

SOUTHERN MEMORIAL PARK

a 'bush cemetery for the bush capital'

MASTERPLAN REPORT

Final

31 MARCH 2021

Rev F

T.C.L. + PLACE
LABORATORY

Prepared for:



Prepared by:



Studio 7, 14 Kendall Lane
Canberra ACT 2601
Australia

+61 402 706 162
www.placelaboratory.com
ourplace@placelaboratory.com

385 Drummond Street
Carlton, Vic 3053
Australia

+61 3 9380 4344
melb@tcl.net.au
tcl.net.au

ABN 73 006 128 963

Subconsultant team:

Engineering &
Ecology



Architecture



W.S.U.D



Cultural Heritage



Subject Matter Expert

Terry King

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- Vision and Aspirations / Design Principles
- Masterplan Review - Options Development
- Masterplan Review - Recommended Options
- DRAFT Masterplan
- FINAL Masterplan**
- Stage 1 PSP

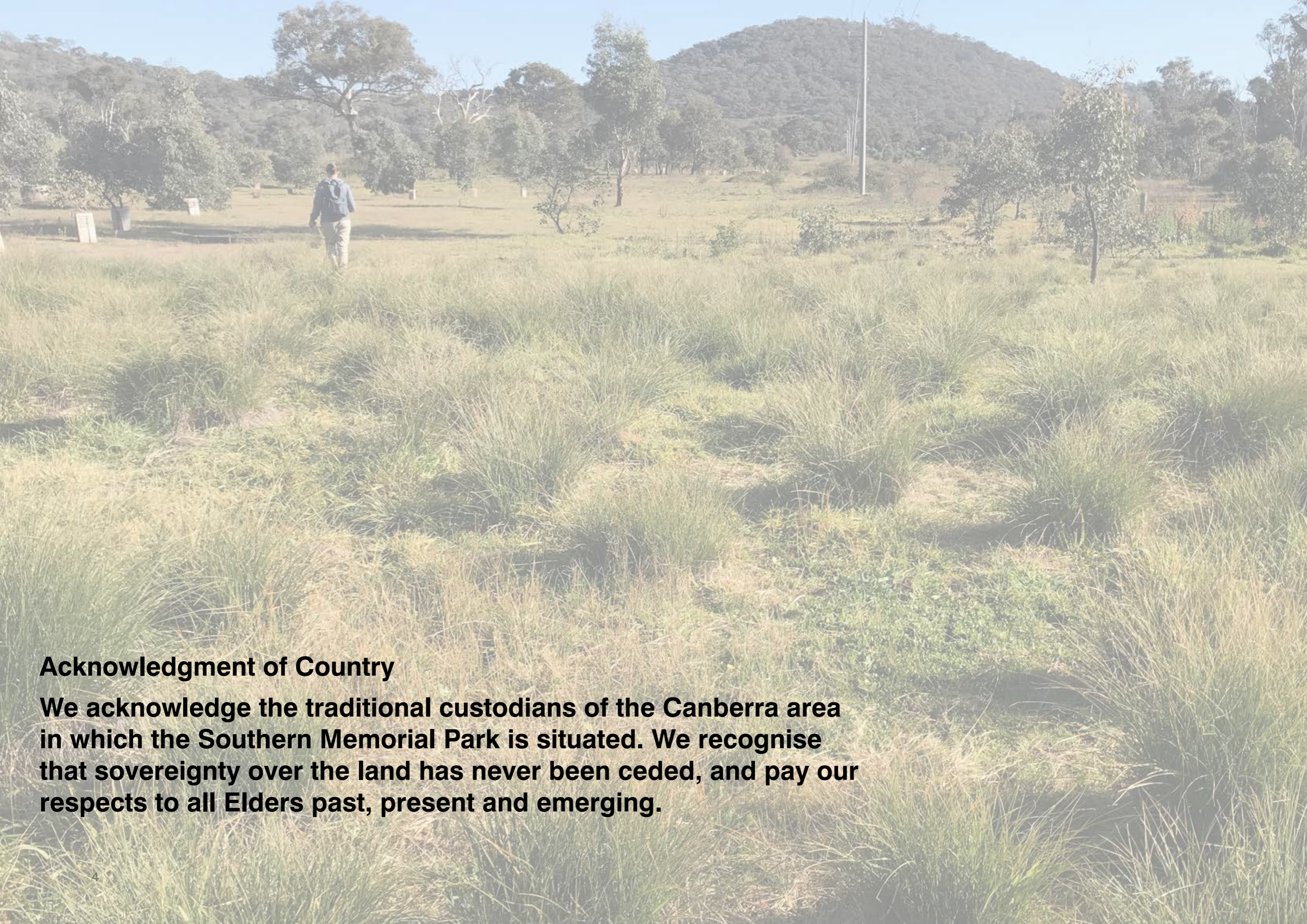
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Acknowledgment of Country

We acknowledge the traditional custodians of the Canberra area in which the Southern Memorial Park is situated. We recognise that sovereignty over the land has never been ceded, and pay our respects to all Elders past, present and emerging.

EXECUTIVE SUMMARY

There are currently three public cemeteries in the ACT: Woden, Gungahlin and Hall. These memorial parks are nearing capacity and insufficient to meet projected demand, particularly for south Canberra where there is a gap in burial and crematorium services.

The ACT Government proposes to develop Southern Memorial Park (SMP) as a major new memorial park, on a greenfield site in Hume, to meet this demand and ensure ongoing and geographically equitable interment, crematorium and memorialisation services for the Canberra community.

To enable this a SMP Masterplan prepared in 2012 has been reviewed and revised resulting in this SMP Masterplan 2021.

The SMP Masterplan 2021 is intended as a guide to inform a strategic and staged approach for implementing the cemetery development. It is informed by higher level detailed assessments of the site, investigations that have resulted in a better understanding of the physical and planning contextual setting, including the impacts of facilities bordering the site.

The intent is to enable the SMP to be delivered progressively to meet ongoing community needs with reference to a plan that is flexible enough to accommodate changes that may be needed over the time the full project is delivered. SMP will service the Canberra community for over 100 years.

The proposed identity for SMP is a 'bush cemetery for the bush capital' capturing the significance of its beautiful bush setting, its iconic status, and potential prominence in the Canberra community.

The plan acknowledges the traditional custodians of the Canberra area in which the Southern Memorial Park is situated. SMP is an opportunity to improve relationships and understanding between non-aboriginal people and aboriginal people through acknowledgement of the indigenous spiritual connections to the land.

Environment, Planning and Sustainable Development Directorate (EPSDD) is the current custodian of the site and leases the land for horse agistment. The planning and staging of SMP facilitates the ongoing use of the site not being occupied by Canberra Cemeteries for horse agistment for approximately another 50 years.

New geotechnical investigations, site surveying and additional environmental and cultural heritage investigations have been undertaken and recorded in reports as part of the Masterplan review. There have been detailed investigations into traffic planning, civil engineering requirements, stormwater management and water sensitive urban design (WSUD) assessments; reporting on service utility requirements as well as preliminary conceptual architectural designs for the future memorial park key buildings. These investigations and studies are provided as discrete chapters in this report or as appendices.

The extensive analysis of site opportunities and constraints and the early investigations into potential site planning options for the new memorial park, that preceded development of this Masterplan, are also included as appendices to this document.

The Masterplan is the culmination of the above inputs, along with ongoing intensive process of review with targeted government and external stakeholders, as well as the guidance and contribution from a cemeteries subject matter expert.

Following public consultation and government endorsement of the Masterplan, Stage 1 of the project will progress to detailed design. It is intended that further consultation will occur with key external stakeholders throughout the development of SMP.



1.0 INTRODUCTION

The ACT Government proposes to develop Southern Memorial Park (SMP) to ensure ongoing and geographically equitable interment, crematorium and memorialisation services for the Canberra community.

The site was identified in the Tuggeranong region on Mugga Lane in 2010. The Environment, Planning and Sustainable Development Directorate (EPSDD) is currently the custodian of the site and it is leased for horse agistment, Rose Cottage Horse paddocks.

1.1 Site Description

The 764,881m² site is bounded to the east by a solar farm, to the north by Mugga Lane Waste Management Centre and west and south by Wanniasa Hills Nature Reserve and Wanniasa Hills Special Purpose Reserve.

The proposed SMP site is located across Blocks 1695, 1676, 1521, 1673 and Block 1520 which is a services zone for power cables.

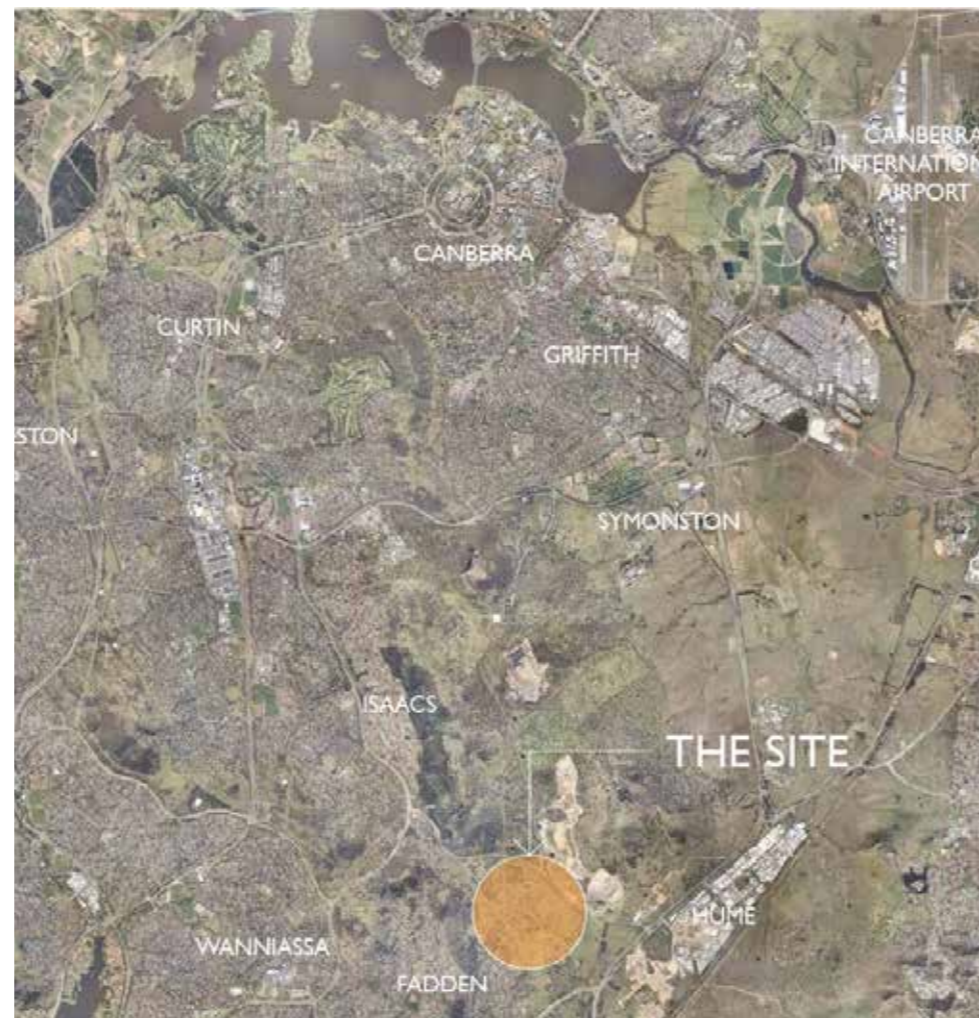


Figure 1. Site Location

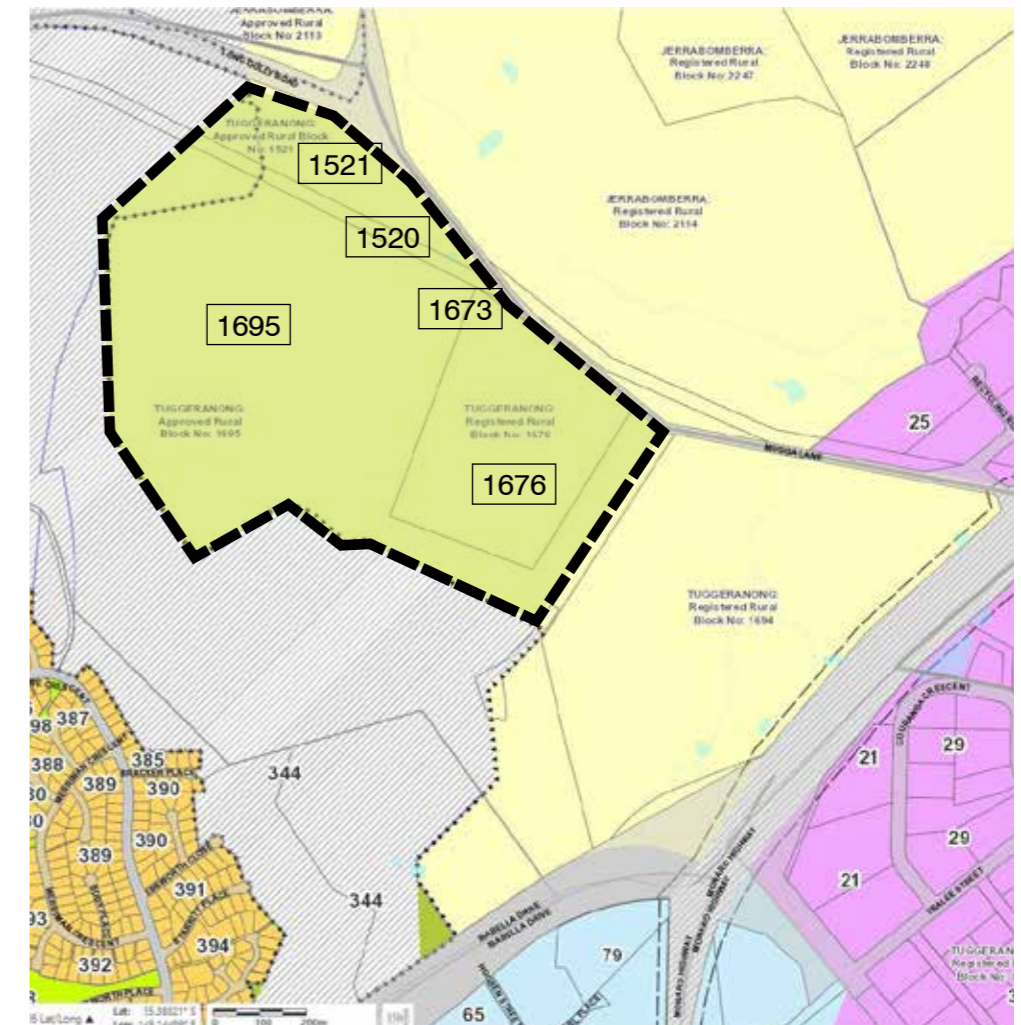


Figure 2. SMP site is located across Blocks 1695, 1676, 1521, 1673 and Block 1520 which is a services zone for power cables.



1.2 Project Purpose

The Southern Memorial Park (SMP) Masterplan was initially prepared in 2012. The Masterplan 2012 was supported by geotechnical investigations, survey, environmental and cultural heritage reports and business modelling.

Being eight years since the Masterplan 2012 was completed, the first phase of the current project was to review and update the Masterplan. This required undertaking further cultural heritage, geotechnical, environmental, and transport investigations.

The revised Masterplan also enables the SMP to be delivered progressively to meet ongoing community needs.

1.3 Design Process

A staged design process was undertaken to review the SMP Masterplan 2012 in order to develop the SMP Masterplan 2021.

Investigation into and analysis of the physical, cultural and ecological attributes of the site resulted in evidence and a report that identified the opportunities and constraints of the SMP site (Refer to **Appendix A** for a summary). Subsequently design options for the cemetery were developed to align with guiding principles which had been developed through a vision and aspirations workshop with the ACT Public Cemeteries Authority (ACTPCA) Special Project Committee (SPC) in late May 2020.

In following these principles, the masterplan design is intended to be sustainable, fit for purpose and financially viable for the long term meanwhile remaining beautiful and iconic.

Two design options, one formal design and the other organic design that reflects the existing topography, were assessed again in detail; the estimated implementation costs were also considered. The assessment resulted in the organic design approach

being recommended to proceed as the new SMP Masterplan design; this was presented to the SPC in the Recommended SMP Masterplan Option Report (31 August 2020). (Refer to **Appendix B** for a summary).

The organic approach to the SMP planning was progressed to reflect the site investigations and assessments undertaken to ensure important remnant ecological and heritage sites were protected, take full advantage of the best inherent assets of the natural landscape of the site and fully inform a feasible interment and memorialisation strategy for the new SMP.

Visitor experience and levels of service expected; site movement, circulation and wayfinding, and operational planning for attending staff and maintenance crews were also considered in the planning.

The SMP design and each of its elements were evaluated continuously throughout design development to ensure alignment with the identified design principles that support the vision for a world-class memorial park designed for a life of one hundred years and attuned to demand and changing expectations in interment and memorialisation services in the ACT population.

This Masterplan Report summarises the work undertaken, which includes site investigations, and detailed assessments and analysis by a multidisciplinary team. It covers traffic planning, civil engineering, surveys, water sensitive urban design, environmental planning and cultural heritage. Requirements for site utility services and planning pathways are also identified. Full detailed reporting on these aspects of the masterplan are provided as Appendices.

The masterplan is supported by analysis that identifies functional requirements for the built facilities for SMP. Conceptual architectural designs for the key new buildings are included in the Masterplan.

A staging plan for works implementation has also been prepared and is supported by cost estimates.

Government stakeholder and asset manager input to design and review of draft reports and proposals was undertaken at key design development stages and additionally as required, to inform design directions as completely as possible. Consultation with targeted external stakeholder representatives also informs the design.

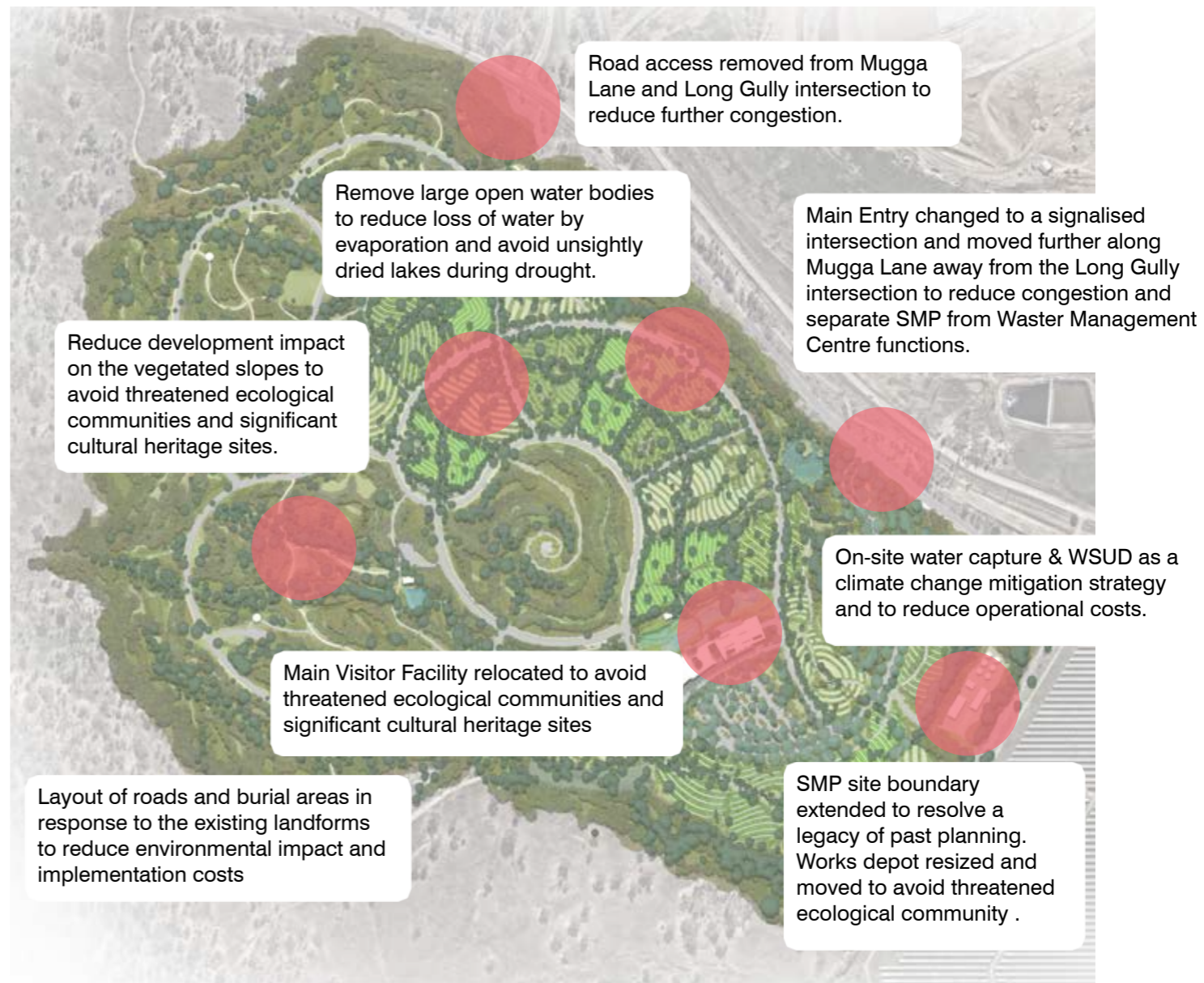
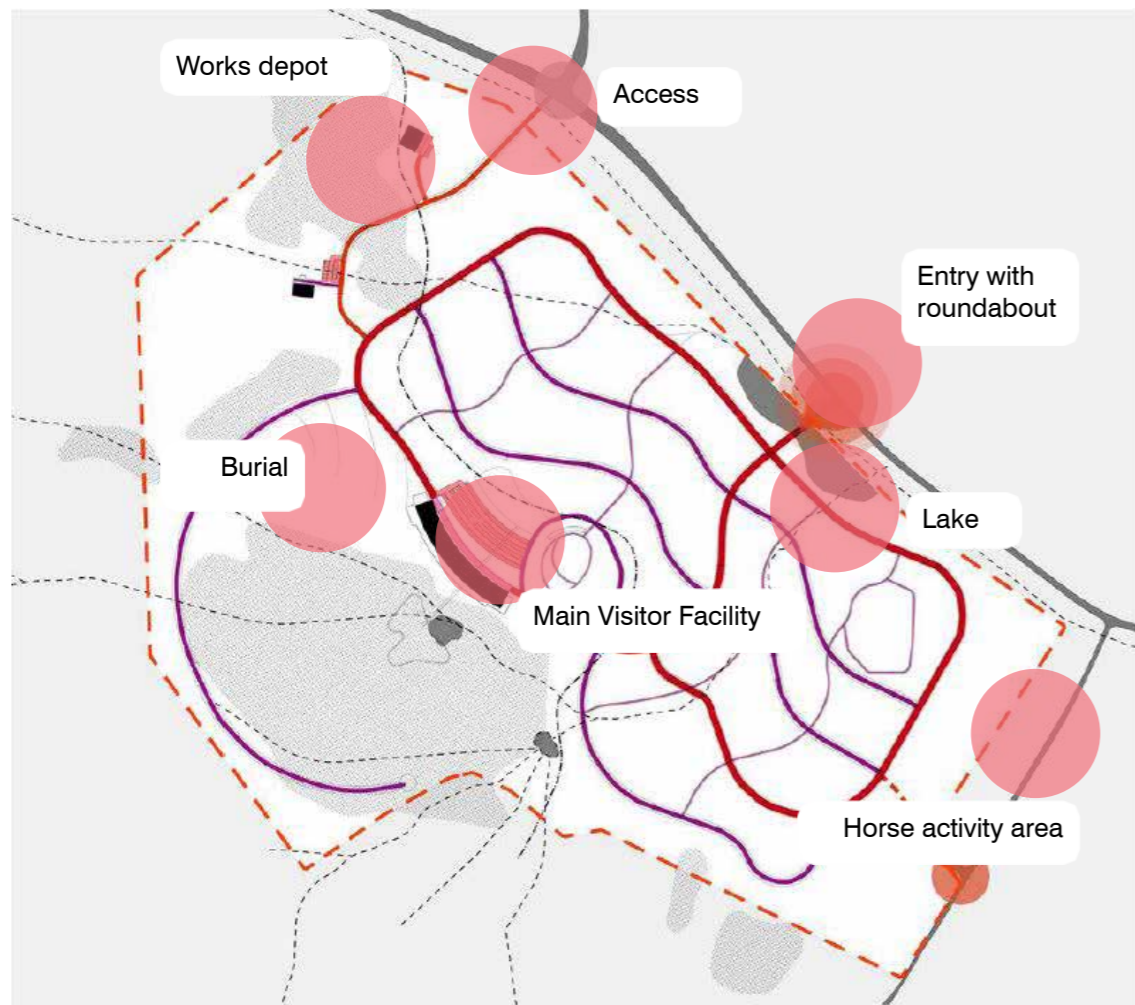


Figure 3. SMP Masterplan 2012 and summary of key modifications as a result of the Masterplan Review.

A landscape photograph showing a dead, skeletal tree in the foreground. The background features a field of green grass and a distant town under a blue sky with white clouds. A large teal triangle is overlaid on the right side of the image, containing the title text.

2.0 MASTERPLAN CONCEPT

2.1 Guiding Principles

Five key principles were identified to guide the revision of the SMP Masterplan.

Principles developed by the SMP Masterplan 2012 were used as a starting point.

An updated set of guiding design principles were proposed following a Vision and Aspirations workshop with the ACTPCA Special Project Committee in late May and formulated in a Discussion Paper (July 2020).



01 Developing a Memorial Park for the Future

Principle Objectives

- Fully integrate SMP into the portfolio of sites under ACTPCA management.
- Plan the delivery of major infrastructure in a rational and cost-effective manner allowing for incremental growth of interment spaces across the site.
- Accommodate a variety range of traditional and non-traditional interment types.
- Provide opportunity for a diverse range of cultural interment rites and traditions.
- Acknowledge future changes in public expectations of interment.
- Provide a flexible and fully integrated digital infrastructure overlay



02 Delivering a high-quality Visitor Experience

Principle Objectives

- Deliver a world class, positive visitor experience that encourages the celebration of life.
- Provide a high level of visitor comfort and well-being with an emphasis on creating spaces that are welcoming and of a human scale.
- Deliver a professional customer service.



03 Responsiveness to Place: the site & its cultural history

Principle Objectives

- Recognise and comprehensively respond to the site's significant cultural history.
- Sympathetically develop the site to embrace and enhance the natural topography.
- Pro-actively respond to the constraints of the underlying geology in planning.
- Acknowledge the local fire ecology in planning.



04 Restoring the Natural Landscape & Showcasing Sustainability

Principle Objectives

- Protect existing threatened endemic vegetation.
- Regenerate the natural ecological systems of the site and region through re-vegetation and habitat creation.
- Restore and enhance the natural waterways.
- Use water sustainably and incorporate water sensitive urban design (WSUD) principles across the site.



05 Engaging with Community

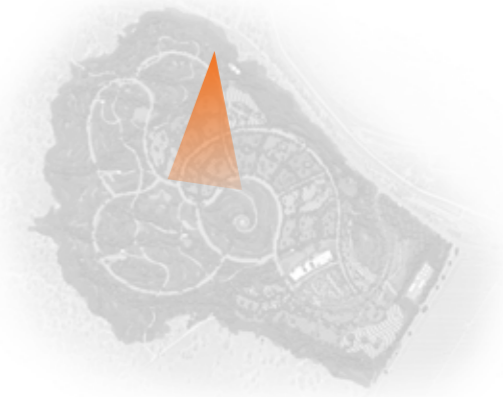
Principle Objectives

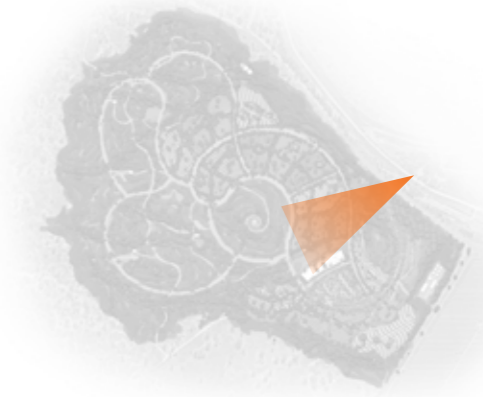
- Celebrate community diversity.
- Acknowledge the culture of local indigenous communities.
- Be an open place providing a range of recreational activities to the whole community.

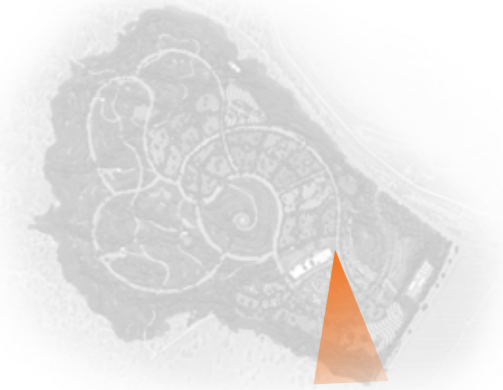
2.2 Overall Masterplan

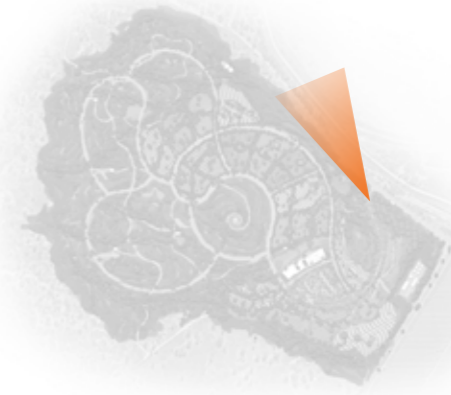


Figure 4. Overall Masterplan









2.3 Masterplan Components: Arrival

Entry and exit to the SMP will be via a new signalised intersection on Mugga Lane. The detailed design of the intersection will be developed in full consultation with relevant stakeholders to ensure the intersection meets technical requirements and standards necessary to accommodate funeral processions, and memorial park operational requirements, while allowing normal Mugga Lane traffic to flow with minimal disruption.

The location of the intersection has been specifically selected to be appropriately distanced south of Long Gully Road and entry points to the adjacent Mugga Lane Resource Management Centre, to minimise impacts on these existing busy traffic intersections.

A main road, of approximately 500metres length, takes people from the entry gates to the main visitor precinct. This tree-lined boulevard fulfils an important role in transitioning visitor's experience from a busy, traffic dominated environment to a natural, calming landscape setting. The road winds around a naturally occurring hillock, past a striking 'forest' of tall eucalypts and a string of small wetland ponds, located to capture stormwater runoff from this low lying section of the site and further enhance the sense of entering a natural landscape retreat.

Refer to Chapter 6 and Appendix C for details about Transport Planning and Traffic Engineering.

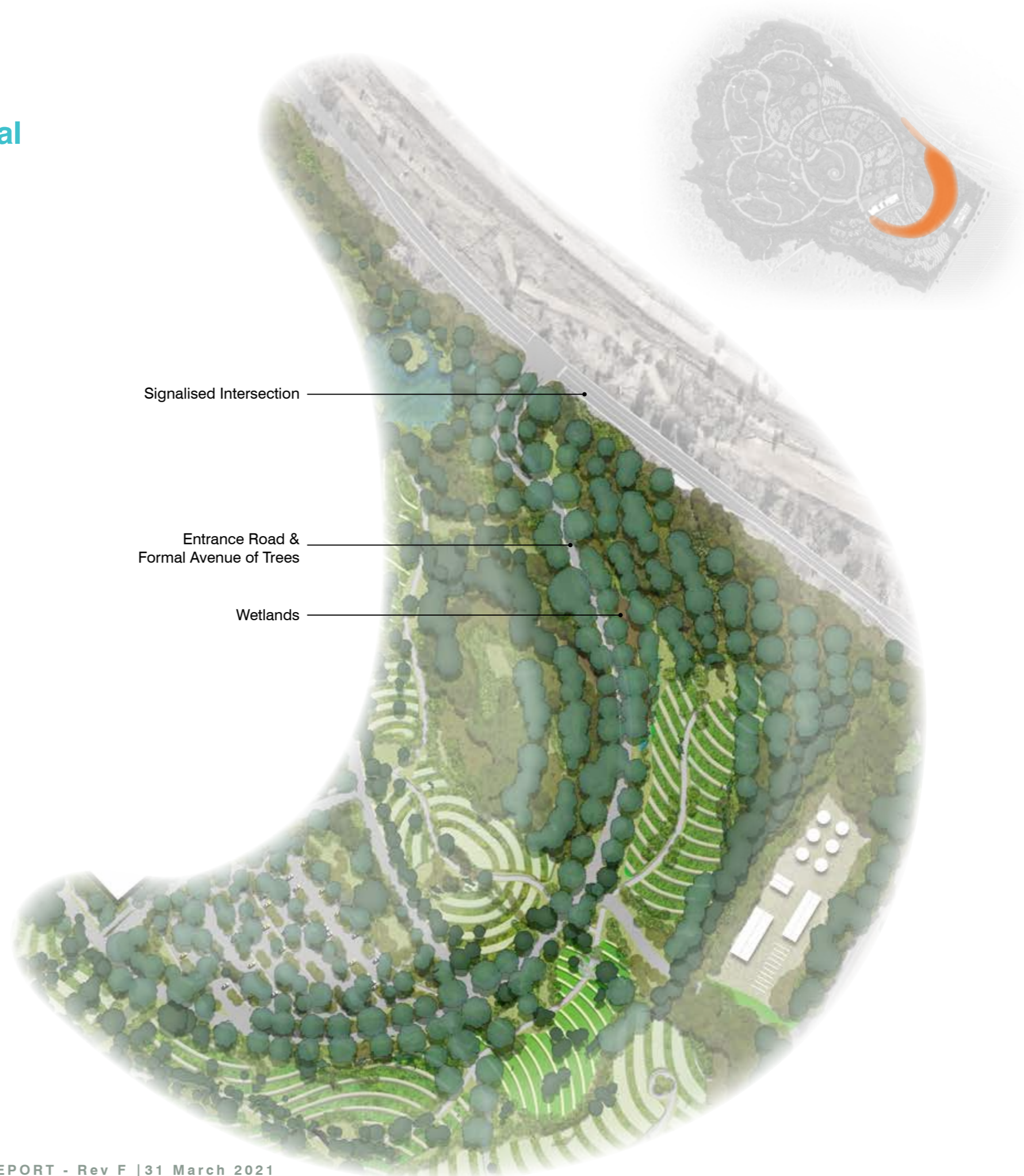


Figure 5. Arrival



2.4 Masterplan Components: Main Visitor Facility

The central focus of SMP will be the main visitor facility. The complex of buildings consolidates all the visitor functions in one location. It includes a central administration and office, large and small memorial halls, a crematorium, two multi-purpose function halls and a cafe with a retail outlet which includes a florist.

The main visitor facility is located on a relatively flat, north-facing site, nestled between two hills, alongside the southern-most of the natural gullies that traverse the site. The careful positioning of buildings makes best use of the natural topography at this location, shielding the precinct from intrusive elements such as traffic noise and views to the adjacent waste management facility and solar farm. Instead views are directed northward across the site toward the larger of the re-vegetated hills and the distant range of hills on the horizon beyond.

The pavilion-like forms of the buildings have been developed to emphasise an environment dominated by a natural landscape.

Generous hard-paved spaces surround the outside perimeters of the buildings and are suitable for gatherings before and after services and events.

Localised landscaping softens these areas to create intimate and private function spaces.



Figure 6. Main Visitor Facility

The complex overlooks a restored waterway on the northern side, where wetlands are proposed. These wetlands serve multiple purposes. Firstly, for water quality treatment, taking in runoff from the surrounding site and new infrastructure, then filtering pollutants before the water is harvested and stored in tanks for site irrigation. The wetlands will be a landscape feature as well as re-established habitat and magnet for native frogs, wading birds and other wildlife.

A small dedicated playspace is proposed adjacent the cafe and function halls to cater to the immediate needs of parents and children attending services.

A paved concourse provides a ceremonial access point for hearses, passenger drop-off and deliveries. Next to the main visitor facility is a carpark with over 150 spaces for staff and visitors. The carpark is designed to minimise its footprint while allowing the landscape to dominate.



2.5 Masterplan Components: Site Facilities

The design and location of a range of facilities across the site are proposed to support the efficient functioning of SMP and address the needs of its users. The site facilities also encourage broader public visitation and recreational use of the site.

An outdoor chapel with a large outdoor pavilion is provided higher on the natural bush slopes, for those who prefer a more relaxed, open environment for dedication services as alternative to formal indoor funeral services and functions. The outdoor chapel takes advantage of an existing dam under mature trees to create a sheltered retreat.

A 'nature play' space for children and their carers is located near the main visitor facility in the filtered shade of an impressive stand of existing riverine eucalypts. The play space will be available to those visiting memorial sites, who have attended services in the park, as well as visitors who are attracted by the beautiful bushland setting. The play space incorporates a place for sand and mud play, rope climbs, tunnels, and natural log balance beams, all weaving through the natural woodland landscape.

Complementing this play facility is a smaller dedicated playspace adjacent to the functional halls and cafe.

The potential of the northern gully is realised by using the natural forming amphitheatre for an event space. It could be used as a venue for memorial services, and be available for community activities such as theatre or music performances.



Figure 7. Site Amenities

A series of lookout points and picnic spots, linked by an access road and bush walking trail, are located along the highest slopes of the site. These will form part of a new trail through the site with connections to the established and popular Canberra Centenary Trail. Existing horse-riding trails at the perimeter of the site that connecting adjacent horse paddocks will be retained.

Works Depot

The works depot is located in the southern corner of the site. It is situated behind an existing densely planted tree windbreak which will reduce its visual and physical impact from day one. The screen will be further enhanced by additional tree planting.

An existing driveway off Mugga Lane, currently used by the horse agistment users and a neighbouring health facility will be sealed to enable occasional use by service vehicles accessing the works depot. All other visitors including funeral directors, funeral processions, staff and deliveries will be required to use the signalised main entry.

The works depot will include office space, staff amenities, work sheds, bulk storage for landscape materials, and washdown areas for equipment. Large tanks for harvested stormwater are located within the compound, with pumps that redistribute water for landscape garden irrigation.



2.6 The 'Bush Cemetery'

Southern Memorial Park has been designed to be welcoming and inclusive. The design is flexible to allow different faith and cultural groups to practice their specific rituals.

Interment is in three broad categories: 'traditional' burials, 'natural' burials which is an emerging trend and ashes memorialisation.

There is an opportunity for designated burials areas dependent on demand. As SMP progresses, Canberra Cemeteries will liaise separately with faith and cultural groups to allocate dedicated areas as required.

The overall approach is to accentuate the natural landscape of the Canberra region as the setting for interment creating a 'Bush Cemetery for the Bush Capital'.



Figure 8. Location of Traditional Burial Portions

Traditional Burials

'Traditional' burials include lawn burials with standardised memorial plaques, as well as more elaborate monumental plots with masonry vaults and headstones. Traditional burials may also take innovative forms such as garden plots amongst gravel paths.

The Masterplan dedicates a large area of the site to traditional burials. To accommodate the necessary excavations for double depth burials as a minimum (or up to triple depth in areas where ground conditions allow), the traditional burial area stretches across the lower plains on the eastern side of the site. These areas provide the flattest terrain and deepest soils most suited to deep burial.

To maintain the sense of a "bush cemetery" in a designed landscape, the Masterplan proposes sixteen portions, each designed as 'garden rooms' or 'bush clearings' enclosed by native trees and shrubs.

Walking trails through the perimeter native planted corridors loop through and connect the 'clearings' for those wishing to walk rather than travel by car. An encircling ring road with widened verges for parking also links the burial grounds.

The 'bush clearings' provide private and intimate spaces at a human scale for interment and dedication.

Laid out sequentially, each portion presents a different burial typology: lawn burial plots, garden and gravel plots in various arrangements, and monumental headstone plots. By interchanging the typologies across the sixteen 'rooms' there is choice of a range of burial options and various levels of affordability for the Canberra community.

As the site is developed incrementally over time, demand for certain typologies will inform how the park takes form. The interchangeability of the garden rooms also allows for non-denominational burials as the default, but equally provides spaces for dedicated denominational, or culturally specific areas, to meet public demand as need changes over time. Other specialised burial needs, such as soldiers' memorials, can also be accommodated in these settings.

Each garden room has its own native garden retreat space, or spaces, providing a setting for complete reflection, rest, or small gatherings of celebration.



Natural Burials

Areas of the upper western slopes, with the most intact remnant vegetation and cultural heritage sites, will be protected, re-vegetated, and will remain largely undeveloped.

This area provides the ideal opportunity for 'natural burials', an emerging trend consisting of returning a body as naturally as possible to the earth, in shallow earth and a simple casket or shroud, in a protected natural landscape.

The Masterplan anticipates that a large area of the upper slopes will be available for natural burials, with necessary ongoing ecological and heritage advice provided to park management to identify areas best suited to natural burials as portions of the upper slopes are opened up for this activity. To ensure the most sensitive areas are protected, sites for burial plots will be selected to minimise adverse impact on trees and other important vegetation, culturally significant sites, and to avoid areas of potential erosion or increased overland water flow.

Permanent markers are not intended for natural burials and graves blend into the surrounding bushland. The locations of these graves are electronically tagged and mapped, with records made available to visitors at the memorial park administration offices or via a web page.



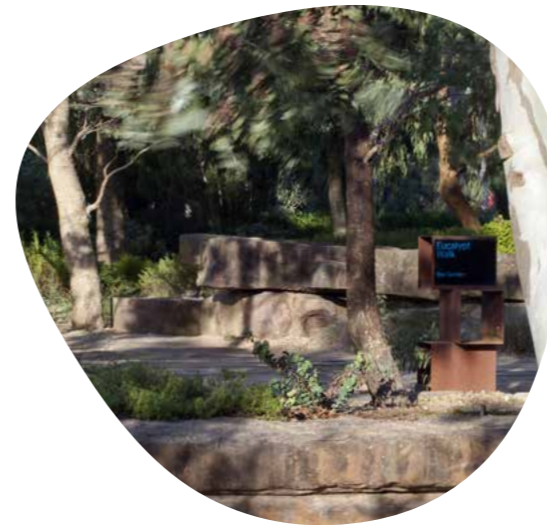
Figure 9. Location of Natural Burial Areas

Cremation and Ashes Interment

There is a variety of opportunities for cremation memorialisation throughout SMP.

This includes placing small commemorative monuments or plaques in bush clearings and garden rooms, along the planted walkways connecting them and on park furniture.

Each of the proposed bushland lookout locations across the site also provide dedicated settings for ashes memorialisation.



Other Interment

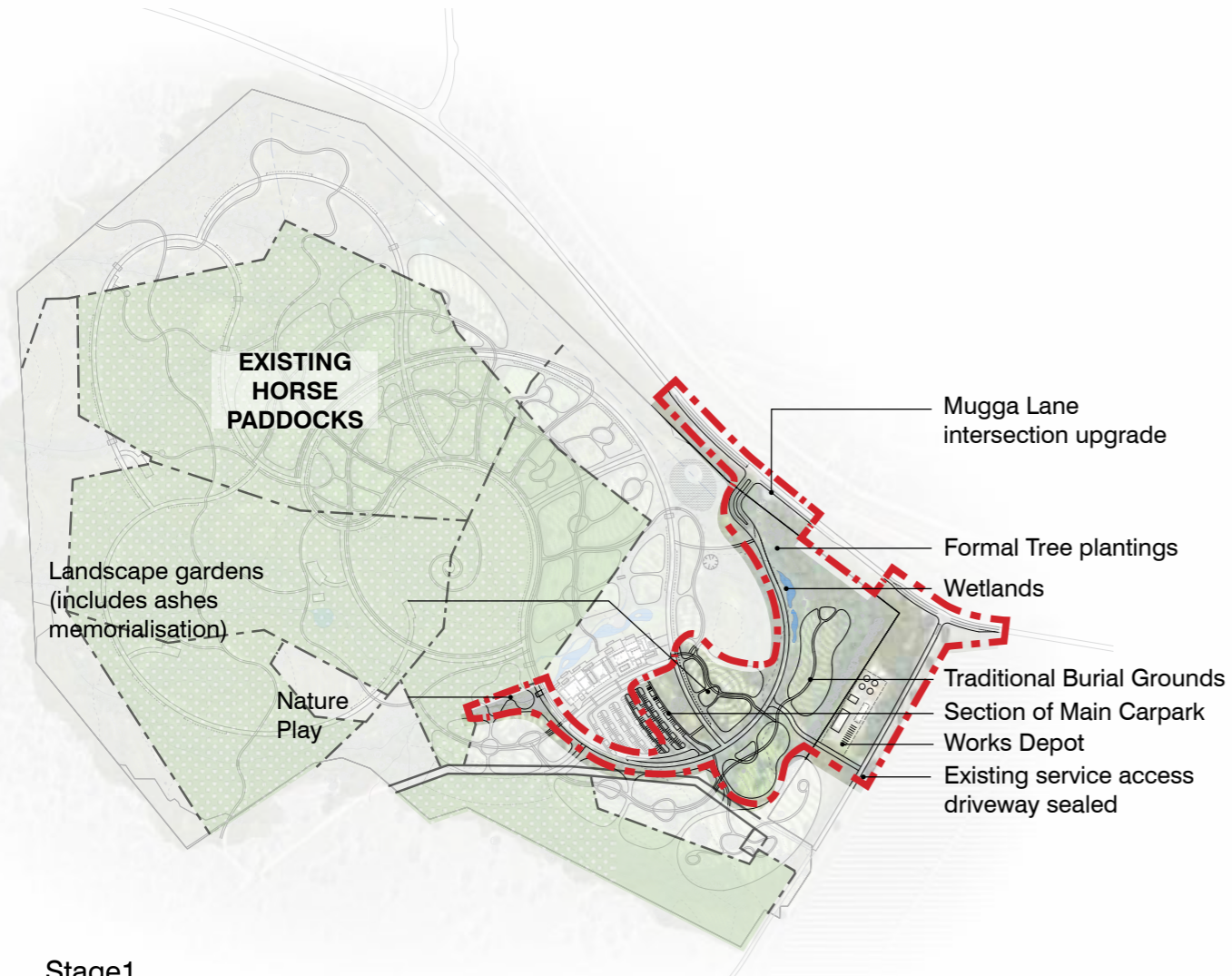
A mausoleum with space for 100 crypts, has been proposed immediately across the creek line from the main visitor facility. It is supported by a small carpark. The requirement for a mausoleum is subject to future demand and further assessment. There are many potential locations within SMP for other mausolea dependant upon demand.

The interment of ashes in running water, as some faith groups prefer, cannot be accommodated at this site due to the intermittent flows of the site's natural gullies.

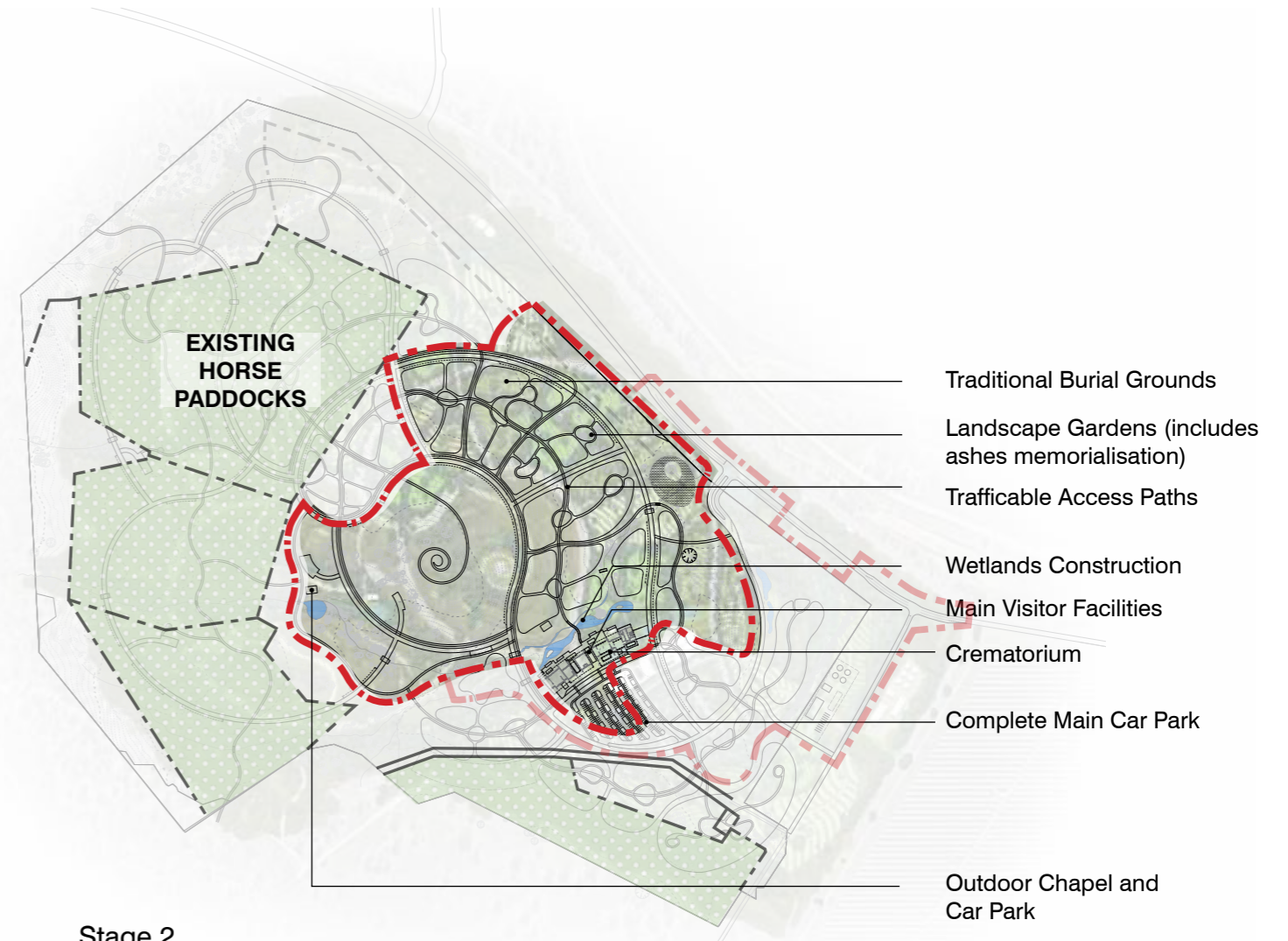


2.7 Staging

The proposed SMP development staging orders the delivery and quantum of future work within an indicative timeframe. This is based on the understanding that development will occur incrementally with detailed design to precede construction. The time required for development is also subject to the statutory approvals process, for example Development Approval for Stage 1 works and environment approvals for further stages. Four stages are proposed over the estimated 100+ years of the facility's life of active interment.

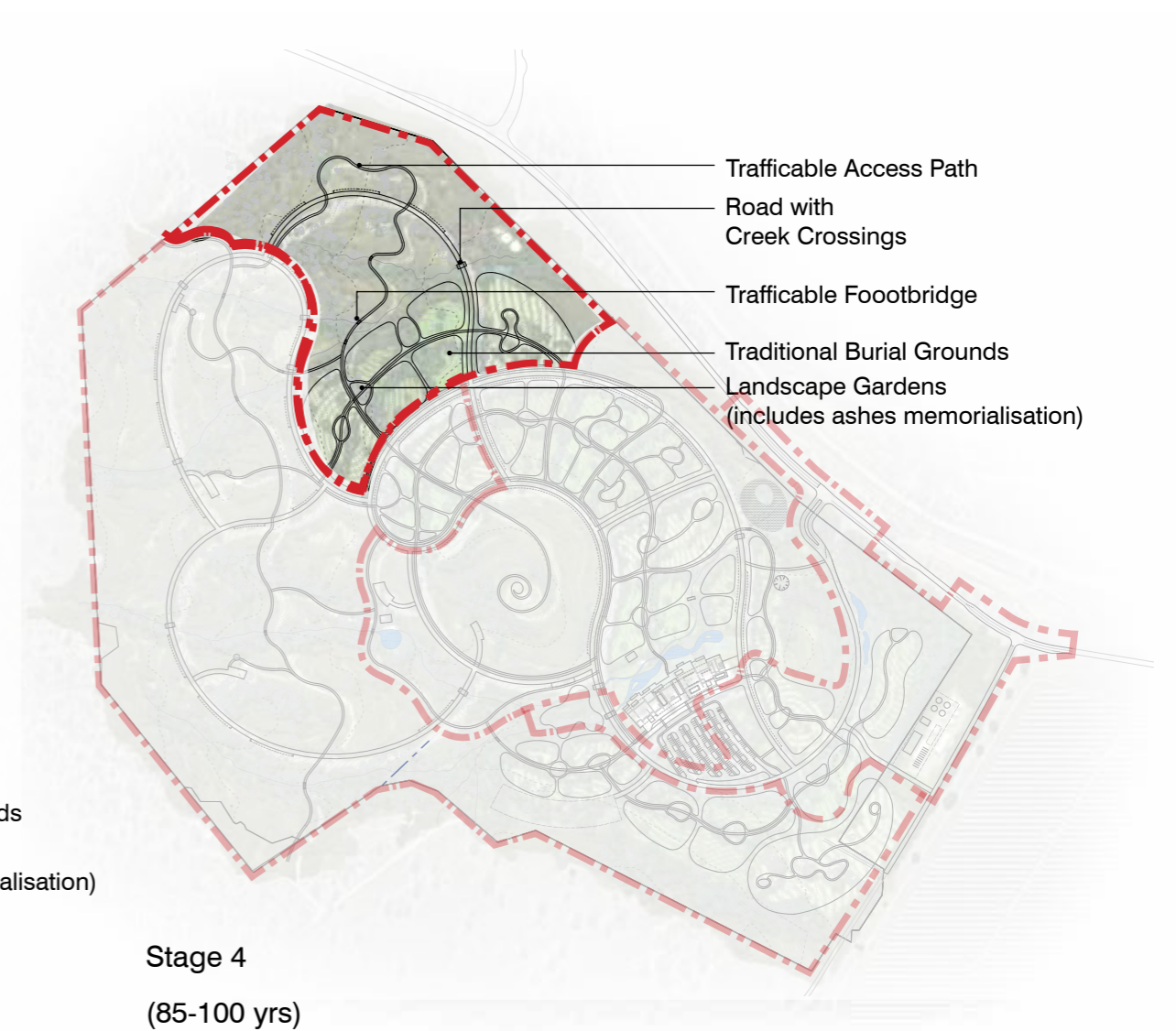
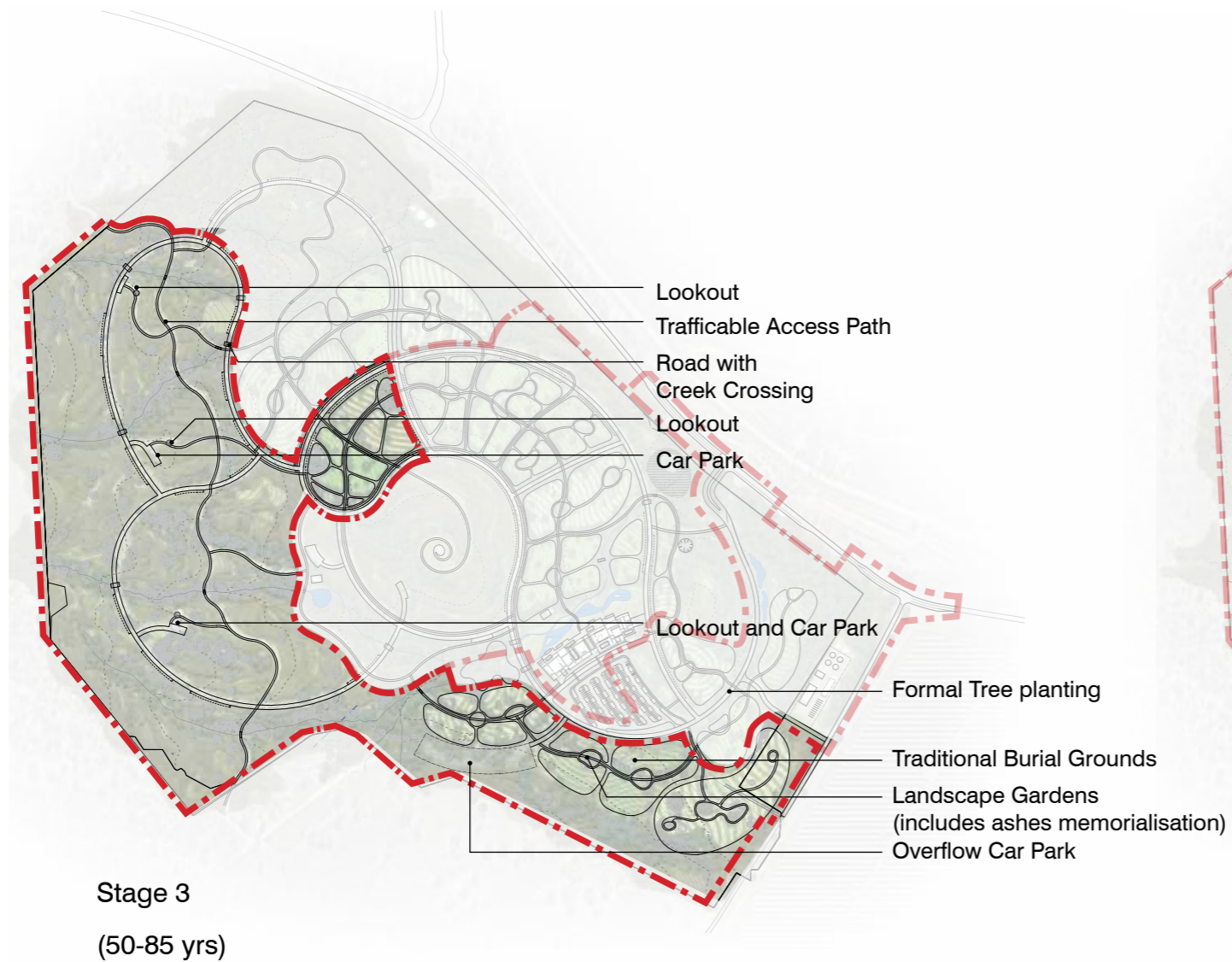


Stage1
(0-5 years)



Stage 2
(5-50 years)

Figure 11. Staging Diagrams



2.8 Burial Strategy

Inherent constraints of the SMP site are strong determinants of how the site can be developed.

Areas with existing cultural artefacts and indigenous heritage significance; remnant vegetation with important ecological values, and adverse subsurface geotechnical factors have been considered in the cemetery design. These key constraints are described in **Appendix A**.

A burial strategy that fully considers the site constraints has been prepared to guide a strategic approach to staged development of the site and provisioning of long-term interment. The cemetery design and implementation strategy has been developed with advice from and review by a cemetery design subject matter expert, independently engaged by Transport Canberra City Services (TCCS) to provide technical advice. (**Refer to Appendix C**)

A summary of the details of the assessments and calculations undertaken to test the site viability and area suitability for traditional and natural burials includes:

1. The assessments show that approximately 28-36 ha (approx. 40% of the total site area) have relatively low-level constraints and are therefore best suited to higher levels of development. All traditional deep burials, and the majority of site infrastructure, are planned to occur within these areas.
2. The remaining 43-50 ha of the site (approx. 60% of total area), largely on the western upper slopes, show relatively higher level constraints reserved for low impact interment - natural burials and ashes interment

– in regenerated natural bushland and areas of ecological value where this is permitted. This approach to planning for the upper slopes of the site where soils are shallowest, reinforces the sense of a memorial park located within a tranquil, natural bushland landscape. These areas may also be utilised for low impact recreational activities such as bushwalking, bird watching or nature photography.

3. The calculations presented below represent a simplified modelling of the assessments of the burial plot area availability and yield estimates based on the proposed site masterplan layout, noting the following:
 - Area figures shown are for space exclusively dedicated to burial portions. Roads, carparking, buildings and other site infrastructure have already been subtracted.
 - Yields are calculated based on an allowance of one 'natural' burial plot per 10m², and 'traditional' burials at two different densities: higher density - one plot per 6.5m², and lower density - one plot per 10m².

BURIAL PLOTS AVAILABLE

Assuming Low Constraint areas used for traditional burials only.

Low Constraint Areas allocated for burial portions: 160,000m²

107,000m² (67%) @ 6.5m²/plot

54,000m² (33%) @ 10m²/plot

Total of traditional burials is 21,800 plots

Assuming High and Moderate Constraint areas used for natural burials only

High+Mod Constraint Areas allocated for burial portions: 100,000m²

Natural Burial Plots (@ 10m²/plot): 10,000 plots

Total of natural burials is 10,0000 plots

YIELD CALCULATIONS

Natural Burials (1 pax/plot): 10,000 pax

Traditional Burials (2 pax/plot): 43,600 pax

Total Yield: 53,600 pax (82% Traditional / 18% Natural)

ESTIMATED MEMORIAL PARK LIFE

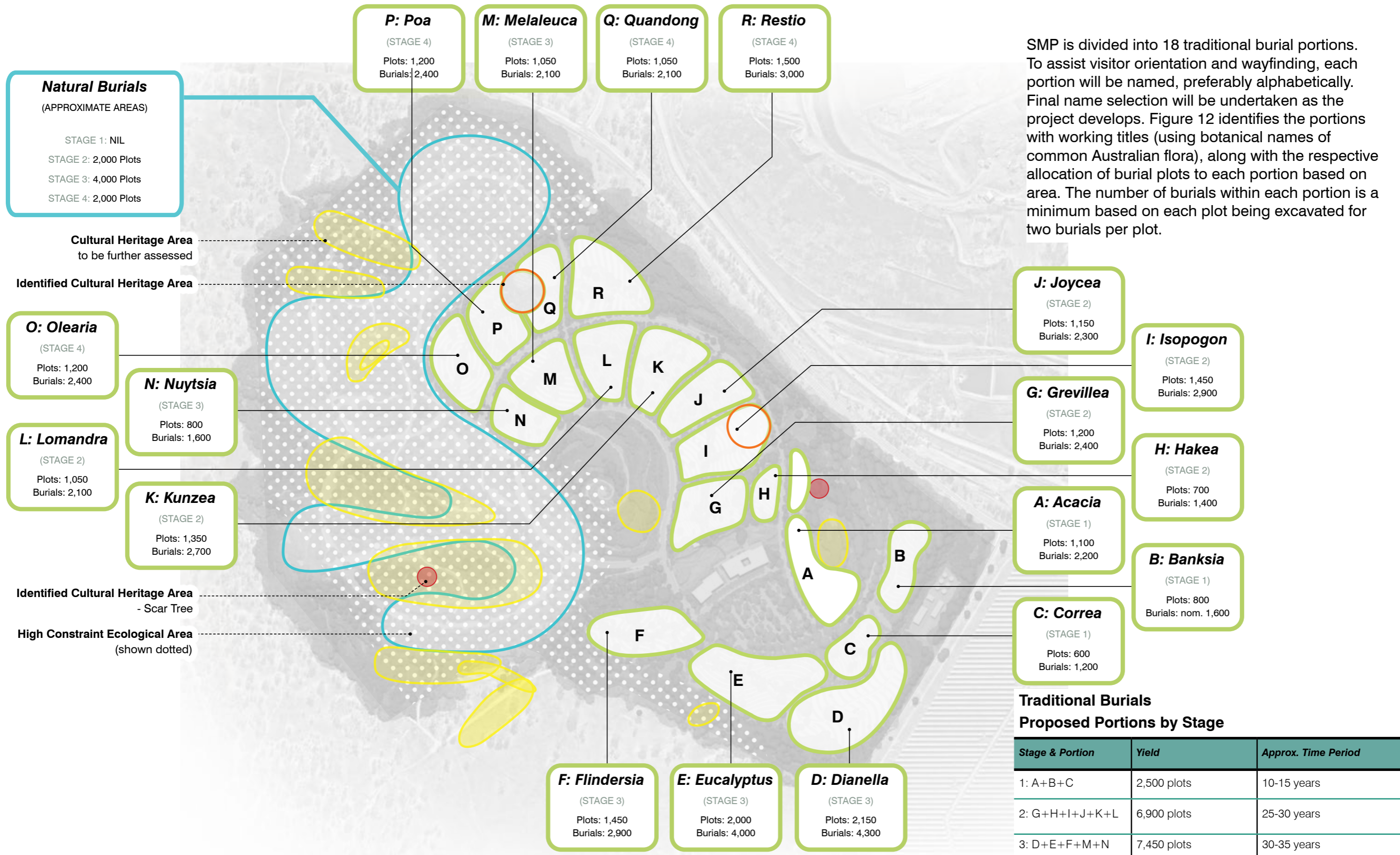
Assuming the following rates of burial for SMP:

200 burials per annum for first 10 years: 2,000 burials

400 burials per annum for next 20 years: 8,000 burials

600 burials per annum for next 70+ years: 42,000+ burials

53,600 burials equates to approximately 103 years of memorial park life



SMP is divided into 18 traditional burial portions. To assist visitor orientation and wayfinding, each portion will be named, preferably alphabetically. Final name selection will be undertaken as the project develops. Figure 12 identifies the portions with working titles (using botanical names of common Australian flora), along with the respective allocation of burial plots to each portion based on area. The number of burials within each portion is a minimum based on each plot being excavated for two burials per plot.

**Traditional Burials
Proposed Portions by Stage**

Stage & Portion	Yield	Approx. Time Period
1: A+B+C	2,500 plots	10-15 years
2: G+H+I+J+K+L	6,900 plots	25-30 years
3: D+E+F+M+N	7,450 plots	30-35 years
4: D+P+Q+R	4,950 plots	20-15 years

Figure 12. Portions and plots

2.9 Access and Wayfinding

Vehicle Movement

The main entry to SMP will be signalised intersection located on Mugga Lane, 600 metres south of the Mugga Lane and Long Gully Road intersection.

The road network proposed for SMP is an arrangement of hierarchical loops based on anticipated volumes of use.

High visitation roads surround the high use central core of the site and roads for lower visitation areas radiate out across the site from this core. Roads and paths follow the longest stretches of natural site contours. When looped back, the routes are on flatter terrain, such as at the main visitor facilities.

Aligning roads and paths along site contours reinforces the organic design, creates a more comfortable, accessible pedestrian environment and is more cost effective to deliver. Improved access for visitors with impaired mobility is also possible.

The looped ring roads and curvilinear layouts enable users to easily return to their starting point. Sequential alphabetical naming of the burial gardens will help people find their way. Strategically placed signage and maps will further assist visitors.

Maintenance staff based at the works depot will use the road network to access all parts of the park.

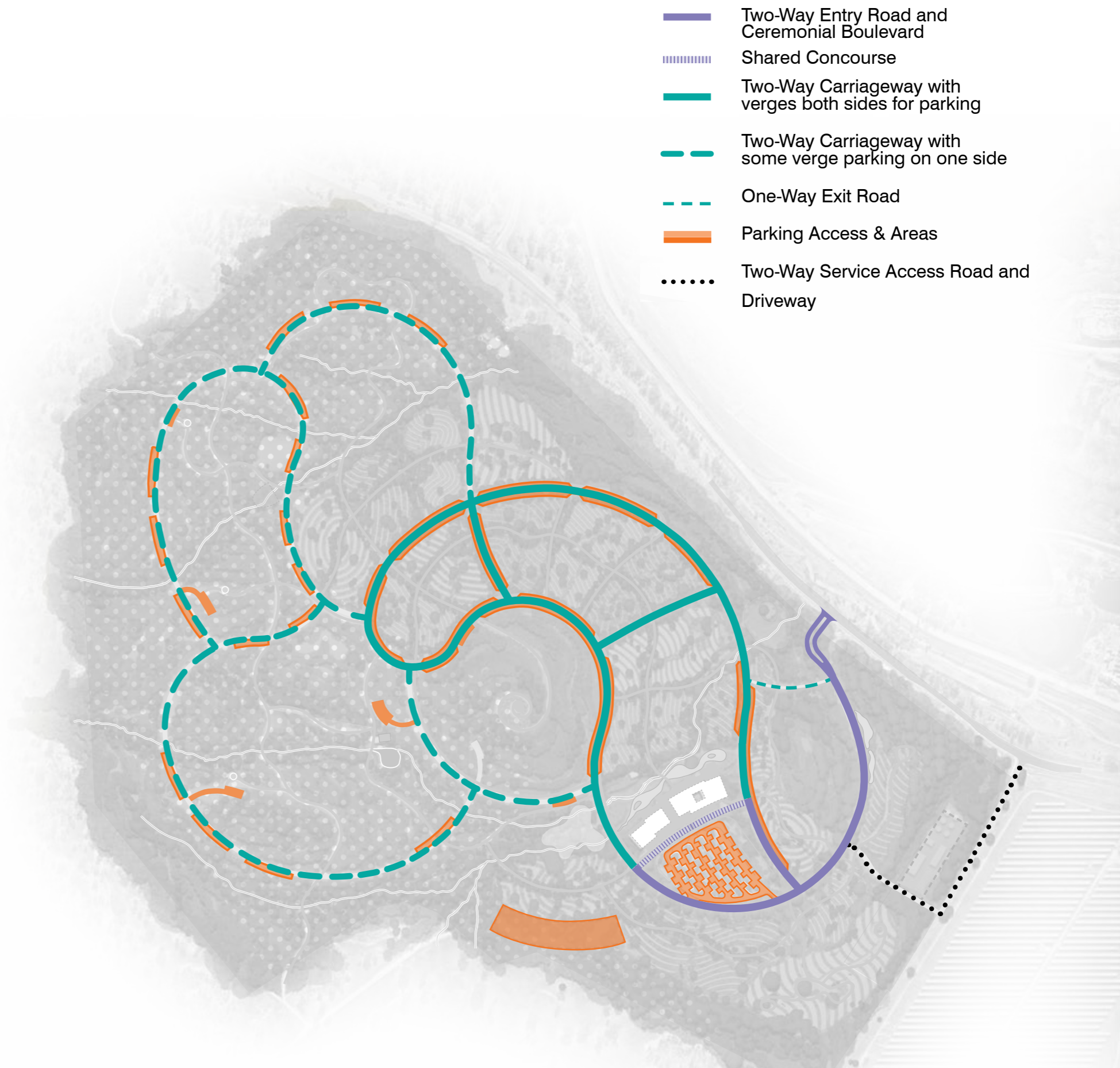


Figure 13. Vehicle Movement

Paths and Trails

The connecting paths and walking trails that thread through both traditional and natural burial areas are designed for pedestrians but are wide enough (3metres width) and robust enough (asphalt or concrete surfaced) to provide the necessary access to burial plots for visitors and maintenance vehicles.

The main north-south orientated walking trail through the upper slopes and natural burial area is designed for both SMP visitor access and recreational walkers.

The trail also connects to the Canberra Centenary Trail network.

The existing horse-riding trails along the perimeter of the site connecting to adjacent horse paddocks are retained.

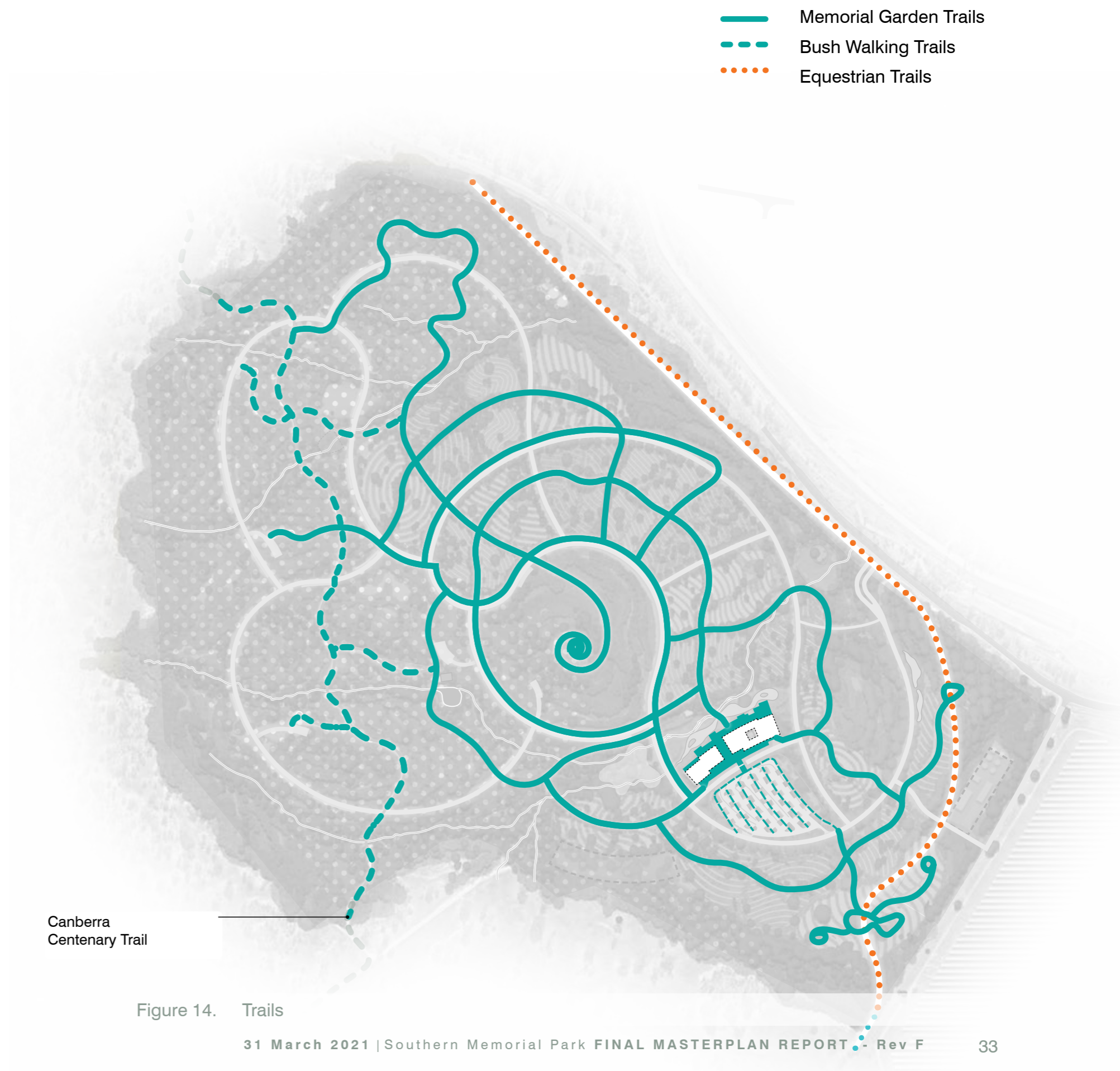


Figure 14. Trails

2.10 Water Management

The SMP site has several natural waterways that have become degraded from past land use and vegetation clearing. These creeks will be rehabilitated and made features of the landscape.

The waterways in conjunction with strategically placed wetlands will capture and treat stormwater generated on the site to meet regulatory requirements to protect downstream waterways. These ephemeral waterways and wetlands will celebrate the landscape character of the site and enrich the park as wildlife habitat and visitor experience.

The proposed 'water sensitive urban design' (WSUD) approach enables treated water from the wetlands to be harvested and used to irrigate the park, thus reducing reliance on potable water.

The major contribution for water conservation at SMP will be the stormwater collection, treatment, storage, and reuse system that will be developed to supply irrigation for the burial plots. Of the various external water supply sources investigated at the site (Refer to Section 8: WSUD) only on-site stormwater was found to be viable, and therefore maximising its harvest has been adopted.

The proposed system of stormwater harvesting will not only capture water for reuse but will also enhance the ecology of the park and protect downstream waterways. Vegetated wetland systems constructed at key locations to treat the runoff and improve water quality will do this. Flows from the roads, car parks and buildings will be directed to the wetlands as well as natural flows along the rehabilitated watercourses.

The wetlands will be shallow permanent bodies of water that are extensively vegetated. They will contain some deeper pools of open water and will be configured to fit naturally into the landscape. Water levels in the wetland will fluctuate over the year and during long dry spells water will recede into the deeper pools.

It is estimated approximately half of the water demands of SMP can be supplied from harvested water collected on the site through a strategy that captures surface runoff and roof water, uses water efficient fitting and fixtures, improves water quality through natural filtration, storage in wetlands and tanks, and reuse.



2.11 Public Art

Art can be a powerful tool in evoking landscape and a sense of place. Public art in a memorial park setting has even greater potential to engage with people on a contemplative, even spiritual level, and as such, incorporating site-specific art into the landscape can be an important component of SMP.

Public art and interpretative landscape installations can be varied and multi-layered; commemorative with specific reference to certain people or sections of the Canberra community interred at the Park, or elements in the landscape intended to provoke a particular sentiment, tell a particular story, interpret the site, its ecology or geography, or be simply be decorative and awe-inspiring.

Public art is also an opportunity to acknowledge the Ngunnawal and Ngambri peoples as the traditional custodians of the Canberra, improve relationships and understanding between non-aboriginal people and aboriginal people, and acknowledge of the indigenous spiritual connections to the land.

As such, works can be in the form of:

- Enduring iconic pieces or stand-alone works, at large or more intimate scales
- Temporary installations
- Performance or works using various forms of interactive media such as sound or projection
- Integrated artistic elements such as custom designed sculptural architectural elements, wayfinding and building signage, artistic elements within shelters, paving and urban furniture.

The Masterplan is flexible to enable art to be positioned anywhere across the site, within the constraints of setting, scale and views.

The strongest public art and interpretation outcomes will be achieved through the commissioning of artists and designers to develop site specific works. The response and concept of such works will consider location, scale, form, and materials. Public art, craft or specialist design that is site-specific has an inherently direct relationship with the fundamental principles that support the functioning and specific users of SMP.

As proposed in the SMP Masterplan 2012, it is recommended that a Public Art Policy be specifically developed to set in place standards to guide the quality, durability and appropriateness of future artworks.



2.12 Landscape and Planting Strategy

As fitting for the “Bush Cemetery for the Bush Capital”, SMP will be designed with a natural bush character showcasing local plant species.

The landscape is also designed in response to the limited availability of water for irrigation. Irrigation will be restricted to areas of the park which are intensively used or where irrigation is necessary. Alternative treatments to the lawn burial, replacing lawn with alternative materials such as gravel while maintaining a ‘green’ appearance will be explored in Stage 1 preliminary design. Plant selection will be based on drought tolerance and suitability for local conditions.

The portions will be designed to be different from each other and therefore more easily remembered and identified on return visits. Themed planting using selected species or flower colour will also make locations more recognisable, thus avoiding large areas of ‘sameness’ that often makes wayfinding in memorial parks difficult even for regular visitors.

The upper slopes of the site, including remnant pockets of important ecological plant communities, will be restored to a natural condition with the intention of improving the ecological value of the site. These areas will be dedicated to natural burials and ashes interment.

The natural gullies and waterways will be restored and enhanced with the introduction of new wetlands.

The memorial gardens, the main visitor facility, carparking areas and road verges will be densely planted with low water use native shrubs and trees known to thrive in local conditions. The plants in these landscapes will emphasise the flora of the Australian bush with a focus on flower colour and beauty appropriate for a memorial park setting.

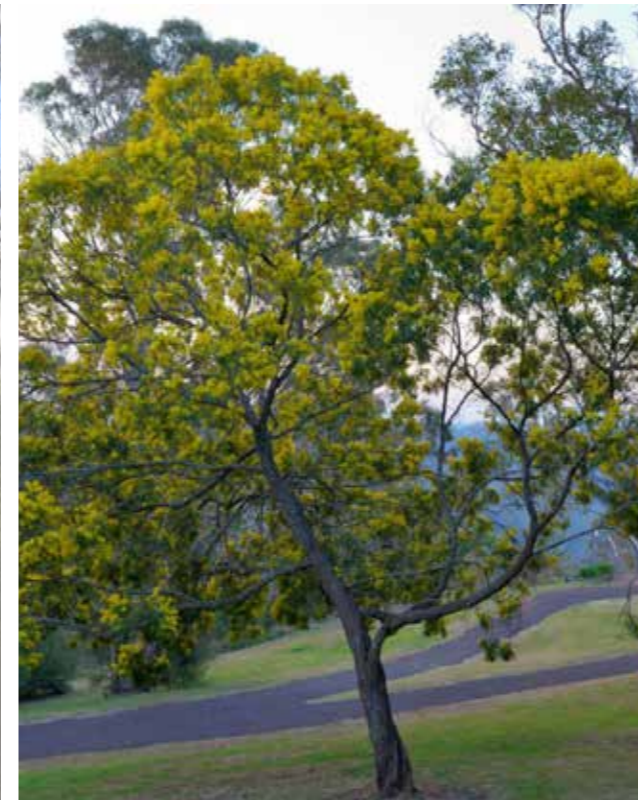




Wahlenbergia stricta



Eucalyptus rossii



Acacia pycnantha



Angophora costata



Eucalyptus polyanthemus



Eucalyptus melliodora



Eucalyptus moorei



Eucalyptus pulverulenta

Figure 15. Locally occurring trees proposed to be used in SMP



3.0 CONSULTATION & PLANNING

3.1 Stakeholder Consultation

Prior to developing the SMP Masterplan 2012, the ACT Government consulted extensively with the community on the development of a new cemetery, its location, and the services the community would expect. This culminated in a Community Discussion Paper 2010 listing the opportunities and constraints of the preferred location on Mugga Lane, Hume.

The SMP Masterplan 2012 outlines the key outcomes from the consultation:

- Confirmation that there is general community support for a new cemetery on the site proposed in south Canberra.
- Strong support for a comprehensive level of service, incorporating appropriate treatment of the various faith groups, and that provision be made for natural burials.
- Some community interest regarding planning considerations, particularly how the proposed cemetery development fits with the Government's intentions for the Hume/Eastern Broadacre area, and the means by which the site was identified.
- Issues to be resolved were inclusion and siting of a crematorium, the impact of siting a cemetery in a wildlife corridor, ongoing provision for horse agistment, identification and treatment of Aboriginal sites and public transport access.

Due to previous extensive community consultation, the stakeholder engagement for the Masterplan Review has been targeted. The project team have met and communicated with stakeholders on multiple occasions to gather information and seek feedback on the proposals. Targeted Stakeholders included:

External Stakeholders

- Territory Agistment (current leaseholder)
- ACT Equestrian Association
- Government Paddock Users Group
- Faith Groups - Islamic, Buddhist, Baha'i, Hindu, Interfaith, Sikh, Roman Catholic, Anglican, Uniting Church, Greek Orthodox, Russian Orthodox, Presbyterian, Baptist, Lutheran, Coptic Orthodox, Imam, Jewish, Quaker, Sathya Sai, Art of Living, Sukyo Mahikari, Sangha.
- Funeral Directors
- Aboriginal and Torres Strait Islander Elected Body (ATSIEB) and
- Registered Aboriginal Organisation

Canberra Cemeteries Stakeholders

- Special Projects Committee of Canberra Cemeteries

Government Stakeholders

- EPSDD – Parks and Conservation Services (PCS)
- EPSDD – Conservator and Impact Assessment
- JACS – ESA
- TCCS – ACT NO Waste
- TCCS – Roads ACT
- TCCS – Development Assessment/ Transport Planning/ Network Planning
- TCCS – Canberra Cemeteries – Operations
- Heritage AC

Refer to Appendix K for Documentation of the Stakeholder Consultation

A summary of the key issues and the proposed actions include:

ISSUE	ACTION
1. Mugga Lane Traffic	
1.1 Mugga Lane already carries a significant amount of heavy vehicle and normal traffic to access the Mugga Lane Resource Management Centre and as a through road to the Monaro Highway.	1.1 The main entry to SMP has been moved further east along Mugga Lane, away from the Long Gully Road intersection. The service road has been relocated from the Long Gully Road intersection to the eastern boundary of SMP.
1.2 The future road design will need to consider the possible impact of traffic related to SMP, including slow moving hearses and funeral processions.	1.2 The proposed roundabout at the main entry has been replaced with a signal-controlled intersection with slip lane pockets for vehicles entering SMP.
2. Mugga Lane Resource Management Centre	
2.1 Proximity of SMP to the Resource Management Centre may be perceived as undesirable. ACT No Waste is currently preparing a Strategic Plan for the Resource Management Centre. This includes expansion of the facility for extensive green waste recycling; this has implications for increased heavy vehicle and other traffic.	2.1 Vehicular access to SMP is independent and well separated from traffic accessing the Resource Management Centre. The location and orientation of proposed SMP facilities will avoid undesirable views of the Resource Management Centre. Tree planting and mounds will assist with screening.
2.2 Management of possible odours and pollution from the Resource Management Centre.	2.2 An air quality assessment report for the site was prepared to assist with locating the crematorium. The meteorological modelling for this provides information on wind direction. This indicates that the most frequently prevailing winds will not transfer odours over SMP. The proposed extensive green waste recycling facility will assist in reducing odours as it is expected that a significant amount of green waste currently managed outside will be undertaken in a building.
3. Ecological Impacts	
3.1 Stage 1 has been planned to avoid ecological impacts on Threatened Ecological Communities.	3.1 SMP layout aligns low impact functions with ecologically and culturally sensitive areas. Wildlife corridors are maintained through the site.

ISSUE	ACTION
4. Faith Groups Rituals and Burial Requirements	
4.1 Each different group has specific cultural and burial rituals.	4.1 SMP has been designed to be welcoming and inclusive. The design is flexible to allow each group to practice their specific rituals. Specific requirements of the Central Visitor Facility will be addressed in Stage 2 Design. Additional foot wash areas and bins have been added to Stage 1 Design.
5. Acknowledgement of Indigenous Heritage and Culture	
5.1 The many pre and post-colonial contact stories that underlay the history of the landscape should be shared. Opportunity to use interpretation to improve relationships and understanding between non-aboriginal people and aboriginal people. Acknowledge the spiritual connections to the land through:	5.1 SMP should acknowledge both Ngambri and Ngunnawal. Cultural Heritage Assessment has been prepared and approved by Heritage ACT. SMP has been designed to be welcoming and inclusive. There is an opportunity for designated burials for First Nations People portion dependent on demand.
<ul style="list-style-type: none"> • Symbolic Gestures – art, naming, language, historical and cultural interpretation, and rituals. • Using Aboriginal language to name features and aspects of the landscape. 	5.2 The PAD and scar tree located in the Stage 1 has been fenced. A Conservation Management Plan will be prepared for the scar trees in Stage 1 Detail Design Phase.
5.2 Respect for the land and the cultural heritage will create good karma	5.3 In the next stages of the project further consultation and collaboration to incorporate into the design elements that recognise the spiritual connection to the land.
5.3 Provide a burial area for First Nations People.	
5.4 Other opportunities such as employment of a First Nations caretaker.	5.4 Canberra Cemeteries to investigate employment opportunities for local aboriginal people as SMP is implemented and becomes operational.

ISSUE	ACTION
6. Horse Agistment Activities	
6.1 The plan needs to take into consideration the existing equestrian track which runs along the edge of the southern horse activity area. Additional rock bollards are required to prevent vehicles or motorbikes entering the trail network. Realignment of this track could be considered.	6.1 The existing trails have been retained. Rock bollards are proposed to prevent vehicles or motorbikes entering the trail network. Details will be developed during Stage 1 Detail Design phase in consultation with equestrians.
6.2 Horse activity signage is required at intersections between the trail and roads.	6.2 Horse activity signage will be developed during Stage 1 Detail Design phase in consultation with the equestrians.
6.3 In Stage 1 and 2 water supply to the yards and troughs needs to be retained.	6.3 Existing mains water supply has been realigned to the perimeter of the SMP site to ensure water supply to yards and troughs and access for maintenance (Stage 1 and 2). Details will be developed during Stage 1 detail design and construction phases in consultation with leaseholder.
6.4 Stage 1 encroaches on part of the horse activity area. A replacement area outside Stage 1 and Stage 2 will need to be identified to replace the area lost.	6.4 A level replacement site for the horse activity area will be identified in collaboration with the current land custodian and leaseholder. The replacement site is expected to be implemented before construction commences.
6.5 The leaseholder and horse paddock users will need to be consulted prior to commencement of construction to ensure 24/7 access is maintained to the horse paddocks (to feed and care for horses) and for riders to have access to equestrian trails.	6.5 Construction Management Plans and Temporary Traffic Management Plans will be prepared at detail design and construction phase in consultation with the leaseholder and horse paddock users.
6.6 Tree planting areas excised from the paddocks lease, have not been managed in a way that would protect the quality of the surrounding grazing areas. This has placed additional cost burden on Territory Agistment to manage weeds and bush fire hazards. Government horse paddock users would like a stronger commitment from TCCS/ EPSDD to manage land that has been excised from the horse paddocks to minimise risk to adjoining properties.	6.6 The Masterplan has identified some management requirements that need to be implemented when the SMP becomes operational: <ul style="list-style-type: none"> • Show on a plan of land areas to be included or excluded from the Territory Agistment lease. • Define respective management responsibilities of land custodians, land managers and leaseholders in relation to vegetation, weed control, bush fire, fences, trails, and animals.

Staged impact on Horse Agistment

Benefits of SMP that the equestrian community could expect include:

- Incremental staging of SMP which enables the horse agistment to be retained on site for approximately 50 years.
- Future onsite facilities will be available to equestrians (public toilets, café).
- Retention of equestrian trails.
- Sealing of driveway to horse agistment parking area.
- Improved site surveillance.

The staged development of SMP allows for horse agistment activities to be retained on site during Stage 1 (with minimal disruption) and Stage 2 (with moderate disruption) for approximately 50 years.

In later stages of the SMP the Rose Cottage and adjacent Macarthur Park Horse Agistment areas could be amalgamated to make a more viable business for the leaseholder.

Figure 16 indicates changes to the horse agistment lease area with regard to anticipated staging of the development.

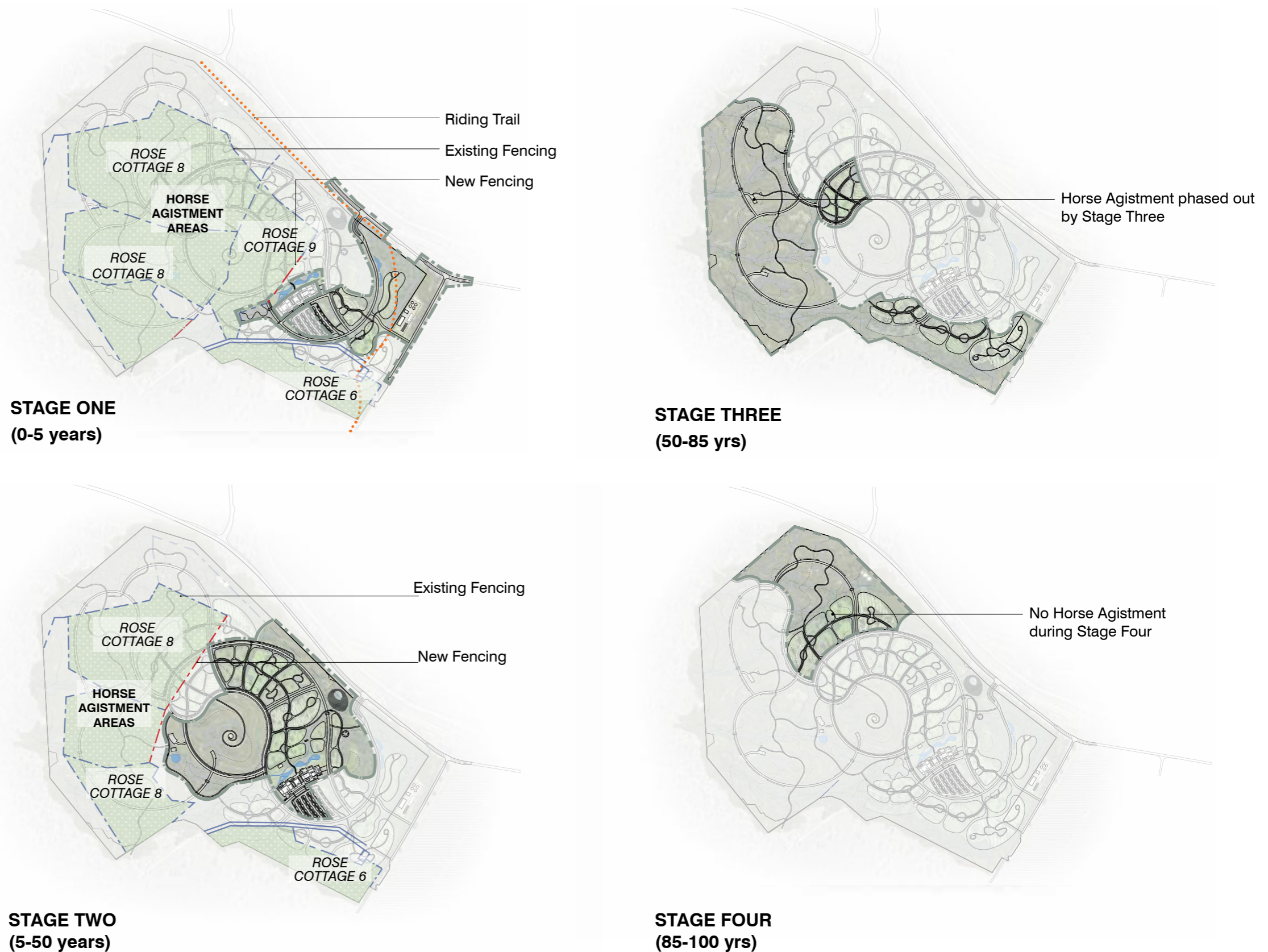


Figure 16. Impact of Horse Agistment over the Development Stages

3.2 Environmental Investigation Summary

Ecological, contaminated land, noise and vibration, and air quality specialist investigations were undertaken as part of the study to identify:

- Existing environmental attributes within the project site, which could result in potential environmental constraints or opportunities for future development.
- Feasible recommendations to update the masterplan.
- Data gaps and recommendations for additional assessment needed to confirm the findings.

The review of environmental conditions has informed preparation of the Masterplan through identifying:

- Areas of remnant native vegetation to avoid where practicable
- Current noise generating activities near the site and noise standards for construction and operation
- Potential for contamination on the site and appropriate mitigation measures.

Ecology

Ecology investigations consisted of desktop assessment of publicly available data and existing ecological reports for the SMP site. A site inspection was undertaken during May 2020 to confirm the findings of the desktop assessment and identify any inconsistencies with these. The site inspection confirmed vegetation communities mapping within the study area, recording of the location of significant habitat features such as hollow bearing trees where observed, assessing the significance of habitat for threatened flora and fauna and incidental observations of fauna utilising the site.

The SMP site is highly modified as a result of agricultural activities including tree removal, tree planting, pasture improvement and seeding, heavy grazing and ongoing use for horse agistment; the kangaroo population is extremely high and adversely impacting the vegetation; there is also weed infestations. However, some areas of remnant native vegetation communities remain including:

- Blakely's Red Gum – Yellow Box tall grassy woodland
- Red Box tall grass-shrub woodlands primarily on hillslopes and footslopes in the Australian Capital Territory
- Native grassland.

Contaminated Land

Contaminated land investigations consisted of desktop document review and assessment, a search of the ACT Environment Protection Authority (EPA) contaminated sites database and a site inspection in May 2020.

Historical information shows there is low potential for contamination to be present within the project site as the predominant land use was pasture and horse agistment. However some contamination may be present given previous site history and surrounding activities. Risk areas are:

- Uncontrolled fill in the three existing dam embankments, the main gravel road and/or the small stockpile of gravelly sand in the western portion of the site
- Agistment management activities including regular spraying of herbicides and pesticides
- Ongoing operation of the adjacent Mugga

Lane Waste Management Centre north of the site, which may produce contaminated groundwater (including contaminants such as faecal coliforms or heavy metals) that could potentially migrate underneath the project site.

Other areas of environmental concern based on the site's rural use may exist associated with fuel storage and dispensing facilities, chemical and municipal waste disposal, hazardous materials storage and hazardous material in buildings.

Management of these risks will be resolved through an Environmental Management Plan to be prepared by Canberra Cemeteries prior to the commencement of site operations.

Noise and Vibration

Desktop review of the ACT Noise Zone limits and land uses within and surrounding the project site was prepared. The project site may be subject to noise intrusion from adjacent land uses including:

Mugga Lane solar park about 120 metres to the east due to noise emissions from solar panel inverters, vehicle movements and maintenance activities, however this is low risk for high noise levels within the project site

Mugga Lane Resource Management Centre about 550 metres to the north, due to machinery for waste management and heavy vehicle movements, which may be audible at the project site

Boral Quarries about 3km to the north is a low risk for high noise levels within the project site given the distance.

Noise generated during construction or operation activities within the project site

must meet the standards for noise control prescribed in the Environment Protection Regulation (ACT) 2005. The noise standards applicable to the zoning for the project site is available in the Preliminary Environmental Assessment appended to this Masterplan report. **(Refer to Appendix E)**

Air Quality

A meteorological model has been prepared for the site. The study found that emissions from modern crematorium are minimal and unlikely to be noticed by people nearby or in the area.

However, to reduce the perception of emissions impacting on people it is recommended that gathering spaces be located up-wind of prevailing wind directions, or down-wind of the least frequent wind directions. On average, for the years assessed, it was predicted that locations:

- north-west of any proposed crematorium are up-wind of prevailing winds
- north-east of any proposed crematorium are down-wind of the least frequent winds

3.3 Planning Context and Pathway

Planning System

All land in the ACT belongs to the Commonwealth and under the Planning and Land Management Act 1988 (P&LM Act) is divided into either:

- Territory Land – managed through the Territory Plan by the EPSDD (ACT Government) under the Planning & Development Act 2007 (P&D Act), or
- National Land – managed by the National Capital Authority (NCA).

SMP is sited to avoid any impacts to National Land. However as Territory Land SMP development is subject to two layers of legislation and approvals:

- Commonwealth: Department of Agriculture, Water and Environment (DAWE) under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
- Territory: EPSDD under the Planning & Development Act 2007 (P&D Act)

Territory Plan

SMP is zoned Broadacre under the National Capital Plan, Territory Plan and applicable Development Codes.

SMP is defined as a Cemetery under the Territory Plan 2008 and would be permissible under the Broadacre land zoning for the site.

Recommended Planning Pathway

A single approval pathway under the ACT planning system for the whole SMP site has been discussed with EPSDD and has been found to be unsuitable given the extended delivery time period of development over 80 years in four stages. The limitations of the planning approval, including expiration of an Environmental Impact Statement (EIS) after

five years and Development Applications (DA) typically requiring construction to commence within two years of approval, will require separate planning approvals for each subsequent stage of development.

Stage One Development

Stage 1 of SMP is unlikely to require referral to DAWE under the EPBC Act. Initial desktop and site assessments by WSP in 2020, indicate that Stage 1 works is not expected to impact on cultural heritage areas, Commonwealth listed Threatened Ecology Community (TEC) and Commonwealth listed species .

Stage 1 will require ACT Government approval, initially following an Impact Track DA process, to determine whether an Environmental Significance Opinion (ESO) relating to biodiversity and heritage triggers, would be applicable. Granting (or not granting) of an ESO will determine the final DA track to be followed.

Future Stages

Future stages will have an impact on TEC and Commonwealth listed species (subject to seasonal surveys). However the nature and quantum of the impact is still to be determined. Based on current approval processes future stages of SMP will require referral to DAWE under the EPBC Act.

Once it is referred, DAWE can decide that the proposed development is a 'controlled' action and it is determined that it does not require assessment under part 8 of the EPBC Act, a bilateral agreement between the Commonwealth and the Territory under that Act allows the proposal to be assessed under the P&D Act. If this is the case then future stages of SMP development would only

require assessment under the Impact Track DA process. If this Commonwealth process is determined to be relevant to those stages of SMP then it is recommended that the client seek approval using the ACT bilateral assessment process.

Next Steps

STAGE 1 ACTIONS

- Confirmation of final design and impact area.
- Confirmation of any lease variation and changes to lease boundaries.
- Conduct seasonal ecology surveys.
- Confirm final impacts to registered heritage places or objects.
- Request a pre-application meeting with EPSDD for confirmation on pathway and any additional entity requirements for development approval.
- Prepare an application for an Environmental Significance Opinion from the Conservator of Flora and Fauna (if appropriate).

Environmental Significance Opinion (ESO) Process:

- Prepare ESO application form (Form 1M) and authorisation forms for signatures by block custodians / lessee's.
- Undertake any additional ecological and/or heritage investigations and reporting required to support the application for an ESO.
- Prepare and submit the application for an ESO.
- If the Conservator of Flora and Fauna and the ACT Heritage Council determines the Project is unlikely to cause a significant adverse environmental impact on the respective biodiversity for heritage values, then the Project may progress as a merit track development application.

Merit track DA process:

- Prepare letter of authorisation (Form 4) for signatures by block custodians / lessee's.
- Prepare DA supporting documentation like the statement against relevant criteria and

assessment of environmental effects.

- Prepare DA drawings to meet EPSDD minimum requirements.
- Prepare any additional reporting and information requested during the pre-application process.
- Lodge DA package via edevelopment.
- Refer to the checklist: Minimum Documentation Requirements For Lodgement of a Development Application (DA) <https://www.planning.act.gov.au>

FUTURE STAGES ACTIONS

- Due to the timeframes between stages, a single approval pathway for the whole SMP site is not applicable. It is recommended that in the years leading up to the future stages that a suitably qualified consultant be engaged to assess and confirm the most appropriate approval pathway. Based on legislation and SMP design as of January 2021, future stages of the project would require:
 - Confirmation of final design and impact area.
 - Confirmation of any lease variation and changes to lease boundaries.
 - Conduct seasonal ecology surveys.
 - Confirm impacts to registered heritage places or objects.
 - Consult with DAWE on EPBC Referral process and applicability of cumulative assessment approach to future stages.
 - If applicable prepare EPBC Referral based on final design and impact area.
 - If the EPBC Act referral determines that the Project is a Controlled Action, then an Environmental Impact Statement would likely be required as the prescribed assessment approach. Discussion with DAWE should be held to agree if a bilateral assessment process can be applied to the Project.



4.0 ARCHITECTURE

4.1 Inspiration

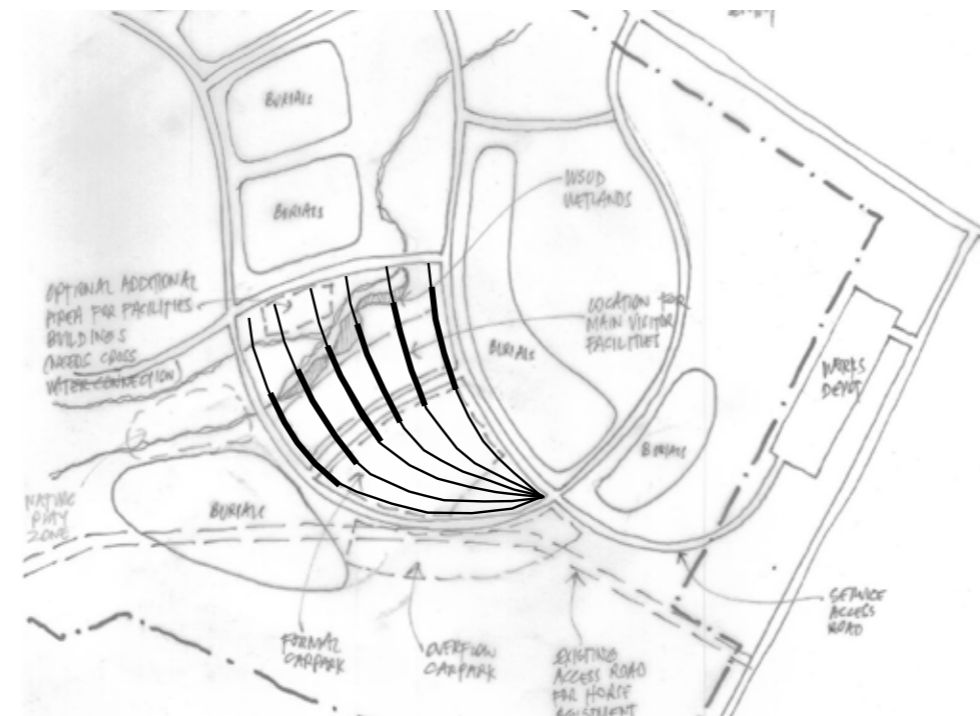
INSPIRED BY THE LOCAL TOPOGRAPHY

The unique qualities of the SMP site, including the topography, vegetation, colours, acoustics and views were references for the architecture. The gently rolling hills of the landscape are the most defining characteristic of the site, further reinforced by more subtle contour changes across the site location and influence the design proposed for the SMP main visitor facility buildings .



INSPIRED BY THE CURVILINEAR GEOMETRY

The curvilinear geometric layout of the landscape and road network of SMP is derived from a series of curved, radial and apex profiles. In order to develop a building concept that is integral with the landscape, the architectural design adopts a series of radial lines to give direction and form to the emerging architecture.



4.2 Main Visitor Facility

The main Visitor Facility is designed as a series of open pavilions linked by overhanging roofs and courtyard gardens. It comprises of:

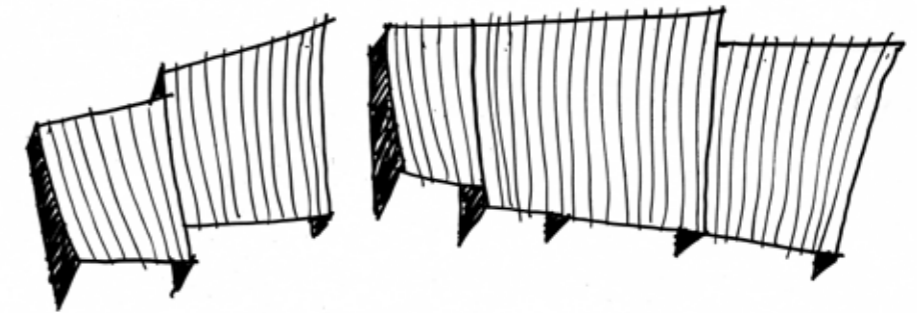
- Concourse
- Memorial Halls
- Function Halls
- Administration
- Crematorium
- Café
- Courtyards

The key architectural concept is to integrate the building with the site topography and landscape while providing visitors with a dignified and serene experience. The key concepts are:

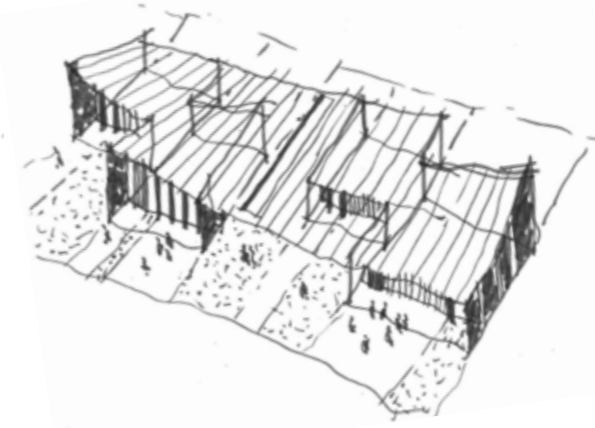
- A village of three pavilion buildings that terrace gently along the topography.
- An expressive roof profile that celebrates the existing site while unifying the three pavilions.
- Stepping of the halls, administration and cafe to create identity and privacy for each group of users.
- A series of walls that separate functions, while providing connection through the site.
- A restrained material palette which responds to the colours of vegetation on site.



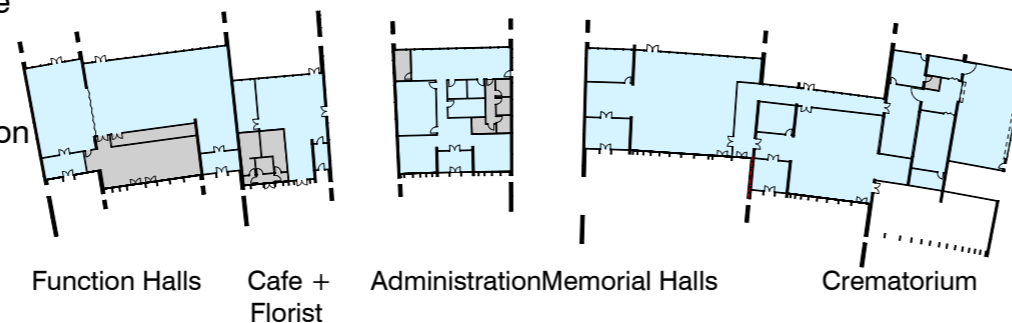
1 A VILLAGE OF THREE PAVILIONS THAT TERRACE GENTLY ALONG THE TOPOGRAPHY



2 AN EXPRESSIVE ROOF PROFILE THAT CELEBRATES THE EXISTING SITE WHILE UNIFYING THE THREE PAVILIONS



3 STEPPING OF HALLS, ADMINISTRATION & CAFE TO CREATE IDENTITY & PRIVACY FOR EACH GROUP OF USERS



4 A SERIES OF WALLS THAT SEPARATE FUNCTIONS, WHILE PROVIDING CONNECTION THROUGH THE SITE



5 A RESTRAINED MATERIAL PALETTE WHICH RESPONDS TO THE COLOURS OF VEGETATION ON SITE

The building requirements are similar to the SMP Masterplan 2012 proposal. These are:

Concourse

Entry to the main visitor facility will be from a shared vehicular and pedestrian Concourse, aligned with the gently curving complex and stretching its entire length.

The tree-lined narrow one-way road with designated drop off zones is primarily for hearse, visitor drop off and pick up, and delivery vehicles.

Main entries to each buildings will be defined by porte-cochere roof providing sheltered access to the hearse and generous gathering areas.

Memorial Halls

The memorial Halls for funeral services and ceremonies are non-denominational 'chapels', with a reverent but not sombre atmosphere. Whilst the focus will be on the casket and adjoining lecterns, possibly with screens for audio-visual presentations, there should be outside views and well-controlled daylight, giving relief to attendees.

Seating should be on fixed pews or seats, with generous aisles for circulation and for 'standing room' at well-attended funerals. One or two walls of the hall could be openable to allow overflow space for very large services.

The small Memorial Hall can seat 50 people. The larger Memorial Hall has capacity for about 200 seated and an overflow space directly to the north.

The entries to the halls face onto the Concourse. There is an entry area for gathering, meeting and greeting. A separate exit opens onto a covered outdoor

terrace or courtyard for mingling following the funeral service and access to the Functional Halls or back to the carpark.

Each hall should have the following engineering services:

- Air conditioning to suit the variable timing and levels of occupancy.
- Dimmable lighting (but not window blackout).
- Daylight screens (located inside and outside) for visual presentations.
- High quality audio for speech and recorded music.
- Security.

Function Halls

Two Function Halls are provided for events. The smaller function space can sit 50 people and the larger space can seat 200 people. Large operable doors between the spaces will allow the areas to be combined. They will also open out to the terrace.

The rooms should be capable of full blackout, and be supplied with stackable chairs and folding tables to allow set up as banquet dining, cocktail function, lecture or group discussion.

The rooms share catering kitchen sized to provide required food and beverage service for functions. Whether the kitchen is only a 'plating kitchen' relying on external catering with food prepared at another kitchen, or a equipped to cook and prepare all food for the Function Rooms will depend on a separate business case.

The Function Halls should have the following engineering services:

- Air conditioning to suit the variable timing

and levels of occupancy.

- Dimmable lighting (but not window blackout).
- Daylight screens (located inside and outside) for visual presentations.
- High quality audio for speech and recorded music.
- Security.

Administration

In the future the sales and administrative function of Canberra Cemeteries will be located at SMP.

The office will include work station areas for up to 18 staff, staff amenities, management offices, meeting and board rooms, and a public consultation area with private rooms and memorial displays. Staff toilets and other amenity areas will be provided in accordance with current work standards.

A centrally located cloakroom and public toilets in the Administration Building will services both the Function Halls and Memorial Halls.

The Administration area should have the following engineering services:

- Air conditioning with optional natural ventilation
- Good daylight and artificial lighting
- Communications data and power.
- Security.

Crematorium

The most significant departure from the SMP Masterplan 2012 has been the decision to locate the crematorium in the main visitor facility with direct connection

to the memorial halls;this allows easier transportation of the deceased.

The crematorium will be linked to the smaller Memorial Hall. A viewing window in the hall will enable family members to view the deceased and provide instructions to the crematorium staff. The crematorium design is based on the new crematorium at Gungahlin Cemetery. It will have one cremator, with adjoining space for a further cremator or an alkaline hydrolysis chamber. The building includes service and amenity areas for staff, as well as the Muslim body washing room, which would be separately accessed and screened from the cremation areas.

The cremator would be gas powered from a gas tank. The stack would be only 3 – 4 metres tall, and be hidden from view by the sweeping roofline.

The crematorium is located approximately 900 metres from the nearest housing and screened by the ridgeline of Wanniasa Hill.

Cafe and Florist

A small and informal café co-located with a florist will be a valuable addition to the Southern Memorial Park.

The café would have a dining space and courtyard facing the north towards the landscape creekline, and its own small kitchen.

It would also have access to centrally located public toilets and other facilities. A small playspace will be located near the functional hall and cafe for patrons to use.

Courtyards

The courtyards between the pavilions reinforce the landscape setting and enable the buildings to connect directly to the gardens.

The courtyard adjoining the small memorial hall will have a canopy around the outside and be open to the air through the middle. This space can be used for some cultures and faiths to be able to carry out the last rites at their own pace and in their own way.

Materials

The materials of the buildings will be natural and simple to suit the character of the site and ensure long-term durability and timelessness. Consideration should be given to the use of natural timber and local stone, as well as high-performance glass and well-insulated walls to ensure good energy performance. Roofs and walls should be non-reflective, in natural bush colours.

Drawings

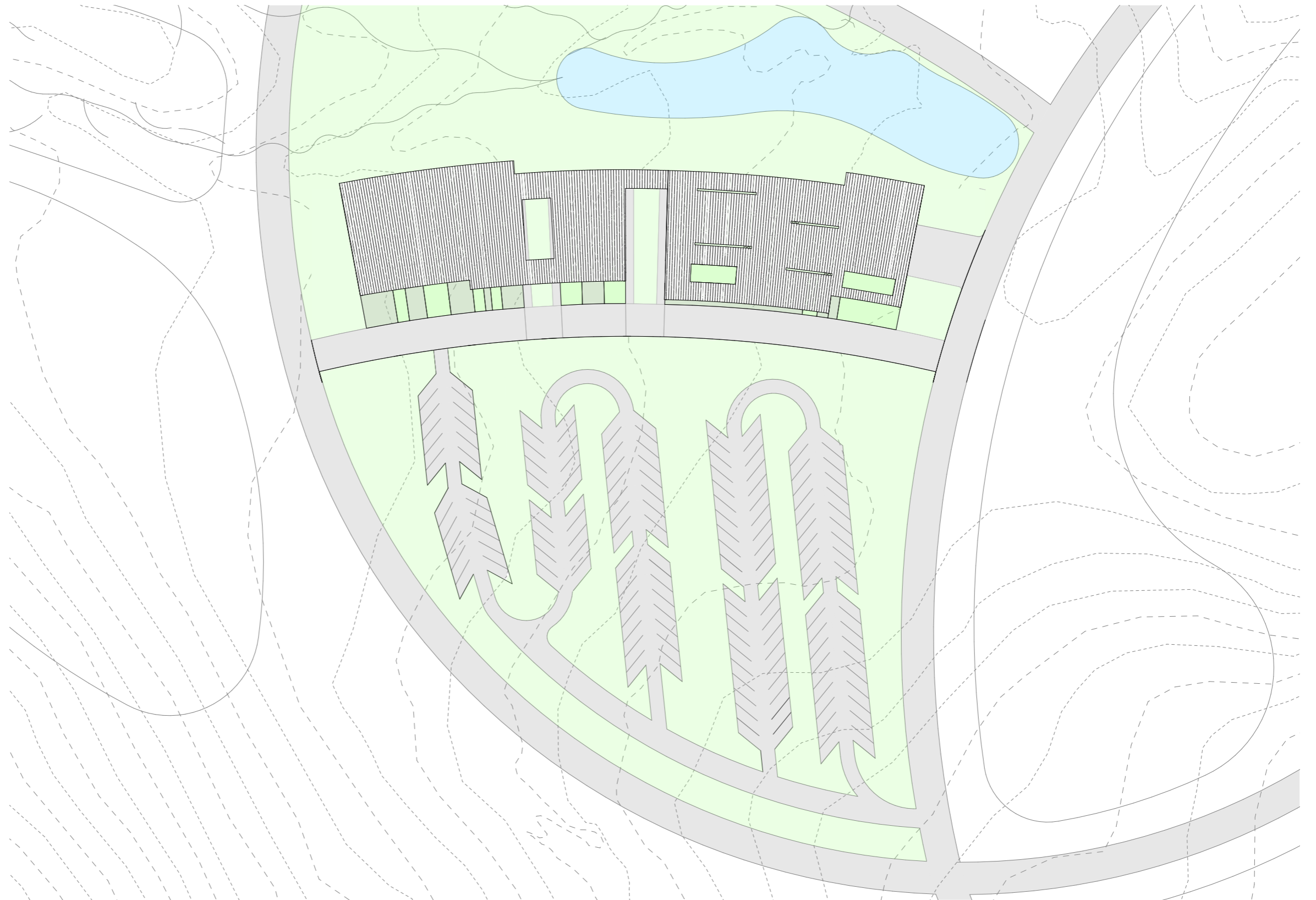


Figure 17. Site Plan of Main Visitor Facility

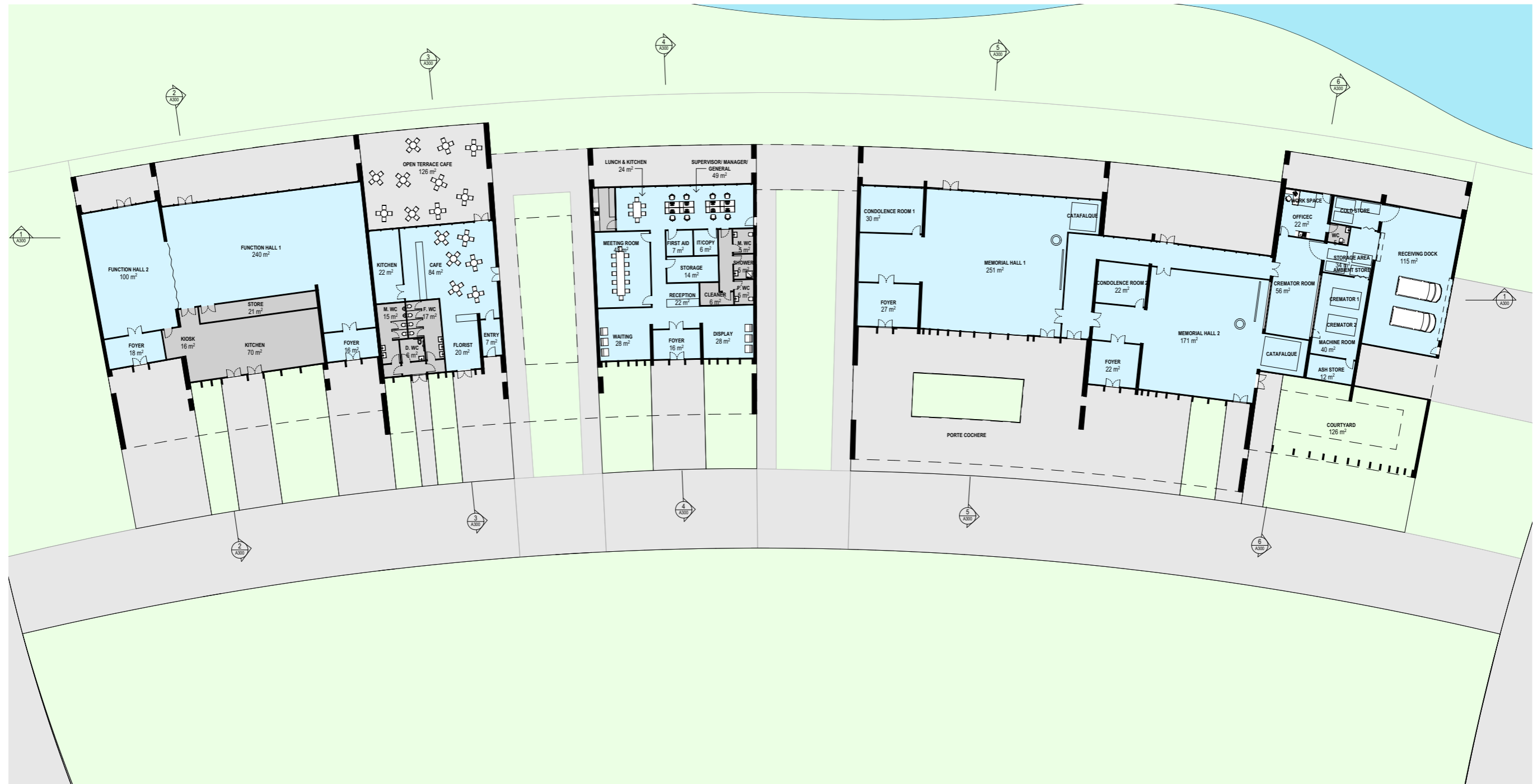


Figure 18. Main Visitor Facility Floor Plan

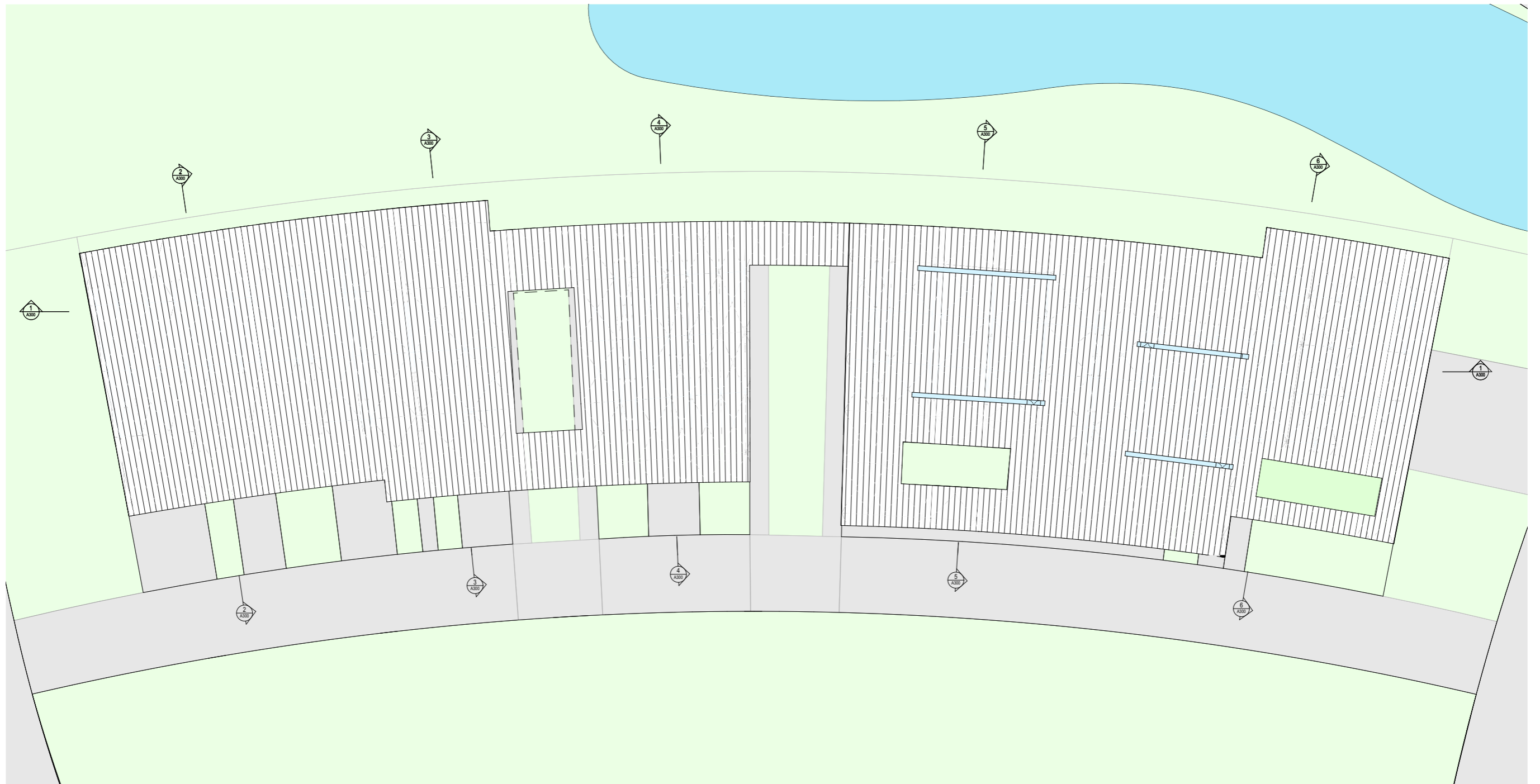
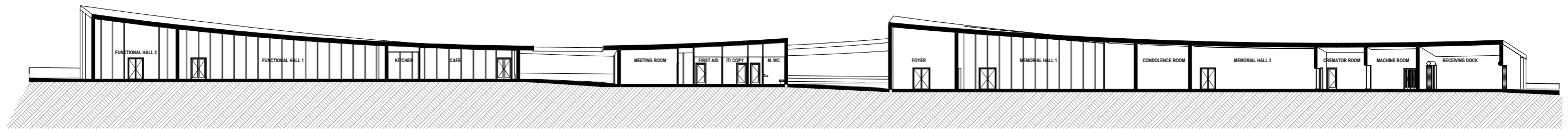
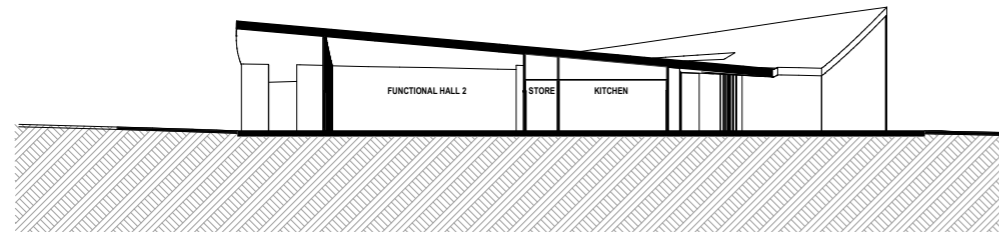


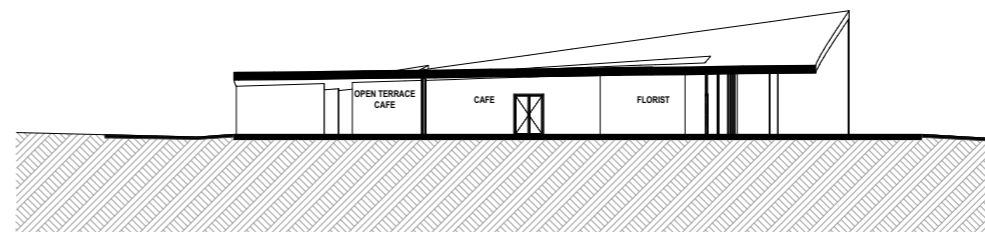
Figure 19. Main Visitor Facility Roof Plan



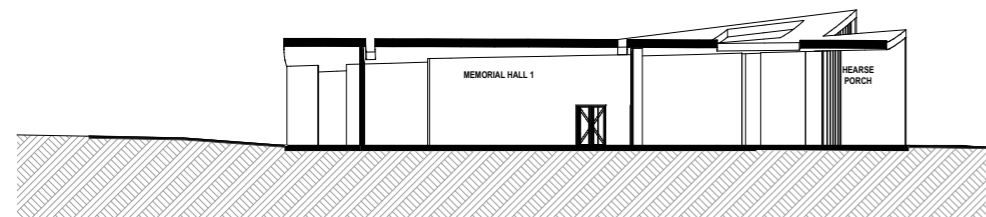
1 SECTION 01
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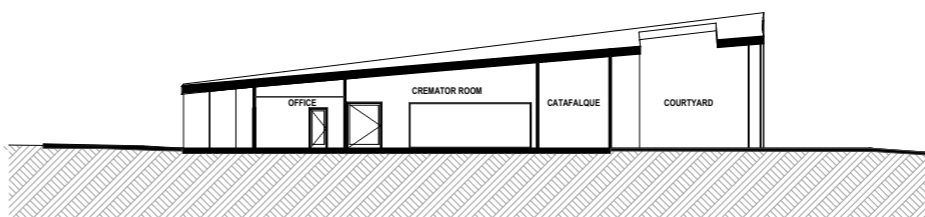
2 SECTION 02
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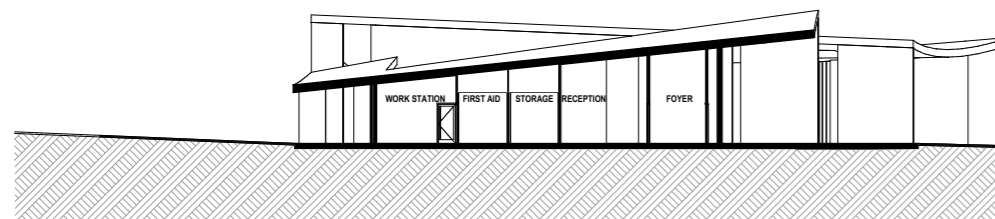
3 SECTION 03
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5 SECTION 05
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6 SECTION 06
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4 SECTION 04
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Figure 20. Main Visitor Facility Elevations

Perspectives

TOP LEFT: Aerial View from the South of the Building Entry and Concourse

TOP RIGHT: Aerial View from the South of the Memorial Halls, Crematorium and Courtyard

BOTTOM: Function Hall Entry



TOP: View of the Function Halls from the North

BOTTOM RIGHT: Memorial Halls, Crematorium and Courtyard

BOTTOM LEFT: Administration Building, Cafe with Florist



TOP LEFT: Interior of Memorial Halls

TOP RIGHT: Interior of Memorial Halls

BOTTOM: View from the north of the link between the Memorial Halls and Function Halls



BRIEFED FUNCTIONAL REQUIREMENTS TABLE OF AREAS

The Table of Areas listed is based on the functional areas from the SMP Masterplan 2012 (page 35), and forms the basis for the current SMP architectural brief.

The table includes the original briefed areas, as well as the current concept design areas. Where these areas are noted as “TBC”, the corresponding spaces are yet to be designed.

REVERSE BRIEF/AREA SCHEDULE

SOUTHERN MEMORIAL PARK

ROOM USE	POP. NO	BCA D1.13 AREAS [m ² /person]	BRIEF DESIGN SIZE [m ²]	CONCEPT DESIGN SIZE [m ²]
CENTRAL FACILITIES				
MEMORIAL HALL				
Chapel/Memorial Hall Large	200	1	250	251
Chapel/Memorial Hall Small	50	1	150	171
Function Centre Large	200	1	250	240
Function Centre Small	50	1	100	100
Sheltered Gathering Area Large	200	1	200	140
Sheltered Gathering Area Small	50	1	50	130
Condolence Rooms	N/A	N/A	60	52
Chair + Tables Store	N/A	N/A	30	21
General Store	N/A	30	10	5
Porte Cochere	N/A	N/A	20	100
			TOTAL : 1070	TOTAL : 1210
MAIN KITCHEN				
Kitchen	N/A	10	70	70
Servery/Kiosk	N/A	10	10	16
Store Room	N/A	30	20	21
			TOTAL : 100	TOTAL : 107
AMENITIES				
Male WC (MEMORIAL HALL)	200	N/A	20	15
Female WC (MEMORIAL HALL)	200	N/A	25	17
Accessible WC (MEMORIAL HALL)	N/A	N/A	5	6
			TOTAL : 50	TOTAL : 38
ADMINISTRATION				
Reception	1	10	15	22
Waiting Area	2	10	20	28
Sales + Display Area 1	1	10	15	14
Sales + Display Area 2	1	10	15	14
Management Office	1	10	15	
Supervisor Office	1	10	15	49
General Office	1	10	15	
Meeting/Conference Room	20	40	50	43
First Aid Room	1	10	15	7
Store Room	N/A	30	15	14
Staff Lunch Room	2	10	20	24
Staff Kitchen	2	10	5	
Staff Male WC	3	N/A	5	5
Staff Female WC	3	N/A	5	5
Staff Unisex Shower	1	N/A	5	5
			TOTAL : 230	TOTAL : 230
CAFÉ				
			100	84
FLORIST SHOP				
	100	1	20	20
Circulation + Services	N/A	3	300	270
External Walls	N/A	N/A	190	210
			TOTAL CENTRAL FACILITY : 2060	TOTAL CENTRAL FACILITY: 2195

ROOM USE	POP. NO	BCA D1.13 AREAS [m ² /person]	BRIEF DESIGN SIZE [m ²]	CONCEPT DESIGN SIZE [m ²]
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CREMATORIUM				
Cremation Chamber	1	N/A	10	40
Cremation Viewing Area	4	N/A	15	56
Body Storage/Fridge Area	5	N/A	20	34
Ashes Processing Room	1	N/A	15	12
Ashes Storage Room	1	N/A	15	
Cremator Office	1	10	15	22
Male WC	10	N/A	10	
Female WC	10	N/A	15	5
Accessible WC	N/A	N/A	5	
			TOTAL CREMATORIUM : 120	TOTAL CREMATORIUM : 169

PAVILION				
Covered Outdoor Pavilion	N/A	N/A	100	TBC
Male WC	50	N/A	10	TBC
Female WC	50	N/A	15	TBC
Accessible WC	N/A	N/A	5	TBC
Store	N/A	N/A	15	TBC
Services	N/A	N/A	5	TBC
			TOTAL PAVILION : 150	

WORK COMPOUND				
Nursery	N/A	N/A	100	TBC
Outdoor Sales Nursery	N/A	N/A	200	TBC
General Store Room	N/A	N/A	50	TBC
Garden Store Room	N/A	N/A	30	TBC
Diggers Store Room	N/A	N/A	100	TBC
Workshop	1	30	40	TBC
Circulation	N/A	N/A	50	TBC
External Walls	N/A	N/A	60	TBC
			TOTAL WORKS COMPOUND : 630	

PUBLIC FACILITIES				
Car park	250	N/A	5625	TBC
Male WC	100	N/A	10	14
Female WC	100	N/A	10	16
Accessible WC	N/A	N/A	10	10
Gazebos	N/A	N/A	20	TBC
Dedication Seating	N/A	N/A	N/A	TBC
			TOTAL PUBLIC FACILITIES : 5675	TOTAL: 40

4.3 Works Depot

The works depot is located on the eastern edge of SMP. This site is characterized by a large expanse of grassland and a perimeter of trees on the edge of an existing access road.

The works depot is strategically located near the driveway and at the edge of the site to separate its caretaker and administrative functions from the more formal aspects of SMP. The building is comprised of four distinct parts over a single level:

- An administration office and amenities for traditional office workers that has some engagement with the public;
- A back of house office and amenities for horticulture staff;
- A series of garages and workshops for depot equipment; and
- A large external site compound for horticulture materials, parking, large vehicle movements and exterior storage.

The arrangement of these functions is carefully organized and legible in the plan.

The depot site is arranged such that the fenced exterior compound is located close to the service access road to enable ease of vehicular movement.

Entry to the depot is from the south. An outbound entry is located at the north east corner of the compound to allow for larger vehicles to manoeuvre through the site without turning.

The depot building is a long linear element that bounds the western edge of the compound. It is organised into three distinct parts - the administration office to the south, the back of house office in the centre and the garages and workshops to the north.

Entry for the public to the depot building is from the south, with some closely located carparks nearby outside the compound perimeter. People enter the building into a small waiting foyer and reception and have access to a meeting room beyond controlled by staff at the desk. A unisex disabled toilet is available from the foyer. A small office, utility and tea kitchen are behind the reception separated from the public interface.

The back of house office and amenities are accessed from the eastern side of the building and are secure within the fenced compound. Access to the compound is through a pedestrian gate adjacent to the large vehicular gates.

A common lounge, kitchenette and shared office are contained within the space. The remainder of the building is dedicated to vehicle garaging and workshops. Between the garage and the back of house offices are change rooms and toilets, that allow for staff coming from the field a transition space before entering the cleaner office environment. A small courtyard connects the administration office and the back of house office for shared use and collaboration.

The building architecture is characteristic of the metal clad industrial buildings that are common on the adjacent sites around. A single pitch broad roof covers the buildings, providing sun shading and weather protection to the windows and doors. The roof projects at the south of the building to signify the entry to the administration office for public in attendance.



Figure 21. Work Depot: Administration

The material palette is predominantly in pressed metal sheet, for both the roof and walls. Glazed openings in aluminium frames are strategically located to maximize view and light, while vertical louvres shade the building from the western sun. The roof soft is in timber panel to create a sense of warmth and connect the materiality of the depot building to that of the others in the Southern Memorial Park main visitor facility.

The depot is a highly functional industrial building which provides a quality workplace for the various types of staff within. It has an architectural refinement that is characteristic of a building that engages with the public and will blend well within the rural industrial context of Hume as well as the new dignified buildings of the Southern Memorial Park central buildings

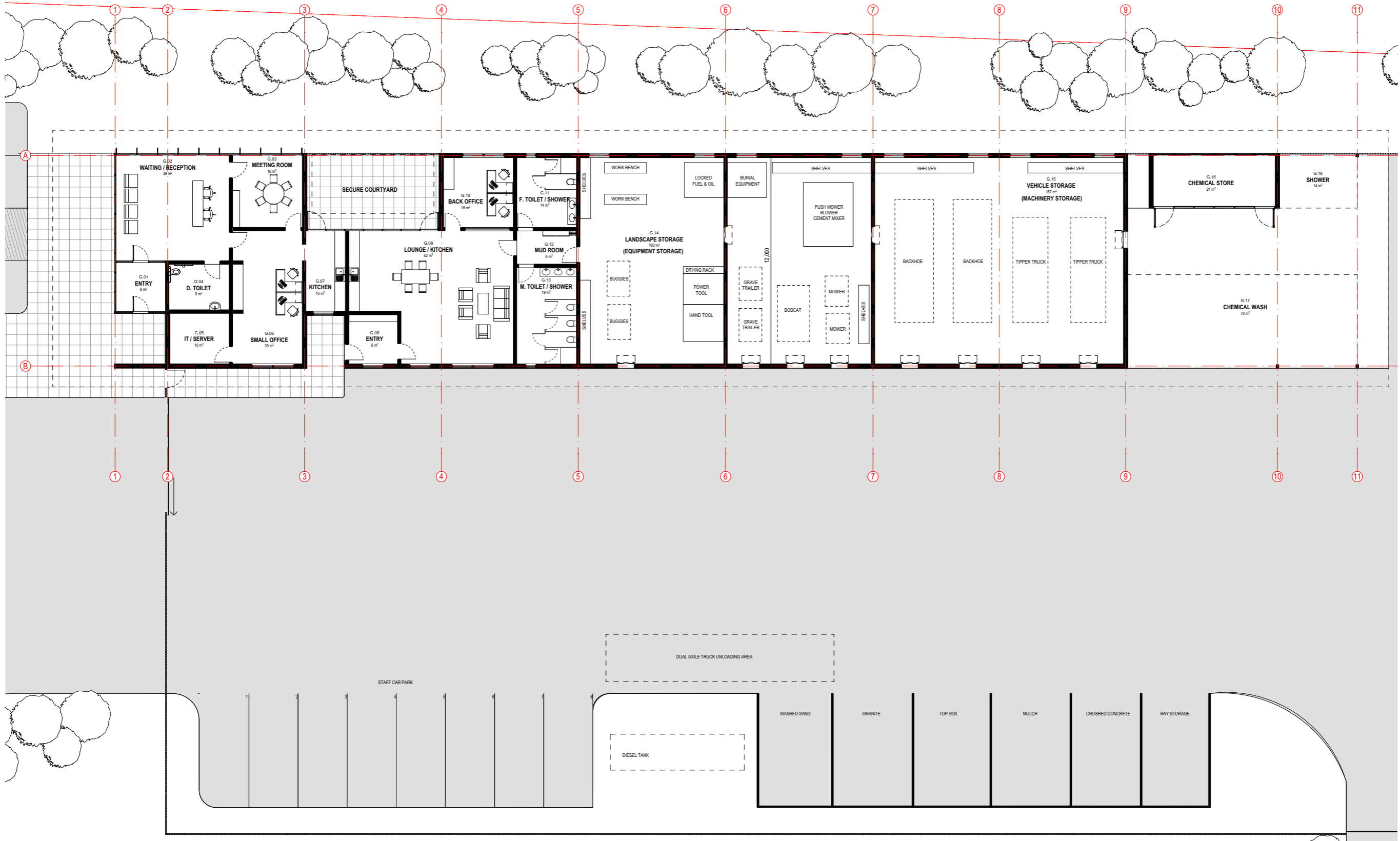


Figure 22. Work Depot: Floor plan



5.0 TRANSPORT PLANNING

5.1 Planned Transport Features

Overview

The movement and transport network surrounding SMP includes:

- Mugga Lane is classified as a rural road located to the north-east of the site.
- Long Gully Road is classified as an arterial road, located to the north-west of the site.
- B-double routes are available along Mugga Lane and Long Gully Road.
- Centenary Trail is a principal recreational trail along the western boundary of the site. No other walking or cycling facilities are in close proximity to the site.
- Bus routes are located along Monaro Highway to the south-east of the site.
- Some of the surrounding intersections are currently operating at capacity during the morning and afternoon peak hours. However, the Long Gully Road, Erindale Drive and Yamba Drive intersection generally operate with a satisfactory Level of Service and with some spare capacity in both morning and afternoon peak hours.

Planned Movement and Transport Features

The movement and transport related features of SMP include:

- Main vehicle access point via Mugga Lane approximately 700 metres south-east of the intersection of Mugga Lane and Long Gully Road.
- Landscaped formal car park in the centre of the site.
- Landscaped formal car park and overflow car park area in the centre of the site, including 250-300 formal car parks with parking for people with disabilities comprise a minimum of 3% of the total number of spaces provided.
- Small pocket car parks including on-street and off-street car parks across the site.
- Work Depot with a dedicated car park.
- Driveway access to the depot for vehicles up to 13m in length.
- Internal road network generally of 6m wide two-way roads and 3m wide one-way roads.
- Low internal road network speed - 20km/h.
- Retention of Canberra Centenary Trail through the site with links to with other internal paths and trails.

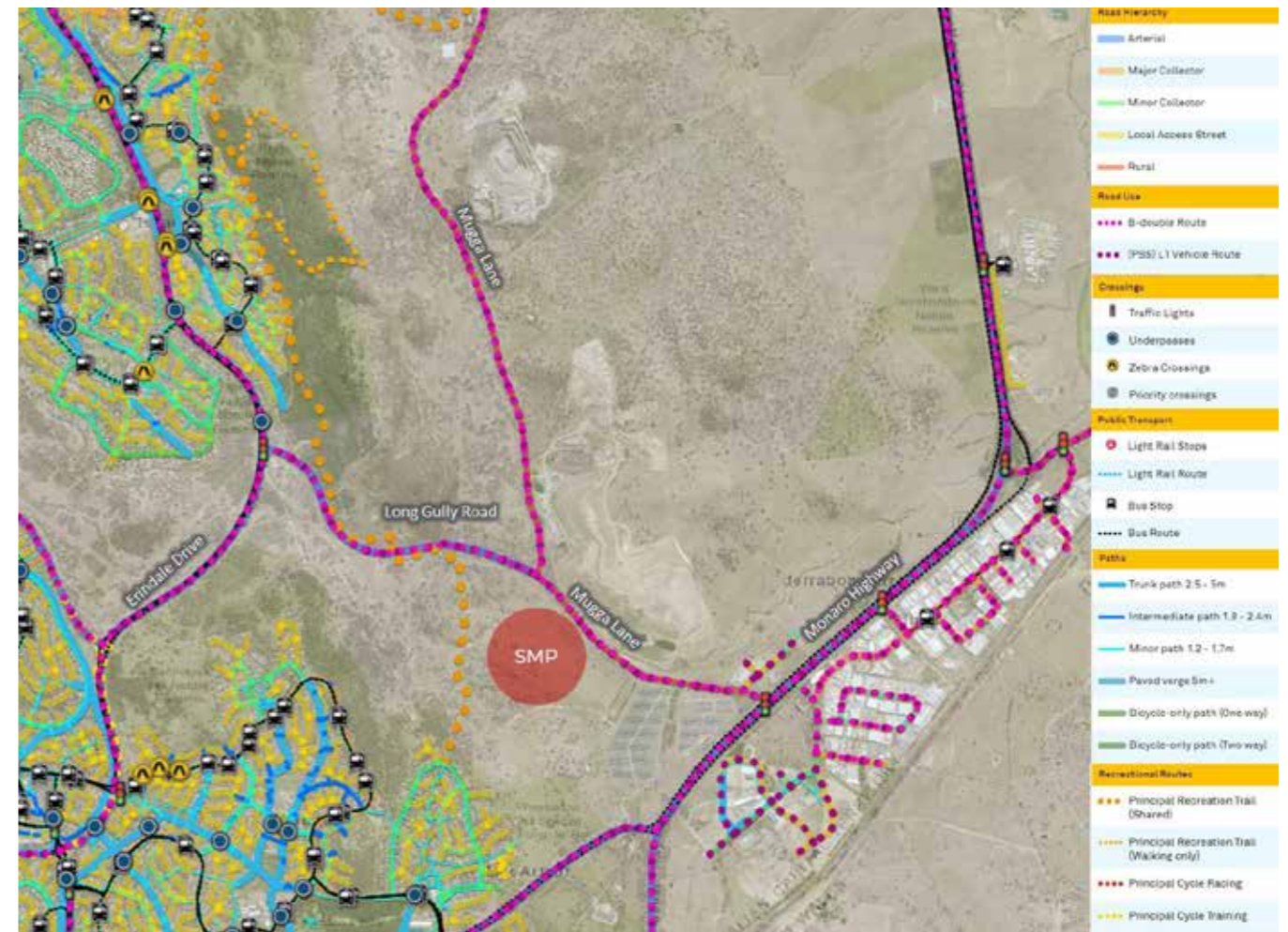


Figure 23. Existing surrounding network

5.2 Main Entry

Main vehicle access point via Mugga Lane is located approximately 700 metre south-east of the intersection of Mugga Lane and Long Gully Road.

An assessment of access into the site from Mugga Lane was undertaken by applying existing Mugga Lane traffic volumes (1,350 vehicles per hour two-way) to various turn treatments (basic, auxiliary and channelised) based on the Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings (Austroads, 2020).

The assessment indicated that the main entry would likely require a signalised intersection with auxiliary lanes. Two options were identified.

Option 1 includes:

- Dedicated right turn lane on Mugga Lane of around 125 metres long to accommodate the peak vehicle arrivals
- Dedicated left turn lane of 125 metres for left turning vehicles into the site
- SMP site access configured with dedicated left and right lanes and two entry lanes, as requested by TCCS.

Option 2 includes:

A revised intersection design option which includes a left turn slip lane proposed from the exit. Option 2 features:

- Dedicated right turn lane on Mugga Lane of 125 metres to accommodate peak vehicle arrivals
- Dedicated left turn lane on Mugga Lane of 125 metres for left turning vehicles into the site
- SMP site access configured with a dedicated right turn lane, a dedicated continuous left turn slip lane with acceleration lane of 305 metres on exit, and two entry lanes, as requested by TCCS.

Both options include two lanes on entry to the site, to allow a vehicle to overtake a slow moving vehicle as requested by Canberra Cemeteries. However, it is noted that the internal speed limit is 20km/h and is therefore is not necessarily needed.

The provision of left-turn slip into the site was also considered but provided limited benefit. A comparison of the SIDRA Intersection modelling results for both options shows that both Option 1 and Option 2 would operate well however, Option 2 has the benefit of allowing left turning vehicles exiting from SMP to do so without requiring a phase transition and stopping the main flow of traffic along Mugga Lane

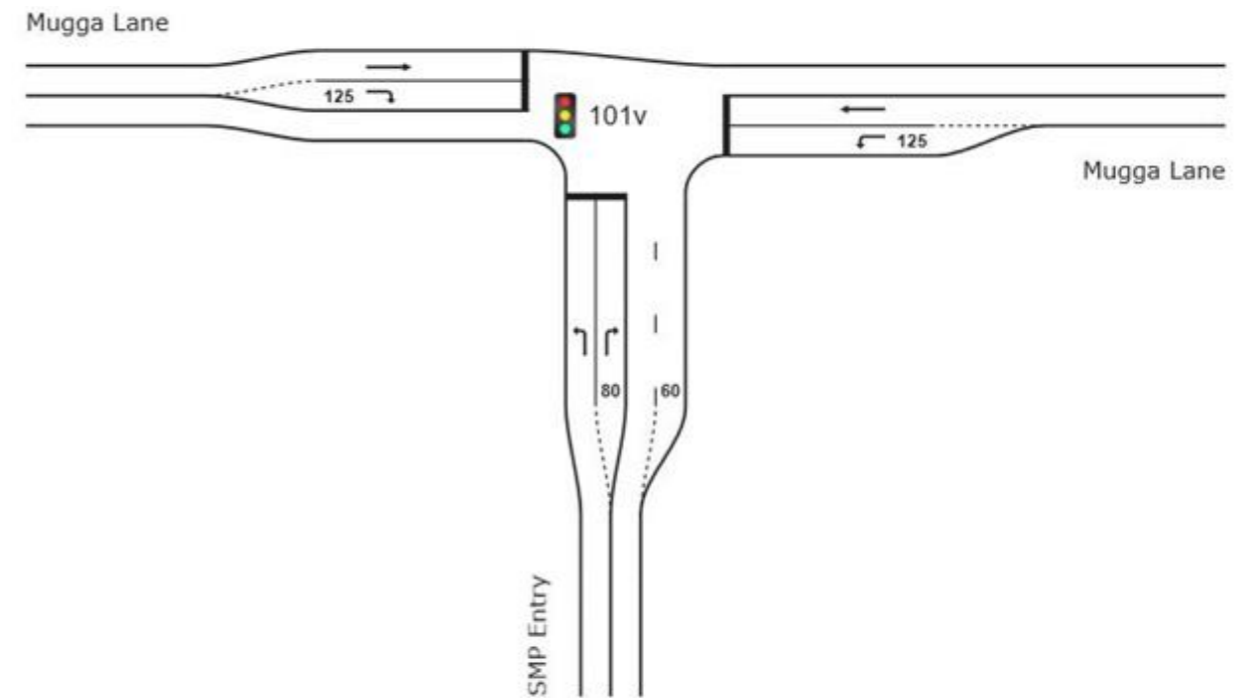


Figure 24. Main Entry: Option 1

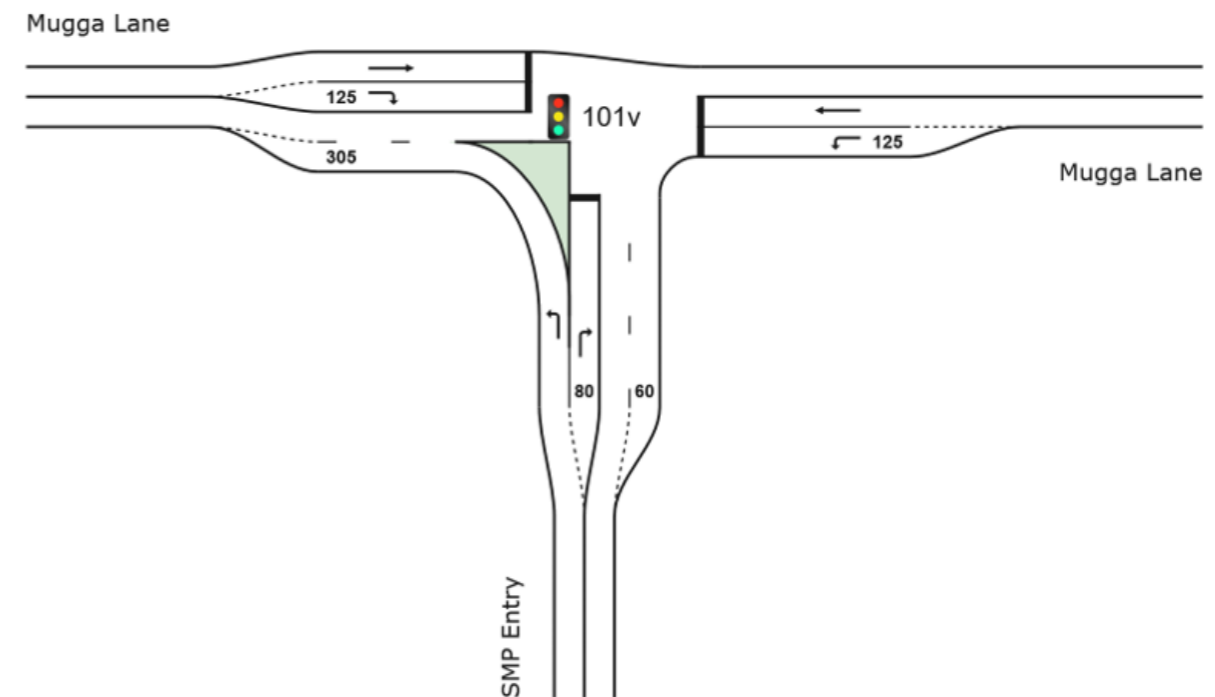


Figure 25. Main Entry: Option 2

5.3 Summary of Impacts

It has been estimated that SMP functions could generate around 418 additional vehicles in the AM and PM peak hours. This estimate is a conservative assessment and is based on the traffic generated for the maximum size event to be held at Southern Memorial Park, and this event coinciding with the local traffic AM and PM peak hours.

Smaller events and events held outside of peak hours would reduce the traffic impacts of the development on the local road network.

Background traffic growth on the surrounding road network is likely to cause most of the surrounding intersections to operate at or above capacity in the future years. Additional road network capacity would be needed for the road network to cater for this forecast demand.

The additional traffic volumes generated by the site combined with the future growth may exacerbate the existing traffic capacity issues at the surrounding intersections.

The intersection of Mugga Lane and Long Gully Road would likely need to be signalised in the future. However, the intersection treatment needs to be considered in light of the forecast traffic volumes on these roads and noting any broader corridor road network improvements that would be required to meet these future demands.

The proposed site access (signalised intersection with a slip lane) would operate with a good level of service in 2020, 2031 and 2041 (except in the PM peak hour).



6.0 CIVIL ENGINEERING

6.1 Stormwater

The stormwater infrastructure has been designed to maximise capture and harvesting of stormwater runoff for irrigation.

The stormwater runoff will increase during rainfall events with development of the site and additional impervious surfaces including:

- Asphalt access roads;
- On-grade asphalt car parks;
- Proposed new buildings;
- Above ground burial areas.
- Proposed swales and spoon drains; and
- Pit and pipe infrastructure network.

Proposed Stormwater Controls

The ACT Design Standard for Urban Infrastructure (DSUI) – Section 1 is the primary document for regulating stormwater design in Canberra. In accordance with the DSUI, the additional stormwater runoff generated by the proposed development will need to be attenuated to prevent any actionable downstream nuisance.

Furthermore, the proposed road network requires stormwater overland flow controls to minimise runoff flowing across roads and reducing potential dangers to vehicles and pedestrians. The DSUI states that continuous overland flow paths must be provided from the top of the existing catchment through the development site. The overland flow paths, where impacted by the road network or other components of the proposed development, will be appropriately redirected and controlled by swales, spoon drains, pit and pipe infrastructure, on-site detention basin and engineered wetlands.

The existing major stormwater gullies have been identified in Figure 27: Stormwater Infrastructure Plan.

Grassed Swales

Grassed swales will be utilised, primarily adjacent the proposed access roads, as naturally vegetated engineered controls to the stormwater overland flow. The swales will guide the stormwater runoff to appropriate culverts crossings under the road network. Grassed swales also provide water quality treatment contributions to the stormwater runoff.

Grassed swales are primarily proposed in areas where stormwater capture and harvesting is unachievable or infeasible. This is due to the nature of the swales and the characteristics that allow for infiltration, evaporation and vegetation absorption of stormwater.

The proposed swales will be designed to safely convey major storm events while maintaining the required freeboard directed by the DSUI. The DSUI further states a maximum depth of 900mm, with a maximum flow velocity of 2m/s to prevent scour. The detailed sizing of individual swales will be determined by the sub-catchments that are to be controlled, and velocity controls such as rock checks can be implemented where required. A typical section of the proposed swale design can be found at Figure 26.

Combined Swales and Concrete Spoon Drains With Piped Infrastructure

The use of a combined grassed swales and concrete spoon drains with pit and pipe infrastructure is proposed in areas where stormwater may be harvested for re-use in irrigation or operational use.

In storm events that produce less runoff, the concrete spoon drains will direct the stormwater into a pit and pipe network that can be harvested and stored for re-use. While larger storm events will inundate the pit and pipe network and be controlled by the larger capacity swales, as per the other grassed swales.

The velocity of the water in the channel may be further reduced by drop structures in conjunction with rock checks.

The pit and pipe network is expected to be sized for smaller storm event, while the larger swale will control larger storms.

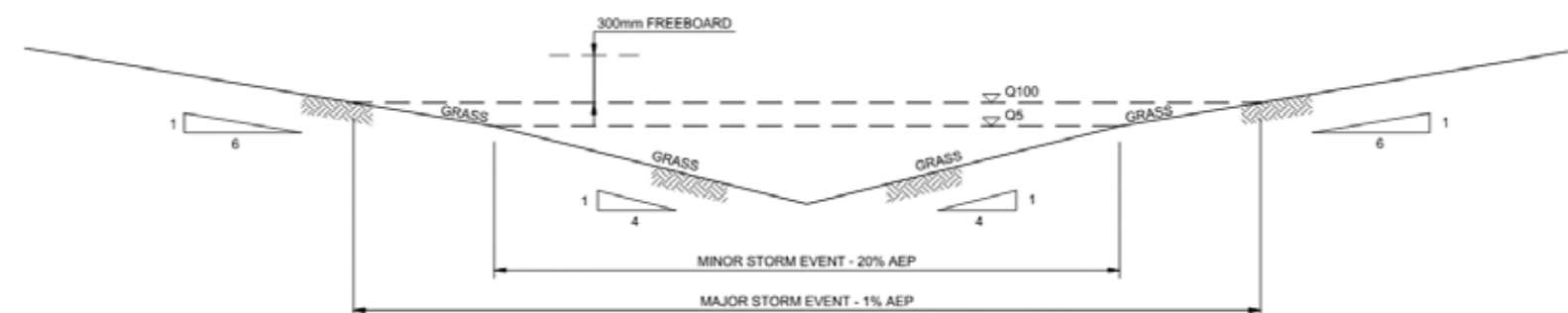


Figure 26. Grass Swale (Note: Actual size of swale dependent on final location)

On-Site Detention Basin

On-Site Detention (OSD) is a stormwater attenuation control device, used to prevent additional runoff, produced by an increase in impervious area, from causing actionable nuisance downstream of the new development. The proposed OSD device must limit the stormwater runoff from the site to the pre-development flow rate.

The proposed OSD device for this development is a detention basin. This basin will capture a defined amount of water from the site and slowly release it over a larger period, this ensures that at no point the stormwater runoff coming from the proposed development exceeds the flow rates of the pre-developed site. Due to the existing site being a 100% pervious greenfield area, any increases in impervious area will contribute additional stormwater runoff.

The proposed detention basin size to attenuate runoff is approximately 1200-1400m³, or a basin that is 30m x 30m at an average of 1.5m deep. An indicatively sized basin has been shown in the Masterplan.

Culverts

It is recommended that all proposed culverts are sized to allow for storm events, to prevent inundation of access roads. In conjunction with appropriate culvert sizing assisting with preventing damage to the road surface and basecourse; a case could be made that visitors to the proposed development may not be deterred by large storm events and safety is a primary ideology of the masterplan.

Due to the extensive size of the proposed site, earthworks are anticipated to be minimised and localised where possible. The proposed one-way cross-fall of the majority of the access road network is primarily against the natural fall of the land and will require localised grading to achieve. A better balance between the cut and fill can be achieved by utilising the adjacent swale cut for fill in the road grading, pending geotechnical advice.

6.2 Earthworks Recommendations

Earthworks pads for buildings and at-grade car parking will be determined at detailed design of the appropriate stage.

More extensive earthworks are proposed in localised burial site areas to achieve a greater depth of suitable fill material. This additional fill is proposed to increase the burial capacity of the selected areas. Some of the proposed burial areas are suggested to be augmented with earthworks to realign natural gullies to maximise burial space.

Further detailed geotechnical analysis of specific areas are recommended as part of the future detailed design phases of the staging process.

6.3 Pavement Recommendations

The access roads proposed throughout the Memorial Park are based on 6 meter wide carriageways with 1m unsealed shoulder, to support two-way traffic.

The pavement is recommended to be asphaltic concrete on a densely graded base-course with a flush in situ concrete kerb.

This pavement option offers the benefits of low maintenance, lower noise levels from tyres, and the impervious area creates stormwater runoff that can be harvested for re-use.

A one way cross fall is recommended for the majority of the site, allowing runoff to be captured in the adjacent swales and piped infrastructure network.

Kerb and channel is limited throughout the masterplan, and only recommended in areas that may see an increased level of pedestrian movements, and therefore areas that may be adversely affected by large stormwater swales.

Subsoil drainage will need to be installed where required to cut-off subsurface drainage and protect the road base-course, this will be primarily on the upstream side of the proposed roads, except in cases of two-way cross-fall.

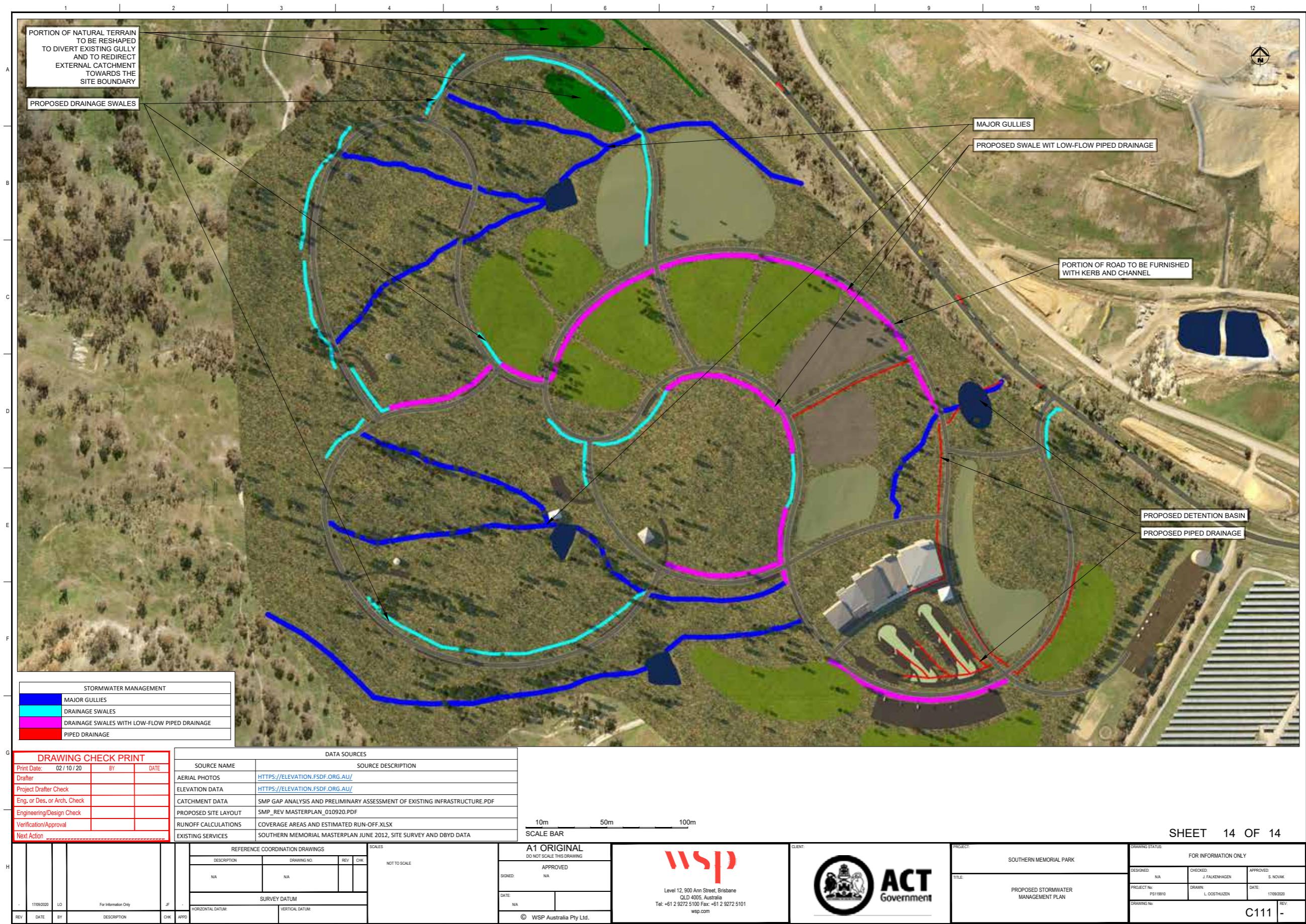


Figure 27. Stormwater Infrastructure Plan

A landscape photograph of a pond with trees and a teal overlay. The pond is in the foreground, reflecting the sky and trees. The background shows a line of trees and a clear blue sky. A large teal triangle is overlaid on the right side of the image, containing the text '7.0 WSUD'.

7.0 WSUD

7.1 WSUD Objectives

Water sustains life, creates landscapes and dictates where we live, work and unwind. The value of water requires that we preserve and manage it as a fundamental part of designing urban communities.

Waterbodies can be used to restore ecological habitats and provide recreation, amenity and passive cooling benefits. While these areas are primarily focussed on aquatic ecology they will also play a role in recreation by providing places of reflection, resting areas and means to be absorbed in nature.

This section outlines a water sensitive urban design (WSUD) strategy to conserve and maintain water quality for the health of the water systems on the site.

WSUD objectives are defined by the ACT Practice Guidelines for WSUD (2017). These include:

- Mains water use reduction (of 40% compared to 2003 consumption)
- Peak stormwater flow rates do not exceed pre-development conditions
- Developed areas will reduce stormwater pollutants by:
 - 90% for gross pollutants
 - 60% for suspended solids
 - 45% for total phosphorus
 - 40% for total nitrogen.
- Preserve and rehabilitate the natural waterways of the site
- Use water to support green infrastructure.

7.2 WSUD Initiatives

The following water management principles are proposed for Southern Memorial Park:

Reduce mains water consumption

- Adopt water efficient fitting and fixtures
- Incorporate water reuse systems for toilets and irrigation

Rehabilitate natural drainage lines

- Stabilise local erosion areas
- Extensively vegetate using local species

Safely convey and detain stormwater

- Use a network of swales, pipes and overland flow paths to convey stormwater
- Provide a flood detention basin to detain peak flows from the site to pre-development flow rates

Incorporate wetland systems for treatment

- Treat stormwater runoff before it leaves the site
- Direct treated stormwater to tanks for irrigation
- Incorporate the wetland designs with surrounding landscapes and buildings

Figure 28 shows an overview of the WSUD initiatives proposed for SMP.

WATER CONSERVATION

Water efficient fitting and fixtures will be used through the buildings. This will include taps, urinals, toilets, kitchen fittings and showers.

To supply water for toilet flushing in the visitor centre (a significant water use in the buildings) roof water will be collected and plumbed to toilets. It is proposed to direct at least 2,000m² of roof area to a 50KL tank. This will provide more than 80% of toilet flushing demands (550KL/year).

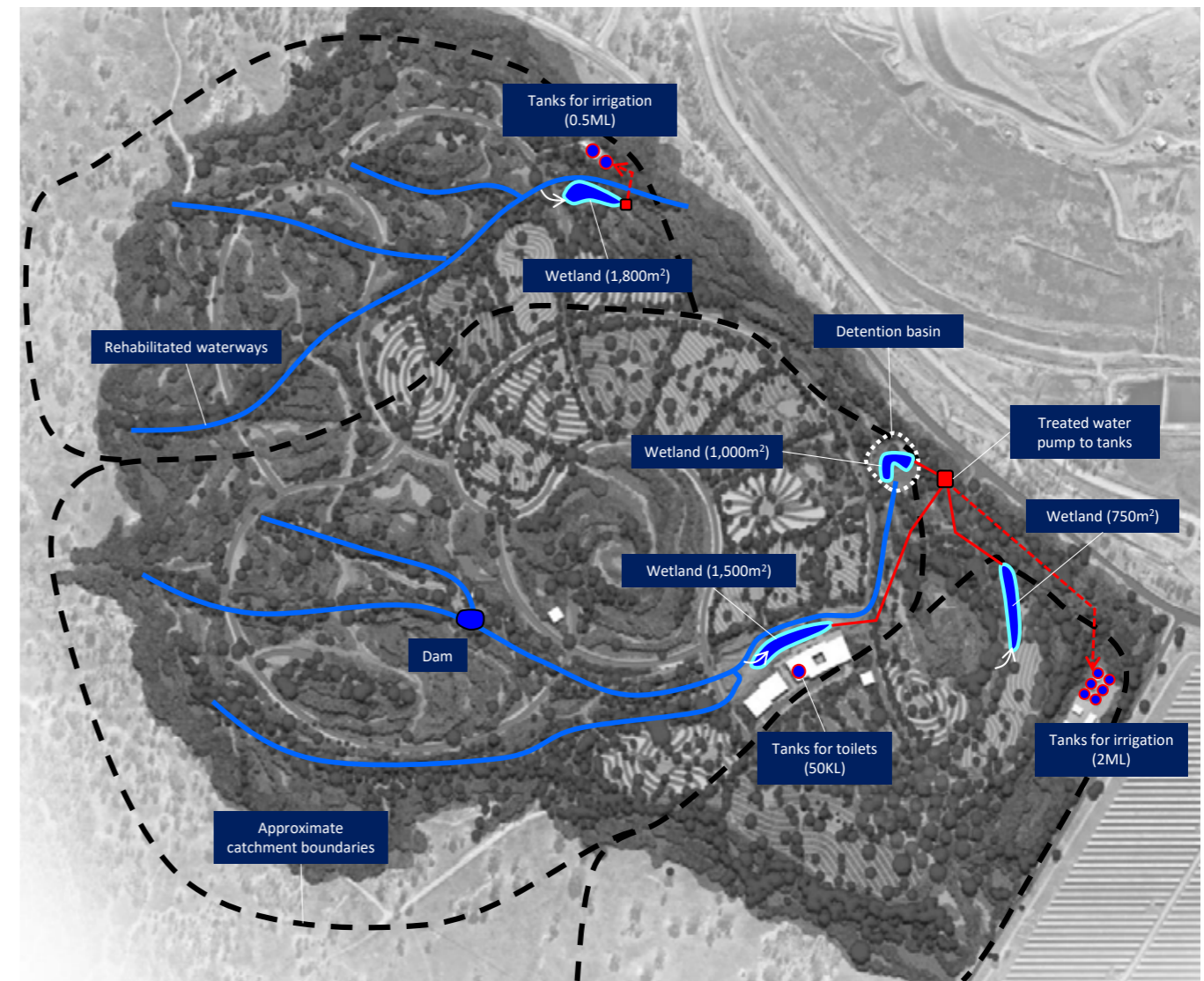


Figure 28. Overview of the stormwater treatment and water reuse system

7.3 Water Quality

The major contribution for water conservation is a stormwater collection, treatment, storage and reuse system to supply irrigation for the burial plots. Total irrigation demand for the site is estimated to be approximately 27ML per year over the nine hectares of irrigated area.

Various water sources to supply irrigation were investigated including regional non-potable water (from the Tuggeranong scheme), groundwater and transfer from the waste treatment facility. None of these options were found to be viable, therefore, an approach to maximise stormwater harvesting on site was adopted.

It is proposed to pump treated stormwater from the treatment wetlands to storage tanks for irrigation supply in addition to directing roof areas of the depot to the storage tanks. Two schemes will supply irrigation, one in the south-east of the site that has tanks within the depot area and one to the west of the site targeting the western catchment.

The stormwater harvesting system would employ the following components:

Treatment wetlands – configured for stormwater treatment but taking advantage of the natural watercourses. Each to have a notional detention time of 48 hours, 350mm of extended detention and be extensively vegetated

Pump to tanks – a submerged pump to be located in a pit to transfer treated water to the tanks

Direct roof water to tanks – all depot roof areas will drain to the storage tanks

Tanks for storage – above ground tanks that can efficiently store water (and have less losses compared to open water storages)

Irrigation pump station – water to be drawn from the tanks, passed through filters and distributed for irrigation (note that disinfection is not considered necessary if irrigation is conducted at night and there is no public access).

Stormwater treatment, using WSUD principles, will be applied to all stormwater runoff to enhance the ecology of the park and protect downstream waterways. Vegetated wetland systems will be constructed at key locations to provide treatment to the runoff. Roads and car parks will all be directed to the wetlands as well as flow along the watercourses.

Four wetlands are proposed to treat sufficient stormwater generated on the site. Figure 24 shows their sizes and locations.

The wetlands will be designed to be predominantly shallow permanent bodies of water that are extensively vegetated. They will contain some deeper pools of open water and will be configured to complement the surroundings.

The wetlands will incorporate a treatment train approach – capturing larger pollutants first then progressively finer pollutants. All stormwater treatment systems will be protected from scour during large flood events by incorporating inlet ponds and high flow bypass routes.

Water levels in the wetland will fluctuate over the year and during long dry spells water will recede into the deeper pools.

The wetlands will be designed to complement the surrounding landscape and offer areas for reflection, complementation and to be absorbed in nature.

Restore Natural Drainage Lines

Natural drainage lines will be retained and rehabilitated by stabilising local erosion areas using natural stream management techniques and the extensively planting out the bed and riparian areas of the streams. Local plant species will be used.

Water and pollutant balance

A broad water and pollutant budget is developed to provide an appreciation of the scale of water demands and understand what contribution stormwater could make as a source. Stormwater pollutant removal was also modelled to ensure the development meets the requirements of the ACT Practice Guidelines for WSUD (2017).

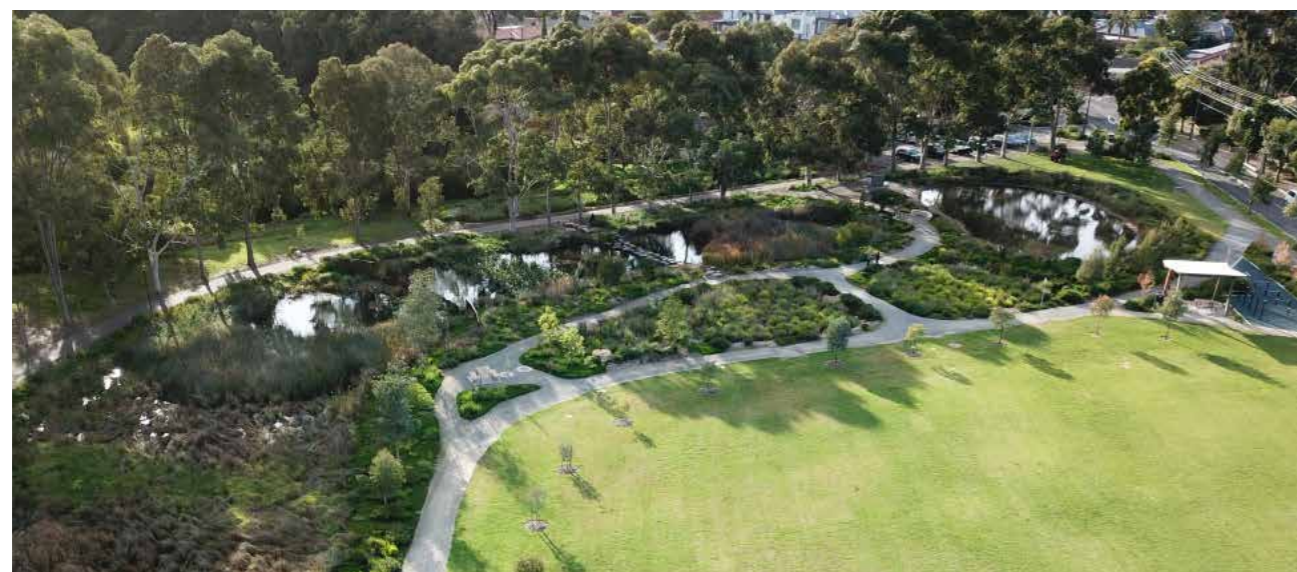


Figure 29. Wetlands in a park setting

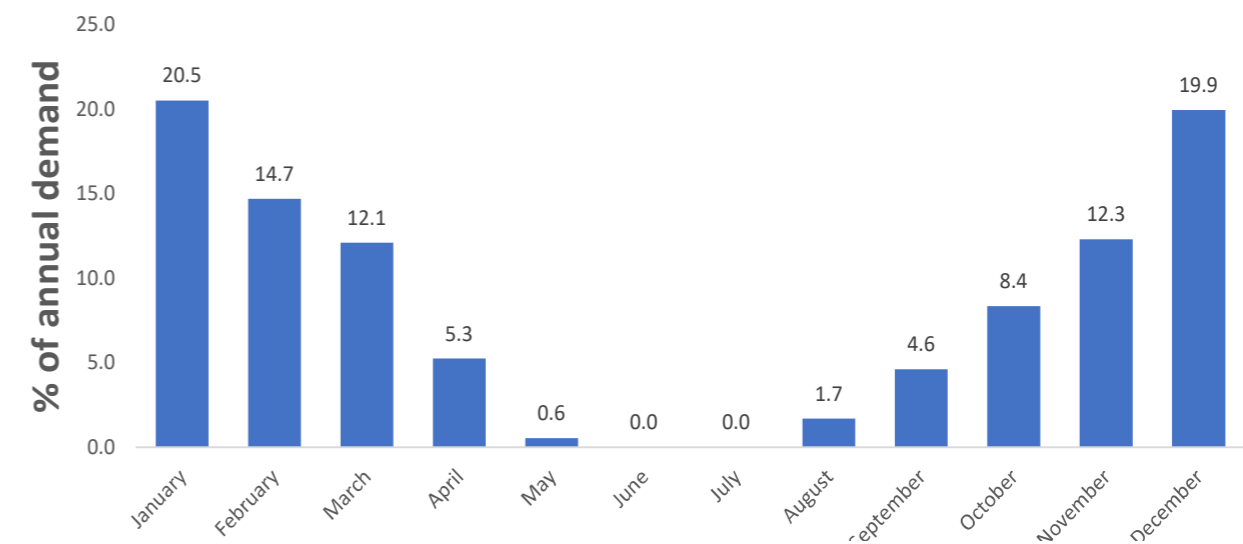


Figure 30. Monthly irrigation demand profile

7.4 Water Balance

The Model for Urban Stormwater improvement Conceptualisation (MUSIC) was used to develop a water and pollutant balance. The model uses 10-years of 6-minute rainfall data from Canberra airport (1999-2009). The average annual rainfall during this period was 495mm which is lower than the long-term average for Canberra airport (585mm) thus being conservative for the purposes of assessing the reuse potential for stormwater as irrigation.

Catchment areas and surface types are defined in the civil engineering section of the report and these assumptions were adopted for this analysis. These show a total area of approximately 175 hectares divided across three catchments.

Water Demands

Water demands for the whole park were estimated for the following categories of use:

- Visitors centre (including kitchen, café and functions)
- Depot operations
- Irrigation.

The tables in figure 28 shows the estimates for water demands at the Park. It shows that the visitor centre and depot have approximately 3ML per year demands and irrigation is estimated to be 27 ML per year.

Irrigation

The rates used and quantities assumed for irrigation are shown in Table 2. These were used in the water balance model to assess the contribution that stormwater can make for irrigation supply.

Irrigation demands are assumed to vary during the year. An irrigation profile was developed by applying an irrigation calculator that assesses the vegetation type,

average monthly rainfall and evaporation to derive a monthly irrigation demand. This is shown in Figure 3.

Possible Water Sources

A mix of water sources is proposed and these include:

- Potable water from the mains network
- Roof water -for toilet flushing from the visitors centre and from the depot building for the irrigation system
- Treated stormwater from four wetlands to supply irrigation.

These sources are quantified in the next section.

USE	DEMAND KL/year	SOURCE	AMOUNT SUPPLIED KL/year
Toilet flushing	550	Visitor centre roof water	450
		Mains water (back up)	100
Other indoor uses	1,700	Mains water	1,700
Depot	300	Mains water	300
Irrigation	27,100	Stormwater and depot roof water	15,200
		Mains water (back up)	11,900
TOTAL	30,000	Stormwater and roof water	15,600 (52%)
		Mains water	14,400 (48%)

Table 1 - Estimated water demands

LOCATION	USES	UNITS	NUMBER	ASSUMPTIONS	DEMAND (KL/year)
Visitors centre	Toilets	flushes/day	500	3L per flush, 500 visitors / day + 20 staff	550
	Kitchen (functions)	people/day	150	25L/day	1,400
	Other indoor uses	people/day	150	5 L/day	300
Depot	Operations	staff/day	15	50L/day including outdoor	300
East catchments	irrigation	Ha	5.6	200-450 mm/yr demanding on garden type	16,100
West Catchments	irrigation	Ha	3.5	200-400 mm/yr demanding on garden type	11,000
TOTAL WATER DEMANDS					30,000

Table 4 - Stormwater pollutant reduction performance

Figure 31. Water Demand Estimates

7.5 Conclusions

WSUD objectives for SMP will be achieved in the following ways.

Water conservation

- using of water efficient fixtures and fittings
- capturing, storing and reusing roof water for toilet flushing
- capturing treated stormwater to use for irrigation from four constructed wetlands the site.

Stormwater quality:

- using vegetated swales to convey road runoff
- constructing four stormwater treatment wetlands
- transferring treated stormwater to tank for reuse
- rehabilitating existing watercourses through the site to reduce erosion

Stormwater quantity:


- conveying stormwater through a network of swales, pipes and natural waterways
- detaining flow in a retarding basin to ensure pre-development flow rates are not exceeded.

LOCATION	AREA Ha	RATE mm/year	DEMAND ML/year
Visitors Centre	0.6	450	2.7
Lawn burial east	1.65	400	6.6
Entrance road area	0.3	200	0.6
Natives burials east	3.1	200	6.2
Native burials west	1.5	200	3.0
Lawn burials west	2	400	8.0
TOTAL IRRIGATION DEMANDS	9.15		27

Table 2 - Irrigation estimates

POLLUTANT	GENERATED (from development area)	TARGETS		ACHIEVED
		%	Kg/year	
TSS	11,000	60	6,600	9,900
TP	20	45	9	16
TN	102	40	41	68
Gross Pollutants	1,300	90	1,200	1,200

Table 3 - Water budget for Southern Memorial Park

A photograph of a rural landscape featuring a utility pole in the foreground, a grassy field, and a hill in the background. A large teal triangular overlay covers the right side of the image, containing the section header text.

8.0 UTILITY SERVICES

8.1 Electrical

Existing Services

There is currently a high voltage overhead service line located within the property boundary along Mugga Lane.

Relocation of Existing Services

It has been requested to relocate the existing overhead high voltage service line to an underground service and to the outside of the property boundary. Evoenergy advice in this regard is still pending and can only be progressed once site plans are finalised and a formal application is submitted. Evoenergy will then appoint a project engineer to develop their scope of works and prepare a formal letter of offer which will confirm their costs. It is expected that the full capital cost for this relocation will need to be borne by the project.

Low Voltage Supply

Evoenergy have confirmed that a substation will be required on site which will be supplied from the high voltage network off Mugga Lane.

The supply could either be via an overhead or underground supply and to either a pole top or padmount substation. The overhead supply to a pole top substation would be the lower cost option which is anticipated to be offered by Evoenergy as part of their standard Least Cost Technically Acceptable Solution (LCTAS) strategy.

Stage 1 has been developed assuming that the high voltage supply will be inground and that the substation will be a padmount type

Assess Maximum Demand

The initial site demand for Stage 1 (0 to 5 years) has been assessed as follows:

- Depot Building: 50kVA
- Street and pathway lighting: 5kVA
- Total for Stage 1: 55kVA

For Stage 2 (5 to 50 years) the maximum demand has been assessed based on a VA/m² for the proposed Visitors Centre (1,620m²). It is also understood that the Crematorium will be gas fired.

- Visitors Centre 121kVA
- Crematorium: 50kVA
- Street and pathway lighting: 5kVA
- Total for Stage 1 and 2 231kVA

For Stage 3 (50 to 85 years) the assessed maximum demand is as follows:

- Outdoor Chapel: 5kVA
- Outdoor Amphitheatre 20kVA
- Street and pathway lighting 5kVA
- Total for Stage 1, 2 and 3 261kVA

For Stage 4 (85 to 100 years) the assessed maximum demand is as follows:

- Street and pathway lighting 5kVA

Total for Stage 1, 2, 3 and 4 266kVA

Site Power Distribution

It is proposed to install a padmount substation and associated site main switchboard as part of the Stage 1 development. It will be located near to the proposed Visitors Centre which will also be the main load centre on site. It will be sized to accommodate all four stages of the works. The switchboard will contain the site main revenue meters and will supply the downstream distribution boards located within the various buildings.

A network of low voltage power conduits and pits will be located along road and pathway verges to distribute power to the distribution boards. In addition, and depending on the detailed staging of the works, local distribution panels may be required to distribute power and controls to the road and pathway lighting poles and power to remote pump stations.

Solar PV

Rooftop solar PV where installed can be connected into relevant buildings' distribution board. This will need to be included in the formal PNA application to Evoenergy.

Site Lighting

Site lighting is designed to minimal required levels due to limited night-time site use. Pole top mounted luminaires, typically 6m tall, will be located along the entry road leading to the work depot and the carpark. These will be designed to the lowest relevant lighting categories as per AS/NZS1158. Power to the luminaires will be distributed along conduits and pits from the nearest building distribution boards. Additional distribution pillars may be required depending on the staging of the works.

Recommended luminaire types are full

cut of LED with appropriate choice of light distribution to suit the application.

Obtrusive Lighting

Obtrusive lighting, light pollution and light spill into the night sky, to neighbouring properties and the surrounding environment will be controlled through careful selection of luminaire fittings. As a minimum, all site lighting will be designed to meet obtrusive lighting requirements of AS/NZS4282. Recommended design strategies to limit obtrusive lighting and light spill:

- Light sources should be shielded and concealed without direct view of light sources from off the site. Prioritise the use of luminaires with upward waste light ratios (UWLR) less than 3%
- Use luminaires with appropriate optics to provide light coverage where needed, minimising spill light where not needed, and allowing efficient spacing of luminaires
- External lighting will generally be controlled via local photoelectric sensors integral to the luminaires. Areas that may benefit from timeclock control will be incorporated to switch off lighting late at night to reduce light pollutions and energy use. Timeclock control will be located within the distribution cubicles.



Figure 32. Example area luminaire

8.2 Communications

Existing Services

There is currently an inground Telstra service within the northern end of the site and parallel with Long Gully Road. This line continues along Mugga Lane.

Relocation of Existing Services

Depending on the location of the proposed natural burial sites in the Stage 4 works it may be necessary to relocate the in-ground Telstra service line. As this stage is planned for quite some time into the future (85 to 100 years) it is proposed to perform this relocation at that time.

NBN Service

It is proposed to connect the incoming NBN fibre service along Mugga Lane and in proximity to the new entry road. As the Works Depot will be one of the first permanent structures built on site it is proposed to locate the NBN cabinet within a secure and clean area (ideally a communications room) within the Depot building.

A network of conduits and pits, located along the road and pathway verge, will distribute the fibre communications services to the various buildings that will be constructed in subsequent Stages. Depending on the nature of the services required within the buildings these may either be provisioned as continuation of an NBN compliant network or a private network.

Site WiFi

Where required external grade WIFI modules can be mounted onto fixed buildings (ie public toilets) and onto the road and pathway lighting poles. This will require separate communications conduits to be installed to the relevant lighting poles.

8.3 Hydraulic

Existing Services

Existing site services are as follows:

- Potable Water: Existing ICON Water 225 dia main crosses the site in the North-West corner of the site
- Sewer Drainage: no current gravity service to site
- Gas System: no current gas supply to site

Potable Water

It is proposed to connect to the ICON Water main located in Long Gully Road on the Northern boundary. The supply will be installed in accordance with ICON Water and AS3500 requirements with water meter and boundary backflow prevention provided at the point of connection.

The 225mm dia main enters the northern boundary of the site approximately 200m east of the Mugga Lane-Long Gully Road intersection, and is encompassed by a separate 30m wide block (Block 1520). Correspondence with ICON Water indicates the possibility to consolidate the separate block into an easement as part of the proposed planning.

Pipework will reticulate around the site to provide potable water to the various buildings located within the property.

Sewer Drainage

Stage 1 is to provide a localised onsite treatment plant to treat and dispose of waste locally, discussions with the local authorities will be required to determine the extent of treatment required to satisfy local conditions.

Pipework will reticulate around the site to collect waste water from the various buildings located within the Stage 1 boundary and connect to the onsite system.

At this stage there is a minimal allowance for the connection of Stage 2 facilities into this system, dependent on the facilities with modifications to the plant Stage 2 facilities can connect to the same distribution line and plant.

Alternatively, there may be an ICON Water system available for connection of the whole facility.

Gas Service

Gas can be provided to the site by the use of LPG gas bulk storage bullets the reticulated around the site to all points requiring gas. Sizing of the reticulated mains and required storage will be determined once gas loads are determined.

Fire Hydrants

Similar to the potable water it is proposed to connect to the ICON Water main located in Long Gully Road on the northern boundary. The supply will be installed in accordance with ICON Water AS2419 and AS3500 requirements with boundary backflow prevention and hydrant booster provided at the entry to the property.

Localised hydrants will be located around the site requiring protection via an underground pipework network.

Non-Potable Water Supply

A non-potable irrigation supply will be provided from the storage tanks located at the works depot to distribute water to a series of valved points located around the facility for connection by the irrigation designer/contractor.

Note the tanks at the works depot will be provided with a potable water backup in the event that there is insufficient water collected

from the rainwater harvesting system.

Horse Agistment Water Supply

Currently there is a water supply line running across the Stage 1 site servicing the existing horse troughs, as part of these works it is intended to disconnect the existing trespassing line and provide a new supply from the meter located at the boundary on Mugga Lane.

The main will be located in the driveway outside of Stage 1 to the east of the proposed works depot.





9.0 OPERATION & MANAGEMENT CONSIDERATIONS

9.1 Cemeteries and Crematoria Act 2003

Management of SMP will be undertaken in accordance with the Cemeteries and Crematorium Act 2003. The Act outlines a code of practice relating to the management and maintenance of the facilities including:

- Burials, exhumations and cremations;
- The operation of cemeteries and crematoria;
- The design, construction and maintenance of buildings, monuments, memorials, tombstones, gravestones, tablets, monumental inscriptions, mausoleums, vaults and other structures and things within cemeteries and crematoria; and walls, fences, paths, roads, drains and other works of cemeteries and crematoria;
- Responsibility for the maintenance of buildings, monuments, memorials, tombstones, gravestones, tablets, monumental inscriptions, mausoleums, vaults and other structures and things within cemeteries and crematoria;
- The equipment used in cemeteries and crematoria, including its maintenance;
- The grounds of cemeteries and crematoria, including their maintenance;

The final operational model is yet to be decided by the ACT Government, however it is expected the Authority will operate the cemetery and the crematorium located in SMP.

9.2 Responsibilities

Consultation with stakeholders highlighted the a number of environmental issues that will need ongoing monitoring and management Including:

- Weeds
- Pest Animals
- Native Fauna
- Bush fire
- Public equestrian and walking trails
- Fences

An Environmental Management Plan needs to be developed to guide the ongoing management of these issues.

The respective responsibilities of Parks and Conservation (PCS), Canberra Cemeteries and the leaseholder (Territory Agistment) in relation to environmental management of the site also needs to be determined for each Stage of the project.

Initial negotiations indicated Custodianship of SMP will be incrementally given to TCCS/ ACT Public Cemeteries Authority as each stage is developed.

Any undeveloped area of the site will remain in the custodianship of EPSDD until required by Canberra Cemeteries.

9.3 Environmental Management Plan

Canberra Cemeteries will need to maintain the site they occupy. A site specific management plan will be required. Management responsibilities will include:

- Landscape maintenance of the burial portions and memorial gardens
- Continually weed-control of broad acre areas to prevent weed regrowth.
- Ongoing revegetation of the broad acre areas native grass species. Consider fences to protect certain vegetation.
- Control of pest animals such as foxes, rats and rabbits in accordance with ACT policy.
- Maintain a wildlife corridor through the site.
- Maintain a sustainable kangaroo population on the site, and ensure some areas are available for grazing.
- Maintain paddock fences on the perimeter of the site.
- Maintain public walking and equestrian trails passing through the site to ensure they are safe.

9.4 Bush Fire Risk Assessment

A bushfire risk assessment has been undertaken for SMP. This has informed a Bush Fire Design Brief (BFDB). (**Appendix H**)

The primary acceptance criteria of the BFDB includes the provision of:

- Maintenance of safe vehicle access at all times for Category 1 Bushfire Tanker(s) or similar larger Fire Fighting Appliance(s) entering the SMP,
- Maintenance of defensible space to any new building structure,
- Identification and maintenance of a strategic / perimeter fire trail to the site,
- Identification and maintenance of powerline easement management to reduce ignition potential within vicinity of the site,
- Formal Emergency Management & Evacuation Planning. and associated signage,
- Formal Fuel Management Planning.



10.0 NEXT STEPS

Following public consultation and government endorsement of the Masterplan, Stage 1 of the project will progress to detailed design.

It is intended that further consultation will occur with key external stakeholders throughout the development of SMP.

As part of ongoing project development the following actions have been identified:

Intersection Signals (traffic control signal design)

- WSP prepared two options for the intersection. Both intersection options are considered suitable. Due to complexity of the broader road network, further investigation at detail design into future traffic impacts to confirm requirements should be undertaken before the preferred intersection design is selected.
- A signals design for the entry to be completed when detail design for the intersection is undertaken.

Noise Mitigation

Mugga Lane traffic noise was identified as an impact on Stage 1 and Stage 2 of SMP. Modelling to test and put in place effective noise mitigation strategies will be required at the detail design phase.

Crematorium Air Quality Dispersion Modelling

A quantitative air dispersion modelling for the crematorium is required and will be prepared for the Development Application submission.

Undergrounding of HV powerlines

Powerlines are proposed to be retained above ground in the existing easement. The powerlines can be moved underground at a later stage if desired. This requirement should be identified at the detail design phase and a formal application made to Evo Energy.

Geotechnical Investigation

- Site specific geotechnical investigation will be required for the depot site at detail design phase.
- Site specific test graves should be undertaken in Portions A, B and C at detail design phase to confirm final depth of fill required to achieve the 2.1m double depth.

Seasonal ecology surveys

Seasonal ecological surveys targeting Stage 1 impact area will be required to inform the Environmental Significance Opinion to be included with the Stage 1 Development Application. This should include transect surveys for Perunga Grasshopper as well as for the Golden Sun Moth.

Contamination Intrusive Assessment

Further investigation of the surficial soil assessment and groundwater ingress from the Waste Management Centre may be required by the EPA to be included with the Stage 1 Development Application.

Tree Management Plan

Prepare a Tree Management Plan, in accordance with Tree Protection Act 2005, including advice about tree protection requirements as part of the Stage 1 Development Application.

Irrigation

At Stage 1 Detail Design Phase:

- Prepare an irrigation strategy and design that provisions for the whole SMP site.
- Undertake an irrigation design for Stage 1 in accordance with the irrigation strategy and storm water treatment strategy (as defined in the Masterplan).

Conservation Plan

A Conservation Plans to approval of Heritage ACT will be required for the scar trees located on site,

Environmental Management Plan

Prior to operation of SMP, an Environmental Management Plan should be developed to guide the ongoing management of the site. The Environmental Management Plan will define respective management responsibilities of land custodians, land managers and leaseholders in relation to vegetation, ecological areas, weed control, bush fire, fences, trails, and animals. Respective responsibilities to be agreed with relevant stakeholders, reconfirmed and mapped with each development stage.