

Fencing Guidelines for Flood-Prone Areas

March 2020



North
Central
CMA



Acknowledgment of Country

The North Central Catchment Management Authority acknowledges Aboriginal Traditional Owners within the region, their rich culture and spiritual connection to Country. We also recognise and acknowledge the contribution and interest of Aboriginal people and organisations in land and natural resource management.

Document Control			
Version	Date Issued	Prepared By	Reviewed By
1	September 2019	Peter O'Toole	Camille White, Sonia Robinson
2	May 2020	Peter O'Toole	Rohan Hogan, Project Delivery Team
3	July 2020	Peter O'Toole	Brad Drust

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North Central Catchment Management Authority
628-634 Midland Highway, Huntly
PO Box 18, Huntly Victoria 3551
Telephone 03 5448 7124
Facsimile 03 5448 7148
Email info@nccma.vic.gov.au

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Purpose of these guidelines

These guidelines have been compiled to minimise flood risks associated with fences constructed on flood-prone land. Construction of a new or replacement fence on flood-prone land in residential areas usually requires the approval of your local council in the form of a planning permit and while less common planning permits for fencing can be required on rural properties depending on the proposed fencing type. Your application for a planning permit for a new or replacement fence in a flood-prone area is more likely to be successful if your proposed fence complies with these guidelines.

Floodplain management responsibilities

The North Central Catchment Management Authority (CMA) is the floodplain management authority for the region depicted in Figure 1 and has responsibilities for identifying where flooding is likely to occur, how high flood water is likely to rise and advising local government on whether developments on flood-prone land are appropriate. Local government authorities are responsible for issuing permits for permitting land-use and development.



Figure 1- North Central CMA region

Regulations

The use and development of all land in Victoria is controlled by state and local government authorities under the *Planning and Environment Act 1987*.

Construction of fences in flood-prone areas is regulated by local government via a planning permit system (except where exemptions apply). Decisions to grant planning permits are made according to the land-use and development policies and objectives of the municipal planning scheme. Planning schemes are devised and administered by local government

and are the key tools used at the local level for controlling how land is used and developed. Please note there are exemptions for post and wire and post and rail fencing on properties with floodway and land subject to inundation overlays.

Why regulate fencing in flood-prone areas?

Fences in flood-prone areas change the way flood water moves across the landscape. During floods fences can:

- act as a flow boundary and cause changes in localised flood levels
- redirect the direction of flow
- collect flood debris and cause blockages
- be damaged by floodwaters and subsequent fence debris may cause damage to other structures (Figure 2).

These changes can be minor when a fence on a single property boundary is considered, however, the impact of several fences can add up to a significant effect on floodwaters (a cumulative impact). Inappropriately designed fencing can cause significant disruption to the passage of floodwater, particularly when fences are aligned across the direction of floodwater flow.

Solid fences like a tin fence do not respond well to high flows during a flood event and are likely to sustain damage (as illustrated in Figure 2) and may lead to flood waters being transferred to neighbouring properties. Thereby increasing the overall flood impact, contributing to a greater cost to individuals and the community.



Figure 2- An example of damage to inappropriate floodplain fencing

Zones and Overlays

Planning schemes are overarching statutory documents that identify the use and development of land in an area. A planning scheme identifies specific land-use **zones** and **overlays** within them, to establish the rules around land-use development. For example, a planning scheme can identify a Residential Zone, and a specific Heritage overlay within it. Minimising flood risk or protecting environmental values are other examples of how overlays can be utilised. Zones and overlays within local government planning schemes are key tools for the management of floodplains and the control of development in flood-prone areas.

The zones and overlays that are most relevant to development of flood prone land are:

Land Subject to Inundation Overlay (LSIO)

The land subject to inundation overlay typically relates to relatively low hazard flooding during floods ranging up to and including the 1% Annual Exceedance Probability (AEP) flood. A 1% AEP flood refers to the size of a flood that has a 1% chance of occurring in any year. Floodwater is expected to be relatively shallow and slow moving according to the best available information. This commonly occurs on the fringe of the 1% AEP floodplain. Development of land covered by this overlay can be permitted provided development proposals respond appropriately to the degree of flood risk.

Floodway Overlay or Rural Floodway Overlay (FO or RFO)

Identifies land prone to relatively high hazard flooding during floods ranging up to and including the 1% AEP flood. This land is likely to be flooded by relatively deep and fast-moving water that poses a significant hazard to people (according to the best available information). The FO commonly applies to the main flow path areas of the floodplain where development should be avoided (if possible) to mitigate future flood damage costs. Development can be permitted in some circumstances provided development proposals respond appropriately to the degree of flood risk.

Special Building Overlay (SBO)

Identifies land in urban areas prone to flooding when the water flow capacity of urban drainage infrastructure is exceeded. Development can be permitted in some circumstances provided development proposals respond appropriately to the degree of flood risk.

Urban Floodway Zone (UFZ)

Is applied to land where it is appropriate to fully preserve the natural flood conveyance and storage function of land and therefore restrict land use to compatible forms only (e.g. agriculture or public open space).

Guiding principles for design and approval

1. Impact of flood behaviour

Fencing in flood-prone areas can affect floodwater behaviour by altering flood levels, flow velocity, flood storage and flow direction. These changes can result in increased risks to property, human and stock life, safety and wellbeing. Therefore, changes to flood behaviour should be minimised as far as is practicable.

2. Damages

Inappropriate fencing design in flood-prone areas is susceptible to damage during flood events and may exacerbate the impact to other structures by causing localised increases in flood levels and therefore increasing associated flood damage costs.

3. Location and orientation

Appropriate location and orientation of fencing can minimise the associated flood risk. Where possible, fencing should be located where depths and velocities are low, and parallel with the direction of moving floodwater. Fencing that crosses the main floodway channel should be avoided if possible or be designed to minimise disruption to the passage of floodwater.

4. Design

Fences should be designed to minimise disruption to the passage of floodwater. Flood-proofed (swing, drop or layflat) or fences with a higher ratio of openings compared to solid structure cause less disruption to moving floodwater and are therefore more appropriate in locations with a higher flood risk. Appropriate fence designs can be found under floodplain fencing types below.

5. Cumulative impact

The cumulative impact of fences in the floodplain is a key consideration in the approval of fencing in the floodplain. While one solid fence may have a minor localised effect on flood behaviour, multiple fences can act as a major barrier to flood flow and cause significant changes to the way floodwater behaves.

Is your fence in a flood-prone area?

If your property is within an Urban Floodway Zone, Floodway Overlay, Rural Floodway Overlay, Land Subject to Inundation Overlay or Special Building Overlay then it is in a flood-prone area and will require a planning permit for the erection of fencing issued by the local government authority.

To check if your property is covered by a flood related zone or overlay visit <https://mapshare.vic.gov.au/MapShareVic/> (Planning Maps Online service -MapshareVic). Alternatively, you can contact your local council or the North Central Catchment Management Authority for advice.

How to use these guidelines

1. Determine where your fence line is located in the floodplain by using one of the information sources described above.
2. Use the definitions and matrix below (Table 1), to understand what type of fence is likely to gain planning approval at your location.
3. Refer to the *Floodplain Fencing Types* below to select the type and design of fence that is most suited to your circumstances.

- Submit your planning permit application to your local council and make reference to your use of these guidelines in formulating your application.

Table 1- Floodplain Fencing Suitability Matrix

Type	Rural Areas		Urban Areas		
	Floodway	Land Subject to Inundation	Floodway or Urban Floodway Zone	Land Subject to Inundation >300mm	Land Subject to Inundation <300mm
	Highest Hazard			Lowest Hazard	
A					
B					
C					
D					
E					
F					

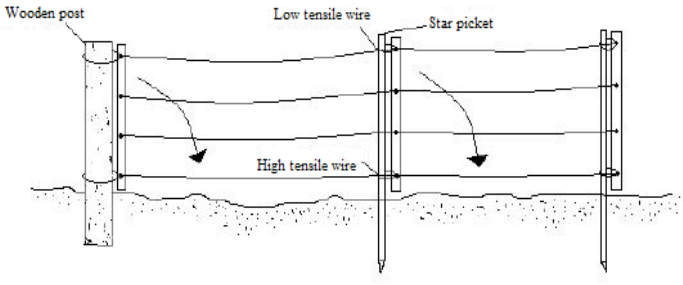
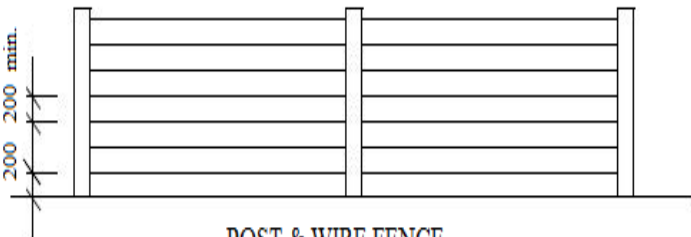
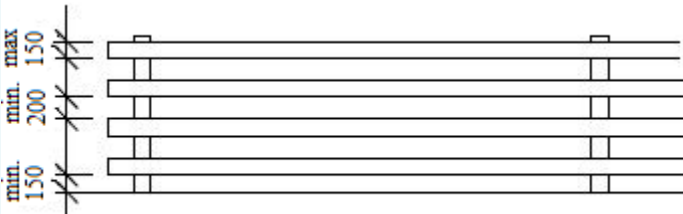
Likelihood of Approval	
	Unlikely
	Likely

Floodway is the area adjacent to the main channel that is dry land during average flow conditions. Floodway land is characterised by fast moving and deep floodwaters. Floodway is the high hazard part of the floodplain and can be the site of considerable damage to infrastructure.

Land Subject to Inundation is usually dry land but is characterised by relatively shallow and slow-moving water in times of flood. Land Subject to Inundation is generally classified as the medium hazard part of the floodplain. In urban areas land subject to inundation can be categorised into two classes <300 mm and >300 mm, which vary in hazard level and potential damage.

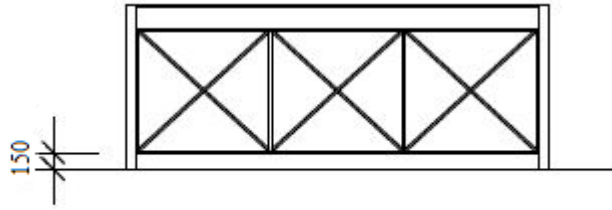
Land Subject to Inundation Fringe is the outermost edge of the land subject to inundation and marks the maximum flood extent. Floodwater is shallow and may be motionless. Land Subject to Inundation Fringe is the lowest hazard part of the floodplain.

Floodplain Fencing Types

Flood proof (drop, swing or layflat) fencing	
TYPE A	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <ul style="list-style-type: none"> • Designed to collapse automatically under the pressure of floodwaters without causing damage to the fence. Once the floodwaters have receded it may simply be re-erected. • Use of mesh wire or grid wire is acceptable (chicken, cyclone etc.) • Must be built to drop with the direction of the water flow • Electric fences with one or two wires are permissible </div> <div style="width: 50%;">  <p style="text-align: center;">DROP FENCE</p> </div> </div>
Post and Wire (single strand- wide spacing)	
TYPE B	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Option 1</p> <ul style="list-style-type: none"> • Post spacing no less than 3 metres apart • Single wires spaced no more than one horizontal strand per 200 mm <p>Option 2</p> <ul style="list-style-type: none"> • Post spacing no less than 2 metres apart • Single wires spaced no more than one horizontal strand per 150 mm • We advise against installing wire mesh or rabbit proof (netting) fences in flood prone areas, they are likely to be destroyed during flood events. </div> <div style="width: 50%;">  <p style="text-align: center;">POST & WIRE FENCE</p> </div> </div>
Single Rail or Post & Rail	
TYPE C	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <ul style="list-style-type: none"> • Post spacing no less than 3 metres apart • Rails no more than 150 mm wide • Rails spaced no less than 200 mm apart • Bottom rail no less than 150 mm off the ground </div> <div style="width: 50%;">  <p style="text-align: center;">SINGLE RAILING FENCE</p> </div> </div>

Timber Cross

- Minimum 3 metre post spacing
- Minimum 150 mm ground clearance off the ground

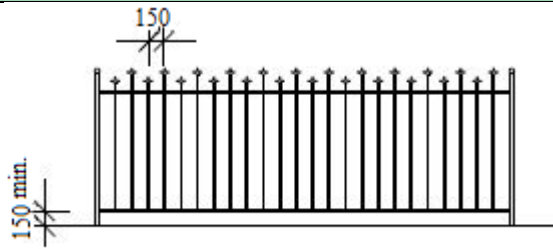


TIMBER FENCE

TYPE D

Tubular Steel

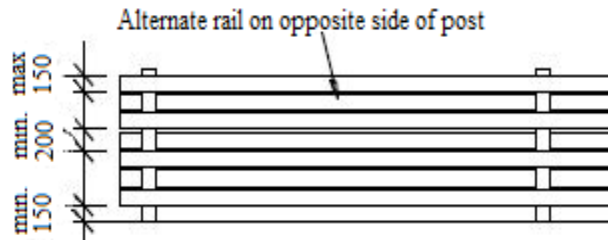
- Vertical or horizontal rails spaced no less than 150 mm apart
- Bottom rail spaced no less than 150 mm off the ground
- When using tubular steel for pool fences these standards are superseded by the Australian Standards for pool fencing



TUBULAR STEEL FENCE

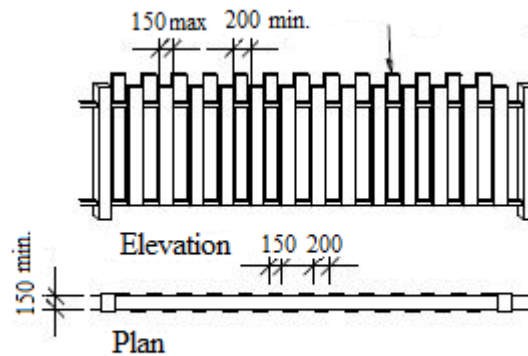
Double railing or double paling

- Vertical or horizontal rails or palings alternating on both sides of the posts/stringers
- 150 mm maximum width of rails or palings
- Minimum 200 mm spacing between alternate rails or palings
- Minimum 150 mm clearance off the ground



DOUBLE RAILING TIMBER FENCE

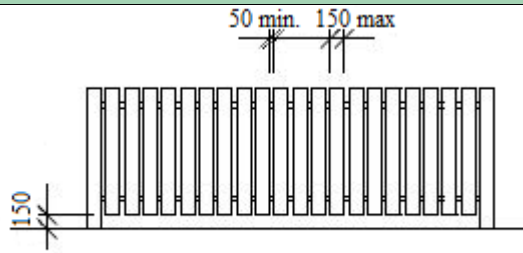
TYPE E



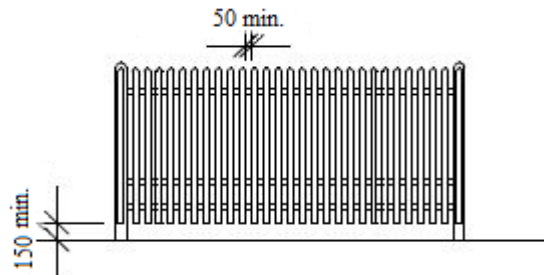
DOUBLE PALING FENCE

Paling, Picket, Gap Brick and Corrugated Iron

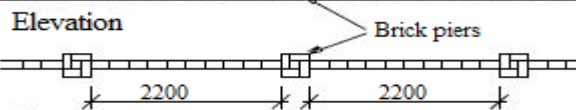
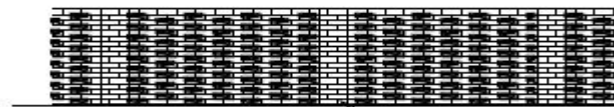
- Minimum of 50 mm spacing between pickets or palings
- Pickets or palings spaced a minimum 150 mm clearance off the ground
- Minimum of 2200 mm between brick piers
- Minimum of every third brick omitted per coarse
- Corrugated fence requires a 150 mm clearance off the ground and wire mesh used to fill the gap



PALING FENCE

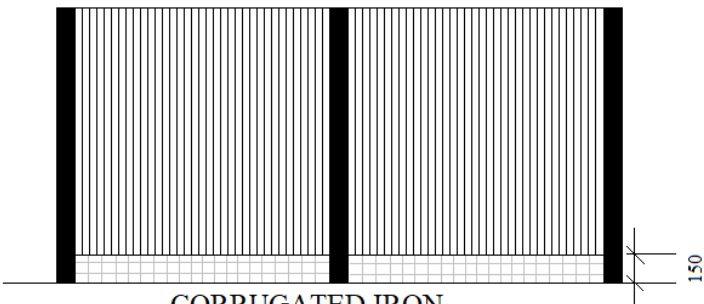


PICKET FENCE



BRICK FENCE

Every Third Brick Omitted



CORRUGATED IRON

150 mm gap with steel mesh to be supported, wooden plinth to be avoided

TYPE F