



ENGINEERING DESIGN GUIDELINES
BUSHFIRE PROTECTION

Planning Scheme Policy No. 15.09

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1 Scope and general

1.1 Scope

This section sets out the Guidelines developed specifically for the design of bushfire protection facilities to protect life and property and bring a fire to a halt.

The guideline contains procedures for the design of fire protection facilities. Designs shall satisfy requirements of the Council and Guidelines as provided by the Queensland Fire Service – Rural Fire Brigade.

1.2 Objectives

This Guideline aims to outline the requirements that will minimise bushfire hazard in developments. The requirements are particularly pertinent to rural developments but should be an integral part of urbanised development as well. The principles outlined are to be incorporated at an early stage of development design and form an integral part of the approved development.

1.3 Reference and Source Documents

(a) Council Guidelines

C501 Bushfire protection (Perimeter Tracks)

(b) QLD State Legislation

Queensland Fire & Rescue Act, 1996
Integrated Planning Act (IPA)

(c) QLD State Authorities

State Planning Policy 1/03 – Mitigating the adverse impact of Flood, Bushfire and Landslide
Queensland Fire Service
Rural Fire Brigade
Queensland Department of Environment and Heritage

(d) Other

Department of Bushfire Services (Now NSW Rural Fire Service Planning for Bushfire Protection). *A Guide for Land Use Planners, Fire Authorities, Developers and Home Owners.*, May 1991
Californian Department of Forestry
"Fire Safety Guides for Residential Development in California" 1980
Insurance Council of Australia
"Bushfire Safety in Urban Fringe Areas"
Luke, R.H. *"Before the Fires Start"*.

2 Design Criteria

2.1 General

Where a subdivision will abut unimproved timber in a bushfire prone area (as classified by Council), perimeter tracks are to be located immediately between the created allotment and the bushland within a minimum cleared width of 6 m, and have a minimum formed width of 4 m. Such roads shall be adequately drained to provide all weather access for fire fighting vehicles.

The perimeter track shall be contained within a 20 m reservation or easement that borders those allotments abutting the bushfire prone area. Such a reserve shall serve as a basis for fire protection measures to be undertaken and will not be considered as part of the public reserve dedication applicable to the subdivision.

Access shall be provided from the above described reservation from the local road system at regular intervals in a system of 'loops'.

For those subdivisions receiving reticulated water, fire hydrants shall be situated at appropriate intervals or near where potential fire hazard areas exist as determined by Council.

Fire protection zones access tracks and perimeter tracks shall be clearly indicated on the subdivision plan. Erosion control features and revegetation requirements shall also be indicated in the subdivision plan.

2.2 Fire Protection Zones

The provision of Fire Protection Zones (FPZs) shall occur as part of the development of the subdivision pattern. Each individual allotment shall have adequate space for the main building (*usually a dwelling*), an area of open space (*front, back or side yard*) and the FPZ (*which may include part of the yard area and/or neighbouring properties*)/ Figure D10.1 illustrates a typical FPZ.

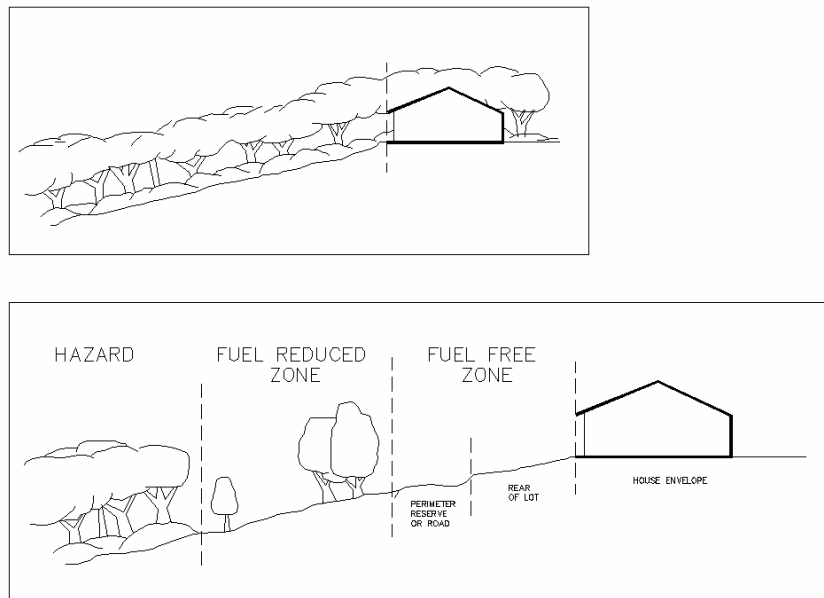


Figure D10.1 Fire Protection Zone

FPZs shall be required for any development fronting a bush fire hazard area, whether a single dwelling, a group of isolated dwellings or an urban subdivision. They act as a buffer zone between the development and the fuel.

The primary purpose of FPZs is to ensure that a progressive reduction of fuel occurs between the bush fire hazard and any combustible structures within the development.

Apart from its primary purpose the FPZ serves a number of other important purposes, dependent upon local fire fighting policy. The FPZ shall be designed to:

- (a) Maximise the separation distance between high intensity fire and any structure, thereby reducing the radiation and direct flame contact;
- (b) Provide an area where embers can fall with minimal opportunity to create further fire outbreaks'
- (c) Provide a safe access to a structure for fire fighters by reducing the heat level from the main fire;
- (d) Provide a safe retreat for fire fighters; and
- (e) Provide a clear control line from which to begin back burning or hazard reduction operations.

Safety requirements sometimes dictate that fires are fought from the property itself rather than along the perimeter track.

The FPZ incorporates up to three separate components:

- (a) Fuel Reduced Zone (FRZ); and
- (b) Fuel Free Zone (FFZ) incorporating:
 - (i) a perimeter road or reserve (which incorporates an access track); and
 - (ii) a set-back (currently defined by minimum lot depths), which is usually part of the allotment.

2.3 Fuel Reduced Zones

The FRZ is located adjacent to the hazard:

Originally, it would have been part of the bush fire hazard but has become an area where the fuel loadings are reduced through thinning of vegetation, mechanical clearing, hazard reduction burning or location of suitable developments such as playing fields or car parks (provided it is wide enough).

Fuel loadings within the FRZ shall be kept to a level where the fire intensity expected will not impact on adjacent developments. In the absence of any policy to the contrary, 8 tonnes per hectare of total fuel is commonly used.

The FRZ should always be part of the development so that dedication of land or monetary contribution through Part 5 Infrastructure Charges (IPA) ensures that the cost of fire protection is met by the Developer, not by the general community.

For slopes greater than 20 degrees, the environmental consequences of ground clearing (erosion) may not be acceptable. Developments abutting such slopes shall avoid both the ridge and the slope.

2.4 Fuel Free Zones

The fuel free zone is located adjacent to, or is part of, the development and comprises a perimeter road and a set-back.

- (a) Perimeter Road

- (i) The perimeter road or access trail lies between the FRZ and the boundary of the allotments.
- (ii) The concept of a perimeter road requires that one side of the road has no fuel. Perimeter roads are not fire breaks in the same sense as used in fire fighting operations. Their main purpose relates to reduction of radiation and provision of access. Without a fuel source on the other side, perimeter roads can however prove very effective fire breaks.
- (iii) The form that the perimeter road or track takes will depend on local policy in regard to both road construction and fire fighting. In many instances, a perimeter reserve will be preferred due to cost. The reserve should be a minimum of 20 m wide, with a 6 m access track and passing bays about every 200 m.
- (iv) In designing for a perimeter road or track, the distance required may not seem very great. Given that the probability of fire jumping a fire break increases as the width decreases, then areas where the highest intensity fires are likely should have fire breaks of greatest width.
- (v) Perimeter roads can be less economic than roads which service two frontages unless some innovative designs are incorporated into the subdivision. Figure 2 illustrates perimeter roads and perimeter tracks.

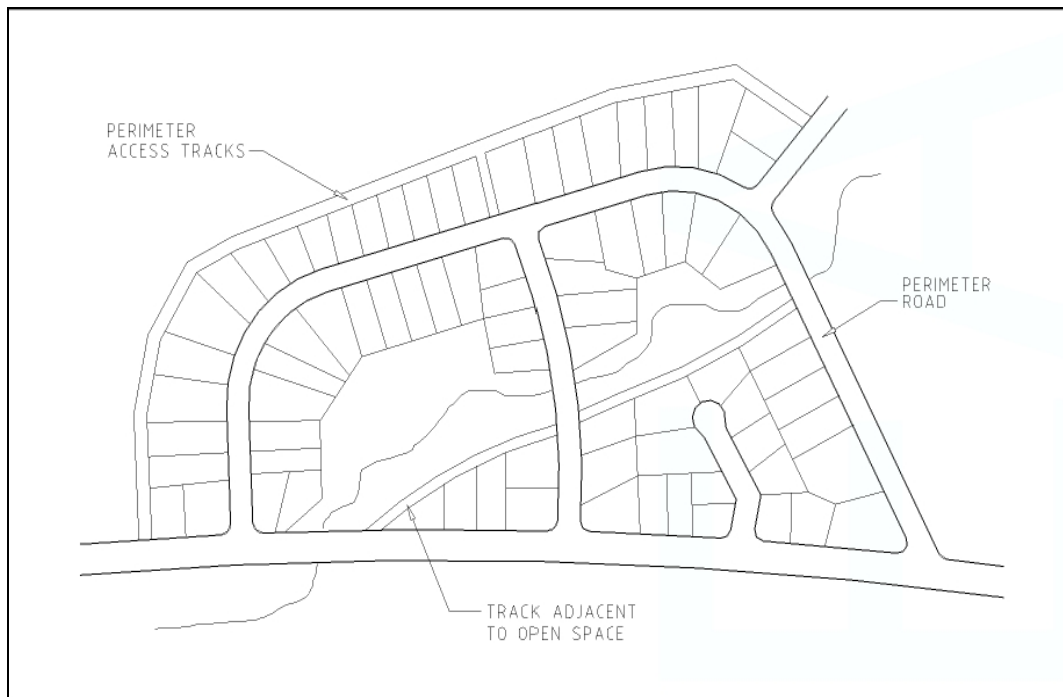


Figure D10.2 Perimeter Road Track

- (vi) Perimeter roads that do not require clearing or maintenance (compared to tracks), can be cheapest in the long term. Ultimately the decision between a road or track depends on the local Council's subdivision and bush fire fighting policies.
 - (vii) Tracks shall be constructed to Council requirements.
- (b) Set-back
- (i) Part of the allotment can be used as a section of the buffer by setting a minimum lot depth and rear setback. This can ensure that sufficient room (30 – 35 m) is available to allow for erection of a dwelling that does not encroach upon the rear of the allotment.

- (ii) The policy previously required a minimum of 40 m lot depth in order to be consistent with the average minimum lot depth in bushland residential developments. Based on the requirement to maximise the distance between hazard and structures on reasonable grounds (*as developed above*) and a 30 m wide building envelope which includes the surrounding yard, there is no justification for a 40 m minimum lot depth in some instances.

2.5 Modifications to Fuel Reduced and Fuel Free Zones

Modifications to the width of either the FRZ or the FFZ shall only be made with the written approval of Council and based on an examination of the particular cases rather than according to any formula.

Modifications would need to take account of adjacent or proposed development. Some difficulties arise where new development abuts existing development that is a fire hazard because of the nature of its usage (eg forests, parks etc). The general principle is that fire protection should be shared by both users which may require a certain level of negotiation outside the planning system.

Even without an extensive area of fuel outside the FRZ, intense fires can develop if the FRZ has not been hazard-reduced and if the fire begins as a line ignition from spotting embers.

Under adverse conditions fires moving up a slope may not be slowed by the presence of rocky outcrops and ledges, even though the continuity of the fuel bed may be broken.

2.6 Internal Access from Subdivision Roads

The provision of adequate internal access is also controlled by subdivision design. Subdivision roads shall incorporate the following features:

- (a) Width, vertical clearances and any dips and crests which allow the two way movement of fire fighting appliances;
- (b) construction standards of roads and any bridges which allow for the carrying of fully loaded fire appliances (28 tonnes or 8 tonnes per axle);
- (c) Curves which have a minimum inner radius of 12 m and are minimal in number;
- (d) Maximum grades which do not exceed 15% (1:7) and preferably not more than 10% (1:10);
- (e) Clearly signposted roads;
- (f) Dead end roads which do not exceed 200 metres in length;
- (g) Dead ends which incorporate a minimum turning circle of 12.5 m diameter; and
- (h) A road network which connects regularly to any access tracks.

2.7 Staging Works

When considering the rate of development, planners shall provide for initial development to occur on the hazard perimeter of the development. A line of dwellings will tend to minimise the threat to the entire subdivision by limiting the hazard interface.

Scattered developments on the other hand, will allow a continuous network of fuel to threaten individual buildings until development is substantially underway.

For similar reasons, new developments should be 'tacked' onto old developments to minimise the hazard perimeter.

It is important that much of the bush fire protection is incorporated into the design of the development, rather than into individual allotments.