

## Floodplain Development Guidelines

GUIDELINES FOR DEVELOPMENT IN FLOOD PRONE AREAS



#### Feedback

We welcome feedback on these Guidelines at any time. Comments in writing should be addressed to:

Manager, Floodplains Corangamite Catchment Management Authority 64 Dennis Street, Colac VIC 3250

or emailed to: floodinfo@ccma.vic.gov.au

#### Enquiries

If you would like to develop in a flood prone area, we encourage you to get our advice before you apply for a Planning or Building Permit. Visit the CCMA Flood Portal or submit a Flood Advice Request Form from our website.



Corangamite Catchment Management Authority 64 Dennis Street, Colac, Vic 3250 Ph: 1800 002 262 www.ccma.vic.gov.au

Final endorsed by Corangamite CMA board
Last modified

These guidelines will be reviewed every 5 years and amended when appropriate.

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# Part One: Introduction

These guidelines aim to promote safe and appropriate development in flood prone areas within the Corangamite CMA (CCMA) region.

If you are a property owner, developer, designer or builder who is seeking approval for a development in the Corangamite region, then these guidelines are for you.

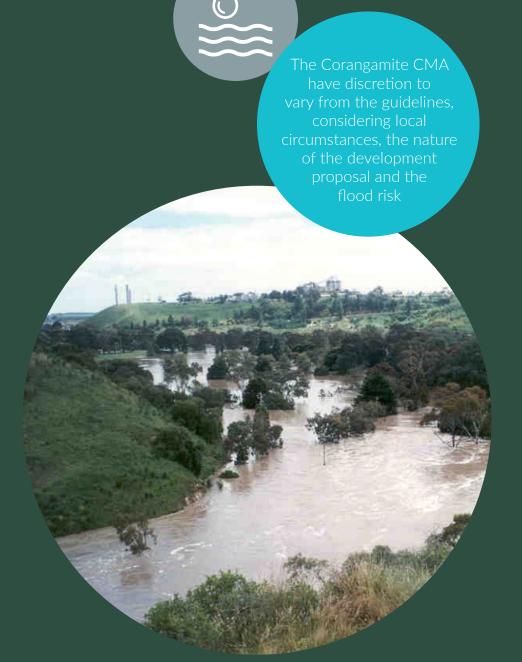
These guidelines align with the requirements of the Victorian Planning Scheme and build on the state-wide *Guidelines for Development in Flood Affected Areas*, *DELWP*, *2019*, with a focus on the flooding challenges unique to the Corangamite region. It is recommended that both these guidelines be read to ensure a greater understanding of the requirements of development in floodplains.

The purpose of the guidelines is to provide a clear, consistent and transparent process for managing land use and development in flood affected areas. They are intended to be used with the land use planning and development system. Usually, the information in the guidelines is sufficient to guide decision making. However, the guidelines cannot cover all the circumstances and aspects of flood behaviour and/or development.

The Corangamite CMA have discretion to vary from the guidelines, considering local circumstances, the nature of the development proposal and the flood risk.

We encourage you to read these guidelines and the DELWP 2019 Guidelines, and submit a **Flood Advice Request Form** from our website before you apply for a Planning Permit.

The CCMA provides specialist flood advice and assessment of development, based on the objectives in part two for development in flood prone areas.



### 1.1 ABOUT FLOODING

Flooding is a natural hazard which occurs as a result of heavy rainfall, coastal storm surges or inadequate drainage. Floodplains are the area of land that is subject to inundation by floods. Floods are classified by the frequency at which they are likely to occur.

In Victoria, all proposals for development on floodplains are assessed against a flood that, on average, will occur once every 100 years. A flood of this size has a 1% chance of occurring in any given year and is known as either the 100-year Average Recurrence Interval (ARI) flood or the 1% Annual Exceedance Probability (AEP) flood. There is always a possibility that a flood larger in height and extent than the 1% AEP flood may occur in the future.

#### TYPES OF FLOODING

#### Riverine flooding

Riverine flooding is caused when a waterway, watercourse or water body can't convey the catchment runoff from a major storm within its banks and water spills onto surrounding areas, which are called floodplains. These flows may escape or be released from a lake, river, creek or other natural watercourse or a reservoir, canal or dam. This form of flooding is usually relatively predictable and can be known hours or even days in advance.

#### Flash flooding

Flash flooding is sudden and unexpected flooding that is often caused by sudden local or nearby heavy rainfall. It is often defined as flooding that peaks within six hours of the causative rain. It is generally not possible to issue detailed flood warnings for flash flooding.

#### Overland and stormwater flooding

Overland flows occur as the result of movement of heavier than usual rainfall runoff flowing across the land according to the grade, often to a watercourse. Overland flows may also occur as the result of local runoff exceeding the capacity of an urban stormwater drainage system or flows along poorly defined drainage paths. Overland flooding associated with urban drainage systems is known as stormwater flooding.

#### Coastal and estuarine inundation

Tidal or storm driven coastal events, resulting in a higher than normal sea level, have the potential to inundate adjacent low-lying land. Estuaries are the locations where rivers flow into coastal waters. These locations are sensitive to a combination of coastal and riverine or overland flooding. Land that is currently above tidal or storm surge levels may be at risk under future climate change scenarios.

#### **CLIMATE CHANGE**

Climate change is expected to result in significant changes in storm (and hence flooding) behaviour. The information currently available suggests that extreme rainfall events that drive major flooding are likely to increase in frequency and severity over the next few decades.

Victoria's *Planning Policy Framework (PPF)* includes clauses that require assessment of development to consider natural hazards and climate change and the potential impacts of climate change on coastal inundation and erosion.

The 'Guidelines for Coastal Catchment Management Authorities: Assessing development in relation to sea level rise' (DSE, 2012) outline the Victorian Government response to the likely impacts of possible sea level rise.

The Guidelines include policy direction allowing agreement between councils and Catchment Management Authorities on appropriate flood levels for anticipated sea level rise. Currently, the Guidelines form the basis of the CCMA's decision making for all coastal councils in our region except the City of Greater Geelong.

The City of Greater Geelong has created a new overlay in its planning scheme, identifying areas that are likely to be impacted by coastal flooding under a future 0.8 metre sea level rise scenario. The planning permit process should ensure that the use and development of land in this overlay is compatible with the future level of flood risk at the site.

Table 2 on page 17 provides details on how developments along the coast are assessed in relation to climate change.

## THE VICTORIAN FLOODPLAIN MANAGEMENT STRATEGY

The Victorian Floodplain Management Strategy (2016) sets the direction for floodplain management in Victoria. Part 2, "avoiding or minimising future risks," endorses the use of planning controls to manage the potential growth in risk. The guidelines respond to Objective 3 in the strategy: "not making things worse."

### 1.2 LEGISLATION AND RELEVANT PLANNING CONTROLS

As identified in the **Guidelines for Development in Flood Affected Areas, DELWP, 2019**, numerous Legislation provides the authorising environment and establishes the arrangements for regulating land use and development. To be effective, floodplain management authorities and municipal councils need to work in partnership.

The Planning Permit and Building Permit systems operate under different pieces of legislation. Planning Permits are legal documents giving permission for a land use or development. Development includes the construction, alteration or demolition of a building or works and the subdivision or consolidation of land. Building Permits relate specifically to the carrying out of building construction.

Most forms of development on flood prone land require a Planning Permit and/or a Building Permit. The Responsible Authority (usually the Local Government Authority) will seek specialist advice from the relevant floodplain manager during the permit assessment process and will usually impose conditions following this advice when granting a permit. The proposal must satisfy all the conditions on a permit.

#### PLANNING AND ENVIRONMENT ACT 1987

The main instruments to control planning decisions under the *Planning and Environment Act 1987* (*Vic*) are Planning Schemes. They set out the types of land use or developments that are or are not allowed and for which a permit is required. Planning schemes apply to every part of Victoria. They can be viewed at local council offices and are available on the Department of Environment, Land, Water and Planning, **Planning Schemes Online** website.

These guidelines respond to several planning objectives set out in the *Planning and Environment Act 1987* including (but not limited to):

- To provide for the fair, orderly, economic and sustainable use and development of land;
- To secure a pleasant, efficient and safe working, living and recreational environment for all Victorians and visitors to Victoria
- To facilitate development in accordance with the objectives in the Planning and Environment Act.

State policy identifies the need to consider flooding related matters and is captured under Clause 13 (Environmental Risks and Amenity). Clause 13 states that:

Planning should strengthen the resilience and safety of communities by adopting a best practice environmental management and risk management approach.

Planning should identify, prevent and minimise the risk of harm to the environment, human health, and amenity through:

- Land use and development compatibility
- Effective controls to prevent or mitigate significant impacts.

Climate change impacts (13.01) takes into consideration (i) natural hazards and climate change (13.01-S) with the objective to minimise the impacts of natural hazards and adapt to the impacts of climate change through risk based planning, and (ii) Coastal inundation and erosion (13.01-2S) aims to plan for and manage coastal hazard and climate change impacts.

Clause 13.03 (Floodplains) has the following objectives:

To assist the protection of:

- Life, property and community infrastructure from flood hazard, including coastal inundation, riverine and overland flows
- The natural flood carrying capacity of rivers, streams and floodways
- The flood storage function of floodplains and waterways
- Floodplain areas of environmental significance or of importance to river, wetland or coastal health.

These state level policies pave the way for the introduction of flooding controls (Floodway Overlay, Land Subject to Inundation Overlay and Urban Floodway Zone) to manage risk. What this means for the landowner is greater certainty that the objectives of Clause 13 are met and protecting future land owners and their assets/investments.

Zone and overlay controls for flood prone areas require Local Government Authorities (LGA) to refer Planning Permit applications to the CCMA so that it can provide specialist advice. This requirement can only be waived if the LGA believes the proposal satisfies requirements or conditions previously agreed to in writing by the CCMA.

The following zone and overlay provisions, and their related schedules, ensure that the use and development of land subject to flooding is appropriate given the flood hazard.

## Urban Floodway Zone – Clause 37.03 of the Victorian Planning Provisions

The Urban Floodway Zone (UFZ) applies to riverine flooding in urban areas. Unlike the overlays, the UFZ controls land use as well as development, with land use being restricted to low intensity uses such as recreation and agriculture. Development is generally not permitted in the UFZ.

### Floodway Overlay - Clause 44.03 of the Victorian Planning Provisions

The Floodway Overlay (FO) applies to riverine flooding in both rural and urban areas where there is a flood risk and there is less need to control land use. Most types of development are not encouraged but buildings and works associated with low intensity uses such as agriculture may be permitted. Key considerations are whether the development will obstruct flood flows or increase flood risk.

### Land Subject to Inundation Overlay - Clause 44.04 of the Victorian Planning Provisions

The Land Subject to Inundation Overlay (LSIO) applies to riverine flooding in both rural and urban areas, as well as coastal inundation. Areas covered by the LSIO may have similar or lower flood risk than those covered by UFZ or FO, depending on whether mapping has been developed to delineate the floodway. The planning permit process should ensure that the use and development of land in this overlay is compatible with the level of flood risk at the site.

## Special Building Overlay – Clause 44.05 of the Victorian Planning Provisions

The Special Building Overlay (SBO) applies to stormwater flooding in urban areas. The purpose of the SBO is to ensure that flood waters are not obstructed or diverted by development, while ensuring development appropriately considers and responds to the flood hazard. Within the Corangamite region, the SBO is currently only used by the City of Greater Geelong. As the Drainage Authority, Local Government Authorities are ultimately responsible for the underground drainage system in urban areas. As such, the Corangamite CMA has an active Memorandum of Understanding with the City of Greater Geelong to manage flooding within the Special Building Overlay.

### General Decision Guidelines - Clause 65.01 of the Victorian Planning Provisions

The Planning Scheme also requires the consideration of flood issues for all planning applications regardless of whether a site is affected by a relevant zone or overlay. More information about the Planning Scheme decision guidelines and objectives is available in the Appendix D – Decision Guidelines.

#### **BUILDING ACT 1993**

The Building Act 1993 governs building activity in Victoria. It sets out the legislative framework for the regulation of building construction, building standards and the maintenance of specific building safety features. The Building Regulations 2018 are the instrument under the Building Act that control decisions about building. Regulation 153 in the Building Regulations 2018 requires the relevant Local Government Authority to consult with the CCMA prior to granting a building permit in an area liable to flooding.



## 1.3 APPLYING FOR A PLANNING OR BUILDING PERMIT IN A FLOOD PRONF ARFA

Before making an application for a Planning Permit with your local council, please visit the CCMA **Flood Portal** and/or submit a **Flood Advice Request Form** from our website for free specialist flood risk advice.

The team can provide advice about flood levels and preliminary development proposals before you formally apply for a permit from your relevant council. Seeking pre-Planning Permit application advice can significantly speed up the permit process and avoid expensive redesign and document resubmission.

As a minimum, any application for pre-Planning Permit advice should include the following:

- The location details of the land proposed for development;
- A brief description of the development; and
- A sketch or plans showing the boundaries, layout and scale
  of the development would help identify the location and
  impact of the development
- Consideration be given to any requirements in the relevant schedule of the overlay or zone (i.e. including but not limited to, finished floor levels, ground level survey to metres Australian Height Datum, m AHD)
- Access route (existing and proposed) to the site shall be provided.

When making an application to your council Planning Department, you are encouraged to submit fully documented applications to enable efficient assessment and processing.

The following details will assist in our assessment of your application:

- The location details of the land proposed for development;
- The boundaries, dimensions, layout and use of the proposed development and existing buildings and works;
- Surface ground levels to Australian Height Datum (AHD) taken by a registered Land Surveyor; and
- Floor levels of any existing and proposed buildings to AHD.





## Part Two: Assessing Development Proposals

The CCMA assesses all applications against the Guidelines contained in this document. These guidelines have been developed in accordance with the relevant National, State and Local Policies, Guidelines and Practice Notes. Refer to Appendix C for a list of the relevant documents.

The Floodway Overlay and Land Subject to Inundation Overlay have their own decision guidelines, which must be considered in the assessment of an application for a Planning Permit. The decision guidelines include (but are not limited to):

- Whether the proposal could be located on flood-free land or land with a lesser flood hazard;
- Susceptibility of the development to flooding and flood damage:
- Potential risk to life, health and safety associated with the development. Flood risk factors include:
- Frequency, duration, extent, depth and velocity of flooding;
- Warning time if available; and
- Danger to occupants, other residents and emergency personnel if flooding occurs.
- Effect of the development on redirecting or obstructing floodwaters, reducing flood storage, and increasing flood levels and flow velocities.

#### LOCAL FLOODPLAIN DEVELOPMENT PLANS

Where a Local Floodplain Development Plan has been developed for a particular area and been incorporated into the council's planning scheme, an application must be consistent with the plan.

### 2.1 ASSESSMENT OBJECTIVES

The 'Corangamite Regional Floodplain Management Strategy' (2018-2028) sets out the following vision for Corangamite: Floodplains of the Corangamite Region are protected for their ecological and cultural values. Communities, businesses and government agencies are aware of their flood risks and actively taking measures to manage these risks. The strategy sets out the following objectives to achieve this vision:

- Assess flood risk and share information undertaking flood studies and sharing this information with communities, businesses and emergency response agencies
- Build a flood resilient community effective sharing of flood information allows communities and emergency response agencies to understand and better manage their flood risk
- Reduce existing flood risks through flood mitigation infrastructure, flood warning systems and emergency management
- Avoid future flood risks through effective land use planning and building controls that account for the impacts of climate change
- Manage residual flood risks through flood insurance, provision of flood risk information and flood emergency management
- Protect and restore floodplains for their ecological values – integrating the management of flood risk with the protection of natural floodplain values
- Protect and restore the cultural values of floodplains floodplains hold significant cultural assets such as midden sites, ancestral remains and scar trees and are important places for Aboriginal people.

This guideline has been developed with the specific purpose of helping the Corangamite community meet the fourth objective which is to avoid future flood risks by ensuring development across our region responds appropriately and consistently to the flood hazard. The CCMA provides specialist flood advice and assessment of development, based on the following assessment objectives for development in flood prone areas:

(01	Objective 1: Site safety

STEP 1

Objective 2: Site access

03 Objective 3: Flood damage

STEP 2

04 Objective 4: Flood flow

05) Objective 5: Flood storage

Objective 6: Floodplain and waterway condition

07 Objective 7: Water quality

When assessing development proposals, the CCMA uses a **two-step process**.

#### STEP 1

The first step considers Objective 1 and 2, namely the flood hazard at the site and along the egress route. The egress route includes roads located both within and outside the subject property to flood free land to locations where community facilities are available to support evacuated residents in a flood event. Step 1 assesses the proposed development type against the flood hazard criteria presented in Table 1. If the proposed development type meets the minimum flood hazard criteria based on pre-development conditions, Step 2 then ensures that appropriate engineering and other mitigation measures can be considered to meet the remaining Objectives 3 through to 7.

The primary determinate of flood hazard is the flood depth and velocity and the flood depth multiplied by velocity. It is important to note that the flood risk factors listed in the Decision Guidelines in the Floodway and Land Subject to Inundation Overlays do not diminish the hazard. For example, a long warning time doesn't diminish the risk posed by driving through, or having a building located in, deep or high velocity floodwaters.

#### Flood Warning and Flood Emergency Response Plans

The Bureau of Meteorology (BOM) issues Flood Warnings for several locations within the Barwon catchment of the Corangamite region. These warnings are one part of a total flood warning system and are provided so that existing communities along the Barwon, Leigh and Moorabool Rivers can respond appropriately to an imminent flood.

The 'Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice Flood Risk Management in Australia' (AIDR, 2017) stipulates that flood warning systems and emergency management plans are designed to assist existing communities at risk, not to facilitate or justify the expansion of those communities at risk or the development of new at-risk areas.

The CCMA does not accept the presence of a BOM Flood Warning or the subsequent production of a flood emergency response plan as justification for new development to occur in areas that do not meet the CCMA flood safety criteria as summarised in Table 1.

#### STEP 2

If the development meets the safety criteria in Step 1 and is not likely to have a detrimental impact on the environmental values of the floodplain, engineering solutions to mitigate the flood risk will be considered. If engineering solutions with the potential to impact on flood storage or flow conveyance are to be considered, a two-dimensional flood study and/or cut and fill balance is generally required to demonstrate that there will be no adverse impacts on flood behaviour and surrounding properties.

Tables 1 and 2 summarise the flood hazard criteria adopted by the CCMA for assessing the most common types of development in our region. For information on development types other than those listed in the tables below, please submit a **Flood Advice Request Form**. More information is available in the VPP Practice Note 'Applying for a Planning Permit under the Flood Provisions' (DEWLP, 2015). A second practice note 'Applying the Flood Provisions in Planning Schemes - A Guide for Councils' (DEWLP, 2015) provides guidance about applying the flood provisions in planning schemes.

The detail of each of the CCMA objectives for development in flood prone areas are presented in the following sections. These objectives are supported by the objectives presented in the Department of Environment, Land, Water and Planning (DELWP) publication 'Guidelines for Development in Flood Affected Areas' released in February 2019, which are:

- 1. Flood safety
- 2. Flood damage
- 3. Flood impacts
- 4. Waterway and floodplain protection.

### 2.2 FLOOD SAFETY

Protect human life and health and provide safety from flood hazard (DELWP, 2019).



### Development must not be located where the depth and flow of floodwaters is hazardous.

During a flood, people must not be exposed to deep or fast flowing water.

Table 1 overleaf summarises the minimum flood hazard criteria adopted by the CCMA for assessing site safety for development.



## Development must not be located where the depth and flow of floodwaters along the access to or from the property is hazardous.

The Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia (AIDR 2017) states that flooding can isolate properties and cut off evacuation routes to flood-free land or locations where community facilities are available to support evacuated residents in a flood event. This can result in a dangerous situation, because people may see the need to cross floodwaters to access services, employment or family members. Many flood fatalities result from the interaction of people, often in vehicles, with floodwaters. Any situation that increases people's need to cross floodwaters increase the likelihood of an injury or fatality.

With the above in mind, people trying to enter or leave a property during a flood must not be exposed to deep or fast flowing water. This includes driveways, roads and footpaths that link a property to a refuge area and aims to safeguard emergency workers as well as residents and visitors.

Table 1 summarises the flood hazard criteria adopted by the CCMA for assessing site access safety for development.



#### Table 1 Summary of CCMA minimum flood hazard criteria for the most common development types impacted by riverine flooding.

Flood depths in the table below are only applicable when velocities are low. When velocities are greater than 1.0 metres per second then shallower depths will apply as per Figure 1 General flood hazard vulnerability curves (AIDR, 2017).

ТҮРЕ	MAXIMUM PRE-DEVELOPMENT FLOOD DEPTH* ON SITE AND EGRESS	MINIMUM REQUIRED FINISHED FLOOR LEVEL IF FLOOD DEPTH CRITERIA ARE MET			
Accommodation					
Single dwelling	0.3 metres	At or above *Nominal Flood Protection Level (NFPL)			
Replacement dwelling – increase in footprint less than 20 square metres	N/A	At or above NFPL			
Replacement dwelling – increase in footprint greater than 20 square metres	0.3 metres	At or above NFPL			
Dwelling extension less than 20 square metres	N/A	At or above existing finished floor level of dwelling			
Dwelling extension greater than 20 square metres	0.3 metres	Refer to Table 1.1 below			
Additional dwelling (incl. Dependent person's unit)  Group accommodation  Residential Village  Retirement Village  Basement	0.3 metres #	At or above NFPL			
Carport, garage and non domestic sheds associated with urban and low density residential development	0.3 metres	1% AEP flood level + 0.15 metres freeboard			
**New permanent caravan or cabin sites at an existing caravan park	0.3 metres	At or above NFPL			
**Temporary camping or caravan sites (where caravans can be quickly moved)	N/A	N/A			
Accommodation	0.3 metres	At or above NFPL			

ТҮРЕ	MAXIMUM PRE-DEVELOPMENT FLOOD DEPTH* ON SITE AND EGRESS	MINIMUM REQUIRED FINISHED FLOOR LEVEL IF FLOOD DEPTH CRITERIA ARE MET			
Subdivision					
New minor subdivision (less than 16 lots)	All new lots must have flood depths less than 0.3 metres on building envelope and egress	All finished floor levels of dwellings must be at or above NFPL			
New major subdivision (16 lots or more)	Urban Residential Zones - All new lots must have finished surface levels at or above NFPL and egress must have flood depths less than 0.3 metres	All finished floor levels of dwellings must be at or above NFPL			
	Rural residential zones – all lots must provide for building envelopes that are flood free and egress must have flood depths less than 0.3 metres.				
***Agricultural buildings					
Buildings associated with grazing, crop raising and animal husbandry, including animal keeping, animal training and animal production. Excludes intensive animal industries	0.5 metres	At or above NFPL			
Sheds and outbuildings less than 40 square metres	N/A	Sheds less than 20 square metres - none Sheds between 20 and 40 square metres - 1% AEP flood level			
Sheds and outbuildings greater than 40 square metres	0.5 metres	At or above NFPL			
Commercial and industrial buildings					
Industrial building, office, retail building, or warehouse	0.3 metres	At or above NFPL			

<sup>\*</sup>Nominal Flood Protection Level (NFPL) = 1% AEP flood level + 0.3 metres freeboard

<sup>#</sup> Dependent Person's Unit should be located outside of the 1% AEP flood extent.

<sup>\*\*</sup> Caravan Parks impacted by flooding must develop a Flood Response Plan.

<sup>\*\*\*</sup>All chemicals should be stored above NFPL

Table 1.1. Dwelling Extensions – the finished floor level of the extension must be set to at least the level determined in the following table:

SIZE OF GROUND LEVEL		LEVELS BELOW THE 1% THE DIFFERENCE IS:	FOR EXISTING FLOOR LEVELS ABOVE THE 19 AEP FLOOD LEVEL. IF THE DIFFERENCE IS:					
DWELLING EXTENSION (GROSS FLOOR AREA)	300 MM OR MORE   BE		BETWEEN 0 AND 300 MM BETWEEN 0 AND NFPL					
	Set the minimum required floor level of the extension at:							
Up to 20 m²	Existing floor level	Existing floor level	Existing floor level	NFPL				
20 to 40 m <sup>2</sup>	NFPL	Existing floor level	Existing floor level	NFPL				
40 to 80 m <sup>2</sup>	NFPL	NFPL	Existing floor level	NFPL				
Greater than 80 m <sup>2</sup>	NFPL	NFPL	NFPL	NFPL				



#### Table 2 Summary of CCMA flood hazard criteria for developments impacted by coastal flooding.

Note: Developments impacted by coastal flooding are assessed in relation to future sea level rise. Developments within the City of Greater Geelong's LSIO2 overlay are assessed differently to other jurisdictions. Coastal developments in all other Local Government Areas are assessed against the Guidelines for Coastal Catchment Management Authorities (DELWP, 2012).

DEVELOPMENT TYPE	CRITERIA - OL Assessed in accordance with G Management Authorities Assessing	ND HAZARD ASSESSMENT JTSIDE LSIO2 - uidelines for Coastal Catchment development in relation to sea level te 2012.	COASTAL INUNDATION AND HAZARD ASSESSMENT CRITERIA - WITHIN LSIO2			
	MAX ACCESS DEPTH	FLOOR LEVELS	MAX ACCESS DEPTH	FLOOR LEVELS		
Single dwelling in existing residential areas	Max 0.3m depth at current	Current 1% AEP flood level +	Max 0.3m depth at current	2070* 1% AEP flood level +		
	1% AEP flood levels	0.5m freeboard	1% AEP flood levels	0.3m freeboard		
Intensification (i.e., subdivision into 2 or more lots) or multiple dwellings in existing residential areas	Max 0.3m depth at current 1% AEP flood levels	Current 1% AEP flood level + 0.5m freeboard	Max 0.3m depth at 2100 1% AEP flood levels	2100 1% AEP flood level + 0.3m freeboard		
New and replacement dwellings and other individual buildings outside existing urban areas	Max 0.3m depth at current	Current 1% AEP flood level +	Max 0.3m depth at current	2070* 1% AEP flood level +		
	1% AEP flood levels	0.5m freeboard	1% AEP flood levels	0.3m freeboard		
Greenfield development (subdivision outside existing urban areas)	Max 0.3m depth at 2100	2100 1% AEP flood level +	Max 0.3m depth at 2100	2100 1% AEP flood level +		
	1% AEP flood levels	0.3m freeboard	1% AEP flood levels	0.3m freeboard		

<sup>\*</sup>A sea level rise of 0.4 metres predicted for the Bellarine Peninsula and Corio Bay by 2070 (ref: Victoria's Climate Science Report, DELWP, 2019) has been adopted in recognition that 2070 is within the 50 year expected lifespan of most developments.

For information on other development types, please submit a **Flood Advice Request Form**.

### 2.3 FLOOD DAMAGE

Minimise flood damage to property and associated infrastructure (DELWP, 2019).



#### **OBJECTIVE 3: FLOOD DAMAGE**

## Development must be designed to minimise the potential damage to property due to flooding.

Developments must be designed to minimise the potential for water to enter and damage properties. Development should also be located away from flow paths to avoid creating obstructions which would cause floodwater to build up and then overflow.

Development should be located to minimise any flood damage, particularly at locations that are likely to be affected by significant flood velocities or water depths or a combination of flood depth and flood velocity. Where buildings in flood prone areas are supported, the finished floor level shall be above the Nominal Flood Protection Level (NFPL). Where non-habitable buildings with a floor level below the NFPL are supported, the use of flood-resistant materials is usually required. There are numerous sources of information for flood resistant materials, two of which have been provided below. Please note this list is not exhaustive and you should contact you builder or building surveyor to confirm the most up to date flood resistant material specifications relevant to your location.

https://www.ses.nsw.gov.au/media/2247/building\_guidelines.pdf

• Flood resilient guide to retrofitting your home



### 2.4 FLOOD IMPACTS

Maintain free passage and temporary storage of floodwaters (DELWP, 2019).



#### Works or structures must not adversely affect floodwater flow paths or the physical form of a waterway.

Existing flood risks must not be made worse by changes to the flow characteristics of a floodplain, or overland flow path.

The positioning and alignment of development in flood affected areas can affect flow conveyance and flood storage. Inappropriately positioned and aligned development can cause flood levels and flow velocities to increase and may adversely divert floodwater onto surrounding land. An increase in flow velocity can create safety hazards and cause erosion across the floodplain or within a waterway. Careful consideration must therefore be given to the location and alignment of buildings. As a principle not interfering with existing flow paths will minimise a developments impact on flow conveyance.

Where floodplain manipulation is proposed, the proposal must be supported by hydraulic modelling (Flood Impact Assessment) undertaken by a suitably qualified and experienced professional to the satisfaction of the CCMA. The CCMA has a flood study data base and advice should be sought from us on the availability of an existing model and the modelling requirements expected.



### Works or structures must not reduce floodwater storage capacity.

Flood storage is the area available to temporarily store water during a flood. If this area is filled or otherwise obstructed, displacement of floodwater may cause higher flood levels elsewhere. Works or structures must not reduce floodwater storage capacity or displace floodwater. The aim is to prevent higher flood levels on adjoining properties or displacement of floodwaters to downstream reaches and surrounding properties.

Cumulative impacts are critical when considering flood storage. While a single development may not measurably reduce flood storage, many similar developments will. The CCMA responds to around 1400 floodplain proposals every year and requires fill to be minimised to ensure flood behaviour does not change over time.

The CCMA will only approve the placement of fill within a floodplain to facilitate development if it is within the flood fringe (where flood depths are less than 0.3 metres), and is supported by a cut and fill balance and/or two-dimensional flood study that demonstrates:

- No reduction in the capacity of the floodplain to store and convey floodwaters over a range of flood events up to and including the 1% AEP flood;
- No increase to the flood levels, depths or velocities on properties external to the development.

Buildings located within the floodplain must be constructed on stumps (or piers) and bearers if a fill pad will result in loss of flood flow area and/or flood storage area. A fill pad may be considered if it is supported by a detailed cut and fill plan that demonstrates that floodplain storage and flow area will not be decreased.

### 2.5 FLOODPLAIN AND WATERWAY PROTECTION

Protect and enhance the environmental features of waterways and floodplains (DELWP, 2019).



Development must ensure the protection of floodplains and the maintenance or improvement of waterway condition including vegetation and physical form.

Clause 13.03-1S (Floodplain management) of the *Planning Policy Framework (PPF)* states the following objective -

To assist the protection of:

- Life, property and community infrastructure from flood hazard
- The natural flood carrying capacity of rivers, streams and floodways
- The flood storage function of floodplains and waterways
- Floodplain areas of environmental significance or of importance to river health.

Orderly planning requires:

- Floodplains to be protected to ensure they can continue to provide their natural flood carrying capacity; and
- Flood storage functions and protect areas of environmental significance and areas of importance to river health.

Periodic inundation of floodplains is important to replenish sediment and nutrients and to allow recharge of groundwater systems. Development that impacts on these values directly or is likely to contribute to cumulative impacts is in contravention of orderly planning and will not be supported.

The Corangamite Waterway Strategy (2014-2022) recognises that riparian corridors along waterways play an important role in maintaining and improving waterway health.

Waterway condition is assessed by the quality and quantity of vegetation (both in-stream and on land), the physical form of the bed and banks, the quality and quantity of water within the waterway and the level of connection to wetland and floodplain areas.

Ephemeral waterways or natural drainage corridors serve as conduits for conveying and improving the quality of rainfall runoff. While some minor waterways may have low environmental values, their function in conveying and treating runoff from surrounding catchments into major waterways plays a significant Floodplain Management and River Health role.

Applications will be assessed against their contribution to the maintenance or improvement of waterway condition, including whether they demonstrate things such as:

- Protecting vegetation both in-stream and on land;
- Reducing the concentration of flows into waterways;
- Providing appropriate buffers between the development and the waterway;
- Incorporating self-sustaining systems that minimise the costs of maintenance. For example, the use of native vegetation species as opposed to lawn.

Wetlands are a particularly important environmental asset in our region and the CCMA does not support development in or filling of any wetlands. In addition to any Planning Permit you may need from Council, all works within 30 metres of a designated waterway require a Works on Waterways permit issued by the CCMA under the *Water Act 1989*. An application form is available on the **CCMA website**.



### Development must maintain or improve the quality of stormwater and catchment run-off in rural and urban areas.

Where development has the potential to influence waterway health, applicants must demonstrate how they intend to maintain or improve stormwater and run-off quality and volumes in accordance with best practice standards.

For most subdivisions, stormwater treatment and management should be at a minimum, conceptually designed prior to finalisation of lot layout (e.g. provided at application stage and well before certification of the plan of subdivision is lodged for final sign off), to ensure that appropriate land is set aside for this purpose. This is an important consideration as catchments will change as a development(s) progresses and certification is a check to confirm that the developer can actually achieve minimum stormwater treatment of the development. Stormwater quality works must be undertaken prior to the works commencing for the development that they will treat. The CCMA encourage the use of Integrated Water Management solutions into development designs to minimise the impacts of stormwater on receiving waterways.

Any proposed discharge of stormwater requiring a direct connection to a designated waterway will require a Works on Waterways permit issued by the CCMA under the *Water Act* 1989. An application form is available on the **CCMA website**.



## Part Three: Design Requirements

The following section deals with some common development types and design responses when developing in flood prone areas.

#### **ACCOMMODATION**

In the Victoria Planning Provisions, the term 'accommodation' refers to "land used to accommodate persons" (Clause 73.03). The CCMA applies the criteria below to all accommodation types defined under Clause 73.03, which includes dwellings, camping and caravan parks, corrective institutions, dependant person's units, group accommodation, host farms, residential aged care facilities, residential buildings, residential villages and retirement villages.

The CCMA assess the flood hazard of a development location using Table 1 Summary of CCMA flood hazard criteria. Table 1 has been developed using the Flood Hazard Vulnerability Curves shown in Figure 1 below. The Flood Hazard Vulnerability Curves set hazard thresholds that relate to the vulnerability of the community when interacting with floodwaters and are based on empirical evidence.

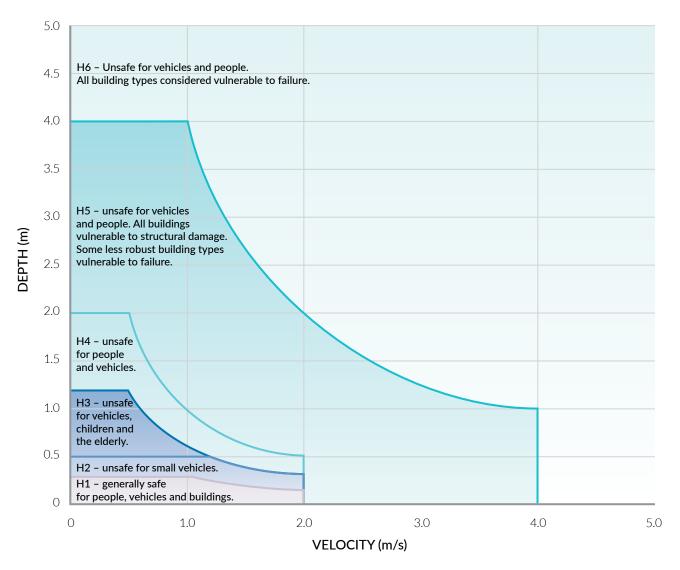
The Flood Hazard Vulnerability Curve shown in Figure 1 is taken from the Australian Disaster Resilience Handbook Collection guideline 7-3 Flood Hazard (AIDR, 2017).

As seen in Table 1, for most development types, the flood hazard criteria specify a maximum flood depth of 0.3 metres on the site and over the egress route. This is based on the upper limit of the H1 Flood Hazard Vulnerability Curve (refer to Figure 1) and is considered the safe depth limit for small vehicles.

Where flood velocities are greater than 1.0 metre per second, the flood depth criteria in Table 1 may be critical. When this is the case, the assessment of the flood safety criteria will be based on the applicable Flood Hazard Vulnerability Curve.



Figure 1 General flood hazard vulnerability curves (AIDR, 2017).



### PART THREE: DESIGN REQUIREMENTS (CONT.)

Where dwelling sites meet the CCMA criteria for flood depth and velocity over the site and vehicle egress, the finished floor level of the dwelling must be at or above the relevant Nominal Flood Protection Level (NFPL) at that location. The NFPL includes a freeboard above the 1% AEP flood level and is the minimum height required to protect a building or its contents from 1% AEP flood waters. The minimum freeboard required for dwellings is 0.3 metres.

To maintain the free passage of floodwaters, stumps rather than fill must be used to raise the finished floor level of a dwelling up to the NFPL where this is required. Any enclosure of the sub-floor must be of an open style that allows for the free passage of flood waters under the dwelling. Fill pads will only be considered if maintenance of flow paths and floodplain storage capacity can be demonstrated.

The Victoria Planning Provision Planning Practice Note 11 'Applying for a planning permit under the flood provisions – a guide for councils, referral authorities and applicants' (2015) allows an extension to an existing dwelling of less than 20 square metres to be constructed at the existing floor level. Any extension greater than 20 square metres must be constructed in line with Table 1.

Building materials located below the NFPL can be damaged during floods, which can compromise the safety of the building. This should be taken into consideration in the selection of materials used in construction below the NFPL, with a preference to use flood resistant materials where possible.

New permanent caravan or cabin sites have a similar function to dwellings and similar safety issues. The CCMA does not support intensification of existing caravan parks or development of new caravan parks where the relevant criteria are not met.

#### **SUBDIVISIONS**

All subdivisions must ensure safe access/egress can be maintained during a 1% AEP flood event, ensuring flood depths do not exceed 0.3 metres.

Major residential subdivisions (16 lots or more) require the finished surface level of all new lots to be no lower than NFPL (1% AEP flood level + 0.3m).

Rural residential subdivisions must provide for flood free building footprints.

All other subdivisions require each lot to have an adequate building envelope where the 1% AEP flood depth is less than 0.3 metres.

For all subdivisions where lots are impacted by the 1% AEP flood extent, the Plan of Subdivision must show the building envelopes large enough for a normal dwelling and minimum finished floor levels.

Proposals for the subdivision of flood prone land may need to be supported by a Flood Impact Assessment (FIA) undertaken by a suitably qualified and experienced professional to the satisfaction of the CCMA. The FIA will need to demonstrate the 1% AEP flood extent, depth, velocity and hazard of flooding for existing and developed conditions. The FIA must demonstrate that the proposal meets the relevant safety criteria for the subdivision and will result in no adverse hydrologic or hydraulic impacts off site.

Proposals for subdivisions must also consider the health and protection of any floodplain areas, designated waterways and wetlands, as well as management of stormwater.

Where waterways flow through or alongside large developments, the CCMA preference is for a reserve to be created along the waterway and buffer and for that reserve to be vested in Council. Every effort must be made to ensure new lots do not each contain section of waterway as this often leads to issues related to poor maintenance which in turn has potential to impacts on adjacent landowners by blocking flows and causing unwanted physical damage to waterways.

The CCMA notes that there is scope for boundary realignments on the condition that any realigned lots (that do not create additional lots) are created that have sufficient flood-free land for a building envelope, and that all lots have flood-free vehicle access to the nearest emergency services.

Refer to Appendix B for more information about the process and requirements for multi-lot subdivisions.

#### **EMERGENCY AND COMMUNITY FACILITIES**

Clause 13.03-1S of the Planning Policy Framework requires emergency facilities (including hospitals, ambulance stations, police stations, fire stations, residential aged care facilities, childcare facilities, communication facilities, transport facilities, community shelters and schools) to be located outside the

1% AEP flood extent or on land with the lowest flood hazard and, where possible, at levels above the Probable Maximum Flood (PMF).

Some of the above services need to function continuously and therefore need to be located outside the 1% AEP flood extent, and preferably above the Probable Maximum Flood.

Building's housing vulnerable people, including dependent persons' units and residential villages, should also be located outside the 1% AEP flood extent. Vulnerable people are defined in the glossary.

#### STORMWATER MANAGEMENT

Clause 56.07-4 (Stormwater Management Objectives – Standard C25) of the Victorian Planning Provisions, states that the stormwater management system for residential subdivisions must be:

- Designed to meet the current best practice performance objectives for stormwater quality as contained in the *Urban Stormwater – Best Practice Environmental Management Guidelines* (Victorian Stormwater Committee, 1999)
- Designed to ensure that flows downstream of the subdivision site are restricted to pre-development levels unless increased flows are approved by the relevant drainage authority and there are no detrimental downstream impacts.

Where development has the potential to influence waterway health or flooding impacts, a Stormwater Management Plan will generally be required to demonstrate:

- The stormwater runoff will not increase the flood peak levels for all flood events (from 50% to 1% AEP). If the stormwater runoff is likely to increase the peak flood levels, stormwater detention will be required
- Stormwater quality meets current best practice performance objectives; and
- Minimal changes to waterway hydrology, such as stream velocity or volume
- No perceptible change in flows across other properties.

The CCMA's preference is for the use of off-stream stormwater treatments which minimise the physical disturbance to the waterway.

For large subdivisions, stormwater treatment and management should be conceptually designed prior to finalisation of lot layout, to ensure that appropriate land is set aside for this purpose. Stormwater quality works must be undertaken prior to the works commencing for the development that they will treat.

The above stormwater management requirements extend to apartment developments, commercial and industrial subdivisions and developments, all public use developments and all residential multi-dwelling developments.



### PART THREE: DESIGN REQUIREMENTS (CONT.)

#### SHEDS AND OUTBUILDINGS

Sheds and outbuildings less than 20 square metres may be constructed at the natural surface level. Sheds greater than 20 square metres must be constructed with a minimum finished floor level of 0.15 metres above the applicable 1% AEP flood level. Sheds must be located away from active flow areas and orientated to minimise potential impacts on flow paths. Access ways should not obstruct flood flow or storage.

The CCMA requires that electrical outlets be fixed above the NFPL. Any high value and/or hazardous materials must be stored at or above the NFPL.

Building materials located below the NFPL can be susceptible to damage during inundation which can compromise the safety and function of the building. This should be taken into consideration in the selection of materials used in construction below the NFPL, with a preference to use flood resistant materials where possible.

#### **FENCES**

Impermeable fences and fences that are likely to trap flood debris are not supported in locations with a higher flood risk (such as in the Floodway Overlay, FO) or in active flow paths in both the FO or the Land Subject to Inundation Overlay (LSIO), as they can obstruct flood flows and alter flood behaviour. Fences that do not impede flows (by being open style, contain break-away panels or gaps) up to the 1% AEP flood level may be supported.

The following types of fences are considered open style fencing:

- · Post and wire:
- Post spacing no less than three metres apart;
- Single wires spaced no more than one horizontal strand per 200mm.
- Post and rail:
- Post spacing no less than three metres apart;
- Rails no more than 150mm wide:
- Rails spaced no less than 200mm apart;
- Bottom rail no less than 150mm off the ground.
- Tubular steel pool security fencing.

#### **EARTHWORKS**

Some development proposals seek to manage the flood risk by placing fill within the floodplain. The CCMA generally does not support the placement of fill within the floodplain and considers that where a property contains flood-free land, development should be limited to that part of the land in preference to raising the level of low-lying land for development.

Where flood-free land is limited, the placement of fill may be supported within the fringe of the floodplain where flood depths are less than 0.3 metres if it can be compensated with a greater volume of excavation and it can be demonstrated that the earthworks won't:

- Reduce the capacity of the floodplain to store and convey floodwaters:
- Raise flood levels, depths or velocities on properties external to the development.

Any application involving the placement of fill within the floodplain must:

- Demonstrate a balance of cut and fill on the site at a ratio of 1.3 cubic metres of cut to 1.0 cubic metres of fill
- Excavated areas to achieve the balance of cut and fill must:
- Be located on the development site; and
- Be naturally self-draining so that the area of cut is actively available for storage during a flood event; and
- Located in areas which are subject to flooding for the full range of flood events expected to affect the site being filled (i.e. the excavated area is not filled before the arrival of the flood peak).

#### Or

- Demonstrate that there will be no worsening of flood impacts on neighbouring properties via hydraulic modelling approved by the floodplain management authority; and
- Demonstrate how level-for-level floodplain storage compensation will be achieved.

#### FLOOD EMERGENCY RESPONSE PLANS

The CCMA does not accept the use of Flood Emergency Response Plans (FERP) to justify new development in areas that do not meet the flood safety criteria for site and access.

Flood Emergency Response Plans may be considered for proposals where existing use rights are recognised and the FERP improves the flood risk from the existing conditions. The CCMA will require Flood Emergency Response Plans to be developed by an appropriately qualified and experienced engineering consultant to the satisfaction of the CCMA and formalised on Title through a Section 173 agreement to ensure owners understand the flood risk and the appropriate response in the event of a flood.

#### **WATERWAYS**

Clause 14.02-15 (Catchment planning and management) of the *Planning Policy Framework (PPF)* seeks to assist the protection and restoration of catchments, water bodies, groundwater and the marine environment. One of the strategies set out in Clause 14.02-15 to achieve this is the retention of natural drainage corridors with vegetated buffer zones at least 30 metres wide along each side of a waterway.

The CCMA also refer to Waterway Corridors – Guidelines for greenfield development areas within the *Port Phillip and Westernport Region*, *Melbourne Water*, 2013, where appropriate.

Designated waterways must be protected, vegetated and maintained into the future. To ensure their long-term protection, where waterways flow through or alongside large developments, the CCMA preference is for a reserve to be created along the waterway and buffer and for that reserve to be vested in Council. A Waterway Management Plan (WMP) will be required as part of the development. The WMP applies to the entire reserve and guides revegetation and provides a plan for ongoing maintenance of the reserve.

Waterway Management Plans must include a plan detailing landscaping and a maintenance schedule.

The landscape plan should include at a minimum the planting zones, plant types and densities, cross sections of planting and details of inlets, outlets and other features.

The maintenance schedule should include establishment actions, a maintenance plan including inspection details, the short-, medium- and long-term actions and identify the responsible parties. Waterway planting should make use of indigenous species consistent with the prevailing Ecological Vegetation Class (EVC).

The protection of human life must be prioritised in bushfire affected areas in accordance with Clause 13.02-1S of the PPF. This does not justify ignoring or nullifying other policy considerations such as the requirement to provide 30m vegetated buffers along waterways under Clause 14.02-1S. If conflict arises, the development layout will need to respond appropriately to both requirements and ensure that any dwellings or new lots are appropriately located to reflect the risk associated with the vegetated waterway.

#### **EFFLUENT FIELDS**

Consideration must be given to the location of effluent disposal fields to ensure they comply with the requirements of the 891.4: EPA code of practice – onsite wastewater management.

Specifically section 3.9.2 Flood-prone areas which states:

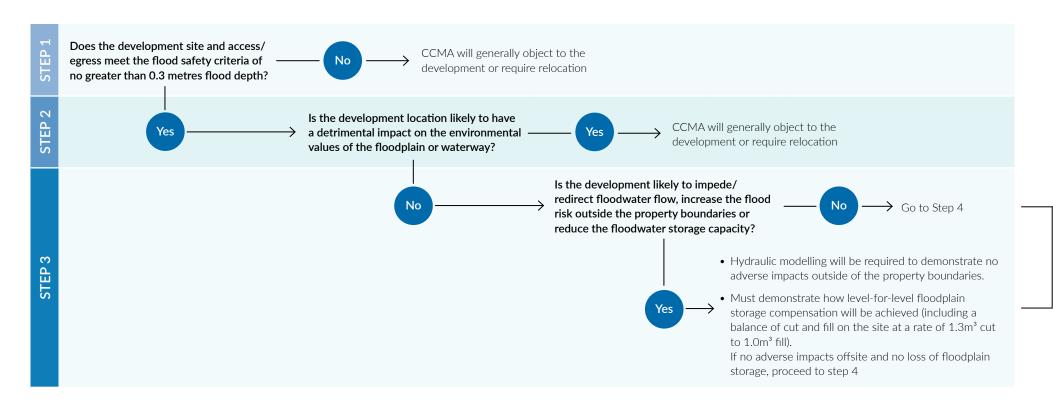
Onsite wastewater management systems are generally not suitable for areas likely to flood more frequently than every 20 years (on average) unless the treatment system is watertight and has mechanisms in place which prohibit floodwaters or wastewater from the land application system from flowing into the tank and from the tank into the premises. Systems which are not watertight may only be installed in areas that have an 'annual exceedance probability' (AEP) of flooding of more

than 20 years (i.e. are likely to flood less frequently than every 20 years).

## Appendix A

## DEVELOPMENT GUIDELINES SUMMARY PAGE

General Assessment Criteria for Development when assessing against the 1% AEP flood event:



Proposed development impacted by flooding will generally need to be referred to the CMA. Development includes anything that requires a Planning Permit or Building Permit and generally includes the construction, alteration or demolition of a building or works and the subdivision or consolidation of land.

The Victorian Planning Scheme requires development to be assessed against the 1% Annual Exceedance Probability (AEP) flood event. Floods occur randomly and in different magnitudes. The 1% AEP flood event is a rare and large event that has a 1% chance of occurring in any one year.

For other developments that don't meet the descriptions in the guidelines, seek free flood advice from the CCMA via a **Flood Advice Request Form** from the CCMA website.

## STEP 4

#### General requirements depending on development type:

**Dwellings and most buildings (other than small sheds and garages:** will require a minimum finished floor level set at the NFPL (1% AEP flood level + 0.3m freeboard). Buildings within the floodplain will generally be required to build on stumps and bearers or provide a cut and fill balance to demonstrate no loss of floodplain storage area.

#### Subdivisions:

- Depending on the size of the subdivision and potential impact, a Stormwater Management Plan may be required to demonstrate:
- That the stormwater runoff will not increase the flood peak levels for all flood events (from 50% to 1% AEP). If the stormwater runoff is likely to increase the peak flood levels, detention will likely be required;
- Stormwater quality meets current best practice performance objectives; and
- Minimal changes to waterway hydrology.

- Where waterways border or intersect developments, a Waterway Management Plan will be required to demonstrate how the waterway will be protected from the development and managed into the future. Waterways should be kept in their natural condition if possible and reserves created over the waterway to ensure
- a suitable buffer (generally 30m either side of the waterway) is retained
- Any fencing within the floodplain must not block the flow of floodwaters
- All roads, footpaths and cycle paths must meet the flood safety category H1 criteria on the ADRH flood hazard vulnerability curve
- Major residential subdivisions require the finished surface level of all new lots to be no lower than NFPL (1% AEP flood level + 0.3m)
- Major rural residential subdivisions must provide for flood free building envelopes
- All other subdivisions require each lot to have an adequate building envelope where the 1% AEP flood depth is less than 0.3 metres.

<sup>\*</sup> For all other development types, refer to Table 1 \*\* For developments subject to coastal flooding, refer to Table 2



## Appendix B

## INFORMATION GENERALLY REQUIRED FOR MULTI-LOT SUBDIVISIONS IMPACTED BY RIVERINE FLOODING

#### SEEK FREE FLOOD ADVICE

Seek free flood advice from the CCMA prior to design via a **Flood Advice Request Form** from the CCMA website.

#### PLANNING PERMIT APPLICATION

Depending on the advice given above, the CMA is likely to require the following be provided at this stage:

- a. Flood Impact Assessment using the most recent Australian Rainfall and Runoff methodology. This assessment compares the flood risk under existing conditions to the flood risk under developed conditions. It enables the subdivision to be designed to meet the flood hazard requirements and to demonstrate no off-site flood impacts as a result of the development.
- b. Stormwater Management Strategy (This is often combined with the FIA). The CMA's interest in the stormwater management strategy is to ensure there is no increase in peak flood levels for all flood events (from 50% to 1% AEP) downstream of the development. To meet this requirement, it will need to be demonstrated that:
- i. The stormwater will get away prior to the riverine flood peak arriving (i.e. stormwater detention would not be appropriate). This can usually be demonstrated in the form of a hydrograph comparison. Although, the occurrence of a localized storm event needs to be taken into consideration.

OR

- ii. If the above can't be demonstrated, then detention will be required for all storm events (e.g. 20%, 10%, 5%, 2%, 1% AEP events) to ensure stormwater is detained until the peak flood flows have passed.
- c. Waterway Management Plan this will be required if a waterway borders or flows through the development. It is required to demonstrate how the waterway will be protected in the development and managed into the future. The CMA's preference is for waterways to remain natural and for reserves to be created over the waterway to ensure a suitable buffer is in place.

## CERTIFICATION OF PLAN OF SUBDIVISION

- Prior to consenting to certification, detailed design of flood mitigation and stormwater infrastructure is generally required. This is to ensure the subdivision layout is satisfactory and enough land has been set aside
- If a Waterway Management Plan was required, it must be written prior to certification.

## STATEMENT OF COMPLIANCE

 Prior to issuing Statement of Compliance, the CMA may require an as-constructed survey (in metres AHD) (if requested) in PDF and GIS format and evidence of the completion of all required stormwater treatment infrastructure as well as implementation of the Waterway Management Plan (e.g. plantings completed).

## Appendix C

## RELEVANT POLICIES, GUIDELINES AND PRACTICE NOTES

The Guidelines contained in this document have been created in accordance with the following National, State and Local Policies. Guidelines and Practice Notes.

- Australian Disaster Resilience Handbook 7
   (Australian Institute for Disaster Resilience, 2017)
- Australian Disaster Resilience Guideline 7-3
   (Australian Institute for Disaster Resilience, 2017)
- 3. 'Victorian Floodplain Management Strategy' (Victoria State Government, 2016)
- 4. Council Planning Schemes (**Planning Schemes Online**), including the:
  - Planning Policy Framework
  - Local Planning Policy Framework
  - Relevant Zones and Overlays
- 5. **'Guidelines for Development in Flood-Affected Areas'** (DELWP, 2019)
- 6. 'Guidelines for Coastal Catchment Management Authorities: Assessing development in relation to sea level rise' (DSE, 2012)
- 'Applying for a Planning Permit under the Flood Provisions

   A Guide for Councils, Referral Authorities and Applicants'
   (DELWP, 2015)

- Victorian Coastal Strategy' (Victorian Coastal Council, 2014)
- **9.** Corangamite Regional Strategies, including the:
  - Corangamite Regional Floodplain Management Strategy (2018-2028)
  - Corangamite Waterway Strategy (2014 2022)
  - Corangamite Regional Catchment Strategy (2013-2019)



# Appendix D DECISION GUIDELINES

	FLOOD	SAFETY	FLOOD	FLOOD IMPACTS		WATERWAY & PROTE	
	SITE SAFETY	SITE ACCESS	DAMAGE	FLOOD FLOW	FLOOD STORAGE	WATERWAY CONDITION	WATER QUALITY
PPF 13.03-1S Floodplain management to help protect:							
Life, property and community infrastructure from flood hazard.	<b>√</b>	1	1				
The natural flood carrying capacity of rivers, streams and floodways.				<b>√</b>			
The flood storage function of floodplains and waterways.					1		
Floodplain areas of environmental significance or of importance to river health.						<b>√</b>	<b>√</b>
Planning Scheme Clause 65 Approval of an application or plan. Before deciding on an application	or approval of a	plan, the respons	sible authority m	ust consider, as	appropriate:		
The effect on the amenity of the area.						✓	
Factors likely to cause or contribute to land degradation, salinity or reduce water quality.						<b>✓</b>	<b>√</b>
Whether the proposed development is designed to maintain or improve the quality of stormwater within and exiting the site.							<b>√</b>
The extent and character of native vegetation and the likelihood of its destruction.						<b>✓</b>	
Whether native vegetation is to be or can be protected, planted or allowed to regenerate.						<b>√</b>	
The degree of flood, erosion or fire hazard associated with the location of the land and the use, development or management of the land so as to minimise any such hazard.	1	1	1	1			
Urban Floodway Zone (UFZ) Decision guidelines:							
The local floodplain development plan or flood risk report.	<b>√</b>	1	1	1	<b>√</b>	<b>√</b>	<b>√</b>
Any comments of the relevant floodplain management authority.	1	1	/	/	1	/	<b>√</b>

	FLOOD SAFETY		FLOOD	FLOOD	IMPACTS	WATERWAY & PROTE	
	SITE SAFETY	SITE ACCESS	DAMAGE	FLOOD FLOW	FLOOD STORAGE	WATERWAY CONDITION	WATER QUALITY
Floodway Overlay (FO) Decision guidelines:							
The local floodplain development plan or flood risk report.	1	1	1	1	<b>√</b>	<b>√</b>	<b>√</b>
Any comments of the relevant floodplain management authority.	1	<b>/</b>	1	1	<b>/</b>	<b>✓</b>	<b>√</b>
The Victorian River Health Strategy (2002) and any relevant regional health strategy and associated wetland plan.						✓	<b>√</b>
Land Subject to Inundation Overlay (LSIO) Decision guidelines:							
The local floodplain development plan or flood risk report.	<b>✓</b>	<b>✓</b>	<b>/</b>	<b>√</b>	<b>√</b>	<b>✓</b>	<b>√</b>
Any comments of the relevant floodplain management authority.	<b>✓</b>	1	1	1	<b>√</b>	<b>✓</b>	<b>√</b>
The existing use and development of the land.	<b>✓</b>	<b>/</b>	1				
Whether the proposed use or development could be located on flood-free land or land with a lesser flood hazard outside this overlay.	1	1	1				
The susceptibility of the development to flooding and flood damage.	/	/	1				
The potential flood risk to life, health and safety associated with the development. Flood risk factors to consider include:	1	1	1	1	<b>✓</b>	1	<b>√</b>
The frequency, duration, extent, depth and velocity of flooding of the site and accessway.	/	/	1				
The flood warning time available.	<b>✓</b>	1	1				
The danger to the occupants of the development, other floodplain residents and emergency personnel if the site or accessway is flooded.	1	1					
The effect of the development on redirecting or obstructing floodwater, stormwater or drainage water and the effect of the development on reducing flood storage and increasing flood levels and flow velocities.				V	<b>✓</b>		
The effect of the development on river health values including wetlands, natural habitat, stream stability, erosion, environmental flows, water quality and sites of scientific significance.						<b>√</b>	<b>√</b>

	FLOOD SAFETY		FLOOD SAFETY		FLOOD SAFETY		FLOOD SAFETY		FLOOD SAFETY		FLOOD SAFETY		FLOOD SAFETY		FLOOD SAFETY				FLOOD	FLOOD IMPACTS		WATERWAY & FLOODPLAIN PROTECTION	
	SITE SAFETY	SITE ACCESS	DAMAGE	FLOOD FLOW	FLOOD STORAGE	WATERWAY CONDITION	WATER QUALITY																
VPP 56.07-4 Stormwater management objectives:																							
To minimise increases in stormwater and protect the environmental values and physical characteristics of receiving waters from degradation by stormwater.	1	1	<b>√</b>	1	<b>√</b>	<b>✓</b>	<b>√</b>																
Designed to meet the current best practice performance objectives for stormwater quality as contained in the <i>Urban Stormwater - Best Practice Environmental Management Guidelines</i> ( <i>Victorian Stormwater Committee</i> , 1999).							<b>/</b>																
Designed to ensure that flows downstream of the subdivision site are restricted to pre-development levels unless increased flows are approved by the relevant drainage authority and there are no detrimental downstream impacts.			<b>✓</b>	<b>✓</b>	1	<b>√</b>																	
VPP 13.01-2S Coastal inundation and erosion. Strategies include:																							
Plan for sea level rise of not less than 0.8 metres by 2100 and allow for the combined effects of tides, storm surges, coastal processes and local conditions such as topography and geology when assessing risks and coastal impacts associated with climate change.	1	1	<b>✓</b>	1	1																		
Ensure that land subject to hazards is identified and appropriately managed to ensure that future use and development is not at risk.	1	1	1	1	1																		
Avoid use and development in areas vulnerable to coastal inundation and erosion.	1	1																					
Ensure that development or protective works that seek to respond to coastal hazard risks avoid detrimental impacts on coastal processes.				1	1	/																	
Practice Note 11: A council or floodplain management authority should consider the following d	ecision guidelin	es when decidi	ng or commenti	ng on an applic	ation.																		
<ul> <li>A development must be consistent with:</li> <li>The SPPF (Clause 13.02)</li> <li>Any flood-related statements made in the MSS (Clause 21) and local planning policies (Clause 22) of the planning scheme</li> <li>Any flood-related guidelines incorporated in the planning scheme</li> <li>Any regional catchment strategy or floodplain management strategy adopted by the CMA</li> <li>Any local floodplain development plan adopted by a council</li> <li>Any other development guidelines agreed to by the council and the floodplain management authority</li> <li>The potential impact of an extreme event larger than the 100-year ARI flood on life, health, safety and damage.</li> </ul>	<b>√</b>	✓	<b>√</b>	✓	<b>✓</b>	✓	<b>√</b>																

	FLOOD SAFETY		FLOOD	FLOOD	IMPACTS	WATERWAY & PROTE			
	SITE SAFETY	SITE ACCESS	DAMAGE	FLOOD FLOW	FLOOD STORAGE	WATERWAY CONDITION	WATER QUALITY		
Practice Note 11: A council or floodplain management authority should consider the following d	ractice Note 11: A council or floodplain management authority should consider the following decision guidelines when deciding or commenting on an application. (Continued)								
Emergency facilities should be located above the 100-year ARI flood level, and preferably above the PMF level.	1	1	1						
The possibility of relocating that development to land which is flood-free or which has a lesser risk.	<b>√</b>	<b>√</b>	<b>√</b>						
Residential, commercial and industrial buildings are not generally an appropriate development on floodway land in view of their potential for flood hazard and for obstruction of flood flows.	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>√</b>	<b>✓</b>	<b>✓</b>	<b>√</b>		
Significant earthworks, such as levee banks, channel banks and raised roads are not appropriate on floodway land in view of their potential for obstruction of flood flows.				<b>√</b>	<b>✓</b>				
The incremental long-term effects of developments. While a single development may not cause a significant change, the cumulative effect of several similar developments may be substantial.	<b>√</b>	<b>✓</b>	<b>✓</b>	<b>√</b>	<b>✓</b>	<b>✓</b>	<b>√</b>		
The design of buildings should adopt flood-proofing measures that minimise the physical effects of flooding on the building structure and its contents.			<b>✓</b>						
Activities that generate or store significant quantities of nutrients or noxious or hazardous materials should not be located on land subject to inundation; for example, sewage treatment and pumping plants, intensive animal industries, sanitary landfill depots and food-processing plants.						1	1		
A development should be refused if it is likely to cause an unacceptable increase in flood risk in the following situations:									
• It is likely to result in danger to the life, health and safety of the occupants due to flooding of the site									
It relies on low-level access to and from the site									
• It is likely to increase the burden on emergency services and the risk to emergency personnel									
It is likely to increase the amount of flood damage to public or private assets									
<ul> <li>It is likely to raise flood levels or flow velocities to the detriment of other properties.</li> <li>Potentially adverse effects on upstream and downstream areas must be identified and addressed. Development should not transfer flooding problems from one location to another</li> </ul>	<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>/</b>	<b>√</b>		
• It is likely to obstruct flood flows or reduce natural flood storage. The capacity of land subject to inundation to convey and store floodwater must be maintained									
<ul> <li>It is likely to be detrimental to natural habitats, waterway stability, water quality or sites of significance</li> </ul>									
<ul> <li>If any subdivision, development or redevelopment is likely to increase the number of buildings located in a floodway area.</li> </ul>									

## Glossary

#### 1% AEP flood:

A large flood having a 1% chance of occurring in any given year.

#### Accommodation:

Land used to accommodate persons, which includes dwellings, as per Clause 73.03 of the Victoria Planning Provisions.

#### Annual Exceedance Probability (AEP):

The likelihood of occurrence of a flood of a given size or larger happening in any one year. AEP is usually expressed as a percentage, e.g. 1% AEP.

#### Australian Height Datum:

A common national surface level datum corresponding approximately to mean sea level. It is used to measure height (typically in metres) above sea level throughout Australia (denoted as metres AHD or m AHD).

#### Average Recurrence Interval (ARI):

A statistical estimate of the average number of years between the occurrences of a flood of a given size or larger. The ARI of a flood event gives no indication of when a flood of that size will occur next.

#### Building envelope:

The area on a site where new buildings or extensions to existing buildings are proposed.

#### Catchment:

The area of land draining to a site. It always relates to a specific location and includes the catchment of the main stream and tributary streams.

#### Coastal flooding:

Flooding of low-lying areas by ocean waters caused by higher than normal sea level, due to tidal or storm-driven coastal events, including storm surges in lower coastal waterways.

#### Design flood:

The flood selected for design and planning purposes that is used to define the flood zone. In Victoria, for most types of development, this is the 1% AEP flood (or 100-year ARI flood).

#### Development:

The construction or exterior alteration or exterior decoration of a building; the demolition or removal of a building or works; the construction or carrying out of works; the subdivision or consolidation of land, including buildings or airspace; the placing or relocation of a building or works on land; and the construction or putting up for display of signs or hoardings (*Planning and Environment Act*, 1987).

#### **Emergency services facilities:**

Buildings expected to remain fully functional during floods up to the Probable Maximum Flood. They include ambulance stations. fire stations and police stations.

#### Flood:

For these guidelines, the covering of normally dry land by water. The insurance industry considers flooding to be water that has escaped or been released from the normal confines of:

- a. A lake, river, creek or other natural watercourse, whether or not altered or modified; or
- b. Any reservoir, canal, or dam.

#### Flood prone land:

Land inundated by the 1% AEP flood from time to time.

#### Floodplain:

Low-lying land adjoining a waterway (e.g. an open river creek or drainage path) that is covered by water when the river overflows during floods. The extent of the floodplain is defined as the area of land inundated during a Probable Maximum Flood

#### Floodplain management authority:

In Victoria, a Catchment Management Authority or Melbourne Water.

#### Flood-resistant materials:

Materials used in building construction that are capable of withstanding direct and prolonged contact with floodwaters without sustaining significant damage.

#### Flow:

The rate of flow of water measured in volume per unit time; for example, cubic metres per second (m3/s). Flow is different from the speed or velocity of flow, which is a measure of how fast the water is moving, for example metres per second (m/s).

#### Freeboard:

The height above the design flood level. It is a factor of safety typically used in relation to the setting of floor levels, apex of underground carpark entrances and so on. Freeboard compensates for a range of factors, including wave action and localised flow effects. It can also compensate for uncertainties in the accuracy of the 1% AEP flood level estimate.

#### Greenfield development:

For these guidelines, greenfield development refers to intensification of development of a completely different nature to that associated with the former land use. It can be for residential, industrial or commercial purposes.

#### Infill development:

For these guidelines, refers to the development of a vacant block of land within an existing township boundary that are generally surrounded by other developed properties.

#### Inundation:

The covering of land by water.

#### Nominal Flood Protection Level (NFPL):

The applicable 1% AEP flood level plus the applicable freeboard.

#### Outbuilding:

A building subordinate to but separate from a main building.

#### Overland flooding:

Inundation by local runoff caused by heavier than usual rainfall. It can be the result of local runoff exceeding the capacity of an urban stormwater drainage system or water backing up urban stormwater drainage systems. In rural settings it can also be flow overland on the way to waterways.

#### Refuge area:

A location where emergency relief and recovery services can be accessed.

#### Riparian zone:

Land that adjoins a river, creek, estuary, lake or wetland.

#### Riverine flooding:

The covering of normally dry land by water that has escaped or been released from: the normal confines of a lake, river, creek or other natural watercourse (whether or not altered or modified); or a reservoir, canal or dam.

#### Runoff:

The amount of rainfall that is not intercepted, captured or absorbed into the ground during a storm and that subsequently runs along the ground surface. It is also known as rainfall excess

#### Planning Policy Framework:

The principles, policies and strategies for how land is to be used and developed in Victoria. It includes mandatory state-wide components. For example, the State planning policy for floodplain management is to protect life, property and community infrastructure, and to protect areas of environmental significance and river health. The policy requires land affected by a 1% AEP flood to be identified in Planning Scheme maps and for planning decisions to avoid intensifying the impacts of flooding through inappropriately located uses and developments.

#### Stormwater flooding:

Overland flooding associated with urban drainage systems.

#### Storm surge:

A rise above the normal sea level along a shore resulting from strong onshore winds and or reduced atmospheric pressure. Storm surges can be formed by intense low-pressure systems.

#### Subdivision:

The division of land into two or more parts which can be disposed of separately (*Subdivision Act 1988*). For these guidelines, subdivision also includes proposals to set aside building envelopes or fill pads.

#### Vulnerable people:

For these guidelines, individuals or groups of individuals who are dependent on more able people for mobility and basic needs. They include the elderly, infirmed, mentally or physically incapacitated, incarcerated and very young children.

#### Waterway:

Rivers and streams, their associated estuaries and floodplains (including floodplain wetlands) and non-riverine wetlands.

#### **Victoria Planning Provisions:**

A comprehensive set of standard planning provisions, including compulsory State policies and strategies, and zones and overlays used locally. They provide a standard format and consistent policies and controls for all Victorian planning schemes.

#### Works:

Includes any change to the natural or existing condition or topography of land including the removal, destruction or lopping of trees and the removal of vegetation or topsoil.

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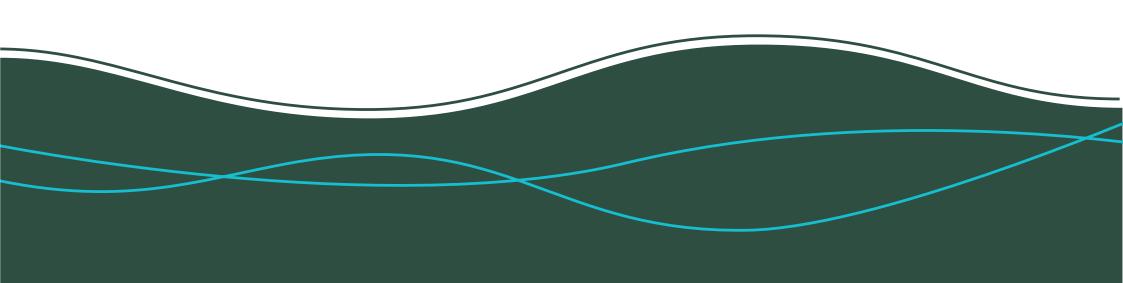
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64 Dennis Street, Colac, Victoria, 3250 PO Box 159, Colac, Victoria, 3250

**PHONE** 1800 002 262

**EMAIL** info@ccma.vic.gov.au