

KINGSTON & ARTHUR'S VALE HISTORIC AREA
NORFOLK ISLAND
CONDITION & CONSERVATION REPORT
JULY 2017



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CONDITION & CONSERVATION REPORT

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EXECUTIVE SUMMARY

The Kingston and Arthur's Vale Historic Area has been actively conserved since the establishment of conservation programs and practices of the early 1960s. The active care and maintenance of the significant built elements of this historic site has sought to retain their integrity, intactness and condition as a means of ensuring their values for future generations.

Best practice conservation principles have developed since the implementation of the maintenance program and, while the extant significant fabric remains in reasonably sound condition, a revision of practice is considered important to ensure the ongoing condition and integrity together with an authenticity to the presentation of the items within the landscape.

As the Conservation Maintenance Program continues it is essential that adequate planning, funding and resourcing is provided as part of a Total Asset Management Framework.

Maintenance is fundamental to conservation. A regular program of built and landscape maintenance works has occurred over several decades. The maintenance program, however, has concentrated only on some elements of the main buildings and could be expanded to address other elements such as significant ruins, plantings, and features such as agricultural remains. Over recent years, funding for physical maintenance works and staff has been reduced, whilst some additional funding has been provided for other purposes. More complex and costly maintenance works have not progressed, but routine works such as mowing and painting has been ongoing.⁰¹

This report provides an overview of the research undertaken into past maintenance specifications and practices together with observations derived from a site inspection and makes recommendations for change to achieve best practice outcomes while acknowledging the sound work executed to date, and the opportunities and constraints of the operational environment.



View of Kingston, c.1880. Source: State Library of Victoria Pictures Collection.

⁰¹ KAVHA HMP, 2016, p.83

I INTRODUCTION

I.1 DESCRIPTION

The Kingston and Arthur's Vale Historic Area (KAVHA) comprises more than 40 buildings, substantial ruins and archaeological remains set within 225 hectares of relatively undisturbed land. All structures were constructed by offenders from stone quarried on Norfolk and Nepean islands or with local timber. KAVHA demonstrates the use of penal transportation to expand Britain's geo-political spheres of influence, punishment of offenders, deter crime in Britain and to rehabilitate. The site is also associated with global developments in the punishments and reformation of offenders during the 19th century.

The layout of the site reflects the strategic spatial placement of buildings that separated both the real and symbolic power of authorities to scrutinise and control the convict population. A complex of military and administrative buildings is elevated on the rise along Quality Row. These include military compounds, offices and cottages for civil and military personnel and a Commissariat Store. There is a clear view from these buildings down to the convict precinct on the foreshore. The pre - 1850s Georgian style buildings (some partly reconstructed) survive in a streetscape setting.⁰¹

The 1829 Government House is one of the earliest and most intact remaining government house buildings in Australia. The 1835 Commissariat Store (now All Saints Church) is the finest remaining colonial (pre 1850) military commissariat store in Australia.⁰² The buildings from the Second (Penal) Settlement 1825-1855 provide one of the finest collections of surviving colonial Georgian structures in the world.⁰³

I.2 STATEMENT OF SIGNIFICANCE

The Kingston and Arthur's Vale Historic Area is of outstanding heritage value to the nation as a convict settlement spanning the era of transportation to eastern Australia between 1788-1855. It is also significant as the only site in Australia to display evidence of early Polynesian settlement, and the place where the Pitcairn Island descendants of the Bounty mutineers were re-settled in 1856.⁰⁴

A full statement of significance, and assessment against the prescribed World, National, Commonwealth and Norfolk Island heritage values is available within Section 4 of the KAVHA Heritage Management Plan (HMP), 2016.

I.3 VISION STATEMENT

The Kingston and Arthur's Vale Historic Area is a place of outstanding heritage value to the people of Norfolk Island, the Australian community and internationally.

The rich and interwoven natural and cultural landscape of the KAVHA site will be conserved, managed, protected and presented with authenticity as a vibrant place through effective governance, good management, improved support, best practice techniques/tools and enduring community partnerships.⁰⁵

I.4 KAVHA HERITAGE MANAGEMENT PLAN 2016

The following policies from the KAVHA HMP (pages 107-110) have relevance to this project and will frame the recommendations:

8.3.1 Fabric Conservation

- All works to significant buildings, structures or ruins within the KAVHA site will be consistent with the principles and practices of the Burra Charter;
- Fabric conservation will respect the historic layering of individual buildings, structures and ruins;
- Remaining unaltered original finishes and materials will be preserved and not changed;
- Intrusive and incompatible fabric will be removed as and when appropriate;

8.3.2 Maintenance

- Modern materials will be avoided where they may be likely to impact upon or cause damage to significant original fabric.

⁰¹ Australian Convict Sites World Heritage Nomination, Commonwealth of Australia, January 2008, p.18

⁰² KAVHA Heritage Management Plan, JRA, Context and GML, 2016, p. 52

⁰³ Ibid, p.63

⁰⁴ <https://environment.gov.au/heritage/places/national/kavha>

⁰⁵ KAVHA Heritage Management Plan, JRA, Context and GML, 2016, p. 16

8.3.3 Buildings

- Traditional building materials and techniques will be used where possible to retain the handmade individual characteristics of each building.

8.3.6 Other Structures

- Original fabric will be retained, repaired and stabilised, in preference to the introduction of replacement fabric.



Aerial view of Kingston & Arthur's Vale World Heritage Site. Source: Google Earth, edited by Purcell

I.5 THE BRIEF

Purcell understand that the Commonwealth is seeking to achieve the following outcomes from this project:

- 01 An evaluation of the building fabric conservation issues occurring in KAVHA, outlining supporting evidence.
- 02 Identification of best practice conservation and maintenance solutions to issues identified.
- 03 Recommendations on future approaches to building fabric maintenance and conservation in the short, medium and long term, including advice on materials, treatments and processes.
- 04 Advice regarding the likely cost/benefit of implementing the recommended conservation approach.
- 05 Comments on technical aspects of the draft KAVHA Maintenance Manual, incorporating the above advice.

It is also presumed, with reference to the KAVHA HMP, that the conclusions and recommendations of this report will inform the basis of the Conservation Works Plan arising from HMP Recommendation 18, while also identifying any appropriate skills and trades training which may be required, and as provided for in Recommendation 19 of the HMP.

I.6 DEFINITIONS

Conservation

Conservation means all the processes of looking after a place so as to retain its cultural significance (Burra Charter).

Maintenance

Maintenance means the continuous protective care of a place, and its setting. Maintenance is to be distinguished from repair which involves restoration or reconstruction. (Burra Charter).



View of cemetery and Emily Bay beyond. Source: © Black Diamond Images via Flickr

2 HISTORY OF CONSERVATION WORKS & REPORTING

2.1 INTRODUCTION

A review of archival records and reporting has been undertaken in the preparation of this report. This review is not exhaustive and is a selection of documents considered relevant to this report and made available by KAVHA.

2.2 BACKGROUND TO CONSTRUCTION MATERIALS AND METHODS

2.2.1 Stone

The majority of the Colonial buildings are constructed from locally quarried calcarenite limestone. This stone is comprised of fossils, shells and general calcareous (limestone-based) detritus, 'cemented' together within a calcite and/or clay matrix. The coarseness of the stone is likely to mean it is very porous (has lots of air pockets) and permeable (it admits water). In a seaward environment such as KAVHA, this is likely to mean it will be prone to crystallisation failure from salt-based aerosols in the air, as well as weathering from moisture (liquid and vapour), which will gradually dissolve any soluble components in the stone.

The 2007 Draft CMP provides a valuable overview of the geological presentation of Norfolk, Nepean and Phillip Islands, the coastlines of which are mostly bounded by precipitous cliffs of basalt and tuff 60-90m in height, the result of marine erosion.⁰⁶

The only coastal lowland is at Kingston, which is 1km long and up to 0.8km wide with a fringing coral reef. Between 120,000 and 20,000 year B.P sea level dropped and fluctuated between 40-90m below the present level. Coral reefs were formed on this shallow marine platform, and with a further drop in sea level to 140m below present level these reefs were exposed and eroded. Blown by the prevailing southerly winds into the vicinity of Point Hunter and Nepean Island, the sand sized fragments cemented together to form the sedimentary rock calcarenite. This cross bedded sedimentary carbonate rock outcrops along the shore of the Kingston lowland. Nepean Island is pure calcarenite up to 35m thick. Calcarenite was the material from which the Second Settlement structures of Kingston were largely built.⁰⁷

The geological presentation of Norfolk, Nepean and Phillip Islands provides two building stones - 'Rubble' and 'Massive' calcarenite. 'Rubble' calcarenite has been used for general wall construction, with the 'massive' calcarenite, which presents as a denser material with tighter pore structure, being employed on those elements with a greater structural role, or requiring a higher level of dressed and carved finish.⁰⁸ Stone was quarried in a number of locations, at Chimney Hill, to the rear of Government House, adjacent to the lime kilns and from the reefs of Slaughter and Cemetery Bays⁰⁹ and Nepean Island.

There is one documented instance of the use of Bondi Sandstone, as the left hand side column (northern) of the Royal Engineers building c.1980s. There are potentially additional stone supply sources across KAVHA.

2.2.2 Lime

Records indicate that building lime for use at KAVHA was manufactured by burning the 'rubble' calcarenite stone from Chimney Hill from c.1792.¹⁰ *'The Norfolk Island lime, burnt from locally quarried calcarenite, on hardening, assumes the same characteristics as the stone itself. The survival of vestiges of the First Penal Settlement is largely due to this characteristic of the lime. When the buildings were fired at the end of the first Settlement the lime became very hard, protecting the structures from weathering.'*¹¹

Laboratory testing and reporting associated with the 1985 *Report on Renders and Plasters*, in Section 2.4, provides a testing methodology which will enable the identification of early plaster and will prove beneficial in any future programs of conservation works for the retention of extant significant fabric.¹²

2.2.3 Sand

Anecdotal, oral and documentary evidence (see Cox 1985) indicates that sand used in the construction of the historic structures of KAVHA was locally quarried beach sand from Emily and Cemetery Bays. While noting that the sand is sourced from marine environments the matrix and grain distribution of the sand is good, it is sharp and well graded. Given the marine origin of the sand it is likely that it is salt laden. It could

⁰⁶ Kingston and Arthur's Vale Historic Area Draft CMP, Otto Cserhalmi & Partners, 2007, p.47

⁰⁷ Ibid, p.47

⁰⁸ Ibid, p.299

⁰⁹ Ibid, p.239

¹⁰ Ibid, p.189

¹¹ Ibid, p.189

¹² Norfolk Island Conservation Program Report on Renders and Paints, Phillip Cox & Partners, January 1985, p.59

therefore safely be presumed that with no known documentary evidence of hot mixing practices in the preparation of lime mortars, and recorded advice of the KAVHA conservation crews that *'The washing of sand to remove salt has never been practice on Norfolk Island and the techniques to achieve this by simple means are not known'*¹³ that mortars, renders and plasters would have a high residual salt content.

It is however interesting to note the results of laboratory testing undertaken in association with the 1985 report on renders and paints, which indicated relatively low residual salt levels in traditional mixes, as opposed to later mixes with cement components. This warrants further investigation and testing should sand be locally sourced for future conservation programs. Further commentary is provided within Item 2.4 and within the source material.

2.2.4 Timber

There is an abundant supply of Norfolk Island Pine, employed for building purposes across KAVHA. There is evidence of borer activity and documented history of treating pine with salt water and lime¹⁴ and with creosote.



Norfolk Island Pine sourced for timber roofing shingles. Source: Department of Environment, 2007.



An example of the Calcarenite as found in Slaughter Bay. Note sound condition given the exposed location. Source: Purcell.



Extant renders and harling to the outbuildings of No. 10 Quality Row. Source: Purcell.



Sand was traditionally sourced from the adjacent Emily and Slaughter Bays. Source: Purcell.

¹³ Report on Historical Buildings and Other Structures at Norfolk Island with Estimates of Cost of repairs, Department of Works, August 1959, p.15

¹⁴ Report on Historical Buildings and Other Structures at Norfolk Island with Estimates of Cost of repairs, Department of Works, August 1959, p.5

2.3 OBSERVATIONS ON THE HISTORY OF CONSERVATION MAINTENANCE PRACTICES & REPORTING

Research was undertaken on a limited number of reports considered relevant to the review of current maintenance practices. Observations are provided of the following documents which outline the history of conservation and maintenance approaches.

2.3.1 Old Colonial Structures - Schedule of Materials 1962

A document titled 'Norfolk Island – Old Colonial Structures – Schedule of Materials to be provided and work to be carried out in the execution of preservation and maintenance of existing structures at Norfolk Island' was prepared (author unknown) for the Commonwealth of Australia, Department of Works in January 1962. This document states that 'It is not intended to reconstruct the structures to their original form but to put them in a condition that will retard their further deterioration.'¹⁵ This intention is consistent with best practice conservation principles, and remains so today. It is interpreted that the specification has been drafted as a means of halting the aggressive decay likely to have presented given the environmental factors and inherent properties of the calcarenite limestone as a building material in this environment. That said, the specification outlined within the document represents a conservation approach which is discouraged in today's practice and does not account for the since evolved and informed technical and diagnostic approach to conservation works, nor today's best practice principles, such as that of the 'like for like' approach called for in the Australia ICOMOS Burra Charter, or the Conservation and Management Policies of the KAVHA HMP, 2016, as cited earlier in Section 1.4.

In summary, the specification calls for the use of cementitious mortars and renders (compo mortar of 1 part lime: 1 part cement: six parts sand, together with a 3:1 mix for horizontal surfaces, or large void filling) and waterproofed cements¹⁶, cement based and PVA plastic paints¹⁷, and bonding agents¹⁸. In many instances, original textured renders are nominated for removal and replacement with compo mortar renders and Boncote to both internal and external walls, then finished in either a cement based, or PVA paint.

The application of these cementitious renders is widespread, both with regard to the number of buildings subject to this scope, but also with regard to the extent of application, such as the building up of undermined stonework, the filling of large voids, and the repointing of joints with cement, or compo mortar, prior to the application of cementitious renders. Reference to archival photographs would suggest that the bagging of walls with this render extended to some buildings which appear to have originally been left uncoated, typically those of utilitarian use.

At this time gloss enamel paints are appropriately specified for timber elements and the scope of conservation and maintenance works to timber elements generally appears practical and reasonable and consistent with today's best practice standards. It is to be noted that current painting practice employs water based acrylics for timbers, a departure which has implications for the presentation of the buildings, and potentially increases the frequency of the painting program.



View of KAVHA. Source: Flickr.

¹⁵ Norfolk Island – Old Colonial Structures, Commonwealth of Australia, 1962, p.1

¹⁶ Ibid, p.2

¹⁷ Ibid, p.4

¹⁸ Ibid, p.6

It is understood that this specification was applied to the conservation of No. 8 Quality row in 1969-70, supervised by an architect, and developed as an approach subsequently used in the conservation and maintenance of masonry since this time. It is further understood that this practice introduced smooth render to the walls, replacing the original 'pebbledash',¹⁹ also known as rough cast or harling.

2.3.2 Report on Renders & Paints 1985

*'From the experience gained in conservation work generally the application of a surface conditioner totally goes against the basic principle of permitting the wall to breathe.'*²⁰

The 1985 report outlines research and trials into the durability, performance and conservation suitability of a range of mortars and paints for implementation in later Maintenance Manuals (See Item 2.5 & 2.6), and accompanying specifications. Its conclusions and findings informs the basis of the specification implemented in the 1980s which has continued largely unaltered since this time.

Each of the trialed renders contained a proportion of cement with paints being acrylic based and applied over the Boncote implemented following the 1962 specification.²¹ Insightfully the report makes the following observation following the trials *'...these factors should not be considered in isolation as the effects of latent water in the wall and exposure could have an impact on the performance of the paint and render.'*²²

Contemporary best practice would inform that the failure of the said trial was a result of a lack of permeability created by the effective sealing of the walls with comparatively impervious finishes, trapping latent water in the wall and impacting the performance of the render.

An important observation of the report is that, of the trials undertaken across the site, some subject to previous works following the 1962 specification, those mortars which contained the highest proportion of salt consistently contain cement, in some instances up to 9.7%. Those traditional mortars tested, which contain no cement, returned comparably lower salt readings. It is important to note that some of the samples had the potential for salt contamination if taken from areas expressing salt attack. This potential anomaly appears not to have been accounted for in the findings of the report.

The report notes that *'Water in walls will migrate and transfer any salts to the outside faces (internally and externally) of the wall'*²³, and *'A 100% acrylic paint can be satisfactorily applied over new render and sound boncote. ...it is considered that water and salt are two problems if present in the wall. Furthermore, the paint must permit the transmission of water vapour otherwise problems will result.'*²⁴

The archival records of the reporting, testing and research of this period reflect the clear acknowledgment of factors impacting the deterioration and integrity of the significant extant fabric. This acknowledgment accounts for the inherent properties of the materials (stone, lime, sand and mortar) to the inappropriateness and failings of the boncote and cementitious renders from the 1962 specification. This is again represented by the following extract from a British Paints News Journal:

'At one stage, before British Paints was called in, cement-based coatings had been used in an effort to protect the deteriorating buildings. These were only partly successful due to an increase in moisture which, as British Paints technical advisor Noel Cole points out, is one of the main contributing causes of premature breakdown of surface coatings. Moisture also has a bearing on the fretting of the substrate. "The buildings were made from coral rock, calcarenite", he explained. "This was of course extremely alkaline, and so was the lime used in the rendering of the surfaces. Also, sea sand, containing large amounts of salt, was used in the construction of the buildings so there's salt attack from within and without – These buildings lie in the midst of thousands of miles of ocean, and there's nothing to shelter them from the salt-laden air. Fretting of the stonework and efflorescence (soluble salts being drawn to the surface) were causing concern, and the architects were looking for a reliable surface coating system that would offer the buildings appropriate protection."

The answer was pure acrylic, whose combined durability and flexibility was ideal for this demanding job...²⁵

¹⁹ KAVHA Heritage Management Plan, JRA, Context and GML, 2016, p. 36

²⁰ Norfolk Island Conservation Program Report on Renders and Paints, Phillip Cox & Partners, January 1985, p.10

²¹ Norfolk Island Conservation Program Report on Renders and Paints, Phillip Cox & Partners, January 1985, p.11

²² Ibid, p.11

²³ Ibid, p.15

²⁴ Ibid, p.16

²⁵ Spectrum – British Paints News Journal No. 12 June 1985

The findings and recommendations of this exercise, and that of the conservation works arising from the 1962 specification were not unchallenged. R.V.J Varman commented on the trials in 1983 stating that *'it is suspected that many are unsuitable as they appear to seal the surface to such an extent as to trap moisture. Bubbling and disintegration is a common problem. Tests should be carried out experimenting with new render mixes and traditional mixes should also be considered. In many cases, the use of white-wash in the place of paint would be more desirable.'*²⁶

It was however resolved at this time (1985) to implement a specification for acrylic paint noting that *'All paint on rendered coral rock walls which is not 100% acrylic should be removed and replaced with 100% acrylic paints'*²⁷ also noting that there is *'...no sound reason to change from the present boncote system.'*²⁸

2.3.3 Maintenance Manual 1988

The 1988 Maintenance Manual, prepared by Philip Cox, Richardson, Taylor & Partners, was based on the extensive testing research and trials undertaken since 1962. Together with a specification it includes a schedule of structures and an inspection checklist for annual, three yearly and five yearly inspections. It establishes that:

The main component of the 'Maintenance' program is a cyclical maintenance program of three years for the exterior of structures and five years for their interior. This is the minimum level of maintenance required to preserve the fabric of the buildings. 'Maintenance' would not normally include maintenance outside this five-year program, except where it is essential for the preservation of the fabric of a building.²⁹

The document is structured for individual items by way of an inventory sheet, citing history, significance, relevant archival documentation and an overview of work executed to date. The inventory then structures a 15 year inspection program for each item programming the nominated annual, three yearly and five yearly inspections. As a bound volume, accompanied by the specification, it presents a comprehensive methodology for a Conservation Maintenance Program, to run in parallel with a Capital Works program generated out of the major five yearly inspections. Such an approach is consistent with the best practice principles relating to Total Asset Management.



View of _ Quality Row. Source: Purcell.

²⁶ Norfolk Island Conservation Program Report on Renders and Paints, Phillip Cox & Partners, January 1985, p.64

²⁷ Report on Render and Paint Systems used on Norfolk Island, author and date unknown.

²⁸ Ibid

²⁹ KAVHA Governance Review, Commonwealth of Australia, Attorney Generals Department, 2010, p.97

2.3.4 Draft Maintenance Manual 2016

The 2016 Draft Maintenance Manual, prepared by Eric Martins and Associates, was commissioned by DIRD as an update of the 1988 KAVHA Maintenance Manual. The brief required that the Manual ‘...reflect advances in best practice standards, legislation, heritage listings and on-site knowledge. The updated manual will help guide priority setting, establish programming, schedule routine maintenance works and inform future capital projects.’ The Brief goes on to note an intended shift from scheduled, fixed cycle maintenance, to a more responsive model that prioritises activities based on annual condition reporting. It appears that this briefing seeks a shift from the 1988 model to a more reactive, rather than planned, maintenance program and if so would be inconsistent with best practice and the programs of comparable organisations such as the Port Arthur Historic Site and Total Asset Management Principles.

The revised Draft Maintenance Manual is comprised mostly of a specification, broadly consistent with the earlier 1988 Manual, with additional commentary as required by the Brief. The Manual is not accompanied by the inventory sheets of the earlier 1988 Manual. The 2016 Manual makes the observation that the 1988 Manual ‘...does not reflect current best practice³⁰ and in some instances the specification no longer reflects best practice conservation. In several instances the Manual notes that individual practices are no longer best practice but ‘accepts the current situation’ and makes recommendation for a continuation of this practice. This approach is inconsistent with the Policies of the HMP regarding best practice and that ‘Modern materials will be avoided where they may be likely to impact upon or cause damage to significant original fabric.’³¹

It is understood that this Draft Manual has peer reviewed by the Port Arthur Historic Sites Management Authority (PAHSMA). Purcell have considered both the Draft Manual and peer review in the compilation of this report, its conclusions and recommendations. Purcell consider that PAHSMA, as a comparable management model for a site of equal listing, suggest a move toward best practice, both with regard to specification and management, which is both wholly appropriate and essential for the ongoing conservation and integrity of the values and fabric of the KAVHA Site.



New Gaol. Source: Purcell.

³⁰ KAVHA Maintenance Manual, Eric Martin and Associates, Issue 3 2016, p.4

³¹ KAVHA HMP, 2016, p.108

3 CONDITION & TYPICAL PRESENTATION

3.1 INTRODUCTION

The inspection of the built features at KAVHA was undertaken over the course of the week commencing 12 June 2017. The weather was clear without significant rainfall during, or in the lead into the inspection. The following personnel attended the inspection:

- Brian Prince, Commonwealth Heritage Manager, Norfolk Island, Department of Infrastructure and Regional Development;
- Michael Johnston, A/g Manager Local Services & Assets, Norfolk Island Regional Council;
- Tracey Skovronek, Partner, Purcell; and
- Lucy Burke-Smith, Senior Architect & Heritage Specialist, Purcell.

The inspection was limited in its extent with subject buildings nominated by KAVHA representatives. The inspections did not involve any opening up of roof, or floor voids, was limited to fabric evident without invasive testing or exposure and undertaken from ground level. The following buildings and structures formed the scope of the inspections:

- Settlement Guard House;
- Royal Engineers Building;
- No. 10 Quality Row and outbuildings;
- No. 6 Quality Row and outbuildings;
- No's. 1 & 2 Quality Row and outbuildings;
- Government House;
- Sea walls to Slaughter Bay; and
- Various monuments to the Cemetery Reserve (accompanied by Sexton Shane Quintal).



SCOPE OF THE STUDY PLAN

A	Settlement Guard House	E	No's. 1 & 2 Quality Row and outbuildings;
B	Royal Engineers Building	F	Government House;
C	No. 10 Quality Row and outbuildings;	G	Sea walls to Slaughter Bay;
D	No. 6 Quality Row and outbuildings;	H	Various headstones to the Cemetery Reserve

It is to be noted that this report makes no findings or recommendations with regard to the structural presentation, constituting advice of engineering disciplines, or with regard to the conservation of archaeological or natural values. The inspections did not involve an investigation of sub-surface drainage, nor review of services plans.

A series of Case Studies have been compiled as a means of demonstrating the observations arising from the site inspection. These identify the background to each item, current observations relating to the condition / general appearance and conclusions that seek to briefly summarise the recommended way forwards.



View of Kingston. Source: [http:// www.visitcapitalcity.com/oceania/kingston-norfolk-island](http://www.visitcapitalcity.com/oceania/kingston-norfolk-island)

3.2 CLEANING

3.2.1 Background

Site inspections indicate the presence of various biological growths such as algal growth to timber and masonry elements, and lichens to monuments within the Cemetery Reserve.

It is understood that sodium hypochlorite is currently used in the cleaning of biological growth across the KAVHA, applied twice a year to buildings and followed by a pressure clean.

The specification of this cleaning agent is outlined in the 2016 Draft Maintenance Manual (page 38), but is inconsistent with technical notes on the cleaning of biological growth to historic masonry, '... never use common domestic cleaners and mould removers: many contain both bleach (sodium hypochlorite) and caustic soda (sodium hydroxide) and can be very damaging'³² The use of sodium hypochlorite '... may leave behind damaging salt residues...' ³³ which is contrary to the objective of removing sea spray from buildings, together with biological growth.

3.2.2 Observations

There is an evident need for the cleaning of algal growth across the site to maintain site presentation. There is however evidence to suggest that the current practice, when applied to masonry, is impacting the condition and presentation of stone, in some cases resulting in bleaching and discolouration.

3.2.3 Conclusions

In instances of exposed stone, such as Cemetery Reserve monuments and the entrance to the New Goal, the cleaning of biological growth should not be undertaken unless it can be demonstrated that the growth is impacting the integrity and condition of original fabric.

When the case for cleaning is substantiated the cleaning practices for KAVHA should be re-specified in consistency with best practice conservation. Biocides should be quaternary ammonium compounds such as benzo chlorides (commercially available as products such as wet and forget) and be applied in accordance with evidence based trials.

Research should be undertaken into potential alternative products for the treatment of algal growth to timbers.



Monuments have been cleaned using inappropriate masonry cleaners.



Stones to Government House demonstrate signs of bleaching and discolouration from cleaning.



Biological growth, thought to be lichen, is evident to some monuments of the cemetery.

³² Treating Biological Growths on Historic Masonry, D.Young for Heritage Council NSW, 2005

³³ Biological Growth on Masonry: Identification and Understanding, Historic Scotland, 2013 p.7

3.3 DAMP & SALT ATTACK

3.3.1 Background

The matrix of the calcarenite limestone and the fragility of its binders makes it particularly susceptible to damp. While the large pore structure of the 'rubble' calcarenite makes it less susceptible to salt attack than a smaller pored stone the documentary and physical evidence indicates that the majority of these surface pores have been filled with cement from 1962. The resulting limitation on permeability due to these mortars and renders, together with the application of acrylic paints, bonding agents and waterproof costings of the 1960s, is likely to be increasing the deterioration of the calcarenite stone.

3.3.2 Observations

Salt attack was observed in several locations across the site and, with the exception of the Government House cellar, all in the presence of cementitious renders and acrylic paints. Typically, internal spaces are also poorly ventilated. There are examples of rising, falling and lateral damp.

While damp proof courses are outlined within conservation and maintenance reports of 1962 and 1985 there is little evidence of their introduction or specification.

3.3.3 Conclusions

A prioritised program of remedial works should be developed for the treatment of damp and salt attack. This program should look to remove acrylic paints, and to the extent practical, non original plasters and renders, especially those in areas vulnerable to rising or lateral damp. Following this a program of desalination, carefully specified by an appropriately experienced practitioner, should be implemented prior to the reapplication of traditional plasters, renders and lime based finishes.

Ventilation should be improved within these spaces where ever practical.

Given the solid wall rubble construction of most structures it is impractical to rely on damp proof courses in the suite of preventative measures to combat rising damp and salt attack. Furthermore, the removal of imperious materials will in itself make a significant contribution to the remediation of this presentation.

Consultation with an archaeologist should be undertaken when ground levels are above internal floor levels to identify locations where external ground levels can be reduced.



The Government House cellar, with limewashed walls shows limited evidence of salt attack adjacent areas of water ingress. Note the different failure mechanism to that of acrylic paint.



The Settlement Guardhouse exterior with significant bubbling and failure of acrylic paint coatings.



Paint failure to the Royal Engineers is expressed both internally and externally.



Paint failure within the Prisoner Barracks Museum trapped salt crystallisation.

3.4 RENDERS, MORTARS AND PLASTER

3.4.1 Background

Physical evidence indicates that the original applied coating to the Calcarenite 'rubble' walling was similar to that of harling or roughcast, *'...the rough open-textured surface of the harling dissipated the impact of driving rain and increased evaporation of moisture once rain eased. Roughcast was quick and easy to apply, with a wet slurry mixture (washed course aggregate mixed with hot lime) thrown onto the render or floating coat that has been scratched.'*³⁴ Typically the harling is then finished in limewash. It is however noted, with reference to archival photographs³⁵ that not all structures and walls were finished.

Bagging the 'rubble' calcarenite walls was widely implemented following to the 1962 specification.

3.4.2 Observations

The cementitious renders and plasters, which are now in some instances 50 years old are starting to fail. In those instances, for example compound walls, where the render has been bagged directly to the surface of the 'rubble' calcarenite, the stone appears reasonably sound, but presents now as exposed to the environmental factors which early lime mortars and renders were protective of.

It is assumed that at upper and lower levels of such walls there is likely to be a greater penetration and extent of cementitious products, due to the resulting treatment for rising damp and the protection to the exposed wall heads to from falling damp.

3.4.3 Conclusions

There are no practical ways through which to remove these contemporary coatings without significant impact to the extant original fabric. As such these areas should be left to take their course of deterioration. Future works should be undertaken in lime based materials.

Should there be a desire to present a more unified aesthetic to the walls, mitigating the visual impact of the grey 'bagged' finish, consideration could be given to the application of a limewash.



Evidence of original mortars, plasters and finishes within the Settlement Guard House.



A range of treatments and renders at No. 10 Quality Row.



Evidence of original renders and harling at No. 10 Quality Row.



Evidence of cementitious renders.

³⁴ English Heritage Practical Building Conservation: Mortars, Renders & Plasters, p.89

³⁵ Image Reference (TBC)

3.5 COATINGS AND FINISHES

3.5.1 Background

The 1988 Maintenance Manual saw the introduction of 100% acrylic paints as a replacement to the traditional practice of lime-washing, white-washing and distempers evident in both archival and physical documentation.

It was also around the time of the 1988 Maintenance Report that the original tonal colours, evident in photographic archives and in extant physical evidence (see image top right), changed.

3.5.2 Observations

The change in surface texture arising from the mortar and paint specification, together with the departure from the original colour scheme, has impacted the setting and presentation of the historic buildings within the landscape.

*'The monochrome appearance of a wall, which can be gained with modern paints, was not the character of the place in the nineteenth century.'*³⁶

It is further noted that some elements which appear to have been unpainted historically have since been included within the painting program. Elements such as the replacement column to the Royal Engineers Building, carved of Bondi Stone in more recent years, are displaying evidence of accelerated deterioration due largely to acrylic costings.

Comparatively, the cellar to Government House, the only such space inspected to retain lime wash finishes, is in sound condition requiring no more maintenance than reapplication of this same material.

3.5.3 Conclusions

The specification of acrylic paint is impacting on the integrity, condition and presentation of the significant fabric and structures of KAVHA. Reverting to lime based finishes, as also recommended by the 2011 Report by D. Elsmore will not only be more appropriate for the long term integrity and condition of the fabric but will improve the authenticity and presentation of the buildings.

A 2011 Report on the Investigation of Paint Finishes, prepared by Donald Elsmore provides a valuable analysis of the history of coatings and finishes, including an analysis of historic photographs and historic and physical evidence, consistent with the findings of this report, and observation of the Draft 2007 CMP.



A range of treatments at No. 10 Quality Row, note the whitewashed boarder to the lintel and window reveal.



Typical failure of acrylic coatings.



Limewash applications to the Government House Cellar are performing well by comparison.

³⁶ KAVHA, Draft CMP, JRA, 2007, p.257

3.6 METALS

3.6.1 Background

Metal elements through KAVHA, a highly exposed marine environment, are expressing signs of accelerated corrosion, due largely to the absence of coatings and regular cyclic maintenance. Ferrous metals require, as part of a maintenance program, some form of surface protection. Typically elements such as these would have been coated with oils or paints. While best practice seeks to retain the 'patina of age' it is important to rationalise this with the practice of preservation and to note that *'Iron oxides,...are very porous, so corrosion is ongoing, and indeed since rusts tend to trap water and salts, deterioration may accelerate with time.'*³⁷

Most, if not all metal elements will have an interface with other fabric of significance, typically masonry or timber. In both instances the deterioration of metals elements impacts the integrity and condition of adjacent fabric and the conservation and maintenance of one cannot be considered or implemented without the other.

3.6.2 Observations

The treatment of metals across the site is variable, with some elements, such as cannon and some door and window hardware receiving treatment and application of surface coatings. Other elements, such as door hardware to the Government House cellar doors are in poor condition and are presumably not part of an active maintenance program.

The 2016 Draft Maintenance Manual makes reference to a range of differing treatment methodologies however the rational for application and specification is not outlined.

3.6.3 Conclusions

An active treatment of metal conservation is required to sufficiently address and retard further deterioration of metals across the site, and their subsequent impact to parent materials.



Doors and hardware to the Government House cellar.



Deterioration of Cellar door hardware due to corrosion, presenting risk to adjacent fabric.



Typical corrosion presentation of embedded metals.

³⁷ English Heritage Practical Building Conservation: Metals, p.27

3.7 CEMETERY RESERVE MONUMENTS³⁸

3.7.1 Background

The Cemetery Reserve contains burials and monuments from all periods of KAVHAs occupation and remains an active part of cultural practice on Norfolk Island. Various conservation methodologies and approaches have been implemented and it is apparent that a definitive approach has not been resolutely agreed by all stakeholders. The approach to re-cutting, blackening and the application of consolidants remains subject to much discussion. It is important to have an approach that balances the social and historical values and is benchmarked against comparable examples.

3.7.2 Observations

The massive calcarenite masonry monuments within the Cemetery Reserve are in sound presentation and condition when compared to similarly dated sandstone monuments of other convict precincts, such as the Isle of the Dead at the Port Arthur Historic Site.

Within the various reports on Cemetery Headstones there are a range of maintenance specifications such as periodic flushing, cleaning of biological growth with 'Domestos' and the application of Boncrete, or alternative acrylic binders³⁹, which do not represent best conservation practice, nor form part of established conservation programs to comparable sites.

The Cemetery is exposed to significant on shore wind conditions and salt sea spray. In this saline environment the buried nature of the stones sees them acting as wicks in a salt laden environment. The practice of flushing, currently specified, will be exacerbating the deteriorating mechanism from salts going in and out of solution.⁴⁰

It is observed that those monuments subject to diluted Boncrete treatments are beginning to express disaggregation of natural case-hardened stone surfaces, which some may interpret as deterioration due to a lack of maintenance and care. It is however more likely that this weathering is related to the impervious layer of the coating '*...the application of impervious protective coatings (such as 'sealers') can, after exposure to weathering cause flaking of the surface.*⁴¹

The Cemetery Reserve is exposed to significant on shore wind conditions within an environment subject to ongoing salt spray, wind and sand erosion. There is some buffering of these conditions presented by the vegetative wind screening along fence lines, with a noticeable reduction to penetrating wind conditions.



View of Cemetery Reserve and Emily Bay



Detail of Cemetery



Detail of typical weathering to monuments.

³⁸ The term monuments is employed to account for all typologies of grave markers

³⁹ Norfolk Island Cemetery Headstones, E. Martin & Associates, 2013.

⁴⁰ Caring for Historic Graveyard and Cemetery Monuments, English Heritage, 2011, p.14

⁴¹ Caring for Historic Graveyard and Cemetery Monuments, English Heritage, 2011, p.16

3.7.3 Conclusions

Efforts should be made to engage all stakeholders in the evaluation of historic and best practices in the interests of a long term conservation maintenance program.

Decisions regarding the practice of re-cutting and blackening should be considered once all remaining preventative and recording options have been excised. *'Inscriptions may on occasion need to be recut so that they can be read... If recutting is necessary, is should be carried out by an experienced letter-cutter.'*⁴² The blackening of lettering *'...must always be carried out with great sensitivity but it can be justified if the inscription is of significance and is in danger of being lost. In many cases, just recording the inscription will be sufficient.'*⁴³



Black diamond of monument 1

⁴² Ibid, p.37

⁴³ *Caring for Historic Graveyard and Cemetery Monuments*, English Heritage, 2011, p.38

The following conclusions and recommendations are presented following our site inspection, consultation with KAVHA representatives, and a review of the documents, plans and policies called up within this Report.

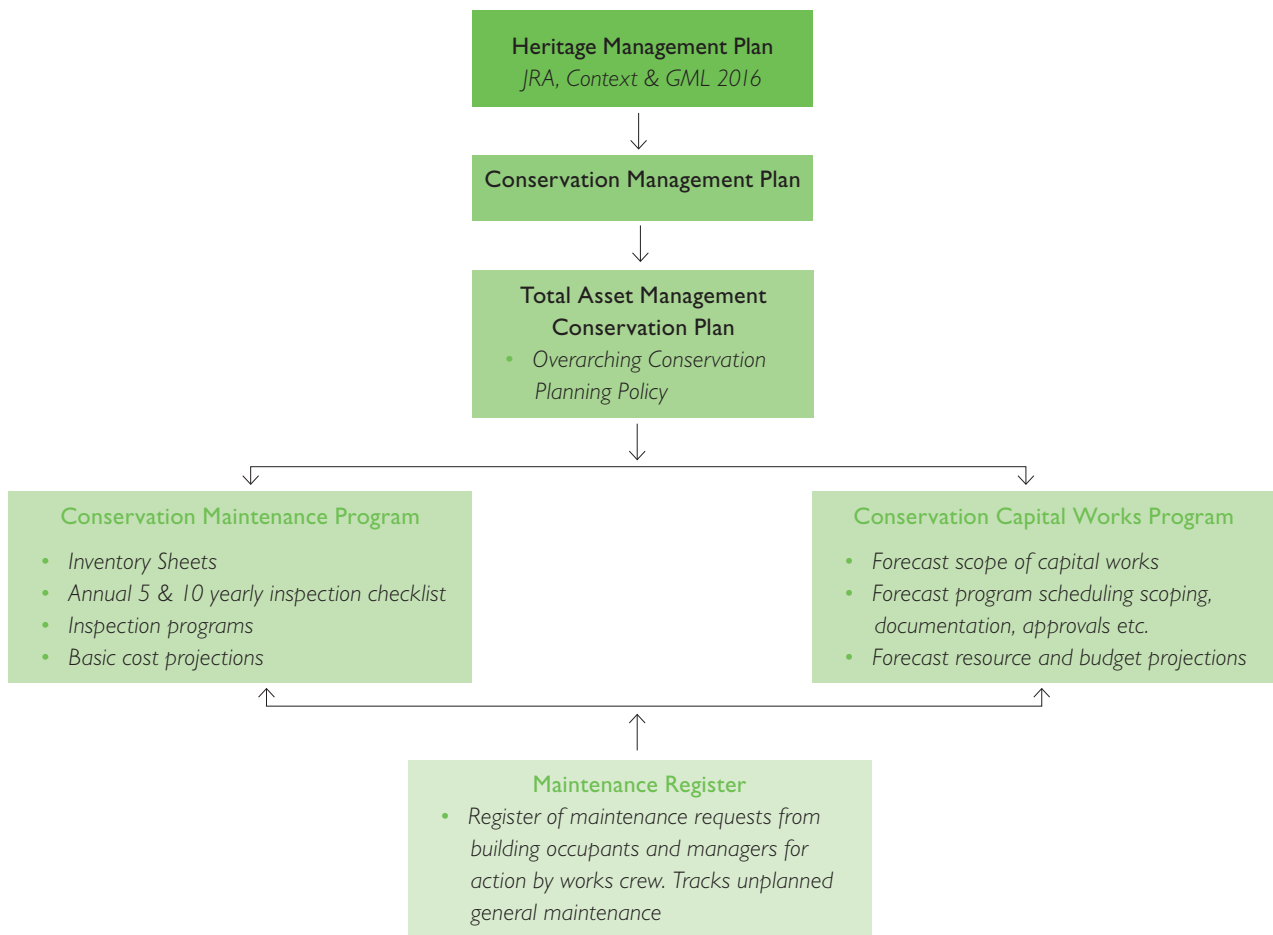
4.1 CONSERVATION MAINTENANCE FRAMEWORK

Maintenance or Conservation Plans for KAVHA should be developed in consideration of the existing governance framework if they are to best respond to the legislative, operational and budgetary requirements of the site, and be effective in the delivery of sound conservation and economical outcomes in a best practice manner.

Conservation refers to all the processes of looking after a place so as to retain its cultural significance. It includes maintenance and may, according to circumstances, include preservation, restoration, reconstruction and adaptation and will be commonly a combination of more than one of these. (Australia ICOMOS Burra Charter, 1998)

The purpose of this framework is to establish a general philosophical approach that, together with a clear understanding of significance, can guide decision making and help identify the appropriate conservation and maintenance response in the ongoing management of the place.

The following framework is provided as a key recommendation of this report:



This structure provides the opportunity of a multi-tiered and co-ordinated plan which responds to both the forecast strategic and operational requirements of KAVHA. Such an approach enables sound projection of budget, resource, training and logistical planning within the constraints of KAVHA.

*'...very much more requires to be done in a more detailed way if the present generation is to meet its obligation to pass on these Historically valuable relics to posterity, in some reasonable condition.'*⁴⁴

⁴⁴ Report on Historical Buildings and Other Structures at Norfolk Island with Estimates of Cost of repairs, Department of Works, August 1959, p.4

RECOMMENDATION 1

So as to ensure an appropriate Total Asset Management Framework the planning of maintenance and capital works should be informed by the development of a strategic program, guided by a clear policy of best practice conservation and sit within the framework of the KAVHA Heritage Management Plan.

RECOMMENDATION 2

Future revisions of the Conservation Management Plan should be based on the Draft CMP, prepared by Jean Rice Architects, 2007.

4.2 CONSERVATION MAINTENANCE PROGRAM

There has been recognition as to the importance of an ongoing Conservation Maintenance Program and budget forecasting for the extant significant structures of KAVHA as early as 1959.

'...irrespective of the degree of maintenance carried out in the near future, there will inevitably be a continuing and increasing need for maintenance indefinitely in the future. The deterioration of buildings and structures generally has reached an advanced stage and all the work...is considered to require urgent attention if further deterioration and even collapse in some cases is to be avoided'⁴⁵

There is a significant amount of relevant information available by way of the 1988 Maintenance Manual and the 2002 Inventories, both informed by projects as early as the 1950s and 60s, to establish a revised Maintenance Manual which can guide the programming of a cyclic program of conservation maintenance and capital works.

The development of such a Manual could readily form the basis of a comprehensive costing exercise which could forecast operational and capital expenditure, resources, materials, plant and equipment requirements and be central to the budget bidding cycle for Commonwealth funding.

The development of a Conservation Management Program should be supported by baseline data as to the condition of each individual item, and its known conservation and maintenance history and could be readily compiled from the basic framework developed for the 1988 Maintenance Manual. An updated inspection schedule (checklist) standardised to the specific requirements and experience of the asset managers and maintenance crews, should be developed to guide annual maintenance inspection as the basis of a cyclic Conservation Maintenance Program.

The Conservation Maintenance Program should be supported by clear, substantiated and readily implementable Specification Data Sheets which guide the implementation of conservation works and define the threshold at which detailed specialist advice should be sought.

Major inspections at defined milestones (5-10 years) and with a more detailed inspection checklists would then be employed to develop a prioritised Conservation Capital Works Program, consistent with the Recommendation of the HMP that within 1 year 'A *prioritised five-year forward plan should be prepared for fabric conservation works to identify urgent works, catch-up works and cyclical works.*⁴⁶ All major inspections should be undertaken by an architect and engineer suitably qualified in the diagnosis and specification of conservation works.

Annual, five and ten yearly inspections across the portfolio should be carefully programmed so as to ensure a distribution of inspection types in consideration of resource and budget cycles, i.e, not all items should be subject to major ten yearly inspections in the same year.

A defined program such as that outlined above will ensure that 'Conservation works will be prioritised to address unstable or deteriorated fabric first.' As required by Policy 8.3.1 of the KAVHA HMP.

RECOMMENDATION 3

A Conservation Maintenance Program, sufficiently costed, funded and resourced should be employed as a key action in the long-term conservation of the values and fabric of KAVHA.

⁴⁵ Report on Historical Buildings and Other Structures at Norfolk Island with Estimates of Cost of repairs, Department of Works, August 1959, p.2

⁴⁶ Report on Historical Buildings and Other Structures at Norfolk Island with Estimates of Cost of repairs, Department of Works, August 1959, p.2

4.3 CONSERVATION MAINTENANCE PRINCIPLES

A change in specification and practice is required to ensure the long term conservation and integrity of the extant significant fabric of KAVHA. Such change is consistent with the Policies and Recommendations of the HMP, and the intention of early conservation programs for KAVHA. This change in practice is important for both the technical and aesthetic presentation of the Site.

As outlined within Item 1.4 of this Report the KAVHA HMP outlines several policies to guide the practice of conservation works at KAVHA. These policies are consistent with, and aim to ensure best practice conservation outcomes. Several of the current maintenance practices, informed by the 1962 *Old Colonial Structures – Schedule of Materials* and continued in the 1988 and 2016 Maintenance Plans require refinement to ensure consistency with these policies.

The 2016 Heritage Management Plan called for a conservation policy for ‘...individual significant historic structures within the KAVHA site.’⁴⁷ These policies present the opportunity for the individual conservation needs of items to be considered and accounted for within any revision of the Maintenance Manual.

RECOMMENDATION 4

Conservation Maintenance Practices should be refined in response to the policies of the KAVHA HMP and emerging knowledge of contemporary best practice. Specifically, modern materials should be avoided when specifying works to original fabric and traditional materials and techniques should be employed.

RECOMMENDATION 5

The development of Conservation Policies for individual items should consider their specific conservation maintenance needs and inform maintenance practices.

4.4 MATERIALS AND PRESENTATION

Inconsistency or inappropriateness of approach, workmanship or materials can result in a loss of significance, with regards to both building fabric and aesthetic value. This loss often manifests itself over time and as such results in a gradual erosion of character that may not be immediately evident; therefore, it is important to ensure that the most appropriate materials are employed when carrying out repairs.

*There has been considerable change in conservation approach since the development of the Burra Charter... The current external appearance of the buildings at KAVHA indicates as much about the prevailing conservation philosophy during the 1970s and 1980s as it does about the original nature of the external finishes.*⁴⁸

The gradual and continued change to the harling rendered wall finish, roofing materials, colour schemes and rainwater goods impacts the authenticity and integrity of the buildings, their presentation and interpretation, and in some instances, presents risk to their ongoing condition. The Colonial buildings at KAVHA were constructed using local materials and available techniques. Wherever possible these materials should be sourced and specified as direct replacements, it is however noted that the supply of appropriate replacement stones, is limited. It is therefore important to consider and research appropriate alternatives, with sampling and testing for suitability as appropriate.

RECOMMENDATION 6

Research should be undertaken into appropriate replacement materials. This research is to consider opportunities to employ original source materials, locally from the Site and surrounds.

RECOMMENDATION 7

The specification of works such as, but not limited to, renders, mortars, cleaning, finishes (painting), washing of the buildings and desalination should be revised as a matter of priority.

RECOMMENDATION 8

The revision of any such specification should be undertaken with a clear understanding as to the operational, geographic and resourcing constraints presented at KAVHA.

⁴⁷ KAVHA HMP, 2016, p.110

⁴⁸ KAVHA Draft CMP, JRA, 2007, p.257

4.5 CEMETERY

It is noted that there is no current maintenance or conservation program in place, and that the 2016 KAVHA HMP notes the need for conservation and 'A prioritised program of cemetery conservation works...'⁴⁹ This exercise is considered urgent and essential as there is an immediate need for the establishment and implementation of a program of works. Such a review should evaluate the performance of all passive and active conservation methods, identify the factors affecting deterioration, and result in an agreed recordings and maintenance plan. In the interim, and until resolution the monuments should be conserved in-situ, plaques and markings should be avoided and the application of coatings, re-cutting and blackening reserved. 'The application of either a consolidant or surface treatment should not be carried out before a thorough understanding of the rate and mechanism of decay have been fully understood. Such treatments should be considered as a last resort and should only be applied by an experienced conservator.'⁵⁰

'Cleaning is a complex issue involving both aesthetic and technical considerations and should be considered as a major intervention; as such it is important to involve a qualified conservator... to provide advice.'⁵¹ Cleaning should be reserved for those instances in which it can be identified that the biological growth for the potential to damage the parent material. 'There should always be a presumption against the removal of biological growths.'⁵²

RECOMMENDATION 9

A dedicated maintenance and conservation program should be developed for those monuments relating to the significance and values of KAVHA. This program should be allocated appropriate funding and resources.

RECOMMENDATION 10

The practice of 'flushing' the stone with clean water, and cleaning biological growth with Domestos, should be retired and reviewed as part of an overall conservation and maintenance program. The application of Boncrete, or acrylic primers, as surface consolidants is not supported and should be replaced with an evidence based treatment program, developed by a conservator experienced in similar materials. Such a treatment program should also account for the conservation of metals, and investigate those monuments with physical evidence of plasters and whitewashing. The program should set parameters for the cleaning of lichens and mosses, which should generally be limited to invasive growth.

RECOMMENDATION 11

Additional vegetative wind screening should be considered for the boundary of the Cemetery to further mitigate the long term impacts of erosion.

RECOMMENDATION 12

A formalised recording program should form part of any maintenance program. It should look to incorporate the valuable recording undertaken voluntarily by the Sexton. Consideration should be given to digital scanning which may provide greater evidence of eroded engravings. The orientation and rotation of the monuments should be recorded so as to determine ongoing stability.

RECOMMENDATION 13

The practice of recarving and blackening should be considered by KAVHA stakeholders including the Heritage Manager, Sexton and KAVHA Advisory Committee, with reference to best practice publications.

⁴⁹ HA HMP, 2016, GML, Context & JRA, p.109

⁵⁰ Caring for Historic Graveyard and Cemetery Monuments, English Heritage, 2011, p.36

⁵¹ Ibid., p.33

⁵² Ibid, p.36

4.6 MATERIALS & ELEMENTS

4.6.1 Calcarene Limestone

The maintenance and conservation of the calcarenite masonry walls is a practice central to the ongoing structural integrity of the buildings, and the presentation, authenticity and integrity of the values embodied in, and represented by the built fabric of KAVHA. It is considered that the calcarenite stone, both in its massive and rubble form, presents in sounder condition than may have been considered c.1960s, and that the deterioration observed related more to the mortars and renders, as would sacrificially be the case. These traditional sacrificial coatings were applied to ensure the integrity and condition of the stone substrate, especially that of the more permeable rubble calcarenite. The use of materials such as cementitious mortars and renders, acrylic paints and waterproof coatings in lieu of these traditional materials presents a risk to the long term integrity of the stone and such practices should be reversed accordingly.

It is recognised that there is little available replacement material making it further important that conservation practices are specified to retard deterioration and protect extant significant fabric. Practices such as the introduction of lead weatherings, commonly employed in conservation practice, shed water clear of projecting stone elements, protecting from water ingress and retarding salt attack and biological growth.

RECOMMENDATION 14

The introduction of lead weatherings are to be considered for dressed stone elements, such as the main entrance to the New Goal, to ensure their long term condition.

RECOMMENDATION 15

Inappropriate coatings and finishes are to be allowed to deteriorate without maintenance or, where practical, be actively removed from stone when there is an evident and urgent need to do so.

4.6.2 Mortars, Plasters & Renders

The nature, fragility and deterioration of the calcarenite limestone calls for careful and diligent specification for mortars, renders and plasters. It is in this area that the KAVHA HMP Policy for the avoidance of modern materials is most important. Mortars and renders are to be lime based without the inclusion of cement or modern additives such as setting agents, water repellents, epoxies etc.

The application of trowelled cementitious renders, commenced following the 1962 *Old Colonial Structures – Schedule of Materials* not only presents an impact to the ongoing condition of the fabric, but also the aesthetic presentation of the site more broadly. *'Photographic evidence reveals a subtle difference in character between the nineteenth and mid to late twentieth century appearance of the Penal Settlement Buildings. During the Second Penal Settlement the buildings had a softer outline, with shingle roofs and walls rendered with a pebble-dash mixture made from local Calcarene. A lime washed finish also seems to have been applied... The modern rendered finishes at KAVHA are smoother than the finish originally used.'*⁵³

The process and build up of harling is similar to that of the methodology defined in 1962 for remedial works, however it employs traditional, and more appropriate materials, consistent with the long term care and conservation of this significant fabric, and its original presentation.

RECOMMENDATION 16

The practice of harling or roughcast, the method and application of textured lime renders, should be reintroduced.

Pre-prepared mortars, free of cement and additives, suitable for some of these applications are commercially available, however an investment in equipment and training would afford KAVHA the opportunity to prepare mortars for varying applications (pointing or harling) while continuing trade skills and training supporting attendance by KAVHA works crew members of relevant training programs and or having a specialist tradesperson visit KAVHA for training workshops on the preparation of lime mortars and lime washes and harling techniques should be considered.

Noting that all materials were originally sourced locally, from Calcarene deposits or beach sands, careful consideration and research into sources of lime, sand for mortars and aggregate for harling, should inform the preparation of Specification Data Sheets for these works.

⁵³ KAVHA Draft CMP, JRA, 2007, p.257

The following recommendation is made in response to Policy 8.3.3 of the 2016 HMP 'Traditional building materials and techniques will be used where possible to retain the handmade individual characteristics of each building.'

RECOMMENDATION 17

The 1962 methodology for the conservation and maintenance of masonry should be superseded with Specification Data Sheets for mortars, plasters and renders which reflect today's, proven, best practice of lime based mixes.

4.6.3 Coatings, Finishes & Colour Schemes

While intended as a conservation method to prevent the ingress of salt laden water and sea spray, contemporary best practice now avoids the application of acrylic paints and similar impervious coatings to historic fabric, especially masonry.

'A major cause of deterioration of traditional mortars, renders and plasters is the application of dense or impermeable materials. Buildings constructed from porous building materials can transmit water through their fabric and dissipate it by evaporation... If this balance is disrupted by the application of coatings that restrict moisture movement and evaporation, problems may arise. Impermeable paints limit evaporation of capillary moisture from the outer face of the wall.'⁵⁴

'Many modern paints are incompatible with historic substrates, due principally to their poor permeability, where their application can lead to accelerated deterioration of the historic fabric.'⁵⁵

The 2016 HMP and Draft 2007 CMP makes reference to an inversion of the tonal distinction of walls and cills and make note that cills and lintels were sometimes unpainted. Physical evidence would suggest the use of copperas colours (ferrous sulphate to limewash) to the buildings of Quality Row, and White wash to some monuments of the Cemetery.

RECOMMENDATION 18

Acrylic paints and waterproof coatings are not to be applied to original fabric. The Specification Data Sheets of any revised Maintenance Program should call for the use of traditional coatings and finishes. In instances where these modern coatings are known to be impacting the condition and deterioration of fabric, such as examples provided within Section 3.5 of this report they should be prioritised for removal and replacement with traditional coatings and finishes.

RECOMMENDATION 19

Consideration should be given to the removal of acrylic paints prior to the repainting of any masonry item across the Site. The decision framework should consider condition, cost, long term conservation and presentation and be underpinned by best practice conservation.

RECOMMENDATION 20

Future implementation of the painting program should seek to revert to original tonal relationships as represented by archival photographs and physical evidence to ensure a '...focus on authenticity and integrity'.⁵⁶

4.6.4 Rainwater Goods

Reference to archival photographs supports the observation of the 2016 Draft Maintenance Manual that many of the extant buildings were not originally fitted with rainwater goods. It is however noted that many have since be retro fitted with gutters and downpipes. The addition of rainwater goods, while not historically accurate represents an effort at preventative maintenance, ensuring better management of water at the base of walls and footings. The use of PVC is not considered sympathetic and does impact the presentation of the buildings within the historic landscape.

RECOMMENDATION 21

Introduced rainwater goods are to be retained as part of a preventative maintenance approach. If PVC is determined to be the most appropriate material for introduced rainwater goods it is to be painted to mitigate its visual impact.

⁵⁴ English Heritage Practical Building Conservation: Mortars, Renders & Plasters, p.154

⁵⁵ Ibid, p.474

⁵⁶ KAVHS, HMP, 2016, p.92

4.6.5 Roofing

The Maintenance Plan, and other documentation, identify the historic use of Norfolk Island Pine for roof shingles. The identification and sourcing of suitable timbers is a challenge for other agencies, such as the Port Arthur Historic Site, who equally find limited availability of replacement timbers and have identified a reduction in the lifespan of more readily available alternatives. It is noted that NSW casuarina timbers have been used at KAVHA in the past, but are not supported for use by the current Maintenance Plan, with Norfolk Island Pine nominated as the replacement material, together with an unspecified clear preservative. Those involved in the delivery of the Maintenance Program of KAVHA note sufficient supplies of suitable timber for ongoing roofing projects.

It is understood that the preparation of pine shingles is a trade skill that continues to be practiced at KAVHA.

RECOMMENDATION 22

For so long as sufficient materials are available the re-roofing of buildings historically roofed in Norfolk Pine shingles should be continued as part of the conservation practice and presentation of the Site. Specification Data Sheets should then be developed, together with the KAVHA Conservation Team experience in this area, to guide the selection, preparation and laying of shingles.

The existing skill and knowledge within the crew of this specialist trade is to be disseminated to ensure a continuity of knowledge and application.

4.6.6 Metalwork

The active conservation of metals is a fundamental component of any maintenance program. Maintenance practice should account for the treatment of the existing presentation together with the application of protective coatings, which should then be maintained on a cyclic basis.

RECOMMENDATION 23

The conservation of metals should be incorporated within the Conservation Maintenance Program. The conservation methodology should look to include the application of protective surface coatings while also treating the interface with adjacent materials.

4.6.7 Chimney caps and building ventilation

While it is appreciated that Chimneys are often capped to prevent the ingress of water, vermin and the nesting of birds, these elements play an important role in the ventilation of buildings, especially those which are experiencing damp or are infrequently occupied.

RECOMMENDATION 24

An alternate design for chimney caps should be developed which prohibits the ingress of water, vermin and nesting birds, while permitting ventilation.

4.7 TECHNICAL RESOURCES & ARCHIVAL DOCUMENTATION

The 2016 Maintenance Manual provides a comprehensive list of reputable and reliable publications and technical notes. It is however noted that guidance as to the selection and application of individual resources should be considered against the specific fabric considerations and operating environment of KAVHA. It is considered more appropriate for the relevant information from various technical guides to be translated into more comprehensive specifications and works methodologies forming part of a revision of the 1988 Maintenance Manual. It is also noted that there is a wealth of information within the KAVHA archives which should be more readily accessible and protected as part of a Risk Management Strategy and in response to the Policies of the 2016 KAVHA HMP which state that the 'Existing archival records related to the KAVHA site will be retained, catalogued and conserved. As resources allow, existing hardcopy archival records will be transferred to electronic media.'⁵⁷

The practice of recording, which has been so comprehensive in the past, should be supported, continued and expanded across all aspects of KAVHA's conservation and maintenance as a record of ongoing condition and to inform the diagnosis and treatment of individual elements, such as that of the Cemetery monuments. This is further supported by the HMP Policy for 'One centralised set of records...maintained of all conservation and management decisions'⁵⁸ and that 'Accurate records of all physical works within the KAVHA site will be maintained and updated as required, both digitally and in hard copy.'⁵⁹

⁵⁷ KAVHA, Draft CMP, JRA, 2007, p.125

⁵⁸ Ibid, p.125

⁵⁹ KAVHA, HMP, 2016, p.107

RECOMMENDATION 25

A project should be established for the digitisation of the extensive archives of KAVHA, including reports, specifications, plans and images.

RECOMMENDATION 26

Recording of all works should be undertaken in a systematic and standardised manner, archived centrally as part of the ongoing record of works at KAVHA.

4.8 RESOURCES, SKILLS & TRAINING

The original KAVHA Conservation Program saw the establishment of a dedicated team responsible for the care and conservation of these important assets. *'The relatively small works crew is highly skilled and very experienced to undertake the required maintenance and work...'*⁶⁰ Guided by the specifications provided, and with working knowledge of traditional trades such as the slaking of lime and billeting, splitting and laying of Norfolk Pine shingles these Crews have been able ensure the condition and integrity of these assets over some 50 years keeping the knowledge and skills of some traditional trades within the local community.

The capacity for these resources to maintain the level and frequency of maintenance has been significantly reduced since the transfer of governance in 2015, when there was a *'works crew of approximately 10 expert tradespeople, responsible for the conservation and maintenance of buildings, structures, gardens, landscape and infrastructure'*⁶¹. While the HMP notes that *'...the Commonwealth has developed an ongoing capital program in 2015-2016 which has increased available funding'* the financial allocation to conservation and maintenance is understood to have been reduced by the approximately one third previously contributed by the Norfolk Island Administration and many of the works crew have left and not been replaced. In addition, infrastructure and capital works projects across the island impact the availability of skilled external contractors to supplement the works crew to undertake *'Cyclical maintenance of significant buildings, structures and ruins... as a normal part of the day-to-day KAVHA site management'*⁶² as supported by Policy 8.3.2 of the KAVHA HMP.

The (2015) works program was focused on maintenance works and based on a 1988 Maintenance Manual (which was under review).⁶³ It is noted that the exercise of revising the 1988 Maintenance Manual did not extend to the revision and update of the Inspection Checklists or Program. Furthermore, budget projections based on the 1988 Maintenance Manual are unlikely to account for the costs associated with any residual catch-up maintenance or implications arising from a change in specification to reflect contemporary best practice conservation. Equally without an established Conservation Works Program and associated Capital Works Program there is risk of operational budgets being reallocated to un-forecasted urgent and essential Capital Works.

A continuation of trade practices, together with exposure to additional and emerging best practice techniques, should be fostered to ensure the long term viability of the Conservation Program and provide for valuable skills training and employment for future generations. *'...if there is not a new generation of apprentices trained and offered opportunities to gain experience, this important skill set is in danger of being lost.'*⁶⁴ Additionally, an investment in ongoing and expanded skills training presents economical means of delivering the Conservation Program without dependency on interstate skills and enables KAVHA to engage and promote conservation work as part of a program of interpretation for the site, and engagement by the local community with its built heritage.

A change in conservation practice, as is recommended within this report will require an investment in plant and equipment, in addition to the aforementioned skills training. *'The facilities, and plant and equipment available to the works crew require review and upgrading.'*⁶⁵ An investment in equipment such as a forced action mixer for the preparation of lime mortars, and a captive head vacuum for desalination would assist in the implementation of works recommended within this report.

The case for a Total Asset Management (TAM) Framework for the management of heritage assets has long been recognised by government and industry bodies in publications such as Treasury NSW Total Asset Management – Heritage Management Guideline, September 2004 and English Heritage English Heritage Asset Management Plan for the Maintenance of the Historic Estate, 2011-15. The long term conservation of KAVHA is reliant not only on best conservation practice but conservation practice which is economically viable, sitting within a TAM Framework. A TAM approach will guide investment decisions, ensure a cost effective framework for a conservation maintenance program and

⁶⁰ KAVHA, HMP, 2016 p.78

⁶¹ *ibid*, p.78

⁶² *Ibid*, p.108

⁶³ *Ibid*, p.78

⁶⁴ *Ibid*, p.78

⁶⁵ *Ibid*, p.78

allow sound budget projections for the management of a defined capital works program. Together with the implementation of best practice conservation methods a dedicated investment in equipment and skills training will provide KAVHA the opportunity to implement a cost effective maintenance program with reduced reliance on external expertise and the costly importation of proprietary materials. It is considered that a return to a cyclic maintenance program is the first step toward preventative maintenance which is fundamental to a cost effective TAM Framework, de-risked against escalated costs associated with an unplanned responsive, rather than planned cyclic, maintenance program. The initial departure from current specifications, and remedial works required to enable a return to best practice will require an initial capital investment. This is likely to be costly. It is however important to recognise that much of the current maintenance investment is targeted to areas of recurrent failure in methods which are now proven to be ineffectual. It is therefore important to consider the initial capital required for a return to best practice as an investment with a greater likelihood of successful outcome and one which is anticipated to greatly reduce the scope and frequency of current remedial works.

RECOMMENDATION 27

A dedicated Conservation Works Crew should be re-established for the implementation of the Conservation Works and Capital Programs at KAVHA.

RECOMMENDATION 28

Following the development of specifications which account for the specific requirements of KAVHA and respond to best practice conservation techniques, training should be provided to those responsible for the execution of the works in traditional practices and contemporary techniques.

RECOMMENDATION 29

Opportunities to develop training and apprenticeship schemes should be investigated and investment made in the attendance of KAVHA Crew members at training courses.

RECOMMENDATION 30

Budget allocation should be made to the procurement of plant and equipment for the Conservation Maintenance Program.

4.9 BUILDING SPECIFIC POLICIES

Several buildings were inspected as a representation of typical presentations across KAVHA. While these inspections were not exhaustive and were limited by the parameters outlined in Section 3.1 of this report the following recommendations are provided at the request of DIRD to guide the development of building specific conservation works and specifications.

4.9.1 Settlement Guardhouse & Royal Engineers Building

The Guardhouse is expressing internal evidence of rising and lateral damp and salt attack. Consideration should be given to the removal of acrylic paints both internally and externally. Testing of internal and external plasters and renders should be undertaken, together with readings of moisture content to walls. Efforts should then be made to remove cementitious material to the extent that is practical (see Section 3.3.3), but not less than 300-500mm above the damp 'tide' line. A program of conservation works should be implemented under the guidance of an appropriately experienced practitioner, including the reapplication of traditional plasters renders and lime based finishes, potential preceded by a program of desalination. Opportunities to increase ventilation should be sought and archaeologists consulted in instances where external ground levels are higher than internal floor levels.

4.9.2 No. 10 Quality Row & Outbuildings

No. 10 Quality Row retains evidence of early harling coatings and copperas limewash finishes and is a valuable resource for the authentic presentation of buildings at KAVHA. Extant original fabric should be carefully stabilised and conserved in traditional methods without the use of contemporary materials. The application of cement renders is to be avoided and failing cement patches allowed to deteriorate. Particular care should be given to the specification of conservation works to these outbuildings and it is suggested that current practice cease subject to considered review in the context of the important resource presented by these buildings.

4.9.3 Government House

The practice of lime wash application to the cellar of Government House is to be respected and continued, with minor desalination to those areas expressing salt crystallisation. Those areas across the House expressing salt crystallisation should be incorporated within the household maintenance plan (as is currently the case) with salts vacuumed for removal. Specific care and attention is to be made to the cellar doors and their metal hardware which is in a poor state of corrosion and impacting on the integrity of fixing points (See images to Section 3.6.1).

Internal blistering paint to halls and corridors is evidence of damp and salt attack. Consideration should be given to the removal of acrylic paints both internally and externally. Testing of internal and external plasters and renders should be undertaken, together with readings of moisture content to walls. Efforts should then be made to remove cementitious material to the extent that is practical (see Section 3.3.3), but not less than 300-500mm above the damp 'tide' line. A program of conservation works should be implemented under the guidance of an appropriately experienced practitioner; including the reapplication of traditional plasters renders and lime based finishes, potential preceded by a program of desalination. Opportunities to increase ventilation should be sought and efforts made to increase permeability externally where concrete pavers and slabs are currently found.

Trials should be considered for biological cleaning techniques which reduce the pressure on existing programs arising from high frequency of cleaning, with products selected for their compatibility to adjacent masonry materials.

