VicRoads Supplement to the Austroads Guide to Road Design

Part 6B – Roadside Environment

NOTE:

This VicRoads Supplement must be read in conjunction with the Austroads Guide to Road Design.

Reference to any VicRoads or other documentation refers to the latest version as publicly available on the VicRoads website or other external source.

VicRoads Supplement to the Austroads Guide to Road Design Updates Record

Part 6B – Roadside Environment

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Rev. 2.0 July 2011	Heading 2.2 Section 2.2.4 Section 4.1.2 Section 4.4.6	Change of title Add Livestock Crossings Reference "Welcome to Country" signage Removal of outdated truck bay layout	Principal Advisor – Road Design, Traffic & Standards

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This VicRoads Supplement has been developed by VicRoads Technical Consulting and authorised by the Executive Director – Network and Asset Planning.

The VicRoads Supplement to the Austroads Guide to Road Design provides additional information, clarification or jurisdiction specific design information and procedures which may be used on works financed wholly or in part by funds from VicRoads beyond that outlined in the Austroads Guide to Road Design guides.

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References

AGRD – Austroads Guide to Road Design

GTEP – Guide to Traffic Engineering Practice (superseded)

VRD/RDG – VicRoads Road Design Guidelines (superseded)

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NSW Govt. (2009). Primefacts No. 823: Underpasses for Moving Livestock under Expressways. NSW Department of Primary Industries, February.

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VicRoads (2010). Guidelines for Road Lighting Design TCG006-2-2010.

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VicRoads (2010). Roadside Planting Guidelines (not yet released).

VicRoads (undated). VicRoads Freeway Service Centres: Design Guidelines – website information.

VicRoads Standard Specifications for Roadworks (Section 706).

VicRoads Traffic Engineering Manual Volume 1 – Traffic Management

VicRoads Traffic Engineering Manual Volume 2 – Signs and Marking.

Vict. Govt. (2004). Road Management Act 2004.

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Vict. Govt. (2008). Code of Practice for Management of Infrastructure in Road Reserves (Victoria Government Gazette No. S269 Monday 6 October 2008).

1.0 Introduction

1.1 Purpose

VicRoads has no supplementary comments for this section.

1.2 Scope of this Part

VicRoads has no supplementary comments for this section.

1.3 Design Objectives

VicRoads has no supplementary comments for this section.

1.4 Factors to be considered

1.4.1 Ecologically sustainable development

In order to lessen the environmental impact of the arterial road network, VicRoads has developed the *VicRoads Environment Strategy*. This strategy informs VicRoads activities when developing and maintaining the road network, through effectively managing environmental issues through project planning and delivery.

To support the Environment Strategy, VicRoads has also developed the *VicRoads Environmental Sustainability Policy*. VicRoads is working to reduce greenhouse gas emissions and has developed initiatives aimed to improve energy efficiency, and use materials which conserve natural resources or have minimal environmental impact.

Integrating roads with existing infrastructure, and addressing the needs of drivers, pedestrians, cyclists and public transport users are key elements of a well-planned and functional environment.

1.4.2 Other important considerations

VicRoads policy and guidelines for roadside areas regarding informal stopping places, truck parking areas, rest areas and service centres and amenities are provided in the *VicRoads Supplement to AGRD Part 6B, Section 3.4.*

2.0 Environmental Aspects

2.1 Stormwater Run-off

Drainage systems for arterial roads are designed to remove water quickly, in order to provide for the safety of traffic, to preserve the pavement strength and to prevent damage. However, some residential streets may be designed to act as drainage channels for storms greater than the design ARI. Road drainage includes removal of water entering the pavement from the surface or through the soil, by provision of a system of subsurface drains.

VicRoads guidelines require water quality, erosion control, and water sensitive road design for operational and maintenance stages of the road network as well as construction site management.

Best practice is the required minimum standard, and where available best practice guides and design tools have been referenced.

2.2 Fauna and Livestock Management

Road projects are designed to have minimal impact on fauna-rich areas, such as wildlife corridors. Wildlife corridors are often located along creek lines intersecting highways or within the remnant indigenous vegetation along the road reserve. VicRoads aims to protect fauna movement where possible, by creating fauna crossings (underpasses or overpasses). This reduces break-up of habitats and improves and maintains species diversity.

Refer to the following documents for further information:

- *Roadside Management Strategy* (VicRoads, 2002) for information on fauna management.
- *Roadside Handbook: An Environmental Guide for Road Construction and Maintenance* (VicRoads, 2006).
- *Roadside Conservation Management Plans Guidelines* (VicRoads, 2006).

V2.2.4 Livestock Crossings

For further guidance regarding design of Livestock Crossings in Victoria, refer to *Primefacts No. 823: Underpasses for Moving Livestock under Expressways* produced by NSW Department of Primary Industries available on their website.

Crossings should provide an absolute minimum height of 3.0m with an absolute minimum width of 3.5m at its narrowest point to allow for vehicle access and driver and passenger entrance/exit from the vehicle. Livestock crossings under roads in Victoria are typically constructed from precast boxed culvert sections. Minimum width requirements can be equally applied to other types of livestock crossings e.g. fenced crossings under bridges.

Where emergency vehicles or farm machinery are required to access the livestock crossing,

consideration should be given to adopting a larger cross section such as 4m high and 4m wide (minimum). Emergency Services and adjacent farmers should be consulted during determination of appropriate cross section for specific sites.

Livestock Crossings under roads designed in Victoria should also consider yard design, receiving/holding/forcing pen and lighting requirements as outlined in Primefacts No. 823. It is important to consider design issues at the scoping stage of projects and assess the risks to livestock and Occupational Health and Safety of persons using the crossing, in accordance with Section 28 of OH&S Act.

2.3 Noise Control

2.3.1 General

Where a new freeway or arterial road that does not have direct property access is constructed, or where an existing road is widened by two or more lanes AND buildings are removed, the project must comply with the current *VicRoads Traffic Noise Reduction Policy*. This policy sets out noise limits that apply at the fascias of noise sensitive buildings such as homes or schools.

2.3.3 Noise barriers

It is generally preferable for noise mitigation to be achieved by the use of barriers and low noise pavement materials. However, where unreasonably high noise barriers would be required to achieve the noise requirements, it may be acceptable to supplement the barriers with acoustic architectural treatment to the affected buildings.

Specific advice on interpretation of the Traffic Noise Reduction Policy may be found in *RDN 06-01 – Interpretation and Application of VicRoads Traffic Noise Reduction Policy 2005*.

Design guidelines for noise barriers may be found in VicRoads *Bridge Technical Note 1999/06: Design Criteria for Noise Barriers*.

The minimum superficial mass of 15 kg/m2 is the absolute minimum for noise barrier materials in Victoria. The minimum superficial mass of 12.5 kg/m2 identified in *AGRD Part 6B, Section 2.3.3 – Acoustic Requirements* (pg 21) shall not be adopted.

Aesthetic requirements

There is a need to consider community and local government acceptance of proposed noise barrier in relation to appearance, location and maximum height.

VicRoads does not require a 1.5m width vegetated screen either/both sides of the noise barrier, however requirements should be discussed with the relevant VicRoads Region and local municipality prior to inclusion in tender details.

2.3.4 Barrier Types (from RDG 3.6.10)

For cross-sectional purposes, there are four main barrier variants, illustrated in Figure V2.1:

(a) noise attenuation mound

(b) noise attenuation fence

(c) fence mounted on mound

(d) fence mounted on concrete barrier

Regardless of the barrier type chosen, consideration shall be given to the requirements for future maintenance, including access for the relevant types of machinery.

Mound Slopes (from RDG 3.6.10.4)

The foreslopes on noise attenuation mounds preferably should be 3:1, which provides for a variety of landscape treatments including grassing or planting with shrubs. Backslopes may be as steep as 1.5:1 where right-of-way width is limited. Such steep slopes should be closely planted with shrubs to minimise maintenance.

If it is proposed to use 2:1 on foreslopes, the designer shall ensure that sight distance is not restricted by the planting. Shrubs can be assumed to be at least 1.5 metres high, unless otherwise advised by the landscape architect.

Berm Width (from RDG 3.6.10.5)

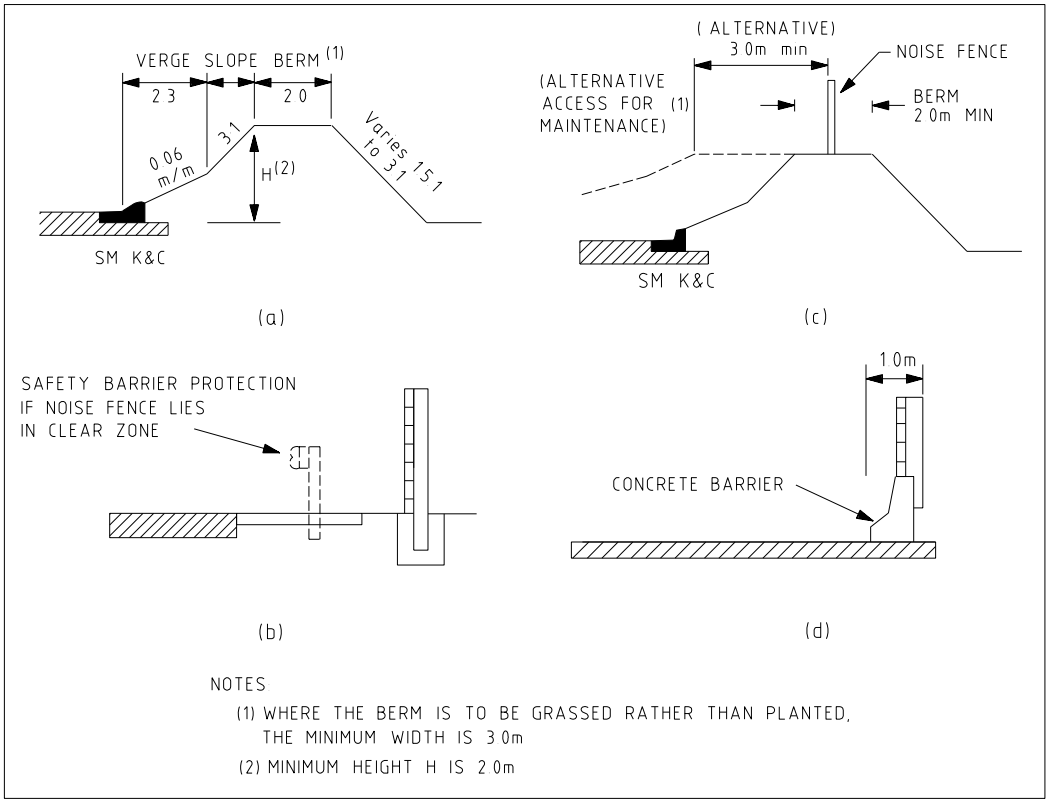
The minimum width of berm at the top of a noise attenuation mound with or without a fence is 2 metres. Where access is required for maintenance vehicles, a width of 3 metres is required in front of any noise attenuation fence and consideration needs to be given to how maintenance vehicles will safely access berms.

Noise Attenuation Fence

Due to ongoing durability problems with timber posts, the use of timber posts to support noise attenuation fences are prohibited for the construction of new noise attenuation fences.

Where noise attenuation fences are attached or constructed in close proximity to a concrete barrier or similar, designers shall consider the working width of that barrier and roll angle for taller vehicles that may strike the barrier. *AGRD Part 6* provides further guidance regarding the design envelope for road safety barriers.

Figure V2.1 – Noise Attenuation Barrier Types (from RDG Figure 3.6.10.3)



3.0 Roadside Amenity

VicRoads has no supplementary comments for this section.

3.1 Urban and Regional Design

VicRoads has no supplementary comments for this section.

3.2 Visual Amenity

VicRoads has no supplementary comments for this section.

3.3 Landscaping

VicRoads is currently developing the *VicRoads Roadside Planting Guidelines* (VicRoads, 2010) which will provide guidance on roadside landscaping and will become available later in 2010.

Until the VicRoads landscaping guideline are available, refer to *A Guide to Tree Planting within Road Reserves, Technical Bulletin No. 36* (RCA, 1987) for information

3.3.4 Landscaping specific situations

Batters and embankments

Refer to VicRoads specifications and project specific requirements for detailed requirements for batter slopes and subsequent planting/landscaping and maintenance of such activities.

3.4 Rest Facilities

3.4.2 Road design considerations for rest areas and service centres

Service centres

Project planning aspects are set out on VicRoads website under *Freeway Service Centres: Design Guidelines*. The layout should be developed in consultation with landscape architects.

Rest Areas and Service Centres (from RDG 5.8.2)

Service Centres and Rest Areas are costly, and should be installed on rural freeways only after preparation of a strategic plan to identify suitable locations. Service Centres are less frequent than Rest Areas. It is undesirable to install them unless they will be commercially viable for 24 hour services, seven days a week.

Sites are usually selected in pairs on opposite carriageways, and should be sufficient distance from interchanges to allow for proper signing and development of standard exit and entry ramps with tapers. The exit and entry ramps and tapers should be designed in accordance with the same standards as for other interchanges. The site should not compromise the operation or safety of adjacent interchanges. Refer to the following for further details:

- *Leasing and Licensing of Road Reserves Policy* (VicRoads, 2009).
- *Assess & Implement Proposals for Special Freeway Access Authorisations* (VicRoads, 2003).
- *Provision & Management of Rest Areas on Rural Arterial Roads Guidelines* (VicRoads, 2004).
- *General requirements for Freeway Service Centres* (VicRoads website).

3.4.4 Design of service centres and rest areas

Speed
Refer to VicRoads guidelines regarding design speed or use of speed limit signs in rest areas.

Lighting
Refer to *Guidelines for Road Lighting Design* (VicRoads, 2010), *Lighting of Freeways Policy* (VicRoads, 2009) and *Lighting of Arterial Roads Policy* (VicRoads, 2008) regarding the need for and the extent of lighting provided/required. Where required, lighting should be provided in accordance with AS/NZS 1158.

4.0 Roadside Infrastructure

4.1 Road Furniture

4.1.2 Signs, markings and delineation

Kilometre posts
Refer to *VicRoads Traffic Engineering Manual (TEM) Volume 2* for the provision of and spacing of posts.

VicRoads Welcome to Country Signage
Information regarding the requirements for VicRoads 'Welcome to Country' signs located in VicRoads TEM Volume 2, Chapter 14 - Information Signs.

4.1.3 Poles

Lighting poles
Refer to VicRoads policy and guidelines for the use of poles for combined support for road lighting and other uses such as traffic signals, road signs, telecommunications and/or emergency telephones.

Refer to *VicRoads Guidelines for Lighting Design* (April, 2010) on the use of frangible poles for mounting luminaires.

4.1.5 Supports for road signs

Refer to VicRoads guidelines in *VicRoads TEM Volume 2* for details on various types of sign supports and gantry requirements.

4.1.6 Fences

Specific uses of fences and design considerations
VicRoads Standard Drawings for Roadworks provide a range of standard fence types for a variety of applications, from rural stock fences to wildlife fencing.

Stock Grids
Refer to *Manual for Traffic Control at Stock Crossings* (VicRoads, 2009) for further guidance on stock grids.

Boundary Fence (from RDG 5.8.7.1)
The safety of freeways depends partly on excluding slow-moving vehicles, pedestrians and animals from the road reserve.

Along rural freeways where the abutting land use is rural in character, post and wire fences sufficient to exclude farm animals and wild life may be constructed along the boundary (see SD3101, SD3111, SD3121). These fences are not adequate to control kangaroos.

In some forest locations, special panelled fences may be required to exclude koalas, but provision should be made at structures to allow koalas to cross under the roadway.

In urban areas or in areas frequented by kangaroos, the 2.4 metre high chain mesh fence (SD3131) is used.

Care should be taken with the details at the ends of the fences to ensure that the barrier cannot be bypassed easily, and that the fence does not obscure sight lines at ramp terminals.

Gates may be required to allow access for emergency vehicles. Suitable locations should be negotiated with the Emergency Services in the area. Usually an emergency crossover would be placed in the median opposite the gate.

4.2 Road lighting

4.2.4 Warrants for lighting

Refer to VicRoads lighting policies and guidelines for lighting requirements and warrants.

4.2.5 Road lighting design

Table 4.3 Factors influencing the lighting layout
For operating speed of road refer to VicRoads policy and guidelines regarding the setback of lighting poles.

Site constraints
Refer to VicRoads policy and guidelines regarding the collection and storage of survey data, in particular *AGRD Part 8*.

Road lighting pole location
Refer to VicRoads policy and guidelines on lighting pole setback and dimensions.

Special requirements for road and public access lighting design
Refer to VicRoads Road Lighting Policy and guidelines for design requirements.

Compliance with road authority specification and guidelines
Refer to VicRoads lighting policies and guidelines for design and installation requirements.

Refer to the appropriate VicRoads Regional Office in relation to maintenance agreements.

Table 4.4 Aspects in the evaluation of alternative lighting layouts
Standard of lighting – Refer to VicRoads lighting policies and guidelines for design requirements.

4.2.6 Specific design considerations

Freeways and interchanges
Refer to VicRoads lighting policies and guidelines for provision and design requirements on these facilities.

4.2.7 Bridge Lighting

Overbridge (overpass) lighting
Refer to VicRoads lighting policies, guidelines and standard drawings regarding poles mounted on bridge overpasses, or where lighting under the structure shall be provided.

4.3 Emergency/Help Telephones

4.3.1 General

Refer to *VicRoads Managed Freeway Guidelines* (April, 2010) and standard drawings for the provision and location of emergency/help phones.

4.3.3 Location

Refer to *VicRoads Managed Freeway Guidelines* (April, 2010) for the location of Help Phones.

Telephone installations should be well signed so that drivers are aware of the spacing and the distance to the nearest telephone. Lighting should be provided at each installation. The shoulder may need to be locally widened near the telephone so that a stationery vehicle can stand clear of the traffic lanes. Details of emergency help phone bays can be found in the Standard Drawings for Roadworks. Details of signing are contained in *VicRoads TEM Volume 2 Signs and Linemarking*.

4.4 Off-street Parking

4.4.6 Parking for Large Vehicles (from RDG 3.12.3)

Location of truck parking bays should be considered during preparation of a strategic plan for rest areas, truck parking bays and wayside stops along rural highways. The layout design should cater for truck fleet and demand (type and number) at a specific location and be developed in consultation with environmental and landscape practitioners.

In rolling or mountainous country, truck parking bays should be located at the crest of a hill, so that the exit taper assists acceleration of trucks.

4.5 Utilities

The management principles and practices applying to utilities and road authorities for the installation, maintenance, replacement and operation of utility infrastructure within road reserves in Victoria are set out in the *Road Management Act 2004*, *Road Management (Works and Infrastructure) Regulations 2005* and the *Code of Practice for Management of Infrastructure in Road Reserves* (Vict. Govt. 2008).

All planning, design and installation or replacement of utility services shall be carried out in accordance with the requirements set out in the above legislative framework.

During the design process, reference usually needs to be made to relevant service authorities for specific requirements regarding their assets. Some guidance regarding VicRoads' requirements is provided in *VicRoads Standard Specification for Roadworks (Section 706).*

The location of future services and the required maintenance regime should be taken into consideration during the development of a design.

References

VicRoads has no supplementary comments for this section.

Appendix A

Examples of post selection charts and sign support gantries

Refer to VicRoads policies and guidelines regarding the types of supports used for all signs, including large signs.