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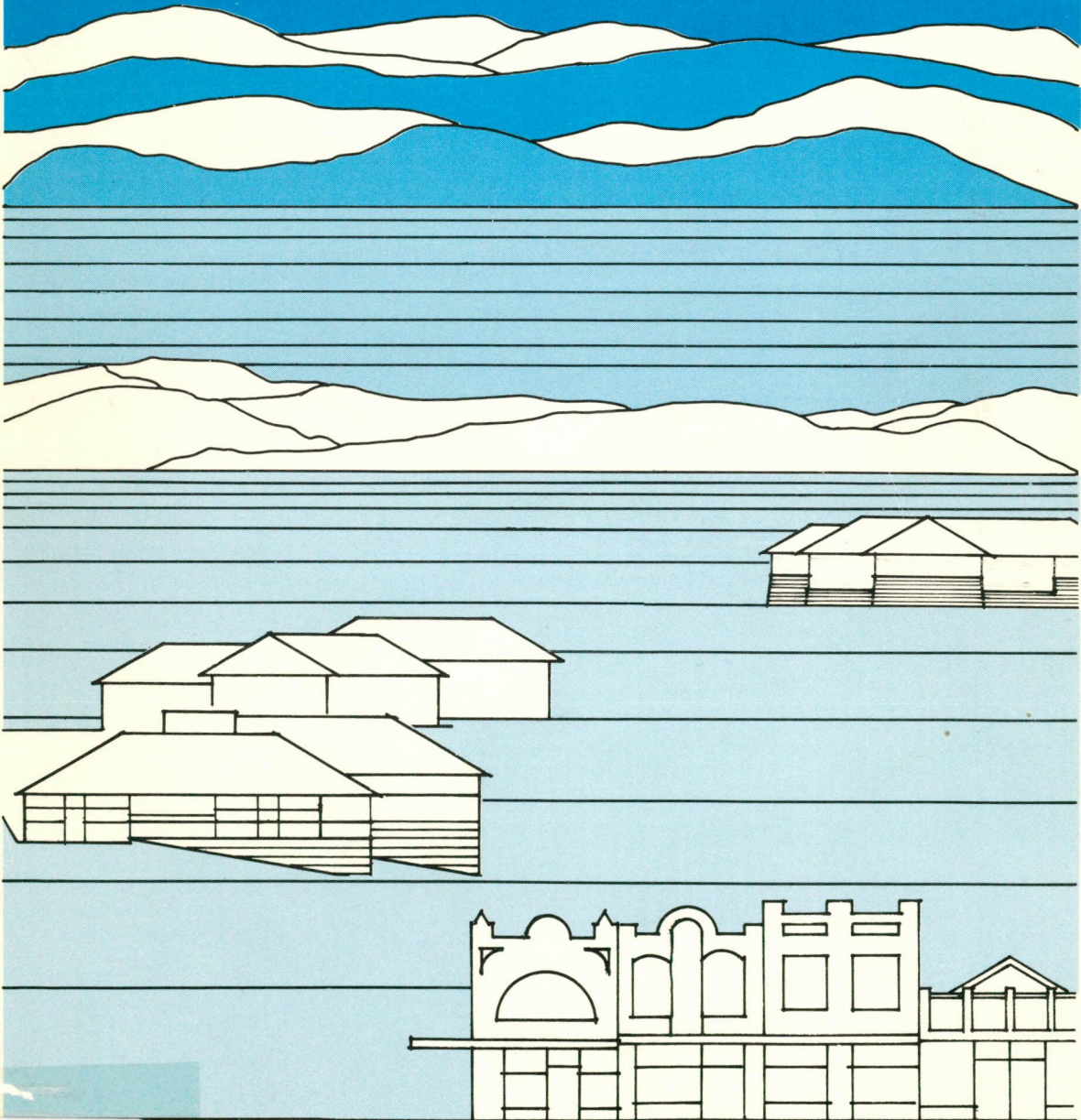


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# Design Guidelines for Urban and Rural Development in the Snowy Mountains Area of New South Wales



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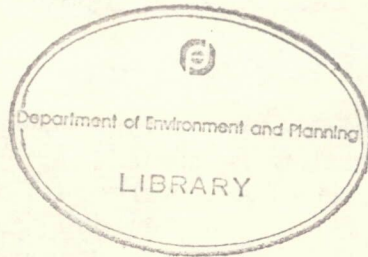
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# Design Guidelines for Urban and Rural Development in the Snowy Mountains Area of New South Wales



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## **Acknowledgments**

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Illustrated by Rick Bardsley-Smith and Neil Wilson

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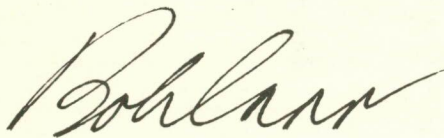
## **FOREWORD**

The alpine areas centred on Kosciusko National Park are of immeasurable importance to New South Wales for their tourism and recreation opportunities and their environmental significance. A draft regional environmental plan for Kosciusko (Snowy River) has been prepared by the Department of Environment and Planning to preserve and enhance these assets.

The Department has now produced these design guidelines to complement the draft regional plan. The guidelines stress ways in which urban and rural development can be designed to blend with the natural character of the region.

The guidelines are intended to help councils, architects, builders and developers to achieve a high standard of design.

This is a positive step towards raising the standards of development in the area around Kosciusko National Park. I am confident it will lead not only to more pleasing design of homes and other buildings but to the enhancement of the region's attraction for tourists and outdoor enthusiasts.



Bob Carr  
Minister for Planning  
and Environment



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## INTRODUCTION

The Snowy Mountains area has a spectacular landscape which contributes to the attraction of a large tourist population. Because of this developers have a responsibility to build in a manner which enhances rather than diminishes the visual qualities of the area.

Unfortunately there are many examples of development in the region which tend to visually detract from the area. This study was prompted by a concern that future development should be more responsive to design principles that complement the natural environment rather than detract from it.

The guidelines set out in this document have resulted from an examination of the features of design that need careful attention and examples are used wherever possible to demonstrate good or bad effects.

The guidelines cover all aspects of the built environment which have a visual relationship with the natural environment. Within towns the visual relationship between new and existing buildings is also considered. The objective is to produce visual harmony, rather than discord or even contrast. It is recognised that contrast may be appropriate at times, and for almost every rule there is an exception. For this reason the principles in this document have been expressed as guidelines rather than as rules.

However, in the great majority of cases it is assumed that the community will prefer consistency to contrast. These guidelines should assist in producing a harmonious visual environment.

The study covered the centres of Cooma, Berridale, Jindabyne, East Jindabyne, Kalkite, Khancoban, Cabramurra, Providence Portal, Old Adaminaby, Adaminaby and Anglers Reach. Developments within Kosciusko National Park were also considered. Appendix A identifies a number of zones for the area where certain climatic and other characteristics apply. These zones may also apply to towns outside the region and where this is so they are referred to in the Appendix.

The study area includes a wide variety of landscape types - from the rolling grasslands punctuated by granite tors of the Monaro Plains through to more hilly timbered country, to the deeply dissected mountainous landscape of the Snowy River and its tributaries, and finally the alpine areas.

In addition there are the large artificial lakes associated with the Snowy Mountains Hydro-Electricity Scheme.

The dominant colours of this landscape are greys, dull greens, khakis, light browns and beiges. It is primarily a landscape of dull, subtle colours but at a detailed level there are flashes of vivid, intense colour e.g. lichens and the bark of trees, notably candlebarks.



For various reasons, buildings, with the passage of time, tend to take on the same hues as the landscape in which they are located. Their materials are weathered by the same processes that impinge on their surroundings. The dust from the soil collects on them and vegetation grows on and around them and eventually they begin to sit well in the environment.

In such a visually impressive landscape as the Snowy Mountains area, to deny the context can only result in discordant, jarring development. The most pleasing results come from those buildings which emulate the visual principles applying to the natural landscape. This involves interpretation of the features of the landscape as a whole as well as the particular site and consideration of the effects of a development on the wider context and the need to design sympathetically within it.

## BUILDING DESIGN

### RESIDENTIAL BUILDINGS (including multiple occupancy and commercial residential development, such as motels)

The introduction to this guide identified a number of distinctive characteristics of the visual environment in the Snowy Mountains area. The relevant characteristics for residential buildings are primarily those of the natural environment - the landforms, water bodies and vegetation.

It is evident that some buildings relate to this environment better than others. The components of these relationships have been analysed and identified, and guidelines for new buildings formulated.

#### Form

Buildings which are low and which appear to hug the ground are less assertive and blend into the landscape better than buildings which have a vertical emphasis and, by contrasting with the landforms, draw attention to themselves.

#### Guidelines

- Limit heights to two storeys plus roof which may contain an attic. State Environmental Planning Policy No.6 defines "storey". Figures 1 and 2 illustrate this principle.

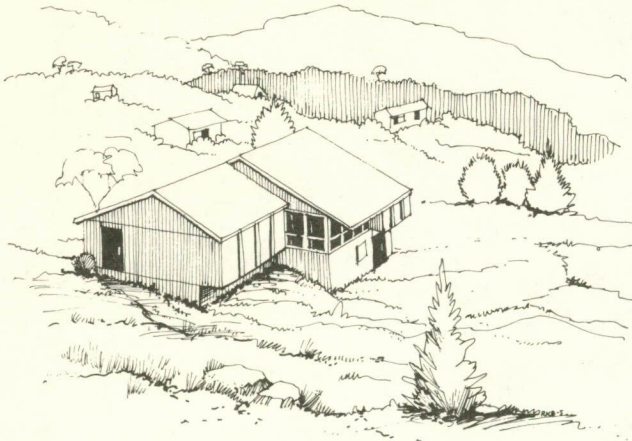


Figure 1 : Desirable



Figure 2 : Undesirable



- Build load-bearing structures directly from the ground, and avoid piers and stilts. Refer to Figures 3 and 4.

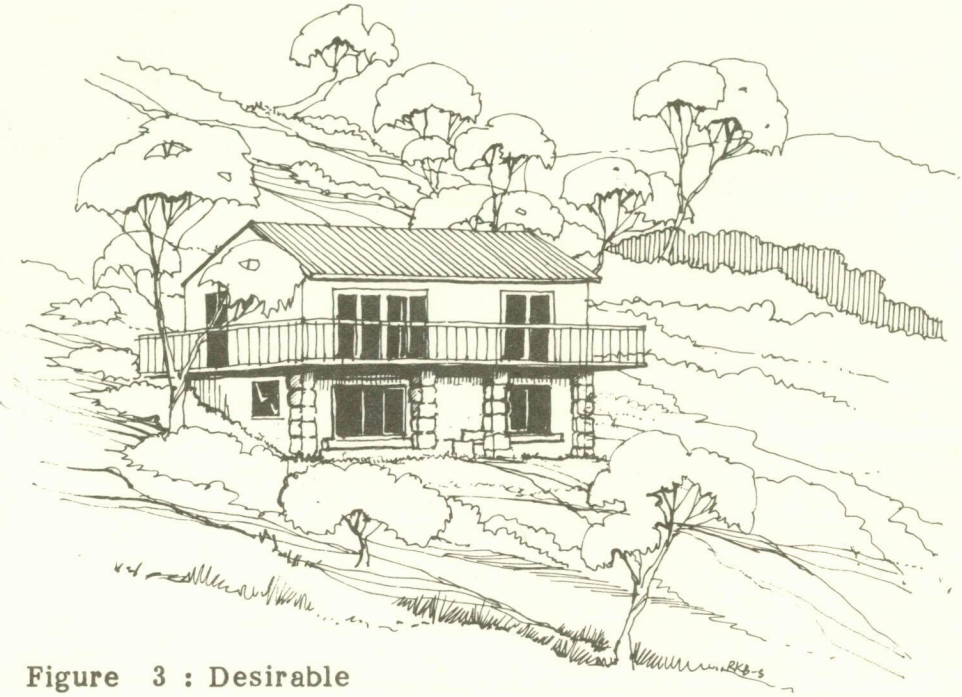


Figure 3 : Desirable

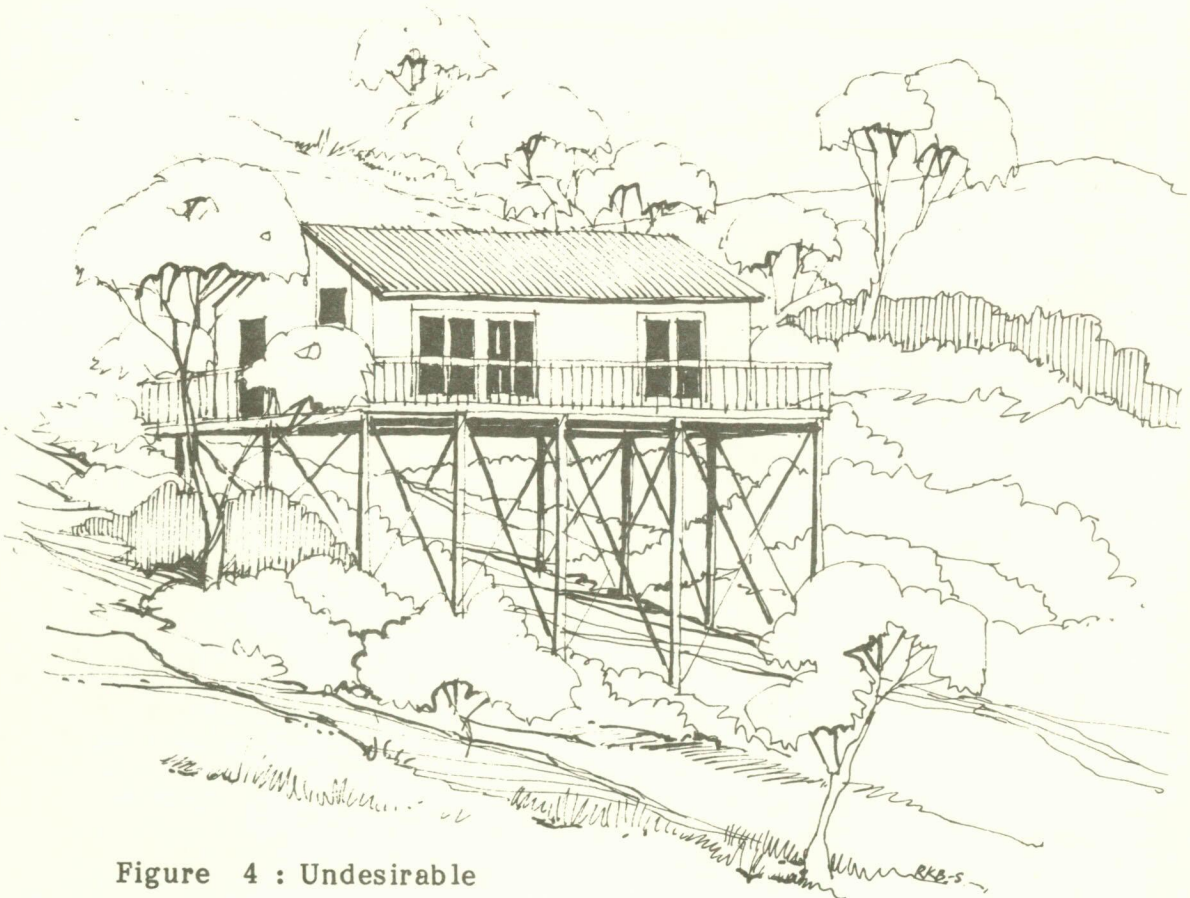


Figure 4 : Undesirable

- Give horizontal emphasis to the composition of building elements - wall panels, windows, roof lines, eaves lines and verandah lines. See Figures 5 and 6.

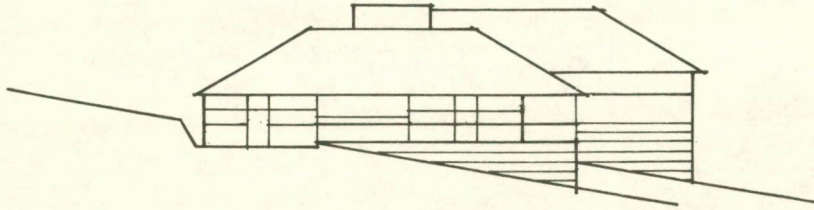


Figure 5 : Desirable

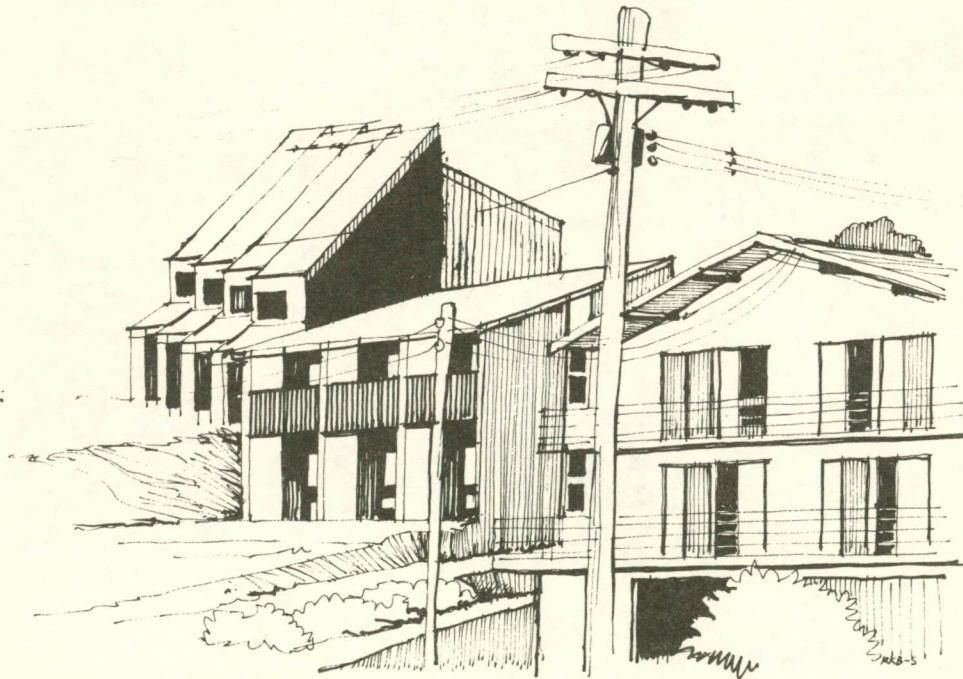


Figure 6 : Undesirable



- Finish the roof with wide eaves or verandahs, and bring the roof edge as close to the ground as possible. Hipped roofs are preferable to gables. Figures 7 and 8 give examples.

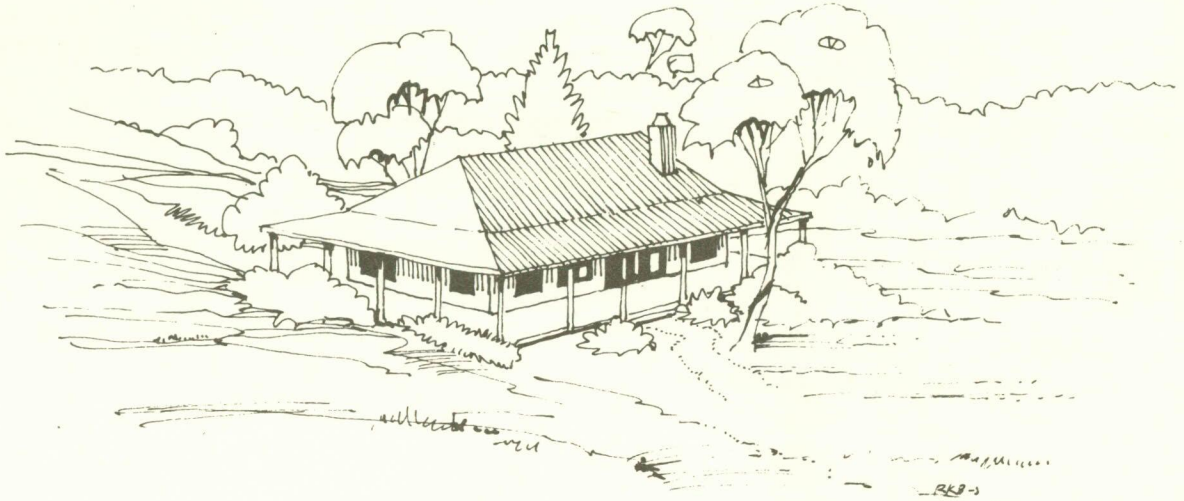


Figure 7 : Desirable

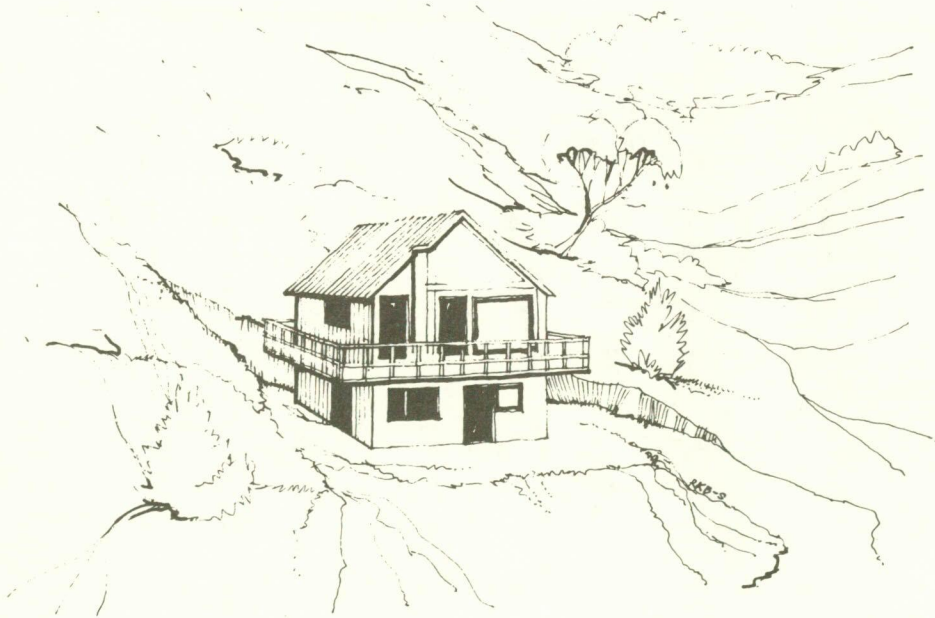


Figure 8 : Undesirable

- The top edges of roofs should not terminate in a skillion form, but should return at the same pitch. The principle is illustrated in Figures 9 and 10.

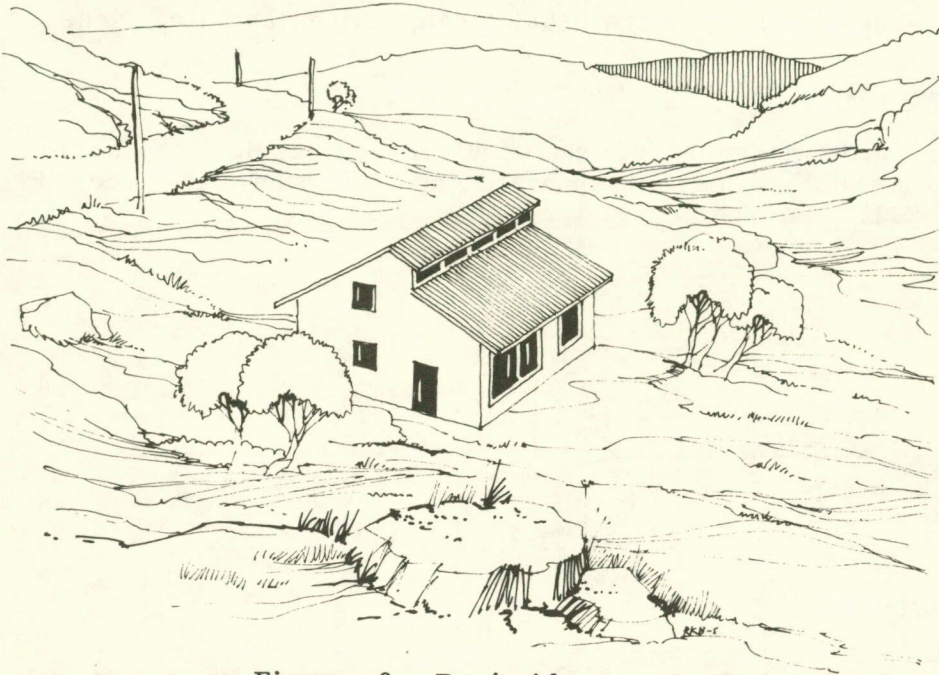


Figure 9 : Desirable

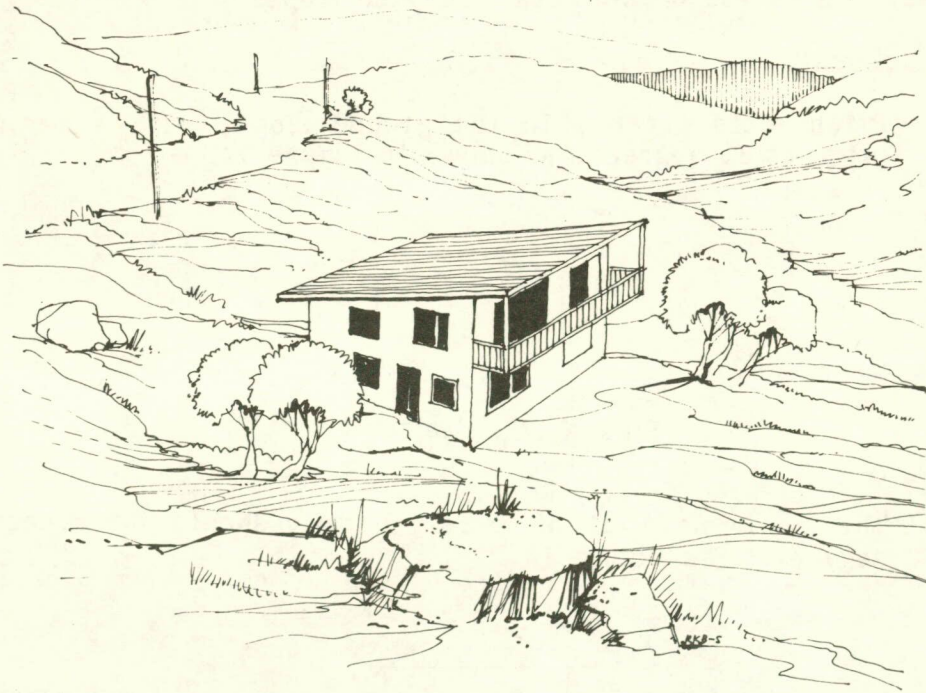


Figure 10 : Undesirable



Rounded or curved buildings, either in plan or elevation (i.e. expressed as roofs or walls) are no less compatible with the landscape than the more usual straight lines and flat planes.

#### Guideline

- Allow freedom of architectural expression to include the possibility of curved wall and roof surfaces. See Figure 11.

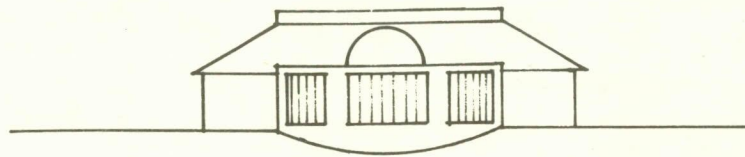


Figure 11 : Desirable

#### **Roofs**

In the hilly country of the region, often with a backdrop of mountains, it is most unusual to see a flat or low pitched roof that reflects and blends with the landforms. Steeply pitched roofs also usually appear obtrusive because their slopes are greatly in excess of the natural ground slopes.

#### Guidelines

- Pitch roofs parallel to the ground slope, with a minimum pitch of 10 degrees, as shown in Figure 12.

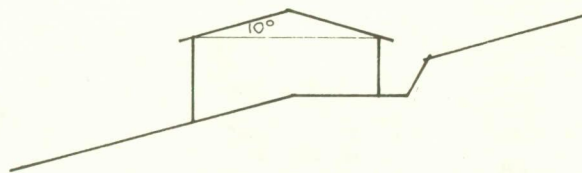


Figure 12 : Desirable

- The maximum pitch of roofs generally should not exceed 30 degrees. See Figure 13.

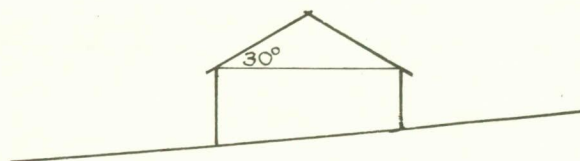


Figure 13 : Desirable

Very occasionally in the area, a flat roof appears acceptable in a particular context. In these cases, the roof plane is broken up into small elements to avoid large flat surfaces. Roofs of any pitch appear better when the roof surface is broken up by dormer windows, small gables or breaks in the ridge line.

### Guidelines

- No single plane or element of a normally pitched roof (10 degrees to 30 degrees) should exceed 10 metres in any dimension. Figure 14 illustrates this principle.

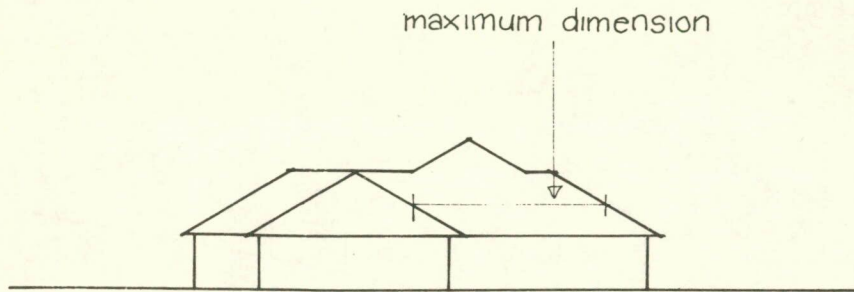


Figure 14 : Desirable

- No single plane or element of a flat or low pitched roof (up to 10 degrees) should exceed 4 metres in any dimension, as shown in Figure 15.

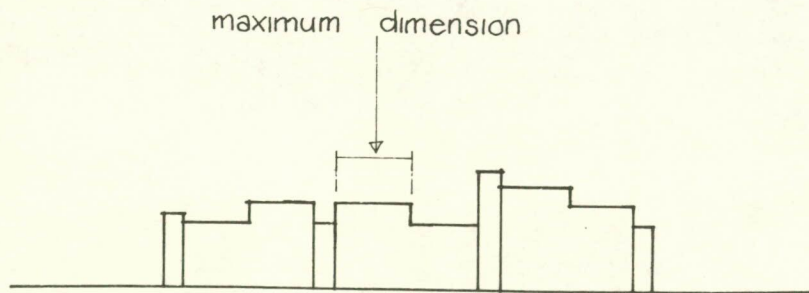


Figure 15 : Desirable



Buildings in the area which have their main ridges at right angles to the natural ground slope, so that gables face downslope, appear obtrusive. The strong triangular geometry of the gable gives a vertical emphasis to the building, prevents a calm relationship of building to ground, and is usually at variance with the landforms. A-frame buildings are particularly obtrusive.

#### Guideline

- Site buildings so that roof ridges are predominantly along the contours, rather than across the slope, and avoid large gables facing down the slope. Figures 16 and 17 give examples.

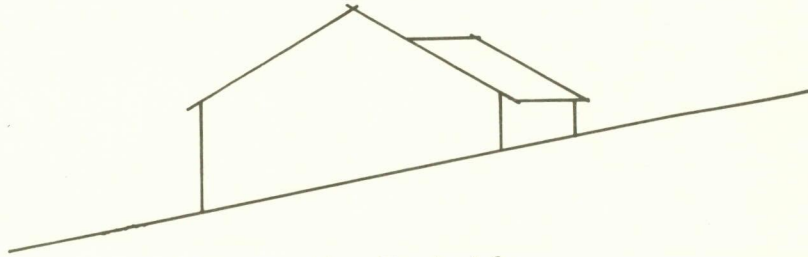


Figure 16 : Desirable

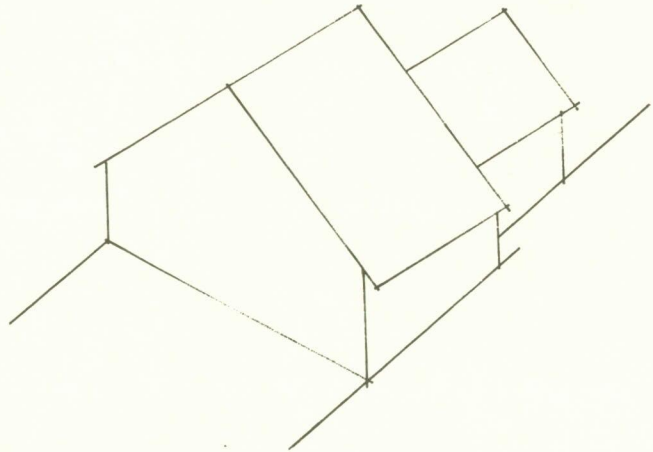


Figure 17 : Undesirable

## Facades

Large flat unbroken wall surfaces, of any material, appear obtrusive. Buildings relate better to the landscape when walls are stepped in plan, and are relieved in elevation by bays or recesses.

## Guidelines

- Modulate facades by horizontal and vertical stepping, as illustrated in Figure 18.



Figure 18 : Desirable

- No single plane or element should exceed 10 metres in any dimension. See Figure 19.

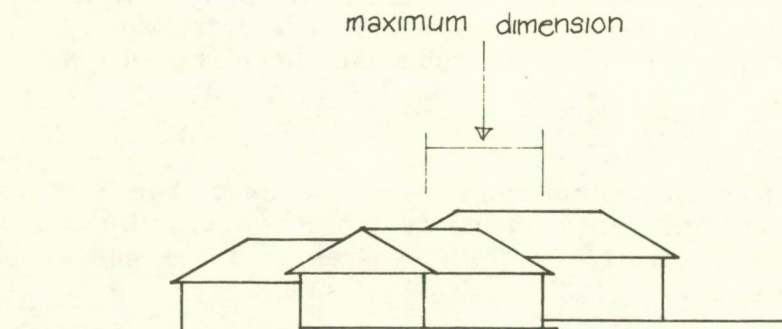


Figure 19 : Desirable



Buildings are much better visually tied to the ground when set on a solid masonry base. The best base is native rock. In the Snowy Mountains area this is commonly granite. However, granite is an expensive building material and though preferable, cannot be mandatory. If its use is limited within a particular building, it is most effectively used as a base (rather than, for example, in vertical panels).

Guidelines (as shown in Figure 20)

- Construct solid masonry bases to all facades, either in granite, concrete block or brick.
- When granite is used in a facade, but its use is restricted by cost constraints, it should be used in the lower areas of facades to visually tie the building to the ground.

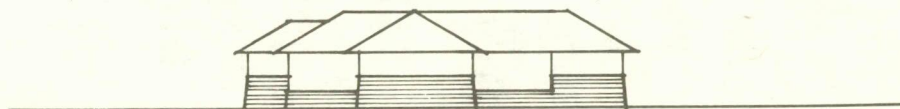


Figure 20 : Desirable

### COMMERCIAL AND OTHER TOWN CENTRE BUILDINGS

The centres of the towns in the area are characterised by low heights, small buildings, small scale and small texture. They have a consistent pattern of continuous shops built up to the footpath with awnings for weather protection.

These characteristics are typical of country towns and help create pleasant, relaxed places that are intrinsically different from the centres of cities or suburban shopping centres.

#### Form

Heights of existing buildings rarely exceed two storeys, and high-rise buildings are non-existent. However, the larger scale and increased density of town centres give a sense of identity and importance.

Guidelines (as shown in Figure 21)

- Limit heights to two storeys, except where three or four storeys may be justified in the local context in visual terms.
- Avoid gaps in a generally consistent continuous two storey building height throughout the town centre.

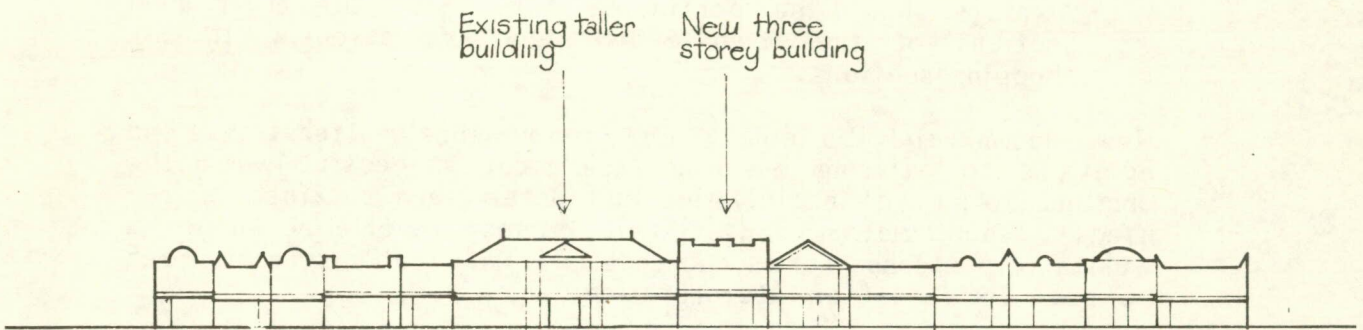


Figure 21 : Desirable

Continuous shopping frontages are required for efficient retail operation and for convenient shopping by pedestrians. It is most convenient when shops are built to the front footpath alignment without recesses. This pattern is also visually more cohesive.

Guideline

- Build shops in continuous rows which front onto the street to the footpath alignment, as shown in Figure 22.

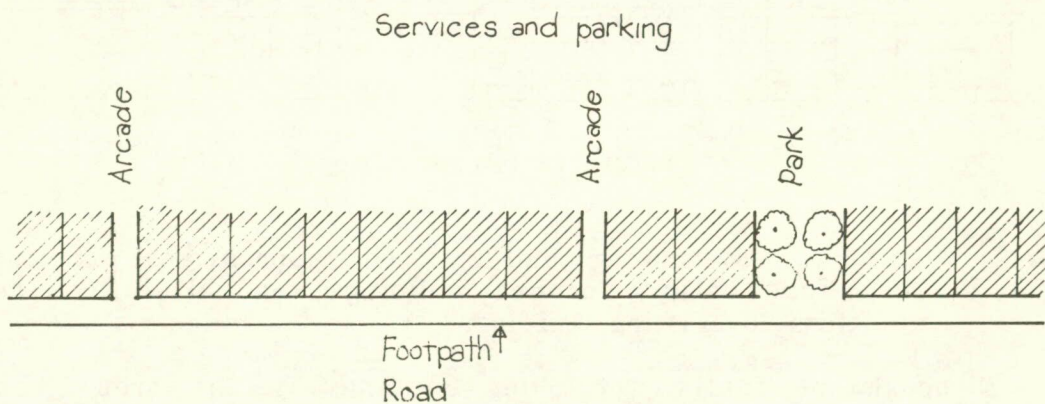


Figure 22 : Desirable



Weather protection against sun and rain is a necessary feature of the town centres. Awnings over footpaths are visually the most acceptable form because they can visually link otherwise diverse shop fronts and building types. They are also the traditional means of achieving efficient weather protection.

#### Guideline

- . Awnings should be continuous throughout the most used sections of the town centre and are essential in the shopping sections.

New commercial buildings, and renovations, alterations and additions to existing buildings are most successful when the original forms, characteristics and details are retained or re-used. The existing context will almost invariably supply a wealth of patterns, forms and details from which a selection can be made for re-use or interpretation.

#### Guidelines (refer to Figure 23)

- . Retain existing original characteristics and details of buildings when undertaking conversions and additions.

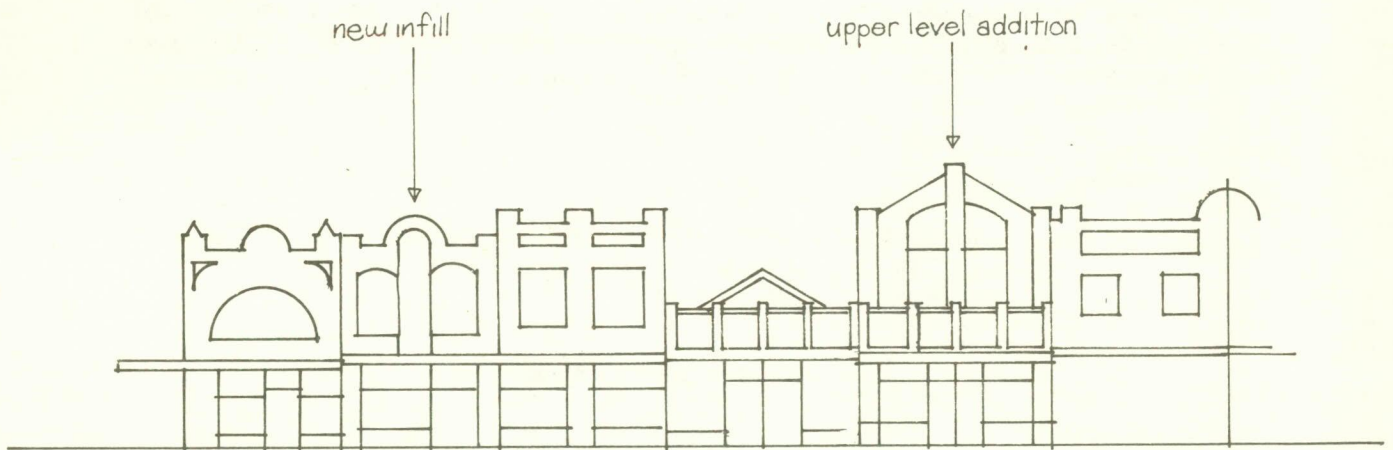


Figure 23 : Desirable

- . Look to surrounding buildings for appropriate patterns, forms and details for new buildings, and alterations and additions to existing buildings.

A consistent feature of older buildings in the area's town centres is fine detailing, and in particular, narrow fascias. Many newer buildings have very deep fascias which are totally out of character with existing buildings and which introduce a new, larger scale. This problem is becoming very prevalent, and is contributing more than most other features to a detrimental change in character in these centres.

### Guideline

- Limit fascia depths to a maximum of 40 centimetres, as illustrated in Figure 24.

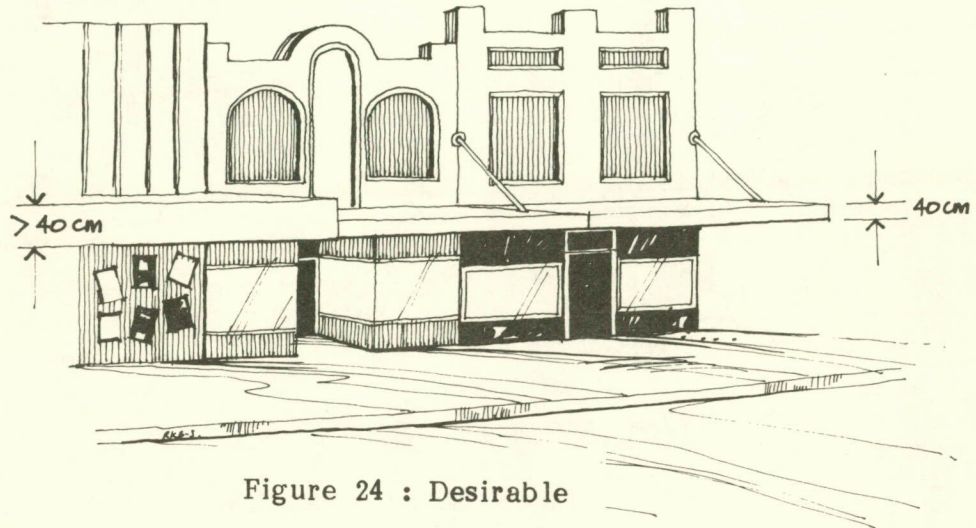


Figure 24 : Desirable

### **INDUSTRIAL BUILDINGS**

The industrial buildings of the region display some characteristics of both residential and town centre buildings. However industrial structures tend to have a larger overall scale, their components are larger and they are built more cheaply with less attention to detail, finishes and appearance.

These differences are normally accepted by the community and consent authorities, but some newer industrial estates show that this need not be so. The outstanding landscape qualities of the area and the importance of a consistently good visual environment for tourism make it worthwhile to attempt to improve the appearance of industrial buildings.

Figure 25 illustrates a successful approach to incorporating an industrial building into the landscape, while Figure 26 shows a lack of such consideration.

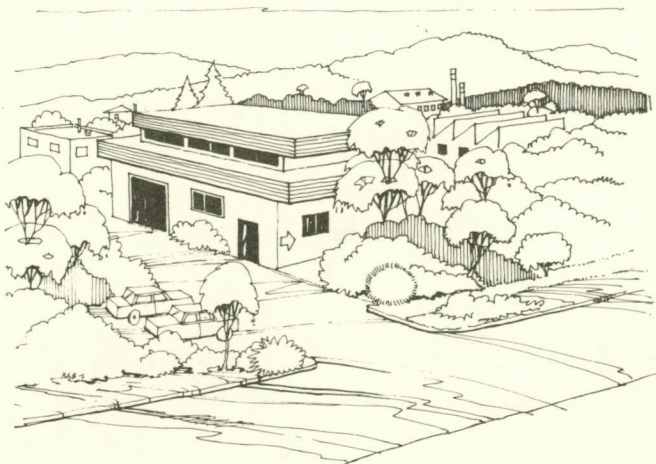


Figure 25 : Desirable



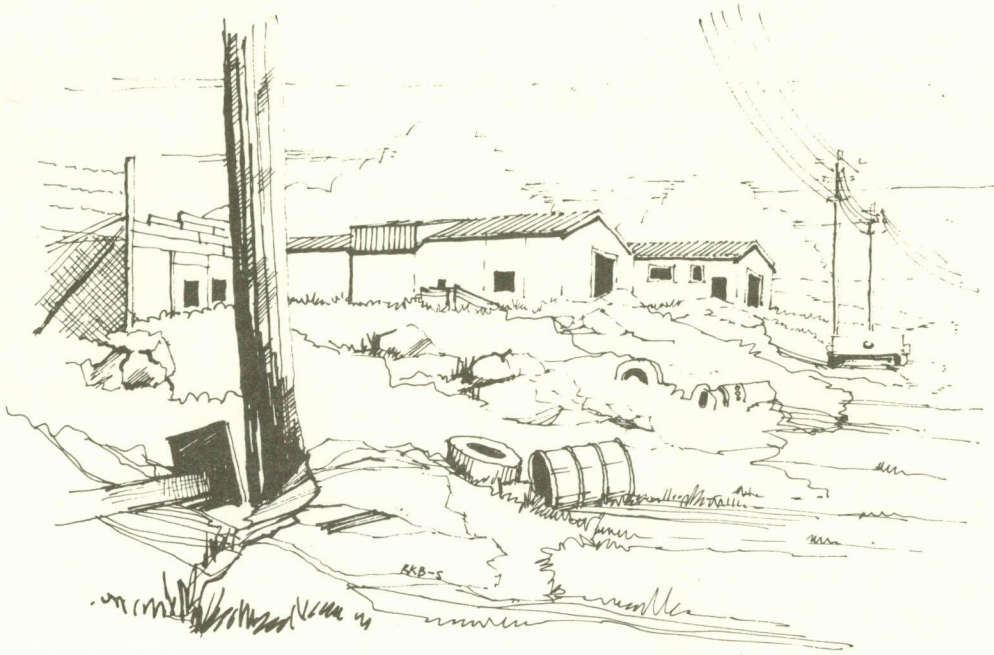


Figure 26 : Undesirable

Improvements can be made in two ways: thick planting of vegetation as a screen, and more visually acceptable buildings.

Planting is dealt with separately, in the "Landscaping" section.

Building design guidelines are similar to those for residential and commercial buildings. All of the guidelines for residential buildings apply to industrial buildings, as listed below. A number of guidelines for commercial buildings also apply and these are listed as well.

#### Guidelines

- Limit heights to two storeys plus roof which may contain an attic. State Environmental Planning Policy No.6 defines "storey".
- Build load-bearing structures directly from the ground, and avoid piers and stilts.
- Give horizontal emphasis to the composition of building elements - wall panels, windows, roof lines, eaves lines and verandah lines.
- Finish the roof with wide eaves or verandahs, and bring the roof edge as close to the ground as possible. Hipped roofs are preferable to gables.
- The top edges of roofs should not terminate in a skillion form, but should return at the same pitch.

- . Allow freedom of architectural expression to include the possibility of curved wall and roof surfaces.
- . Pitch roofs parallel to the ground slope, with a minimum pitch of 10 degrees.
- . The maximum pitch of roofs generally should not exceed 30 degrees.
- . No single plane or element of a normally pitched roof (10 degrees to 30 degrees) should exceed 10 metres in any dimension.
- . No single plane or element of a flat or low pitched roof (up to 10 degrees) should exceed 4 metres in any dimension.
- . Site buildings so that roof ridges are predominantly along the contours, rather than across the slope, and avoid large gables facing down the slope.
- . Modulate facades by horizontal and vertical stepping.
- . No single plane or element should exceed 10 metres in any dimension.
- . Construct solid masonry bases to all facades, either in granite, concrete block or brick.
- . When granite is used in a facade, but its use is restricted by cost constraints, it should be used in the lower areas of facades to visually tie the building to the ground.
- . Retain existing original characteristics and details of buildings when undertaking conversions and additions.
- . Look to surrounding buildings for appropriate patterns, forms and details for new buildings, and alterations and additions to existing buildings.
- . Limit fascia depths to a maximum of 40 centimetres.



## **BUILDING MATERIALS**

The materials which look best in a landscape are those which are derived directly from the land. They simply look natural. Within the Snowy Mountains area, only two indigenous materials are used in building - stone and timber. However, the stone is expensive to work and place, and the native hardwoods only acquire a natural appearance when allowed to weather grey which is appropriate in very limited circumstances.

### Guideline

- . Wherever costs allow, use granite as a wall material, and where appropriate use native hardwoods which can be allowed to weather.

Most building materials used in the area are imported and manufactured. Of these, some are more in tune with the landscape than others. Generally those which most closely resemble the native materials in colour and texture are best.

### Guideline

- . Use materials which approximate the area's natural colours and textures such as:

concrete blocks;

clay bricks;

concrete bricks;

bleached timber;

lightly tannilised timber;

stained timber (but must be maintained); and

timber shingles or shakes.

Other "less natural" materials also appear very acceptable in the landscape.

### Guideline

- . Use:
  - unpainted galvanised iron (blue orb);
  - zincalume iron;
  - clay tiles;
  - asbestos cement "slates";
  - small section metal decking;

painted timber;

glass in small panes and panels; and

galvanised steel.

A number of materials are visually less acceptable in the Snowy Mountains area and should be avoided. Generally these are reflective, lack texture and surface detail, are bland, or are manufactured materials which unsuccessfully imitate the colour and texture of natural materials.

#### Guideline

. Do not use:

highly reflective surfaces e.g. large unshaded expanses of glass (especially without transoms or mullions);

glass roofs (or all non-vertical glass surfaces);

sheet materials such as asbestos cement or ribbed metal decking as a cladding; and

split concrete blocks.



## COLOURS

Along with design, mass and texture, the colour of a building is an important factor, in determining how it sits in the landscape. Colour may be bright and assertive or dull and recessive.

In the Snowy Mountains area those colours which reflect the hues of the surrounding landscape and blend with the environment are preferable to those which increase the visual impact of a building.

The natural colours of the region vary with location but they are generally dull and subtle - greys, blue-greys, dull greens, olives, light browns and fawns. There are transitory flashes of vivid colours - the yellows of autumn willows and poplars, the blues and silvers of sunlit water, the oranges and apricots of lichens and candlebarks. These brighter colours may be used to advantage as accents on buildings such as doors, window frames, eaves and bargeboards. Table 1 provides a guideline to appropriate colours for roofs, walls and trim on new buildings and for the repainting of existing structures.

The most suitable combinations of colours will vary with locality and the prevailing colours of the surrounding countryside.

A building sited among the greys, blue-greys and grey-greens of freshly cut or weathered granite will blend into its setting if constructed of granite blocks, granite veneer, concrete blocks or natural timber.

A building seen against earth or grasses may be more recessive if colours ranging from vellum through fawn to grey-green and sky green are used. Locally available bricks in the PGH range (mid and dark mottle colours) blend well with the area's environment.

Accent colours of French grey, pink, purple brown and terracotta give a lift to building design and can help to identify particular elements, advertising and street furniture.

TABLE 1

**Colour Guide for New Buildings or  
Repainting Existing Structures**

Building Element	Appropriate Colours (British Standard)			
Roof - Tiles	2027	Mushroom		
	2028	Dark mushroom		
	5058	Vellum		
	5059	Grey-green		
	5060	Grey-green		
	3035	Fawn		
	210	Sky green		
	9094	Mid-grey		
	9095	Dark grey		
	222	Light bronze green		
	- Metal deck	9095	Dark grey	
		222	Light bronze green	
	Walls - Brick	2027	Mushroom (mid mottle PGH)	
2028		Dark mushroom		
4049		Drab (dark mottle PGH)		
- Concrete block		9094	Grey	
		8087	Light blue	
		5060	Grey-green	
		9095	Dark grey	
		360	Stone	
		630	French grey	
- Natural timber		5058	Vellum	
		5059	Grey-green	
		5060	Grey-green	
		9095	Dark grey	
Trim - Gable ends, barges		630	French grey	
		- Columns, barges	1020	Pink
			- Gable ends	450
	- Dado on white building	414	Golden brown	
	- Lamp posts, fire hydrants	414	Golden brown	
444		Terracotta		

Note: Colours are British Standard 2660 or B.S. 381C as referred to by colour patches in Evans, I. et al., Colour Schemes for Old Australian Houses, Sydney, 1984.



## **SITING**

The siting of a building is a critical factor in its relationship with its environment. Visual impact, energy efficiency, access to views and privacy are all dependent to a large degree on where a building is located and how it is oriented.

Selection of a building site and location of a building within that site should be made only after the following matters have been considered:

- . orientation (to the north, where possible);
- . direction of views and slopes;
- . protection from wind and adverse weather, particularly in winter;
- . relationship to the landscape, especially in areas of environmental sensitivity;
- . privacy;
- . seclusion from roads, noise and other disturbances;
- . retention of existing vegetation, particularly in rural areas where trees can provide a backdrop and shelter for a new building; and
- . future use and enjoyment.

In hilly country like much of the Snowy Mountains area, siting of buildings should be a balance between access to views and minimisation of visual impact. If a building is sited below the top or the leeward side of a hill, it may lose some views but it will also be less exposed to adverse weather conditions. Building in low-lying frost hollows or damp areas should also be avoided for obvious reasons.

### Guidelines

- . Orient buildings to maximise energy efficiency.
- . Site buildings to achieve desirable views, but not at the expense of causing major visual impact or loss of vegetation.
- . On sloping land locate buildings to minimise the need for excavation or elevation on piles.
- . Site buildings to minimise their exposure to strong wind and other adverse weather conditions.
- . Site buildings to minimise their impact on areas of environmental significance.

- . Site buildings to maximise privacy for occupants and seclusion from roads, noise and other disturbances.
- . Retain existing vegetation where possible to provide screening and shelter.
- . Site buildings to provide maximum opportunities for the future use and enjoyment of occupants.



## **EXCAVATION**

Removal of vegetation cover can lead to increased runoff and erosion in most parts of the region. Excessive excavation for building sites can cause unstable conditions, and erosion and drainage problems, as well as visual scarring.

Any required levelling of a site should be stepped to follow the natural slope of the land. The advantages of this practice include:

- . better soil stability;
- . fewer erosion problems;
- . fewer construction problems such as cracking and dampness;
- . reduced visual impact; and
- . better landscaping potential.

### Guideline

- . Excavate sloping sites in a stepped manner to minimise erosion and visual impact.

Excavated material which cannot be used in landscaping (e.g. rock walls, granite cladding, etc.) should be removed from the site or stored out of sight.

### Guideline

- . Remove surplus excavated material from the site or store out of sight of public roads.

## **SERVICES**

Structures associated with services are rarely visually positive. Generally they are best screened, or designed and sited in such a way that they are visually recessive.

### **Electricity and telephone supply**

Overhead wires and their supporting poles are conspicuous by their absence in several town centres and residential areas. This indicates that in such a visually sensitive environment, with heavy reliance on tourism for economic viability, it is worth the additional cost of locating these services underground.

#### Guideline

- . In the main streets of town centres, locate wires underground.

Most electricity and telephone services however will be above ground. In these cases, the most effective ways to reduce the obtrusive visual impact of poles and wires are by rationalisation and sensitive location, and where possible by screening with vegetation.

#### Guidelines

- . When installing or renewing overhead electricity or telephone supplies, rationalise the location of poles wherever possible and locate them sensitively.
- . Use tree planting to screen wires and poles.

### **Electricity substations**

These are often intrinsically pleasing forms and shapes, but they usually appear obtrusive because of insensitive location, their contrast with other urban development and their security fencing.

#### Guideline

- . Screen electricity substations with thick vegetation.

### **Water supply**

Water tanks are one of the largest manufactured objects in the landscape, and because of their siting on hilltops, often the most visible. Their forms may be bold and visually pleasing, but because of their size and prominence in a sensitive landscape they can appear obtrusive. For this reason it is better not to draw attention to them, and construction, siting, landscaping and painting should all contribute to a blending into the landscape.



Guidelines (as illustrated in Figure 27)

- Site water tanks below ridge lines.

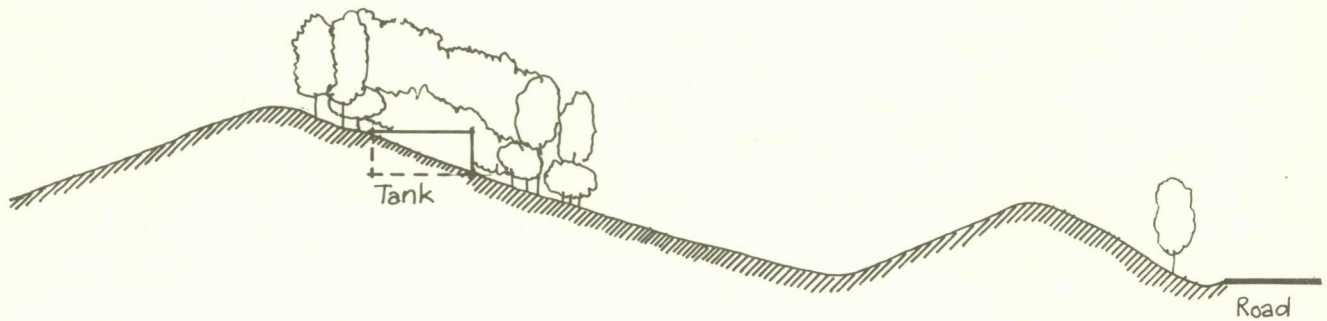


Figure 27 : Desirable

- Locate tanks out of view of main roads.
- Sink tanks below ground level whenever possible.
- Screen tanks with dense vegetation.

**Sewerage**

Sewage treatment works are probably the least visually acceptable of all utilities and they should be totally hidden from public roads and residential areas.

Guideline

- Completely screen sewage treatment works with dense vegetation and screen walls of weathered or stained timber.

**Gas supply**

With no reticulated gas supply in the area, gas is stored in tanks. These can be large fixed installations or portable aluminium gas bottles. All are potentially obtrusive.

Guideline

- Screen gas supply tanks and tank storage areas, with thick vegetation and low screen walls of stone, or timber which is stained or allowed to weather. Figure 28 illustrates this.

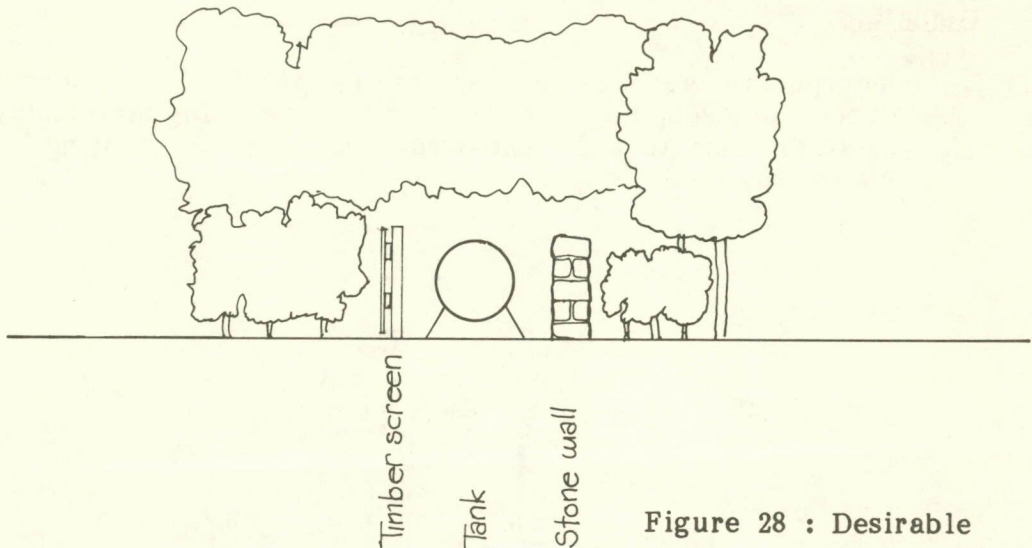


Figure 28 : Desirable

**Garbage collection**

Within residential, commercial and industrial areas, the storage of garbage cans and garbage containers should be entirely hidden from view, either within the curtilage of buildings or by screening.

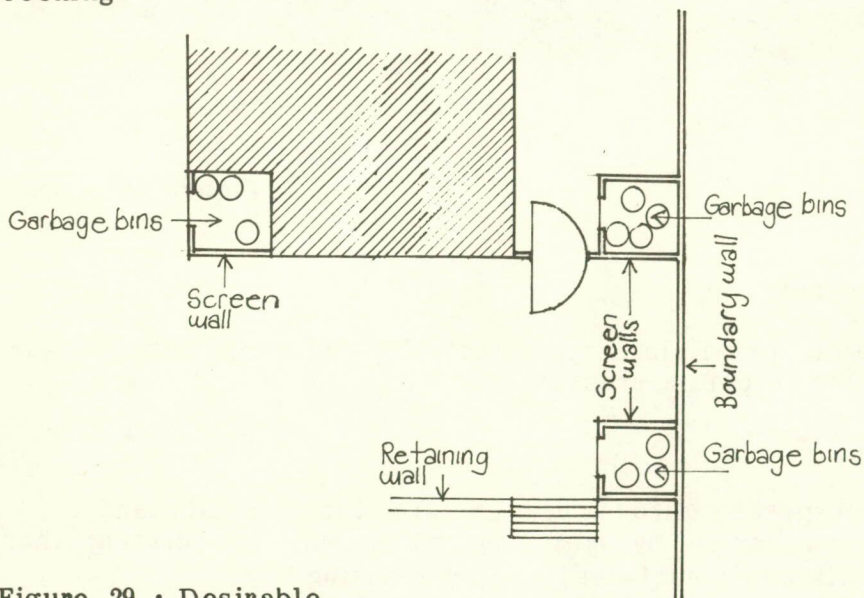


Figure 29 : Desirable



Guidelines (see Figure 29)

- Completely screen garbage cans and garbage containers within the curtilage of developments, or by thick vegetation and screen walls.
- Incorporate screen walls into the building and landscape treatment by using similar materials and by physical links.

Within public areas, garbage containers should be visible, but incorporated into the general landscape treatment.

Guideline

- Incorporate garbage containers in public areas into the overall landscape and urban design by matching materials, by relating them to walls and structures, and by planting. See Figure 30.

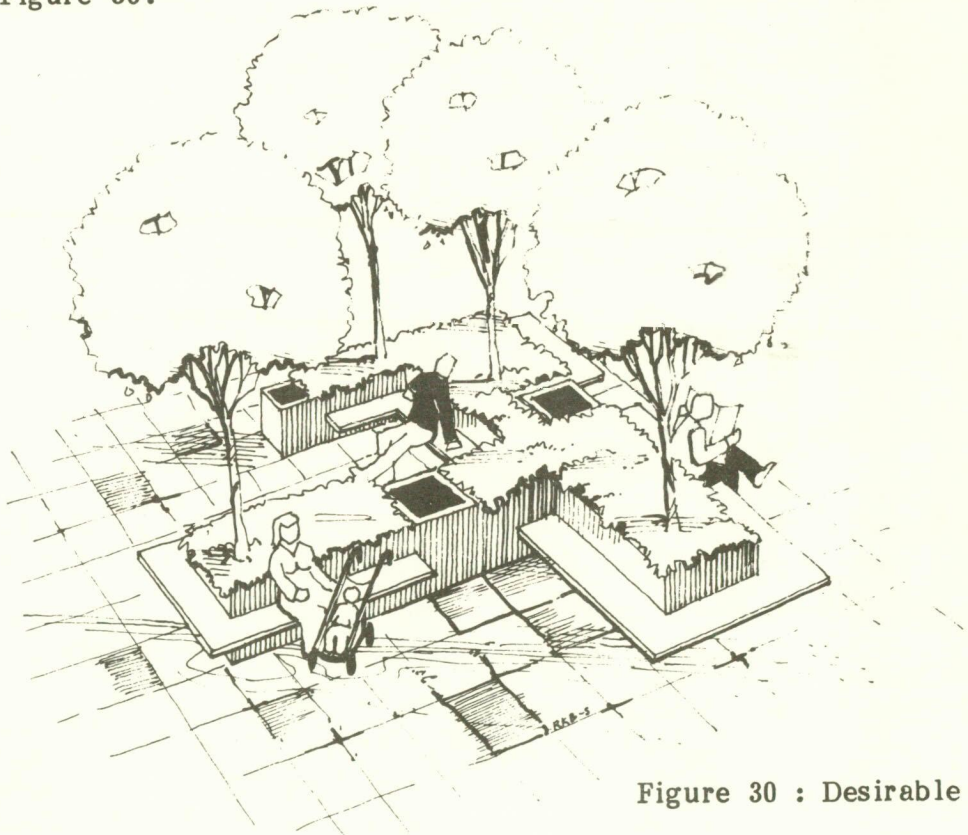


Figure 30 : Desirable

**Fire hydrants**

The same principles apply to fire hydrants as to garbage containers in public areas.

Guideline

- Incorporate fire hydrants into the overall landscape and urban design by matching materials, by relating them to walls and structures, and by planting.

## ACCESS

Roads, footpaths, driveways and in particular car-parking areas are prominent elements of the visual environment. To reduce obtrusive visual effects, the size of each element can be reduced to a minimum, with large elements broken up by differences in paving, levels and by planting.

### Guidelines

- Build roads to minimum design widths commensurate with safety and efficiency. See Department of Environment and Planning Technical Bulletin No. 12.
- Build residential driveways as two concrete wheel tracks separated by grass (rather than 2.5 to 3 metre wide concrete or asphalt drives).
- Modulate car-parking areas by separation into several smaller elements, changing paving material, terracing, low walls and dense tree planting within and around the car parks, as shown in Figure 31.

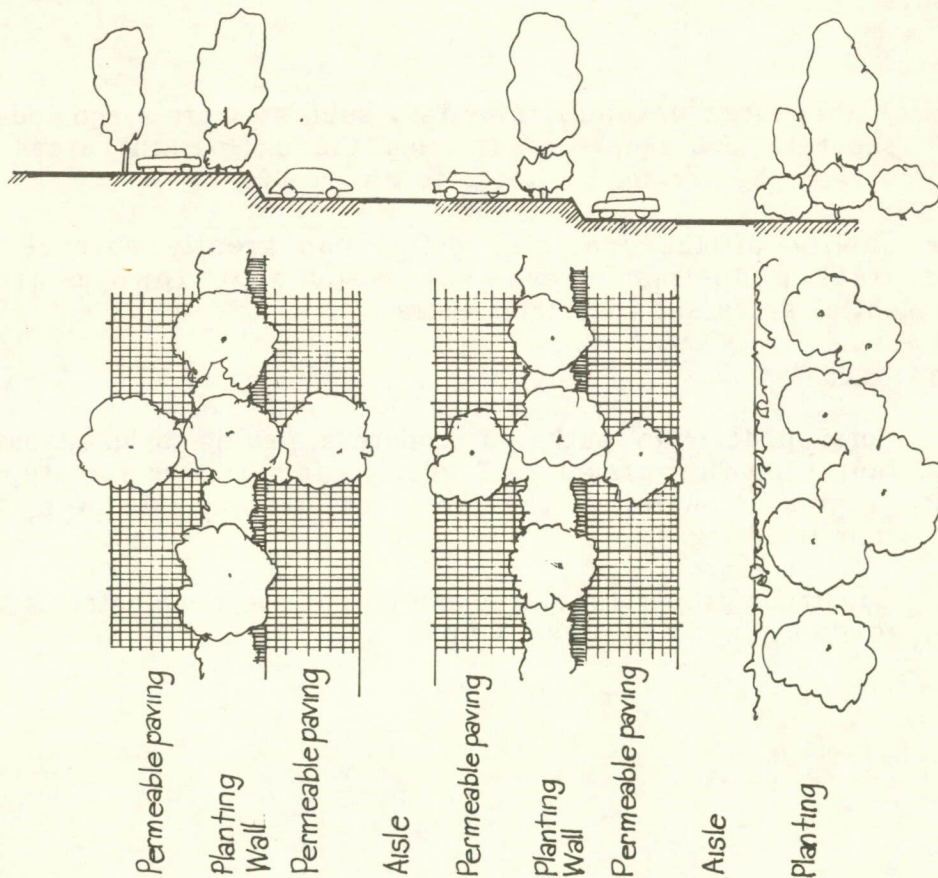


Figure 31 : Desirable



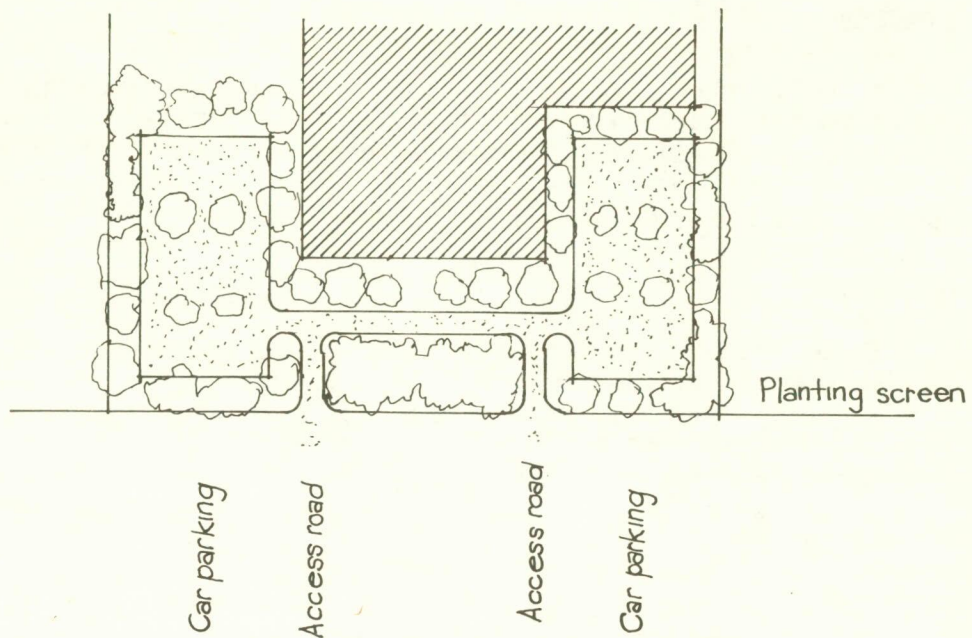


Figure 32 : Desirable

- Within large development sites, such as motels and lodges, separate the access roads from the car-parking areas and screen the parking. Refer to Figure 32.

The quality of the footpath system can greatly enhance and facilitate pedestrian movement throughout town centres, residential areas and industrial areas.

#### Guidelines

- Form pedestrian paths of concrete paving bricks, paving blocks or fine gravel. If gravel, form risers for steps in granite, concrete, brickwork or railway sleepers (not tannilised logs).
- Construct proper footpaths and do not force pedestrians onto roads by landscape treatment.

## **SIGNAGE AND ADVERTISING**

The economy of the Snowy Mountains area is heavily dependent on its scenic quality. Signage and advertising, while an economic necessity, quite often severely detracts from that same scenic beauty by repetition, aggressive garishness and insensitivity to the surroundings.

Along with other aspects of development in the region, consideration should be given to how advertising can contribute to the area rather than detract from it.

It has become a common practice for business chains (notably service stations, car dealerships and building societies) to promote their corporate images by use of standardised layouts and colour schemes regardless of the circumstances. A company's petrol station in Cooma may look exactly the same as one in Cairns. Such advertising detracts from the overall appearance of an area because it ignores its surroundings and it is questionable whether such a policy necessarily enhances the profitability of the business concerned.

For example, a common technique employed by building societies is to cover an existing facade which may be part of a row, in a manner which is completely out of character with the surrounding buildings.

This approach breaks up the continuity of a facade in a streetscape by removal of awnings, the covering of original ornamentation and the application of a limited range of bright colours and inappropriately scaled lettering.

### **Skyline**

Other forms of signage which detract from the visual quality of the area are signs which are large enough to interrupt the skyline.

It is important to consider a proposal in terms of its wider implications, to analyse the significant and worthwhile aspects of the skyline, and to design a sign which complements it without dominating or demanding attention because of garishness or size.

### **Repetition and excessive information**

Many establishments provide a plethora of signage in a variety of sizes, styles and colours, commonly saying the same thing many times. This tendency to repeat signage and attempt to list as many of the services offered as possible clutters the scenery and should be resisted. It also confuses the messages that signs are intended to give.

Signage should be limited to clearly announcing the primary functions of the establishment and should be applied in a consistent style, and in a scale and colour which relates to the circumstances.



### Guidelines

- In rural areas signs should be restricted to a maximum area of 0.2 square metres and a maximum height of 2 metres, not as shown in Figure 33.

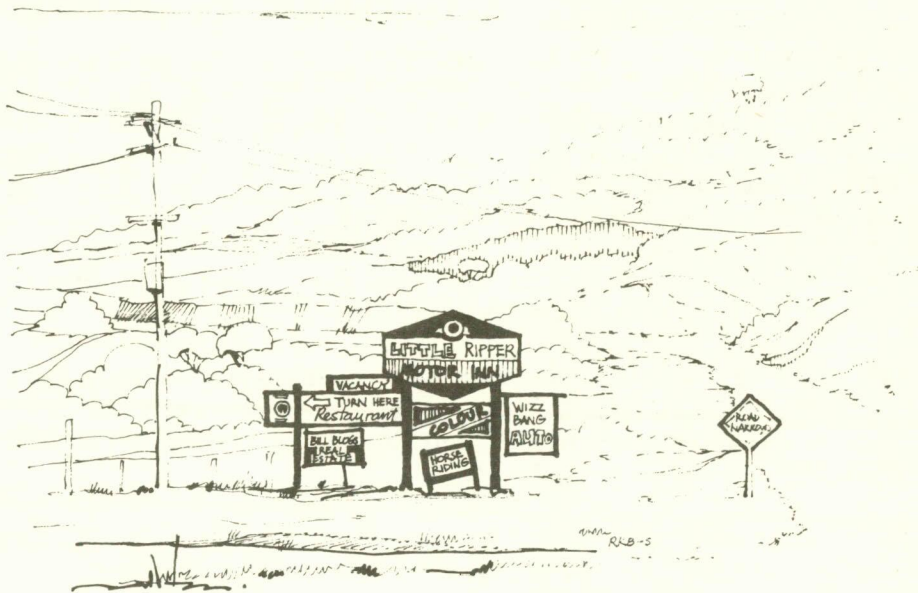


Figure 33 : Undesirable

- Colours should complement the dominant colours of the landscape whether natural or built, and fluorescent paints should be avoided. (See section on "Colour".)
- Signs or advertisements should not protrude above the roof of buildings.
- Signage should not obstruct important sight lines involving visually important areas whether natural or built, rather than as illustrated in Figure 34.

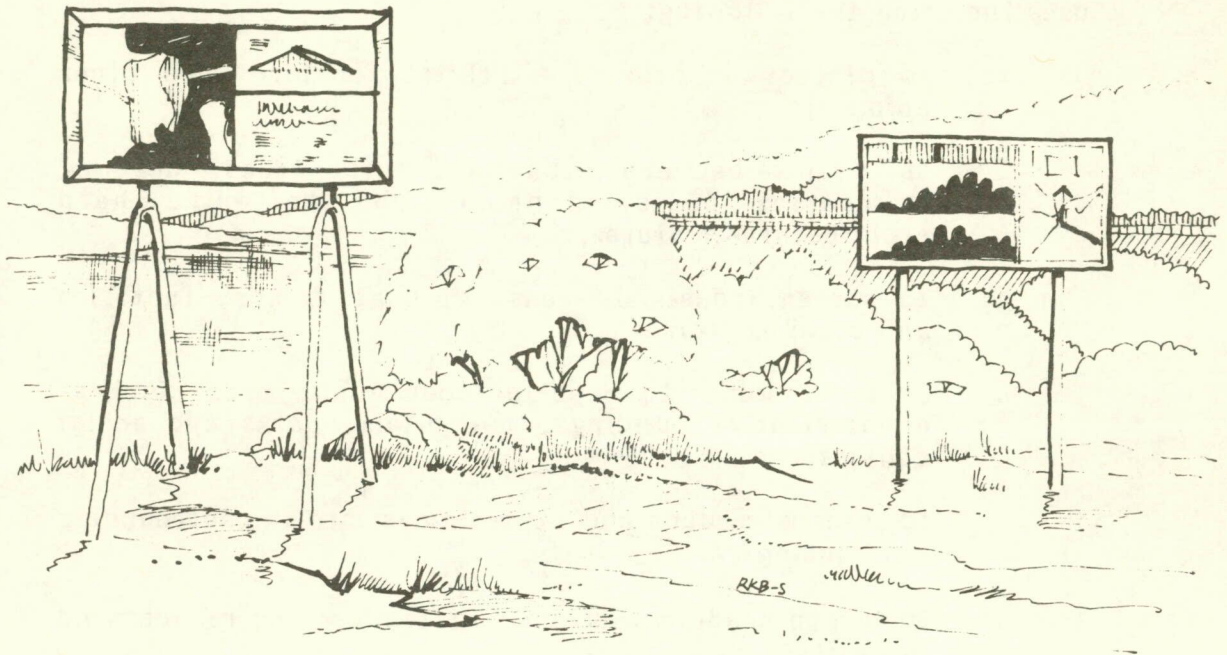


Figure 34 : Undesirable

- Signage should be limited to the name and a brief announcement of the nature of business or activity.
- Freestanding signs should not exceed 5 metres in commercial zones.
- Large signs should be limited to commercial zones.



## LANDSCAPING

While the sympathetic design, siting and colour of new development can achieve a great deal in reducing visual impact in scenic areas, many of the present problems within the area are derived from existing structures built without the benefit of adequate guidelines or planning controls. Appropriate landscaping can hide a multitude of past mistakes as well as soften the impact of new development.

Vegetation, whether natural or planted, has many benefits and uses including the following:

- . to protect or provide a habitat for birds and other animals;
- . as a link between urban and rural areas, defining boundaries of development and softening hard architectural features;
- . to screen industrial areas, garbage dumps, factories and building works;
- . as focal points to important community areas such as administrative buildings, memorials, parks and social centres;
- . to integrate roads and expressways into the surrounding environment;
- . to screen headlamp dazzle, baffle noise and reduce wind intensity;
- . to provide shade during summer and in winter to allow the sun to penetrate in the case of deciduous trees;
- . to define roads and indicate approaching curves or intersections in areas susceptible to fog and mist;
- . to direct movement of pedestrians at points of interest or at approaches to crossings and to separate vehicles from pedestrians;
- . to improve the aesthetic quality of the environment;
- . to break up the mass of large structures or large expanses of hard surface e.g. facades of buildings such as supermarkets and bitumen-clad car parks; and
- . to provide privacy for residential or commercial environments.

Plants for landscaping should be chosen with the following parameters in mind:

- . appropriateness for location;

- . suitability for purpose e.g. screening, delineating pathways;
- . drought tolerance;
- . frost hardiness;
- . ease of maintenance; and
- . attractiveness.

Much of the region is within Kosciusko National Park where conservation of native vegetation is a major priority. The planting of exotic species in or close to the Park in the past has led to considerable management problems. Many of these species, particularly willows and poplars, propagate freely and spread quickly along roads and watercourses. While we may admire their soft spring growth and autumn colour they are better restricted to urban areas outside the Park and to those rural areas where they have become a traditional element in the landscape.

The vertical emphasis and rich colours of trees like poplars and many conifers may clash with native vegetation or granite outcrops, but may be very appropriate in treed farmland with little topographic relief. Here they enhance the landscape as shelter belts or specimen trees and provide welcome relief and flashes of colour or different texture. Rows of Lombardy poplars sit particularly well in the undulating to flat countryside of the Monaro and produce a spectacular display in autumn against the clear blue sky.

Plant material in the area must be able to withstand both extremes of temperature and lengthy periods without water, as experienced during the prolonged drought of the early 1980s. Since many properties in the area have landlords or owners who are absent except during particular seasons, it is most important that landscape treatments should require minimum maintenance. Species which need regular pruning, frequent pest control measures or constant watering should be avoided unless such maintenance is readily available.

Appendix A provides information on the climate, soils and vegetation of the area.

#### Guidelines

- . Prepare landscaping plans for all new development, including single occupancy residential dwellings.
- . Choose plant species appropriate for the location and suitable for the intended landscape function. Careful consideration should be given to frost hardiness, drought tolerance, disease resistance, ease of maintenance and attractiveness.



- . Avoid using exotic or non-local native plant species in areas where they might spread into national parks or nature reserves.
- . Avoid planting large trees close to structures where they might later cause physical damage.
- . Avoid planting active water-seeking trees and shrubs in areas where they might invade water or sewer pipes.
- . Avoid planting highly inflammable plant species in areas where they might increase the threat to property in the event of bushfires.

Table 2 lists plant species - ground covers, climbers, rockery plants, water feature plants, shrubs and trees which are worth trying in the area. They have been selected either because they are listed in published works as having both drought resistance and frost hardiness or because they are proven performers in similar environments, notably that of Canberra.

Advice on nurseries supplying plants suitable for the Snowy Mountains area may be obtained from local councils, the Forestry Commission of New South Wales or the Yellow Pages sections of the Telephone Directories for Cooma, Canberra, Eden and Braidwood districts.

Availability of plants will vary in different parts of the region. It is also advisable to check with nurseries or local councils about the suitability of planting certain species close to buildings, under power lines or near sewers and drains.

TABLE 2

**Plants Suitable for Landscaping in the  
Snowy Mountains Area**

Native trees taller than 10 metres

Acacia melanoxyton  
 Araucaria bidwillii  
 Callitris columellaris inland race  
 C. endlicheri  
 Eucalyptus cinerea subsp. cinerea  
 E. delegatensis  
 E. dives  
 E. elata  
 E. fastigata  
 E. globulus subsp. bicostata  
 E. globulus subsp. maidenii  
 E. mannifera subsp. maculosa  
 E. mannifera subsp. mannifera  
 E. melliodora  
 E. pauciflora subsp. pauciflora  
 E. radiata subsp. radiata  
 E. radiata subsp. robertsonii  
 E. rossii  
 E. rubida  
 E. sieberi  
 E. stellulata  
 E. tereticornis  
 E. viminalis subsp. viminalis

Native trees lower than 10 metres

Acacia baileyana  
 A. dealbata  
 A. decurrens  
 A. mearnsii  
 A. parramattensis  
 A. pycnantha  
 Allocasuarina torulosa  
 Backhousia myrtifolia  
 Banksia marginata  
 Callistemon "Dawson River"  
 C. "Hannah Ray"  
 C. "Lilacinus"  
 C. paludosus  
 C. "Prolific"  
 Eucalyptus alpina  
 E. pauciflora subsp. debeuzevillei  
 E. pauciflora subsp. niphophila  
 E. stricta  
 E. sturgissiana  
 Melaleuca linariifolia  
 Pittosporum undulatum  
 Prostanthera lasianthos



Native shrubs taller than 3 metres

Acacia fimbriata var. fimbriata  
 A. pravissima  
 Banksia ericifolia  
 Callistemon citrinus  
 C. citrinus "Endeavour"  
 C. "Dawson River"  
 C. "Lilacinus"  
 C. macropunctatus  
 Grevillea "Cascade"  
 G. "Hookerana"  
 G. "Ivanhoe"  
 G. "Johnsonii"  
 Hakea dactyloides

Native shrubs between 1 metre and 3 metres

Acacia boormanii  
 A. buxifolia subsp. buxifolia  
 A. elongata var. elongata  
 A. longifolia var. longifolia  
 A. vestita  
 Baeckea linifolia  
 Banksia spinulosa  
 Callistemon "Burgundy"  
 C. "Candy Pink"  
 C. Captain Cook  
 C. citrinus "Austraflora Firebrand"  
 C. "Harkness"  
 C. Kings Park Special  
 C. Mauve Mist  
 C. pallidus  
 C. Reeves Pink  
 C. sieberi  
 C. Western Glory  
 Calytrix tetragona  
 Correa alba var. alba  
 C. reflexa var. reflexa  
 Dodonaea viscosa var. angustifolia  
 D. viscosa var. arborescens  
 Eriostemon myoporoides subsp. myoporoides  
 Goodia lotifolia  
 Grevillea arenaria  
 G. aspleniifolia  
 G. Boongala Spinebill  
 G. Canberra Gem  
 G. Clearview David  
 G. Clearview Robin  
 G. Evans Coronet  
 G. glabella Limelight  
 G. juniperina  
 G. Pink Pearl  
 G. Poorinda Constance  
 G. Poorinda Queen  
 G. rosmarinifolia southern race

Kunzea ambigua  
 Lambertia formosa  
 Leptospermum flavescens  
 Melaleuca bracteata "Golden Gem"  
 M. bracteata "Revolution Gold"  
 M. bracteata "Revolution Green"  
 M. capitata  
 Olearia phlogopappa  
 Phebalium squamulosum subsp. squamulosum  
 Podocarpus lawrencei  
 Prostantera lasianthos  
 P. ovalifolia  
 Telopea mongaensis  
 Westringia brevifolia "Raleighii"  
 W. eremicola

Native shrubs less than 1 metre

Allocasuarina nana  
 Bauera rubioides var. rubioides  
 Blandfordia nobilis  
 Boronia anemonifolia var. anemonifolia  
 Callistemon citrinu "Anzac"  
 C. subulatus  
 Crowea exalata  
 Diplarrena moroea  
 Epacris impressa  
 Grevillea alpina  
 G. baueri  
 G. lanigera  
 Helichrysum bracteatum "Dargan Hill Monarch"  
 Hibbertia obtusifolia  
 Isopogon anemonifolius  
 I. anethifolius  
 Kunzea capitata  
 Leptospermum flavescens "Pacific Beauty"  
 Lomandra longifolia subsp. longifolia  
 Lomatia myricoides  
 Melaleuca linariifolia  
 Patersonia fragilis  
 P. glabrata  
 P. longifolia  
 Ricinocarpos bowmanii  
 Sowerbaea juncea  
 Stylidium graminifolium  
 Stypantra glauca  
 Swainsona galegifolia  
 Westringia lucida

Native ground covers

Acacia alpina  
 A. pravissima  
 Acaena anserinifolia  
 Allocasuarina nana  
 Bauera rubioides var. rubioides  
 Billardiera scandens



Brachycome scapiformis  
 Clematis aristata  
 Danthonia pallida  
 Gonocarpus elatus  
 Goodenia hederacea subsp. hederacea  
 Grevillea australis var. brevifolia  
 G. baueri  
 G. juniperina  
 G. juniperina "Austraflora Lunar Light"  
 G. juniperina "Molonglo"  
 G. juniperina "Pink Lady"  
 Hardenbergia violacea  
 Helichrysum bracteatum "Diamond Head"  
 Kennedia retrorsa  
 Kunzea muelleri  
 Kunzea sp. "Badja Carpet"  
 Leptospermum flavescens "Pacific Beauty"  
 Micromyrtus ciliata  
 Muehlenbeckia axillaris  
 Potentilla anserina  
 Rhagodia nutans form a  
 Scaevola albida  
 Viola hederacea

Native rockery plants

Dichosciadium ranunculaceum  
 Diplaspis hydrocotyle  
 Dracophyllum minimum  
 D. secundum  
 Goodenia hederacea  
 Helichrysum acuminatum  
 Helipterum anthemoides  
 Parahebe perfoliata  
 Pelargonium australe  
 Pentachondra pumila  
 Plantago muelleri  
 Podolepis robusta  
 Psoralea adscendens  
 Ranunculus graniticola  
 Rubus gunnianus  
 Senecio lautus subsp. maritimus  
 Stackhousia monogyna  
 S. pulvinaris  
 Stylidium graminifolium  
 Viola betonicifolia  
 Wahlenbergia floriosa

Native aquatic plants and plants suitable for water features

Blechnum penna-marina  
 Caltha introloba  
 Carex gaudichaudiana  
 Danthonia nivicola  
 Polystichum proliferum  
 Schoenus calyptratus

Native climbers

Billardiera scandens  
 Clematis aristata  
 Hardenbergia violacea  
 Pandorea pandorana subsp. pandorana

Introduced trees taller than 10 metres

Acer negundo  
 A. platanoides  
 A. pseudoplatanus  
 Aesculus hippocastanum  
 Araucaria araucana  
 Betula papyrifera  
 B. pendula  
 B. pubescens  
 Calocedrus decurrens  
 Castanea sativa  
 Cedrus atlantica  
 C. atlantica "Glauca"  
 C. deodara  
 Celtis australis  
 Chamaecyparis lawsoniana  
 Cladrastis lutea "Rosea"  
 Cupressus arizonica  
 C. goveniana  
 C. lusitanica  
 C. macrocarpa  
 C. sempervirens "Stricta"  
 C. torulosa  
 Fagus sylvatica "Purpurea"  
 Fraxinus americana  
 F. excelsior  
 F. excelsior "Aurea"  
 F. ornus  
 F. oxycarpa  
 F. oxycarpa "Raywoodii"  
 F. pennsylvanica  
 Ginkgo biloba  
 Gleditsia triacanthos  
 G. triacanthos var. inermis  
 G. triacanthos "Sunburst"  
 Juniperus chinensis  
 J. virginiana  
 Koelreuteria paniculata  
 Larix decidua  
 L. x eurolepis  
 Liquidambar styraciflua  
 Liriodendron tulipifera  
 Maclura pomifera  
 Morus alba  
 Nyssa sylvatica  
 Oxydendrum arboreum  
 Parrotia persica  
 Phellodendron amurense



*Picea abies*  
*Picea engelmannii*  
*P. pungens* "Glauca"  
*Pinus canariensis*  
*P. cembroides*  
*P. contorta*  
*P. halepensis*  
*P. mugo*  
*P. nigra* subsp. *laricio*  
*P. pinaster*  
*P. pinea*  
*P. ponderosa*  
*P. radiata*  
*P. roxburghii*  
*P. strobus*  
*Pistacia chinensis*  
*Platanus x acerifolia*  
*P. orientalis* "Cyprus"  
*Platycladus orientalis*  
*Populus alba*  
*P. canescens*  
*P. deltoides*  
*P. euroamericana*  
*P. nigra* "Italica"  
*P. simonii* "Fastigiata"  
*P. tremula*  
*P. tremuloides*  
*P. trichocarpa x maximowiczii*  
*P. yunnanensis*  
*Prunus avium*  
*Pseudotsuga menziesii*  
*Pyrus calleryana*  
*P. ussuriensis*  
*Quercus cerris*  
*Q. coccinea*  
*Q. ilex*  
*Q. lusitanica*  
*Q. palustris*  
*Q. robur*  
*Q. rubra*  
*Q. suber*  
*Q. virginiana*  
*Robinia pseudoacacia*  
*Salix alba*  
*S. alba* var. *calva*  
*S. alba* var. *vitellina*  
*S. alba* var. *vitellina* "Pendula"  
*S. babylonica*  
*S. chilensis*  
*Sophora japonica*  
*S. microphylla*  
*S. tetraphylla*  
*Sorbus aucuparia*  
*S. decora*  
*S. domestica*  
*S. intermedia*

*S. mougeotii*  
*Taxus baccata*  
*Thuja plicata*  
*Thujopsis dolabrata*  
*Tilia cordata*  
*T. x europaea*  
*Ulmus glabra* "Lutescens"  
*U. pumila*  
*Zelkova serrata*

Introduced trees lower than 10 metres

*Acer buergeranum*  
*A. ginnala*  
*Amelanchier canadensis*  
*Aralia elata*  
*Arbutus unedo*  
*Carpinus betulus*  
*Celtis sinensis*  
*Ceratonia siliqua*  
*Cercis canadensis*  
*C. siliquastrum*  
*Chamaecytisus proliferus*  
*Chionanthus retusus*  
*Cordyline australis*  
*Cotinus coggygria*  
*C. obovatus*  
*Crataegus crus-galli*  
*C. laevigata*  
*C. phaenopyrum*  
*Elaeagnus angustifolia*  
*E. pungens* "Gilt Edge"  
*E. pungens* "Limelight"  
*Euonymus japonica* "Aureovariegata"  
*Fraxinus syriaca*  
*F. velutina*  
*Hoheria populnea*  
*Ilex aquifolium*  
*I. pedunculosa*  
*Juniperus communis*  
*J. scopulorum*  
*Koelreuteria elegans*  
*Laburnum anagyroides*  
*Magnolia delavayi*  
*M. sieboldii*  
*Malus floribunda*  
*M. toringoides*  
*Olea europaea*  
*Photinia glabra* "Rubens"  
*Pittosporum eugenioides* "Variegatum"  
*Prunus x blireiana*  
*P. cerasifera* "Moseri"  
*P. cerasifera* "Nigra"  
*P. cerasifera* "Pissardii"  
*P. cerasifera* "Pollardii"  
*P. laurocerasus*



*P. lusitanica*  
*P. mume*  
*P. spinosa* "Purpurea"  
*Pyracantha atalantoides*  
*P. crenulata*  
*Salix matsudana* "Tortuosa"  
*Styrax japonicus*  
*Tamarix chinensis*  
*Trachycarpus fortunei*  
*Ulmus parvifolia*

Introduced shrubs between 1 and 3 metres

*Abelia x grandiflora*  
*Berberis thunbergii* "Atropurpurea"  
*Choisya ternata*  
*Cotoneaster franchetii*  
*C. glaucophylla*  
*C. horizontalis*  
*C. pannosa*  
*C. serotinus*  
*Escallonia rubra* var. *macrantha*  
*Hibiscus syriacus*  
*Jasminum mesneyi*  
*J. primulinum*  
*Mahonia aquifolium*  
*Nandina domestica*  
*Photinia glabra* "Robusta"  
*Pyracantha angustifolia*  
*P. coccinea* "Lalandei"  
*P. fortuneana*  
*P. koidzumii*  
*P. rogersiana*  
*P. rogersiana* "Flava"  
*Rhapis excelsa*  
*Rosa* species and cultivars  
*Spiraea cantoniensis*  
*Teucrium fruticans*  
*Viburnum tinus*  
*Vitex agnus-castus*  
*Yucca aloifolia*  
*Y. glauca*  
*Y. recurvifolia*

Introduced climbers

*Clematis montana* cultivars  
*Hedera helix* cultivars  
*Lonicera japonica*  
*Parthenocissus quinquefolia*

**TIDYING UP**

Many Australian properties, in both urban and rural environments are eyesores because they are littered with an assortment of discarded materials and equipment such as old car bodies, water tanks, containers, farm machinery, building timber and iron etc.

Tidying up around buildings, particularly those visible from roads and railways makes good sense. It not only reduces the visual impact caused by accumulated clutter but also makes the area safer by discouraging vermin and removing safety hazards. A well-kept dwelling and property is also easier to maintain and landscape.



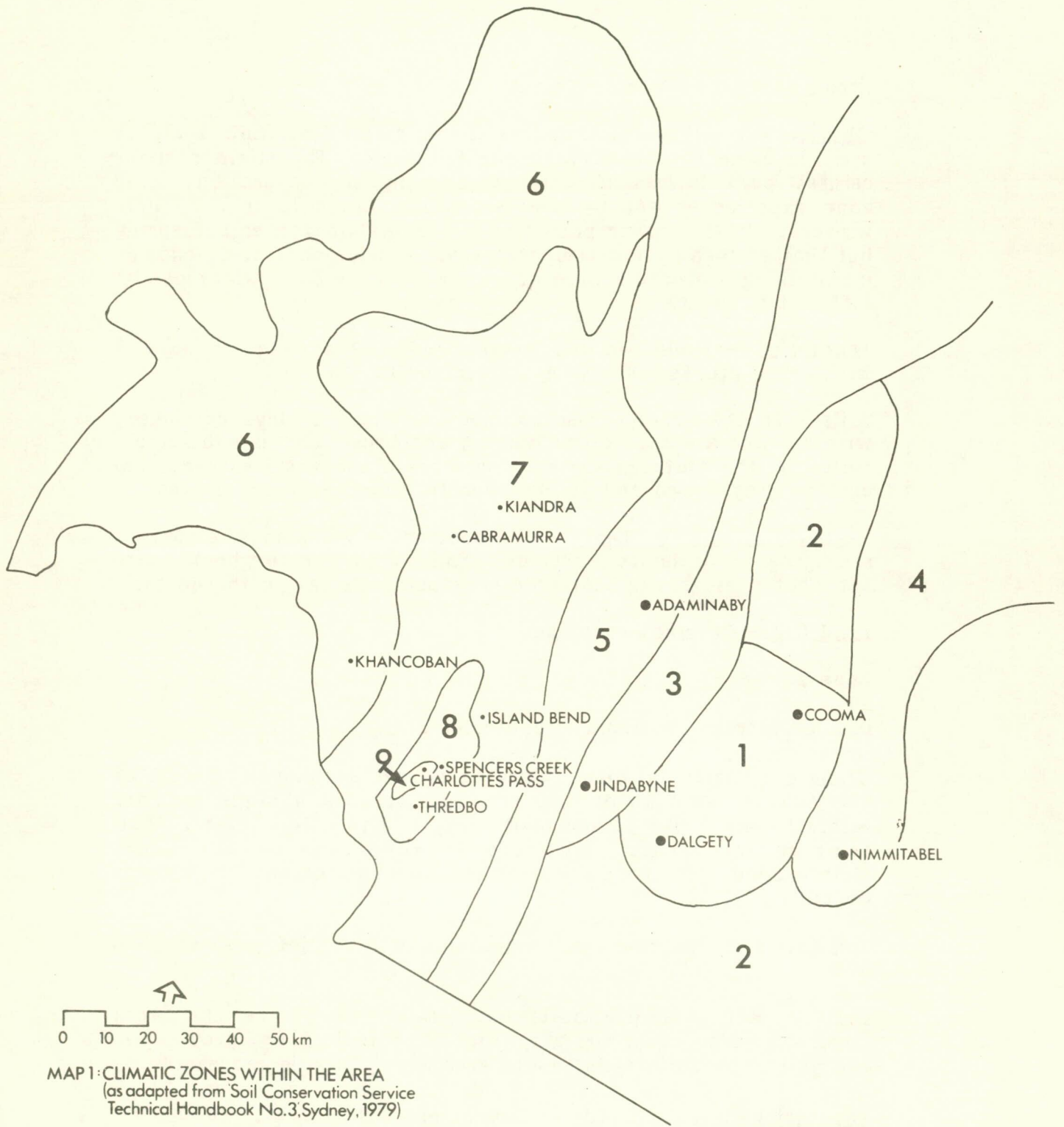
**APPENDIX A**

**CLIMATIC, SOIL AND VEGETATION CHARACTERISTICS OF THE  
SNOWY MOUNTAINS AREA**

**TABLE 3**  
**Elevations, Median Annual Rainfall and Ranges of Maximum and Minimum Temperature for Selected Centres Within the Snowy Mountains Area**

ZONE	LOCATION	ELEVATION (Metres above sea level)	RAINFALL (Median annual in mm.)	TEMPERATURE (Celsius)			
				Maximum		Minimum	
				Lowest	Highest	Lowest	Highest
1	Cooma North (Snowy Mountains Authority)	839	521	9.7	25.7	-0.5	11.2
	Berridale	914	579				
2	Bombala		609				
3	Jindabyne	1006	602				
4	Nimmitabel						
5	Adaminaby	1006	701				
6	Khancoban (Snowy Mountains Authority) Tumbarumba	336	1023	11.0	29.7	0.8	12.1
7	Cabramurra (Snowy Mountains Authority)	14663	1591	3.5	19.2	-1.4	9.9
	Island Bend	1249	1250	5.8	22.3	-3.1	6.5
	Kiandra (Chalet)	1395	1598	4.1	21.1	-4.4	6.0
	Perisher Village	1718	1917	1.9	18.6	-5.8	6.4
8	Spencers Creek	1767	1742	1.0	16.4	-4.6	5.8
	Thredbo (Crackenback)	1956	1446	0.0	15.7	-5.4	7.1
9	Charlottes Pass	1758	2173	2.4	17.6	-5.6	6.4





MAP 1: CLIMATIC ZONES WITHIN THE AREA  
 (as adapted from Soil Conservation Service  
 Technical Handbook No.3, Sydney, 1979)

TABLE 4

## General Characteristics of the Climatic Zones

## Zone 1

Urban Centres - Cooma, Dalgety.

Climate - The long-term median annual rainfall for Cooma at 484 mm. is close to the average for the zone. The slight summer rainfall peak is less effective due to higher evaporation. The zone experiences hot to mild summers, and mild to very cold winters. Plant growth potential is greatest in winter and spring but limited then by low temperatures. Erosion control depends on maintaining protective vegetation cover on the soil, which can be difficult in summer.

Landforms - Plains in the north, and plateaus and mountains with relief greater than 60m. in the south.

Soils - In the northern sector, grey and brown clays dominate, with smaller areas of black earths, red-brown earths and solodic soils. In the southern sector, there are kraznozems and acid red earths, grey-brown and yellow podzolic soils and black earths.

Vegetation/Grazing Lands - Woodlands, grasslands/temperate shortgrass (Danthonia - Stipa - Enneapogon) throughout, with xerophytic midgrass (Danthonia - Chloris - Stipa) to the north.

Land Use - Grazing, cropping.

## Zone 2

Urban Centres - Bombala, Countegany.

Climate - Bombala with a long-term median annual rainfall of 609 mm. is typical of the zone. There is a slight summer rainfall peak, with hot summers and mild to cold winters. Low temperatures limit plant growth for much of the year. Maintenance of ground cover is most important in erosion control.

Landforms - Plateaus and mountains with relief greater than 60m.

Soils - Red podzolic soils and prairie soils are the most common. Also occurring are lithosols, solodic soils, grey-brown and yellow podzolic soils, and kraznozems and acid red earths.

Vegetation/Grazing Lands - Dry sclerophyll forest, woodlands, wet sclerophyll forest/temperate shortgrass (Danthonia - Stipa - Enneapogon) throughout, with temperate tallgrass (Themeda - Poa).

Land Use - Cropping, grazing, forestry.



TABLE 4 (cont.)

## General Characteristics of the Climatic Zones

## Zone 3

Urban Centres - Jindabyne (also Canberra, Bungendore).

Climate - Jindabyne with a long-term median annual rainfall of 576 mm. is typical of the zone. Rainfall is spread evenly throughout the year with a slight October peak. The zone experiences hot summers and mild to cold winters. Plant growth is limited by low winter temperatures and inadequate moisture from January to March. Erosion tends to be greatest in summer because of high intensity storms and reduced ground cover resulting from low moisture status.

Landforms - Mainly hill lands with relief less than 60m.

Soils - Dominated by solodic soils in the north, red podzolic soils in the centre, and grey-brown and yellow podzolic soils in the south.

Vegetation/Grazing Lands - Woodlands, wet sclerophyll forest/temperate shortgrass (Danthonia - Stipa - Enneapogon) throughout, with temperate tallgrass (Themeda - Poa) to the south.

Land Use - Cropping, grazing.

## Zone 4

Urban Centres - Nimmitabel (also Araluen, Braidwood, Captains Flat, Goulburn).

Climate - Braidwood, outside the area, has a long-term median annual rainfall of 675 mm. and is illustrative of the zone. There is no real pattern of rainfall reliability but falls are most variable in late summer and autumn. Low soil moisture limits plant growth in the warmer months and low temperatures limit growth from May to November. Reduction in ground cover because of dry seasonal conditions and grazing pressure can lead to summer erosion as a result of high intensity rainfall.

Landforms - Ranges and mountains all with relief greater than 60m.

Soils - In the south grey-brown and yellow podzolic soils dominate, with red podzolic and solodic soils also occurring.

Vegetation/Grazing Lands - Woodlands, dry sclerophyll forest, wet sclerophyll forest/temperate shortgrass (Danthonia - Stipa - Enneapogon) to the north and temperate tallgrass (Themeda - Poa) to the south.

Land Use - Cropping, grazing, forestry.

TABLE 4 (cont.)

## General Characteristics of the Climatic Zones

## Zone 5

Urban Centres - Adaminaby (also Cavan, Gunning, Gundagai, Holbrook, Albury).

Climate - Albury with a long-term median annual rainfall of 695 mm. is typical of this zone. A winter rainfall peak with less variability in the cooler months, and mild summers and cold winters are experienced. Plant growth is restricted by low soil moisture in summer and early autumn and by low temperatures in winter. Late autumn and spring are the most favourable periods for plant growth.

Landforms - Lowlands with relief less than 30m., hill lands with relief less than 60m. and mountains with relief greater than 60m.

Soils - Dominated by podzolic soils and lithosols.

Vegetation/Grazing Lands - Dry and wet sclerophyll forests and woodlands/ temperate tallgrass (Themeda - Poa) and temperate shortgrass (Danthonia - Stipa - Enneapogon).

Land Use - Grazing, cereal cropping, orchards.

## Zone 6

Urban Centres - Khancoban (also Tumbarumba, Tumut, Burrinjuck Dam).

Climate - Tumbarumba, with a long-term median annual rainfall of 937 mm. is typical of this zone. Rainfall at Khancoban (987mm.), as for the rest of the zone, is high and reliable with a winter peak. Runoff from catchments is likely to occur frequently. Soil moisture is adequate for plant growth throughout the year but severely constrained from May to September by low temperatures. Mild summers and cold winters are the norm, with best plant growth during summer. As soon as ground cover is removed by cultivation or earthmoving, the erosion risk is high.

Landforms - Hill lands with relief less than 60m. and mountains with relief less than 60m.

Soils - Dominated by red podzolic soils with minor occurrences of kraznozems and solodised soils.

Vegetation/Grazing Lands - Wet sclerophyll forest/temperate tallgrass (Themeda - Poa).

Land Use - Conservation, grazing, forestry, orchards, horticulture, catchment.



TABLE 4 (cont.)

## General Characteristics of the Climatic Zones

## Zone 7

Urban Centres - Kiandra, Cabramurra, Island Bend.

Climate - Kiandra, with a long-term median annual rainfall of 1598 mm. and Cabramurra with 1591 mm. show definite winter peaks, with winter rainfall also more variable. Mild summer and very cold winter temperatures are experienced. There is adequate soil moisture for plant growth for all months, even February, the driest. Low temperatures depress plant growth to less than half potential from mid-autumn to mid-spring, but cause only minor restrictions at other times. Low temperatures and wind exposure severely limit the range of species which may be grown successfully.

Landforms - Mountains with relief greater than 60m.

Soils - Mainly red podzolic soils with some alpine humus soils.

Vegetation/Grazing Lands - Wet sclerophyll forest, sub-alpine woodlands/temperate tallgrass (Themeda - Poa), sub-alpine sodgrass (Poa - Danthonia) and heaths and sedgeland.

Land Use - Conservation, grazing, forestry, orchards, recreation, catchment.

## Zone 8

Urban Centres - Spencers Creek, Thredbo (Crackenback).

Climate - Rainfall figures for these two localities should be treated with caution since data are for short periods of only 5 and 10 years respectively. Median annual rainfall is 1446 mm. at Thredbo and 1742mm. at Spencers Creek, high throughout the year with late winter and early spring peak. Mild summers and very cold winters are usual. Catchment runoff probability is high for most of the year. Low temperatures impose severe restrictions on plant growth for most of the year, with virtually no growth from May to October. Erosion potential is critical if ground cover is reduced.

Landforms - Mountains with relief greater than 60m.

Soils - Alpine humus soils.

Vegetation/Grazing Lands - Sub-alpine woodlands, wet sclerophyll forest/sub-alpine sodgrass (Poa - Danthonia) and heath and sedgeland.

Land Use - Conservation, recreation.



TABLE 4 (cont.)

## General Characteristics of the Climatic Zones

## Zone 9

Urban Centres - Charlottes Pass.

Climate - The median annual rainfall for Charlottes Pass, the only station in this zone, is 2173mm. over 14 years. Rainfall is high throughout the year with a winter peak - the median for October is almost double that of February. There is a high chance of catchment runoff throughout the year. Mild summers and very cold winters are typical. Low temperatures severely restrict plant growth throughout the year, with minimal growth from May to October. The risk of erosion is minor if ground cover is maintained but extreme if reduced.

Landforms - Mountains with relief greater than 60m.

Soils - Alpine humus soils.

Vegetation/Grazing Lands - Alpine herbfields, tussock grasslands, sub-alpine woodlands/ sub-alpine sodgrass (Poa - Danthonia) and heaths and sedgeland.

Land Use - Conservation, catchment, recreation.

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