



STAGE 05 | MASTER PLAN

INTRODUCTION

The development of the Master Plan was undertaken between the 11th October 2010 and the 7th December 2010. During this stage the Master Plan was finalised and the Plan of Management expanded with actions and delivery phasing. A Financial Model was also prepared to detail income, expenditure and phasing. The Financial model can be used to underpin a business case for the Master Plan.

The 2010 Master Plan for Callan Park is founded on local community engagement and participation. The plan includes many of the ideas and suggestions placed on the collaborative map by the community in stage one. The plan is framed by the fourteen Project Principles, agreed by the community in stage two that were derived from the Guiding Purpose of the Callan Park [Special Provisions] Act 2002. The proposals and actions embedded in the Master Plan also reflect the set of Sub Principles defined by the community in stage three of the project. Stage four consultations also informed the development of the Master Plan in this stage.

The Master Plan and Plan of Management for Callan Park are organised according to the biocity systems first presented in stage three of the consultation process. Organising the Master Planning actions, sub-projects and objectives into these systems allows the information to be presented in a clear and concise way.

THE WELLNESS SANCTUARY CONCEPT

Callan Park is a wellness sanctuary, bridging the gap between acute care and home life for those with mental illness, and contributing to the mental, physical and social health of the entire community

Landscape architecture has long been a transformative agent in human health and wellbeing. In the early 1800's Frederick Law Olmstead worked on the site selection and planning of the McLean Hospital in the Boston area of Massachusetts that has become a world leader in the treatment of mental illness and chemical dependency. It undertakes research into the cause of mental illness and has trained generations of mental health care providers. Modern psychiatric care has undergone major shifts due to clinical and human rights advances and the transformative aspects of landscape in healing the mentally ill are becoming increasingly documented. In modern society the qualities of natural landscape has great potential to assist people recovering from mental illness.

Throughout the development of this community led Master Plan the idea of wellness, and in particular community wellness has constantly arisen. Callan Park is a community space with a history that bridges the old divides of institutional mental health and community physical health. What has emerged out of the 'Youplan' process is a framework that breaks down the paradigm of separate mechanisms achieving physical and mental wellness by developing the concept of a 'Wellness Sanctuary' where the whole of Callan Park is rediscovered as a therapeutic landscape.

Refining the Draft Master Plan

The Stage 4 Draft Master Plan was displayed online and at open drop-in events over a period of three weeks between 8th October 2010 and the 29th October 2010. Almost five hundred individuals commented on the Master Plan through the web site and hardcopy surveys provided at the drop-in sessions. The results from the online surveys gave a strong endorsement of the plan. The following question was used on the web site to test the level of support: "Overall, what do you think of the Draft Master Plan in its current form?". The results were as follows:

- 23% Excellent
- 31% Very Good
- 33% Good
- 7% Poor
- 6% Very Poor

The results showed that 87% of respondents supported the Master Plan. Although there was broad community support for the Master Plan in its draft form, analysis of the consultation results and feedback by the team identified nine points that we recommended for further investigation in a Council run forum.

The community forum held on 20th November was chaired by the mayor of Leichhardt, Jamie Parker. The purpose of the forum was to inform the final decision on nine aspects of the Draft Master Plan.

The following summary provides an overview of the issues and the responses from Council:

Topic 1 – Dog Walking

Required Council decision – Defer preparation of 'Companion Animals Management Plan' to 2011 with further consultation

Summary of issues raised:

- Maintain current arrangements pending LCAMP review in 2011
- Acknowledge dog walking in plan, it is a function of Callan Park
- Cat fencing bushland
- All native animals to be protected
- Areas other than Callan Point have significant fauna – King George Park – Need to do survey
- Dogs use beach at Mushroom Rock

Outcome :

Defer issue and address in the course of reviewing the 'Companion Animals Management Plan' in 2011 - with further specific consultation.

Topic 2 – Provision for Sports

Required Council decision – Endorse or oppose the range of sporting facilities proposed by the plan

Summary of issues raised:

- Support existing draft Master plan proposal
- Investigate Glover Street tennis court
- Tennis courts on to of Car Park – Nth Sydney
- Underground Car Parking
- Remove reference to specific sports – to be determined at a later date. Wait until future management is known and in place
- Mini Bus impractical
- Additional Parking – young children and families (e.g. Under 7) in at 9.00 leaving at 9.30
- Example of buses given – not relevant to sporting grounds
- Transport/Parking also required for equipment

Outcome :

Endorsement of the range of sporting facilities proposed by the plan and remove reference to specific sports – to be determined at a later date. Wait until future management is known and in place.

Topic 3 – Orchard on Balmain Road

Required Council decision – endorse or oppose the orchard proposed by plan

Summary of issues raised:

- Converting parking space to Orchard and other park area to car park
 - Expensive – Leave as is
 - Orchard seasonal
 - Gangs take fruit and wreck trees
 - Orchard Former Car Park contaminated
 - Former car park contaminated?
 - Not mono Culture
 - Priority should be latest/best practice in sustainable agriculture
- Potential Agriculture/Horticulture uses to:-
- Achieve best practise sustainable agriculture
 - Green edge to park
 - Acknowledge history of such uses on Callan Park

Outcome:

Include notation on plan identifying the area as a site for Potential Agriculture/Horticulture uses that:

- Achieve best practise sustainable agriculture
- Provide green edge to park
- Acknowledge the history of such uses on Callan Park.

Topic 4 – Existing Land uses

— Required Council decision – endorse or oppose the use mix proposed by plan

Summary of issues raised:

- Need to emphasise primacy of Mental Health uses on site, set aside 100 years ago for this purpose still needed – to protect the people who are most vulnerable and neglected
- No one is proposing that ambulance move off the site, however the site is at risk of being overrun and dismembered by a number of good people and good organisations

- Expansion of ambulance would put pressure on site
- Make sure amount of footpaths are not reduced – individuals who don't belong to a group don't get some consideration

Outcome:

Points noted, nothing specific to action.

Topic 5 – Aboriginal Culture and Social Services

Required Council decision – defer decision on aboriginal facilities pending appropriate consultation process in next stage of plan

Summary of issues raised:

- Aboriginal uses pre-dates mental health uses – need to remember this
- Look keeping one building – if needed for future – to facilitate an outcome, based on additional suggested research
- Urban aboriginal mental health could also be accommodated on site
- Should not limit aboriginal contribution to just a few key areas of the site, e.g. also at entrance to the site – to introduce visitors to site
- Agreed to defer till next stage based on more appropriate consultation methodology customised to issue and stakeholders involved

Outcome: Defer decision on aboriginal facilities until next stage of plan when future management is known and in place. Use more appropriate consultation methodology customised to issue and stakeholders involved in order to further refine/develop options for Callan point and to incorporate Aboriginal Culture across the site.

Topic 6 - Mental Health

- Required Council decision – endorse or oppose the proposed master plan mental health framework
- Unmarked graves – Douglas Holmes
- ARC – only lived experience on site – Council should provide support
- Veteran's field or patient's field?
- Community development – wiped out if had to pay market price
- WIRES – would like a presence on site
- Request for consumers to be represented in the governance of the site, part of the process not a process for them
- Convergence is taking place
- Major centre for mental health
- Education
- Training
- Employment
- Research
- Social inclusion
- Living on site – OK – short term only – preparing for the outside world – so they can again live in the community
- Research – not to detriment of consumers, not to be fodder
- Where possible – involve mental health consumers, in management /operation of site

Outcome: Wherever possible, Mental Health Consumers should be included in the management and operation of the site these people are to be represented in Governance of the site, and are to be part of the process and actively involved in determining the future of the site.

Topic 7 – Skate Park

- Required Council decision – endorse or oppose the proposed skate park
- Okay in principle – not in this location – this is the only location that satisfies criteria

Outcome: A successful skate park site has a number of prerequisites; passive surveillance, public transport, involvement of entire community in design and management. These criteria must be satisfied in order to have a skate park at Callan Park.

Topic 8 – Ferry Wharf

- The proposal for a ferry wharf at the end of Wharf Road was rejected by Leichhardt Council on the grounds it would disrupt the use of Iron Cove by local rowing organisations.

Topic 9 – Parking regulations

- Required Council decision – Defer decision on final Parking fees and regulations until future management is known and in place
- Access to nursing home – double traffic in streets
- Number of car parking spaces – now/future
- Area of hard surface – now/future
- Disabled parking – mobility stickers
- Parking under Bonnie View cottage?
- Regulation – key issue and will need to be addressed in future
- May be opportunity to regulate via a range of options-, permit parking, boom gates, parking meters, signage and enforcement

Outcome:

Parking management will be a key issue in the future and will need to be addressed. There may be opportunity to regulate via a range of options-, permit parking, boom gates, parking meters, signage and enforcement. These will need to be investigated

THE MASTER PLAN OVERLAYS

The Master Plan recommendations have been arranged under the following systems:

Biodiversity, Built Form, Culture/Education, Economy, Pollution/ Chemicals, Energy, Food, Governance, Health, Transport, Waste, Water.

Each system is illustrated by an overlay drawing. The overlays are described by scope, existing situation, Objectives and Targets and finally implementation actions. There is also an explanation of how the overlay responds to the Project Principles, Sub Principles and community feedback received throughout the project. The Plan of Management supports each Master Plan action detailing phasing and performance targets measurements and responsibilities.



BOTTOM. The Final community forum was held on Callan Park on 20th November 2010, over 80 people attended.

THE MASTER PLAN

The following implementation actions are identified on the adjacent plan:

- 1 Manning Street pedestrian access
- 2 Car access to be closed at Cecily Street with car free plaza
- 3 New Alberto Street vehicle access
- 4 Consolidated parking area and public transit hub
- 5 Look out point at the end of Wharf Road
- 6 Bus stop and shelter
- 7 Bike hire kiosk
- 8 Drop off to child care centre
- 9 New car parking
- 10 NSW Ambulance & public parking in shared arrangement
- 11 Kalouan Medium and high support accommodation
- 12 Vocational skills centre and education services for people recovering from mental illness [TAFE link]
- 13 Callan Park Wellness Centre
- 14 Sustain - cafe and restaurant
- 15 Wharf Road Apartments Medium support accommodation & Bootmakers Cafe
- 16 Bootmakers Cafe
- 17 Wharf Road Cottages Low support accommodation
- 18 Wharf Road House Family accommodation
- 19 Expanded play area
- 20 Playground
- 21 Callan Park Farm
- 22 Expanded Glovers Community Garden
- 23 Potential Horticultural/Agricultural Uses
- 24 Pavilion with BBQ and seating area
- 25 Veteran's memorial wall for ceremonies
- 26 Community spaces in the Cane Room and Building 504
- 27 Lookout shelter
- 28 Sydney College of the Arts
- 29 Performance and rehearsal space
- 30 Extension to NSW Writers Centre
- 31 Studio and exhibition space, Sydney College of the Art and others
- 32 Art therapy and studio space
- 33 Summer House heritage building retained for ecological and Aboriginal interpretation
- 34 Board walk through bushland
- 35 Bush regeneration
- 36 Bush regeneration around Glover Street Oval
- 37 New board walk for pedestrian access to the Callan Point beach
- 38 Existing Waterfront Drive fields
- 39 New pavilion and amenities
- 40 Regional skatepark
- 41 Sports field
- 42 Realigned Bay Run, seating & level change
- 43 AFL/Baseball/Rugby League field
- 44 Additional parking on Glover Street
- 45 Tennis & basketball court
- 46 Kayak launching jetty
- 47 Indoor yoga & zumba
- 48 Reinstated salt marsh and new sea wall
- 49 Creek restoration
- 50 Wetland
- 51 NSW Ambulance expansion into Linen store
- 52 Vehicles removed from courtyards and building surrounds
- 53 Buildings removed to consolidate parking
- 54 New parking area for University of Tasmania
- 55 Secure parking for ambulance with sandstone wall enclosure
- 56 Moodie Street Cottage site maintenance administration
- 57 Pleasure Gardens restored
- 58 Existing trees screening the Convalescent Cottages removed and replaced with tall trunked Eucalyptus

- 59 Callan Park Museum located in Bonnyview Cottage
- 60 Callan Park administration headquarters in Broughton Hall
- 61 Fig trees to Balmain Road
- 62 Cove garden
- 63 NGO opportunities within the cultural cluster
- 64 NGO opportunities in the Wellness Centre
- 65 Rose Cottage B402
- 66 Building B488
- 67 Recycled black water for non-potable reuse to all buildings
- 68 Irrigate sports field with recycled water
- 69 Irrigate Agricultural/Horticultural areas with recycled water
- 70 Treated stormwater stored on site for reuse - Wetland area treats stormwater prior to storage
- 71 Bio-swales filter storm water adjacent to roads and parking areas
- 72 Wetland filter storm water from central subcatchment
- 73 Non potable reuse pumping station

Each proposition is detailed on the overlays that can be reviewed over the following pages. The Plan of Management provides further details on phasing and implementation.



IMAGE. Figure no. 59 Final Draft Master Plan.



- MASTER PLAN LEGEND**
- Callan Park Boundary
 - Existing Contours
 - Proposed Contours
 - Callan Park Retained Pedestrian Net
 - Callan Park Demolished Pedestrian N
 - Callan Park Proposed Pedestrian Net
 - Callan Park Retained Buildings
 - Callan Park Demolished Buildings
 - Callan Park Proposed Buildings
 - Retained Street Network
 - Demolished Street Network
 - Proposed Street Network
 - Proposed Car Parking
 - Proposed Hardscape Plaza
 - Proposed Skate Park
 - Proposed Wharf and Pier
 - Proposed Memorial Park Area
 - Existing Sports Grounds
 - Existing Community Garden
 - Proposed Community Garden
 - Proposed Urban Agriculture
 - Existing Vegetation
 - Proposed Orchard
 - Proposed Planting
 - Proposed Native Bushland
 - Proposed Salt Marsh and Wetland
 - Proposed Bush Walk Trail

OVERLAY 01 BIODIVERSITY

Scope

This system covers the natural ecologies of Callan Park both terrestrial and aquatic, including habitats of both resident and migratory species. The Master Plan protects and enhances the existing fauna and flora in Callan Park as well as making connections to existing habitats on its boundaries.

Existing Situation

Callan Point contains the only area of remnant Iron Bark forest within the Leichhardt Local Government area, and Callan Park and the Iron Cove foreshore environs provide habitats for native and exotic flora and fauna. A community led bush care and regeneration project has been under way since 1994. There are several areas of Callan Park where self-seeded exotic tree species have not been managed and a colony of stray cats lives within the Convalescence Cottages.

Objectives and Targets

The Master Plan will enhance the long-term ecological value of Callan Park and provide opportunities to connect wider habitats along Iron Cove.

Implementation

The Master Plan identifies areas for further enhancement of both the existing terrestrial and aquatic habitats through the following measures:

- Bush regeneration from Callan Point through to the Manning Street pedestrian access point and around Glover Street Oval
- Bush regeneration at the eastern edge of Wharf Road between the NSW Ambulance campus to the south and the Wharf Road Apartments to the north around Glover Street Oval
- Replacing the existing trees screening the Convalescent Cottages with native Tall Trunked Eucalyptus
- Identification of an ecological corridor zone to connect the bush regeneration areas
- Planting of Port Jackson Figs along the Balmain Road frontage between the junction of Wharf Road and the eastern site boundary.
- Developing a GPS enabled smart phone application providing botanic data across Callan Park
- Limiting the new planting of exotic species to replacing dying and damaged trees that are part of the heritage gardens in the Broughton Hall and Pleasure Gardens; and in the Agricultural or horticultural area.

YourPlan Consultation

The comments on the Stage 4 Draft Master Plan showed strong support for the aspects of the plan that restored natural habitats for wildlife, both in the bush areas and on the foreshore. Of all the online respondents who gave feedback on the Draft Master Plan 46% commented on the Callan Point and Bush Regeneration layer. The majority of comments were supportive of the ideas and intentions. A suggestion raised at the drop-in sessions was for the inclusion of an ecological corridor in Callan Park to connect the bush regeneration areas within Callan Park and also connect to the habitat areas adjacent to Callan Park. This suggestion has been included in the Master Plan.

Project Principles

The biodiversity overlay proposals respond to the following Project Principles:

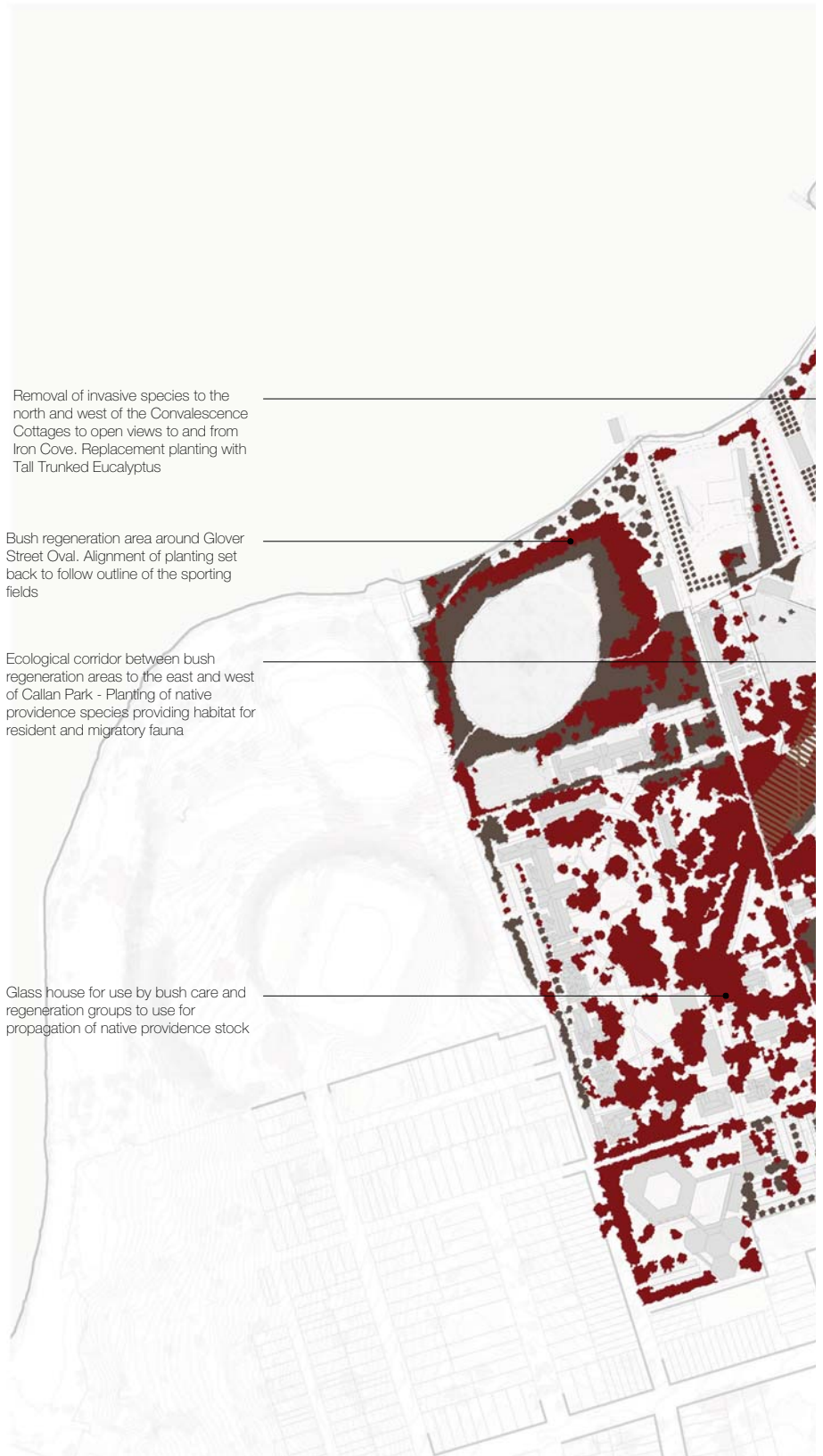
- Ensure Callan Park is a world-leading model for social, environmental and economic sustainability.
- Improve the quality of community lands through conservation, restoration and management.
- Ensure that best practice conservation processes are applied to historic buildings, gardens and other landscape features.

Sub Principles

The Sub Principles that related to biodiversity received the following support:

- Reinstatement natural waterways/wetlands – 76%
 - Cleaning and recycling storm water – 85%
 - Moving Parking to the edges of Callan Park – 62%
 - A focus on natural bushlands rather than manicured lawns – 59%
- The stage three consultation results demonstrated strong support for principles that responded to the ecological role of Callan Park. There was clear support for the reinstatement of natural waterways, wetlands and bush areas.

By incorporating measures that expand the ecological capital on Callan Park the 2010 Master Plan addresses these Sub Principles.



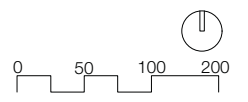
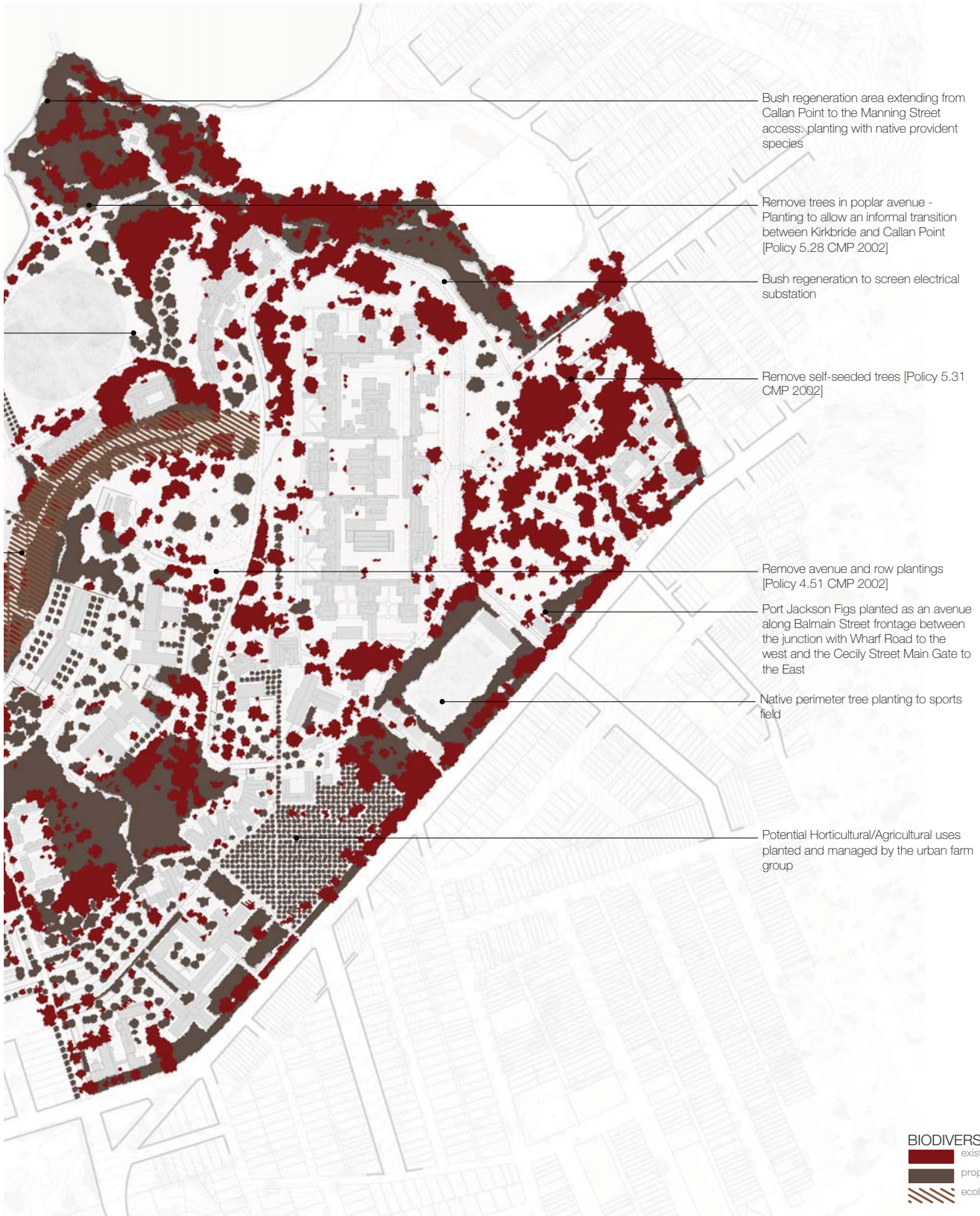
Removal of invasive species to the north and west of the Convalescence Cottages to open views to and from Iron Cove. Replacement planting with Tall Trunked Eucalyptus

Bush regeneration area around Glover Street Oval. Alignment of planting set back to follow outline of the sporting fields

Ecological corridor between bush regeneration areas to the east and west of Callan Park - Planting of native providence species providing habitat for resident and migratory fauna

Glass house for use by bush care and regeneration groups to use for propagation of native providence stock

ABOVE. Figure no. 60 Biodiversity overlay



OVERLAY 02 BUILT FORM AND INFRASTRUCTURE:

Scope

There is eighty-five and a half thousand square meters [85,500 m²] of floor space contained in over one hundred and forty buildings and structures located on Callan Park. Currently eighty-three of the buildings are vacant, representing nearly thirty-two thousand square metres [32,000 m²] of available floor-space. Excluding the Kirkbride Complex, twenty-three buildings have been classified as being of exceptional or high heritage status [CMP 2002]. The information in this section relates to all buildings, structures services and infrastructure on Callan Park, detailing uses, proposed demolitions and the foot-prints and building envelopes that will accommodate new structures. Recommendations for services infrastructures are also proposed.

Existing Situation

The plans in stage one detail the historic development of buildings and associated infrastructure on Callan Park. While the phasing of development and laise faire addition of buildings has helped give Callan Park its character some of the more recent buildings or groups of buildings have diminished the setting and quality of areas of Callan Park with significant heritage value. Since the transfer of the last patients from Callan Park in April 2008 many of the buildings and supporting site infrastructure have fallen into a state of severe dilapidation. NSW Health provided the Master Plan team with floor plans and building assessments conducted in 1995 for all the vacant buildings on Callan Park and this information along with the building inspection site survey conducted by members of the Master Plan team has contributed to the final Master Plan.

Objectives and Targets

The Master Plan sets out a framework for built form and infrastructure on Callan Park, with the over arching objectives being:

- Respecting the heritage values of the site through the selective demolition of intrusive and low heritage significance buildings as outlined in the CMP.
- Identifying opportunities for new building and structures located within the footprint and envelopes of existing buildings.
- Defining uses for all buildings as either Community Education and Health use in accordance with the Callan Park [Special Provisions] Act 2002
- Recycling building waste on site or disposal of waste in accordance with best practice methods.
- Establishing a panel of emerging architects to ensure the adaptive reuse of buildings meets sustainability and design excellence objectives.
- Create a modern, efficient site infrastructure system that delivers lending sustainability outcomes.

Implementation

One of the key changes to Callan Park will be the demolition of thirty-nine buildings and structures. This programme of demolition has been proposed for the following reasons:

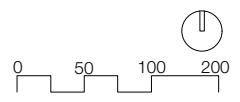
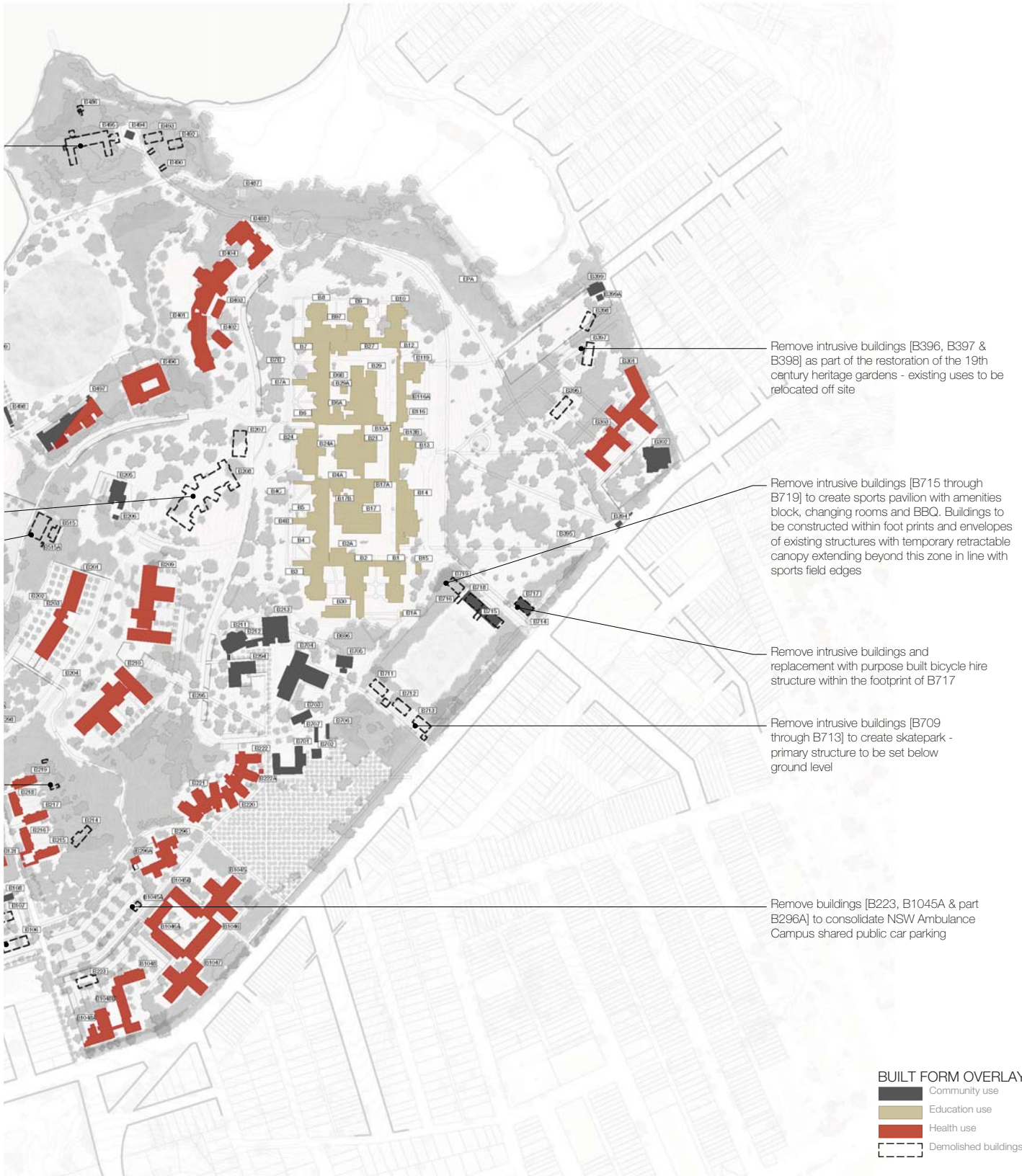
- To increase open space
- To provide purpose built structures for new activities such as bicycle hire and sports amenities
- To consolidate car parking on the edges of Callan Park
- To reinstate the relationship between the key heritage buildings
- To create designated bush areas
- To demolish structures that are unsound and suffering from structural failure

A number of new structures and buildings are also proposed on Callan Park. These will be located within the footprints and envelopes of existing buildings to conform to the objects of the Callan Park [Special Provisions] Act 2002. New buildings will be located in the following areas:

- A pavilion in the Veteran's Field
- A pavilion and amenities block adjacent to the Balmain Oval
- Cycle hire stations in close proximity to the new Cecily Street site access and within the new consolidated car park off Wharf Road
- 'Kalouan' has also been identified as a potential site for a purpose built facility, providing short term high support accommodation for Mental Health Consumers



ABOVE. Figure no. 61 Built Form and Infrastructure overlay



Infrastructure Report

Northrop Engineers

Introduction

Northrop Consulting Engineers has performed an investigation of existing water, sewer, stormwater, gas, power and telecommunications services. We have also examined the existing road network to assess the condition of trafficable and pedestrian pavements.

Our investigation consisted of the following activities:

- Perform Dial Before You Dig Service Search
- Review of Dial Before You Dig plans received
- Review of reports prepared by URS and Hughes Trueman
- Review of site serving plans
- Discussions with NSW Department of Health Facility Manager – Greg Fitzpatrick
- Perform site inspection to undertake visual assessment of infrastructure
- Review of proposed site facilities and consider the impacts to existing infrastructure
- Prepare a strategy to optimise the use of existing services

This report has been informed by site observations and review of previously undertaken reports. Site investigation has been carried out visually at surface level. Thus during the course of our investigations we have not observed infrastructure that is buried or obscured. Intrusive investigation of pavements has not been undertaken thus underlying pavements layers have not been assessed.

Capacity of existing services was assessed by discussions with utility service providers' facility manager and preliminary engineering calculations to determine service demand.

The Callan Park, Utilities and Pavement Condition/ Capacity Report prepared by URS in April 2008 and Rozelle Hospital Preliminary Infrastructure Investigation prepared by Hughes Trueman Pty Ltd in December 2001 have been reviewed by Northrop.

Both reports draw similar conclusions as to the extent of existing services but do not draw definitive conclusions to their capacity or condition. Both of these reports can be described as "desk top studies" supported by site observations. As such it would be difficult to ascertain the condition or capacity of specific elements of a service network. Drawing upon the previous studies and our own investigations we are seeking to build on the previous reports by identifying opportunities and constraints with a view to inform the master plan of an appropriate infrastructure strategy. This strategy will need to strike a balance between maintaining (or reusing) existing infrastructure and construction of new site infrastructure.

Trafficable and Pedestrian Pavements

The age of the existing pavements is unknown, but they have reached the end of their service life. It appears that a period of time has passed where minimal maintenance operations have been undertaken. This lack of maintenance may have contributed to accelerated rates of deterioration. The deterioration is primarily due to water ingress to the pavement structure through cracks and discontinuities in the wearing course. Our site review indicates a significant portion of existing pavements require rectification works immediately.

Rectification works would primarily involve reconstruction of existing pavements and installation of a new wearing course. It is envisaged the existing pavement materials could be exhumed, processed and reused. Furthermore materials resulting from building demolition could be used for pavement reconstruction (particularly concrete).

Further investigation is necessary to prepare a rectification strategy. Investigations include core sampling and testing of the pavement structure to assess the condition of underlying pavement layers. Detail investigation of the pavement structure would not be required until the detail design phase.

Reconstruction of pavements would be conducive to implementing a stormwater drainage strategy that is aligned with the principals of water sensitive urban design (WSUD). Bio-retention swales can easily be incorporated into the road network during reconstruction operations. Further detail is provided in the prepared by Equatica detailing water management strategy for the site.

Kerb and guttering is also in a dilapidated condition and requires rectification works. If an alternate strategy for stormwater drainage is adopted it may be viable to delete guttering to the roads. The kerb and gutters may have some heritage value, particularly those formed from sandstone. Further investigation in this regard is required.

Stormwater Drainage

Leichhardt Council stormwater drainage infrastructure (such as pipes and channels) is located within the site. Generally this infrastructure

conveys stormwater from upstream catchments to the east of the site (in addition to site generated stormwater runoff) to Sydney Harbour. This system is currently under the control of Council and would remain so under the master plan as it is a key component to draining of the upstream catchments. Future development of the site will generally avoid any disruption to this system. Council owned infrastructure could be modified to allow stormwater harvesting as apart of the stormwater strategy.

The minor drainage system servicing the roads and buildings is owned by the Department of Health. Maintenance works are required to the system as many pits were found to be completely blocked with sediment and the deleterious materials.

Prior to any investigation to determine capacity or condition be undertaken the system would need to be cleaned. It has been estimated the newest portions of the drainage system are 40 years old. Thus it may not comply with current standards for capacity. Having said this no significant instances of site damage due to the system being blocked or under capacity was observed during our site inspection.

Opportunities do exist to utilise the existing stormwater drainage system to service the final outcome for the site. To determine the extent of the system that could be utilised further investigation is required to determine capacity and condition. The investigation to calculate capacity would involve a physical inspection and survey report of the system to determine pipe sizes, depths of pipes and distances between stormwater pits.

Condition investigations will involve an internal inspection of the pipe network using closed circuit television (CCTV) equipped robots. Condition and capacity stormwater drainage system should occur directly after the master plan has been adopted as the results will inform the design outcomes of future development.

All site generated stormwater runoff currently discharges into Sydney Harbour untreated. Considering the large amount of landscape area on the site we are of the opinion that pollutant would be lower than runoff from a typical urban area. Future development shall include the introduction of water treatment measures in line with current regulations and community expectations. The large amount of existing open space is also conducive to provision of water treatment measures (which is also in line with a WSUD strategy).

The future WSUD strategy for the site will influence the final form of the stormwater drainage system. In this regard it may be feasible to abandon the traditional below ground pit and pipes and rely on swales for the management of stormwater runoff. Furthermore a rainwater harvesting could be incorporated into such an approach. Adopting a WSUD strategy is highly likely to reduce demand on any formal drainage system.

Climate change has been predicted to increase the frequency of high intensity rainfall events. This will result in greater surface runoff of stormwater. Future drainage systems for the site will need to allow for the affects of climate change.

On-site stormwater detention facilitates would not be required for this site due to its proximity to Sydney Harbour.

Utility Services, (Water, Sewer, Power, Gas, and Telecommunications)

Significant authority (i.e. Sydney Water, Energy Australia, Atlanta, Telstra, and Optus) infrastructure is present within the site or immediately adjacent to the site. From a supply point of view we envisage this infrastructure is able to cater current and future site demands.

There are opportunities to utilise existing services infrastructure for future development outcomes. To do this further investigation of the capacity and condition is required. Such investigations can be costly and time consuming with a risk of finding the service unsuitable. As such it may be more economical to abandon old infrastructure and construct a new services.

The Callan Park Act instructs that no new buildings shall be added to the site. Furthermore any new buildings can only replacing an existing building is to be of an identical size. Due to these limitations it is envisaged that demand for services would not increase significantly to currently levels. An ecologically sustainable design (ESD), incorporating WSUD strategy would also limit increases to service demand lowering energy consumption and water usage.

The above may not be true for telecommunications where any new development would require access to high speed internet (or data) services. It is understood that such services are not readily available across the site. The challenge is to balance the economical utilisation of existing services with the construction of new services. To determine the right "mix" of new services to existing services detailed investigation is required.

Three key characteristics of services need to be understood before informed decisions can be made being; location, capacity and condition. The suitability of existing services can be finalised when the type of development (particular building use) is known.

At this stage of the project the most beneficial work will be to provide a snapshot of existing services and the capacity of Authorities to meet the demand of any future development. Such works would include:

- Preparation of an infrastructure data base or register
- Closed circuit television (CCTV) inspection of water and sewer infrastructure.
- Potholing of gas, power and telecommunications infrastructure to confirm size and condition
- Pressure testing of water and gas services to determine condition.
- Modelling of services to calculate capacity.

Thus without the above works being undertaken it would be difficult to determine economic viability of maintaining an existing system. Condition and capacity of the utility services should occur directly after the master plan has been adopted as the results will inform the design outcomes of future development.

The proposed infrastructure loop as presented on the Callan Park Master Plan – Energy 05 plan provides a “ring main” to provide water (both potable and recycled), power, gas and communications services to site facility. The infrastructure loop is based on our conclusion that a significant portion of the existing site services can not be utilised for future site facilities. The infrastructure loop provides an economical means of distributing services to the site and can be constructed in parts to compliment the staging of site facilities.

YourPlan Consultation

The Draft Master Plan was broadly supported for offering options for a range of community, education and health uses. Although there was slightly more support for refurbishment of existing buildings rather than new build this was not perceived to be a strong issue of contention in relation to the provision of some new buildings on Callan Park.

Project Principles

The built form overlay proposals respond to the following Project Principles:

- Governance
- Ensure Callan Park is a world-leading model for social, environmental and economic sustainability.
- Public Access to Open Space that offers active and passive recreation
- Preserve public access to open space and the Iron Cove Foreshore.
- Ensure an equitable balance between passive and active recreation to contribute to community health and wellbeing.

- Develop public transport and infrastructure to broaden public access and reduce traffic intrusion.
- Preserving the Heritage Significance of Callan Park
- Ensure that best practice conservation processes are applied to historic buildings, gardens and other landscape features.
- Encourage public use of buildings acknowledged as having the most heritage significance.
- Ensure that the history of Callan Park is commemorated and documented on site.
- Future Development of Health, not-for-profit Community and not-for-profit Education Facilities at Callan Park
- Encourage complementary health, community and educational uses to maximise synergies and benefits for the community.
- Ensure that community, health and education uses at Callan Park demonstrate a commitment to social, environmental and economic sustainability.

Sub Principles

The sub principles show clear support for the removal of buildings to increase open space on Callan Park, and the implementation of many of the objectives implicit in the Sub Principles will require some changes to the built fabric on Callan Park. Specifically, the Sub Principles that this overlay support are;

- improving bushland within Callan Park
- increasing open space by removing buildings with no heritage significance
- moving parking to the edges of Callan Park



BOTTOM. Morning light at Callan Park looking towards the Museum of the Mind.

OVERLAY 03 CULTURE

Scope

The scope of this system relates to the cultural uses of buildings on Callan Park, opportunities for interpretation of the cultural landscape, historic interpretation and initiatives that provide a framework for on-going community development. A key direction will be supporting synergies between culture, mental health and wellbeing.

Existing Situation

Callan Park is located on Leichhardt's cultural ridge line, a creative ribbon extending from Balmain through Rozelle to the cultural hub next to Hawthorne Canal in the west. Callan Park accommodates some of Sydney's most important cultural stakeholders. Sydney College of the Arts [SCA] occupies the Kirkbride complex and the New South Wales Writers Centre [NSWWC] located in Garry Owen House. Both organisations have extensive programs in addition to their core activities. A number of venues and spaces are available for hire. Festivals and events also draw many groups to the park particularly in the summer months.

Callan Point is also the site of interpretative artworks and signage documenting the Aboriginal cultural heritage of the area. The post-colonial and recent cultural heritage of Callan Park is extensive and integral to the planning process. Included are the heritage gardens, memorials, vistas, the cultural topography and the built form.

The existing strong cultural presence of the two major arts institutions provides a solid base for the development of cultural activities in Callan Park. SCA and NSWWC represent a broad spectrum of the creative arts, and both institutions have the capacity to expand within the site.

Objectives and Targets

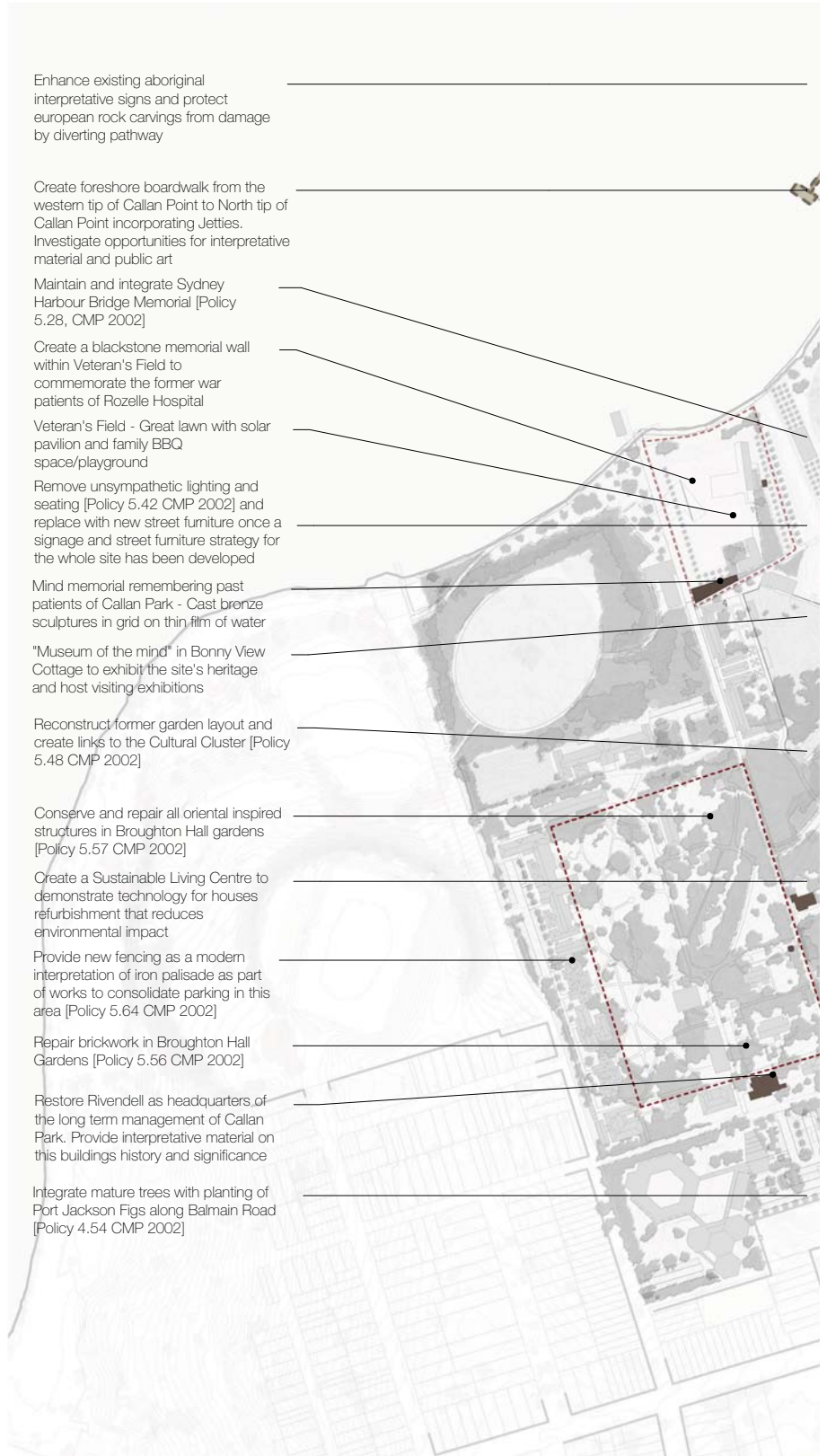
The targets for the Master Plan are:

- To both commemorate and celebrate the past and future cultural role of Callan Park
- To document the cultural heritage of Callan Park through an on site museum and interpretative signage to educate visitors to Callan Park
- To develop a national centre of excellence to support the links between art, mental health and wellbeing
- To create an international artist in residency program that focuses on 'outsider art' and artists who explore issues of mental health in their work.
- To provide opportunities for performance based cultural activities such as music, dance and theatre
- To provide spaces for year round outdoor performance and events within the cultural cluster
- To provide a range of studio, rehearsal and workshop spaces for local artists and arts based NGOs
- To offer short term and incubator spaces for emerging artists and creative groups
- To ensure the potential for robust, long term tenancies in key locations

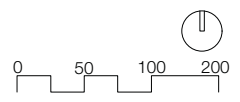
Implementation

The Master Plan makes the following recommendations:

- The formation of a 'cultural cluster' in close proximity to the Sydney College of the Arts and NSW Writers Centre
- An initiative to link art, creativity and wellness through the establishment of a Centre for Art, Mental Health and Wellbeing based on the Cité Internationale des Arts model that focuses on artists with experience of mental health illnesses
- The expansion of NSW Writers Centre
- The development of an on-site museum and new interpretive signage to encourage a greater depth of understanding of the history of Callan Park
- The restoration of the heritage Broughton Hall Gardens and Pleasure Gardens
- The restoration of the Harbour Bridge memorial
- Links between culture, community and environment with a new bush trail that starts close to the Manning Street entrance finishing at Callan Point.
- Designated performance space artist studio and exhibition space within the cultural cluster
- A new space in the Veteran's Field at the end of Wharf Road in Callan Park to commemorate the former mental health patients who lived on Callan Park
- A sustainable living centre located in B299 that is linked to the Callan Park Farm



ABOVE. Figure no. 63 Culture overlay



Community Consultation

Project Principles

The culture overlay proposals respond to the following Project Principles:

- Preserving the Heritage Significance of Callan Park
- Ensure that best practice conservation processes are applied to historic buildings, gardens and other landscape features.
- Encourage public use of buildings acknowledged as having the most heritage significance.
- Ensure that the history of Callan Park is commemorated and documented on site.

Sub principles

The stage three sub principles demonstrated strong support for a number of cultural initiatives that have been included in the Master Plan. These include; more interpretive signage/trails, an on-site museum, the restoration of the heritage gardens and the inclusion of public art. There was also a recognition that the cultural history of Callan Park should extend beyond European settlement.

YourPlan Consultation

Support for the cultural cluster centred on the strengths of Sydney College of the Arts and the NSW Writers Centre by creating new arts and cultural opportunities. Feedback suggested that these art and cultural activities could play a significant role in treating mental illness and building community wellness.

The responses to the Draft Master Plan also showed strong support for the inclusion of an outdoor performance area close to the cultural cluster and this has been incorporated in the 2010 Master Plan.

Callan Park Arts and Culture Workshop

The Master Plan has sought to respond to community interest in the cultural future of Callan Park and to include actions and initiatives raised during the consultation process and as part of the Callan Park Arts and Cultural Workshop. The Master Plan addresses the community consultation through:

Creating links between creativity and wellbeing

This was a priority area with community members suggesting strong links between the mental health functions of Callan Park and the capacity of the arts to both assist recovery and document personal experience. The proposed Centre for Art, Mental Health and Wellbeing is a comprehensive response to this and has great scope to provide real health and wellbeing outcomes. Other initiatives include connecting the cultural and natural environments and retaining and restoring places of quiet reflection including the heritage garden and bush areas. The potential for appropriate public art is another community idea that will be included.

Providing improved studio and workshop space for artists

The adaptive use of appropriate buildings and spaces within Callan Park has been seen as an opportunity by both the arts community and other. The 2010 Master Plan identifies a specific cultural cluster within which studio and workshop space would be located. Linked outdoor performance space extends the cultural amenity of this locality.

Expanding facilities for cultural organisations

Linking Sydney College of the Arts to the cultural cluster and Centre for Art, Mental Health and Wellbeing provides the college with the opportunity to extend its programs, in particular its residency programs. The capacity to expand the links between art education, mental health and creative interventions is also possible. The proposed expansion of the NSW Writers Centre is a direct response to an identified need. An EOI process is in place to identify cultural organisations requiring operational space.

Ensuring good management and development of cultural facilities

The creation of a manageable cultural cluster within Callan Park is in response to community concern about governance and sustainable management of cultural organisations. The Master Plan provides a planning response that would enable coordination and management of a range of studios, workshops and spaces should this be appropriate. Development of facilities over time as funding becomes available is also possible with this approach.

Heritage Review of Master Plan

Tanner Architects

Written description of work area

The heritage significance of the site, which is analysed and identified in the Conservation Management Plan, underlies the Master Plan. Tanner Architects' work area includes:

- Heritage analysis of built and landscape components of the Callan Park site. The built and landscape components have been considered in an integrated approach rather than as discrete elements;
- Guidance as to appropriate responses to significant buildings and landscape areas;
- Recommendations for appropriate uses for specific parts of the site, based on the history of the site and uses that have occurred on it in the past and on existing information that the site is able to provide;
- Development of an interpretation strategy for the site;
- Aboriginal archaeology and European archaeology should be addressed by specialist consultants. However, these issues are addressed in the 2002 Conservation Management Plan.



BOTTOM. The view over Callan Parks foreshore

Heritage targets to achieve

As far as the heritage of the site is concerned, there are a number of targets that are important to achieve:

- Ensuring a balanced approach to the conservation of significant built items and landscape elements;
- Consideration and integration of the association aspects of heritage, that is, the links and connections that may exist between the community and the site;
- An integrated approach to interpretation of the site and its history, to include Aboriginal occupation and European developments;
- Establishing heritage considerations as an integral part of site management, including leasing procedures;
- Facilitating appropriate successful future uses so that the heritage significance of the site is maintained and enhanced.

Heritage implementation actions

Several actions should be undertaken so that the master plan can be implemented in a successful manner:

- Undertake essential conservation works to buildings that are to be retained as a matter of immediate priority. The buildings should be made weather-proof and vermin-proof. Invasive vegetation should be removed and any building up of ground levels or installation of hard paving abutting that has occurred at the bases of buildings should be remedied to prevent water ingress. These works should be undertaken to prevent further deterioration of building fabric and to minimise future costs associated with conservation and adaptive reuse of the buildings
- Update the Conservation Management Plan, which was completed in 2002. Circumstances relating to the site have changed in that time in terms of ownership, management and legislation, and reviewing the document is now advisable. The revised Conservation Management Plan should then be endorsed by the Heritage Council of New South Wales and Leichhardt Council;
- Undertaken more detailed studies for buildings of exceptional, high and moderate significance – a Conservation Management Plan or Conservation Management Strategy (minimum case) - to guide conservation and change for each building;
- Heritage Impact Statements to accompany development applications for adaptive reuse to buildings of exceptional and high significance;
- Future studies to be undertaken for landscape areas and planting of exceptional and high significance – Conservation Management Plan or Conservation Management Strategy (minimum case) - to guide conservation and change for each landscape component;
- Review existing studies relating to Aboriginal archaeology and heritage for the site and update as necessary;
- Develop guidelines for heritage components of the site's landscape and integrate these guidelines into overall site management;
- Develop appropriate overall management strategies for individual buildings and garden areas that acknowledge their heritage significance and control change;
- Devise an interpretation strategy for the site, which should include a policy for public art, naming and way finding;
- Initiate processes and strategies to protect fragile heritage components, such as rock carvings and Aboriginal relics.

Procedures for implementation

Implementation procedures should include:

- Adopting the Australia ICOMOS Burra Charter and NSW Heritage Branch guidelines and procedures as best practice for managing heritage at Callan Park;
- Adopting the endorsed Conservation Management Plan as the over-arching heritage management guideline for the Callan Park site;
- Review and update all heritage listings for the site;
- Preparing a development control plan for the site that appropriately incorporates heritage conservation issues;
- Developing an asset management plan that includes a Heritage Management Strategy;
- Clearly explain the heritage significance of the site and individual components of the site to all stakeholders;
- Incorporating individual conservation management plans or conservation management strategies for built and landscape items of exceptional or high heritage significance into leasing agreements;
- Establishing a mechanism to ensure that all works to significant buildings and landscape/garden items are undertaken under the jurisdiction of an acknowledged conservation practitioner with the

appropriate experience for the item concerned;

- Archive the site as a whole, including individual buildings and landscape items, and the relationships between these items.
- Archive buildings of exceptional, high and moderate heritage significance prior to undertaking work to them. Keep a copy of the record on site and lodge a copy with the local studies section of Leichhardt Library;
- Maintain a publicly accessible archive within the grounds that has the capacity to hold archaeological relics that are uncovered in the future;
- Undertake detailed archaeological assessments based on the recommendations included in the Conservation Management Plan;
- Review and revise the Callan Park Act to allow appropriate and sensitive new development, to expedite the successful management of the site and to accommodate the changes in uses and perceptions that will occur over time in a flexible manner;
- Engaging public artists to create works that acknowledge the interpretation strategy.

Staging considerations

Heritage priorities for staging are:

- Make buildings weather tight as a matter of priority;
- Review and endorse Conservation Management Plan;
- Prepare a Development Control Plan for the site once the Conservation Management Plan has been endorsed by the Heritage Council and Leichhardt Council
- Prepare an interpretation strategy for the place.
- These actions should form the basis for future heritage-related actions.

OVERLAY 04 ECONOMY

Scope

The scope of this system relates to the ongoing funding of activities on Callan Park by State and other groups and organisations. As discussed previously the Callan Park (Special Provisions) Act 2002 places controls on the ability to generate economic activity on Callan Park. These controls are related to the permissible uses as follows:

- Community uses must be on a not-for-profit basis
- Educational uses must be on a not-for-profit basis
- Health uses must can take place on either a for-profit or not-for-profit basis

Existing condition and situation

Based on the Master Plan terms, current understanding grounds and essential maintenance of derelict buildings are funded through a \$1.8 million dollar budget. We are unable to quantify the maintenance budget for individual leased and licenced buildings. The site currently generates approximately \$250,000 dollars of rental income from the NGOs located to the west of Wharf Road.

Objectives and Targets

The targets for the Master Plan are:

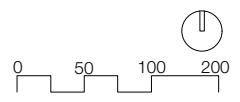
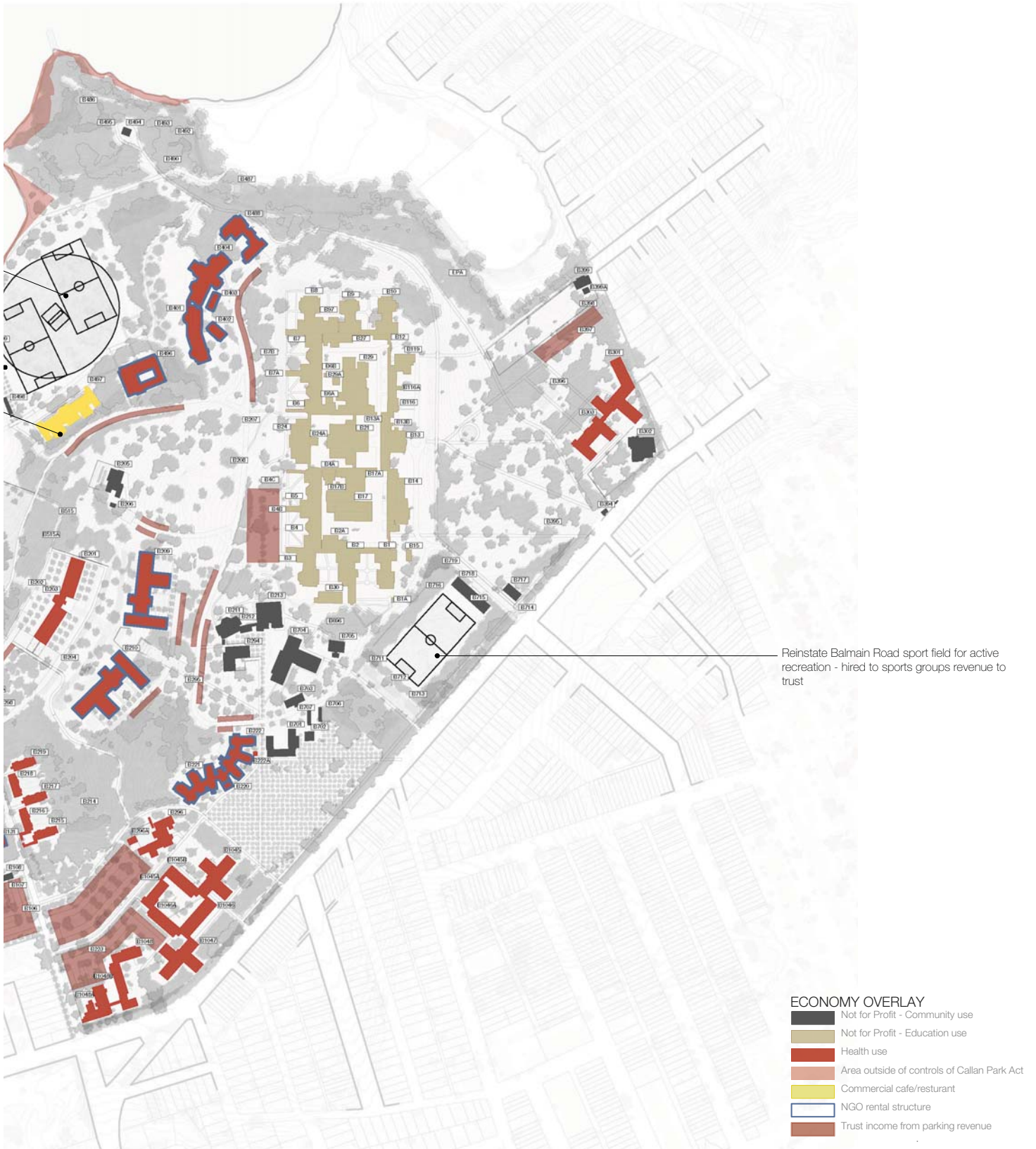
- To ensure the long term financial sustainability of Callan Park
- To ensure open, transparent and accountable management of income and expenditure by the Callan Park governance organisation
- To ensure Callan Park secures the Federal and State funding required to implement the Master Plan
- To maximise governance income generated through site leases
- To maximise governance income generated from other uses on Callan Park
- To work with local businesses and statutory authorities to ensure mutual benefit from the implementation of the master plan

Implementation

The Callan Park governance organisation will have ultimate responsibility for coordinating economic active. Within the structure of the governance organisation an accounts and legal team has been identified, the Governance overlay section later in this document provides further details.



ABOVE. Figure no. 64 Economy overlay



OVERLAY 05 ENERGY

Scope

This system relates primarily to the energy infrastructure on Callan Park providing power, heating and cooling to buildings and site structures. Much of the infrastructure will be below ground level although the inclusion of roof mounted panels for solar power generation and hot water supply will have a visual impact across Callan Park requiring careful integration.

Existing Situation

The condition of much of the sites power infrastructure is currently unknown. Power is provided through four on-site substations with high voltage links to the local Energy Australia network. Metering is centralised and maintenance is currently undertaken on an ad-hoc basis with work carried out in response to break downs in the system rather than as part of an on-going maintenance programme.

Objectives and Targets

The over arching objective of the Master Plan is to create a zero carbon park providing a high quality environment for its users and visitor and opportunities for education around sustainable living. The zero carbon targets will be achieved in the following ways:

- Though the refurbishment of existing buildings and the use of low energy fittings
- Through on-site power generation, Organic Photovoltaics (OPV) and Tri-generation
- Through the use of Solar Water Heating
- Through the purchase of electricity from green power providers
- Through continued education of visitors and users of Callan Park
- To use best practice heritage techniques when developing strategies for incorporating sustainability measures to exceptional and high significance heritage buildings
- Providing on-site recharge points for electric vehicles including the proposed electric shuttle bus
- Instigate building performance monitoring of energy use and production
- Achieve Carbon Neutral for Operational Energy by 2030

The strategy for achieving the target has been split into three main areas of implementation. The first will be to refurbish all existing buildings to reach minimum levels of compliance with regards to the latest BCA regulations and to assess each building on an individual basis to consider how the buildings can be further improved to operate at a higher level of energy efficiency. This may include implementing operable skylights for daylight penetration where possible to reduce reliance on artificial lighting.

Strategies for implementation

Sustainable Refurbishment of Existing Buildings

The initial step will be to target a 40% reduction in energy consumption compared to a base case scenario for energy consumption of typical existing buildings.

Strategies to achieve the target are as follows:

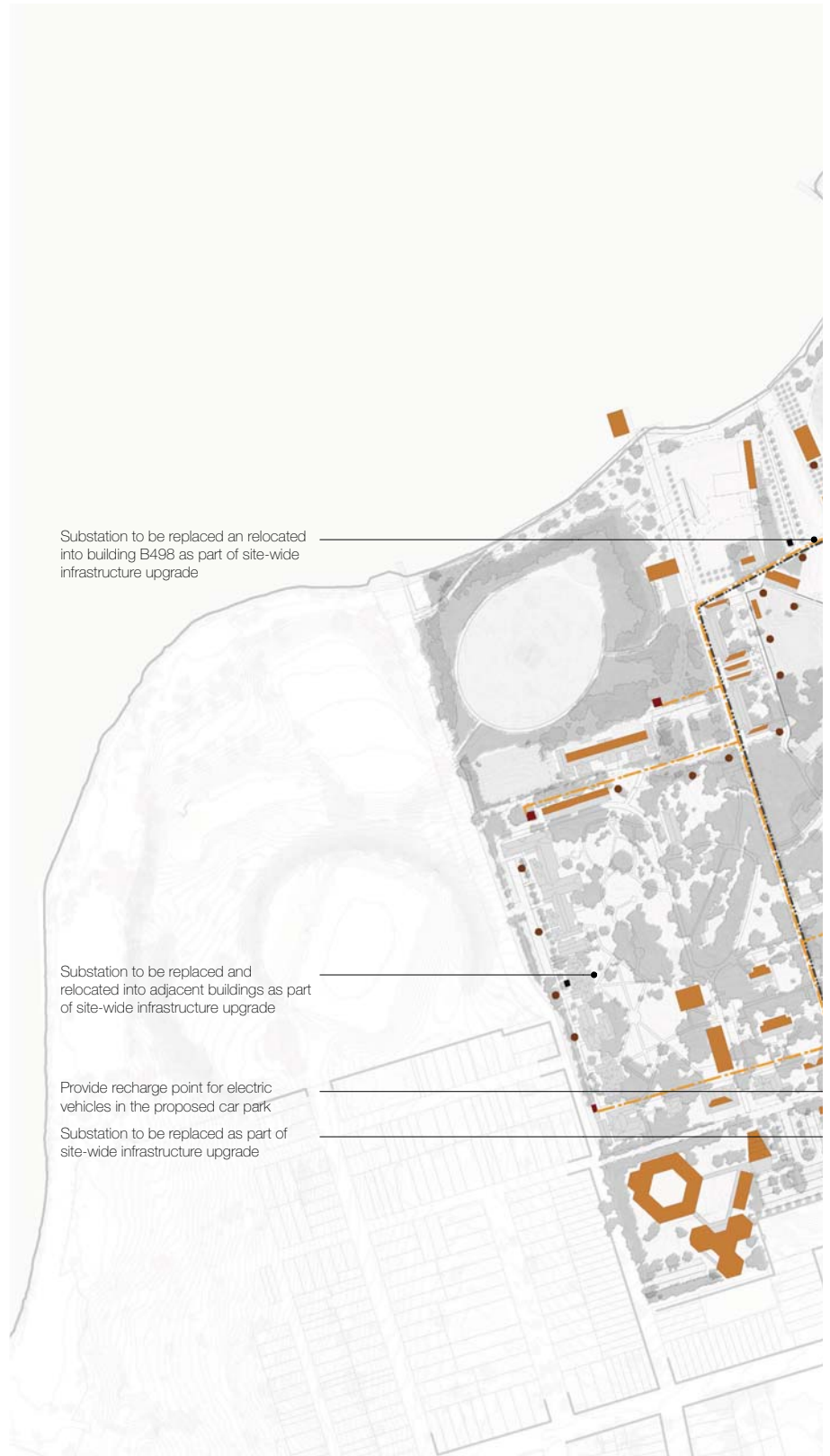
- Increased day lighting levels to reduce artificial lighting loads – reduce lighting power to 5 W/m²
- Mixed-Mode buildings and use of natural ventilation through operable façade and design for cross flow ventilation
- Ensure building envelope is optimised - building sealing and insulation

Low Carbon Energy Infrastructure

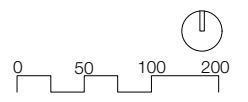
Buildings which will require cooling and heating due to the nature of the use of the building or during the peak climate conditions will need a fuel source of either electricity or gas. Gas is a less carbon intensive method of providing heating and cooling and a cogeneration system can be implemented to provide electricity at a higher level of efficiency with the by pass product of waste heat either used for heating or to drive absorption coolers for cooling purposes.

Site wide energy infrastructure strategies include:

- Combined Heat Power (CHP) utilising gas to produce electricity and utilise waste heat for hot water or for a Tri-generation scheme to run Absorption chillers which utilise low grade heat to produce chilled water.
- If we reduce the site wide building consumption by 40% through sustainable refurbishment we will require an area of 250 m x 250 m for PV panels to offset the remaining site wide energy requirements – this is a big area!
- The options for the site wide infrastructure are to implement a large



ABOVE. Figure no. 65 Energy overlay





scale central cogeneration system and distribute waste heat pipes for buildings to connect into or provide a gas ring around the site for smaller scale localised Tri-generation systems to serve buildings.

Each have advantages and disadvantages as discussed below:

Carbon Fund

The carbon fund scheme will need to be developed in conjunction with the government and site developer to build a fund for investing in low carbon technology. A management system will need to be put in place where annual reviews are conducted and every 2 years investments are made in a site wide low carbon technology or renewable energy scheme helping the overall site reach the carbon neutral operational energy target.

Grants

Further research at the time of design development will need to be conducted into grants available to the site development as these are subject to frequent change. Current grants applicable to the site depending upon the type of building and building users are:

- Green Building Fund
- Solar Schools Program
- PV Feed in Tariff Scheme (Solar Bonus Scheme – the tariff has recently been changed from 60 c/kwh to 20 c/kWh)
- Carbon Trust scheme to be released shortly.

Additional Studies:

The following is a selection of further studies which will need to be conducted in relation to developing the energy reduction strategy:

- Further research into the condition of existing buildings and focusing on indoor environmental quality
- Studies into behaviour change and how to implement and encourage energy efficient operation of buildings through educating building users across the site
- Site wide metering strategy and reporting/benchmarking systems to allow all the buildings on the site to be compared for building performance and highlight buildings which need further investment in reaching the overall site wide carbon neutral operational energy target

Community consultation

Project Principles

The energy overlay proposals respond to the following Project Principles:

- Governance
 - Ensure Callan Park is a world-leading model for social, environmental and economic sustainability.
 - Future Development of Health, not-for-profit community and not-for-profit education facilities at Callan Park
 - Ensure that community, health and education uses at Callan Park demonstrate a commitment to social, environmental and economic sustainability.

Sub Principles

The community feedback on the sub principles showed clear support for the installation and use 100% renewable energy infrastructure and the objective that Callan Park should target zero carbon emissions.

YourPlan Consultation

Consultation during stage four demonstrated principally supported sustainability because:

- It demonstrates Leichhardt Council's commitment to environmental sustainability
- The feedback on achieving all sustainability targets was that they should be achieved in the shortest time possible.
- In relation to the installation of panels [Solar Photo Voltaic and hot water] on heritage buildings the majority view was that best practice conservation processes should be employed to achieve solar panels in these situations.

TOP. The bootmakers Cafe and Callan Park Farm.

OVERLAY 06 FOOD

Scope

This system relates to the production and consumption of food at Callan Park.

Existing Situation

There is a long history of organised agriculture on Callan Park, from the kitchen gardens and livestock that supported the early gentleman's estates on the site to the community garden on Glover Street - Sydney's oldest. Glovers Community Garden is the only area of Callan Park that has any organised productive agricultural capacity and it is well subscribed.

There are currently no commercial stand-alone cafes or restaurants on Callan Park, although there is a cafe within the Sydney College of the Arts that is open to the public, and there are canteens within some of the larger organisations on Callan Park that cater for staff and people undergoing treatment within the NGO area.

Objectives and Targets

Promote the development of sustainable urban agriculture to benefit both the mental and physical wellness of park users. Objectives include:

- Creating opportunities for employment, education and participation for Mental Health Consumers across the urban agriculture projects on Callan Park
- Providing opportunities for community building with local residents
- Recognising the long history of food production on Callan Park and provide educational opportunities around sustainable living for the community
- Promotion of the best practice sustainable permaculture and organic or biodynamic food production principles

Implementation

The following actions for the Master Plan relate to food production and consumption on Callan Park:

- The establishment of Callan Park Farm
- The expansion of the Glover Street Community Garden
- The planting of a community agricultural or horticultural area on the Balmain Road frontage
- The provision of cafes and restaurants serving organic produce grown on Callan Park
- The development of capacity building links with local organisations that promote backyard and urban agriculture

Community consultation

Project Principles

The food overlay proposals respond to the following Project Principles:

- Governance
- Ensure Callan Park is a world-leading model for social, environmental and economic sustainability
- Preserving the Heritage Significance of Callan Park
- Ensure that the history of Callan Park is commemorated and documented on site
- Future Development of Health, not-for-profit Community and not-for-profit Education Facilities at Callan Park
- Encourage complementary health, community and educational uses to maximise synergies and benefits for the community
- Ensure that community, health and education uses at Callan Park demonstrate a commitment to social, environmental and economic sustainability

Sub Principles

The Master Plan Sub Principle that related to urban agriculture canvassed community support for growing sustainable crops on site for consumption in the park and this Sub Principle was well supported.

YourPlan Consultation

Public support for urban agriculture was strong, in particular opportunity for providing work, skills and participation opportunities for Mental Health Consumers and the potential for developing links between food production on site and in the surrounding community.

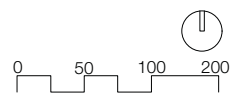


"Sustain" restaurant and a cafe in the restored established in B497 building providing training and employment opportunities for mental health services users

Refurbishment of the Bootmakers Workshop to Create the Bootmakers Cafe. Cafe to provide work opportunities for mental health services users and serve food produced on the Callan Park Farm

Glovers Community Garden to be expanded to site boundary to the west and to the edge of the proposed east west road in the south. Landscape buffer to be established around perimeter as visual screen

ABOVE. Figure no. 66 Food overlay



OVERLAY 07 GOVERNANCE

Scope

Governance is the activity of governing. It is the democratic process of decision making and administration that will ensure public expectations for the Callan Park site are enacted. The governance system enables the granting of power to a selected group who should be elected or appointed through a transparent process and are responsible for the management or leadership processes with respect to the site. The governance representatives also have a responsibility to verify performance and to ensure the corporate goals of the governing body are delivered. The corporate goals for the governing body should be tied to the Master Plan and Plan of Management for the site.

In the case of Callan Park the governing body must be a not for profit organisation to facilitate delivery of the objects of the Callan Park [Special Provision] Act 2002.

Existing Situation

Governance of Callan Park is currently splintered across a number of government and non-government groups. The 61 hectare Callan Park site is currently owned by the NSW Department of Health. NSW Maritime control a strip of land along the foreshore at Iron Cove. A range of leases have been granted by the Minister to various organisations including Sydney College of the Arts and the Writers Centre. A comprehensive schedule of the existing leases is contained in the master plan building asset register. Site maintenance and management is undertaken by at least four different groups including The Sydney Harbour Foreshore Authority [SHFA], NSW Department of Health, Sydney South West Area Health and some non government organisations including WHO'S. Limited coordination or sharing of information is undertaken between these groups.

Objectives and Targets

Delivery of the Callan Park Master Plan and Plan of Management requires the incorporation of an independent body that can operate at arms length from government. One of its main objectives will be to depoliticise decision-making processes so that implementation of long term actions and operations can be undertaken outside election cycles. Also the body needs to be able to negotiate with different tiers of government and various NSW State agencies as the Park provides both local and regional services.

The consultation work has identified that there is community demand for the body to function with public transparency and accountability. The Callan Park [Special Provision] Act 2002 requires any transfer of management for buildings to either Council or a Trust. That means that the governance model must be either a Trust or Council run body.

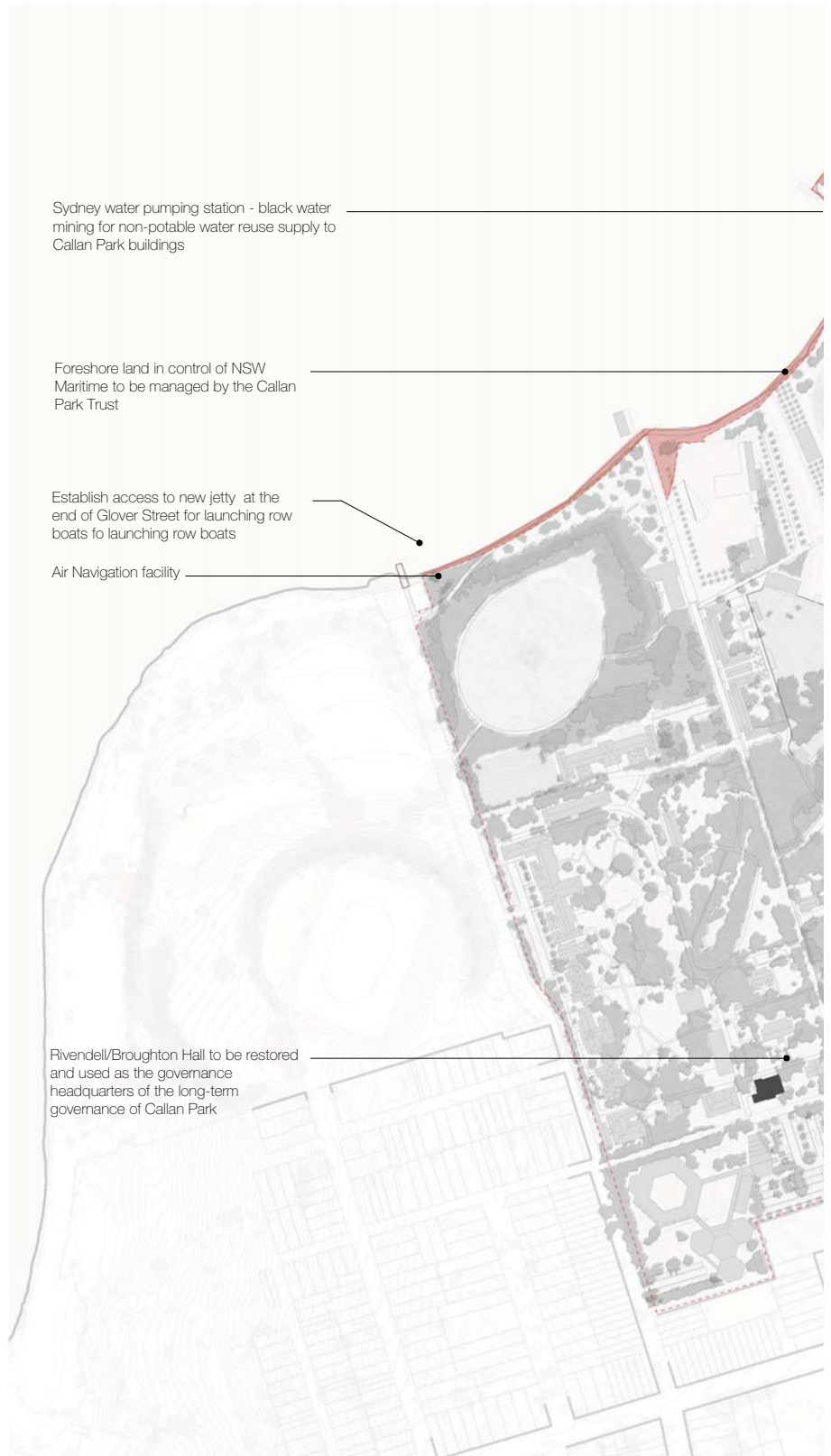
Due to the inter governmental complexity, mix of uses, building and infrastructure restoration costs and size of the Callan Park project it would be prudent to adopt a Trust model. The governance model should make a complimentary fit to the other NSW Government Park Trusts inside the Communities NSW, Sport Recreation and Parklands Cluster.

Implementation

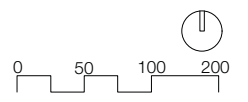
The proposed governance model for Callan Park is a State owned Trust under the jurisdiction of the Director-General, Communities New South Wales inside the Sport Recreation and Parklands Cluster. The proposed Callan Park Trust would be located alongside existing state bodies in the cluster including, Illawarra Venues Authority, Parramatta Stadium Trust, Hunter Region Sporting Venues Authority, Centennial Park And Moore Park Trust, Parramatta Park Trust, Western Sydney Parklands Trust and Sydney Olympic Park Authority. Alternatively it may be located inside the Community Development Cluster.

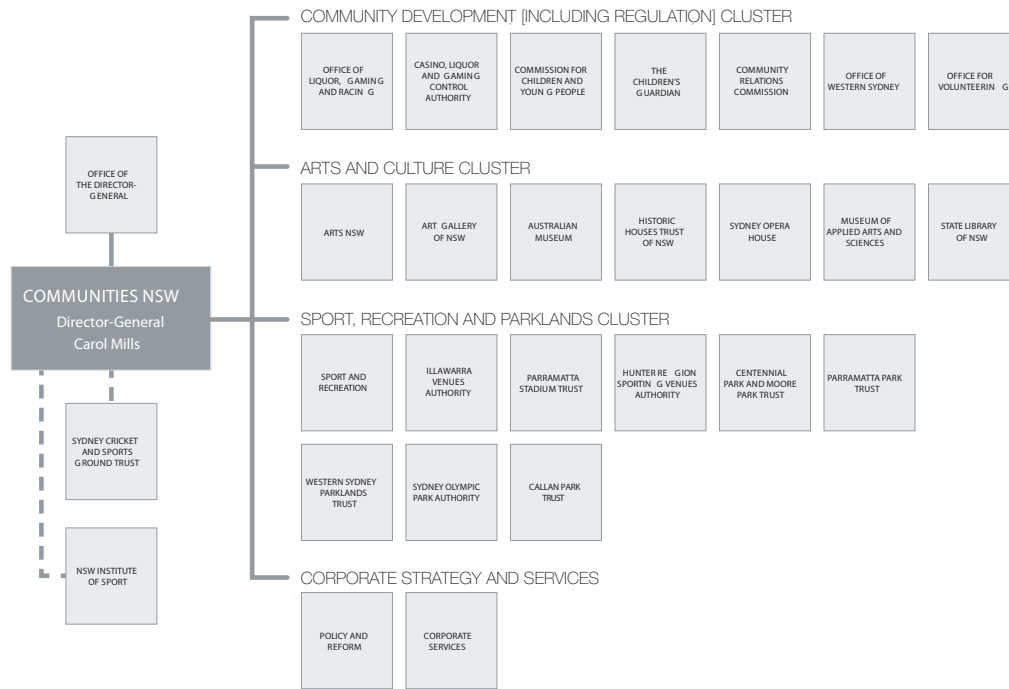
The Callan Park NSW Government Trust will be required to:

- Implement the Callan Park [Special Provision] Act 2002 and the Callan Park Master plan 'Wellness Sanctuary' together with the Plan of Management across the entire 61 hectare site area
- Act as a not-for-profit financial vehicle for capturing and reinvesting revenue
- Attract and manage revenue streams while containing cost to create a long term sustainable bottom line
- Publish transparent financial reports that can be assessed against corporate objectives
- Manage buildings as required by the Callan Park [Special Provision] Act 2002
- Manage complex inter-governmental jurisdictions between Federal, NSW and Local Government agencies across health, education and community services.
- Utilise accepted models for similar sites such as; Centennial



ABOVE. Figure no. 67 Governance overlay





- Incorporate democratic community and Leichhardt Council representation
- Undertake security, maintenance and project delivery operations across the 61 hectare site
- Assemble and control a multidisciplinary management and operations team
- Effectively manage the Callan Park cultural and natural heritage
- Manage the cost of maintaining ageing assets, including buildings and infrastructure, as well as the landscape and significant trees
- Ensure no future sub-division of the site occurs
- Act as the single body responsible for decision making at Callan Park

The key mandate of the Board will be to implement the Callan Park [Special Provision] Act 2002 and the Callan Park Master Plan 'Wellness Sanctuary' together with the Plan of Management. It is proposed that the Trust be operated by a Chief Executive reporting to a Board of six Directors. Two advisory panels would be established covering Mental Health and Community Representation and each would elect and appoint a chair that would in turn be a Trust Board member. These panels will require a formal governance structure and regulation of operation. Three other Board members would be appointed by the NSW Government. The General Manager of Leichhardt Council would also be a Board member. Including the Chief Executive, the Board would consist of a total of seven members.

Park operations would be conducted through six primary directorates, each led by a Manager reporting to the Chief Executive and Board of Directors. Three directorates being Health, Education and Community are included in accordance with delivering the objects of the Callan Park [Special Provision Act 2002]. An additional three directorates are included in line with similar Trusts in NSW.

Advisory Panels

The chair of each advisory panel from, the Mental Health Advisory Panel and Community Advisory Panel would provide strategic advice to the Board, assisting in measuring and monitoring the Trust's performance against the Master plan, Plan of Management and corporate business strategy.

Mental Health Advisory Panel

The mental health panel would consist of an executive committee, eminent chair person well qualified in mental health, and general community membership. The panel would canvas broad representation including; various stakeholders, mental health consumers and carers, health professionals, government health experts, mental health community groups and interested members of the general community.

The chair and executive committee would have the capacity to establish a set of standing committees from the general membership

to provide it with specialist advice in a number of key areas [e.g. a consumer advisory committee, a government liaison committee, a quality evaluation committee, etc]. The panel would provide external advice to the Trust Board on daily operational matters concerning the mental health services across the site. The Chair would be a member of the Trust Board.

Community Advisory Panel

The community panel would consist of an executive committee, eminent chair person well qualified in local issues, and general community membership. The panel would canvas broad representation including; various stakeholders, special interest groups and interested members of the general community.

The chair and executive committee would have the capacity to establish a set of standing committees from the general membership to provide it with specialist advice in key areas. The panel would provide external advice to the Trust Board. The Chair would be a member of the Trust Board.

Directorates

Health Services

Led by an Operations Manager, Health Services will coordinate communications across the various mental and physical health service providers on the site. It will ensure that facilities are efficiently shared and managed to obtain the most effective benefits to the site users and mental health consumers. Valuing the primacy of mental health services provision, the directorate will engage with the site tenants to foster and facilitate the delivery of site wide health programs.

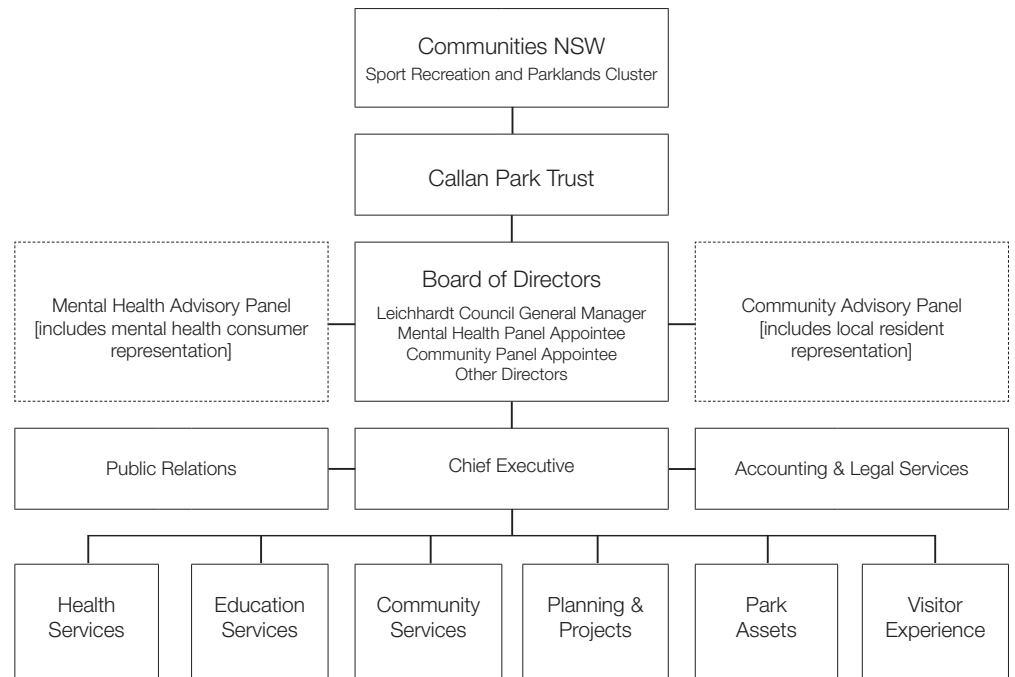
Education Services

Led by an Operations Manager, Education Services will coordinate communications across the various education providers on the site. It will ensure that teaching facilities are efficiently shared and managed to obtain the most effective benefits to the site users. Valuing the primacy of mental health services provision the directorate will engage with the site tenants to foster and facilitate cross site education programs. As an existing site tenant, Sydney College of the Arts will be a valued partner and their art programs can be integrated into vocational training programs for people with mental illness.

Community Services

Led by an Operations Manager, Community Services will coordinate communications across the various community services providers on the site. It will ensure that community facilities are efficiently shared and managed to obtain the most effective benefits to the site users. Valuing the primacy of mental health services provision the directorate will foster and facilitate programs designed to unite the community. The cultural cluster and sports and recreation facilities will form a major part of the remit of this directorate.

TOP. Figure no. 68 Location of Trusts within NSW Government structure.



Planning and Projects

Led by a Design Manager, Planning and Projects will enable and deliver significant capital works and other major projects of long-term importance. It also will manage a range of stakeholder issues. The directorate will be tasked with selecting the design excellence panel of emerging architects that will form the group from which building restorations and adaptive reuse project designers will be selected. The directorate will seek advice from the Master Plan team on ongoing planning, design and implementation issues to ensure the Master Plan is delivered according to the Plan of Management actions.

Park Assets

Park Assets will be closely aligned with the Planning and Projects directorate and will manage the maintenance and presentation of the physical fabric of the Park. Its remit includes management of the landscape, buildings, sustainability programs and services infrastructure. It also is responsible for site security and surveillance.

Visitor Experience

Visitor Experience will manage the Trust's venue services, events, visitor programs and its marketing and communications strategies. It will work closely with the public relations department. It will have an objective to integrate the needs of mental health consumers and the community.

Statutory Review of the Master Plan

Ingham Planning

Discussion of Legislative Framework

The main legislation that is relevant to the Master Plan and all future planning of Callan Park is the Callan Park (Special Provisions) Act 2002 (the Callan Park Act) which commenced on 24 December 2002.

This site specific Act provides the framework for a very clear vision for the site. The long title of the Callan Park Act describes its purpose well: 'An Act to preserve the public ownership of Callan Park; to protect its current features and restrict its future use; and for other purposes.'

The Callan Park Act determines how the site is to be used and managed. It limits permitted land use on the site to health, community and education facilities. Further community and education facilities must provide services on a 'not-for-profit' basis.

The Callan Park Act also describes how land should be leased and includes controls building envelopes, floor area and retention of existing open space.

The Callan Park Act requires that the environmental planning instruments that apply to the site are those that existed immediately before the Act commenced on 24 December 2002. The primary environmental planning instruments that are so 'frozen in time' are:

- State Environmental Planning Policy 56 – Sydney Harbour Foreshores and Tributaries (SEPP 56) which requires a Master Plan approved by the Minister for Planning before development consent can be granted;
- Sydney Regional Environmental Plan No 22 – Parramatta River (SREP 22); and
- Leichhardt Local Environmental Plan 2000 (the LEP).

Callan Park is a State Heritage item and the Callan Park Act specifically notes that The Heritage Act 1977 applies to the site.

The subject Master Plan has been prepared in accordance with the requirements of SEPP 56 as detailed below. Once the final Master Plan has been adopted, SEPP 56 requires that it be considered prior to granting of development consent and that the development be consistent with the Master Plan.

Table no. 56 on the following pages demonstrates that the Callan Park Master Plan is consistent with the requirements of the legislative framework. However it is noted that this legislation will also apply to any development application submitted for Callan Park. In this regard it is recommended that Council prepare a guideline document for the preparation of development applications for Callan Park so that applicant's have a clear understanding of the relevant planning considerations and processes that are relevant to the future use and management of the site.

TOP. Figure no. 69 Proposed organisational structure of the Callan Park Trust.

Relevant Legislation	Comment
Callan Park (Special Provisions) Act 2002	
4 Objects of Act	Stage 2 and Stage 3 of the Master Plan report discuss the manner in which the Principles and Sub Principles have been developed from the objects of the Act. All aspects of the Master Plan are consistent with these objects and all future development will also have to demonstrate consistency with these objects as required by Section 7(8) of the Act.
5 Callan Park not to be sold or otherwise disposed of	The Master Plan does not propose any sale of the land however it does envisage lease of parts of the site in accordance with the requirements of the Act. This matter is addressed in the draft Plan of Management that has been prepared.
6 Leases, licences and management agreements	The manner in which it is proposed to manage the site including granting of leases is discussed in the draft Plan of Management that has been prepared.
7 Development at Callan Park restricted	In accordance with the requirements of this section: The Master Plan acknowledges that Leichhardt Council will be the consent authority for all development applications; <ul style="list-style-type: none"> - all of the uses proposed in the Master Plan fall within the definitions of health facilities, community facilities or educational facilities as required. This is discussed in detail in Stage 4 of the Master Plan report. In terms of the requirement that community facilities and educational facilities must provide services on a not-for-profit basis, the uses proposed in the Master Plan can be provided on this basis, however each specific proposal will need to demonstrate consistency with this requirement when a development application is submitted for Council's consideration; - no retirement villages are proposed by the Master Plan; - no SEPP 5 housing is proposed by the Master Plan, however the ability to provide some accommodation is included where it is ancillary to the provision of health facilities; - the Master Plan does not provide for any new buildings outside existing building envelopes. The Council's interpretation of building envelopes is discussed in Stage 4 of the Master Plan report; - the Master Plan provides for an increase in the existing open space on the site of around 1 ha. In order to remain compliant with the Act in this regard, development will need to be staged to ensure that any new development does not diminish the overall open space on the site. The issue of staging is discussed in the Plan of Management that has been prepared; - the Master Plan provides for a decrease in the existing floor space on the site by approximately one hectare. In order to remain compliant with the Act in this regard, development will need to be staged to ensure that any new development does not increase the overall floor space on the site. The issue of staging is discussed in the Plan of Management that has been prepared; - the development proposed in the Master Plan will not adversely affect Broughton Hall Garden, Charles Moore Garden or Kirkbride Garden and in fact will enhance their heritage significance.
Heritage Act 1977	The Act applies to the site as it is listed on the State heritage register. There are no specific provisions of the Act of relevance to the Master Plan however, the Master Plan is not inconsistent with any of its general requirements. The main relevance of this Act will be to development applications, which, depending on what is proposed, will need the agreement of the NSW Heritage Council through the 'integrated development' provisions of the Environmental Planning and Assessment Act 1979.
7 Guiding principles	Pursuant to Clause 17(2) of SEPP 56, a Master Plan must explain how the guiding principles are addressed.
(a) increasing public access to, and use of, land on the foreshore,	The Master Plan significantly improves public access to the foreshore and the ability to use this area.
(b) the fundamental importance of the need for land made available for public access, or use, on the foreshore to be in public ownership wherever possible, particularly land that is within the foreshore area as defined in the Sydney Harbour Foreshore Authority Act 1998,	The Master Plan proposes that the land will remain in public ownership and will remain accessible to the public.
b1) if public ownership of foreshore land is not possible, the use of appropriate tenure mechanisms to safeguard public access to, and public use of, that land and to ensure the rights of public authorities to determine the design of, use of, and amenities on, the land over time,	NA
(c) the retention and enhancement of public access links between existing foreshore open space areas,	The Master Plan proposes links throughout the site and to adjoining areas that will improve public access to the foreshore
(d) the conservation of significant bushland and other natural features along the foreshore, where consistent with conservation principles, and their availability for public use and enjoyment,	The Master Plan includes the retention of existing significant bushland areas and will result in significant improvement to quality through weed removal and bush regeneration.
(e) the suitability of the site or part of the site for significant open space that will enhance the open space network existing along the harbour foreshores,	The Master Plan proposes to increase the overall open space on the site and enhance its usability.
(f) the protection of significant natural and cultural heritage values, including marine ecological values,	The Master Plan will respect the natural and cultural heritage values as discussed in Stage 4 of the Master Plan report.
(g) the protection and improvement of unique visual qualities of the Harbour, its foreshores and tributaries,	The Master Plan provides to the removal of intrusive elements in the setting of the site and will protect and enhance the visual quality of the Harbour and its foreshore.
(h) the relationship between use of the water and foreshore activities,	The Master Plan provides for improved relationships between foreshore activities and the water including increased public access by the removal of intrusive buildings and providing foreshore boardwalks and jetties.
(i) the conservation of items of heritage significance identified in an environmental planning instrument or subject to an order under the Heritage Act 1977,	The Master Plan includes retention of all significant heritage on the site and proposes removal of intrusive elements on the site that detract from its heritage significance. This is discussed in further detail in Stage 4 of the Master Plan Report.
(j) the scale and character of any development, derived from an analysis of the context of the site,	All new buildings must be located within existing building envelopes, ensuring that the scale and character of development on the site is retained.

FULL SPREAD. Table no. 56 Statutory review of the Final Master Plan.

(k) the character of any development as viewed from the water and its compatibility and sympathy with the character of the surrounding foreshores,	Compliance with the requirements of the Callan Park Act will ensure that the Master Plan proposals will have appropriate character. This will be further assessed as part of any development application submitted.
(l) the application of ecologically sustainable development principles,	The Master Plan is highly supportive of the principles of ESD as discussed in detail in Stages 4 and 5 of the Master Plan report.
(m) the maintenance of a working-harbour character and functions by the retention of key waterfront industrial sites or, at a minimum, the integration of facilities for maritime activities into development and, wherever possible, the provision of public access through these sites to the foreshore,	The Master Plan proposes the reintroduction of a ferry wharf on the site which will contribute to the harbourside character.
(n) the feasibility and compatibility of uses and, if necessary, appropriate measures to ensure coexistence of different land uses,	The uses proposed in the Master Plan have been carefully selected to achieve the best overall land use planning outcome for the site.
(o) increasing opportunities for water-based public transport.	As noted above the Master Plan includes the provision of a ferry wharf.
Part 3 State significant development (land in Schedule 1)	The site is referred to as 'Rozelle Hospital' in Schedule 1 and accordingly this part is of relevance to the site.
11 Requirement for master plans	This clause forms part of Part 3 and as the site is identified in Schedule 1, a master Plan is required before development consent can be granted. Further in assessment of a development application the consent authority must consider the Master Plan and ensure that the proposal is consistent with the Master Plan.
15B Control of subdivision	This clause relates to the subdivision of public domain areas. The Master Plan does not propose any subdivision of the site.
Part 5 Master plans (land in Schedule 1 or Schedule 2)	As noted above the site is identified in Schedule 1 and as such a Master Plan is required.
17 Nature of master plans	Pursuant to this clause, the Master Plan outlines provisions relating to the development of the land and contains an assessment of the Guiding Principles of SEPP 56 (as detailed above) and other relevant environmental planning instruments.
18 Requirement to prepare master plan	Pursuant to this clause, the Master Plan relates to the whole of the 'Rozelle Hospital' site.
19 Preparation of master plans	Pursuant to this clause, the Master Plan has been prepared on behalf of Leichhardt Council and includes information to illustrate and explain the proposals relating to: (a) design principles drawn from an analysis of the site and its context (see discussion in Stages 2 and 3 of the Master Plan report); (b) phasing of development (see discussion in the Plan of Management that has been prepared); (c) distribution of land uses including foreshore public access and open space (see Built Form Overlay that forms part of the Master Plan and the discussion in Stages 4 and 5 of the Master Plan report); (d) pedestrian, cycle and road access and circulation networks (see the Transport Overlay that forms part of the Master Plan and the discussion in Stages 4 and 5 of the Master Plan report); (e) parking provision (see the Transport Overlay that forms part of the Master Plan and the discussion in Stages 4 and 5 of the Master Plan report); (f) subdivision pattern (no subdivision is proposed); (g) infrastructure provision (see the Energy, Water and Transport Overlays that form part of the Master Plan and the discussion in Stages 4 and 5 of the Master Plan report); (h) building envelopes and built form controls (see the Built Form Overlay) It is noted that these matters are strictly controlled by the provisions of the Callan Park Act and that all proposals will be consistent with these requirements); (i) heritage conservation, implementing the guidelines set out in any applicable conservation policy, and protection of archaeological relics (see the Cultural Overlay that forms part of the Master Plan and the discussion in Stages 4 and 5 of the Master Plan report); (j) remediation of the site (see Pollution Overlay that forms part of the Master Plan, the discussion in Stage 1 of the Master Plan report and the Plan of Management); (k) provision of public facilities (see the Overlays that form part of the Master Plan and the discussion in Stages 4 and 5 of the Master Plan report); (l) provision of open space, its function and landscaping (see the Overlays that form part of the Master Plan and the discussion in Stages 4 and 5 of the Master Plan report); (m) the impact on any adjoining land that is reserved under the National Parks and Wildlife Act 1974 (Not applicable).
Sydney Regional Environmental Plan No 22 – Parramatta River (SREP 22)	It is noted that whilst this SREP has now been repealed, it remains relevant to Callan Park as the Callan Park Act 'freezes in time' the relevant environmental planning instruments to those that applied on 24 December 2002. The Master Plan is not inconsistent with any of the requirements of SREP 22 however any development application lodged will have to have regard to the provisions of this SREP. Further there are consultation requirements for 'development control guidelines' (such as a Master Plan) and for Plans of Management, which will need to be considered as part of the consultation and approval process for the Master Plan and Plan of Management.
Leichhardt Local Environmental Plan 2000 (LEP 2000)	It is noted that whilst LEP 2000 is still in force as the Callan Park Act 'freezes in time' the relevant environmental planning instruments to those that applied on 24 December 2002, the version of LEP 2000 that applied at that time is relevant to Callan Park. The Master Plan is not inconsistent with any of the requirements of LEP 2000 however any development application lodged will have to have regard to the provisions of this SREP. In terms of the uses permitted in the Public Purpose Zone which applies to the site under LEP 2000, the uses proposed in the Master Plan fall within those uses permitted in the zone being specifically: car parking, community facilities, community gardens, educational establishments, hospitals (which includes a wide range of professional health care and ancillary services), passenger transport terminals, public amenities, public buildings, public transport stops, recreation facilities, roads, demolition.
Other environmental planning instruments	Other environmental planning instruments that were in force at 24 December 2002 will apply to Callan Park. However these are of limited relevance to the Master Plan but may be of greater relevance to any development application submitted.

OVERLAY 08 HEALTH

Scope

As the major prescribed use under the Callan Park [Special Provisions] Act 2002 mental health provides the most opportunity for returning the site for highest community benefit. The 'Wellness Sanctuary' concept developed by the community combines mental and physical services in a modern far reaching way. The mental health framework for the project was developed by Professor Vaughan Carr in conjunction with the design team.

Existing Situation

Since the closure of Rozelle Hospital there have been no state operated public health facilities on Callan Park other than NSW ambulance and nursing accommodation. A number of NGO organisations occupy buildings under the management of NSW Health and SSWAHS. NSW Ambulance also have their regional headquarters on Callan Park and use these buildings for a range of operational and response activities.

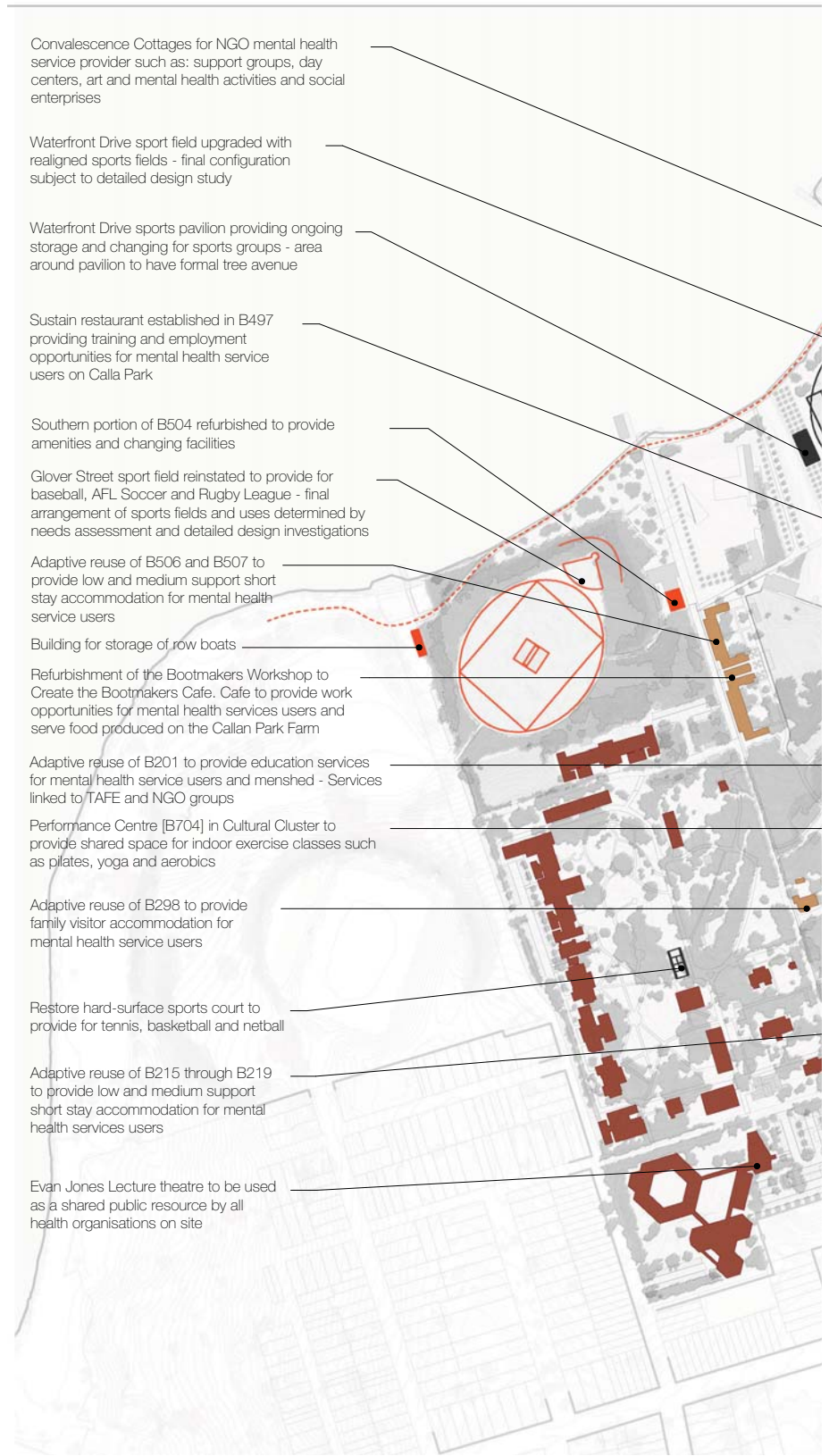
Objectives and Targets

As set out in stage four of the community consultation the shared vision for Callan Park is a 'Wellness Sanctuary, bridging the gap between acute care and home life for those with mental illness, and contributing to the mental, physical and social health of the entire community. The key objective is to deliver a Master Plan that fulfils the 'Wellness Sanctuary' concept

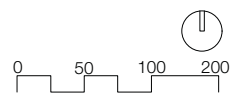
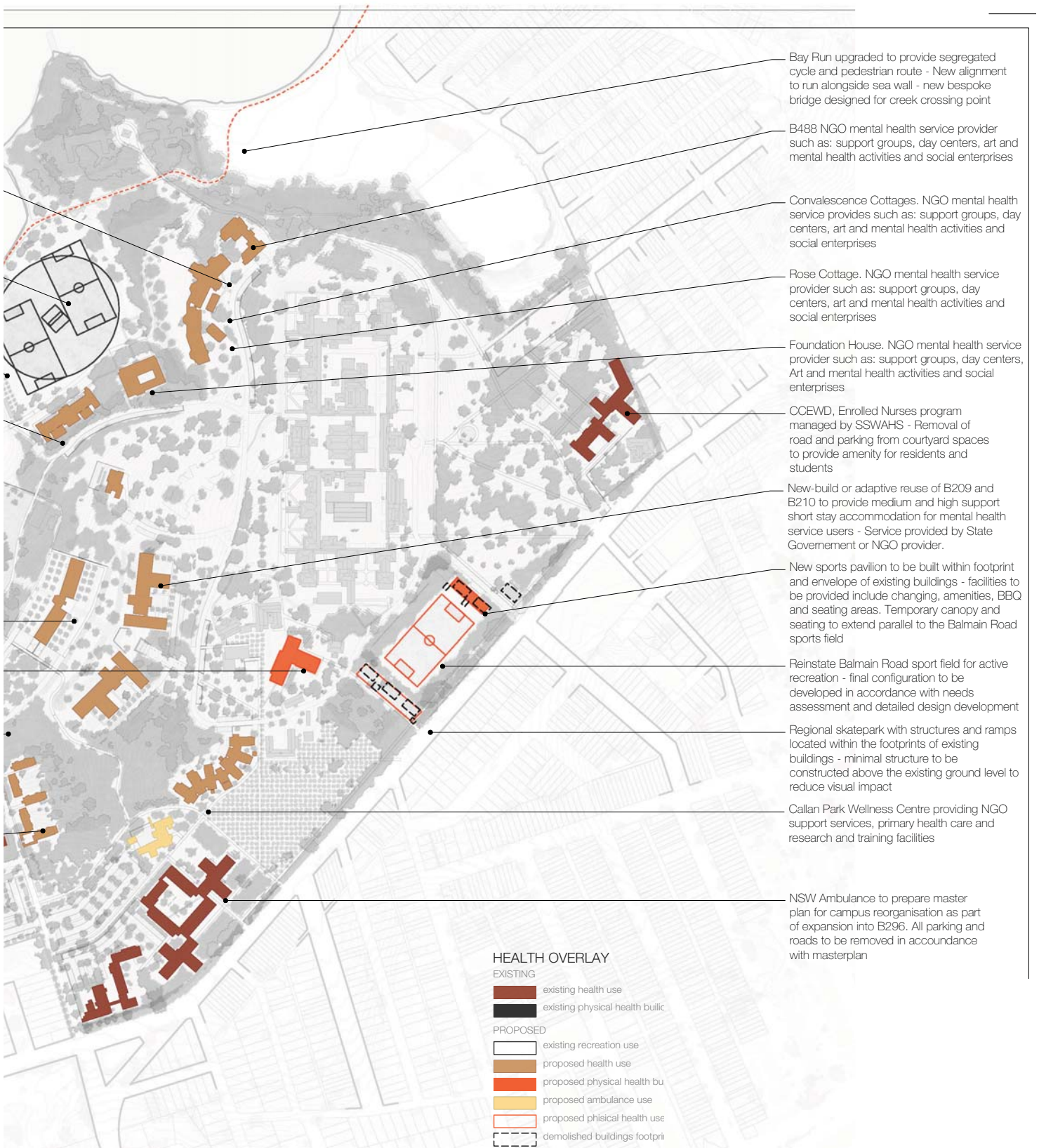
Implementation

The following recommendations relate to health services on Callan Park:

- Establishment of a governance group for the mental health services on Callan Park that coordinates all related activities and has representation from Mental Health Consumers, carers and clinical professionals
- The development of a charter that makes a commitment to providing employment and training opportunities for Mental Health Consumers within organisations operating from Callan Park
- To work with the cultural stakeholders on Callan Park to develop a national centre to promote the linkages between Art, Mental Health and Wellbeing, including an international artist in residency programme that focuses on 'outsider art' and artists that explore issues of mental health in their work.
- To work with the local sports groups and organisations to develop programmes for Mental Health Consumers
- Creation of a Mental Health and Community Wellness Centre providing a range of services such as, peer support, primary care, psychiatric evaluations and lifestyle support
- To work with Aboriginal groups to establish how targeted mental health services can be provided on Callan Park.
- Development of an independent research and training organisation within the Mental Health and Community Wellness Centre to monitor and evaluate the various treatment programmes and facilities provided to the Mental Health Consumers
- Creation of a Vocational skills centre and education services for Mental Health Consumers with a TAFE link to provide accreditations and a Men-shed facility.
- To provide opportunities for Mental Health Consumer led social enterprises on Callan Park under the remit of a for-profit health use
- To provide a range of non-acute voluntary accommodation options for Mental Health Consumers, their families and carers on a short term basis with a suite of accommodation to cater for various levels of independent living
- To work with NSW Ambulance for a detailed campus Master Plan consolidating parking and services on their existing site
- To refurbish the existing Waterfront Drive playing fields
- To reinstate playing fields on Glover Street and Balmain Road working with local sports groups to determine the best future configuration and access arrangements based on a 25 hour weekly sporting calendar
- To provide purpose built amenities adjacent to the Balmain Road Sports field and upgraded amenities adjacent to the Glover Street Oval sports fields
- To work with the local community and stakeholders to design and build a regional skate park adjacent to the Balmain Road sports field with structures set below the existing ground level and constructed within the footprints and envelopes of the existing building
- To undertake detailed design studies to upgrade the existing Bay



ABOVE. Figure no. 70 Health overlay



- Run as a segregated pedestrian and cycle pathway
- To provide indoor space for exercise classes such as yoga, pilates and aerobics
- To work with NSW Health to remove parking and reorganise the external spaces around the nurses training buildings.
- To exhibit movable heritage items related to Mental Health within the Callan Park Museum at Bonny View Cottage

Mental Health Framework

Professor Vaughan Carr

Background

The development of Callan Park to include the reinstatement of mental health services provided an extraordinary opportunity to help address some acknowledged gaps in current mental health services. The challenge was to develop a mental health concept for Callan Park based on established guidelines and policies for mental health care and that complemented existing services while acknowledging the challenges faced by mental health consumers, their families, friends and carers, and promoting a synergy with existing and potential activities on Callan Park. It was recognised that this would best be achieved by asking various stakeholders, including mental health professionals, NGOs, mental health consumers and their families, friends and carers as well as other members of the community, to voice their opinions and outline their vision for mental health services on Callan Park.

In response to a mental health discussion paper outlining the various opportunities for developing mental health services at Callan Park, the master planning team received in excess of 20 submissions from various stakeholders stating their views on mental health service provision at Callan Park. The submissions identified service gaps in the promotion of recovery and wellness following an acute episode of illness. They endorsed the development of services to facilitate health and wellbeing, social connection and participation in meaningful activity. From these submissions a concept for mental health services was developed and presented for further feedback at a community workshop.

The Plan

The concept for mental health services at Callan Park comprises of five elements that aim to address the gaps in service provision. These include:

- Vocational and social - This element aims to promote participation in meaningful activity. It includes job-readiness skills training, TAFE training programs, job skills and vocational training; cooperative and commercial enterprises, including consumer run enterprises, which offer both employment and training opportunities; supplementary training programs, including cognitive remediation, cognitive-behavioural therapy, and social skills training. It also offers opportunities for social engagement, relationship building and improving living skills.
- Information and support - This element aims to provide information and support to consumers and their families, friends and carers as well as the general public. It includes the provision of electronic and paper-based information on mental illness, web-based family/carer psycho-education and coping skills programs backed up by email and telephone support. It also includes individual advocacy, a mental health museum and memorial space, and peer and consumer worker training.
- Health and lifestyle - This element aims to promote and support physical wellbeing in consumers, which is often neglected. It includes a primary care clinic to assess, treat and monitor physical health problems, dietary assessment and advice/assistance for healthy eating, physical fitness assessment and advice/assistance in training and exercise, smoking cessation programs, drug and alcohol treatment programs and sporting, recreational and creative arts activities.
- Residential - This element aims to address the lack of transitional, supported accommodation that provides an opportunity to address individual consumer early intervention and recovery needs in a supported environment. It provides an opportunity for diagnostic re-evaluation and clinical re-assessment, stabilisation of treatment and monitoring of response, special investigations or therapeutic procedures, initiation of new treatments and intensive rehabilitation accessing on-site services. It could encompass a spectrum of levels of time-limited, short-to-medium stay non-acute accommodation for people accessing on-site services, including no/low support, hostel or serviced apartment style accommodation, medium support HASI-style temporary accommodation for those requiring some supervision, and high support in a more traditional sub-acute hospital-style facility.
- Education, training and research - The aim of this element is to improve interventions for consumers. This would be achieved through education and training sessions for a range of medical, health and mental health professionals. It also includes a research facility to systematically evaluate, through scientific investigation, the effectiveness of innovative treatments and rehabilitation interventions provided on the site.



BOTTOM. Memorial to mental illness at Veterans Field.

Functioning

To ensure that an individual plan is developed to address each consumer's unique recovery needs a potential entry procedure has been proposed. Specifically, a consumer could be referred to access mental health services on Callan Park from any external source including NGOs, public acute/hospital services, private practitioners [GP, psychiatrist, psychologist] or community mental health teams; self referrals would also be accepted. All referrals would be made to an intake and personal planning unit that assessed the consumer's needs by liaising with the referring agent and listening to the concerns and requests of the consumer. An individualised intervention plan would then be developed and initiated within the framework of the five elements of the service. On return to the community a continuing recovery plan would be developed and discussed with the consumers, their clinicians and support people to ensure continued recovery in the community setting.

Governance

The mental health panel would consist of an executive committee, eminent chair person well qualified in mental health, and general community membership. The panel would canvas broad representation including; various stakeholders, mental health consumers and carers, health professionals, government health experts, mental health community groups and interested members of the general community.

The chair and executive committee would have the capacity to establish a set of standing committees from the general membership to provide it with specialist advice in a number of key areas [e.g, a consumer advisory committee, a government liaison committee, a quality evaluation committee, etc]. The panel would provide external advice to the Trust Board on daily operational matters concerning the mental health services across the site. The Chair would be a member of the Trust Board.

Implementation of the concept

It is proposed that an implementation steering committee be established. It should have a composition similar to that of the governing board. The tasks of this committee would be fourfold. First, develop a more detailed articulation of the mental health services plan for Callan Park with the aim of precisely operationalising and costing the provision of the five elements outlined above. This would include planning and costing both the capital development/refurbishment on site and the recurrent costs of personnel. Second, identify the potential sources of funding for both capital development/refurbishment and recurrent costs, and then secure funding commitments where required from appropriate sources. Third, develop a staged implementation plan with clear milestones within a realistic time frame. Fourth, draw up terms of reference for the governing board, identify suitable members of the board, and disband the implementation steering committee when the governing board has been established. The board would then assume responsibility for making the appointments of key personnel and for the establishment of the proposed services on the site

Community consultation

The community comments on both the mental health and active and passive overlays of the Draft Master Plan received wide support, and although there was still some divergence of views on some of the individual components of the mental health overlay there was consistent support for the reinstatement of critical mental health services on Callan Park.

Project Principles

The health overlay proposals respond to the following Project Principles:

- Future Development of Health, not-for-profit Community and not-for-profit Education Facilities at Callan Park.
- Ensure that Callan Park develops as a place for strengthening and restoring mental health and community wellness.
- Encourage complementary health, community and educational uses to maximise synergies and benefits for the community.
- Ensure a focus on wellbeing with an equitable balance of health, community and educational uses at Callan Park.
- Ensure that community, health and education uses at Callan Park demonstrate a commitment to social, environmental and economic sustainability.
- Public Access to open space that offers active and passive recreation.
- Ensure an equitable balance between passive and active recreation to contribute to community health and wellbeing.

Sub Principles

A number of the Sub Principles offered choices related to mental and physical health. The community showed support for health, community, education, non-acute care, wellness and making Callan Park

recovery oriented.

The Wellness Sanctuary concept with its focus on health and wellbeing addresses these Sub Principles and provides opportunities across Callan Park to further these objectives.

YourPlan Consultation

The overlays and options associated with health and wellbeing received high visitation and strong endorsements. The role of mental and physical health for Callan Park had already been established through the earlier project stages and the Draft Master Plan consultation reaffirmed the earlier results.

OVERLAY 09 POLLUTION

Scope

Pollution encompasses both the existing areas of the site that are contaminated due to past activities and the capacity for new uses and activities to pollute and damage the environment in and around Callan Park.

Existing Situation

A number of contamination studies have been undertaken over the past ten years to determine the extent of ground contamination at Callan Park. A series of zones have been established as areas of concern where further studies and remediation will be required as part of the implementation of the Master Plan. There is also an understanding that there are high pollutant levels in all sediments along the shore of Iron Cove.

The master plan process has not been able to quantify the volumes of polluting materials and chemicals that are used on site or how these materials are processed.

Objectives and Targets

The actions and initiatives of the 2010 Master Plan provide an opportunity for specific remediation in association with project delivery. Definitive identification of areas with contamination is still required following further testing. The decontamination and management of polluted areas will need to be undertaken to protect the community from harm.

Implementation

Undertake detailed contamination studies to support the Master Plan proposals and develop an ongoing remediation strategy for project delivery including:

- On-site cleaning and sorting of all demolition waste that does not require specialist disposal for on site reuse
- Audit existing consumption of pollutants and chemicals and then develop strategies for achieving zero pollution and zero waste
- Storage and reuse of demolition material on site
- Develop a system for the collection of organic waste for on site composting from surrounding neighbourhoods for use in urban agriculture

Technical assessment

Sydney Soil and Environmental Laboratory Assessment

Contaminant issues on the site have been extensively surveyed and the major areas of potential impact identified. Future work should concentrate on site-specific issues as individual areas are developed. Each area within the zones of potential pollution identified in the overlay will need a Detailed Site Investigation [DSI] taking into account the nature of the development and potential environment impacts. The preferred and most sustainable response to a requirement is to develop a Remediation Action Plan (RAP) will be capping and containment over excavation and off-site landfill.

Despite extensive geotechnical and contaminant soil survey little or no information is available to assess soils for horticultural quality. Given the importance of restoration of the living heritage collection and construction of new food and amenity gardens it will be necessary to conduct agronomic-based soil investigations as areas are developed or restored.

Community consultation

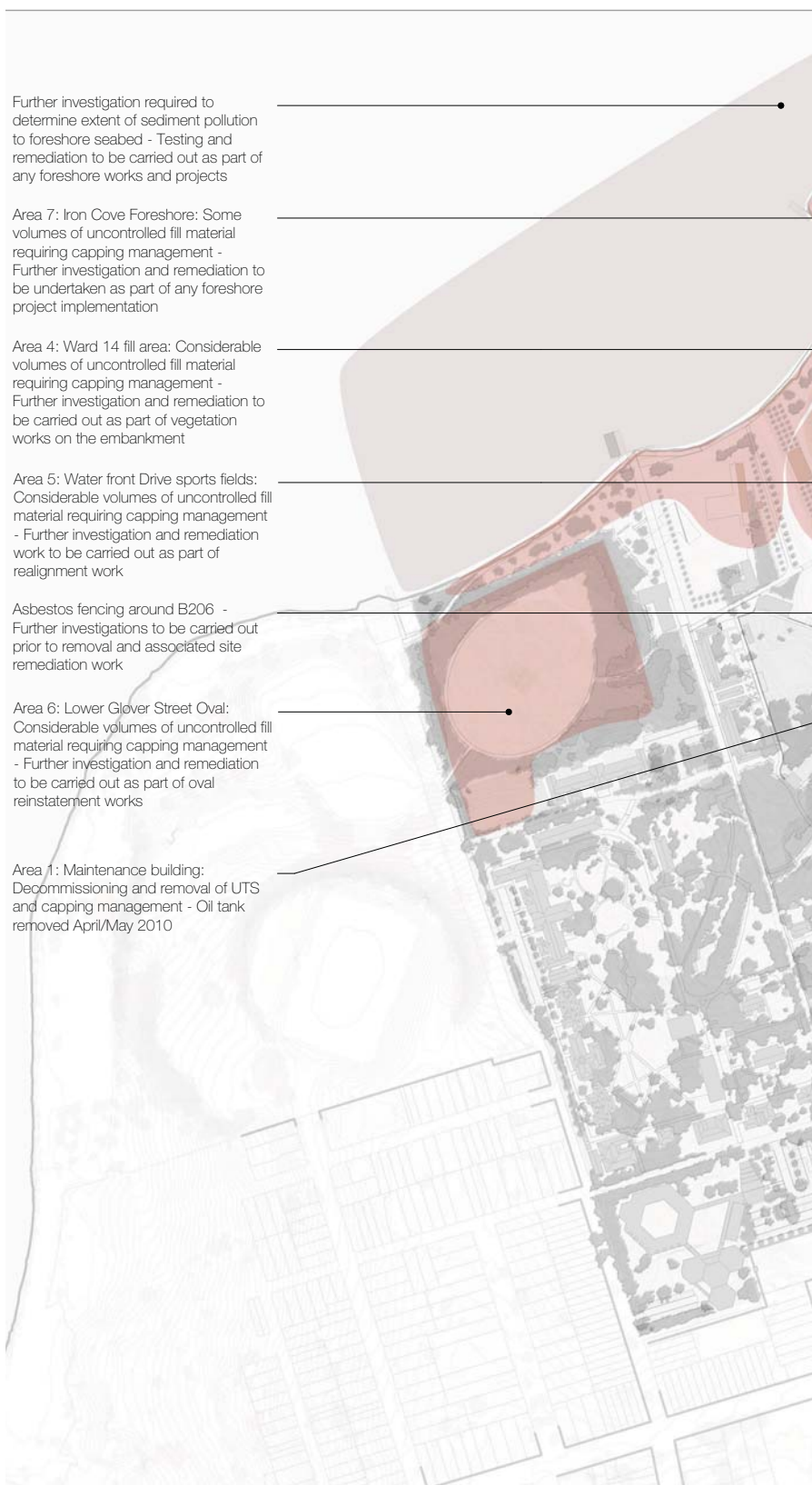
Project Principles

The pollution and chemicals overlay proposals respond to the following Project Principles:

- Governance
- Ensure Callan Park is a world-leading model for social, environmental and economic sustainability.
- Preserving and Managing Open Space
- Improve the quality of community lands through conservation, restoration and management.

Sub principles

The community feedback on the Sub Principles demonstrated strong support for recycling on site and the 2010 Master Plan provides a framework for ensuring that best practice waste management strategies are implemented across Callan Park.



ABOVE. Figure no. 71 Pollution overlay



OVERLAY 10 TRANSPORT

Scope

The transportation system on Callan Park encompasses all the movement systems, public and private, pedestrian and motorised. It includes all paths, roads, parking areas and spaces where people congregate as well as access points for non motorised aquatic vessels.

Existing Situation

The network of sealed roads and paths on Callan Park has not been subject to any on-going maintenance programme in recent years and ranges from severely degraded to fair condition. There is currently no consistent enforcement or regulation of parking on Callan Park. This is particularly evident in and around the NSW Ambulance Headquarters during the week and on Wharf Road on the weekends when sporting events and the weekend market at Orange Grove School generate considerable demand. Buses along Balmain Road provide public transport access to Callan Park, and there are currently no designated cycle paths within Callan Park.

Objectives and Targets

The Master Plan seeks to reconcile the objective of minimising private vehicular travel and encourage sustainable transport, while at the same time providing good access to the proposed uses and services on Callan Park. The overlay recognises that the shift from institutional based care to voluntarily accessed mental health programmes will require an overall increase in designated parking areas on Callan Park to cater for the increased movements in and out of the site. The overarching objective of the transport strategy is to conceptualise Callan Park as a series of destinations where private vehicle use is strictly limited. This approach will require changes by the existing tenants on Callan Park as well as the groups that use Callan Park for other activities such as sports or meetings.

Implementation

The Master Plan makes the following recommendations:

- Downgrade existing roads to create shared and segregated pedestrian and cycle paths
- Divide the site access to limit private vehicle movement
- Consolidate parking on the edges of Callan Park and remove existing parking away from heritage buildings
- Reinstate a pedestrian access point on Manning Street
- Formalise pedestrian desire lines into paths
- Remove car access from the 'Main Entrance' to create a pedestrian plaza with a new access point on Alberto Street
- Identify a route for a public bus through the western section of Callan Park with new bus stops within Callan Park and on Balmain Road
- Provide an electric shuttle bus between Lilyfield Lightrail and Rozelle Town Centre, connecting the two road systems through a shared way south of the Veteran's Field.
- Provide discrete visually unobtrusive parking areas throughout Callan Park
- Provide cycle hire stations to encourage sustainable transport

Transport and access assessment

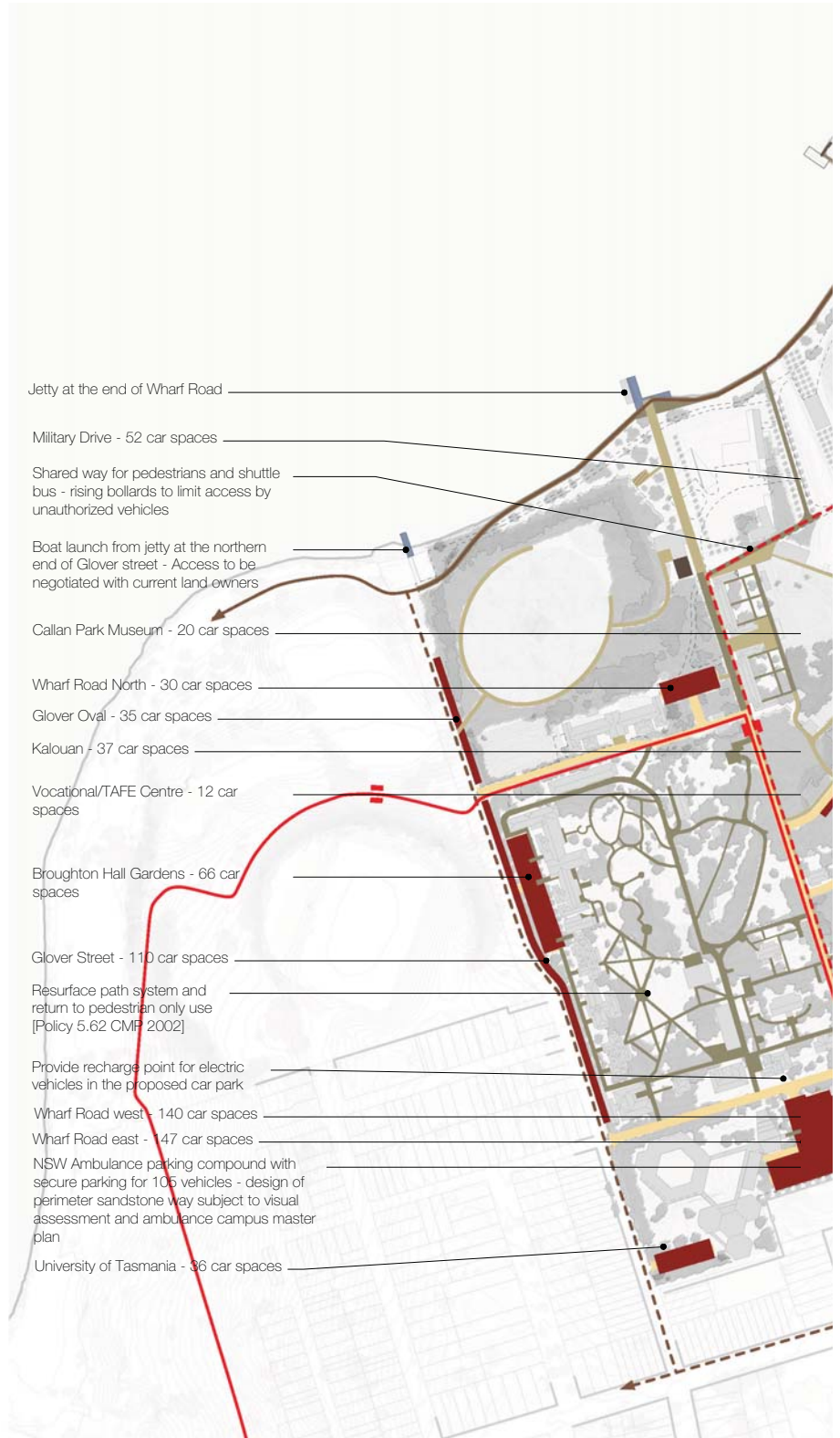
GTA Consulting

Introduction

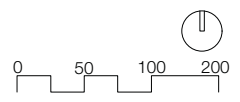
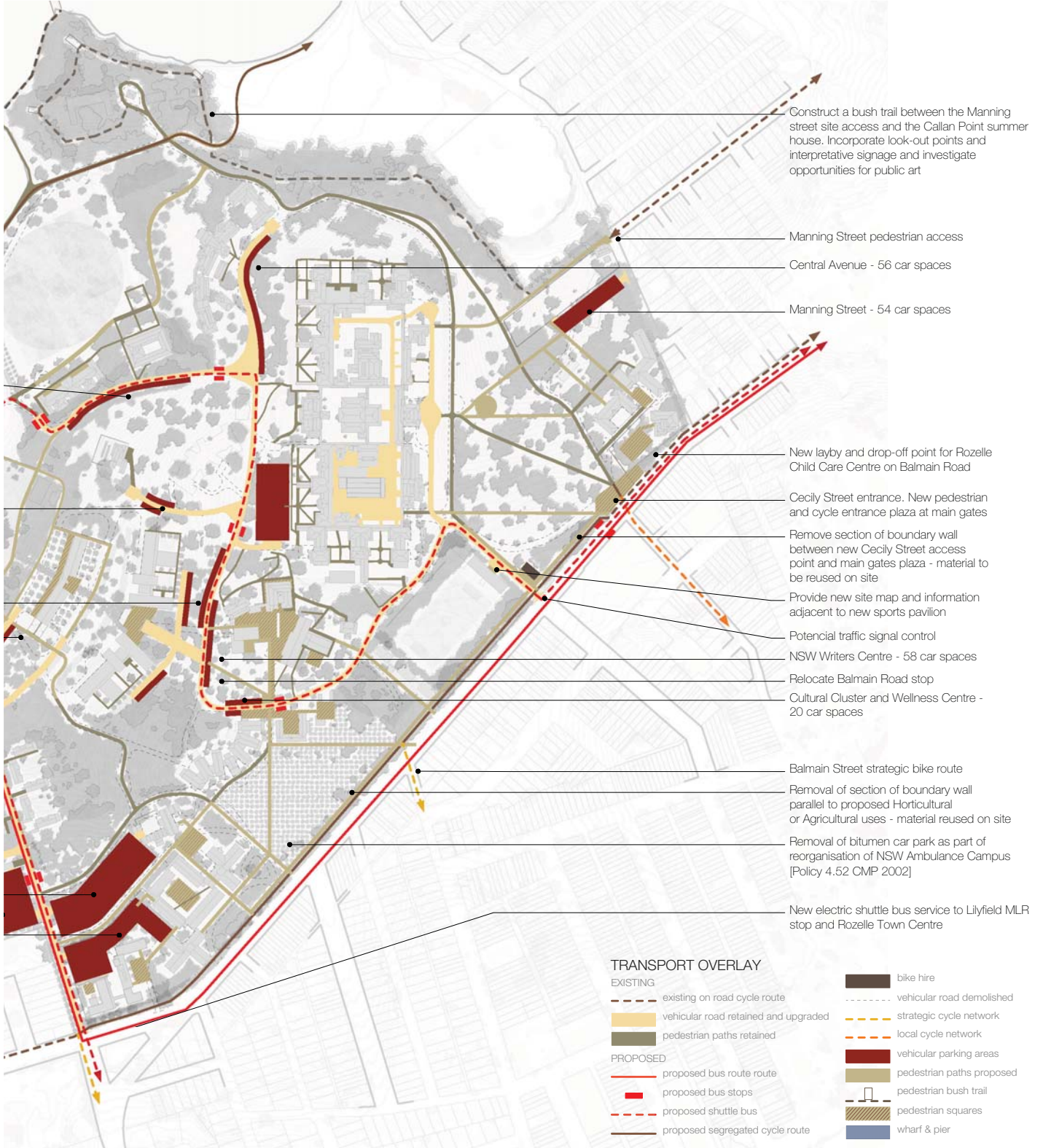
The community has endorsed a plan for Callan Park which delivers a vision for a Wellness Sanctuary, bridging the gap between acute care and home life for those with mental illness, and contributing to the mental, physical and social health of the entire community. Other key features of the preferred Master Plan include:

- open space and access to the foreshore
- allowance for sports activities as well as quiet reflection
- address existing traffic problems
- reinstate native bushland
- encouragement for community organisations to keep delivering crucial services
- building on the arts and cultural platform created by the Sydney College of the Arts and the NSW Writer's Centre
- restored heritage buildings that continue to allow public access.

These features are based around the core values of sustainability and community wellness.



ABOVE. Figure no. 72 Transport overlay



Purpose of this assessment

This report sets out an assessment of the transport features of the Master Plan, with reference to the following project principle:

"Develop public transport and infrastructure to broaden public access and reduce traffic intrusion."

This report includes:

- details of the transport proposals in the final Master Plan
- transport targets for the proposals
- how the proposals support the vision for a Wellness Sanctuary
- implementation and staging of the proposals, with reference to broader policies, best practice and staging considerations.

Master Plan Vision

The Master Plan has a vision to be a Wellness Sanctuary, based around the core values of sustainability and community wellness.

In terms of traffic, transport and parking, the concept of a 'wellness sanctuary' is supported through the following key initiatives:

- focussing on provision of sustainable transport – providing greater travel choices than the private vehicle alone
- reducing traffic intrusion including noise and visual impact
- providing good active travel facilities to support safe walking and cycling, supporting health and wellbeing
- providing pedestrian-only areas that do not allow vehicle access.

Master Plan Features

Public Transport

Diversion of Existing Bus Route/s

A bus route diversion is proposed to service Leichhardt Park Aquatic Centre and the west side of Callan Park. The new route would include two new bus stops at locations along Wharf Road and would reduce the walking distance required for Callan Park visitors to access a bus stop. This loop alternative would also remove the need for the main part of the Callan Park site to be able to accommodate large commercial buses.

Bus routes L37, 440, 444 and 445 travel along Balmain Road and Perry Street and provide direct links to Callan Park to and from Balmain East, City (via Parramatta Road), Leichhardt, Haberfield and Campsie. Each of these routes would be considered for diversion. The diversion is expected to operate on a part-time basis only, with one of every two to four buses travelling along the diversion.

The proposed diversion would use Mary Street, Wharf Street and Riverside Road (via a new intersection at Glover Street, as shown in The Transport Overlay). The total length of the diversion is approximately 1.5km, which equates to a travel time in the order of five minutes, including several bus stops. The existing travel time along this section is less than two minutes. This proposed diversion minimises any reduction in accessibility to a bus route for properties south of Perry Street and west of Balmain Road as a result of the bus route diversion, as all but one of the existing bus stops would be serviced by all routes and services along the corridor. The bus stop located on Perry Street near Glover Street would continue to be serviced by buses not travelling along the diversion.

Pedestrian access to the bus stops along Balmain Road would be improved with more pedestrian connections from Balmain Road into Callan Park, potentially increasing the number of people using the existing bus services.

Shuttle Bus

A shuttle bus is proposed for inclusion at the site to support internal site movements.

In the short-term, this would initially be designed to service internal land uses only and would be able to transport visitors from Balmain Road bus stops and on-site car parks around to all land uses within the site.

There is a longer term option to link further to nearby local destinations external to the site, such as Lilyfield light rail station and the Balmain shops.

The proposed shuttle vehicle would be an electric mini-bus which could carry approximately 20 passengers.

Further details regarding the potential shuttle bus service are subject to further testing and feasibility analysis.

Access to Light Rail

Lilyfield Light Rail Station is located approximately 600m south of the boundary of Callan Park and is best accessed via Grove Street (approximately 8-10 minute walk or 2 minute bicycle ride).

The State Government's Metropolitan Transport Plan (draft released in 2010) allocated funding to extend the light rail line from Lilyfield to

Dulwich Hill, which would increase the catchment area for light rail users and allow for connections to Parramatta Road bus services and the Western heavy rail line.

The Master Plan proposes to establish a new pedestrian/ cyclist access point into Callan Park opposite the intersection of Balmain Road and Grove Street, thereby improving the connection to the light rail station.

Walking and Cycling

Active Travel Loop

The Bay Run is a popular walking and cycling path around Iron Cove which passes through the northern portion of Callan Park. The Sydney Harbour Foreshore Authority (SHFA), who is responsible for the maintenance of the foreshore area along the north side of Callan Park, is planning to upgrade the existing unsealed section of the Bay Run, with a Development Application aiming to address existing issues associated with inconsistencies along the route (i.e. dimensions, finishes, signage, design user, etc) currently being considered by Council. The proposed layout of the Bay Run pathway is a 3.0m wide shared access path, including a pedestrian bridge linkage across the existing stormwater outfall channel. Council are considering the merit of this proposal with concerns that the proposed width would not be appropriate for the heavily utilised pathway. It would be preferable for the path to be wider and to separate pedestrians and cyclists for increased capacity and safety.

It is proposed to provide an active travel loop of Callan Park as part of the Master Plan which would act as an extension of the Bay Run route to create a training loop and/or provide an alternative route through the park. This facility would be a shared path of up to 5.0m wide for use by both pedestrians and cyclists. It would ideally be located wholly within the site and not be shared with the roadway/ vehicle routes. This type of facility is supported by Council.

Integration with Cycle and Pedestrian Network

The Master Plan provides pedestrian and cyclist access along all Callan Park frontages which ensure high accessibility/ permeability and encourage greater pedestrian use of the park. This includes a minimum of four accesses along Balmain Road, including a new access at Balmain Road located centrally along the site, at Manning Street opposite Moodie Street on the east side of the site, at several locations along Wharf Road and to the waterfront and the Bay Run. These additional pedestrian access points also improve access to the public transport facilities along the site frontage, which includes five public bus stops and a link to the Metro Light Rail.

The Master Plan layout would improve access to and within Callan Park for pedestrians and cyclists, including:

- increasing overall movement access into and throughout the site, allowing pedestrians and cyclists to easily negotiate all areas and land uses
- reducing pedestrian/vehicle conflict by providing dedicated pedestrian only or shared bicycle and pedestrian facilities, many as a result of converting existing roadways to footpaths
- designing paths to safely accommodate the range of expected users and minimise conflicts between pedestrians and cyclists
- designing paths that offer better access for mobility-impaired pedestrians, including wheelchair users and people with prams
- integrating the new facilities with the existing cycle and pedestrian network.

There are signalised pedestrian crossing facilities at two locations along Balmain Road in the vicinity of the site – Wharf Road and Cecily Street. There is also a signalised crossing facility at Waterloo Street/ Belmore Street located further northeast towards Victoria Road.

Due to proposed modifications to the vehicle access points at Callan Park, the Cecily Street traffic signals would be relocated further southwest to Alberto Street. Pedestrian refuge crossings are provided at a number of points and there is a marked pedestrian "zebra" crossing on Perry Street at Glover Street. There is a large portion of the site frontage that does not have a safe crossing point, with 650m between Wharf Road and Alberto Street and 500m between Alberto Street and Waterloo Street/Belmore Street. The need for additional signalised crossing points should be reviewed over time as a result of pedestrian demand and observed desire lines.

Balmain Road is a strategic bicycle route in accordance with the Leichhardt Bicycle Strategy, providing a connection between Leichhardt and Balmain. Leichhardt Council has plans to improve the on-road bicycle facilities along this route adjacent to Callan Park through the provision of a bicycle lane, which is scheduled for construction during the 2010/2011 financial year.

The key links and proposed facilities are shown in Figure no. 72.

Bicycle Hire Scheme

A bike hire scheme based in Callan Park would make cycling available for visitors to travel internally around the site as well as to surrounding local destinations such as Balmain.

There are proposed to be two bike share pods located within Callan Park, currently proposed at the new main site access off Balmain Road near Alberto Street and on Wharf Road. Ideally these pods would be complemented by pods outside of the site, such as at Darling Street in the shopping/retail district and at Lilyfield light rail station. This would give people a place to securely park bicycles as part of their local travel.

An example service is run by the Western Sydney Cycling Network (WSCN), based in Fairfield (<http://www.westernsydneycyclingnetwork.com.au/>). This bicycle recycling program consists of the three main themes of: donation of bikes, repair of bikes and the loan of bikes to the public. The community is welcome to donate any old/unused bikes to the recycling program by dropping them off during club open hours. Volunteers work on bikes to return them to a standard for re-use on a community loan system. In this example, recycled bicycles are loaned on a permanent basis for the one-time cost of \$25, which includes the provision of a helmet if necessary.

In applying this example to Callan Park, the bicycle recycling would involve public donations and time from volunteer bicycle repair mechanics, with the recycled bicycles loaned on an hourly or daily basis for free or a small fee. A number of bicycle locking systems are available to allow the scheme to operate without full-time staffing requirements. This implementation strategy would provide opportunities for community involvement and provide a more cost-effective solution than formal bike hire schemes.

Access and Vehicle Circulation

The Master Plan consolidates vehicle access to Callan Park into two main accesses, namely at Wharf Street and Alberto Street.

Wharf Street is an existing access point which is controlled by traffic signals at its intersection with Balmain Road and Perry Street.

A new main access point is proposed for Balmain Road opposite Alberto Street, which would replace the existing main access opposite Cecily Street. The existing access is controlled by traffic signals, whilst the existing intersection of Balmain Road and Alberto Street is sign-controlled only. As part of the Master Plan, traffic signals would be located at the intersection of the site access, Balmain Road and Alberto Street. Due to the close proximity of Alberto Street and Cecily Street (i.e. around 200m), the existing signals at Cecily Street would likely be removed.

The internal road network has been consolidated to a few key roads which service all land uses and the on-site car parking. However, it is not possible to link internally from one side of the site to another, limiting vehicle intrusion into pedestrianised areas.

Parking

The Master Plan would aim to even out the usage of car parking across both the weekdays and weekends.

Formalising the parking areas would consolidate parking into designated parking areas, therefore aiming to remove ad-hoc parking around the site. This opens up the space for recreational purposes.

A large portion of the parking supply is located close to the arterial road network, namely the parking off Wharf Road near Balmain Road. This limits the need for vehicles to travel very far into Callan Park, contributing to a reduction in vehicle intrusion.

The Master Plan proposes to provide 1,028 spaces across the site, including:

- 392 spaces in the vicinity of NSW Ambulance (Wharf Road near Balmain Road)
- 247 spaces along Glover Street
- 42 spaces on Wharf Road towards the northern end
- 293 spaces within the main core of the site surrounding the University buildings
- 54 spaces accessed from Manning Street on the east side of the site.

The proposed supply equates to the addition of 509 spaces for new land uses created by the Master Plan, based on an existing parking demand of 519 spaces observed by GTA Consulting on a typical weekday (09/06/2010), excluding University parking.

The proposed Master Plan land uses consist predominantly of mental health accommodation and a wellness centre, community spaces (including administration and bookable space), a public gallery and a cultural quarter surrounding the existing writers centre. These land uses equate to an increase in land use of 23,253sqm, compared to the existing supply of 24,582sqm (excluding the University). As such, the area of land use floor space is effectively being doubled across Callan Park. The majority of parking demand generated by these uses would be associated with staff, with general visitors com-

ing for the range of community and public uses within Callan Park.

Relevant general parking demand calculations are as follows:

- Existing parking rate = 519 spaces / 24,582sqm = 2 spaces/100sqm.
- Increase in parking demand = 23,253sqm x 2 / 100 = 465 spaces.

The proposed increase of 509 spaces would be appropriate for accommodating the expected increase in parking demand by 465 spaces.

In order to promote sustainable modes of transport, it is desirable to limit oversupply of parking on the site. As such, there is the potential to reduce the amount of additional parking proposed as part of the Master Plan. It is anticipated that the exact number of spaces to be provided within Callan Park would be determined through the detailed design process.

Transport Targets

The key transport targets for the Callan Park Master Plan are related to mode splits for transport modes other than single-occupant private vehicles. However, baseline information about how people travel to Callan Park needs to be captured so that achievable mode split targets can be set.

The recommended way to monitor travel mode splits and to limit the number of single-occupancy vehicle journeys for travel to and from a site is through the use of a Green Travel Plan.

Principle objectives of a Green Travel Plan include:

- i limit the overall number of vehicle trips by employees
- ii manage the demand for on-site car parking
- iii limit the level of car travel to the development by visitors
- iv encourage the use of public transport, walking and cycling by employees commuting to work and for visitors.

A Green Travel Plan would contain a number of recommended initiatives for development and implementation to achieve these principle objectives.

Typically Green Travel Plan targets are set in order to gauge the effect of initiatives in reducing private car usage. Targets are generally set in the context of an existing workforce or population whose demographics and travel characteristics are already known. As such, the first step for Callan Park would be to undertake a travel survey for employees and visitors to the site to establish baseline transport characteristics. Using these results, appropriate targets for trips undertaken by public transport, walking and cycling could be established. This is likely to be based on a target reduction in vehicle trips to the site over a 3-5 year period, for example 10% reduction, with a resultant increase in trips made by public transport, cycling and walking.

A Green Travel Plan Working Group would need to be established to take responsibility for coordinating the Green Travel Plan management and implementation. The Working Group would comprise 4-6 people representing a range of tenants and site users. This group would be led by a Green Travel Plan Coordinator who would facilitate Working Group meetings and take responsibility for monitoring and reviewing the Green Travel Plan document.

The primary aims of the Working Group would include:

- review Green Travel Plan initiatives and determine a program for implementation
 - provide suggestions and ideas
 - provide feedback on activities and initiatives
 - review material
 - assist Green Travel Plan coordinator to promote activities
 - assist Green Travel Plan coordinator to disseminate information
 - advocate sustainable transport modes generally amongst employees and customers.
- The use of a Green Travel Plan to encourage the use of public transport, walking and cycling as viable transport modes for travel to and from Callan Park is in-line with Leichhardt Council's goal to:
- reduce car dependency for journeys within, into and out of the Leichhardt Municipality
 - increase the proportion of commuter trips that use public transport or active transport
 - promote solutions to the accessibility needs of Leichhardt's community.

Master Plan Actions, Implementation and Staging

Public Transport: Key Actions

Diversion of Existing Bus Route/s

A feasibility study associated with the public bus diversion or establishment of a new route is required to confirm the details of the pro-

posal that provide the greatest benefit for the local Callan Park users and the wider community.

Some of the issues to be investigated further include:

- A permanent diversion for all services on a single route may reduce the attractiveness of the route for existing users due to the increase in travel time.
- If the diversion is not regular enough, the attractiveness of the route for new users visiting Callan Park and the Aquatic Centre would be reduced and may discourage the use of public transport for visits to these local destinations.
- Whether it would be more feasible to establish a new route that services the local destinations as well as a wider catchment, potentially improving accessibility for areas that are currently not well serviced.

Consultation would be required to be undertaken with NSW Transport, Sydney Buses and local bus operators through the feasibility assessment process.

As part of the feasibility assessment, a review of the road network should be undertaken to ensure that the bus manoeuvrability requirements are met along the potential route diversion, including at intersections, on curves and at any proposed new bus stops. This would identify any mitigating works that should be undertaken.

Shuttle Bus

A feasibility analysis is required to confirm the scope and scale of the shuttle bus service, including routes, vehicle types, times of operation and fee structure (i.e. free or fee paying). Consideration would need to be given to the type/ size of vehicle to be used in conjunction with the proposed travel route(s) within Callan Park, to ensure suitable manoeuvrability requirements (similar to the diversion of existing bus route/s above), as well as turn-around areas as appropriate.

The cost of operating a shuttle bus would depend on whether it services the site internally only or both internal and external destinations. In the case of an internal service, the service would be funded wholly by Callan Park (e.g. by a newly-established Callan Park Trust). If the service were to travel outside of Callan Park and hence providing some benefit to users not necessarily visiting Callan Park, then Leichhardt Council would be responsible for providing a proportion of the funding to establish, operate and maintain the service.

Implementation and Staging

New public transport services should be available when new land uses are opened. Without appropriate public transport facilities available, new visitors could use the private car as a short-term option but would be more likely to continue this behaviour once new public transport facilities become available. The establishment of sustainable travel habits should be encouraged for new land uses as soon as they commence operation.

A Green Travel Plan should also be prepared for the site prior to the establishment of any new land uses, so that all new employees and site visitors are made aware of the range of options they have for travel to the site.

Walking and Cycling: Key Actions

The majority of the paths which form the walking and cycling network would need to be replaced, including those paths which are currently part of the road network. An all-weather surface would be preferred,

such as concrete, as this requires less maintenance than an unsealed path surface.

The location and type of control for the pedestrian and cyclist crossings of Balmain Road should be reviewed, with the provision of additional signalised crossing points to be considered based on pedestrian demand and desire lines. This is due to there being a large portion of the site frontage that does not have a safe crossing point.

Council is considering the merits of a proposal from SHFA to upgrade the Bay Run along the foreshore through Callan Park to a 3.0m shared use path. There are concerns that the proposed width would not be appropriate for the heavily utilised location. It would be preferable for the path to be wider and to separate pedestrians and cyclists for increased capacity and safety. Reference should be made to the Austroads Guide to Road Design Part 6A: Pedestrian and Cyclist Paths, which provides guidance on the dimensions of shared paths. This document indicates that a recreational path for shared use would have a desirable minimum width of 3.5m, ranging between 3.0m and 4.0m. A lower width around 3.0m should only be adopted where cyclist volumes and operational speeds will remain low, whilst a greater width of around 4.0m may be required where the numbers of cyclists and pedestrians are very high or there is a high probability of conflict between users (e.g. people walking dogs, roller bladers and skaters etc.). These guidelines should be referenced for the Bay Run upgrade and other shared use paths proposed for Callan Park.

Implementation and Staging

Efforts should be made to ensure that accessible pedestrian and cycling routes are available throughout the construction phase.

The new walking and cycling network should be established prior to the commencement of any building works.

In order to set-up and operate the bike share facility, some initial seed funding would be available from the State Government, whilst there would be ongoing voluntary efforts from the public to donate bikes and time for repairing.

Access and Vehicle Circulation: Key Actions

With reference to the proposed road network and the pavement condition report prepared by URS, the following roads would need to be improved as part of the Callan Park Master Plan:

- Wharf Road (total length) – immediate maintenance required.
- Internal road No. 6 (parallel to Balmain Road) – works required within 5 years.

The majority of other roads currently requiring repair would no longer be part of the road network and would instead be upgraded to function as a shared pedestrian/cycleway facility.

Closing the vehicle access points at the Ambulance HQ would leave Wharf Street as the main access to the western portion of the site. The impact of the current traffic generation, in the order of 350-400 vehicles per hour during the peak hour, is distributed across the existing four access points, which assists in controlling congestion. Reducing the number of access points would increase the volume of traffic using each intersection. As well as being the most convenient access to the proposed ferry wharf, there are also 450+ parking spaces that are accessed from Wharf Road via its intersection with Balmain Road that would generate traffic demand during the AM and PM peak periods.

The right turn movements from Balmain Road to Wharf Street



TOP: Callan Park from Balmain Road looking North

and the new site access opposite Alberto Street, likely to be highest in the morning, may cause congestion for the westbound through traffic. At the existing Wharf Street traffic signals, it is noted that there is currently no right turn arrow for this movement, which means the right-turn movement would run in the same phase as the through movement. Further design review and modelling is required to identify a preferred layout and signal phasing for both signalised intersections, to ensure site access operates effectively.

State funding would initially be required for road improvements, with ongoing funding from Trust and leasing arrangements (i.e. funded by Callan Park).

Any works associated with Balmain Road, including intersection upgrades and provision of traffic signals, would be jointly funded by Leichhardt Council and the RTA.

Implementation and Staging

As for the walking and cycling network, the new road network should be established prior to the commencement of any building works.

Parking: Key Actions

The implementation of a paid parking scheme, which would provide some revenue for a Callan Park Trust fund, should be investigated. These funds could be used to invest in public transport, such as an internal shuttle bus, and improving active travel facilities within Callan Park.

Detailed survey information needs to be collected for a typical Saturday where sporting activities are occurring within Callan Park, in order to quantify the parking occupancy. This would be compared against the counts undertaken on a weekday, which indicate low utilisation of parking close to the foreshore and high utilisation closer to Balmain Road. It is understood that on a weekend these results may be reversed, with low utilisation of the formal car parking at the Balmain Road end of the site.

Implementation

Large portions of existing parking should not be closed until replacement facilities are made available. This is particularly the case for the existing off-street car park servicing the needs of the Ambulance HQ, which is planned to be replaced with new off-street car parks closer to Wharf Road. If new parking is not available, the parking demand could be temporarily transferred into surrounding residential streets.

OVERLAY 11 WASTE

Scope

This system encompasses all unwanted or unused materials disposed of as a result of activities on Callan Park. Some of this material is recycled and some goes to landfill.

Existing Situation

The Master Plan process has not been able to quantify the volumes and type of waste removed from Callan Park and to what extent this waste is recycled.

Objectives and Targets

The over arching objective will be to work towards a zero waste development with the use of 100% recyclable material and 100% recycling of waste products. The proposal for demolition of buildings on Callan Park presents an opportunity to manage and recycle construction waste and use this material in future projects on Callan Park.

Implementation

To achieve a zero waste target the following actions and initiatives are proposed:

- Audit existing waste consumption, waste generation and recycling practices and then develop strategies for achieving zero waste
- Store and reuse demolition material on site
- Implement composting of organic material produced on site
- Develop a system for the collection of organic waste for onsite composting from surrounding neighbourhoods
- Develop a waste export policy that stipulates which types of materials may be taken off site and acceptable treatment / recycling / waste disposal methodologies

Community consultation

Project Principles

The waste overlay proposals respond to the following Project Principles:

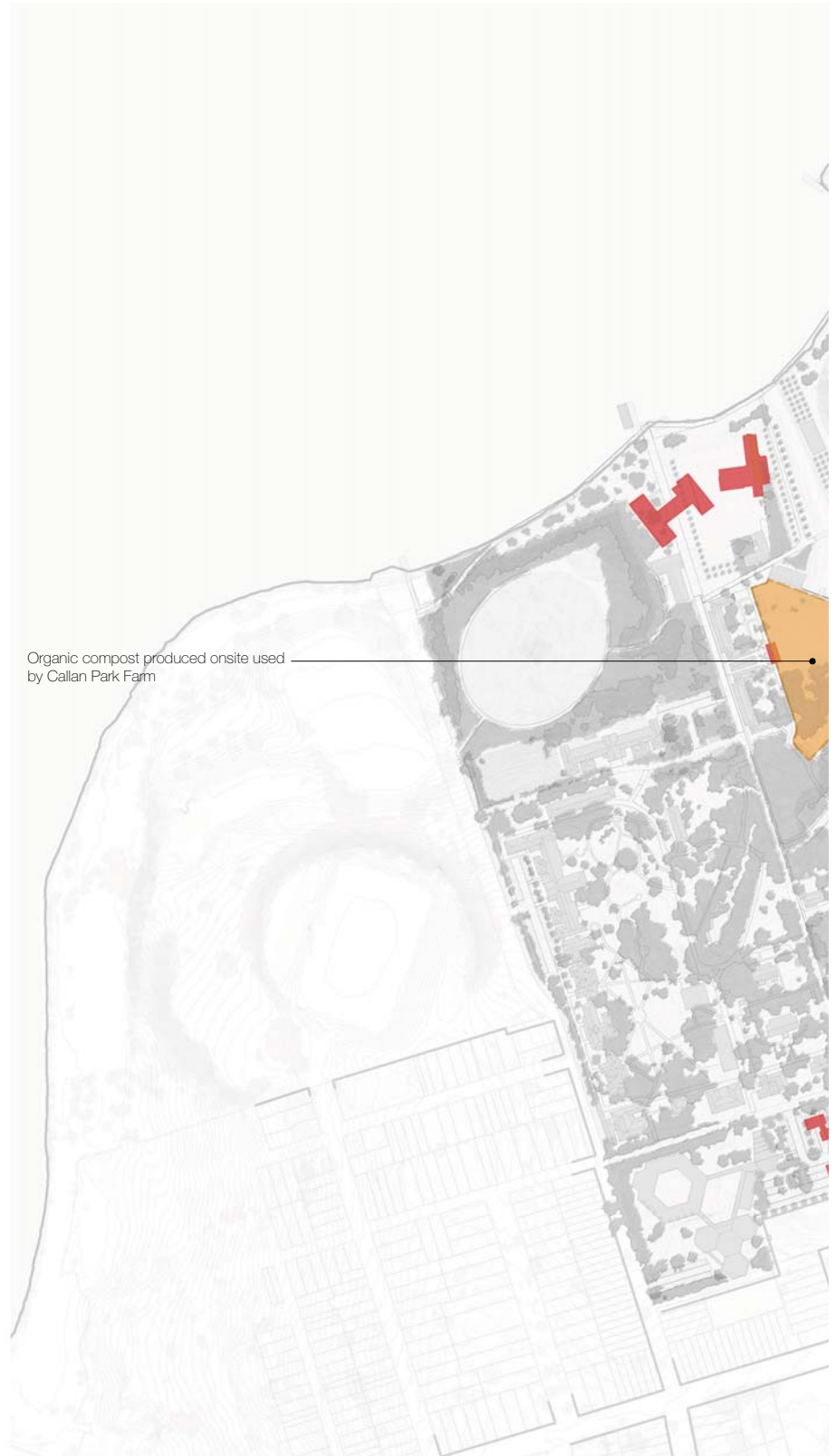
- Governance
- Ensure Callan Park is a world-leading model for social, environmental and economic sustainability.
- Preserving and Managing Open Space
- Improve the quality of community lands through conservation, restoration and management.

Sub principles

The community feedback on the Sub Principles demonstrated strong support for recycling on site and the 2010 Master Plan provides a framework for ensuring that best practice waste management strategies are implemented.

YourPlan Consultation

The sustainability overlay presented to the community in stage four received strong backing with the option of including onsite recycling for organic waste from surrounding neighbours. This proposal gained good support and the 2010 Master Plan incorporates this idea.



Organic compost produced onsite used by Callan Park Farm

ABOVE. Figure no. 73 Transport overlay



OVERLAY 12 WATER

Scope

This system encompasses the to bodies of water in and around Callan Park, both natural and man-made, activities that require a supply of water or are based on water and the treatment of water that passes through Callan Park as part of the urban stormwater catchment area.

Objectives and Targets

The over arching target for water use on Callan Park is for the site to have zero water use and become a net water exporter to the surrounding neighbourhood. To meet this objective a range of Water Sensitive Urban Design initiatives are proposed both as stand alone initiatives and as part of the required infrastructure upgrades. Additionally the Master Plan will provide better access to the foreshore of Iron Cove for passive recreation and water based active recreational uses. The implementation of the Master Plan must also include the potential impacts of climate change and sea level rise into any foreshore restoration and renewal works. The Master Plan also sets out a series of proposals to restore the sites aquatic habitats and systems.

Implementation

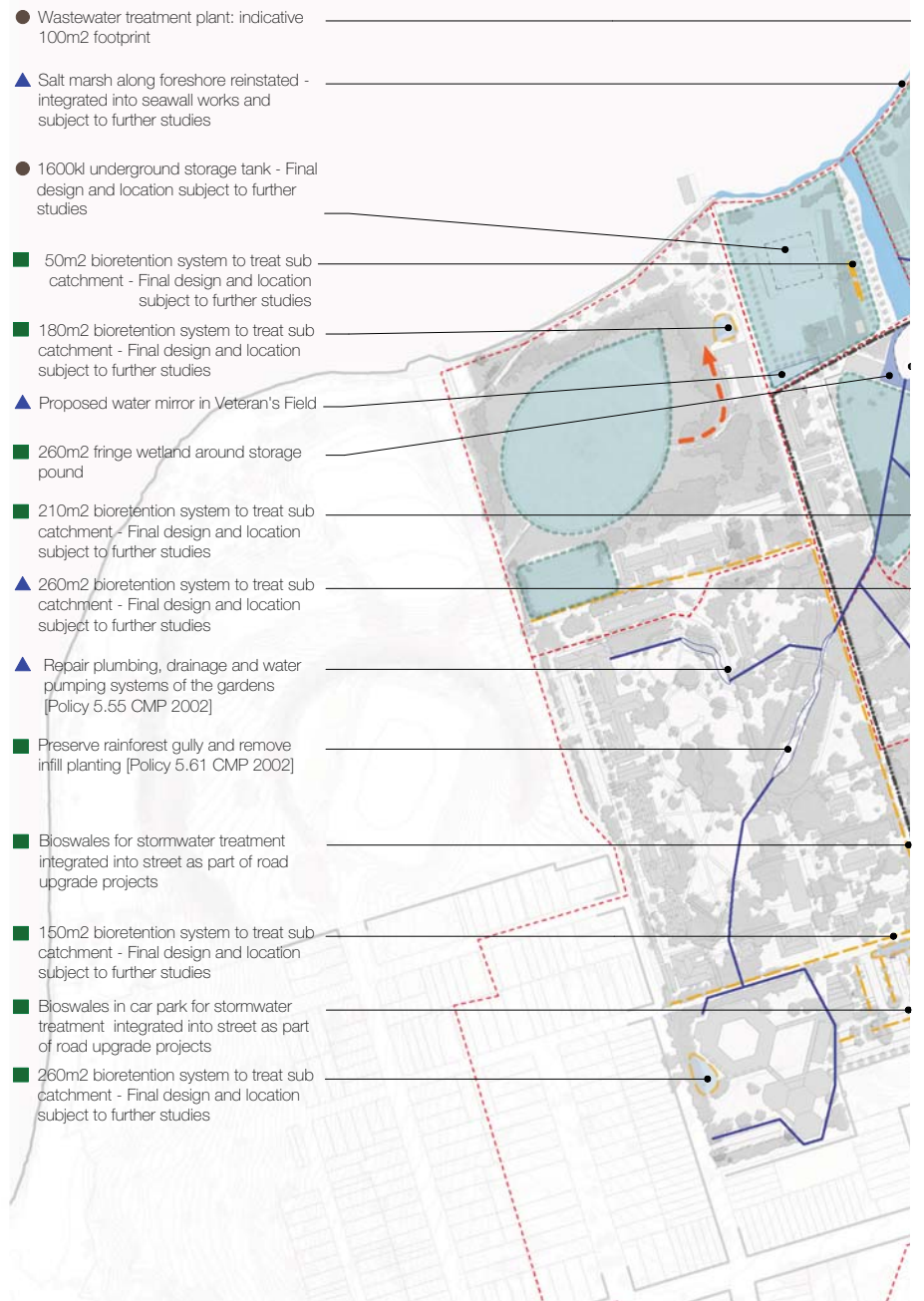
The following actions are proposed:

- Building refurbishments will meet the highest levels of current best practice water conservation measures
- Appropriate studies will be conducted to inform any work carried out at Callan Point to ensure the ecological and cultural heritage of the area is not compromised
- Incorporation of WSUD infrastructure as part of the site-wide upgrade and renewal of site services
- Treating all stormwater stored on site for reuse in bioretention systems
- Integrating WSUD design into all public domain design and infrastructure projects
- Storing treated water in underground and above ground storage tanks for reuse
- Nil irrigation of grass with mains potable water
- Recycled water to be used for all required irrigation
- The use of Black water mining technology to provide water for reuse on site
- Exporting treated storm water to the surrounding neighbourhood for non-potable use
- Employing best practice water conservation measures as part of any adaptive reuse or building restoration initiative
- Integration of water delivery infrastructure with the proposed site-wide main to include new piping for potable and non-potable water supply.

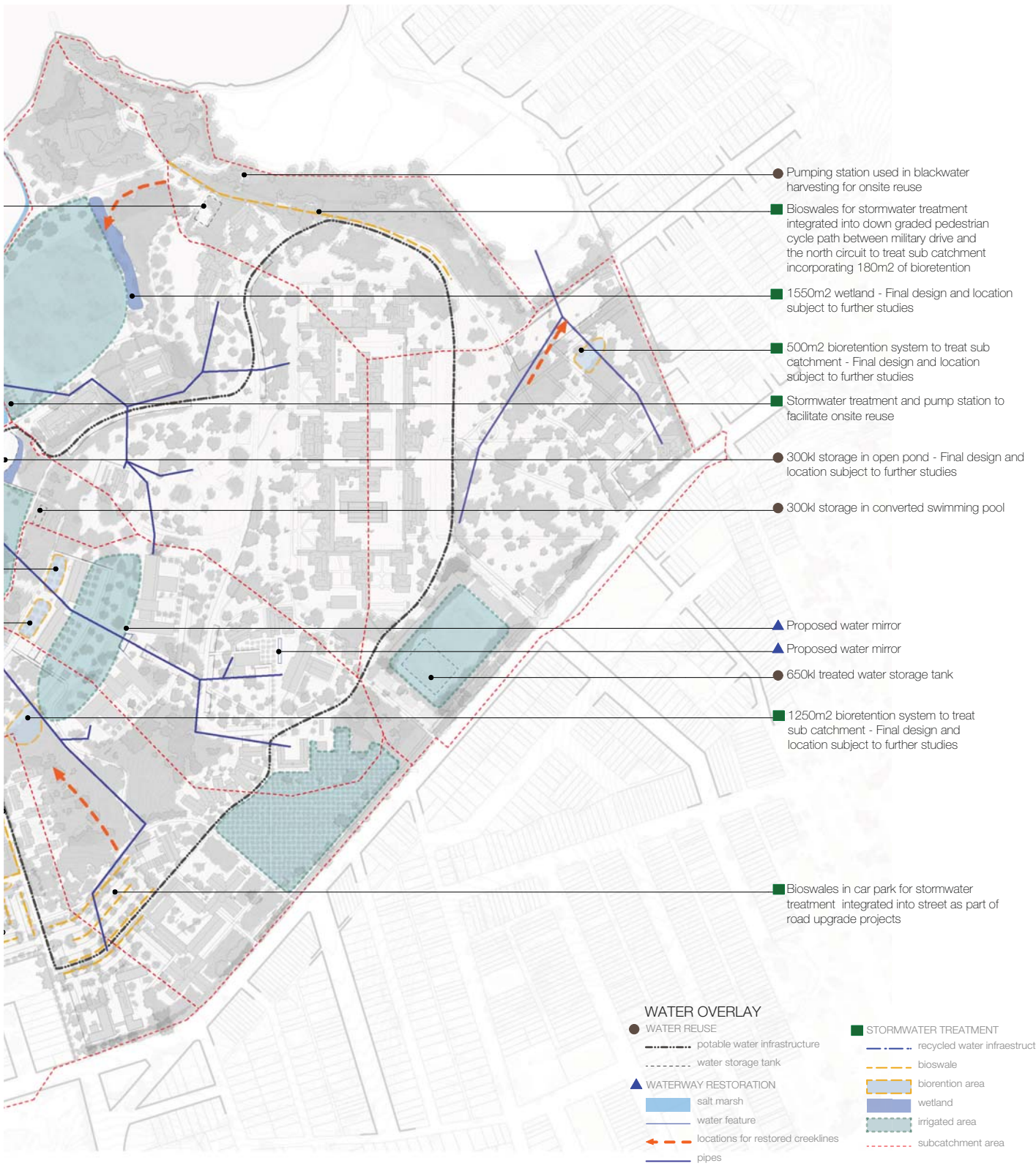
The Master Plan also promotes the importance of the foreshore and natural water courses within Callan Park. As part of the foreshore enhancement works the endangered coastal salt marsh habitat is restored and a natural creek is reinstated to replace the concrete channel to the west of the Waterfront Drive. The Master Plan also identifies a series of locations for creek and water course restoration.

Three locations have been identified for water features within the public realm, the entrance to Kalouan, the Veteran's Field and in the new public space in the cultural cluster

Four new jetties will be located on the foreshore of Iron Cove. These will provide access for water based recreational activities. The new jetties are located at the northern most point of Callan Point, on the site of the original Callan Point Wharf and at either end of the foreshore board walk on Callan Point.



ABOVE. Figure no.74 Water overlay



Integrated Water Cycle Management

Equatica

Introduction

This Integrated Water Cycle Management Strategy (IWCM Strategy) has been prepared to accompany the Callan Park Master Plan on page 166 and 167. The IWCM Strategy has been developed in conjunction with the Master Plan, both contributing to the Master Plan and responding to other elements of the Master Plan.

Key elements of the Master Plan which relate to water management include:

- Significant irrigated areas, including sports fields, gardens and productive landscapes
- Refurbishment of many buildings and replacement of others
- Upgrading the road and path network on site
- A series of stormwater treatment systems to treat urban stormwater runoff before reuse or discharge to Iron Cove
- A scheme for stormwater and wastewater harvesting and reuse, to supply non-potable water demands throughout the site
- Restoration of waterways on the site
- Opportunities for community involvement in water management activities

These are discussed further in this report. The report has been prepared to provide background information on how the IWCM Strategy was developed for Callan Park, establish a rationale for IWCM at the site, and to provide key information on how IWCM should be implemented at the site.

The Callan Park Master Plan is shown on pages 168 and 169.

Background

Callan Park is located in Leichhardt local government area, on the north-western side of the Balmain Peninsula. The park extends from Balmain Road to the foreshore of Sydney Harbour at Iron Cove. It is bounded by Glover Street in the south-west and by Manning Street and King George Park in the north-east. As Callan Park extends from a ridge line to the Harbour, the site presents an opportunity to take a catchment-wide approach to water management.

Callan Park has a total area of approximately 61 ha, which includes

a mixture of buildings and open space. Open space areas include sports fields, kick about and dog off leash areas, formal and informal gardens and some native bushland. The Master Plan also proposes significant productive landscapes, including an expanded community garden, an agricultural or horticultural area and a city farm. There is also a road and path network throughout the site.



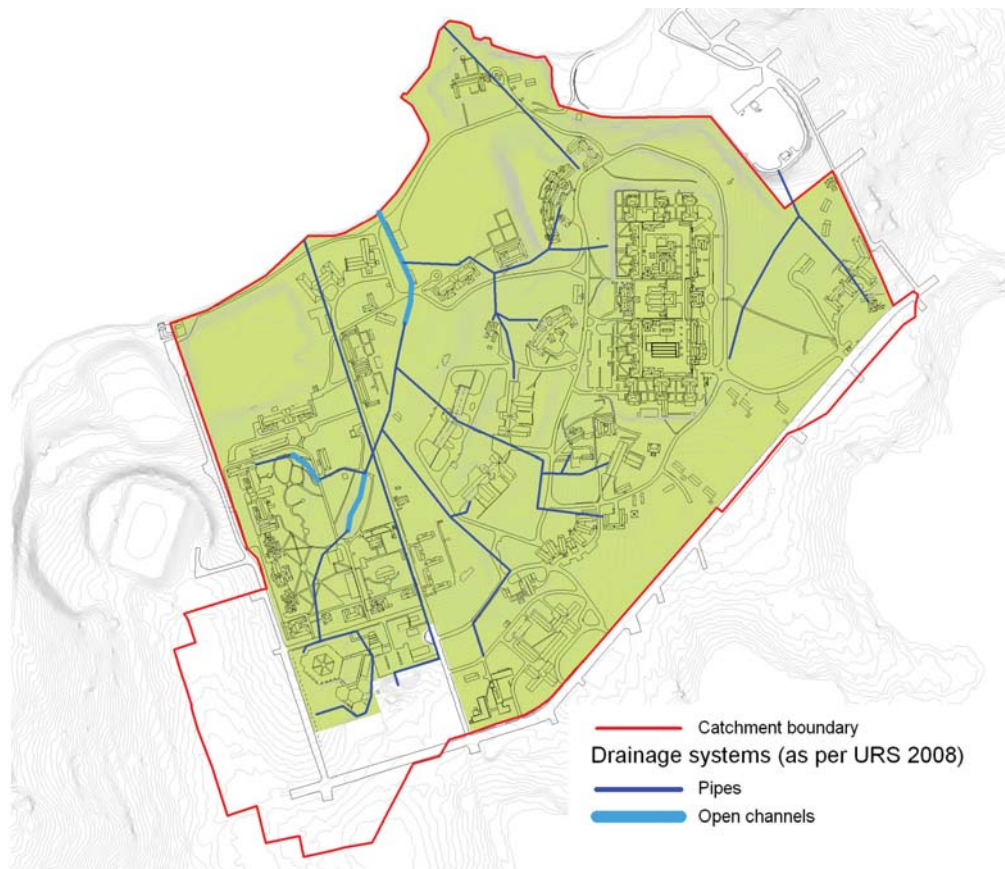
Topography and drainage

Callan Park drains in a north-westerly direction, from a ridge line along Balmain Road to Iron Cove. There are two small areas which drain into the park from external catchments; one area south-east of the park and one south-west.

Within the park, most stormwater is channelled in underground pipes. There are two significant sections of open channel along the main drainage line which are pictured in Figure no.75 above:

- One section at the upstream end, within the gardens of Broughton Hall;
- One section at the downstream end, which runs between the existing playing field and the former veteran's homes.

Both of these sections are channelled, and the riparian zone – the interface between the land and the stream – has also been significantly modified. The upstream section is constructed of sandstone blocks



— Catchment boundary
Drainage systems (as per URS 2008)
 — Pipes
 — Open channels

TOP RIGHT. Figures no. 75 Sections of open channel, including section lined with sandstone blocks in rainforest gully and Concrete channel immediately upstream of Iron Cove
BOTTOM. Figures no. 76 Drainage systems



and is set within a landscaped rainforest gully. This section has heritage significance and forms part of the Broughton Hall Gardens. The downstream section is a concrete channel. Images of each of these sections are shown in Figure no. 75 on the previous page.

Site inspections undertaken for this project revealed that several of the drainage lines in Water Plan are plotted inaccurately. For example:

- The plan shows a drainage line discharging into the Harbour approximately 100 m west of the open channel, however there is no outlet at this location. There is a stormwater outlet to the Harbour approximately 75 m east of the open channel.
- The plan also shows a drainage line discharging into the Harbour at Callan Point, however this line does not exist. There is a drainage line which discharges into the Harbour in between Callan Point and King George Park, which is not shown on the plan.

Prior to undertaking further stormwater management design work, it would be prudent to arrange for additional survey of the stormwater system to confirm the locations of underground drainage lines.

Despite some uncertainty over the smaller drainage lines, the alignment of the main drainage line, including the two sections of open channel, appears to be correct, and most of the site's stormwater drains into this system.

Geology and soils

Callan Park's geology is Hawkesbury Sandstone and there are some areas of outcropping sandstone on site, for example at Callan Point. Sandstone is a feature of the creeklines in Broughton Hall Gardens (see the next section). Shallow bedrock may increase the cost of construction of stormwater treatment systems in some parts of the site and may ultimately pose a constraint in some locations.

Key soil contamination risk areas are highlighted on the Pollution Overlay discussed previously. There are several potential constraints, including:

- Soil contamination – areas of fill: Coffey (2002) identified several areas of fill on site which may include refuse disposal. Asbestos may be present in some of the fill material;
- Soil contamination – hot spots: Coffey (2002) also identified potential contamination hot spots, including sites where fertilisers, herbicides and pesticides have been stored and used intensively and sites where other hazardous materials have been stored and used.
- Groundwater: only small areas of groundwater were present and the groundwater was impacted by low level concentrations of chemicals of concern with only one elevated level of Arsenic reported.
- Underground storage tanks: containing fuel were identified, which require decommissioning.

- Potential acid sulphate soils: the lower parts of Callan Park adjacent to the Harbour have been filled and some land reclaimed from Iron Cove. In these areas, shallow, saline groundwater may be present, as well as the risk of acid sulphate soils.

Further information on soils is available in the Background Paper on soils and contamination (prepared by Ryall, 2010).

TOP. Figure no. 77 Existing catchment and drainage system



Heritage

Callan Park has several formal gardens with heritage significance. The largest of these is Broughton Hall Gardens, which includes several creeklines. These are shown in Figure no. 78 above. The creeklines have been formed to create a series of water features, which appear as if they may once have been fed with a re-circulating water supply. One source (www.dictionaryofsydney.org) describes the system as being fed by "overflow from the hospital refrigerator". Some sections only have small catchment areas and are quite dry; however they appear to have been designed for larger flows.

The creeklines include interesting features such as pools, sandstone benches, vegetation, bridges and walls, however some sections are weedy and some of the bridges and walls are in need of maintenance and repairs. The area has significant potential for landscape restoration.

Vegetation

Existing vegetation on the site includes:

- Formal gardens
- Sports fields
- Open grassed areas
- Remnant native bushland

As discussed, some of the formal gardens have heritage significance. The remnant native bushland is highly valued as it represents the only area of remnant bushland in Leichhardt LGA. Therefore both of these areas present constraints to the location of new water cycle infrastructure such as stormwater treatment and reuse systems.

Proposed stormwater treatment systems can complement existing landscapes by utilising similar vegetation, including locally native species. Proposed stormwater treatment systems can also help to manage the impacts of stormwater on important vegetation. Uncontrolled stormwater runoff can cause erosion and can help spread weed propagules; therefore part of the stormwater treatment strategy for the site involves a stormwater treatment system to form a buffer upstream of the remnant native bushland area.

Existing water cycle infrastructure

The layout of stormwater, wastewater and water supply infrastructure was identified in the 2008 Callan Park, Utilities and Pavement Condition/Capacity Report (prepared by URS for Sydney Harbour Foreshore Authority).

There is an extensive network of stormwater pits and pipes on site, however the majority of pits are completely blocked (URS 2008). An example is shown in Figure no. 79. In many parts of the site, where water cannot enter the piped system, stormwater regularly flows overland, which contributes to the degradation of grassed areas and bitumen surfaces.

The wastewater drainage network also extends throughout the site, servicing all of the buildings. There is a wastewater pumping station on the north-eastern side of the site, and most wastewater from the park drains to this point. This pumping station serves an area beyond the park itself.

Mains water supply also extends to each of the buildings.

All of this existing infrastructure will need to be taken into account in any proposal to redesign the site's water management infrastructure.



TOP. Figure 78 Creek lines in Broughton Hall Gardens
LOWER RIGHT. Figure no. 79 Blocked pit at Callan Park.

Callan Park Water Cycle

The following sections examine the site's future water demands, wastewater and stormwater flows.

Water demands

The Master Plan developed for Callan Park will require water for a range of different uses, including:

- Irrigated playing fields
- Formal gardens
- Community and other productive gardens
- Within buildings (toilets, showers, laundries, kitchens, workshops, etc)

Water demands have been estimated for future land uses at Callan Park and are summarised in Table no. 57 below.

Facilities	Potable water demands (ML/year)	Non-potable water demands (ML/year)
Buildings:		
Accommodation	6.7	10.0
Workplaces (offices, teaching, etc)	9.5	37.9
Public (galleries etc)	2.0	8.2
Irrigated areas:		
Glover sports field (12, 270 m2)		8.1
Expanded community garden (2,800 m2)		3.6
Urban agriculture (7220 m2)		9.4
Memorial Park (9660 m2)		2.8
Existing sports fields (8280 m2)		5.4
Balmain Road sports field (4140 m2)		2.7
Agricultural or horticultural area (17,000 m2)		22.0
Other irrigated areas (est. 90,000 m2)		22.9
Total water demands	18.2	133.0

The water demands for buildings were based on the following assumptions:

- 150 L/person/day in accommodation (this is based on a 40% reduction from a baseline of 256 L/person/day used in BASIX)
- 1 kL/m2/year in workplaces (offices, teaching facilities, etc). This is based on the NABERS 3 star benchmark for Sydney (DEH 2006) and compares to a 1 star benchmark of 1.7 kL/m2/year.
- 2 kL/m2/year in public buildings (galleries, etc). This is based on the best practice benchmark in the NABERS "Water Efficiency Guide" (DEH 2006) and compares to a baseline benchmark of 3.3 kL/m2/year.

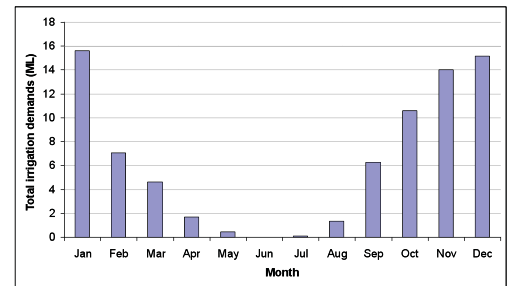
The demand values for workplaces and public buildings are based on net lettable area. These water demands represent typical benchmarks for new development that includes standard water efficiency measures such as dual flush toilets and low-flow shower heads. The residential development would need to comply with BASIX, and this has been factored into the future water demand estimate.

Table no. 58 shows that water efficiency measures are expected to reduce building water demands from a total of 126 ML/year to 74 ML/year across the site. This represents savings of approximately 40%.

Non-potable water demands in buildings include water demands for toilet flushing, laundry and hot water. All of these can potentially be supplied with rainwater and/or a high quality source of recycled water, which can bring about additional water savings. This is discussed in further detail later.

Irrigation demands were estimated using Sydney Water's "Water Right" tool. It was assumed that sports fields would be maintained to meet reasonably high standards, and would be subject to a high

level of use. Irrigation demands would be seasonally distributed and the estimated pattern of annual irrigation demands is summarised in Figure no. 80. This shows that the irrigation demands are highest in summer, with December and January's demands each representing approximately 20% of the total annual demands.



Wastewater

Callan Park itself will not generate large volumes of wastewater (wastewater volumes are expected to be approx. 70-90% of the building water demands, i.e. 52-67 ML/year). However there is a sewer pumping station immediately adjacent to Callan Park (on the edge of King George Park), and this services a larger area. The pumping station is pictured in Figure no. 81.

The Institute for Sustainable Futures (ISF) (2010) estimated that the wastewater flow in this pumping station totals 1,300 kL/day, while the overnight baseflow would be equivalent to 660 kL/day. Sydney Water will require some of this flow to remain to enable conveyance of solids, however ISF estimated a daily minimum flow of 400 kL/day would be available for sewer mining.

- 400 kL/day is equivalent to 146 ML/year.



Stormwater

Stormwater flows through the site have been estimated at 387 ML/year, including 306 ML/year generated within the Park, and 81 ML/year generated in external catchments which flow through the Park. Stormwater subcatchments are shown in Figure no. 82 on the next page.

Stormwater flows were estimated using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC), using 55 years of daily rainfall data from Ashfield Bowling Club, approximately 3km from the site and which was the nearest daily rainfall station to the site with more than 20 years of data.

The same model was used for sizing stormwater treatment systems, however 30 years of 6-minute rainfall data (from Observatory Hill) was used for this purpose as this was the closest pluviograph to the site.

Overall water balance

A water balance for Callan Park is shown in figure no. 83 on the next page. This includes estimated future water demands (green), as well as rainfall (blue), infiltration and evapotranspiration (pale blue), runoff (yellow) and wastewater (brown) flows.

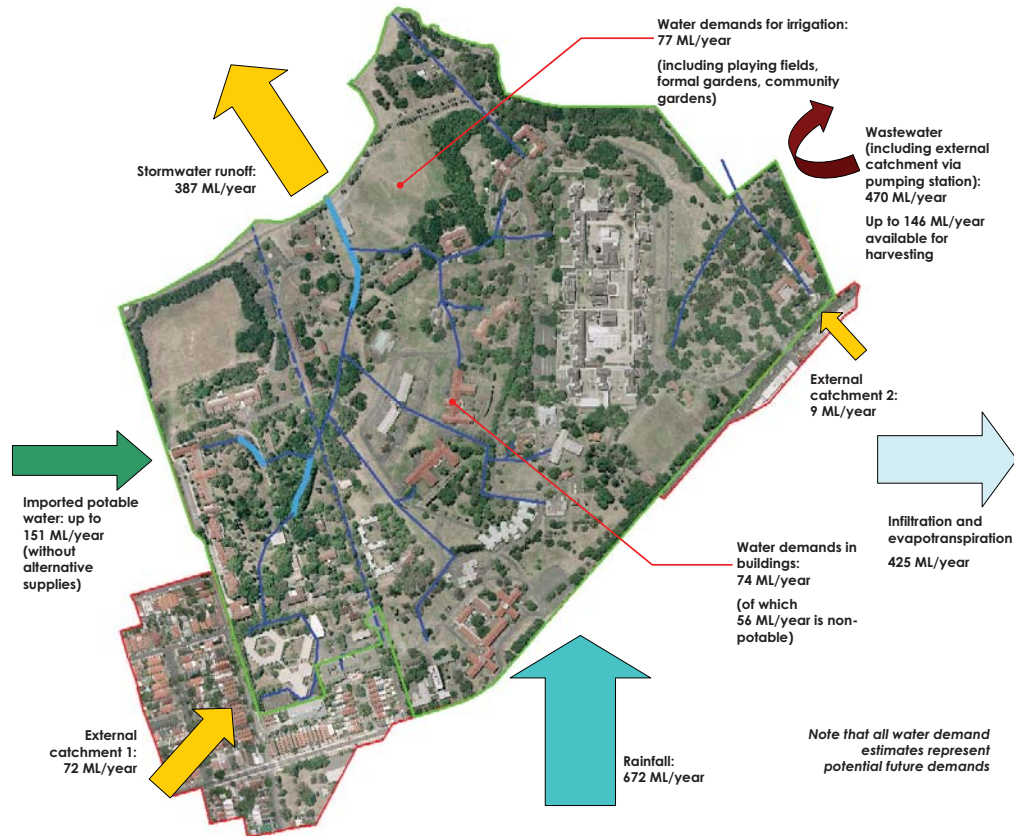
Scenario	Baseline		Best practice	
Accommodation	256 L/p/day	29 ML/yr	150 L/p/day	17 ML/yr
Workplaces	1.7 kL/m2/yr	81 ML/yr	1.0 kL/m2/yr	47 ML/yr
Public buildings	3.3 kL/m2/yr	17 ML/yr	2.0 kL/m2/yr	10 ML/yr
Total		126 ML/yr		74 ML/yr

LEFT. Table no. 57 Estimated future water demands at Callan Park.

BOTTOM. Table no. 58 Summary of water demands in buildings – baseline and best practice.

TOP RIGHT: Figure 80: Estimated monthly distribution of irrigation demands.

MIDDLE RIGHT. Figure no. 81: Wastewater pumping station located on the edge of King George Park, adjacent to Callan Park.



TOP. Figure no. 82 Callan Park subcatchments.
BOTTOM. Figure no. 83 Callan Park water balance.

Target category	Best Practice	Stretch
Water conservation, recycling and reuse	Within buildings, mains water demands should be reduced by 60% below baseline, where baseline water demands are those demands for similar existing facilities with no water conservation measures. Within open space, 80% of water demands should be met using a sustainable supply, e.g. stormwater harvesting or wastewater recycling.	"zero water" – Callan Park should completely offset its demand on mains water supplies, by becoming a net exporter of water for reuse
Stormwater treatment	Treat stormwater to meet the following water quality objectives: 85% retention of the mean annual load of total suspended solids 65% retention of the mean annual load of total phosphorus 45% retention of the mean annual load of total nitrogen	Treat stormwater to restore pre-development pollutant loads into Iron Cove from the Callan Park catchment.
Waterway restoration	Restoration of waterways (where site constraints allow) to re-establish a strong connection between catchments and receiving waters: Reinstatement of riparian vegetation Use of swales rather than pits and pipes to convey flows into the main drainage lines	Restoration of waterways to natural conditions: Removal of piped/channelised sections and replacement with a natural waterway Matching the natural stream flow regime (in terms of the frequency, quantity and rate of flows) as closely as possible

Callan Park Water Balance

The water balance highlights the fact that stormwater and wastewater volumes are significant in comparison to water demands. This emphasises the potential for stormwater harvesting and reuse or sewer mining to meet non-potable water demands on the site.

IWCM Objectives

Urban re-development can potentially bring about significant negative impacts on the natural water cycle, including:

- The import of significant quantities of potable (drinking) water to meet demands within buildings and irrigated landscapes
 - The export of significant quantities of wastewater
 - The export of pollutants in stormwater runoff, including sediment, nutrients, heavy metals, hydrocarbons and other organic compounds
 - Increased runoff and a faster runoff rate from paved surfaces directly connected to a structured drainage system
 - Degradation of natural drainage lines
- Sustainable water management involves the preservation, as far as possible, of the features of an area's natural water cycle. Sustainable water management in the urban environment involves:
- Reducing demand for potable (drinking quality) water
 - Minimising wastewater generation
 - Treating wastewater to a standard suitable for beneficial reuse (i.e. water recycling)
 - Treating urban stormwater to meet water quality objectives for reuse and/or discharge to receiving waters - stormwater from Callan Park should not have a negative impact on Iron Cove and Sydney Harbour
 - Matching the natural stream flow regime (in terms of the frequency, quantity and rate of flows) as closely as possible
 - Protecting and enhancing natural waterways and receiving waters
 - Integrating water management elements into the landscape and urban design to maximise the visual and recreational amenity of urban development
- The sustainable water management strategy for Callan Park is

based on "best practice" and "stretch" targets for water management. The recommended targets are summarised in Table 59.

All of the targets in the "Best Practice" column represent current best practice in urban water management, and reflect both an aspiration to minimise impact on the natural water cycle, as well as pragmatic considerations about what is achievable in an urban environment.

The best practice water conservation target for buildings compares to a 40% reduction required for new residential dwellings in NSW (this is a requirement of the NSW Government's Building Sustainability Index (BASIX) scheme). In practice, a 40% reduction is relatively easy to achieve using water efficient fittings and appliances (appliances can be included in the BASIX score for multi-unit dwellings). A 60% reduction is readily achievable with the addition of a rainwater tank plumbed to internal demands including toilets and laundry. Plumbing the rainwater tank to hot water provides additional water savings.

The best practice stormwater treatment objectives aim to remove a large proportion of the pollutant load from urban stormwater. In capturing suspended solids and nutrients (nitrogen and phosphorus), other pollutants including heavy metals, hydrocarbons, organic pollutants and pathogens will also be removed. Currently these objectives apply in Sydney's growth centres and in a wide range of local government areas, but are yet to be extended to all new development in Sydney.

Callan Park has the potential to showcase sustainable water management principles and practices to the community, supporting broader adoption of sustainable water management beyond Callan Park itself, throughout the local area. For this reason, "Stretch" targets have also been proposed, which represent world-leading practice in sustainable urban water management. One of the project principles for Callan Park is to "ensure Callan Park is a world-leading model for social, environmental and economic sustainability". The stretch targets are consistent with this goal.

IWCM Constraints and Opportunities

Constraints

The sustainable water management strategy for Callan Park will need to respond to the rainfall and climate of the local area, the site's natural topography, the existing development and infrastructure on site

Principles of sustainable water management	Opportunities to Implement sustainable water management at Callan Park
Reduce potable water demand	Where appropriate, choose locally indigenous and water efficient species for landscape planting and retrofit buildings with water-efficient fittings. Seek alternative sources of water supply, including rainwater tanks, stormwater harvesting and/or wastewater treatment and reuse
Minimise wastewater generation and treat wastewater to a standard suitable for effluent reuse	Reduce indoor water demands to reduce the quantity of wastewater generated. Investigate opportunities to recycle wastewater from the existing pumping station
Treating urban stormwater to meet water quality objectives for reuse and/or discharge to receiving waters	Utilise stormwater treatment systems such as swales, bioretention systems and wetlands to treat stormwater before it drains into the Harbour. Investigate opportunities to store treated stormwater for reuse
Match the natural runoff regime as closely as possible	Reduce stormwater runoff through infiltration, evaporation, storage and reuse. Reinvent the drainage system to replace pits and pipes with swales and natural channels to slow flows and promote infiltration
Protect and enhance natural waterways and receiving waters	Explore opportunities to restore the drainage lines which have been channelised and converted to underground pits and pipes.
Integrate water management elements into the landscape and urban design so as to maximise the visual and recreational amenity of urban development	There are significant landscaped areas on site and a wide range of opportunities to integrate natural systems for stormwater treatment and conveyance. Explore opportunities to utilise existing infrastructure (for example, existing water storage facilities) to minimise requirements for new structures.

TOP. Table no. 59 Callan Park IWCM targets

BOTTOM. Table no. 60 Principles of sustainable water management and associated opportunities.

Strengths of Callan Park	Role of sustainable water management
Variety of landscaped areas, including formal landscaped gardens and open parkland	Where possible, landscaped areas should comprise locally indigenous species suited to local climatic conditions, or drought-tolerant species with relatively low water demands. However Callan Park's formal gardens have heritage significance and hardy native planting aren't suitable for all areas of the site. Irrigated landscapes and water features should be supplied with a sustainable source of water, sourced locally and treated to a standard appropriate for irrigation.
Assets for passive and active recreation	Sports fields, which rely on irrigation to maintain a quality playing surface, should also be irrigated from a sustainable source of water. This will reduce reliance on mains water and help ensure that water is available in times when restrictions apply.
Remnant native bushland	Sustainable stormwater management at Callan Park should protect remnant bushland from the impacts of uncontrolled stormwater discharge, including erosion, deposition of sediments, nutrient enrichment and transport of weed propagules. This can help protect the quality and biodiversity of the bushland area.
Connection to Sydney Harbour	Sustainable water management includes management of stormwater and wastewater quality and quantity, to minimise discharge of pollutants into Iron Cove and Sydney Harbour and to support ecosystems such as seagrass beds in Iron Cove. Callan Park presents an opportunity to take a catchment-wide approach to water management, as the park extends from a ridge line to the Harbour.
Community facilities	Water demands in buildings should be reduced, and sustainable supplies should be sought to meet non-potable demands. Buildings also present opportunities to harvest rainwater from roofs or collect and recycle wastewater.
Place for community events and recreation	Callan Park can showcase sustainable water management principles and practices to the community, supporting broader adoption of sustainable water management beyond the park itself, throughout the local area. There are also opportunities at Callan Park to involve the community more actively in participatory sustainable water management activities.

and the key features of the site which are to be preserved, enhanced and developed as part of the Master Plan.

Key constraints were summarised, including those relating to topography and drainage, geology and soils, heritage, vegetation and existing water cycle infrastructure.

Opportunities

Sustainable water management has the capacity to support Callan Park's key strengths, minimise risks associated with poor water management practices, and reverse past negative impacts on the natural water cycle.

Poor water management practices present risks including:

- Pollution of the harbour from stormwater runoff and/or sewer overflows
- Impacts on native bushland via uncontrolled stormwater runoff
- Further loss of habitat and biodiversity in drainage lines, riparian areas and the Harbour
- A shortage of water for irrigation of sports fields, landscaped areas and other purposes (for example if restrictions are in place and irrigation is reliant on mains water)
- Flooding and drainage issues

The sustainable water management strategy for Callan Park will address these risks, as well as providing opportunities to enhance Callan Park's key strengths.

Opportunities for sustainable water management are summarised in the following tables, which respond to different types of water management drivers:

- Table no. 61 lists the key principles of sustainable water management, and opportunities which arise from these and identifies some key strengths of Callan Park, which will be enhanced by the Master Plan and which give rise to other water management opportunities.

IWCM Strategy

Sustainable water management at Callan Park will take an holistic approach to the site's water cycle, and will focus on:

- Reducing water demands within buildings, facilities and landscaped areas
- Providing sustainable sources of water to supply demands that don't require drinking quality water
- Protecting Iron Cove from water-borne pollution
- Restoring natural waterways, with respect for heritage features (i.e. seek opportunities to restore natural channels and riparian zones where appropriate; however maintain heritage features such as the sandstone block-lined channel and rainforest gully)
- Protecting remnant native bushland on the site
- Promoting sustainable water management and serving as an

example of best practice

The IWCM Strategy for the Park has been developed in conjunction with the Master Plan, both contributing to the Master Plan and responding to other elements of the Master Plan. Key elements of the IWCM Strategy are outlined in the following sections.

Water conservation

Water demands can be minimised through the implementation of water-efficient landscaping, best practice irrigation techniques, and installation of water-efficient fittings and appliances within buildings. These options are widely available.

A key challenge will be encouraging individual building tenants to take up water-efficient options. This could be assisted via:

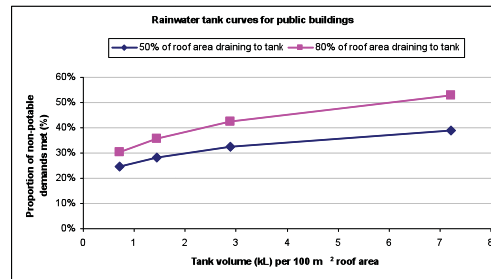
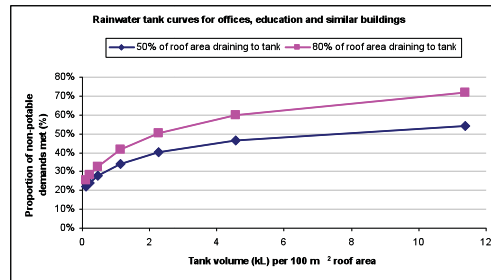
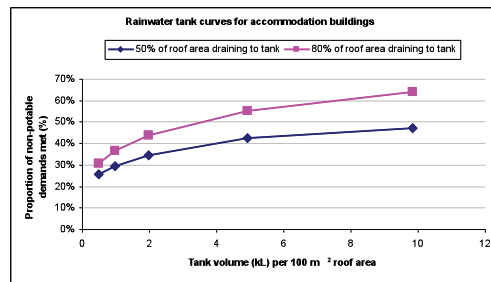
- Setting minimum standards for Callan Park tenants
- Setting a site-wide water conservation target and providing building tenants and other users of the Park with feedback on progress towards the target
- Offering financial incentives, such as a discount on water-efficient fittings/appliances
- Providing "green loans" to facilitate water (and energy) efficient retrofits
- Setting up demonstration sites at key buildings within the Park
- Providing relevant information to tenants
- Providing design advice, such as rainwater tank sizing

In landscaped areas, water demands can be minimised by planting water-efficient species, establishing landscaped areas well and using efficient irrigation practices. This should involve:

- Wherever possible, selecting hardy, water-efficient plants and "warm season" turf grasses
- Establishing irrigated landscapes on a good quality soil, with suitable moisture-holding capacity
- Use of mulch to retain soil moisture in garden beds
- Utilising high quality irrigation equipment and a good irrigation design, which applies water efficiently to the area required (for example, utilising drip irrigation where practical to minimise evaporation losses)
- Installation of a high quality irrigation control system, which allows operators to irrigate only when required (for example, using a rainfall sensor to estimate the shortfall in water demands after rainfall is taken into account, or using soil moisture probes to determine when soil moisture is depleted)
- Irrigating at night and in calm conditions when evaporation is low
- Maintaining irrigated areas to keep irrigation equipment working well and manage compaction (e.g. by aeration of the soil)

These principles should be incorporated into landscape and irrigation design and future maintenance contracts for irrigated areas at Callan Park.

TOP Table no. 61 Strengths of Callan Park and associated opportunities



Potable water substitution

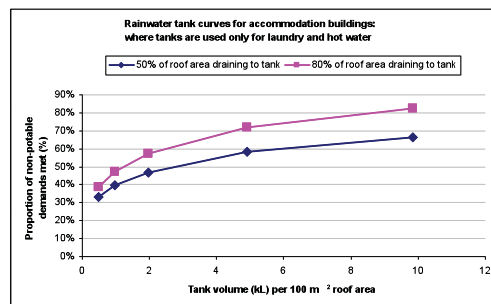
There is a clear opportunity to supply a large proportion of Callan Park's water demands from alternative sources. Rainwater tanks can provide one alternative source of supply. Potential additional sources of supply are stormwater harvesting and/or sewer mining. These options are discussed in the following sections. A later section summarises the potential to adopt a "zero water" target at the site and a physical plan for a sustainable water supply strategy at the site.

Rainwater tanks

As there are a large number of buildings distributed across Callan Park, rainwater tanks will be a cost-effective option for providing non-potable water to buildings. Rainwater tanks can be adopted relatively quickly, as they are small-scale distributed structures and do not require major new infrastructure (such as reuse pipelines, centralised treatment systems) to be delivered up front before they can be adopted. In buildings which are to be substantially refurbished or newly constructed, rainwater tanks should form part of the design. Rainwater tanks can also be retrofit to existing buildings.

Rainwater can be used to meet toilet flushing, laundry and hot water demands in most cases without any treatment. In some cases (e.g. where the roof is affected by substantial leaf litter loads) filtration may be worthwhile. Hot water systems are effective at providing disinfection via the heating process.

Location and design of rainwater tanks will need to consider heritage values of the buildings, however it is expected that most buildings will be able to accommodate one or more tanks in suitable locations.



TOP LEFT. Figure no. 84 Rainwater tank sizing curves for Callan Park, where rainwater tanks are used for all non-potable demands.

BOTTOM LEFT. Figure no. 85 Rainwater tank sizing curves for accommodation buildings, where rainwater tanks are only used for laundry and hot water demands.

RIGHT. Table no. 62 Stormwater harvesting scenarios

Rainwater harvesting was a key feature of Callan Park's history, as water supplies for the original hospital were all sourced on site and stored in a large underground tank at the Kirkbride building. Therefore rainwater harvesting is consistent with the site's heritage values.

In order to understand the potential for rainwater harvesting at Callan Park, a water balance model was set up to model various scenarios for rainwater tanks on buildings. The three types of buildings identified in Figure no. 84 (accommodation, workplaces and public buildings) were modelled. Various tank sizes were considered, and two different scenarios were considered where either 50% or 80% of the roof would be connected to the tank.

Results are shown in Figure no. 85. These show that rainwater harvesting (utilising rainwater tanks at each building) has the potential to meet approximately 30-60% of non-potable water demands in buildings at Callan Park. Assuming that 45% of these demands are met overall, this is equivalent to approximately 25 ML/year or 19% of the site's non-potable water demands.

A second option was considered whereby rainwater tanks would only be used to meet hot water and laundry demands. These are the demands where higher quality water is required (compared to toilet flushing or cooling towers) and therefore treated stormwater or recycled wastewater may not be suitable for these end uses. This option was applied only to the accommodation buildings, because workplaces and public buildings are not expected to have significant hot water or laundry demands. Again, two scenarios were considered whereby either 50% or 80% of the roof would be connected to the tank.

This shows that these rainwater tanks can meet a reasonable proportion of hot water and laundry demands, providing a large tank is provided and a large proportion of the roof area is connected into the tank. Many of the accommodation buildings at Callan Park will be new buildings, and therefore this should be feasible, providing rainwater harvesting is considered up front as a key part of the building's design.

Laundry and hot water demands in the accommodation buildings represent approximately 18 kL/day or 6.7 ML/year. If rainwater tanks are used for laundry and hot water demands and they are sized to meet 70% of these demands, then they can provide approximately 4.7 ML/year.

Stormwater harvesting

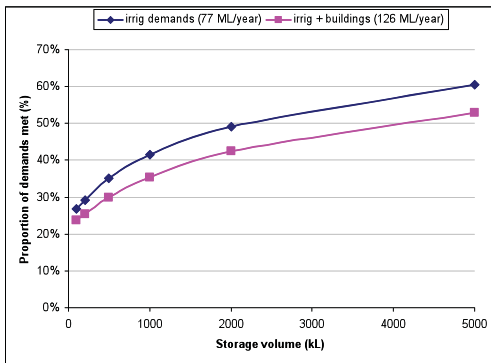
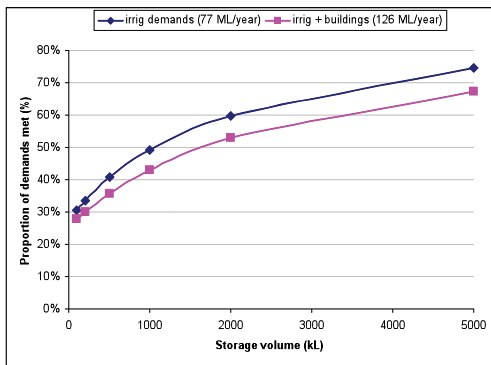
Both stormwater and wastewater supplies on the site are limited. Stormwater flows are also highly variable and stormwater harvesting relies on storage to balance supplies and demands. To assess the potential for stormwater to meet non-potable demands, and size appropriate storage systems, a daily water balance model has been set up. This model has initially been run for two stormwater harvesting scenarios, which are summarised in Table 62.

Scenario	Catchment	Water Demands	Storage
1	Whole site + external catchment	Each scenario was tested for two demand scenarios:	Each scenario was tested for a range of storage volumes, assuming that up to 300 ML would be provided in an open pond (and accounting for the associated evaporation losses)
2	Area draining to main channel, upstream of tidal section	(a) irrigation demands (77 ML/year) (b) irrigation (77 ML/year) plus non-potable demands in buildings, excluding laundry and hot water (49 ML/year)	

Scenario 1 represents the maximum potential for stormwater to supply irrigation demands. Scenario 2 is more realistic, as it will not be possible to drain every part of the site to a stormwater harvesting system. Option (b) would involve a reticulated supply to Callan Park's buildings, to supply toilet flushing and any cooling tower demands. Laundry and hot water demands have been excluded from this scenario because they require higher quality water and treated stormwater may not be suitable. In Section 6.2.1 it was shown that rainwater tanks could meet a good proportion of laundry and hot water demands.

Results for both stormwater scenarios are shown in Figure no. 86. These results show that for stormwater harvesting to supply a reasonable proportion of demands at Callan Park, a significant storage volume is required, with approximately 2,000 ML being optimal. Below this volume, the scheme's effectiveness drops quickly, while above this volume, larger storages provide diminishing returns in terms of the reliability of supply.

Based on the results for Scenario 2 (where water is only harvested



from the main channel), and based on a storage volume of 2,000 ML, stormwater harvesting would be able to supply approximately:

- 49% of irrigation demands (i.e. 38 ML/year); or
- 42% of irrigation + building non-potable demands (i.e. 54 ML/year);

Both options fall short of water conservation targets for the site, however the latter option represents the best outcome in terms of water savings. 54 ML/year represents approximately 41% of the site's total non-potable water demands.

A site investigation on 21 September 2010, after six days without rainfall, found a persistent baseflow in the concrete stormwater channel at the upstream end of the channel. This flow was estimated at 0.3 L/s, which is equivalent to approximately 25 kL/day or 9 ML/year. Persistent baseflows are a common feature of large stormwater catchments, and can arise from groundwater seepage, potable water or wastewater leaks or cross-connections. In Callan Park there was evidence of groundwater seepage in the channel – the reddish-orange deposits (evidence of iron compounds leached from the soil and groundwater) visible in Figure no. 87 are typical of groundwater flows in Sydney. This is also consistent with a catchment which has a large pervious fraction (therefore significant infiltration) and old stormwater infrastructure (therefore a likelihood of seepage into stormwater pipes).

Further investigation would be required to confirm whether this baseflow is persistent and to confirm the estimated flow rate, however based on the current estimate, it can potentially supply approximately 9 ML/year or 7% of the site's total non-potable water demands.

Wastewater recycling

There is potential to implement a sewer mining scheme at Callan Park. The potential daily flow available for sewer mining has been estimated at 400 kL/day, which is equivalent to 146 ML/year.

Despite the fact that the total annual supply from sewer mining exceeds the estimated total annual non-potable water demand for Callan Park (133 ML/year), it would not be possible to meet all the non-potable demands with recycled wastewater. There would be a significant shortfall in summer, when irrigation demands are at their highest. Recycled wastewater is also not likely to be suitable for supplying laundry and hot water demands.

Average irrigation demands in January (the month with the highest demands) have been estimated at approximately 15.6 ML or 500 kL/day. Demands in December are also 15.2 ML or 490 kL/day. In addition to irrigation demands, non-potable demands in buildings (other than laundry and hot water demands) average 135 kL/day year-round. Therefore the total daily demand for non-potable water would be approx. 635 kL/day in January and 625 kL/day in December.

If wastewater were used alone to meet the site's irrigation and selected non-potable demands (excluding laundry and hot water demands), then a constant supply of 400 kL/day could meet all of

these demands in February to September. However there would be a shortfall in October to January as follows:

- October: 2.4 ML
- November: 6.1 ML
- December: 7.0 ML
- January: 7.4 ML

Therefore the total shortfall would be approximately 23 ML/year. The total demand supplied would be approximately 103 ML/year. Recycled wastewater could therefore meet approximately 82% of the irrigation and selected non-potable demands, which is equivalent to 77% of the site's total non-potable demands.



Potential to meet a "zero water" target

Given the limited supply of wastewater and stormwater, it will be necessary to implement both in order to meet more than 80% of Callan Park's non-potable water demands, and there is still likely to be some shortfall on peak summer days during dry periods.

It is expected that with a carefully designed and well-managed system, a combination of rainwater tanks, stormwater harvesting and wastewater recycling will be able to come close to meeting 100% of the site's non-potable demands (which are 133 ML/year). However it is not likely to be worthwhile to design a system to meet 100% of the non-potable demands, as this would entail a high degree of redundancy and would require very large storage volumes to provide security of supply.

To provide an initial indication of the effectiveness of a combined wastewater recycling and stormwater harvesting scheme, a final stormwater harvesting scenario was modelled, where stormwater was used only to meet the shortfall identified in Section 6.2.3 after a 400 kL/day wastewater recycling scheme is implemented. Results for this scenario are shown in Figure no. 88.

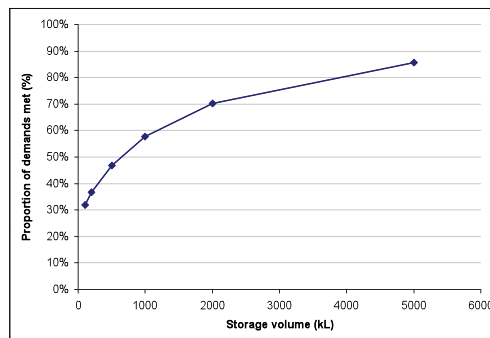


Figure no. 88 shows that a storage volume of 2,000 kL can supply approximately 70% of the shortfall, which is equivalent to 16 ML/year. This represents 12% of the site's total non-potable demands.

Table no. 63 ON THE NEXT PAGE summarises the potable water conservation and substitution strategy which has been developed in the previous sections, quantifying the volumes which can be supplied from various sources.

Note that the scenarios above exclude baseflow, which has been estimated at 9 ML/year, however the long-term reliability of this supply is uncertain.

TOP LEFT. Figure 86: Potential for stormwater harvesting to supply Callan Park's water demands: (a) where runoff from the whole site is captured in the harvesting scheme (top) and (b) where runoff is only captured from the main stormwater channel, upstream of the tidal section (bottom)

TOP RIGHT. Figure 87: Baseflows at the upstream end of the open concrete channel in Callan Park

A zero water target would mean looking for opportunities to "offset" any shortfall in meeting the non-potable demands, as well as offsetting the whole amount of the Park's potable water demands. This would be achieved by supplying water off site (e.g. to nearby facilities), as it is unlikely to be feasible/cost effective to supply water for potable purposes on site. Nearby opportunities are limited, but may include irrigation of King George Park or Leichhardt Park. These could be linked with a pipeline along the foreshore. Note that Leichhardt Park already has a stormwater harvesting scheme in place to meet water demands at the Leichhardt Oval, however other areas of the park (which includes some other sports fields) may be able to use additional recycled water.

Further from Callan Park, other sites with significant non-potable water demands may potentially include Bridgewater Park, Sydney Secondary College, Rozelle Public School, Orange Grove Public School, Easton Park or Blackmore Park. Providing recycled water to these sites would be more difficult/costly, as there would be a need to cross roadways and other infrastructure. However all of these sites are within 1 km of Callan Park.

Callan Park's potable water demands have been estimated at 18.2 ML/year. This is equivalent to the irrigation demands of approximately three sports ovals, each 1.0 ha in area (similar to King George Park). The total shortfall in Table 66 after rainwater tanks, stormwater harvesting and wastewater recycling are implemented has been estimated at 27 ML/year. This is equivalent to the irrigation demands of approximately four and a half 1.0 ha sports ovals. As supply reliability is likely to be less than 100%, a larger area would actually have to be connected to the system.

Physical plan for sustainable water supply

Based on the assessment above, a plan has been developed to illustrate the key physical infrastructure required to implement a sustainable water supply strategy at Callan Park. This is shown in the Water Overlay and includes:

- Recycled water reticulation – the proposed strategy includes a ring main following the alignment of the "infrastructure loop". This would be connected to each of the sources of supply and would carry treated water suitable for non-potable reuse (excluding laundry and hot water). The reticulation network would also include connections to each building and irrigated area; note that these smaller water supply lines are not shown in the Water Overlay diagram.
- Treated water storage – a storage tank would provide a buffer to balance peak demands with available supplies. At this stage a buffer tank of 650 kL has been suggested, which is just over the average daily non-potable water demands estimated for the peak month (i.e. during January). A location has been nominated under the new sports field on Balmain Road. This would be connected into the ring main so that it could either be filled from the main or

could provide supply into the main.

- Stormwater harvesting – stormwater (including any available base flows) would be harvested from the main channel. Stormwater storages have been proposed as follows:
 - A storage pond is proposed downstream of the city farm. It has been estimated that approximately 300 kL active storage volume can be accommodated in this location.
 - A second stormwater storage has been proposed by converting the existing swimming pool, adjacent to the city farm, into a stormwater storage. The estimated volume available here is also approximately 300 kL.
 - As the optimal storage volume is approximately 2,000 kL, a further 1,600 kL storage tank is proposed under the new Memorial Park. This location has been selected because it is also close to the stormwater channel and the Master Plan includes substantial modification of this area, including filling above the existing ground levels.

These storages should be linked together so that they operate effectively as one storage system. Stormwater would be extracted from these storage systems, treated online and fed into the recycled water ring main. To allow the system to meet peak daily demands when water is available, the stormwater treatment system would need to be designed for a flowrate of at least 250 kL/day, which is equivalent to approximately 3 L/s.

- Wastewater recycling – wastewater would be extracted from the sewer at the pumping station on the edge of King George Park, and treated in a 400 kL/day wastewater treatment plant. An indicative footprint for this plant is 100 m². A preferred location has been identified amongst the trees to the north of the buildings where Wards 12, 13 and 14 are located. Treated water would be fed into the recycled water ring main.

- Rainwater tanks (not shown) – the strategy should include rainwater tanks on the accommodation buildings. These can initially supply all non-potable demands in the building, then when the reticulated recycled water becomes available, the rainwater tanks should be modified to supply only those end uses where a higher quality is required (e.g. hot water and laundry) while recycled water is used for toilet flushing. If the non-potable water reticulation network cannot be implemented for more than 5-10 years, rainwater tanks may also be worthwhile as an interim measure for other buildings as well.

During concept design, the strategy for stormwater harvesting and wastewater recycling should be reviewed to optimise the system as a whole. More detailed water balance modelling is required for this task. It is likely that some of the storage volumes could be reduced by designing and operating the system to operate as a smart network where storages are interlinked.

Scenarios and options		Water savings	Remaining water demands	Proportion of water demands offset (compared to baseline)
Buildings	Baseline	0	126	-
	Best practice	52	74	41%
	Rainwater tanks for toilets and hot water	+5 =57	69	45%
	Option A: stormwater harvesting for all other non-potable demands	+21 = 78	48	62%
	Option B: wastewater recycling for all other non-potable demands	+49 =106	20	84%
Irrigation	Baseline	0	77	-
	Option A: stormwater harvesting	33	44	42%
	Option B: wastewater recycling	54	23	70%
	Option C: combined wastewater recycling and stormwater harvesting	54+16 =70	7	91%
Totals	Baseline	0	203	
	Best practice	52	151	26%
	Rainwater tanks	+5 =57	146	28%
	Option A: stormwater harvesting	+54 =111	92	55%
	Option B: wastewater recycling	+103 =160	43	79%
	Option C: combined wastewater recycling and stormwater harvesting	=176	27	87%

BOTTOM. Table no. 63 Summary of potable water conservation and substitution strategy

OPPOSITE PAGE - BOTTOM RIGHT. Figure no. 88: Potential for stormwater harvesting to make up the shortfall in October to January after wastewater recycling meets other demands

Stormwater treatment

Callan Park occupies a relatively self-contained catchment (there is just a small external catchment which drains into the site from the south), and this presents an opportunity to achieve strong stormwater treatment outcomes for the catchment as a whole. The whole catchment can be treated to meet "best practice" stormwater quality targets and minimise the site's impact on the Harbour. This would involve the use of vegetated treatment systems (e.g. swales, wetlands, Bio-retention systems).

Considering the catchment as a whole, the total area is 70 ha and the impervious fraction has been estimated as 31%. The impervious area has been split into roads, roofs and other impervious areas (which have different characteristics in terms of pollutant generation) and mean annual pollutant loads have been estimated as:

- Total suspended solids (TSS): 80,800 kg/year
- Total phosphorus (TP): 176 kg/year
- Total nitrogen (TN): 1,320 kg/year

Best practice treatment targets (widely adopted in NSW and elsewhere in Australia) are pollutant removal rates of 85% for TSS, 65% for TP and 45% for TN. To achieve these targets would require the following total treatment system areas:

- Approximately 5,000 m² Bio-retention systems; or
- Approximately 15,000 m² wetlands.

A combination of swales, Bio-retention systems and wetlands could be used and should be distributed throughout the site according to the catchment and drainage characteristics.

The preferred locations for stormwater treatment systems have been determined in conjunction with the development of the overall Master Plan. These are shown in The Water Overlay. Each of the

treatment systems has been sized to meet the best practice objectives.

The stormwater treatment systems shown in the Water Overlay include a range of different systems including wetlands, Bio-retention systems and swales. Some of the proposed systems would be integrated into open space areas and are likely to include 'soft' vegetated edges, while others would be incorporated into more formal landscapes and are likely to include 'hard' edges. Some examples of typical stormwater treatment systems in parks are shown in Figure no. 90, to provide a general impression of the options available.



Waterway restoration

There is one major drainage line and several smaller drainage systems on the site, all of which are highly modified. Full restoration to natural conditions is not possible within the context of the proposed Master Plan, however there are good opportunities for partial restoration of these watercourses, including "daylighting" piped sections and re-vegetating with native species.

Waterway restoration can help re-establish a strong connection between catchments and receiving waters. It could link with bush regeneration activities already occurring in the Park; it could also enhance spaces for passive/contemplative recreation and reduce some of the large expanses of mown grass. There would also be links with the stormwater quality strategy.

Key opportunities for waterway restoration are highlighted in the Water Overlay. These include:

- Naturalising the concrete channel downstream of Military Drive. The Master Plan identifies this and the adjacent foreshore (where the seawall will be modified) as an area for salt marsh restoration;
- Restoring the heritage water features in Broughton Hall Gardens; and
- Daylighting pipes and restoring creeklines in conjunction with stormwater treatment systems where the topography suits and space allows.

The area of salt marsh will need to be carefully thought out to allow for both flow conveyance and salt marsh restoration. Salt marsh thrives in a hyper-saline environment, normally found at the upper limit of the tidal zone, where the salt marsh is not inundated by every tide but is inundated by the highest tides. Salt marsh will need to be protected from large freshwater flows from the upstream catchment and is likely to be feasible only as a fringing area around the channel. Within the channel, the natural levels are optimal for mangroves, which thrive in the intertidal zone where they are inundated in every high tide and exposed in every low tide.

Figure no. 91 shows a restored salt marsh at Sydney Olympic Park. Mangroves are visible in the background in areas with lower substrate levels.

Within Broughton Hall Gardens, restoration should focus on weed removal, repairing existing structures and protection of the heritage values. It would also be good to restore flows to these systems to restore pools and add interest, as there is very little flow in the creeklines in the Gardens. The top left image on the opposite page shows a section of the Broughton Hall Gardens where there was some flow after recent rain, suggesting the potential for an attractive natural water feature.



LEFT. Figure no. 90 From top to bottom: Example of a formal bioretention system in a park [Pirrama Park, Pyrmont]; Example of an informal bioretention system fringing parkland [Prince Henry, Little Bay]; Example of a bioretention swale in a park [Chain of Ponds Reserve, Strathfield South],

TOP RIGHT. Figure 91 Salt marsh at Sydney Olympic Park.



Community involvement in sustainable water management

There is an opportunity for Callan Park to act as a demonstration site for sustainable water management (as well as other sustainable practices). The Park could include both education and participatory opportunities, to help inspire and inform broader action amongst the community.

Demonstration projects could include:

- Water saving measures for houses and gardens
- Rainwater harvesting
- Greywater treatment
- Stormwater treatment techniques for household scale



BOTTOM LEFT. Figure no. 92 Ideas for sustainable water experimentation and demonstration at Callan Park, Green wall experiment [image from Bankstown City Council]; Greywater treatment wetland [http://urbangardenmagazine.com]; Urine separation and reuse [http://www.eawag.ch]

BOTTOM RIGHT. Figure no. 93 Proportion of future demands to be met by various sources at Callan Park.



There could also be opportunities within the Park to test and demonstrate novel technologies and techniques, including green walls and green roofs, composting toilets, urine separation and reuse systems, novel wastewater treatment systems, etc. There could be links with other facilities at Callan Park (for example urine could be reused as a valuable fertiliser in the productive landscapes on site). There could also be links with research as well as value in community involvement.

CERES in Melbourne (<http://www.ceres.org.au/>) is an example where visitors can learn about green technology including composting toilets, raingardens, vegetated wastewater treatment systems, etc. The CERES model encourages experimentation and demonstration of new technologies and practices.

Outcomes of the IWCM Strategy

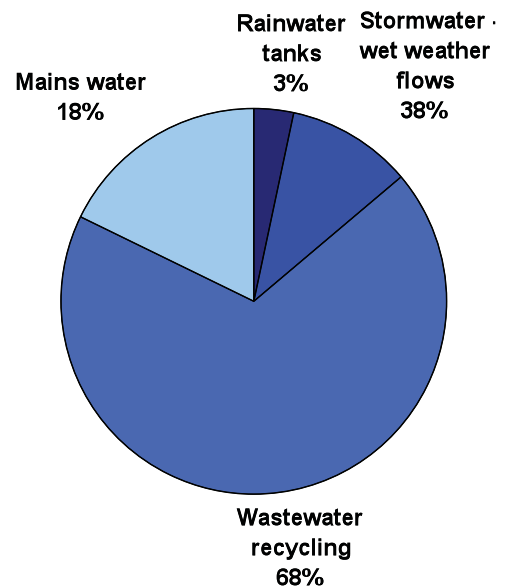
The IWCM Strategy for Callan Park has been developed to address the Objectives and Targets outlined in previously in this document.

In terms of water conservation, recycling and reuse, the proposed strategy is expected to exceed the best practice targets for buildings (60% reduction in mains water demands) and irrigation (80% reduction in mains water demands), and a strategy has been outlined which can potentially achieve the stretch target of zero net mains water demands for Callan Park.

Figure no. 93 below illustrates the proportion of Callan Park's future water demands (total 151 ML/year) which can be met with rainwater, stormwater and recycled wastewater. It also includes the shortfall which needs to be supplied from mains water (and can potentially be offset by supplying other off site demands).

In terms of stormwater treatment, this document has put forward a stormwater treatment plan capable of achieving best practice targets for pollutant load removal, including an 85% reduction in the mean annual load of TSS, 65% reduction in TP and 45% reduction in TN. The proposed stormwater harvesting scheme will contribute to even greater removal of pollutant loads, by harvesting approximately 50 ML/year of stormwater flows and preventing these flows (approx. 13% of total stormwater runoff) from discharging into Iron Cove.

It would not be feasible to meet the stretch target of reducing pollutant loads to pre-development levels. This can be achievable on sites



which have a large external catchment, so that the site can provide a service to a larger area. However Callan Park only has small external catchments and therefore it is very difficult for the site to provide additional pollutant removal beyond current best practice.

In terms of waterway restoration, this document has put forward a strategy which includes naturalisation of a section of concrete channel, restoration of salt marsh along the Iron Cove foreshore and restoration of creeklines within the Broughton Hall Gardens. The waterway restoration strategy has also identified several opportunities for daylighting pipelines immediately upstream of proposed stormwater treatment systems.

This IWCM Strategy has also identified opportunities for community involvement in sustainable water management, including demonstration projects, education and participatory activities. These opportunities could link to other elements of the Master Plan such as the city farm, the community garden and other productive landscapes.

Implementation of the IWCM Strategy

While some elements of the IWCM Strategy rely on centralised infrastructure (for example the recycled water supply main and treated water storage tank), there are many elements which will be decentralised and can be implemented utilising a staged approach:

- Water conservation can begin immediately. Potential mechanisms to encourage sustainable water management practices in individual buildings and landscaped areas at Callan Park. The proposed Callan Park Trust should play a role in facilitating sustainable water management using these mechanisms.
- Rainwater tanks can be retrofitted to existing buildings as they are refurbished and can be included in the design of new buildings. In this way, rainwater can begin to supply non-potable demands quickly, before other recycled water infrastructure is available. Rainwater tanks can be modified later on when recycled water becomes available.
- 3. The stormwater treatment strategy should be integrated with infrastructure and open space upgrades. The site's existing stormwater network is in poor condition, and this presents a good opportunity to move away from piped stormwater drainage and use swales and natural drainage lines instead. For example if the road network is modified, then new roads can be constructed to feed runoff into stormwater treatment systems rather than into the piped drainage system. Waterway restoration should also take place as specific areas are upgraded.
- 4. Once the key infrastructure is in place to form the recycled water network, including the ring main and treated water storage tank, non-potable water supplies can begin to feed into this network and individual buildings and landscaped areas can be hooked up via distribution mains. The recycled water network could initially operate using mains water if necessary, then gradually switch over to treated stormwater and recycled wastewater supplies as these become available.
- 5. Stormwater harvesting storage systems should be constructed as works are undertaken at their proposed locations, downstream of the city farm, at the existing swimming pool and in the proposed Memorial Park. This could occur before or after the recycled water network infrastructure is in place. Once both the storages and the recycled water network are in place, the stormwater treatment system can be completed and brought online. It may be possible to start supplying treated stormwater before all of the storages are complete, depending on the design of the system.
- 6. The wastewater recycling plant should be constructed once the recycled water network is in place or construction is underway.

Prior to commencing any detailed design or physical works associated with this IWCM Strategy, a thorough concept design is recommended to validate the estimates in this document and firm up the key elements of the strategy. This will ensure that the strategy can work as a whole and ensure early identification and resolution of potential conflicts with other services or features.

The concept design should include rainwater tank sizing and design information suitable for use in individual buildings, to inform this part of the strategy.

To ensure a consistent and high quality approach to design of stormwater treatment systems, it is recommended that a set of design guidelines should be produced to inform the design of stormwater treatment systems and waterway restoration activities at Callan Park. This will help ensure that the strategy is not reduced to a piecemeal approach. The proposed Callan Park Trust should play a role in implementing these guidelines.

The concept design should also address risks inherent in the IWCM strategy:

- Technical risks: for example poor water quality and intermittent flows present risks for recycling and reuse schemes

- Organisational risks: the sustainable water management strategy will require ongoing support for its implementation, operation and maintenance
- Financial risks: likewise, the strategy will require ongoing funding

REFERENCES

- Coffey (2002) "Rozelle Hospital Preliminary Contamination Assessment" prepared for NSW Health Department
- DEH (Department of Environment and Heritage) (2006) "Water Efficiency Guide: offices and public buildings" Commonwealth of Australia
- Institute for Sustainable Futures (2010) "Leichhardt Municipal Council Water Reuse Feasibility Study Report" prepared for Leichhardt Municipal Council
- URS (2008) "Callan Park, Utilities and Pavement Condition/ Capacity Report" prepared for Sydney Harbour Foreshore Authority
- Ryall Environmental (2010), Focussed Environmental Assessment, Callan Park, Rozelle NSW, Sydney

THE NEXT STEPS

The final stage of the Master Plan project is a public exhibition. The Final Master Plan and accompanying Plan of Management will be exhibited online and in Council buildings for a period of up to two months. This will take place between during February 2011.

