

OUTDOOR RECREATION FACILITIES IN NATURAL ENVIRONMENTS

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Abstract

Government and semi-government authorities in Australasia who own or control outdoor recreation facilities in natural environments are showing increasing interest in outdoor structures. Typical are national park authorities who have a range of facilities ranging from viewing platforms regularly subject to crowd loadings to rope crossings for streams on remote bushwalking tracks frequented by only the most hardy and experienced bushwalkers.

The increased concern stems in part from the findings of the Commission of Inquiry into the collapse of a viewing platform at Cave Creek in New Zealand in April 1995. The platform collapsed and fell about 30 metres killing 14 young people and injuring others.

The challenge is to provide the appropriate facilities for various user groups and manage these assets in a responsible way.

The paper describes the particular conditions pertaining to outdoor structures and their use. It examines why these structures are not adequately covered by existing building type codes and what work has been done in New Zealand and Australia accordingly.

Key Words: recreation structures, outdoor, litigation, park infrastructure, walking tracks, track classification, recreational opportunity spectrum, asset management

Introduction

Management Authorities in Australia have been increasingly active in the recent past in assessing structures on walking tracks for their adequacy. Many structures have been found not to conform to the "deemed to comply" provisions of the Building Code of Australia (BCA). Furthermore many of them are in sensitive environments, are fit for purpose and a fully conforming structure would be out of keeping with the environment and the experience being sought by the type of visitor using them. It has become clear that improved "deemed-to-comply" provisions that recognise these conditions are needed. New Zealand have already commenced similar work (Dept of Conservation, 1997) following the findings of the Commission of

Inquiry into the Cave Creek Disaster in that country.

There is now similar work well progressed with Standards Australia.

Background

Park infrastructure, bridges, lookouts and boardwalks in urban areas have been subject to suitable standards for some time. Indeed their design and construction are controlled in most Australian States by legislation engaging the Building Code of Australia (BCA).

Infrastructure in natural environments has been less well controlled. Many tracks have

developed over a long period, in many cases in a largely unplanned way. Some facilities have been produced by well meaning but ill-equipped or inadequately skilled persons or groups.

Not surprisingly there have been accidents. A disaster occurred at Cave Creek on the South Island of New Zealand in April 1995. A party of seventeen students on an outdoor recreation course crowded onto a viewing platform at Cave Creek on the West Coast of New Zealand. The newly constructed platform collapsed and fell about 30 metres. As a result 14 young people lost their lives and the others were seriously injured. The Commission of Inquiry which followed found the primary cause of the collapse was the failure of the structure to support the weight of people on it. Secondary causes were:

- i. lack of qualified engineering input into the design and approval of the project
- ii. failure to adequately manage the construction
- iii. no proper inspection by statutory authorities before, after or during construction
- iv. lack of warning signs indicating that the platform had a maximum loading of 10 people
- v. cost-cutting measures including staff reductions led to key personnel having to cover several jobs. The platform was completed by "volunteers".

Concurrently park managers in Australia have been facing an increasingly litigious environment. Key legal cases that have helped interpret duty of care in Australia have been *Nagle vs Rottnest Island Authority* (1993) and *Romeo vs Conservation Commission of the Northern Territory* (1998).

In *Nagle* a person was seriously injured and permanently incapacitated when he dived into shallow water on a beach on the island and struck his head on a submerged rock.

The court held that a duty of care was owed because the accident was foreseeable but not obvious and warnings should have been posted.

In the case of *Romeo* a Darwin girl fell over the edge of a cliff at a popular parking spot in a public area and was left a paraplegic. She fell in the early hours of the morning during a party at the spot and was under the influence of alcohol at the time.

The appeal before the High Court was not unanimously rejected. However in his summation, judge Kirby provided improved guidelines for land managers to gauge the extent of their liability at law:

- i. while land managers have a duty of care to visitors there is a corresponding responsibility of users also to take proper care. Managers did not have a responsibility to protect against reckless behaviour of visitors
- ii. where a danger is apparent to an ordinary person with reasonable skills, the land manager is not required to take precautions that assumed a lower level of knowledge or skills
- iii. a land manager is entitled to take into account the environment in designing or deciding not to provide protection for users if that provision would clearly be contrary to the natural values of the area
- iv. as land managers do not have unlimited resources, standards have to be cognisant of this.

Nevertheless it is clear that where a man made facility is introduced into an otherwise natural environment by a land manager, visitors are by default invited to use it and the law will demand a duty of care accordingly. Land managers in Australia and New Zealand are uniformly experiencing increased litigation by visitors suffering injury and seeking remedy at law.

Why Problems Have Occurred With Outdoor Recreation Facilities

The authors have encountered numerous examples of structures on walking tracks that have been either structurally or functionally inadequate.

The structures are not, in the main, structurally complex.



Figure 1 Most structures are simple in engineering terms but some are more complex

They are however often constructed:

- i. by people not adequately trained for the building task
- ii. in the absence of a formal design and approval process
- iii. without any regulation or quality process
- iv. in remote locations where it is difficult to carry materials and good equipment
- v. on a constrained or sensitive site where it is critical to avoid disturbance to the environment
- vi. using materials that are “in keeping” with the environment, leading to increased likelihood of inadequacy or short safe life.



Figure 2 Environmental impact is important

The author's have found that, where there are significant structural safety problems at a site, they are typically in the following areas:

- i. inadequate foundation detail e.g. posts on inclined rock surfaces
- ii. inadequate bracing or unsupported column length
- iii. unsafe barrier design.

Understanding The Risk Environment

Managers are faced with a risk management task within an environment of limited financial resources. Figure 3 shows that the environment for risk is created by:

- i. the physical site itself,
- ii. the use is made of it by visitors, and
- iii. unsafe barrier design.

The range of actions available to the land manager are shown on the right of Figure 3. All of them can be handled within an asset management context as described below.

Targeting the Right Level Of Service

Park Managers, whether in the public or private sector, manage in response some identified customer need and in an environmentally sustainable way. Research

in New Zealand has shown that visitors to the “back country” are fundamentally after a different experience to those in urban situations. Standards have historically been developed for urban situations.

In recognition of this situation, Standards Australia has prepared a Committee draft (1998) of a standard for walking tracks that has defined a six class structure for land managers to classify tracks. The summary descriptors are presented in Table 1.

It is expected that the standard will be adopted and promoted on walking tracks nationwide, included in significant track heads and park brochures.

When so disseminated it has the potential to create a notional contract between the track provider or land manager and the potential visitors. It will help preserve the type of walking that skilled, experienced, well

equipped walkers are after while also assisting other walkers to make an informed choice not to embark on a journey that would be beyond their capability.

The definitions recognise the range of experiences being sought by various visitor groups. This follows what has been referred to as the Recreational Opportunity Spectrum (ROS). ROS is well defined by Bryan (1981). While the deemed-to-comply provisions of the BCA are suitable for structures on track classes T1 and T2 they are too restrictive and unnecessary for the higher classifications. If used in these situations the structures so designed risk inappropriately impacting the very environment that visitors want to see preserved. This can be managed at the moment by invoking the alternative solutions provisions of the BCA.

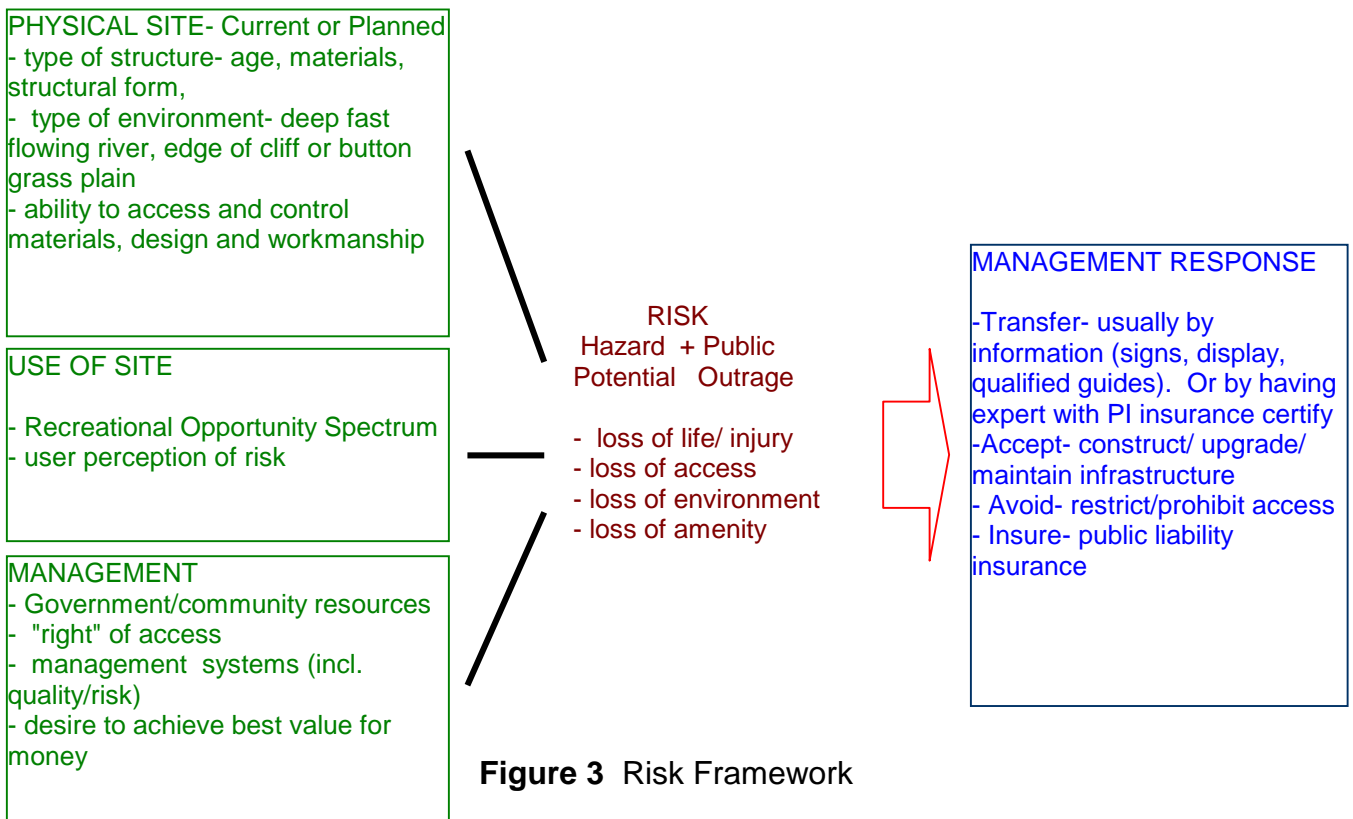


Figure 3 Risk Framework

Grade	Description
T1	Opportunity for large numbers of visitors and those with reduced mobility to undertake walks providing a high level of interpretation and facilities.
T2	Opportunity for large numbers of visitors to walk easily in natural environments with a moderate level of interpretation and facilities.
T3	Opportunity for visitors to walk in relatively undisturbed natural environments requiring a moderate level of fitness and care, but where interpretation and facilities are uncommon.
T4	Opportunity for visitors to explore and discover unmodified natural environments along defined and distinct tracks with minimal (if any) facilities.
T5	Opportunity for visitors with advanced outdoor knowledge and skills to find their own way along often distinct tracks in remote locations.
T6	Opportunity for highly experienced walkers to explore remote and potentially hazardous natural areas without the reliance on managed tracks.

Table 1 Walking Track Classification

The increasingly litigious environment faced by land managers described in section 2 of this paper, combined with this requirement to move to alternative solutions has generated a need to better define alternative solutions. An Australian Standards Committee (CS29/1) is therefore preparing an Australian code that will provide such guidance and ensure that land managers are best able to determine the appropriateness of a facility for its user group.

Addressing The Issue In An Asset Management Framework

Figure 4 shows a framework within which responsible land managers can undertake asset management.

The new Australian Standard, even if not engaged as a deemed-to-comply solution in the BCA, will provide building surveyors with a reference on which to place some reliance for new facilities. It is set out so as to allow land managers maximum scope to provide each client group, as defined by the corresponding track classification, with an appropriate level of service.

As figure 4 shows, the BCA and the current legislative framework only covers new facilities. Most of the asset stock at any point in time is not “new”.

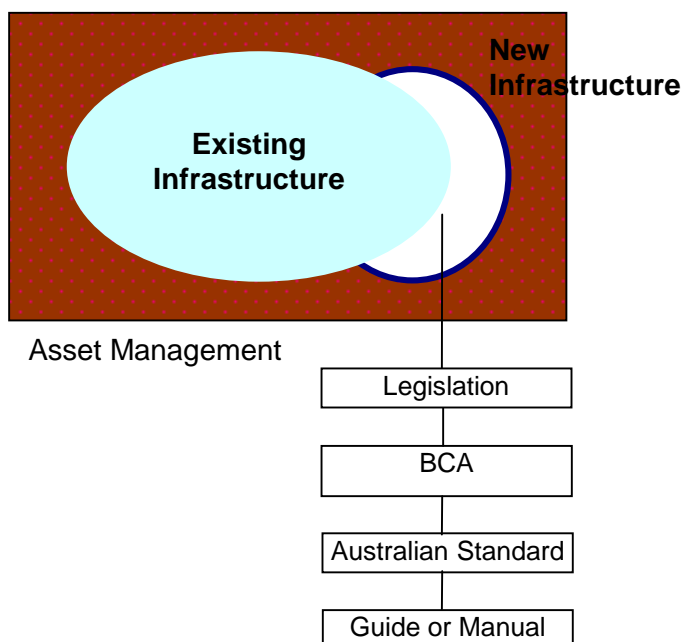


Figure 4: Framework for management of walking track assets

Nevertheless the standard will also provide a convenient benchmark against which to assess and prioritise facilities for upgrade or re-construction

The conventional asset management approach can be taken:

- i. create an asset inventory
- ii. inspect the asset at an appropriate frequency (determined by the track classification amongst other things)
- iii. identify candidates for maintenance, upgrading or re-construction
- iv. assess candidates by reference to corporate strategic level goals, usually including reference to user needs (again track classification is helpful here)
- v. undertake work appropriate to the customer group (per the draft Australian Standard).

The New Zealand Contribution

New Zealand has taken the lead in researching a number of aspects of the problem for outdoor structures. The mechanism they have engaged is the New Zealand Building Code. Like the BCA, the New Zealand Building Code is a performance based code. A Code of Compliance document has been produced for Outdoor Visitor Structures. It recognises the recreational opportunity spectrum and attempts to provide appropriate guidance on solutions that allow designers and managers of structures appropriate scope to provide various users with the type of outdoor experience they are seeking in sympathy with the environment.

The approach to loadings and barrier design in the draft Australian Standard are very

similar and follow those in the New Zealand code.

The New Zealand approach is to bring the design, construction and management of these structures under a quality system regime.

Conclusion

There are currently well advanced moves to codify the requirements for structures on walking tracks. They recognise the need for land managers to protect the very environment that visitors are seeking to enjoy and the range of outdoor experience various groups are looking to have. These advances are expected to increase the reliability of structures both when constructed and throughout their service life.

Land managers across the nation have already commenced reviews of their current stock of assets.

References

Department of Conservation New Zealand(1997), *Draft Means of Compliance With the New Zealand Building Code- Outdoor Visitor Structures*

High Court of Australia (1998), *Romeo v Conservation Commission of the Northern Territory*, HCA 5 February 1998

Hobson Bryan (1981), *The Concept of Recreational Specialisation, Outdoor Recreation: Australian Perspectives*, Melbourne: Sorrett Press.

Standards Australia (1998), *Draft Australian Standard DR 98208 Walking Tracks Part 1: Classification and Signage*

Author Biography



Bill Lawson has been a Principal of Sinclair Knight Merz for three years. Bill is a professional engineer and is well known in local government circles in Australia. He heads Sinclair Knight Merz' capability in the local government market.

Bill has practiced widely in all areas of local government and engineering. Particular areas of expertise are in efficiency and outsourcing, asset management, performance benchmarking and roads and bridges. He has pioneered extensive investigatory work on structures in Tasmania's national parks and has been instrumental in ensuring improved National standards are established.

Bill has been very active in youth employment as one of the founders of the Beacon Foundation and is currently Chairman of the Tasmanian Polar Network.

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Graeme Booth is also a professional engineer with post graduate qualifications in management. He is a fellow of the Institution of Engineers and an Associate Fellow of the Australian Institute of Management. He joined Sinclair Knight Merz in 1997 after some 20 years practice as a professional engineer and senior manager in the Tasmanian Public Service.

Graeme's background is in road transport and bridge engineering. He has held the post of Program manager for Business Systems with Austroads. He has consulted widely in project management and has provided advice to the New Zealand on the delivery of the road program there. Graeme also has a solid background in asset management.

He facilitated the early work towards the draft Australian Standard on Walking Track Infrastructure.

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