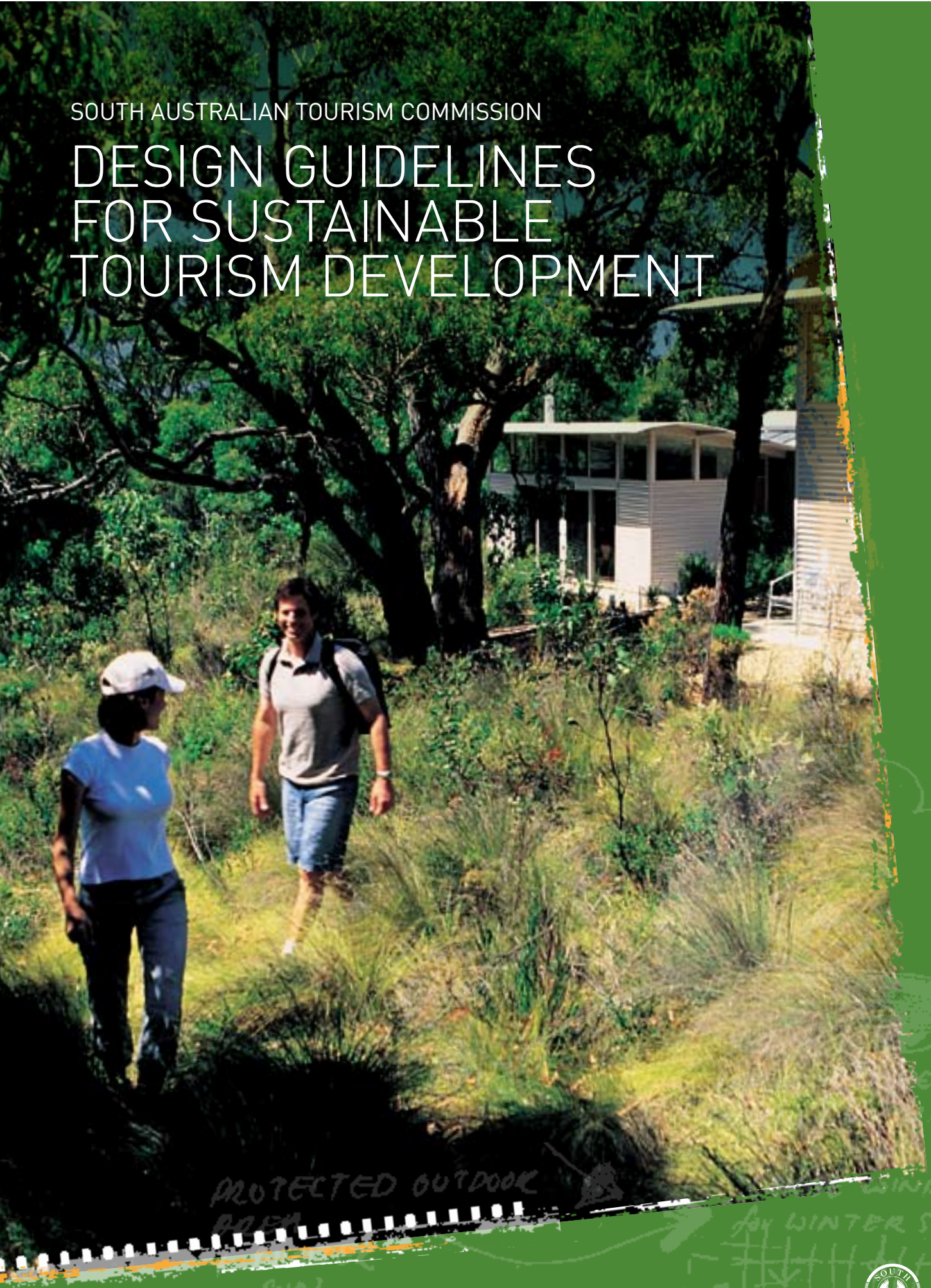
SOUTH AUSTRALIAN TOURISM COMMISSION

DESIGN GUIDELINES FOR SUSTAINABLE TOURISM DEVELOPMENT



January 2007

Government of South Australia

South Australian Tourism Commission

The Sustainable Tourism Package

The Design Guidelines are a key part of South Australia's 'Sustainable Tourism Package'.

The Sustainable Tourism Package is a series of aligned initiatives and projects designed to ensure the sustainable development of tourism consistent with South Australia's vision to be an inspirational leader in innovative and sustainable tourism.

These guidelines are supported by an electronic database that provides information on a range of environmentally sound technologies suitable for tourism development – www.tourism.sa.gov.au/tourism

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FOREWORD

One of the key challenges and opportunities for the South Australian tourism industry is to develop new product that can meet the growing market demand for unspoilt and authentic destinations.

South Australia's variety of unique natural and cultural attractions ensure that the State is well placed to develop innovative tourism product that can satisfy this growing market.

There is, however, a responsibility on all those involved in tourism development to ensure that tourism is more sustainable. This is not just about controlling and managing any negative impacts. Tourism is in a special position to benefit local communities economically and socially, as well as raising awareness and support for conservation.

The South Australian Tourism Commission is taking a leading role in encouraging the private sector and other stakeholders to respond to sustainability issues. Sustainable tourism development and growth is at the heart of the State's tourism strategy.

The *Design Guidelines for Sustainable Tourism* aim to encourage and assist the private sector to undertake small to medium-sized sustainable tourism developments that are consistent with the State's tourism strategy.

Government of South Australia

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Banrock Station Wine & Wetland Centre, Riverland, South Australia

1. INTRODUCTION

This chapter provides the reader with a general introduction on sustainable tourism and design and describes South Australia vision for tourism.

PURPOSE

Despite the strong interest in sustainable tourism there remains a degree of uncertainty over how to make tourism more sustainable.

The Design Guidelines will assist tourism developers understand how to respond to the key issues involved in the design of sustainable tourism developments.

The guidelines draw on the experiences and knowledge gained from site visits and interviews with tourism managers and owners who have sought to design and operate their facilities in a sustainable manner. This is reflected throughout the guidelines in the photos, illustrations and the case studies.

The guidelines are intended to be most useful for:

- Developers of new tourism product
- Existing tourism industry operators considering upgrading
- Architects and building design consultants
- Local and State Government planners involved in preparing planning policy and assessing development applications.

The guidelines are not a statutory planning document, however it is intended that they will play an important role during the development assessment process. Their use by developers and assessment authorities will enable a shared understanding of the key issues involved in the design of a sustainable tourism development.

These guidelines are not a substitute for professional advice. Specialist advice is essential to bring the required level of expertise to a project.

However, their use will enable developers or project managers to understand the issues, guide professionals and review their work.

OUTLINE

The guidelines have been prepared in three parts.

Chapters 1 to 4 provide the reader with a general introduction to the concept of sustainable tourism and begin to explore some of the key issues involved in the design of a sustainable tourism development.

Three related factors are identified as playing a key role in ensuring a successful development concept is achieved. These include understanding and targeting the market; the desired experience; and sense of place.

This part also introduces some basic concepts in sustainable design with a particular focus on the first essential steps in the process; climate analysis, locality analysis and site analysis.

The Design Guidelines in Chapter 5 are in many ways the core of the document. They build on the information contained in the earlier chapters and have been prepared as a way to identify, structure and manage environmental, social and economic, cultural and experiential information.

The Design Guidelines are not intended to form a checklist, but rather to indicate appropriate ways a sustainable tourism development might respond to a range of development issues and impacts.

The case studies in Chapter 6 provide an insight into the unique approach that each development has taken. They focus on accommodation and provide selected examples from South Australia and interstate. They also provide the opportunity to learn from existing developments and, hopefully, improve upon them.

WHAT IS SUSTAINABLE TOURISM?

Sustainable tourism is a concept that should be applied to all forms of tourism.

It also includes the more specialised forms of tourism such as nature-based tourism and ecotourism.

Sustainable tourism is often considered to be a special kind of tourism that appeals to a particular market niche that is sensitive to environmental and social impacts. This is a narrow view as sustainable tourism is much more than a discreet or special form of tourism.

The term sustainable tourism refers to a fundamental objective to make all tourism more sustainable. It is a continual process of improvement, one which applies equally to tourism in cities, resorts, rural and coastal areas, hills and protected areas. It should be thought of as a condition of tourism, not a type of tourism.

Sustainable tourism is based on the three 'pillars' of sustainability (economic, social and environmental) and is simply defined by the World Tourism Organisation as:

"Tourism that takes full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities." (WTO 2005)

This definition embraces the concept of stewardship – a responsibility to care for the destination in a way that will preserve and enhance its well-being for residents and its appeal for the visitors of tomorrow.

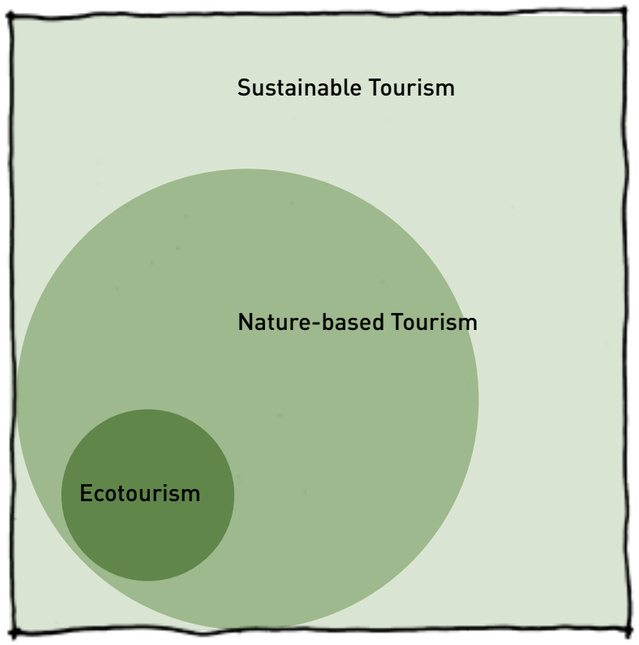
Confusion over the meaning of sustainable tourism has been compounded by the use of the terms 'nature-based tourism' and 'ecotourism'. While these terms have often been used interchangeably they are not the same:

Nature-based tourism refers to any sustainable tourism activity or experience that relates to the natural environment, whether for relaxation, discovery or adventure.

Ecotourism refers to a niche nature-based form of tourism where the key motivation is learning, appreciation and conservation. It is specialised, low-capacity, discreet, 'educational', conservation-minded and returns tangible benefits to the local community or natural resource.

The relationship between the three is demonstrated in Figure 1.

Figure 1: The relationship between Sustainable Tourism, Nature-based Tourism and Ecotourism



THE DESIGN PROCESS

Design is a creative process where the outcome is planned rather than relying on chance.

Design is a widely used term that's true meaning is not always fully appreciated or understood.

In a development context, design is a process of creation and problem solving that goes beyond spatial planning, sculptural form and appearance. It is a cyclical process that enables solutions to be developed to complex environmental, social and economic and cultural issues.

The cyclical nature of the design process allows for continual learning and increasing knowledge. A solution that best fits meets all environmental, social and economic requirements is sought. A good design result is when the built environment becomes an ecologically integrated part of the broader environment.

Figure 2 shows conceptually how the design process cycles through the key stages of:
- Gathering knowledge;
- Developing concepts and proposals;
- Testing proposals.

This cyclical process provides the best way to approach the complex interactions that occur between the different disciplines. For example the interactions between designers/architects, engineers, project managers and builders.

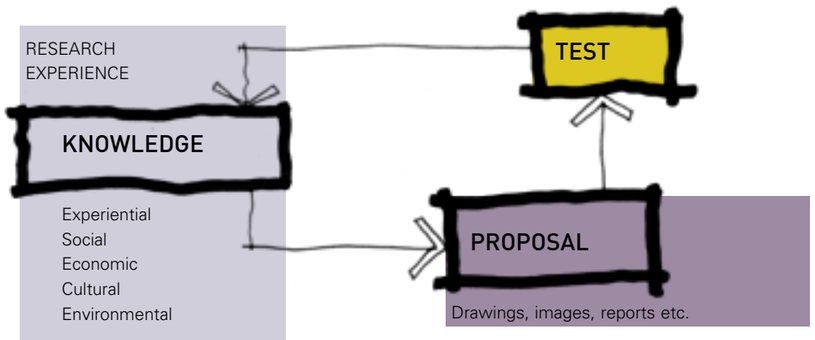
Undertaking tourism development, particularly in natural areas, initially requires a broad range of knowledge from different disciplines (and stakeholders) to be brought into the design process. As a design progresses, more detailed information is required.

Gathering this knowledge enables the designer to have a better understanding of the impacts of a development, allowing them to prepare concepts and proposals that are responsive to the natural and cultural environment and the needs of visitors and the community. Ideally these concepts should be tested with the technical disciplines as well as assessment authorities and, where relevant, the community.

The ultimate goal is not to achieve the perfect development, as this is impossible. What is important is that the design process has ensured that the final development best fits all environmental, cultural, social and economic requirements.

A key point that can be overlooked in designing for sustainable tourism is the importance of creating an experience that evokes an emotional response from the visitor. This is discussed later in this publication.

Figure 2: The design process



SOUTH AUSTRALIA'S TOURISM VISION

South Australia's tourism vision is to be an inspirational leader in innovative and sustainable tourism.
SA Tourism Plan 2003-2008

South Australia has experienced significant investment in tourism and tourism related projects over the last 20 years, however this investment has principally been in Adelaide. Examples include SkyCity Adelaide, the Adelaide Convention Centre, National Wine Centre, redevelopment of the Art Gallery and the Museum and the new Adelaide Airport Terminal.

However, regional areas of South Australia require greater levels of investment in order to keep pace with destination improvements by national and international competitors.

South Australia's regional areas provide a wide range of unspoilt natural attractions that tell a unique part of Australia's story. For example:

Kangaroo Island
Diverse flora, fauna, spectacular coastline and geological significance.

Eyre Peninsula and the Nullarbor Plain
Spectacular coastline and whale breeding grounds, site of the world's longest caves, meteorite sites and karst limestone landscape.

The Outback and Lake Eyre Basin
Including Coongie Lakes, Innamincka and Dalhousie Springs.

Flinders Ranges
Spectacular and ancient arid mountain landscape.

Murray River and The Coorong
An ancient river system and internationally significant wetlands area

South Australia also has some of Australia's most highly prized wine regions: The Barossa, Coonawarra, Clare Valley, McLaren Vale, Adelaide Hills and the Riverland all provide opportunities for tourism to value-add to the wine industry.

These natural attractions and cultural and heritage assets provide visitors to South Australia with unique experiences. The challenge is to find a way for the tourism industry to add value to these attractions and assets and, most importantly, sustain them.

To achieve South Australia's vision, the *SA Tourism Plan 2003-2008* encourages the strategic development of accommodation that:

- Demonstrates sustainable design solutions
- Respects the environment
- Has a reputation for being different, unique or innovative
- Provides a memorable experience
- Reinforces South Australia's core positioning themes – eg natural attractions, wine and food or culture.

Nature-based tourism is one area that can provide visitors to South Australia with high-quality experiences.

The joint SA Department for Environment and Heritage/South Australian Tourism Commission *Responsible Nature-based Tourism Strategy 2004-2009* identified the need to facilitate at least three memorable nature-based accommodation developments in strategic locations by 2009.

Looking to the future, the South Australian Tourism Commission will support and encourage strategic investment in tourism that is consistent with South Australia's vision and core positioning themes of wine and food, nature-based tourism and coastal tourism.

Riesling Trail, Clare Valley, South Australia

2. TOURISM AND SUSTAINABILITY

This chapter examines the links between sustainable development and tourism. It begins by looking at the origins of sustainable development and identifying pioneering sustainable tourism developments overseas and in Australia. The chapter considers how the basic principles of sustainability can be applied to all forms of tourism (rather than just specialty nature-based or ecotourism developments) and concludes by stating 12 principles of sustainable tourism.

SUSTAINABLE DEVELOPMENT AND ITS RELATIONSHIP WITH TOURISM

A shift in the tourism industry is occurring.

Tourism is now giving greater priority to the protection of the environment and achieving sustainability in its design, construction and operations.

The most frequently used definition of sustainable development is still that given in the *Bruntland Report of the World Commission on Environment and Development - Our Common Future (1987)* where it means:

'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.'

Another way to think about this is that we should pass on to our children a world that is at least as good, and hopefully better, than the one that we inherited.

The concept of sustainability has evolved since the 1987 definition to embrace three dimensions or 'pillars' of sustainable development.

Economic sustainability has a focus on generating prosperity at different levels of society and ensuring the viability of enterprises and activities is maintained in the long-term.

Social sustainability has a focus on respecting human rights and providing equal opportunities in society. There is an emphasis on local communities, recognising and respecting different cultures and avoiding exploitation.

Environmental sustainability has a focus on conserving and managing resources, especially those that are not renewable, requiring action to minimise pollution of air, land and water and conserving biological diversity and natural heritage.

Tourism is in a unique position because of the contribution it can make to sustainable development and the challenges this presents.

If developed without concern for sustainability, tourism can harm the natural, cultural or social environment. Conversely a sustainable approach to tourism has the capacity to benefit local communities, economically and socially, and to raise awareness and support for conservation of the environment.

The CSIRO in its report *Balancing Act: A triple bottom line analysis of the 135 sectors of the Australian economy, 2005* says the tourism industry has the ability to be a sustainability leader:

This sector [Accommodation, Cafes and Restaurants] could become a sustainability leader since it is the destination of so many production chains, and in venues where the final consumer is usually in a happy and positive frame of mind, and the price of the service is often subservient to its appeal and positioning in quality terms. However leadership would be required in the sector to move beyond direct sector issues (energy saving in the kitchen, reusing towels in the hotel), to improving the environmental performance standards of its infrastructure and, most importantly, choosing its raw inputs in light of the full supply chain that includes both the direct and indirect effects of water and energy.

PIONEERS OF SUSTAINABLE TOURISM DEVELOPMENT

Society's interest in the environment and sustainability has been a driver for changes in the tourism industry. One of the earliest examples of sustainable tourism (or in this instance ecotourism) is the pioneering environmental practices at Maho Bay on St John Island in the US Virgin Islands.

Maho Bay Camps was developed in 1976 when 18 tent cottages were built on elevated platforms in Virgin Islands National Park. The platforms were connected by elevated walkways that left the natural environment virtually undisturbed.

Historically, Australia has provided excellent opportunities for undertaking sustainable tourism development because of its broad range of unique natural and cultural attractions.

Developments such as Arkaroola Wilderness Sanctuary in South Australia, Binna Burra Lodge and O'Reillys in South East Queensland and Jemby Rinjah in the Blue Mountains in New South Wales are longstanding examples of the provision of nature-based accommodation.

Sustainable tourism development – in particular the segments of nature-based and ecotourism – are rapidly growing tourism markets. More recently there have been signature accommodation developments in the Daintree and Fraser Island in Queensland and Cradle Mountain and Bay of Fires in Tasmania. These businesses are successfully providing visitors with high-quality accommodation in secluded natural areas.

Jemby Rinjah Eco Lodge
The Blue Mountains, NSW

Jemby Rinjah was developed in 1985 and grew out of a desire to demonstrate that a development could co-exist in harmony with its surrounding environment and provide a facility where guests could learn about sustainability.

It has proved a successful early model of how a tourism development can be both financially viable and ecologically sustainable.

TOURISM ACCREDITATION AND SUSTAINABILITY

As with any growth industry (or product) tourism has grappled with issues of quality, standards and accreditation. Tourists are becoming more discerning about the tourism experience they are seeking and the standard of service and product quality.

Accreditation programs, such as the National Tourism Accreditation Program (NTAP), provide tourism businesses with an action plan for improvement that can lead to better management, improved tourism product and higher customer satisfaction. This type of accreditation program is beneficial to consumers as a means of providing information and greater assurance of product and service quality.

Accreditation programs have also been developed to assist the tourism industry implement best practice standards for sustainable tourism practices. The World Travel and Tourism Council has established Green Globe as a global benchmarking, certification and improvement system for sustainable travel and tourism.

Green Globe is based on Agenda 21 and principles for Sustainable Development endorsed by 182 Heads of State at the United Nations Rio de Janeiro Earth Summit. The aim of Green Globe is to improve the environmental performance of all sectors of the tourism industry. In 2005, there were Green Globe participants in all continents and approximately 50 countries including Australia.

One of the most widely recognised programs in Australia is the Eco Certification Program developed by Ecotourism Australia. The Eco Certification Program provides categories of certification for both nature-based and ecotourism businesses. Developed in Australia, this program is now being exported to the rest of the world via Green Globe as the International Ecotourism Standard.

PRINCIPLES OF SUSTAINABLE TOURISM

Banrock Station Wine & Wetland Centre Riverland, SA

Before its purchase by Banrock Station in 1994, this 1750-hectare property was suffering the impact of 100 years of intensive farming and grazing. Banrock Station has been proactive in rebuilding its environmental values.

In partnership with Wetland Care Australia, Banrock Station has undertaken a program of wetland restoration work to restore the Banrock Lagoon.

In 2002, Banrock Station was awarded the most prestigious wetland conservation award in the world – the Ramsar Wetland Conservation Award – for its commitment to wetland restoration.

The rehabilitated Lagoon has played a vital role in the regeneration of native flora and fauna. Banrock has recently launched its threatened species recovery program as one of the most extensive and ambitious breeding operations undertaken in Australia.

The program aims to reintroduce Bilbys, Brush-tailed Bettongs and Numbats into a 1600-hectare area of the property, surrounded by a 10-kilometre long, 1.8 metre high feral-proof fence, specifically constructed as part of the program.

The following 12 principles consider economic, social and environmental issues relevant to the tourism industry.

The order in which they are listed does not imply any order of importance.

Minimising environmental impacts
Tourism should consider both local and global environmental impacts. At a local level tourism should seek to maintain the visual quality of landscapes and avoid having a physical impact on the immediate environment by minimising pollution of air, water or land and generation of waste. At a global level, tourism should pay attention to issues such as greenhouse gas emissions and use of non-renewable resources.

Achieving conservation outcomes
Tourism should seek to support the conservation of natural areas, habitats and wildlife and minimise damage to them. A mutually beneficial alliance can be achieved between tourism and conservation. Through understanding and enjoyment comes greater appreciation, empathy, advocacy and protection for the resource.

Being different
One of the keys to successful and sustainable tourism is achieving a clear sense of difference from other competing destinations. This can be achieved by basing development and marketing on the attributes and strengths of the destination. The development should reinforce the destination brand and brand values.

Achieving authenticity
The attractions most likely to be successful, and those with the greatest enduring appeal, are those which are genuinely relevant to the history, industry, culture, lifestyle and natural resources of the district.

Reflecting community values
This means representing the past, present and future aspirations of the local community in a living and dynamic way rather than embalming the past or imposing development. This involves listening to and responding to the community.

Understanding and targeting the market
Understanding the broad market trends and the needs and expectations of specific segments is critical. This involves the development of specialised products based on the inherent attributes of an area.

Enhancing the experience
People's motivation for travel is to seek something they cannot experience at home. The 'bundling' of attributes enhances the appeal of a place and the likelihood of visitation.

Adding value
Adding value to existing attributes achieves a richer tourism experience and helps to diversify the local economy. This can include accommodation, sales outlets or dining, in association with established industries.

Having good content ('telling the story')
Tourism development can interpret (present and explain) natural, social, historic and ecological features. Telling the story provides a more rewarding experience and ultimately helps conserve the destination.

Enhancing sense of place through design
Good design respects the resource, achieves conservation outcomes, reflects community values, and is instrumental in telling the story. It is not just about form and function but also about invoking an emotional response from the visitor.

Providing mutual benefits to visitors and hosts
Tourism is not encouraged for its own sake. It is an economic and community development tool and must take into account the benefits that both the host community and the visitor seek.

Building local capacity
Good tourism businesses do not stand isolated from the communities in which they operate. They get involved with the community and collaborate with other businesses and stakeholders and help to build local capacity.

Punters Vineyard Retreat, Coonawarra, Limestone Coast, South Australia

3. CRITICAL SUCCESS FACTORS

Most of this document is concerned with design, which presupposes a site has been selected. This chapter identifies some of the factors that play a fundamental role in achieving a successful development concept. Three factors are discussed in detail:

- The market
- Desired experience
- Sense of place.

THE DEVELOPMENT CONCEPT

There are many factors that contribute to a successful tourism development. These factors include having a concept that meets market demand, uniqueness of the place, nature of the experience, access to finance, feasibility analysis, environmental responsibility, community support, cultural sensitivity, control of construction costs and so on.

While all are important considerations, this chapter focuses on three factors that are fundamental to achieving a successful development concept:

- The market
- Desired experience
- Sense of place.

Each of these three elements is related to the other, and they all need to be aligned to create a successful sustainable tourist development.

Creating a tourism development can start with any of these. One might have a special site in mind, or want to offer a unique experience, or see an opportunity to satisfy a particular market. The beginning point is not important. What is important is to make sure these three critical factors are aligned (refer Figure 3).

Figure 3: Creating a successful sustainable tourism development starts by aligning the three key elements

THE MARKET

The success of new tourism products depends on supplying people with experiences they want. Different people want different experiences, and are prepared to pay different amounts. To succeed, a new tourism product needs to be targeted at a group of people with similar desires. It cannot be all things to all people.

The target market needs to be well defined. The better the target market is understood, the more likely the product will meet customers' needs and the easier it will be to promote the product to them.

This relationship between target market, product and promotion and distribution can be represented as the marketing triangle (refer Figure 4).

In many cases tourism developers and investors have been guilty of relying on the philosophy that 'if we build it, they will come'. As this ignores the market it is a very risky attitude. The more sophisticated approach of understanding and targeting the market reduces the risk of business failure, and heightens the opportunities to create profitable businesses.

Understanding and selecting a target market involves looking at the market from two different perspectives: the existing market and the potential market.

Existing market

This involves understanding the visitor market that currently comes to the state, region and locality within which the development is to be located. The following questions are among those to explore:

How many visitors come?

Look at this question from a regional perspective and then break it down to a more specific town or area if the data is available.

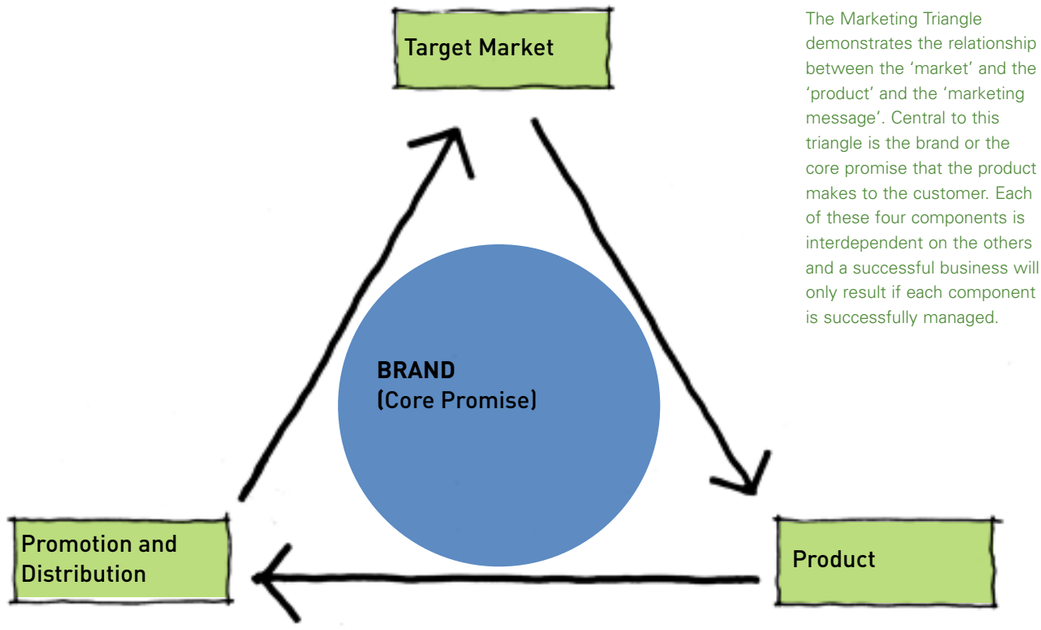
Why do visitors come?

What are the broad visitor preferences, expectations, or needs? Most might come to holiday, but do they come to escape and unwind, or are they on a sightseeing tour? Are they dropping in on their way to somewhere else?

Where do they come from?

Of those who come, what proportion comes from a specific region, city, interstate, or overseas?

Figure 4: The Marketing Triangle



The Marketing Triangle demonstrates the relationship between the 'market' and the 'product' and the 'marketing message'. Central to this triangle is the brand or the core promise that the product makes to the customer. Each of these four components is interdependent on the others and a successful business will only result if each component is successfully managed.

Who are they?

The types of visitors can be understood in a number of different ways. For example:

- By place of origin
- Demographic profile (age, life cycle stage or travel group)
- Psychographic profiles (values, attitudes and lifestyles that determine consumption patterns)
- Holiday typology (travel behaviour e.g. short break, getaway, touring).

Where do they stay?

Do they tend to stay in caravan parks and camp grounds, hotels, bed and breakfast, or with friends and relatives?

In addition to understanding the current market, it is also important to examine what 'competition' there will be for the proposed development within this market and how it can differentiate itself from this competition. (Remember that conversely, a competing development also provides the opportunity for marketing collaboration within the region and locality).

These analyses seek largely to establish what share of the existing market the development can achieve and how, through collaboration with other products, it can help grow the regional/ local demand at the same time.

Potential market(s)

Some developments are more pioneering and seek very strong points of differentiation. While mindful of the existing market demand situation, they do not wish to be constrained by working within existing market demand. Rather, they seek to create new markets and hence new demand.

These developments, particularly those that tap into emerging consumer trends, are at the 'cutting edge' of tourism development and are usually market leaders. They develop distinctive brands and are powerful catalysts for attracting a new and expanded customer base to a region.

Target Market

Once the market is understood, a market segment can be chosen as the target. In essence, the target market is a clear description of the customer. The target market needs to be well-defined and there are many ways to do this, including the demographic profile, the psychographic profile and the holiday typology.

Identifying a target market in this way does not limit the market. If the development appeals to a core market others will also come. Though the marketing, promotion and distribution to the target market is not discussed within this publication at length, it is important to remember that a development's most powerful marketing weapon is word-of-mouth and the memories that the visitor takes away with them and shares with others (refer Table 1).

The Brand

Central to marketing and becoming a place of choice is creating a distinctive brand. The brand is the core of any development's business strategy and is the basis upon which it achieves recognition in the marketplace. For example, Banrock Station is a brand that has achieved recognition for its core promise of delivering an appealing wine, river/nature and conservation experience.

The brand is at the heart of the marketing triangle (refer Figure 4) and communicates a 'core promise' to the customer.

In tourism, it should be a promise of a compelling experience that meets the needs of customers and evokes an emotional response. The promise must be credible, clearly differentiated and offer the visitor a relevant benefit. It should always be from the consumer's perspective, not the provider. It must focus on the primary audience: it cannot be all things to all people.

Table 1 shows how the brand contributes to success in the competitive marketplace.

One way to identify the brand or 'core promise' is to work through a process of constructing a brand pyramid. Appendix 4 contains a hypothetical example of a brand pyramid.

Table 1: Attributes of success in the competitive marketplace

Time	Marketing materials	Consumers' response
Before	The brand	Expectations
During	The experience	Emotional reactions
After	Word of mouth	Memories

DESIRED EXPERIENCE

In tourism, the key to what you have to sell (the product) is the experience. Tourists are seeking experiences that are different, authentic and compelling, and that evoke emotional responses. Tourists travel to gain an experience they cannot get at home. Visitors may seek adventure, enlightenment, relaxation or all three. They may want something to brag about when they get home and to provide pleasant memories thereafter.

The demand for new, powerful and 'real' experiences is one of the key drivers of tourist choice. Research undertaken by the New South Wales Tourism Commission has shown that the top five drivers of Australian and international visitors seeking a nature-based holiday are:

The lure of the beach
Australians love going to the beach. Where a beach is not available some form of water is a must. Getting into the water, however, is not as popular.

The great outdoors
Australians want an unspoilt natural setting for activities and interests; somewhere they can do their favourite things in the great outdoors.

A room with a view
Australians want spectacular views and accommodation that 'lets nature in'.

Food with a view
Australians from the cities want to eat well, in a natural setting, in the open air.

Animals in nature
Australians want to see animals in their natural environment.

It therefore makes sense that creating the 'experience' should underpin all aspects of the development's brand philosophy and delivery.

A successful development is more than the sum of the buildings, facilities, activities and services provided. It is about giving the consumer benefits at an emotional level. To deliver these crucial emotional benefits, the designer must go beyond the technical or 'scientific' aspects of development, dealing with buildings, facilities and services; he or she must create a setting for experiences.

A visitor experiences a place directly through the senses, including sight, smell, hearing, touch and movement. Of these, sight (or aesthetics) is usually the most important, invoked by colour, form and vistas. These sensory experiences are gained through both static positioning, and by movement through a sequence of spaces.

Added meaning can be given by telling stories, such as the history of the place, current use, and other people's perspectives. People's response to the place can be both emotional and intellectual. The desired emotional response is usually pleasure, but this may be leavened with a little fear, awe and humour as well.

It is important to select the site and shape the facilities on the site to provide a physical environment that supports the desired emotional experience. For example, a romantic experience might be supported by a sense of being alone together, of luxury and mystery. This would be assisted by an environment that is isolated, out-of-the-ordinary, intimately scaled and with a layout that is not immediately apparent.

The importance of good site selection and site and facility design that enhances the experience is discussed in more detail throughout this publication.

Paperbark Camp
Jervis Bay, NSW

Paperbark Camp provides guests with fulfilling multidimensional experiences including:

- Luxury tented accommodation where people feel part of the surrounding natural bush
- Fine restaurant dining at tree-top level
- Activities such as canoeing, whale and dolphin watching, bushwalking, campfire talks, spotlight wildlife walks and bush tucker tours.

The design of the site promotes this core promise through:

- A long, winding, enclosed entry drive
- Small, luxurious and intimate sleeping spaces surrounded by bush and isolated from other people's living spaces
- Dense bush making the layout of the site a little mysterious
- A living environment that is out-of-the-ordinary.

SENSE OF PLACE

Tourism is an industry that is reliant on a strong sense of place. The unique natural or cultural values of a place are the primary resource that provides visitors with a reason to visit.

The tourism experience of a place occurs in three related settings:

- The locality
- The site
- The facilities on the site.

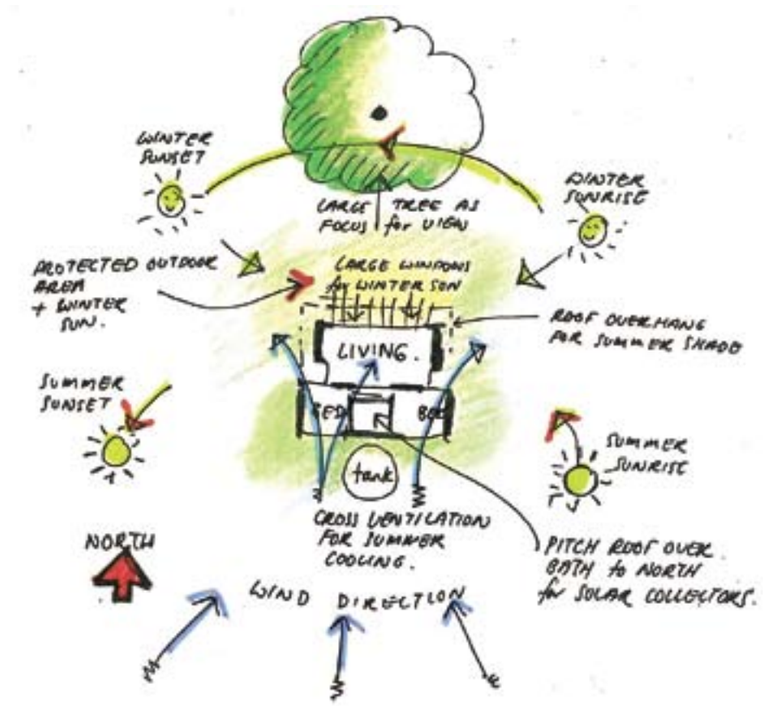
Collectively these three related settings contribute to the tourism experience and overall 'sense of place'. A good example of these three related settings contributing to the tourism experience is the Rawnsley Park Eco Villas (refer to case studies).

The Eco Villas offer luxury and an intimate experience set within the privacy of unique straw bale buildings. The buildings provide a strong connection with the spectacular scenery, walking trails and activities at Rawnsley Park Station and are experienced as part of the wider locality of Wilpena Pound and the northern Flinders Ranges.

The Western Australian Tourism Commission's *Designing Tourism Naturally – A Review of World Best Practice in Wilderness Lodges and Safari Camps 2000* reviewed wilderness and tented safari camps as the basis for understanding the dynamics of successful nature-based tourism development. The findings of this report reinforce in the first instance the importance of having the right setting (locality and site) for undertaking nature-based tourism development.

"The place-making characteristics of the setting underpin everything else. Environmental setting is the single most important factor that contributes to overall attractiveness and relates directly to consumer satisfactions. An excellent setting will contribute to consumer satisfaction. The absence of an excellent setting, despite the presence of all other dimensions will not result in satisfactions being experienced."

Figure 5: Ridgetop Retreats – Enhancing sense of place through design



Having found the right setting, it's important to create facilities that enhance and build on the 'sense of place' that already exists. In other words, try to capture the essence of the place in the design. There are many ways to do this – whether it's creating a special sense of arrival, making the most of an outstanding view, using local building materials or elements of local building vernacular.

In providing facilities and activities for visitors, special care must be taken not to have an impact on the resources or qualities that the visitor comes to experience. Adopting a sustainable approach to design is important. Sustainable design starts by preserving the qualities that make a place special. This is discussed in greater detail in the next chapter.

A good example of how to capture the essence of the place through design is the Ridgetop Retreats development in Deep Creek Conservation Park (refer to Case Studies).

The architect has used design to highlight the natural bushland setting and focus on views of a unique tree (refer to Figure 5).

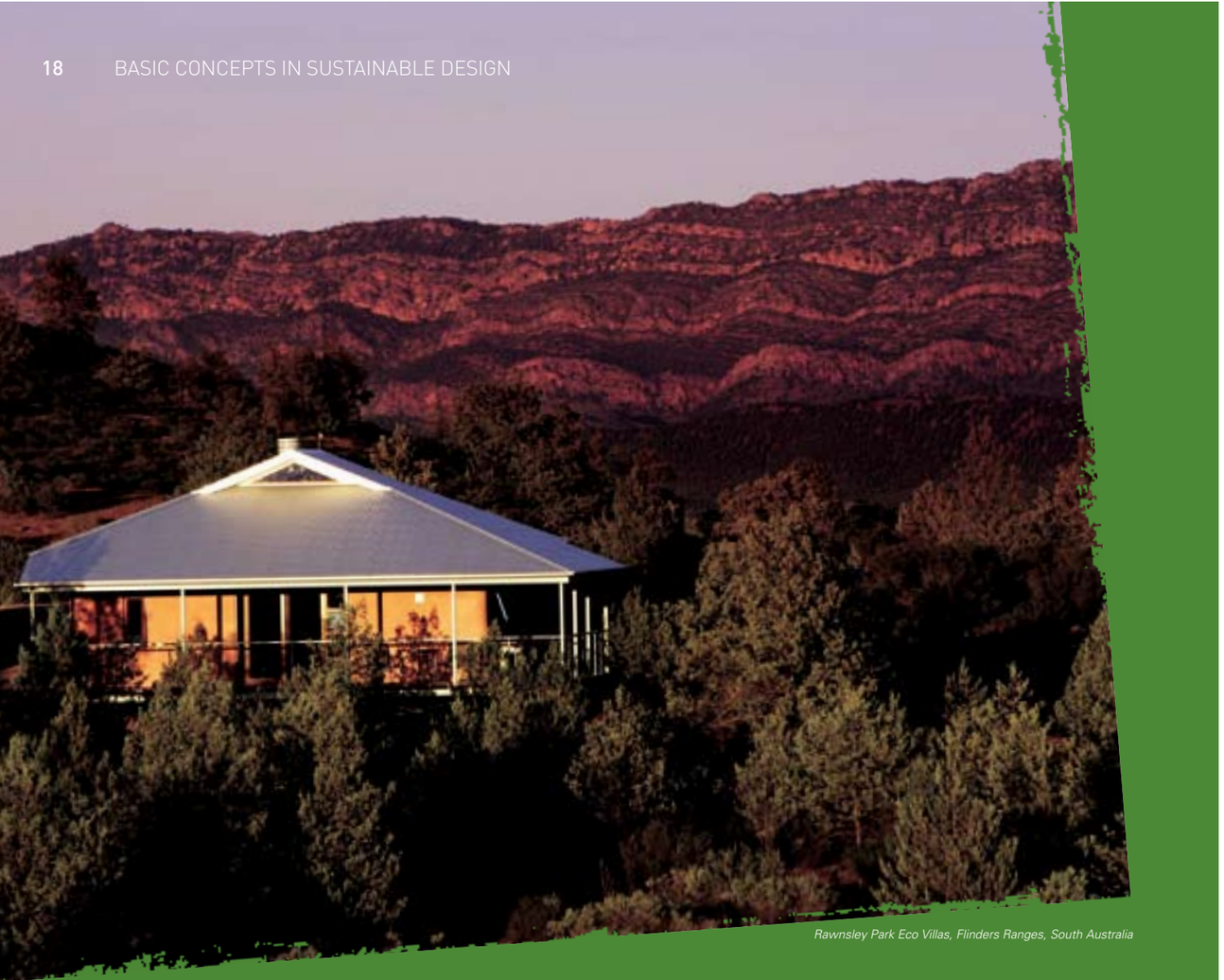
Ridgetop Retreats
Deep Creek
Conservation Park, SA

Ridgetop Retreats received a Design Award from the Royal Australian Institute of Architects. A feature of the Retreats is the way the design connects inside spaces with outside spaces.

In the image above, the interior of the Retreat is focused on the views of a unique tree. This design strategy provides guests with a heightened appreciation of the bush.

IN SUMMARY

Does the proposed tourist development provide a target market with a desired experience in a unique place? If it does, the development is a long way along the path to success.



Rawnsley Park Eco Villas, Flinders Ranges, South Australia

4. BASIC CONCEPTS IN SUSTAINABLE DESIGN

This chapter emphasises the importance of gathering information and knowledge that can be used to better understand the impacts of a development. The first essential steps in this process are climate analysis, locality analysis and site analysis. The chapter concludes with a simple framework that provides a way to think about and approach the design of a sustainable tourism development.

DESIGNING FOR SUSTAINABLE TOURISM

Sustainable tourism development should, by nature, follow the basic principles of sustainable development. It should be responsive to the constraints of the natural and cultural environment. Some environments are more unique and fragile than others. Hence there is not a simple formula to manage the impacts of tourism. The designer is required to develop unique solutions to unique problems.

Sustainable tourism development should also be responsive to the needs of visitors. Designing in this way can provide an opportunity to bring visitors physically closer to the natural and cultural values of a site by managing the impacts of a development. This enables the sensory features of the environment, such as sights, smells and sounds, to be fully appreciated.

In order to manage the impacts of a development, they need to be well understood. A useful analogy is to consider a development as a pebble being thrown in a pond. As it hits the water it creates ripples that move outwards in all directions. What impact will the ripples from the pebble generate?

Designing in this way is not easy as there are many variables that need to be taken into account: for example the ripple effect always depends on a range of other factors such as the changing condition of the water and what's below the surface.

The impacts of development must be considered beyond the scale of a building or a site. They must be considered at a range of scales, from specific building locations to site, site catchment and more global systems.

The best way to begin to understand the impacts of a development is to start by gathering some basic information (knowledge) that can then be used during the design process. The first essential steps in the process are climate, locality and site analysis.

These steps can assist with establishing some basic design concepts based on broad environmental constraints, then refining these considering local issues and tailoring them to a specific site. As design is a cyclical process, it may be necessary to work through the various issues a number of times before a final design evolves.

CLIMATE ANALYSIS

Climate has a major influence on:

- Building materials, construction and orientation
- Energy consumption
- The nature of the land eg topography, soils, hydrology, vegetation and fauna
- The feel, character and qualities of a place
- Comfort and convenience of users.

South Australia can be broadly divided into three climatic regions, as shown on Figure 6:

- Hot–Dry Inland
- Temperate
- Sub–Temperate.

Regional differences in landscapes and built form are often a response to local climatic conditions. Each climatic region requires a different approach to building design, construction and material selection to ensure the good passive thermal performance of a building.

Thermal performance relates not only to ecological responsibility but can also improve the economic bottom line.

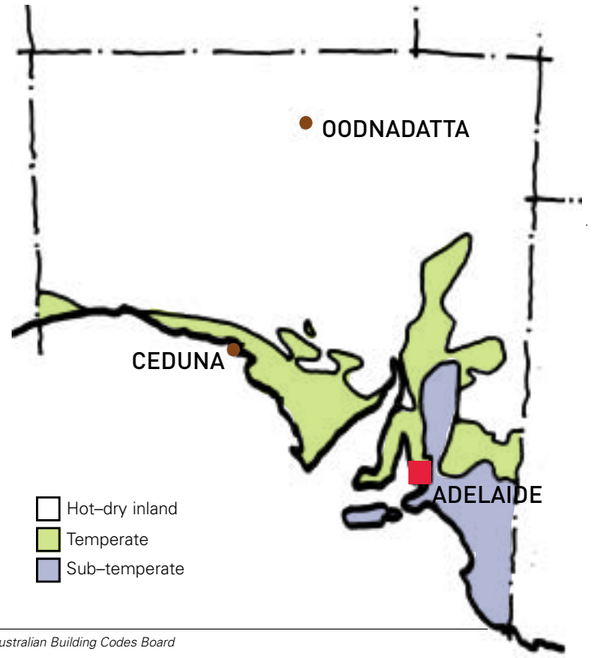
The basic information that needs to be gathered to design for climate includes:

- The path (vertical and horizontal angle) of the sun during the year
- The temperature range
- The annual rainfall amount and annual distribution
- The wind intensity, direction and occurence
- The most likely direction of storms, cold or strong winds
- The most common directions of good breezes.

Design for climate is discussed in more detail in *Energy – Passive Solar Design* in Chapter 5.

Climate analysis is taking on greater importance as society begins to understand the long-term implications of climate change. Climate change will present significant challenges but also provide opportunities for innovation.

Figure 6: South Australia Broad Climate Zones



Source: Australian Building Codes Board

LOCALITY ANALYSIS

A locality can be seen as the catchment of a site. It might also be considered as an extension of the site. Potential impacts of the development should be considered at this broader scale.

Locality analysis should be carried out to consider issues such as:

- Identifying an appropriate site and the scale or type of development that might suit
- Access to local resources and services eg food, building materials, fuel, labour, water sources and infrastructure
- Access to quality environmental values eg natural ecosystems, local culture and history
- Climatic factors eg prevailing winds, rainfall
- The tourism appeal of the area.

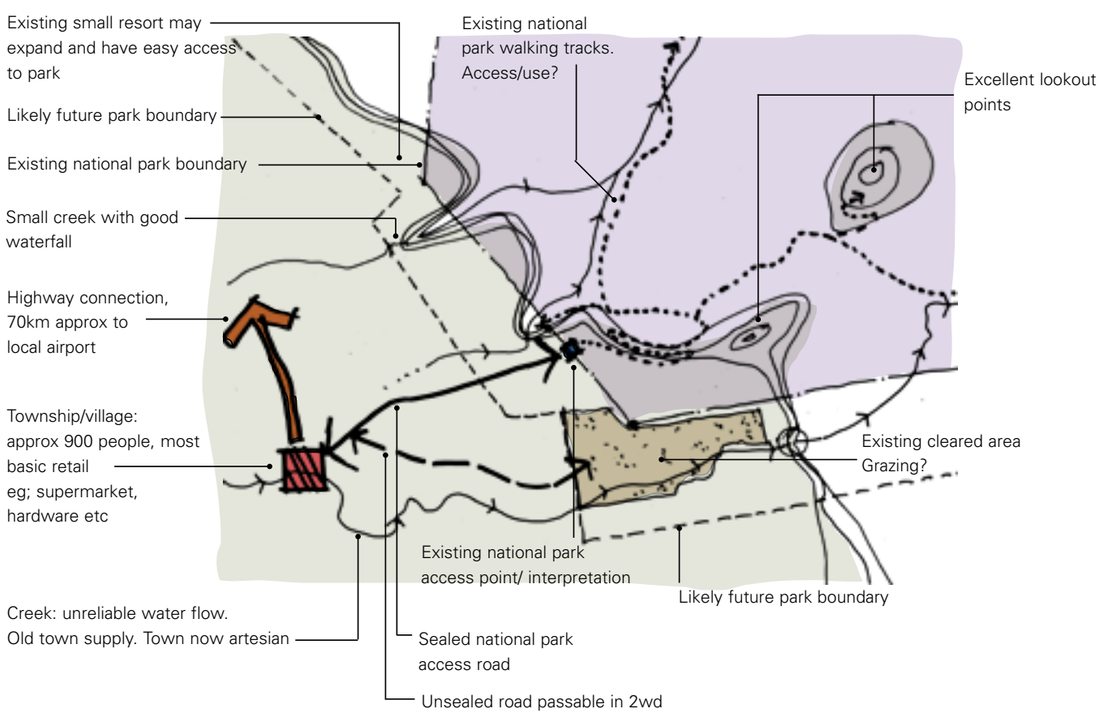
It is necessary to gain a broad picture of the locality before making detailed decisions about the suitability, type, design or management of the development. This is a key input into feasibility analysis, especially in its early stages. Figure 7 is an example of a locality analysis.

Locality and site analysis is fundamental to sustainable design and should be prepared early in the design process.

Ningaloo Reef Retreat
Cape Range National Park , WA

The developer spent time camping and snorkelling at various locations in Cape Range National Park during different seasons, weather conditions and tides before deciding on a final location to establish a semi-permanent camp.

Figure 7: An example of a locality analysis



SITE ANALYSIS

The site is the likely or specific location for built development. In some projects the site is a given, while in others it becomes apparent through locality analysis.

Site analysis needs to be undertaken to enable correct decisions to be made about the design and layout of the overall development and the exact location of built elements.

There are some general principles to be followed when deciding upon the specific site for a structure:

- Build on the least sensitive areas, or areas that have already been subject to human disturbance
- Site the development in an area with natural values that can be used to interpret the environment in a wider context
- Consider the type of tenure and rights of access and use
- Optimise the best available views without building on prominent points or ridgelines.

These principles are discussed in more detail in Chapter 5.

The type and detail of information to be prepared as part of the site analysis will depend upon factors such as the type, scale and intensity of the development and the nature of site conditions.

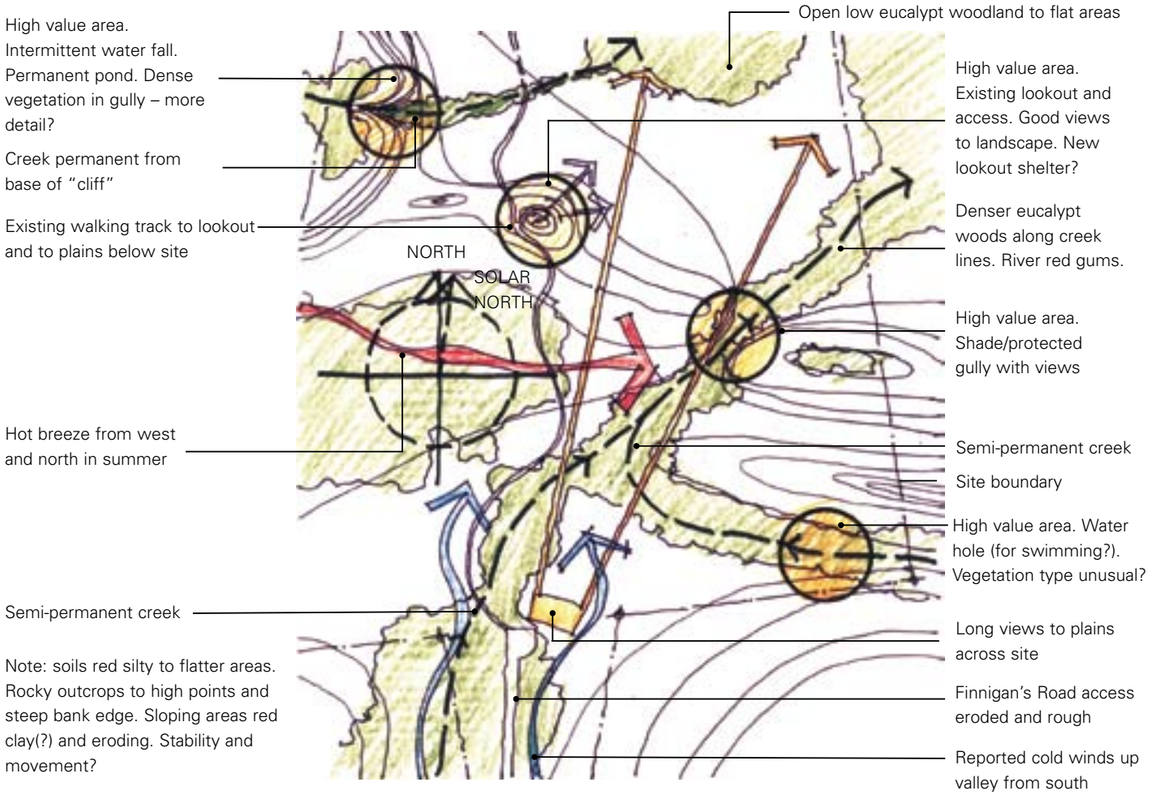
One way to evaluate the potential of the site to sustain a tourism use is to evaluate the carrying capacity of the site. Carrying capacity is a measure of the amount of human activity a site can sustain without significant change to the ecology. An assessment of carrying capacity might include factors such as the:

- fragility or resilience of the site
- availability of water and power resources
- type of development
- maximum number of visitors, and
- connections to different parts of the site eg bushwalking trail or swimming at a nearby beach.

A Site Analysis Plan should be prepared to depict graphically the various factors that will influence the development. This Plan will also be useful for the planning authority to understand why certain design responses have been chosen.

Figure 8 is an example of a broad Site Analysis Plan. A comprehensive list of the issues that should be considered when undertaking a site analysis for tourism development is listed in Appendix 2.

Figure 8: Example of broad site analysis



A FRAMEWORK FOR SUSTAINABLE DESIGN

This framework (a series of five questions) provides a simple way to think about and approach the design of a sustainable tourism development.

The framework is broadly based on the Environmental Management System: International Standard ISO14001, but has been adapted to suit Sustainable Design rather than building construction and product manufacture.

The five questions are given in what is the typical order for most projects, but they can be asked in a different order. These questions will need to be re-addressed a number of times as design proceeds.

What do we want to do?

Begin with a broad, functional description of what is proposed. This description might include:

- The brand (core promise) and desired experience that the development will deliver to consumers
- The target market
- Initial development concept, eg scale, number of beds
- The design philosophy eg lightweight and reversible or heavy and permanent.

This type of information can be incorporated into a design brief prepared for the architect or building designer. Some broad environmental, social, economic, cultural and experiential issues will begin to emerge at this stage.

Where is it being done?

Describe the context for the development. This may include:

- Natural features
- Climatic influences
- Cultural considerations
- Social setting
- Economic conditions.

The emphasis should be on what are the unique features or attractions that make this place special? Are they accessible? The information obtained during site and locality analysis will assist this description.

What are the development issues and impacts?

The development impacts (both negative and positive) will have begun to emerge in the descriptions above. A review of the Design Guidelines (refer to Chapter 5) will assist to identify a comprehensive range of development issues and their impacts.

What are the priority issues and impacts?

The priority issues and impacts will need to be identified. The design team, stakeholders and assessment authorities will play an important role in identifying these.

They will vary depending on the site and locality and must be addressed during the design process.

How should the priority issues and impacts be addressed?

A review of the actions listed in Chapter 5 will assist in identifying a range of sustainable development responses.

There are different ways to evaluate the best response beyond the obvious short-term cost considerations. These might include:

Return Period

Which issues will cost additional money initially but will deliver longer term cost benefits? This is simple return period and/or lifecycle cost analysis.

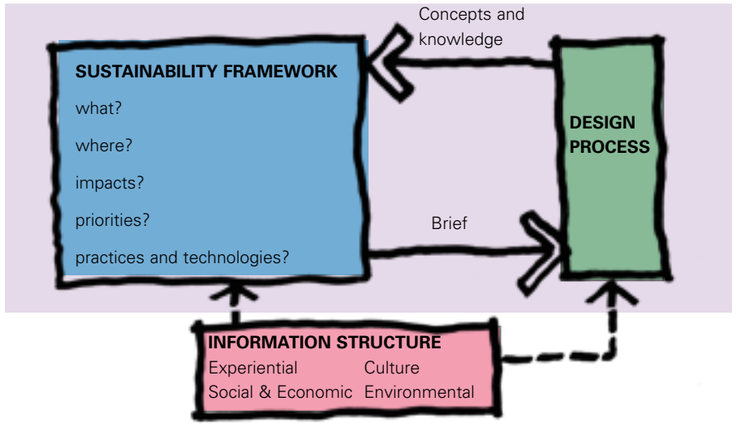
Marketing Benefit Analysis

Which issues should be addressed to provide marketing advantages in the short-term and in the longer term?

As the design process proceeds, these five general questions can relate to specific design issues eg energy supply.

The framework and design process rely heavily on the input of environmental, social and economic, cultural and experiential information. The relationship between the framework, the information structure and the design process used in this publication is illustrated in Figure 9.

Figure 9: The relationship between the framework, design process and information strucure



Cladich Pavilions, Aldgate, Adelaide Hills, South Australia

5. DESIGN GUIDELINES

This chapter has been developed with an information structure that enables the user to sort through the issues and information that need to be considered when designing a sustainable tourism development.

The information is structured into four key topics:

- Environmental
- Social and Economic
- Culture
- Experiential.

USING THE DESIGN GUIDELINES

The Design Guidelines have a consistent format that includes:

- **Issue** – brief description of each development issue.
- **Preliminary information** – basic information that needs to be gathered to commence analysis of the issues.
- **Objective** – describes the overarching development outcome that is sought for each issue.
- **Actions** – describes a range of possible actions that will help to ensure sustainable outcomes. The actions are divided into those that are relevant for planning, construction and operation.

The Design Guidelines have been prepared on the assumption that the development is in a sensitive area and must, therefore, closely consider all issues. In reality not all issues will be relevant or a priority for all developments.

On occasions the guidelines may conflict. For example, an insulated, heavy weight construction to moderate the climate can be incompatible with steep, sensitive sites.

Recognising and resolving these conflicts is important. Sustainable practices cannot be seen in isolation or used separately. The requirements of any single issue must be seen in the context of, and balanced with, the requirements of other issues. Input from the design team will help to balance any conflicts between the requirements of different issues and help to create innovative solutions.

Banrock Station Wine & Wetland Centre, Riverland, South Australia

ENVIRONMENT

This section is most relevant for developments that occur in close proximity to sensitive natural environments.

It aims to consider the wide range of complex and interrelated issues that affect the level of human activity a particular environment can sustain. The key issues discussed include land, energy, materials, water and waste treatment.

For the purpose of this section, environment refers to all aspects of the environment, excluding people.

LAND

Ningaloo Reef Retreat
Cape Range National Park, WA

Located in a remote sensitive location, that lacks basic infrastructure, Ningaloo Reef Retreat is a good example of a tourism development that 'touches the earth lightly'. Low impact construction that complements the natural landscape, efficient use of energy and water and limited visitor numbers ensure this development has minimal impact on natural processes and systems.

Land is made up of a number of elements and systems that interact to form natural landscapes. It is possible to place a building in a natural landscape and have minimal impact on these elements and systems.

A common expression used in sustainable development is to 'touch the earth lightly'. While some change to the environment is inevitable through human activity, a sustainable tourism development should ensure that the environment continues to function as an intact ecosystem.

When designing a tourism development in a natural landscape, the following elements and systems need to be understood and accounted for:

- Hydrology
- Soils
- Vegetation
- Fauna
- Bushfire management; and
- Topography.

Hydrology

Hydrology includes surface and groundwater flows from outside the site and rainfall/stormwater flows.

All sites are located within a catchment and will have a natural or altered hydrology that includes surface water, groundwater and stormwater flows. The hydrology of a site needs to be understood, as this will influence the design of a development.

Development should minimise changes to the hydrology in terms of volume, distribution and quality. Refer to Figures 10 and 11.

Preliminary information

- What is the average rainfall?
- What are the surface and ground water flows, eg source, volume, distribution, quality?
- How sensitive is the site to changes in hydrology?
- Is there a risk of flooding?
- What are the policy or legislative requirements?

Objective

Minimise changes in the flow regime (volume, distribution and quality) of surface water and groundwater.

Actions

Planning

1. Elevate structures where buildings will be located in or near areas prone to flooding.
2. Where natural flows will be interrupted, provide ways of remediating flows down-stream of any structure such as agricultural piping, soakage or storage systems.
3. Install rainwater tanks or other storage devices to control run-off from intensified flows from roofs and hard surface areas.

Operation

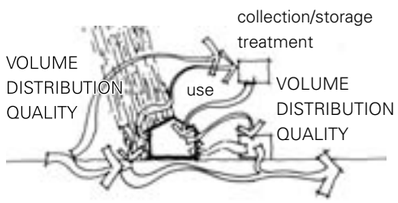
4. Re-use as much of the water captured on the site as possible.

5 Nutrient input into the natural hydrology should be avoided or minimised. Sources of nutrients include fertilisers, soil disturbance and waste systems.

6. Chemical contamination of the natural hydrology should be avoided or minimised. Sources of chemical contamination include cleaning products, waste systems, vehicles and fertilisers. Petroleum products should be limited to sealed, contained areas.

Figure 10: Key components of a natural hydrology system

Figure 11: Key components of an altered hydrology system, which maintains natural system downstream of development



Soils

Soils are related to the original and underlying geology and geological processes. They are either of volcanic origin or sedimentary. They can be measured by their form, patterns (or distribution), nutrient regime, permeability to water and profile (or layers).

The vast majority of soils in South Australia are low in nutrients. Nutrients generally occur as a result of biological activity in the surface leaf litter layer and surface levels of the soil. The topsoil is therefore an important seed, biological activity and nutrient resource.

Development should aim to minimise impacts on vegetation and topsoil as this can deplete a landscape of its nutrients.

Preliminary information

- What is the nutrient level(s) of the soil?
- What are the soil types and their distribution?
- What is the soil/substrata structure (strength, permeability, stability)?
- Is there any existing soil contamination?
- Are there any hazards, eg coastal acid sulphate soils?
- Are there any broader locality issues eg infestation by soil borne disease phytophora?

Objective

Minimise changes to soil form, profile and nutrient content.

Actions

Planning

1. Use permeable surfaces for driveways and paths, eg compacted gravel, stones, permeable paving.
2. Consider elevating intensively used pathways, eg boardwalks.
3. Bulk excavations should be avoided or minimised by appropriate design responses. See Figure 12 under the heading Topography.

Construction

4. Minimise erosion problems by limiting the clearance of vegetation and/or site excavations.
5. Where erosion control is required, ensure that any mechanical or pre-used erosion control systems do not import weed or non-indigenous plant species.
6. All leaf litter and topsoil layers should be stockpiled carefully and reused in subsequent regeneration or landscaping works. Soil from lower layers should not be placed permanently over upper layers. Take care to fill in the opposite order to excavation.
7. Areas damaged by excavation and construction should be replanted using local indigenous species as soon as possible. All areas replanted should be carefully managed and monitored to ensure replanting is successful.

Aquila Eco Lodges
Grampians, Victoria

Local stones have been placed loosely to create paved pedestrian pathways and prevent erosion.

Paperbark Camp
Jervis Bay, NSW

Care has been taken in siting the building to minimise the removal of mature trees. This adds to the guest experience as they dine among the tree canopy and view wildlife up close.

Ridgetop Retreats
Deep Creek Conservation Park, SA

The Retreats were designed and constructed to minimise site impacts on vegetation. Construction practices included:

- Areas available for construction and use were tightly defined and enforced to minimise impacts on the bush
- The site was cleaned up daily during the construction phase
- Only one access point was used during construction and in operation
- A project manager was on site daily to ensure compliance with the above points.

Vegetation

South Australia's native vegetation with its supporting geology and soils constitutes a unique landscape. This landscape provides the basis for habitat and biodiversity.

Creating a strong relationship with vegetation is important. A development with a strong relationship to vegetation, and hence fauna, can provide unique experiences.

Aim to minimise the extent of any vegetation clearance on those parts of the site to be built on, and establish revegetation programs with local indigenous species where disturbance has occurred.

Local indigenous species are considered to be any plant species found growing at the site prior to settlement and that has been propagated from local seed sources.

Note: Native vegetation in South Australia is protected by law. If a development is proposed in or near areas of native vegetation, the Native Vegetation Branch should be contacted for advice. Refer to Appendix 3.

Preliminary information

- What are the types and species of vegetation across the site?
- Is there any rare or endangered vegetation across the site?
- Are there any weeds, introduced species or diseases? If so, what is the location and extent?
- What are the policy or legislative requirements?

Objective

Minimise negative impacts on site vegetation.

Actions

Planning

1. Identify and protect any areas of significant vegetation or endangered species.
2. Create defined pathways to prevent guests from walking on and damaging the surrounding vegetation, eg compacted gravel or boardwalks. The advantage of elevated boardwalks is that they can allow light and moisture to pass through which encourages growth.
3. Buildings should be located and designed to minimise the removal of mature trees and interference with tree canopies.
4. Aim to minimise or avoid firebreaks around buildings by using perimeter ground based and roof mounted sprinkler (water spray) systems and appropriate building construction details (see Bushfire Protection). It is possible, after detailed analysis, to establish plantings near buildings that contribute to reducing fire spread.
5. If limited clearance of vegetation is required, this should be offset by vegetation conservation initiatives, such as replanting with locally indigenous species, to ensure the overall result is a net biodiversity gain. Also consider the purchase of carbon credits to contribute to revegetation in other regions.
6. Locate driveways or access points on cleared land or along property boundaries to avoid unnecessary clearance.

Construction

7. A construction envelope can be defined and physically sectioned off to prevent accidental damage to vegetation outside the envelope. Preferably this envelope should be in an already degraded part of the site.
8. Weed infestations can be minimised or avoided by:
   - not importing soil/organic materials
   - ensuring vehicles and tyres are decontaminated in a sealed, controlled area.

Operation

9. Where possible site revegetation should be undertaken using seeds collected from the site and propagated for this purpose.
10. Weed infestations should be identified and quickly managed.
11. Investigate sustainable low-impact productive plantings such as permaculture. Ideally this should occur on degraded places and needs to be locally appropriate.

Fauna

A rich variety of fauna is found in the natural landscapes of South Australia. However, changes to the natural landscape and native habitat following European settlement have placed many fauna species at risk. These 'threatened species' refer to species classified as rare, endangered or vulnerable under the National Parks and Wildlife Act.

Aim to minimise site impacts on fauna and, where possible, support the long-term recovery of any threatened species.

A development with a strong relationship to fauna provides the opportunity for unique experiences. However, interactions between guests and fauna need to be carefully managed.

Developing an understanding of the fauna at a site should occur over a long time frame, as fauna occurrence and distribution will change because of seasonal influences or more complex reasons such as the impact of disease or loss of habitat.

The Department for Environment and Heritage provides a wide range of information at a regional level. At a local level information can often best be obtained by talking with local people.

Preliminary information

- What are the dominant species?
- Are there any endangered, vulnerable or rare species?
- What are the corridors or movement patterns of fauna across the site?
- Are there any existing or potential fauna hazards, eg diseases?
- What are the policy or legislative requirements?

Objective

Minimise impacts on site fauna.

Actions

Planning

1. Identify and protect important fauna habitat and threatened species.
2. Ensure development does not occur in areas that may endanger or threaten important nesting or breeding areas or movement/ migration patterns of fauna, eg Glossy Black Cockatoo habitat.
3. Where possible, intensively used pathways should be elevated to allow small fauna species to move undisturbed. Where this is not possible, pathways should be designed so that they do not significantly limit fauna movement.
4. In degraded areas consider re-establishing fauna habitat or movement corridors to initiate repopulation by endemic fauna.

Construction

5. Any threatened fauna found within the building envelope should be relocated by a specialist.
6. Waste should be removed from site daily to prevent contamination of habitats.
7. Areas for the movement/storage/parking of construction vehicles, site sheds and materials storage should be designated and controlled.

Operation

9. Check for and manage or eliminate any pest animal species.
10. Visitor interactions with fauna need to be carefully managed to minimise disturbance and prevent dependency on humans.
11. Provide opportunities for guests to actively participate in onsite programs, eg biodiversity surveys, monitoring programs and habitat restoration.

Banrock Station Wine & Wetland Centre
Riverland, SA

The restoration of the wetland at Banrock Station has increased the variety of birdlife and resulted in roosting areas closer to shore. Visitor interaction with the birdlife is managed by providing dedicated bird hides for viewing.

Bushfire Protection

Bushfires are a natural part of the ecology in most bushland areas of South Australia. Flame contact, radiant heat and ember attack can have severe impacts on life, property and environmental assets. Identifying and managing the risks to life and property from bushfires and grassfires should form part of the development and building planning. The impact of fire protection measures needs to be assessed and balanced against the level of risk and potential impacts on the environment and visitor experience.

The requirements for development in bushfire prone areas are found in local council Development Plans and the Building Code of Australia. The Country Fire Service (CFS) provides a wide range of information regarding the planning and construction of buildings in bushfire prone areas.

Key issues that must be considered during the planning process include:

- Access and egress
- Siting and design of buildings
- Fuel hazard levels and vegetation (type and amount)
- Availability of water.

An appropriate protection plan for occupants should also be developed based on the principles of stay and defend or leave early.

From a tourism perspective, bushfire requirements (such as clearance of vegetation around buildings) can be at odds with design responses aimed at minimising impacts on vegetation and providing visitor experience.

A co-operative approach during the design process will generally assist to resolve such conflicts. This means talking to the relevant authorities (local council, CFS Development Assessment Unit and Native Vegetation Branch) early in the design process and investigating a range of possible development responses to satisfy statutory requirements.

Preliminary information

- Is the site in a bushfire prone area or bushfire prone?
- What is the bushfire risk classification of the site, eg low, medium, high or extreme?
- How does the bush fire risk classification affect the design, construction and protection of the development?
- What are the policy or legislative requirements?

Objective

Protect the building and occupants from the threat of bushfire.

Actions

Planning

1. Investigate a range of passive fire protection design and management measures such as:
   - Design measures to minimise spark and embers attack and build up of litter in gutters and against/around buildings
   - Fuel reduction, eg thinning and/or removal of flammable undergrowth
   - Landscaping for fire protection, eg selected plant species and mulches are less flammable than others. This should only be carried out after detailed analysis of the local environment
   - Use of building materials with high fire resistance, eg masonry.
2. Investigate a range of active fire protection measures. These measures can include:
   - Installation of perimeter ground-based and roof-mounted sprinkler (water spray) systems with adequate water storage capacity
   - Installation of metal bushfire shutters over external wall glass areas
   - Installation of bushfire water tanks, fire hoses and a fuel driven pump for occupants' use.
3. Develop an appropriate fire protection plan for occupants based on the principles of stay and defend or leave early.
4. Design to comply with requirements of Building Code of Australia.
5. Siting and design should consider access for fire vehicles and access to available on-site water for fire fighting.

Operation

6. Undertake a regular monitoring and/or maintenance program of fire protection measures including:
   - Checking sprinkler systems are operating
   - Identifying possible risks and fuel hazards around the buildings and in surrounding contiguous vegetation
   - Thinning (reducing vegetation canopy), mowing or slashing flammable undergrowth before the start of the bushfire season.

Topography

For the purposes of this publication, topography considers the impact of the development on the natural landform. The visual impact of the development on the natural landform is considered as a separate issue in Aesthetics.

There is a strong relationship between the topography of an area or site and the soils, hydrology and vegetation. Any changes to topography will have an impact on these.

In South Australia's climate, heavy weight forms of construction can be advantageous because of the thermal mass they provide. This creates difficulties on steep, sensitive or unstable land. In these cases lightweight building options should be explored. Light weight, low-impact – possibly removable – structures may be required in more sensitive areas.

Preliminary information

- Gain an understanding of the topography (a topographical survey will assist to locate ridges, valleys and identify the slope of the land).
- How difficult is it to build there, eg consider access, construction methods and materials.

Objective

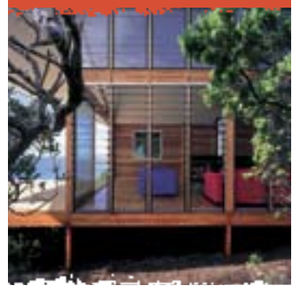
Minimise changes to landform caused by building on steep or sensitive areas.

Actions

Planning

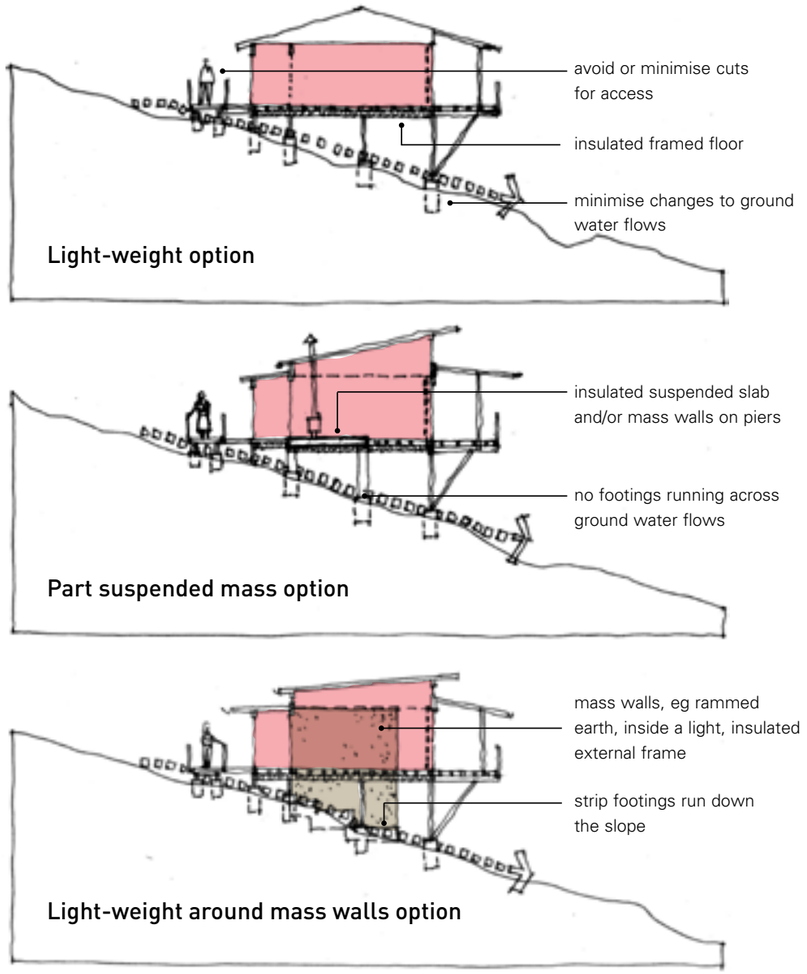
1. Design buildings to sit above sloping ground and avoid or minimise impacts on the natural landform, eg by minimising the extent of cut and fill.
2. Explore building design options including:
   - Light weight option
   - Part suspended mass option
   - Lightweight around mass walls option. (Refer to Figure 12 on following page).

Bay of Fires Lodge Tasmania



This building has been gently placed in the landscape to create minimal disturbance to natural land forms while maximising the visual connection with the surrounding vegetation.

Figure 12: Building models for steep or sensitive sites



ENERGY

Energy is used in buildings for heating and cooling, hot water, lighting and services and equipment.

Well-designed buildings can significantly reduce energy consumption. Environmental impacts can be further reduced by using energy from a renewable source such as solar or wind.

Lower energy use reduces Greenhouse Gas emissions (such as carbon dioxide, methane and nitrous oxide) and reduces operational costs.

Important issues that contribute to reducing energy consumption include:

- Passive solar design
- Mechanical appliances and equipment
- Renewable energy
- Embodied energy.

Passive Solar Design

Passive solar design is design that minimises the need for mechanical heating and cooling. Buildings that are passively designed take advantage of natural energy flows to maintain thermal comfort.

Passive solar design of the building will partially determine the types of materials used in the building.

The use of a heavy weight structure (e.g. concrete slab, masonry or rammed earth walls) is the simplest approach for South Australian climate types. The use of light weight structures may be required on steep sites, hard to access locations and sites with unstable soils and foundation material.

Figure 13 illustrates two simple building design solutions in response to the broad climatic regions in South Australia as identified in Chapter 4.

Preliminary information

- What is the site orientation?
- Does the site have good solar access?
- What are the prevailing winds (direction, likely speed, likely occurrence and duration)?
- Is there localised data on key climate variables?
- What are the impacts of vegetation?

Objective

Use Passive Solar Design (Design for Climate) to maintain thermal comfort and minimise the energy used for heating and cooling.

Actions

Planning

1. Orient buildings towards the north as much as possible so that solar access can be easily controlled by simple fixed shading systems (roof and awnings). Buildings should have long walls to the north and south and should generally be simple in plan unless otherwise dictated by site or functional requirements.

   Orientation interacts with:

   - Views
   - Privacy between neighbours and
   - Functional and social relationships within the building, eg sleeping areas and living areas.

   Any conflict should be resolved through design.

2. Design shading to optimise solar access appropriate to the climatic region. The main strategy is to allow the sun in during winter and to keep the hot summer sun out (Refer Figure 14 and 15).

   Shading may be achieved through building devices (awnings, roof overhangs) and/or through controlled landscape planting.

Shading interacts with:

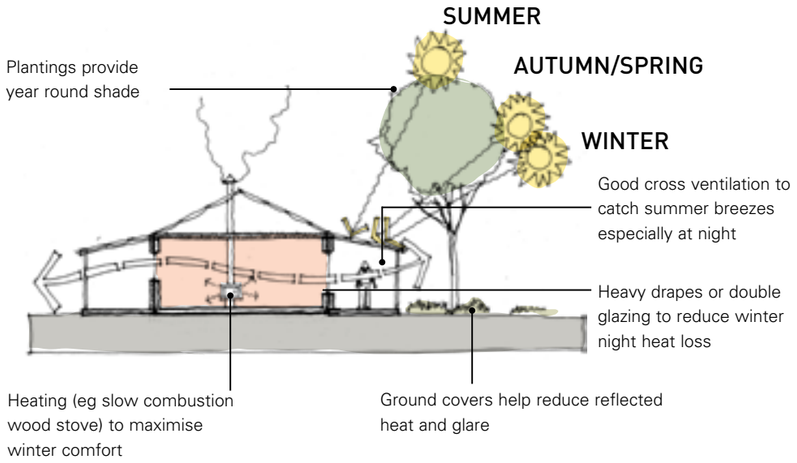
- Orientation
- Views
- Privacy between neighbours
- Landscape design and surrounding vegetation
- Ventilation.

Any conflict should be resolved through design.

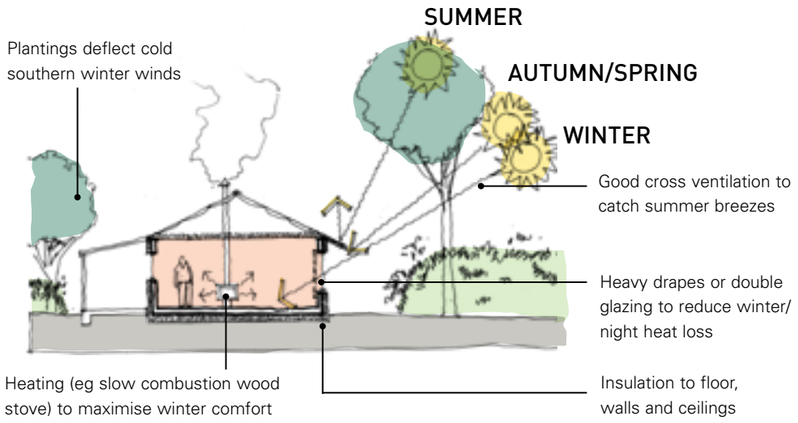
It is people who demand and use energy. Therefore energy use is a social issue (education) as much as a design and technical issue.

Figure 13: Indicative Design Responses for SA Climate Zones

HOT–DRY INLAND CLIMATE MODEL



TEMPERATE CLIMATE MODEL: COASTAL



3. Insulate walls and ceiling to prevent heat gain or loss between interior and exterior.

   In regions where ground temperatures are very low, insulate the concrete floor slab edges to prevent heat loss.

4. Design buildings to be opened to breezes in summer or whenever cool air is available and desired. Sufficient ventilation must occur throughout the year to ensure suitable indoor air quality and a healthier and more comfortable building.

   In regions where summer temperatures become very high, install ceiling fans or evaporative cooling to augment natural ventilation. Remember that evaporative cooling consumes substantial amounts of water.

5. The size and placement of windows for natural lighting must be integrated into the passive solar design.

   Skylights can be used to optimise and control natural light penetration into internal areas.

   Natural light goes hand in hand with heat. Analysis can be done to determine an optimal balance between light and heat gain using careful design of shading (Refer Figure 16).

   Products such as laser cut polycarbonate angular selective skylights are available and can be customised for specific buildings.

Figure 14: Solar paths during the year

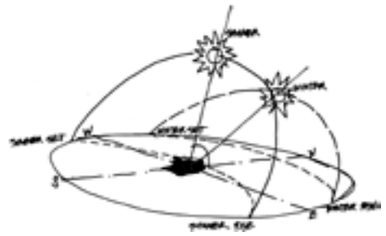


Figure 15: The roof or awnings can be used as simple shading systems

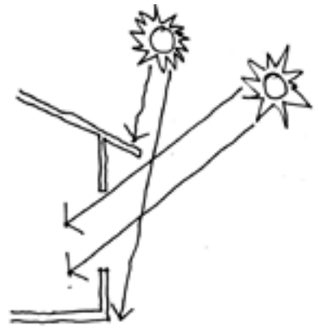
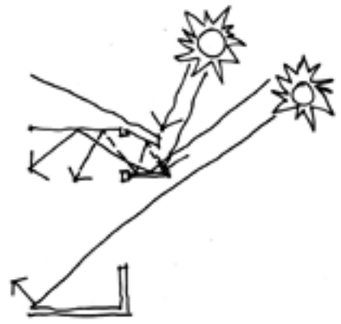


Figure 16: Basic elements of optimum natural lighting

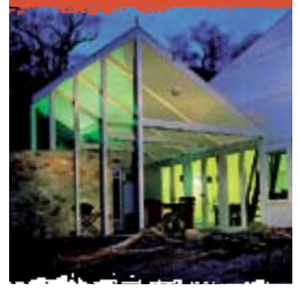


Computer-based passive thermal performance modelling can be carried out.

This provides a measure of the internal comfort of a building (temperature range) or the amount of energy required to keep the internal spaces of a building within a defined temperature range (star rating).

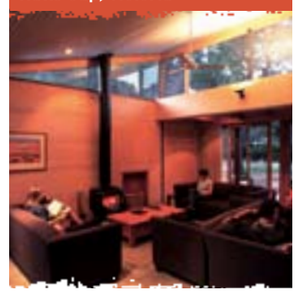
It is useful as a design tool to test variables such as window sizes, roof overhang, orientation and level of insulation.

Aquila Eco Lodges
Dunkeld, Victoria



The use of the steep roof pitch over the north facing patio allows winter sun into the patio and living areas while excluding summer sun.

Grampians YHA Eco-hostel
Halls Gap, Victoria



High level windows provide opportunities for winter sun to enter the building and increase natural lighting.

Grampians YHA Eco-hostel Halls Gap, Victoria

The hostel's hot water system consists of seven roof-mounted solar hot water heaters that supply 2819 litres of hot water. In winter, a water heating jacket in the slow combustion wood heater boosts the solar heaters.

Ridgetop Retreats Deep Creek Conservation Park, SA

Passive solar design principles such as north facing glass in the living areas, roof overhangs and cross ventilation minimise the need for heating and cooling. These are supplemented by a slow combustion wood heater and ceiling fans for cooling.

Mechanical Appliances and Equipment

Select mechanical appliances and equipment that are energy efficient. This is especially important where a development generates its own energy.

Heating water accounts for a major proportion of energy use, so this should be a priority area for reduction in energy use.

Preliminary information

- What are the likely number of visitors and guests?
- What are the expectations of the guests?
- What are the likely usage patterns?

Objective

Reduce energy consumption.

Actions

Planning

1. The energy consumed in heating water can be reduced by:
   - Using solar or instantaneous gas hot water systems. For larger installations, consider a recirculating, instantaneous gas system as these can be very energy efficient and economical
   - Insulating hot water pipes to minimise heat loss between heating system and fittings.

2. The energy consumed in lighting can be reduced by:
   - Using the least number of light fixtures possible in conjunction with good use of natural light
   - Using low wattage compact fluorescent lamps
   - Using computer controlled lighting management systems that reduce artificial lighting to suit natural light levels and respond to room use
   - Using reflective internal surfaces and/or light colours that increase efficient use of available lighting
   - Using solar powered lighting externally.

3. The energy consumed by white goods can be reduced by using the smallest, most energy efficient white goods and appliances possible for the number of occupants. Consider gas as a potential energy source for ovens and cook-tops.

4. The energy consumed by heating can be reduced by using slow combustion wood burning stoves where timber is plentiful* or gas heaters. Ensure timber is provided from a reliable, renewable and sustainable source.

   A building that is well designed for the climate will require little heating.

   * A plentiful supply of timber can be produced by a carefully designed timber plantation. This may be part of a regeneration scheme or for the longer term production of timber. A plantation making use of successional plantings can produce a supply of combustible wood relatively quickly.

5. The energy consumed by cooling can be reduced by:
   - Using ceiling fans or evaporative cooling depending on the climatic region
   - In desert regions, air extraction ventilation systems may be used where cool air is available, eg night purging.

Operation

6. Ensure that computers, sound systems, televisions and other appliances and equipment are not left in standby mode. 'Standby' consumes nearly as much energy as when the item is being used.

Renewable Energy

Renewable energy can be obtained from natural sources such as the sun, wind and water flows.

Typically, renewable energy is costly to produce especially when using smaller scale systems. Improvements in technology and manufacturing and market development are continuing to reduce costs. Generally larger installations remain more economical.

In remote natural areas that are beyond the extent of the electricity grid, systems using a combination of solar, wind and a back-up generator can meet all electricity needs.

In remote areas there are government grants available that can subsidise up to 50% of the cost of a renewable system.

If using a generator investigate the availability of biodiesel as a fuel source.

Preliminary information

- What are the likely numbers of visitors, guests and staff?
- What are the likely usage patterns?
- What natural energy sources are appropriate to the climatic region?

Objective

Generate energy from a renewable resource where practicable.

Actions

Planning

1. Investigate use of renewable energy sources appropriate to the climatic region such as photovoltaic or wind.

2. Conduct an energy audit during the design process to quantify the energy use during typical and peak occupancy periods. This can identify ways by which energy or appliance use can be minimised or avoided and result in reduced energy infrastructure sizes and capital costs.

Cape Cassini Wilderness Retreat, Kangaroo Island, SA

A remote area power supply system, incorporating a tracked solar system, wind turbine and back-up diesel generator, provides all power needs for occupants at Cape Cassini.

A Federal Government grant scheme assisted by contributing 50% of the total supply and installation costs.

Banrock Station Wine & Wetland Centre, Riverland, SA

Rammed earth has low embodied energy during construction. Rammed earth has gained popularity as a building material because of its thermal mass properties and aesthetic appeal.

Embodied Energy

Embodied energy of materials refers to the energy used in the production of the material and the energy used to construct a building using a particular material.

The energy used in operating a building can be readily measured, however the embodied energy contained in the structure is difficult to assess. This energy use is often hidden and can only be fully quantified through a Life Cycle Assessment (LCA).

An LCA examines the total environmental impacts of a product throughout its life – from obtaining the raw materials to manufacture, transport, storage and use.

Embodied energy comparisons should be balanced against material durability, local availability and the requirements of appropriate climatic design. This last item is notable because the energy used in the running of a building is generally larger than savings in embodied energy through material selection.

Notes:

- Generally the more highly processed a material the higher its embodied energy.
- Materials with lower embodied energy intensities, eg rammed earth, concrete, bricks and timber, are usually consumed in large quantities. Materials with high energy content (eg stainless steel, aluminium and plastic) are often more efficient and used in much smaller amounts.

Preliminary information

Embodied energy use comparisons for different building materials.

Objective

Minimise the total amount of embodied energy used in development.

Actions

Planning

1. Undertake embodied energy comparisons of building materials and balance these comparisons against material durability, local availability and longer term operational considerations.

MATERIALS

The built environment and the materials that comprise it should be viewed from a life-cycle perspective. This involves considering material availability, source, consumption, durability, re-usability, recycling, contamination issues and embodied energy.

Some complex design decisions are required to be made in this area. Examples include:

- A more durable material may be more difficult to recycle
- A building designed for easy re-use may consume slightly more materials
- A structurally efficient, durable and recyclable material such as aluminium, causes contamination in its manufacture and has a very high embodied energy.

Materials selection is very much a product of the design responses to the land and energy aspects discussed earlier. There is also the financial feasibility or cost analysis considerations. A longer-term, payback period approach to material selection may also affect the choice of materials.

The marketing value of appropriate materials is also important. For example the use of locally sourced timber or stone can contribute to the sense of place and be used as part of the storytelling.

Preliminary information

- What local building materials are available?

Objective

Minimise the environmental impacts of material consumption, sourcing, processing or manufacture.

Actions

Planning

1. Design buildings to minimise the amount of materials. Spaces should be a ‘close-fit’ to their use and the number of people using them.
2. Make the most use out of each piece of material. Every piece of material has structural value – it can provide shelter from sun, wind and rain and has surfaces that can be incorporated into the finishes (colour, pattern, textures) of the buildings. For example, sheet materials for cladding can also provide structural bracing.
3. Design buildings on a simple geometrical grid based on standard building material sizes. This approach allows off-site fabrication/ prefabrication of building components, minimising site waste and reducing on-site construction time.
4. Where possible make use of existing buildings on the site that are currently not in use. This may require some adaptation, renovation and extension of the existing building.
5. Where available and appropriate, re-use any existing building materials in good condition, eg aluminium and timber-framed windows, structural timber and steel components and corrugated steel sheeting.
6. Use materials sourced locally to the site and where possible natural (stone, timber and rammed earth). This also contributes to the authenticity/sense of place.

Construction

7. Use a construction system that allows materials and panels to be removed for replacement, re-use or recycling. Lightweight structures may be able to be removed for re-use elsewhere. Consider bolted main fixings instead of nailed, glued or welded.
8. Design buildings for durability (low maintenance). Use ‘dry’ methods (metal flashings, membranes and good construction methods) in lieu of sealants to the greatest possible extent. This requires thoughtful detailing of the construction of buildings.

Cape Cassini Wilderness Retreat Kangaroo Island, SA

Use of locally sourced building materials such as stone and rammed earth contributes to the development’s ‘sense of place’.

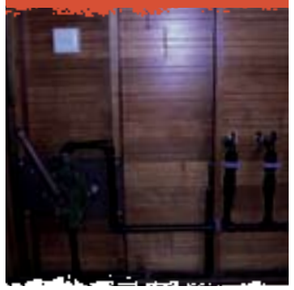
Structural and material efficiency requires working with a good engineer who, through the design process, integrates the structure with the overall design of the development.

WATER

Banrock Station
Wine & Wetland Centre
Riverland, SA

The building depends on collected rainwater for the functioning of its water systems. The tanks service the evaporative air conditioning units and provide potable water to the tasting counter, wet areas and kitchens. Waste water is treated and reused for toilet flushing.

Bay of Fires Lodge
Tasmania



At Bay of Fires Lodge, collected rainwater is adequate to supply all needs.

A hands-on approach to handling water (hand pumping of water to header tank before use) and visibility of tanks allows guests to appreciate the amount of available water and how much they are using, encouraging water conservation.

Water is used for a range of purposes in tourism developments, including drinking, bathing, washing and waste disposal. Principal water sources in remote areas typically include rainwater, groundwater and surface water. In some areas of South Australia, controls exist on the taking of groundwater and surface water.

Rainfall can provide a sustainable water supply and is commonly used as the primary water source in remote tourism development. Precautions need to be taken to maintain water quality for guests.

Regardless of the water source, a sustainable tourism development should aim to use water efficiently at all times and take measures to conserve water. The most preferable options are to avoid the use of water (where waterless options exist) or reduce the use of water. When this cannot be achieved, investigate recycling of treated waste water. The least preferable option is to dispose of unrecycled or untreated wastewater.

Preliminary information

- What water sources are available e.g. groundwater, rainfall?
- Is the taking of water prescribed in this area, eg does it require a licence?
- Are there any hazards, eg salinity, contamination?
- What are the policy or legislative requirements?

Objective

Ensure that the development has a sustainable water supply and is efficient in the use of water.

Actions

Planning

1. Provide a sustainable water supply of sufficient quantity and quality. Where possible, harvest water from the site eg rainwater.
2. Design landscaping and select indigenous plant species that are well adapted to local climatic conditions, thus removing the need for irrigation.
3. Investigate the suitability of waterless toilet systems (composting). Where their use is not practicable install water efficient dual flush systems.
4. Investigate the potential for treatment and re-use of waste water. The design solution will need to take into account specific factors such as soils, topography, natural hydrology, climate and vegetation.

   Note: While it is feasible to treat and re-use waste water, this greatly increases energy requirements. It is better to avoid a problem rather than to have to find a technical solution.

Operation

5. Provide educational information about water efficient features and encourage staff and guests to reduce their consumption.
6. Use water efficient fittings and accredited water efficient appliances.

   Note: The National Water Efficient Labelling Scheme (WELS) has introduced a WELS water rating label for all fittings and appliances that display from one to six stars.

WASTE

Waste is produced during the construction phase and the use of the building. Waste causes not only visual pollution of the site, but also has the potential to cause contamination of the soil, water and air with nutrients, chemical residues and fumes.

Waste management should be considered in accordance with the waste management hierarchy. Refer to Figure 18.

The most preferable options are to avoid or reduce waste. Where these cannot be achieved, materials should be reused and recycled/recovered wherever possible. The least preferable options are the treatment and disposal of waste.

There are two main types of waste: organic and non-organic.

Organic Waste

Organic wastes include waste such as sewage and food scraps that are subject to decay and other biological activity. Organic waste is often high in nutrients that are very difficult to remove during treatment but can be readily recycled, eg composting. Refer to Figure 19.

Organic wastes can also contain or are mixed with chemical contaminants such as cleaning chemicals, pesticides and mineral oils. It is important to avoid or reduce the chemical contaminants that enter the organic waste management system.

In remote areas, an alternative wastewater treatment system will generally be required. Approval must be obtained from the Department of Health before any alternative on-site wastewater treatment system is installed.

Preliminary information

- Work through the waste management hierarchy. The starting point is to consider ways to avoid or reduce waste.
- What local waste management infrastructure exists, eg sewage treatment, composting?
- What are the policy or legislative requirements?

Objectives

Minimise organic waste impacts during construction and operation.

Figure 18: Waste Management Hierarchy

Figure 19: Organic waste and nutrient cycle

Aquila Eco Lodges
Dunkeld, Victoria

All sewage waste is directed to a Dowmus sewage treatment system. Worms assist to breakdown organic waste. Waste water is removed and passed through a sand filter and into a soakage trench. Food scraps are added to the waste system. Interpretive signage educates guests on the operations of the system.

Actions

Planning

1. Investigate alternative on-site wastewater systems including:
   - Composting toilets or other sewage treatment technology systems (see point 2 below)
   - Greywater /sullage systems, eg laundry, bath, wastewater, shower, kitchen
   - Reedbed systems
   - Nutrient removal systems
   - Other wastewater systems using environmentally sound technologies.
2. A range of sewage treatment technologies exist, including:
   - Dry composting systems, which use very little water and produce a dry compost waste that is effectively inert
   - Flushing systems that biologically digest/ treat waste using either a mechanical system (pumps, valves, digestion tanks) or biological systems. These produce a liquid waste that can be dried to a very small volume using evaporation
   - A 'hybrid' very low flush composting
3. All organic waste products should be carefully dealt with in a manner that is in accordance with the fragility of the natural environment, ie:
   - Wastewater may be distributed in areas of plantings that will use nutrients to avoid contamination of the soil and ground water with excess nutrients. Alternatively it may need to remain isolated from the environment and removed, preferably to a food production area
   - Separate kitchen wastes, food scraps and other compost materials from solid waste and put them into the organic waste cycle.

Construction

4. During construction all sewage waste should be stored and removed from site.

Operation

5. Avoid or minimise chemical contaminants (such as cleaning chemicals, pesticides and mineral oils) that enter the organic waste management system.
6. Educate guests on the operations of the organic waste management system and explain the environmental benefits.

Non-organic Waste

Non-organic wastes are made up of a number of materials that vary greatly in their ability to be re-used or recycled. They should also be considered, as far as possible, as resources and parts of material cycles. Refer to Figure 20.

In remote areas, the capacity for sustainable waste management by the tourism operator may be limited by the availability of access to local infrastructure and services provided by local authorities and commercial operators, eg access to recycling. This emphasises the importance of minimising the amount of waste generated. If it's not generated, you don't have a problem to deal with.

Preliminary information

- Work through the waste management hierarchy. The starting point is to consider ways to avoid or reduce waste.
- What local waste management infrastructure exists, eg solid waste collection, recycling availability?
- What are the policy or legislative requirements?

Objectives

Minimise non-organic waste impacts during construction and operation.

Actions

Planning

1. Designate areas for storage and separation of non-organic waste, eg plastic, metal and glass.
2. Minimise building waste during construction:
   - Off-site prefabrication (to minimise on site waste)
   - Minimise the number of different materials by designing each piece of material and structure to have multiple uses
   - Design to suit material sizes (minimise off-cuts)
   - Re-use and recycling of building materials.

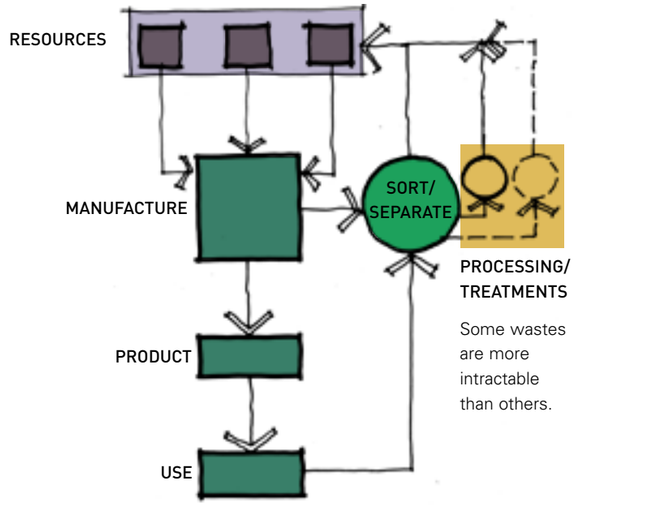
Construction

3. Establish a waste management system during construction as part of the Environmental Management Plan. This should be based on sorting/separation of waste for recycling or for other uses and should also allow for regular removal.

Operation

4. Non-organic wastes should be sorted into components for recycling, eg plastic, metal and glass. Designate areas for storage and remove waste regularly.
5. Maximise the use of recycled products or products that can be recycled, eg recycled paper, glass containers.
6. Educate guests on the operations of the waste management system and explain the environmental benefits.
7. Select products that minimise the use of packaging.

Figure 20: Non-organic waste and nutrient cycle



TRANSPORT

Ningaloo Reef Retreat
Cape Range National Park, WA

A shuttle service is provided to transport guests to and from the airport or the nearest town (Exmouth). On arrival guests walk approximately 500 metres on a narrow path that winds its way through the dunes and adjacent lagoon to reach the secluded retreat. This adds to the sense of arrival.

Paperbark Camp
Jervis Bay, NSW

Private vehicles are parked near the reception area outside the site. A golf buggy is available for transport of luggage and bicycles are available for use by guests.

Aim to minimise the impact of vehicles on the environment. This can occur by reducing the number of private vehicle trips and reducing vehicle impacts on the site.

There are successful tourism developments in natural areas that deliberately limit or exclude vehicle access around the site. This is not just good for the environment, it can also make a significant contribution to enhancing the visitor experience. Ningaloo Reef Retreat and Paperbark Camp are good examples.

Rural and remote areas are often desirable cycling destinations with established networks of recreational cycling trails (both road and off-road). Where possible, site planning and design should aim to facilitate bicycle access to and from the site and connect to nearby local attractions.

Preliminary information

- Does the site have access to public transport?
- What are the likely transport needs of the target market?
- Is there a safe unobtrusive site where cars can be parked?

Objectives

Minimise the requirement for and impact of private vehicles on the environment.

Actions

Planning

1. Provide private vehicle parking in one location (preferably near the reception area) and provide alternative transport around the site, eg pedestrian, bicycle or golf buggy. This will minimise the requirement for wide paved vehicle access ways.
2. Reduce the expanse of car parking areas by using natural barriers such as vegetation to define or segregate them.
3. Investigate bicycle linkages with nearby attractions.

Operation

4. Provide transport alternatives for guests not travelling by private or hire car, eg shuttle service to nearest public transport facilities.

Prairie Hotel, Parachilna, Flinders Ranges, South Australia

SOCIAL AND ECONOMIC

This section deals with the variety of social and economic interactions that occur between people during the life of a tourism development. These interactions relate to the community of people directly involved with the development (staff, visitors, suppliers and construction workers) and to the wider community of which the development is part.

LAND USE AND TENURE

Ridgetop Retreats
Deep Creek Conservation Park, SA

This site was previously used as a storage depot and identified in the Deep Creek Conservation Park Management Plan as a possible development site. A lease for a 2000 square metre site was negotiated with the Department for Environment and Heritage to undertake the development.

Land use and tenure are the starting points for examining the regulatory controls over a site.

Generally the best place to start is by talking to the local council and understanding what planning controls apply to the site. The local council Development Plan will include zones that provide a broad indication of suitable land uses.

The potential impacts of a suitable land use (as nominated by a Development Plan) must be thoroughly considered from an environmental, cultural, social and economic point of view. This is especially true on a relatively natural site where detailed consideration of land use is needed.

Regulatory controls are also affected by tenure. The most common type of tenure is freehold, although a licence or lease may also apply.

Preliminary information

- What planning controls apply?
- Is the tenure suitable?
- What are the policy or legislative requirements?

Objective

Ensure that the land use and tenure is appropriate for the site and catchment.

Actions

Planning

1. Identify the key local/state authorities and meet with them to understand the land use controls and legislative requirements relevant to any proposed development.
2. If necessary seek professional planning advice on the suitability of land use and tenure for development on the site.

PRIVACY AND SOCIAL INTERACTION

Privacy and social interaction are important considerations that need to be addressed at different planning scales within a tourism development:

- Individual level – inhabitants in the same space or dwelling
- Buildings – inhabitants of separate buildings.

Visitors need opportunities to have physical, intellectual and emotional experiences.There should be flexibility for both communal and private experiences: swimming, walking or talking as a group, but being able to slip away for private thoughts or sensations.

Visual and acoustic privacy needs will vary depending on the type and nature of development and the type of experience intended. Opportunities to facilitate social interaction among guests should also be considered (eg tours, dining), although these needs will vary.

Preliminary information

- What is the likely type and density of buildings?
- Where are the best views?
- What type of experience is the target market seeking?
- What natural screening opportunities exist? (eg vegetation, rocks, natural landforms)

Objective

Provide buildings in a landscape setting that enables good personal privacy but facilitates social interaction if desired.

Actions

Planning

1. Provide visual and acoustic privacy between separate rooms and between buildings. The siting and orientation of buildings is fundamental to achieving privacy objectives. Methods for achieving privacy must also be flexible and able to be varied by individuals to suit their needs in different locations, at different times and for different activities. Privacy devices such as screens, blinds, fences and plantings can be used.
2. The need for privacy should be balanced against other needs:
   - Social interaction
   - Views
   - Natural light
   - Breezes/ventilation
   - Experiences.
3. Consider creating private spaces in public areas by:
   - Providing partly 'hidden' areas and/or areas that can be made private in communal interior spaces
   - Providing 'refuges' and/or areas that can be made private in the landscape.
4. Provide sheltered external gathering areas that connect simultaneously to an internal space and to a large open communal space, eg barbecue areas connecting to a natural landscape setting.
5. Provide internal informal gathering spaces (eg library, games rooms), where visitors/ guests can interact. Some of these might have a focus or 'theme' (books, drinks or special views). Consider the balance between the possibility of the space being made exclusive by a group and its potential for facilitating informal interactions.

Ningaloo Reef Retreat
Cape Range National Park, WA

Guests assist with preparing meals in the communal dining tent, which provides the opportunity for social interaction. They can also retreat to the privacy of the tents which are purposely designed with an outer layer of shade cloth that wraps around the front veranda to provide complete privacy from adjoining tents, yet uninterrupted views of the water.

Grampians YHA Eco-hostel
Halls Gap, Vic

External courtyards are partly sheltered by a pergola and located to connect with the internal lounge and dining areas.

ACCESSIBLE FACILITIES

Head of Bight
Nullarbor Plain, SA

The cliff top viewing areas at Head of Bight provide accessible visitor facilities for viewing Southern Right Whales.

Tourism operators should aim to make all customers feel welcome. Ever-increasing numbers of people have a disability and are participating in tourism and recreation activities. This is a growing market and a major potential source of income for the tourism industry in the future.

There are regulatory requirements related to physical access but these should be seen as a minimum. Ease of moving around a facility will be appreciated by all customers, not just those with disabilities.

Providing accessible facilities is more than just access ramps and wider parking bays: it relates to the design of the building and also includes factors such as customer service, the design of furniture and communication.

Preliminary information

- Identify common disabilities and associated guest requirements.
- What are the policy or legislative requirements?

Objective

Provide good access for all people.

Actions

Planning

1. Ensure that the development (both buildings and landscape) is accessible to people of all ages and abilities.

Operation

2. Communicate the accessible features of the development to guests, eg through the use of signage, brochures, advertising and websites.

SAFETY AND SECURITY

The safety and security of staff and guests should be considered during design. Requirements will vary depending on the type of accommodation, level of public access and the experience sought by guests.

There are statutory building requirements that will apply, however these should be considered as a minimum. It may also be useful to commence early discussions with insurers to understand whether any particular safety or security constraints will apply.

Occupational health and safety (OH&S) is an important operational consideration. The National Tourism Accreditation Program (NTAP) provides a structured program for tourism operators to address risk management and OH&S issues.

Preliminary information

- Identify any local safety or security hazards.
- What local emergency and security infrastructure exists?
- Commence initial discussions with insurers.
- What are the policy or legislative requirements?

Objective

Provide guests with a safe, healthy and secure environment.

Actions

Planning

1. Provide safe and secure:
   - Accommodation and related spaces
   - Public/communal buildings, eg central facilities
   - Landscape, eg paths and tracks
   - Activities.

Operation

2. Prepare a risk management plan.
3. Prepare an OH&S plan.

Jemby Rinjah
Blue Mountains, NSW

Heavily used pathways have been elevated to prevent guests from damaging surrounding vegetation. Handrails are needed because of the height of the boardwalk above the ground.

COMMUNITY AND ECONOMIC INTERACTIONS

A community that has a sense that a development belongs locally has the potential to provide valuable marketing and economic support.

A sustainable tourism development should become an integrated part of the local community. Even a 'private' or secluded place will interact with the local community and its human and economic resources in some way. These interactions should provide positive impacts for the local community, eg local employment opportunities.

The local economy of an area should be the first place to look for resources, skills and labour for both the design/construction and operation stages of a tourism development.

Preliminary information

- What local suppliers and readily available materials and equipment are available? Is there capacity to obtain non-standard supplies?
- What local builders, sub-contractors and consultants are available?
- What is the capacity of local accommodation and hospitality?
- What training resources are available?

Objective

Facilitate and enhance strong relationships between the development and the local community.

Actions

Planning

1. Involve the local community in the design of the development and take into account community expectations. Gather feedback for use in the design process.

Operation

2. Keep the local community informed about the development.
3. Where possible employ local residents to impart knowledge to guests.
4. Establish supply chains within the local community to ensure economic benefits of the development flow through to the community.

SPACE REQUIREMENTS

Using less and getting the most out of materials and other resources is a key principle of sustainability. To do this the physical and social functions of the development need to be understood.

The entire development and individual buildings should be kept to an optimal size to suit functional requirements and social interactions without compromising the visitor experience.

Space requirements should have regard to function/purpose, number of employees, the number of visitors/patrons and social interaction to occur within and between buildings.

Preliminary information

- What are the likely numbers of staff and visitors/guests?
- What facilities are to be provided? eg reception, central facilities, number of bedrooms or cabins
- Initial ideas on how spaces should feel? eg bedrooms to be open to views or bathrooms to have a private courtyard.

Objective

Ensure the entire development and individual buildings are kept to an optimal size without compromising the visitor experience.

Actions

Planning

1. Design built space to an optimal size to match the target market expectations and preferences.
2. Design built spaces to create interesting places and enhance visitor experiences, eg strong connections to the outdoors can make spaces look and feel larger than they actually are.

Bay of Fires Lodge Tasmania

Bay of Fires Lodge has been designed to accommodate 20 walkers and six guides during the four-day walk. Communal dining and kitchen areas and flexible sleeping quarters (that satisfy singles or couples) are provided to cater for the needs of guests.

HEALTH

Grampians YHA Eco-hostel
Halls Gap, Victoria

Practical use of materials to create a healthy internal environment include the use of:

- Natural materials like rammed earth
- Plywood (low off-gassing of VOC's)
- Polished concrete floor.

Paying attention to guest health and wellbeing is becoming increasingly important in tourism development as consumer preferences change.

Consumers are increasingly looking to stay at and experience places which they believe are designed to be healthy for them. Since health includes emotional wellbeing, they are interested in the 'atmosphere' or 'ambience' generated by the place, as well as the practical steps that have been taken to provide a healthy environment.

The health outcomes of decisions made about a development will also have impacts beyond the development. Workers constructing the built elements, workers manufacturing materials and communities exposed to waste from that manufacture are all affected.

Preliminary information

- Identify specific health risks?
  eg related to the specific site or building materials.
- Are there any special intentions of the development related to health?
- What are the policy or legislative requirements?

Objective

Ensure that the development provides a healthy environment.

Actions

Planning

1. Design internal spaces to be well ventilated.
2. Minimise or avoid the use of materials that release Volatile Organic Compounds (VOC's) into the air, eg carpets made from synthetic materials, most acrylic and solvent based paints, vinyls, most tiling and flooring glues.
3. Maximise the use of natural materials, especially for internal structures and finishes. Composite boards provide a sound alternative, (eg MDF, particle board, plywood) as these products use high quality, external grade, low off-gassing adhesives.
4. Minimise or avoid the use of carpets. If they are required use those made from natural materials (eg wool or plant fibres) and which are thin and dense (tightly woven).
5. Use water or natural oil/solvent based paints with natural pigments, drying agents and preservatives (anti-fungal agents).
6. Where the use of artificial finishes and other materials (eg adhesives) cannot be avoided, minimise their use and select the most appropriate materials. Compare material data sheets.

Operation

7. Minimise or avoid the use of toxic chemicals for cleaning and maintenance.

COMMUNICATIONS

Communications are essential infrastructure for any tourism development. Technology is providing a massive array of telecommunications options in urban areas, however remote country areas are often not as well equipped with modern communications infrastructure. Technology options include:

- CB radios are the cheapest form of vehicle-to-vehicle or point-to-point communications and the most popular, but are limited from 1km to 30km depending on terrain, traffic and weather.
- UHF CB radio provides FM quality, short range, line of sight communications. In Outback areas where repeater towers are installed, it can extend communication up to 300km.
- HF radio is the only system that can offer virtually Australia-wide contact almost 24 hours a day.
- Mobile phone usage is generally restricted to 10km from main towns where there is a mobile phone tower, however many Outback towns don't have this service.
- Satellite phones provide good coverage, however the high cost of calls and unit prices have kept usage levels down. Satellite phones will gradually become more common in remote areas as the technology improves and they are able to offer direct dial voice, fax and data communications from anywhere in Australia around the world.

The type of communication system used for tourism comes down to its primary purpose. This may be emergency calls (satellite phone or HF), regular contact with staff in the immediate location of the business (CB radio) or contact with neighbours or tour operators in the immediate region (UHF), or world-wide connection to high speed communication devices (satellite phone and satellite dish connected to broadband technology).

To avoid communications becoming intrusive they must be carefully managed to suit the intentions of the development. Generally good facilities should be available but discretely located.

Preliminary information

- What local communications infrastructure exists?
- What is the target market's likely requirements? eg internet, mobile phone access.

Objective

Provide good communications systems that do not compromise visitor experiences.

Actions

Planning

1. Provide functional communications systems that meet statutory requirements (eg emergency services) without compromising visitor experiences or the site's intrinsic values.

Notes

- Generally conference or business retreat facilities will benefit from a higher level of communications.
- The more remote, or secluded the experience provided, the less guests are likely to seek or require communications infrastructure.

Iga Warta, Northern Flinders Ranges, South Australia

CULTURE

Culture is a broad term that refers to a community's set of shared ideas and understanding of the world. Language, institutions, ways of behaving, spiritual activities, buildings and rituals all manifest the culture of a group of people or the whole of society. Culture is always linked to a community's sense of place: how they feel about it and what they value in it.

This guide largely restricts itself to considering what might be lost, restored, enhanced, rediscovered, interpreted and/or made use of during a tourism development.

In South Australia, as in Australia as a whole, there are a multitude of cultures and histories. For simplicity, these have been condensed into two areas, Aboriginal and non-Aboriginal.

ABORIGINAL TRADITIONS AND CULTURE

A sustainable tourism development should consider two key issues about local Aboriginal history and traditions.

Firstly, the development might have an impact on a site by destroying or disturbing relics, valued places and/or pathways. Local and State Government regulations control such impacts.

Secondly, consumers are increasingly seeking authentic Aboriginal cultural experiences. These experiences can include song, dance, storytelling, art and artefacts. Seek to identify opportunities to encourage and develop linkages with Aboriginal culture.

Gathering basic information involves historical research, engagement with local stakeholders and direct engagement, where possible, with local Aboriginal people.

Preliminary information

- Are there any important artefacts or valued places on the site?
- What key aspects of language, stories, accessible rituals and social interactions can be told?
- What are the policy or legislative requirements?

Objective

Protect and celebrate Aboriginal traditions and culture.

Actions

Planning

1. Make sure that the development does not result in the damage or loss of artefacts and does not have an impact on Aboriginal cultural values. This may require talking to the relevant Aboriginal communities to advise on locations that are likely to be free of cultural significance.
2. Look for ways to interpret local Aboriginal history and traditions. This can occur in a variety of ways, such as preparation of brochures or displays, and may require exhibition and administration spaces in buildings and/or pathways in the landscape.

Construction

3. Make sure that designers and builders actively look for and protect any artefacts disturbed by building works. If artefacts are discovered during construction these should be reported to the local authority and Aboriginal community.

Operation

4. Identify opportunities to link with or promote existing Aboriginal tourism product.

Coorong Wilderness Lodge
Meningie, SA

The Coorong Wilderness Lodge restaurant has been designed in the shape of a fish to represent the giant cod fish (Ponde) in the Ngurunderi Dreaming.

Ngurunderi is one of the great ancestral Dreaming heros of the Ngarrindjeri people. In the Dreaming, Ngurunderi travelled down the Murray River in a bark canoe, in search of his two wives who had run away from him. At that time the river was only a small stream. A giant cod fish (Ponde) swam ahead of him widening the river with sweeps of its tail. Ngurunderi chased the fish trying to spear it from his canoe…

and so the story continues to The Coorong, along the coast to Cape Jervis and, eventually, Kangaroo Island.

Iga Warta
Northern Flinders Ranges, SA

At Iga Warta, visitors experience Adnyamathanha culture by living, sharing and learning in an Aboriginal community setting.

Here a senior cultural tour guide is explaining the cultural meaning and significance of this particular rock art. A traditional place of the Adnyamathanha people, this site is titled 'Malki' (pronounced Mull-kai), meaning painting site.

NON-ABORIGINAL HISTORY AND TRADITIONS

Prairie Hotel
Flinders Ranges, SA

The Prairie Hotel at Parachilna is renowned for its strong brand. These signs are great examples of the use of local materials, design and humour. They convey a unique sense of place and entice the visitor to find out more.

Non-Aboriginal history and traditions can also be considered at two broad levels.

Firstly, at the physical level, some local communities have made use of particular building elements or features to develop a building style that is distinctive. There may be opportunities to reflect this vernacular building style in a fresh contemporary way in the design of tourism development.

There may also be opportunities to reuse and restore existing old buildings. Buildings of historic significance are generally protected under Commonwealth, State and Local Government heritage controls so it is important to check what controls may apply.

Secondly, a tourism development represents a place where visitors can experience local culture. Try to find ways to 'tell the story'. It can be as simple as displaying local art or providing interpretive material that explains the local history or culture of the area.

The best place to start is by talking to the locals. This might involve contacting the local council or stakeholders such as the local historical society.

Preliminary information

- Are there any important buildings or places on the site?
- What is distinctive about the local culture, eg natural, social, historic features and interactions?
- What are the policy or legislative requirements?

Objective

Protect and celebrate non-Aboriginal history, traditions and lifestyle.

Actions

Planning

1. Work with an architect/building designer to identify whether there are any distinctive local building styles that can be reflected in the design.
2. Where possible reuse heritage buildings and contribute to their preservation and enhancement.
3. Look for ways to provide interpretation and plan experiences. These will require exhibition and administration spaces in buildings and spaces and pathways in the landscape.

Iga Warta, Northern Flinders Ranges, South Australia

EXPERIENTIAL

As discussed in Chapter 3, the demand for new, powerful and real experiences is one of the key drivers of consumer choice. It therefore makes sense that creating and enhancing the 'experience' should underpin all aspects of the development's philosophy and delivery.

Development can be designed to have good experiential impacts in the same way that environmental, social and economic and cultural impacts are considered. There are two important and related factors to consider when designing for good experiential impacts:

- the aesthetic impact on the senses; and
- the emotional responses that these impacts generate.

AESTHETICS

Ningaloo Reef Retreat
Cape Range National Park, WA

Use of building form, lightweight materials and colours ensure Ningaloo Reef Retreat is in keeping with the existing landscape.

Flinders Chase Visitor Centre
Kangaroo Island, SA

The use of rainwater tanks clearly located and linked to roof gutters is an implicit design response. This communicates the source of the water; rain collected from roof gutters. The tanks show that the amount of water available is finite and, therefore, should be used with care.

Aesthetics is commonly an area of debate in the design and assessment of development.

The broad approach to sustainability, used by this guide, provides a credible basis for aesthetic outcomes. This is because there is a strong relationship between the sustainable design responses (practices and technologies) of buildings and what they look like (scale, form, texture, colour, light and shade).

It is worth exploring this relationship rather than seeing the starting point of design in a sculptural/artistic way. Sustainable responses to environmental issues such as land, water, energy and materials have powerful, positive aesthetic impacts. These responses provide pleasing aesthetic outcomes and are an expression of the environment and the development's sustainable relationship to it.

This is not to say that sculptural/artistic work is not important to design. There is still room for sculptural and artistic expression where this furthers the creation of the desired experience. However, it is saying that aesthetic outcomes have a broader and authentic basis in sustainability.

In addition to responding to environmental issues, the analysis of the aesthetic qualities of the existing natural and built environment provides a further layer of input into the design process.

This analysis should consider aspects of existing landscape, vegetation and valued buildings such as:

- Scale and form
- Pattern and texture
- Colours
- Visual mass and articulation
- Views (significant views into and out of the site)
- Scenic quality.

Preliminary information

- What environmental issues will the development need to respond to?
- What are the aesthetic qualities of the existing natural and built environment?

Objective

Ensure the built environment is an integrated part of its visual context.

Actions

Planning

1. Specific design responses include:
   - Unobtrusive – aims to hide or camouflage as much as possible
   - Contextual – 'in keeping', develops precedent and interprets existing, takes cues from surrounding environment (i.e. Ningaloo Reef Retreat); or
   - Controlled contrast – designed to be seen and noticed, makes a positive statement (i.e. Ridgetop Retreats).
2. Give priority to providing experiences for guests and visitors, such as:
   - Spaces inside the building
   - Views relating to landscape ('outside')
   - Views of the buildings.
3. Communicate explicit and implicit design responses:
   - Explicit experiences can be directly communicated in built responses through the use of signage, interpretation, infrastructure and guidebooks.
   - Implicit experiences are expressed responses to environmental issues in the built form. These built forms communicate their environmental purpose to observers through their implicit function and appearance.
4. Screen unsightly utility and service areas as appropriate (some services and their function may be an integral part of the visual design).
5. Avoid dominating the landscape by placing buildings in prominent positions (e.g. top of ridge lines).

EMOTIONAL RESPONSE

The design of facilities and sites can deliberately create many varied emotional responses, including surprise, wonder, a sense of freedom, intimacy, restfulness, privacy and mystery. Aligned with the overall experience being offered to the target market, these can create a powerful experience and lasting memories.

The human mind reacts to forms, colours and materials, and their combinations. It also reacts to the sequence of experiences. An individual scene can be moving, but it will be more powerful if it is part of a sequence of spaces and scenes that builds to a climax. In moving through a place, a person continuously innately absorbs and assesses the position of one's self in relationship with surrounding objects and spaces. One also senses objects and spaces beyond what is immediately visible.

The initial view of a long straight path is soon digested and further movement along it becomes monotonous. A more positive emotional reaction is evoked by a quick succession of vistas, by changes of level, and by contrasting a strongly enclosed space with a wide open space.

When designing a sustainable tourism development, special attention should be given to the entry experience. One never gets a second chance to make a first impression.

Think about how a visitor will perceive the arrival sequence, from turning off the public road to lying in their bed for the night. What image does the entry sign convey? What response is sought from the drive in? What is the response from the first view of the main building? Does the carpark dominate? Do you want everything on show, or progressively revealed? What route do people take from check-in to their room? If there is a special view, when and where is it revealed?

Preliminary information

- What experiences can the site offer?
- What is the best approach route to the site?
- Is there a desired experiential sequence?
- Are there stories or knowledge about the place that are exciting or intriguing?

Objective

Create a 'product' that is different, authentic and compelling, which will evoke powerful emotional responses in the customer.

Actions

Planning

1. Undertake a site analysis to stimulate a genuine 'feel' for the site and its locality. Take time to settle down and learn by experience how to capture the essence of the place. Base the concept on reflecting the site values and experiences.
2. Provide an entry sequence (sense of arrival) that gives people a clear perception of the place, is legible and clear, but also raises questions and stimulates people's curiosity as to what lies beyond.
3. Design to enhance people's experience of a place and create emotional responses. Specific design responses include:
   - Create indoor landscapes and outdoor rooms (using enclosure and partial enclosure)
   - Stimulate the senses (sight, hearing, touch, smell, taste)
   - Capture views as panoramas or as tantalising glimpses from different perspectives
   - Provide spaces for privacy and for social interaction as desired.
4. Consider types of activities that enhance the experience and the linkages between them.
5. Establish a story or series of stories, related to the place, the built environment and the interaction between them. Turn these into journeys supported by the built environment. These stories can be achieved using both explicit and implicit methods.

Banrock Station Wine & Wetland Centre
Riverland, SA

A well-crafted entry experience highlights sustainable design features of the building yet provides only a small glimpse of the wetland views beyond.

Upon entering the building, magnificent views of the vines and wetlands 'unfold' from the interior and the deck.

Rawnsley Park Eco Villas, Wilpena Pound

6. CASE STUDIES

The following case studies showcase tourism developments throughout Australia that display elements of sustainable design, construction and operation. The case studies highlight unique design responses to a range of environmental, social and economic and cultural issues.

Additional case studies can be viewed at www.tourism.sa.gov.au/tourism

RIDGETOP RETREATS

KEY FEATURES

- Award-winning architectural design
- Passive heating and cooling
- Energy efficiency
- Environmentally sensitive construction practices
- Conservation Park setting

INTRODUCTION

Background

Southern Ocean Retreats is a family owned business that aims to provide visitors to Deep Creek Conservation Park with a choice of quality accommodation at different locations within the Park. Barry Duykers and Jane Formato have developed a range of accommodation from renovated rustic cottages to the modern Ridgetop Retreats set in a bushland area of the Park.

The Ridgetop Retreats were designed by well-known Adelaide-based architect Max Pritchard. Ridgetop Retreats has received critical acclaim and has received the highest design award available, a Royal Australian Institute of Architects Award of Merit, for design and building excellence.

Objectives

The owners had a number of development objectives including:

- A requirement to establish three units on the site
- Providing a high level of luxury. The retreats together with the Deep Creek Homestead complement other properties run by Southern Ocean Retreats at the budget end of the market
- Ensuring the units were custom designed to take full advantage of the natural environment and setting
- The units to be built on best practice energy and conservation principles
- Giving visitors an authentic experience of the setting, its climate and attractions.

The Setting

Deep Creek Conservation Park lies at the southern tip of the Fleurieu Peninsula in South Australia. It contains some of the State's most spectacular semi-wilderness areas and coastal scenery.

The Park is a contrast of rugged coastal views across the Southern Ocean as well as tranquil settings beneath tall stringy bark forests. Orchids and ferns grow in moist gullies with permanent running creeks. The Park is home to some 400 native plant species including several of conservation significance.

Western Grey Kangaroos can be seen as they graze on nearby grasslands. There are some 120 bird species in the park, ranging from the tiny Blue Wren to the mighty Wedge-tailed Eagle.

From left to right: The Retreats at dusk; a great example of minimal site disturbance.

Facilities

Ridgetop Retreats was established on a flat ridge-top on the edge of a stringy bark forest within Deep Creek Conservation Park. The development site was previously disturbed and used by National Parks and Wildlife as a storage depot.

The development involved the construction of three modern self-contained retreats on a tightly defined 2000 square metre site.

The retreats have a small footprint (65 square metres) and include two double bedrooms, kitchen, lounge room and bathroom. The retreats also feature a stainless steel kitchen, leather lounge with wood fire and quality fixtures and fittings.

Other facilities constructed on the site included a large rainwater tank for each unit and a separate rainwater tank for fire-fighting purposes. The owners have also commenced replanting the site with native vegetation.

Issues and Constraints

The development issues and constraints included:

- Constructing a new tourism accommodation development within a Conservation Park
- Minimising site disturbance caused by the development and construction process. Priority concerns were natural hydrology, soil stability and quality and disturbance of vegetation around the site.
- Control of access to surrounding area to avoid damage to natural vegetation
- Appropriate native (or regenerative) plantings to the site
- Power supply
- No mains connection for water and waste disposal
- Views, and other qualities of the site
- Access to walking paths
- Fire protection considerations.

ENVIRONMENT

Building materials and construction

- The retreats feature primarily 'lightweight' building materials apart from the concrete slab. A waffle pod concrete slab was used as it avoids the need for excavation and provides thermal mass.
- Other building materials include a mix of laminated glass, colourbond steel and compressed fibre cement for wall cladding and colourbond steel for roofing. The walls and roof are insulated. Materials have been selected primarily for passive thermal performance/good design for the climate, durability and aesthetic values.
- During construction, the areas available for builder's access and building envelopes were tightly defined and a daily clean-up of the building site was enforced to minimise impact on the bush.

Energy

- A key feature of the retreats is the use of passive solar design principles including:
  - north facing floor-to-ceiling laminated glass windows
  - appropriate roof overhang to allow thermal performance during winter and shading during summer
  - concrete slab construction for thermal mass
  - cross-flow ventilation is facilitated by the site's location on a ridge-top and prevailing southerly breezes.
- Other energy conservation principles include a solar hot water system, energy efficient down lights with dimmers, a slow combustion heater and ceiling fan.
- Importantly, there is no air-conditioning provided (ceiling fan only), however the design features maintain comfort levels all year round.
- The retreats are reliant on a mains power connection located approximately 40 metres from the site. The owners considered alternative energy solutions but these proved costly. The use of passive solar design, solar hot water and energy conservation principles has helped minimise reliance on mains power.

Water

- Each retreat is completely reliant on a 25,000-litre rainwater tank as the sole source of water. The retreats are in a high rainfall area (880mm/year). To date this rainwater supply has been adequate, even with high occupancy rates and during dry years.
- Water conservation measures include the installation of water efficient showerheads and taps and a dual-flush toilet.
- A separate 25,000-litre rainwater tank has been installed for fire-fighting purposes. In the event of fire, this tank provides the capacity to douse the units in water for a minimum of 20 minutes.

Waste

- The retreats rely on an Envirocycle septic system. Because of the limited size of the site and the need to minimise site disturbance, a conventional septic system could not be installed.
- The Envirocycle system is an aerobic waste treatment system that reticulates clean nutrient rich water into the surrounding landscape. The existing soils are low in nutrients, however there has been no visible impact on native vegetation.

Fire protection considerations

- Fire protection measures in place include installation of a dedicated rainwater tank and sprinkler system, use of fire preventative building materials (such as laminated glass, aluminium windows and colourbond steel) and establishment of an evacuation plan.

EXPERIENTIAL

- The siting of the retreats on a ridge-top provided opportunities for either distant panoramic coastal views (facing south) or intimate nature views of a natural stringy bark forest (facing north). The desire to incorporate passive solar design principles determined the northerly orientation of buildings.
- The open plan design and floor to ceiling windows has maximised indoor/outdoor views and succeeded in 'bringing the outside in'.
- Although the retreats are in relatively close proximity, with minimal screening between each, the careful staggered siting and deliberate avoidance of side facing windows affords a high degree of privacy.
- The retreats are characterised by a strong sense of individuality, attention to detail and careful aesthetic choices in interior design. The overall sense of the interior space is of peace, isolation and a heightened appreciation of the bush.

SOCIAL AND ECONOMIC

- Positive linkages with the surrounding community have been established. These include linkages with local business for holiday packages in the South Australian Tourism Commission's marketing campaigns, and packages with local restaurants and wineries.

DEVELOPMENT APPROVAL PROCESS

- Because the site is within a Conservation Park, two layers of approval were required. Approval was sought from the Department of Environment and Heritage and the Local Council.
- The approval process was difficult and the proponent's success can largely be attributed to their persistence and the credibility they had established through operating existing accommodation within the Conservation Park.
- Importantly the development site was identified within the Deep Creek Management Plan as a site where development could occur. This was largely because of the previously disturbed nature of the site as a storage depot. The proponents were successful in negotiating a lease over the 2000 square metres development site.

From left to right: Bringing the outside in; Quality interior furnishings and fittings; The Retreats rely completely on rainwater.
Inset image: The design features a mix of lightweight building materials.

RAWNSLEY PARK STATION ECO VILLAS

KEY FEATURES

- Spectacular views of the Flinders Ranges
- Passive solar design
- Straw bale construction
- Retractable fabric ceiling and skylight

INTRODUCTION

Background

Rawnsley Park Station is a 3035-hectare working sheep station at the southern corner of Wilpena Pound. Managed by Tony and Julieanne Smith, Rawnsley Park offers a variety of accommodation and experiences relating to outback life and recreation.

The property was first settled as part of Arkaba Station in 1851. In 1895 parts of Arkaba were subdivided for farming purposes. In 1953, following several changes of ownership, the original portion of Arkaba Station was renamed Rawnsley Park Station.

In 1968 the first cabin was erected and sheep shearing demonstrations began. Originally tourism was developed as a sideline to grazing however, changing circumstances have now resulted in tourism being the major enterprise at Rawnsley Park. Activities and attractions include the Woolshed Restaurant, sheep shearing demonstrations, bushwalking, cycling, horse riding, scenic flights and four wheel drive tours.

The Eco-Villas development was named best new tourism development at the 2006 South Australian Tourism Awards.

Setting

The Flinders Ranges is one of South Australia's most popular holiday destinations. Its landscape is characterised by rugged mountain ranges, spectacular gorges, sheltered creeks lined with River Red Gums and abundant wildlife. This area is world-renowned for its geological history, Aboriginal rock art sites, impressive fossil remains and ruins of early European settlement.

Facilities

The development involved the construction of four luxury self-contained eco villas (three single bedroom and one two-bedroom) on a secluded elevated site within Rawnsley Park Station. The four villas are deliberately orientated to capture individual views of one of the four surrounding range aspects.

Villa 1 (Acacia) – west to Elder Range
Villa 2 (Sandalwood) – north west to Wilpena Pound
Villa 3 (Cypress) – north east to Rawnsley Bluff
Villa 4 (Casuarina) – east to Chace Range.

Each villa includes a fully equipped kitchen, contemporary furnishings, two-person bath, private deck and laundry facilities. A retractable fabric ceiling, combined with a covered skylight, provides an innovative night viewing panel from the bedroom.

The villas were designed by Adelaide architect Paul Downton who is internationally acclaimed for his environmentally sustainable architecture.

Issues and Constraints

Key issues and constraints that were addressed during the design process included:

- Dealing with the significant temperature fluctuations that occur in the Flinders Ranges. Between April and October daily temperatures are usually in the average of 16-20C but at sunset the temperature can fall sharply (often sub zero). During the hotter months of November through March, the days can regularly rise above 40C
- Minimising vegetation disturbance by careful siting of the villas and control of site disturbance and access during the construction process
- Availability of infrastructure including power, water and waste disposal
- Maximising views of the surrounding range aspects.

ENVIRONMENT

Energy

A key feature of the villas is the use of passive solar design principles to provide thermal efficiency and minimise energy consumption. These features include:

- Use of straw bale walls and double glazing to windows and doors for insulation purposes
- Locating windows and doors to facilitate cross-flow ventilation
- Raked ceilings, a ceiling fan and natural exhaust venting at ceiling apex
- Overhanging eaves and verandahs to shade walls
- Suspended concrete slab and rendered straw bale walls for thermal mass.

The retreats are currently reliant on mains power. Alternative energy solutions have been investigated but have not proved economically viable because of the presence of mains power on the site.

While the units are designed to maximise thermal efficiency, during extreme temperatures supplementary heating and cooling was considered necessary. To cope with these extremes, an underfloor reverse-cycle air conditioner has been installed within each unit.

Water

Rainfall is generally low (300mm per annum) however, when it does fall, it can be torrential. Each villa has a 4500-litre rainwater tank installed that provides water for drinking.

One of the most vigorously debated decisions has been whether to install spas. The owners have made the decision that, while spas may add to the luxury appeal of the accommodation, their use in an environmentally sustainable development cannot be justified on the grounds of water and energy use.

The water at Rawnsley Park Station is obtained from a bore that draws water from the groundwater aquifer. This sandstone aquifer is replenished by water from a dam constructed on the property in 1992. Rawnsley Park has been able to improve the quality of ground water from 900 parts per million (ppm) dissolved salts in 1998, to 500ppm in 2004.

Waste

The villas rely on an innovative wastewater treatment system called Biolytix. This system uses a polythene tank that has alternate layers of peat soil and polythene tubes to create an environment where bacteria can naturally treat organic matter (in the same way that a rainforest floor operates).

The aerated surface of the holding tank becomes a breeding ground for earthworms that provide the first stage of organic breakdown. The benefit of this system is that it requires minimal power to operate and delivers highly treated water suitable for subsurface irrigation.

Rubbish recycling (cans, bottles and paper) is carried out on-site: all other rubbish goes to landfill. Paper is currently being stored for a planned fire brickette machine at Wilpena.

From left to right: Eco Villas with Wilpena Pound in the background; Rawnsley Bluff; the Eco Villas surrounded by native pines.

Building Materials and Construction

Building materials and construction techniques were selected with regard to passive thermal performance, traditional building techniques, durability and cost effectiveness. They consist of:

- A suspended concrete floor to provide thermal mass, yet minimise site disturbance
- A lightweight steel and timber frame
- Straw bale construction for the walls (470mm thick). Straw provides the highest thermal insulation available (R12) and the render also adds to the thermal mass of the building
- Lightweight corrugated zinc aluminium roofing
- Recycled oregon timber for window frames and door frames.

EXPERIENTIAL

The villas are carefully sited among native pines on a secluded ridgeline. Their part-elevation on a suspended slab enables the villas to capture close views of the surrounding native pines and maximise distant vistas of the ranges beyond. The deep window reveals created by the straw bale walls appear to frame and accentuate these views and succeeds in bringing a slice of the outside in.

The central placement of the bedroom, enables guests to draw back the sliding doors and enjoy the spectacular views in complete privacy.

Perhaps the most innovative design feature of the villas is the retractable fabric ceiling and roof skylights in the bedroom so guests can view the night stars. Careful aesthetic choices of timber flooring and contemporary furnishings and fittings create a sense of luxury and indulgence in the bush.

CULTURE

Tony Smith is the fourth generation of his family in the Hawker district and second generation on Rawnsley Park Station. The fabric ceiling is inspired by traditional settler houses in which a hessian or calico fabric was often used. The overall look of thick walls and 'old' timber provides the villas with a sense of connection with the stone-walled houses built by early settlers.

The Adnyamathanha people of the Flinders Ranges consider Wilpena Pound very important in their dreaming. Artworks by acclaimed local artist Lavene Ngatokorua are featured in the eco-villas.

SOCIAL AND ECONOMIC

Following almost two years of planning, design and construction, the straw bale villas were completed in April 2006. Local businesses have been used wherever possible. Major contributions were made by:

- Ecopolis Architects – Paul Downton and Shani Louey-Gung
- Hawker Earthmoving – Henry, Darren and Loche
- Redden Bros – Mark Redden and the team
- HP & CJ Fels – Heath, Ian and Brady
- Smulders Contracting – Paul, Bradley and William and Steve Allen.

Rawnsley Park Station uses local businesses at Hawker, Quorn and Port Augusta for supplies and services wherever possible. Hawker is the nearest service centre for school, hospital, banking, mechanical repairs etc. Staff are recruited locally from the Hawker and Wilpena districts wherever possible. There are nine staff living on-site at Rawnsley Park Station, plus five staff at the associated Woolshed Restaurant and Central Air Services.

From left to right: Contemporary furnishings and fittings provide a sense of luxury; Strawbale construction before application of render.

CAPE CASSINI WILDERNESS RETREAT

KEY FEATURES

- Self-sufficient lifestyle
- Wind and solar powered energy system
- Passive solar design
- Panoramic ocean views

INTRODUCTION

Background

Cape Cassini Wilderness Retreat is a family-owned bed and breakfast run by David and Pat Welford, who have built this self-sufficient retreat on private wilderness property near Cape Cassini headland. It enjoys panoramic views over Backstairs Passage and Gulf St Vincent.

Cape Cassini has been accredited by Ecotourism Australia and received a commendation for new tourism development in the South Australian Tourism Awards 2003.

Objectives

The Welfords' objective was to design a self-sufficient lifestyle for themselves and their guests to experience. Key considerations were:

- Blending lifestyle and business objectives
- Generating energy from natural resources
- The ability to produce healthy and appetising food from local sources.

Setting

- Kangaroo Island is Australia's third largest offshore island, approximately 16 kilometres south of the southern tip of Fleurieu Peninsula. The island has a moderate coastal climate that is generally slightly warmer in winter and cooler in summer than Adelaide.
- The island has spectacular coastal scenery including pristine beaches and rugged cliffs, opportunities to see native animals in their natural environment and a worldwide reputation for locally produced gourmet foods and wines.
- Cape Cassini is a rugged coastal headland on the northern side of the island. The Welford's property is 360 hectares of wilderness area that includes 2.25 kilometres of coastline, dense bushland, several stands of gums and a number of gullies.

Issues and Constraints

The development site chosen by the Welfords was 4.5 kilometres from the nearest public road. The site was chosen primarily for its proximity to the headland, panoramic coastal views and minimising clearance of native vegetation. Key infrastructure related considerations included energy supply, waste disposal, water availability and vehicle access.

Main image: The living areas and conservatory face north with views over the water.

Facilities

The Retreat provides hosted accommodation for up to six guests. Features include:

- Three guest bedrooms, two of which are on the upper level and feature en-suites and balconies with sea views
- A glass north-facing conservatory for viewing of wild wallabies, kangaroos and local birdlife
- A large guest lounge with wood combustion fire and sea views
- An extensive library with books on Kangaroo Island and other subjects
- Binoculars and a telescope for birdwatching and viewing the Southern Hemisphere stars.

An organic orchard has been established near the retreat to provide fresh fruit and vegetables. The orchard has been enclosed with a wire fence and bird netting to protect it from possums and birds. Ducks are kept in the orchard to assist with fertilising the soils.

Activities available for guests include bushwalking on marked trails through diverse bushland and coastal terrain, fishing, swimming, and personalised wildlife and sightseeing tours.

ENVIRONMENT

Siting and Design

- The retreat is at the edge of broom bush scrub and heath, atop the exposed headland to maximise the panoramic views of the ocean and provide opportunities to achieve passive solar design.
- The design is two-storey with a steeply pitched roof and small eaves (apart from extended overhangs on the northern facade). Colours and materials have generally been selected to blend with the landscape.
- The building is visually exposed over about 180 degrees. As the only publicly accessible place that the building could be seen from is the sea, this is not an issue. Consequently the effective visual impact is very low.

Building materials and construction

- Principal building materials include stone, rammed earth, colourbond, glass and plantation timber.
- Materials have been selected principally for passive thermal performance, local availability (the stone and rammed earth was from local sources) and aesthetics.
- Embodied energy, chemical sensitivity and use of renewable plantation timbers was also a factor in material selection.

Energy

- Electricity is supplied via a Remote Area Power System (RAPS), a combination of wind and solar energy. The system comprises 16 solar cells (approx 1.2kw) on a mechanical tracking system and a 2.5 kilowatts Westwind wind turbine generator. Energy is stored in a battery bank that comprises 24 x 2 volt batteries. An invertor rated at 3.8 kilowatts converts this energy into 240 volts. A small petrol operated back-up generator is occasionally run for short periods to charge batteries during periods of limited wind or sun.
- A whiteboard, prominently positioned in the Retreat, advises guests of daily weather conditions, and gauge readings from the power system interpret how much electricity is being generated and used.
- Establishing the RAPS proved to be a effective solution to energy supply. The Welfords obtained a quote of $80,000 for a connection to the grid network from the nearest public road (4.5km away). In contrast, the RAPS system cost the Welfords $60,000 to install and they were eligible for a $30,000 government rebate for installation of a remote system.
- The Retreat design incorporates some passive solar design principles. The use of expansive north-facing windows and the conservatory assist with warming living areas and upstairs bedrooms.
- A 360-litre Solahart water heater is installed on the roof to heat water. A gas booster is also used to ensure instantaneous hot water.

Water

- The Retreat relies on rainwater for all domestic uses. Rainwater is collected from the roof and runs into a 100,000-litre tank. A nearby shed also collects water into a 20, 000-litre tank. Water is then pumped to a header tank on the hill above the property and gravity fed to the house. A dam near the retreat collects water run-off for use on the orchard and garden.
- Water minimisation practices are promoted. Interpretive information supplied to guests advise water is a scarce resource and requests showers are limited to one per day for four minutes. A spa has been installed and is available for use by guests during times when water and electricity is plentiful.

Waste

- All waste water (black, yellow and grey) is collected in a 'Septreat' sewerage treatment system. The Septreat system consists of two tanks, a primary settlement tank and a second tank containing three chambers (settlement, aeration and chlorination). Treated waste water is re-used on orchard and garden.
- Organic soaps, shampoos and conditioners are supplied to guests to ensure the system functions effectively. Beneficial microbes can be killed by strong household disinfectants and these are avoided.
- Interpretive information supplied to guests advises about waste minimisation practices with an emphasis on re-use and recycling.

EXPERIENTIAL

- The retreat provides the opportunity to experience a rugged, isolated and pristine coastal environment with an abundance of local wildlife.
- A major part of the experience is the opportunity to live in a managed self-sufficient environment with solar and wind energy, low allergy, passive energy design and dining on local produce.

SOCIAL AND ECONOMIC

Guests are encouraged to determine the level of social interaction with the hosts. The Welfords are friendly and passionate about the self-sufficient lifestyle they have established around the retreat. Opportunities for social interaction include dining or personalised tours.

From left to right: Cape Cassini Wilderness Retreat; The 1.2kw solar collector and 2.5kw Westwind wind turbine; The guest bedrooms have balconies and sea views; Cape Cassini Headlands.

BANROCK STATION WINE & WETLAND CENTRE

KEY FEATURES

- Environmental design and construction
- Minimising energy consumption
- Collection and re-use of rainwater
- Walking trails and wetland educational experience

INTRODUCTION

Background

Banrock Station is a global wine brand that has emerged as one of the fastest growing brands in major wine drinking countries. The main driver behind Banrock Station's success has been its close association with the environment. This association with the environment began in 1994 with the purchase of a 1750-hectare property at the junction of Banrock Creek and the Murray River, near Kingston-on-Murray.

There are 1100 hectares of floodplain and wetlands on Banrock Station with the main lagoon covering 120 hectares. In 1925 a lock was built adjacent to Banrock Station causing the river level to rise and water began permanently flowing into the main lagoon. This prevented the lagoon from drying out which removed the main stimulus for breeding of native plants and animals. In 1969 European Carp invaded the lagoon, becoming the dominant fish, muddying the water and removing many of the aquatic plants from the area.

Conservation work had previously commenced on the property in 1992. Wetland Care Australia developed and implemented a new wetland management plan and built structures to control the flow in and out of the lagoon, enabling it to dry out. This was the catalyst for the environmental involvement by Banrock Station.

Objectives

Banrock Station Wine & Wetland Centre was established on this site in 1999. Designed by Richard Stafford Architects, the objectives were:

- To meet ecological standards consistent with the philosophy of the Banrock Station brand
- Provide a level of comfort and ease of operations comparable with what patrons and staff would expect from a 'normal' building.

The Setting

- Banrock Station is near Kingston-on-Murray about 200 kilometres north-east of Adelaide in the Riverland.
- The property consists of 12.5 kilometres of river frontage, 300 hectares of Mallee woodland, 1100 hectares of floodplain and wetlands and 350 hectares of previously cereal cropped areas for development of premium grape varieties.
- The site selected for the building sits on a ridge, facing east over Banrock Lagoon. The positioning of the building provides elevated views over vineyards, the lagoon to the floodplains and the Murray River beyond.

Facilities

Banrock Station Wine & Wetland Centre is a cellar door and interpretive facility designed to provide a range of activities to encourage visitors to stay longer than normally expected at a cellar door. Services include a conference facility, interpretive display, casual dining, viewing areas and cellar door sales.

Walking trails from the Centre provide daily access to the floodplain and main lagoon. A feature of the trail is the 800 metres of elevated boardwalks over the wetland that provides access to four bird viewing hides.

Constraints

The Riverland is a harsh environment, an arid zone where temperature fluctuations are significant. Spring, summer and autumn temperatures are frequently between 30 and 40 degrees with extreme 43 degree days not uncommon. Rainfall is minimal, averaging 250mm per annum.

ENVIRONMENT

Energy

The building is designed, constructed and operated to minimise energy consumption.

Passive design and construction features that contribute to low energy consumption include:

- Rammed earth (on selected walls) and concrete floor for thermal mass
- Reverse brick veener on selected walls for thermal mass and insulation
- The use of large openings facing east towards the lagoon to capture cooling summer breezes and high windows to assist with cross-ventilation.

In addition to passive features, evaporative cooling is provided for extreme weather conditions and wood heating to supplement passive warmth.

The operational philosophy of the building is to pre-condition the building at night for the coming day's use. During summer, the building is cooled by the use of fans and windows to remove accumulated heat; in winter the building is closed and blinds lowered to retain heat. The building is designed:

- To passively maintain that state early in the day through full building closure
- To provide support ventilation with selected openings and fans as interior warmth increases due to solar gain
- To provide mechanical support only when needed later in the day
- To open the building to cross-ventilation.

The building also features a grid connected tracking solar energy system sized to supply the normal daytime operating energy requirements (2 to 4kw/hr/day) for the Centre.

Water

The building relies on collected rainwater for its water systems. The system includes main storage tanks and individual purpose feeder tanks to service air-conditioning units, potable water supply to tasting counter, wet area and kitchen. Pumps at each tank pressurise the system and deliver water to the point of use.

Waste

The building's toilet and kitchen connect to the underground septic tank and disposal trenching. Grey water from the tasting counter, wet area basin and cleaners' sink drain is re-used for toilet flushing. The system operates by water draining to a grease trap, and then via a reed bed to a polishing tank under the northern deck of the building. Re-used water is pumped from the polishing tank to a toilet flushing tank.

From left to right: Banrock Station Wine & Wetland Centre faces east overlooking the vines and wetlands; the design emphasises space and light throughout the centre; the elevated boardwalk over the lagoon enables guests to experience the wetlands.

Building Materials and Construction

The selection of materials is a compromise between embodied energy and other factors including:

- Efficiency of the building structure
- Insulation and thermal mass qualities
- Availability of suitable materials locally.

Materials include:

- Steel for the skeleton of the building
- Australian hardwoods from managed resources including Jarrah wall cladding, windows and door frames and NSW Blackbutt on the decking
- Rammed earth from local sources.

EXPERIENTIAL

Sense of arrival

A carefully crafted entry sequence from the highway to the Centre leads past vineyards and scrub. Visitors are screened from panoramic views of the wetlands by a rammed earth wall on approach. The siting of the rainwater tanks and solar panels on the approach to the building reinforces sustainability principles. Views to the river and wetlands are only revealed once inside the building.

Interpretation

The wetland educational experience is a key feature promoted at the building. A detailed trail guide and interpretive signs along walks provide information on the flora, fauna and human history of the site and the river.

Wall-mounted panels in the cellar door area display the relationship of the building to:

- the natural environment
- renewable energy systems
- building materials and recycling of rainwater.

SOCIAL AND ECONOMIC

Since 1998, part proceeds from Banrock Station wine sales have been used to fund and support projects that restore natural habitat in Australia and throughout the world. At 2005, total donations have exceeded AU$2.6 million.

Banrock Station has formed important partnerships with several conservation groups including Wetland Care Australia, Landcare Australia, local action planning groups, Greening Australia, the Bookmark Biosphere Community, Conservation Volunteers Australia, schools, community groups and Government agencies.

From left to right: The carefully crafted entry experience conceals views of wetlands until the visitor enters the building; The grid connected tracked solar system; Timber bi-fold doors opening out to the deck create a flexible indoor/outdoor space.

KABMINYE WINES

KEY FEATURES

- Contemporary design allowing flexible use of internal space
- Low embodied energy and solar passive design features
- Low toxicity and recycled materials selection
- Minimal impact on vineyard management and site revegetation
- Panoramic views of the Mount Lofty Ranges and Barossa vineyards
- Traditional regional cuisine featuring local produce

INTRODUCTION

Background

The development consists of three enterprises under one roof: Kabminye Winery Cellar Door, Krondorf Road Café and Peripheral Art Space. Richard and Ingrid Glastonbury designed the building and now run the business with the involvement of both their daughters Ilona and Tullia.

Objectives

The Glastonbury's objective was for the three aspects of the business – winery, restaurant and gallery – to complement each other within one flexible space. Guiding the design process was the philosophy to 'tread on the earth lightly' and materials were also selected according to their environmental performance. Key considerations were:

- Blending lifestyle and business objectives
- Selecting materials with low embodied energy and low toxicity
- Using recycled or sustainably sourced material
- Minimising waste in construction and operation
- Minimising energy demands through design and appliance fit-out
- Providing regionally distinctive cuisine from local sources.

Setting

The Barossa is Australia's best-known wine region, located approximately 60-kilometres north of Adelaide. The Barossa also has a rich Germanic heritage that is celebrated through regional festivals and locally produced gourmet food. The Krondorf area, between Lyndoch and Tanunda, is home to five wineries and close to the world-famous Jacob's Creek.

The Barossa has a moderate climate that is generally slightly cooler in winter, and drier overall, than that of Adelaide. Kabminye is set on seven hectares at the foot of the northern Mount Lofty Ranges. The property falls to the west and is bound by a creek on the southern boundary.

Facilities

The Krondorf Road Café usually provides dining for up to 50 guests, although for special occasions the space can be extended to seat 100 through the use of the mezzanine floor (Peripheral Art Space). Features of this distinctive building include:

- Straw bale construction used at ground level on western half to maintain temperature control for wine storage and conceal servicing.
- Extensive use of recycled timber in construction, notably for window frames (oregon), support posts (red gum) for mezzanine floor and salvaged timber (Queensland hardwood) used for mezzanine decking.
- Verandahs on the northerly and easterly aspects allow solar access during winter and shading in summer. External Luxaflex blinds are installed on the second storey windows on the northern elevation for improved thermal performance.
- High level opening windows on east and west elevations act as flues for thermal regulation, particularly in summer. Bamboo blinds are also installed externally at ground level on these elevations during the hottest six months of the year.

Main image: The extensive use of glazing allows panoramic views of the nearby Mt Lofty Ranges and vineyards. Servicing has been kept on the southern side of the building, away from the entrance. Photograph by Tony Sheffield courtesy SA Life magazine, Adelaide.

- Wood-fired oven for cooking and temperature control, evaporative air conditioning, underfloor heating and wood combustion fire for additional temperature control during temperature extremes.

A herb garden and an organic orchard have been established on-site to provide fresh produce for the restaurant, although these will take some years to become fully productive.

Constraints

The property is relatively long and narrow, in the traditional Lutheran subdivision style that allowed for equitable creek access. The site was previously cleared and used for general agriculture, but otherwise undeveloped. Before the detailed design began, repeated visits were undertaken over a year, so that the influence of seasonal variation could be factored in when selecting the optimum building site. The eventual site was in the centre of the property, which allowed unimpeded views of the rolling hills, as well as creating a sense of isolation. With the establishment of vines, this effect has been enhanced.

An extension to the mains electricity supply was required. While there was a considerable cost to underground the supply, it was considered important in order to preserve the views. Treatment and disposal of wastewater was the other key constraint, given the proximity to a natural creek and Environment Protection Authority requirements.

ENVIRONMENTAL

Siting and Design

Kabminye has a northerly orientation to achieve passive solar design. A grassed area extends from the eastern half of the building, and was planned to provide natural cooling breezes to the restaurant area. This slight setback from the vineyard also allows panoramic views of the rolling hills to the east.

The location of the building is several hundred metres from Krondorf Road, with vehicle access via a winding road lined with indigenous species (through revegetation). A paved path from the carpark allows for wheelchair access to the ground floor.

The design is inspired by the traditional Barossa 'chook shed', with a steeply pitched roof facing south and extensive use of galvanized iron. This contrasts with the historic timber and stone cottages that dot the Barossa, without detracting from the surrounding landscape. Importantly, it allows for energy performance that would not have been possible in a traditional cottage form.

Building materials and construction

- Principal building materials include straw bales, recycled and plantation timber, galvanized iron, glass and structural steel.
- Materials have been selected principally for their low toxicity, low embodied energy, passive solar performance, local availability (the straw was harvested from the site, timber posts from a nearby barn) and aesthetic value.
- To avoid the use of Multiple Density Fibreboard (MDF), which contains formaldehydes, natural alternatives, such as blue gum and marble, were used.
- The ground floor is concrete, sealed with a water-soluble finish with the occasional use of woollen carpet with natural (hair) underlay, to avoid formaldehydes.
- Termimesh was laid with the concrete slab, to avoid use of termiticides and fungicides.
- To minimise material wastage the design features straight geometry, rather than the originally intended curved design.
- Bio-paints were used wherever possible (except in the wet areas) as these do not contain many of the harmful additives used in normal paint.
- Western Cypress posts were used in the vineyard, rather than CCA-treated pine, which contains arsenic.

Energy

- Mains electricity services the entire building, and has been laid underground (at additional cost) to ensure the building's sense of isolation is not diminished.
- The passive solar design, featuring expansive north-facing windows, verandahs and thermal flues assists with maintaining a comfortable internal temperature.

Water

- Kabminye currently relies solely on mains water, however rainwater collection will be incorporated as part of the next two development stages (barrel storage and winery).
- The vineyard is dry-grown and has minimal spraying; both these practices significantly reduce the demand for water.
- Toilets within the building are dual-flush and the dishwasher recycles its wastewater.
- The creek that flows along the southern boundary has been fenced and revegetated to rehabilitate the riparian zone and improve water quality.

Waste

- All waste water (black, yellow and grey) is collected in a septic tank, where it is held for removal. Given the proximity of the site to the creek, this was a condition of approval stipulated by the EPA.
- Organic or biodegradable cleaning products are used wherever possible.
- Purchase of fresh local produce minimises packaging waste, and any organic scraps are composted for use in the herb garden and orchard.

EXPERIENTIAL

The café specialises in the traditional food of the area's pioneer settlers. The philosophy that 'food is history on a plate' is epitomised in the menu, wherein each item has an accompanying explanation of the ingredients and their importance in traditional life.

A key component of the café experience is the opportunity to enjoy premium wine and authentic regional cuisine in a setting that 'brings the landscape in'.

The Peripheral Art Space features the works of emerging conceptual artists, attracting a clientele that might not have visited otherwise.

CULTURE

The Glastonburys are passionate about telling the story of the Barossa through reviving the traditional cuisine and wine varieties of the pioneer settlers. This has been achieved through extensive interviews with older residents and detailed research, as well as guest contributions.

SOCIAL AND ECONOMIC

The use of the venue for youth-oriented events and exhibition launches provides the opportunity for increased social interaction between locals and visitors. The business provides part-time employment for eight staff (additional to the family), all of whom are local residents.

From left to right: The geometry and intersecting angles of the roofline marry nicely with the ranges beyond and creates interesting sightlines from every angle; Straw used in wall construction was harvested from the site. This provides excellent insulation which maintains stable temperatures – essential for wine and food storage – while also providing a softer appearance to the building; The use of recycled, sustainably harvested and low toxicity materials are featured: the Red Gum pillars were salvaged from a nearby barn, the counter is SA blue gum and marble, and the mezzanine is plantation oregon. Carpet is free from formaldehydes and the concrete floor has a natural lacquer. Peripheral Art Space provides a venue for conceptual art – a market that wasn't previously catered for in the Barossa. The area can also be used for functions and additional dining. Photographs by Tony Sheffield courtesy SA Life magazine, Adelaide.

SHAW AND SMITH WINERY

KEY FEATURES

- Waste management strategies
- Siting and environmental design
- Water conservation practices

INTRODUCTION

Background

Shaw and Smith Pty Ltd are producers of premium Adelaide Hills wines. They specialise in three grape varieties – Sauvignon Blanc, Chardonnay and Shiraz.

The company began in 1989 when cousins Martin Shaw and Michael Hill-Smith decided to realise a long-held dream to make wine together.

In September 1999 Shaw and Smith purchased a 46-hectare property on Jones Road between Balhannah and Hahndorf in the Adelaide Hills. The property has been planted with Riesling, Pinot Noir, Sauvignon Blanc and Shiraz.

A new winery was built for vintage 2000, which houses Shaw and Smith's production, marketing and administration. Shaw and Smith Winery is highly regarded by the Environment Protection Authority and industry as a 'best practice' for its environmental design and waste management practices.

Martin Shaw is the company winemaker. He graduated from Roseworthy College in 1981 and worked at Petaluma for eight years. He consults widely and currently advises companies in Australia and New Zealand.

Michael Hill-Smith became the first Australian to pass the rigorous Master of Wine examination in London. He is a wine producer, wine judge, consultant and occasional broadcaster. In 1992, he set up the Universal Wine Bar in Rundle Street, Adelaide, and sold the business in 2001 to focus on Shaw and Smith.

Brand Philosophy

Shaw and Smith's aim is to make contemporary high quality wines that stand amongst the best of their type both nationally and internationally.

For wine to be released under the Shaw and Smith label it must be:

- An outstanding example of its type
- Made from grapes grown in the Adelaide Hills.

Setting

- The Adelaide Hills is an easy 20-minute drive south east of Adelaide. The region is a diverse landscape with a patchwork of forests, farms, orchards, vineyards and bustling townships.
- Annual rainfall is approximately 825mm per annum.
- A large part of the region falls within the Mount Lofty Ranges Watershed area, which provides on average, 60% of Adelaide's mains water supply requirements.
- The region faces development pressures from primary production, industry and residential development, which have an impact on the quality of water draining into Adelaide's reservoirs.

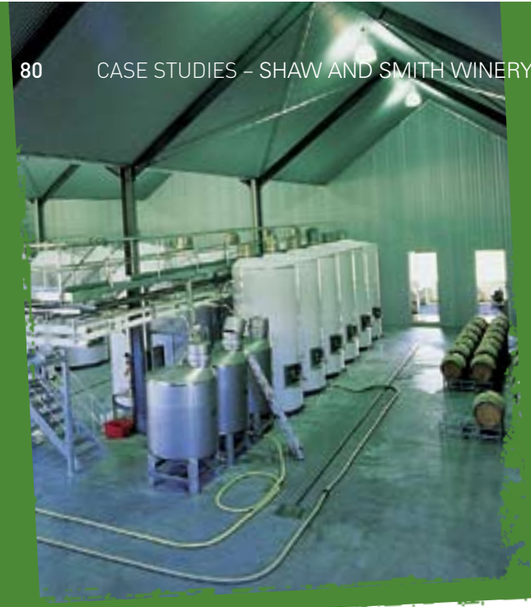
The Site and Facilities

- The land is gentle to moderately sloping with a large dam and stands of native vegetation studded throughout the property.
- The main building houses the winery, barrel and dry goods store, bottling line, offices, a laboratory, meeting areas and amenities.
- All winemaking operations (i.e. grape receival, crushing, pressing, clarification, fermentation, maturation marc storage and bottling) are undercover.
- The administration and tasting room are located on the northern side of the main building and face north over the vineyards
- The large dam is fed by a combination of surface water run-off and a licensed bore.
- A two-hectare woodlot is planted a short distance from the winery and is used for the dispersal of treated waste water.
- The nearest residence is 300-metres to the south west of the main winery building.
- The winery currently operates at a 1000 tonne/annum crush with an Environment Protection Authority (EPA) licence to crush up to 2000 tonne/annum.

Winery Development in the Adelaide Hills

- In July 2001 the State Government placed a moratorium on the development of new wineries in the Mount Lofty Ranges Watershed by listing all new wineries as non-complying.
- The moratorium was put in place to enable a winery water quality risk assessment study to be undertaken. This study found "that there is very little risk to water supply reservoirs from potential spills originating from winery and ancillary developments if all new developments are sited appropriately and adopt a range of best environmental design and management practices".
- On 8 June 2006, the State Government approved new planning rules allowing controlled growth of best-practice wineries, cellar doors and associated restaurants in the Adelaide Hills and surrounding areas.
- Under the changes, further new wineries will be allowed subject to stringent conditions, including size restrictions; the need for wine-making, bottling and storage facilities to be in enclosed buildings; and for strict waste water and spill measures to be in place.

From left to right: Shaw and Smith Winery; tasting room with views over the vineyards; the picturesque Adelaide Hills setting.



ENVIRONMENT

Water Supply

- Three large rainwater tanks (560,000 litre total capacity) provide a source of high quality water for use during winery production. Towards the end of vintage, water may need to be trucked in to top up supplies.
- The dam and licensed bore supplies water for vineyard irrigation.
- Management place a strong emphasis on water conservation. Conservation strategies include:
  - Sloped floor in winery to reduce water required to clean it, rubber broom used instead of hose for cleaning
  - Several tanks are cleaned in sequence (sharing water used between them), instead of one tank at a time.

Waste Treatment and Disposal

- The winery is 100 metres from the nearest watercourse and 205 metres from the dam. A priority concern of development and licensing authorities was the method of winery waste water disposal.
- The EPA regards Shaw and Smith's waste water treatment and disposal system as 'best practice'. Key features of the waste water system include:
  - A rotary screen for the removal of solids
  - Automated water quality sensing station, sump/pump, PH adjustments all controlled by PC
  - A purpose-designed clarifier provides a final screen to remove any sedimentation before irrigation. This final screen ensures a higher level of waste water treatment than is required by the EPA
  - Liquid sediment sludge is stored and transported three or four times per year to a sewerage treatment plant
  - Irrigation of waste water to a two hectare wood lot (*Eucalyptus Grandis*)
  - Solid waste (dry marc) is used locally in compost
  - Bathroom wastes are treated on site by an Envirocycle waste system and irrigated to the surrounding lawn area or woodlot
  - A comprehensive system monitoring and contingency plan is in place
  - A 16 mega-litre dam stores irrigation water during the wet months of June, July and August when they are unable to irrigate.

Note: The premium quality of the company's product and the emphasis on the overseas market means the company uses as few chemicals as possible and then only those chemicals which are regarded as 'soft'.

Materials and Construction

- The winery building is a simple modular shed construction built of slate grey colourbond. The modular construction is cost-effective and allows the opportunity for further expansion.
- The administration and tasting room area is constructed of glass and fibre board in a slate grey finish facing north over the vineyards. A verandah on the north side of the administration area provides shelter over the outdoor dining patio.

Design and Aesthetics

- Shaw and Smith Winery is an aesthetically appealing building that has been constructed in sympathy with the landscape. Important design and setting elements include:
  - The setback of 170 metres from Jones Road and siting of the building slightly below a crest in the landscape reduces the profile of the building
  - The surrounding hills form a natural backdrop to the winery when viewed from Jones Road.
  - The modular construction and the steep pitch of the roofline enable natural landscape elements to be visible between the ridgelines
  - The use of grey colorbond provides a contemporary appearance yet compliments the landscape.

From left to right: Modern undercover winemaking facilities; An aesthetically appealing building that fits within the landscape; The siting below a crest in the hill reduces the profile when viewed from Jones Road.

AQUILA ECO LODGES

KEY FEATURES

- Victorian Ecotourism Award winner
- Innovative architectural design
- Completely environmentally sustainable energy supply
- Bushland setting bordered by a National Park

INTRODUCTION

Background

Aquila Eco Lodges are in a private natural bushland setting bordered on three sides by Grampians National Park. It is a small family business owned and operated by Barb Bjerking and Madeleine Claus. It was established to promote the philosophy and ease of sustainable living.

They have constructed a small number of high quality, architecturally unique lodges using simple building methods and affordable energy supply and waste disposal technologies. Aquila Eco Lodges demonstrate how sustainable living is achievable and financially viable for the average person without any compromise on comfort.

Objectives

The development objectives established by the owners included:

- Using best environmentally sustainable practice and technology in the design, construction and ongoing use of the lodges
- Providing a high level of comfort and luxury for guests
- Ensuring units were architecturally designed to maximise the experience of the bushland setting.

Setting

- Aquila Eco Lodges are at the southern end of Grampians National Park at the base of Mount Abrupt in Victoria. This National Park contains a very dramatic range of rugged rocky mountains projecting abruptly from the surrounding bushland.
- Vegetation in the area consists of brown stringy bark forest with an understorey of heath and grass trees. There is also a unique and extensive range of native orchids.
- Wildlife in the region is prolific. Notable species include the Eastern Grey Kangaroo, Swamp Wallaby, Emu, Wedge-tailed Eagle and numerous parrots and other birdlife.

Issues and Constraints

Aquila Eco Lodges are set in 100 acres of freehold land that is covered by a covenant enforced by Trust for Nature. Covenant conditions permitted building only in areas where there would be minimal disturbance to existing vegetation. All proposed development had to be assessed and approved.

Other development issues included:

- Minimising disturbance to vegetation and preventing soil erosion during the construction process – this included minimising access to surrounding vegetation
- No mains power supply to site
- No mains water supply or sewage connection to site
- Bushfire protection.

Main image: Aquila Eco Lodges Lofthouse.

Facilities

Aquila Eco Lodges consists of four luxury self-contained lodges: two 'lofthouses' accommodating six people (two doubles and two singles) and two 'tree houses' accommodating four people (one double and two singles). All units feature a private outdoor living area with barbecue, a wood combustion stove in the living area and quality furniture, fittings and fixtures. There is also a large communal area for gatherings of large groups. The manager's accommodation and the reception office are also on site.

ENVIRONMENT

Building Materials and Construction

Building materials have been selected for passive thermal performance, cost effectiveness, durability, low embodied energy and minimal toxic waste. They consist of:

- A concrete slab floor and timber framed structure
- Fibre cement sheeting with timber battens to join to interior and exterior walls
- Corrugated steel roofing
- Pilkington 'Comfortone' thermal glass
- Insulation to walls and roof
- Local timber and local stone
- No PVC pipes
- Waterbased paint systems.

Waste was centralised during construction and the site was kept tidy to minimise the impact on the surrounding bush.

Energy

- The entire complex is powered by solar energy with a generator back-up. Vegetable oil waste is collected from a local restaurant and converted on-site into bio-diesel to fuel the generator.
- Slow combustion wood burners are used for heating.
- Instantaneous gas hot water systems have been used to minimise water wastage.
- Low energy lighting and appliances.
- Passive thermal design principles including:
  - Concrete slab on ground for thermal mass
  - North facing glazing
  - Insulated walls and roof
  - Cross-ventilation.

Water

- The water supply for the lodges consists of rainwater collected from the roofs and is augmented with water collected from the creek during seasonal flow. Rainfall to the area is approximately 600mm to 700mm annually and this is currently providing an adequate water supply.
- All water is filtered for leaves and wildlife and is tested for safe consumption.
- AAA rated water flow restrictors have been installed on all fittings to minimise water consumption.
- A separate 40,000-litre rainwater tank has been installed for fire fighting purposes.

Waste

- All sewage and organic kitchen waste is treated on site in a Dowmus (worm farm) sewage treatment system. Filtered nutrient rich waste water is removed from the system and released into the soil via a soakage trench. This has had no visible detrimental effect on the native vegetation.
- Guests are encouraged to deposit their kitchen food scraps into the Dowmus system.
- Inorganic household waste is separated – guests are encouraged to separate their own waste – and it is taken to recycling bins in Dunkeld by the management.

Fire Protection Considerations

Fire protection measures include:

- The installation of tanks containing 40,000 litres of rainwater maintained specifically for roof-mounted fire sprinklers and fire hoses located between each lodge. This water supply will last for 30 minutes.
- Designation of the existing stone house as a fire refuge, steel screens are kept ready for installation over windows
- Regular control of leaf litter around the buildings
- Use of fire preventative building materials including fibre cement sheeting and steel roof sheeting.

EXPERIENTIAL

- The lodges have been sited in bushland at the base of Mt Abrupt. Careful placement of windows in the architectural design capture views of the undergrowth and tree tops and long vistas of the mountains beyond.
- The open plan design and extensive areas of glazing enhance the indoor/outdoor experience and heighten the overall appreciation of the bush.
- The lodges are successfully positioned to attain privacy without a feeling of isolation. Additional indigenous trees have been planted between units to enhance visual privacy.
- The height, scale and muted colour of the buildings allow them to successfully blend into the bush setting. The distinctive architectural design of both interior and exterior enhances the unique quality of the experience.
- All infrastructure and services are placed underground to minimise visual impact.
- The owners have established a number of well interpreted walking trails around the property to enhance the bush experience.

SOCIAL AND ECONOMIC

- Aquila Eco Lodges is a very private retreat and there is limited opportunity for interaction between guests. However, interaction with the owners is encouraged in the form of guided walks and the provision of information regarding the sustainability aspects of the local flora and fauna.
- Positive economic and social links have been formed with the local community including:
  - Use of local trades during construction and continued use for ongoing maintenance
  - Use of the local laundry service
  - Collection of oil waste from the local restaurant for use in the bio-diesel generator
  - The sale of local produce in reception
  - The recommendation of local restaurants, services and accommodation if the property is fully booked.

From left to right: Winding experiential pathway between lodges to prevent erosion – use of local stone; The Treehouse; Interior view of Treehouse with views to bush outside; Use of local stone for feature walls.

GRAMPIANS YHA ECO-HOSTEL HALLS GAP

KEY FEATURES

- Award winning architectural design
- Environmentally sustainable energy supply
- Passive heating and cooling
- Flexible building layout
- Waste water recycling

INTRODUCTION

Background

Grampians YHA Eco-hostel aims to provide guests with a high level of hostel accommodation plus the experience of staying in a building that relies on a sustainable energy supply and passive thermal design.

The development objectives included:

- Building a hostel that uses approximately 50% less energy and 50% less water than a conventional hostel
- Using environmentally sustainable practice and technology in the design, construction and ongoing use of the hostel
- Ensuring units are designed to take full advantage of views and solar aspect of the site
- Providing a high level of comfort.

Setting

- Grampians National Park is the third largest in Victoria and is characterised by a series of striking folded sandstone ranges that run north-south for about 100 kilometres.
- Vegetation in the area consists of brown stringy bark forest with an understorey of heath and grass trees.
- Wildlife in the region is prolific. Notable species include the Eastern Grey Kangaroo, Swamp Wallaby, Emu, Wedge-tailed Eagle and numerous parrots and other birdlife.
- Grampians YHA is in the heart of the Grampians in the township of Halls Gap.

Facilities

- The hostel consists of a two-storey accommodation building housing 64-bed accommodation in twin-share and family dormitories and a single storey wing that contains two communal kitchens, dining and living areas.
- A feature of the hostel is the flexibility of the building layout. The communal kitchens have been divided into two parts so one can be sectioned off when occupancy levels are low or designated to large groups. Likewise the two communal lounge areas can be designated to separate large groups if required or used as separate noisy living and quiet living areas.
- The hostel features wood combustion stoves in the communal living areas and quality furniture, fittings and fixtures.

ENVIRONMENT

Energy

- Solar electricity tiles have been installed on the roof of the two-storey wing of the hostel. These tiles become the roofing material and achieve a saving in roofing material costs. Excess electricity generated at the hostel is fed into the main electricity grid for purchase by other electricity users.
- Other energy conservation measures installed in the building include;
  - Installation of seven solar hot water services with electric backup (five supply 443 litres and two supply 302 litres)
  - Slow combustion wood burners for heating of communal areas. One heater is fitted with a water heating jacket to boost the solar hot water heaters
  - Low energy lighting and appliances.
- Passive solar design principles have been incorporated into the design including:
  - Concrete slab on ground and rammed earth walls for thermal mass and insulation properties
  - North facing glazing
  - High level glazing for cross ventilation
  - Reverse brick veneer (brick on the inside and timber frame on the outside) on upper level of accommodation building
  - Heavy curtains over large areas of glazing to minimise heat loss.

Water

- The water supply for the hostel consists of rainwater collected from the roofs and is augmented with mains water supply, when required, during summer.

Waste

- The hostel is connected to the main sewer line. Grey waste water from showers, sinks and laundry is used for toilet flushing and irrigation of gardens.
- Kitchen waste, including vegetable and meat scraps, is collected and used to feed chickens kept in the hostel garden. The chickens, in turn, provide eggs for the free use of hostel guests. Compost from the chickens is used to fertilise the hostel herb garden that is also for the use of the guests.
- Kitchen grease is sold to a local business that uses a worm farm to produce fertiliser.
- Guests are encouraged to divide their recyclable waste and it is collected by the local council.
- The hostel uses biodegradable citrus and eucalyptus cleaning products.

Fire Protection

- Rainwater tanks have been installed specifically for fire protection and are connected to eight fire hoses operated with a diesel pump. The tank holds 25,000 litres of water for 1.5 hours supply.
- During summer the town water supply is used to augment tank water for fire fighting purposes.

Building Materials and Construction

Building materials have been selected for passive thermal performance, cost effectiveness, durability, low embodied energy and minimal toxic waste. They consist of:

- A concrete slab floor
- Rammed earth walls made from local materials
- Corrugated steel roofing
- Insulation to walls and roof
- Local timber and local stone
- Waterbased paint systems.

From left to right: The entrance to Grampians YHA Eco-hostel; Passive solar design includes extensive north facing glazing and roof overhang.

EXPERIENTAL

Sense of Place

- The open plan design and extensive areas of glazing enhance the indoor/outdoor experience and capture views of the rugged Grampians Range beyond.

Siting

- The communal wing of living, dining and kitchen have been separated from the private/semi-private sleeping wing to ensure acoustic privacy.
- The building has been carefully oriented to allow solar access where possible for natural light and warmth.

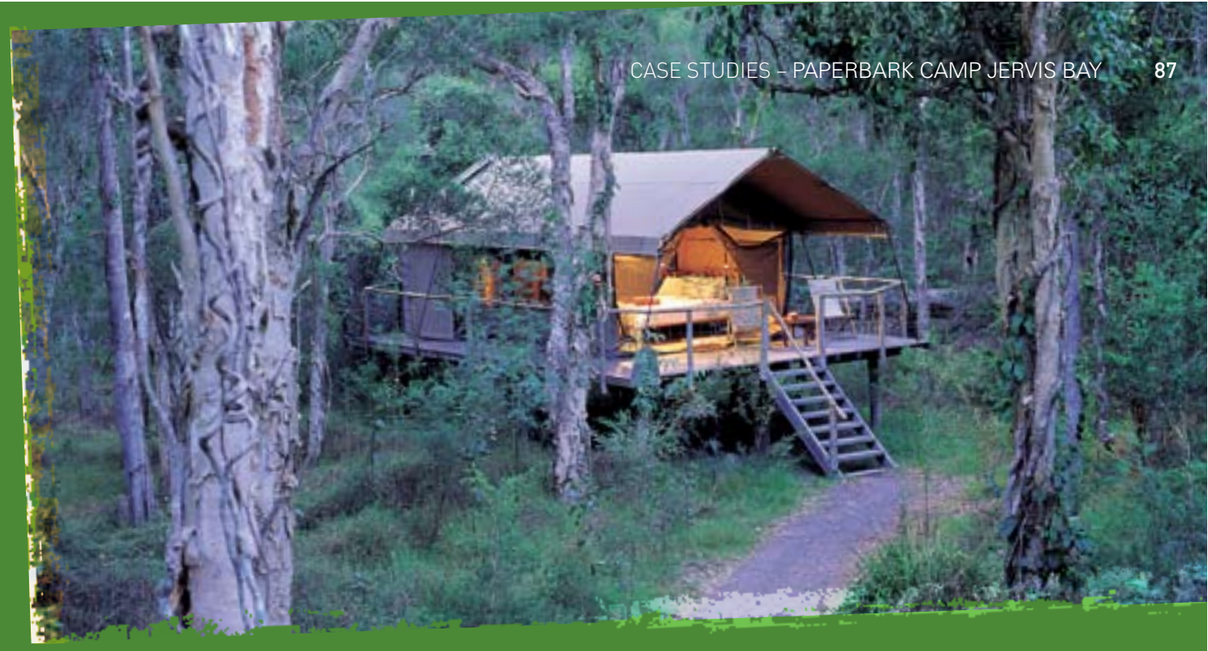
Visual Impact

- The distinctive architectural design of both interior and exterior enhances the unique quality of the experience.
- The exterior form, scale and variety of materials and colours sit very comfortably with the surrounding landscape.
- The rich variety of natural textures and colours of materials create an environment of interest, warmth and comfort.
- The variety of ceiling heights and scale of spaces creates the opportunity for both communal and intimate areas.

SOCIAL AND ECONOMIC

- The Grampians YHA Eco-hostel encourages interaction between guests and staff. This occurs in all of the accommodation's communal facilities, thereby adding the extra dimension of shared experience.
- Links with the local community include:
  - Use of local tradesmen during construction and continued use for ongoing maintenance
  - Sale of kitchen grease to local worm farm
  - Recommendation of local restaurants, services, entertainment and alternative backpacker accommodation if the hostel is fully booked.

Main image: Passive solar design and building materials, including rammed earth, enhance the living environment.



PAPERBARK CAMP JERVIS BAY

KEY FEATURES

- Idyllic bush setting
- Preservation of the environment
- Gourmet tree-top dining
- Environmentally sensitive construction practices
- Diverse activities

INTRODUCTION

Background

Paperbark Camp is a family-owned business that opened in 1998 to provide visitors to Jervis Bay with a unique luxury tented camping experience. The business has fulfilled the vision of Irene and Jeremy Hutchings whose objective was to create a low impact, niche-market venture that adhered to the principles of ecologically sustainable tourism.

Paperbark Camp has been recognised by Tourism NSW as a "role model for future tourism on the South Coast" and received critical acclaim for the gourmet dining experience provided in The Gunyah restaurant.

Paperbark Camp has also been awarded Ecotourism Australia Accreditation.

Objectives

Irene and Jeremy Hutchings objectives were to:

- Own and operate a profitable small business
- Promote the natural environment
- Sustain the local ecology
- Develop a low-key, niche, ecotourism facility
- Provide local and regional benefits.

Setting

- Paperbark Camp is 200 kilometres south of Sydney, a few kilometres inland from Jervis Bay and the nearest town of Huskisson.
- Jervis Bay is a Marine Park that covers an area of approximately 22,000 hectares and spans over 100 kilometres of coastline. The Marine Park is a multiple-use park that aims to conserve marine biological diversity and marine habitats, while catering for a broad range of recreational and commercial activities. Activities include swimming, fishing, whale and dolphin watching, kayaking, snorkelling, diving and sailing.
- Paperbark Camp is next to pristine Currambene Creek that forms part of the Marine Park. Local fauna include Eastern Grey Kangaroos, Swamp Wallabies, possums, Sugar Gliders, King Parrots, Gang Gang and Yellow Tail Black Cockatoos.

Facilities

- The development involved the construction of ten safari tents and a restaurant referred to as The Gunyah, an Aboriginal word for meeting place, or place of shelter.
- The safari tents are elevated 1.5 metres above the ground on timber platforms. The tents are furnished with queen or twin beds, pure wool doonas, insect screens, solar powered lighting and locally made handcrafted bush furniture.
- The Gunyah is a striking contemporary building designed by Sydney architects Nettleton Tribe. The building is elevated four metres above the ground in the tree canopy and includes a 50-seat restaurant with outdoor dining on the balcony and a lounge with open fire. A timber walkway has been constructed to provide disabled access to the building.
- Facilities and activities include pushbikes, canoes, bushwalking, birdwatching, dolphin and whale watching, diving and snorkeling, bush tucker, Aboriginal culture tour and fishing.

Main image: Paperbark Camp Safari Tent.

Issues and Constraints

Paperbark Camp has been built in a natural bush setting among a tall stand of spotted gums and paperbarks. The total site is 88 hectares in size with a 600-metre frontage to Currambene Creek.

Issues and constraints include:

- Minimising site disturbance and preservation of the delicate ecosystem and natural flora and fauna
- Providing road access to the development site through a paperbark swamp
- Minimising the impact of motor vehicles on the campsite and surrounding natural environment
- Access to power and water
- Waste disposal
- Development in a flood prone area
- Natural hazards such as bushfires
- Heating during the winter months.

ENVIRONMENT

Building materials and construction process

- The development site was selected for its elevation (in relation to the surrounding land), sense of isolation and natural beauty and proximity to the creek for water activities.
- During construction the original landscape was carefully cleared by hand, so that delicate ecosystems, natural flora and birdlife have been preserved. No major earthworks or clearing was done.
- The tents and The Gunyah are sited among the trees and elevated to maximise views, deal with the threat of floods and assist with septic flows.
- Paperbark Camp engages a tree doctor to regularly check trees within the camp to minimise the likelihood of trees losing limbs because of disease or poor health.
- The use of timber poles, elevated timber platforms and lightweight materials ensure the development 'touches the earth lightly'.
- The tents are conventional canvas safari tents erected on timber platforms. The platforms are constructed using hardwood posts, frames and decking. The tents have a partially enclosed private ensuite added on to the rear. The interior of the ensuite is clad in minorb for waterproofing and aesthetics.
- The Gunyah is constructed using treated pine, corrugated steel, glass and extensive use of plywood cladding. The building materials have been selected for their lightweight construction performance, cost effectiveness and aesthetics.

Energy

- The Gunyah is connected to mains power (underground) although this has limited capacity. Energy efficiency measures in The Gunyah include gas used for cooking in the restaurant, energy efficient lighting, use of low voltage appliances and a slow combustion heater.
- The tents are all powered by a single solar cell (80w) that is connected to a 12-volt battery. The batteries are rotated and charged every few weeks (if necessary) from mains power.
- The heating of tents during the colder months is an issue, however this has largely been resolved by a decision, for business and lifestyle reasons, to close Paperbark Camp during the two coldest months (July and August).

Water

- Paperbark Camp is connected to mains water supply. The Hutchings are considering installation of rainwater tanks for drinking water and fire-fighting use.

Waste

- The Hutchings were advised during the development assessment process that they were unable to dispose of any waste on site because of the proximity to Currambene Creek, which drains into Jervis Bay Marine Park.
- To overcome this problem, all waste water and grey water from the Camp is collected in a central holding tank. The waste is then pumped 800 metres to a septic holding tank next to the property entrance. This tank is then pumped out by a truck weekly.

EXPERIENTIAL

- The Gunyah is one of the keys to the success of Paperbark Camp. This restaurant is one of the most popular gourmet dining experiences on Sydney's south coast.
- The restaurant complements the accommodation experience and allows Paperbark Camp to market their facility as a romantic getaway.
- Siting and layout is a feature of Paperbark Camp. The tents are in a circular pattern, around The Gunyah which forms the heart of the Camp. Paperbark Camp has achieved a delicate balance by providing a secluded and intimate camping experience within a comfortable walking distance of The Gunyah. Narrow winding gravel pathways through the bush link the safari tents to The Gunyah.
- A feature of the design and layout is the visual contrast between The Gunyah and the safari tents. The height and mass and building materials of The Gunyah create a striking appearance in the canopy of the paperbark trees. The tents, on the other hand, blend with the paperbark and can barely be seen from The Gunyah.
- Motor vehicles are excluded from the site with a designated parking area approx 200 metres from the Camp. This enables the sounds of the bush to prevail and adds to the sense of solitude and peace at the camp. An electric golf buggy is available to transport luggage if required.

SOCIAL AND ECONOMIC

- One of Paperbark Camp's objectives is to provide local and regional benefits to the surrounding community. Paperbark has a 'buy local' policy and promote local produce through the restaurant, particularly seafood.
- During the development assessment process the local Koori Elders (Jerringa people) inspected the site and provided the necessary written approval.
- The local Indigenous community is involved extensively in campfire recitals (folklore and music) as well as bush tucker tours.

DEVELOPMENT APPROVAL PROCESS

The State Planning Authority requested the preparation of an Environmental Impact Assessment (EIS) during the development assessment process. The trigger for the EIS request was the Coastal Wetlands Protection Code, which states that no excavation or fill is possible in a coastal wetland. The EIS took about 12 months to complete – in part because of the level of consultation required with various affected government agencies.

The use of dry composting toilets for waste removal was acceptable to the EPA however the Hutchings eventually discounted this as a viable option. The key considerations were the large number of composting toilets required (approximately 14) and the lack of continuous use of the toilets because of the Camp shut down in June and July. The final solution was to use the full pump-out service provided by the local council contractor.

From left to right: The Gunyah; Private ensuite with bush views; Interior of The Gunyah; Interior of Safari Tent

NINGALOO REEF RETREAT

KEY FEATURES

- A wilderness camping experience
- Fringing coral reef and ancient limestone range
- Low impact design, construction and operation
- Variety of nature-based activities

INTRODUCTION

Background

Ningaloo is an Aboriginal word-meaning 'promontory'. Cape Range Peninsula is the 'promontory' and Ningaloo Reef runs parallel to its western coast.

Ningaloo Reef Retreat is a high quality tented camp within Cape Range National Park. Developed by Paul Wittwer and Liz Handley, this intimate getaway retreat provides accommodation for up to 12 guests in a unique coastal landscape overlooking a fringing coral reef.

Setting

- The Cape Range Peninsula is on the northwest coast of Western Australia, approximately 1200 kilometres north of Perth. The area is well-known for the striking contrast between the clear blue seas, coral reefs and sandy beaches of Ningaloo Marine Park, and the rugged scenery of Cape Range.
- Ningaloo Marine Park protects one of Australia's most important tracts of reef. It is unique because of its accessibility from the coast and for its prolific marine life. It supports over 500 species of fish, 250 species of coral and about 600 species of molluscs. Lagoons, ranging from 400 metres to seven-kilometres wide, are protected from the large oceanic swells by the fringing reef.
- Ningaloo Marine Park is visited seasonally by Humpback Whales (August to October) and Whale Sharks (April to June). Ningaloo Reef is also one of the world's main breeding areas for turtles. The three species seen at Ningaloo Reef are Green, Loggerhead and Hawksbill Turtles.
- Cape Range is an impressive weathered limestone range with plateau up to 314-metres high. It forms the spine of the peninsula that stretches up towards North West Cape in the Gascoyne region of Western Australia.
- The backbone of the range is fossil bearing limestone, laid down on what was once the sea floor. Bushwalkers may encounter fossils in the nearby Mandu Mandu Gorge.

Description of Facilities

- Five canvas safari tents are constructed on elevated timber platforms, each with sea views, private ensuite facilities, a private deck and quality furnishings. The tents feature ocean views (northwest) and take account of prevailing winds – southwest in summer and east in winter.
- The hub of the camp is the Retreat, with lounge, dining tent, elevated sun deck and a well appointed kitchen where meals are prepared.
- The Retreat also has a small library with interpretive information on the marine life, wildlife, birdlife, Cape Range National Park and Ningaloo Marine Park. There is also a selection of novels that can be exchanged.
- Vehicles are excluded within the campsite. Guests can take advantage of a private shuttle service from Exmouth or park their vehicles in the nearest carpark (approximately 600m from the campsite). Guests follow the compacted gravel pathway that winds its way through the dunes and adjacent the lagoon's edge to the campsite. Assistance can be provided with luggage or for visitors with disabilities.
- Throughout the campsite a series of elevated walkways and compacted gravel paths provide access between facilities and the beach and prevent damage to the fragile dune system.

- Preservation of the delicate sand dunes and reef environment is assured by the sensitive approach to all aspects of the design, construction and operation of the camp.

Site Constraints

- The lack of any basic infrastructure (power, water or electricity) on the site.
- The need to preserve the site and ensure development impacts are negligible.
- Climatic constraints are low rainfall (275mm per year) and cyclone hazards. The campsite was narrowly missed by Cyclone Vance in 1999. Staff monitor cyclone warnings and have an evacuation plan in place. In the event a blue alert is received (meaning a cyclone is imminent within 48 hours) all guests are evacuated and the tent fabric and all furniture are removed.

ENVIRONMENT

Energy

- All energy needs are supplied on site.
- The tents rely on solar power for all lighting needs. Two 75 watt solar panels are connected to a 12-volt battery at each tent. A larger tracked solar array (5kw) supplies lighting needs for the Retreat. Energy efficient lighting is used throughout.
- Gas is used for cooking in the kitchen.
- The showers are solar heated.

Water

A condition of the licence by the State Department of Conservation and Land Management (CALM) limits the facility to consuming a maximum of 200 litres/day of water. Each of the tents is provided with 20 litres/day for showering and washing.

All water is transported from Exmouth in 20-litre containers and an electric golf buggy is used to carry the water around the site.

Waste

Composting toilets are installed to prevent sewage waste from entering the environment and to minimise water consumption. Grey water flows into grease traps and then into soakage trenches.

All solid and organic waste is removed from site to the municipal waste disposal system in Exmouth.

Building Materials and Construction

Plantation timber is used for all timber platforms. Posts embedded 800mm in the ground support the timber platforms. A flat plate on the bottom of the posts prevents them pulling out of the sand. During construction the local Aboriginal people (the Bayanyo people) provided approval for the individual siting of facilities and the digging of pylons.

The tents are designed with three separate layers:

- The first (outer) layer is a sand-coloured shade cloth supported by curved steel posts to create the curved appearance (in the shape of a wave or dune) of the tents. This outer layer is lightweight and permeable to water.
- The second layer is a plastic-coated canvas waterproof covering that protects the tent. Timber posts support this layer.
- The third (inner) layer is the canvas safari tent.

The tents and common area are a reversible construction, a necessity in a cyclone prone area. The facilities can be dismantled within 48 hours.

From left to right: The tents overlooking the fringing coral reef; An experience that enables guests to get close to nature; Timber walkways and compacted gravel paths preserve the delicate sand dunes.

EXPERIENTIAL RESPONSES

The design of the outer layer (curved roofs and dune-like colour) ensures the tents are a reflection of the local environment. They do not have the hard angular edges of a traditional safari tent. This layer is designed to wrap around the ensuite and front veranda to provide complete privacy from adjoining tents, yet uninterrupted views of the water.

This quality, yet simple, accommodation enables guests to fully appreciate and enjoy the spectacular environment and the variety of nature-based activities. Guests are fitted with snorkelling equipment on arrival and need venture no more than five metres from shore into waist deep water to experience an incredible diversity of coral, tropical fish, turtles and other marine life. Following an initial guided snorkelling tour, guests can enjoy the snorkelling at any time. Other activities include a sea kayak on the sheltered lagoons of Ningaloo Reef or a guided bushwalking tour into nearby Mundu Mundu Gorge.

CULTURE

About one-kilometre east of the camp guests can visit one of the oldest reliably dated archaeological sites in northern Western Australia. At the Mandu Mandu Creek rock shelter, archaeologists discovered modified shells used as ornamental beads that were dated at 34,000 years old, one of the earliest records of decorative traditions in the world.

SOCIAL AND ECONOMIC

Ningalo Reef Retreat encourages social interaction between guests, particularly during the preparation of the evening meal where guests are encouraged to assist staff members.

The Retreat also has a 'buy local' policy. Where possible all goods are purchased in Exmouth. Staffing includes three full-time staff and two casual staff. Staff are engaged on a six-month contract and are typically recruited from Perth.

DEVELOPMENT APPROVAL PROCESS

Local Government development approval was not required because of the location of the development on Crown Land within a National Park. Various licences were required from the State Department of Conservation and Land Management (CALM). The development has occurred in stages as various licences and approvals were obtained.

In 1997, Paul and Liz spent three months in Cape Range National Park researching the best locations for a tourist facility. They narrowed the locations down to three sites and visited these sites in various weather and tidal conditions before determining a preferred location. Approval was gained from CALM for a one-year licence to take tourists in swags camping in the Park.

In 1998 they were the successful applicant in an expression of interest and gained a two-year licence to develop tented accommodation on the present site.

In 2000, a further two-year licence was granted to continue operations.

In 2002 a three-year licence was granted to continue operations and this has subsequently been extended for a further three years to 2008.

Main image: Ningaloo Reef Retreat is located between a fringing coral reef and an ancient limestone range.

BAY OF FIRES LODGE

KEY FEATURES

- Award-winning architectural design
- Environmentally sensitive construction techniques
- Sustainable energy, water supply and waste management
- Isolated wilderness setting

INTRODUCTION

Background

Bay of Fires Lodge provides simple but upmarket accommodation for two nights during the four-day Bay of Fires walking tour through Mount William National Park on Tasmania's northeast coast.

The walk, for a maximum of ten guests and conducted by two guides, begins at Pleasant Banks, continues to the Forester Beach Camp for one night and then continues on to Bay of Fires Lodge for the remaining two nights. Walks are booked on most days of the summer walking season which extends from November to May, with the peak season being December to March.

Both Bay of Fires Lodge and Forester Beach Camp were established and designed by acclaimed Tasmanian architect Ken Latona to provide a unique, educational and environmentally sustainable way of experiencing the dramatic landscape of Mount William National Park.

The Setting

- Bay of Fires Lodge is set on 35 hectares of private property next to Mt William National Park on the north-eastern corner of Tasmania. It contains a dramatic and diverse wilderness landscape of white sandy coastline and woodland scenery.
- The Park is a haven for wildlife including Eastern Grey Kangaroos, echidnas, Brushtail Possums, wombats, wallabies and Tasmanian Devils as well as over 100 species of birdlife. There are many significant Aboriginal sites within the Park.
- Bay of Fires Lodge is set on a hilltop 40 metres above the ocean, among native vegetation, and has spectacular views of Bay of Fires and the Tasman Sea.
- The site is reached by foot from a private vehicle road approximately 200 metres away or from the beach as part of the guided walk. It is also accessed by helicopter twice yearly for delivery and removal of large supplies.

Facilities

Bay of Fires Lodge consists of two linear pavilions constructed principally of timber and glass connected by large timber decks. The Lodge provides accommodation for 20 guests (twin share/double) and six staff. There are common areas for dining both indoor and outdoor, a reading room and a lounge room and shared bathroom facilities. Meals are prepared by staff in a communal kitchen. The Lodge features a wood combustion stove in the living area and quality furniture, fittings and fixtures.

Main image: View from the Lodge deck.

Site Issues and Constraints

- The siting of the building was dictated by an existing clearing on the site to minimise the removal of trees and vegetation. Only three trees were removed during the building process.
- The nearest vehicle access is 200 metres from site. This required an innovative approach to construction. The local tip six kilometres away was used as a base for trucks delivering materials. These were then divided into loads of a maximum 500kg and flown in by helicopter.
- There is no mains power, mains water or sewage connection so all basic services are provided on-site.
- All efforts were made to minimise damage to surrounding vegetation during construction and use.
- The walk is only operated for six months of the year allowing any damaged vegetation the opportunity to regrow while undisturbed.

ENVIRONMENTAL

Energy

The main power supply for the building is solar energy with a back-up generator. Passive solar design features to reduce energy consumption include:

- Extensive use of glass louvres to provide sunlight penetration and cross-ventilation, the louvres are shielded from the direct summer sun by 1200mm eaves on the skillion roof
- The long north facing building plan and skillion roof (pitched north)
- Siting the building low in the vegetation to provide shelter from strong coastal winds
- Use of a lightweight structure, no thermal mass is required to retain heat because the accommodation is only open during the summer months.

Other energy conservation features include:

- Instantaneous gas hot water systems
- WC fan vents powered by solar energy
- Fridges, cooktop and barbecue powered by LPG. Cylinders are brought in and removed every six months by helicopter
- Low energy lighting.

Water

- The water source for the Lodge is supplied by rainwater collected from the roofs into five, 22,000-litre tanks. This water is used for drinking, showers, kitchen use and bushfire protection. Rainfall to the area is currently providing an adequate water supply.
- AAA rated water flow restrictors have been installed on fittings to minimise water consumption.
- Water for showers and basins is hand-pumped from the water tanks by guests to a header tank on the roof. This hands-on approach to water use, and visibility of tanks was designed to give guests a greater appreciation of their water usage and encourage conservation.
- The water supply pump to the kitchen uses solar power for the convenience of staff.

Waste

- All sewage and organic kitchen waste is treated on site in a Clivus Multrum Dry composting system. Waste water is removed from the system and passed through a 'digester' where it is further filtered through a fine weave material treated with bacteria and then passed into a transpiration trench where it evaporates. Kitchen waste water is run through a grease trap and then into the 'digester'. Basin waste water runs straight to the 'digester'.
- Solid waste is recycled where possible.
- Any larger waste is collected and removed by helicopter every six months at the beginning and end of the season.

Fire Protection

The timber construction and proximity to vegetation means the building cannot be protected from fire. Minimal bushfire protection measures include fire hoses and tank water set aside for fire protection. In the case of a fire the building will be evacuated and left to burn.

Building Materials and Construction

- Prevention of vehicle access to the site meant that all materials had to be either brought in by helicopter or walked in. Selected building materials were lightweight and allowed for simple construction techniques.
- A limited number of materials were used to minimise the amount of wastage. Materials included Tasmanian hardwood and plantation pine structure, cladding and flooring, corrugated steel roof sheeting and glass. Walls are of single skin construction reducing the amount of material required.
- Waste was centralised during construction and the site was kept tidy to minimise the impact on the surrounding bush.

EXPERIENTIAL

Connection with the landscape

- The Lodge achieves a very strong connection with the landscape. The long timber and glass open plan pavilions and outdoor decks have uninterrupted views to the bush and the ocean. The design of common areas is very open to the elements ensuring a full experience of the weather and climate while still affording all necessary protection.
- The exposed laminated beams and glass louvres reflect the horizon line of the ocean while the skillion roof pitch follows the line of the wind clipped trees.

Aesthetics

- The building is approached from the beach as part of the guided walk. It is not visible until almost upon it because of the dense vegetation, successfully achieving a dramatic sense of arrival and surprise.
- The careful and detailed use of single skin timber cladding throughout the building creates a strong sensation of comfort and warmth.
- The Lodge is a very beautiful piece of architecture sited in an amazingly breathtaking location creating a completely unique and memorable experience.

SOCIAL AND ECONOMIC

- The Bay of Fires Walk is a very social experience and encourages interaction between guests and staff. This occurs both during the walk and in all of the accommodation's communal facilities thereby adding the extra dimension of shared experience. The design also enables privacy when required in the individual sleeping areas.
- The site is very isolated so the links with the closest local community are limited to:
  - Use of local tradesmen during construction and continued use for ongoing maintenance
  - Use of the local laundry service
  - Use of local produce and Tasmanian wines in prepared meals.

DEVELOPMENT APPROVAL PROCESS

- The approval process experienced some difficulties because the conservation values of the site and the proximity to a National Park. Ken Latona's success can be largely attributed to his embracing the notion of 'touch the earth lightly' architecture and the credibility he has established through working with the National Parks and Aboriginal Land Council (a government and Aboriginal community-based council).
- Out of respect for local sacred Aboriginal sites, approval was sought from the Aboriginal Land Council before siting the building. Koori groups were consulted when developing the interpretation for the guided walks.

From left to right: Bay of Fires Lodge; The Lodge viewed from the rear; The view from outside the Lodge looking in.

FORESTERS BEACH CAMP – BAY OF FIRES WALKING TOUR

KEY FEATURES

- Demountable 'tent' structure
- Coastal setting within a National Park
- Low impact design, construction and operation

INTRODUCTION

Background

Foresters Beach Camp provides accommodation for guests on the first night of the Bay of Fires walking tour in Mount William National Park on Tasmania's north-east wilderness coast.

The Camp was designed by Ken Latona as a simple demountable structure that would minimise environmental impacts and provide ease of construction and deconstruction. The site's location within a sand dune swale in Mount William National Park necessitated a low impact demountable form of construction that can be removed if required.

The Setting

Foresters Beach Camp is on a leased site in Mount William National Park. Guides bring guests to the camp that is located between sand dunes and among vegetation via a coastal walking track. The building sits into the landscape and is hidden from view from the beach by vegetation. The closest point for vehicle access is four kilometres from the campsite.

Facilities

Facilities at Foresters Beach Camp include:

- Twin share rooms for ten guests and two staff
- Full kitchen facilities where meals are prepared by staff
- Common dining areas (indoor and outdoor)
- Private wash areas and composting toilets.

ENVIRONMENT

Energy

Energy needs (principally lighting) are supplied by solar power with generator for back-up. LP gas powers fridges, cooktop and barbecue (LPG cylinders are brought in by helicopter every six months).

Water

- All rainwater from roofs is collected for use in three, 7,000 litre tanks.
- Water for bathroom taps is gravity-fed from rainwater collection tank.
- Solar bush showers are provided (water placed in black bags to heat in sun).
- A hands-on approach to handling water is employed (carrying water in tubs from tanks) and visibility of tanks allows guests to appreciate the amount of available water and how much they are using.

Waste

Environmental technologies and management principles are in place to ensure all waste is contained or removed from the site and not released back into the National Park. These include:

- Black/yellow waste and organic kitchen waste is diverted to a Clivus Multrum Dry Composting System. Waste water is removed from the composting system and passed through a 'digester' where it is further filtered and then passed into a transpiration trench where it evaporates.
- Kitchen wastewater is run through a grease trap and then into the 'digester'. Basin wastewater runs straight to the 'digester'
- Solid waste is collected and removed from site by staff and recycled where possible
- Helicopters bring in/remove bulk supplies and waste (eg gas cylinders, non-perishable food) twice during the walking season.

Building Materials and Construction

A key objective was to design a demountable form of accommodation that could be removed at the end of each season if required. The materials and construction methods employed included:

- Using a demountable 'tent' structure (a tarpaulin strung over steel frame). The tent structure was selected because it was lightweight and caused minimal waste and damage to the landscape during construction
- Using helicopters to fly in building materials during construction
- Using plywood inside the tarpaulin structure for security. This was installed at a later stage to stop vandalism during unoccupied months
- Treated plantation pine decking from timber sourced locally
- Fibre cement sheeting to amenities pavilion.

EXPERIENTIAL

- Foresters Beach Camp is approached from the beach or bush as part of the guided walk. Because of the topoghraphy and dense vegetation, it is not visible untill guests are almost upon it. This successfully achieves a dramatic sense of arrival and surprise. Clean lines, bold colour and simple forms of tent structure are very effective in the isolated bush location.
- Swimming and snorkelling are available in the shelter of a natural, rock-ringed 'harbour'.
- Meals can be taken on the outdoor decks or on the beach.
- Guests can view a large variety of bird species and animal species including wombats, wallabies, Eastern Grey Kangaroos, echidnas, Brushtail Possums and Tasmanian Devils.

From left to right: Aerial view of Foresters Beach Camp; Foresters Beach Camp.

CASE STUDY CONTACT DETAILS

Southern Ocean Retreats

Location: Deep Creek Conservation Park, South Australia
Contact: Barry Duykers and Jane Formato
Telephone: +61 8 8598 4169
Website: www.southernoceanretreats.com.au
Email: barry.duykers@southernoceanretreats.com.au
jane.formato@southernoceanretreats.com.au

Cape Cassini Wilderness Retreat

Location: Kangaroo Island, South Australia
Contact: David and Pat Welford
Telephone/fax: + 61 8 8559 2215
Website: www.capecassini.com.au
Email: retreat@capecassini.com.au

Banrock Station Wine & Wetland Centre

Location: Holmes Road, Kingston-on-Murray, South Australia
Telephone: +61 8 8583 0299
Website: www.banrockstation.com.au

Kabminye Cellar Door, Restaurant and Gallery

Location: Krondorf Road, Barossa, South Australia
Contact: Ingrid and Richard Glastonbury
Tel/fax: + 61 8 8563 0889
Website: www.kabminye.com
Email: wine@kabminye.com

Aquila Eco Lodges

Location: Victoria Valley Road, Dunkeld, Victoria
Telephone: +61 3 5577 2582
Website: www.ecolodges.com.au
Email: ecolodges@ozemail.com.au

Grampians YHA Eco-hostel

Location: Cnr Buckler Street and Grampians Road, Halls Gap, Victoria
Telephone: +61 3 5356 4544
Website: www.yha.com.au/hostels
Email: grampians@yhavic.org.au

Paperbark Camp

Location: Jervis Bay, New South Wales
Contact: Jeremy and Irene Hutchings
Telephone: +61 2 4441 6066
Website: www.paperbarkcamp.com.au
Email: info@paperbarkcamp.com.au

Ningaloo Reef Retreat

Location: Yardie Creek Road, Cape Range National Park, Western Australia
Contact: Paul Wittwer and Liz Handley
Telephone/fax: + 61 8 9949 1776
Website: www.ningalooreefretreat.com
Email: info@ningalooreefretreat.com

Bay of Fires Lodge and Foresters Beach Camp

Location: Mt William National Park, Tasmania
Telephone: + 61 3 6391 9339
Website: www.bayoffires.com.au
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Rawnsley Park Station

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Chapel Hill Winery, McLaren Vale, Fleurieu Peninsula

7. APPENDICES

APENDIX 1: REFERENCE AND RESOURCE LIST

Australian Building Code Board
www.abcb.gov.au

Australian Government,
Tourism White Paper A Medium to Long Term Strategy for Tourism
Commonwealth of Australia, 2003

Australian Tourism Export Council
www.atec.net.au

CSIRO Techincal Report
Balancing Act: A triple bottom line analysis of the 135 sectors of the Australian economy, 2005

Ecotourism Australia
www.ecotourism.org.au

GreenGlobe
www.greenglobe21.com

Maho Bay
www.maho.org

South Australian Tourism Commission
South Australian Tourism Plan 2003-2008,
December 2002

South Australian Tourism Commission and Department for Environment and Heritage,
Responsible Nature-based Tourism Strategy 2004-2009

South Australian Tourism Commission
Sustainable Tourism Package, 2005

South Australian Tourism Commission and Planning SA,
Sustainable Tourism Development in Regional South Australia,
Discussion Paper, November 2002

Tourism New South Wales,
Our Natural Treasures: a shared vision for NSW, 2004

United Nations Environment Programme and World Tourism Organisation, *Making Tourism more Sustainable - A Guide for Policy Makers*, 2005

Western Australian Tourism Commission,
Designing Tourism Naturally – A Review of World Best Practice in Wilderness Lodges and Safari Camps, July 2000

World Tourism Organisation
www.world-tourism.org

APPENDIX 2: SITE ANALYSIS INFORMATION

The following matters should be considered when preparing a Site Analysis Plan.

Plan details
- Scale plan 1:100 to 1:500 (depending on the size of the site)
- Show site boundary, allotment dimensions, scale and north point

Climatic conditions
- Prevailing winds
- Aspect to sunrise and sunset
- Overshadowing from existing features

Topography and geology
- Contours and slope analysis (steepness eg 1 in 10)
- Direction of fall of the site
- Natural drainage lines or watercourses
- Geological features
- Soil contamination

Services
- Existing services, connection points and easements
- Existing pedestrian and vehicle access points
- Existing trails eg walking, cycling, bridle

Existing buildings on site
- Location of existing buildings
- Buildings to be retained or demolished
- Heritage value of any existing buildings

Vegetation on site
- Type, location and size of existing trees and plants
- Condition – intact/robust/degraded vegetation, distribution

Adjoining property conditions
- Land uses and activities, including possible future land uses (as per zoning)
- Potential topographic separation
- Location and height of buildings
- Any special features such as significant vegetation or watercourses etc
- Type, height and condition of boundary fences

Views
- Significant views from the site and site viewpoints
- Significant views into the site by neighbours or passers-by
- Topographic attributes relevant to siting of structures

Potential external pollution sources
- Noise
- Dust
- Spray drift
- Odours
- Discharges

Access
- Level and condition of access roads
- Other users of access roads
- Safety aspects (eg sight lines)

Risks
- Flood prone areas
- Soil/cliff stability etc
- Bushfire potential (including from external sources)

Wildlife habitats
- Species diversity and habitat value
- Wildlife corridors
- Migratory patterns

Environmental issues in locality
- Erosion
- Plant, soil diseases
- Ground water

Indigenous features
- Native title
- Protection of sites and artefacts
- History

Potential interpretive features
- Cultural/heritage/history
- Ecological processes/geology
- Endangered species
- Environmental restoration
- Indigenous sites/artefacts/history

Relationship to local communities
- Identification of adjacent communities
- Cultural identity
- Distinctive vernacular architecture

Coastal features (if applicable)
- High and low water marks
- Coastal processes
- Marine features
- Coastal acid sulphate soils

Source: ***Sustainable Tourism Development in Regional South Australia***, Discussion Paper, November 2002

APPENDIX 3: RELEVANT GOVERNMENT CONTACTS

ISSUES	INDUSTRY AND GOVERNMENT ORGANISATION
ABORIGINAL TRADITIONS AND CULTURE	SA Department for Aboriginal Affairs and Reconciliation www.daare.sa.gov.au
ACCESSIBLE FACILITIES	Australian Human Rights and Equal Opportunity Commission – Disability Rights www.hreoc.gov.au Australian Building Codes Board www.abcb.gov.au
BUSHFIRE PROTECTION	SA Country Fire Service – Development Assessment Unit www.cfs.org.au Planning SA www.planning.sa.gov.au
CLIMATE CHANGE	SA Department for Environment and Heritage – Office of Sustainability www.environment.sa.gov.au
COAST	SA Department for Environment and Heritage – Coast and Marine www.environment.sa.gov.au
ENERGY	Energy SA www.energy.sa.gov.au
FAUNA	Commonwealth Department of Environment and Heritage – Environment Protection Biodiversity and Conservation – Assessment and Referrals www.deh.gov.au SA Department for Environment and Heritage – Biodiversity www.deh.sa.gov.au
HEALTH	SA Department of Health www.dh.sa.gov.au/pehs/
HYDROLOGY & WATER	SA Department of Water, Land, and Biodiversity Conservation – Water Resources www.dwlbc.sa.gov.au SA Water www.sawater.com.au
LAND USE	Planning SA www.planning.sa.gov.au
LOCAL GOVERNMENT	Local Government Association of South Australia www.lga.sa.gov.au
NON-ABORIGINAL TRADITIONS AND CULTURE	SA Department for Environment and Heritage – Heritage Branch www.environment.sa.gov.au
SAFETY AND SECURITY	SA Department for Administrative and Information Services – Workplace Services www.eric.sa.gov.au National Occupational Health and Safety Commission www.nohsc.gov.au National Tourism Accreditation Program www.tourismaccreditation.com.au Australian Building Codes Board www.abcb.gov.au
TOURISM Research Business advice Marketing	South Australian Tourism Commission www.tourism.sa.gov.au
VEGETATION MANAGEMENT Native Vegetation	SA Department of Water, Land, and Biodiversity Conservation – Native Vegetation Branch www.dwlbc.sa.gov.au
Threatened Species	Commonwealth Department of Environment and Heritage – Environment Protection Biodiversity and Conservation – Assessment and Referrals www.deh.gov.au SA Department for Environment and Heritage – Biodiversity www.deh.sa.gov.au
WASTE	Zero Waste SA www.zerowaste.sa.gov.au SA Department of Health www.dh.sa.gov.au/pehs

APPENDIX 4: HYPOTHETICAL BRAND PYRAMID

The brand or core promise can be articulated through the construction of a brand pyramid.

Constructing this pyramid helps to identify the core promise that is made to prospective customers.

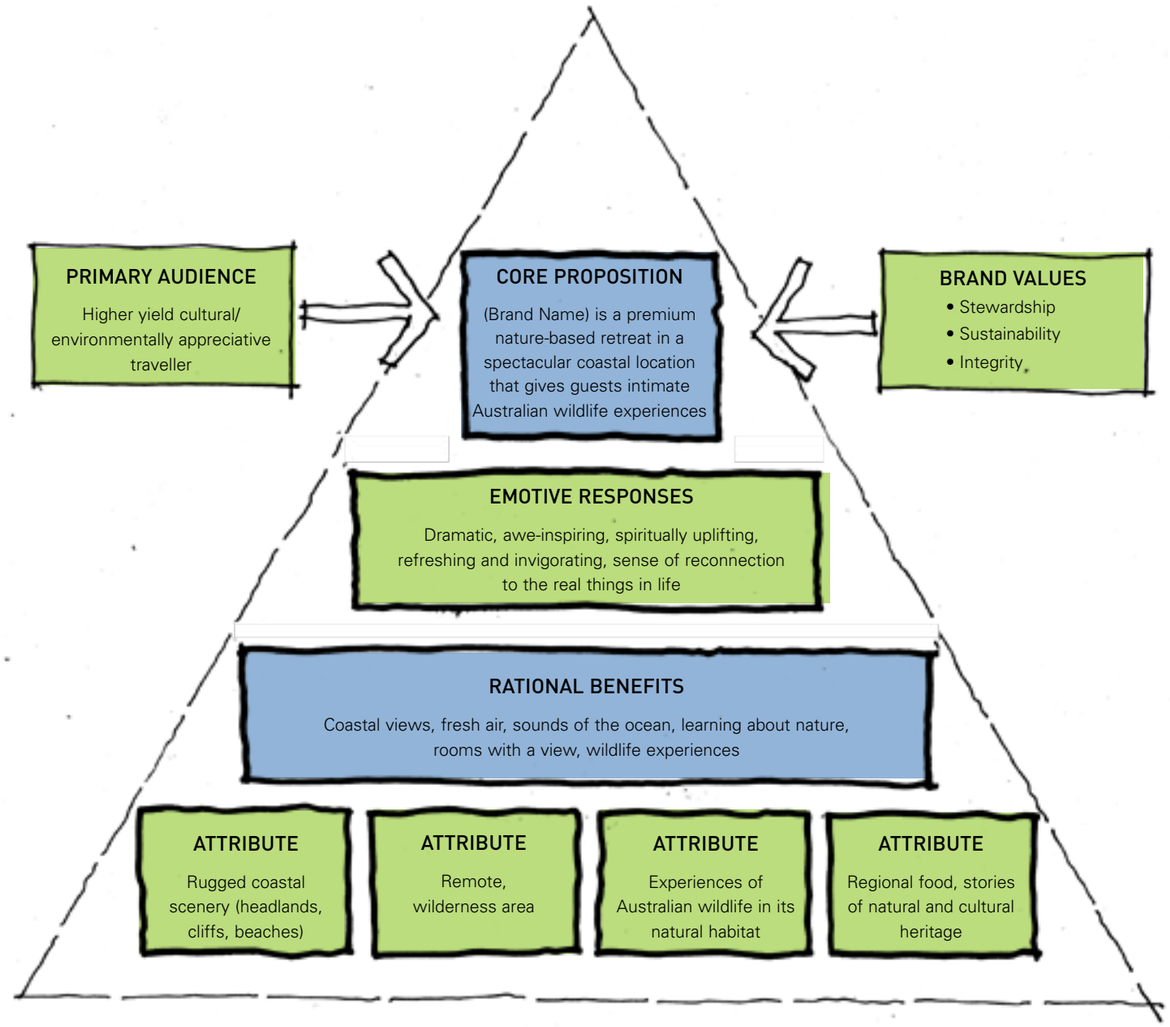
This process begins with identifying the key attributes of the region/location, which will help to define the essential character and nature of the product.

The next step is to identify the rational benefits that the experience of such things offers the visitor. These are generally the benefits the visitor seeks or appreciates.

Following this, the emotive responses that it is hoped the visitor will derive from these experiences can be identified. This is the key to the core promise. These are less tangible benefits, expressed as the type of 'feelings or emotions' that are invoked.

Gathering together this information in this sequence and identifying the critical elements in each, helps to provide increasing focus for the core proposition. This core proposition is underpinned by the brand values (what you stand for). The brand pyramid may describe a combination of actual and aspirational aspects.

A hypothetical pyramid for a premium nature-based tourism development is shown below for illustrative purposes.



APPENDIX 5: ACKNOWLEDGEMENTS

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Zero Waste SA

Sharon Ede

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Kabminye Cellar Door Restaurant

Ingrid and Richard Glastonbury

Cape Cassini Wilderness Retreat

David and Pat Welford

Aquila Eco Lodges

Barb Bjerking

Paperbark Camp

Jeremy, Irene and Camilla Hutchings

Grampians YHA Eco-hostel

Kamila and Andrew Lucas

Ningaloo Reef Retreat

Paul Wittwer

Bay of Fires Walk

Sally Latona

Jemby Rinjah Eco Lodge

Bill and Noreen Urquett