BUILDING RESILIENCE IN OUR COMMUNITIES THROUGH APPROPRIATE DEVELOPMENT – THE VICTORIAN DEVELOPMENT GUIDELINES

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Abstract

Development controls are an important mechanism for reducing flood risk in Victoria. They complement land use zones and overlays in planning schemes which identify areas affected by 1% Annual Exceedance Probability (AEP) flooding. In general terms, if a developer (large or small) wishes to construct earthworks, subdivide, extend, or build in land that has been identified as being affected by flooding, a planning permit is required.

A planning permit application will be referred to an expert floodplain manager in a floodplain management authority (a catchment management authority or Melbourne Water). The floodplain management authority will advise on the suitability of the proposal and provide relevant conditions that are attached to the planning permit.

This approach works reasonably well, but there are some issues around the consistency of decision making. Floodplain managers differ in how they assess the different forms of development against the flood risk and what the constraints to development are. Developers are therefore uncertain on what forms of development are appropriate. Greater clarity would help planning permit applicants design their developments in ways that are likely to receive approval.

To address these issues the Department of Environment, Land, Water and Planning has worked with the floodplain management authorities to develop state-wide guidelines for assessing development proposals in flood affected areas. This has been a three-year journey that has benefitted from the different views, experiences and approaches to development proposals applied by the experts.

In this paper, an overview of the guidelines will be provided, as well as some of the challenges along the way.

Introduction

Land use planning and development controls have long been recognised as extremely useful tools to address flood risk. If development can be built in a manner that minimises the inherent flood risk, the future occupants are more resilient to the impacts of flooding.

In Victoria, planning schemes enable proposals to use and develop land to be assessed against the flood risk. Generally, a planning permit is required.

The assessment is made by floodplain management authorities: Melbourne Water and nine catchment management authorities. Their floodplain managers provide flood advice to Local Government Authorities (LGAs - municipal councils), as referral authorities.
The Victorian Development Guidelines (the guidelines) have been developed to provide a mechanism to ensure that decision making is consistent and transparent.

It is expected that the guidelines will be utilised in various ways:
- by developers when formulating their proposals
- by LGAs as a resource to share with the local community
- by floodplain management authorities when assessing development proposals.

It is also likely that members of the Victorian Civil and Administrative Tribunal will be asked to consider the Guidelines when called upon to resolve disagreements.

**Land Use Planning and Community Resilience**

The Planning Institute Australia defines resilience as it relates to the built environment as:

> The ability of people, property and infrastructure within our communities to adapt over time in a manner that minimises the governance, social, economic and environmental burden in responding to, and recovering from, the changing effects of natural hazard stresses and shocks like floods, bushfire, cyclones, droughts and earthquake.

(Planning Institute Australia, 2015, pg.13)

In this context, land use planning provides a mechanism for LGAs to adaptively plan for how they want their communities to function in the short and long term.

**Land Use Planning in Victoria**

Land use planning is complex. Figure 1 describes most of the basic components. More detail is provided in Appendix 1.
The main points in relation to the guidelines are:

- LGAs are required to prepare and administer planning schemes. They do not usually have the experience or expertise to assess flood risk.

- The floodplain management authorities have this experience and expertise, and are referral authorities in providing flood advice to the LGAs.

- If a proposal to use or develop land is in flood affected land, it triggers a referral to a floodplain management authority for advice.

- There are four types of maps for identifying flood affected land. They are described in Table 1. Ordinances associated with each map establish flood controls.

- The contents of the flood controls are defined by the state, but LGAs have discretion to decide which are appropriate.
<table>
<thead>
<tr>
<th>Flood map control</th>
<th>Applies to</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Urban Floodway Zone</strong></td>
<td>Riverine flooding. Used in urban areas of high flood hazard, to ensure that the natural function to convey and store floodwater remains.</td>
<td>There is limited opportunity for most forms of development. Low development intensity uses that are compatible with the flood storage and conveyance function are generally permitted. They include agriculture, extensive animal husbandry, leisure and some forms of recreation.</td>
</tr>
<tr>
<td><strong>Floodway Overlay</strong></td>
<td>Riverine flooding in both rural and urban areas. Represents the high hazard parts of the floodplain. Areas that are important for conveying or storing floodwater are targeted. For urbanised areas, the FO signifies that it is difficult to develop. For rural areas it identifies areas where development that is incompatible with the flood hazard should be avoided.</td>
<td>While the underlying zoning characterises land use (e.g. residential, commercial, industrial, agricultural), it is difficult to develop land to a more intense use. There are tight controls on subdivisions.</td>
</tr>
<tr>
<td><strong>Land Subject to Inundation Overlay</strong></td>
<td>Riverine and coastal flooding in both rural and urban areas. Used to delineate the area of land flooded by the 1% AEP flood. If the high hazard Floodway Overlay component has been separately identified, it is excluded from the LSIO.</td>
<td>This is the most common form of flood map control. Outside the floodway, most forms of development will be suitable, provided there are no impacts on third parties.</td>
</tr>
<tr>
<td><strong>Special Building Overlay</strong></td>
<td>Urban areas subject to stormwater flooding. Used to delineate land that is inundated if the capacity of the drainage system is exceeded during heavy rainfall.</td>
<td>The purpose of the SBO is to manage urban development in overland flow paths. While flood behaviour may be different to riverine or coastal flooding, the hazard can still be significant. Most forms of development will be suitable, provided there are no impacts on third parties.</td>
</tr>
</tbody>
</table>
Assessing Development

Figure 2 shows the process by which planning permit applications are assessed. This is a simplification, as it does not capture mechanisms to reduce the number of referrals or streamline decision making.

All flood controls contain similar decision guidelines. They are summarised at the bottom of Figure 2. No guidance is provided in the flood controls on how these matters are to be addressed. Each planning permit application is assessed on merits.

LGA = local government authority
FMA = floodplain management authority
VCAT = Victorian Civil and Administrative Tribunal

Figure 2: The Process of Assessing a Planning Permit Application

Adapted from Planning Practice Note 11 (DELWP 2015).
Why the Development Guidelines are Necessary

To a floodplain manager, applying a zone or an overlay that recognises the severity of the flood hazard makes sense. It provides a transparent signal that it will be difficult to develop some areas, and less difficult in other areas. However, an elected councillor may have a different perspective if ratepayers are concerned about the implied loss of value of land with a high flood hazard. Many LGAs therefore apply a blanket Land Subject to Inundation Overlay that does not distinguish the flood hazard. This creates uncertainty for developers.

For most development applications assessment is based on merit, using decision guidelines that are generally the same for all flood controls (see Figure 2). Information on the flood hazard will usually be provided in the response from the floodplain manager, but not the detailed criteria that prompted the decision. Therefore, there is limited transparency on how the floodplain managers make their decisions.

The consistency of decision making also varies. A floodplain manager in one part of Victoria may consider one type of development appropriate. It may be rejected by another floodplain manager in a different part of Victoria.

To address these issues the Department of Environment, Land, Water and Planning has worked with the floodplain management authorities to develop state-wide guidelines for assessing development proposals in flood affected areas. This has been a three-year journey that has benefitted from the different views, experiences and approaches to assessing development proposals applied by the floodplain managers.

Developing the Guidelines – the Process

Work on the guidelines commenced in late 2014. A simple questionnaire was prepared to develop a common understanding of what the problem was and what the most important issues were, from the perspective of the floodplain managers. Table 2 provides a snapshot of the five biggest issues: the more ticks, the bigger the issue.

The floodplain management authorities were then consulted separately, following up on their responses to the questionnaire. A preliminary draft version of the guidelines was prepared to provide a starting point for further input, drawing on different versions being developed or utilised by various floodplain management authorities at the time.

Interested floodplain managers from the floodplain management authorities formed a working group to develop further drafts. The working group handed its version of the guidelines back to the Department of Environment, Land, Water and Planning (DELWP) in July 2016. This was refined further by DELWP and further feedback was sought.
Table 2: The Big issues for Floodplain Managers

<table>
<thead>
<tr>
<th>Issue</th>
<th>Importance</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inconsistent advice</td>
<td>✔ ✔ ✔</td>
<td>Agreed decision criteria &amp; core objectives and principles required</td>
</tr>
<tr>
<td>Lack of guidance on coastal flooding and accessways</td>
<td>✔ ✔ ✔</td>
<td>Information on coastal flooding issues and accessways required</td>
</tr>
<tr>
<td>Insufficient transparency in decision-making</td>
<td>✔ ✔ ✔</td>
<td>Guidelines should be accessible to those affected by decisions</td>
</tr>
<tr>
<td>Insufficient policy support</td>
<td>✔ ✔</td>
<td>Need to link with the land use planning system</td>
</tr>
<tr>
<td>Timeliness – deliver to agreed timelines</td>
<td>✔ ✔ ✔</td>
<td>Guidelines could reduce time to assess applications</td>
</tr>
</tbody>
</table>

A workshop facilitated by Melbourne Water and DELWP in March 2017 identified where there were still contentious issues. The main topics identified through the workshop were:

- Treatment of sheds, garages and carports
- Whether the guidelines should be prescriptive or flexible
- Freeboard
- Setting minimum standard floor level requirements
- Filling on the floodplain
- Standards for safe access.

After the workshop, DELWP reviewed the latest draft, had it professionally edited and re-issued to the floodplain management authorities for further comment. Further changes were made before seeking and obtaining approval in principle to adopt and apply the guidelines from the Chief Executive Officers of the catchment management authorities.

At the time of writing this paper, the guidelines have not been finalised. The remaining steps in the engagement process are to provide an opportunity for local councils to make submissions of the guidelines, and to seek approval to publish.

When they are finalised, they will be available on [www.delwp.vic.gov.au](http://www.delwp.vic.gov.au)

**Overview of the Guidelines**

The guidelines have been developed in three parts, described below. It is not possible to reach total agreement on some of the issues, so the floodplain managers will still have discretion to deviate from the guidelines, based on local considerations. It is estimated that 80 to 90 per cent of development proposals can be accepted (with appropriate conditions) using the guidelines.
Part One - Introduction

Part One introduces the objectives, guiding principles and approved measures, that provides the framework for assessment in Part 3:

- An objective describes the desired outcome to be achieved.
- A guiding principle describes the requirements to meet the objective.
- An approved measure is an approach, action, practice or method that is incorporated into a development proposal that would satisfy the relevant guiding principle.

Approved measures are not mandatory. A permit applicant may propose alternative solutions, if the relevant objectives and guiding principles are satisfied.

Part One also focuses on the background, purpose, intended audience and key principles for development.

The purpose of the guidelines is to provide a clear, consistent and transparent process for facilitating development in flood affected areas in Victoria. The intended audience includes the floodplain management authorities, prospective developers and LGAs.

The following general principles have been applied in the development of these guidelines:

- The flood risk to people (including emergency services personnel) should be kept to acceptable safety thresholds.
- Any development in a flood affected area, including associated infrastructure, should be planned to avoid or minimise the flood damage potential.
- There should be no detrimental impacts to adjacent properties.
- Development should preserve, and if possible enhance the social and environmental values and benefits of floodplains and waterways.

Part Two - Context

Part Two focuses on the links to the relevant legislation and policies, and other contextual matters. An outline is given in Figure 3.

While the main application of the guidelines is for assessing development proposals, the following principles are provided when considering land use planning more strategically:

- Don't rezone to a higher density land use without considering the flood risk.
- Identify flood affected land by applying a flood zone or flood overlay.
- Avoid losing access to safer ground (the island effect).
Figure 3: Overview of Part Two of the Guidelines
Part Three - Application

Part Three contains the development assessment approach. Each development proposal is assessed on merits against four relevant objectives. Guiding principles are linked to the objectives, and approved measures, which provide the criteria for assessment. An alternative design solution may be considered if the floodplain management authority is satisfied that it meets the relevant objective. If an objective cannot be achieved, the development proposal must not be supported.

The requirements are summarised in Tables 3 to 6, along with information on how they are to be applied.

The flood safety objective is perhaps the most contentious, as it can restrict development proposals if there are significant safety issues at the site or the accessway.

The flood damage objective is less contentious. It is achieved by setting floor levels above the design flood level, and protecting basements.

The flood impact objective allows floodplain managers to require changes in the location, design and footprint of a building or works, if it is in an area with significant flood storage or flow conveyance issues. This avoids increasing flood levels and velocities to the detriment of third parties.

The waterway and floodplain protection objective applies to buildings and works impacting the bed and banks of rivers and streams, and those parts of floodplains and estuaries that are associated with them. Developers are required to protect the environmental values and physical characteristics of receiving waters from degradation. Sediment and other wastes may need to be filtered prior to its discharge into waterways, through wetlands, retention basins or other works. Stormwater runoff may also need to be retarded.
Table 3: Flood Safety

**Objective:** Protect human life and health, and provide safety from flood hazard

<table>
<thead>
<tr>
<th>Guiding principle</th>
<th>Applies to</th>
<th>Approved measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site and access safety must not be compromised.</td>
<td>Subdivisions and buildings</td>
<td>Development should not be allowed on properties where the depth and flow of floodwaters would be hazardous to people or vehicles entering and leaving the properties. Safe velocity and depth criteria are based on research into flood behaviour on small cars, children and buildings, from <em>Australian Rainfall and Runoff</em> (Ball et al, 2016).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exemptions apply for low risk development, such as small extensions and domestic sheds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Detailed tables in the guidelines provide clarity.</td>
</tr>
<tr>
<td>Development must be located on sites of lowest overall hazard.</td>
<td>Subdivisions and buildings</td>
<td>Development and access should be located on land with the lowest overall hazard.</td>
</tr>
<tr>
<td>Greenfield Development sites must be designed to be safe from flood impacts.</td>
<td>Greenfield development sites, which are characterised by residential, industrial or commercial expansions requiring major extensions of roads, water supply, sewerage and electricity.</td>
<td>Greenfield development sites should either be flood free or contain building envelopes filled to the nominal flood protection level (NFPL - the 1% AEP flood level plus freeboard).</td>
</tr>
<tr>
<td>Hazardous materials must not contaminate floodwater.</td>
<td>Buildings requiring the storage or disposal of environmentally hazardous industrial and industrial chemicals and wastes, including agricultural and industrial buildings, and sewage treatment plants.</td>
<td>Developments and uses which involve the storage or disposal of hazardous materials must not be located on floodplains unless the materials are totally isolated from floodwaters.</td>
</tr>
<tr>
<td>Vulnerable people must not be exposed to dangerous flood conditions and community services must be operational during floods.</td>
<td>Hospitals, ambulance stations, police stations, fire stations, transport facilities, communications facilities, community shelters and schools.</td>
<td>Buildings housing vulnerable people and community services should be sited outside the 1% AEP flood extent and, where possible, at levels above the height of the maximum probable flood.</td>
</tr>
<tr>
<td>Guiding principle</td>
<td>Applies to</td>
<td>Approved measure</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Buildings must not interfere with existing or proposed water, sewer or drainage services.</td>
<td>Subdivisions and buildings in Melbourne Water's Drainage area.</td>
<td>Buildings should be located sufficiently away from a water, sewer or drainage asset to enable that asset to be serviced.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ground floor levels for significant buildings are set to the 1% AEP plus full freeboard.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lesser freeboard applies to some buildings (e.g. garages).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Some dwelling extensions and minor buildings can be built at the existing floor level. Detailed tables in the guidelines provide clarity.</td>
</tr>
<tr>
<td>Buildings must be designed to avoid significant financial impacts of flood damage.</td>
<td>Buildings.</td>
<td>Buildings with floor levels below the 1% AEP level should be protected by a continuous apex that is set at the NFPL to ensure floodwaters do not enter the basement.</td>
</tr>
<tr>
<td>The basements of any new buildings must not flood.</td>
<td>Buildings with basements.</td>
<td>Basements with floor levels below the 1% AEP level should be protected by a continuous apex that is set at the NFPL to ensure floodwaters do not enter the basement.</td>
</tr>
<tr>
<td>Those parts of buildings affected by flooding must be able to withstand the effects of inundation.</td>
<td>Portion of buildings below the NFPL.</td>
<td>Any building or portion of a building below the 1% AEP flood level should be constructed from flood-resistant materials.</td>
</tr>
<tr>
<td>Services to a building must be capable of functioning during and after a flood.</td>
<td>Services associated with the supply of electricity, gas, power, telecommunications, water supply, drainage and sewage that are vulnerable to flooding.</td>
<td>Services to a building should be floodproofed or raised above the NFPL.</td>
</tr>
</tbody>
</table>
### Table 5: Flood Impacts

**Objective:** Maintain free passage and temporary storage of floodwaters

<table>
<thead>
<tr>
<th>Guiding principle</th>
<th>Applies to</th>
<th>Approved measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimise adverse impacts of flooding on surrounding properties by ensuring that the natural function of floodplains and overland flowpaths to convey and store floodwater is not compromised.</td>
<td>Buildings or works that, in the opinion of the floodplain management authority, are likely to have significant impacts on flow conveyance or flood storage.</td>
<td>Development (including earthworks) should not divert floodwaters to the detriment of any adjoining property. Development (including earthworks) should not increase the flood velocity on any adjoining property. Development (including earthworks) should not increase flood levels on any adjoining properties. Earthworks and buildings should not result in a detrimental loss of flood storage.</td>
</tr>
</tbody>
</table>

### Table 6: Waterway and Floodplain Protection

**Objective:** Protect and enhance the environmental features of waterways & floodplains

<table>
<thead>
<tr>
<th>Guiding principle</th>
<th>Applies to</th>
<th>Approved measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings and works impacting on waterways and floodplains must consider their environmental qualities.</td>
<td>Buildings and works that impact on a waterway.</td>
<td>Development should maintain or improve waterway and floodplain conditions. Development should allow access to maintain riparian corridors. Development should maintain or improve water quality. Development should maintain (by avoidance or offset) altering the natural function of floodplains and waterways in storing and conveying floodwater. Development should retain or improve significant vistas or landscapes within the riparian corridor.</td>
</tr>
</tbody>
</table>
Obstacles and Challenges

It was gratifying to see the passion and enthusiasm of the floodplain managers contributing to the guidelines. Early in the process however, it became obvious that there were many different views on what the guidelines should contain. There are often no black and white answers when assessing flood risk, as flood risk varies across different floodplains and across each floodplain. And the risk appetite varies within and between different floodplain management authorities.

There was wide acknowledgement that the flood advice from the floodplain management authorities was not consistent. Floodplain managers were comfortable having state-wide guidelines, if they conformed to what they were doing already. Many were reluctant to change their views.

The views were quite diverse. Some floodplain managers considered that the guidelines should focus on objectives and allow floodplain management authorities to have considerable discretion on deciding whether the objective was met, because every floodplain is different. Flood behaviour in steep and narrow floodplains is different from flood behaviour in flat and wide floodplains, for example.

Other floodplain managers preferred the guidelines to be written as a technical standard, with a high level of prescription, and with no discretion for variation. This would allow a high degree of consistency, but it would stifle development for some communities. It may also lead to developers rigidly applying the rules in unexpected ways, leading to undesirable outcomes.

There were also different views on specific matters such as:

- the amount of freeboard
- how much development intensification is appropriate in urban areas with roads that are unsafe in a flood
- how much weight to apply to the duration of flooding and the time available for evacuation.

Ultimately the guidelines are based on reasonable consensus. Floodplain managers have discretion to vary their decision making according to local circumstances, but there is sufficient prescription to allow most development applications to be assessed in a consistent manner.

Two other challenges have shaped the final form of the guidelines: climate change and a reform of Victoria’s planning processes.

Climate Change

Coastal flooding is affected by the behaviour of tides, so site and access safety considerations may need to consider this aspect. The development guidelines do not address this in detail, so perhaps this is one area in which floodplain managers will choose to consider local circumstances, rather than rigidly stick to the approved measures in the guidelines. It should be noted however, that separate guidelines on assessing development in areas subject to coastal flooding already exist.

The effect of climate change on hydrology is also an important consideration. The guidelines address this by referring to the methodology advocated for flood studies in
Australian Rainfall and Runoff. If flood studies have not addressed climate change, the guidelines favour additional freeboard.

Reform of the Planning Controls

Victoria’s planning system has remained unchanged for many decades. A review is currently underway, with the main intention of reducing complexity and red tape. This provides an opportunity to simplify the flood controls in planning schemes.

As the guidelines cannot pre-empt the outcome of the reform, they have been written on the basis of assessing proposals on merits, and not on the flood zone or flood overlay that applies.

Conclusion

The Development guidelines allow floodplain managers to treat potential developers consistently. It is estimated that 80 to 90 per cent of development proposals can be accepted using the guidelines. Where flood behaviour and flood risk is complex, the floodplain managers can vary their decisions to suit local circumstances.

A wide range of potential development is targeted, from small sheds to large scale Greenfield development.

The decision-making processes have been transparently documented and they encompass the collective views of floodplain managers involved in decision making.

The guidelines should provide more clarity and instruction to all involved in the assessment process: councils, developers of all types, floodplain management authorities and the Victorian Civil and Administrative Tribunal.

Appendix 1: Planning Schemes

LGAs are required to prepare their planning schemes using a template called the Victoria Planning Provisions (VPP).

Land use zonings govern how land is used, and overlays determine how land can be developed. Standard zones and overlays are applied, and LGAs have discretion to determine the most appropriate combination. The 1% AEP flood is used as the design flood for land use planning purposes.

The VPP include a compulsory State Planning Policy Framework, a Local Policy Planning Framework and a range of standardised land use zonings and overlays. The elements most relevant to land use planning and floodplain management are illustrated in Figure 4.

LGAs write their own local planning policies, which must be consistent with State Planning Policy Framework. They also have discretion in selecting the relevant standard zones and overlays.
Figure 4: Planning Scheme Components Relevant to Floodplain Management
References


