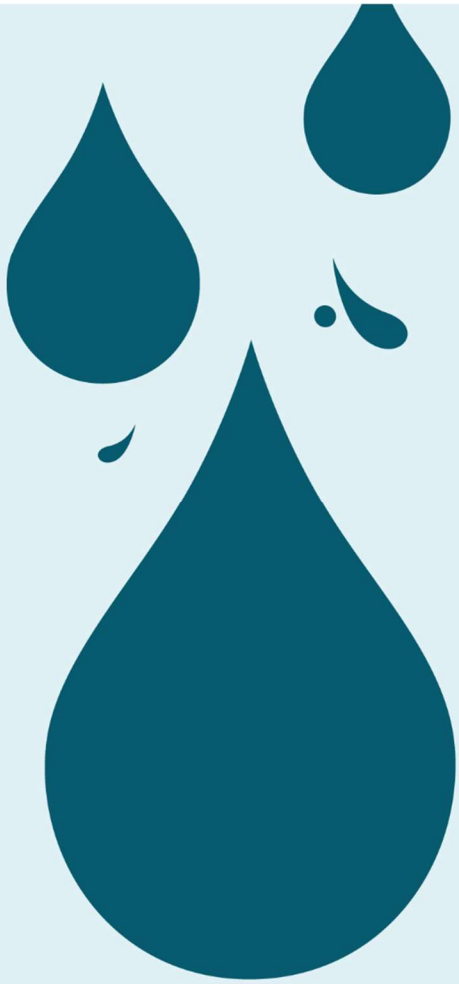
Outputs should be modelled for the following:

**Table 3– Model scenarios**

| **Scenario:** | | | | |
|---|---|---|---|---|
| **Baseline** | 1 in 30 | 1 in 100 | - | 1 in 1000 |
| **Post-development** | 1 in 30 | 1 in 100 | 1 in 100 + CC | 1 in 1000 |

An 80% blockage scenario for culverts should be considered for all scenarios, and sensitivity testing should be applied to the land cover roughness parameters.

A report detailing the inputs and outputs of the model is required as part of any planning submission where flood risk modelling has been undertaken.



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