

A U S T R A L I A I C O M O S

**CONSERVATION GUIDELINES
FOR
BUILDING SURVEYORS**

FINAL REPORT

PETER PHILLIPS AND DON TRUMAN



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Published by Australia ICOMOS Inc.

ISBN 0-9581987-0-5

Australia ICOMOS
Faculty of Arts
Deakin University
221 Burwood Highway
Burwood VIC 3125
Australia
austicomos@deakin.edu.au
<http://www.icomos.org/australia>
Tel: +61 3 9251 7131
Fax: +61 3 9251 7158

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ACKNOWLEDGEMENTS

The preparation of the Conservation Guidelines for Building Surveyors was carried out with the assistance of funds made available by the Commonwealth of Australia under the National Estate Grants Program.

The authors gratefully acknowledge the assistance of the following people in the preparation of these guidelines:

David Logan	Australia ICOMOS
Trevor Howse	Building regulations consultant
Grahame Crockett	Australian Heritage Commission
Alison Reed	Australian Heritage Commission
Helen Truman	
Jane Phillips	

The authors also gratefully acknowledge the following people and organisations as sources of illustrations. All other illustrations were provided by the authors.

David Logan	Figures 12 (drawings by John Sulman, architect) and 15 (drawing by M Dunn, architect) reproduced in Logan 1987
Heritage Council of NSW	Figures 13 (drawing from draft Technical Information Sheet 4) and 18 (drawing from Technical Information Sheet 3)
Paul Green, photographer	Figure 20
Don Truman (as part of Clive Lucas Stapleton & Partners, Architects)	Figures 21, 35, 36, 41 and 48
Honeywell Limited	Figure 24
Michael Fursland, Sutherland Shire Council	Figures 30, 44 and 45
Michael Eagles, Camden Council	Figures 37 and 38
Luigi Zaniol	Figure 49
Fire Control Pty Ltd	Figure 51

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CONSERVATION GUIDELINES FOR BUILDING SURVEYORS

1. INTRODUCTION

These guidelines are generally intended for use by practising building surveyors, although they will be useful for many people who deal with heritage buildings. The guidelines are intended to help building surveyors and private certifiers make good decisions about heritage buildings and places, by highlighting commonly occurring problems and offering solutions that have been achieved in similar situations. Being aware of the heritage issues is the key to solving the problems.

Most heritage buildings are unable to comply with current building regulations. This does not necessarily mean that they are unsafe or unhealthy. In most cases, heritage buildings can be upgraded to meet the intention of current building regulations. The challenge is to do this without losing the qualities which give the buildings their heritage significance. The introduction of a performance-based Building Code of Australia (BCA) has made this task a little easier.

2. HOW TO USE THESE GUIDELINES

The introductory sections deal with some basic heritage concepts which building surveyors need to know. The basic terms used in heritage conservation are defined. The intent is not to confuse the reader with heritage jargon, but to explain the terms used in conservation as a means of explaining the concepts. Then follows a brief explanation of the methodology of heritage conservation, and how this translates into heritage listings affecting buildings and other places.

The guidelines themselves are laid out to correspond to the normal method of assessing a building for compliance with the BCA. They follow a typical building assessment process, starting with general attributes of the building (e.g. size, class of occupancy) and proceeding to particular issues of structural safety, access, fire safety, and health and amenity. For each section, three questions are asked and answered:

- *Do you need to do anything?* (is there really any non-compliance?)
- *If so, what is the least you can do?* (to resolve any non-compliance that genuinely exists)
- *How have others done it?* (what good ways have been found elsewhere to achieve compliance?) Examples of good (and occasionally bad) practice are illustrated.

The examples used are drawn mainly from New South Wales. However, the principles illustrated can be applied throughout Australia.

Many issues affecting heritage places in which building surveyors become involved are not necessarily directly related to the BCA, for example fencing, subdivision and landscaping. The guidelines therefore include also some of the more common issues of this kind, together with suggested procedures.

The reader can follow the assessment process through, or skip to a particular area of interest. Alternatively, the index can be used to find the relevant material.

3. BUILDING REGULATIONS AND THE BUILDING SURVEYOR

The building surveyor's job is to administer the building regulations embodied in the BCA along with other relevant regulations, and in most cases to certify on behalf of Council that the performance requirements have been met. In some parts of Australia this job is also being done by private certifiers.

In relation to heritage issues, building surveyors may have an expanded role when heritage provisions are incorporated in building regulations (such as the demolition provisions of the NSW Local Government Act 1993). This is in addition to their ongoing role in administering the detail of building approvals relating to heritage buildings, and the new role of both building surveyors and private certifiers in dealing with integrated development and building applications.

4. HERITAGE AND THE BUILDING SURVEYOR

4.1 What is heritage?

Heritage in a broad sense means, simply, anything which we have inherited. Heritage as usually understood refers to those things from the past which we value today and wish to pass on to our children. In other words, we need to make judgements today about things which we think will be valued by those who come after us.

Widespread community concern for buildings of the past is a relatively recent phenomenon. Apart from a few isolated organisations such as the Society for the Protection of Ancient Buildings in Britain, the formation of National Trusts and similar bodies has mostly occurred since the Second World War. In Australia, the National Trust was established in NSW in 1947, but it was a private organisation which could only advocate conservation, not enforce it. In 1975, following an inquiry into the National Estate, the Australian Heritage Commission Act was passed which established the Commission and a Register of the National Estate. The Commission still had little power to enforce conservation of heritage items except for those owned by the Commonwealth. The first place to be listed on the Register of the National Estate was Fraser Island. This occurred in 1977, the same year the NSW Heritage Act was passed. This established the Heritage Council of NSW which had power to make conservation orders over heritage items and control what happened to them. Similar legislation had been implemented in Victoria in 1974 and was subsequently passed in Western Australia (1990), the ACT and Northern Territory (1991), South Australia and Queensland (1992) and Tasmania (1993). At the same time, planning laws such as the NSW Environmental Planning and Assessment Act (1979) and the South Australian Planning Act (1982) provided for heritage controls to be incorporated into the local government planning process. A table of legislation controlling heritage in Australia is included as an Appendix to these guidelines.

4.2 Heritage jargon

Like all disciplines, the heritage industry has its jargon or shorthand language for describing what it does. Most of these terms are listed and defined in a charter prepared by Australia ICOMOS (International Council on Monuments and Sites), the Australian branch of a UNESCO organisation for heritage professionals. This document is popularly known as the *Burra Charter*. A few definitions from the Charter will be helpful:

Adaptation means modifying a *place* to suit proposed compatible uses.

Compatible use means a use which involves no change to the culturally significant *fabric*, changes which are substantially reversible, or changes which require a minimal impact.

Conservation means all the processes of looking after a *place* so as to retain its *cultural significance*. It includes *maintenance* and may according to circumstances include *preservation*, *restoration*, *reconstruction* and *adaptation* and will commonly be a combination of more than one of these.

Cultural significance means aesthetic, historic, scientific or social value for past, present or future generations.

Fabric means all the physical material of the *place*.

Maintenance means the continuous protective care of the *fabric*, contents and setting of the *place*, and is to be distinguished from repair. Repair involves *restoration* or *reconstruction* and it should be treated accordingly.

Place means a site, area, building or other work, group of buildings or other works together with associated contents and surrounds.

Preservation means maintaining the *fabric* of a *place* in its existing state and retarding deterioration.

Reconstruction means returning a *place* as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the *fabric*. This is not to be confused with either recreation or conjectural reconstruction which are outside the scope of the Charter.

Restoration means returning the EXISTING *fabric* of a place to a known earlier state by removing accretions or reassembling existing components without the introduction of new material.

Note that **restoration** in the Burra Charter has a much narrower and more precise meaning than is generally used in everyday language.

Where the term **heritage significance** is used in these guidelines, it is meant to encompass all possible kinds of significance being:

- natural significance (including all things not introduced by man)
- cultural significance (including all things affected or introduced by man), which can be aboriginal or non-aboriginal

4.3 How do we decide what is valuable?

To reduce the influence of personal opinion in deciding what is listed as heritage, a method has been developed for assessing heritage places and deciding what is important about them. The method is:

- Find out everything you can about the place
- Compare the place with other similar places
- Assess the *cultural significance* of the place as a whole and the relative significance of its components

This method is (or should be) the basis of every list of heritage items, every statement of heritage impact (or heritage impact assessment) and every conservation plan. Standard criteria for assessing heritage items have been developed to ensure that the assessments are comparable, clear and as objective as possible.

4.4 Heritage conservation in development and building controls

In most cases, heritage issues are dealt with at the development application stage by Council's heritage planner or heritage adviser. However, management of the approval through detailed documentation and construction monitoring usually passes to the building surveyor, and the heritage staff may not be involved. The implementation of their advice is therefore in the hands of the building surveyor.

4.5 What does the building surveyor need to know?

i) Is the building listed?

Does it appear on a statutory list (in NSW, is it listed as a heritage item in a Local Environmental Plan (LEP), Regional Environmental Plan (REP), or listed on a State heritage register?). There are many such lists or registers of heritage place; and one can refer to the Appendix to these guidelines for a table of the various Commonwealth, State and Territory laws governing heritage. Find out if the place is heritage listed from Council's rating information, or consult the heritage planner or adviser for the local Council or State heritage authority. Commonwealth property is bound by the Register of the National Estate which is administered by the Australian Heritage Commission. This Register is also an authoritative (although non-binding) statement on the heritage significance of non-Commonwealth owned property.

If not formally listed, does the building have an advisory listing? The most common of these is a National Trust listing. Other listings include the Register of the Institution of Engineers and the Royal Australian Institute of Architects Register of 20th Century Buildings of Significance. Again, the Council heritage planner or adviser is probably the first source of information. Many buildings which do not find their way on to statutory lists may be included in heritage studies for a local government authority which in many instances precede formal listing.

Even if a building is not yet listed by anyone, this does not necessarily mean that it is not worthy of listing. The process of identification is a continuous one, and at no stage can one say that all places of heritage significance have been identified. Building surveyors need to be alert to the possibility that unlisted buildings may be important, and their significance is often discovered only when they are being opened up for alteration or demolition.

ii) Does the listing include a statement of significance and schedule of elements of significance?

In other words, has the building been professionally assessed by a conservation specialist to identify:

- why it is important?
- what parts of the building are essential to that importance; what parts contribute to that importance; and what parts either make no contribution or detract from that importance?

This information provides essential background to the decisions that building surveyors have to make. In most cases, the significance of a place is explained principally by its fabric, and often the significance of the whole place relies on the sum of its parts. Conversely, where adaptation of heritage items is necessary, any changes to the fabric should occur in the less significant parts. If the information on elements of significance has not been provided, you need to ask for it. If it has, you may need to check that it is correct. Council's heritage planner or adviser can assist.

5. THE BUILDING APPROVAL PROCESS

5.1 The BCA and heritage buildings

The goals of the BCA are worth restating here:

The goals of the BCA are to enable the achievement and maintenance of acceptable standards of structural sufficiency, safety (including safety from fire), health and amenity for the benefit of the community now and into the future.

These goals are applied so that the BCA extends no further than is necessary in the public interest, is cost effective, easily understood, and is not needlessly onerous in its application.

The BCA is now a performance code. It includes objectives, functional statements and performance requirements as the primary regulations. It includes prescriptive requirements only as deemed-to-satisfy provisions. In other words, compliance with the performance criteria can be satisfied by compliance with the prescriptive rules, but can also be satisfied in other ways.

Building surveyors and private certifiers should always be mindful of the discretionary powers that the authorities have to approve non-standard provisions if they meet the objectives of the regulations and are reasonable in the circumstances of each case.

5.2 Why is the building surveyor important?

The building surveyor and private certifier have a primary role in representing Council as the public guardian of the welfare of all building users. Conserving the community's heritage assets can be seen as part of this responsibility.

Successful building conservation needs awareness of heritage issues, good detailing and good building, all being considered by the building surveyor.

The building surveyor makes a major contribution particularly at two main stages

i) Building approval

Building surveyors receive details of structure, access, services and fire protection as part of the approval submission. They have the knowledge to understand the impact of these elements on the fabric of the building, and if armed with background heritage knowledge can comment on the effect of the proposals on the significance of the building. Building surveyors can also suggest other solutions which achieve the performance requirements with less impact.

ii) Construction on site

The building surveyor is usually the person consulted if site conditions are different from those assumed at the time of application, or if client changes are proposed. This is often the stage at which previously negotiated good outcomes are lost. In some cases, unexpected significant early or original fabric can be exposed, requiring a review of the heritage assessment and possibly further research which changes the understanding of the place. In such circumstances there is a great temptation for a builder or owner to avoid the complications that this can cause. The building surveyor equipped with the right knowledge can make a significant contribution to the project on these occasions.

Building surveyors now frequently have an opportunity to contribute to a project at the design stage, either through initial applicant consultation with the local authority, or through involvement of private certifiers or building consultants with the design team. Comments from building surveyors at this stage can be crucial to the outcome.

5.3 The assessment process for existing buildings

A proposed assessment method for existing buildings, suggested in the AUBRCC publication *Guidelines for Achieving Fire Safety When Recycling a Building*, mirrors the assessment method frequently adopted by building surveyors. In brief, the method advocates a progressive check of the existing building and proposal, proceeding from general to particular issues:

- | | |
|---|---|
| 1. Size of building (total floor area, effective height, number of storeys and basements, maximum population, storey heights) | <i>Indicates scale of fire risk, and capacity of building to accommodate proposed uses and number of occupants</i> |
| 2. Class(es) of occupancy | <i>Indicates usage which affects fire risk (likely fire sources, combustible contents, and capacity of occupants to become aware of fire and escape), structural loadings, sanitary facilities etc</i> |
| 3. Structural system (load paths, resistance to earthquakes, load carrying capacity) | <i>Indicates capacity of structure to perform under current and future loads.</i> |
| 4. Number and nature of entrances and exits and paths of travel | <i>Indicates capacity of building to provide safe access, circulation and egress for people with different mobilities</i> |
| 5. Fire and smoke resistance | <i>Type of construction, fire and smoke resistance of all building elements including stair and corridor enclosures. Indicates inherent capacity of building structure and design to perform in event of fire</i> |
| 6. Early fire hazard indices | <i>Materials and finishes. Indicates risk of early fire and smoke spread</i> |
| 7. Areas and volumes of fire compartments | <i>Indicates maximum size of fire to be expected</i> |

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- | | |
|---|---|
| 8. Fire fighting equipment (fire main, hydrants, hose reels, sprinklers) | <i>Indicates potential for containing fire either automatically or by occupants or fire brigade</i> |
| 9. Egress safety equipment (stair pressurisation, emergency lights, exit signs) | <i>Indicates capacity of exits to remain safe for occupants to leave the building</i> |
| 10. Fire warning systems (fire and smoke detection, emergency warning and intercommunication) | <i>Indicates the time within which occupants and fire brigade can become aware of fire</i> |
| 11. Health and amenity (damp-proofing, light, ventilation, sanitary facilities and heating) | <i>Indicates potential for health or amenity risk</i> |

6. HERITAGE ISSUES IN BUILDING CONTROL

The above method has been used as the model for the heritage guidelines below. Under each assessment item listed above, common heritage issues are identified, together with some suggestions for dealing with problems and solutions which have worked elsewhere. Other issues outside the BCA in which building surveyors may become involved are also dealt with in the same way.

Although for clarity each issue is dealt with separately in these guidelines, remember that all buildings must be dealt with as a whole, using a package of interdependent measures which address all the issues together to achieve the performance requirements.

Remember too that although some aspects of a building may fall short of the current performance requirements, other aspects may considerably exceed the requirements. For example, a stout hardwood post may have so much excess loadbearing capacity that it can still carry the required load even after it has been reduced in cross-section by charring in a fire. This surplus performance in some areas can sometimes be “traded off” against shortcomings in other areas. Similarly, providing active means of fire protection such as sprinklers can compensate or be a trade off for deficiencies in passive protection such as unprotected timber floors.

In all heritage work, as the Burra Charter says, conservation is based on respect for the existing fabric. The objective of conservation is not to make something old look new. On the contrary, the existing place should retain its patina of age and the evidence of past uses and wear. Significant fabric must therefore be preserved wherever possible, as its unnecessary removal breaks these tangible links with the past. The golden rule for work to heritage places is “as much as necessary, and as little as possible”, or in other words “if it ain’t broke don’t fix it”!

Assessment item	Heritage issues
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6.1 Size of building

Do you need to do anything?

Many heritage buildings have small floor areas which effectively limit their populations, and greater than normal ceiling heights.

If so, what is the least you need to do?

Assess the size of the building critically with a view to identifying aspects which can be used as a trade-off for other deficiencies, such as greater than normal storey heights which can be helpful for smoke management.

How have others done it?

In Playfair Terrace at the Rocks in Sydney, the limited capacity of the original domestic buildings (now used for retail) meant that the existing narrow and steep stairs (which also included winders) could be retained, although limited to two storeys for public access.

6.2 Class(es) of occupancy



Figure 1. Small guest houses like this are now classified as Class 1b rather than Class 3.

Do you need to do anything?

Heritage buildings are frequently unable to be used for their original purpose. If they are to survive they need to be adapted to ensure economic viability, which often involves upgrading to meet modern standards. You always need to assess the nature of the proposed occupancy and its consequences for the building. In some cases, these consequences for a heritage building (for example, major structural alteration) are so great that the best course is to find another use.

If so, what is the least you need to do?

You need to understand in detail the nature of the proposed occupancy. This may coincide with the BCA classification.

How have others done it?

In the past, small guest houses were classified as Class 3 before Class 1b was introduced into the BCA. Class 1b recognises that small buildings may represent a lower risk. You can apply the same logic to other classes.

6.3 Structural system

- **Generally**

Do you need to do anything?

In most cases, building surveyors will be relying on certification from project structural engineers that buildings meet structural requirements. You need to be aware that many engineers are not experienced in assessing the adequacy of existing buildings and may therefore be over-cautious. If a building has been standing adequately for a century or more, then unless it has deteriorated badly it will continue to perform (other things being equal).



Figure 2. This crack looks serious, but has existed for many years without change and is not affecting structural stability

If so, what is the least you need to do?

If a building is still apparently sound when calculations show that it is unsound, the calculations may well be wrong. If in doubt obtain a second opinion from a heritage engineer, or one experienced in the analysis of existing structures of traditional construction.

How have others done it?

If a building is cracked, the standard approach is to monitor the cracks over time to see whether they are stationary (in which case often no action is required), cyclical (caused by changes in ground moisture in clay soils) or progressive. Cyclical cracking has been treated by stabilising the moisture content of the ground, with no actual work to the building.

- **Load paths**

Do you need to do anything?

Other things being equal, a building will only collapse if it has exhausted all possible ways of standing up. Often the building is carrying its load quite adequately, although not as the designer intended.

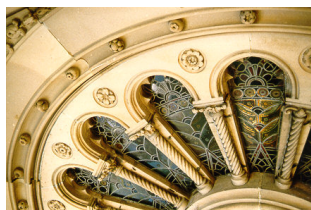


Figure 3. The slipped tracery of the rose window at the Great Synagogue, Sydney

If so, what is the least you need to do?

Analyse the structure carefully with the aid of a suitably experienced structural engineer. Provide bracing or additional support to supplement the existing structure.

How have others done it?

The rose window at the Great Synagogue, Sydney, has settled over the years. A reinforced concrete bracing frame was provided internally as a precaution against further movement.

Assessment item	Heritage issues
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- Earthquake resistance**



Figure 4. This building in Newcastle, supposedly in danger of imminent collapse, took a ball and chain crew nearly all day to demolish.

Do you need to do anything?

If a building has resisted previous earthquakes, it may well have the capacity to resist future ones. The Newcastle earthquake resulted in the needless demolition of many heritage buildings through incorrect assessment. One building was condemned on the basis of cracking which had occurred in a previous earthquake.

If so, what is the least you need to do?

Traditional structures rely mainly on gravity and mass to keep them standing – often their components are not tied together. In many cases, providing connections between walls and floors, and bracing freestanding elements such as parapets and chimneys, will be sufficient for heritage structures up to about four storeys.

How have others done it?

Australian Standard AS3826-1998 shows a number of standard methods of upgrading existing buildings, which can be adapted to suit heritage buildings.

- Load carrying capacity**



Figure 5. Typical warehouse framing of the 19th century

Do you need to do anything?

Many old buildings such as warehouses were designed to carry much greater loads than a proposed change of use may generate. Even where the use is the same, old methods of structural design often led to spare structural capacity. A proper analysis may show that the structure is perfectly adequate for its new use.

If so, what is the least you need to do?

Have an experienced engineer check the capacity of the structure. If it is doubtful, look at the points of inadequacy and strengthen those first. For example, although timber joists may be unable to comply with notional stress grades, they are not necessarily unsafe. Old timbers will be very well seasoned and may be stronger than they look. If the timbers genuinely need strengthening, it is best to leave the existing members and add supplementary members. However, if the structure is seriously overloaded, question whether the proposed use is appropriate in the first place.



Figure 6. Supplementary roof timbers at Glenmore, Mulgoa

Assessment item	Heritage issues
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How have others done it?

At Elizabeth Farm, Parramatta, and Juniper Hall, Paddington, NSW, very old timbers (including structural beams) had been eaten out by termites. Rather than replace the members, the engineers elected to strengthen them using internal steel rods and epoxy.

6.4 Entrances, paths of travel and exits

- Access



Figure 7. 19th century buildings had steps at entrances

Do you need to do anything?

Most heritage buildings are not accessible to people with physical disabilities. It was common to introduce steps at entrances, partly for architectural effect and partly to raise the floor above the damp ground. Hence some compromise is almost always needed. Refer to the Bibliography for useful references on this subject.

The BCA now includes significantly greater requirements in relation to access, in particular the need for *equitable and dignified* access. This follows the introduction of the Commonwealth Disability Discrimination Act and its State counterparts. The implementation of these rules may have a considerable effect on heritage significance, and great care is therefore needed to develop appropriate solutions.



Figure 8. The new entrance ramp at Hyde Park Barracks gives access to the ground floor only

If so, what is the least you need to do?

Identify possible ways of providing the access that the BCA requires. Assess the impact of each way on the significant elements of the building and its significance as a whole. Determine a *reasonable* extent of compromise which will achieve as much equitable access as possible without undue loss of significance.

In some cases full equity of access may not be achievable, although full access can usually be provided with minimal impact on significance, using mechanical devices such as wheelchair lifts.

Assessment item	Heritage issues
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How have others done it?

At Duntroon, ACT, steps at doors from a stone flagged verandah were eliminated by swaling the verandah surface up to form ramps. At the Sydney Customs House, a new entrance ramp was introduced over the existing steps and lobby which were left intact underneath. At the Sydney GPO, a new principal entrance was introduced on the western side of the building.

• **Number of exits**

Do you need to do anything?

Check that the number of exits is at least sufficient for the expected population. Many heritage buildings have more exits than required which can be a trade-off for other deficiencies.



Figure 9. New stair at Hyde Park Barracks

If so, what is the least you need to do?

Can another exit be provided without undue loss of significance? If not, can the deficiency in the number of exits be compensated for in other ways (such as an improved detection and alarm system or minimising numbers of people using the building)?

How have others done it?

Hyde Park Barracks, Sydney is a long three storey building with a single stair towards one end. A new stair was introduced at the other end, and unobtrusive full-height doors with hold-open devices were provided in the central corridor to smoke isolate both stairs.

• **Fire-isolated exits or external stairs**

Do you need to do anything?

Assess the risks to the existing exits.



Figure 10. Glass smoke doors at the Carrington Hotel are held open on magnetic catches and close automatically if smoke is detected

If so, what is the least you need to do?

Often smoke isolation is all that is needed if populations are small and receive early warning. Consider whether the isolation can be provided by enlarging the protected compartment. Also consider whether active fire protection (sprinklers etc) can achieve sufficient isolation with less adverse impact on significance, for example by using fire-resistant glass or drenchers to glazed partitions.

Alternatively, adding another stair, possibly externally at the rear, may have less impact on significance than enclosing an important original internal stair, for example in a rural hotel.

Assessment item	Heritage issues
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How have others done it?

The Carrington Hotel at Katoomba, NSW relied on a mix of new fire isolated stairs (taking out a bedroom on each floor) and smoke isolation of existing stairs, coupled with sprinklers.

• **Exit travel distances and configuration**

Do you need to do anything?

Assess risks associated with the exit paths. If the degree of non-compliance is slight [for example, a travel distance of 21m rather than 20m] consider whether any action is really needed.

If so, what is the least you need to do?

Consider whether active systems such as a better than normal early warning system can compensate for physical deficiencies.

How have others done it?

In the CML Building in Hunter Street, Sydney, the Fire Access and Services Advisory Panel of the Heritage Council of NSW recommended approval of stairs with interconnected rising and descending flights, because the stair configuration and visual cues such as changes in floor finish were enough to promote safe egress.

• **Dimensions of exits and paths of travel**

Do you need to do anything?

Research shows that, although in theory a commonly required 1m stair can accommodate two people side by side, in practice people still move down in single file. Existing stairs, even 0.7m wide, may be perfectly adequate for an emergency. Existing winders in traditional stairs can often be tolerated especially in small buildings, and particularly if the occupants are familiar with the building.

How have others done it?

In most Inter-War residential flat buildings, the service stairs although very narrow have usually been considered adequately wide for egress.



Figure 11. Existing service stairs in an Inter-War block of flats, Potts Point, Sydney

6.5 Fire and smoke resistance

- Fire resisting construction**

Figure 12. Early methods of fire-resistant floor construction recorded by John Sulman

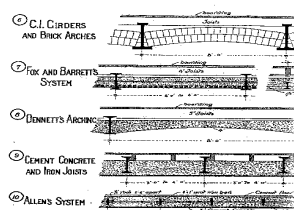
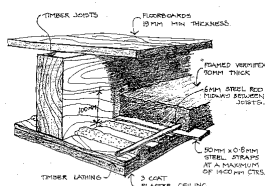


Figure 13. Upgrading traditional floor-ceiling construction



Do you need to do anything?

Assess the fire resistance of the existing construction in the light of the building's configuration and proposed use. Many heritage buildings have walls of more than adequate fire resistance. Some buildings, especially commercial buildings, were designed with early methods of fire resistant construction which still provide useful protection.

If so, what is the least you need to do?

Consider whether active systems such as sprinklers can compensate for deficiencies. Alternatively, consider whether active protection can be provided in a way which does not impact adversely on fabric or significance.

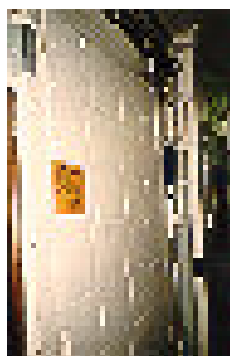
How have others done it?

A method of upgrading lath-and-plaster ceilings using vermiculite within the floor cavity has been tested by the NSW Heritage Council's Fire Advisory Panel, which can enable traditional construction to remain in place and still provide a 1 hour rating.

- Smoke hazard management**

Do you need to do anything?

Keeping smoke out of the egress paths forms the basis of the fire safety solution in most heritage buildings. Conditions in exit paths may remain tenable for an acceptable time in a heritage building, because traditional buildings often have much higher ceilings than modern ones.



If so, what is the least you need to do?

In older smaller buildings, smoke management may involve as little as smoke seals on upgraded doors, coupled with a good smoke alarm system (see below). In larger buildings, stair pressurisation or controlled mechanical ventilation may be appropriate, although very careful design is needed because of the size of the necessary equipment and its potentially severe impact on significant fabric.

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Figure 14. Existing original sliding fire doors have been given new control mechanisms to allow them to remain as part of the fire safety system

How have others done it?

A large 1929 department store in Sydney is about to be equipped with a complex automated system controlling the mechanical ventilation and door systems.

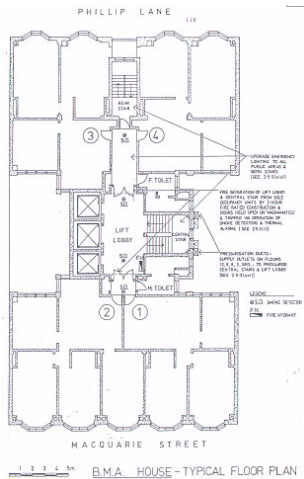


Figure 15. Typical floor plan of BMA House, showing principles of the fire safety system

At BMA House in Sydney, the principal stair opened directly onto the lift lobby, and separating it would have required an intrusive enclosure protruding into this significant space. The fire safety system involved fire separating the whole lift lobby using doors held open on magnetic catches and released by the smoke alarm system, and pressurising the combined stair and lobby using ducts in the light wells.

6.6 Early fire hazard indices

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Figure 16. These 1830s cedar joinery elements survived a fire with protection from their original shellac covering.

Do you need to do anything?

Old finishes are often highly significant, and rarely present a real fire hazard. Some old finishes such as shellac have actually been found to give some protection to timber in a fire.

If so, what is the least you need to do?

Consider whether active systems such as sprinklers can compensate for deficiencies.

6.7 Areas and volumes of fire compartments

- **Compartmentation and separation**

Do you need to do anything?

Most heritage buildings are comparatively small. Larger buildings such as old warehouses can usually be divided at logical places. The main problems generally arise from weaknesses in the ability of some elements such as timber floors to enclose the fire compartments or prevent the passage of smoke.

If so, what is the least you need to do?

Consider whether active systems such as sprinklers can compensate for deficiencies. Alternatively, for example in old warehouse buildings, consider the use of floor toppings of concrete or magnesite in a reversible manner, which can also facilitate new uses while allowing the original timber floor construction to remain in situ and visible from underneath.



Figure 17. A discreet sprinkler head at Juniper Hall

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How have others done it?

At Juniper Hall in Paddington, NSW, a sprinkler system was introduced to allow the retention of the original timber floors, 6 panelled doors, and ceilings in a three storey building with a caretaker's flat on the top floor.

- **Protection of openings**

Do you need to do anything?

Original doors, windows and hardware are vital to the character of most heritage buildings. However, they are often the weak points in an otherwise acceptable smoke or fire compartment. Assess the risk if the opening is not protected.

If so, what is the least you need to do?

Consider whether active systems such as sprinklers can compensate for deficiencies or whether tenable conditions can be attained for safe egress without affecting the significant fabric. Smoke seals can often be fitted to door edges.

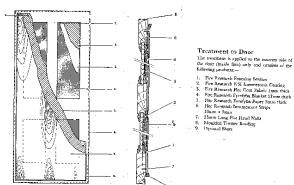


Figure 18. Construction of the upgraded timber panelled door

How have others done it?

The NSW Heritage Council's Fire, Access and Services Advisory Panel has developed a method of upgrading a timber panelled door from the room side to achieve approximately 30 minutes fire rating. This allows corridors in buildings such as old hotels or apartment blocks to retain the original corridor appearance.

In the Customs House Hotel in Sydney, Council wanted entrance doors to the main bar (which also served as final exit doors) rehung to open outwards, which would have adversely affected their original external appearance. After negotiation, the doors were allowed to remain opening inward provided they were fixed open during opening hours.

6.8 Fire fighting equipment

- **Generally**

Fire fighting equipment has a potentially major impact on significance; for example, upgrading the water supply may involve a large tank at roof level. Hydrants, hose reels and sprinklers may require rooms for valves and booster pumps. However, these services, if carefully designed and installed, can also avoid damage or removal of significant fabric.

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• **Hydrants**

Do you need to do anything?

In residential buildings, the fire brigade is often reluctant to use hydrants because of the large amount of water damage that can result. If the building has good external access, consider asking the brigade to agree to a concession, especially if there are sprinklers installed.

Sometimes, the building already has a hydrant system installed complete with hoses. Early fire safety systems can be part of the significant fabric of the building.

If so, what is the least you need to do?

Consider whether external hydrants are sufficient. If not, try to locate the main riser, outlets and associated equipment where they will do least damage to significant fabric. For example, locate penetrations in areas with plain ceilings rather than where there are decorative ceilings. If there is an existing early hydrant system, try to leave existing equipment in place while adapting it so that the Fire Brigade can still use it. Make use of existing voids in a building rather than creating new penetrations. If there is a reliable water supply, consider if a grade 2 supply would suffice instead of grade 1.

How have others done it?

In a block of units at Potts Point, NSW, the hydrant riser was brought through the void in the centre of the fire stair, with branches at each level to the adjacent corridors, to avoid unsightly pipework and penetrations in the lobbies.

• **Hose reels**

Do you need to do anything?

Given that fire extinguishers have become much easier to use, and that trained staff can now be used as part of the fire safety system, consider whether hand-held extinguishers would not be sufficient, especially in buildings with permanent staff such as hotels or shops.

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Figure 19. Exposed hose reels in the Argyle Centre, Sydney

If so, what is the least you need to do?

Select locations for hose reels and associated equipment which will have minimal impact on significant fabric and appearance. In many places, especially in former warehouses or industrial buildings, exposing the hose reels may be more discreet than concealing them in cabinets.

How have others done it?

At the Argyle Centre in Sydney, hose reels were left exposed, blending in to the industrial character of the original building.

• **Sprinklers**

Do you need to do anything?

Sprinklers are commonly accepted as providing an alternative to passive (structural) fire upgrading such as fire-rated ceilings. Although sprinklers are now regarded as acceptable even where valuable contents are susceptible to water damage, in some buildings installing sprinklers causes more damage to significant building fabric than passive protection.

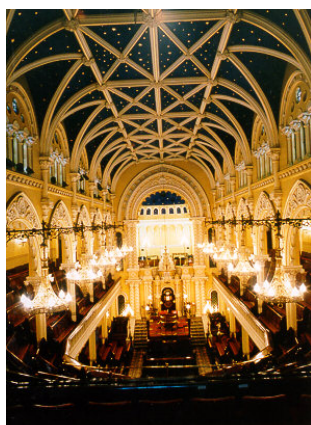


Figure 20. Unobtrusive sprinkler heads in an ornate ceiling

If so, what is the least you need to do?

Consider using a residential sprinkler system which needs less associated equipment and water supply. Other options include copper to reduce pipe sizes in critical areas, and side wall or flush mounted sprinkler heads. Run concealed piping within existing building cavities wherever possible, and locate sprinkler heads to follow the pattern of ornate ceilings.

As with hydrants, consider if a grade 2 supply will suffice.

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Figure 21. Sprinkler pipes were concealed within the floor space of this traditional building during repairs to joists and floorboards, allowing other fabric to remain undisturbed.

How have others done it?

In Sydney's Queen Victoria Building, sprinklers were installed underneath trachyte stairs using copper pipe and side-throw heads. In Sydney's Government House, sprinkler heads have been "concealed" by locating them within the pattern of ornate ceilings.

6.9 Egress safety equipment

- **Stair pressurisation**

Do you need to do anything?

In most heritage buildings, the size of equipment required to pressurise stairs is potentially very damaging to significance. As an alternative, consider smoke seals.

If so, what is the least you need to do?

The system will need careful design to minimise the size of compartment to be pressurised and thus the equipment required to do it.

How have others done it?

In the former Mark Foys building (now the Downing Centre), Sydney, generously proportioned fire stairs were pressurised using a duct through the stair void, to avoid having to replace significant metal windows. In BMA House, the pressurisation system was installed in the light wells (see above).

- **Emergency lights**

Do you need to do anything?

Emergency lighting is usually one of the easiest services to install without undue damage to significant fabric. Nevertheless, as with all services, the number of lights needs to be minimised.

If so, what is the least you need to do?

Emergency lights should preferably be integrated with existing lighting; alternatively, use unobtrusive new fittings. Ensure that cabling is laid out and installed to cause minimal damage.

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Figure 22. Existing light fittings in Sydney Town Hall also serve as emergency lights.

How have others done it?

In Sydney Town Hall, existing light fittings were adapted to function as emergency lights.

- **Exit signs**

Do you need to do anything?

Most buildings need exit signs in some locations. However, where the paths of travel are straightforward and direct to the outside, consider whether exit signs need be installed at all.



Figure 23. Typical exit sign in the Queen Victoria building.

If so, what is the least you need to do?

It is common to use exit signs as part of the emergency lighting system, resulting in a sign that is larger and brighter than may be necessary. In residential or other buildings, consider using (or retaining) signs painted on exit doors in lettering appropriate to the style of the building. In many cases, a specially designed illuminated sign may be warranted to avoid the unsightly visual impact.

How have others done it?

Exit signs in the Queen Victoria Building in Sydney were specially designed and made to minimise their visual impact.

6.10 Fire warning systems

- **General**

Generally these services are an important and effective life safety provision needing little substantial intervention in the significant fabric of a building. In some instances however the physical impact of hard wired systems and the aesthetic impact of standard fittings is an issue that needs to be carefully addressed upon implementation.

- **Fire and smoke detection**

Do you need to do anything?

Consider whether the size and use of the building make a detection system necessary at all. If so, it may be possible to implement management practices which avoid the need to install a full AS1670 system.

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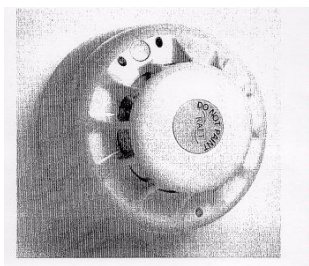


Figure 24. Recently accredited wireless smoke detectors can be very effective with minimal physical intervention

If so, what is the least you need to do?

Assess the use and likely fire hazard of each space within the building to determine the type and location of smoke and fire detection devices. Reducing the extent of hard wired detection systems will minimise intervention in the fabric, as will installing wiring in existing voids (crevices, redundant conduit, pipes or cavities in the floor structure)

How have others done it?

Alternatives to conventional detectors include the VESDA system, and the recently approved wireless smoke detection systems which have been installed in multi-storey residential apartment blocks.

- **Emergency warning and inter-communication system (EWIS)**

Do you need to do anything?

Consider whether management practices (such as a fire warden system) together with the necessary alarms associated with the fire detection and protection systems are sufficient not to warrant the installation of EWIS.

If so, what is the least you need to do?

Like fire and smoke detection systems, EWIS should be reticulated in available crevices, redundant pipes, conduits and cavities within the building structure. Discreet standard or purpose designed concealed speaker systems will minimise impact on aesthetic significance.

<h2>6.11 Health and amenity</h2>

- **Generally**

While fire safety measures are provided for events which happen rarely if at all, heritage buildings need adequate health and amenity provisions for everyday use. As with fire safety, many heritage buildings already incorporate reasonable provision for these requirements, and any additional measures need to be carefully designed for specific cases.

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- **Sanitary and cooking facilities**

Do you need to do anything?

Many old buildings had no internal lavatories or kitchens, and no proper bathrooms at all. Heritage buildings now commonly require these facilities to be able to continue in use. Consider whether adequate facilities can be provided within the heritage building, or whether a new addition or separate building may be preferable. If the facilities already exist and have worked satisfactorily in the past, they may well continue to perform adequately and even cope with a small increase in demand. Sometimes more diligent or frequent maintenance can be used to keep the existing installation going rather than replace it.



Figure 25. A modern kitchen was installed in this 1830s house. Note that original walls have been carefully covered by laminated sheet which allows for easily cleaned surfaces, but can be reversible such that intervention to original fabric is minimal

The normal requirements throughout Australia for achieving health standards in kitchens can be very damaging to the significance of the place. For example, commercial kitchens often require large ventilation ducts which can impact on both appearance and fabric, or impervious materials which may cause substantial and irreversible damage to significant fabric. Assess the significance of building fabric in the space proposed for the kitchen area, and the kind of food preparation processes proposed there. Consider the objectives of relevant health standards and whether the selected space can be used without the need to do anything which will interfere with fabric. Critically assess the real need for:

- impervious materials
- coved skirtings
- fully washable surfaces
- removing joinery elements to prevent grease and dirt accumulating
- floor wastes
- grease arrestors
- mechanical ventilation

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Figure 26. Original joinery, linings, architraves and skirtings have been preserved in adapting this space for a kitchen. New floor covering has been fitted to allow easy cleaning yet original floor boards remain intact



Figure 27. This services stack, housing essential services (under construction), is located in a former air shaft and light well area which was infilled during the mid 20th century

If so, what is the least you can do?

Rather than enforce all prescriptive requirements of health codes, consider alternatives which may achieve the same objective but with less impact on significant fabric:

Impervious walls and floors

On walls, sealing junctions of the walls and floors with sills, linings, architraves and skirtings can be an acceptable alternative to removing all such joinery. Gloss paint on a reasonably dense plaster or masonry wall may be acceptable in lieu of tiling. Over more delicate surfaces a timber framed and tiled false wall may be the only solution. On timber floors, sheet vinyl or linoleum may be an appropriate and less damaging substitute for tiles. Alternatively, if a floor waste is required an impervious membrane can be laid over a timber floor, followed by a weak reinforced cement base laid to falls, and finally tiles or sheet.

Service pipes and penetrations

Existing pipes should continue to be used for as long as possible. Any new pipes should be taken through existing holes in the fabric, or located in areas of low significance. If floor wastes and traps are needed, shallow traps can be used with pipes running in the direction of joists to minimise cutting. Alternatively, if the space and ceiling below are of low significance, drainage pipes may be exposed or enclosed in a bulkhead. Water supply pipes can be surface mounted, or concealed behind a tiled false wall.

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Figure 28. This under-ground grease arrestor was installed next to the Hyde Park Barracks café with minimal intervention to significant interior fabric or archaeological deposits

Grease arrestors

If there is an existing grease arrestor which is technically inadequate for the new use, consider alternatives to replacing it such as limiting the number of patrons or requiring more frequent maintenance. If a new grease trap is unavoidable, it should be located in an area of relative minor significance. Other mechanical means such as pumping can also be used to minimise the need to interfere with significant fabric.

If an external or subterranean grease arrestor is required, it should be located away from areas of potential archaeological sensitivity so that the excavation will not damage evidence of former use of the place below the ground surface.

- **Drainage services**

The introduction or upgrading of sewer and stormwater drainage in existing heritage places can potentially have a substantial impact on significance. Strict compliance with modern regulations may require additional services to be provided; for example, many authorities now require that stormwater retention tanks be installed in new developments which may impact on landscape features or archaeological relics.

Do you need to do anything?

If the systems are working reasonably well at the moment, there may be no need for any change. A typical example is a stormwater gully in a small inner city yard which discharges into the sewer system. If the amount of water involved is small there may be no justification to disturb the fabric for the installation of a new stormwater drain.

If so, what is the least you need to do?

If replacement of services is unavoidable, reuse existing penetrations, or alternatively rationalise services stacks in coordinated positions, to minimise intervention to fabric.

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Where underground services lines are to be installed or replaced, be mindful of archaeologically sensitive areas and any statutory requirements (for example, excavation permits under the NSW Heritage Act). Rationalise the services lines to minimise the number of trenches required. On sites of known or predicted archaeological sensitivity it may be necessary for excavations to be monitored by an archaeologist.

- **Damp-proofing**

Ways of protecting a building against moisture from outside have varied widely throughout Australia's history. It is important to be aware of the traditional methods and work with them rather than against them. Implementing modern day requirements strictly to old buildings can do substantial damage to significant fabric, and using the wrong modern treatment may make the damp problems worse. Also remember that even after the cause of the damp problem has been correctly diagnosed and treated, the damp may persist for some time afterwards until the fabric has dried out.



Figure 29. Damp proof course installation should only be considered after exploring all other possible causes of rising damp. This example of a chemically injected dampcourse is used to illustrate the technique rather than the unacceptable manner of patch repair

Do you need to do anything?

Firstly, explore all possible causes of the damp problem. Often it is simply excessive water, caused by faulty gutters, broken downpipes or drains; drains blocked by tree roots, or a change in overland or subsurface flow caused by later development within the vicinity. Other possibilities include well-watered garden beds next to walls, build up of surrounding earth against walls; or construction of concrete or other impervious paths against old buildings.

If so, what is the least you need to do?

The first step is to eliminate the excess water. In many cases correct management of subsoil and surface water will solve the problem without any need for additional measures.

If additional treatment is needed, start with the simple and cheap remedies before embarking on the more expensive ones. One possible measure is additional subfloor vents to increase subfloor ventilation, although this may have a considerable adverse impact on both appearance and fabric.

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As a last resort against rising damp, installation of a damp proof course may be necessary. Some methods of installing damp proof courses (such as chemical injection techniques).do less damage to buildings than others. Applying cement render hardly ever solves rising damp problems; in fact it usually makes them worse. A better solution is a weak lime based render which decays preferentially as it draws the salts out of the masonry.

• **Natural light**

Modern day technology and lifestyles have resulted in new buildings having larger areas of glass than old ones. Many old buildings have less natural light than current codes require. Increasing window or glazing sizes can have substantial effects on the significance of a place. In most instances large expanses of uninterrupted glass are not appropriate to buildings of heritage significance.



Figure 30. Sensitive design in traditional materials and details allows this porch opening to be enclosed and for more flexible use of the space internally.

Do you need to do anything?

Many places of heritage significance will have acceptable levels of natural light within them. If view rather than light is the real issue, consider whether a verandah can be adapted instead of introducing larger windows.

If so, what is the least you need to do?

Explore the possibility of adjusting spatial planning of the building so as not to make substantial changes to fabric or appearance yet still achieve acceptable views. In some instances it may be acceptable to install roof lights within the existing roof plane to improve natural light. As a last resort, if new windows have to be inserted, they should have traditional proportions and detailing.

• **Ventilation and thermal comfort**

Ventilation, thermal design and heating methods for traditional buildings have evolved over time in response to Australia's varied climatic conditions. The range of responses to those conditions varies from the traditional elevated timber framed "Queensland House" in northern areas, to the thermally massive masonry of Tasmanian buildings in the south.

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Figure 31. Traditional openable transom lights can provide good cross ventilation

Do you need to do anything?

You need to understand how traditional buildings have been designed and constructed to respond to the environment in various areas of Australia. This will provide an insight into whether there is a need to improve the natural ventilation or thermal performance of those buildings, and if so how it can occur with least impact on significant fabric.

If so, what is the least you need to do?

Traditional buildings relied on natural ventilation and many had efficient systems involving devices such as openable transom lights and high wall vents. In many instances simply repairing or reinstating the original method of operation will restore effective ventilation. Generally, air conditioning in old buildings is neither necessary nor appropriate.

Internal bathrooms and commercial kitchens need mechanical ventilation which often requires large ducts. These can potentially do great harm to significant fabric. In the case of kitchens, consider whether the kind of food preparation proposed really warrants mechanical ventilation, and if so whether the duct can be located where it will have minimal heritage impact.



Figure 32. Original elements of this fireplace, in particular the marble pieces incorporated into the reconstructed chimney piece were found behind the covered fireplace opening during conservation of the house.

Traditional fireplaces and chimneys often produce better heating than modern appliances. The move to replace fireplaces with modern gas or electric systems is often excused by a reported lack of replacements for missing parts. However, in most instances the parts can be sourced, and indeed will sometimes be found concealed on site behind the flap opening (if the fireplace has a fitted register grate).

The capabilities of fireplaces to draw smoke can be affected by modern intervention such as capping the chimney flue, installing inappropriate chimney pots or simply failing to clean and maintain the flue. Tradesmen still exist who can rectify these problems to enable the chimney and fireplace to operate effectively.

6.12 Fences

Fences can play an important role in the historic and aesthetic significance of heritage places, one which can easily be overlooked in assessing proposed works to them. Retaining original fence alignments helps to delineate historical boundaries, and contributes to the setting of a heritage building.



Figure 33. While the base of this significant picket fence needs repair, epoxy patching and painting of existing fabric can be used to preserve most of the significant elements without need for replacement.

Do you need to do anything?

Wherever possible historical fence lines should be preserved. Fences should generally be maintained in their existing positions, unless this has a detrimental effect on the significance of a place.

If so, what is the least you need to do?

Only those parts of a fence which are rotten or damaged need to be replaced, not the whole fence. Keeping the sound parts of the fence achieves conservation objectives and may also be cheaper. However, it is important to repair using the same jointing, fixing, profiles and materials as the original fences. In some cases, supplementary propping can be used to avoid replacing major elements.

6.13 Subdivision

The subdivision pattern of a place can tell us a lot about its historical development and the events which have affected it. Tangible, physical links between significant elements of a place can be lost by subdividing it, affecting our ability to understand and interpret the original arrangement. Outbuildings, wells, gardens, trees, orchards, access ways, fence lines, archaeological relics, garbage deposits and other elements of the cultural and natural landscape can have important links to the evolution of that place.

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Figure 34. This house and outbuildings at the rear formed part of an original chicken farm. Subsequent subdivision and development of residential flats placed pressure on redevelopment of this site. Incentives to an adjoining residential development resulted in the total conservation of the whole site including its remaining lot boundaries and rear out buildings and former fowl houses.

Do you need to do anything?

Assess whether the subdivision pattern being proposed will have an impact on significant elements, and whether there are any elements on the area to be subdivided from a place which may have substantial links to the significance of the place.

If so, what is the least you need to do?

Explore alternatives for altering the proposed subdivision boundaries to allow for those links to be preserved and maintained. Investigate possible incentives to encourage either adjustment of the subdivision boundaries or avoiding subdivision altogether. Such incentives could include amended provisions for setbacks, height limits, densities, land use, access, car parking, or financial contributions. The objective is to achieve more acceptable outcomes for the site from a conservation point of view while also satisfying the applicant's desire to develop it.

6.14 Driveways and pathways



Figures 35 and 36. Historical research and selective excavation uncovered this important remnant of a significant section of paving (above) from which the pathway alignment and design was reconstructed (below)



Introduction of new driveways or pathways can have a substantial impact on the interpretation of a place by removing or concealing the historical alignments of previous driveways and pathways.

Do you need to do anything?

If the original layout of paths and driveways survives, assess whether there is any good reason to change it. Deteriorated finishes can be patched or repaired, and undesirable finishes can often be adapted.

If so, what is the least you need to do?

Investigate the original locations of pathways, garden beds and driveways within a place. If these have changed, good evidence of them may still be available. In general, at least the alignment of traditional, historical driveways and pathways should be maintained.

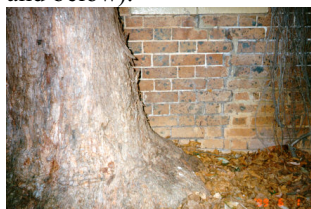
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It is preferable for the original surface, edging, drainage and planting to be preserved or reconstructed as well. If there is deterioration of the original (for example from tree roots or soil subsidence) investigate the causes and rectify them first. Changes from existing or significant alignments may involve disturbance of potential archaeological deposits or former garden planting. These should be assessed and managed, preferably in consultation with experienced practitioners.

6.15 Trees and gardens



Figures 37 and 38. Whether purpose planted or self-sown, this tree is obviously causing damage to the adjoining building (above and below).



The traditional landscaped setting of a place can be fundamental to its significance. As much damage can be done by inappropriate new plantings as by removal of original plants and trees.

Do you need to do anything?

Assess critically the arguments advanced for the removal of significant landscape elements. Typically these include damage to nearby buildings, roads or drains, or risks to buildings or public safety from falling trees or branches. Seek advice from specialist practitioners including experienced engineers, landscape architects, arborists or botanists. Proper advice on the structural stability, age, or condition of landscape elements may help avoid wrong decisions to remove or replace significant plantings.

If so, what is the least you need to do?

The need to remove trees or gardens often arises from their effect on existing buildings, or their location in relation to proposed new buildings or other elements such as driveways.

Consult specialists with a view to determining the minimum work necessary to control the effects of trees or reduce adverse impact to significant gardens. Trimming or pruning of trees or roots is almost always preferable to removal.

6.16 Building services and plant location

Arguably the most damaging impact on the significant fabric of any heritage place (buildings particularly) is the introduction of services to suit modern needs.

Do you need to do anything?

All too often there is a tendency to replace all the existing services even if they are performing adequately, because they are considered old-fashioned. In some cases the services to be replaced have high historic or scientific (technical) significance in themselves. It is always worth considering whether existing services can be maintained in use through appropriate management practices.



Figure 39. Sewage ejector pots are becoming increasingly rare because they are replaced by many people who consider them antiquated. However, the technology remains sound and if in good condition these pots can usually be retained.

If so, what is the least you can do?

Maintaining the existing services in operation and prolonging their life will not achieve all that is required, consider supplementing those services with new services. To avoid compromising the significance of a place, new services should be introduced in the same locations as existing redundant services, and make use of the same penetrations.



Figure 40. Wires can be easily threaded through floor cavities and behind purpose designed skirtings as above.

The location of new plant and equipment is crucial to minimising its potential adverse impact on significance. Services need to be installed in zones of lesser significance, both within the building and underground. Existing building cavities should be used for reticulation wherever possible. It is always worth asking for the services to be marked out on site prior to any cutting or chasing so that the proposed route can be reviewed before any damage is done.



Figure 41. Discreet installation of mechanical plant at roof level

How have others done it?

In a very restricted City building with a small floor area, all mechanical ventilation plant was rationalised and grouped on the rear (and most discreet) side of the roof, keeping its size and height as small as possible and minimising intervention to significant interior fabric and spaces

6.17 Compatibility of materials

Old and new materials do not always go together. Using modern materials and methods incorrectly with traditional construction can cause a great deal of damage to significant fabric, in many cases turning a small problem into a much larger one.

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Do you need to do anything?

If partial replacement of damaged fabric is proposed, assess whether leaving the original fabric in place and repairing it is practicable (it is almost always preferable). Just because a corrugated iron roof is surface rusted does not necessarily mean it needs to be replaced. Rust converters and “cold galvanising” paints combined with a responsible maintenance routine will prolong the life of the original material. In the same way, spalling stone can sometimes be cleaned and rubbed back rather than replaced.



Figure 42. Where incompatible metals are in contact, or water flows from one to another, rapid corrosion may occur. In this example, a copper condensate drain has corroded the galvanised steel tray and been extended in a crude manner with ordinary garden hose.

It is important to understand how traditional building materials and methods work, and how they might react with modern materials. For example, corrugated galvanised iron or steel roofing was originally used in conjunction with lead flashings. The modern equivalent, zincalume steel, is not compatible with lead and the use of the two materials together will lead to rapid corrosion. Zincalume roofing used with galvanised steel gutters also produces corrosion.

If so, what is the least you can do?

As a general rule, repairs to traditional materials are best done using the same materials and techniques as were used originally, especially where the old material is being patched rather than replaced which is generally the preferred method for repair of traditional fabric. The use of modern materials to patch traditional fabric is more often than not an inappropriate means of repair because of the incompatibility of the materials.

<ul style="list-style-type: none"> • Replacement of corrugated iron/steel roofing 	<p>The replacement of old corrugated roofs with modern zincalume or Colorbond steel is widespread. As well as the potential problem of incompatible metals, using the modern material will change the traditional appearance of the roof. New steel sheet roofing is usually fixed in single length sheets from top to bottom, with hexagonal head fixings, whereas the original roof will usually have two or more shorter sheets lapped, and domed slotted screws with lead washers. Also, instead of the traditional soft flashings at abutments, modern roofs tend to have pre-folded sheet flashings.</p>
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Figure 43. Something as simple as roof fixings will have an impact on the significance of a place if not undertaken in a proper, traditional manner. Domed slotted screws with lead washers can still be sourced if the desire is there

The combination of these changes is a loss of correct visual detail which diminishes the significance of the building. It is still possible to repair corrugated iron with corrugated galvanised steel products fixed and flashed in the traditional manner. One other advantage of galvanised steel over zincalume is that it will weather more quickly to reduce glare.

- **Cement mortar and traditional masonry**

Up to the end of the first World War, mortars with a high cement content were not traditionally used, and most masonry was built in lime mortar. Consequently, patching or repointing traditional masonry with cement-rich mortar is inappropriate and can have long lasting, damaging effects on the masonry elements of a building.



Figures 44 and 45. Inappropriate cement-rich repointing and rendering to this stone building (above and below) has probably been done in response to a breakdown in the original lime based mortar. This is a classic example of what not to do. Cement rendering is not the answer to rising damp as it only pushes the damage higher up the wall.

The principle of traditional masonry was that the mortar was weaker than the brick or stone, so that any damage caused by evaporating moisture would occur preferentially in the mortar joints which could readily be repointed. However, where the mortar has a high cement content and is denser than the weaker masonry elements, the moisture (and soluble salts within) cannot escape through the mortar and therefore cause breakdown in the masonry elements, leading to spalling of the brick or stone with the mortar remaining unaffected.



The other problem with cement-rich mortar is its structural strength. Lime mortar allows the masonry to move slightly to adjust to structural movements, for example from foundation movement in clay soils. As a result, if any cracking occurs in the wall it will be slight and will occur in the joints only. However, walls repaired in cement mortar will be unable to adjust in this way, and cracks when they occur will often be more severe and through the bricks as well as the joints.

Assessment item	Heritage issues
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- **Masonry walls and enamel (oil based) paint**



Figure 46. The bubbling of paint shown above is a “balloon” of moisture from the wet masonry surface behind which cannot escape the oil based painted surface

Stone and face brick which were intended to have their original surfaces exposed should not be painted. Some brick walls were however originally painted. If repainting of previously painted masonry surfaces is required, acrylic paints should be used in preference to oil based enamel paint.

The reason is that most traditional walls were built in solid masonry without cavities, and rely on evaporation of moisture from the outside to keep the inside surface dry. Oil based paints, or modern liquid membranes, prevent the wall from “breathing” and may force the moisture to evaporate from the inside face, making the damp problem worse.

- **Ferrous products in traditional masonry**



Figure 47. Poorly prepared and maintained ferrous fixing in this instance has caused breakdown in the masonry reveal. Note the inappropriate patching in hard cement based mortar

Where wrought iron or steel products such as iron palisade fences or security bars on windows are used, they are prone to corrosion unless properly protected or continually maintained. The use of lead sleeving with iron pickets or bars when bedded into masonry assists in sealing the masonry/iron junction and preventing corrosion of the iron. Where precautions such as this are not taken, the iron or steel corrodes in the damp masonry causing eventual deterioration of the stonework or brickwork.

6.18 Properties of traditional materials

Many traditional materials and methods of construction have inherent properties which are not widely understood. As a result, significant elements are needlessly removed from old buildings, or discounted when buildings are being upgraded.

Assessment item	Heritage issues
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Do you need to do anything?

Understand the capability of the existing building and its elements. In many cases, the original fabric will be adequate for its purpose, without any further upgrading for health or safety. Some examples are discussed below.

- **Traditional hardwood framing**



Figure 48. The hardwood framing conserved in this warehouse was previously exposed to fire, with minimal charring of the structural members.

In a number of traditional buildings (particularly warehouses), hardwood framing was used which has high inherent fire resisting capabilities. Indeed, after recent fires in turn-of-the-century Sydney warehouses, hardwood structural elements were found to have performed better than iron or steel. Hardwood structures may therefore need no additional fire protection.

- **Shellac**

Shellac-based products for clear finishes on traditional joinery elements have been found to provide some inherent fire protection to the timber.

- **Terracotta lumber**



Figure 49. Terracotta lumber used as part of a wall.

Terracotta lumber was a lightweight building block used in the late 19th and early 20th century for “fireproof” construction, in lightweight walls and also as protection to beams and floors.

Assessment item	Heritage issues
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- **Wired glass**



Figure 50. Wired glass fire resistant window as shown in the original pane below

The use of wired glass in traditional fire windows was a formerly accepted method of fire resistance. Steel framed fire windows were made with fusible links so that they would close automatically when the link melted, and were used to protect openings in external walls in early to mid 20th century buildings.

- **Tin clad fire doors**

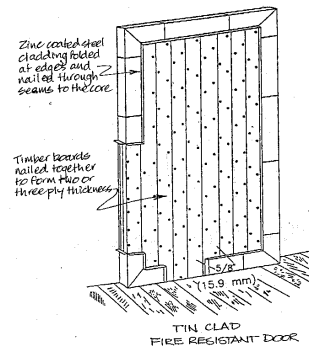


Figure 51. Tin clad fire doors as shown below can achieve acceptable fire resistance

Tin clad fire doors which were prevalent from the early part of the 20th century have been found in practice to have good fire resistance capabilities, although not tested to modern standards.

Assessment item

Heritage issues

- **Sand-lime pugging**



Figure 52. Sand and lime pugging, in this instance between joists, was a common form of sound and thermal insulation

In numerous traditional buildings, sand and lime mixed pugging (usually between joists in timber framed buildings) was used as a sound and thermal insulator. The mass formed by lath and plaster walls on timber framing can also have surprising sound attenuating capabilities.

Although traditional construction elements have usually not been tested to current standards, they can make a contribution to the performance of the whole building. The properties of such elements should not be discounted in the assessment of the total package

6.19 Colour schemes

Inappropriate use of colours on traditional buildings can have substantial effects on the aesthetic significance of a place.

Do you need to do anything?

It is always important to maintain the paintwork of a place in order to ensure the continuing protective care of elements subject to deterioration. It is also important to know what the early colour schemes were, which can be found by carefully scraping away the paint on nominated building elements to reveal the layers underneath. Both the choice of colours, and the placement of those colours on specific elements of a building, affect the success of the colour scheme.

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Figures 53 and 54. These before and after photographs (above and below) show the result of a well considered colour scheme based on scrapes from the building. Note the placement of colours which is critical for a successful scheme.



If so, what is the least you can do?

Provided that the colours selected are from a range available at the appropriate period in time for the building, and are used in the traditional ways and locations, it is not essential to reproduce the original colour scheme. It is important that the correct type of paint is used, and that only surfaces intended for painting are painted.

It may be beneficial for the colour scheme to be determined by a conservation practitioner.

6.20 Materials handling on site

The handling of materials on site requires great care to avoid damage to the heritage item. Small constrained sites and those in heavily built up areas present special difficulties. Damage can be done when significant fabric or elements (including landscape elements) need to be removed or substantially altered in order to move or store materials on site. For example, substantial holes may have to be made in floors and walls of a building in order to move materials from one floor to another.

Do you need to do anything?

Obviously, in any building project materials must be moved on to and around the site. Explore all ways to use existing spaces and services (such as lifts, stairways, disused shafts or voids), and existing openings (or new openings to be made in the finished building) to allow the movement of materials within the site without affecting other elements of significance.

If so, what is the least you can do?

Plan the work thoroughly in consultation with the builder to minimise or preferably eliminate openings required only for construction. Investigate appropriate materials handling machinery.

6.21 Car parking

Car parking can have substantial detrimental effects on the significance of a place, although it can also help a heritage property remain viable.

Do you need to do anything?

Consider whether there needs to be any car parking on site at all, especially if it will have a strong adverse impact on the significance of a place. Council often has discretion to vary its normal parking requirements when dealing with heritage items.

If so what is the least you can do?

Using the assessment of significance, locate areas on the site of higher and lower significance. Factors to consider include aesthetic qualities of the place and its setting, research potential of areas such as original garden beds, pathways or driveways, or historical boundaries or fence lines.



Figure 55. Large expanses of hard surface car parking area can be softened by choosing an appropriate surface material—pea gravel in the above example. The treatment of surfaces near traditional buildings needs careful landscape design.

Having regard to those elements of significance, select the most appropriate place for car parking and determine how it will be provided. For example, vast areas of hard surface car parking in the front garden of a significant building is probably not the most appropriate way to provide parking facilities. For small numbers of vehicles, existing facilities (former garages, stables, coach houses or storage areas in the past) may be able to be adapted for car parking.

6.22 Civil engineering works

The local authority's own civil works, such as new footpaths, road widening, street furniture, and signage, have great potential for both positive and negative impacts on the cultural significance of a place. The significant qualities of traditional streetscapes or townscape or even individual places can be substantially compromised by inappropriate civil works.

Assessment item

Heritage issues



Figure 56. Excavation for footpath works (above) can uncover archaeologically sensitive relics and significant services to adjoining buildings, and needs careful pre-planning.

Do you need to do anything?

Consider whether a comprehensive upgrading or replacement program needs to be undertaken, or whether the existing infrastructure is reasonably intact and requires only patching and repairing. Heritage towns often retain much of their original fabric and need only a carefully directed effort to remove intrusive items, make repairs and coordinate acceptable colour schemes.

If so, what is the least you can do?

Most civil engineering works involve excavation. Investigate whether there are any archaeologically sensitive areas or deposits likely to be exposed or damaged during the works. Proper archaeological assessment before works begin (possibly with an archaeological management plan in place) can avert destruction of significant relics during the course of the works.

Civil engineering works need to be designed and constructed with care for their potential impact upon significant cultural and natural landscapes, the setting of significant places, and traditional subdivision patterns. Materials should be selected with due regard for their setting and historical context, and may involve traditional materials including brick, stone or granite (trachyte) kerb and guttering; concrete, bitumen or masonry flagged paving elements; or garden edging elements.



Figure 57. Well considered, modern design such as the new bus shelter above can sit well in an otherwise traditional townscape.

The design and placement of street furniture including sign posts, garbage bins, street lighting, seating, bus shelters, drinking fountains and bollards should have due regard to the significance of the place in which they are to be installed.

APPENDIX A

Further Reading

Apperly, Richard, Irving, Robert and Reynolds, Peter. A Pictorial Guide to Identifying Australian Architecture. Angus & Robertson 1989.

Australian Heritage Commission. The Heritage of Australia: The Illustrated Register of the National Estate. Macmillan 1981.

Australian Uniform Building Regulations Coordination Council. Guidelines for Achieving Fire Safety When Recycling a Building 1992.

Evans, Ian. Caring for Old Houses. Flannel Flower Press 1988.

Evans, Ian, Lucas, Clive and Stapleton, Ian. Colour Schemes for Old Australian Houses. Flannel Flower Press 1984.

Evans, Ian, Lucas, Clive and Stapleton, Ian. More Colour Schemes for Old Australian Houses. Flannel Flower Press 1992.

Evans, Ian. Restoring Old Houses. Macmillan Sun 2nd edition 1986.

Freeman, Peter and Martin, Eric. Building Conservation in Australia. Royal Australian Institute of Architects 1985.

Heritage Council of NSW and Royal Australian Institute of Architects (NSW Chapter). Infill. NSW Department of Planning 1988.

Logan, David. Fire Safety Provisions in Heritage Buildings. Graduate Project Report for degree of M Built Env (Building Conservation). University of NSW Graduate School of the Built Environment March 1987.

Marquis-Kyle, Peter and Walker, Meredith. The Illustrated Burra Charter. Australia ICOMOS Inc 1992.

Kerr, James Semple. The Conservation Plan. National Trust of Australia (NSW) 4th edition 1996.

Nangle, James. Australian Building Practice. Sydney Technical College 1911.

NSW Department of Planning. Getting the Details Right. Flannel Flower Press 1989.

NSW Department of Urban Affairs and Planning. Fire and Heritage. 1995.

NSW Heritage Office. NSW Heritage Manual 1995.

NSW Heritage Office. Maintaining Heritage Assets: A Guide to Good Practice 1997.

Stapleton, Ian. How to Restore the Old Aussie House. Flannel Flower Press 2nd edition 1991.

Many of the above books contain bibliographies giving further references. In addition, the Heritage Council or its equivalent and National Trust of Australia all publish material on heritage and conservation.

APPENDIX B

Relevant Federal and State Legislation Regarding Heritage Matters

State	Act	Summary of Provisions
Common-wealth	Australian Heritage Commission Act 1975	Established Australian Heritage Commission and Register of the National Estate. Control limited to Commonwealth-owned properties.
	Aboriginal and Torres Strait Islander Heritage Protection Act 1984	Protects Aboriginal cultural heritage in all States and Territories. S21A(1) provides for emergency declarations and temporary or permanent declarations to protect cultural heritage. Minister keeps Register of Declarations. Aboriginal cultural heritage agreements possible.
Queensland	Qld Heritage Act 1992	Heritage Council determines if a place satisfies one or more criteria in Act (S20(4)). Listed in Register with statement of heritage significance. Development application made to Heritage Council or its delegate, Local Council Objections to listing made to panel of assessors who advise Heritage Council. Appeal to Planning Environment Court a) against listing on grounds “not of cultural significance” or does not satisfy criterion b) within 30 days if development application refused by Heritage Council Non-development order for up to 10 years if owner convicted of offence. Minister may make emergency preservation orders Heritage Agreements available.
	Local Government (Planning and Environment) Act 1990	Conservation plans may be made for local areas.
	Cultural Record (Landscapes Qld and Qld Estate) Act 1987	Governor may declare a designated area. Minister keeps Register of Queensland Estate Minister’s authority needed for interference or entry.
	Local Government (Aboriginal Lands) Act 1978	Regulates entry to Aboriginal Lands.

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Australian Capital Territory	Land (Planning and Environment) Act 1991 Part III – Heritage	Heritage Council assesses according to criteria in Schedule 2. Listed in Heritage Places Register. Applications for approvals for development to Minister. Heritage Council comments on applications. On Councils advice, Minister may refuse to grant application. Objections go to Land and Planning Appeals Board. Decisions of Appeals Board may be referred on question of law only to Supreme Court. Minister may apply to Supreme Court for injunction to stop controlled activities. Div 2 of Act requires Aboriginal heritage places to be specified as such in Heritage Places Register. Notification of places of significance to Aboriginal people.
	Heritage Objects Act 1991	Similar provisions as above but for objects rather than places or land.
New South Wales	Heritage Act 1977	Minister makes interim heritage orders on advice of Heritage Council. Establishment of State Heritage Register of items of State significance. Application for development must be made to Heritage Council. S170 requires a list of State Government-owned or controlled heritage items to be prepared and maintained. S136 Minister or Chairman of Heritage Council may make emergency orders to control demolition without advice of Heritage Council.
	Environmental and Planning and Assessment Act 1979	Local Councils assess places in area. Lists in Local Environment Plans (LEPs) and Regional Environment Plans (REPs). Development proposals referred to specifications in LEPs and REPs. If a place is also on State Heritage Register development proposals go to Heritage Council..
	Historic Houses Act 1980	Provides for Historic Houses Trust and management of particular historic houses and museums.

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	National Parks and Wildlife Act 1974	Minister declares place, relic for purposes of Act (particularly relevant to Aboriginal heritage). Director of National Parks and Wildlife responsible for care, preservation and restoration exhibition of relics. Director must produce plans of management Conservation Agreements possible.
Victoria	Heritage Act 1995	
	Planning and Environment Act 1987	Local Councils include heritage places in planning schemes if not on register and regulate accordingly Appeals to Heritage Council, Minister has final discretion.
	Victorian Conservation Trust Act 1972	
Western Australia	Heritage of Western Australia 1990	Heritage Council advises Minister on places meeting criteria set out in Act (S47). Minister lists places on Register of Heritage Places. Development applications referred to Heritage Council for its advice. Conservation Orders available whether place on Register or not. Appeal to Town and Planning Appeal Tribunal S62 provides for restoration orders if demolition without approval.

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	Local Government Act 1960, Town Planning and Development Act 1928, Metropolitan Region Town Planning Scheme Act 1959, Strata Titles Act 1985	All provide for development applications for registered places to be referred to the Heritage Council.
	Aboriginal Heritage Act 1972	Aboriginal sites must be referred to Trustee or Police Officer. Trustee recommends to Minister if site of outstanding significance. Trustee may recommend to Minister for declaration as protected area. Land use with Minister's consent. Act administered by Aboriginal Cultural Material Committee.
	Conservation and Land Management Act 1984	Administered by Land and Forests Commission and National Park and National Conservation Authority. Sets up Department of Conservation and Land Management.
	Environment Protection Act 1986	
South Australia	South Australia Heritage Act 1992	State Heritage Authority assesses heritage places according to criteria set out in Act. Listed on Register, subject to removal by Minister; interim listing possible. Authority may make emergency orders prohibiting actions destroying or reducing heritage values of a heritage place. Act provides for restoration orders and non-development orders for up to ten years. Schedule 2 provides for Aboriginal Heritage Agreements.
	South Australian Development Act 1993	
	National Trust of South Australia Act 1955	

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	Aboriginal Heritage Protection Act 1994	Private owners report discovery of place/item to Minister. Minister may direct preservation, or prohibit or restrict use. S3 traditionally secret information may not be divulged. Administered by Aboriginal Heritage Committee.
	South Australia Planning Act 1982	No development of heritage item or place without consent of planning Authority. Aboriginal sites must be referred to Minister responsible for Aboriginal Heritage Act.
Northern Territory	Heritage Conservation Act 1991	Heritage Advisory Council advises Minister on places meeting criteria prepared in accordance with Act Listed on Register. Register must note if place is Aboriginal sacred site. Council includes one nominee of Aboriginal Areas Protection Authority. Development consent of Minister or delegate. Appeal on question of law to Local Court. Council may obtain interim conservation orders from Minister or Territory Council. Council may prepare conservation management plan . Heritage Agreements may be entered into (S37).
	Aboriginal Sacred Sites Act 1989	Custodian of sacred sites may apply to Aboriginal Areas Protection Authority. Listed in Register of Sacred Sites – deemed to be registered once application made.
	National Parks and Wildlife Conservation Act 1974 (Cth)	Commonwealth legislation which applies to Uluru-Kata Tjuta and to Kakadu National Park. Plans of management for sites/areas of significance to Aboriginals.
	Conservation Commission Act Environment Assessment Act	
Tasmania	Local Government (Building and Miscellaneous Provisions) Act 1993 Part 8	National Trust recommends preservation orders to Local Council. Listed by Recorder of Tiles under Land Titles Act 1980 or Registration of Deeds Act 1935.

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	<p>Port Arthur Historic Site Management Act 1986, Theatre Royal Management Act 1986, Tasmanian Development Act 1983, National Trust of Australia (Tasmania) Act 1975</p>	<p>Specific management provisions.</p>
	<p>Aboriginals Relics Act 1975</p>	<p>Applies to relics on land where they are situated. Director of National Parks and Wildlife recommends to Minister for declaration as protected site. Director manages and maintains. Does not apply to any object after 1876. Aboriginal Relics Advisory Council advises Minister and Director.</p>

The above appendix is based on research contained in draft document as part of stage 1 guidelines for building surveyors undertaken for Australia ICOMOS and the Australian Heritage Commission.

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