

**The majority of information in this document comes directly from the publication *Historic South Australian Graves and Cemeteries Conservation Guidelines* publication (2004) prepared by McDougall and Vines which I have adapted for GMCT purposes. It also relies heavily on various publications produced by English Heritage as noted in the bibliography and those of the National Trust of Australia.** After reading many similar publications, I concluded that the SA work generally contained the most useful, clear and practical set of guidelines available and could be used as a general starting point in the absence of any dedicated conservation management plans for any of our cemeteries. It does not replace the need for individual conservation management plans, which are highly recommended but will provide guidance in the period leading up to the preparation of such plans. Where necessary, I have included advice from several sources so it should not be assumed that any of this work is necessarily quoted word for word from any particular source unless so noted. Any errors are mine and not the original authors of any works used.

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## **GUIDING PRINCIPLE:**

**“the aim of conservation is to slow down the natural rate of deterioration and remove and causes of instability, while preserving as much of the historical significance and original material as possible. Natural weathering is inevitable and often attractive, so the objective is not to restore to a pristine state. Restoration is usually only justified where inscriptions are of particular historical interest or where decay has totally disfigured the monument.”**

Bulletin of the Historic Environment Conservation (Issue 66 Summer 2011) *The Heritage of Death*, p.25.

## **CONSERVATION MANAGEMENT PLANS**

A Conservation Management Plan should be prepared before any major works are undertaken in an historic cemetery. This will then provide a framework for the priorities for conservation activities. Conservation within a cemetery will usually involve both the cultural and natural environment.

The aim of conservation in a cemetery is to maintain the area, its landscape and its monuments in good condition, while still retaining its character, evidence of age and all important built and natural elements. Conservation works should not be about improvement, but about retaining the significance of the cemetery itself. It is not intended to make monuments look new or ‘improve’ them, rather to ensure that they are maintained appropriately. It is important that the history of the cemetery be easily seen when visited. After works are completed in any particular area of a cemetery, it should still be able to be seen that the monuments reflect the period of time since burials first occurred in the

graveyard. The natural and imposed historic landscape should also be intact and understandable.

Cemeteries are an expression of community including the varied cultural beliefs that make up the community, as often cemeteries contain burials from different ethnic and religious groups with diverse burial customs. Policies should be sensitive to this and reflect the significance and expectations of various cultural groups.

The first step should be a complete inventory of the cemetery including all relative documentation, such as written and oral histories, a landscape design plan, various surveys, such as tree surveys and ecological surveys (if required), an architectural survey perhaps and any other information available. A photographic survey regularly updated can be invaluable for tracking any works and a standard inventory sheet will make recording the current situation clear and make information available to everyone, plus updating it as and when required will enable all works to be recorded.

All conservation works should be recorded with written descriptions and photographs, both before and after whenever possible. This documentation will ensure that any responsible cemetery authority in the future will have a clear record of past works.

It is sensible if only essential maintenance is undertaken until an informed decision about policy for the cemetery has been made, and before the site is disturbed in any way.

It is also good conservation practice to monitor the results of work in the cemetery, and to review and adapt the Conservation Management Plan as required. Some actions may not have the expected results.

## METHODOLOGY AND PROCESS

A Conservation Management Plan is essentially a two step process.

The first step is to accurately describe and record the cemetery and all its features to enable us to develop and understand the place and all its features, its significance, the resources available and the possible constraints. The second step is to work out what needs to be done and by whom.

The accepted methodology for preparing a Conservation Management Plan is included in the Burra Charter, prepared by Australia ICOMOS, ([www.icomos.org/australia/](http://www.icomos.org/australia/)) and the principles in the charter apply to conservation of the cultural values of cemeteries.

Detailed guidelines for the preparation of conservation plans are outlined in J S Kerr, **The Conservation Plan: A Guide to the Preparation of Conservation Plans for Places of European Cultural Significance**, National Trust NSW, 2001.

Guidance for identifying, protecting and managing the natural heritage values of a place is provided in **Protecting Natural Heritage – using the Australian Natural Heritage Charter** Second Edition 2002. This handbook provides an excellent manual for developing conservation policies which will retain and manage natural heritage values. It can be downloaded from the Australian Heritage Commission website - [www.ahc.gov.au/publications/pnh/](http://www.ahc.gov.au/publications/pnh/)

Reference to these documents will provide some idea of the scope of a Conservation Management Plan for a cemetery, which involves both cultural and natural heritage.

The logical and necessary steps in preparing and implementing a Conservation Management Plan are:

- Assess the cultural and natural heritage values of the cemetery. This will include assessing the physical condition, researching its history, contacting people or groups with an interest in the place, and finding out as much as possible. This is to ensure that there is enough information on which to base a statement of the natural and cultural heritage values of the place

- Develop a conservation policy for all elements of the cemetery. The policy must be based on the recognised heritage values of the place
- Determine conservation processes and management strategies to fulfil the policies. Processes and strategies should take into account the resources of the responsible managing authority
- Implement conservation strategies and management processes in accordance with the policy.

These steps are equally relevant to places of all sizes and complexity, and need to be agreed on and written down prior to any works being undertaken.

Where possible the preparation of a Conservation Management Plan should be undertaken with the assistance of an experienced person/s with appropriate professional qualifications. These will include historians, conservation and heritage consultants, landscape architects or environment consultants.

## APPROPRIATE CONSERVATION POLICIES FOR CEMETERIES

**Policies should aim to cover the following issues, where relevant:**

- Retention of the heritage values of the cemetery
- Conservation of the cemetery's historic physical elements:
  - Retention of all historic monuments
  - Relocation of monuments
  - Re-erection of broken fragments
  - Inscriptions
  - Plinth repairs and reconstruction
  - Kerbing and grave fencing
  - Grave furniture and ornaments
  - Maintenance of landscape features

### General maintenance and ongoing works

- Re-monumentation
- New inscriptions and memorials
- Reuse of graves
- Painting of structures
- Paths and drainage
- Seating, fencing and gates
- Water supply, standpipes and taps
- Irrigation where appropriate

### New works

- Columbaria and Lawned Areas
- Seating, fencing and gates
- Landscaping and paving
- New graves in existing historic areas
- Reinstatement of landscape features

### Interpretation and signage

- Design and location of signs
- Marking of graves and locations
- Publicity and information

### Ongoing responsibility and management

- Maintenance and works protocols
- Care of cemetery records
- Research and recording

## Conversion of cemeteries or areas within historic cemeteries

### CARE OF STRUCTURES AND MATERIALS

#### Conservation Actions

All structures within the cemetery area need to be considered. These include, but are not limited to, graves, monuments, buildings, crematoria, mausoleums, chapels, shelters, signage, plaques and plinths, kerbing and grave fences, grave furniture and ornaments and so on. The conservation of monumental masonry and graves within a cemetery is dependent on a range of issues including the materials of the monument, its current condition, the context and setting of the monument and general requirements for cleaning and repairs. Cleaning is not encouraged on most historic fabric unless the contaminant is causing damage.

**The guiding principle for conservation works in cemeteries should be that established by the Burra Charter:  
DO AS MUCH AS NECESSARY BUT AS LITTLE AS POSSIBLE.**

Conservation can be a range of actions from stabilisation through to complete repair. Once a headstone or other cemetery element is damaged, repair should take place as soon as possible to prevent further deterioration. Detailed instructions for care and maintenance should be developed in a Conservation Management Plan.

It is helpful if recommendations are prepared for individual significant graves, as well as general guidelines for conservation works.

Wherever possible, existing materials and methods of construction should be used. Only badly damaged elements should be replaced with new materials.

#### Personnel

Conservation work for monuments and graves varies in complexity and will often require the input of an experienced tradesperson or mason. However, basic maintenance and repairs can be carried out by volunteers working carefully to sensible instructions, with the aim of retaining original materials and appearance. Training should be given and insurance cover should be in place before any volunteer labour is used.

Removal of elements: Many elements are often removed from graves, usually because of deterioration or in the interests of 'tidiness'. All elements of a grave are significant and none should be removed. This includes headstones, footstones, fences and railings and any other original elements such as vases or flower holders. Material should be kept on site wherever possible and never removed and simply stored.

#### Staging of works

It is recommended that a staged program of general maintenance for existing graves, based on the assessments provided as part of a survey of the cemetery be developed and implemented as time, money and labour are available. This will be particularly useful if volunteer labour is involved as tasks can be assigned as willing workers become available.

Information on the requirements of the graves and methods of care and maintenance could also be passed on to families who regularly tend their graves currently.

### COMMON MATERIALS IN CEMETERIES

#### Masonry

##### Marble:

Marble can be from a variety of sources and can be of many colours and fineness. Marble is easily stained and can attract discolouration from air born particles and lichen.

##### Sandstone:

Sandstone was also used for headstones. However, most sandstone in cemeteries is used for kerbing or railing blocks or as plinths for marble headstones. Sandstone headstones are susceptible to weathering and erosion and de lamination.

## Granite:

More recent graves use black or pink granite for headstones, and this is highly polished. Some earlier monumentation in the form of columns and obelisks is in grey granite.

## Slate:

The earliest headstones in most cemeteries, particularly near quarry areas were cut from slate. The early slate headstones generally show serious delamination and deterioration, often where rising damp is an issue.

## Concrete:

Concrete is used in a range of locations, usually as a base for kerbing and as the top ledger of a grave. It has more recently been used to repair damaged headstones inappropriately.

## Metals:

Most metal work in cemeteries is either cast or wrought iron and is used for grave railings and fences. In some early cemeteries there are some ornate cast iron crosses still in existence and some cemeteries retain plate iron headstones. Some grave fences are constructed in rolled ribbon steel and date from the early 1900s.

Lead is used for applied lettering for inscriptions and also as a filler to hold headstones in plinths.

Other metal materials may include zinc or bronze sections to monuments or fences.

## Timber:

Timber is sometimes found in cemeteries as fences around graves or as simple wooden grave markers, usually crosses. Due to the variety of causes of deterioration of timber (moisture, rot, termites, fire, accidental impact and vandalism) little timber monumentation remains intact in historic cemeteries.

## What to do first: basic maintenance and initial conservation measures for grave sites

There are some things that can be done before a Cemetery Conservation Management Plan is prepared. These basic tasks will ensure that no further deterioration occurs and will keep things in place until more complicated works can be arranged.

There are four main practical treatment types for memorials and monuments: emergency intervention, repair, cleaning and consolidation and surface treatments.

Many conservation works require the use of a specialised contractor or conservator. Such advice should always be sought before beginning any works other than basic works. *When in doubt, record and leave alone until advice is received.*

Remember, deterioration and the effects of weathering are an inevitable part of the history of a monument, as is the natural growth of trees and shrubs.

## Leaning or dangerous monuments:

Monuments should not be manually stress-tested as this will only encourage further deterioration. Careful monitoring over time will allow for early intervention and the application of normal risk assessment practises will ensure a safe site at all times.

Dangerous or strongly leaning monuments of headstones need to be fenced to ensure visitor and staff safety until they can be made safe. As a last resort, headstones or monuments can be laid on the grave site, face up on a bed of sloping gravel but this is a temporary measure only. Laying unsafe monuments flat is seldom necessary except as a temporary measure in response to urgent safety concerns.

## Location and collection of fragments:

Pieces of any damaged headstone or part of a monument such as lettering, tiles and other fragments should be collected together and kept temporarily at the relevant gravesite until appropriate repairs can be done. If there is any risk of further damage on site, the fragments should be securely stored, clearly labelled and their location identified for later reinstatement.

## Temporary placement of broken monuments:

Broken pieces of headstones should be collected and laid on the grave with the inscription upwards. These pieces should be set on a sloping bed of coarse aggregate to allow water run-off, and also allow the inscription to be read by visitors. More permanent conservation should be carried out as soon as possible as this is a temporary solution only.

## Basic weeding:

Weeds and invasive vegetation should be removed carefully by hand, poisoned with a herbicide which does not damage stonework, carefully trimmed or mowed or a combination of these methods. Any specifically planted grave plants, such as bulbs or roses, should be carefully protected and retained. Current practise limits the use of poisonous substances, such as herbicides, to a minimum and prefers the use of hand shears and secateurs or any hand tools for weed and shrub removal.

## Excavation to expose plinths or kerbs:

Any soil or debris which has built up around the base of the grave or its surrounds should be carefully removed using hand tools, to reduce sources of damp and deterioration. Ground levels should slope gently away from the base of graves. Check any removed soil for grave fragments such as lead lettering.

### Chocking beneath unsupported plinths and kerbs:

The gaps beneath unsupported masonry of headstones and grave surrounds should be chocked with coarse stone and gravel bound with a stiff mortar made from low alkali cement. This will provide some resistance to further erosion, until major conservation works can be done

### Filling to counteract erosion:

If erosion has occurred the ground surface should be built up with an outward sloping surface to direct water run-off away from the base of graves and prevent further erosion and undercutting.

## General cleaning of headstones

(These notes are based on recommendations made by David Young, Heritage Consultant and Conservation Scientist, for conservation at West Terrace Cemetery in 1997.)

The value of cleaning soiling from headstones should be carefully weighed against the loss of patina and character that is an important part of an historic cemetery. *When in doubt – don't.*

### The usual causes of soiling of headstones are:

- Dirt, dust and grime from urban pollution
- Soot or smoke staining
- Organic growth (algae, fungi, lichens, mosses)
- Other stains from metals, oils or other materials
- Efflorescence from soluble salts in the stone.

The decision to clean headstones must balance the 'new' appearance against the necessary care of the headstone. No headstone which is particularly brittle or fragile should be cleaned. If the stone is cracking, splitting, flaking or scaling, or has a grainy surface, do not attempt to clean it. The process should involve initial brushing with a soft bristle brush to remove loose, dry material. This may be sufficient to dislodge dust and loose dirt or efflorescence. If further cleaning is required the next step should be generous wetting with clean water and scrubbing with a soft bristle brush. No wire brushes or metal tools should be used.

Cleaning should start from the base up to avoid streaking of dirt over uncleaned sections, and the whole of the headstone should be cleaned in the same way.

A non-ionic detergent or pH neutral soap may be useful in some cases of heavy soiling, but tests should always be undertaken first, to ensure that no discolouration or filming results from washing with a detergent solution. *Photo-flo*, non-ionic detergent, a Kodak product used by photographers as a degreasing agent is excellent for washing headstones, and is available from photographic supply shops. An acceptable alternative is dishwashing detergent made for sensitive skin, the mildest formula available. Either form of detergent should be made up to a very weak solution of around 10ml (one teaspoon) per 10 litre (bucket of water).

Household bleach should not be used to whiten marble or remove moss and lichen, and no other acidic or corrosive chemical cleaners should be used. Stone headstones, particularly white marble ones, often have biological growth on them. Where the fungi, lichen, moss or mould does not obscure information, this will generally cause little damage and cleaning may not be necessary. If the headstone is covered in lichen or moss which is causing deterioration of the stone and cannot be removed by brushing, an appropriate biocide can be used.

### Biological growth should be removed when:

- The monument is greatly disfigured by lichen or moss growth
- The monument is being damaged by the growth, if sandstone is deteriorating or lead lettering is being dislodged
- Inscriptions are obscured and made unreadable
- The growth is across areas which need conservation repairs such as repointing Remember: it is important to test any cleaning process on a small, hidden portion of the stone first.
- No wire brushes or metal tools should be used.
- Do not sandblast or pressure clean a gravestone.

### IF IN DOUBT, ASK.

## Cleaning headstones and monuments

It is possible to remove some long term dirt and organic growth on headstones if it is damaging the stone or inscriptions. Remember though, that old headstones do not have to be shiny and new-looking after cleaning. They should retain some evidence of their age and character. Overall, cleaning is not encouraged on historic headstone or monuments. If necessary the following approach is considered the best:

- Carefully check the condition of the headstone or monument. If the stone is cracking, splitting, flaking or scaling, or has a grainy surface, do not attempt to clean it. If it is subject to rising damp and sounds hollow when tapped, it should not be cleaned and should be handled carefully
- Decide what the soiling is that you want to remove, and indeed whether it should be removed at all. The usual causes are:
  - dirt, dust and grime from urban pollution
  - soot or smoke staining
  - organic growth (algae, fungi, lichens, mosses)
  - other stains from metals, oils or other materials
  - efflorescence from soluble salts in the stone

- First brush gently, using only as much force as the condition of the headstone would indicate. This may be enough
- Start any cleaning by using the most gentle method, soaking the headstone with clean water to soften the dirt and grime
- Continue rinsing with clean water and gently brush with a soft bristle brush (natural or nylon bristles) using a circular motion. Organic growth can be gently prised off with wooden skewers or an icy pole stick. Do not use metal scrapers
- Always start at the bottom and clean upwards to avoid any streaking or staining downwards. Rinse regularly while cleaning and keep brushes clean
- If after patient work this does not move the soiling sufficiently, choose an appropriate material to assist with the cleaning. Start with a weak solution of non-ionic detergent like *Kodak Photo-Flo* (from photographic suppliers), or use the mildest dishwashing liquid available. Test first to make sure no film or residue is left on the stone
- Test before you apply any cleaning materials. Do this in an inconspicuous small area on the headstone. Always thoroughly wet the monument with water before applying any chemical cleaning solutions. This prevents excessive penetration into the stone and softens the stains or soiling
- Finally, rinse thoroughly with clean water to remove all residues which might cause blotches or further staining. Cleaning solutions must not dry on a monument
- If you need to use stronger cleaning methods get some expert advice. Make sure you use the most effective cleaning method for each case. One method won't solve all problems, and could damage stonework further.

**REMEMBER, IF YOU ARE IN ANY DOUBT, GET SOME EXPERT ASSISTANCE.**

## CONSERVATION AND REPAIR OF ELEMENTS

### Headstones

Leaning and falling monuments: Headstones or other monuments on graves often show some degree of tilting or leaning. This is not a problem unless the stone is in danger of falling due to its own weight, or the angle of leaning invites a push. It is appropriate to leave headstones which are only tilting marginally. The cause of tilting includes root growth, collapse of underground structures, variations in soils or clays, or inadequate drainage.

If straightening is required, a secure base should be created using compacted fill of firmly tamped soil, sand and gravel which will enable adequate drainage.

In all cases, it is essential that the ground surface be adjusted to slope away from the monument. Headstones should be monitored to determine whether they are tilting further and need support.

The same approach should be used to straighten headstones still firmly set in sandstone plinths. Any repairs to plinths should be carefully undertaken in a lime mortar (one part lime putty to two parts fine matching sand). Repairs to sandstone should use sand in the mortar which matches the stone in grain size and colour as closely as possible.

### Disassembled monuments (not broken):

Monuments which have been knocked or fallen but not broken should be reassembled carefully and made stable. This may require dowels or carefully sited mortar or adhesives of appropriate composition. Ensure the base or plinth is stable before resetting headstones and other elements.

### Broken Monuments or Headstones:

If headstones, or monuments such as crosses, have broken above their base or plinth, these should be repaired using threaded stainless steel or nonferrous dowels and pins. Adhesives should be used to hold the sections and dowels in place. Epoxy resins pre-mixed with fillers are most effective. This type of work should be done by an experienced conservator or mason.

Alternatively, the headstone can be repaired using a back plate, smaller than the headstone but of the same material and thickness. This can be either adhered with acrylic or epoxy glue, or fixed with bronze or stainless steel pins, making sure the pins are shorter than the thickness of the two pieces to be joined. Other methods include attaching a metal strip on the back.

If the repaired headstone has no base and cannot be re-erected, it should be laid, but not stuck, on an appropriate sloping concrete or compacted gravel bed constructed in the grave top. It is important to keep it in the correct plot.

### Cracking masonry:

Masonry will crack due to pressure from misalignment or expanding metal dowels or fixings. Straighten the masonry element or remove any rusting metal and replace it with new fixings isolated from stone work by lead lining or fillers. Ensure any water run-off is directed away from the connection points of stone and metal fixings.

### Spalling, fretting and delamination of stone monuments:

This type of deterioration is almost always caused by rising damp or accumulation of corrosive salts or rainwater. Drainage and run-off must be improved and flaking stone removed or, where advisable, re-adhered with acrylic resin or stone consolidant. Expert advice is needed for this process

### Inscriptions:

Carved inscriptions should be generally brushed back and cleaned. Re-blackening could be undertaken if required, using lamp black and linseed oil. Recarving of inscriptions is not generally recommended; however, if the original inscription is illegible, re-inscription could be undertaken by a monumental letter cutter.

The work should be guided by a clear and detailed photograph taken, if possible, well before the work becomes necessary. It is also necessary to add a footnote or inconspicuous plaque which notes the fact that re-inscription of the original has taken place, and the year noted. Alternatively a plaque fixed to an inconspicuous part of the grave site can note the original inscription which had been transcribed.

### Loss of lead lettering:

Any lead letters which have fallen out of the headstone can often be found close by on the ground. These should be retained and carefully replaced in the appropriate position. Replacement of missing lead lettering with new letters requires expert assistance, and may not be necessary if the inscription can still be clearly read.

### Fretting of inscriptions on stone monuments:

This is due to natural weathering, delamination of slate or rising damp. Ensure that all sources of moisture penetration are reduced or removed completely. Record any deteriorated inscriptions before they are lost entirely.

### Adding new lettering:

No new lettering should be added to original inscriptions. Any new inscriptions for new interment in family graves should be separated from the original and clearly marked as new with a current date.

## Plinths and kerbing

Cracked or broken plinths: Broken plinths may also be dowelled together or repaired with lime mortar, following the procedure recommended for headstones.

### Replacing Plinths:

It is possible to replace badly damaged and deteriorated plinths with appropriately cast concrete plinths and reset headstones into them, ensuring separation of the stone from the concrete by the use of fillers. This will ensure the salts in the cement do not damage the stone.

### Movement of kerbing:

Any sandstone, slate or marble kerbing which exists should be carefully straightened if required, and it should be ensured that the ground level is sufficiently low as to not cause pressure on the kerbing or the blocks which hold it. A mixture of sand, gravel and soil can be used to create a secure base under areas of kerbing and surrounds which have moved out of original alignment. Any simple, clean cracks in the masonry kerbing should be repaired with a lime mortar of one part lime putty to two parts fine washed matching sand.

## Grave floors and ledger slabs

### Concrete and aggregate floors:

Often early graves are covered with concrete slabs, creating a floor which is often covered in gravel or aggregate.

Occasionally, the concrete floors are tiled, usually with plain white tiles. Concrete floors often fracture and frequently cave in due to subsidence below. Where possible pieces of the concrete floor should be raised to level by packing earth or gravel beneath. This means they can be retained in situ and not replaced.

However, if the floor is badly broken, it will need to be replaced and the new floor should be at the same level as the original. Once all elements of the grave topping or tiling have been removed, the grave should be filled with earth and compacted gently.

A new level floor of 40-50mm depth of concrete should be installed with an allowance for expansion around the edges if kerbing is in place. All elements of the existing grave including kerbing and headstones should be protected during the reinstatement or replacement of the concrete floor.

Ensure that the new concrete floor drains appropriately and water does not collect on the grave top. Low alkali type cement should be used for the concrete. Once the top has cured the aggregate toppings or tiling should be replaced.

### Tile repairs:

Repairing tiled grave tops or ledgers is difficult and should be undertaken with care. Accurate matching should be the aim, but this may be difficult. Each case will need to be assessed on its merits and specialist advice should be sought if necessary.

## Grave floor/topping:

Where grave floors have subsided or broken, the grave itself should be filled with compacted material (gravel and filling) and used to support the sections of the grave top which remain. If a new grave top must be laid, this should be undertaken very carefully after filling of the grave site.

The fill used to even up the surface must not allow water to pond beneath the surface and the existing surface should be reshaped to enable water to drain away. The appropriate topping, usually white or grey gravel, should be reused. If there is evidence of other topping, this should be matched.

Extra topping can be added to level off grave floors which have sagged a little, but not collapsed. Drainage holes through the kerbing or grave surrounds should be cleared and made workable.

## Ledger Slabs:

Ledger slabs sit on top of grave toppings, often resting on the kerbing. If these have moved and are in one piece, they can be gently lifted and replaced in the correct position. Kerbing may need to be reinstated to its original levels to support ledger slabs securely. It is recommended that any packing should be solid and inert. Timber is not appropriate as it swells and shrinks with moisture changes.

## Repointing of joints

All pointing of joints between stones in the monument must also be made sound to prevent water penetration. Any jointing should be as fine as possible and match any existing on the grave or one similar in materials and design.

An appropriate mortar mix for repointing is a relatively dry mortar mix of one part lime putty: to two parts fine washed sand. All mortar for fine stonework or rubble stonework should match the existing wherever possible in colour and texture. When any repointing is done all excess mortar should be immediately removed from the face of the stonework, and not smeared across the stones.

## Metal grave surrounds and fences

### Rusting of cast and wrought iron memorials and grave surrounds:

Many railings and fences around nineteenth and early twentieth century graves are constructed in cast iron or wrought iron, often unpainted.

This ironwork needs protection against corrosion, and in most cases a routine application of fish oil (Wattyl Killrust Fishoilene in a 50:50 mix with mineral turps to help penetration into joints) or other metal preservative will inhibit further rust.

The railings should be gently brushed back with a bristle brush to remove loose, flaking iron scales prior to the application of any preservative surface. This process should be undertaken in dry warm weather. It is not recommended that the grave surrounds be painted if they are currently unpainted.

### Dislodged iron railing:

An iron railing or fence should only be disassembled if the blocks on which it stands require replacement. Loose sections can be strengthened by neatly tying with soft galvanised wire.

### Broken cast iron railing:

It is possible but complex to recast broken sections of cast iron railings and expert advice should be sought if this is required. Local foundries can assist in the casting of new elements. Callington Cast Iron is one such foundry, others are listed in directories.

## Wooden monuments

Sources of moisture should be eliminated near wooden monuments and structures. Fungal or insect attack should be assessed by an expert and treatment which is the least damaging to the element be determined.

Cleaning of timber monuments should be done as gently as possible and no pressurised systems should be used. Any repairs should be undertaken in well-seasoned timber of the same species or an appropriate match. Seek advice from a good carpenter, builder or conservation architect as to the correct timber. New work should be identified with a stamp, carving or plate with the date of the new work.

## Painting and protective coatings on stone and iron

No protective coatings should be used on old stone or masonry. If any original paint can still be seen on the monumentation this should not be removed with cleaning as it is evidence of original finishes.

To retain the early character of an historic cemetery it is probably better not to repaint any sections including old iron work. This can be conserved as recommended in the section under metals in these guidelines.

## Removal of graffiti

Graffiti should be removed as soon as possible, both to discourage further graffiti and to minimise damage to headstones and other historic materials.

Graffiti removal is technically complex and should be undertaken by skilled persons using appropriate techniques and materials. Generally, solvents can cause inks and dyes to spread further into porous stonework, while poultices draw the staining material out. Occupational Health and Safety requirements must be met when working with toxic chemicals.

## Drainage and water run-off

Graves can be easily undermined by erosion and headstones damaged by moisture penetration and rising damp.

Often ground levels build up against early headstones and grave surrounds. Drainage away from grave sites and bases of monuments is essential to prevent any water damage, and earth and other debris should be cleared away from the base of graves. Effective site drainage systems should be in place in cemeteries to ensure moisture damage and erosion does not occur. These could be either simple swales and surface drains, or more complicated full storm water removal systems. The responsible authority for a cemetery should ensure that effective drainage is in place, but basic maintenance at each grave site can direct water away from graves and assist in keeping headstones dry.

## Care of planting and landscape

Most cemeteries landscapes were carefully designed to create sites fit for the dead and to evoke meaning and sacredness. Planting was often designed to enhance the symbolism of the landscape with various species selected for their symbolic meanings.

Most GMCT cemeteries have the ordered, grid-like layouts common in mid-19th century cemeteries. This reflects the period's use of English-based cemetery designs as people moved away from churchyard burial sites - which had become overcrowded - and began to establish large dedicated cemeteries away from churches.

Perimeter fencing and entrance gates form essential elements of these designs. The typical cemetery layout of roads and paths creates an "address" for each grave, and a sense of control for the plot owner. Even drainage designs are important. As most were Greenfield sites many now retain remnant habitats or areas of native vegetation which should be protected. Such elements of cemetery landscapes are important parts of the heritage fabric of the place. Other elements, such as self-seeded trees and shrubs, are destructive and should be controlled to avoid damage to significant structures and grave sites. The landscape and context of the cemetery as a whole should be carefully analysed, preferably as part of a Conservation Management Plan, before any work is planned.

## Conservation of significant landscape elements

### Layout:

The layout of the cemetery, whether a simple grid in a small cemetery or a more elaborate plan with focal points, built structures, avenues and path systems, makes an important contribution to the character of the cemetery.

Always aim to retain the original features of the layout where possible. A plan recording the landscape elements is a useful reference document. If any changes are required they should be made with minimal impact on the overall layout so as not to compromise the original character.

### Existing plantings:

Trees form an important part of the character of a cemetery. They help define the structure, provide shade and provide habitat for native fauna.

Both native and exotic trees were traditionally planted, usually evergreen. If trees need to be replaced they should be of the same species as the original, especially where they form avenues.

Where trees are indigenous to the locality and their continued use is appropriate, it is preferable to use local seed sources.

Some traditional species are no longer considered appropriate for use in cemeteries. They may have invasive root systems that damage grave sites (e.g. *Casuarina glauca* - swamp sheoak) or may have seeds which self-sow (e.g. *Pinus halepensis* - Aleppo pine, *Olea europaea* - Olive and *Fraxinus* spp - ash) which also cause damage to monuments or compete with other desirable plants.

Due to the seasonal nature of plants, a 12-month period of observation and recording should be undertaken before any work is carried out on plantings.

Spraying or mowing could damage rare plants which contribute to the cultural as well as natural significance of the cemetery. These plants may also be a valuable botanical resource.

### Existing native vegetation:

Native vegetation is often found associated with cemeteries and makes a significant contribution to both the natural and cultural values of the place. They may contain examples of original ecosystems, include specimens of rare or threatened plants, and provide habitat for native animal life.

It is important to conserve these areas by preparing a conservation policy and conservation plan to ensure appropriate management techniques are used. As with introduced plantings, observation, recording and preparation of the conservation policy is required before any actions are undertaken.

Particular care is required with herbicide spray which should be avoided within these areas.

## APPENDIX 1

### Tools and materials for gravestone cleaning products

#### Marble and limestone

- Water
- Non-ionic detergent (Photo-Flo, Kodak product)
- Dishwashing detergent for sensitive skin
- Household ammonia (requires water hose for rinsing and Hydrion paper test strips for pH testing)
- Calcium Hypochlorite (HTH) for biological growth retardation (requires water hose for rinsing and Hydrion paper test strips for pH testing)

#### Slate and sandstone

- Water
- Non-ionic detergent (Foto-Flo-Kodak product)

#### General cleaning

- Good water supply
- Non-ionic detergent (Photo-Flo-Kodak product) - 25ml per 20 litres
- Ammonia - 250ml per 5 litres (for marble only)
- Calcium Hypochlorite (granular) - 25g per 5 litres
- Assortment of brushes (NOT WIRE) of varying stiffness
- Toothbrushes (firm), sponges
- Scrapers - craft sticks, plastic scrapers, wooden skewers.

#### Poultice softening

- Kaolin/porcelain clay (dry)
- Glycerine (use 50/50 mixture)
- Water
- Glad Wrap and heavy plastic for wrapping
- Tape/string to secure plastic
- Scrapers - plastic and wood

#### DO NOT USE

- Wire brushes, metal instruments, abrasive pads (Scotchbrite, Brillo, Steel wool)
- Acid or acidic cleaners (especially on marble or limestone) or liquid chlorine (should only be used by conservators with property training on non-calcareous stone)
- Household cleaners: soap (Lux), strong detergents (liquid or powder), Borax, Chlorox, TSP, Calgon, Ajax, Jif, Gumption (or any other abrasive cleaner)

#### **Remember:**

*The use of improper cleaning materials and practices can cause serious and irreparable damage to gravestones. Make sure the stone is stable before attempting to clean it; no flaking, delaminating or other deterioration.*

## APPENDIX 2

### Plants suitable for cemeteries

The following is adapted from:

Robert Nicol, **Cemeteries of South Australia**, Department of Environment and Planning, 1988, Celestina Sagazio ed. **Conserving Our Cemeteries**, National Trust of Australia (Victoria), Melbourne.

An enormous variety of soil and climatic conditions may be found when dealing with cemeteries. Local knowledge will therefore be an important element of any planting scheme. However, within that limitation it is possible to produce a general list of plants which can be found in cemeteries or for the use of which evidence is available. A general caution must be included that some plant species adapt well to particular soils and climates and may themselves become a pest.

*# denotes potential weed species*

#### Trees (natives)

Native plants are normally found as natural stands or in perimeter plantations, but also at times as specimen trees).

- Acacia various species Wattles
- Acacia ulicifolia Juniper Wattle, Prickly Moses
- Acmena smithii Lilly Pilly
- Agonis flexuosa Willow Myrtle, Peppermint Tree
- Allocasuarina verticillata Drooping She Oak, Mountain Oak
- Araucaria bidwillii Bunya Bunya Pine
- Araucaria cunninghamii Hoop Pine
- Araucaria heterophylla Norfolk Island Pine
- Brachychiton populneus Kurrajong
- Callistemon citrinus Lemon Scented Bottlebrush
- Callitris gracilis syn. preissii Rottneest Island Pine, Slender Cypress Pine
- Casuarina distyla She Oak
- Eucalyptus bicostata Eurabbie, Southern Blue Gum
- Eucalyptus camaldulensis River Red Gum
- Eucalyptus ficifolia Scarlet Flowering Gum
- Eucalyptus leucoxydon Yellow Gum
- Eucalyptus nicholii Peppermint Gum
- Eucalyptus rossii Scribbly Gum
- Eucalyptus rugosa Kingscote Mallee
- Languanaria pattersonii Norfolk Island Hibiscus, Pyramid Tree
- Tristaniopsis laurina Weeping Box, Water Gum

#### Exotics

- Abies nordmanniana
- Abies pinsapo
- Arbutus unedo
- Calocedrus decurrens
- Cedrus atlantica
- Chamaecyparis funebris
- Chamaecyparis lawsoniana
- Cinnamomum camphora
- Cupressus glabra
- Cupressus lusitanica
- Cupressus macrocarpa
- Cupressus sempervirens
- Ficus macrophylla
- Morus alba
- Pinus canariensis

#### *# Pinus halepensis*

- Pinus pinea

#### *# Pinus radiata*

- Prunus laurocerasus
- Prunus lusitanica
- Quercus ilex
- Quercus robur

#### *## Salix babylonica*

#### *# Schinus molle*

- Taxus baccata
- Ulmus procera

#### Trees - palms

- Phoenix canariensis
- Phoenix reclinata
- Washingtonia filifera

#### Trees - shrubs (natives)

- Acacia var. sp.

#### *\*Acacia iteaphylla*

#### *\*Westringia fruticosa*

## Trees – shrubs (exotics)

- Buxus sempervirens
  - Carissa spectabilis
  - Coleonema album
  - Caucasian Fir
  - Spanish Fir
  - Irish Strawberry Tree
  - Californian Incense Cedar
  - Atlas Cedar
  - Chinese Mourning Cypress
  - Lawson Cypress
  - Camphor Laurel
  - Arizona Cypress
  - Mexican Cypress, Cedar of Goa
  - Monterey Cypress
  - Italian Cypress, Mediterranean Cypress
  - Moreton Bay Fig
  - White Mulberry
  - Canary Island Pine
  - Aleppo Pine
  - Italian Stone Pine
  - Radiata Pine, Monterey Pine
  - Cherry Laurel
  - Portuguese Laurel
  - Holm Oak, Holly Oak
  - English Oak
  - Weeping Willow
  - Peppercorn Tree
  - Yew
  - English Elm
  - Canary Island Date Palm
  - Senegal Date Palm
  - Fan Palm
  - Flinders Range Wattle
  - Native Rosemary
  - English Box
  - Winter Sweet
  - White Diosma
- # Coleonema pulchrum**
- Cotoneaster serotinus
  - Pink Diosma
  - Cotoneaster
  - Elaeagnus angustifolia
  - Euonymus japonica
  - Hebe sp.
  - Lavandula angustifolia
  - Lavandula dentata
  - Russian Olive
  - Evergreen Spindle Tree
  - Veronica
  - English Lavender
  - French Lavender
- ## Lavandula spicata**
- Ligustrum ovalifolium
  - Ligustrum vulgare
  - Photinia glabra
  - Photinia serrulata
  - Lavender
  - Golden Privet
  - Glossy Privet
  - Photinia
  - Chinese Hawthorn
  - Rhamnus indica
  - Rosmarinus officinalis
  - Tecomaria capensis
  - Viburnum tinus
  - Indian Hawthorn
  - Rosemary
  - Tecoma, Fire Flower
  - Laurustinus

## Roses

A variety of nineteenth and early twentieth century roses are now available and a selection of those appropriate for cemeteries is listed below. From a maintenance perspective, either standard or miniature roses are preferred.

### Climbing Roses

- White - Cherokee Rose (*Rosa laevigata*)
- Félicoté et Perpétue
- Rambling Rector
- Silver Moon
- Cream - Albéric Barbier
- Devoniensis
- Fortuniana
- Mme Alfred Carrière
- Yellow Banksia Rose (*Rosa banksiae*)
- Gloire de Dijon
- Souvenir de Mme Boulet
- Pink American pillar
- Cécile Brünner
- Souvenir de la Malmaison
- Red Crimson rambler
- Dortmund
- Ramona

### Shrub Roses

White  
Cream/Yellow  
Pink  
Mauve  
Red

### Climbers and Groundcovers

*Hedera helix*  
*Lonicera fragrantissima*  
*Stachys officinalis*  
*Pelargonium* sp.  
#*Vinca minor*  
#*Vinca major*  
*Wisteria sinensis*

## Bulbs, Tubers etc

### #*Agapanthus africanus*

- *Amaryllus belladonna*
- *Freesia refracta*
- *Hippeastrum puniceum*
- *Iris* sp.

### ## *Watsonia* sp.

- Alba Semi Plena
- Frau Karl Druschki
- Mme Hardy
- Desprez à Fleur Jaune
- Gabriel Noyelle
- Gardenia
- *Centifolia Muscosa*
- La France
- May Queen
- Mme. Abel Chatenay
- Mme. Pierre Oger
- Mme Scipion Cochet
- Charles de Mills
- Magnifica
- Karl Herbst
- Prince Camille de Rohan
- Ivy
- Winter Honeysuckle
- Lamb's Ears
- Pelargoniums and geraniums were popular grave plants
- Periwinkle
- Periwinkle
- Chinese wisteria

### #*Agapanthus*

- *Belladonna*
- *Freesia*
- *Hippeastrum*, Barbados Lilly
- *Iris*

### #*Watsonia*

*A wide variety of annual and small perennial plants and flowers are also suitable for cemetery planting, but it must be noted that the majority require consistent maintenance if they are to add to, rather than detract from, the appearance of the site.*

## APPENDIX 3

### Repair broken gravestone

- Material and thickness of back plates to match existing headstone.
- Drill through back plates into headstone 10mm diameter.

#### **DO NOT BREAK THROUGH FRONT FACE.**

- Fix using 8mm diameter stainless steel threaded rod and HILTI HIT C100 adhesive.
- Back plate to be the same material as the headstone.
- Butter thin layer of HILTI HIT headstone C100 over faces of breaks.
- Tool off excessive adhesive. Do not attempt to fill voids and base with pins. Fix headstone and chipped edges with adhesive.
- On completion no epoxy shall be visible.
- Butter thin layer (epoxy) of HILTI HIT C100 over face of break.
- Tool off excessive adhesive.

#### **DO NOT ATTEMPT TO FILL CHIPPED EDGES ETC. WITH ADHESIVE.**

- On completion of repair no epoxy should be visible.

### Typical tablet repair detail

- Material and thickness of back plates to match existing headstone.
- Drill through back plates into headstone 10mm diameter.

#### **DO NOT BREAK THROUGH FRONT FACE.**

- Fix using 8mm diameter stainless steel threaded rod and HILTI HIT C100 adhesive.
- Back plate to be the same material as the headstone.
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- On completion no epoxy shall be visible.
- Butter thin layer (epoxy) of HILTI HIT C100 over face of break.
- Tool off excessive adhesive.

#### **DO NOT ATTEMPT TO FILL CHIPPED EDGES ETC. WITH ADHESIVE.**

- On completion of repair no epoxy should be visible.

### Typical tablet repair detail

- Pinning for Face Joints
- Use acrylic resin for marble headstones, grind marble and mix with acrylic to make self-coloured filler.
- Mask joints to ensure no epoxy is visible.
- Stainless steel fixing pins.

### Typical cross repair details

- 8mm diameter stainless steel rod x 150mm long.
- Drill 10mm diameter hole x 80 deep into each piece.
- Fill holes with HILTI HIT C100 prior to inserting of threaded rod.

### Fixing pin detail (typical)

- Setting boards approx. 900 long (fabricated from timber) clamp tablet.

#### **USE SETTING JIG TO ENSURE ACCURATE RE-ALIGNMENT OF FACES AND EDGES**

- Clean up excess adhesives as soon as possible.

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