

Additional information for the holders of Flood Information Certificates

This information explains the terms used in City of Newcastle's (CN) Flood Information Certificates and provides some basic information on CN's requirements for future development of flood prone land.

Compliance with these requirements in the Development Control Plan does not guarantee approval, however, in most cases, the flood issues can be resolved by adhering to these guidelines.

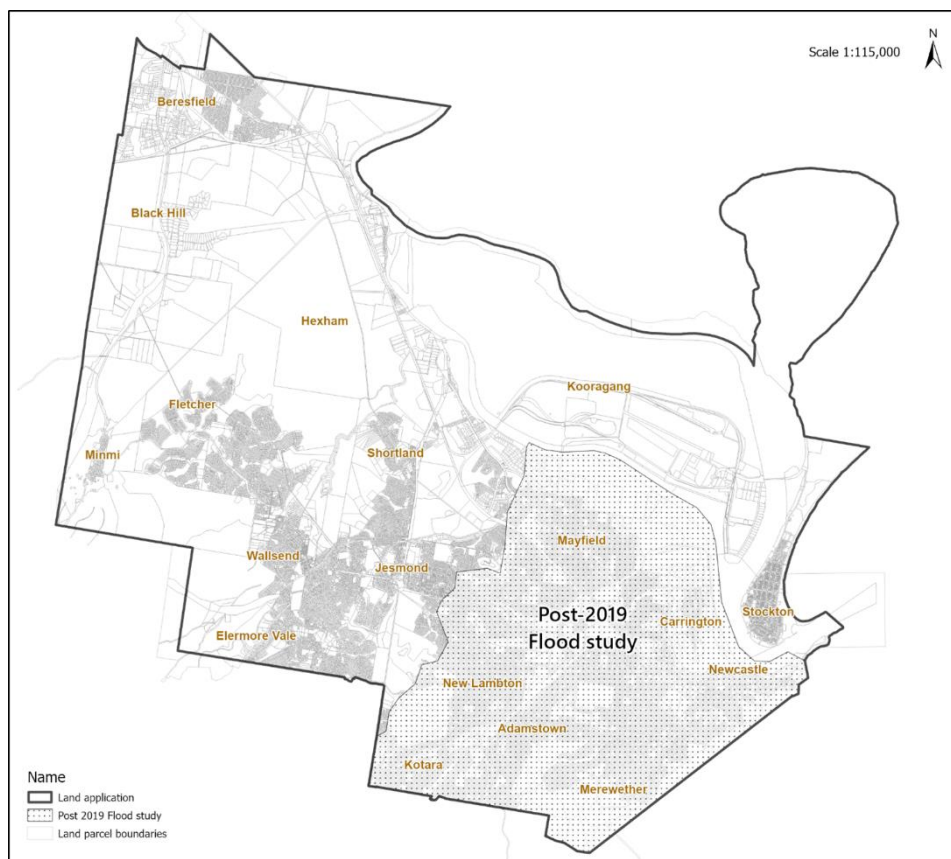
The following information applies to local catchment (flash) flooding only. This is expected to be the critical flood for most areas studied in the 2023 Throsby, Styx and Cottage Creek flood study. For information relating to ocean and riverine flooding please refer to Section B1(a) of the Newcastle Development Control Plan 2023.

FOR PROPERTIES IN THE THROSBY, STYX AND COTTAGE CREEK CATCHMENTS

FLOOD CERTIFICATE NOTES

GENERAL:

- The information presented in this Flood Information Certificate ("the Certificate") relates to the Newcastle City-wide Floodplain Risk Management Plan and the Newcastle Development Control Plan, which have been developed in accordance with the principles of the NSW Government's Flood Prone Land Policy.
- CN's flood information is compiled from a composite of data. The variability of rainfall itself is a major factor in the uncertainty of flood information and accordingly, this certificate is only an estimate of real flood characteristics. Any particular flood is likely to be different to the conditions described in this certificate.
- CN acknowledges that its flood information is incomplete and varies in accuracy, however it is the best available to CN at the time of issue.
- Where information is presently not known, it is denoted by "unknown".
- From time to time, on-going research and studies will replace or add to CN's flood information. Accordingly, the information in the Certificate is not warranted after the day of issue.
- Should you disagree with CN's assessment of the flood behaviour, you may conduct your own investigations or enquiries and submit them to CN for consideration. Where revision of this assessment is warranted, CN is committed to making such amendments to its information.
- This document applies to properties within the Post-2019 Flood Study area (see below).



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EXPLANATIONS FOR TERMS USED IN THE FLOOD INFORMATION CERTIFICATE

Is any part of the site affected by a Floodway?

Generally, where a property is affected by a floodway, we will provide you with additional information on where we believe the floodway to be by way of a map. In rare circumstances it may be possible to redirect a floodway subject to appropriate engineering advice. You should start by discussing the matter with a Development Officer from CN.

A **Floodway** is a pathway taken by major discharges of floodwaters, the obstruction or partial obstruction of which would cause a significant redistribution of floodwaters, or a significant increase in flood levels. Floodways are often aligned with existing or historic natural channels or watercourses but can form elsewhere in the floodplain.

Section B1(b) of Newcastle DCP 2023 states:

"No building or structure can be built, and no land can be filled with any materials in areas identified as floodways, except for small changes to ground levels that do not significantly change the flow patterns for:

- a) roads*
- b) parking*
- c) below ground structures*
- d) landscaping.*

Where dividing fences across floodways are unavoidable, they are constructed only of open type fencing that does not restrict the flow of flood waters and are resistant to blockage. New development is designed to avoid fences in floodways."

Is any part of the site affected by a Flood Storage Area?

Where a property is wholly affected by a Flood Storage Area, we will answer "yes" to this question on the Certificate. Where a property is partly affected, we will provide additional information by way of a map.

Flood Storage Area is an area where flood water accumulates and the displacement of that floodwater will cause a significant redistribution of floodwaters, or a significant increase in flood levels, or a significant increase in downstream flood frequency. Flood storage areas are often aligned with floodplains and are usually characterised by deep and slow-moving floodwater.

Section B1(b) of Newcastle DCP 2023 states:

"Not more than 20% of the area of any development site in a flood storage area is filled. The remaining 80% is generally developed allowing for underfloor storage of floodwater by the use of suspended floor techniques such as pier and beam construction.

Where a development is proposing to build over more than 20% of the site area, the portion of the structure being suspended is to have a floor level at the FPL as a minimum. As part of the structure's design, it must allow water to flow freely into and out of the underfloor area and must not be restricted by solid cladding or similar around the perimeter of the structure below the floor level."*

* FPL is the Flood Planning Level which is explained further below.

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1% Annual Exceedance Probability (AEP) event level:

The 1% AEP event is a flood event that has a 1 in 100 chance of being exceeded in any one year. Conceptually, it is similar to a "1 in 100 year" event, except that the term "1 in 100 years" conveys the notion that the event is definitely going to happen in a 100-year time frame, and will only occur once in that time frame. In fact, a "1 in 100 year" event has a 67% probability of occurring once in any nominate hundred-year period.

1% AEP in 2050 event level:

The 1% AEP in 2050 event is a modelled flood event in the Throsby, Styx and Cottage Creek Flood Study (Rhelm 2023) simulating a 1% AEP event as it would occur in 2050 within a RCP8.5 climate scenario. The model uses a 0.5% AEP rainfall event as a proxy for rainfall intensification due to climate change and a 0.4 metre sea level rise.

In 2023, CN adopted the 1% Annual Exceedance Probability event in 2050 as the Defined Flood Event for flood planning purposes to improve community resilience to climate change impacts. The Defined Flood Event is the flood event selected as the general standard for the management of flooding to development.

Levels are reduced to the Australian Height Datum. This means that the quoted levels are heights above sea level. They can be compared to ground levels determined by a surveyor using the same datum to ascertain the likely flood depth.

In general, the minimum requirement for development of flood prone land is to set floor levels of all occupiable rooms of all buildings not lower than above the **Flood Planning Level (FPL)**. The Flood Planning Level is the peak flood level for the Defined Flood Event **plus** the appropriate freeboard (usually, but not always 500mm, depending on the circumstances) to account for uncertainty, wave action, and model error.

Section B1(b) of Newcastle DCP 2023 states:

"Floor levels of all occupiable rooms of all buildings are not set lower than the FPL."

"Garage floor levels are no lower than the 1% 2050 AEP event. However, it is recognised that in some circumstances this may be impractical due to vehicular access constraints. In these cases, garage floor levels are as high as practicable."

"Basement garages may be acceptable where all potential water entry points are at or above the probable maximum flood (PMF), excepting that vehicular entry points can be at the FPL. In these cases, explicit points of refuge are accessible from the carpark in accordance with the controls for risk to life set out below."

"Electrical fixtures such as power points, light fittings and switches are sited above the FPL unless they are on a separate circuit (with earth leakage protection) to the rest of the building."

"Swimming pools are to be located to ensure they are not inundated from minor flooding events. Electrical connections and fixtures around swimming pools are to be sited at the FPL."

"Where parts of the building are proposed below the FPL, they are constructed of water-resistant materials."

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Flood Hazard Thresholds

Flood Hazard Thresholds provide generalised qualitative measures of the relative vulnerability of people, vehicles, and buildings based on the velocity and depth of floodwaters. These thresholds and their effects on people and property are derived from research (Smith, Davey & Cox 2014*) and have been adopted for use in Department of Planning and Environment's *Flood risk management manual* and Geoscience Australia's *Australian Rainfall and Runoff 2019*.

These Flood Hazard Thresholds are used in NDCP 2023 to apply appropriate development controls to manage flood risks arising from development in flood affected areas.

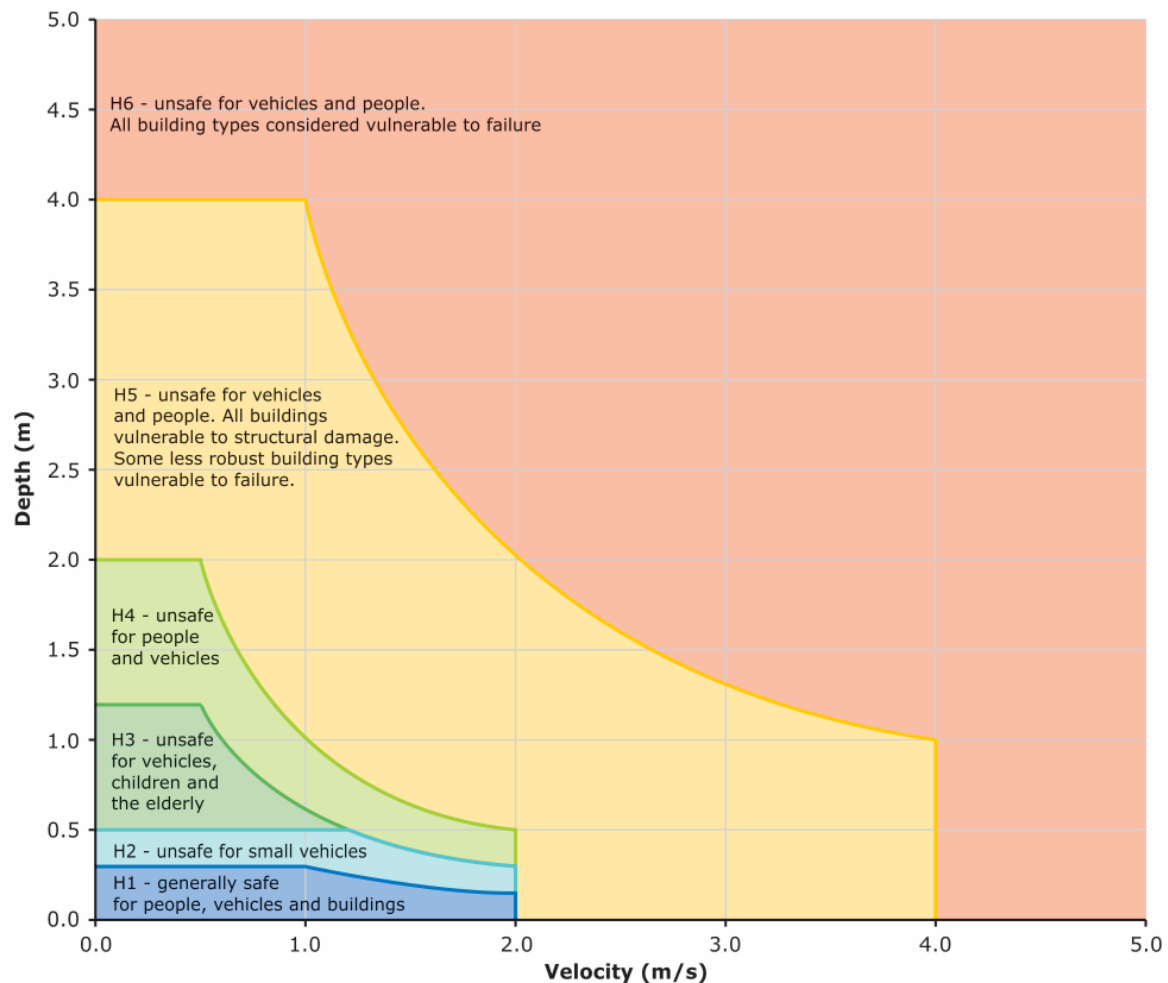


Figure 1 - Flood Hazard Thresholds and their descriptive effects on the stability of people and property (Smith, Davey & Cox 2014*)

*Smith, G.P., Davey, E.K. & Cox R.J. 2014, *Flood Hazard*, WRL Technical Report 2014/07, UNSW Water Research Laboratory, Sydney

Highest Property Risk Category:

Property risks describe the danger that flood waters might pose to the property of persons affected by flooding. Generally, the descriptions are:

- P1** Parked or moving cars remain stable
- P2** Unsafe for small vehicles

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- P3** Suitable for light construction (e.g. timber frame, masonry and brick veneer). Unsafe for vehicles, children and the elderly.
- P4** Suitable for light construction (e.g. timber frame, masonry and brick veneer). Unsafe for vehicles and people.
- P5** Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure.
- P6** Unsafe for vehicles and people. All building types considered vulnerable to failure.

They are determined by direct correlation to the Flood Hazard Threshold (P1 relates to a Flood Hazard Threshold of H1) as determined at the Defined Flood Event, usually the 1% AEP in 2050 flood. The Flood Hazard Thresholds used in the determination of these risks are shown in Figure 1 below.

For the purposes of the flood information quoted here, the property hazard relates to the ground level as understood by CN at the time the information was collected. The property risk cannot be used to determine the ground level of the site.

Property risks can be reduced by filling a site, or raising floor levels as appropriate provided that the work is compatible with the applicable (if any) floodway or flood storage area.

In general, the minimum requirement for managing property risk is to set floor levels to the Flood Planning Level (usually expressed as a reduced level above the Australian Height Datum, or AHD).

The Newcastle DCP 2023 states:

"Areas where cars, vans and trailers are parked, displayed or stored are only located in areas subject to property risk of P1. Containers, bins, hoppers and other large floatable objects are not to be stored in these areas. Heavy vehicle parking areas can only be located in locations subject to P1 or P2 categories."

"Timber framed, light steel construction, cavity brickwork and other conventional domestic building materials are generally suitable forms of construction where the property risk is P1 to P4."

"Property risk of P5 is generally unsuitable for building construction and building is discouraged from these areas. Where building is necessary, the structure is certified by a practising structural engineer to withstand the hydraulic loads (including debris) induced by the flood waters."

"Property risk of P6 is unsuitable for any type of building construction."

Highest Life Risk Category:

Life risks describe the danger that flood waters might pose to the lives of persons affected by flooding. Generally, the descriptions are:

- L1** Flood event (typically ocean and riverine flooding) too long for a refuge enclosed by floodwaters to be appropriate. Refuge must be sought outside of the entire flood via formal community evacuation plans. Sufficient warning is generally available for such events.
- L2** Generally safe for people.
- L3** Unsafe for children and the elderly. On-site refuge is to be provided in development other than commercial premises or industry.
- L4** Unsafe for all people. On-site refuge is required.

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L5 Unsafe for all people. On-site refuge is required. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure.

L6 Unsafe for all people. All building types considered vulnerable to failure.

Life risks are determined by considering the Flood Hazard Threshold (see below) at the Probable Maximum Flood (PMF).

		Flood Hazard Threshold					
		H1	H2	H3	H4	H5	H6
Catchment Response time	Riverine and Ocean	L1					
	Flash	L2	L3	L4	L5	L6	

Figure 2 - Life Risk determination

The Newcastle DCP 2023 states:

"On-site refuge is to be provided for all development where the risk to life category is L3 or higher unless:

- the proposed development is less than 40m from the perimeter of the PMF extent and the higher ground is accessible, or*
- the proposed use is defined as commercial premises or industry in which case onsite refuge is only required where the risk category is L4 or higher."*

"Where on-site refuge is required for a development, it should comply with the following minimum standards:

- The minimum on-site refuge is the level of the PMF. On-site refuges are designed to cater for the number of people reasonably expected on the development site and are provided with emergency lighting.*
- On-site refuges are of a construction type able to withstand the effects of flooding. Design certification by a practising structural engineer that the building is able to withstand the hydraulic loading due to flooding (at the PMF)."*

The requirement for on-site refuge (where applicable) will generally be satisfied by a two-storey building form. However, for residential properties, attic access stairs and suitable small platform will usually also suffice.

In most cases where on site refuge is required, the duration of the peak flood event is short and accordingly, it is not expected to have to utilise flood refuge areas for long periods of time, especially when the chance of them being used is generally less than 1% in any given year. Accordingly, comfort factors are not of large concern to owners, occupiers or CN in determining the suitability of flood refuges.