Part 3

Flood Hazard

Application

This Guideline applies to land identified as being flood prone land on the Flood Control Lot Map for both the Dobroyd & Hawthorne Canal Catchment areas (see Schedule 2).

Flood prone land consists of land which:

• is in the flood planning area (mainstream flooding for both the Dobroyd & Hawthorne Canal Catchments areas); and/or

• is in the flood planning level (for local overland flooding).

The areas identified on the Flood Control Lot Map were based on information available to Council when the map was prepared. As new information becomes available, additional land may be identified as potential flood prone land.

A flood is an overflow or accumulation of an expanse of water that submerges land. In the sense of flowing water, the word may also be applied to the inflow of the tide. Floods are a natural and inevitable event that communities must learn to live with while minimising risks to public health and safety, property and infrastructure.

This policy recognises that there are some flooding risks that require development controls and guidelines in order to reduce or eliminate their impacts.

Using this Guideline

In using this Guideline reference should also be made to Section 1—Preliminary at the front of this DCP.

The Guideline is performance based. In this role, it is intended to provide both a level of certainty for applicants, Council and the community while also enabling consideration of high quality, innovative design. This is appropriate as given the complexity of the LGA urban environment, it is not possible or desirable in all instances for council to specify quantitative, pre-determined criteria that development must achieve. Rather, in such setting an appropriate design emerges from a well-considered site analysis that explores and responds to the characteristic of the site, adjoining properties, the streetscape and neighbourhood, as well as putting in place adequate measures to mitigate any potential negative impacts.

The Guideline comprises the Purpose, Performance Criteria and Design Solutions. Alternative Solutions to the Design Solution may also be proposed by an applicant.

The Purpose and Performance Criteria identify the performance outcomes that must be achieved for council to consider granting development consent to a development application. Council will not approve a development application that cannot meet all parts of the Purpose or all Performance Criteria, where relevant.

Design Solutions provide a guide for achieving the Performance Criteria, and by association, the Purpose. Through the development application process, an applicant may propose an Alternative Solution to the Design Solution. Council will consider the Alternative Solution against the Performance Criteria and Purpose. If sufficient justification exists, largely informed by a site analysis and argued against sound urban planning and design grounds, council may consider accepting an Alternative Solution to the Design Solution.

Purpose

- To minimise risk to human life and damage to property.
- to maintain the existing flood regime and flow conveyance capacity.
- To enable the safe occupation of, and evacuation from, land to which flood management controls apply.
- To avoid significant adverse impacts upon flood behaviour.
- To avoid significant adverse effects on the environment that would cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of the river bank/watercourse.
- To limit uses to those compatible with flow conveyance function and flood hazard.

Development Standards for Flood Affected Land

Performance Criteria	Design Solution
General	
	DS1.1 A Flood Risk Management Report must be submitted for applications that are on land identified on the Flood Control Lot Map (See Schedule 2) The report must be informed by flood information relevant to the subject property and surrounds, including the 1% AEP flood level, Flood Planning Level, Probable Maximum Flood (PMF) level and the Flood Hazard Category, as obtained from Council. The report is not required where the assessed value of the works is under $50,000 except where, in the opinion of Council, those works are likely to substantially increase the risk of flood to the subject or adjoining or nearby sites. The report may be limited to a short report (Flood Risk Management Statement) for single residential dwellings, alterations and additions or change of use developments where the property is confirmed by Council as being subject only to low hazard flooding. The Flood Risk Management Statement must reference the source of flood information; specify the relevant flood information applicable to the site, then describe the proposed development and how it meets the relevant development controls. If Council is concerned with the apparent loss of flood storage and/or flood or overland flow paths, and/or increase in flow velocities, and/or risk of life, on any type of development, the applicant may be requested to undertake further analysis in support of the proposal and detail it in a new/revised Flood Risk Management Report.
	DS1.2 The Flood Risk Management Report must address: • Description of the existing stormwater drainage system, including catchment definition. • Extent of the 1% AEP flood event in the vicinity of the development. • The Flood Hazard Category affecting the subject site and surrounds. Where the site is subject to the high hazard flooding category, the Probable Maximum Flood (PMF) extent must be shown. • Long and cross sections showing the Flood Planning Level(s) in relationship to the floor levels of all existing and proposed components of the development. • Recommendations on all precautions to minimise risk to personal safety of occupants and the risk of property damage for the total development to address the flood impacts on the site during a 1% AEP flood and PMF event. These precautions must include but not be limited to the following:

Performance Criteria	Design Solution	
		o Types of materials to be used to ensure the structural integrity of the development for immersion and impact of velocity and debris for the 1% AEP flood event and PMF (for high hazard); o Waterproofing methods, including electrical equipment, wiring, fuel lines or any other service pipes or connections; o A flood evacuation strategy (Flood Emergency Response Plan); and o On site response plan to minimise flood damage, and provide adequate storage areas for hazardous materials and valuable goods above the flood level; • Details of any flood mitigation works that are proposed to protect the development. • Supporting calculations. • The architectural/engineering plans on which the assessment is based. • The date of inspection. • The professional qualifications and experience of the author(s).
	DS1.3	All applications for development must be accompanied by a survey plan including relevant levels to AHD (Australian Height Datum) *Note: These surveys must use a survey datum with a minimum vertical class "D" and a vertical order of five (5) as identified on the Survey Control Information Management System on the Land and Property Information website. Consideration must be given to whether structures or filling are likely to affect flood behaviour and whether consultation with other authorities is necessary.*
	DS1.4	Compliance with flood management controls must be balanced by the need to comply with other controls in this Policy.
Controls for new residential development		
	DS2.1	Floor levels of habitable rooms must be a minimum of 0.5m above the 1% AEP flood level at that location. For areas of minor overland flow (a flood depth of 300mm or less or overland flow of 2cum/sec or less) a lower freeboard of 300mm may be considered on its merits.
	DS2.2	Any portion of a building classified as being flood prone must be constructed from flood compatible materials (See Schedule 1).
	DS2.3	Flood free access must be provided where practicable.

Performance Criteria	Design Solution	
Controls to residential development – minor alterations		
	DS3.1	Additions with a habitable floor area of up to 30m2 may be approved with floor levels below the 1% AEP flood level at that location if the applicant can demonstrate that no practical alternatives exist for constructing the extension above the 1% AEP flood level.
	DS3.2	Additions greater than 30m2 will be considered against the requirements for new residential development (refer DS2.1, DS2.2, and DS2.3). *Note: Additions greater than 30m2 do not necessarily mean an increase to the existing building footprint by 30m2. It relates to the area which shall the demolished and rebuilt shall not exceed 30m2.*
	DS3.3	Any portion of a building subject to inundation must be constructed from flood compatible materials. All flood sensitive equipment must be located above the 1% AEP flood level at that location.
Controls for non-habitable additions or alterations		
	DS4.1	All flood sensitive equipment must be located above the 1% AEP flood level at that location.
	DS4.2	Any portion of buildings subject to inundation must be built from flood compatible materials.
Controls for new non-residential development		
	DS5.1	Floor levels (except for access-ways) must be at least 0.5m above the 1% AEP flood level, or the buildings must be flood-proofed to at least 0.5m above the 1% AEP flood level. For areas of minor overland flow (a flood depth of 300mm or less or overland flow of 2cum/sec or less) a lower freeboard of 300mm may be considered on its merits.
	DS5.2	Flood-free access must be provided where practicable.
Controls for non-residential development - additions		
	DS6.1	Where the proposed development is for an addition to an existing building on flood prone land, the development may be approved with floor levels below the 1% AEP flood level if the applicant can demonstrate that all practical measures will be taken to prevent or minimise the impact of flooding. In determining the required floor level, matters which will be considered include: • The nature of the proposed land use; • the frequency and depth of possible flooding; • the potential for life and property loss; • the suitability of the building for its proposed use; And • whether the filling of the site or raising of the floor levels would render the development of the site impractical or uneconomical.

Performance Criteria	Design Solution	
	DS6.2	Any portion of the proposed addition below the flood 1% AEP flood level must be built from flood compatible materials.
Controls for change of use of existing buildings		
	DS7.1	Development consent for change of use of an existing building with floor levels below the 1% AEP flood level will only be given where there is no foreseeable risk of pollution associated with the proposed use of the building in the event that the 1% AEP flood event occurs.
	DS7.2	In determining whether to grant development consent for change of use of an existing building with floor levels below the 1% AEP flood level, consideration will be given to whether the proposed development would result in increased flood risk for the property on which the building is located, or other land. In this regard, the following matters will be considered: • The nature of the proposed use and the manner in which it is proposed to be carried out within the building or on the land; And • The foreseeable risk of pollution associated with the proposed use of the building/land in the event that the 1% AEP flood event occurs.
Controls for subdivision		
	DS8.1	Development consent for the subdivision of flood prone land may depend on whether the land to which the proposed development relates is unsuitable for any development made likely by the subdivision, by reason of the land likely to be subject to flooding.
	DS8.2	Development consent for the subdivision of flood prone land may depend on whether the carrying out of the subdivision and any associated site works would: • adversely impede the flow of flood water on the land or land in its vicinity; • imperil the safety of persons on that land or land in its vicinity in the event of the land being inundated with flood water; And • aggravate the consequences of flood water flowing on that land or land in its immediate vicinity with regard to erosion or siltation.
Controls for filling of flood prone lands		
	DS9.1	Development consent will not be granted to filling of flood ways or high flood hazard areas. Consideration will only be given to granting development consent to the filling of other flood prone land where: • flood levels are not increased by more than 0.01m by the proposed filling;

Performance Criteria	Design Solution
	• downstream velocities are not increased by more than 10% by the proposed filling; • proposed filling does not redistribute flows by more than 15%; • the potential for cumulative effects of possible filling proposals in that area is minimal; • the development potential of surrounding properties is not adversely affected by the filling proposal; • the flood liability of buildings on surrounding properties is not increased; And • the filling creates no local drainage flow/runoff problems. *Note:* Where the proposal has the potential to increase flood levels, depths, velocities and/or the risk to life or property, through loss of flood storage and/or blockage/ redirection of overland flowpaths, the Flood Risk Management Report supporting the development application must include detailed flood analysis. Such analysis should address compliance with all relevant development controls and include survey cross-sections to provide representative topographic information. The proponent should approach Council to determine available Council flood studies for the area, with the analysis based on or calibrated against relevant studies. In some cases, flood model data can be obtained from Council, subject to application and payment of fees.
Controls for land uses on flood prone land identified on the Flood Control Lot Maps	
DS10.1	A site emergency response flood plan must be prepared in case of a PMF flood.
	DS10.2 Adequate flood warning systems, signage and exits must be available to allow safe and orderly evacuation without increased reliance upon the State Emergency Service (SES) or other authorised emergency services personnel.
	DS10.3 Reliable access for pedestrians or vehicles must be provided from the building, commencing at a minimum level equal to the lowest habitable floor level to an area of refuge above the PMF.
Controls for basement garages, car ports	
	DS11.1 The floor level of new enclosed garages must be at or above the 1% AEP flood level plus 200mm. In extenuating circumstances, consideration may be given to a floor level at a lower level, being the highest practical level but no lower than 180mm below the 1% AEP flood level, where it can be demonstrated that providing the floor level at the Flood Planning Level is not practical within the constraints of compliance with Australian Standard AS/NZS 2890.1 Parking facilities as amended.
	DS11.2 The floor levels of open car park areas and carports must

Performance Criteria	Design Solution	
		meet the same criteria as above for garages. In extreme circumstances, for single dwelling residential development, a floor level below the 1% AEP flood level minus 180mm may be accepted for a single car space, subject to bollards being provided along the 'free' perimeter (excluding the vehicle entry on one side only) at 1.2m intervals and the floor level being raised as high as practical within the constraints of compliance with Australian Standard AS/NZS 2890.1 Parking facilities as amended.
	DS11.3	On properties with a low flood hazard classification, basement (below natural ground level) car parking must have all access and potential water entry points above the Flood Planning Level, and a clearly signposted flood free pedestrian evacuation route provided from the basement area separate to the vehicular access ramps. For basement car parking in properties affected by High Hazard flooding further considerations will apply.
	DS11.4	Basement garages must include: • Suitable pumps must be provided within the garage to allow for the drainage of stormwater should the underground garage become inundated during flooding. • Adequate flood warning systems, signage and exits must be available to allow safe and orderly evacuation without increased reliance upon the SES or other authorised emergency services personnel.
	DS11.5	For parking areas servicing more than two parking spaces, reliable access for pedestrians must be provided from all parking areas, to a safe haven which is above the PMF.

Schedule 1 – Flood Compatible Material

Building component	
Flooring and sub-floor	• Concrete slab-on-ground monolith
	• suspended reinforced concrete slab
Floor covering	• clay tiles
	• concrete, precast or in situ
	• concrete tiles
	• epoxy, formed-in-place
	• mastic flooring, formed-in-place
	• rubber sheets or tiles with chemicals-set-adhesive
	• silicone floors formed-in-place

	• vinyl sheets or tiles with chemical-set adhesive
	• ceramic tiles, fixed with mortar or chemical-set adhesive
	• asphalt tiles, fixed with water resistant adhesive
Wall structure	• Solid brickwork, block work, reinforced, concrete or mass concrete
Roofing structure (for situations where the relevant flood level is above the ceiling)	• reinforced concrete construction • galvanised metal construction
Doors	• solid panel with water proof adhesives
	• flush door with marine ply filed with cell foam
	• painted metal construction
	• aluminium or galvanised steel frame
Wall and ceiling linings	• fibro-cement board
	• brick face or glazed
	• clay tile glazed in waterproof mortar
	• concrete
	• concrete block
	• steel with waterproof applications
	• stone, natural solid or veneer, waterproof grout
	• glass blocks
	• glass
	• plastic sheeting or wall with waterproof adhesive
Insulation windows	• foam (closed cell types)
	• aluminium frame with stainless steel rollers or similar corrosion and water resistant material
Nails, bolts, hinges and fittings	brass, nylon or stainless steel removable pin hinges hot dipped galvanised steel wire nails or similar

SCHEDULE 1 – FLOOD COMPATIBLE MATERIALS (cont.)

Electrical and mechanical equipment

For dwellings constructed on land to which this DCP applies, the electrical and mechanical materials, equipment and installation must conform to the following requirements:

Main power supply

Subject to the approval of the relevant authority the incoming main commercial power service equipment, including all metering equipment, must be located above the relevant flood level. Means must be available to easily disconnect the dwelling from the main power supply.

Wiring

All wiring, power outlets, switches, must be to the maximum extent possible, located above the maximum flood level. All electrical wiring installed below this level must be suitable for continuous underwater immersion and must contain no fibrous components. Earth leakage circuit-breaker (core balance relays) or a Residual Current Device must be installed. Only submersible type splices must be used below maximum flood level. All conduits located below the relevant designated flood level must be so installed that they will be self-draining if subjected to flooding.

Equipment

All equipment installed below or partially below the relevant flood level must be capable of disconnection by a single plug and socket assembly.

Reconnection

Should any electrical device and/or part of the wiring be flooded it must be thoroughly cleaned or replaced and checked by an approved electrical contractor before reconnection.

Heating and air conditioning systems

Where viable, heating and air conditioning systems should be installed in areas and spaces of the house above maximum flood level. When this is not feasible, every precaution must be taken to minimise the damage caused by submersion according to the following guidelines:

Fuel

Heating systems using gas or oil as fuel must have a manually operated valve located in the fuel supply line to enable fuel cut-off.

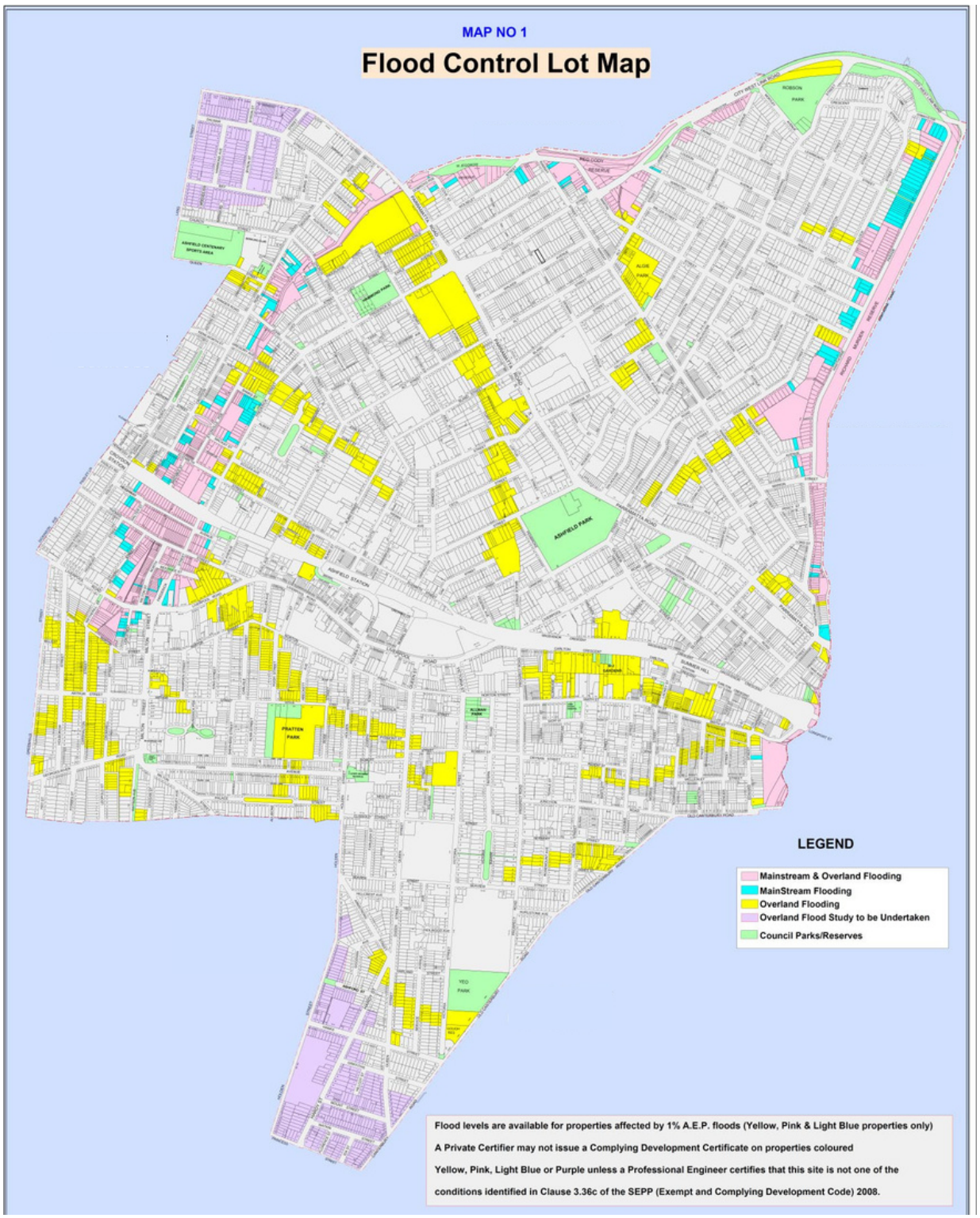
Installation

Heating equipment and fuel storage tanks must be mounted on and securely anchored to a foundation pad of sufficient mass to overcome buoyancy and prevent movement that could damage the fuel supply line. All storage tanks must be vented to an elevation of 600 millimetres above the relevant flood level.

Ducting

All ductwork located below the relevant flood level must be provided with openings for drainage and cleaning. Self-draining may be achieved by constructing the ductwork on a suitable grade. Where ductwork must pass through a water-tight wall or floor below the relevant flood level, a closure assemble operated from above relevant flood level must protect the ductwork.

Schedule 2 – Flood Control Lot Map



Go to Council website to view pdf and to enlarge map.