

APPENDIX 3

TABULATED GUIDE TO THE CONSERVATION OF MONUMENTS

The following notes are largely based on guidance provided in the National Trust of Australia's (NSW) Guidelines for Cemetery Conservation (Sagazio ed, and which guide is also available online at www.nationaltrust.org.au/cemsappb.html) with amendments based on guidance from Ian Bowman, Conservation Architect and from observations of specific issues at Linwood Cemetery. They 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 Repair, Stabilisation, Reconstruction or Adaptation work.

Problem	Due to	Solutions	Additional Comment and reference to Implementation Examples, Appendix 1
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.	Cross Reference Photos 2, 4
	water erosion	Correct drainage problem.	
	rabbit burrows	Fill holes with cobbles and earth.	Not currently a problem at Linwood Cemetery
	tree roots raising one side	Chop off offending root.	In some cases, the entire tree will need to be removed.

			Cross Reference Photo 10
	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.	Particularly an issue at southern end of the cemetery
	<p>soil slump, i.e. localised movements of land usually after heavy rain</p> <p>a) on river banks and gullies</p> <p>b) in slate and shale areas</p> <p>Note that a slight lean is not a problem unless the cemetery is subject to 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.</p>	<p>a) erosion control measures</p> <p>b) uphill drainage control.</p>	
2. Monuments disassembled but not broken	Vandalism or temporary removal to permit essential works.	Check top of plinth to ensure that it is level, rebed if necessary. Reassemble, avoiding Portland cement. For tall structures vulnerable to vandalism consider introduction of non ferrous dowels (e.g. bronze).	Cross reference Photo 1
3. Broken	Accident and vandals; often involving heavy falls	In general, employ an experienced monumental	Cross reference Photo 1,

<p>Monuments</p> <p>(i) Breaks in sturdy stone monuments</p> <p>(ii) Multiple breaks in relatively thin slabs.</p>	<p>on masonry or iron surrounds or uneven ground.</p>	<p>mason to reset stone on plinth and dowel parts together using waterproof epoxy resin adhesive. It is important to avoid Portland cement.</p> <p>If re-erected they will be vulnerable to vandalism. The alternatives are:</p> <p>a) leave lying on ground.</p> <p>b) erect a solid slab, and pin the pieces to slab with bronze dowels and waterproof epoxy resin.</p> <p>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.</p> <p>d) pin stones to a local structure(a last resort)</p> <p>e) prepare a facsimile for erection on site and remove original to museum.</p> <p>f) leave pieces on site, reproduce inscription on small stainless steel plate and erect inconspicuously on site.</p>	<p>Photo 3</p>
<p>5. Monuments with cracked or broken mortise in the</p>	<p>Fall</p>	<p>Where mortise is damaged the options are:</p> <p>(a) replace plinth with a facsimile.</p>	

plinth		<p>(b) cut back existing plinth and remortise.</p> <p>(c) set stone in similar moulded concrete plinth with mortise, in the same way as original.</p>	
6. Masonry cracking	Pressure from the continuing process of iron rusting and expanding when damp	<p>(a) where iron clamps within the masonry have expanded replace with bronze clamps, and repair masonry.</p> <p>(b) where wrought iron rails posts and bars have expanded and cracked masonry:-</p> <ul style="list-style-type: none"> • 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	Rising damp particularly near the base of the stone)	Improve drainage at the base of the stone.	Cross reference photo 6 A poultice may be a solution

<p>delamination of monuments</p>	<p>Salt accumulation (particularly under mouldings)</p> <p>Ponding of rainwater (particularly on shoulders and carving of monument)</p>	<p>Note that resetting stone monuments improperly in concrete will accelerate this deterioration and any work should be avoided unless under the guidance of a Stone Conservator.</p> <p>Where significant monuments are already so set and deteriorating, the concrete base should be broken off as carefully as possible and the monument rebedded.</p> <p>Stones should be reset vertically if they are leaning in such a way that the inscription or decorative side is inclined to the ground.</p> <p>Remove loose and flaking stone. Fill cracks with acrylic resin.</p> <p>Remove overhanging branches which trap airborne dust and salt particles and shed them upon the stone.</p> <p>Repair pointing to prevent entry of water if it is a compound monument. Ensure that water is thrown off monument.</p>	<p>to get rid of the salts causing the hard outer crust, but it would need to be done every 5-10 years since salts will continue to enter the stone through the ground. Micro grouting is a technique developed by the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) for reattaching or consolidating heritage fabric such as fresco and stonework. Micro grouting involves drilling tiny holes in the stonework, flushing the holes with alcohol to clean them and then very gently injecting lime fly ash grout.</p>
<p>8. Inscriptions fretting on monuments</p>	<p>See (7).Also abrasion by vegetation in a wind</p>	<p>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.</p>	<p>Cross reference Photo 7</p>

		<p>As a general rule inscriptions and decorations in stone which are of interest because of their style and character 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.</p> <p>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.</p> <p>Other inscriptions may be recut provided:</p> <ul style="list-style-type: none"> • 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 surrounds is superficial and presents no structural problems.	

10. Rusting of wrought iron memorials and surrounds	Exposure to damp	Rusting surfaces on most 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.	Cross reference Photo 5
11. Iron monuments broken in parts	Vandalism	Parts can be joined if necessary by pin or splint.	Cross reference Photo 5
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.	Cross reference Photo 3
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.	Cross reference Photo 7
15. Red	Chemical attack on lead, mainly in industrial	Partial removal by scrubbing with water and	

staining on white marble from lead lettering	areas.	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.	Although best practice advice is generally not to scrape off biological growth, this may be done carefully with a scalpel by or under the control of a stone conservator or experienced contractor. Cross reference Photos 14.
17. Growth of disruptive vegetation on masonry	Lack of maintenance	Where sturdy shrub or tree 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.	Cross reference Photo 10.