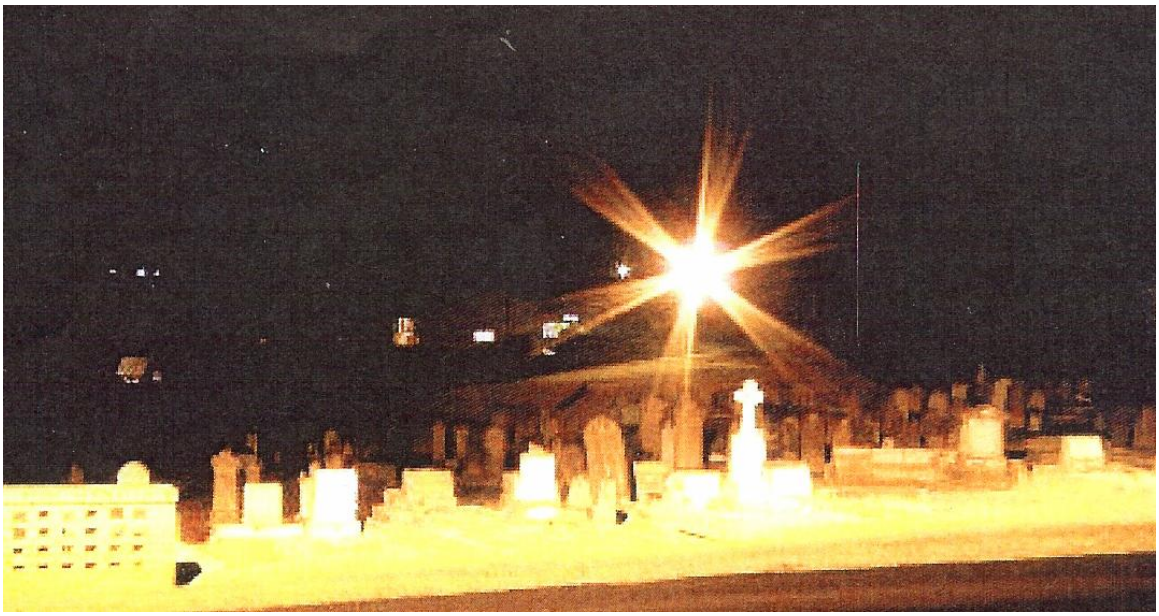
Hawkesbury City Council

attachment to item 214

Attachment 1
The Wilberforce Cemetery Conservation Management Plan - Volumes 2

date of meeting: 21 October 2008
location: council chambers
time: 5:00 p.m.

WILBERFORCE CEMETERY



CONSERVATION MANAGEMENT PLAN

Final

Volume 2 (Appendices)

Prepared for:
HAWKESBURY CITY COUNCIL

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7 April 2008

Cover Photo:
Wilberforce Cemetery 2004. Source: Hawkesbury City Council, taken by Energy Australia

Appendix 1

The brief for this report.

Hawkesbury City Council

conservation management plan brief for Wilberforce Cemetery

TABLE OF CONTENTS

1. INTRODUCTION

The purpose of this brief is to develop a individual conservation management plan for Wilberforce Cemetery. The plans must identify the cemeteries heritage significance and outline policies to retain this significance that allow for economic re-use, possible future development and ongoing management and maintenance.

Wilberforce Cemetery is Crown Land Reserves under the care control and management of Hawkesbury City Council.

Wilberforce Cemetery is located in the town of Wilberforce, bordered by Old Sackville Road, Duke Road.. The Cemetery was recently fenced to restrict access to vandals. The cemetery is open during the day but locked at night.

2. THE PLAN

2.1 Objectives

In preparing the *conservation management plan* the objectives are to:

- to provide a clear philosophy and strategic direction for the conservation and retention of the heritage values associated with this cemetery.
- to identify most culturally significant graves, including zoning plan.
- to further understand the cultural significance of this cemetery through investigation of its historical and geographical context, history, fabric, research potential, and importance to the community
- to prepare a *statement of significance* - the plan will analyse documentary and physical evidence to determine the nature, extent and degree of significance of the cemetery.
- to develop a *conservation policy*, arising out of the statement of heritage significance, to guide the development potential the cemetery and its ongoing maintenance and development. (taking into consideration constraints and opportunities).
- recommend the cemetery can best be managed bearing in mind those responsible and interested in its ongoing conservation. It is to include proposals to review the conservation management plan and principles of maintenance for those graves.

2.2 Previous reports/available information

The conservation management plan is to be a concise document. Information on the cemetery included in previous reports is not to be repeated, unless of particular relevance. Rather, in the plan simply refer to the other documentation available.

2.3 Background material

The following documents are to be used to develop the statement of significance, conservation policy and management guidelines.

Australia ICOMOS 2000, Australia ICOMOS *Charter for the Conservation of Cultural Significance (The Burra Charter)* and *Guidelines to the Burra Charter: Cultural Significance, Conservation Policy, and Undertaking Studies and Reports*, Australia ICOMOS, ACT. The Burra Charter gives definitions for terms used in heritage conservation, discusses acceptable conservation processes and establishes the best practice for achieving the heritage conservation of a particular item.

Heritage Office 1996, *Conservation Management Documents*, HO, Sydney. These guidelines answer some common queries regarding the preparation of conservation management plans.

Heritage Office 2001, *Assessing Heritage Significance*, HO, Sydney. These guidelines explain how to use historical themes and evaluation criteria to assess heritage significance.

Kerr, James Semple 2000, *The Conservation Plan*, National Trust of Australia (NSW), Sydney. This publication presents a methodology for the preparation of conservation plans.

Additional documents, which will be made available to the consultant, include:

Barkley, Jan and Nichols, Michelle 1994, *Hawkesbury 1794 - 1994 - The First 200 Years of the Second Colonisation*, Hawkesbury City Council, Windsor

Cathy McHardy and Nicholas McHardy 2003 *Sacred to the memory: A study of Wilberforce Cemetery* Published by Cathy McHardy 2003

2.4 Investigate Significance

Gather and analyse written and graphic information (including photographs and drawings) to establish the historic context of the cemetery.

Investigate the physical evidence of the cemetery to authenticate its history and to help assess its significance.

Evaluate the current condition of the cemetery.

Consult with relevant community and interest groups.

Provide a chronological history of the cemetery and its context, including use and significance over time.

2.5 Assess Significance

Use *Assessing Heritage Significance*, 2001 in the NSW Heritage Manual, and *Archaeological Assessments*, published by the Heritage Office and Department of Urban Affairs and Planning in 1996.

Prepare a *statement of significance*. This should be done for the whole subject area and, where necessary, separately for items of individual significance. The main statement as to why the item is considered to be of significance is to be succinct. Its purpose is not to

reiterate the history and description of the cemetery and individual heritage items (unless it is particularly relevant); rather, the statement is a result of the *analysis* of documentary and physical evidence.

Complete an inventory form for the NSW Heritage Database for each item (and any sub-items). Using the database form will assist comparative analysis and cross-checking assessments of the significance.

Indicate the individual significance of the component parts of the item on a one-to-five zoned system:

- exceptional 5
- considerable 4
- some 3
- little or no significance 2
- intrusive 1

Indicate how the ranking has been determined and applied.

2.6 Manage Significance

Outline the constraints and opportunities that arise as a result of the heritage significance, of each specific heritage item, and relate how that impacts on the cemetery.

Outline the constraints and opportunities that arise as a result of the physical condition of the heritage items (for example, structural adequacy, existing services, archaeological relics).

Prepare a succinct statement of *conservation policy* that includes:

- feasible uses - the plan should identify whether the cemetery can be reopened for burials. Briefly explain how this would impact on the cemetery and any heritage significance, opening times and lighting.
- step by step for conservation works for individual graves
- interpretation - the most appropriate ways of making the significance of the cemetery understood, are to be identified.
- controls on intervention - these should identify the degree of physical intervention acceptable for non-conservation purposes as well as how any essential intervention is to be recorded
- priorities for urgent conservation works are to be identified.
- Reference should be made to the National Trust for conservation of the cemetery

2.7 Implementation Strategy

Outline the Hawkesbury City Council's preferred use eg could the cemetery be reopened and the works involved.

Provide guidance on how such works can be implemented while minimising the impact on heritage significance.

Justify, in terms of the viable future of heritage items, any works that will have a substantial impact on heritage significance.

2.8 Asset Management Guidelines

Management - recommend a management policy through which future decisions on conservation are to be made.

Statutory approvals - outline the necessary approval procedures to allow works to be carried out. Identify any planning or other issues that have a bearing on the adaptive re-use or development of this cemetery and circumstances when permits would be required.

Maintenance - include a maintenance strategy or give guidance on the need for a specialised ongoing maintenance strategy to be developed in a separate plan of management.
Exemptions - note that if the heritage items/cemetery are subject to a conservation order under the Heritage Act, the plan should recommend that certain works (such as maintenance and

repair) can be carried out in accordance with section 57(2) of the Heritage Act without requiring the approval of the Heritage Council. (See *NSW Heritage: Guidelines on Standard Exemptions for Items Covered by Conservation Orders*, 1995, published by the Department of Planning and the Heritage Council.)

2.9 Executive Summary

Provide an executive summary at the beginning of the conservation management plan, highlighting the significance of the cemetery (& individual items), the main conservation policies and the recommendations for implementation and management.

2.10 Monitoring and Review

Recommend a time frame for the monitoring and review of the conservation management plan and who should be requested to endorse the plan.

3. SUPERVISION AND LIAISON

The project supervisor (representing the Hawkesbury City Council) is:
Mr Sean Perry, Manager Parks and Recreation. Direct phone line is (02) 4560 4507

The consultant is to meet a minimum of three times during the study (initially, following the public consultation process, after draft conservation plan) with the project supervisor/steering committee.

In preparing the conservation management plan the consultant must involve the public and community groups in the planning process. Education about the process will be an important part of the preparation of a conservation plan. The consultant will need to organise at least one (1) community meetings and hold discussions with relevant stakeholders. These include:

Heritage Advisory Committee
Hawkesbury City Council
Return Services League (RSL) groups
Local history society
Local museum
National Trust
Heritage Council
Friends of the Wilberforce Cemetery
User groups

Note: The consultant may present an alternative community consultation model for consideration at the project inception meeting.

4. CONSULTANT SKILLS

The skills of the head consultant and other consultant team members should be appropriate to the task. It may be beneficial to involve an historian in the process, particularly during the assessment phase.

The consultant might also require other specialist assistance such as an archaeologist, engineer or landscape architect. The project supervisor must be notified and must approve any sub-consultants before the project commences.

The head consultant is to co-ordinate and take responsibility for integrating the contributions of sub-consultants to the final report.

The head consultant and the sub-consultants will be identified in the tender or quotation, along with their relevant experience.

All consultants must be given the opportunity to endorse, or comment on, the draft document before finalisation.

5. SELECTION PROCESS

A decision on the selection of the consultant to prepare the conservation management plans will be based upon the following(Consultants may be subject to an interview):

- A demonstrated, appropriate method to the conservation plan, including a submission of a programme for community consultation;
- Demonstrated experience in heritage and recreation planning;
- Demonstrated skills in community consultation and involvement in projects;
- Experience and demonstrated knowledge of relevant legislation, policies and processes;
- A capacity and experience to communicate in clear, concise and plain language;
- Demonstrated experience with managing projects of similar sites and scope;
- A capacity to start and finish the project as required in the brief;
- Provision of personnel names, responsibilities and cost estimates for rates of work;
- Timeline for project;
- Company/business profile.
- At least two (2) recent referees
- Leadership
- Cost to undertake work

6. TIMEFRAME

The appointed consultant will be required to:

Commence the study during February 2006. There are time constraints for the completion of these plans and thus each Consultant is to prepare a timetable as part of the proposal.

7. FORMAT AND NUMBER OF COPIES

Three copies are required of the conservation plan. The plans must be A4 size, spiral-bound, with original photos provided in each copy. An electronic copy of the conservation plans also needs to be provided.

8. COPYRIGHT

The Consultant will respect copyright provisions and acknowledge Council ownership of all contract materials regardless of what form in which they are stored. The Consultant will acknowledge that any discoveries, inventions, patents, designs or other rights arising from the project are the property of Council. The Consultant will ensure a full transfer of knowledge and accreditation of same to Council during the course of the project.

The consultant is to treat as confidential any information obtained in the course of the work, and it shall not be disclosed without the expressed permission of the client, in writing.

9. BUDGET

A total budget of $10,000, excluding GST, has been allocated to prepare this conservation plan.

10. DECLARATION OF CONFLICT OF INTEREST

Consultants submitting quotations will be required to submit with their proposal a statement that undertaking the consultancy will not result in any conflicts of interest, and to identify any existing and potential conflicts of interest and steps taken to resolve this conflict.

11. FINANCIAL STATUS AND INSURANCE DETAILS

Consultants submitting quotations shall provide a declaration and financial viability of the company in relation to the services being undertaken.

The selected consultant will need to provide a certificate of currency for professional indemnity insurance and public liability insurance. If the consultant is a company then a copy of their Workers Compensation Policy also needs to be provided.

12. OCCUPATIONAL HEALTH AND SAFETY

The successful consultant will need to prepare and submit a Risk Assessment prior to commencing works under the contract. The consultant will also need to submit a complete copy of their Occupational Health and Safety documentation.

13. RETURN BRIEF

The head consultant is to provide a return brief outlining the intended approach to the conservation management plan, a program for community consultation and any additional matters not covered by this brief.

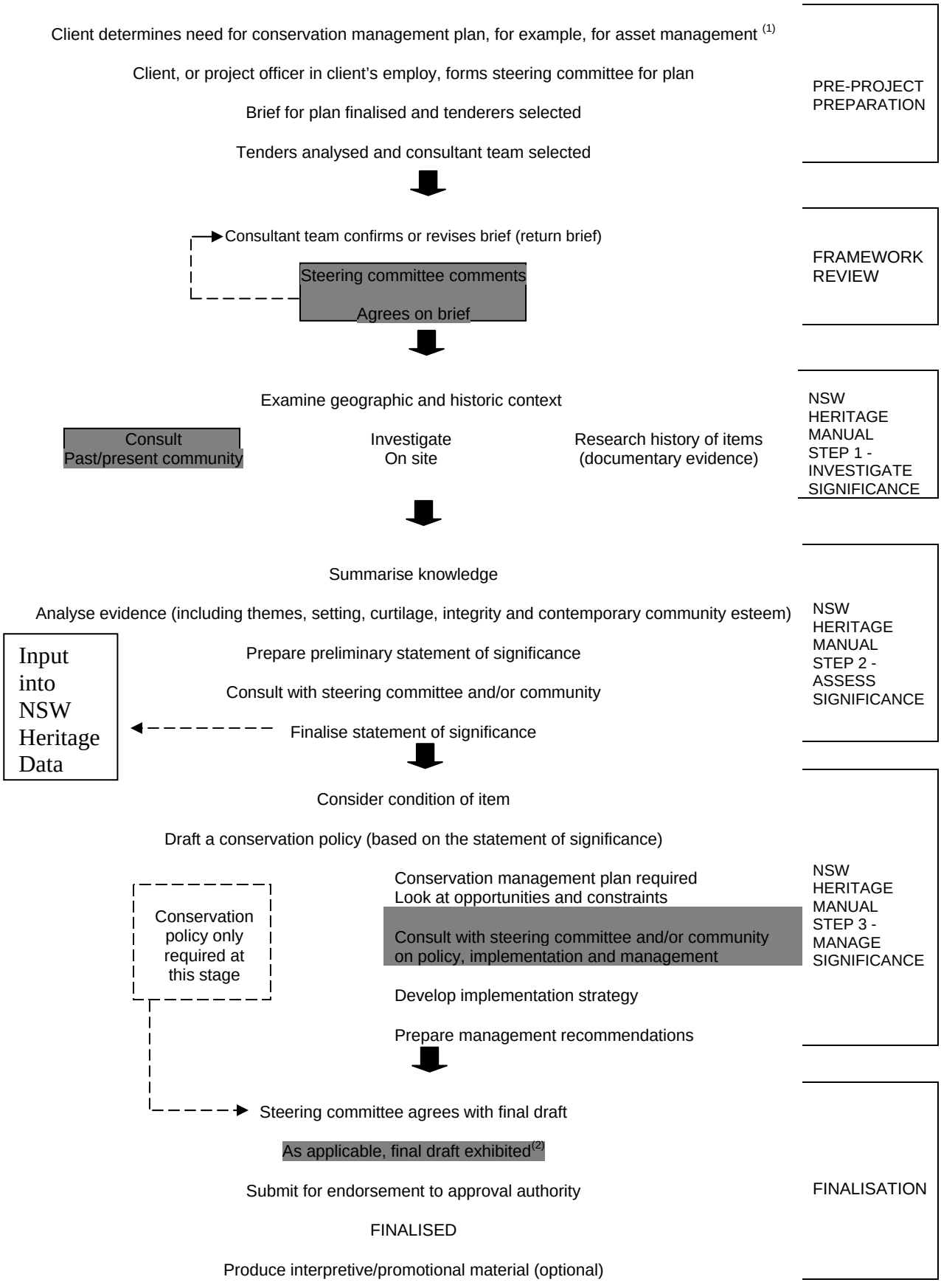
Return briefs for the conservation plan should be sent to the address below by no later than the close of business on Friday 24 November 2006:

Mr Sean Perry
Manager Parks & Recreation
Hawkesbury City Council
PO Box 146
WINDSOR NSW 2756

14. FURTHER INFORMATION

Any queries regarding this brief should be directed to Sean Perry by telephone on (02) 4560 4507 or fax (02) 4560 4400.

CONSERVATION MANAGEMENT PLAN FLOW CHART



Note: ■ Public consultation

(1) In some circumstances, a conservation policy or management plan may be requested

(2) Exhibition refers to conservation management plans & is at the discretion of the approval authority

Appendix 2

Australia ICOMOS Charter for the Conservation of Places of Cultural Significance - The Burra Charter

The Burra Charter

(The Australia ICOMOS Charter for Places of Cultural Significance)

Preamble

Considering the International Charter for the Conservation and Restoration of Monuments and Sites (Venice 1964), and the Resolutions of the 5th General Assembly of the International Council on Monuments and Sites (ICOMOS) (Moscow 1978), the Burra Charter was adopted by Australia ICOMOS (the Australian National Committee of ICOMOS) on 19 August 1979 at Burra, South Australia. Revisions were adopted on 23 February 1981, 23 April 1988 and 26 November 1999.

The Burra Charter provides guidance for the conservation and management of places of cultural significance (cultural heritage places), and is based on the knowledge and experience of Australia ICOMOS members.

Conservation is an integral part of the management of places of cultural significance and is an ongoing responsibility.

Who is the Charter for?

The Charter sets a standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance, including owners, managers and custodians.

Using the Charter

The Charter should be read as a whole. Many articles are interdependent. Articles in the Conservation Principles section are often further developed in the Conservation Processes and Conservation Practice sections. Headings have been included for ease of reading but do not form part of the Charter.

The Charter is self-contained, but aspects of its use and application are further explained in the following Australia ICOMOS documents:

- Guidelines to the Burra Charter: Cultural Significance;
- Guidelines to the Burra Charter: Conservation Policy;
- Guidelines to the Burra Charter: Procedures for Undertaking Studies and Reports;
- Code on the Ethics of Coexistence in Conserving Significant Places.

What places does the Charter apply to?

The Charter can be applied to all types of places of cultural significance including natural, indigenous and historic places with cultural values.

The standards of other organisations may also be relevant. These include the Australian Natural Heritage Charter and the Draft Guidelines for the Protection, Management and Use of Aboriginal and Torres Strait Islander Cultural Heritage Places.

Why conserve?

Places of cultural significance enrich people's lives, often providing a deep and inspirational sense of connection to community and landscape, to the past and to lived experiences. They are historical records, that are important as tangible expressions of Australian identity and experience. Places of cultural significance reflect the diversity of our communities, telling us about who we are and the past that has formed us and the Australian landscape. They are irreplaceable and precious.

These places of cultural significance must be conserved for present and future generations.

The Burra Charter advocates a cautious approach to change: do as much as necessary to care for the place and to make it useable, but otherwise change it as little as possible so that its cultural significance is retained.

Articles

Article 1. Definitions

For the purposes of this Charter:

1.1 *Place* means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views.

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

Cultural significance is embodied in the *place* itself, its *fabric, setting, use, associations, meanings*, records, *related places* and *related objects.*

Places may have a range of values for different individuals or groups.

1.3 *Fabric* means all the physical material of the *place* including components, fixtures, contents, and objects.

1.4 *Conservation* means all the processes of looking after a *place* so as to retain its *cultural significance.*

1.5 *Maintenance* means the continuous protective care of the *fabric* and *setting* of a *place,* and is to be distinguished from repair. Repair involves restoration or reconstruction.

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

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

1.8 *Reconstruction* means returning a *place* to a known earlier state and is distinguished from *restoration* by the introduction of new material into the *fabric.*

1.9 *Adaptation* means modifying a *place* to suit the existing use or a proposed use.

1.10 *Use* means the functions of a place, as well as the activities and practices that may occur at the place.

1.11 *Compatible* use means a use which respects the *cultural significance* of a *place.* Such a use involves no, or minimal, impact on cultural significance.

1.12 *Setting* means the area around a *place,* which may include the visual catchment.

1.13 *Related place* means a place that contributes to the *cultural significance* of another place.

Explanatory Notes

The concept of place should be broadly interpreted. The elements described in Article 1.1 may include memorials, trees, gardens, parks, places of historical events, urban areas, towns, industrial places, archaeological sites and spiritual and religious places.

The term cultural significance is synonymous with heritage significance and cultural heritage value.

Cultural significance may change as a result of the continuing history of the place.

Understanding of cultural significance may change as a result of new information.

Fabric includes building interiors and sub-surface remains, as well as excavated material.

Fabric may define spaces and these may be important elements of the significance of the place.

The distinctions referred to, for example in relation to roof gutters, are:

- maintenance — regular inspection and cleaning of gutters;
- repair involving restoration — returning of dislodged gutters;
- repair involving reconstruction — replacing decayed gutters.

It is recognised that all places and their components change over time at varying rates.

New material may include recycled material salvaged from other places. This should not be to the detriment of any place of cultural significance.

Articles

Explanatory Notes

1.14 *Related object* means an object that contributes to the *cultural significance* of a *place* but is not at the place.

1.15 *Associations* mean the special connections that exist between people and a *place.*

Associations may include social or spiritual values and cultural responsibilities for a place.

1.16 *Meanings* denote what a *place* signifies, indicates, evokes or expresses.

Meanings generally relate to intangible aspects such as symbolic qualities and memories.

1.17 *Interpretation* means all the ways of presenting the *cultural significance* of a *place.*

Interpretation may be a combination of the treatment of the fabric (e.g. maintenance, restoration, reconstruction); the use of and activities at the place; and the use of introduced explanatory material.

Conservation Principles

Article 2. Conservation and management

2.1 *Places* of *cultural significance* should be conserved.

2.2 The aim of *conservation* is to retain the *cultural significance* of a *place.*

2.3 *Conservation* is an integral part of good management of *places* of *cultural significance*.

2.4 *Places* of *cultural significance* should be safeguarded and not put at risk or left in a vulnerable state.

Article 3. Cautious approach

3.1 *Conservation* is based on a respect for the existing *fabric, use, associations* and *meanings.* It requires a cautious approach of changing as much as necessary but as little as possible.

The traces of additions, alterations and earlier treatments to the fabric of a place are evidence of its history and uses which may be part of its significance. Conservation action should assist and not impede their understanding.

3.2 Changes to a *place* should not distort the physical or other evidence it provides, nor be based on conjecture.

Article 4. Knowledge, skills and techniques

4.1 *Conservation* should make use of all the knowledge, skills and disciplines which can contribute to the study and care of the *place.*

4.2 Traditional techniques and materials are preferred for the *conservation* of significant *fabric.* In some circumstances modern techniques and materials which offer substantial conservation benefits may be appropriate.

The use of modern materials and techniques must be supported by firm scientific evidence or by a body of experience.

Articles

Article 5. Values

5.1 *Conservation* of a *place* should identify and take into consideration all aspects of cultural and natural significance without unwarranted emphasis on any one value at the expense of others.

5.2 Relative degrees of *cultural significance* may lead to different *conservation* actions at a place.

Article 6. Burra Charter process

6.1 The *cultural significance* of a *place* and other issues affecting its future are best understood by a sequence of collecting and analysing information before making decisions. Understanding cultural significance comes first, then development of policy and finally management of the place in accordance with the policy.

6.2 The policy for managing a place must be *based* on an understanding of its *cultural significance.*

6.3 Policy development should also include consideration of other factors affecting the future of a *place* such as the owner's needs, resources, external constraints and its physical condition.

Article 7. Use

7.1 Where the *use* of a place is of *cultural significance* it should be retained.

7.2 A *place* should have a *compatible* use.

Article 8. Setting

Conservation requires the retention of an appropriate visual *setting* and other relationships that contribute to the *cultural significance* of the *place.*

New construction, demolition, intrusions or other changes which would adversely affect the setting or relationships are not appropriate.

Explanatory Notes

Conservation of places with natural significance is explained in the Australian Natural Heritage Charter. This Charter defines natural significance to mean the importance of ecosystems, biological diversity and geodiversity for their existence value, or for present or future generations in terms of their scientific, social, aesthetic and life-support value.

A cautious approach is needed, as understanding of cultural significance may change. This article should not be used to justify actions which do not retain cultural significance.

The Burra Charter process, or sequence of investigations, decisions and actions, is illustrated in the accompanying flowchart.

The policy should identify a use or combination of uses or constraints on uses that retain the cultural significance of the place. New use of a place should involve minimal change, to significant fabric and use; should respect associations and meanings; and where appropriate should provide for continuation of practices which contribute to the cultural significance of the place.

Aspects of the visual setting may include use, siting, bulk, form, scale, character, colour, texture and materials.

Other relationships, such as historical connections, may contribute to interpretation, appreciation, enjoyment or experience of the place.

Articles

Article 9. Location

9.1 The physical location of a *place* is part of its *cultural significance*. A building, work or other component of a place should remain in its historical location. Relocation is generally unacceptable unless this is the sole practical means of ensuring its survival.

9.2 Some buildings, works or other components of *places* were designed to be readily removable or already have a history of relocation. Provided such buildings, works or other components do not have significant links with their present location, removal may be appropriate.

9.3 If any building, work or other component is moved, it should be moved to an appropriate location and given an appropriate use. Such action should not be to the detriment of any *place* of *cultural significance*.

Article 10. Contents

Contents, fixtures and objects which contribute to the *cultural significance* of a *place* should be retained at that place. Their removal is unacceptable unless it is: the sole means of ensuring their security and *preservation;* on a temporary basis for treatment or exhibition; for cultural reasons; for health and safety; or to protect the place. Such contents, fixtures and objects should be returned where circumstances permit and it is culturally appropriate.

Article 11. Related places and objects

The contribution which *related places* and *related objects* make to the *cultural significance* of the *place* should be retained.

Article 12. Participation

Conservation, interpretation and management of a *place* should provide for the participation of people for whom the place has special *associations* and *meanings,* or who have social, spiritual or other cultural responsibilities for the place.

Article 13. Co-existence of cultural values

Co-existence of cultural values should be recognised, respected and encouraged, especially in cases where they conflict.

Explanatory Notes

For some places, conflicting cultural values may affect policy development and management decisions. In this article, the term cultural values refers to those beliefs which are important to a cultural group, including but not limited to political, religious, spiritual and moral beliefs. This is broader than values associated with cultural significance.

Conservation Processes

Article 14. Conservation processes

Conservation may, according to circumstance, include the processes of: retention or reintroduction of a *use;* retention of *associations* and *meanings; maintenance, preservation, restoration, reconstruction, adaptation* and *interpretation;* and will commonly include a combination of more than one of these.

There may be circumstances where no action is required to achieve conservation.

Article 15. Change

15.1 Change may be necessary to retain *cultural significance*, but is undesirable where it reduces cultural significance. The amount of change to a *place* should be guided by the *cultural significance* of the place and its appropriate *interpretation.*

When change is being considered, a range of options should be explored to seek the option which minimises the reduction of cultural significance.

15.2 Changes which reduce *cultural significance* should be reversible, and be reversed when circumstances permit.

Reversible changes should be considered temporary. Non-reversible change should only be used as a last resort and should not prevent future conservation action.

15.3 Demolition of significant *fabric* of a *place* is generally not acceptable. However, in some cases minor demolition may be appropriate as part of *conservation.* Removed significant fabric should be reinstated when circumstances permit.

15.4 The contributions of all aspects of *cultural significance* of a *place* should be respected. If a place includes *fabric, uses, associations* or *meanings* of different periods, or different aspects of cultural significance, emphasising or interpreting one period or aspect at the expense of another can only be justified when what is left out, removed or diminished is of slight cultural significance and that which is emphasised or interpreted is of much greater cultural significance.

Article 16. Maintenance

Maintenance is fundamental to *conservation* and should be undertaken where *fabric* is of *cultural significance* and its maintenance is necessary to retain that *cultural significance*.

Articles

Explanatory Notes

Article 17. Preservation

Preservation is appropriate where the existing *fabric* or its condition constitutes evidence of *cultural significance*, or where insufficient evidence is available to allow other *conservation* processes to be carried out.

Preservation protects fabric without obscuring the evidence of its construction and use. The process should always be applied:

- where the evidence of the fabric is of such significance that it should not be altered;
- where insufficient investigation has been carried out to permit policy decisions to be taken in accord with Articles 26 to 28.

New work (e.g. stabilisation) may be carried out in association with preservation when its purpose is the physical protection of the fabric and when it is consistent with Article 22.

Article 18. Restoration and reconstruction

Restoration and *reconstruction* should reveal culturally significant aspects of the *place.*

Article 19. Restoration

Restoration is appropriate only if there is sufficient evidence of an earlier state of the *fabric.*

Article 20. Reconstruction

20.1 *Reconstruction* is appropriate only where a *place* is incomplete through damage or alteration, and only where there is sufficient evidence to reproduce an earlier state of the *fabric.* In rare cases, reconstruction may also be appropriate as part of a use or practice that retains the *cultural significance* of the place.

20.2 *Reconstruction* should be identifiable on close inspection or through additional *interpretation.*

Article 21. Adaptation

21.1 *Adaptation* is acceptable only where the adaptation has minimal impact on the *cultural significance* of the place.

Adaptation may involve the introduction of new services, or a new use, or changes to safeguard the place.

21.2 *Adaptation* should involve minimal change to significant fabric, achieved only after considering alternatives.

Article 22. New work

22.1 New work such as additions to the *place* may be acceptable where it does not distort or obscure the *cultural significance* of the place, or detract from its *interpretation* and appreciation.

New work may be sympathetic if its siting, bulk, form, scale, character, colour, texture and material are similar to the existing fabric, but imitation should be avoided.

22.2 New work should be readily identifiable as such.

Articles

Explanatory Notes

Article 23. Conserving use

Continuing, modifying or reinstating a significant *use* may be appropriate and preferred forms of *conservation.*

These may require changes to significant fabric but they should be minimised. In some cases, continuing a significant use or practice may involve substantial new work.

Article 24. Retaining associations and meanings

24.1 Significant *associations* between people and a *place* should be respected, retained and not obscured. Opportunities for the *interpretation,* commemoration and celebration of these associations should be investigated and implemented.

For many places associations will be linked to use.

24.2 Significant *meanings,* including spiritual values, of a *place* should be respected. Opportunities for the continuation or revival of these meanings should be investigated and implemented.

Article 25. Interpretation

The *cultural significance* of many places is not readily apparent, and should be explained by *interpretation.* Interpretation should enhance understanding and enjoyment, and be culturally appropriate.

Conservation Practice

Article 26. Applying the Burra Charter process

26.1 Work on a *place* should be preceded by studies to understand the place which should include analysis of physical, documentary, oral and other evidence, drawing on appropriate knowledge, skills and disciplines.

The results of studies should be up to date, regularly reviewed and revised as necessary.

26.2 Written statements of *cultural significance* and policy for the *place* should be prepared, justified and accompanied by supporting evidence. The statements of significance and policy should be incorporated into a management plan for the place.

Statements of significance and policy should be kept up to date by regular review and revision as necessary. The management plan may deal with other matters related to the management of the place.

26.3 Groups and individuals with *associations* with a place as well as those involved in its management should be provided with opportunities to contribute to and participate in understanding the *cultural significance* of the place. Where appropriate they should also have opportunities to participate in its *conservation* and management.

Article 27. Managing change

27.1 The impact of proposed changes on the *cultural significance* of a *place* should be analysed with reference to the statement of significance and the policy for managing the place. It may be necessary to modify proposed changes following analysis to better retain cultural significance.

27.2 Existing *fabric, use, associations* and *meanings* should be adequately recorded before any changes are made to the *place.*

Articles

Article 28. Disturbance of fabric

28.1 Disturbance of significant *fabric* for study, or to obtain evidence, should be minimised. Study of a *place* by any disturbance of the fabric, including archaeological excavation, should only be undertaken to provide data essential for decisions on the *conservation* of the place, or to obtain important evidence about to be lost or made inaccessible.

28.2 Investigation of a *place* which requires disturbance of the *fabric,* apart from that necessary to make decisions, may be appropriate provided that it is consistent with the policy for the place. Such investigation should be based on important research questions which have potential to substantially add to knowledge, which cannot be answered in other ways and which minimises disturbance of significant fabric.

Article 29. Responsibility for decisions

The organisations and individuals responsible for management decisions should be named and specific responsibility taken for each such decision.

Article 30. Direction, supervision and implementation

Competent direction and supervision should be maintained at all stages, and any changes should be implemented by people with appropriate knowledge and skills.

Article 31. Documenting evidence and decisions

A log of new evidence and additional decisions should be kept.

Article 32. Records

32.1 The records associated with the *conservation* of a *place* should be placed in a permanent archive and made publicly available, subject to requirements of security and privacy, and where this is culturally appropriate.

32.2 Records about the history of a *place* should be protected and made publicly available, subject to requirements of security and privacy, and where this is culturally appropriate.

Article 33. Removed fabric

Significant *fabric* which has been removed from a *place* including contents, fixtures and objects, should be catalogued, and protected in accordance with its *cultural significance.*

Where possible and culturally appropriate, removed significant fabric including contents, fixtures and objects, should be kept at the place.

Article 34. Resources

Adequate resources should be provided for conservation.

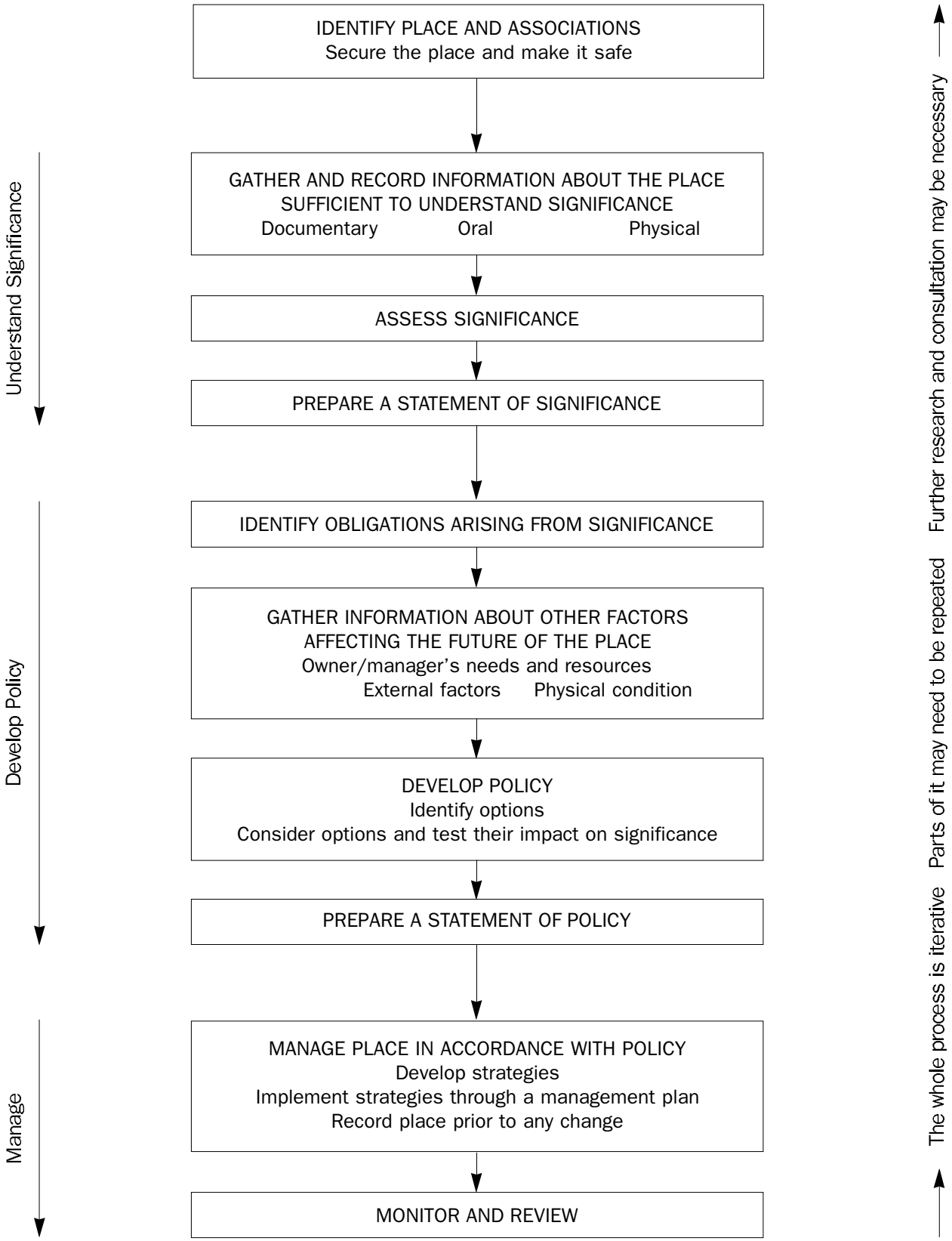
Words in italics are defined in Article 1.

Explanatory Notes

The best conservation often involves the least work and can be inexpensive.

The Burra Charter Process

Sequence of investigations, decisions and actions



Appendix 3

"Suggested Gravestone Terminology" *Guidelines for Cemetery Conservation* (2002) National Trust of Australia (NSW) Internet

SUGGESTED GRAVESTONE TERMINOLOGY

These notes present some suggested terms and labels. They will not be agreed upon by all monumental masons and other interested parties.

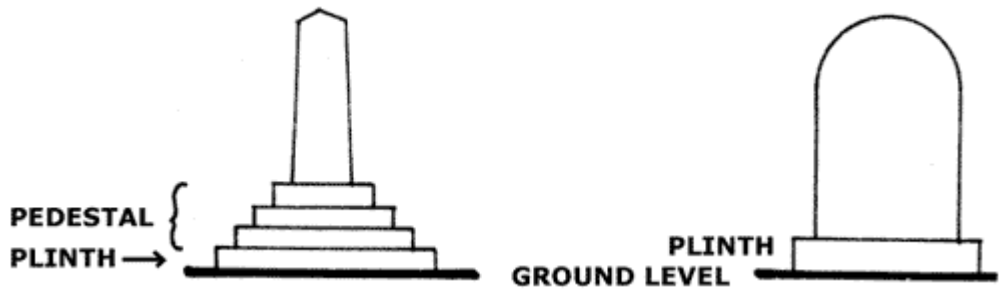
All built features on a grave are monuments.

Gravestones are actual markers (i.e. headstones, footstones, sculpture).

The most common type is the **upright slab** or **stele**.

Plinth - course in contact with ground only.

Pedestal - any other courses.



Six major classes of monument shape are defined:

A. Upright slabs/stelae

B. Crosses

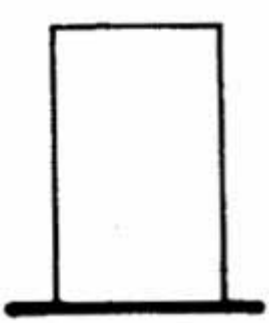
C. Pillars

D. Sculptures

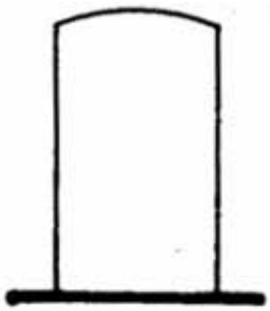
E. Horizontal slabs

F. Miscellaneous

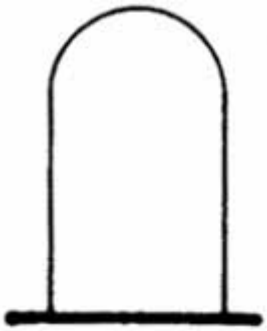
A. UPRIGHT SLABS / STELAE



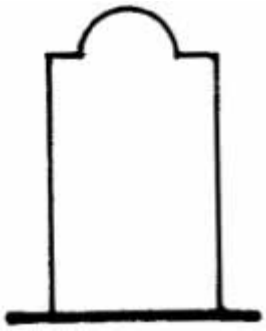
1. Rectangular



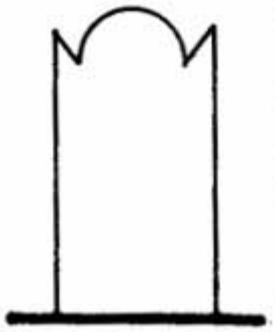
2. Cambered



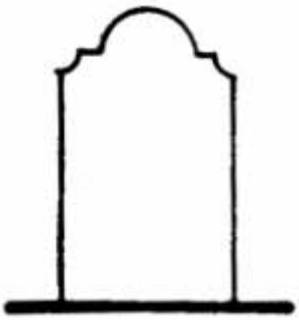
3. Semicircular



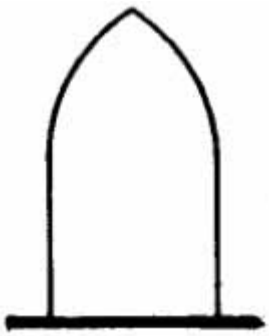
4. Semicircular with shoulders



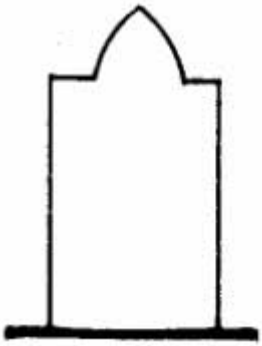
5. Semicircular with acroteria



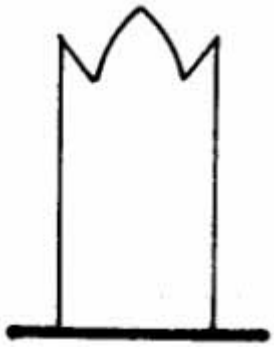
6. Semicircular with cut away shoulders



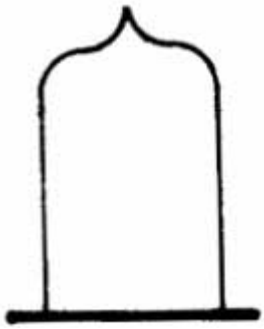
7. Gothic



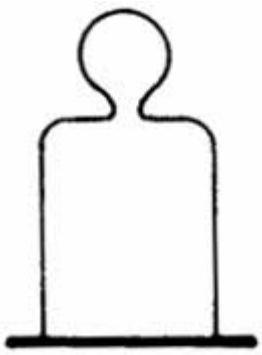
8. Gothic with shoulders

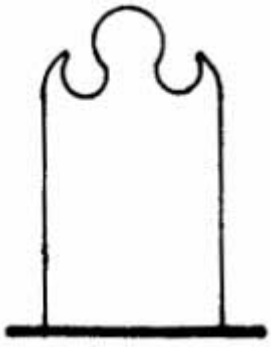


9. Gothic with acroteria

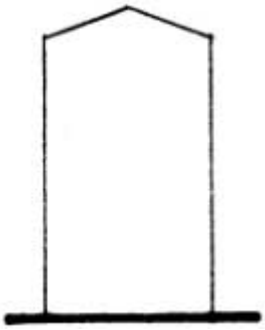
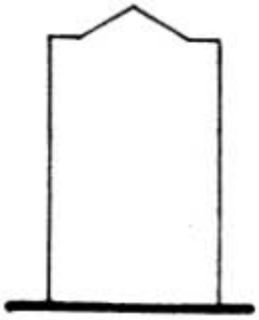
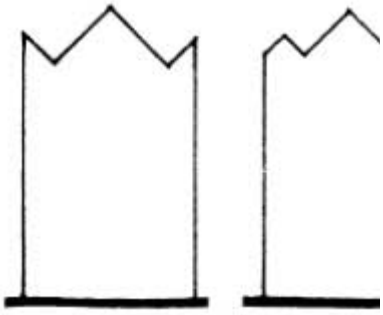
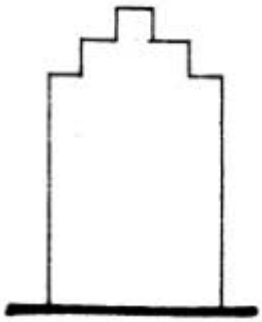
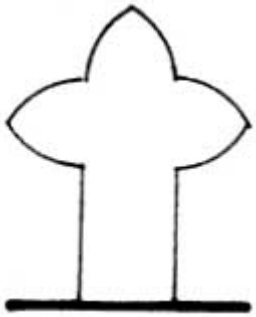
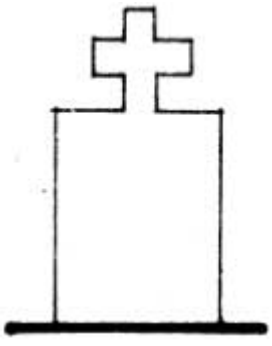
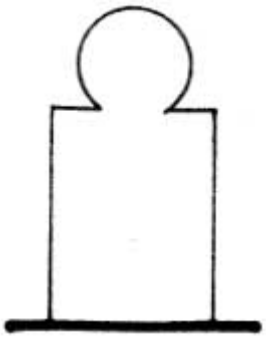
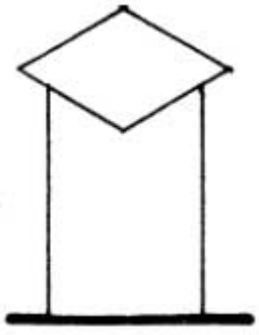


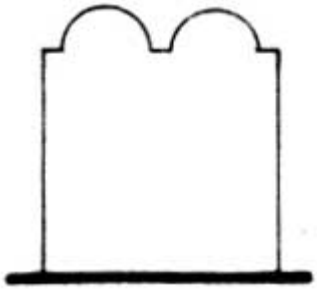
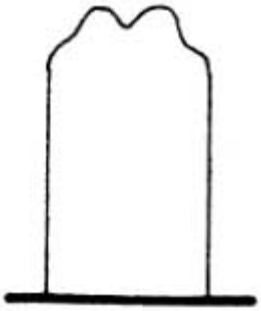
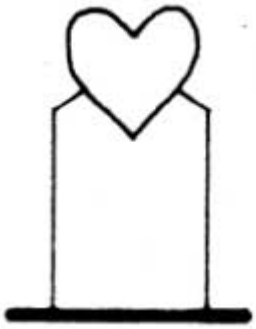
10. Ogee





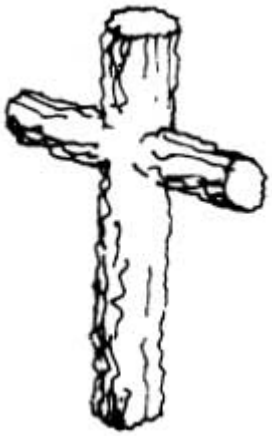
12. Anthropomorphic with

	11. Anthropomorphic	peaked shoulders
 13. Gabled	 14. Pedimented	 15. Gabled with shoulders
 16. Gabled with peaked shoulders	 17. Stepped	 18. Cruciform
 19. Cross surmount with shoulders	 20. Circular surmount with shoulders	 21. Diamond

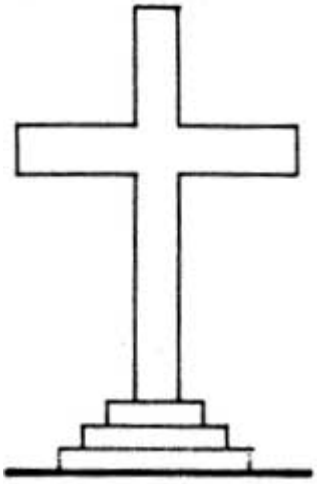
 22. Double	 23. Stylised double	 24. Miscellaneous e.g. Heart

B. CROSSES

1. Circular Latin

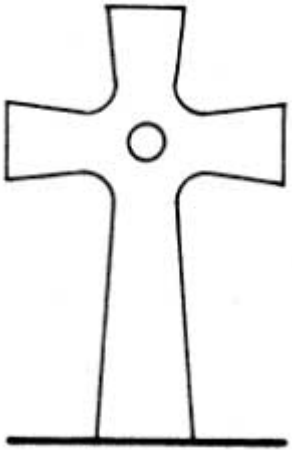


2. Rustic Latin



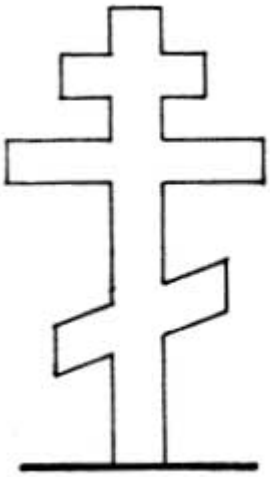
3. Roman/Latin (with 3 steps - Calvary)

4. Celtic

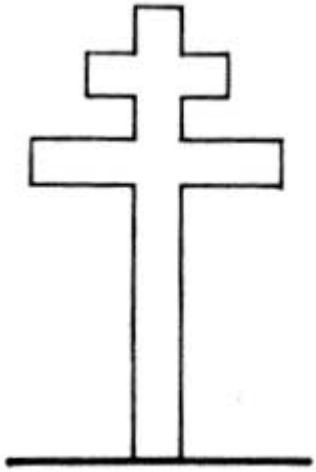


5. Saxon

6. Cornish

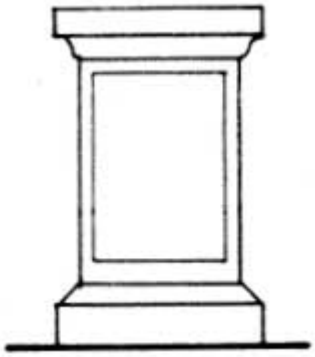


7. Eastern/Russian Orthodox

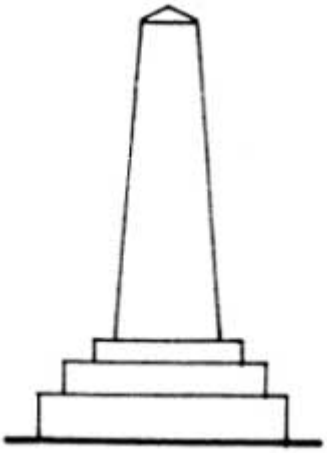


8. Lorraine

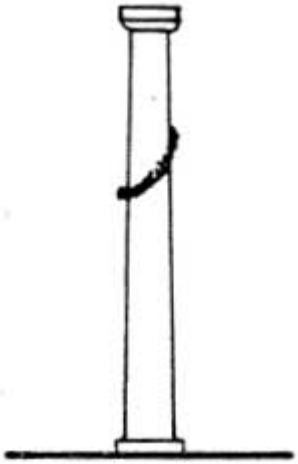
C. PILLARS



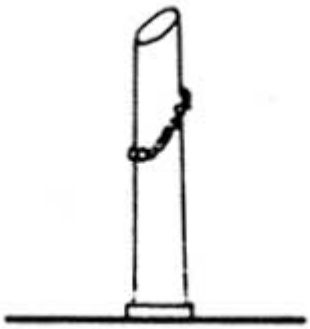
1. Pedestal (Champhered base)



2. Obelisk (Stepped base)



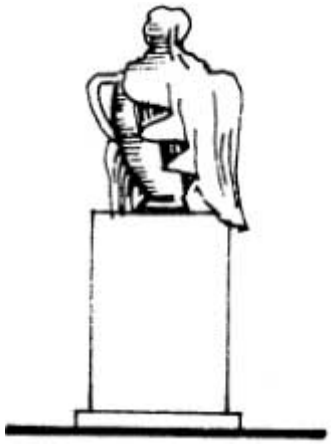
3. Column



4. Broken Column

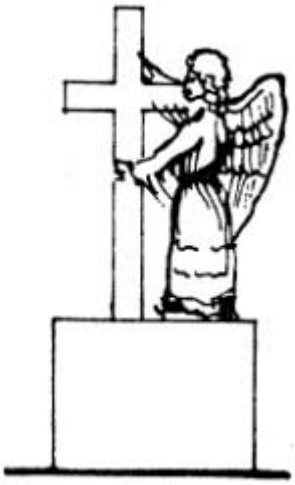
D. SCULPTURES

1. Urn



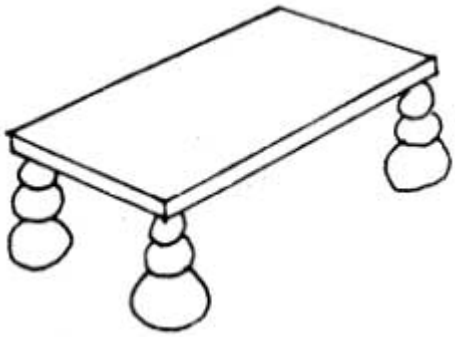
2. Draped Urn

3. Angel

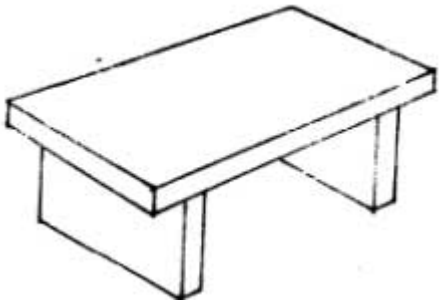


4. Composite - Angel and Cross

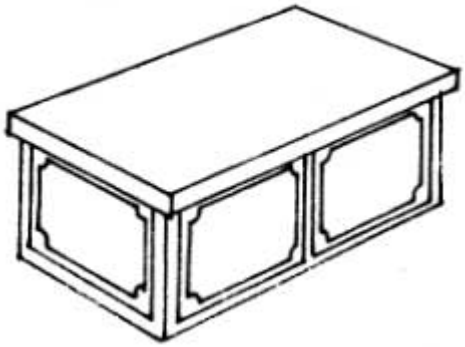
E. HORIZONTAL SLABS



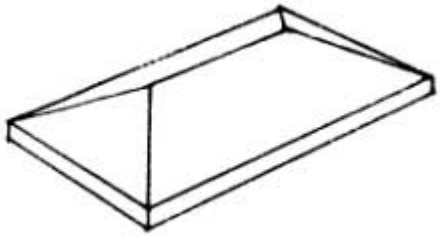
1. Table



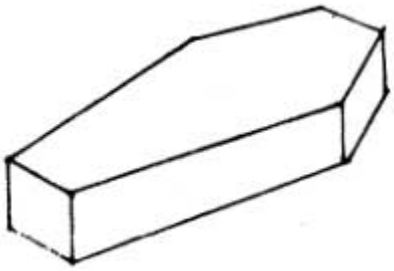
2. Table



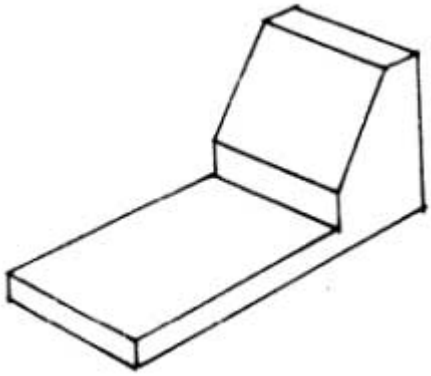
3. Altar



4. Sarcophagus

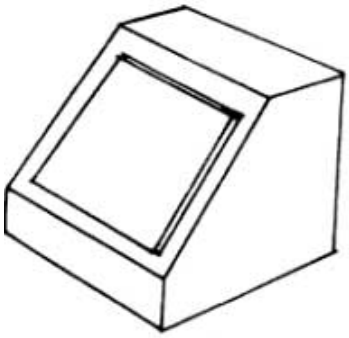


1. Coffin

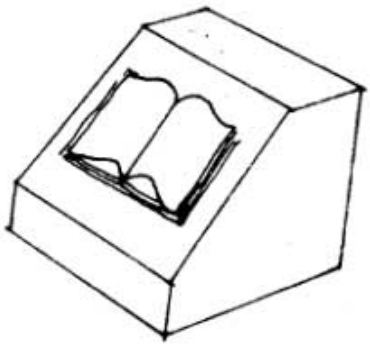


2. Slab and desk

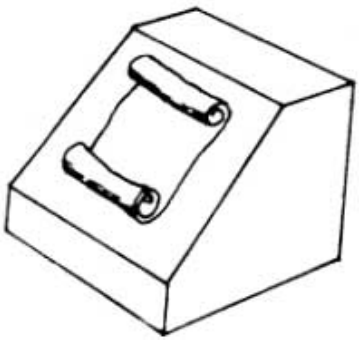
DESK DECORATION



1. Tablet

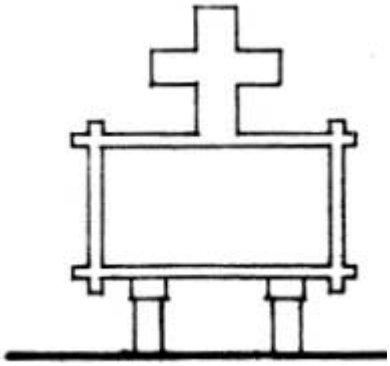


2. Book



3. Scroll

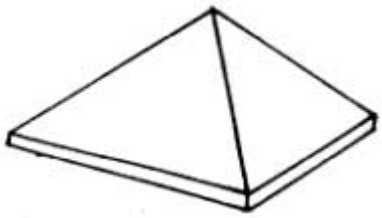
F. MISCELLANEOUS



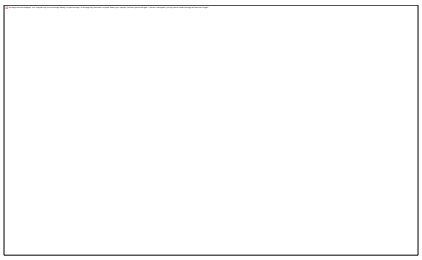
1. Iron 'Etna'

2. Cairn

3. Rustic pedestal



4. Pyramid

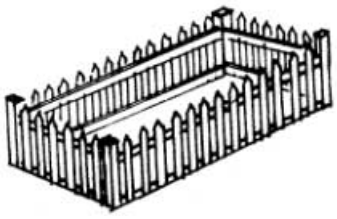


5. Stepped Pyramid

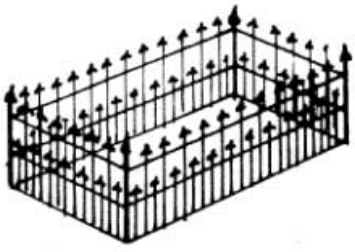
G. SURROUNDS

These are usually distinguished by material and motif.

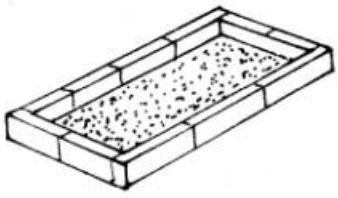
Examples:	Cast iron	Wood	Arrowheads
	Wrought iron	Concrete	Fler de Lys
	Stone	Brick	Floral Motif



1. Timber Picket



2. Iron Picket

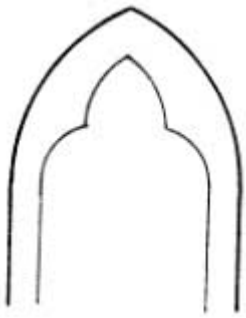


3. Stone

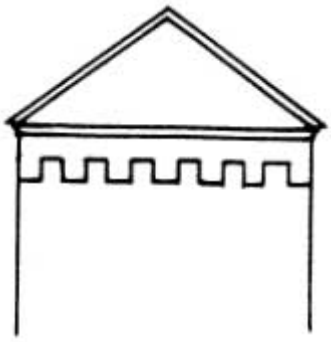
H. EMBELLISHMENT

Architectural terms should generally be used.

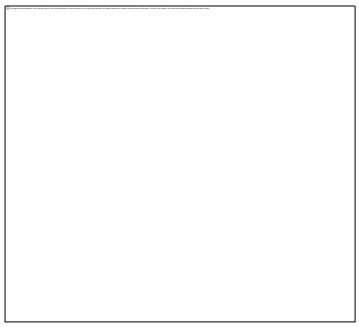
Examples:



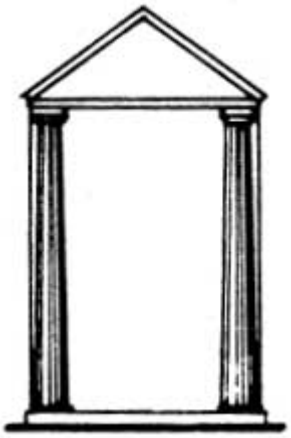
1. Cusps



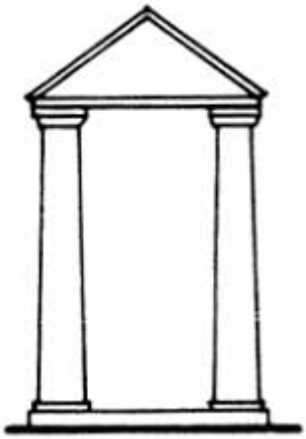
2. Dentils



3. Crockets



4. Columns (separate)



5. Pilasters (relief)

Appendix 4

"Tabulated Guide to the Conservation of Monuments" *Cemeteries – A Policy Paper* (2002) National Trust of Australia (NSW)

TABULATED GUIDE TO THE CONSERVATION OF MONUMENTS

The following notes are intended as a general guide to recommended procedures in the conservation of cemetery monuments. The recommended solutions should be regarded as options and not as definitive answers as they will not apply in every case. It is recommended that professional advice be sought prior to the commencement of any restoration work.

Problem	Due to	Solutions
1. Leaning and fallen monuments	Failure of footings and/or foundations because of:	
	normal compaction of grave fill	Wait to stabilize them. Re-bed monument on porous fill, e.g. sand.
	vault distortion or collapse	Seek professional advice on stabilization or re—construction.
	water erosion	Correct drainage problem.
	rabbit burrows	Fill holes with cobbles and earth.
	tree roots raising one side	Chop off offending root.
	differential compaction, e.g. one side on rock and other on fill, or one side dry and the other side wet due to broken drain or hollow in ground	Check drainage, improve if necessary and re—bed in sand.
	soil creep on hillside	Generally an intractable problem, however avoid the removal of local bushes and trees. It is sometimes caused by poor subsurface drainage, in which case an agricultural drain on the uphill side may help.
	soil slump, i.e. localized movements of land usually after heavy rain a)on river banks and gullies b)in slate and shale areas Note that a slight lean is not a problem unless the cemetery is subject to	 a) erosion control measures b) uphill drainage control.

Problem	Due to	Solutions
	vandalism, in which case the lean will attract the attention of vandals, or unless the lean is causing the lettering to fret on the leaning side.	
2. Monuments disassembled but not broken	Vandalism or temporary removal to permit essential works.	Check top of plinth to ensure that it is level, re—bed if necessary. Re—assemble, avoiding Portland cement. For tall structures vulnerable to vandalism consider introduction of non ferrous dowels (e.g. bronze).
3. Broken Monuments (i) Breaks in sturdy stone monuments (ii) Multiple breaks in relatively thin slabs.	Accident, vandals and cattle; often involving heavy falls on masonry or iron surrounds or uneven ground.	In general, employ an experienced monumental mason to reset stone on plinth and dowel parts together using waterproof epoxy resin adhesive. It is important to avoid Portland cement. If re-erected they will be vulnerable to vandalism. The alternatives are: a) leave lying on ground. b) erect a solid slab, and pin the pieces to slab with bronze dowels and waterproof epoxy resin. c) pin pieces to horizontal or sloping slab (so that water will not lie on upper surface). e.g. Granites can be horizontal but limestones should have water thrown off. d) pin stones to a local structure (a last resort) e) prepare a facsimile for erection on site and remove original to museum. f) leave pieces on site, reproduce inscription on small stainless steel plate

Problem	Due to	Solutions
		and erect inconspicuously on site.
5. Monuments with cracked or broken mortise in the plinth	Fall	Where mortise is damaged the options are: (a) replace plinth with a facsimile. (b) cut back existing plinth and remortise. (c) set stone in similar moulded concrete plinth with mortise, in the same way as original.
6. Masonry cracking	Pressure from the continuing process of iron rusting and expanding when damp	(a) where iron cramps within the masonry have expanded replace with bronze clamps, and repair masonry. (b) where wrought iron rails posts and bars have expanded and cracked masonry:· • remove iron from masonry • scrape away loose rust • treat as set out in 10. (hot dip galvanize if possible) • apply protective paint • repair masonry • lead-in prepared hole in masonry ensuring that no part of iron is in contact with stone • stop interstices in masonry to make watertight and ensure that water is diverted from area.
7. Spalling, fretting and delamination of monuments	Rising damp particularly near the base of the stone) Salt accumulation	Improve drainage at the base of the stone. *Note that re—setting stone*

Problem	Due to	Solutions
	(particularly under mouldings) Ponding of rainwater (particularly on shoulders and carving of monument)	*monuments improperly in concrete will accelerate this deterioration and any work should be avoided unless it is strictly in accord with the procedures outlined in Appendix 5.* Where significant monuments are already so set and deteriorating, the concrete base should be broken off as carefully as possible and the monument re—bedded. Stones should be reset vertically if they are leaning in such a way that the inscription or decorative side is inclined to the ground. Remove loose and flaking stone. Fill cracks with acrylic resin. Remove overhanging branches which trap airborne dust and salt particles and shed them upon the stone. Repair pointing to prevent entry of water if it is a compound monument. Ensure that water is thrown off monument.
8. Inscriptions fretting on monuments	See (7).Also abrasion by vegetation in a wind	Treat cause as in (7) above, but first record as much of inscription as possible and photograph with the sun slanting across the face of the stone. Lodge record with local History Society and Society of Genealogists. As a general rule inscriptions and decorations in stone which are of interest because of their style and character

Problem	Due to	Solutions
		should not be recut. In such cases a small stainless steel plate with punched inscriptions may be fixed to the rear of the stone with water-proof epoxy resin adhesive. In exceptional cases where the character of the inscription and detailing of the monument is of such significance that it must be preserved, it should be carefully removed to a prepared location in a local museum and a facsimile monument erected in its place. Other inscriptions may be recut provided: • it is carried out by a competent letter cutter. • the precise character and mistakes of the original are meticulously retained. • the initials or symbol of the new cutter and the year are cut in an inconspicuous place.
9. Rusting of cast iron memorials and loss of inscriptions	Exposure to elements	Rusting of cast iron memorials such as those by ETNA and PATTON is superficial and presents no structural problems. However as the inscriptions are generally painted on, these are rapidly lost and should be recorded before all trace is gone. Failing this, documentary and oral sources should be tapped.
10. Rusting of wrought	Exposure to damp	Rusting surfaces on most

Problem	Due to	Solutions
iron memorials and surrounds		wrought iron is not seriously damaging unless it is flaking heavily. However where treatment is necessary the iron work should be dismantled, grit blasted back to a hard surface and rust inhibitor Alternatively the iron can be applied galvanized and painted.
11. Iron monuments broken in parts	Vandalism	Parts can be joined if necessary by pin or splint.
12. Monuments astray from their original location		Attempt to ascertain from documentary (cemetery surveys and registers) and oral sources (family) the correct location and reinstate. Where the original location cannot be found, place the monument in a group of strays.
13. Odd alignment of monuments	This is not a problem, such stones are usually early and date from a period before the cemetery was surveyed. As such they and their alignment are of particular interest and should be carefully preserved.	
14. Deterioration of leaded lettering on marble monuments	Frequently weathering of marble adjacent to letters	Can be re-leaded: may require extensive work.
15. Red staining on white marble from lead lettering	Chemical attack on lead, mainly in industrial areas.	Partial removal by scrubbing with water and soft bristle brushes.
16. Growth of mosses, lichens and fungus on monuments	Moisture and type of stone used. e.g. marble are liable to black mould and sandstones to lichen	These growths offer some physical protection to the stone and at the same time do slight damage. On balance they may be left unless they are unsightly or obscure the lettering. In such cases an organic poison should be applied and the growth allowed to dry and fall off over a period of time. Don't attempt to scrape it off.
17. Growth of disruptive	Lack of maintenance	Where sturdy shrub or tree

Problem	Due to	Solutions
vegetation on masonry		seedlings take root on monuments and surrounds they should be poisoned and allowed to die and decay. They should not be pulled out where it will damage the masonry.
18. Damage by cattle and horses to monuments	Inadequate fencing and gates	Ensure that fencing is cattle, horse and pig proof. Much damage can be done by cattle and horses leaning on monuments to scratch themselves. Sheep and goats if tethered and supervised can make useful lawn mowers provided that edible plants important to the cemetery landscape are not present.

Appendix 5

"Conservation of Gravestones" *Cemeteries – A Policy Paper* (2002) National Trust of Australia (NSW)

CONSERVATION OF GRAVESTONES

The visible parts of a cemetery consist essentially of monuments, generally of stone; the inscriptions upon them; and the setting and environment in which they stand.

Restoration and conservation of a cemetery thus includes the maintenance and conservation of the gravestones and inscriptions, as well as their actual surroundings. The following notes are divided into three sections corresponding to the three main classes of stone used in NSW cemeteries, viz, granite, marble and sandstone. Some of the comments can be carried over to rarer types of stone, such as slate, quartzite and basalt; but technical or professional advice should be sought where these stones are used.

1. GRANITE

Granite is a hard, crystalline, generally coarse—grained rock which takes a high polish that persists for many years. True granites are generally pink or grey, but monumental masons apply the term to other hard crystalline rocks, including so-called “black granites” which are generally rocks of gabbro type.

Most granites are almost immune to weathering. Some may gradually lose their polish. They will not generally be physically damaged by re-polishing, but:

1. It must be realized that a re—polished stone is no longer “the original”.

2. Loss of polish may indicate that the stone was poorly selected, and that cracks are actually developing within and between the constituent grains. In this case, physically handling the stone may cause serious damage.

3. In the case of “black granite”, loss of polish may be caused by solutions washed out of unsuitable jointing (especially Portland cement) above the polished surface. Replacement of such jointing with an inert filler is more important than re—polishing of the stone.

2. MARBLE

The term marble is applied by masons to any rock consisting dominantly of calcite (calcium carbonate), and includes limestones as well as true marbles. Calcite is white, but minor impurities can give marble colour —red, brown, grey or even black. All marble can be readily scratched with a knife or key, and the powder is always white.

Calcite is slightly soluble in rain—water, so marble gravestones always become rounded. The polished surface becomes rough because of uneven weathering of individual grains. To preserve the inscription in this situation, the carved lettering is filled with lead or a metal alloy, to preserve the sharpness of the writing. In time, however, the marble dissolves away from this lettering and the letters peel away from the stone.

This natural destruction is inevitable, but the process can be slowed to some degree by appropriate management.

The situations which lead to rapid erosion of marble are:

(a) exposure to exhaust fumes from cars and smoke from coal fires;

(b) growth of black moulds on the stone surface or green moulds just inside the stone;

(c) overhanging tree limbs, which may produce organic acids, and which act as traps for industrial fall—out which trickles onto the stone in conditions of misty rain or heavy dew.

Where marble is slightly more permeable than usual, problems can also result from sea spray blown inland, and from soil water ("rising damp") entering through the base of the stone by capillary action. In these cases the stone will show fretting, blistering or spalling, usually in a band a small distance above ground level.

3. SANDSTONE

Sandstones are rocks consisting of sand—sized particles (individually visible to the naked eye) held together by natural mineral cements. White or brown sandstones usually consist mainly of quartz grains; grey and greenish sandstones usually have grains composed of very fine grained aggregates of mineral material. Quartz sandstones may fret and shed individual grains, but the grains themselves are extremely resistant. Other sandstones, however, may weather or decay evenly, sometimes by surface grains dissolving away, in a similar manner to limestone.

Sandstone deteriorates in similar ways to limestone, but rising damp is relatively more important. The amount of salt and industrial fallout is also important: in Sydney region, cemeteries near the coast show considerably greater deterioration of sandstone monuments than those 10—20km inland.

The Sydney quartz sandstone sometimes shows fretting at the apex of decorations, or in shoulders near the top of the stone. This may result from leaching of cementing minerals, caused by rainwater percolating downwards. In this case it is advisable to remove any overhanging tree branches, but use of surface consolidants (resins, silicones etc.) is **not** recommended.

In other cases a thick (1—3cm) layer of stone may spall off the surface of the monument. Again, the mechanism is not fully understood, but injection of a hydrepoxy consolidant may sometimes be justified here on the grounds that the surface will fall away entirely if left untreated. In the present state of the art, however, such consolidants must be seen as a palliative, not a solution to the problem.

4. SOME COMMENTS ON "ARTIFICIAL" PRESERVATION OF SANDSTONE

Where sandstone items are of extreme value, the only way they can be indefinitely preserved is by placing them under cover, in a controlled atmosphere, isolated from the natural ground surface and their "natural" environment.

Developments overseas now enable stones to be completely saturated in hard—setting resins, but there are four objections to the process.

The first is that it is irreversible; the second that it alters the stone's appearance; the third that its long—term effects must still be suspect. Finally, is such action actually preservation, when the whole nature of the material has been changed, and its natural history (including deterioration) interrupted?

Similar problems arise in considering re-inscription of gravestones. To the extent that the words are important, they are best preserved by transcripts and photographs. Until the message is actually illegible, the stone is still "original"; re-inscription destroys this originality. In this case it may well be argued that relettering is a natural and traditional maintenance operation, and therefore more acceptable than use of consolidants. (There is a counter—argument that development and use of new maintenance methods is equally a traditional process in society!)

Technically, re-inscription does not always cause problems. The newer surface tends to weather faster than the older one, and this should be realized; but the "readable life" of the monument is almost invariably extended.

Different people and groups will react differently to the principles discussed here, and it is not suggested that there is a single "right" answer. Indeed, most people will conclude that the whole approach to conserving a gravestone will depend on the reason it is important, in the same way that techniques used will vary according to the nature of the monument.

5. REPAIRING DAMAGE OF VANDALS

One of the most important agents of tombstone deterioration is man. Vandals break stones and push monuments off their pedestals; and in some cases, still more damage is done by individuals attempting to set things right.

Two basic principles can be laid down. Firstly, never use Portland cement or plaster of Paris in repair work: both can react with stone, and cement can even spoil the polish of some "granites". Secondly, never use iron or steel dowels or clamps in repair work - they expand when they rust, and can crack even the strongest gravestone or pedestal.

Where a stone is cracked across, it is best repaired by use of bronze dowels set in lead or mason's putty. Some masons now use epoxy resin cements, both for setting the dowels and for sealing the crack. Note, however, that a special, waterproof grade must be used, or it will deteriorate with time: standard Araldite, for example, is quite unsuitable. There is a problem in use of resins in sandstone and marble, as it prevents moisture migration in the stone; it is therefore undesirable in situations

where the stone is subject to rising damp, especially if it shows any signs of natural weathering.

In some cases, financial constraints are such that the only alternative to abandoning a cemetery may be to set the stones individually in concrete pedestals. If this is done, it is essential that the cement mix be made as waterproof as possible, by using a commercial waterproofing agent; that the base of the stone be underlain by at least 5 cm of concrete; and that the upper surface of the cement block be well clear of the ground, and slope away from the stone to shed rainwater

Appendix 6

"Notes on the Conservation of Wooden Cemetery Features" *Cemeteries – A Policy Paper* (2002) National Trust of Australia (NSW)

NOTES ON THE CONSERVATION OF WOODEN CEMETERY FEATURES

The factors affecting the life of wood elements under the severe conditions likely to be experienced in cemeteries are:—

(1) mechanical damage and vandalism

(2) weathering

(3) decay

(4) insect attack

(5) fire.

MECHANICAL DAMAGE

Damage from vandalism, the operation of gravedigging equipment and mowers etc., is largely dependent on the degree of supervision possible which in most instances would be virtually negligible. Some timbers which might be chosen for durability against weathering and decay (e.g. Californian redwood, western red cedar) could be very soft and easily damaged.

WEATHERING

Wood is by nature absorbent of moisture and the surface layers readily take up dew and rain, with consequent expansion of the wood substance. Then the sun heats up the surface and the air humidity is reduced, resulting in contraction so the surface layers are continually buffeted by dimensional change. A multitude of fine surface cracks will often form and thus assist the erosion of the surface, a process speeded up by the softening of those surface layers by fungal organisms encouraged to develop by continuing dampness.

End grain is more susceptible to breakdown than side grain because of its much greater absorbency so the provision of some inhibitor of water entry (e.g. metal caps on the tops of fence posts, coatings of bitumen or paint on other end grain) can be helpful.

DECAY

Decay (or ‘rot’ as it is commonly called) is the breakdown of the constituents of wood by various fungi when the moisture content of the wood is favourable to their growth. Wood kept reasonably dry (say, below 20% moisture content), or when saturated with water, is usually safe from attack. An illustration of the conditions favouring attack can often be observed on old fence posts removed from the ground: most of the decay will be within the zone 300mm above to 300mm below the groundline in the zone where the moisture content of the wood will be in the range of say 20% to 50%.

The wood of the tree’s stem may be subdivided into sapwood and heartwood. The sapwood is the usually paler coloured wood just under the bark and often about 25 to 35mm wide. It is the conductor of the life processes of the tree and usually contains a lot

of sugars and starches which enhance its attractiveness to the decay organisms. The sapwood of all species is liable to decay readily.

Heartwood is non-living tissue; when it is converted from sapwood the connections between cells become blocked with materials with varying degrees of toxicity to fungi, depending on the tree species. The blocking of the cells also makes the heartwood much less absorbent of moisture.

While density is a useful guide to the comparative durability of species, there are many exceptions (e.g. cedar, redwood). The very dense Australian eucalypts such as ironbark, grey gum, tallowwood and white mahogany have excellent durability but the colder climate ash—type eucalypts are only of moderate durability.

The presence of sapwood is advantageous when preservatives are to be impregnated into the wood because of its greater permeability; otherwise, all sapwood should be removed from components which are to be exposed to the elements or ground contact.

It should be noted that it is very difficult to obtain penetration of preservatives into the heartwood of most species except under very specialised and costly conditions.

INSECT ATTACK

Termites and borers cause significant damage to wood but termites are by far the greater hazard, especially the subterranean termites which cause millions of dollars damage each year to buildings throughout Australia, except except for the colder districts of Tasmania and south—eastern Victoria. Because of their subterranean habits their presence often goes unnoticed until considerable damage has been done and only an outside shell of untouched wood remains. Wood in ground contact can be protected by treating the adjacent soil with solutions of the termiticides chlordane or dieldrin. Such work should be carried out by qualified operators, with care taken to ensure that children and animals are kept away from the treated soil.

The presence of borer holes on a piece of timber does not mean that it is under attack. Some borers, such as the common pin—hole borer die soon after the log is sawn up and reinfestation does not occur. The only type liable to cause some concern in cemetery wood components is the lyctid borer which attacks only the sapwood of some hardwoods; this attack usually occurs within the first year or two of service. Since only a small section of the component is likely to be affected the attack can usually be ignored; if extensive, replacement of the affected component is preferable to attempts at chemical treatment.

FIRE

If cemeteries are allowed to become overgrown with vegetation the resulting fire hazard presents a great risk to wood components.

Timber of large section area does not burn readily since its low thermal conductivity slows the penetration of heat. However, most wood components will be of small section and ignite readily.

Most commercial fire retardants are water soluble and thus only suitable for treating internal members.

For further information see

Bootle, K. 1983

Wood in Australia

McGraw Hill