Muswellbrook Shire Council

DEVELOPMENT DESIGN SPECIFICATION

AUS-SPEC (Cot 09)

0013 Bushfire protection

Amendment Record for this Specification Part

This Specification is Council's edition of the AUS-SPEC generic specification part and includes Council's primary amendments.

Details are provided below outlining the clauses amended from the Council edition of this AUS-SPEC Specification Part. The clause numbering and context of each clause are preserved. New clauses are added towards the rear of the specification part as special requirements clauses. Project specific additional script is shown in the specification as italic font.

The amendment code indicated below is 'A' for additional script 'M' for modification to script and 'O' for omission of script. An additional code 'P' is included when the amendment is project specific.

Amendment Sequence No.	Key Topic addressed in amendment	Clause No.	Amendment Code	Author Initials	Amendment Date
0	Customisation for Muswellbrook Council Local Government Area	all	AMOP		24/10/2011

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0013 BUSHFIRE PROTECTION

1 GENERAL

1.1 SCOPE

Design

General: Carry out designs to satisfy requirements of the State or Territory, Local Council and any guidelines published by the State's Rural Fire Service or equivalent.

1.2 OBJECTIVES

Bushfire hazards

General: To minimise bushfire hazards. The requirements are particularly pertinent to rural developments but should be an integral part of urbanised development as well. The concepts proposed need to be incorporated at an early stage of design development.

1.3 CROSS REFERENCES

Associated Worksection

Associated worksections: Conform to the following:

- *0161 Quality (Design).*
- *0281 Bushfire perimeter tracks*.

1.4 REFERENCED DOCUMENTS

The following documents are incorporated into this worksection by reference:

Standards

AS/NZS 1596-2008 The storage and handling of LP Gas
AS 2419 Fire hydrant installations
AS 2419.1-2005 System design, installation and commissioning

Other publications

NSW Environment Planning and Assessment Act 1979—Section 94.

NSW Rural Fires Act, 1997.

NSW Rural Fire Service - Planning for Bushfire Protection. A Guide for Councils, Planners, Fire Authorities and Developers 2006 and Guidelines for Subdivision Applications 2004.

Energy Australia - NS 179 Vegetation safety clearances-2002.

State requirements

ACT: ACT Rural Fire Service http://www.rfs.act.gov.au

NSW: NSW Rural Fire Service http://www.rfs.nsw.gov.au/

NT: Northern Territory Fire and Rescue Service http://www.pfes.nt.gov.au

http://www.nt.gov.au

QLD: Rural Fire Service QLD http://www.ruralfire.qld.gov.au/

SA: Country Fire Service http://www.cfs.org.au/

TAS: Tasmania Fire Service http://www.fire.tas.gov.au

VIC: Country Fire Authority http://www.cfa.vic.gov.au/

WA: Fire and Emergency Services Authority http://www.fesa.wa.gov.au/

Bibliography

Board of Fire Commissioners - Hazard Reduction for the Protection of Buildings in Bushland Areas, 1984.

Californian Department of Forestry - Fire Safety Guides for Residential Development in California, 1980.

Department of Land and Water Conservation (formerly Land Management) - Soil Conservation Service 1994. Guidelines for Planning, Construction and Maintenance of Tracks.

Insurance Council of Australia - Bushfire Safety in Urban Fringe Areas.

Luke, R.H - Before the Fires Start.

Ministry of Urban Affairs (formerly Environment) and Planning - Planning Guidelines for Subdivisions in Bushfire Prone Areas, 1985.

NSW Department of Urban Affairs (formerly Environment) and Planning - Circular 74: Planning in Fire Prone Areas, 1984.

1.5 INTERPRETATIONS

Definitions

General: For the purposes of this worksection the definitions given below apply.

- Asset Protection Zone (APZ): An area surrounding a development managed to reduce the bush fire hazard to an acceptable level. It is also referred to as a fire protection zone. It aims to protect human life, property and highly valued public assets and values.
- Fire trails: Serve the following functions in inaccessible but strategic locations:
  . Safe access for fire fighters.
  . Fire control lines.
  . Access for APZ maintenance and equipment.
- Local Environmental Plan (LEP): Plans prepared by a Council that describe the planning status and or development standards required for the future development of an area.
- Perimeter roads: Form part of the asset protection zone and are required to provide a separation between the building and the boundary of the bush fire hazard by a wide, permanent and low maintenance fire break.
- Property access: Access from a public road system onto private land and access to the habitable building by fire fighters.
- Public roads: Include the perimeter road and the internal road system of any urban subdivision as well as public roads in rural-residential subdivisions.
- Setback: The distance required through planning provisions to separate a building from the bush fire hazard, street frontage or from adjacent buildings.

2 DESIGN CRITERIA

2.1 PLANNING

Descriptions

Perimeter tracks: Where a subdivision abuts unimproved timber in a bushfire prone area (as classified by Council), locate perimeter tracks immediately between the created allotment and the bushland within a minimum cleared width of 6 m, and with a minimum formed width of 4 m. Drain such roads adequately to provide all weather access for fire fighting vehicles.

Property access: Provide alternative property access roads or egress for fire fighters and residents during a bush fire emergency if part of the road system is cut by fire. A distinction is drawn between rural private access and urban areas. Provide one property access road for developments that are located more than 200 m from a public through road.

Minimum formed carriageway width: 4 m for rural areas and for urban areas with a distance greater than 70 m from the nearest hydrant point to the most remote external part of the proposed building.

Fire trail: In rural-residential subdivisions fire trails form part of the Inner Protection Area (IPA) surrounding isolated or groups of dwellings. In suburban subdivisions they function as a strategic control line around the hazard side of the IPA if they are connected to the public road. It is not a substitute for a perimeter road.

Reservations and easements: Contain the perimeter track within a 20 m reservation or easement which borders those allotments abutting the bushfire prone area. Such a reserve serves 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.

Requirements

Access: Provide access to reservation or easements from the local road system at regular intervals in a system of ‘loops’.

Fire hydrants: For those subdivisions receiving reticulated water, locate fire hydrants at appropriate intervals or near where potential fire hazard areas exist in accordance with AS 2419.1 or as determined by the Council.

Consultation: Consult the Council for technical advice in relation to bushfire protection of subdivisions.

Representation: Indicate clearly asset protection zones access tracks and perimeter tracks on the subdivision plan. Also indicate erosion control features and revegetation requirements in the subdivision plan.

2.2 ASSET PROTECTION ZONES (APZ)

Description

Primary purpose: The primary purpose of Asset Protection Zones (APZ) is to ensure the progressive reduction of fuel and to reduce potential radiant heat levels, flame, ember and smoke attack between the bush fire hazard and any combustible structures within the development.

Location: Provide an APZ as part of the development of the subdivision pattern. For each individual allotment allow adequate space for the main building (usually a dwelling), an area of open space (front, back or side yard) and the APZ (which may include part of the yard area and/or neighbouring properties). Figure 2.1 illustrates a typical APZ.

Requirement: Provide an APZ for any development fronting a bush fire hazard area, whether a single dwelling, a group of isolated dwellings or an urban subdivision, to act as a buffer zone between the development and the fuel.

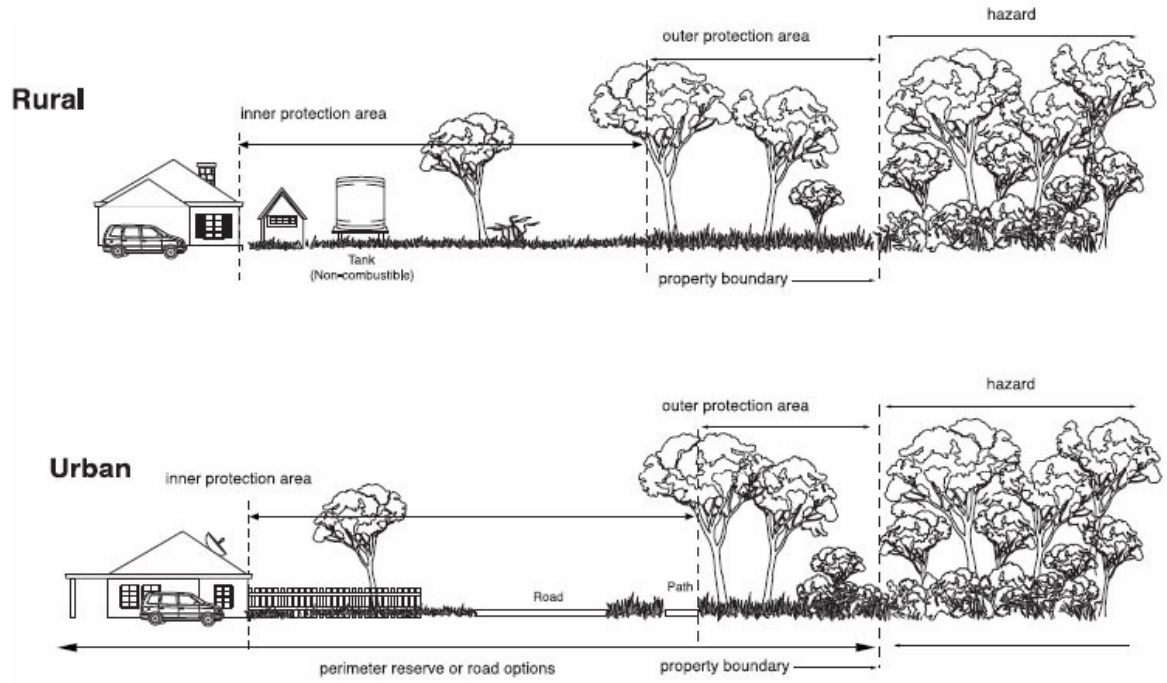

Figure 2.1 Components of an Asset protection zone

Other design considerations

Secondary purposes: The APZ serves a number of other important purposes, dependent upon local fire fighting policy. Design the APZ to:

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

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

Components

Functional areas: Incorporate the following separate components in the APZ:

- Outer Protection Area (OPA).
- Inner Protection Area (IPA) incorporating:
  - a perimeter road or reserve (which incorporates an access track); and
  - a setback (currently defined by minimum lot depths), which is usually part of the allotment.

2.3 OUTER PROTECTION AREA (OPA)

Planning

Location: The Outer Protection Area (OPA) is located adjacent to the hazard.

Cost: Provision of the OPA is part of the development so that the cost of dedication of land or a monetary contribution for fire protection is met by the developer, not by the general community.

Steep slopes: For slopes greater than 20 degrees, the environmental consequences of ground clearing (erosion) may not be acceptable. Avoid both the ridge and the slope in developments abutting such slopes.

Fuel loadings

Reduction: Fuel loadings can be reduced through thinning of vegetation, mechanical clearing, hazard reduction burning or location of suitable developments such as playing fields or car parks (provided they are wide enough).

Minimum fuel loadings: Keep fuel loadings within the OPA 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/hectare of total fuel is commonly used.

2.4 INNER PROTECTION AREA (IPA)

Planning

Description: The Inner Protection Area (IPA) is located adjacent to, or is part of, the development and comprises a perimeter road, fire trail and a setback.

Perimeter roads and fire trails

Location: The perimeter road or access trail lies between the OPA and the boundary of the allotments.

Concept: 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 they are used in fire fighting operations. Their main purpose relates to the reduction of radiation and provision of access. Without a fuel source on the other side, perimeter roads can however prove to be very effective fire breaks.

Form: The form that the perimeter road or track takes will depend on the Council policy in regard to both road construction and fire fighting. In many instances, a perimeter reserve will be preferred due to cost. Provide a reserve of minimum 20 m width, with a 6 m access track and passing bays about every 200 m.

Width: 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, provide fire breaks of greatest width in areas where the highest intensity fires are likely.

Costs and benefits of perimeter roads and tracks:

- Perimeter roads can be less economic than roads which service two frontages unless some innovative designs are incorporated into the subdivision. Figure 2.2 illustrates perimeter roads and perimeter tracks.
- Perimeter roads which do not require clearing or maintenance (compared to tracks), can be cheapest in the long term. Ultimately the decision between a road and a track depends on the Council's subdivision and bush fire fighting policies.
- Construct tracks to Soil Conservation Service (1983) guidelines.

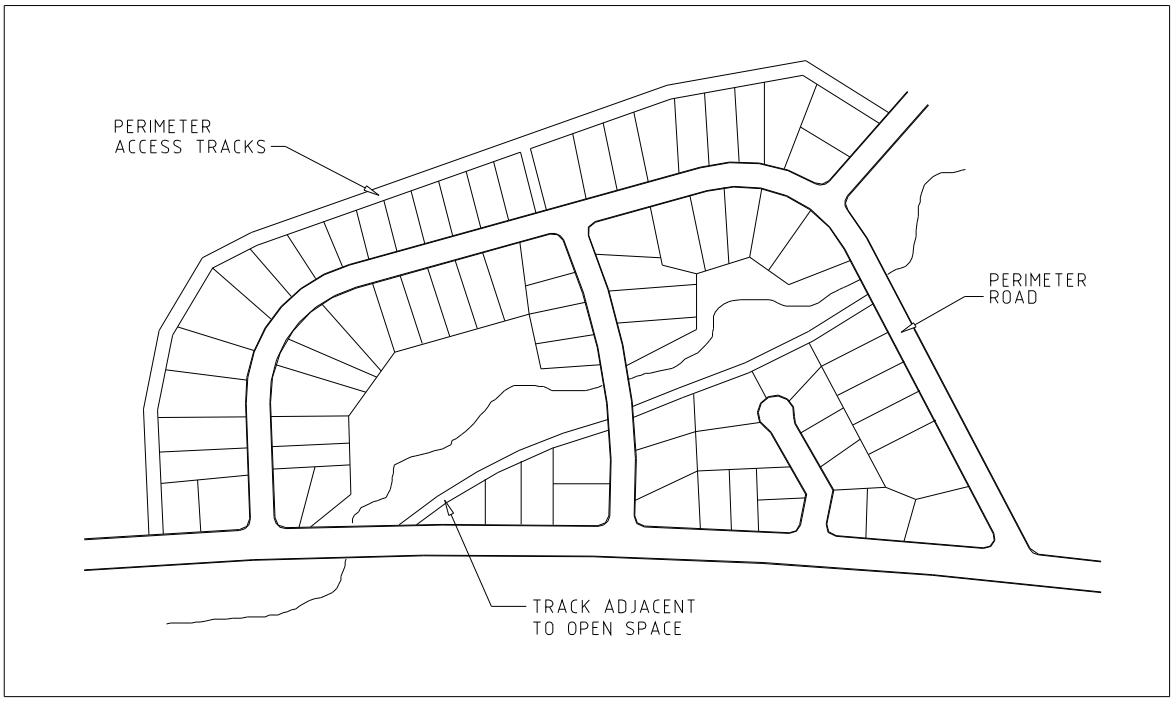

Figure 2.2 Perimeter road track

Setback

Minimum lot depth: 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. Figure 2.3 shows the minimum setback required in an APZ.

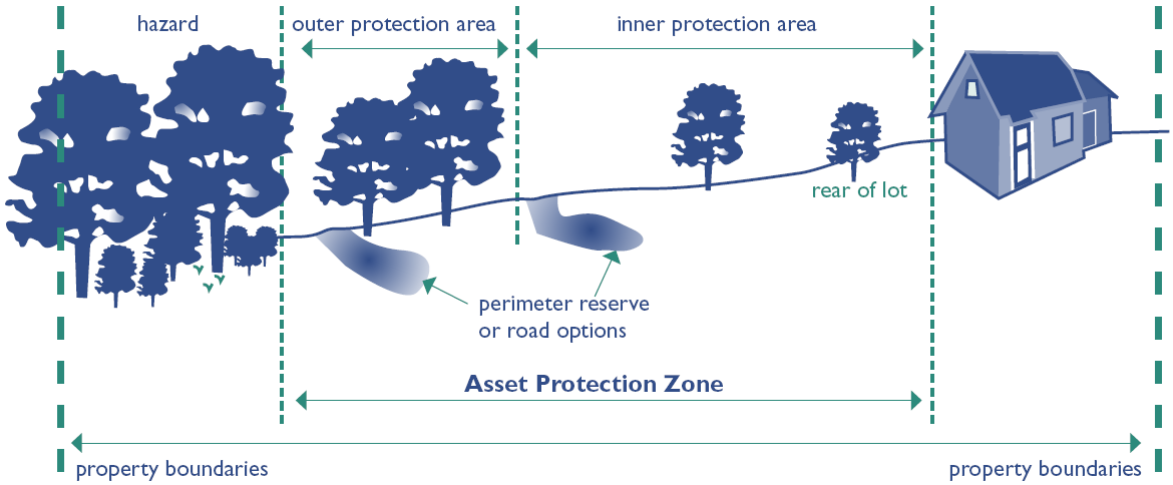

Figure 2.3 Asset protection zone (Source: NSW Rural Fire Service *Guidelines for Subdivisions applications*)

2.5 MODIFICATIONS TO OPA AND IPA

Approval criteria

Requirement: If modifications to the width of either the OPA or the IPA are proposed obtain, the written approval from the Council. Base any proposed modification or examination of the particular cases rather than according to any formula.

Adjacent development: Modifications 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 (e.g. 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.

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

Slope: 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

Planning

Subdivision design: Control the provision of adequate internal access by subdivision design incorporating the following features:

- Width, vertical clearances and any dips and crests which allow the two-way movement of firefighting appliances.
- Construction standards of roads and any bridges which allow for the carrying of fully loaded fire appliances (28 tonnes or 9 tonnes/axle).
- Curves which have a minimum inner radius of 6 m and are minimal in number.
- Maximum grades for sealed roads less than 15% (1:7) and an average grade less than 10% (1:10).
- Clearly signposted roads.
- Dead end roads which do not exceed 200 m in length.
- Dead ends which incorporate a minimum 12 m outer radius turning circle.
- Minimum vertical clearance to a height of 4 m above the road at all times.

- For roads greater than 6.5 m in width locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression.
- A road network which connects regularly to any access tracks.
- Roads which do not traverse a wetland or other land potentially subject to periodic inundation (other than a flood or storm surge).
- Parking bays which are a minimum of 2.6 m wide from kerb edge to the road pavement.
- For public roads up to 6.5 to 8 m wide and one way only public access roads no less than 3.5 m wide provide parking in parking bays.

2.7 STAGING WORKS

Development control

Sequence: When considering the rate of development, 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 allow a continuous network of fuel to threaten individual buildings until development is substantially underway. New developments should be 'tacked' onto old developments to minimise the hazard perimeter. It is important to incorporate much of the bush fire protection into the design of the development, rather than into individual allotments.

2.8 LOCATION OF SERVICES

Reticulated water supplies

Design: Use a ring main system to urban subdivisions for reticulated water supply. For fire hydrant spacing, sizing and pressures comply with AS 2419.1. Do not locate hydrants within any road carriageway. Provide only metal above ground water services, external to the building.

Non-reticulated water supply areas

Provision: Install and maintain a water supply reserve dedicated to firefighting purposes for rural-residential or developments in bushfire prone areas. Do not use swimming pools, creeks and dams as a substitute for a dedicated static supply as these sources are not reliable during drought conditions.

Requirement: Provide the minimum dedicated water supply required for fire fighting purposes in accordance to the **Minimum dedicated water supply table**.

Minimum dedicated water supply table

Development type	**Water requirement**
Residential lots (< 1000 m^2)	5000 litres/lot
Rural-residential lots (1000 – 10000 m^2)	10,000 litres/lot
Large rural/Lifestyle lots (> 10000 m^2)	20,000 litres/lot
Dual occupancy	2500 litres/lot
Townhouse/Unit style (e.g. Flats)	5000 litres/unit to 20,000 litres maximum

Connections: Make available a suitable connection for firefighting purposes, located between the IPA and away from the structure. Provide 65 mm Storz outlet with gate or ball valves.

Tanks: Provide the following facilities:

- For underground tanks, provide an access 200 mm hole to allow tankers to refill directly from the tank. Provide a hardened ground surface within 4 m of the access hole.
- Above ground tanks are of concrete or metal. Protect stands for raised tanks. Provide adequate shielding for the protection of fire fighters for the tanks located on the hazard side of the building. Provide only metal, above ground water services external to the building.

Electricity services

Design: Locate electricity services so that they limit the possibility of ignition of surrounding bushland or the fabric of the building. Undertake regular inspection of lines to ensure they are not fouled by branches. Wherever practicable provide electrical transmission lines underground. Where overhead transmission lines are proposed, install lines with short pole spacing of 30 m, unless crossing gullies, gorges or riparian areas. Limit the distance of a tree from the power line to the local electricity provider's requirements.

Gas services

Design: Locate gas services so that they do not lead to ignition of surrounding bushland or the fabric of the building. Install and maintain the reticulated or bottled gas in accordance to AS 1596. Use metal piping. Keep all fixed cylinders clear of all flammable materials to a distance of 10 m and shielded from the hazard side. If gas cylinders are kept close to the building, direct the release valves at least 2 m away from the building so as not to act as a catalyst to combustion. Do not use polymer sheathed flexible gas supply lines to gas meters adjacent to buildings.