

MOUNT ISA CEMETERY MASTER PLAN

MOUNT ISA, QLD



Florence Jaquet
Landscape Architect
Cemetery specialist

8 Rowell Avenue,
Camberwell, VIC 3124
M: 0419 983 641
E: flo@fjla.com.au
W: fjla.com.au

ACKNOWLEDGEMENTS

We acknowledge and thank the following persons for their contributions:

MOUNT ISA CITY COUNCIL

- | | |
|----------------------|--------------------------------|
| - Elizabeth Byers | Coordinator Technical Services |
| - Tony Connolly | Team Leader Parks & Gardens |
| - Emilio Cianetti | Director Engineering Services |
| - Geraldine Hollyman | GIS & Asset Management Officer |
| - Stacey Marshman | Technical Officer |
| - Merlita Perry | Executive Assistant |
| - Russell Reinke | Works Overseer |
| - Les Edenborough | Sexton |

RESIDENT

- | | |
|--------------------|-----------------|
| - Kim-Maree Burton | Local Historian |
|--------------------|-----------------|

We acknowledge and thank our staff for their effort, expertise and dedication:

Ola Kraemer
Florence McIver-Jaquet
Xuyao Wang

VERSION	DATE	PREPARED BY	COMMENTS
1	03/05/19	FJ/XYW	DRAFT FOR COMMENTS
2	13/05/19	FJ/XYW	FINAL DRAFT

CONTENTS

EXECUTIVE SUMMARY	5
INTRODUCTION	7
Background.....	7
Original Brief.....	7
Aims.....	7
Objectives	7
Scope	7
Analysis.....	7
Stakeholder Consultation	7
Masterplan	7
Internal review	7
Public exhibition	8
Implementation Plan.....	8
Methodology	8
Briefing.....	8
Relevant Documents	8
Stakeholder Consultation	8
Analysis.....	8
Preliminary Masterplan	9
Draft Masterplan	9
Final Masterplan	9
Implementation	9
EXISTING CONDITIONS	11
General	11
Location	11
Planning Controls	11
Heritage	11
Demographics and Market	11
Interment Types.....	13
Landscape	17
Context and Geology	17
Topography and Character.....	17
Views	17
Ecology	19
Access and Roads	19
Parking	19
Buildings	21
Services	21
ISSUES	23
Issues Table.....	23
PROPOSALS	25
Vision	25
Design Principles.....	25
Sustainability	25
The Cycle of Life.....	25
Healing Landscape.....	27

CONTENTS

Legacy	27
Design Narrative	27
Key Elements	29
Circulation	29
Parking.....	29
Irrigation	31
Shelter.....	31
Artwork	31
Planting	31
Protection of existing trees	31
Avenue trees	31
Random trees.....	33
Shrubs and garden beds	33
Shallow Soils	33
Interment Types.....	35
Burials	35
Cremated remains	37
Pet remains	37
Materials.....	39
Interment Yield	39
IMPLEMENTATION	41
General	41
Design Implementation Process	41
Staging.....	41
Opinion of Probable Cost	43
APPENDICES	44
Masterplan (A3)	44
Section.....	45
Planting Concept.....	46

EXECUTIVE SUMMARY

In November 2018, Mount Isa City Council sought quotations from suitable organisations and appointed our practice to carry out a Landscape Masterplan for the existing cemetery and new extension site (north of the existing site) to guide the long-term vision for the site.

Consultation with Council officers, ground staff and the local Funeral Directors highlighted a number of key issues:

- The site is running out of both monumental and lawn graves
- The monumental section is poorly laid out which results in space inefficiencies,
- The lawn area attracts an unreasonable and uncontrolled amount of decorations which leads to safety issues for both staff and visitors,
- The presence of flying foxes and ticks on site renders portions of the site unusable and unmanageable by staff.
- The lack of shade leads to low visitation and complaints.
- Irrigation is manually operated and interfered with by the public (generally moved around)
- Soil depths are shallow in places and prevent burial
- Record keeping needs improvement and currently relies heavily on the Funeral Directors' own records.
- Choice of interment types are low (both for burials and cremated remains).
- There is no provision, yet a potential market for a pet cemetery in Mount Isa.

The proposals herein aim to deliver practical solutions to the site's constraints and opportunities and respond to the local character and climate of Mount Isa.

The Vision for the site is based on the belief that a cemetery can be an inviting open-space for remembrance and contemplation for all to enjoy. Due to the harshness of the climate, it is crucial that it is universally accessible to all and provided with shade in key areas.

The design of a cemetery should consider the continuing relevance of the site to the community it serves, well after it is full. The cemetery must therefore be designed as a park, encouraging the community to use it for contemplation and relaxation in perpetuity.

The Vision for the site is to provide:

- A respectful cemetery in keeping with the Mount Isa character.
- A range of quality and affordable products, more extensive than currently offered.
- A healing landscape
- A sustainable landscape.

The Design is inspired by the local patterns within the surrounding landscape:

- the "drifts" created by vegetation groups, rock formations and run-off patterns which shape the land, also often represented in aboriginal art. They are intrinsic to Outback Australia.
- The circular pits of open-cut mines.

The proposed layout offers the following opportunities:

- Continuing supply of existing forms of interments (lawn graves and monumental graves) to respond to demand,
- New interment types (headstones in garden beds, family graves) to test the market,
- More opportunities for cremated remains (niche walls and memorial gardens)
- A covered walkway with seating for respite/contemplation and shelter from the sun.
- A raised/filled section over shallow soil to enable burial.
- New Children section
- New pet cemetery
- A Heritage trail linking key historically significant graves and celebrating the history of Mount Isa (subject to further research)

A preliminary yield calculation indicates a potential for 6,000 graves. At a rate of 40 new interments per year, the cemetery will therefore cater for burials for the next 150 years at single depth or 300 years at double depth.

A detailed costing and Staging is appended and shall be used to guide the capital works in the short, medium and long term.

Importantly, each stage is to cater for demand in each type of interment and offer all products at any point in time. However it should be noted that as trends and market change, some of the products may become more or less popular and adjustment to the Masterplan may be required.

However the Design Intent and character of the site need not change.

The implementation of the masterplan will take many years and be in the custody of many Trusts Members to come. It is therefore crucial that the Masterplan report and its content be supplied, understood and adopted by all Trust members and staff involved in the running of the cemetery. It also needs to be passed onto the next generation of Trust members and staff in the many decades during which the cemetery will slowly expand. The success of the Masterplan depends on it.

INTRODUCTION

BACKGROUND

In November 2018, Mount Isa City Council sought quotations from suitable organisations and appointed our practice to carry out a Landscape Masterplan for the existing cemetery and new extension site (north of the existing site) to guide the long-term vision for the site.

ORIGINAL BRIEF

To develop a concept and final masterplan for the Mount Isa City Cemetery– incorporating the existing section (approx. area of 9,823ha – existing Layout) and the new section (approx. area 4.5ha) which will contain the following:

- Access road to the new section of the cemetery
- Layouts of the graves
- Appropriate plans and beautification of the area
- Columbarium
- Aesthetic improvement of the existing cemetery to integrate with the new section
- Other features that are required for the cemetery
- Design should be compliant with the relevant Australian Standards and guidelines

AIMS

- Provide ideas for the improvement of the existing cemetery
- Provide a design for the new extension site.
- Maximise the use of the location and space through greater efficiency and design,
- Offer opportunities for the cemetery outside of its current scope
- Provide a financially and environmentally sustainable cemetery.

OBJECTIVES

The Masterplan shall deliver the above aims by:

- Guiding Council in the development of the cemetery site until it is full,
- Ensuring the natural beauty of the site is enhanced and accessible for future generations
- Providing facilities that are, not only contemporary, but inter-generationally sustainable.
- Opening the site up to a wider range of the community and enabling access for less-able persons of all ages,
- Enhancing the landscape experience,
- Improving revenue potential
- Provide an affordable and staged way-forward

SCOPE

The scope of services for the development of the Mount Isa Cemetery Masterplan is to include:

Analysis

- o Interment options currently offered
- o Industry trends
- o Site Constraints and Opportunities

Stakeholder Consultation

- o Council officers including maintenance and office staff
- o Funeral directors
- o Historical groups

Masterplan

- o Conceptual Landscape Plan/layout for proposed developments,
- o Planting philosophy
- o Yield calculation

Internal review

Public Exhibition

- o 28 days exhibition period and compilation of feedback

Implementation Plan

- o Cost estimate
- o Staging plan
- o Priorities

METHODOLOGY

The following methodology was suggested as part of the tender process and accepted by Council:

Briefing by Council officers

Supply of relevant documents

A number of documents were made available to assist in defining the current issues facing the cemetery:

- o Aerial photography with overlay of approximate contour lines
- o Previous Masterplan – in-house (Dated Sept 2009)
- o Title information
- o No Geotechnical not Groundwater report were available.

Stakeholder consultation

The local Funeral Directors, Sue and Derek Tuahine of Centenary Park Funerals, were interviewed and their concerns recorded. Most concerns relate to record keeping.

The local Religious leader (Good Shepherd Parish) was contacted but failed to respond to both Council's and the consultant's contact attempts.

The local Indigenous groups were not contacted nor involved.

Analysis

The issues arising from the site fall into three main categories:

1. Cultural/Religious
Discussions were held on the current religious/Cultural groups using the cemetery and expected changes in the demographics within the catchment.
2. Operations
Considerations were given to current equipment, staffing levels and products available and the viability and effects of change.
3. Landscape/Buildings
A visual analysis was carried out by our practice. The analysis findings were graphically represented in the form of "Constraints and Opportunities" drawings.

Preliminary Masterplan

Based on the findings of the various analyses and the issues highlighted during the stakeholders' consultation process, an issues paper was formulated. This led to the formulation of a preliminary landscape proposal with realistic yet inspiring ideas to resolve wide ranging issues.

This was presented to Council officers on 7th March 2019

Draft Masterplan

Following the receipt of Council officers' feedback and approval in principle, the Masterplan was further developed and drawn electronically. It was accompanied with a Planting concept and yield calculation.

All were sent for comments and approval in Early May 2019.

Final Masterplan

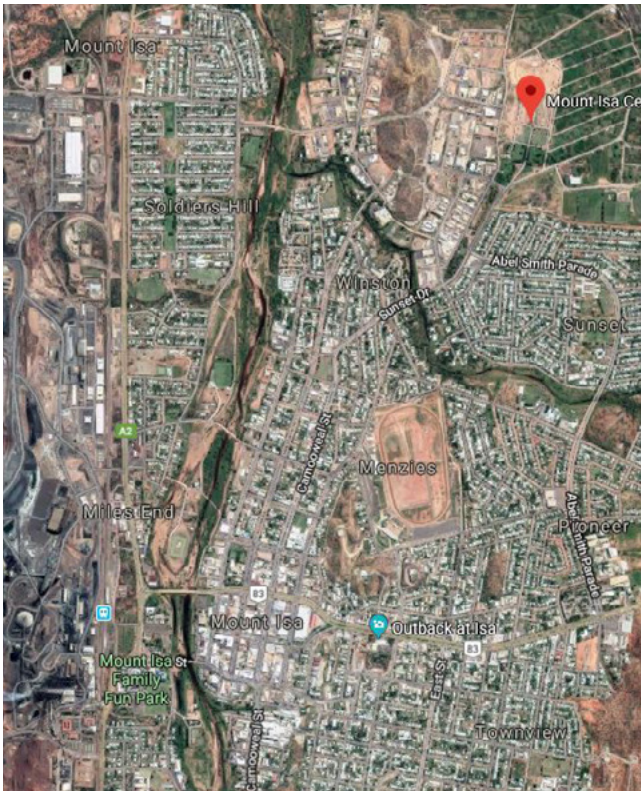
TBC.

Implementation

The main recommendations of the Masterplan were formulated as a series of capital works tasks and prioritised based on budget, product choices and logical sequencing of works.

The implementation plan consists of:

- Costing estimate (Excel) (costed by Council)
- Staging plan/Program



Context area



Title references



Location

EXISTING CONDITIONS

GENERAL

Location

Mount Isa cemetery is located north of the city.

Its main entrance and carpark are accessible from Sunset Drive. Another 2 entrances are available from Commercial Rd.

Planning Controls

The cemetery site comprises of two lots:

- Lot 95 on SP265806 (Main Cemetery)
- Lot 1 on SP125095 (Land to the West of the Sexton Residence)

According to the Mount Isa Planning Scheme, a number of Overlays affect the site:

- It is a registered Local Heritage Site
- It is subject to Indigenous Land Use Agreements
 - The northern part of the Cemetery beyond the existing northern fence line: Mount Isa Cemetery Indigenous Land Agreement (Tribunal No QI2016/059)
 - The whole site within the native title claimants zone: Kalkadoon Local Government ILUA (Tribunal No QI2012/038)

As a consequence, any development will be subject to local planning processes, in particular Heritage Impact Assessment. As part of the Land Agreement negotiations, a number of graves are to be set aside for Indigenous Australians.

Heritage

Historically, and according to a local Historian, the Kalkatung tribes, Indigenous Australian were nomadic in the region and have been living on the land surrounding Mount Isa for over 60 thousand years. Their descendants still inhabit the region.

Mount Isa was founded in January 1924 and has been a mining town ever since.

It may be the largest city in the world (according to the Guinness Book of Records) but it also one of Australia's most remote.

Burials started at the Pioneer cemetery (Ryan Rd) until the opening of the current cemetery site, off Commercial Rd, in the late 1930's.

John Distant, a dual military medal recipient is buried at the cemetery. His unmarked grave was restored in Oct. 2015 and a plaque added to commemorate his deeds.

Demographics and market

According to the 2016 Census from the Australian Bureau of Statistics, Mount Isa's population was counted at 32,500 and is made up of 52 nationalities, with Indigenous Australians representing 23% of the population.

The population's median age is 32 years with more males than females (52% vs 48%).

The death rate is 6.5% , down from 2012.



Monumental graves



Plaques on beams in lawns



According to the Funeral Director (Centenary Park Funerals) the average cremation rate is 36 per year against 40 burials per year, with 50% of burials occurring in the lawn beam section and the other 50% in the monumental section.

Although the monumental section can appeal to established families in the area, it is the most popular form of interment for Indigenous Australians.

There is no clear trend indicating any changes in the population's cultural mix.

Interment types

The cemetery provides a limited range of interment types and styles:

Monumental graves

Monumental graves are surprisingly more popular in Mount Isa than the country's average. This could be attributed to lack of affordability by families but could also be due to the fact that this form of burial is the cheapest at the cemetery.

For similar reasons, memorialisation rate is low. Many graves do not have any headstones, some have a rock, a marker or nothing to identify them. Grave alignment is very ad-hoc leading to inefficiencies in the use of the land.

It also appears that graves can be reserved very cheaply and there could be a large number of graves already reserved which have never been used. This practice must be revisited if Council wishes to use the land as efficiently as possible. (Operational issues are outside of the scope of this report and a separate consultant may be appointed to advise on these matters.)

Stone mulch has been spread around the graves to minimise weed establishment and improve foot traffic when wet, but this has led to an overwhelmingly mineral "look and feel" contributing to a "heat-island" effect in these areas.

Council Ground staff has indicated that they are now trialling a bark mulch. The obvious disadvantage is that it is easily washed away by heavy rains and blown away by strong winds.

This area is not regularly maintained by Ground Staff as it is seen as "belonging to the families". It should be clarified that the monument themselves are the responsibility of the families whilst the land in between is the responsibility of Council.

Attention to the area is generally given once a year, after the wet season, when weeds and grasses have taken over.

Plaques on beams in lawns

Plaques are set on the concrete beams.

The beams are generally raised above ground level which then creates an unfortunate need for whipper-snipping of all edges.

Some are flush with the lawn, possibly as originally intended, so that the beam can act as a mowing strip. However, the tendency for memorialisation over and above the authorised plaque, with artefacts, potteries, plastic flowers, constructed item and in one case solar light and raised glass box, has meant that maintenance is greatly impeded by this clutter.

Not only is it visually unappealing, it is also a WH&S issue for staff and visitors as items break or move into the lawns.



Plaques flush with lawns



Still-born and mine amputees



Memorial Gardens for cremated remains

Plaques flush with lawns

In the older section (ie. On either side of the main entrance), the lawn section consists of plaques set on a concealed concrete block below the ground. The facility to pour these concrete blocks is located at the cemetery's shed and blocks are produced on an "as-need" basis.

In one section (the first 3 rows along the Fig avenue on the eastern side of the entrance drive), the beams are laid below ground and the concrete block placed on the beam, both concealed below the ground. This has been very successful in minimising settlement around the plaques.

Plaques need to be regularly trimmed with whipper-snippers to keep them free of grass runners which can be maintenance intensive.

There is very little memorialisation other than the authorised plaque. Mowing can therefore be carried out very efficiently.

This form of burial is, by far, the most visually appealing on site.

Still-born and mine amputees

A small area is dedicated to them. It consists of a simple lawn, surrounded by low fencing and bordered by a row of shade trees. It is close to capacity.

Memorial Gardens for cremated remains

A number of raised garden beds flank the main entrance but they appear empty and un-memorialised.

A three-wing white brick niche wall is located under a shelter in one of the roundabouts. As the niche cavities are too small to host a full set of ashes, this may explain its lack of popularity.

There are no other form of interments on site for cremated remains with some families opting to put them in the family grave.

Cremation is currently undertaken by the local Funeral Director in a shed next to the cemetery. As part of their service, they also offer some memorial gardens/niche wall positions on their site.

They are the first point of contact for the families and can capture the market, albeit a small one.

It is also possible that they provide this service because Council does not have much to offer at the cemetery.



Context and geology



Flat site



Stockpile of rocky material



Eastern background



Western background

LANDSCAPE

Context and Geology

The Mount Isa Inlier contains major deposits of copper, lead, zinc and silver, and significant deposits of gold, uranium and cobalt.

The geology of Mount Isa environs is complex but is generally characterised by a shallow rock layer.

Evidence of this rock shelf can be seen on the western boundary of the cemetery, where it protrudes out of the ground.

Ground staff has also indicated that the western edge of the cemetery is too shallow for burial, with only 900 to 1.2m deep before rock is encountered.

Topography

According to the survey information supplied by Council, the site is generally flat with a small rise in the south-east corner.

Its lowest point is along the northern boundary.

At the time of the first site inspection, the new extension site was used as a stockpile of rocky material (sourced from outside the cemetery), unsuitable for fill in a cemetery. It has since been removed.

The site has recently been regraded. New survey information is not available.

Climate and character

Mount Isa has a semi-arid climate with only 450mm of rain fall per year, 45% of which falls in January and February. With a temperature range of 17 to 35 with frequent summer peaks up to 45 degrees, low rainfall and high evapo-transpiration rate, there is a water shortage for most of the year.

During the exceptionally heavy rains of February 2019, a large amount of water traversed the new site, travelling from south to north along the horse paddocks, then diagonally across the extension site into a culvert in the top north-west corner.

The site is characterised by a rectilinear road pattern, typical of traditional European-style cemeteries.

Beside a few large trees in the southern part, the site is very open and exposed with occasional small trees. This renders it very hot and inhospitable.

Views

The only features on sites are the existing large trees and one shelter.

A number of views from the cemetery onto the surrounding hills are worthy of note.

The eastern side of the cemetery looks onto the blocks known as the "horse paddocks".

The western side of the cemetery looks onto an industrial estate which may benefit from partial screening.

Although the city's treatment plan is nearby, it is not visible from the cemetery.

There are no other views worthy of retention nor screening.



Snappy gums & Spinifex



Snappy gums & figs



Parking



 PARKING  ENTRANCE  ROAD

Existing vehicle access

Ecology

There is no arboricultural report available for the site.

A number of Fig trees and Snappy gums grow successfully on site although a number of them have been verbally reported as diseased and in need of attention.

It is important for Council, as part of its Risk Management, to carry out an audit of all trees and monitor their health on a regular basis.

At the time of the first inspection (Dec 2018), the north-east corner of the site offered some established vegetation of Snappy gums and Spinifex. All understorey vegetation (Spinifex) has since been removed, leaving few individual trees in place.

The larger trees (Snappy gums and figs) are roosting trees for the migrating Little red flying-foxes (*Pteropus scapulatus*) for half of the year (August to January). They do not appear to favour smaller trees on the site.

These bats can be carriers of dangerous diseases (Australian Bat Lyssavirus and Hendra viruses), are infested with “spider ticks”, are protected under Queensland legislation and must not be disturbed.

This creates a number of significant issues for the cemetery:

- o The bats drop ticks onto both visitors and staff. This is a health hazard for all.
- o The existing graves below the trees cannot be safely accessed for either mowing or visitation.
- o The main entrance gate is condemned and signage displayed during the entire roosting period to protect the public. An alternative entrance is available off Commercial Rd.
- o The trees onto which they roost have previously been assessed by a tree surgeon as weaker and diseased, suffer from regular die-back (due to damage by flying foxes) and are no longer able to withstand the weight of the bats. However, tree surgery work which is noisy and intrusive is prohibited by legislation whilst the flying foxes are present. This creates another Work Health & Safety hazard on site.

Access and roads

The site is currently accessed via the Main entrance at the end of Sunset Drive for half of the year (Refer to Ecology – Analysis for details) and off Commercial Rd all year round.

Most internal roads are sealed with high kerbing to control water flow and protect monuments during the rare periods of wet.

Gates are generally left opened between 7am and 6pm with the exception of the Main gate which is permanently locked during the Flying fox roosting season.

Hearses access is permitted within the burial areas when weather permits and where space allows and a ramp installed to facilitate the mounting of the high kerb.

Parking

The only permanent sealed carpark is available outside of the cemetery, at the end of Sunset Dr and can accommodate approximately 25 cars.

Parking is also available internally and roadside as the roads are wide enough to allow for one parked car and passing traffic.

Visitors tend to park as close as possible to the grave they attend to.

Some processions can have up to 80 cars.

During the drier month, parking also occurs on ad-hoc basis on undeveloped land.



Sexton residence



Office



Sheds



Movable irrigation stands

Buildings

There are a number of buildings on site:

- The Sexton residence, where the Sexton currently resides. It is subject to regular fumigation to protect it against the Flying Fox ticks. It is fenced off for privacy.
- The maintenance shed where equipment is stored.
- Office & Toilet are wheelchair accessible.

All are located in the south-west corner of the cemetery.

Services

Stormwater

As previously mentioned, during the heavy rains of February 2019, a large amount of water traversed the site, travelling from south to north along the horse paddocks. An open drain was created in February 2019 to deal with these peak events.

Electricity/telecom

The caretaker has internet in his home, however there is no computer connectivity in his office.

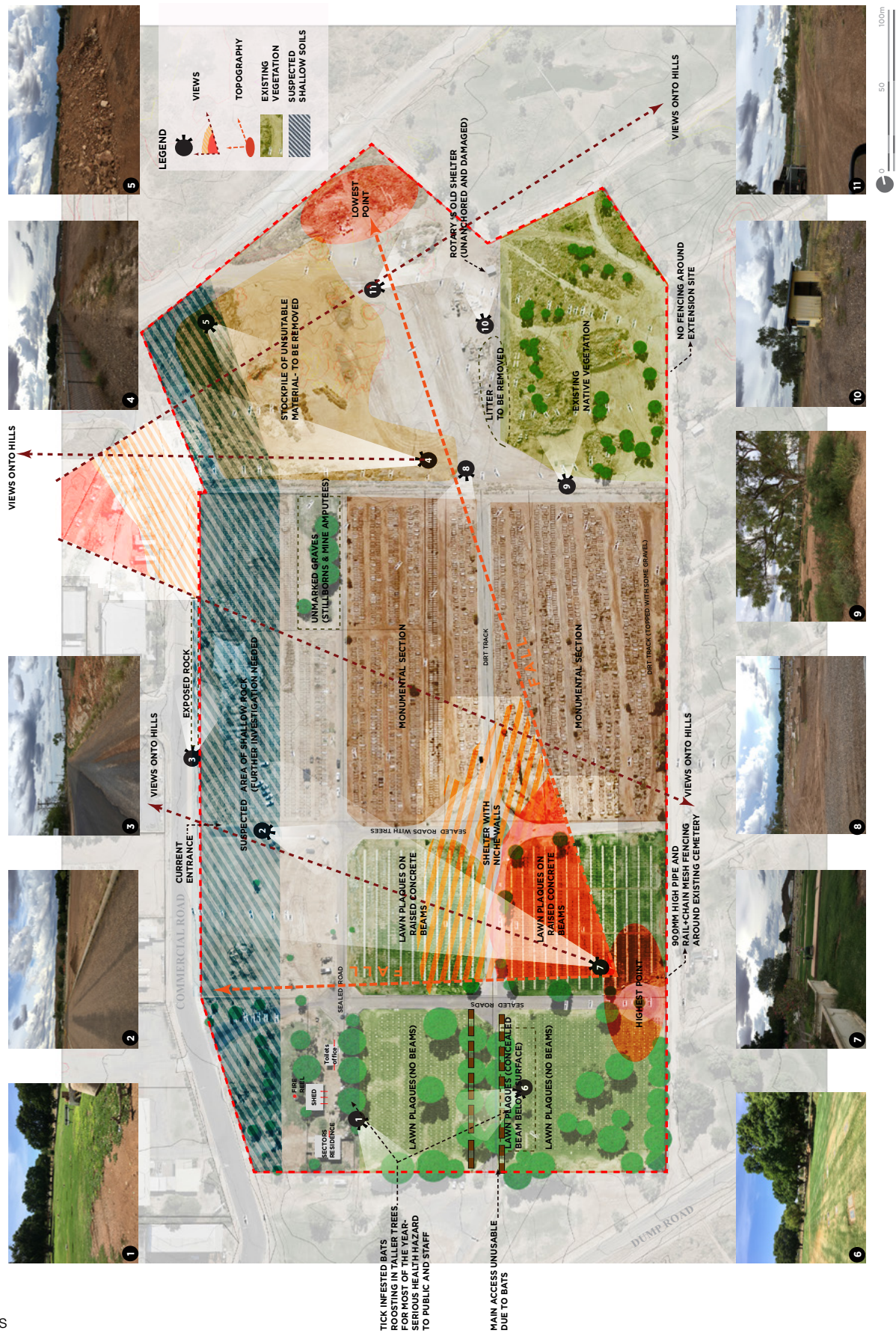
Power is available.

Irrigation

Irrigation is currently available to all lawn sections, using water from the nearby treatment plant.

Supply currently exceeds demand, although watering is allocated in timeslots, shared with other adjacent properties (Horse paddocks)

Irrigation on site is mostly manual, using hoses and sprinkler heads on movable stands. These stands are easily moved which can be an issue when the public interferes with Ground staff's intention and purposely irrigate their preferred graves. It is also labour intensive and requires out-of-hours involvement from the Sexton.



Site analysis

ISSUES

Based on the above analysis, the site presents a number of constraints and opportunities, summarised below:

RAISED FROM INDUSTRY TRENDS AND SITE ANALYSIS

Site Constraints	Site Opportunities
Graves to be set aside for Indigenous Australians as part of the native title claim	
Maintenance in the monumental section is limited to weed eradication	Intersperse with small trees where possible and indigenous ground cover
Monumental section is hot and unappealing	Intersperse with small trees where possible and indigenous ground cover
Monumental section is poorly laid out and leads to inefficient use of space.	Peg rows with visual markers when developing a section
Lawn beams are difficult to maintain due to the excessive memorialisation and rogue ornamentation	Enforce stricter rules on memorialisation and progressively remove offending ones.
Niche wall positions are not selling	Provide more choice, and interment spaces which accommodate the whole set of ashes.
Flying foxes and their ticks are a health hazard	Use smaller trees which are less appealing to Flying foxes
Flying foxes render the existing and only carpark as unusable for half the year	Negotiate alternative Flying Fox management with DPE to minimise or eliminate their presence on site.
Section residence is adversely affected by the presence of Flying Foxes and, at times, a health hazard to staff residing in it.	Negotiate alternative Flying Fox management with DPE to minimise or eliminate their presence on site.
The public interferes with portable irrigation sprinklers, rendering maintenance more difficult and labour intensive	Install automatic in-ground irrigation system
Shallow soils along the western boundary	- Fill the area to enable burial - Use pre-cast graves and fill around them
Solid bed rock estimated at 0.9m to 1.2m depth in places	Fill the area to enable burial + additional 1m buffer for drainage of graves (ie min. 2.8m depth for double depth grave)
	Potential market for a pet cemetery

RAISED FROM STAKEHOLDER CONSULTATION

A number of record keeping inefficiencies and operational issues were raised by the Funeral Directors. As it is outside of the scope of this report, these concerns were only verbally passed onto Council staff.	Funeral Directors showed a strong willingness to cooperate with Council to improve communication/record keeping and operational matters.
Concerns about the gravel mulch	
Concerns about the high kerbs for hearse access	Consider access portable ramps on existing kerbs and ramp access detail in key areas in new areas.
Concerns about the tick-affected bats	
	The local historian/researcher indicated a willingness to research cemetery history and interest facts (subject to funding)
	Consider a Heritage trail within the cemetery



The ultimate 'park-like' cemetery - woodland cemetery - Stockholm - Sweden



The cycle of life

PROPOSALS

VISION

The Vision for the site is based on the belief that a cemetery can be an inviting Public Open Space for remembrance and contemplation for all to enjoy. Due to the harshness of the climate, it is crucial that it is universally accessible to all and provided with shade in key areas.

The Vision for the site is to provide:

- A respectful cemetery in keeping with the Mount Isa character.
- A range of quality and affordable products, more extensive than currently offered.
- A healing landscape.
- A sustainable landscape.

DESIGN PRINCIPLES

Sustainability

Cemeteries need to consider their on-going function and sustainability.

Long gone are the days of a “functional” cemetery, with “efficiency” as the only driver for its design.

Long gone should be the days when cemeteries fill up, become forgotten, unusable and unmanageable destinations, with no connection to the community they used to serve.

Cemetery landscapes are evolving, responding to change and the community’s appreciation of sustainability and environmental issues.

The design of a cemetery should consider the continuing relevance of the site to the community it serves, well after it is full.

It should be designed as a park, encouraging the community to use it for contemplation and relaxation.

It is also important to protect and respect the environment for a sustainable future in all aspects of its construction:

- Minimise cut and fill
- Re-use fill and excess spoil on site
- Minimise impact on the ecology
- Retain vegetation and add trees to maximise carbon-absorption and oxygen production.
- Increase vegetation cover to minimise the “heat-island” effect.
- Source local products.

The Cycle of Life

The circle or cycle of life is the foundation of many religions: Life and Death without beginning or end, reincarnation, rebirth, resurrection and life after death.

It is also visible in all living things on Earth:

- The inevitability of death in all living things, with the return to Earth after death regardless of one’s beliefs after death.
- The passing of the seasons, with seasonal colours and loss of leaves.
- The passing of time, with the sun’s endless rotation from East to West.

The Oval, which is at the centre of the Design, represents these cyclic movements. It represents the heart of the site. Embedding symbolism into the Design is one way to create a meaningful landscape, fit for purpose.



Winkworth Arboretum, UK



Specimen Tree



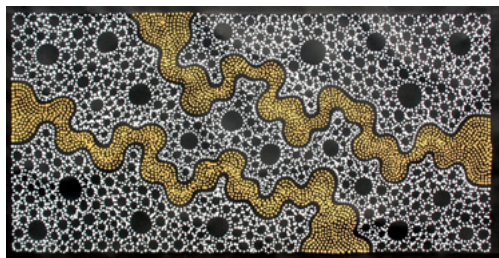
Sculpture



Sculpture



Landscape 'drifts'



Aboriginal art



Outback at Isa

Healing landscape

The overall objective of Landscape Architecture is the improvement of the physical, environmental and psychological well-being of people.

Coupled with the long-held and scientifically supported view that our natural surroundings can have a profound effect on people's well-being, it is clear that we, as landscape architect, need to be cognisant of the **"Psychology of Design"**.

Studies have shown that human beings have an innate attraction to nature. Being surrounded by nature creates feelings of appreciation, tranquillity, spirituality and peace.

Healing landscapes are calming and peaceful garden settings where one can escape and emotionally regenerate.

It is therefore essential for cemeteries to provide a thoughtful, nurturing and soothing environment for visitors. The use of respite areas and artwork upon which to reflect is an essential part of our design philosophy.

Legacy

The role of a cemetery is also to keep a record of social patterns as well as individual's information.

Understanding its past history and paying homage to it can add another dimension to any design.

The presence of artwork in cemeteries can also contribute to the contemplative function of the site and grieving process, all of which used to be represented through funeral architecture and funeral craftsmanship. Unfortunately such artwork in monumental and headstone designs is less prevalent nowadays. Contemporary artwork can now take over the same function.

We see any artwork and heritage interpretation as important legacies to future generations and an opportunity to interpret the Design Narrative (below)

DESIGN NARRATIVE

The Design is inspired by the local patterns within the surrounding landscape:

- The "drifts" created by vegetation groups, rock formations and run-off patterns which shape the land, also often represented in aboriginal art. They are intrinsic to Outback Australia.
- The circular pits of open-cut mines.

The Design provides an abstract interpretation of these "drifts", meandering and random shapes taken for aerial photography.

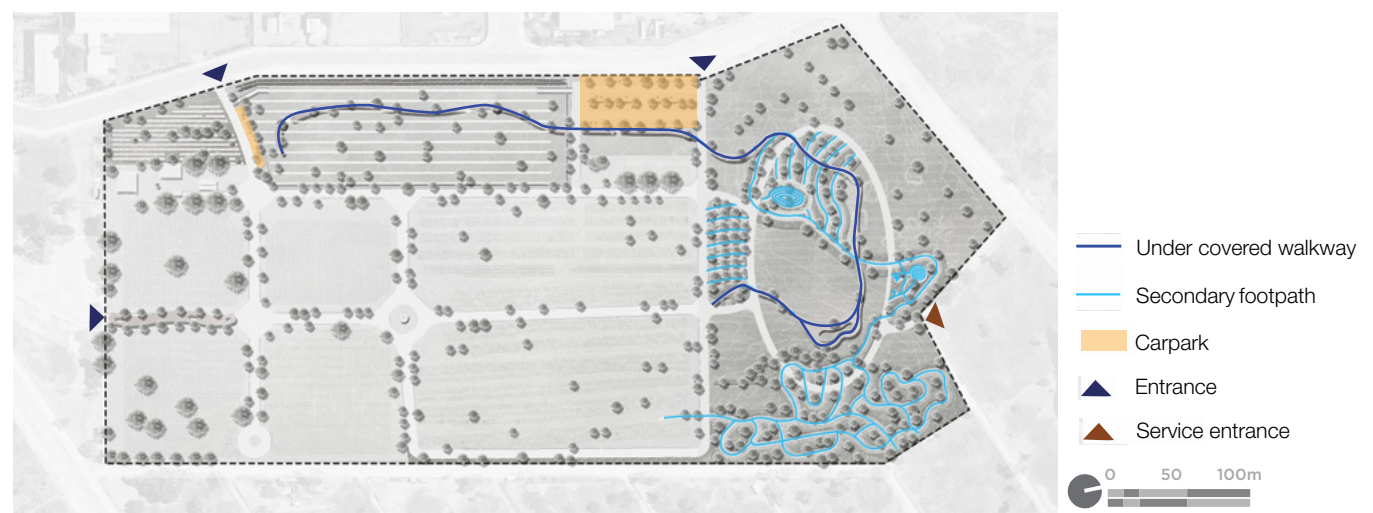
These strong snaking patterns meander through the site, defining organically-shaped gardens and shading structures.

The Design attempts to emphasise the central space as a main focal point, destination and link to other parts of cemetery.

The north-east corner takes advantage of existing remnant vegetation to create a garden-style burial space, with a planting style similar to that of "Outback at Isa"



Vehicle network



Pedestrian network



Parking

KEY ELEMENTS

Circulation

Vehicular

The road layout is already well established in most of the site.

Any extension to the roads will logically align with the main existing thoroughfares and is proposed to terminate at the northern end in a strong oval-shape.

The future roads will be of a width suitable to accommodate one parked car plus passing traffic (approximately 5.5m wide) and would preferably be one-way traffic.

Due to the hot climate, roads have been laid out to minimise walking distances to anyone's grave, typically less than 50 metres.

A new entrance, closer to the new burial areas is proposed of Commercial road and flanked with walls to enhance this major entry point.

The existing "middle entrance" on Commercial will eventually become redundant and replaced with burial plots.

-Pedestrian

The pedestrian network is reflective of the Design intent which suggests a park-like facility.

Although pedestrians are able and expected to walk on the roads and can safely do so due to low traffic speed and numbers, it became apparent through stakeholder consultation and discussion with staff that shaded paths and respite areas are paramount in the region.

So in order to improve visitors' experience and their mourning process, the **main footpath** runs under a **covered walkway**, generally running north-south, linking the office, new carpark and various burial areas.

These paths can be either coloured concrete for longevity or asphalt with stone edging as an alternative.

The provision of universal access (ie. Access for all abilities) to all main facilities is essential in order to ensure equitable and fair access for all and be compliant with the intent of the Disability Discrimination Act.

Parking

Parking is well provided at the southern end, near the main entrance.

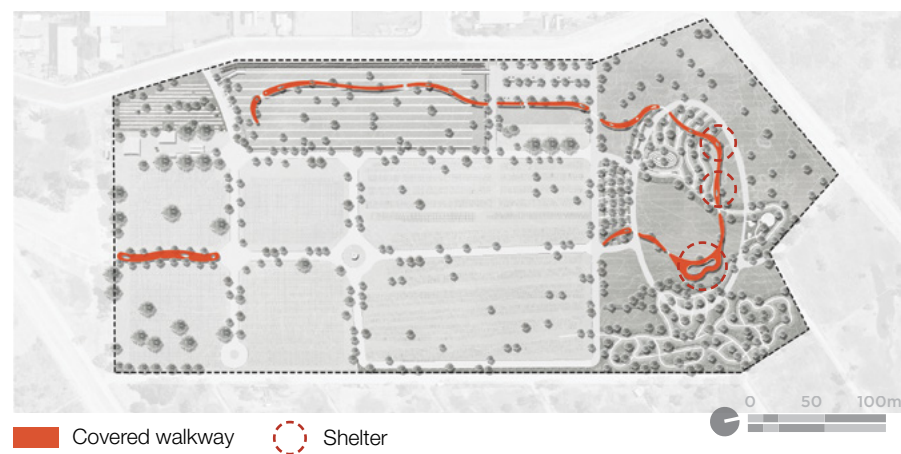
Parking is also permitted on the side of all internal roads.

A new larger carpark, able to accommodate approximately 100 cars, is proposed near the new entrance, where future burials will eventually occur. This carpark should be built when burial demand moves to the northern end of the site, i.e. when the southern portion has reached capacity.

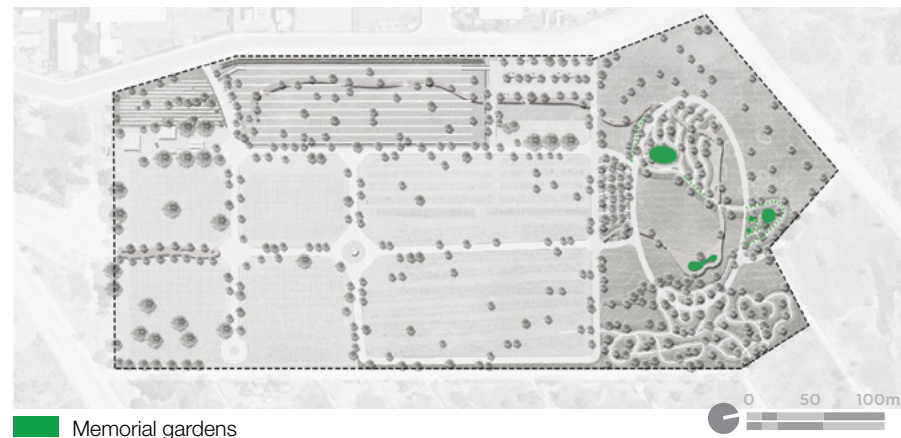
In general any sealed carpark are a potential loss of burial space and consequently a loss of valuable income. These carparks may be considered for removal as the cemetery starts to run out of space – not before.

Wherever possible carparking may also be considered with the road reserves adjacent to the site (eg. Commercial Rd).

In the meantime, any undeveloped parts of the cemetery can be used as temporary carpark by providing a crushed rock base, affordable and easily removable when the area in question requires development.



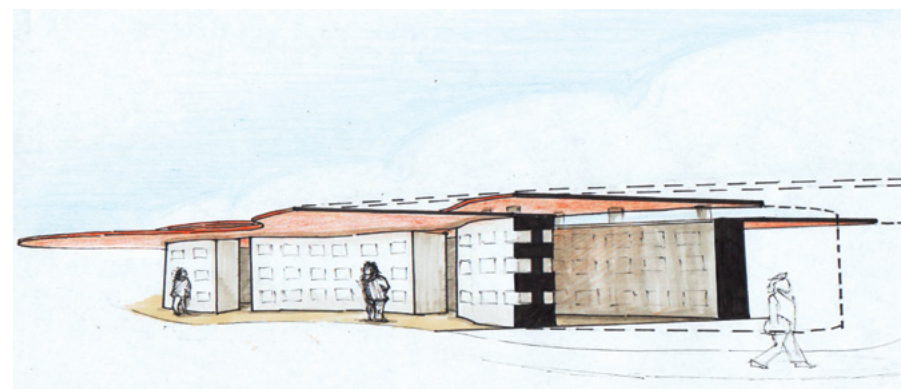
Covered walkway Shelter



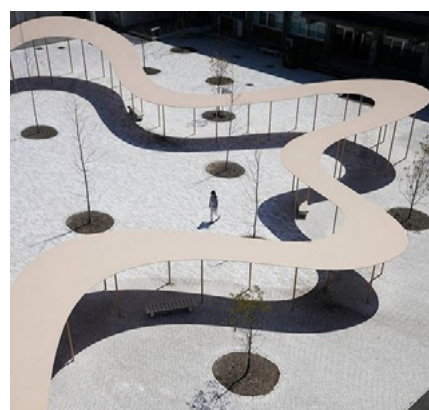
Memorial gardens



Spiral (Indicative Only)



Shelter/Niche wall artist impression



Rock Spiral (Indicative Only)



Rock Headstone (Indicative Only)



Laser cut roof (Indicative Only)

Irrigation

To minimise interference by the public and for efficiencies, an automated inground irrigation system should be installed.

Water demand should be monitored to ensure that supply meets demand. If it cannot meet demand, prioritising will be required, selecting key areas and applying irrigation rates to achieve survival only, especially in lawn sections.

Plant species have been selected for their ability to survive the climate, however irrigation will still be required during their establishment period (typically 2-3 years)

Shelter

As previously mentioned, shading is paramount at the cemetery for both funeral services and casual visitors.

In keeping with Nationwide trends, the use of informal and weather proof shelter are popular for non-religious and casual services. A larger shelter is therefore proposed furnished with seating and picnic tables. The shelter forms part of the “organically shaped” covered walkway which snakes through the site.

Artwork

Artwork should be selected for its relevance to site and /or the design principles. Whether it relates to the concept of Life and Death/Eternity/Remembrance which is directly relating to the use of the site, it can also interpret elements of the Design Narrative.

Although these elements are introduced for aesthetic reasons they must also generate some revenue where ever possible to justify their inclusion. It is expected that most artwork would be designed to either provide ash placements within its body or its base or its surrounds.

There are a number of opportunities to introduce some creativity and meaningful art in the cemetery:

- The “Rock Spiral” is a sculptural element which interprets the shape of the open cut mines in the region. Consisting of rings of monolithic rocks, they offer memorialisation for families and individuals.
- All respite spaces offer opportunities for decorative paving, either as sand-blasted patterns in concrete or mosaics or other artistic inserts.
- The walkway roof may be laser cut with patterns to create shadow patterns on the ground.
- Individual sculptures throughout the site.

Planting

Protection of existing trees

Healthy existing trees which are growing well and have adapted to the constraints of the site are in equilibrium with their surroundings. Any construction work that affects this equilibrium could be detrimental to their health, future growth and safety.

The following basic rules should be followed during the implementation of the Masterplan and beyond:

- Avoid stockpiling within the tree’s dripline,
- Avoid grave digging within the trees dripline,
- Establish mulched garden beds below to encourage natural regeneration,
- Do not remove fallen branches from mulched garden beds to allow natural ecological process to occur and small invertebrates to thrive.
- Regularly monitor the health of the trees for safety hazards,
- Brief maintenance staff of the potential for falling branches when working under the canopy.

Avenue trees

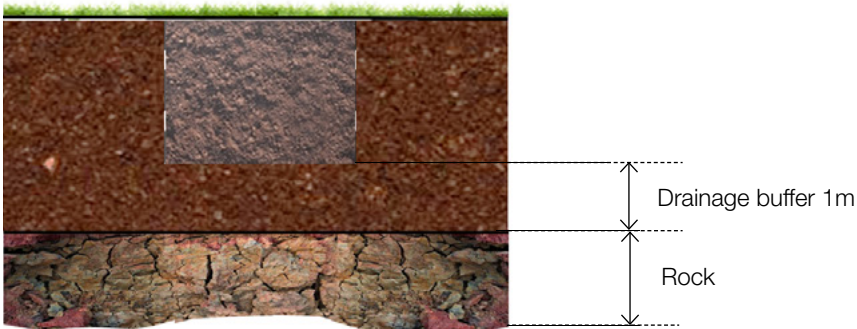
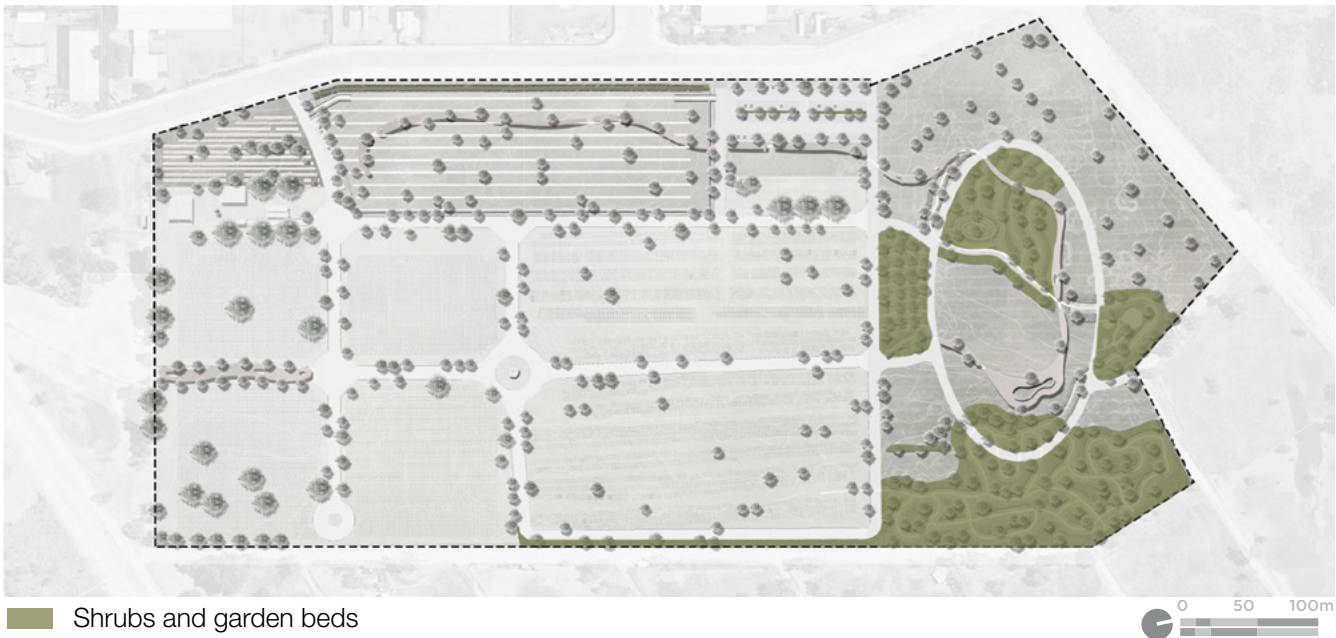
In order to break to openness of the site and provide valuable shade for visitors, roads should be lined with trees. In keeping with the landscape character of the area, we recommend a more random, less formal pattern.



Beautification / Infill planting (Fawkner Old)



Beautification / Infill planting (Box Hill)



Sketch of typical profile

In all cases, it is recommended to set the graves back 2 metres from the trunk.

It is also recommended to select small tree species until a solution to the bats has been found, as they favour taller trees.

All avenue trees have the potential to be memorialised.

Random trees

In contrast and in keeping with the character of the area, the majority of the site will have randomly spaced and positioned trees to greatly increase the tree cover on the site and, as a consequence,

improve shading and visitors' experience. Whilst the majority are located along the footpath to provide shade for pedestrians, there are opportunities to randomly add them amongst the lawn beams. The benefit a shade tree will outweigh the loss of space (one or two graves) taken by this tree. These trees can also be removed when the cemetery has totally ran out of space, releasing valuable burial spot if and when needed.

Random trees in monumental areas are possible once the area is almost full and this option should be considered as part of the long-term beautification of the cemetery.

Any groups of graves where memorialisation is minimal or inexistent can provide a position for a small tree and understorey planting. This has the effect of suppressing weeds as well as softening the otherwise overwhelmingly mineral/granite look. (refer to Box Hill cemetery planting concept)

All random trees (with the exception of the ones on existing graves in the monumental section where a burial right already exists) have the potential to be memorialised.

Shrubs and garden beds

In response to the brief, garden beds have been kept to a minimum to reduce maintenance burden.

The planting concept is therefore predominantly that of trees in lawn.

However, due to the openness and flatness of the site and the limited choice of interments, it was seen as beneficial to break up the burial areas with narrow garden beds. These beds are carefully positioned around existing trees and will provide an indigenous garden setting in keeping with Mount Isa's landscape character. More importantly it provides an alternative burial option in the form of "Headstones in garden beds".

All garden beds have the potential to be memorialised.

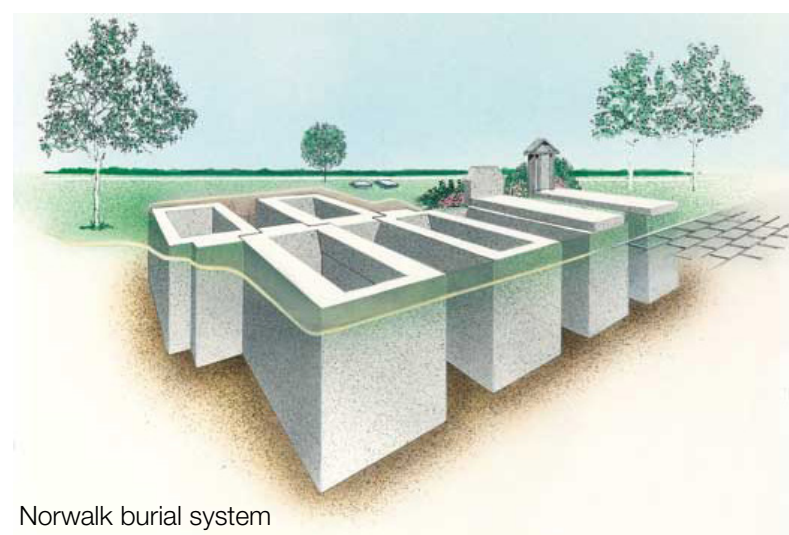
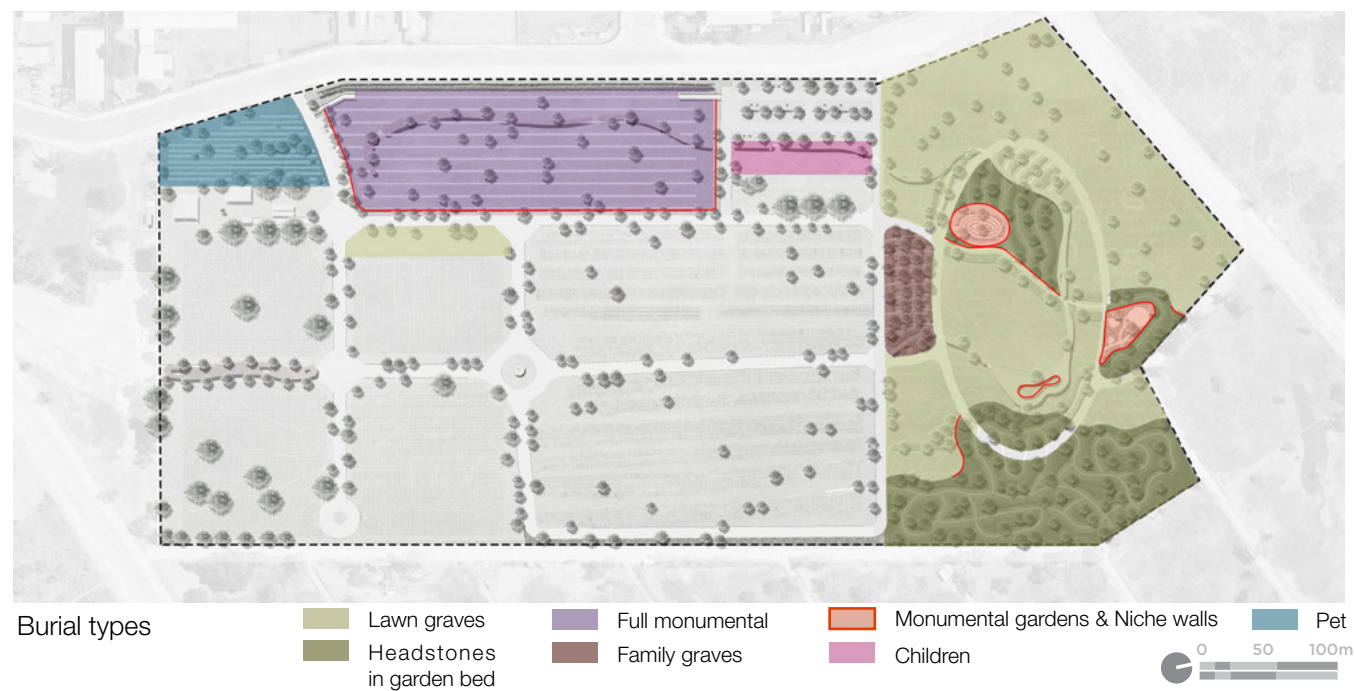
Shallow soils

As noted on the Analysis plan, the majority of the western boundary presents with potential shallow soils. No geotechnical reports are available for the site.

As noted in the above "Issues Paper" (page 23) and as investigated by Ground staff using test pits in the number of location, rock appears to be present at a depth varying between 0.9 and 1.2m.

This presents a number of issues:

- As single depth graves are generally 1.5m deep, the area is too shallow for single burial.
- As double depth graves are generally 1.8m deep, the area is too shallow for double burial.
- As the minimum cover above a coffin is 0.9m, the area is too shallow for burial, except for small pets.



- Based on available worldwide research (World Health Organisation), it is not recommended to bury into or directly over rock. The soil disturbance created by grave excavation means that graves tend to act as “bath-tubs” and any rain fall will percolate to the bottom of the grave. If the bottom of that grave is impermeable (solid rock), the water stagnates at the base and create an anaerobic situation which prevents natural decomposition. The guidelines for burial over rock generally recommends that the bottom of the grave be approximately 1m above any solid rock or water table.
(Refer http://www.ncceh.ca/sites/default/files/Cemetery_setback_distances_surface_water_contamination-Oct_2017.pdf)

It is therefore suggested that in the event of 1.2m available depth on site, an additional 1.6m of fill be provided to ensure a double depth grave (1.8m) (most popular) and a 1.0m clearance above rock. The minimal burial depth over solid rock should therefore be 2.8m.

Spoil onsite re-use

Cemetery operations generate a significant amount of excess spoil as part of the grave digging process. Disposing of this surplus soils can be expensive and is best dealt with on site where possible.

There is an opportunity to dispose of excess soil in the area of “shallow soils” discussed above.

Interment types

Burials (in order of purchase price)

Lawn beams: This consists of a concealed concrete beam located at the head of the grave, on undisturbed ground to avoid ground movement. This beam is double sided to improve yield and will receive a concrete pad (as per current practices) onto which a bronze plaque will be set.
As their visual impact is low, they are generally located at the northern end of the site, within the new landscaped extension site.

Headstones in garden beds: (new product) this consist of lawn graves abutting a garden bed, where the headstones are located into the garden bed and backed with shrubs planting.
This is a hybrid option between lawn and full monumental.

Full Monumental (raised section) These consist of both vertical and horizontal stone monumentation.

This form of interment should not be the cheapest on site and it should be reserved to those who intend to place both a horizontal and vertical stone monumentation.

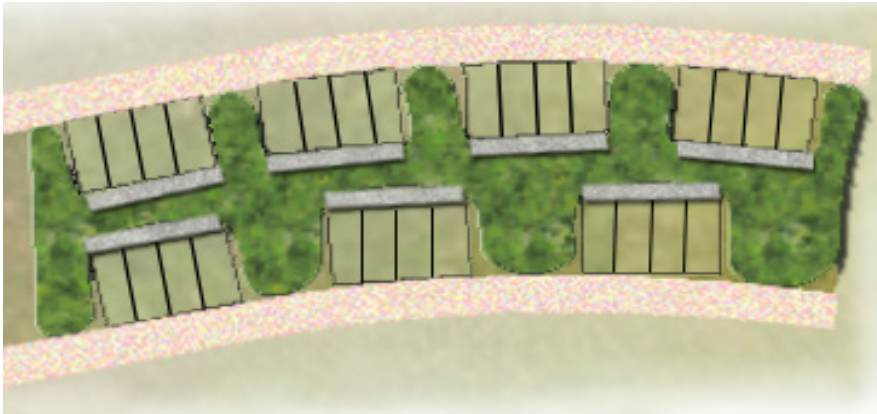
As the site is currently running out of Monumental burial, the market forces will drive the price of such interments up, simply because they are becoming scarce.
Furthermore, to enable more “full monumental” areas to be created , additional funds will need to be spent to prepare the area with engineered solutions. Such expenses need to be recuperated through adjusted fees for new “monumental graves”.

The Monumental graves are generally proposed on the western portion of the site. Due to the shallow depth and presence of rock at approximately 1.2m below existing levels (according to staff), these areas should be filled to provide a full 2.8m depth above rock. The reasons for this are addressed in the report under “shallow soils”, page 33

There are 2 options available for preparing the nominated “full monumental” areas along the Western boundary with the appropriate soil depth for burial:

- Option 1: Fill with suitable imported fill and compact to 95% density.
- Option 2: Use Precast burial systems (such as Norwalk).

The costs and practicalities of both options need further investigations.



Family grave



Family grave



Plaque on stone desk in garden bed (Example)



Individual stone in respite areas (Example)



Memorial seat (Example Necropolis Springvale)

Test excavation or geotechnical investigations are essential prior to committing this area to this purpose.

Machinery access onto the raised sections is provided via access ramps.
Pedestrian access is provided via a ramp and a number of stairs.

Family graves: (New product) In response to Council request for family graves, a specific area is proposed for this purpose. It consists of private alcoves allowing for up to 4 plots (8 interments) associated with a single headstone. It is important to note that this is the most expensive form of interment and the cost associated with this product should be commensurate with the number of graves purchased. The pricing structure must be such that it discourages reservation by individuals who do not commit to using the full set of plots.

Children section: A Children is proposed adjacent to the still-born area , adjacent to the proposed carpark.

Cremated remains

Any area unsuitable for burial is a potential memorial garden for cremated remains.

As cremation gains popularity over Australia, it is important to be allow for traditional and innovative options for memorialisation.

To cater for a wide market, choice is paramount and will be offered in the following forms (in approximate order of purchase price, subject to final design and costing):

Small plaque on concrete edge (typically 150 x 70mm) generally locate along garden beds

Niche wall in retaining wall: Pre-cast holes in concrete wall with stone fascia or highlights (depending on budget), able to accommodate full ashes.

Small to large plaque on communal boulder: for ash scattering memorialisation.

Small to large plaque on private boulder: for individuals or families, throughout

Plaque on stone desk in garden bed: (typically up to 300 x 200mm) in oval gardens

Memorial trees: throughout, for individual and families

Individual stone in respite areas

Sculpture base plinth surround

Memorial seat

Pet remains

As there are no restrictions within the Local Laws on the distance between a human and a pet cemetery and as Council has perceived a need for a Pet Cemetery, the area west of the office, over shallow rock has been earmarked for this purpose.

It is expected that only small domestic animals will be interred (a large dog being the maximal size) as the soil depth may be insufficient for larger animals such as horses.

Although it is suspected that rock is shallow in this area, as it is along the majority of the western boundary, the actually depth is unknown. Extra fill may be warranted. (refer to "shallow soil chapter for minimal depths, page 33)

Test excavation or geotechnical investigations are essential prior to committing this area to this purpose.



Burial types

Lawn graves	Full monumental	Monumental gardens & Niche walls	Pet
Headstones in garden bed	Family graves	Children	

0 50 100m

Legend	Burial types	Grave number
	Lawn graves	5802
	Full monumental	2785
	Monumental gardens	35
	Headstones in garden bed	2180
	Family graves	172
	Children	401
	Pet	2600
	Total	13975

Materials

As previously mentioned throughout the report, materials should be selected for their relevance to the site and the Design Principles:

- Coreten for its rust proof quality, exceptional longevity and relevance to the Design Narrative
- Colourbond corrugated iron as a cheaper alternative
- Local stone for its relevance to the region and Design Narrative
- Local products for sustainability
- Long lived for sustainability and ease of maintenance

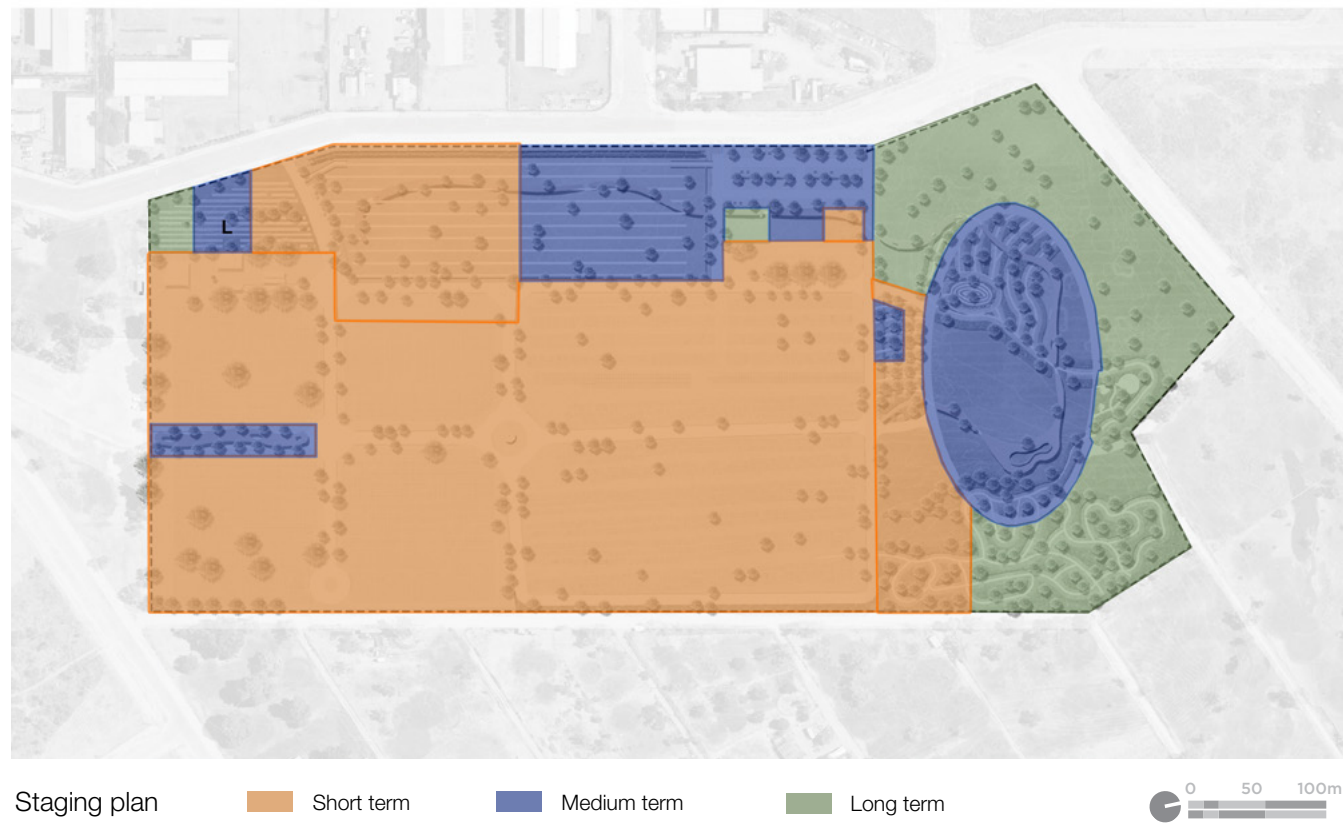
INTERMENT YIELD

The yield is generally only calculated for burials as the potential for ash interment is almost limitless (and therefore unquantifiable). The yield gives a general estimate of how long the cemetery will be in operation for, based on current and known demand.

The table (facing) indicates a potential for 13,000 graves (size 1.2 x 2.4m). At a rate of 40 new interments per year, the cemetery will therefore cater for burials for the next 300 years.

If each grave is able to accommodate 2 burials, the cemetery will last twice as long. When the cemetery cannot supply burial plots anymore, it is expected that it will continue to operate selling ash interments for many more years.

It should be noted that based on the allocation of land for each burial types (monumental vs lawn), which is based on visual impact, the cemetery will run out of full monumental graves quicker than lawn burials. Should monumental graves need to be accommodated for longer, a compromise on the visual qualities of the cemetery will need to be made.



IMPLEMENTATION

General

The implementation of the masterplan will take many years and be in the custody of many Trusts to come. It is therefore crucial that the Masterplan report and its content be supplied, understood and adopted by all Trust members and staff involved in the running of the cemetery. It also needs to be passed onto the next generation of Trust members and staff in the many decades during which the cemetery will slowly expand. The success of the Masterplan depends on it.

Design Implementation process

A number of design disciplines will be required over the next few years to further design, document and administer the various contracts. It is important to understand the design process and follow the logical steps culminating in the project's completion:

- Adoption of the Masterplan and circulation amongst interested parties.
- Determination of scope for first stage and allocation of funds
- Further investigations if required: eg. Geotechnical.
- Detailed Design : eg. Burial areas, shelter, memorial gardens, sculptural elements etc...
- Preparation of tender documents and cost estimate
- Tendering
- Construction on site
- Post-construction evaluation

Staging

The implementation of the recommendations will also need to be staged.

The following suggested staging plan is driven by construction logic rather than available funds as the budget figures were not known.

A simple ranking of short, medium and long term implementation has been suggested as it offers the best flexibility:

SHORT TERM (to be carried out in the first 1-5 years)

- For projects/recommendations which facilitate the creation of new interment , currently in critical shortage
- For projects/recommendations which are likely to have a significant and immediate positive impact on the cemetery and its operations
- For projects/recommendations which involve further studies and negotiations to ensure timely delivery of subsequent tasks.

#	Recommendations
1	Investigate options for bat management (relocation or minimisation) with DPE
2	Carry out arboricultural assessment on existing trees to determine their Safe Useful Life Expectancy (SULE), tree surgery works and removal required.
3	Carry out feature and level survey of areas to be developed, including all existing services within the site.
4	Carry out geotechnical investigation along the whole length of the Western boundary to determine the exact soil conditions and rock depth. Investigate if the recommended WHO's 1m clearance above rock can be reduced due to local conditions.
5	Investigate unused graves and the possibility to reclaim right of burial to maximise the use of graves within existing areas. This may necessitate a specialist consultant.
6	Investigate improvement to record keeping. This may necessitate a specialist consultant
7	Install ground marker in burial areas to assist with grave alignments. Use surveyor if necessary.
8	Fill one monumental area before existing sections run out, to cater for demand. Investigate pros and cons of filling versus using pre-cast concrete modular graves

9	Formalise fencing around the new site.
10	Commission research into cemetery history and notable persons for use in site interpretation.
11	Develop small road access into new site and formalise open-drain/overland flow path alignment.
12	Develop part of the Family grave area
13	Develop some new lawn section and new "headstone in garden bed" section
14	Develop part of the children section
15	Develop a portion of the covered walkway
16	Develop part of the pet cemetery
17	Develop new niche walls
18	Relocate ashes within existing wall to alternative location and provide seating within existing shelter.
19	Develop new in-ground ash interment positions
20	Upgrade irrigation infrastructure to provide automatic in-ground system
21	Remove/reduce dangerous ornaments from beams
22	Improve "still born section" with grass levelling, extra seating and interpretation board.
23	Interplant monumental area with indigenous vegetation as part of an on-going beautification and weed-reduction exercise.
24	Add avenue trees throughout, with in-ground irrigation system, as part of an on-going beautification and weed-reduction exercise.

MEDIUM TERM (to be carried out in the first 6-25 years)

- For projects/recommendations which involve the release of land for burials based on demand at the time

#	Recommendations
25	Develop new Commercial Rd entrance and part of the carpark
26	When Sunset Drive's entrance treed avenue is due for replacement, provide covered walkway and new trees.
27	Interplant monumental area with indigenous vegetation as part of an on-going beautification and weed-reduction exercise.
28	Add avenue trees throughout, with in-ground irrigation system, as part of an on-going beautification and weed-reduction exercise.
29	Extend road network into the new site, first as dirt road.
30	Develop more of the Family grave area
31	Develop more new lawn section and new "headstone in garden bed" section
32	Develop more of the children section
33	Develop more of the covered walkway
34	Develop more of the pet cemetery

LONG TERM (26-70 years)

- Seal road network progressively
- The balance of the development, based on demand.

Opinion of Probable Cost

The site was split into 12 zones and costed accordingly.

The costing was determined by MCC council's officers using our pre-formatted cost estimate table, supplied with quantities. MCC officers used available commercial rates to generate a broad "Cost Estimate".

These figures are estimate only and based on a masterplan which does not always provide measureable quantities. It is an Opinion of Probable Cost.

It covers the whole of the capital works shown on the Masterplan regardless of which decade it may be constructed in. Adjustments for future price increased is not possible.





PET CEMETERY



COVERED WALKWAY



CHILDREN CEMETERY



PLAQUES IN LAWN



ROCK SPIRAL



NICHE WALL



FAMILY GRAVES



HEADSTONES IN LAWN



RESPITE AREA

DRAWN BY: XYW
SHEET NO: 01/03



SCALE:
1:2000@A3

ISSUE	DESCRIPTION	DATE	REVISION
APPR.	CLIENT	03/05/19	

CLIENT:
MOUNT ISA CEMETERY

TITLE: MASTERPLAN
DRAWING NO: SK02

DATE: 24.04.2019
PROJECT NO: 1804

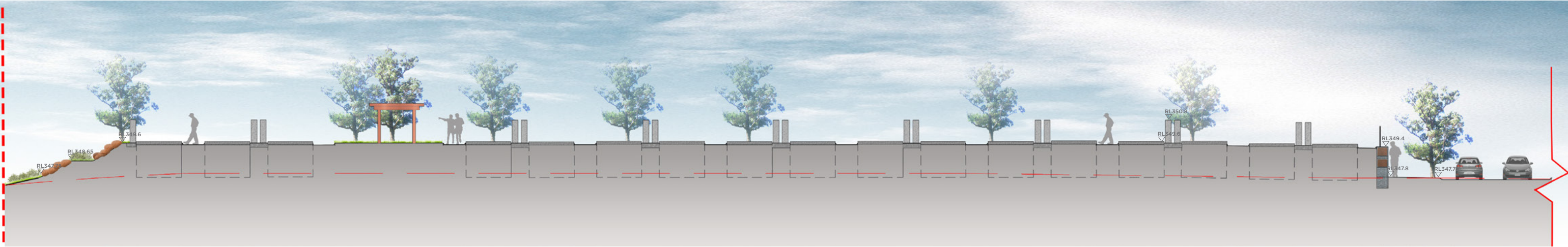
PROJECT NAME:
MOUNT ISA CEMETERY
MOUNT ISA, QLD

A: 8 Rowell Av
Camberwell 3124
E: flo@fjla.com.au
M: 0419 983 641

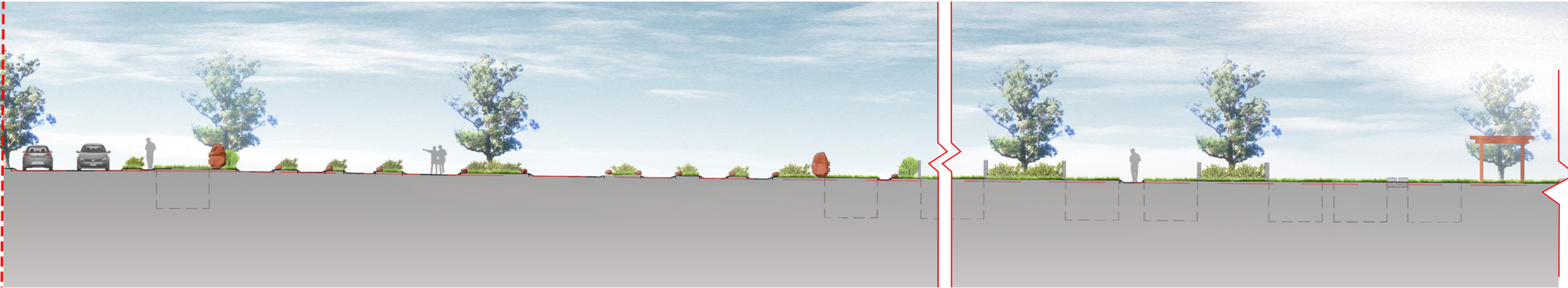
Florence Jaquet
Landscape Architect
Cemetery Specialist

Mount Isa Cemetery Section

MOUNT ISA, QLD



SECTION A-A'



SECTION B-B'



INDICATIVE PLANT LIST

TREES (ROAD SIDE)

Acacia cambagei	Gidgee	15m
Eucalyptus leucophloia	Snappy Gum	6m
Eucalyptus pachyphylla	Red-budded Mallee	7m
Geijera parviflora	Wilga	10m

TREES (RANDOM)

Acacia Peuce	Waddie	10-15m
Grevillea heliosperma		7m
Grevillea pteridifolia	Golden grevillea	6-8m
Hakea sukera	Boot Lace bush	7m
Livingstonia rigida	Cabbage Palm	10m
Melaleuca dissitiflora	Creek Tea Tree	5m
Pandanus	Pandanus	10m
Pittosporum phylliraeoides	Wild Apricot	10m

SHRUBS IN GARDEN BED

Acacia hilliana	Table Top Wattle	1.5m
Acacia holosericea	Soap Bush wattle	8m
Acacia orthocarpa		4m
Callistemon species	Callistemon	3m
Enchylaena tomentose	Ruby Salt Bush	1m
Flueggea virosa	White Current	4m
Grevillea dryandri		2m
Grevillea refracta	Silver-leaf grevillea	5m
Gossypium sturtianum	Sturts Desert Rose	2m
Grevillea wickhamii		5m



LEGEND

 GARDEN BED	 TREES (ROAD SIDE)	 TREES (RANDOM)
--	---	--

Melaleuca viridiflora	Broad Leaf tea tree	3-5m
Petalostylis cassioides	Butterfly Bush	3m
Senna artemisioides	Silver cassia	2m

GROUND COVER / TUFTIES

Triodia longicaps	Spinifex	1-1.5m
Ptilotus exaltatus	Pussy Cat Tail	1.5m
Senna Vennusta	Candlestick Senna	1m

DRAWN BY: XYW
SHEET NO: 03/03



SCALE:
VARIES

ISSUE APPR.	DESCRIPTION CLIENT	DATE 03/05/19	REVISION

CLIENT:
MOUNT ISA CEMETERY

TITLE: PLANTING CONCEPT
DRAWING NO:SK04

DATE: 03.05.2019
PROJECT NO:1804

PROJECT NAME:
MOUNT ISA CEMETERY
MOUNT ISA, QLD

A: 8 Rowell Av
Camberwell 3124
E: flo@fjla.com.au
M: 0419 983 641

Florence Jaquet
Landscape Architect
Cemetery Specialist