DEVELOPMENT DESIGN SPECIFICATION

D10

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 requirement 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
1	IPWEA Mid North Coast Working Party Review of D2 15/9/2000	D10	AMO	HC	20/2/01

DEVELOPMENT DESIGN SPECIFICATION D10
BUSHFIRE PROTECTION

GENERAL

D10.01 SCOPE

1. The work to be executed under this Specification consists of the design of bushfire protection facilities to protect life and property and bring a fire to a halt.

2. The specification contains procedures for the design of fire protection facilities. Designs shall be carried out to satisfy requirements of the Council and the guidelines published by the Department of Bushfire Services, May 1991. Consultation with Council's Fire Control Officer may be required.

D10.02 OBJECTIVES

1. This specification 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 concepts proposed need to be incorporated at an early stage of development design.

Rural Development
Urban Development

D10.03 REFERENCE AND SOURCE DOCUMENTS

(a) Council Specifications

C501 - Bushfire Protection (Perimeter Tracks)

(b) NSW Government Legislation

Environment Planning and Assessment Act 1979 - Section 94

(c) NSW Government Department Publications

Department of Bushfire Services (May 1991)
- Planning for Bushfire Protection. A Guide for Land Use Planners, Fire Authorities, Developer and Home Owner.

Department of Land and Water Conservation (formerly Land Management)
- Soil Conservation Service 1983. Guidelines for Planning, Construction and Maintenance of Tracks.

Department of Land and Water Conservation
- “Bush Fire Trails and Access Tracks on Reserves and State Lands” 1997 – Publication No: HO/31/97

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.

(d) Standards Australian

AS 3959 – 1991-

SAA HB36 - 1993

(e) Other

Board of Fire Commissioners

- "Hazard Reduction for the Protection of Buildings in Bushland areas" 1984.

Bush Fire Council of NSW

- "Everyone's Guide to Bushfire Control" 1984.
- "Everyone's Guide to Bushfire Prevention in Urban Bushland Areas" 1986.
- "Everyone's Guide to Wildfire Prevention in Rural Areas" 1986.

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."

DESIGN CRITERIA

D10.04 GENERAL

1. 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 6m, and have a minimum formed width of 4m. Such roads shall be adequately drained to provide all weather access for fire fighting vehicles. ***Perimeter Tracks***

2. The perimeter track shall be contained within a 20m reservation or easement which 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. ***20m Reservation***

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

4. 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 Hydrants***

5. Council's Fire Control Officer will review technical assessments prepared by the developers bushfire protection consultant. ***Consultation***

6. 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.

D10.05 FIRE PROTECTION ZONES

1. The provision of Fire Protection Zones (FPZs) can only 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. ***Part of Development***

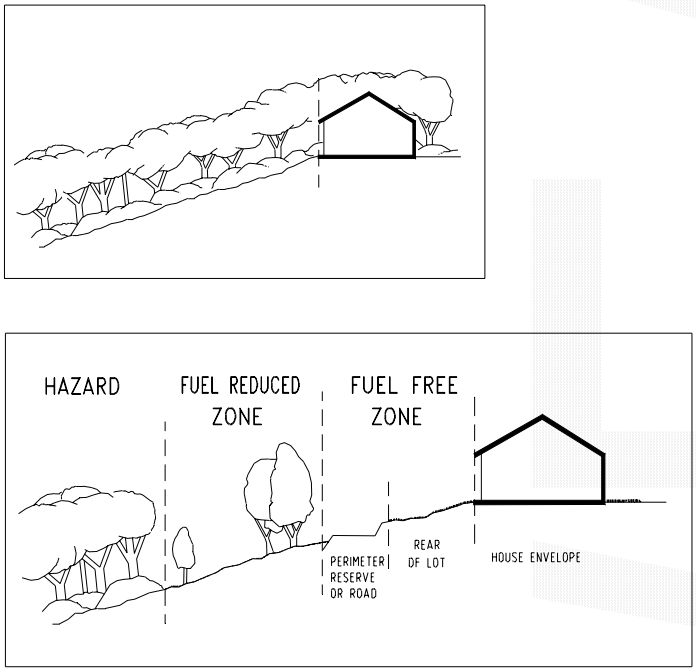

Figure D10.1
Fire Protection Zone

2. 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. ***Buffer Zone***

3. 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. ***Reduction of Fuel***

4. 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: ***Other Purposes***

(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.

5. The FPZ incorporates up to three separate components: ***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.

D10.06 FUEL REDUCED ZONE

1. The FRZ is located adjacent to the hazard: ***Location***

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). ***Reduced Fuel Loadings***

2. 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. ***Minimum Fuel Loadings***

3. The FRZ should always be part of the development so that dedication of land or monetary contribution through Section 94 of the EP and A Act ensures that the cost of fire protection is met by the developer, not by the general community. ***Part of the Development***

4. 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. ***Clearing Steel Slopes***

D10.07 FUEL FREE ZONE

1. 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. ***Location***

(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 ***Concept***

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 20m wide, with a 6m access track and passing bays about every 200m.

Form

(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.

Design

(v) Perimeter roads can be less economic than roads which service two frontages unless some innovative designs are incorporated into the subdivision. Figure D10.2 illustrates perimeter roads and perimeter tracks.

Innovative Design

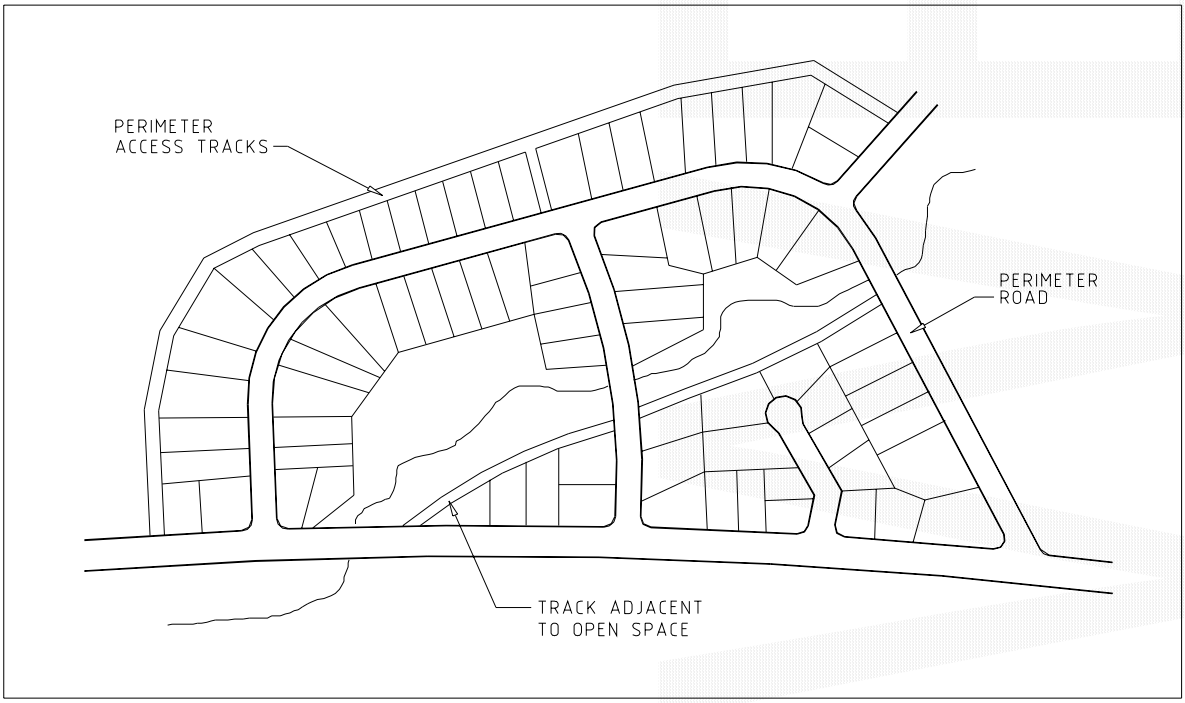

Figure D10.2
Perimeter Road Track

(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.

No Clearance or Maintenance

(vii) Tracks shall be constructed to Soil Conservation Service (1983) & Depatment of Land & Water Conservation (1997) guidelines.

(b) Set-back

Minimum Lot Depth

(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 (30-35m) is available to allow for erection of a dwelling that does not encroach upon the rear of the allotment.

Previous Policy

(ii) The policy previously required a minimum of 40m 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 30m wide building envelope which includes the surrounding yard, there is no justification for a 40m minimum lot depth in some instances.

D10.08 MODIFICATIONS TO FUEL REDUCED AND FUEL FREE ZONES

Reluctance of Fire Authorities

1. Fire authorities would generally be reluctant to agree to modifications in the width of either the FRZ or the FFZ. If modifications were to be agreed, it would be after an examination of the particular cases rather than according to any formula.

Adjacent Development

2. 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.

3. 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.

4. 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.

D10.09 INTERNAL ACCESS FROM SUBDIVISION ROADS

Incorporated in Subdivision Design

1. 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 firefighting appliances;

(b) construction standards of roads and any bridges which allow for the carrying of fully loaded fire appliances (28 tonnes or 8 tones per axle);

(c) curves which have a minimum inner radius of 12m 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 12.5m; and

(h) a road network which connects regularly to any access tracks.

D10.10 STAGING WORKS

Initial Development

1. 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.

on Hazard Perimeter

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

Scattered Developments

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

Minimise Hazard Perimeter

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

Incorporated in Subdivision Design

SPECIAL REQUIREMENTS

D10.11 DWELLINGS IN BUSHFIRE HAZARD AREAS

In bushfire hazard areas, dwellings shall be constructed in accordance with AS3959.

Dwelling Construction

D10.12 FIRETRAILS & ACCESS TRACKS

The maximum spacing of cross banks shall be in accordance with the following criteria

Maximum Spacing of Crossbanks

Slope (degrees)	Maximum Bank Spacing (m)
>=5 -<10	60
>=10 -<15	40
>=15 -<20	30
>=20 -<25	20

Grades in excess of 25% shall not be used unless detailed design is included to ensure the long term stability of the track and wearing surface. Bitumen Sealing of tracks in excess of 25% will be required

Detailed Design

Table drains with grades in excess of 5%, or adjacent to culvert inlets or outlets, shall be designed to resist scour through the utilisation of appropriate techniques, including but not limited to rock checkdams, concrete or bitumen lining, reinforced turfing, rock pitchhing etc.

Stabilisation of Table Drains

D10.13 RESERVED

CONTENTS

CLAUSE **PAGE**