

# Mount Penang Infrastructure Works, Parklands Road Utilities and Related Works: Statement of Heritage Impact

FINAL REPORT

Prepared for Gyde Consulting

2 May 2022

## Biosis offices

### NEW SOUTH WALES

#### Albury

Phone: (02) 6069 9200  
Email: [albury@biosis.com.au](mailto:albury@biosis.com.au)

#### Newcastle

Phone: (02) 4911 4040  
Email: [newcastle@biosis.com.au](mailto:newcastle@biosis.com.au)

#### Sydney

Phone: (02) 9101 8700  
Email: [sydney@biosis.com.au](mailto:sydney@biosis.com.au)

#### Western Sydney

Phone: (02) 9101 8700  
Email: [sydney@biosis.com.au](mailto:sydney@biosis.com.au)

#### Wollongong

Phone: (02) 4201 1090  
Email: [wollongong@biosis.com.au](mailto:wollongong@biosis.com.au)

### VICTORIA

#### Ballarat

Phone: (03) 5304 4250  
Email: [ballarat@biosis.com.au](mailto:ballarat@biosis.com.au)

#### Melbourne

Phone: (03) 8686 4800  
Email: [melbourne@biosis.com.au](mailto:melbourne@biosis.com.au)

#### Wangaratta

Phone: (03) 5718 6900  
Email: [wangaratta@biosis.com.au](mailto:wangaratta@biosis.com.au)

## Document information

<b>Report to:</b>	Gyde Consulting
<b>Prepared by:</b>	Charlotte Allen Madeleine Lucas Hannah Mills
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## Glossary

<b>Biosis</b>	Biosis Pty Ltd
<b>c.</b>	Circa
<b>CBD</b>	Central Business District
<b>CHL</b>	Commonwealth Heritage List
<b>CMP</b>	Conservation Management Plan
<b>DA</b>	Development Application
<b>DAWE</b>	Department of Agriculture, Water and the Environment
<b>DP</b>	Deposited Plan
<b>ELA</b>	Eco Logical Australia Pty Ltd
<b>EP&amp;A Act</b>	<i>Environmental Planning and Assessment Act 1979</i>
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
<b>GDCP</b>	Gosford Development Control Plan 2013
<b>Heritage NSW</b>	Heritage NSW, Department of Planning and Environment
<b>Heritage Act</b>	<i>Heritage Act 1977</i>
<b>HCCDC</b>	Hunter and Central Coast Development Corporation
<b>LEP</b>	Local Environmental Plan
<b>LGA</b>	Local Government Area
<b>NHL</b>	National Heritage List
<b>NSW</b>	New South Wales
<b>REF</b>	Review of Environmental Factors
<b>SHR</b>	State Heritage Register
<b>SoHI</b>	Statement of Heritage Impact
<b>Study area</b>	Parklands Road, McCabe Road, The Avenue, Carinya Street and a corridor of land between Parklands Road and Baxter's Track within Mount Penang Parklands, Kariiong, NSW 2250
<b>TKD</b>	Tanner Kibble Denton Architects Pty Ltd

## Summary

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Biosis Pty Ltd (Biosis) was commissioned by Gyde Consulting on behalf of Hunter and Central Coast Development Corporation (HCCDC) to undertake a heritage assessment and prepare a statement of heritage impact (SoHI). The site is an area of land proposed for infrastructure upgrade works within Mount Penang Parklands, specifically, Parklands Road, McCabe Road, The Avenue, Carinya Street and a corridor of land between Parklands Road and Baxter's Track, Kariong, New South Wales (NSW) (study area). The study area is located within Kariong, approximately 3.9 kilometres west of Gosford and approximately 51.6 kilometres north of the Sydney central business district (CBD).

The study area is contained within a State heritage listed curtilage, Mount Penang Parklands (State Heritage Register (SHR) Item no. 01337), and is also included on a range of other State and local heritage registers. A Conservation Management Plan exists for this item, which has been referenced in preparation of this report.<sup>1</sup>

The project has been divided into two stages of works. Stage 1 of the works covers Parklands Road and its extension to meet Baxter's Track. Stage 2 comprises works to McCabe Road, The Avenue and Carinya Street. There are also two ancillary areas proposed outside of these road corridors. This report assesses the proposed scope of works and the corresponding civil concept and landscape designs for Stage 1 - Parklands Road (Figure 1, Figure 2). The proposed civil concept design for Parklands Road will change the width and configuration of Parklands Road through the establishment of additional and wider lanes and car parking spaces. Similarly, a new shared path will formalise pedestrian access. Services are also proposed which would require subsurface excavation. The Parklands Road civil works' urban design and landscape objectives align with the semi-rural character and landscape planting. [Interpretation, including narratives and storytelling, will be part of the Place Vision plan overlay for the wider Mt Penang Parklands site as part of the detailed landscape design process.](#)

This assessment approach has been undertaken to allow for assessment of both the study area as well as any additional areas in the broader vicinity, which may be affected by the proposal, either directly or indirectly. Biosis has provided heritage advice to the team to avoid impacts where possible, and identified constraints will be used to guide detailed design, with an emphasis on avoiding impacts where feasible. An Arboricultural Impact Assessment has also been prepared for the project, and is presented in Appendix 3.<sup>2</sup>

### Heritage values

Significant heritage values identified within the study area include:

- Four heritage items, including:
  - Mount Penang Parklands (SHR Item no. 01337), including specific heritage elements:
    - Heritage Precinct.
    - Festivals / Gardens Precinct.
    - Baxter's Track Mixed-use Precinct.
    - L2: Scribbly Gum group.
    - L3: Poplar & Brushbox Avenue.

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<sup>1</sup> (TKD Architects 2020)

<sup>2</sup> (Active Green Services 2022)



- L5: Mature cultural plantings along western edge of school.
- Mature cultural plantings, including coral trees, brush box, camphor laurels, white poplars, hoop pines, an oak and a larch (Gosford Local Environmental Plan (LEP) 2014, Item no. 73).
- White poplar avenue (Gosford LEP 2014, Item no. 71).
- Two groups of scribbly gums (Gosford LEP 2014, Item no. 74).
- One conservation area, comprising:
  - Mount Penang Parklands Heritage Conservation Area (Gosford LEP 2014, Item no. C1).

## Impact to heritage values

There will be no adverse direct impacts to the significant built elements of the site as part of these proposed works.

The works presented in the proposed civil concept designs for Parklands Road will have a positive impact from the upgrade to infrastructure. The upgrades will improve the site's amenities, which will support ongoing use by public and private organisations, and also encourage visitors to explore and walk the site on foot through the use of the shared path and safer roads.

There is potential for moderate to major adverse direct physical impacts to heritage tree planting groups (L2: Scribbly Gum group (high value), L3: Poplar & Brushbox Avenue (moderate value) and L5: Mature cultural plantings along western edge of school (high value)) as part of road works and subsurface services. However, options for reducing or minimising these impacts have been provided as part of an Arboricultural Impact Assessment.

The proposed works will have a minor adverse indirect impact to the current views within the Heritage Precinct and Festivals / Gardens Precinct, and moderate adverse indirect impact to current views within the Baxter's Track Mixed-use Precinct. However, the proposed civil concept design of the extended portion of Parklands Road in this precinct is largely in accordance with the suggested road configuration for secondary roads in the GDCP. The landscape design is currently in development, which will provide further detail regarding landscaping and materials to be used for the proposed works.

Overall, the proposed civil works for Parklands Road as they appear in the concept designs would have an acceptable level of impact to the State heritage significance of the item, and would not result in a material effect on the SHR values or local heritage values, but this is only if all of the mitigation measures and recommendations of this report are implemented.

These mitigation measures have been developed with reference to the policies of the CMP, controls of the Gosford Development Control Plan 2013 (GDCP) and the Arboricultural Impact Assessment completed for the project, as well as best practice and the Burra Charter.<sup>3</sup>

## Legislation and policy

An assessment of the project against key heritage legislation and policy is provided and summarised below.

Legislation	Relevant heritage feature on site	Permit / Approval required
<b>Heritage Act 1977</b>	Mount Penang Parklands, specifically: <ul style="list-style-type: none"> <li>• Heritage Precinct</li> <li>• Festivals / Gardens Precinct</li> </ul>	Section 60 approval

<sup>3</sup> (TKD Architects 2020, Active Green Services 2022, Australia ICOMOS 2013)

Legislation	Relevant heritage feature on site	Permit / Approval required
	<ul style="list-style-type: none"> <li>Baxter's Track mix-use Precinct</li> <li>L2: Scribbly Gum group (high value)</li> <li>L3: Poplar &amp; Brushbox Avenue (moderate value)</li> <li>L5: Mature cultural plantings along western edge of school (high value)</li> </ul>	

## Recommendations

The following recommendations have been formulated to respond to client requirements and the significance of the site. They are guided by the ICOMOS *Burra Charter* with the aim of doing as much as necessary to care for the place and make it useable and as little as possible to retain its cultural significance.<sup>4</sup>

### Recommendation 1 Apply for approval for the works under Section 60 of the Heritage Act 1977

The proposed civil concept design does not meet the standard or item-specific exemptions under Section 57 of the *Heritage Act 1977* (Heritage Act). Therefore, approval will be required to undertake the works under Section 60 of the Heritage Act. This SoHI and appendices, along with a copy of the CMP including appendices, the final proposed plans, and landscape designs should be included in the application to Heritage NSW, Department of Planning and Environment (Heritage NSW).

### Recommendation 2 Reduce or minimise impacts to heritage significance

The mitigation measures presented in Section 8 should be investigated and implemented in order to reduce impacts of the proposed works to heritage elements within and heritage significance of the item. In summary, these include:

- Use of tree sensitive design for roads and paths as per the Arboricultural Impact Assessment.
- Undertake non-destructive root exploration for heritage planting trees likely to be impacted by works.
- Develop and adopt a Tree Protection Plan in accordance with Australian Standard 4970 *Protection of trees on development sites*.<sup>5</sup>
- Where possible, retain current kerb alignment on Parklands Road and McCabe Road to limit damage to root systems for trees immediately adjacent to these roads.
- Use of horizontal directional drilling/underboring for services which would enter heritage tree planting TPZs.
- Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works.
- Include sensitive and complementary materials, elements and colours as part of landscape design.

### Recommendation 3 Heritage interpretation as part of Place Vision works

Heritage interpretation, which includes information on the Aboriginal cultural landscape and non-Aboriginal use of Mount Penang Parklands, should be part of the Place Vision works being undertaken for the wider

<sup>4</sup> (Australia ICOMOS 2013)

<sup>5</sup> (Standards Australia 2009)

Mount Penang Parklands site.<sup>6</sup> Any heritage interpretation should be done in a consistent manner across the site including the Heritage Precinct, Festivals / Gardens Precinct, and Baxter's Track mix-use Precinct. Given the nature of the infrastructure works, the development of interpretation for the site could take place following completion of works, but it must be considered as part of any detailed landscape plans.

#### **Recommendation 4 Heritage induction**

All site workers involved in the proposed works should undertake a heritage induction to ensure they are aware of the heritage values of the study area and legislative requirements and implications for non-compliance.

#### **Recommendation 5 Unexpected finds procedure**

While the study area has been assessed as holding low archaeological potential for significant remains and relics, an unexpected finds procedure should be developed and adopted to ensure that any unexpected archaeological remains are managed appropriately.

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<sup>6</sup> (Hunter & Central Coast Development Corporation 2021)

# 1 Introduction

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## 1.1 Project background

Biosis was commissioned by Gyde Consulting to undertake a historical heritage assessment and prepare a Statement of Heritage Impact (SoHI) for the Mt Penang South Infrastructure Works Review of Environmental Factors (REF) project located at Parklands Road, McCabe Road, The Avenue, Carinya Street and a corridor of land between Parklands Road and Baxter's Track within Mt Penang Parklands, Kariong, NSW (Figure 1 and Figure 2), referred to as the study area herein. The study area is situated within Lot 10, DP 1149050, but it does not include the entire SHR curtilage.

The project has been divided into two stages of works. Stage 1 of the works covers Parklands Road and its extension to meet Baxter's Track. Stage 2 comprises works to McCabe Road and The Avenue. There are also two ancillary areas proposed outside of these road corridors. This report assesses the proposed scope of works and the corresponding civil concept and landscape designs for Stage 1 - Parklands Road. The proposed development will be assessed in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979 NSW* (EP&A Act).

## 1.2 Location of the study area

The study area is located within the suburb of Kariong, Central Coast Local Government Area (LGA) (Figure 1). It encompasses 7.1 hectares of public lands. It is currently zoned SP1 (Special Activities).

## 1.3 Scope of assessment

This report was prepared in accordance with current heritage guidelines including *Assessing Heritage Significance*, *Assessing Significance for Historical Archaeological Sites and 'Relics'* and the *Burra Charter*.<sup>7</sup> This report provides a heritage assessment to identify if any heritage items or relics exist within or in the vicinity of the study area. The heritage significance of these heritage items has been investigated and assessed in order to determine the most appropriate management strategy.

The following is a summary of the major objectives of the assessment:

- Identify and assess the heritage values associated with the study area. The assessment aims to achieve this objective through providing a brief summary of the principle historical influences that have contributed to creating the present-day built environment of the study area using resources already available and some limited new research.
- Assess the impact of the proposed works on the cultural heritage significance of the study area.
- Identifying sites and features within the study area which are already recognised for their heritage value through statutory and non – statutory heritage listings.
- Recommend measures to avoid or mitigate any negative impacts on the heritage significance of the study area and wider Mount Penang Parklands.

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<sup>7</sup> (Heritage Office 2001, NSW Heritage Branch, Department of Planning 2009, Australia ICOMOS 2013)



The statement of heritage impact section of the report has been prepared in accordance with the Heritage Manual guideline *Statements of Heritage Impact*.<sup>8</sup>

An Aboriginal Due Diligence Assessment has also been prepared for the project by Biosis, and therefore Aboriginal cultural heritage is not addressed within the scope of this report.<sup>9</sup>

## 1.4 Limitations

This report assesses the proposed scope of works and the corresponding civil concept and landscape designs for Stage 1 - Parklands Road. Impacts as part of Stage 2 - McCabe Road and The Avenue, and the ancillary areas will be assessed in a separate SoHI.

This report is based on historical research and field inspections. It is possible that further historical research or the emergence of new historical sources may support different interpretations of the evidence in this report.

The history of the study area has been well documented as part of the CMPs prepared for Mount Penang Parklands, along with other heritage assessments and local historical studies. As such, much of the information provided in Section 3.3 is based on these secondary sources. Where possible, primary research was undertaken to verify information in these documents, such as through the review of Crown and other plans and ownership records, newspaper articles and imagery (photographs).

Much of the study area contains sealed surfaces or grassed areas, which limits the ability to observe the ground surface for any traces of archaeological material. Furthermore, the physical inspection was undertaken following severe storms, which resulted in soils being washed into various areas.

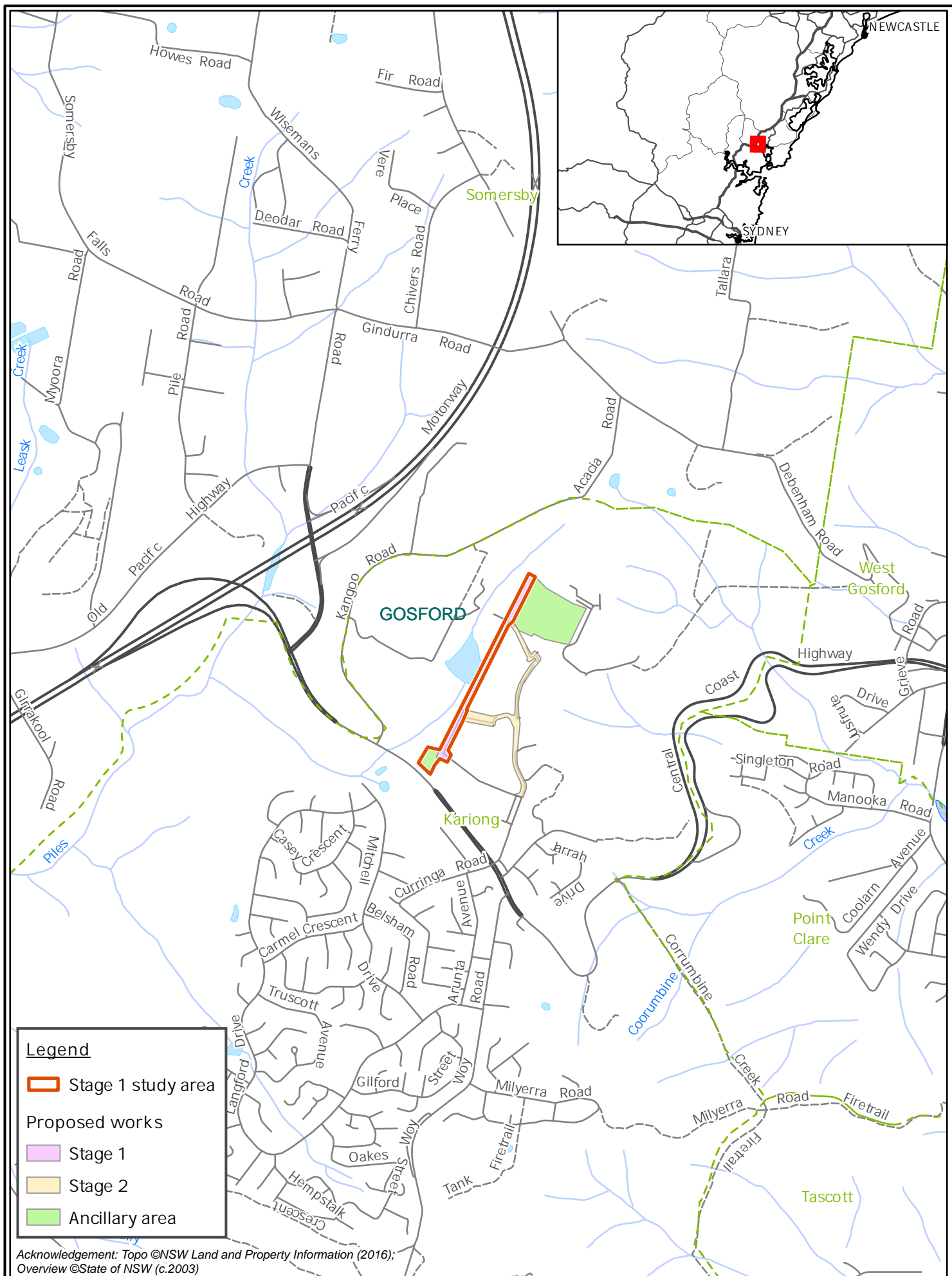
Although this report was undertaken to best archaeological practice and its conclusions are based on professional opinion, it does not warrant that there is no possibility that additional archaeological material will be located in subsequent works on the site. This is because limitations in historical documentation and archaeological methods make it difficult to accurately predict what is under the ground.

The significance assessment made in this report is a combination of both facts and interpretation of those facts in accordance with a standard set of assessment criteria. It is possible that another professional may interpret the historical facts and physical evidence in a different way.

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<sup>8</sup> (Heritage Office & DUAP 1996)

<sup>9</sup> (Biosis Pty Ltd 2022a)









## 2 Statutory framework

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This assessment will REF under Part 5 of the EP&A Act NSW cultural heritage is managed in a three-tiered system: national, state and local. Certain sites and items may require management under all three systems or only under one or two. The following discussion aims to outline the various levels of protection and approvals required to make changes to cultural heritage in the state.

### 2.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the national Act protecting the natural and cultural environment. The EPBC Act is administered by the Department of Agriculture, Water and the Environment (DAWE). The EPBC Act establishes two heritage lists for the management of the natural and cultural environment:

- The National Heritage List (NHL) contains items that have been assessed to be of outstanding significance and define ‘critical moments in our development as a nation’.<sup>10</sup>
- The Commonwealth Heritage List (CHL) contains items that are natural and cultural heritage places that are on Commonwealth land, in Commonwealth waters or are owned or managed by the Commonwealth. A place or item on the CHL has been assessed as possessing ‘significant’ heritage value.<sup>11</sup>

A search of the NHL and CHL did not yield any results associated with the study area.

### 2.2 NSW Heritage Act 1977

Heritage in NSW is principally protected by the Heritage Act (as amended) which was passed for the purpose of conserving items of environmental heritage of NSW. Environmental heritage is broadly defined under Section 4 of the Heritage Act as consisting of the following items: ‘those places, buildings, works, relics, moveable objects, and precincts, of State or local heritage significance’. The Heritage Act is administered by the Heritage Council, under delegation by Heritage NSW. The Heritage Act is designed to protect both known heritage items (such as standing structures) and items that may not be immediately obvious (such as potential archaeological remains or ‘relics’). Different parts of the Heritage Act deal with different situations and types of heritage and the Act provides a number of mechanisms by which items and places of heritage significance may be protected.

#### 2.2.1 State Heritage Register

Protection of items of State significance is by nomination and listing on the State Heritage Register (SHR) created under Part 3A of the Heritage Act. The Register came into effect on 2 April 1999. The SHR was established under the *Heritage Amendment Act 1998*. It replaces the earlier system of Permanent Conservation Orders as a means for protecting items with State significance.

An approval under Section 60 of the Heritage Act is required for works on a site listed on the SHR, except for that work which complies with the conditions for exemptions to the requirement for obtaining an approval.

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<sup>10</sup> ‘About National Heritage’ <http://www.environment.gov.au/heritage/about/national/index.html>

<sup>11</sup> ‘Commonwealth Heritage List Criteria’  
<http://www.environment.gov.au/heritage/about/commonwealth/criteria.html>

Details of which minor works are exempted from the requirements to submit a Section 60 Application can be found in the *Guideline Standard Exemptions for Works requiring Heritage Council Approval*. These exemptions came into force on 1 December 2020 and replace all previous exemptions.

There is one item listed on the SHR within the study area:

- Mount Penang Parklands, (Item No. 01667), Pacific Highway, Somersby, located within the study area.

### 2.2.2 Archaeological relics

Section 139 of the Heritage Act protects archaeological 'relics' from being 'exposed, moved, damaged or destroyed' by the disturbance or excavation of land. This protection extends to the situation where a person has 'reasonable cause to suspect' that archaeological remains may be affected by the disturbance or excavation of the land. This section applies to all land in NSW that is not included on the SHR.

Amendments to the Heritage Act made in 2009 changed the definition of an archaeological 'relic' under the Act. A 'relic' is defined by the Heritage Act as:

*'Any deposit, object or material evidence:*

*(a) Which relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and*

*(b) Which is of State or Local significance'.*

It should be noted that not all remains that would be considered archaeological are relics under the NSW Heritage Act. Advice given in the Archaeological Significance Assessment Guidelines is that a 'relic' would be viewed as a chattel and it is stated that,

*'In practice, an important historical archaeological site will be likely to contain a range of different elements as vestiges and remnants of the past. Such sites will include 'relics' of significance in the form of deposits, artefacts, objects and usually also other material evidence from demolished buildings, works or former structures which provide evidence of prior occupations but may not be "relics".<sup>12</sup>*

If a relic, including shipwrecks in NSW waters (that is rivers, harbours, lakes and enclosed bays) is located, the discoverer is required to notify the NSW Heritage Council.

Section 139 of the Heritage Act requires any person who knows or has reasonable cause to suspect that their proposed works will expose or disturb a 'relic' to first obtain an Excavation Permit from the Heritage Council of NSW (pursuant to Section 140 of the Act), unless there is an applicable exception (pursuant to Section 139(4)). Excavation permits are issued by the Heritage Council of NSW in accordance with sections 60 or 140 of the Heritage Act. It is an offence to disturb or excavate land to discover, expose or move a relic without obtaining a permit. Excavation permits are usually issued subject to a range of conditions. These conditions will relate to matters such as reporting requirements and artefact cataloguing, storage and curation.

Exceptions under Section 139(4) to the standard Section 140 process exist for applications that meet the appropriate criterion. An application is still required to be made. The Section 139(4) permit is an exception from the requirement to obtain a Section 140 permit and reflects the nature of the impact and the significance of the relics or potential relics being impacted upon.

If an exception has been granted and, during the course of the development, substantial intact archaeological relics of state or local significance, not identified in the archaeological assessment or statement required by this exception, are unexpectedly discovered during excavation, work must cease in the affected area and the Heritage Office must be notified in writing in accordance with section 146 of the Heritage Act. Depending on

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<sup>12</sup> (NSW Heritage Branch, Department of Planning 2009, pp. 7)



the nature of the discovery, additional assessment and, possibly, an excavation permit may be required prior to the recommencement of excavation in the affected area.

### 2.2.3 Section 170 Heritage and Conservation Registers

Section 170 of the Heritage Act requires that culturally significant items or places managed or owned by Government agencies are listed on departmental Heritage and Conservation Register. Information on these registers has been prepared in accordance with Heritage Division guidelines.

Statutory obligations for archaeological sites that are listed on a Section 170 Register include notification to the Heritage Council in addition to relic's provision obligations.

The study area is located within the curtilage of one item that is entered on a State government instrumentality Section 170 Register:

- Mount Penang Parklands (HCCDC Heritage and Conservation Register), Pacific Highway, Somersby NSW. Item of State significance.
- There is one item adjacent to the study area that is entered on a State government instrumentality Section 170 Register:
- Girrakool School (State Government Heritage and Conservation Register, Item No. 5064378), 3 Central Coast Highway, Kariong NSW, Item of local heritage significance. The other/former name for this item is 'Remnant farm buildings – the barn, storage shed and dairy'.

Environmental Planning and Assessment Act 1979

### 2.2.4 Local Environmental Plan

The Gosford Local Environmental Plan (LEP) 2014 contains schedules of heritage items that are managed by the controls in the instrument. The study area includes the following heritage items:

- Mount Penang Parklands Heritage Conservation Area, C1, located within the study area, item of State heritage significance.
- Remnant farm buildings – the barn, storage shed and dairy (Item No. 61), Central Coast Highway, Kariong, Lot 521, DP 1017539. Item of local heritage significance.
- Mature cultural plantings (Item No. 72), Central Coast Highway (along northern end of riding school), Kariong, Lot 10, DP 1149050, Lot 702, DP 1128417. Item of local heritage significance.
- Mature cultural plantings, including coral trees, brush box, camphor laurels, white poplars, hoop pines, an oak and a larch (Item No. 73), Central Coast Highway, Kariong, Lot 10, DP 1149050, Lot 702, DP 1128417. Item of local heritage significance.
- Dormitories—"Carinya", "Sobraon", "Walpole", "Vernon" and "The Wood Building" (Item No. 62), Central Coast Highway, Lot 10, DP 1149050. Item of State heritage significance.
- Administration and service buildings—maintenance store, cultural centre, admissions/operations annexe and theatre, school house, Girrakool House, occasional child care, flats (Item No. 63), Central Coast Highway, Lot 10, DP 1149050. Item of State heritage significance.
- Residential buildings—six residential cottages, deputy superintendent's cottage (Item No. 64), Central Coast Highway, Lot 10, DP 1149050. Item of State heritage significance.
- Service and amenity buildings—art room and ablutions block, former officers' dining room, dining room, main kitchen and laundry (Item No. 65), Central Coast Highway, Lot 10, DP 1149050. Item of local heritage significance.

- McCabe Complex—two cottages, McCabe Conference Centre (Item No. 66), Central Coast Highway, Lot 10, DP 1149050. Item of State heritage significance.
- Sports fields—three sports fields, sports oval (Item No. 67), Central Coast Highway, Lot 10, DP 1149050. Item of State heritage significance.
- Built landscape elements—gazebo, stone walls, sculpture park (Item No. 68), Central Coast Highway, Lot 10, DP 1149050. Item of local heritage significance.
- Old pine tree group (Item No. 69), Central Coast Highway, Lot 10, DP 1149050, Item of local heritage significance.
- Dam (Item No. 70), Central Coast Highway, Lot 10, DP 1149050. Item of local heritage significance.
- White poplar avenue (Item No. 71), Central Coast Highway, Lot 10, DP 1149050. Item of local heritage significance.
- Two groups of scribbly gums (Item No. 74), Central Coast Highway, Lot 10, DP 1149050. Item of local heritage significance.
- Sports field perimeter brush box and eucalypt plantings (Item No. 75), Central Coast Highway, Lot 10, DP 1149050. Item of local heritage significance.
- Eastern bushland (Item No. 76), Central Coast Highway, Lot 10, DP 1149050. Item of local heritage significance.
- Entry drive with perimeter brush box and eucalypt plantings (Item No. 77), Central Coast Highway, Lot 10, DP 1149050. Item of State heritage significance.
- International Sculpture Symposium II (1988) (Item No. 270), Mt Penang Parklands, Carinya Road, at entrance to Frank Baxter Juvenile Justice Centre, Lot 10, DP 1149050. Item of local heritage significance.
- International Sculpture Symposium (1987) (Item No. 271), Mt Penang Parklands, Parklands Road, Lot 10, DP 1149050. Item of local heritage significance.
- Please note that Lot 10, DP 1149050 listed by the Gosford LEP 2014 is now Lot 1022, DP 1268228.

### 2.2.5 Gosford Development Control Plan 2013

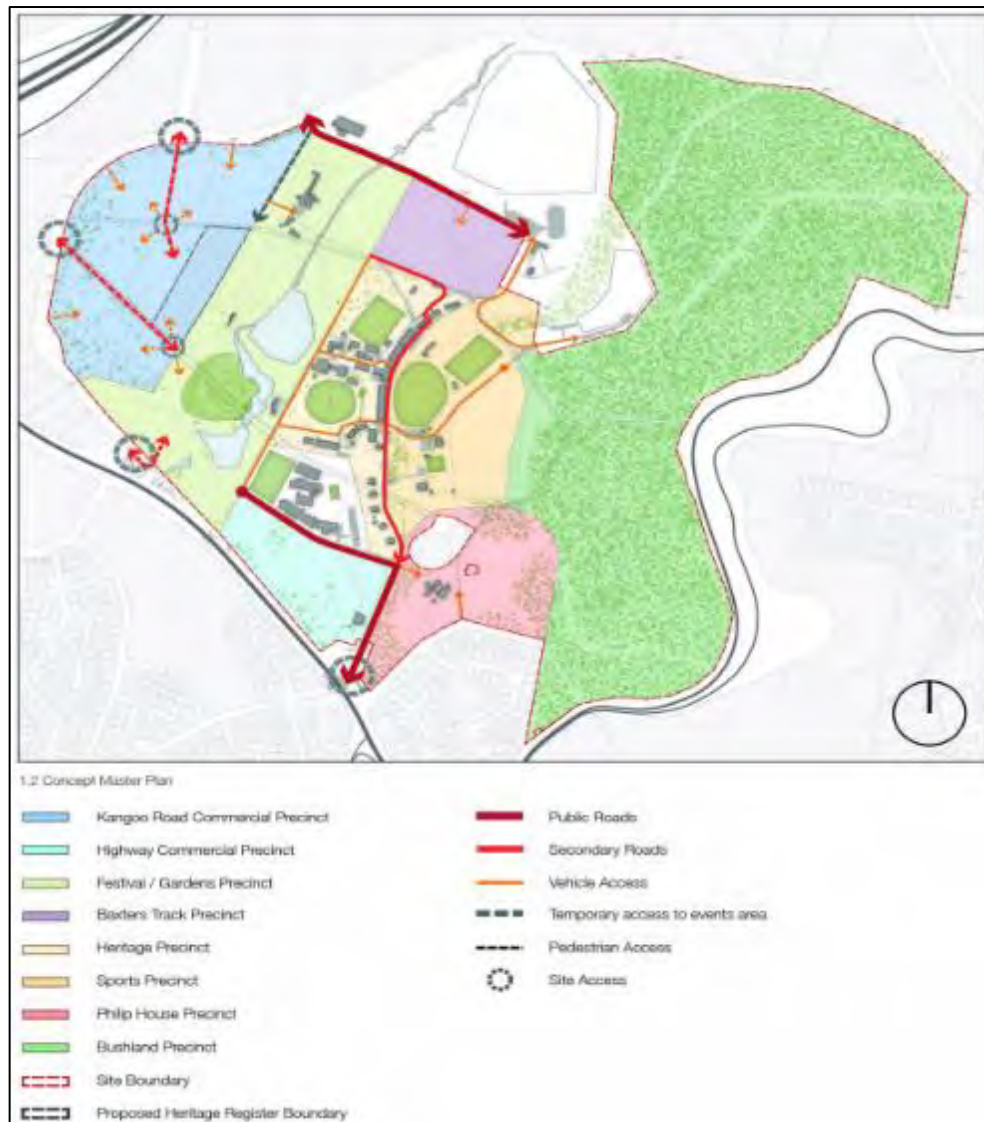
The Gosford Development Control Plan (GDCP) outlines built form controls to guide development. The GDCP supplements the provisions of the Gosford LEP 2014.

The GDCP contains the following general heritage controls for works within the former Gosford LGA, which is now part of the larger Central Coast LGA:

- Site constraints: Any sites containing Aboriginal carvings, relics or other items of significance shall be identified and provision made in the application. The National Parks and Wildlife Service should be contacted for details and verification, and for advice as to the appropriate measures to be taken. Other recognised heritage items, including natural features of the site, buildings, works or historical sites are to be identified and retained. Adequate area is to be retained around any heritage item to protect its setting. Where an application involves an item is heritage listed in the Gosford LEP 2014 the application will be referred to the Council's Heritage Advisory Committee or the relevant Heritage Officer for advice and recommendation.
- Any development within the Mt Penang Parklands or vicinity requires a SoHI to be completed.

- New work to or in the vicinity of a heritage item should be sympathetic in form, siting, proportions, bulk and scale and must not detract from the appreciation of the item and its surrounds. However new work should be identifiable as such. It should be noted that to achieve the above numerical controls may need to be varied and as such maximums may not be achievable.
- An application for development on or in the vicinity of a heritage item must demonstrate that the construction process will not result in structural damage to the item or place.
- Heritage Items are to be retained and conserved and the significance of the place is to remain interpretable.
- Significant external fabric, building features and spaces are to be retained. The interior fabric, where possible, should be retained.
- The redevelopment of sites that include heritage items is to provide for conservation works to the heritage item as part of the redevelopment and ensure its conservation.
- Additions should retain the streetscape prominence of the heritage items. The additions should appear as distinct and secondary to the existing building, using appropriate setbacks.
- Development involving adaptive reuse of a heritage item may require the preparation of a conservation management plan (CMP) or conservation management strategy (CMS) to guide change in a sympathetic manner. An applicant should consult with Council prior to the submission of a development application to establish whether a CMP or CMS is required.

The GDCP contains a specific section regarding the management of Mount Penang Parklands. A concept master plan is presented in the GDCP in reference to future development of Mount Penang Parklands (Photo 1).



**Photo 1 Concept master plan proposed in the Gosford Development Control Plan**

With regards to the project, there are a number of sections which are particularly relevant.

### Street Hierarchy

The GDCP states that the street hierarchy of Mount Penang Parklands must consider the following:

- Entrance points that inform the site's internal road hierarchy. The new road network should, where possible, use existing roadways and upgrades to existing routes to provide greater movement across the site that responds to the site's physical and heritage values.
- Establishing a road hierarchy that respects the existing road patterns and limits traffic in the Heritage Precinct by providing additional access and egress points along Kangaroo Road.

The GDCP states that the impact of vehicular traffic on the amenity of the environment is to be minimised through the following:

- Locating larger landscaped car parks on the site perimeter to minimise traffic circulation within the core area.

- Providing a hierarchy of streets that concentrate the majority of traffic on a perimeter road and limits the traffic in the core of the site to narrow access ways that encourage slower speeds.
- Ensuring the new roads are only used by traffic using the site and not used by through traffic for short cuts.
- Designing streets to the minimum size to provide necessary movement and access.
- Designing roads to reinforce the rural landscape character of the site.

The roads which comprise the study area have been designated as follows:

- Parklands Road – Secondary Road / Access Road (designation alters according to access needed for to different precincts).
- McCabe Road – Secondary Road.
- Carinya Street – Access Road.
- The Avenue – Secondary Road.



**Photo 2** Example configuration of a secondary road as per the GDCP (Source: (Central City Council 2018, pp. 5–32 Figure 2.6.2)



**Photo 3** Example configuration of an access road as per the GDCP (Source: (Central City Council 2018, pp. 5–32 Figure 2.6.3)



## **Pedestrian and Cycle Circulation**

The GDCP states that there should be continuous pedestrian paths around the site connecting the major activities and features, open spaces and areas of natural value.

## **Parking**

The GDCP states that adequate car parking is to be incorporated on the site without compromising the setting and amenity of the site, whilst responding the fluctuations in activity throughout the year. The following are identified as items for consideration regarding parking:

- Locating larger car parks at the perimeter of the site and smaller permanent car parks (10-20) in locations related to specific uses.
- Ensuring car parks and overflow parking is shaded and screened with appropriate planting so that their visual presence is managed appropriately.
- Providing car parks for major events on grassed areas that receive proper drainage, on a relatively level terrain, and accessed by sealed roads with sufficient capacity to manage peak flows.
- Limiting lengths of on-street parking.
- Providing car parking in accordance with Gosford City Council's current parking requirements.
- Parking associated with commercial developments in the Kangoo Road Commercial and Highway Commercial Precincts to be provided on a plot-by-plot basis, meeting the parking requirements outlined in Council's current planning controls.

## **Landscape and Open Space**

The GDCP notes that the landscape character of Mount Penang is determined by the close relationship between the site's various natural features, open spaces, and associated activities. The following considerations are identified so as to ensure these relationships are retained and where possible, enhanced:

- Provide a high quality open space framework consisting of new public streets, avenues, and parks that encourage pedestrian activity.
- Develop a sequence of Village Greens as the focus for a range of activities and events, which may be associated with the Festival / Garden precincts, or respond to the uses within the Heritage Precinct.
- Provide a number of playing fields to cater for a range of sports and recreational activities.
- Structure the Festival / Garden Precinct around a major flexible public open space corridor, which forms the green spine for the site, and during the peak event periods the focal point for activities and movement.

## **Design guidelines**

The GDCP provides the following general guidelines regarding infrastructure works:

- Basic infrastructure and services, such as water, sewer, stormwater, power, telephone lines, gas and roads are outlined and to be delivered in accordance with the referenced servicing strategy reports.
- Council will only consent to development where road infrastructure is in place that is a standard acceptable to Council to service a development.

- The RMS is to be consulted for all new development that includes the addition of lettable floor space and provide specific advice on any impacts to the State Highway network in the vicinity of the development.

Similarly, the GDCP notes the following with regards to general site drainage and stormwater control:

- The impact of development on the existing stormwater, water supply, sewerage and energy supply infrastructure is to be minimised through appropriate site planning, in particular in relation to the conserved bushland areas and watercourses.
- Soil and water management measures should be minimise and control soil erosions and sediment transport.
- Development is to be designed to ensure maximum rainwater infiltration on site by minimising paved areas and providing stormwater drainage systems that promote natural infiltration.
- Development sites should provide for on-site stormwater controls to ensure stormwater flows and stormwater quality are maintained at pre development conditions. Should infiltration devices be utilised to control stormwater then a geotechnical investigation should be submitted with any application for subdivision to demonstrate the capability of the soil to accommodate the infiltration devices.

The GDCP states the following with regards to general landscaping requirements, paving, street furniture, street signage and street lighting:

- A building setback for most new buildings requires a well-designed landscaped area that adds to the amenity of the precinct as well as the buildings. This area should be predominantly planting with minimal paving.
- All streets and paths should be lined with tree planting. The scale and character of the planting may vary for each precinct to give local identity.
- Native species indigenous to the area should be used where practicable. Invasive exotic species should be avoided particularly in close proximity to the conserved bushlands.
- Unit paving is standard for all footpaths.
- Accent paving is required at intersections of pedestrian and cycleway networks.
- All street furniture (bins, bollards, street signs, street lighting, benches, drinking fountains, bus shelters etc.) are to be coordinated with CCRDC.
- All information, directional and identification signs are to be coordinated with CCRDC.
- Street identification signs should be located at all intersections. Street identification signs may be mounted on buildings if possible to reduce clutter.
- Traffic control signs should be limited to those essential for traffic and parking control.
- No private identification or advertising signage is permitted in the public domain.
- Street lighting should be coordinated and standardised through Mount Penang.
- On major pedestrian routes and in key public spaces such as the village greens, the Mount Penang Gardens and the sporting precinct pedestrian lighting of the footpaths is to be provided.
- Buildings with verandahs should incorporate lighting such as wall mounted fittings (instead of pedestrian light standards) to light the verandah.

There are also specific provisions for the different precincts. The study area is contained within the Festivals/Garden Precinct, Baxters Track Mixed-Use Precinct and the Heritage Precinct.

The following provisions regarding access and car parking, and landscape requirements are relevant to the project for the Festivals/Garden Precinct:

- The Festival / Gardens Precinct is to be a pedestrian-priority environment with access for servicing and parking limited to the periphery, including Parklands Road and Baxter Track.
- Permanent car parking is to be provided in designated areas at the periphery of the precinct and in adjacent precincts to protect the amenity of the gardens.
- Pedestrian access to the precinct is from the eastern (Heritage Precinct) and southern frontages (Central Coast Highway and Southern Commercial Precinct).
- The visual impact of car parking when viewed from the gardens should be minimised through screening.
- New planting and landscaped zones should be used to reinforce pedestrian routes through the precinct and delineate the areas where overflow event parking and festival activities are to be undertaken.

The following provisions regarding access and car parking, and landscape requirements are relevant to the project for the Baxter's Track Mixed-Use Precinct:

- The Baxter's Track Precinct is predominantly a pedestrian environment, similar to the Heritage Precinct, where access for vehicles is limited to the periphery.
- Car parking is provided in designated parking around the periphery of the precinct, the area accessed via The Avenue, Parklands Road and Baxter's Track.
- Additional landscaping features are to be provided as part of the Street Hierarchy principles, which relate specifically to the quality and design of the streetscape.

The following provisions regarding access and car parking are relevant to the project for the Heritage Precinct:

- Access to the precinct will be gained via The Avenue and the junction with the Central Coast Highway.
- Secondary access can be gained via Parklands Road along the western boundary of the precinct, however, this is to be avoided where possible.
- The Heritage Precinct is predominantly a pedestrian environment with limited access for service vehicles.
- Car parking is to be provided in designated parking areas so that the amenity of the pedestrian environment can be maintained.
- Parking spaces should be clustered into groups and located in close proximity to the buildings, avoiding large expanses of surface parking.
- Additional landscaping features are to be provided as part of the Street Hierarchy principles, which relate specifically to the quality and design of the streetscape.

## 2.3 Summary of heritage listings

A summary of heritage listings within and in the vicinity of the study area is presented in Table 1, Figure 3 and Figure 4. Please note that Lot 10, DP 1149050 listed by the Gosford LEP (2014) is now Lot 1022, DP 1268228.

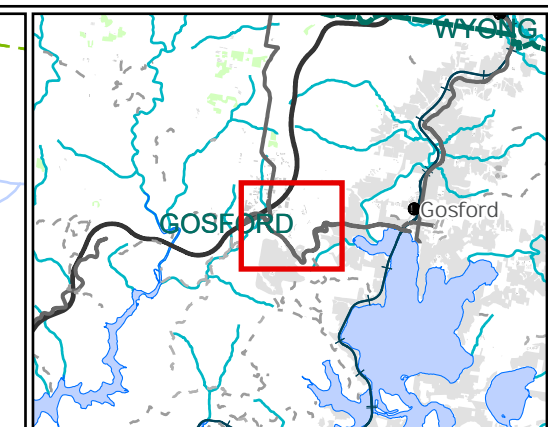
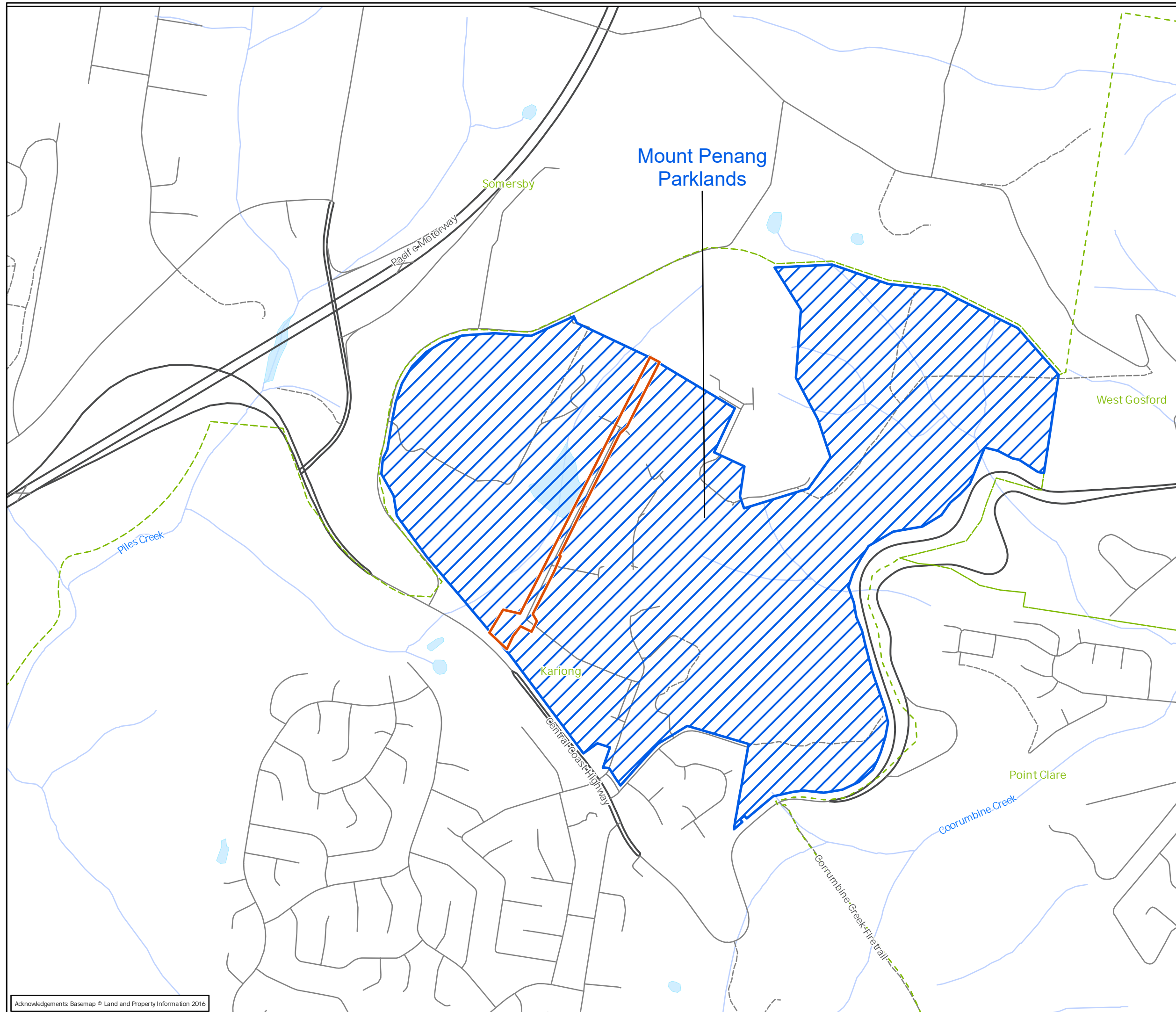
**Table 1 Summary of heritage listings within and adjacent to the study area**

Site number	Site name	Address / Property description	Listings		Significance
			Individual item	As a Conservation Area	
<b>01667</b>	Mount Penang Parklands	Pacific Highway, Somersby	SHR	-	State
<b>C1</b>	Mount Penang Parklands Heritage Conservation Area		-	Gosford LEP 2014	State (locally listed)
-	Mount Penang Parklands	Pacific Highway, Somersby NSW	HCCDC Section 170 Heritage and Conservation Register	-	State
<b>5064378</b>	Girrakool School – Curtilage	3 Central Coast Highway, Kariong NSW	State Government Section 170 Heritage and Conservation Register	-	Local
<b>61</b>	Remnant farm buildings – the barn, storage shed and dairy	Central Coast Highway, Kariong, Lot 521, DP 1017539.	Gosford LEP 2014	-	Local
<b>72</b>	Mature cultural plantings	Central Coast Highway (along northern end of riding school), Kariong, Lot 10, DP 1149050, Lot 702, DP 1128417.	Gosford LEP 2014	-	Local
<b>73</b>	Mature cultural plantings, including coral trees, brush box, camphor laurels, white poplars, hoop pines, an oak and a larch	Central Coast Highway, Kariong, Lot 10, DP 1149050, Lot 702, DP 1128417.	Gosford LEP 2014	-	Local
<b>62</b>	Dormitories—“Carinya”, “Sobraon”, “Walpole”, “Vernon” and “The Wood Building”	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	State (locally listed)
<b>63</b>	Administration and service buildings—maintenance store,	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	State (locally listed)

Site number	Site name	Address / Property description	Listings		Significance
			Individual item	As a Conservation Area	
	cultural centre, admissions/operations annexe and theatre, school house, Girrakool House, occasional child care, flats				
64	Residential buildings—six residential cottages, deputy superintendent's cottage	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	State (locally listed)
65	Service and amenity buildings—art room and ablutions block, former officers' dining room, dining room, main kitchen and laundry	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	Local
66	McCabe Complex—two cottages, McCabe Conference Centre	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	State (locally listed)
67	Sports fields—three sports fields, sports oval	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	State (locally listed)
68	Built landscape elements—gazebo, stone walls, sculpture park	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	Local
69	Old pine tree group	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	Local
70	Dam	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	Local
71	White poplar avenue	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	Local
74	Two groups of scribbly gums	Central Coast Highway, Lot 10, DP 1149050	Gosford LEP 2014	-	Local
75	Sports field perimeter brush box and eucalypt plantings	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	Local



Site number	Site name	Address / Property description	Listings		Significance
			Individual item	As a Conservation Area	
<b>76</b>	Eastern bushland	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	Local
<b>77</b>	Entry drive with perimeter brush box and eucalypt plantings	Central Coast Highway, Lot 10, DP 1149050.	Gosford LEP 2014	-	State (locally listed)
<b>270</b>	International Sculpture Symposium II (1988)	Mt Penang Parklands, Carinya Road, at entrance to Frank Baxter Juvenile Justice Centre, Lot 10, DP 1149050.	Gosford LEP 2014	-	Local
<b>271</b>	International Sculpture Symposium (1987)	Mt Penang Parklands, Parklands Road, Lot 10, DP 1149050.	Gosford LEP 2014	-	Local



**Legend**

- Stage 1 study area
- State Heritage Register
- State heritage item

Figure 3 State heritage items in the vicinity of the study area

0 100 200 300 400

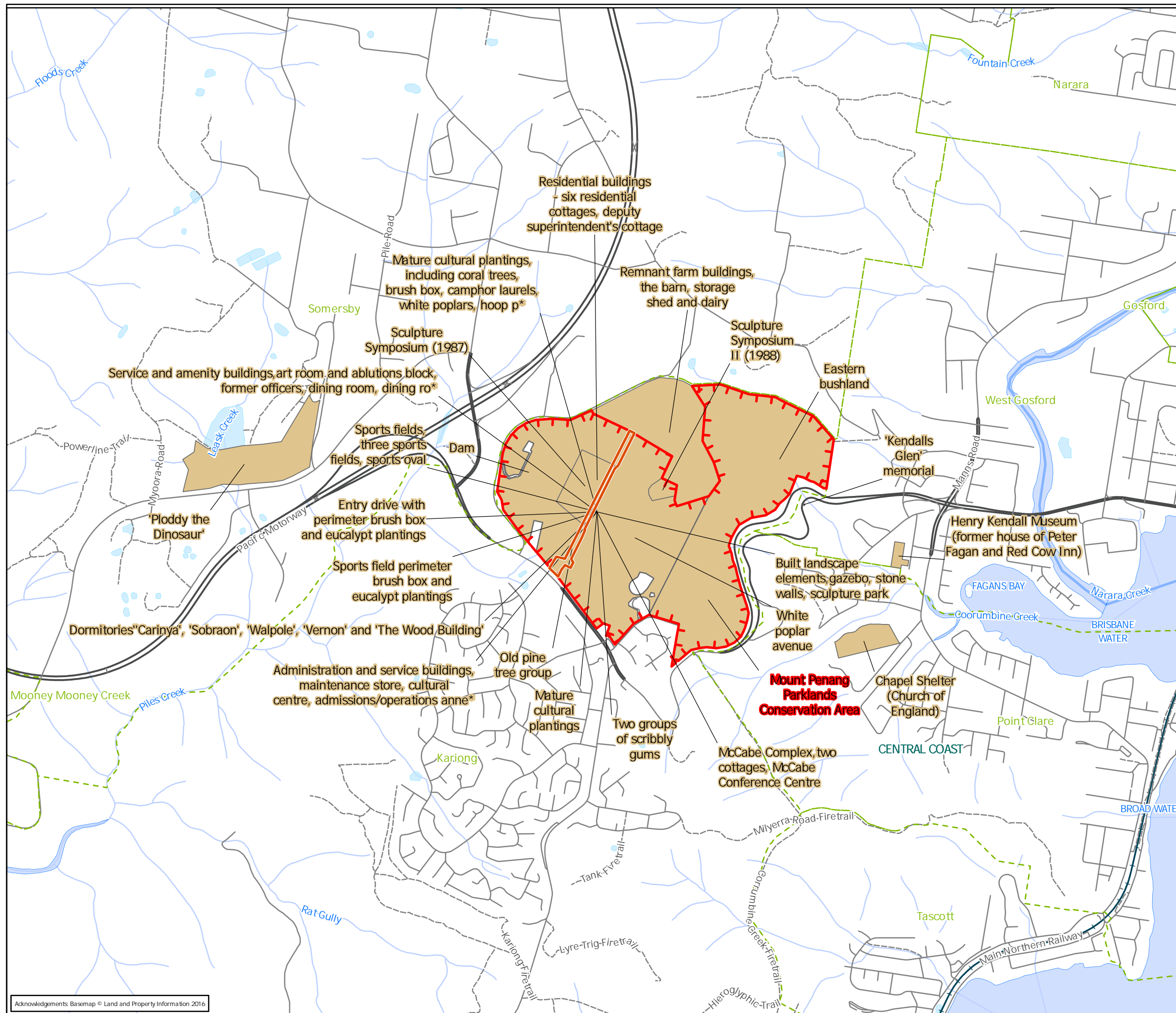
Metres

Scale: 1:10,000@ A3

Coordinate System:  
GDA 1994 MGA Zone 56



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Drawn by: JET, Checked by: ML, Last edited by: jtownsend  
Location: P:\36100s\36159\Mapping\  
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#### Legend

Local heritage items



-  Conservation Area - General
-  Item - General

Figure 4 Local heritage items in the vicinity of the study area

0 200 400 600 800

Metres

Scale: 1:20,000@ A3

Coordinate System:  
GDA 1994 MGA Zone 56



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36159\_ADDA\_MtPenang Layout:



## 3 Historical context

Historical research has been undertaken to identify the land use history of the study area, to isolate key phases in its history and to identify the location of any built heritage or archaeological resources which may be associated with the study area. The historical research places the history of the study area into the broader context of Gosford.

### 3.1 Topography and resources

Mount Penang Parklands is located approximately 5 kilometres west of Gosford, with the study area comprising 7.1 hectares of the wider park. The park sits on the lip of a reasonably flat summit of a sharp escarpment located within the Hawkesbury Sandstone geological unit. The study area is contained within the erosional Somersby soil landscape. A 1917 road map shows the landscape described at the time as “undulating country sandstone formation” with a “stony spur” to the west of the study area and swampy land to the south-east (Photo 4).



**Photo 4** 1917 Crown plan for lands to be resumed for a proposed deviation of the road from Gosford to Peats Ferry (Source: NSW Land Registry Services, R12467.1603)

While the low eucalypt open-woodland and scrub that would have originally been present within the study area has been extensively cleared, the landscape would have generally provided a number of resources used by Aboriginal inhabitants. Aboriginal inhabitants of the region would have had access to a wide range of avian, terrestrial and aquatic fauna and repeated firing of the vegetation would have opened up the foliage

allowing ease of access through and between different resource zones. The eastern area of the wider Mount Penang Parklands remains primarily covered by the 'eastern bushland' landscape, which is listed as an item of local heritage significance on the Gosford LEP 2014 (Item no. 76).<sup>13</sup>

There is one watercourse within the study area, a tributary of Piles Creek running south to north. The study area is in close vicinity to the recent constructed water features within the Mount Penang Gardens, which lie immediately to the east of the study area.

### 3.2 Aboriginal past

It is generally accepted that Aboriginal peoples have inhabited Australia for at least 65,000 years and possessed a distinctive stone tool assemblage.<sup>14</sup> Dates of the earliest occupation of the continent by Aboriginal people are subject to continued revision as more research is undertaken. The timing for the human occupation of the Sydney Basin is still uncertain. The earliest undisputed radiocarbon date from the region comes from Mangrove Creek, approximately 15 kilometres north-west of the present study area. Of the excavated shelters, 31 shelters yielded dates, with the oldest date being 11,050 years before present (BP) at Loggers Shelter.<sup>15</sup> However, the majority of excavated shelter and open sites in the region yield much younger dates of around 3,000 years BP.<sup>16</sup>

Our knowledge of Aboriginal people and their land-use patterns and lifestyles prior to European contact is mainly reliant on documents written by non-Aboriginal people. The inherent bias of the class and cultures of these authors necessarily affect such documents. They were also often describing a culture that they did not fully understand – a culture that was in a heightened state of disruption given the arrival of European settlers and disease. Early written records can, however, be used in conjunction with archaeological information and surviving oral histories from members of the Indigenous community in order to gain a picture of Aboriginal life in the region.

According to Tindale, the study area was traditionally inhabited by the Darkinjung, bordered closely by the Kuringai tribe who inhabited the land between them and the coastline.<sup>17</sup> These two groups were on friendly terms. The Darkinjung lands roughly extended from the Hawkesbury River northwards to Wollombi and the southern drainage of the Hunter River.<sup>18</sup> Vinnecombe places the Darkinjung people as living between the Hawkesbury and Hunter Rivers.<sup>19</sup>

Information gathered by R.H Matthews provides a valuable insight into the lives of the Darkinjung people, although this information was recorded within an already disjointed and numerically decimated community. He stated that all members of the Darkinjung community were segregated into two moieties, Dilbi and Kuparthin, and each moiety was further divided into two sections.<sup>20</sup> On the basis of these moieties and sections, totemic affiliation and marriage relations were determined. Totems consisted of animals or inanimate objects, such as plants, heavenly bodies, the elements or seasons.

It has been suggested that the Darkinjung would move to the coast, within Kuringai territory during summer months, to exploit the abundant coastal resources, and the reverse was true for the Kuringai who moved

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<sup>13</sup> (Heritage NSW n.d.)

<sup>14</sup> (Clarkson et al. 2015)

<sup>15</sup> (Attenbrow 1981)

<sup>16</sup> (Attenbrow 1987, Koettig 1985, McDonald 1985)

<sup>17</sup> (Tindale 1974)

<sup>18</sup> (Tindale 1974)

<sup>19</sup> (Vinnecombe 1980)

<sup>20</sup> (Mathews 1897)

inland during winter months to participate in ritual kangaroo hunts.<sup>21</sup> These two groups had a cordial relationship, with reciprocal visits and regular trading of resources.

Post-contact, the Mount Penang Parklands have significance with local Aboriginal people, as during the time the site functioned as a detention centre a number of Aboriginal community members were detained there.<sup>22</sup> The wider cultural landscape which contains the study area continues to hold a strong connection with the Kuringai and Darkinjung.

### **3.3 Mount Penang – historical development**

#### **3.3.1 Exploration and early development of the Central Coast (1770 to 1866)**

The first European exploration within the Central Coast region took place in 1770, when Captain James Cook and the Endeavour sailed into Broken Bay in 1770. These expeditions were to confirm the occupation status of NSW.<sup>23</sup> It wasn't until the arrival of the First Fleet in 1788 that any further journeys were made, with Governor Arthur Phillip setting out with a small party from Sydney Cove several weeks after coming ashore. The group spent eight days investigating the inlets of Broken Bay for good soils for growing crops, including what was later called Brisbane Water, which Governor Phillip noted as swampy on the accessible areas of land in the upper part of the branch. The following year, Governor Phillip led another expedition in June, exploring the Broadwater at Kincumber, and sailing as far as the current site of Gosford, before moving further up the Hawkesbury River to Mullet Creek and Mooney Creek further inland.<sup>24</sup>

The land around Broken Bay did not hold the fertile soils the colonial settlers were seeking, and the densely timbered areas of useable land and landscape forms ill-suited to agriculture deterred the early exploitation and settlement within the region. Furthermore, the lands north of the Hawkesbury River were restricted by the authorities in order to separate the penal colony at Newcastle from those places south of the river. However, once the convicts were relocated to Port Macquarie, settlers began moving north towards the Hunter River.<sup>25</sup>

Due to the topography, early access to the area was almost entirely by water. However, the Great North Road and a number of tracks branching from it provided access between Wisemans Ferry and the Hunter Valley via Mangrove Mountain, as well as access to Gosford, surveyed and named in 1839. By the 1840s, access across the Hawkesbury River and Brisbane Water was provided by a number of ferries or punts.<sup>26</sup>

Earlier land use comprised primarily of timber-getting, ship building and stock grazing until the second half of the 19th century, when citrus farming became a major industry. This industry was encouraged by improved transport facilities such as the 1880s railway and 1930 Pacific Highway, enabling the bulk transport of produce and resulting in accelerated development within the region.<sup>27</sup> A new road from Gosford over Mount Penang to Mangrove was nearing completion in 1885.<sup>28</sup> By the 20th century, much of the land in Gosford and surrounds was in private ownership.

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<sup>21</sup> (Mathews 1897)

<sup>22</sup> (Heritage NSW n.d.)

<sup>23</sup> (Karskens 2009, pp. 34, Strom 1982, pp. 6)

<sup>24</sup> (Karskens 2009, pp. 49–50, 106, Strom 1982, pp. 6)

<sup>25</sup> (Biosis Pty Ltd 2022b)

<sup>26</sup> (TKD Architects 2020, pp. 1–2)

<sup>27</sup> (Strom 1982)

<sup>28</sup> (Swancott 1953, pp. 52)



Arthur Rutherford Studds took up a Conditional Purchase at Penang Mountain, now Somersby, constructing a house 'Allambie' on Wiseman's Ferry Road.<sup>29</sup> The date of purchase is unclear, but photographs of the property date from 1911. During the period of World War 1, an orchard that was set up on Lackersteen's Road drew an influx of settlers into the area.<sup>30</sup>

### 3.3.2 The Nautical School Ships (1866 to 1911)

Following the findings of an 1859 Select Committee on the condition of the working classes in Sydney, the NSW Parliament passed the Act for the relief of Destitute Children (also known as the Industrial Schools Act) in 1866 to control wayward children.<sup>31</sup> This was an effort to remove the estimated 1,000 destitute children from the streets of Sydney into reformatory schools, inspired by the English 1857 Industrial Schools Act. The first clause of the Act stated:

*The Governor with the advice of the Executive Council may by proclamation in the Government Gazette declare any ship or vessel or any building or place together with any yards enclosures grounds or lands attached thereto to be a "Public Industrial School".<sup>32</sup>*

Nautical School Ships emerged as a response to this Act, combining a system of education with military discipline. Military drills were introduced under Frederick William Neitenstein, the Superintendent from 1878-1895, who believed in a system of discipline, surveillance, physical drills and grading – through hard work and obedience, pupils could earn certain privileges.<sup>33</sup> From 1871 the *Vernon*, the first Nautical School Ship, was moored at Cockatoo Island, where the male students maintained a farm to supply themselves with food. This system would be seen at Mount Penang when the Nautical School Ship *Sobraon*, successor to the *Vernon*, was closed in 1911 and the boys were relocated to a new site in Gosford.<sup>34</sup>

Parish portion 250, 253, 254 and 257 of Gosford parish was identified as the new site for the school, as indicated by a series of Crown plans dating to 1911 and 1912 (Photo 5, Photo 6, Photo 7, Photo 8). This combined land was dedicated as a site for the 'Industrial School' in September 1912.<sup>35</sup> The 1911 and 1912 Crown plans shows several roads and tracks [1] [2] [3], with swamps noted as running through the land, one of which is likely associated with the creekline to the north-west of the study area. Honeysuckle, Mahogany, Gum and Bloodwood trees are also noted, suggesting little to no development or clearing had occurred prior to this. Later annotations record a road cutting through portion 253, and also a railway line survey. No structures are recorded.

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<sup>29</sup> (Dundon 1980)

<sup>30</sup> (Bottomley 2001, pp. 36)

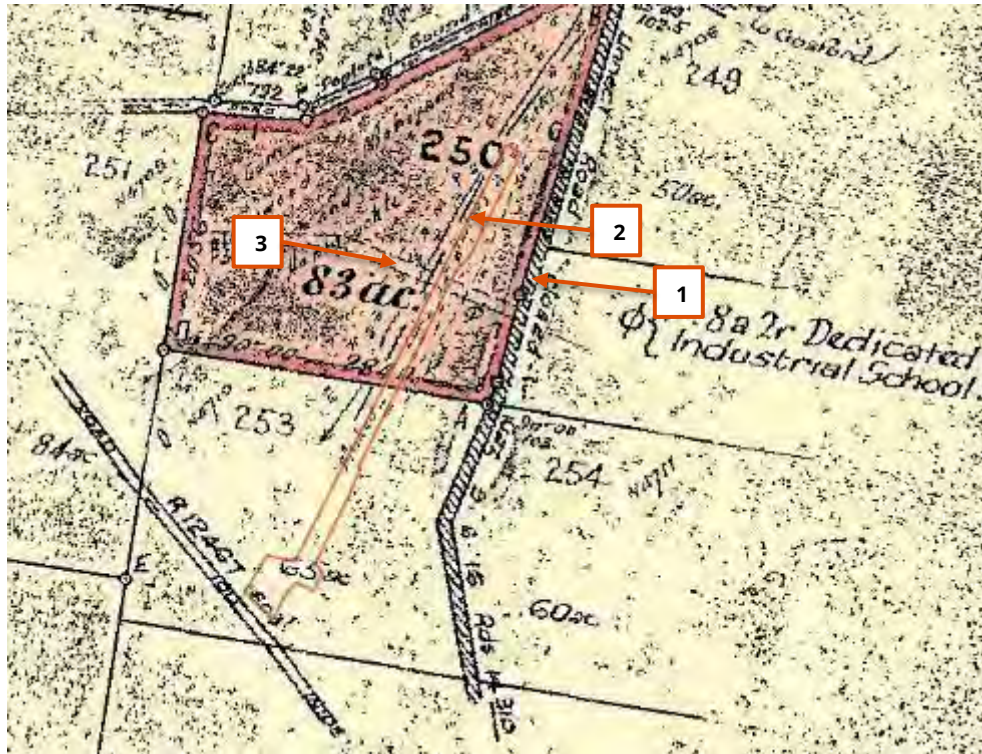
<sup>31</sup> (TKD Architects 2020, pp. 9)

<sup>32</sup> (TKD Architects 2020, pp. 9)

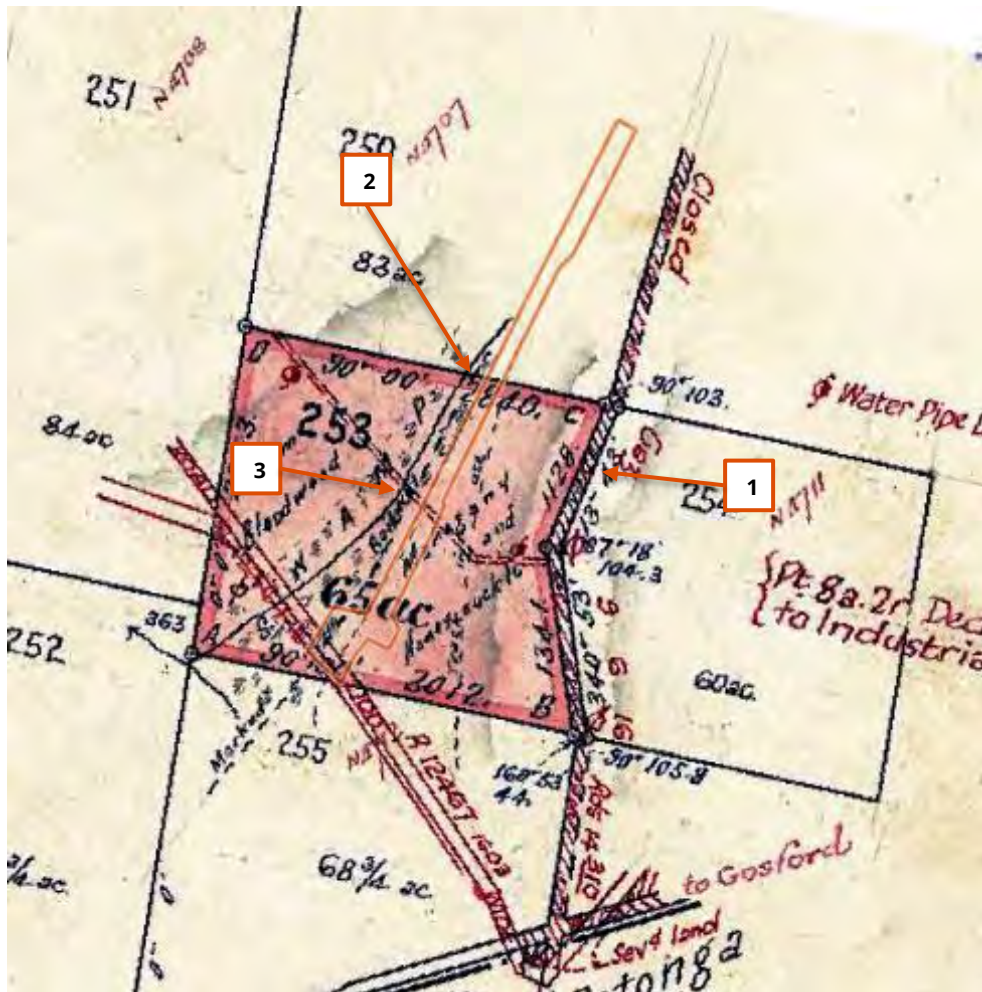
<sup>33</sup> (TKD Architects 2020, pp. 10)

<sup>34</sup> (TKD Architects 2020, pp. 10, 12)

<sup>35</sup> NSW Land Registry Services, Crown plan 4710.2111



**Photo 5** 1911 Crown plan for Gosford parish portion 250, showing three roads or tracks [1] [2] [3], with the study area outlined in orange (Source: NSW Land Registry Services, Crown plan 4707.2111)



**Photo 6** 1911 Crown plan of Gosford parish portion 253, showing three roads or tracks [1] [2] [3], with the study area outlined in orange (Source: NSW Land Registry Services, Crown plan 4710.2111)





**Photo 7** 1911 Crown plan of Gosford parish portion 254, showing two roads or tracks [1] [3], with the study area outlined in orange (Source: NSW Land Registry Services, Crown plan 4711.2111)



**Photo 8** 1912 Crown plan of Gosford parish portion 257, showing a road or track [1], with the study area outlined in orange (Source: NSW Land Registry Services, Crown plan 4775.2111)

### 3.3.3 The Gosford Farm Home for Boys (1912 to 1922)

The Farm Home for Boys was established on Crown land acquired on rainforest at Mount Penang, with over 600 acres (242.8 hectares) dedicated as a “site for an Industrial School” in 1912. The site was developed in response to the increasingly outdated and expensive Nautical Ship Schools, and the *Reformatory and Industrial Schools Act 1901* which repealed the 1866 legislation. The *Reformatory and Industrial Schools Act 1901* gave court power to commit a child to the care of a relative, a named person, the State Children’s Relief Board, or to a public industrial school.<sup>36</sup>

A 1915 Crown plan for the resumption of lands for the deviation of the road from Gosford to Peats Ferry shows the wider area containing the study area at this time (Photo 9). The unused road [1] previously identified is present, but the other two tracks [2] [3] have not been recorded. Topography and further swampy land in the vicinity of the study area is also noted, with vegetation described as low scrub of gum, stringybark, apple and banksia. No structures within or in the vicinity of the study area are recorded on the plan.

<sup>36</sup> (TKD Architects 2020, pp. 11)





**Photo 9** 1915 Crown plan for the land to be resumed for the road from Gosford to Peats Ferry, showing the unused road [1], and the study area outlined in orange (Source: NSW Land Registry Services, Crown plan 12467.1603)

The site was relatively isolated, located on a flat summit of a sharp escarpment approximately 5 kilometres west of Gosford and 1.6 kilometres from the track to Sydney. Approximately 100 boys from the *Sobraon* ship began clearing the Mount Penang site in 1912, with equipment transported by bullocks. Due to the limited accessibility of the site, local hardwood and sandstone (quarried on site) was recommended by the construction Advisory Committee, as bricks would be too expensive to transport.<sup>37</sup> James Nangle, the Committee architect, recommended the use of concrete which was hoped to reduce cost and transport issues.

*The site was 800 ft. [about 244 metres] above sea-level. There were innumerable preliminary difficulties to overcome, and foremost was the steep hill to be climbed between the site and Gosford station. That at first was thought to be an insuperable barrier to getting building materials there. The high cost of carriage accounted for an almost prohibitive estimate which the Works Department supplied when asked to arrange for the construction of the buildings.*

*Mr Nangle, the technical college architect, however, solved the problem by recommending that the buildings be erected of concrete. An outcrop of suitable building sandstone was found on the estate. The thought then struck the Minister that it would be a good thing to interest the boys committed to the industrial school in the construction of the buildings required, The committee reported on the proposal, which depended on two problems – first, whether the method of construction to be adopted was sufficiently simple to allow the boys to usefully assist in the erection, and second, whether it was possible to keep the boys under the necessary*

<sup>37</sup> (TKD Architects 2018, pp. 12)



*restraint in the wild, unbounded country which constituted the estate. The committee decided in favour of the boys, and praiseworthy confidence was expressed by the superintendent of the Brush Farm home in his ability to control the boys, under the novel conditions. That solved the second problem.*<sup>38</sup>

Nangle was the lecturer in charge of Sydney Technical College's department of architecture from 1905 to 1913, when he was appointed the Superintendent of technical education. His architectural work was residential, institutional and commercial, with two of his best known buildings constructed for Marcus Clark at Newtown and on the Pitt Street and George Street corner. In 1920 he was appointed O.B.E. before he retired in 1933. Nangle was also an office-bearer of the Engineering and Town Planning associations of NSW, the State committee of the Council for Scientific and Industrial Research, and a member of the Royal Society of New South Wales from 1893 (later becoming society president from 1920 to 1921).<sup>39</sup>

The Farm Home for Boys plans were approved by the Minister for Public Instruction with a budget of £12,000 for main structures. During construction, the boys working on site were supervised by a master builder and several tradesmen, living in large bell tents and were fed by meals cooked on an open fire by the chief cook of the *Sobraon* (Photo 10).<sup>40</sup> The first buildings were temporary timber constructions for essentials: dormitories, a dining room, staff quarters, offices, a kitchen, accommodation for tradesmen and Clerk of Works, and store rooms for supplies and equipment.<sup>41</sup> Permanent buildings with stone foundations were constructed shortly after, with foundations laid for the No. 1 Dormitory in December 1912 (Photo 11). By the following September, this dormitory had been completed along with the Assistant Superintendent's residence and four weatherboard cottages for married staff members. The cottages still stand along the entrance road to the complex.<sup>42</sup> Works continued on the site until 1922 and included additional dormitories, a concrete reservoir, a store, an office, a windmill, five galvanised tanks for water storage, a carpentry workshop, a 300-yard trolley truck for transporting stone from the quarry site and a permanent dam.<sup>43</sup>

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<sup>38</sup> ('Boys Industrial Home', 1912)

<sup>39</sup> (TKD Architects 2020, pp. 12)

<sup>40</sup> (TKD Architects 2020, pp. 13)

<sup>41</sup> (Heritage NSW n.d.)

<sup>42</sup> (Heritage NSW n.d.)

<sup>43</sup> (Heritage Now 2021, pp. 4)



**Photo 10** 1912 photograph of initial temporary accommodation at the new school site (Source: (Find&Connect 1962)



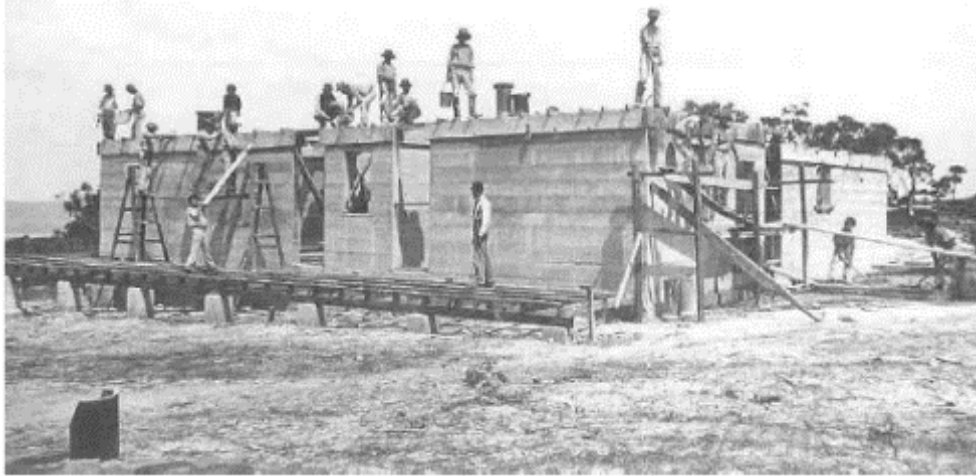
**Photo 11** 1912 photograph of Campbell Carmichael, Minister for Public Instruction, laying the foundation stone on 9 December (Source: (Department of Community Services and Department of Juvenile Justice n.d.)

The concrete mix used in construction contained one portion of cement mixture, two portions of sand and three portions of crushed stone, recorded in the diary of George Walpole, the first schoolmaster on site. Two groups of boys would mix the material, while one transported the material to the work site, and another team lifted the formwork up the scaffolding (Photo 12).<sup>44</sup> In their spare time the boys developed a sports ground under Walpole's supervision, adjacent to the building site and in front of the dormitories at a lower level. The sports ground was dedicated in 1912. To the north of the building site a mile-long drain was opened using a

<sup>44</sup> (TKD Architects 2020, pp. 14)

road plough and a well was sunk 4 metres deep to tap an underground stream for fresh water (Photo 13, Photo 14).<sup>45</sup>

By 1914 the Gosford Farm Home for Boys was dealing with all male delinquents who had been institutionalised in NSW through the Children's Courts.



**Photo 12** 1913 photograph of boys working on the construction of the Assistant Superintendent's House (Source: (Department of Community Services and Department of Juvenile Justice n.d.)

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<sup>45</sup> (TKD Architects 2020, pp. 15)



**Photo 13** 1913 photograph of a completed dormitory building (Source: (Department of Community Services and Department of Juvenile Justice n.d.)



**Photo 14** 1912 photograph of one of the tramlines linking the quarries to building sites; temporary buildings can be seen in the background (Source: (Department of Community Services and Department of Juvenile Justice n.d.)

In 1915, the Superintendent of the Farm Home set out the principles of the work ethic on site in a report the Minister for Public Instruction:

*Habits of steady industry are acquired, which are earned outside the boundaries of the institution and characterise the future conduct of many lads who, before, were not inclined to settle down to any type of work. And herein lies the secret of reformation in many cases. Boys frequently are bad, or delinquent, not from natural bent, but simply because they are lazy and have never been forced to work steadily at any occupation requiring the expenditure of a certain amount of energy.<sup>46</sup>*

Frederick Arthur Stayner was the Superintendent during the early years of the Farm Home. He began teaching in 1884 and was appointed chief schoolmaster to the *Sobraon* by the Department of Public Instruction in 1894. He was later transferred to superintend the Brush Farm Reformatory at Eastwood before moving with the boys there to Mount Penang in 1912. Stayner was removed as superintendent in 1923

<sup>46</sup> (Stayner 1915, pp. 1)

following an enquiry into Mount Penang but continued to work for the Child Welfare Department, becoming the Inspector in Charge of the School Attendance Branch in 1928.<sup>47</sup> He is understood to have died at Eastwood at the age of 85 in March 1954. Under the 1905 legislation, boys sent to the Farm Home were under the custody of the superintendent until they reached the age of 18, or the date of their discharge from the establishment or apprenticeship. The superintendent was empowered to indenture any inmate to a Master as an apprentice under the provisions of the *Apprentices Act 1901*.<sup>48</sup>

Stayner implemented a number of significant administrative operations at the Farm Home. One of these was an honour system, awarding extra privileges to boys who behaved within the set guidelines and had the potential to shorten their time at the facility by advancing to probation through compliance. The disciplinary system of the site was organised by Stayner along military lines, which allowed teachers to carry or use canes without the direct authority of the Superintendent. The emphasis of the Farm Home was intended to be character development for the boys, as opposed to an unnecessarily harsh regime. Competitive sports were introduced to give the inmates regular exercise and a sense of teamwork.<sup>49</sup>

Boys arriving at the Farm Home were assessed to determine their level of education. Each was required to reach a fourth class standard of primary school, regardless of age. Initially, the school operated in any building or verandah available to them. In the first years, schooling was carried out in the converted end of the new dormitory until a school building was constructed behind the main complex. The education received by the boys was based on the Education Department's 1905 syllabus of primary instruction, supplemented after 1935 with visits from Sydney University lecturers. The system of schooling was carried over from the *Sobraon*, where half of a day was spent outdoors on manual training and the other half indoors at school. By the 1920s a standard Department of Education rural school building had been erected at the Farm Home.<sup>50</sup>

A 1921 map of Gosford and Norahville shows the site of the "State Industrial Farm", the unused road [1] has been formalised to The Avenue [4], Parklands Road [5], a reservoir to the south and east, and several structures in adjacent to the study area off The Avenue [4] (Photo 15).

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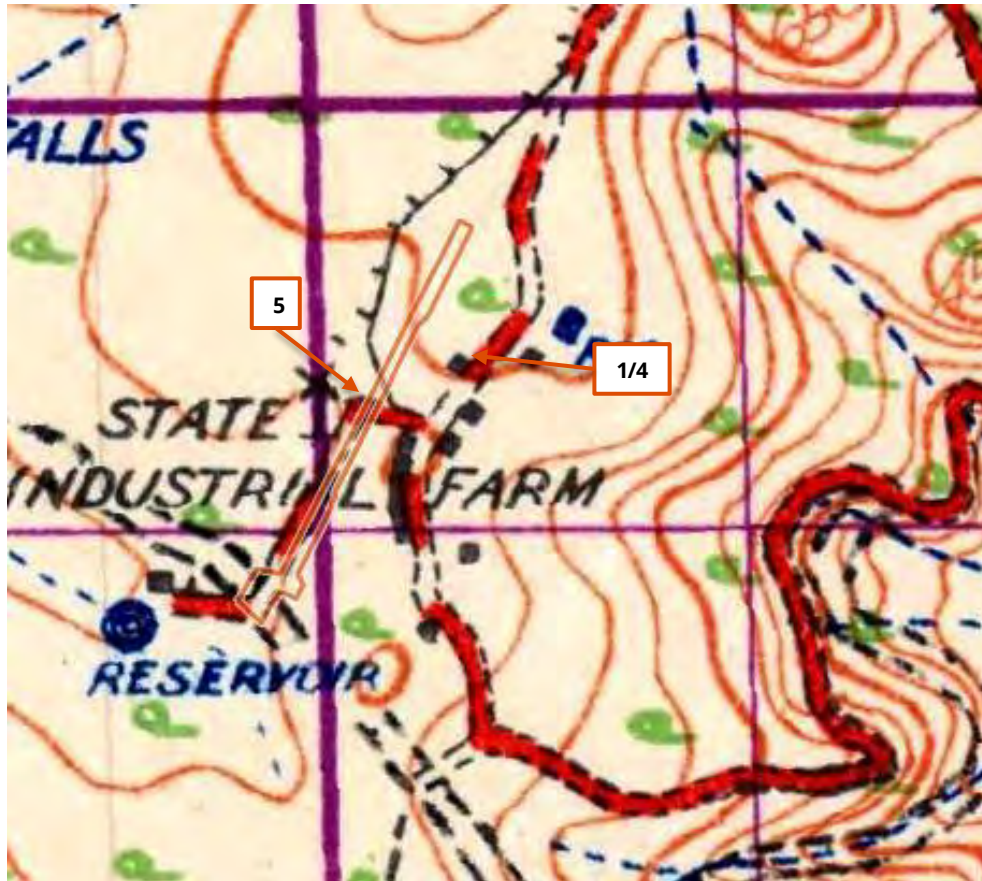
<sup>47</sup> (Sydney Morning Herald 1933, pp. 7)

<sup>48</sup> (Ramsland & Cartan 1989, pp. 70)

<sup>49</sup> (TKD Architects 2020, pp. 18)

<sup>50</sup> (TKD Architects 2020, pp. 18)





**Photo 15** 1921 Gosford and Norahville map, showing the State Industrial Farm, the unused road [1]/The Avenue [4], Parklands Road [5]; the study area is outlined in orange (Source: (National Library of Australia 1921))

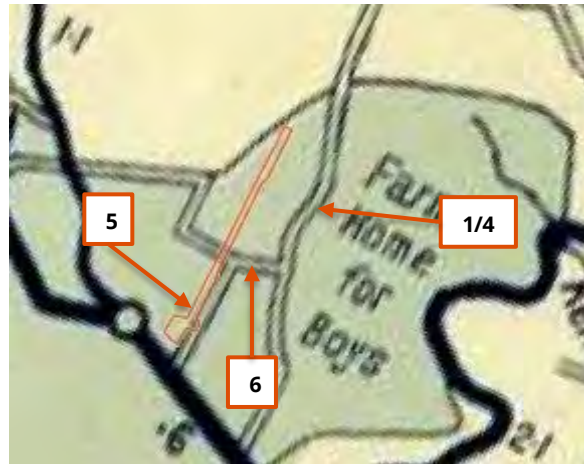
### 3.3.4 Gosford Training School – Consolidation (1923 to 1944)

The NSW *Child Welfare Act 1923* repealed and consolidated a number of provisions that existed in legislation concerning the care and management of children under the State's protection, designed to place greater emphasis on health, welfare and rehabilitation under the direction of the new Child Welfare Department. Walter Bethel, previously involved in setting up the Gosford Farm Home for Boys, was the secretary of this department.<sup>51</sup> The *Child Welfare Act 1923* dealt with juvenile offenders who had come through the Children's Courts up to the age of 16, or those between 16 and 18 on minor charges in the adult system, reflecting the government's recognition of the need for more lenient treatment of young people under State Care away from the harsh environment of the NSW criminal justice system.<sup>52</sup> The new system reclassified the Farm Home as an Industrial School, with the schooling controlled by the Department of Education. The name of the institution was changed accordingly to the Gosford Training School, though it took time for this new name to be more widely used. In a roadmap dated to 1930, the site is still marked Farm Home for Boys (Photo 16).

<sup>51</sup> (TKD Architects 2020, pp. 18)

<sup>52</sup> (TKD Architects 2020, pp. 19)





**Photo 16 1930 roadmap of Wyong, showing the Gosford Training School/former Gosford Farm Home for Boys institution, The Avenue [4], Parklands Road [5] and Carinya Street [6]; the study area is outlined in orange (Source: (State Library NSW 1930))**

As a result, the living conditions and amenities at the school gradually improved between 1923 and 1940. An ongoing building program gave the boys experience that could be practical after their release while simultaneously improving their living conditions (Photo 17, Photo 18, Photo 19). Electric lighting and a hot water system were installed in 1936, followed by a refrigeration service in 1937. By the end of that year, the Training School featured four dormitories, a recreation hall that catered for concerts and movies, a dining and kitchen block, a hospital, a bathing and sanitary block, as well as a variety of outbuildings including a dairy and accommodation for both single and married staff. The Brushbox planted along The Avenue, the original main access route to the School, were planted by 1938 (Photo 20).



**Photo 17** 1923 photograph of the 1914 dam, used as a swimming pool and for lifesaving and swimming classes during the 1920s and 1930s (Source: (NSW State Archives n.d.)



**Photo 18** 1938 photograph of the dormitories looking south along what is now known as The Avenue [4], with the original dairy in the foreground (Source: (State Library NSW n.d.)



**Photo 19** 1938 photograph of the interior of one of the dormitories (Source: (State Library NSW n.d.)

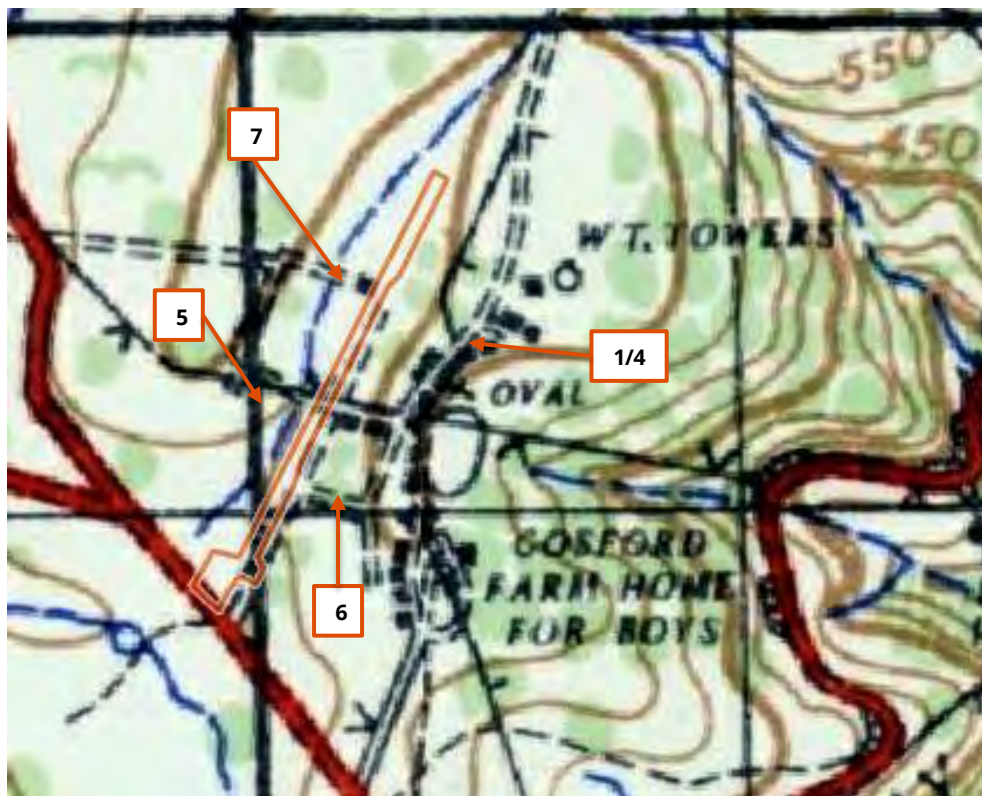


**Photo 20** 1938 photograph of the entrance to the School (Source: (State Library NSW 1938)

In a 1942 map of Gosford and Norahville, the increased development of the School is visible (Photo 21). The Avenue [4], Parklands Road [5], Carinya Street [6] are present, lined with multiple structures (outside of the study area). Parklands Road [5] has been extended north. McCabe Road [7] has also been established by this date, extending from the lengthened Parklands Road [5]. There are three access roads to the site, from the



south, west and north. A road to the west of the study area divides the land for further use. A water tower and the sports oval have been marked, and the institution is labelled with the outdated name Gosford Farm Home for Boys.



**Photo 21** 1942 Gosford and Norahville map, showing The Avenue [4], Parklands Road [5], Carinya Street [6] and McCabe Road [7], with the study area outlined in orange (Source: (State Library NSW 1942))

A farm was established on Government land at Narara, approximately 16 kilometres from the Training School, due to the relatively poor quality of the soil. Thirty-one boys were transferred to clear and prepare the land for cultivation, where a vegetable garden was created. The Narara farm was shortly closed in 1934 following the creation of a much larger institution in Berry the same year. During this period, pasture improvement was being undertaken at the Training School in Gosford, where sufficient milk was being produced. However, the emphasis on farming was shifting to vocational training, with farm training being offered at other sites instead.<sup>53</sup>

The Training School reached out more frequently to the local community in Gosford, attempting to increase community awareness of the site and gain a level of acceptance. This included sporting teams playing in local competitions, including football, cricket and athletics, to both increase positive self-image in the boys and improve relations with the local community. The Recreation Hall was also opened to the public for movie viewings, and the boys were employed on community projects in and around Gosford to develop a sense of civic pride and responsibility (Photo 22). These tasks included maintenance, gardening, and small construction jobs.<sup>54</sup>

<sup>53</sup> (TKD Architects 2020, pp. 20)

<sup>54</sup> (TKD Architects 2020, pp. 20)





**Photo 22 1938 photograph of the interior of the recreation hall; a screen at the rear of the building allowed movies to be shown (Source: (State Library NSW n.d.)**

Despite this, due to the nature of the institution, issues arose with the Training School over time. In 1923, an inquiry was conducted by the Children's Court into allegations of mistreatment of the boys, including undue severity in some punishments and resulting in recommendations to reduce the use of the cane by employed officers. A second enquiry in 1934 investigated the punishments inflicted on site, and found that it was common practice for more senior boys to administer punishment on junior inmates, often unsupervised by staff. For example, one form of punishment required the offender to fight up to five other boys, with or without gloves. The fight would continue until it was deemed the punishment was sufficient.<sup>55</sup>

### **3.3.5 Mount Penang Training School for Boys (1944 to 1960)**

A new sub-institution was opened at the Gosford Training School by the Minister for Education and Child Welfare, Clive Evatt, in May 1944.<sup>56</sup> The facility was designed in the Government Architect's Branch of the Department of Public Works as a maximum-security sub-institution for unresponsive boys:

*The brick structure, which has cost £24,000, is surrounded by a high fence. Inside the 10-acre [4.046 hectares] compound the inmates will begin to grow vegetables on five acres [2 hectares] of virgin soil. Officials expect that in this regard the institution will be self-supporting. Further extensions are contemplated. The capacity of the extension is for 20 boys. Each will have a room. The interior of the building is elaborate. The dining room and kitchen are spacious. There is a doctor's surgery and a dentist's surgery.<sup>57</sup>*

<sup>55</sup> (TKD Architects 2020, pp. 20)

<sup>56</sup> (TKD Architects 2020, pp. 22)

<sup>57</sup> (Newcastle Morning Herald and Miners' Advocate 1944, pp. 2)

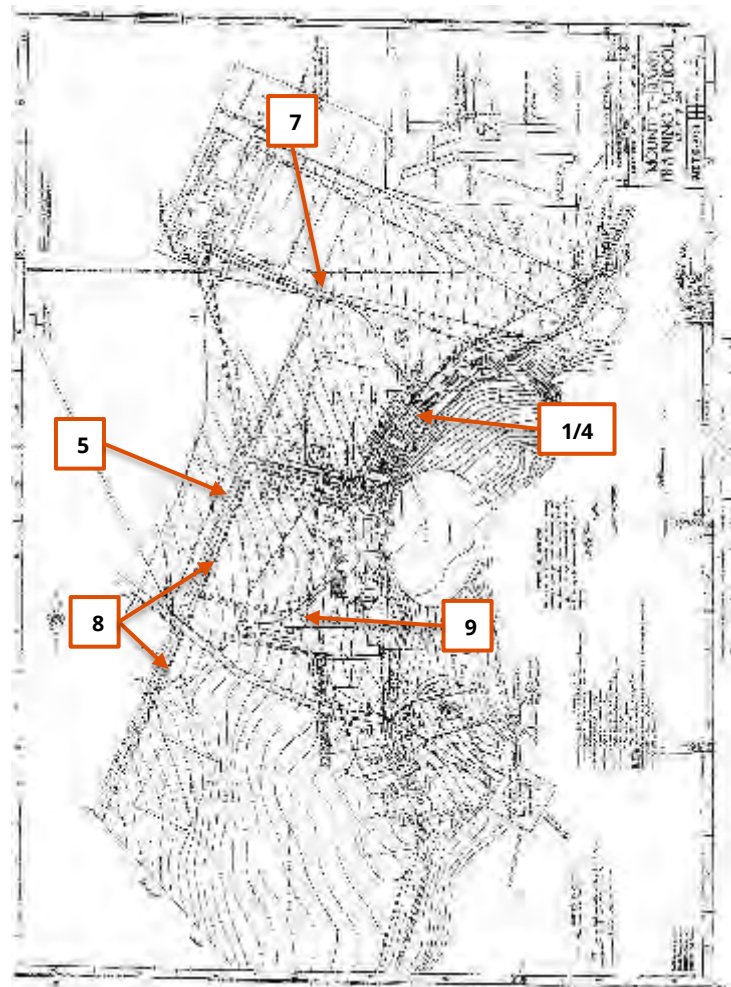
Two cottages, each with three bedrooms, were constructed for staff to the south of this sub-institution. All three buildings were essays in Modernist style architecture, a break with the traditional forms and planning of earlier buildings at Mount Penang.<sup>58</sup>

Vincent Heffernan, formerly an executive officer of the National Emergency Service during the war, was appointed as the new Superintendent in 1944. Arriving at the Training School, Heffernan observed the institution was in a dilapidated state, both physically and ideologically. The honour system introduced under Stayner had deteriorated, discipline had become more rigid, the pastures and livestock were in poor condition, as were various workshops and the schoolhouse. Heffernan invested in new equipment, established a boot shop to supply shoes, upgraded the pastures and raised the pigs and cows to stud standard. During this upgrade extensive landscaping and planting was carried out and a new dairy and stock shed were constructed along with several new recreational facilities, including new playing fields, bowling greens and a tennis court. From the 1940s, the Training School began to show its livestock, winning a number of prizes at local events and the Royal Easter Show in Sydney.

A 1946 site plan of the Training School provides significant detail as to the development of the study area and wider site (Photo 23). The Avenue [4] and Parklands Road [5] and are still in their previous formation, while McCabe Road [7] has been extended east to meet The Avenue [4]. A series of plantings, likely to be Lombardy Poplars [8] are also recorded adjacent to Parklands Road [5]. Carinya Street [6] does not appear to be a formal road in this drawing, but the two rows of plantings [9] indicate its location. More widely, this plan, along with a series of 1948 photographs (Photo 24) shows the significant development that had taken place within the Training School in recent years.

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<sup>58</sup> (TKD Architects 2020)



**Photo 23** 1946 site plan of the Mount Penang Training School, showing The Avenue [4], Parklands Road [5], McCabe Road [7], Parklands Road plantings [8] and Carinya Street plantings [9] (Source: (NSW Department of Public Works and Services, reproduced in GML 2001, pp. 22)



**Photo 24 A series of 1948 photographs showing the dormitories precinct and its associated landscaping (Source: (State Library NSW n.d.)**

The name of the institution was changed in 1946 to Mount Penang Training School for Boys, Gosford. The change was due to the idea that the new name more clearly represented the varied program of planned training that was required for the re-education of delinquent youth. The inclusion of Mount Penang was favoured over other suggestions, such as Kariong, as it had not been applied to another local institution or building.<sup>59</sup>

In 1948, the Institution for Boys at Tamworth was established by the Child Welfare Department, an annexe to Mount Penang Training School for Boys and a place of secondary punishment for boys aged 15 to 18 who had absconded from Mittagong Training Home or Mount Penang, or who had been convicted of offences in those homes. Located in a former adult jail opened in 1881, the institution was one of the harshest child welfare institutions in New South Wales. After Tamworth opened, the use of the recently completed sub-institution changed and became a Privilege Cottage, representing a shift in governmental policy in child welfare. These changes generally sought to move away from authoritarian structures with harsh discipline associated with reform schools towards a more open, family-style environment.<sup>60</sup>

Privilege Cottage was opened by the new Minister for Education, Robert Heffron, in May 1948, redecorated internally with the boys able to choose their own rooms. Although still under supervision, the boys were able

<sup>59</sup> (TKD Architects 2020, pp. 23)

<sup>60</sup> (TKD Architects 2020, pp. 23–24)



to enjoy a more relaxed atmosphere than that of the main centre. The staff cottages now housed visiting family members.<sup>61</sup>

The newly refurbished Cottage represented a new level of privilege at the centre. From the opening of the Gosford Farm Home for Boys, boys were given an opportunity to improve their position at the centre by showing they could be trusted. The remote location of the Privilege Cottage from the main centre reinforced the trust the boys had gained. In the 1950s, a survey of former inmates was carried out identifying that of sixty-two boys who had passed through the cottage, seven had been returned to the main institution, thirty-eight had been discharged and fourteen were still in residence. Of the discharged boys, one had been re-admitted and one had absconded. This survey was interpreted as a demonstration of the Cottage assisting in rehabilitation of the boys and helping them make a successful adjustment to life in the community.<sup>62</sup>

Between the mid-1940s and mid-1950s, several new buildings were erected behind the administration building and a new sports ground was built. The new buildings included a new kitchen/dining room, a laundry and boiler house, a storeroom, a detention cell block, a workshop, an instruction block, and a boot manufactory. The sports ground was defined on its norther boundary by this new collection of buildings. Several of the buildings were later adapted to new uses.

In 1953 the Child Welfare Department assumed control of the school program at the Training School.

### **3.3.6 Mount Penang (1960 to 1999)**

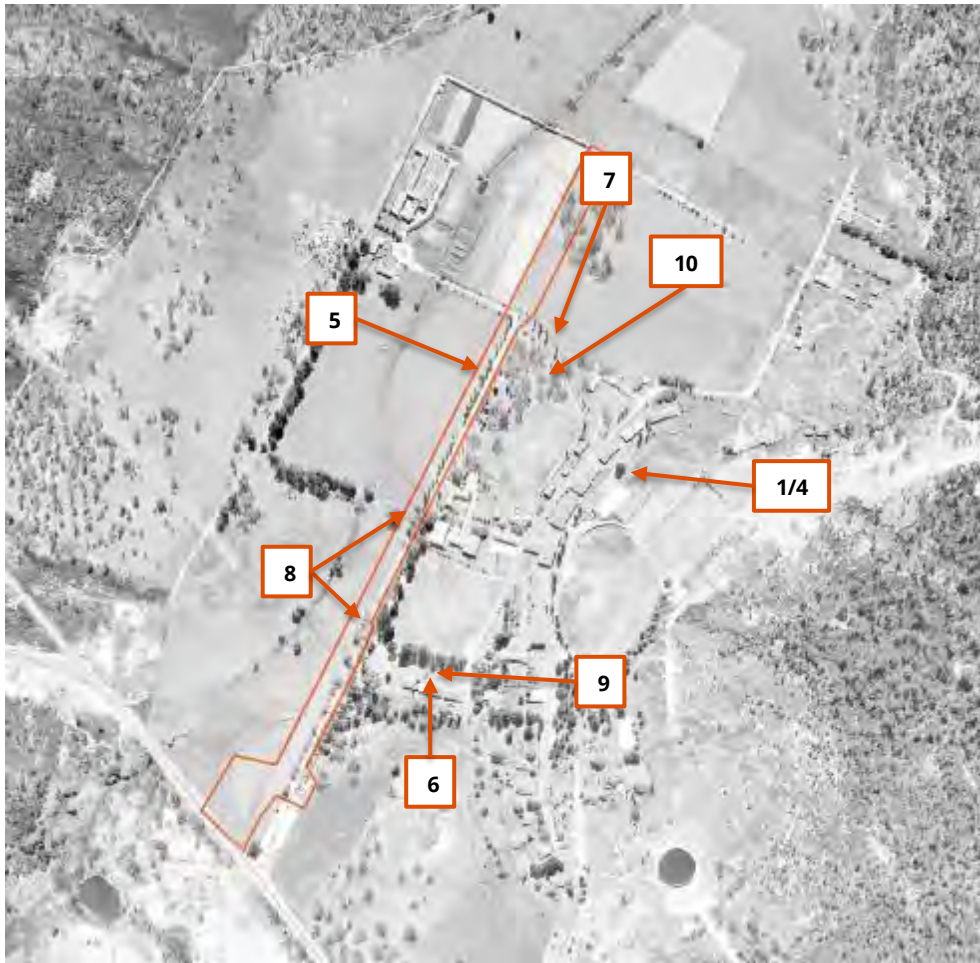
Historical imagery assists in understanding modern developments that occurred within the study area. A 1965 aerial shows the extensive development that has taken place within and immediately surrounding the study area (Photo 25). The complex has well established, graded roads [4] [5] [6] [7] lined with trees [8] [9]. A patch of plantings [10] is present at the junction of Parklands [5] and McCabe [7] roads; it is possible that these may be remnant native vegetation.<sup>63</sup> The sports oval is clearly visible in the east of the institution, as is the watercourse running north-east to south-west through the western portion. A water reservoir is located to the south-west. An access track leading out of the site to the north-east is clearly visible. Similarly, a 1972 site plan of the Training School provides further detail of the structures, roads and other built elements of the wider site. The Avenue [4], Parklands Road [5] and Carinya Street [6] are recorded in this plan (Photo 26).

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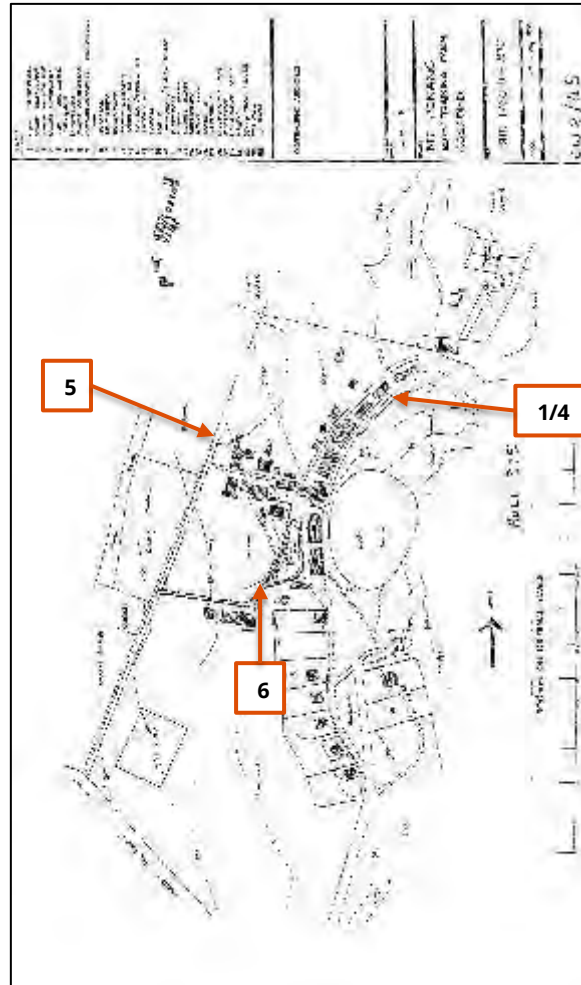
<sup>61</sup> (*Institution for Boys, Tamworth (1848-1976)*., n.d.)

<sup>62</sup> (TKD Architects 2020, pp. 25)

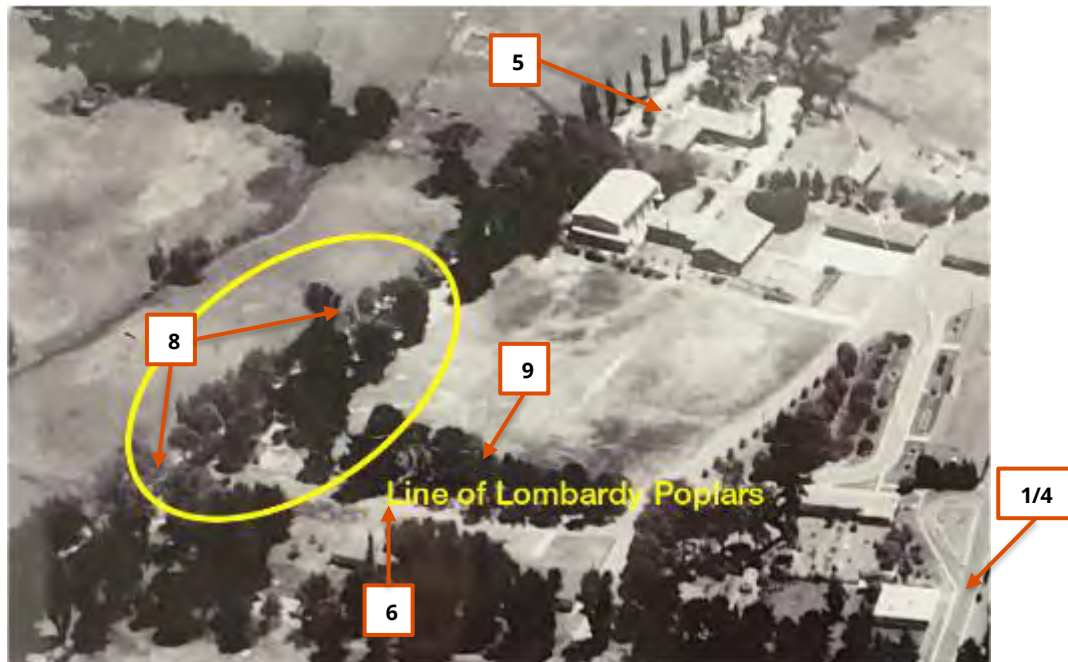
<sup>63</sup> (TKD Architects 2020, pp. 64)



**Photo 25** 1965 aerial photograph, showing The Avenue [4], Parklands Road [5], Carinya Street [6], McCabe Road [7], the Parklands Road plantings [8], Carinya Street plantings [9] and new plantings at the corner of Parklands and McCabe roads [10], with the study area outlined in orange (Source: NSW Spatial Services n.d.)



**Photo 26** 1972 site plan of Mount Penang Training School, showing The Avenue [4], Parklands Road [5] and Carinya Street [6] (Source: Department of Public Works and Services, reproduced in GML 2001, pp. 25)



**Photo 27** c.1970 aerial view of the study area, showing The Avenue [4], Parklands Road [5], Carinya Street [6], the Parklands Road plantings [8] partially highlighted as the Line of Lombardy Poplars in yellow, and Carinya Street plantings [9] (Source: (TKD Architects 2020, pp. 65 Figure 58)

A new building program was implemented at Mount Penang in 1975 by Laurie Maher, the new Superintendent. This included internal modifications of the dormitories, new and upgraded bathroom and toilet facilities, and the redevelopment of a storeroom to a holding room. The following year, Privilege Cottage was rebranded again; renamed McCabe Cottage, the site became a pre-discharge unit. Several new buildings were constructed at the Training School in the following decade, including a new Officer's Dining Room constructed in 1976 adjacent to the boys' dining rooms and a new office block constructed in 1978 containing offices for the Superintendent, Deputy Superintendents, Salary Officer, a police interview room, conference room and general office. New medical facilities and quarters for nurse replacing the 1920s hospital were constructed, as was a new storage/amenities building to the north of the gymnasium. A 50 metre swimming pool replaced the bowling green in 1978, and the former clubhouse associated with the green was converted into a teachers' staff room (Photo 28).<sup>64</sup>

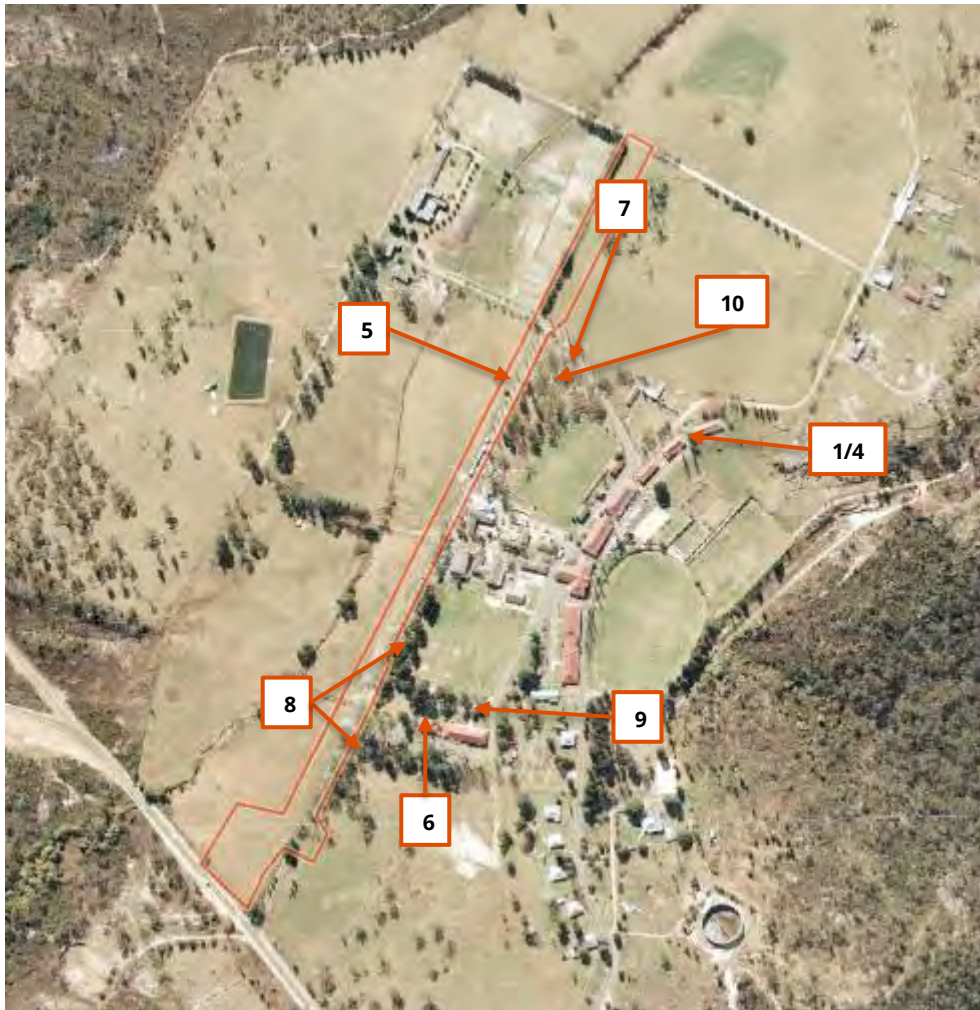
<sup>64</sup> (TKD Architects 2020, pp. 25–26)





**Photo 28 1973 photograph of the newly completed swimming pool (Source: (State Library NSW n.d.)**

Aerial imagery from 1976 show visible changes in across the Training School since 1965 (Photo 29). New structures are visible on the southern edge of Carinya Street, and a waterbody has been constructed in the west of the site. The reservoir in the south-east appears to be empty and may have fallen out of use, though this could simply be due to the weather at the time of photography. The track leading out of the site to the north-east has fallen out of use, while the sports oval is still clearly visible in the east. There appears to have been some reduction in the plantings along Parklands Road [8].

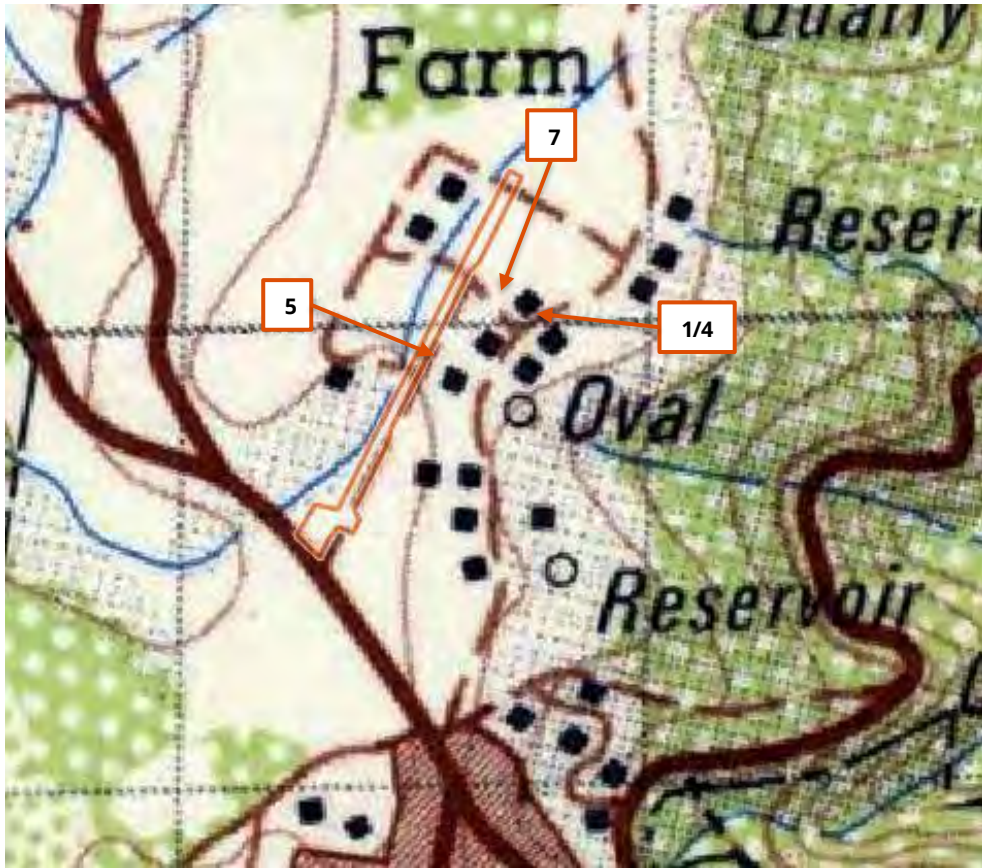


**Photo 29** 1976 aerial photograph, showing The Avenue [4] Parklands Road [5], Carinya Street [6], McCabe Road [7], Parklands Road plantings [8], Carinya Street plantings [9] and the Parklands/McCabe corner plantings [10] with the study area outlined in orange (Source: (NSW Spatial Services n.d.)

In the eastern section of the Training School site, a building complex was opened in February 1977, constructed as a residential facility housing up to 24 children who were wards of the state. The building was closed a decade later in 1988, after being taken over by the Gosford Family Support Service in 1985.<sup>65</sup>

A 1979 map illustrates changes to the Training school (Photo 30). The Avenue [4], Parklands Road [5] and McCabe Road [7] are recorded. More widely, the land has been further divided by roads, with new structures also marked. The site is no longer accessible from the west, but the sports oval remains. The reservoir, mapped to the south of the Highway in 1921 (Photo 15) has been replaced, now located south-east of the sports oval, with a second reservoir to the north-east. In the south-east of the site, the circle road at the south of The Avenue has been removed, and there are fewer marked structures in that location. A quarry has been marked in wider vicinity, to the north-east of the study area.

<sup>65</sup> (Rubie 2003, pp. 161)



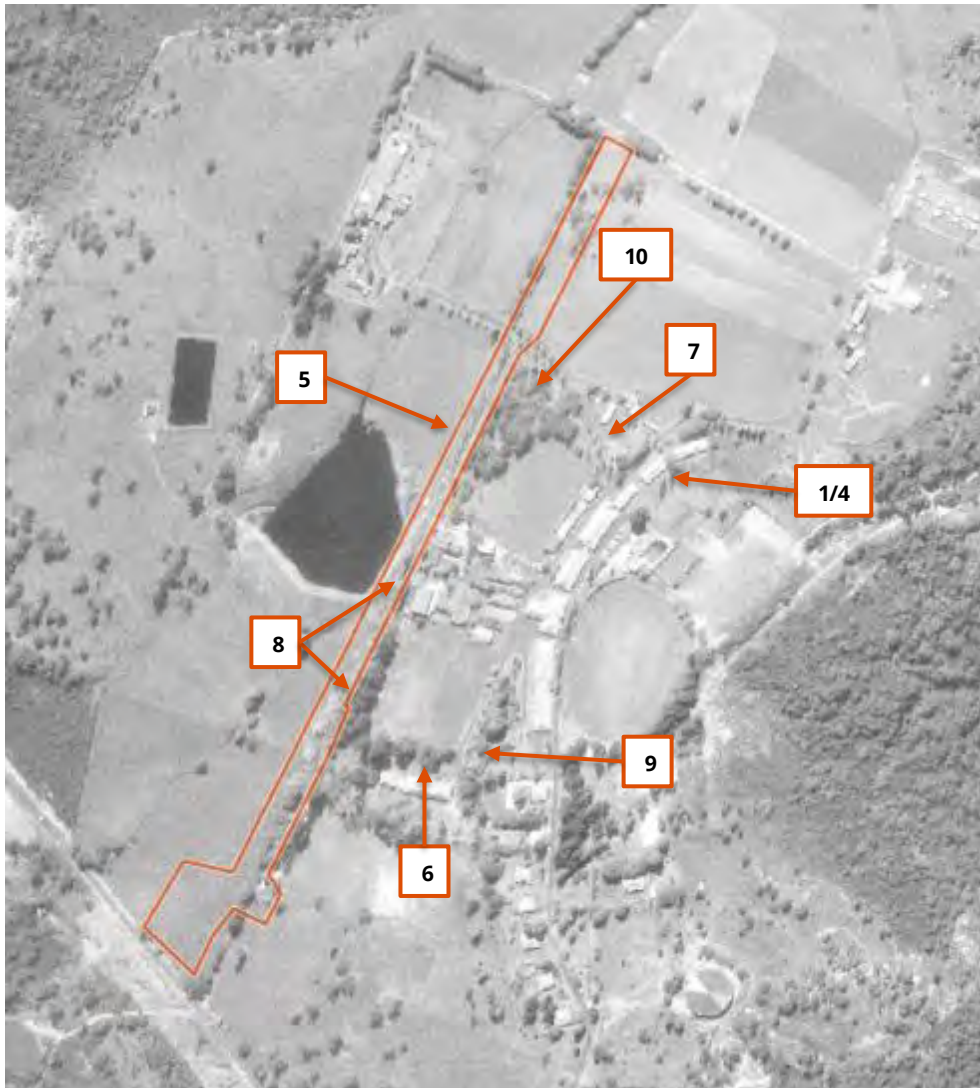
**Photo 30 1979 map of Gosford showing The Avenue [4], Parklands Road [5] and McCabe Road [7], with the study area outlined in orange (Source: (National Library of Australia 1979)**

In 1980, the Mount Penang Training School program was returned to the Education Department and a number of new programs were introduced. This included one for boys who rebelled against traditional schooling methods, as well as a remedial program for one-on-one teaching. The following year, Landcom resumed 80 hectares of Mount Penang's land south of the Pacific Highway, which became part of the residential and recreational areas in the wider suburb of Kariong. In 1986 more land was resumed on the western boundary to accommodate upgrades to the Sydney to Newcastle freeway, leaving the institution with around 182 hectares of land left from the 1912 dedication of over 600 acres.<sup>66</sup>

A 1984 aerial photograph shows a large dam has been created to the west of the study area, where the watercourse crosses the site (Photo 31). In the north-east of the site, additional structures have been added to the complex. The reservoir to the south-east is now covered, and the sports oval remains consistently visible.

<sup>66</sup> (TKD Architects 2020, pp. 26)





**Photo 31 1984 aerial photograph showing The Avenue [4] Parklands Road [5], Carinya Street [6], McCabe Road [7], Parklands Road plantings [8], Carinya Street plantings [9] and the Parklands/McCabe corner plantings [10], with the study area outlined in orange (Source: (NSW Spatial Services n.d.)**

In 1988, the name of the site was changed once again to the Mount Penang Detention Centre. This change reflected the new emphasis on court-based sentencing and children's welfare as managed by the Department of Family and Community Services. The name of the institution was changed again a decade later to the Mount Penang Juvenile Justice Centre after changes in government policies, as the school program was expanded to include secondary education. The school, now named 'Girrakool' in response to the rising stigma attached to Mount Penang, now contained a collection of demountable schoolrooms, with the original two buildings serving as library and cultural centres. In 1990, the centre's Vocational Training Unit was relocated to a former RTA depot on the western extreme of the site.<sup>67</sup>

The last major building program was completed in 1991 with the opening of the Kariong Juvenile Justice Centre in the north-east section of the site; a high security prison for serious juvenile offenders, while Mount Penang functioned as a low-security detention facility. As the Frank Baxter Juvenile Justice Centre was constructed in the north-west section of the site, opening in October 1999, planning for the closure of the

<sup>67</sup> (GML 2001, pp. 14)



Mount Penang institution began. Inmates were progressively relocated to the new institution, with the last inmates transferred on 29 December 1999.<sup>68</sup>

A 1994 aerial photograph shows dramatic change across the wider Mount Penang site, though there is little change within the study area (Photo 32). Extensive tree clearance has taken place to the east, and multiple structures have been erected, including multiple building complexes and an additional reservoir. There is new access to the site, with a road leading out from the north-easternmost area.



**Photo 32** 1994 aerial photograph showing The Avenue [4] Parklands Road [5], Carinya Street [6], McCabe Road [7], Parklands Road plantings [8], Carinya Street plantings [9] and the Parklands/McCabe corner plantings [10], with the study area outlined in orange (Source: (NSW Spatial Services n.d.))

### 3.3.7 Mount Penang (2000 to present)

With the closure of Mount Penang, planning commenced for the site to be transferred to the local Council for community uses. The Festival Development Corporation, a statutory authority established by the State Government under the *Growth Centres (Development Corporations) Act 1974*, took ownership of 156 hectares in

<sup>68</sup> (Rubie 2003, pp. 208)

2000, subject to the control of the Minister for the Central Coast. The areas retained by the Department of Juvenile Justice for the Kariong Juvenile Justice Centre and Frank Baxter Juvenile Justice Centre were excluded from this, as were their surrounding grounds.<sup>69</sup>

The site was renamed Mount Penang Gardens in 2000, the site now containing an events park, sports precinct, retail/commercial areas, and bushland.<sup>70</sup>

An international competition was held to design the Mount Penang Gardens. The brief called for:

*a regional garden attraction that had to be an iconic landmark, a legacy for future generations and compliment [sic] the existing heritage character and landscape setting. It contained the challenge to create a contemporary garden that would prove to be popular and attract substantial visitation. The garden should provide a kiosk and amenities for visitors.*<sup>71</sup>

JMD Design (then Anton James Design) won this competition in 2001, with a design comprising of twelve themed gardens featuring a variety of permanent and changeable garden areas modelled around a cascading water fountain, bottle trees from Queensland, an obelisk water feature and an outdoor amphitheatre intended as an event space. The gardens were opened in November 2003, augmented by twelve sandstone sculptures from two international sculpture symposia that had taken place in 1987 at Wondabyne and 1988 at Mount Penang. Sculptures from the first symposium were installed in 2004, while sculptures from the second are present near the Parklands' north-east boundary.<sup>72</sup> A 2005 aerial overview photograph shows the change that has occurred as a result of these developments across the wider site (Photo 33).

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<sup>69</sup> (TKD Architects 2020, pp. 27)

<sup>70</sup> (Eco Logical Australia Pty Ltd 2019, pp. 3)

<sup>71</sup> (James 2013, pp. 79)

<sup>72</sup> (Hunter & Central Coast Development Corporation n.d.)



**Photo 33** 2005 aerial view of Mount Penang Parklands and its environs, showing The Avenue [4] Parklands Road [5], Carinya Street [6], McCabe Road [7], Parklands Road plantings [8], Carinya Street plantings [9] and the Parklands/McCabe corner plantings [10] (Source: (State Library NSW & Jones n.d.)

Options Disability Support, an organisation established in 1994 to supply living, work and recreational support for adults with a disability on the Central Coast, took occupancy of several of the buildings at Mount Penang in 2006, successfully adapting the buildings to their needs.<sup>73</sup>

Aerial photography from 2006 highlights the rapid development across the wider Mount Penang site (Photo 34). Within/immediately surrounding the southern end of the study area at Parklands Road, access has been increased with the establishment of Festival Drive. In the same area, landscaping associated with the Gardens has taken place to the west with more structures erected, including the building currently holding the Waterfall Café. Previous building complexes in the north-east of the wider site have been massively expanded, with increased road access, car parking and a new fence added. To the west, down the road, additional structures have been built. To the south east, temporary structures have been removed and the area has been landscaped with lines of trees and access paths.

<sup>73</sup> (TKD Architects 2020, pp. 28)





**Photo 34** 2006 aerial photograph showing The Avenue [4] Parklands Road [5], Carinya Street [6], McCabe Road [7], Parklands Road plantings [8], Carinya Street plantings [9] and the Parklands/McCabe corner plantings [10], with the study area outlined in red (Source: (NSW Spatial Services n.d.))

In 2007, the National Aboriginal Islander Skills Development Association (NAISDA) Dance College, formed in 1975, moved from inner Sydney to Mount Penang Parklands. The College now occupies a number of early buildings, including the kitchen and dining room block that was built circa 1950 and former staff cottages. The formation of NAISDA was the emergence of contemporary Indigenous dance during the early 1970s, with the performance arm of the program becoming known as the Aboriginal/Islander Dance Theatre; a touring company employing students and graduates of the new Careers in Dance training program. In 2011, pavilions housing performance spaces and training spaces designed by Jackson Teece were completed built on the site of a gymnasium and assembly hall previously constructed around 1960.<sup>74</sup>

Consent for construction of a Parklands Post Office, Family Tavern, Brewery and Hunter Wines Promotion Centre was obtained in 2007. However, these facilities were not developed, and the Festival Development Corporation was transferred to the Department of Lands.<sup>75</sup> Instead, the Kariong Mountain High School was established in 2010. This followed approval for the new construction and landscaping granted in 2008 after a Statement of Environmental Effects was prepared for Gosford City Council and the NSW Department of

<sup>74</sup> (TKD Architects 2020, pp. 29)

<sup>75</sup> (Heritage NSW n.d.)



Education and Training.<sup>76</sup> The school stands immediately to the west of the study area, with a landscape design that “respects the heritage landscape character of the surrounding areas”.<sup>77</sup>

The development of the school dislodged a designated Events Park site, resulting in the approval for two event park stages granted in 2009. These stages were established for the 2009 Flora Festival and for a permanent events park section in the northern area of the Parklands, to the west of Mount Penang Gardens. Shortly after, the Festival Development Corporation was replaced by the NSW government agency Central Coast Regional Development Corporation (CCRDC) in 2010.<sup>78</sup>

The Central Coast Sports College, founded originally as the International Football and Tennis School in 2012, occupies a number of buildings along The Avenue at Mount Penang. The school opened at Mount Penang in January 2013, registered as a charity assisting Aboriginal and Torres Strait Islander people, children aged 6 to 14, and youths aged 15 to 24. Four months later, Sunnyfield Community Services, established in 1952, opened the McCabe Community Services Hub, providing space for individual clients and facilities for the service's respite programs. Permanent electrical services were installed in the Mount Penang Event Park between March and September 2013.<sup>79</sup>

The development of a comprehensive campus to serve the needs of the National Aboriginal Islander Skills Development Association has been discussed. This campus would be potentially located in the northern section of the Parklands, adjacent to the Juvenile Justice Centre.<sup>80</sup>

In October 2018 the Hunter Development Corporation, founded in 1992, merged with the CCRDC and became the HCCDC.<sup>81</sup>

In 2019, Eco Logical Australia Pty Ltd (ELA) prepared a Historical Archaeological Assessment on behalf of Tanner Kibble Denton Architects Pty Ltd (TKD). This report assessed the archaeological potential of Mount Penang Parklands as low with regards to:

- subsurface features, such as the drain and well (and any wells that were not recorded),
- rubbish or cesspits,
- demolished building footings,
- landscape alterations, such as the road construction, quarrying activities and terracing and levelling of bedrock for building platforms,
- pastoral and agricultural activities.

The Heritage Precinct, containing the current study area, was assessed to contain low to medium potential for the above criteria.<sup>82</sup> The 2020 Conservation Management Plan completed by TKD listed the Heritage Precinct as being of exceptional significance (Photo 35).

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<sup>76</sup> (Knaggs 2008)

<sup>77</sup> (Knaggs 2008, pp. 32)

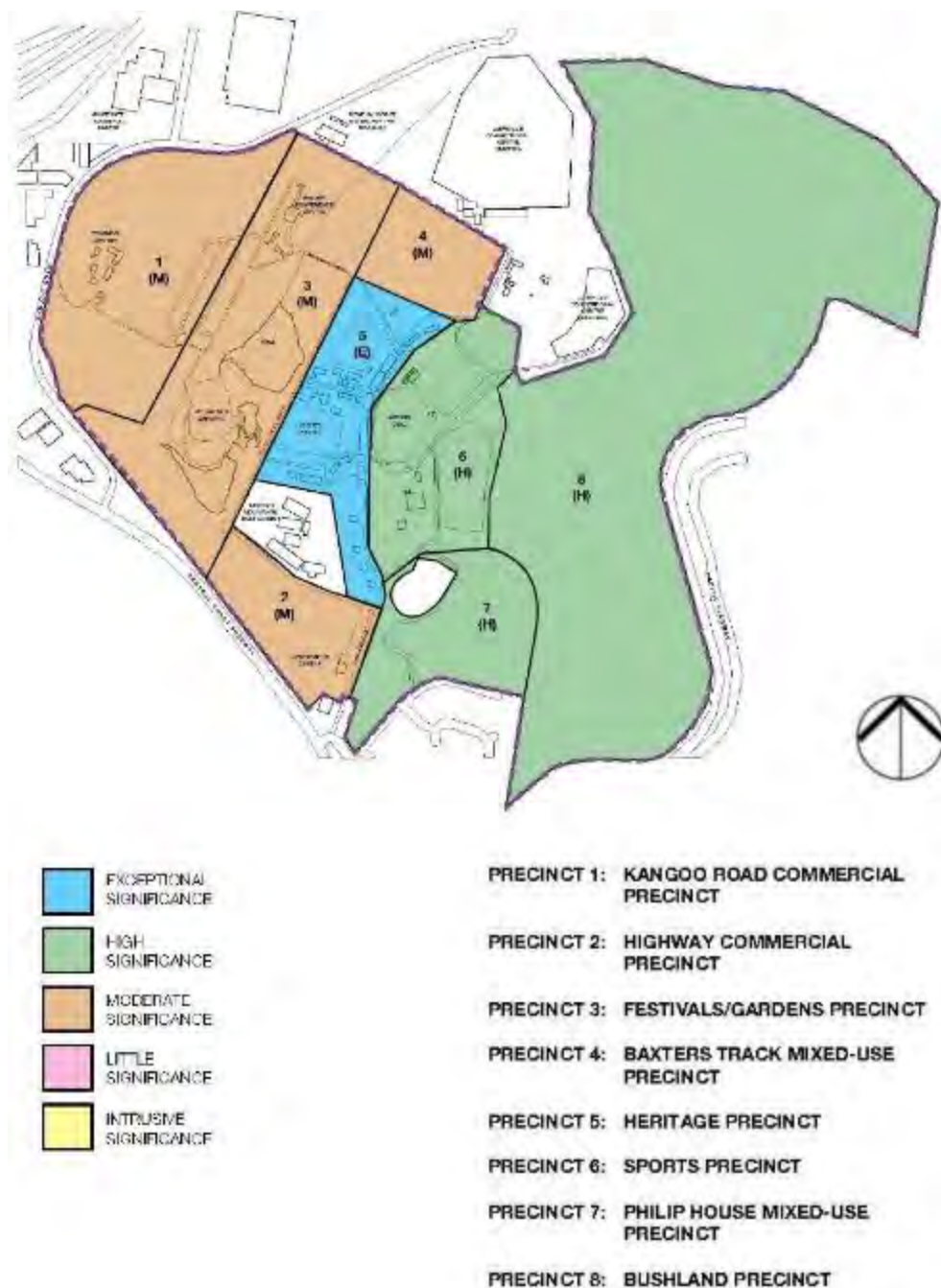
<sup>78</sup> (TKD Architects 2020, pp. 29)

<sup>79</sup> (TKD Architects 2020, pp. 29)

<sup>80</sup> (TKD Architects 2020, pp. 29)

<sup>81</sup> (Parris 2018)

<sup>82</sup> (Eco Logical Australia Pty Ltd 2019, pp. 11)



**Photo 35 Significance of landscape precincts within Mt Penang Parklands (Source: (TKD Architects 2020, pp. 114)**

In 2019, ELA carried out a preliminary tree assessment within Mount Penang Parklands. The assessment considered 308 trees, including those listed on the Gosford LEP 2014 as the “eastern bushland and two groups of scribbly gums and dam, as well as the old pine tree group, white poplar avenue, mature cultural plantings, mature cultural plantings, including coral trees, brush box, camphor laurels, white poplars, hoop pines, an oak and a larch, entry drive with perimeter brush box and eucalypt plantings, sports oval”.<sup>83</sup> The retention value of the trees was determined using a combination of environmental, cultural, physical and social values – 163 high retention value trees were identified in the Mount Penang Parklands, 82 medium

<sup>83</sup> (TKD Architects & Eco Logical Australia 2019, pp. 1-2)

retention value, and 63 low retention value.<sup>84</sup> Photo 36 shows the location of the trees identified, with many marked along Parklands Road within the current study area.



**Photo 36** Eco Logical study area at Mount Penang showing tree retention values (Source: (TKD Architects & Eco Logical Australia 2019, pp. 3)

### 3.4 Chronology of the study area

Based upon the historical research presented it is possible to summarise the chronology of the study area, this is presented in Table 2.

**Table 2** Chronological development of the study area

No.	Building	Date
1	Unused eastern road	Prior to 1911
2	Central track	c.1911
3	East-west track	c.1911
4	The Avenue	Pre-1921
5	Parklands Road	Pre-1921

<sup>84</sup> (TKD Architects & Eco Logical Australia 2019, pp. 5–6)

No.	Building	Date
6	Carinya Street	Pre-1921
7	McCabe Road	Pre-1942
8	Parklands Road plantings	Pre-1946
9	Carinya Street plantings	Pre-1946
10	Parklands / McCabe Street plantings	Pre-1965, possibly remnant native vegetation

### 3.5 Research themes

Contextual analysis is undertaken to place the history of a particular site within relevant historical contexts in order to gauge how typical or unique the history of a particular site actually is. This is usually ascertained by gaining an understanding of the history of a site in relation to the broad historical themes characterising Australia at the time. Such themes have been established by the Australian Heritage Commission and the Heritage NSW and are outlined in synoptic form in Historical Themes.<sup>85</sup>

There are 38 State historical themes, which have been developed for NSW, as well as nine National historical themes. These broader themes are usually referred to when developing sub-themes for a local area to ensure they complement the overall thematic framework for the broader region.

A review of the contextual history in conjunction with the local historical thematic history has identified one historical theme which relates to the occupational history of the study area.<sup>86</sup> This is summarised in Table 3.

**Table 3 Identified historical themes for the study area**

Australian theme	NSW theme	Local theme
<b>Developing local, regional and national economies</b>	Environment – cultural landscape	Diversifying Rural Landuse
<b>Education</b>	Education	Educating Young and Old
<b>Governing</b>	Law and order	No applicable local theme
	Welfare	Looking After Others

<sup>85</sup> (NSW Heritage Council 2001)

<sup>86</sup> (Kass 2016)



## 4 Physical inspection

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A physical inspection of the Stage 1 study area was undertaken on 4 and 15 March 2022, attended by Claire Nunez (Technical Director), Charlotte Allen (Project Archaeologist) and Molly Crissell (Archaeologist) with Tracey Howie and Trudy Robley-Smith (Awabakal & Guringai) and Corrine Quinlan (Darkinjung LALC). The principal aims of the surveys were to identify heritage values associated with the study area; this included any heritage items. Heritage items can be buildings, structures, places, relics or other works of historical, aesthetic, social, technical/research or natural heritage significance. 'Places' include conservation areas, sites, precincts, gardens, landscapes and areas of archaeological potential.

### 4.1 Landscape

The Stage 1 portion of the study area is within the Mount Penang Parklands site, which is situated in a broader setting where urban residential, light industrial and semi-rural landscapes converge, in the vicinity of the M1 Pacific Motorway and Central Coast Highway. The study area is located within Lot 1022, DP 1268228, comprising existing roads, landscape areas and grazing paddocks. The Stage 1 study area slopes gently from the highest point at the northern end of The Avenue to the south, east and west towards the first order tributary of Piles Creek to the west and the steep escarpment-type landscape to the east.

The Stage 1 study area sits within the following precincts which are identified in the CMP:

- Precinct 5: Heritage Precinct.
- Precinct 3: Festivals and Gardens Precinct.
- Precinct 4: Baxter's Track Mixed-use Precinct.

The entirety of the Stage 1 study area has been subject to past development of varying levels as part of the reformatory schools that have operated on the wider Mount Penang Parklands site. The study area sits within a wider designed cultural landscape that has developed, and continues to do so, since 1912.

Parklands Road is located to the west of The Avenue area, and is dominated by a road, open spaces and plantings. Parklands Road intersects with Festival Drive, Carinya Street, and McCabe Road. Parklands Road, Carinya Street and McCabe Road were established over time from the 1920s to 1940s (Photo 37, Photo 41, Photo 44, Photo 45, Photo 46). There are designated heritage planting groups along Parklands Road (L3: Poplar and Brushbox Avenue and L5: Mature Cultural Plantings Along Western Edge of School) (Photo 37, Photo 38, Photo 41, Photo 42, Photo 43) and Carinya Street (L4: Sports Field 1 Perimeter Brushbox and Eucalypt Plantings) (Photo 39, Photo 40); these are first noted in 1946 plan drawings. Some of the original plantings along Parklands Road (L3: Poplar and Brushbox Avenue) (including Lombardy Poplars) have been replaced (White Poplars), but the date for this is not known. There is also several clusters of Scribbly Gums at the corner of Parklands and McCabe roads (L2: Scribbly Gum Group) which may be remnant native vegetation (Photo 47, Photo 48, Photo 49).



**Photo 37** View of southern end of Parklands Road and L5 Mature Cultural Plantings along Western Edge of School, facing north-east



**Photo 38** View of L5 Mature Cultural Plantings along Western Edge of School at the southern end of Parklands Road, facing south-west



**Photo 39** View of Carinya Street and L4 Sports Field 1 Perimeter Brushbox and Eucalypt Plantings, facing west





**Photo 40** View of L4 Sports Field 1 Perimeter Brushbox and Eucalypt Plantings and Carinya Street, facing south-east



**Photo 41** View of central portion of Parklands Road and L3 Poplar and Brushbox Avenue, facing north-east



**Photo 42** View of central portion of Parklands Road and L3 Poplar and Brushbox Avenue on Parklands Road, taken from the top of the dam wall facing south



**Photo 43** View of most northern White Poplar planting of L3 Poplar and Brushbox Avenue in the central part of Parklands Road, taken from the top of the dam wall facing east



**Photo 44** View of northern portion of Parklands Road towards McCabe Road, facing north-east



**Photo 45** View of northern portion of Parklands Road from McCabe Road, facing south-west





**Photo 46** View of western portion of McCabe Road from Parklands Road, facing south-east



**Photo 47** View of L2 Scribbly Gum Group from Parklands Road, facing east



**Photo 48** View of L2 Scribbly Gum Group from McCabe Road, facing south-west



**Photo 49** View of L2 Scribbly Gum Group from McCabe Road, facing west

The northern paddock adjacent to McCabe Road is heavily grassed and features tree plantings at varying levels of maturity, along with a drainage line and post and wire fencing (Photo 50, Photo 51, Photo 52, Photo 53). This part of the wider Mount Penang Parklands site has likely functioned as grazing or agricultural land or for recreation following its initial clearing and fencing.



**Photo 50** View of study area within northern portion of the paddock north of McCabe Road, facing north-east towards Baxter's Track





**Photo 51** View of study area within the northern portion of the paddock north of McCabe Road, facing south-west towards McCabe Road



**Photo 52** View of study area within the central portion of the paddock north of McCabe Road, facing south-west towards McCabe Road



**Photo 53** View of study area within the southern portion of the paddock north of McCabe Road, facing north-east towards Baxter's Track

## **4.2 Built fabric assessment**

Built fabric within the Stage 1 portion of the study area comprises modern sealed roads and car parking areas, concrete kerbs and gutters, drainage and electricity services, light posts, traffic signage and management features, existing interpretive signage, garden beds and street furniture such as picnic tables.

The significant built heritage elements of the Mount Penang Parklands are outside of the study area for this project.

## **4.3 Archaeological assessment**

The potential archaeological resource relates to the predicted level of preservation of archaeological resources within the Stage 1 study area. Archaeological potential is influenced by the geographical and topographical location, the level of development, subsequent impacts, levels of onsite fill and the factors influencing preservation such as soil type. An assessment of archaeological potential has been derived from the historical analysis undertaken during the preparation of this report.

### **4.3.1 Archaeological resource**

This section discusses the archaeological resource within the study area. The purpose of the analysis is to outline what archaeological deposits or structures are likely to be present within the study area and how these relate to the history of land use associated with the study area.

The historical context presented in this report indicates that the Stage 1 study area has been used for agricultural or grazing activities or road or track purposes since the reformatory school was first established in the wider Mount Penang Parklands site in 1911-1912. Archaeological resources which may be associated with this use would include landscape features and evidence of modification, such as fencing post holes and levelling and cutting to create level surfaces or garden beds, as well as cuttings, road base fill and historical road surfaces. The latter are likely to have been relatively informal due to the low levels of traffic within the wider site over time, with its current use likely being the heaviest throughout its history. Photo 20 and Photo 24 suggests that crushed metal or gravels would likely have been used for road surfaces, with the introduction of concrete kerbs and gutters from the 1940s. The 1976 aerial photograph (Photo 29) indicates that Parklands Road had been sealed by this date.

### **4.3.2 Integrity of sub-surface deposits**

While there has been much modification of the natural landscape as part of the development of the wider Mount Penang Parklands site, there is likely to be mixed levels of sub-surface integrity within the Stage 1 study area. The roads and adjacent areas will likely have been subject to maintenance or relaying of road surfaces and introduction of gutters, drainage and other services. The paddock north of McCabe Road is likely to have been subject to low levels of activity and therefore archaeological resources are likely to have a high degree of integrity in this location.

### **4.3.3 Research potential**

Archaeological research potential refers to the ability of archaeological evidence to provide information about a site that could not be derived from any other source and which contributes to the archaeological significance of that site. Archaeological research potential differs from archaeological potential in that the presence of an archaeological resource (i.e. archaeological potential) does not mean that it can provide any additional information that increases our understanding of a site or the past (i.e. archaeological research potential).



The research potential of a site is also affected by the integrity of the archaeological resource within a study area. If a site is disturbed, then vital contextual information that links material evidence to a stratigraphic sequence may be missing and it may be impossible to relate material evidence to activities on a site. This is generally held to reduce the ability of an archaeological site to answer research questions.

Assessment of the research potential of a site also relates to the level of existing documentation of a site and of the nature of the research done so far (the research framework), to produce a 'knowledge' pool to which research into archaeological remains can add.

### **Developing local, regional and national economies - Environment - cultural landscape - Diversifying Rural Landuse**

The Mount Penang Parklands through its history has developed as a designed landscape within a rural setting on the periphery of more urban areas. The Stage 1 study area itself is a component of that designed landscape. However, any archaeological remains within the Stage 1 study area are unlikely to provide additional information regarding this theme in the context of Mount Penang Parklands or the wider Central Coast LGA that is not already available through existing resources.

### **Education - Education - Educating Young and Old**

Education has been a main function of the wider Mount Penang Parklands site, having been established as a reformatory school for boys in 1912, and became increasingly focused on education, training and attainment for the sites pupils. Today, there are a number of educational providers and facilities within the wider site. While the Stage 1 study area is part of the wider Mount Penang Parklands site, the archaeological resources within the Stage 1 study area are unlikely to contribute further to our knowledge of this theme within Mount Penang Parklands or the Central Coast LGA which are not already available through existing resources.

### **Governing - Law and order**

Discipline and reform have also formed a large part of the history of the Mount Penang Parklands. Children who did not conform to traditional schooling or discipline measures, or who were convicted as juveniles, were sent to the school as a way to reform them and allow them to function and contribute to society at the time. While the Stage 1 study area forms part of that wider landscape, the archaeological resources within the Stage 1 study area are unlikely to contribute further to our knowledge of this theme within Mount Penang Parklands or the Central Coast LGA that is not already available through existing resources.

### **Governing - Welfare - Looking After Others**

The initial intent of the reformatory school was also to provide support for destitute children through shelter, education and discipline. This was done in a militaristic way until the mid-20th century when practices shifted to be more aligned with contemporary thinking at the time. Similar to the previous themes, while the Stage 1 study area forms part of that wider landscape, the archaeological resources within the Stage 1 study area are unlikely to contribute further to our knowledge of this theme within Mount Penang Parklands or the Central Coast LGA that is not already available through existing resources.

#### **4.3.4 Summary of archaeological potential**

Through an analysis of the above factors a number of assumptions have been made relating to the archaeological potential of the Stage 1 study area, these are presented in Table 4 and Figure 5.

The assessment of archaeological potential has been divided into three categories:

- **High archaeological potential** – based upon the historical context and documentary evidence presented within this report there is a high degree of certainty that archaeologically significant remains relating to this period, theme or event will occur within the study area.
- **Moderate archaeological potential** – based upon the historical context and documentary evidence presented within this assessment it is probable that archaeologically significant remains relating to this period, theme or event could be present within the study area.
- **Low archaeological potential** – based upon the historical context and documentary evidence presented within this assessment it is unlikely that archaeologically significant remains relating to this period, theme or event will occur within the study area.

**Table 4 Assessment of archaeological potential within the Stage 1 study area**

Item	Description	Probable feature(s)	Possible construction date	Archaeological potential
2	Central track	Cuttings, compacted soils and surfaces	c.1911	Low
5	Parklands Road	Cuttings, compacted road deposits and surfaces	Pre-1921	Low
6	Carinya Street	Cuttings, compacted road deposits and surfaces	Pre-1921	Low
7	McCabe Road	Cuttings, compacted road deposits and surfaces	Pre-1942	Low
8	Parklands Road plantings	N/A	Pre-1946	N/A
10	Parklands / McCabe Street plantings	N/A	Pre-1965, possibly remnant native vegetation	N/A
-	Fence lines	Post hole including cut, remnant timber post and backfill, wire	From c.1911	Low





#### Legend

Stage 1 study area

Lot

Transect

Archaeological potential

Low

Figure 5 Assessment of archaeological potential

0 30 60 90 120 150

Metres

Scale: 1:4,000@ A3

Coordinate System:

GDA 1994 MGA Zone 56



Matter: 36159, Date: 02 May 2022,  
 Drawn by: JT, Checked by: MC, Last edited by: jtownsend  
 Location: P:\36100s\36159\Mapping\  
 36159\_ADDA\_MtPenang, Layout: 36159\_SoH1\_F5\_ArcPotential



## 5 Significance assessment

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An assessment of heritage significance encompasses a range of heritage criteria and values. The heritage values of a site or place are broadly defined as the 'aesthetic, historic, scientific or social values for past, present or future generations'.<sup>87</sup> This means a place can have different levels of heritage value and significance to different groups of people.

The archaeological significance of a site is commonly assessed in terms of historical and scientific values, particularly by what a site can tell us about past lifestyles and people. There is an accepted procedure for determining the level of significance of an archaeological site.

A detailed set of criteria for assessing the State's cultural heritage was published by the (then) NSW Heritage Office. These criteria are divided into two categories: nature of significance, and comparative significance.

Heritage assessment criteria in NSW fall broadly within the four significance values outlined in the Burra Charter. The Burra Charter has been adopted by state and Commonwealth heritage agencies as the recognised document for guiding best practice for heritage practitioners in Australia. The four significance values are:

- Historical significance (evolution and association).
- Aesthetic significance (scenic/architectural qualities and creative accomplishment).
- Scientific significance (archaeological, industrial, educational, research potential and scientific significance values).
- Social significance (contemporary community esteem).

The NSW Heritage Office issued a more detailed set of assessment criteria to provide consistency with heritage agencies in other States and to avoid ambiguity and misinterpretation. These criteria are based on the Burra Charter. The following SHR criteria were gazetted following amendments to the *Heritage Act 1977* (Heritage Act) that came into effect in April 1999:

- Criterion (a) - an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).
- Criterion (b) - an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area).
- Criterion (c) - an item is important in demonstrating the aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).
- Criterion (d) - an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.
- Criterion (e) - an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area).
- Criterion (f) - an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area).

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<sup>87</sup> (Heritage Office 2001)



- Criterion (g) - an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments; or a class of the local area's cultural or natural places; or cultural or natural environments.

## 5.1 Levels of heritage significance

Items, places, buildings, works, relics, movable objects or precincts can be of either local or state heritage significance, or have both local and state heritage significance. Places can have different values to different people or groups.

### Local heritage items

Local heritage items are those of significance to the local government area. In other words, they contribute to the individuality and streetscape, townscape, landscape or natural character of an area and are irreplaceable parts of its environmental heritage. They may have greater value to members of the local community, who regularly engage with these places and/or consider them to be an important part of their day-to-day life and their identity. Collectively, such items reflect the socio-economic and natural history of a local area. Items of local heritage significance form an integral part of the State's environmental heritage.

### State heritage items

State heritage items, places, buildings, works, relics, movable objects or precincts of state heritage significance include those items of special interest in the state context. They form an irreplaceable part of the environmental heritage of NSW and must have some connection or association with the state in its widest sense.

## 5.2 Evaluation of significance

A thorough evaluation of significance has previously been assessed within the CMP and is presented below:

### **Criterion A: An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).**

*Mount Penang is one of the most significant juvenile reformatories to have operated in NSW during the twentieth century. As the Mount Penang Farm Home/Training School it has historical associations with nineteenth-century reformatories and industrial schools, most notably the training ships Vernon and Sobraon, and Brush Farm, of which it was the immediate successor. The Mount Penang Farm Home consolidated the practice of growing fresh produce, which made the Home self-sufficient and provided vocational training for boys who were sent to it. Although not the first juvenile farm home to utilize the labour of inmates for the construction of its buildings, Mount Penang is an early example of this, and notable for the scale of buildings constructed in this way. The subsequent development across the site reflects changes in the juvenile penal philosophies and practices over the course of the twentieth century, are reflected in the development of the site and its features and have influenced the character of the place. Its formerly rural location, its agricultural and pastoral features and the cultural landscape demonstrate the work and recreational activities undertaken by the juveniles at Mount Penang over eighty-five years of operation. Mount Penang is notable for the innovative methods of juvenile reform that were introduced there. The most tangible evidence of this is the McCabe Centre, initially constructed as a sub-institution in 1944 and then adapted for use as a Privilege Cottage in 1948. The location of the institution reflects the increasing urbanisation of the metropolitan area that put pressure on the land needed for institutions of this type. It also reflects a philosophy of isolating juvenile offenders away from urban centres as a precondition of their reform. According to the SHR inventory for Mount Penang Parklands, the place is considered to be very significant in the Aboriginal history of NSW during the 20th century, being a major place of incarceration and detention of Aboriginal boys*

and men from all over the state, and a place for temporarily housing removed Aboriginal children before their relocation to other institutions such as Kinchela Training Home near Kempsey.<sup>88</sup>

The Mount Penang Parklands satisfies this criterion at local and state level.

**Criterion B: An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area).**

*The design and construction of the early dormitories was supervised by the prominent architect James Nangle, OBE, an early supporter of the use of concrete and steel in building. He was the secretary and testing architect of the Institute of Architects and was a member of the Mount Penang Building Committee. Buildings designed and constructed at Mount Penang from the 1940s through to the 1970s are associated with the Government Architect's Branch. Of these the most noteworthy are the buildings making up the McCabe Cottage complex.*

*The Dance College (Building 32) constructed for NAISDA is associated with the prominent architectural firm of Jackson Teece.*

*Due to the minimal archaeological potential of the site and the late date of the site's establishment it is unlikely that the site will contain "relics" and remains which may illustrate a significant pattern in State or local history. The site is likely to have associations with former occupants, but personal or physical evidence is unlikely to be evident in any potential archaeological resource of the site.<sup>89</sup>*

The Mount Penang Parklands satisfies this criterion at local level.

**Criteria C: An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).**

*Mount Penang Parklands is aesthetically significant for its distinctive integration of buildings, cultural landscape, natural landscape and views within the site. The layout of the original buildings associated with the Farm Home along The Avenue, which rise as the road curves to the north to overlook the Cricket Oval, is particularly noteworthy.*

*The early surviving buildings are aesthetically significant because of their consistent human scale, simple domestic form and restrained palette of materials, which unifies their presence on the site and underscores their coherence as a group. The functional layout of the early section of the site reflects then-current attitudes towards the planning of public institutions. The buildings are of technical interest because of the extensive use of concrete in their construction.*

*The siting and topography have been utilised in the design and evolving development of the place. The sense of open space created by views out from within the Parklands, the enclosure provided by uncleared surrounding bushland and the unfolding of vistas along the curving entrance road into the site are essential elements of its character.*

*The McCabe Cottage complex is an excellent example of the Inter-War Functionalist architectural style. Its physical isolation from the main complex allows this building and the architectural character of the main complex to coexist without visual inconsistencies.*

*Later buildings, particularly those designed during the 1970s and after, echo the predominant architectural character of the early buildings to create a uniform appearance across the complex.*

*Apart from the existing views and layout of the site, the potential archaeological resource is unlikely to have aesthetic value.<sup>90</sup>*

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<sup>88</sup> (TKD Architects 2020, Eco Logical Australia Pty Ltd 2019)

<sup>89</sup> (TKD Architects 2020, Eco Logical Australia Pty Ltd 2019)

<sup>90</sup> (TKD Architects 2020, Eco Logical Australia Pty Ltd 2019)

The Mount Penang Parklands satisfies this criterion at local and state level.

**Criterion D: An item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.**

*Mount Penang is of profound significance to the people, both Aboriginal and European, who were detained there over its long history and also their families. For these people, Mount Penang is a place that reflects formative life experiences – both positive and painful. It is a place where the detention of thousands of boys and young men can be acknowledged.*

*The place is of very strong significance to the many people who worked there over many decades. For these people, Mount Penang is a place of personal and professional growth and achievement, as well as the site of experiences that have strongly influenced their lives and outlooks.*

*The site is a significant and recognised physical, social, and historical landmark for the local communities of Gosford, Kariong and Somersby. In a wide variety of ways, it has functioned as a community meeting place and a resource which has supported local community needs. Mount Penang has had a substantial historical and social influence on the development of the local community.*

*Mount Penang is a place where many progressive innovations were introduced into the operation of juvenile detention services. It is, therefore, a place of personal pride and achievement for staff members.*

*Mount Penang is a place where many staff lived, raised their families, socialised, and formed life-long friendships and tight-knit communities. It is a place where some interaction between detainees, the families of staff and the wider community was possible.*

*The site is valued as a landmark and community meeting place for its social, community service and aesthetic qualities.*

*An assessment has not been made of the social significance of the place as an adjunct to the assessment that formed part of the Godden Mackay Logan 2000 CMP.<sup>91</sup>*

The Mount Penang Parklands satisfies this criterion at local and state level.

**Criterion E: An item has the potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area).**

*The complex of buildings and cultural landscape at Mount Penang Parklands was a component of the overall system and practice of justice in NSW. The siting and relationship of buildings to each other and to the sports fields, paddocks and vistas were all components of the operational requirements and practices of the facility. The core of original buildings, augmented by subsequent institutional development across the site are evidence of a body of experience in the operation of a juvenile detention and reformatory facility that is not obtainable from other sources.*

*Mount Penang Parklands has significant natural heritage value. The western portion of the study area is characterized by open grassland and paddocks with sporadic remnant and planted trees. A large dam is located in the centre of the study area that provides habitat for several water birds. The east of the Bushland Precinct contains a large area of intact, remnant vegetation characterized by the underlying Hawkesbury sandstone geology and steep, rocky landform. The vegetation is highly diverse, with several communities present ranging from heathlands to dry sclerophyll forest and small patches of temperate rainforest. The vegetation provides habitat for a range of threatened flora and fauna species listed at a state and federal level.*

*It is not anticipated that the site will yield important historical or research based information that could not be derived from any other source concerning the use of the site as a centre for juvenile detention and education. Valerie Rubie's detailed account of the history and development of the site and the various Annual Reports available for the site's use*

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<sup>91</sup> (TKD Architects 2020)



*detail all manner of information including expenditure, food, educational resources, building materials and day to day operations of the school.*

*While the nature of the site is rare and representative as a centre for juvenile detention and education, the history of the site is well-documented and any archaeological features and deposits that may be located on the site are highly unlikely to reflect juvenile detention. Due to the late date of the use of the site, any archaeological features and deposits are likely to duplicate the data set for schools or institutions of a similar date.*

*It is highly unlikely that the site will contain well-preserved or rare examples of technologies or occupations which are particular to the site or of particular significance.*

*The buildings on the site reflect the development of the place over time but it is unlikely that the limited potential archaeological resource will demonstrate continuity or change.*

*The limited potential archaeological resource is unlikely to be intact, however features such as the quarrying around the oval can be interpreted.<sup>92</sup>*

The Mount Penang Parklands satisfies this criterion at local and state level.

**Criterion F: An item possesses uncommon, rare or endangered aspects of the area's cultural or natural history (or the cultural or natural history of the local area).**

*There are few, if any, comparable surviving juvenile detention centres of this period in Australia so that Mount Penang has rarity value. It was the most important juvenile detention centre in NSW for most of the twentieth century and it is suggested it was the largest centre of its type in the Southern Hemisphere (SHR).*

*The Bushland Precinct has had three threatened flora species previously recorded (*Hibbertia procumbens*, *Callistemon linearifolius* and *Prosenthera junoris*), one of which (*H. procumbens*) was confirmed during the field survey undertaken during the preparation of this CMP. One Threatened Ecological Community (TEC), Lowland Forest in the NSW North Coast and Sydney Basin Bioregions, is known to occur in the Eastern Bushland. One additional TEC, Coastal Upland Swamp, may also potentially occur in the Bushland Precinct in small patches where impeded drainage over the sandstone geology creates these unique swamps.*

*Several threatened fauna species are also likely to occur within the Bushland Precinct such as (but not limited to) Eastern Pygmy Possum, Red-crowned Toadlet and Powerful Owl. The wide variety of threatened species and communities demonstrates that the Bushland Precinct possesses rare and endangered aspects of NSW's natural history that is important to protect.*

*Two groups of *Eucalyptus haemastoma* (Scribbly Gums) are present within the study area, which consists of <very large, old remnant scribbly gums. These scribbly gums are in contrast to the landscape in the vicinity of these trees, which has largely been modified and contains planted species such as poplar or pine trees. The scribbly gums are remnant from the original vegetation community. In addition to the aesthetic value of these trees, given their old age, the majority of the remnant trees contain hollows ranging from very small (<5cm) to very large (>30cm), which provides potential habitat for several fauna species such as microchiropteran bats, birds, mammals and reptiles. Several hollows were in use by Rainbow Lorikeets and Galahs at the time of survey. The groups of scribbly gums are therefor considered important to the natural history of the study area.<sup>93</sup>*

The Mount Penang Parklands satisfies this criterion at local and state level.

**Criterion G: An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places, or cultural or natural environments. (or a class of the local area's cultural**

<sup>92</sup> (TKD Architects 2020, Eco Logical Australia Pty Ltd 2019)

<sup>93</sup> (TKD Architects 2020)

**or natural places, or cultural or natural environments).**

*Mount Penang Parklands was an important component of the juvenile justice system in NSW during the twentieth century. It is representative of juvenile and adult detention centres that included farming as a means of corrective discipline and training. Several of these institutions were a direct outcome of conditions at Mount Penang.*

*The considered early layout and grouping of the Farm Home buildings is representative of the typical design of large institutions and, at Mount Penang, demonstrating centralised design and planning associated with early twentieth century government institutions.<sup>94</sup>*

Eco Logical assessed the archaeological research potential of the Mount Penang Parklands, stating:

*It is not anticipated that the site will yield important historical or research-based information that could not be derived from any other source concerning the use of the site as a centre for juvenile detention and education. Rubie's detailed account of the history and development of the site and the various Annual Reports available for the site's use detail all manner of information including expenditure, food, educational resources, building materials and day to day operations of the school.*

*While the nature of the site is rare and representative as a centre for juvenile detention and education, the history and use of the site is well-documented and any archaeological features and deposits that may be located on the site are highly unlikely to reflect juvenile detention. Due to the late date of the use of the site, any archaeological features and deposits are likely to duplicate the data set for schools or institutions of a similar date.<sup>95</sup>*

The Mount Penang Parklands satisfies this criterion at local and state level.

### **5.3 Evaluation of elements within Mount Penang Parklands**

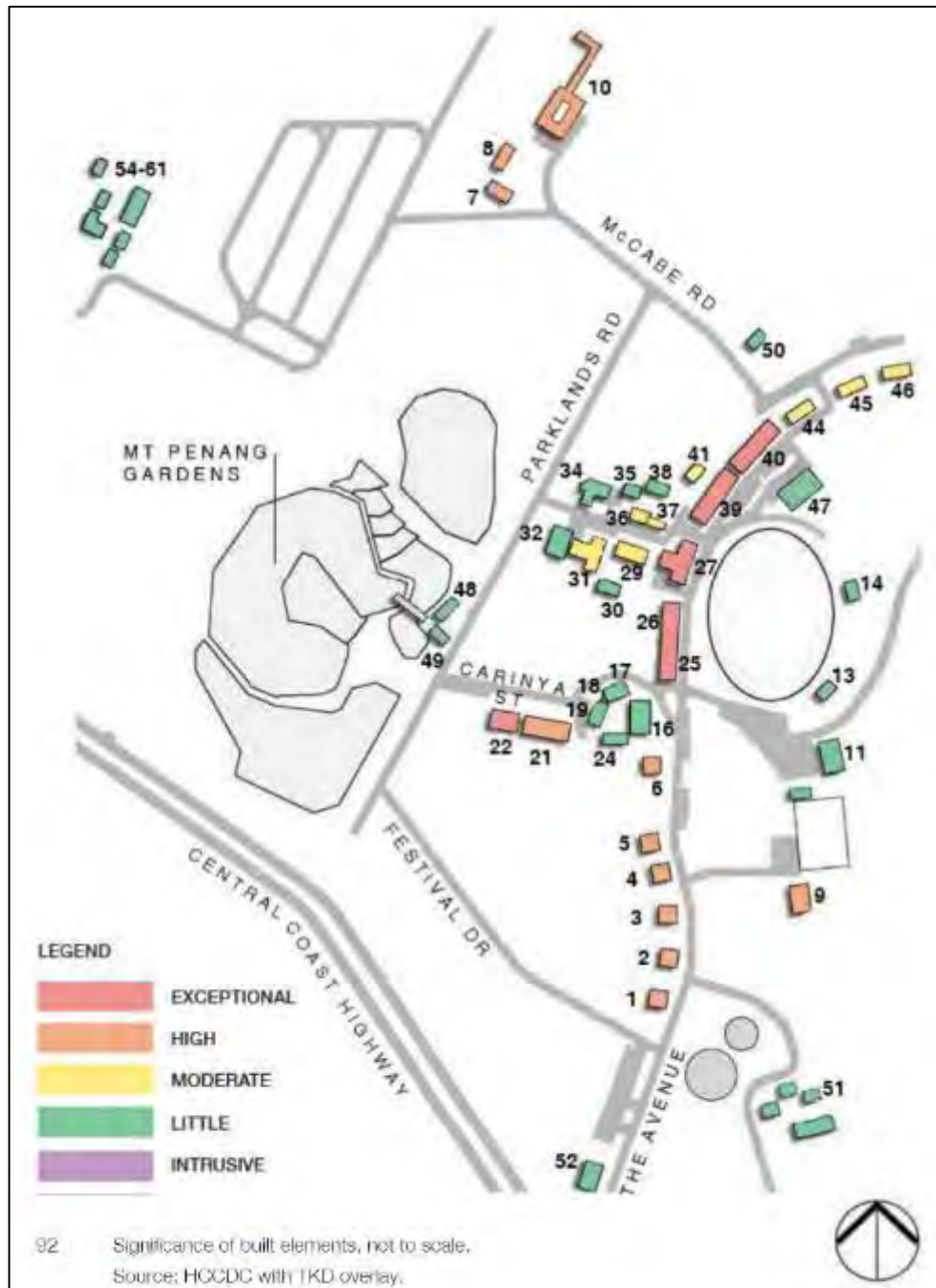
A detailed assessment of significance for elements which comprise the Mount Penang Parklands is presented in the CMP.<sup>96</sup> These assessments are summarised in Photo 54 and Photo 56.

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<sup>94</sup> (TKD Architects 2020)

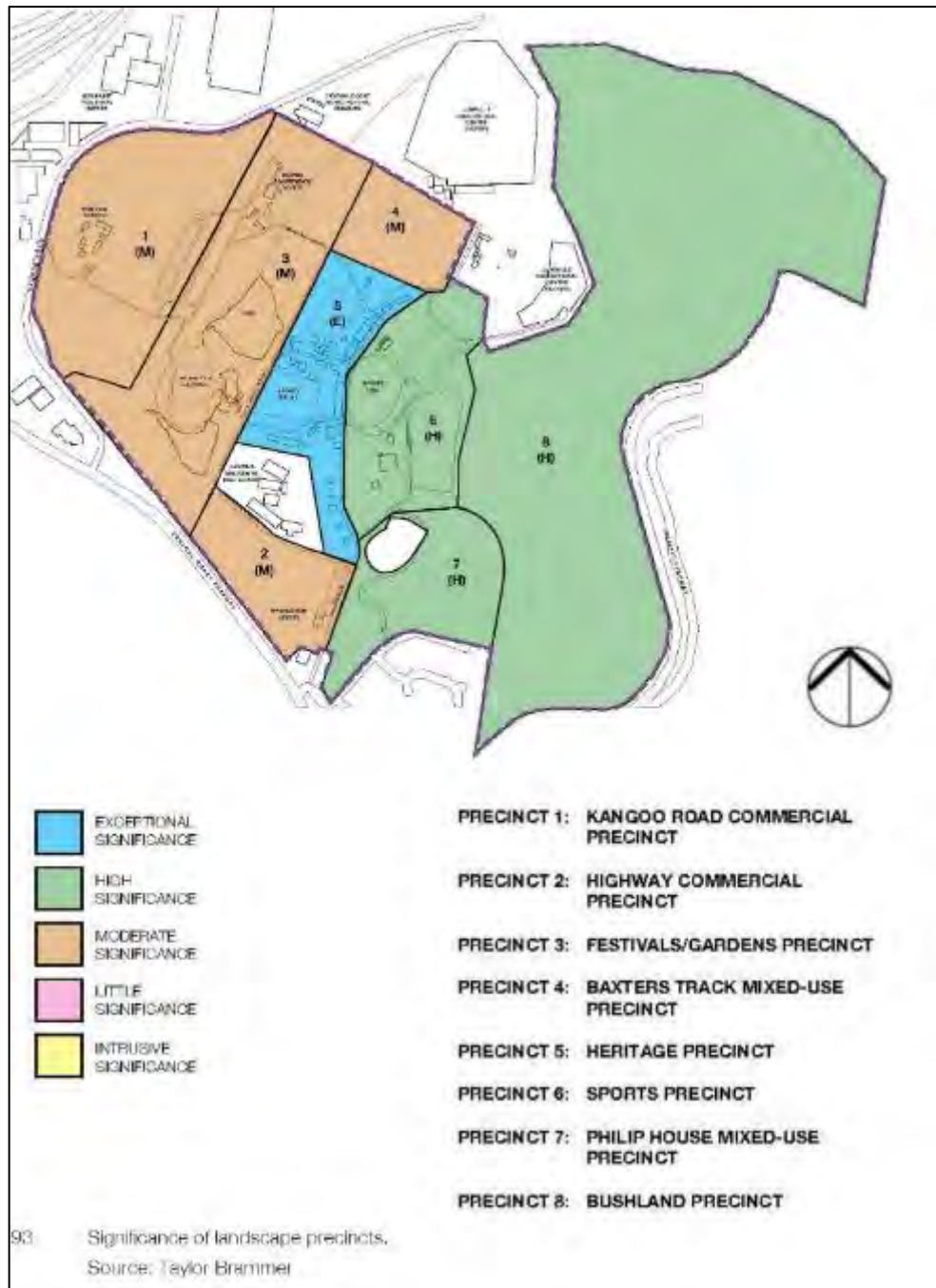
<sup>95</sup> (Eco Logical Australia Pty Ltd 2019)

<sup>96</sup> (TKD Architects 2020, pp. 110–115)

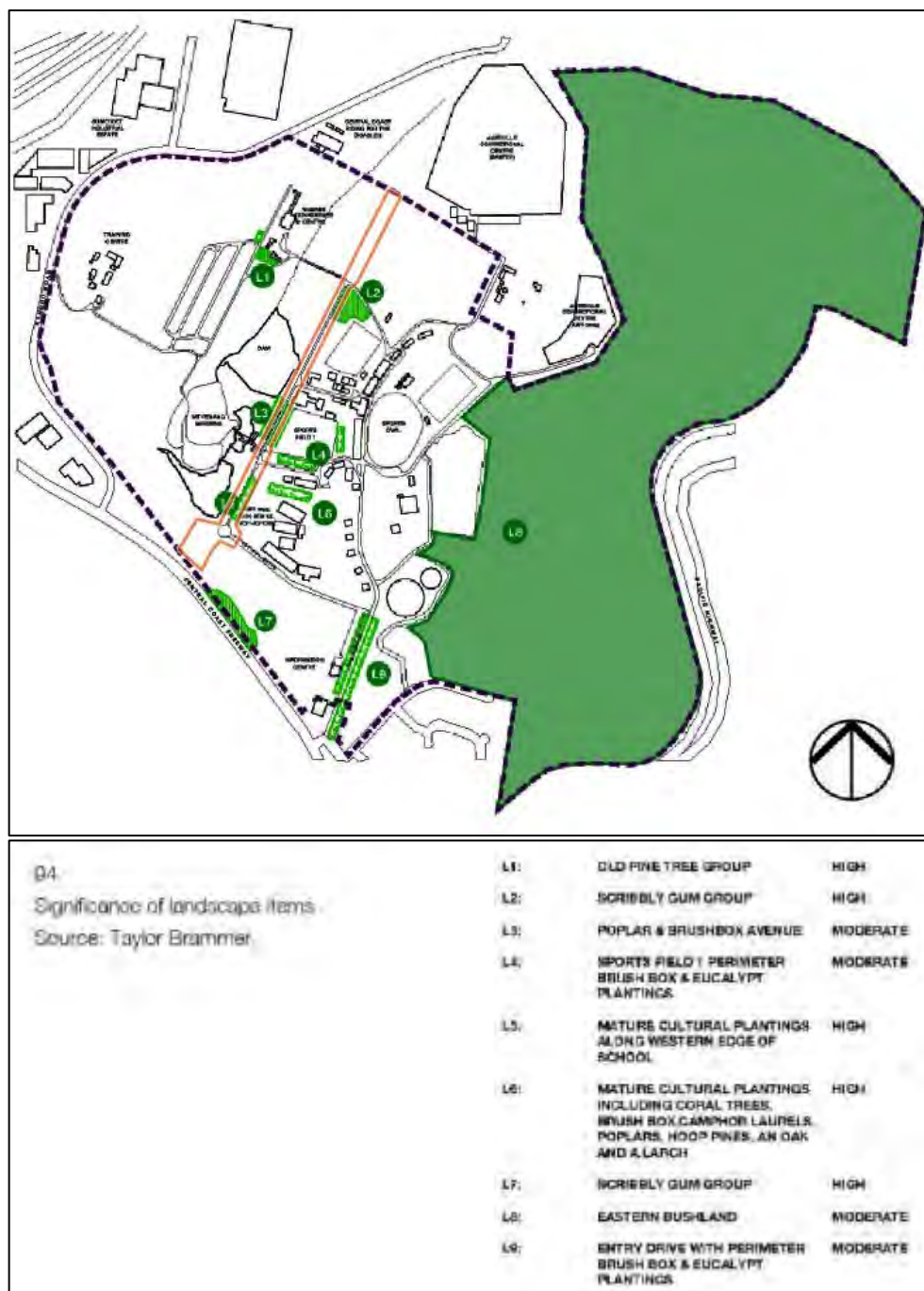


**Photo 54** Significance of built elements within Mount Penang Parklands as assessed in the CMP (please note this image is artistically drawn so could not be accurately georeferenced to overlay the study area) (Source: (TKD Architects 2020, pp. 113 Figure 92)





**Photo 55** Significance of landscape precincts within Mount Penang Parklands as assessed in the CMP (Source: (TKD Architects 2020, pp. 113 Figure 92)



**Photo 56** Significance of landscape items within Mount Penang Parklands as assessed in the CMP, with the study area outlined in orange (Source: (TKD Architects 2020, pp. 115 Figure 94)

## 5.4 Statement of significance

The statement of significance provided in the SHI listing and GML CMP of the Mount Penang Parklands states:

*The Mount Penang Juvenile Justice Centre has been the most important juvenile detention centre in NSW for most of the twentieth century and is a direct continuation of the nineteenth-century system of reformatory training ships. The design of the early buildings, their configuration and the layout of the site itself, as well as its agricultural and pastoral features, its remnant dairy and its landscaping collectively and individually illustrate juvenile penal philosophies and practices of*

*the period and their subsequent evolution over eighty-five years of operation. The location of the Centre is a feature in the historical expansion of the city of Sydney into its rural hinterland and its operations are an element in the development of Gosford and the Central Coast. Mount Penang also has significance for the local Aboriginal people both pre and post-contact, and during the time when Mount Penang as used as a juvenile detention centre and accommodated a number of Aboriginal detainees for whom the site would have profound associations. The Centre has notable aesthetic qualities associated with its site and the available views, and layout of the low-scale buildings and the landscaping. The earlier buildings are attractive, human scaled structures, which, while of an institutional character, utilise colonial homestead architecture appropriate to their setting and construction techniques of particular interest. The earlier buildings reproduce these forms to reinforce the characteristic appearance of the complex, whilst the McCabe Cottages group is an excellent example of the Inter-War Functionalist architectural style. The siting and relationship of buildings to each other and to the sports fields, paddocks and vistas are all components of the operational requirements and practices of the Centre. These provide technical information regarding juvenile detention and reformatory practices. Mount Penang is very important to the many boys and young men who were detained there over the course of nearly a century. For most detainees, Mount Penang is a place where the unforgettable occurred - experiences that strongly influenced the course of their lives. The place is significant to the many men and women who lived and worked at the former detention centre. For many of these people, it is a place of substantial personal and professional achievement. Mount Penang is also important to the local community as a landmark of historical and aesthetic importance. The place has functioned as a community meeting point, with many links between the wider community and the detainees and staff.<sup>97</sup>*

Eco Logical referenced the GML statement of significance, also stating that:

*An archaeological resource relating to the early occupation and construction of the site would be historically and technically significant if it were able to provide information that will contribute to an understanding of unknown aspects of the site. Mount Penang Parklands holds low archaeological potential in several precincts and no archaeological potential in others. While minor evidence of landscape alterations and below ground features may survive, any historical archaeological resource present on the site is unlikely to contribute substantially to known information regarding the establishment and operation of a place of juvenile justice. Detailed documentation of these aspects is available through archival material. Furthermore, due to the volume of archaeological evidence relating to the occupation of Australia in the late 19<sup>th</sup> and early 20<sup>th</sup> century, in combination with mass production of building materials as well as personal and everyday items, most of the surviving archaeological resource located within the site would be unlikely to meet the threshold for State or local significance historically, socially, aesthetically and scientifically, nor would it be rare.<sup>98</sup>*

An alternative statement of significance was proved by TKD, stating:

*Mount Penang Parklands, as the Mount Penang Juvenile Justice Centre, was the most important juvenile detention centre in NSW for most of the twentieth century and is a direct continuation of the nineteenth century system of reformatory training ships and the early Farm Home at Brush Farm, Eastwood.*

*The design of the early buildings, their configuration and the layout of the site and its landscaping, collectively and individually illustrate juvenile penal philosophies and practices of the period and their subsequent evolution over eighty-five years of operation. The location of Mount Penang Parklands demonstrates the historical expansion of metropolitan Sydney into its rural hinterland and its operations are an element in the development of Gosford and the Central Coast.*

*Mount Penang Parklands has notable aesthetic qualities associated with its site and available views, the layout of low-scaled buildings and landscaping. The earlier buildings are attractive, human-scaled structures which, while of an institutional character, utilise simple and direct domestic architectural forms appropriate to their setting and demonstrate construction techniques of particular interest. The most recent buildings emulate these forms to reinforce the characteristic appearance of the complex, whilst the McCabe Cottages group is an excellent example of the Inter-War*

<sup>97</sup> (Heritage NSW n.d., GML 2001)

<sup>98</sup> (Eco Logical Australia Pty Ltd 2019)



*Functionalist architectural style and is evidence of the innovative practices in juvenile reform that took place at Mount Penang.*

*The siting and relationship of buildings to each other and to the sports fields, paddocks and vistas are all components of the operational requirements and practices of the Centre. These relationships provide technical information regarding juvenile detention and reformatory practices. As well, the vistas across the site, which embrace natural and cultural landscape features and significant built elements, are an important component of Mount Penang Parklands' aesthetic significance.*

*The Bushland Precinct of Mount Penang Parklands is significant because it is an intact natural landscape that provides habitat for rare and endangered species of flora and fauna and provides a record of previous Aboriginal occupation of the place. It has aesthetic significance because of its topography and integrity.*

*Scribbly gums in other parts of the site are also significant remnants of the original flora across the site. Mount Penang is very important to the many Aboriginal and European boys and young men who were detained there over the course of nearly a century. For most detainees, Mount Penang is a place where unforgettable experiences occurred - experiences which strongly influenced the course of their lives. The place is also important to the many men and women who lived and worked at the former detention centre.*

*For many of these people, it is a place of substantial personal and professional achievement. Mount Penang is also important to the local community as a landmark of historical and aesthetic importance. The place has functioned as a community meeting point, with many links between the wider community and the detainees and staff.*

*Mount Penang also has significance for the local Aboriginal people both pre and post contact, and during the time when Mount Penang was used as a juvenile detention centre and accommodated a number of Aboriginal detainees for whom the site would have profound associations.*

*Because of the levels of disturbance across much of Mount Penang, there is Low Aboriginal archaeological potential apart from the eastern Bushland Precinct, which has Moderate to High archaeological potential. Mount Penang has a Low historical archaeological potential.<sup>99</sup>*

The study area is part of a wider item which considered to be significant at a local and state level.

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<sup>99</sup> (TKD Architects 2020)

## 6 Proposed works

### 6.1 Proposal details

The proposed works aim to upgrade the infrastructure of a number of roads and services within the Mount Penang Parklands. While there is a wider proposed program, this report focuses on those upgrade works proposed for Stage 1 - Parklands Road and its extension to Baxter's Track. The proposed works are summarised in Table 5. Details of the proposed development are presented in Appendix 2.

A wider Place Vision for the Mount Penang Parklands has been developed to enable a holistic approach to guide the management and development of the site.<sup>100</sup> Upgrades to essential infrastructure are listed as Priority Action 2 in the Vision Plan, while traffic and parking management is listed as Priority Action 8. The Parklands Road civil works' urban design and landscape objectives align with the semi-rural character and landscape planting. Interpretation, including narratives and storytelling, will be part of the Place Vision plan overlay for the wider Mt Penang Parklands site as part of the landscape design process.

#### 6.1.1 Proposed civil works – Stage 1 study area

Table 5 summarises the proposed civil works for the Stage 1 study area as they presented in the civil concept designs prepared by Northrop.

**Table 5 Proposed civil works – Stage 1 study area**

Location	Proposed works	Heritage considerations
<b>Parklands Road, southern end between Festival Drive and Waterfall Café</b>	<ul style="list-style-type: none"> <li>New water main services</li> <li>New sewer main services</li> <li>New high voltage electrical services</li> <li>New stormwater services</li> <li>Upgraded roundabout at junction of Festival Drive and Parklands Road including pavement, stormwater drainage and provision for buses manoeuvring.</li> <li>Widening of Parklands Road from a single lane two-way road to a two lane two-way road. Trafficable AC pavement.</li> <li>Removal of existing trees on western side of Parklands Road.</li> <li>Relocation of existing services on the western side of Parklands Road.</li> <li>Establishment of perpendicular car parking spaces on the western side of Parklands Road, with trafficable permeable pavement and feature planters with trees and passive irrigation from road runoff. Includes two new accessible parking spaces.</li> <li>New pedestrian path running from the roundabout to the café on the western side of Parklands Road.</li> </ul>	<ul style="list-style-type: none"> <li>Replacement of existing kerb is adjacent to heritage plantings (L5: Mature cultural plantings along western edge of school). The new kerb is to maintain existing vertical and horizontal augment to avoid damaging roots.</li> <li>Arborist advice to be sought for impact of works on heritage plantings (L5: Mature cultural plantings along western edge of school).</li> </ul>

<sup>100</sup> (Hunter & Central Coast Development Corporation 2021)

Location	Proposed works	Heritage considerations
	<ul style="list-style-type: none"> <li>Replacement of existing kerb on eastern side of Parklands Road.</li> <li>New substation to be established at north-eastern corner of Parklands Road and Carinya Street.</li> <li>Existing sewer pump station to be removed opposite Carinya Street on western side of Parklands Road</li> </ul>	
<b>Parklands Road, central area between Waterfall Café and Upper Dam</b>	<ul style="list-style-type: none"> <li>New water main services</li> <li>New sewer main services</li> <li>New high voltage electrical services</li> <li>New stormwater services</li> <li>Existing paving and disabled parking to be removed on western side of Parklands Road adjacent to Waterfall Café.</li> <li>Parklands Road to be converted to one-way single land north bound, with trafficable pavement finish TAD.</li> <li>Various types of kerbing proposed.</li> <li>New shared path.</li> <li>New layback to be constructed to tie into existing.</li> <li>Widen Parklands Road to at least 5m but maintain one-way direction. Trafficable AC pavement.</li> </ul>	<ul style="list-style-type: none"> <li>Pedestrian shared path on western side of Parklands Road to avoid line of heritage plantings (L3: Poplar and Brushbox Avenue).</li> <li>Proposed sewer main may need to be located along centreline of Parklands Road to avoid trenching within tree root zone of heritage plantings (L3: Poplar and Brushbox Avenue).</li> <li>Proposed water main to cross from western to eastern side of Parklands Road to avoid root zone of heritage plantings (L3: Poplar and Brushbox Avenue).</li> <li>Arborist advice to be sought for impact of works on heritage plantings (L3: Poplar and Brushbox Avenue).</li> </ul>
<b>Parklands Road, central area between Upper Dam and junction with McCabe Road</b>	<ul style="list-style-type: none"> <li>New water main services</li> <li>New sewer main services</li> <li>New high voltage electrical services</li> <li>New stormwater services</li> <li>Potential construction of gross pollutant trap on stormwater line leading from Parklands Road to Upper Dam.</li> <li>Widen Parklands Road to at least 5m but maintain one-way direction. Trafficable AC pavement.</li> <li>Mixture of kerbing including standard kerb and gutter and flush kerb.</li> <li>Establishment of perpendicular car parking spaces on the western side of Parklands Road, with trafficable permeable pavement and feature planters with trees and passive irrigation from road runoff.</li> <li>Pedestrian shared path west of new parking spaces.</li> <li>4-way intersection at junction of Parklands Road and McCabe Road; signage and line making to indicate right of way and prevent traffic entering Parklands Road from north. Trafficable pavement (finish ATD) at junction points, flush</li> </ul>	<ul style="list-style-type: none"> <li>Proposed water main to cross from eastern to western side of Parklands Road to avoid root zone of heritage plantings (L3: Poplar and Brushbox Avenue).</li> <li>Arborist advice to be sought for impact of works on heritage plantings (L2: Scribbly Gums group).</li> </ul>



Location	Proposed works	Heritage considerations
	to carriageway level to indicate entry into precinct. <ul style="list-style-type: none"> <li>Widening of McCabe Road at junction with Parklands Road.</li> </ul>	
<b>Parklands Road, central area between McCabe Road and Baxter's Track</b>	<ul style="list-style-type: none"> <li>New water main services</li> <li>New sewer main services</li> <li>New high voltage electrical services</li> <li>New stormwater services</li> <li>Extension of Parklands Road from junction with McCabe Road to Baxter's Track. Surfaces include trafficable AC pavement and trafficable pavement (finish TAD).</li> <li>Parallel parking on eastern and western sides of Parklands Road, featuring trafficable permeable pavement, trafficable pavement (finish TAD) and planters with trees with passive irrigation from road runoff.</li> <li>Pavement treatment to be flush with carriageway level in two section to indicate entry into precinct.</li> <li>New shared pedestrian path adjacent to parallel parking spaces on western side of Parklands Road.</li> <li>Proposed T-way intersection for junction of Parklands Road and Baxter's Track; signage and linemarking to indicate Baxter's Track as through road.</li> <li>Kerb and gutter proposed for edge of road and parking spaces.</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>

### 6.1.2 Proposed landscape design – Stage 1 study area

The Parklands Road civil works' urban design and landscape objectives align with the semi-rural character and landscape planting. The Conservation Management Plan is referenced for the design proposal. However, it does not detail exact finish types and planting. This needs to be determined by replicating the existing character. These include:

Materials and elements:

- If used extensively, the minimisation of the kerb and gutter will change the existing character. The treatment of the kerbs and gutters is proposed to be a site applied washed aggregate to be consistent with existing kerb and gutter, such as on The Avenue.
- Bright off white precast or in situ off-white concrete is to be avoided, as they become a dominant element within the landscape.
- Flush kerbs are used predominantly to minimise the impact on tree roots and be consistent with existing ones.
- New parking areas have been extended but maintain the 90-degree alignment. Parking bays are a porous paver to differentiate from the carriageway and enable the healthy establishment of proposed new trees. They also assist in the treatment of runoff towards the dams.

- Trees within paving are edges with hardwood sleepers to match the proposed wheel stops. These will be a more suitable finish than bright new precast concrete.
- With flush kerbs, cars need to be managed with bollards. The existing sandstone 'logs' are a good start but can be rearranged to have a site-specific approach and create furniture opportunities. These logs are used throughout all of the central coast open space indiscriminately and do not represent the character of the space. We suggest a hierarchy of timber bollards (square section 490 hardwood) as a more refined approach near special areas.
- Timber and sandstone monolithic elements are appropriate for the site as a material selection. The use of timber and the locally quarried stone is more suitable than proprietary off-the-shelf items.
- Paths (both footpaths and shared paths) should be bitumen. They are an all-weather and compliant surface that is less intrusive in the landscape than concrete. They will be suitable for low use and are cheaper to install.
- There is a short section of timber boardwalk (with handrails not required) to bridge the roots of two high heritage significant trees. Many options were explored with the civil engineers. This was the most suitable with the least impact.

#### Tree Planting:

- There are 23 trees to be removed due to the road widening adjacent to the parking bays. And at the intersection of McCabe and Parklands Road.
- Eighteen of these trees were planted within the last 20 years on the western side of Parklands.
- There are 55 new trees proposed. This is more than a 2:1 ratio of new to removed.
- The species selected represent existing species found on Parklands or on-site. The species selected are both cultural and indigenous species.
- Species selected include:
  - Eucalyptus haemastoma (Scribbly Gums)- is an iconic indigenous tree on site.
  - Lophostemon confertus (Brushbox) is a native tree used extensively on site and Parklands Avenue.
  - Pinus pinea (Stone Pines) as an accent tree. This refers to the Radiata Pines on site that is a weed species and no longer suitable.
  - Populus deltoides (Cottonwoods) exist on site but are senescent and will need supplementing.
  - Populus simonii can be used as an alternative to the Lombardy poplars as they have a similar form but do not have root suckers.

## 7 Statement of heritage impact

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This SoHI has been prepared to address impacts resulting from the proposed development associated with Stage 1 works within the study area and identifies the level of impact and discusses mitigation measures, which must be taken to avoid or reduce those impacts. This section of the report has been prepared in accordance with the Heritage Manual guideline *Statements of Heritage Impact*.<sup>101</sup>

### 7.1 Assessing impact to heritage item(s)

#### 7.1.1 Quantifying heritage impact(s)

Based upon the discussion of impacts to heritage items, impact to these items can be quantified under three main categories: direct impacts, indirect impacts and no impact. These kinds of impacts are dependent on the proposed impacts, nature of the heritage item and its associated curtilage.

##### **Direct impacts**

Direct impacts are where the completion of the proposed development will result in a physical loss or alteration to a heritage item which will impact the heritage value or significance of the place. Direct impacts can be divided into whole or partial impacts. Whole impacts essentially will result in the removal of a heritage item as a result of the development where as partial impacts normally constitute impacts to a curtilage or partial removal of heritage values. For the purposes of this assessment direct impacts to heritage items have been placed into the following categories:

- Physical impact - whole: where the development will have a whole impact on a heritage item resulting in the complete physical loss of significance attributed to the item.
- Physical impact - partial: where the project will have a partial impact on an item which could result in the loss or reduction in heritage significance. The degree of impact through partial impacts is dependent on the nature and setting of a heritage item. This typically these impacts are minor impacts to a small proportion of a curtilage of an item or works occurring within the curtilage of a heritage item which may impact on its setting (i.e. gardens and plantings).

##### **Indirect impacts**

Indirect impacts to a heritage item relate to alterations to the environment or setting of a heritage item which will result in a loss of heritage value. This may include permanent or temporary visual, noise or vibration impacts caused during construction and after the completion of the development. Indirect impacts diminish the significance of an item through altering its relationship to its surroundings; this in turn impacts its ability to be appreciated for its historical, functional or aesthetic values.

##### **Cumulative impacts**

Cumulative impacts relate to minimal or gradual impacts from a single or multiple developments upon heritage values. A cumulative impact would constitute a minimal impact being caused by the proposed development which over time may result in the partial or total loss of heritage value to the study area or

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<sup>101</sup> (Heritage Office & DUAP 1996)



associated heritage item. Cumulative impacts may need to be managed carefully over the prolonged period of time.

## No impact

This is where the project does not constitute a measurable impact to the heritage item.

### 7.1.2 Discussion of heritage impact(s)

The discussion of impacts to heritage can be centred upon a series of questions which must be answered as part of a SoHI which frame the nature of impact to a heritage item. The Heritage Manual guideline *Statements of Heritage Impact* includes a series of questions in relation to indicate the criterion which must be answered (Table 6).<sup>102</sup>

**Table 6 Discussion of heritage impacts for Stage 1**

Question	Discussion
<b>Minor partial demolition</b>	
<b>Is the demolition essential for the heritage item to function?</b>	The works will not involve the demolition of heritage fabric or landscape elements, as the works are restricted to modern road infrastructure. However, the partial demolition of the existing road infrastructure is needed due to the aging and decreasing capacity of this infrastructure. The minor demolition of non-heritage fabric and landscape elements will enable continued use of the item into the future and allow for enhancement and increased access to (and therefore opportunities to appreciate) the wider site for the local and regional community.
<b>Are important features of the item affected by the demolition?</b>	As is noted above, the works will not involve the demolition of heritage fabric nor landscape elements. The design for the new footpath has been adapted to avoid impacts that would have resulted in detrimental effects to heritage tree plantings (the most northern of the White Poplars in the L3: Poplar & Brushbox avenue on the western side of Parklands Road). Similarly, care has been taken with the design of the upgrades so as avoid road widening on the side of Parklands Road and McCabe Road at the junction of Parklands Road where heritage plantings are located (L2: Scribbly Gum group).
<b>Minor additions</b>	
<b>Will the additions visually dominate the heritage item?</b>	The proposed additions, in the form of new road surfaces and widened road ways, car parking, footpaths and subsurface services, will not visually dominate the heritage item. The works are in part an extension of the current road infrastructure, and will not visually detract or distract from the wider heritage item. Mitigation measures for the detailed design will inform the materiality and design of the new parking areas, with the aim to embed the new areas in the current semi-rural character of the place.
<b>Is the addition sited on any known, or potentially significant archaeological deposits? If so, have alternative positions for the additions been</b>	The proposed works are not located in areas of known archaeological deposits. The study area has been assessed as holding low archaeological potential. However, an unexpected finds procedure and a heritage induction for all site workers should be included as part of site management plans for the works to ensure that any unexpected relics or significant remains can be appropriately managed.

<sup>102</sup> (Heritage Office & DUAP 1996)

Question	Discussion
considered?	
<b>Are the additions sympathetic to the heritage item? In what way?</b>	The additions, in the form of road widening, resurfacing, new footpaths and car parking spaces have been designed so as to be simple and minimal so as to avoid being unsympathetic. Further detail of landscaping has yet to be developed. However, mitigation measures and recommendations can be made as part of this assessment which would ensure that the additions would be sympathetic to the heritage item.
<b>New services</b>	
<b>How has the impact of the new services on the heritage significance of the item been minimised?</b>	<p>Following specialist arborist advice from Active Green Services,<sup>103</sup> a number of options for alignment of the new services were put forward in order to reduce or avoid impacts to heritage landscape elements. In general, the alignment of new services avoids built and landscape heritage elements.</p> <p>One location which has been subject to discussion as part of the development of the concept design involves reducing or avoiding impacts to the most northern White Poplar in the L3: Poplar &amp; Brushbox avenue planting group. These include the location of the new water main (crossing Parklands Road from the western to the eastern side) to reduce impacts to the root zone of the most northern White Poplar in the L3: Poplar &amp; Brushbox avenue planting group. Similarly, the new sewer main has been diverted to run along the centre of Parklands Road. The use of directional drilling instead of open trenching has also been identified as a solution which would reduce physical impacts to the tree root systems for the most northern White Poplar in the L3: Poplar &amp; Brushbox avenue planting group.</p> <p>No new services are proposed in the immediate vicinity of L2: Scribbly Gum group</p>
<b>Are any known or potential archaeological deposits (underground and under floor) affected by the proposed new services?</b>	The proposed new services are not located in areas of known archaeological deposits. The study area has been assessed as holding low archaeological potential. However, an unexpected finds procedure and a heritage induction for all site workers should be included as part of site management plans for the works to ensure that any unexpected relics or significant remains can be appropriately managed.
<b>New landscape works and features</b>	
<b>How has the impact of the new work on the heritage significance of the existing landscape been minimised?</b>	<p>While the detail of the landscaping design to support the civil designs for the works are still in development, a number of steps have been taken to minimise the impact of the new works on the existing landscape.</p> <p>At the southern end of Parklands Road, the road is proposed to be widened on the western side, with trees to be interspersed between car parking spaces. This reflects the current layout where there are younger trees spaced along the western side of Parklands Road south. This will also retain the setting of L5: Mature cultural plantings along western edge of school on the eastern side of Parklands Road.</p> <p>A similar approach has been taken for Parklands Road near the junction of McCabe Road. The use of planters with trees interspersed between parking spaces reflects the current plantings along this length of road, which would be removed to make way for the slight road widening and parking spaces.</p> <p>The proposed extension of Parklands Road from McCabe Road to Baxter's Track will run through a cleared paddock which at present features trees, paddock fences and a</p>

<sup>103</sup> (Active Green Services 2022)

Question	Discussion
	<p>drainage channel. However, the proposed alignment of the road extension runs adjacent to the current paddock fencing, and to the east of a number of established trees. These trees already appear to configure to an informal avenue alignment, so the placement of the extension of Parklands Road emphasises this view. The use of parallel parking also reduces the visual congestion that perpendicular parking would have in this rural setting.</p> <p>The proposed footpath is closely aligned to the western side of Parklands Road and the car parking spaces, away from heritage planting groups. This clusters the new works together and avoids wider disruption of the landscape.</p> <p>Further mitigation measures and recommendations regarding materials, colours and types of kerbing can be made as part of this assessment, which would ensure that the additions would be sympathetic to the heritage item.</p>
<b>Has the advice of a consultant skilled in the conservation of heritage landscapes been sought? If so, have their recommendations been implemented?</b>	<p>Advice regarding heritage landscapes is presented as part of this report, with preliminary advice provided during the development of the civil concept designs. A landscape architect is also involved in the development of the concept and future detailed design.</p>
<b>Are any known or potential archaeological deposits affected by the landscape works? If so, what alternatives have been considered?</b>	<p>The proposed landscape works are not located in areas of known archaeological deposits. The study area has been assessed as holding low archaeological potential. However, an unexpected finds procedure and a heritage induction for all site workers should be included as part of site management plans for the works to ensure that any unexpected relics or significant remains can be appropriately managed.</p>
<b>How does the work impact on views to, and from, adjacent heritage items?</b>	<p>There will be minimal impacts to views to and from adjacent heritage items and within the item itself. The road, parking and footpath works will be at ground level. The temporary presence of cars in the parking spaces will result in a small impact of views to the west towards the Festivals/Gardens Precinct, but views to the east towards the Heritage Precinct will remain unchanged. Due to the topography in the Baxter's Track Mixed-Use Precinct, there will be minimal impact to views resulting from parking on either side of the extended Parklands Road.</p>
<b>Tree removal or replacement</b>	
<b>Does the tree contribute to the heritage significance of the item or landscape?</b>	<p>The civil concept designs for Parklands Road have been adapted to avoid the removal of significant trees. The footpath in the vicinity of White Poplar in the L3: Poplar &amp; Brushbox avenue planting group has been altered to avoid removing the tree and would be located to the tree's western side. Advice from Active Green Services during design development resulted in a solution whereby the footpath is proposed to be built up around the tree, with the use of a permeable surface to enable protection and drainage of the root system.</p>
<b>Has the advice of a tree surgeon or horticultural specialist been obtained?</b>	<p>An Arboricultural Impact Assessment has been undertaken for the proposed civil works on Parklands Road. This report is presented in Appendix 3.</p>

Question	Discussion
<b>New signage</b>	
<b>How has the impact of the new signage on the heritage significance of the item been minimised?</b>	<p>While signage has not been incorporated into the current set of civil concept designs, it is anticipated that signage will be required as part of the new traffic configurations of Parklands Road.</p> <p>Mitigation measures and recommendations regarding location and size of signage will be made as part of this assessment, which would ensure that the additions would have a minimal impact on the heritage item.</p>

## 7.2 Conservation policies

The CMP for Mount Penang Parklands contains a range of conservation policies intended to ensure that the heritage significance of the item is appropriately retained, managed and conserved. Policies relevant to the proposed works are presented in Table 7, along with an assessment of how the proposed civil concept design for Stage 1 - Parklands Road complies with each policy identified.



**Table 7 Conservation policies relevant to the proposed works and compliance assessment of the proposed civil concept design for Stage 1**

Policy no.	Policy detail (TKD Architects 2020, pp. 136–166)	Assessment and compliance
3	<p>Management of the heritage values will be in accordance with the principles, policies and guidelines in this CMP and in other best-practice heritage principles and guidelines including:</p> <ul style="list-style-type: none"> <li>• The Burra Charter.<sup>104</sup></li> <li>• The guidelines produced by the Heritage Council of NSW.</li> </ul>	<p>The advice of specialist consultants in heritage, arboriculture and landscape design are being sought as part of the project in order to ensure that the proposed works are in accordance with best practice heritage principles. The proposed works included in the civil concept drawings are minimal and largely expand on existing above-ground infrastructure to support ongoing use of the site.</p>
4	<p>Individuals with appropriate conservation skills and experience will be employed to undertake any conservation or new works.</p>	<p>While the project has not proceeded past concept design stage, the early engagement of specialist consultants (heritage, arboriculture and landscape design) sets a precedent for future works of the project. Thus far, recommendations and advice from these specialist consultants have been incorporated into the civil concept design for Parklands Road. Mitigation measures and recommendations of this report will encourage the use of contractors, such as arborists or heritage consultants, with appropriate experience and skills in working in heritage landscapes to comply with this policy. No built heritage fabric will be directly impacted by the works.</p>
5	<p>Additional research and assessment of the component spaces and fabric will be undertaken to inform decision-making in relation to the detailed design of conservation, adaptive re-use and alterations and additions to the site and its significant components</p>	<p>Additional investigation and assessment in the form of an Arboricultural Impact Assessment (Appendix 3) has been undertaken to determine the potential impact of the civil concept design on trees, in particular heritage plantings. As the history of the wider site is thoroughly explored in the CMP, additional primary research was undertaken as part of this report to investigate the presence of occupation prior to the establishment of the reform school in 1912. An independent archaeological assessment was also undertaken, as the study area does not contain heritage built fabric.</p>
8	<p>Proposed works will be assessed for their potential to impact (both positive and negative) on the heritage significance of the site and its components.</p>	<p>This report and the Arboricultural Impact Assessment (Appendix 3) meet this policy requirement to assess the impacts of works on the heritage significance of the site and its key components.</p>

<sup>104</sup> (Australia ICOMOS 2013)

Policy no.	Policy detail (TKD Architects 2020, pp. 136–166)	Assessment and compliance
9	A recording of the condition of significant fabric and key features will be undertaken before, during and after repair works or as part of any new works.	<p>The Arboricultural Impact Assessment (Appendix 3) has recorded the location, species, age, height, canopy spread, tree protection zone (TPZ), structural root zone (SRZ), structure, health, estimated life expectancy and retention value of each tree within and adjacent to the study area, including trees within heritage planting groups. These trees have also been tagged as part of that assessment. A Tree Protection Plan has been recommended by Active Green Services.<sup>105</sup></p> <p>A photographic archival recording before, during and after works in accordance with the following guidelines as noted in the CMP will be included as part of the mitigation measures and recommendations of this report:</p> <ul style="list-style-type: none"> <li>• <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i><sup>106</sup></li> <li>• <i>How to Prepare Archival Records of Heritage Items</i><sup>107</sup></li> </ul>
10	The site will be managed in ways that are consistent with applicable heritage legislative requirements. Works required to comply with building code and other legislative requirements are to avoid or minimise impacts on the site's heritage significance.	The proposed works are in part a response to traffic management assessments and the need for increased pedestrian and vehicle safety along Parklands Road. This report is being undertaken in accordance with legislative requirements for State heritage items under the Heritage Act and Part 5 of the EP&A Act.
11	<p>Heritage conservation will:</p> <ul style="list-style-type: none"> <li>• Adopt a holistic approach and extend to all significant aspects of the place, including cultural landscape features, buildings and structures, collections, records, traditions, practices, memories, meanings and associations.</li> <li>• Retain significant components, spaces, elements and fabric of the place consistent with their assessed level of significance and in accordance with specific actions identified within this CMP.</li> </ul>	<p>The proposed civil concept design largely involves minor alterations to the existing road network within Precinct 3: Festivals/Gardens Precinct, which is of moderate heritage value and requires retention, adaptation and maintenance. The extension of Parklands Road to Baxter's Track is a moderate change to the Baxter's Track Mixed-Use Precinct, which requires retention, adaptation and maintenance, but as this follows the same alignment along the existing paddock boundary, a drainage channel and an informal avenue of trees, this change has taken into account the existing landscape of this precinct. While detailed design is yet to be completed, recommendations will be made as part of this report to ensure that a holistic approach is taken to incorporating the proposed works into the current setting and character of the item.</p> <p>The L2: Scribbly Gum group is considered to hold high heritage value according to the CMP, which requires retention, conservation and maintenance. The civil concept design does not propose any works within this area or any road widening of Parklands Road or McCabe Road in the direction of this group of plantings.</p>

<sup>105</sup> (Active Green Services 2022)

<sup>106</sup> (Heritage Office 2006)

<sup>107</sup> (Heritage Office 1998)

Policy no.	Policy detail (TKD Architects 2020, pp. 136–166)	Assessment and compliance
	<ul style="list-style-type: none"> <li>• Make use of all expertise and knowledge, and adopt an evidence-based approach to materials conservation.</li> <li>• Ensure that the authenticity of original elements and fabric is maintained.</li> </ul>	<p>However, the current alignment of McCabe Road and Parklands Road already extends into the TPZ of a number of these trees, but only one estimated SRZ.</p> <p>The L5: Mature cultural plantings along western edge of school are also considered to have high heritage value, which requires retention, conservation and maintenance. Similarly, the civil concept design does not propose any works within this area nor any road widening of Parklands Road on its eastern side, with the current kerb proposed for replacement and no alterations to the vertical or horizontal position of the kerb to protect the trees in this location. Again, the current alignment of Parklands Road already extends into the TPZ of a number of these trees, and several estimated tree SRZ.</p> <p>The L3: Poplar &amp; Brushbox avenue is considered to hold moderate heritage value which requires retention, adaptation and maintenance. The new footpath alignment goes around the trees in this group, avoiding direct intersection with the tree, but within the TPZs of a number of trees, and the SRZ of the most northern of the White Poplars on the western side of Parklands Road. The current alignment of Parklands Road already extends into the TPZ and SRZ of most of the trees within this group.</p> <p>As is noted in the Arboricultural Impact Assessment, tree-sensitive design options should be used for road upgrade or footpath works where there is more than 10% encroachment into the TPZ. This will ensure that any new works will avoid or minimise impacting these heritage trees.</p> <p>Heritage advice and specialist aboricultural advice should be sought in the finalisation of the detailed designs.</p>
15	<p>Conserve Aboriginal objects and sites within Mount Penang Parklands consistent with the principles and practices contained in the following documents:</p> <ul style="list-style-type: none"> <li>• <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales</i><sup>108</sup></li> <li>• <i>Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW</i><sup>109</sup></li> </ul>	<p>An Aboriginal Due Diligence Assessment (ADDA) has also been undertaken by Biosis for the project.<sup>112</sup> The ADDA was undertaken in accordance with the <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales</i> and the <i>Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales</i>.<sup>113</sup> Representatives of the local Aboriginal community were also consulted as part of the ADDA, including Darkinjung Local Aboriginal Land Council (DLALC) and Awabakal &amp; Guringai Pty Ltd (Awabakal &amp; Guringai). The ADDA determined there were no Aboriginal sites located within the study area, and no areas of Aboriginal archaeological potential; this conclusion was also agreed with by representatives of DLALC and</p>

<sup>108</sup> (DECCW 2010a)

<sup>109</sup> (OEH 2011)

<sup>112</sup> (Biosis Pty Ltd 2022a)

<sup>113</sup> (DECCW 2010a, DECCW 2010b)

Policy no.	Policy detail (TKD Architects 2020, pp. 136–166)	Assessment and compliance
	<ul style="list-style-type: none"> <li>The Burra Charter.<sup>110</sup></li> <li><i>Ask First: a guide to respecting indigenous heritage places and values</i><sup>111</sup></li> </ul>	Awabakal & Guringai. No approvals are required under the <i>National Parks and Wildlife Act 1974</i> , but the ADDA has recommended an unexpected finds procedure and heritage induction for all site workers to ensure that any unexpected Aboriginal objects are managed appropriately.
17	New landscaping works will be designed and implemented to retain and enhance the significant built and landscape components of the site.	<p>As has been noted above, the detailed landscaping design for the project is currently in development. However, preliminary advice regarding retention of the rural character of the landscape has been shared by Biosis with the consultant team, inclusive of the landscape architect, during the concept design development and following an initial consultation meeting with Heritage NSW.</p> <p>This report will also make formal recommendations regarding landscaping design and works. Heritage advice and specialist aboriginal advice should be sought in the finalisation of the detailed designs.</p>
21	<p>The landscape precincts, as identified in Section 3.3.2 [of the CMP, see Photo 55], will be managed in accordance with their assessed cultural significance and the following guidelines [extracted and included below].</p> <p><i>Guidelines</i></p> <ul style="list-style-type: none"> <li><i>Mature historic plantings, as identified in this CMP, are to be retained and maintained, particularly the avenue plantings along the entry roads and around the edges of the playing fields as these tree groups are key identifiers of the site and provide a substantial contribution to the character and form of the site.</i></li> <li><i>Roads are to be maintained with their current width so as to retain the mature tree planting along the road verges. Existing road profiles and drainage patterns are to be maintained to ensure</i></li> </ul>	<p>The proposed civil concept design is located within Precinct 3: Festivals/Gardens Precinct and Precinct 4: Baxter's Track Mixed-Use Precinct, both of which are of moderate heritage value which require retention, adaptation and maintenance. The works also extend slightly into Precinct 5: Heritage Precinct, which requires retention, conservation and maintenance.</p> <p>The proposed civil concept designs have been adapted so as to retain the mature historic plantings along Parklands Road (L3: Poplar &amp; Brushbox avenue and L5: Mature cultural plantings along western edge of school), with several options recommended for the detailed design by Active Green Services as part of the Arboricultural Impact Assessment in order to protect trees adjacent to the proposed works.</p> <p>The civil concept designs do propose the widening of Parklands Road from its current width. However, the CMP stipulates that this is to retain the mature tree plantings along the road verges (L2: Scribbly Gum group, L3: Poplar &amp; Brushbox avenue and L5: Mature cultural plantings along western edge of school).</p> <ul style="list-style-type: none"> <li>The current concept design has ensured that road widening will not encroach upon these planting groups. At the southern end of Parklands Road, the road widening and car parking spaces are only proposed on the western side, opposite L5: Mature cultural plantings along western edge of school.</li> <li>In the central part of Parklands Road, there is no intent to widen the portion of the road where L3: Poplar &amp; Brushbox avenue is located adjacent on both sides of the road.</li> </ul>

<sup>110</sup> (Australia ICOMOS 2013)

<sup>111</sup> (AHC 2002)



Policy no.	Policy detail (TKD Architects 2020, pp. 136–166)	Assessment and compliance
	<i>that the moisture regime of the existing trees is not changed.</i>	<ul style="list-style-type: none"> <li>At the northern end of Parklands Road, it is proposed to widen the road to at least 5m wide (if there will be no detrimental impact to trees). For the portion of Parklands Road adjacent to L2: Scribbly Gum group, the proposed widening will occur on the western side so as not to extend further than the current road edge into the planting group.</li> </ul>
24	The Historical (non-Aboriginal) archaeology of the site will be managed in accordance with its assessed significance and with the requirements of the Heritage Act.	An independent historical (non-Aboriginal) archaeological assessment has been undertaken as part of this report. The study area is considered to have low archaeological potential. No approvals from Heritage NSW are required based on this conclusion. However, this report will recommend an unexpected finds procedure and a heritage induction for all site workers to ensure that any unexpected archaeological remains are managed appropriately.
31	Upgrading of existing services and the installation of new services will avoid physical and visual impacts on significant buildings, trees and other landscape elements.	The alignment of new services as part of the civil concept designs have been adapted based on preliminary advice from Biosis and Active Green Services. This includes a solution to redirect water across Parklands Road to the eastern side and sewerage into the centre alignment of Parklands Road to avoid or reduce impacts of these services on the root systems of heritage tree plantings in L3: Poplar & Brushbox avenue. Directional drilling for the HV conduit has been proposed so as to run the service underneath or at the edge of the root system and reduce damage to the health of the northernmost White Poplar in L3: Poplar & Brushbox avenue.
32	Ground disturbance or more substantial excavation will avoid or minimise as much as possible impacts on significant site components including buildings, trees, Aboriginal and historical archaeological items, and other significant components.	<p>As is noted above, realignment of services, the use of directional drilling at the base of root systems and also tree sensitive design (such as raised paths and porous paving) have been incorporated into the civil concept design for Parklands Road.</p> <p>There are no buildings of heritage significance within or adjacent to the Stage 1 area of works.</p> <p>The study area has been assessed as having low potential for Aboriginal and historical (non-Aboriginal) archaeology.</p>
34	Masterplanning will be undertaken for the whole of the site to guide future development in the short to longer term.	<p>A concept Master Plan was developed as part of the GDCP (Photo 1), which is reflected in the CMP in terms of the site precincts (Photo 55).</p> <p>Based on advice from Gyde Consulting, the current proposed works are not part of a specific master plan, but are being undertaken in the spirit of the GDCP concept master plan. The intent of the proposed works are to ensure that infrastructure is fit for purpose and adapts according to the proposed uses of the site and the population of the Central Coast and neighbouring regions.</p>

Policy no.	Policy detail (TKD Architects 2020, pp. 136–166)	Assessment and compliance
36	Alterations and additions will be designed to minimise adverse impacts and on the heritage significance of the site as a whole.	The proposed works are largely upgrades and expansion of existing infrastructure, with an additional extension of Parklands Road to the north to meet Baxter's Track. While detailed design is currently in development, Biosis will provide mitigation measures and recommendations in this report to minimise adverse impacts to the overall item resulting from the proposed works.
37	Equitable access is to be provided to all publicly accessible places on the site where practicable and where it will not have an adverse impact on the heritage significance of the item.	The proposed works include provision for accessible parking spaces as well as improved shared path access which would meet current accessibility requirements for wheelchairs and prams. Currently, the footpath adjacent to Parklands Road is not ideally designed or constructed for accessibility. The location of the shared path hugs the alignment of Parklands Road and proposed parking spaces, which reduces the footprint and visual disruption of the proposed works. As is noted above, solutions to reduce or minimise impacts to heritage tree root systems have also been incorporated into the civil concept design.
41	Proposals for new signs will be formulated with the aim of avoiding or minimising adverse impacts on the significant built and landscape components of the site.	While the civil concept designs do not include details for signage, it is expected that new signage will be required for the changing traffic management of Parklands Road and McCabe Road. It is not certain whether wayfinding signage will also be part of the landscape design. However, mitigation measures and recommendations will be provided as part of this report to help guide design so as to minimise adverse impacts on the significant built and landscape components of the item.

## 7.3 Development controls

As is noted in Section 2.2.5, the GDCP contains a specific section for Mount Penang Parklands. Controls relevant to the project are presented in Table 8, along with an assessment of how the proposed civil concept design for Stage 1 - Parklands Road complies with each control identified.

**Table 8 Development controls relevant to the proposed works and compliance assessment of the proposed civil concept design for Stage 1**

Development control	Assessment and compliance
<b>Street hierarchy</b>	
<b>Entrance points inform the site's internal road hierarchy. The new road network should, where possible, use existing roadways and upgrades to existing routes to provide greater movement across the site that responds to the site's physical and heritage values.</b>	The proposed civil concept designs for Parklands Road largely involve the upgrade and expansion of the existing road network, with the extension of Parklands Road north to meet Baxter's Track the only new addition to road network. The widening of roads to create two-way roads in some areas, defined lanes and introduction of one way traffic management will improve and clarify movement within the item and responds to the changing use and function of the site, while respecting the heritage values and precincts by keeping change to a minimum.
<b>Ensuring the new roads are only used by traffic using the site and not used by through traffic for short cuts.</b>	The proposed civil concept design extends Parklands Road to the north to meet Baxter's Track. While this will create a through route across the site, the proposed traffic management measures are unlikely to make this a more efficient or desirable route for through traffic as an alternative route to and from Kangaroo Road from the Central Coast Highway.
<b>Designing streets to the minimum size to provide necessary movement and access.</b>	The proposed civil concept design has minimised widening of roads in order to maintain the rural character of the site, with two and slightly wider single lane roads remaining. There will be parking areas in three locations adjacent to Parklands Road, with the shared path also proposed adjacent to the road and car parking spaces.
<b>Designing roads to reinforce the rural landscape character of the site.</b>	The retention of single lane one way roads and narrow two-way two-lane roads lined by plantings will ensure continued retention of the rural landscape character of the site. A number of landscaping options have been discussed as part of the design development which would achieve this, such as flush kerbs, roadside plantings and grass swales alongside water-sensitive urban design (WSUD).
<b>Design of roads to meet categorisation of road types</b>	<p>Parklands Road is designated as a secondary AND an access road with regards to access for the different precincts. McCabe Road is designated as a secondary road.</p> <p>The proposed configuration of secondary roads are presented in Photo 2. This configuration comprises two traffic lanes as part of a two-way road, with parallel parking spaces situated adjacent. Tree plantings are then located outside of these parking spaces. Outside of these plantings are parallel parking spaces, a pedestrian footpath on one side of the road and a cycle path on the other side of the road. Suggested widths are also included.</p> <p>The proposed configuration of access roads are presented in Photo 3. This configuration comprises a two-way, two lane road, with street lighting and</p>

Development control	Assessment and compliance
	<p>separate pedestrian and cycle paths on each side of the road. Outside of these are tree plantings. Suggested widths are also included.</p> <p>The proposed layout in the civil concept design, while not necessarily mirroring the GDCP suggested configuration, has been designed in the spirit of this configuration. Some adaptations to the suggested configuration are needed for Parklands Road in order to work within the heritage constraints of the study area and adjacent areas. The use of perpendicular parking over parallel parking in the southern and central portions of the western side of Parklands Road compensates for the inability to place parking spaces on the eastern side due to heritage plantings. The use of perpendicular parking is in response to visitor parking needs and to encourage parking in designated spaces rather than between heritage plantings on Carinya Street. A shared path is proposed on the western side of Parklands Road, rather than separate pedestrian and cycle paths, due to the limited space resulting from heritage plantings on the eastern side. Planters with trees are proposed to be interspersed within these perpendicular parking areas to facilitate road-side trees. Lighting has not been included in the civil concept design.</p> <p>The northern extension of Parklands Road does include parallel parking on both sides of the road, with planters featuring trees interspersed between spaces. The shared pathway continues outside of these parking spaces.</p>
<b>Pedestrian and cycle circulation</b>	
<b>Continuous pedestrian paths around the site connecting the major activities and features, open spaces and areas of natural value</b>	The proposed civil concept design includes provision for a shared path on the western side of Parklands Road, running from the roundabout at the southern end, to the northern extension where the new road will meet Baxter's Track.
<b>Parking</b>	
<b>Locating larger car parks at the perimeter of the site and smaller permanent car parks (10-20) in locations related to specific uses.</b>	Permanent car parking spaces are proposed along the western side of Parklands Road, and on both sides at the northern extension, as part of the civil concept design. These are located at the external perimeter of the heritage precinct. These spaces would be utilised by those visiting the Mt Penang Gardens and Waterfall Café, along with those working at the site or making use of the off-leash dog park.
<b>Ensuring car parks and overflow parking is shaded and screened with appropriate planting so that their visual presence is managed appropriately.</b>	<p>Planters with trees are proposed to be interspersed between car parking spaces along Parklands Road. The landscape design is currently in development which will provide more detail on this element of the proposed works.</p> <p>A number of other landscaping options have been discussed to assist in the reduction of visual impacts, as part of the design development, such as flush kerbs, roadside plantings and grass swales alongside WSUD.</p>
<b>Limiting lengths of on-street parking.</b>	Details regarding timing of on-street parking has not been included in the civil concept design.
<b>Landscape and open space</b>	
<b>Provide a high quality open space framework consisting of new</b>	The proposed works will contribute towards this through the establishment of defined and accessible pedestrian and bicycle paths alongside Parklands Road.



Development control	Assessment and compliance
<b>public streets, avenues, and parks that encourage pedestrian activity.</b>	Parklands Road is to be extended north to meet Baxter's Track.
<b>Design guidelines</b>	
<b>Basic infrastructure and services, such as water, sewer, stormwater, power, telephone lines, gas and roads are outlined and to be delivered in accordance with the referenced servicing strategy reports.</b>	This control is outside of the scope of a heritage impact assessment.
<b>Council will only consent to development where road infrastructure is in place that is a standard acceptable to Council to service a development.</b>	The project is progressing as an REF, meaning the approving authority will be HCCDC. However, consultation regarding services and infrastructure is being undertaken with Central Coast Council as they will be the future owners of this infrastructure.
<b>The impact of development on the existing stormwater, water supply, sewerage and energy supply infrastructure is to be minimised through appropriate site planning, in particular in relation to the conserved bushland areas and watercourses.</b>	The proposed civil concept design for Parklands Road include provision for new water, sewerage, stormwater and electricity services as part of infrastructure upgrades for the site's adapting to larger visitor numbers.
<b>Soil and water management measures should be minimise and control soil erosions and sediment transport.</b>	The proposed civil concept design for Parklands Road does include some provision for trafficable permeable pavement and feature planters with trees and passive irrigation from road runoff as part of car parking. The landscape design will explore this further, for example through the use of WSUD. Mitigation measures and recommendations will be made as part of this report regarding appropriate materials that would aid with soil and water management.
<b>Development is to be designed to ensure maximum rainwater infiltration on site by minimising paved areas and providing stormwater drainage systems that promote natural infiltration.</b>	As part of preliminary advice provided during the development of the concept design, WSUD has been promoted by a number of parties including Biosis, Heritage NSW and the project landscape architect consultant. Proposed stormwater lines in the civil concept design for Parklands Road include leading stormwater into the large water feature west of Parklands Road behind the Waterfall Café.
<b>All streets and paths should be lined with tree planting. The scale and character of the planting may vary for each precinct to give local identity.</b>	The proposed civil concept design for Parklands Road includes provision for planters featuring trees interspersed between car parking spaces. Further detail on plantings will be developed as part of the landscape design. Mitigation measures and recommendations will be made as part of this report regarding tree plantings adjacent to streets and pathways.
<b>Native species indigenous to the area should be used where</b>	Details of planting species is not presented in the proposed civil concept design for Parklands Road, but is likely to be explored as part of the detailed landscape

Development control	Assessment and compliance
<b>practicable. Invasive exotic species should be avoided particularly in close proximity to the conserved bushlands.</b>	design. The use of native plantings has been recommended as part of the ADDA. <sup>114</sup>
<b>Unit paving is standard for all footpaths.</b>	The proposed civil concept design for Parklands Road does not specify materials for the shared pathway. This will be explored as part of the landscape design. Mitigation measures and recommendations will be made as part of this report regarding footpath paving.
<b>Accent paving is required at intersections of pedestrian and cycleway networks.</b>	The proposed civil concept design for Parklands Road does not specify materials for the shared pathway. This will be explored as part of the landscape design. Mitigation measures and recommendations will be made as part of this report regarding footpath paving.
<b>All street furniture (bins, bollards, street signs, street lighting, benches, drinking fountains, bus shelters etc.) are to be coordinated with CCRDC [HCCDC].</b>	The proposed civil concept design for Parklands Road does not include details regarding street furniture. This will be explored as part of the landscape design. Mitigation measures and recommendations will be made as part of this report regarding street furniture.
<b>All information, directional and identification signs are to be coordinated with CCRDC [HCCDC].</b>	The proposed civil concept design for Parklands Road does not include details regarding signage. This will be explored as part of the landscape design. Mitigation measures and recommendations will be made as part of this report regarding signage.
<b>Traffic control signs should be limited to those essential for traffic and parking control.</b>	The proposed civil concept design for Parklands Road does not include details regarding traffic control signage. This will be explored as part of the landscape design. Mitigation measures and recommendations will be made as part of this report regarding traffic control signage.
<b>Street lighting should be coordinated and standardised through Mount Penang.</b>	The proposed civil concept design for Parklands Road does not include details regarding street lighting. This will be explored as part of the landscape design. Mitigation measures and recommendations will be made as part of this report regarding street lighting.
<b>On major pedestrian routes and in key public spaces such as the village greens, the Mount Penang Gardens and the sporting precinct pedestrian lighting of the footpaths is to be provided.</b>	The proposed civil concept design for Parklands Road does not include details regarding footpath lighting. This will be explored as part of the landscape design. Mitigation measures and recommendations will be made as part of this report regarding footpath lighting.
<b>The Festival / Gardens Precinct is to be a pedestrian-priority environment with access for servicing and parking limited to the periphery, including Parklands Road and Baxter Track.</b>	The proposed civil concept design for Parklands Road meets this control through the establishment of car parking spaces along Parklands Road.

<sup>114</sup> (Biosis Pty Ltd 2022a)

Development control	Assessment and compliance
<b>Permanent car parking is to be provided in designated areas at the periphery of the [Festival / Gardens] precinct and in adjacent precincts to protect the amenity of the gardens.</b>	The proposed civil concept design for Parklands Road meets this control through the establishment of car parking spaces along Parklands Road, which is considered the periphery of the Festival / Garden Precinct.
<b>The visual impact of car parking when viewed from the gardens should be minimised through screening.</b>	The proposed civil concept design for Parklands Road does not include details regarding further plantings outside of the planters featuring trees interspersed between parking spaces. However, the use of tree screening along the western side of Parklands Road would disrupt the views within the item and between precincts. Plantings will be explored as part of the landscape design. A number of landscaping options have been discussed as part of the design development which would achieve this, such as flush kerbs, roadside plantings and grass swales alongside WSUD. Mitigation measures and recommendations will be made as part of this report regarding plantings.
<b>The Baxter's Track Precinct is predominantly a pedestrian environment, similar to the Heritage Precinct, where access for vehicles is limited to the periphery.</b>	The proposed extension of Parklands Road through the Baxter's Track Mixed-use Precinct does not necessarily meet this control. However, it does provide a simple, minimalised and accessible link between the Heritage Precinct and the Festivals /Gardens Precinct with the Baxter's Track Mixed-Use Precinct. Mitigation measures and recommendations will be made as part of this report regarding limiting further vehicle access through The Baxter's Track Mixed-Use Precinct.
<b>Car parking is provided in designated parking around the periphery of the [Baxter's Track] precinct, the area accessed via The Avenue, Parklands Road and Baxter's Track.</b>	The proposed civil concept design for Parklands Road includes designated parallel parking along the extended Parklands Road through the Baxter's Track Mixed-Use Precinct in addition to more condensed perpendicular parking in other locations on Parklands Road. The reduction in car parking spaces created by the parallel parking method, while not necessarily meeting this control, minimises the number of cars that can park within the Baxter's Track mixed-Use Precinct.
<b>Additional landscaping features [in the Baxter's Track Precinct] are to be provided as part of the Street Hierarchy principles, which relate specifically to the quality and design of the streetscape.</b>	The proposed civil concept design for Parklands Road largely complies with the suggested configuration of secondary roads (Photo 2). The proposed design includes planters with trees interspersed between parallel parking spaces, with a single shared path on the western side of the road and parking spaces within the Baxter's Track Mixed-Use Precinct. Further detail on landscaping is being developed as part of the landscape design. Mitigation measures and recommendations will be made as part of this report regarding landscaping features in the area of works within the Baxter's Track Mixed-Use Precinct.
<b>Secondary access [to the Heritage Precinct] can be gained via Parklands Road along the western boundary of the precinct, however, this is to be avoided where possible.</b>	The proposed civil concept design for Parklands Road does not extend into the Heritage Precinct except for the junction of Parklands Road and McCabe Road. The inclusion of parking along Parklands Road will encourage visitors to park in this location and use pedestrian access means to enter the Heritage Precinct from Parklands Road.
<b>Car parking [in the Heritage</b>	The proposed civil concept design for Parklands Road does not extend into the

Development control	Assessment and compliance
<b>Precinct] is to be provided in designated parking areas so that the amenity of the pedestrian environment can be maintained.</b>	Heritage Precinct except for the junction of Parklands Road and McCabe Road. The inclusion of designated parking along Parklands Road will encourage visitors to park in this location and use pedestrian access means to enter the Heritage Precinct from Parklands Road.
<b>Additional landscaping features [in the Heritage Precinct] are to be provided as part of the Street Hierarchy principles, which relate specifically to the quality and design of the streetscape.</b>	The proposed civil concept design for Parklands Road does not extend into the Heritage Precinct except for the junction of Parklands Road and McCabe Road. The proposed concept design in this location includes little detail regarding landscaping features, but this is being developed as part of the landscape design. Mitigation measures and recommendations will be made as part of this report regarding landscaping features in the area of works within the Heritage Precinct.

## 7.4 Assessment of impacts

A discussion, assessment and mitigation of impacts from the Stage 1 - Parklands Road concept design to heritage items located within or adjacent to the study area is presented in Table 9.



**Table 9 Assessment of impacts from the Stage 1 concept designs to heritage items either within or adjacent to the study area**

Heritage item	Significance	Discussion	Assessment	Mitigation measures
<b>Mount Penang Parklands (SHR Item no. 01337)</b>	State	There will be no adverse direct impacts to the significant built elements of the item as part of the proposed civil concept designs for Parklands Road.	No adverse direct impact to significant built elements.	N/A
		There will be no adverse indirect impacts to built heritage as part of the proposed civil concept designs for Parklands Road	No adverse indirect impact to significant built elements.	
		There is potential for moderate to major direct impacts to heritage tree planting groups (L2: Scribbly Gum group (high value), L3: Poplar & Brushbox Avenue (moderate value) and L5: Mature cultural plantings along western edge of school (high value)) as part of the road works and subsurface services presented in the proposed civil concept designs for Parklands Road.	Moderate to major adverse direct impact to heritage tree plantings if mitigation measures not implemented.	Options for reducing or minimising these impacts have been provided as part of an Arboricultural Impact Assessment. These include: <ul style="list-style-type: none"> <li>• Use of tree sensitive design for roads and paths.</li> <li>• Undertake non-destructive root exploration for heritage planting trees likely to be impacted by works.</li> <li>• Use of direction drilling underboring for services which would enter heritage tree planting TPZs.</li> <li>• Develop and implement a Tree Protection Plan.</li> </ul>
		The works presented in the proposed civil concept designs for Parklands Road will have a minor adverse indirect impact to the current views within the Heritage Precinct and Festivals / Gardens Precinct, and moderate indirect impact to current views within the Baxter's Track Mixed-use Precinct. However, the proposed civil concept design of the extended portion of Parklands Road in this precinct is largely in accordance with the suggested road configuration for secondary roads in the GDCP. The landscape design is currently in development, which will	Minor adverse indirect impact to landscape in the Heritage Precinct and Festivals / Gardens Precinct. Moderate indirect impact to landscape in the Baxter's Track Mixed-use Precinct.	Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works. Include sensitive and complementary paving, plantings and kerbing as part of landscape design.

Heritage item	Significance	Discussion	Assessment	Mitigation measures
		provide further detail regarding landscaping and materials to be used for the proposed works.		
		The works presented in the proposed civil concept designs for Parklands Road will have a positive impact from the works. The upgrades will improve the site's amenities, which will support ongoing use by public and private organisations, and also encourage visitors to explore and walk the site on foot through the use of the shared path and safer roads.	Direct and indirect positive impact to overall ongoing use of the site	N/A
<b>Mount Penang Parklands Heritage Conservation Area (Gosford LEP 2014, Item no. C1)</b>	State	See above discussion for Mount Penang Parklands (SHR Item no. 01337)	See above assessment for Mount Penang Parklands (SHR Item no. 01337)	See above mitigation measures for Mount Penang Parklands (SHR Item no. 01337)
<b>Mount Penang Parklands (HCCDC Section 170 Heritage and Conservation Register)</b>	State	See above discussion for Mount Penang Parklands (SHR Item no. 01337)	See above assessment for Mount Penang Parklands (SHR Item no. 01337)	See above mitigation measures for Mount Penang Parklands (SHR Item no. 01337)
<b>Girrakool School – Curtilage (State Government S170 Heritage and Conservation Register Item no. 5064378)</b>	Local	No works presented in the proposed civil concept designs for Parklands Road are proposed within or in the vicinity of this item.	No adverse direct nor indirect impacts	N/A
<b>Remnant farm buildings – the barn, storage shed and dairy (Gosford LEP 2014, Item no. 61)</b>	Local	No works presented in the proposed civil concept designs for Parklands Road are proposed within or in the vicinity of this item.	No adverse direct nor indirect impacts	N/A
<b>Mature cultural</b>	Local	No works presented in the proposed civil concept	No adverse direct	N/A

Heritage item	Significance	Discussion	Assessment	Mitigation measures
<b>plantings (Gosford LEP 2014, Item no. 72)</b>		designs for Parklands Road are proposed within or in the vicinity of this item.	nor indirect impacts	
<b>Mature cultural plantings, including coral trees, brush box, camphor laurels, white poplars, hoop pines, an oak and a larch (Gosford LEP 2014, Item no. 73)</b>	Local	There is potential for moderate to major adverse direct impacts to heritage tree planting groups (L2: Scribbly Gum group (high value), L3: Poplar & Brushbox Avenue (moderate value) and L5: Mature cultural plantings along western edge of school (high value)) as part of road works and subsurface services.	Moderate to major adverse direct impact to heritage tree plantings if mitigation measures not implemented.	Options for reducing or minimising these impacts have been provided as part of an Arboricultural Impact Assessment. These include: <ul style="list-style-type: none"> <li>• Use of tree sensitive design for roads and paths.</li> <li>• Undertake non-destructive root exploration for heritage planting trees likely to be impacted by works.</li> <li>• Use of direction drilling underboring for services which would enter heritage tree planting TPZs.</li> <li>• Develop and implement a Tree Protection Plan.</li> </ul>
<b>Dormitories—“Carinya”, “Sobraon”, “Walpole”, “Vernon” and “The Wood Building” (Gosford LEP 2014, Item no. 62)</b>	State	The works presented in the proposed civil concept designs for Parklands Road will have a minor adverse indirect impact to the current views within the Heritage Precinct from the heritage buildings east of Parklands Road. The landscape design is currently in development, which will provide further detail regarding landscaping and materials to be used for the proposed works.	Minor adverse indirect impact to landscape in the Heritage Precinct and Festivals / Gardens Precinct.	Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works. Include sensitive and complementary paving, plantings and kerbing as part of landscape design.
<b>Administration and service buildings—maintenance store, cultural centre, admissions/operations annexe and theatre, school house, Girrakool House, occasional child care,</b>	State	The works presented in the proposed civil concept designs for Parklands Road will have a minor adverse indirect impact to the current views within the Heritage Precinct from the heritage buildings east of Parklands Road. The landscape design is currently in development, which will provide further detail regarding landscaping and materials to be used for the proposed works.	Minor adverse indirect impact to landscape in the Heritage Precinct and Festivals / Gardens Precinct.	Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works. Include sensitive and complementary paving, plantings and kerbing as part of landscape design.

Heritage item	Significance	Discussion	Assessment	Mitigation measures
<b>flats (Gosford LEP 2014, Item no. 63)</b>				
<b>Residential buildings—six residential cottages, deputy superintendent's cottage (Gosford LEP 2014, Item no. 64)</b>	State	No works presented in the proposed civil concept designs for Parklands Road are proposed within or in the vicinity of this item.	No adverse direct nor indirect impacts	N/A
<b>Service and amenity buildings—art room and ablutions block, former officers' dining room, dining room, main kitchen and laundry (Gosford LEP 2014, Item no. 65)</b>	Local	The works presented in the proposed civil concept designs for Parklands Road will have a minor adverse indirect impact to the current views within the Heritage Precinct from the heritage buildings east of Parklands Road. The landscape design is currently in development, which will provide further detail regarding landscaping and materials to be used for the proposed works.	Minor adverse indirect impact to landscape in the Heritage Precinct and Festivals / Gardens Precinct.	Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works. Include sensitive and complementary paving, plantings and kerbing as part of landscape design.
<b>McCabe Complex—two cottages, McCabe Conference Centre (Gosford LEP 2014, Item no. 66)</b>	State	The works presented in the proposed civil concept designs for Parklands Road will have a moderate adverse indirect impact to current views towards the Baxter's Track Mixed-use Precinct from this item. However, the proposed civil concept design of the extended portion of Parklands Road in this precinct is largely in accordance with the suggested road configuration for secondary roads in the GDCP. The landscape design is currently in development, which will provide further detail regarding landscaping and materials to be used for the proposed works.	Moderate adverse indirect impact to landscape in the Baxter's Track Mixed-use Precinct.	Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works. Include sensitive and complementary paving, plantings and kerbing as part of landscape design.
<b>Sports fields—three sports fields, sports oval (Gosford LEP 2014, Item no. 67)</b>	State	The works presented in the proposed civil concept designs for Parklands Road will have a minor adverse indirect impact to the current views within the Heritage Precinct from sports fields east of Parklands Road. The	Minor adverse indirect impact to landscape in the Heritage Precinct	Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works.



Heritage item	Significance	Discussion	Assessment	Mitigation measures
		landscape design is currently in development, which will provide further detail regarding landscaping and materials to be used for the proposed works.	and Festivals / Gardens Precinct.	Include sensitive and complementary paving, plantings and kerbing as part of landscape design.
<b>Built landscape elements—gazebo, stone walls, sculpture park (Gosford LEP 2014, Item no. 68)</b>	Local	No works presented in the proposed civil concept designs for Parklands Road are proposed within or in the vicinity of this item.	No adverse direct nor indirect impacts	N/A
<b>Old pine tree group (Gosford LEP 2014, Item no. 69)</b>	Local	No works presented in the proposed civil concept designs for Parklands Road are proposed within or in the vicinity of this item.	No adverse direct nor indirect impacts	N/A
<b>Dam (Gosford LEP 2014, Item no. 70)</b>	Local	The proposed civil concept design for Parklands Road has intentionally avoided works which would physically damage the structural integrity of earthen walls of the dam adjacent to Parklands Road. While there is likely to be an increase in human activity in the vicinity of the dam, it is unlikely that this will adversely impact the flora or fauna associated with the dam.	No adverse direct impacts	N/A
		The works presented in the proposed civil concept designs for Parklands Road will have a minor adverse indirect impact to the current views within the Festivals / Gardens Precinct. The landscape design is currently in development, which will provide further detail regarding landscaping and materials to be used for the proposed works.	Minor adverse indirect impact to landscape in the Heritage Precinct and Festivals / Gardens Precinct.	Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works. Include sensitive and complementary paving, plantings and kerbing as part of landscape design.
<b>White poplar avenue (Gosford LEP 2014, Item no. 71)</b>	Local	There is potential for moderate to major adverse direct physical impacts to the heritage planting group L3: Poplar & Brushbox Avenue (moderate value) as part of road works and subsurface services.	Moderate to major adverse direct impact to heritage tree plantings if mitigation measures not	Options for reducing or minimising these impacts have been provided as part of an Arboricultural Impact Assessment. These include: <ul style="list-style-type: none"> <li>Use of tree sensitive design for roads and paths.</li> </ul>

Heritage item	Significance	Discussion	Assessment	Mitigation measures
<b>Two groups of scribbly gums (Gosford LEP 2014, Item no. 74)</b>	Local		implemented.	<ul style="list-style-type: none"> <li>Undertake non-destructive root exploration for heritage planting trees likely to be impacted by works.</li> <li>Use of direction drilling underboring for services which would enter heritage tree planting TPZs.</li> <li>Develop and implement a Tree Protection Plan.</li> </ul>
		The works presented in the proposed civil concept designs for Parklands Road will have a minor adverse indirect impact to the current views within the Heritage Precinct and Festivals / Gardens Precinct. The landscape design is currently in development, which will provide further detail regarding landscaping and materials to be used for the proposed works.	Minor adverse indirect impact to landscape in the Heritage Precinct and Festivals / Gardens Precinct.	<p>Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works.</p> <p>Include sensitive and complementary paving, plantings and kerbing as part of landscape design.</p>
		There is potential for moderate to major adverse direct physical impacts to the heritage tree planting group L2: Scribbly Gum group (high value) as part of road works and subsurface services.	Moderate to major adverse direct impact to heritage tree plantings if mitigation measures not implemented.	<p>Options for reducing or minimising these impacts have been provided as part of an Arboricultural Impact Assessment. These include:</p> <ul style="list-style-type: none"> <li>Use of tree sensitive design for roads and paths.</li> <li>Undertake non-destructive root exploration for heritage planting trees likely to be impacted by works.</li> <li>Use of direction drilling underboring for services which would enter heritage tree planting TPZs.</li> <li>Develop and implement a Tree Protection Plan.</li> </ul>
		The works presented in the proposed civil concept designs for Parklands Road will have a minor adverse indirect impact to the current views within the Heritage	Minor adverse indirect impact to landscape in the	Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of

Heritage item	Significance	Discussion	Assessment	Mitigation measures
		Precinct and Festivals / Gardens Precinct. The landscape design is currently in development, which will provide further detail regarding landscaping and materials to be used for the proposed works.	Heritage Precinct and Festivals / Gardens Precinct.	works. Include sensitive and complementary paving, plantings and kerbing as part of landscape design.
<b>Sports field perimeter brush box and eucalypt plantings (Gosford LEP 2014, Item no. 75)</b>	Local	The works presented in the proposed civil concept designs for Parklands Road will have a minor adverse indirect impact to the current views within the Heritage Precinct. The landscape design is currently in development, which will provide further detail regarding landscaping and materials to be used for the proposed works.	Minor adverse indirect impact to landscape in the Heritage Precinct and Festivals / Gardens Precinct.	Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works. Include sensitive and complementary paving, plantings and kerbing as part of landscape design.
<b>Eastern bushland (Gosford LEP 2014, Item no. 76)</b>	Local	No works presented in the proposed civil concept designs for Parklands Road are proposed within or in the vicinity of this item.	No adverse direct nor indirect impacts	N/A
<b>Entry drive with perimeter brush box and eucalypt plantings (Gosford LEP 2014, Item no. 77)</b>	State	No works presented in the proposed civil concept designs for Parklands Road are proposed within or in the vicinity of this item.	No adverse direct nor indirect impacts	N/A
<b>International Sculpture Symposium II (1988) (Gosford LEP 2014, Item no. 270)</b>	Local	No works presented in the proposed civil concept designs for Parklands Road are proposed within or in the vicinity of this item.	No adverse direct nor indirect impacts	N/A
<b>International Sculpture Symposium (1987) (Gosford LEP 2014, Item no. 271)</b>	Local	No works presented in the proposed civil concept designs for Parklands Road are proposed within or in the vicinity of this item.	No adverse direct nor indirect impacts	N/A

## 7.5 Statement of heritage impact

The proposed civil concept design for Stage 1 - Parklands Road will involve widening of the road in a number of locations, establishment of designated perpendicular and parallel parking areas with planters featuring trees interspersed between parking spaces, shared path alongside the road or parking spaces, and new water, sewerage and electrical services. The works are part of a larger program to upgrade the infrastructure of Mount Penang Parklands to ensure it is fit for purpose in its changing role in the local and regional community. At the time of preparation of this report only the civil and landscape concept designs for Parklands Road were available (Appendix 2).

The study area is contained within the Mount Penang Parklands, which is a site of State heritage significance listed on the SHR (Item no. 01337). A number of other items of State and local heritage significance are associated with Mount Penang Parklands. The site was used as a boys reformatory school from 1911, with the boys involved in the construction and establishment of all of the early built elements. Parklands Road was established before 1921, while McCabe Road was in place by 1942. The methods and processes used for the education and reform of the boys changed over time from a severe military style to vocational training and rehabilitation.

The proposed civil concept design for Stage 1 - Parklands Road will change the width and configuration of Parklands Road through the establishment of additional and wider lanes and car parking spaces. Similarly, a new shared path will formalise pedestrian access. Services are also proposed which would require subsurface excavation. There will be no adverse direct impacts to the significant built elements of the site as part of these proposed works.

The works presented in the proposed civil concept designs for Stage 1 - Parklands Road will have a positive impact from the upgrade to infrastructure. The upgrades will improve the site's amenities, which will support ongoing use by public and private organisations, and also encourage visitors to explore and walk the site on foot through the use of the shared path and safer roads.

There is potential for moderate to major adverse direct physical impacts to heritage tree planting groups (L2: Scribbly Gum group (high value), L3: Poplar & Brushbox Avenue (moderate value) and L5: Mature cultural plantings along western edge of school (high value)) as part of road works and subsurface services. However, options for reducing or minimising these impacts have been provided as part of an Arboricultural Impact Assessment.

The proposed works will have a minor adverse indirect impact to the current views within the Heritage Precinct and Festivals / Gardens Precinct, and moderate adverse indirect impact to current views within the Baxter's Track Mixed-use Precinct. However, the proposed civil concept design of the extended portion of Parklands Road in this precinct is largely in accordance with the suggested road configuration for secondary roads in the GDCP. The landscape design is currently in development, which will provide further detail regarding landscaping and materials to be used for the proposed works.

Overall, the proposed civil works for Stage 1 - Parklands Road as they appear in the concept designs would have an acceptable level of impact to the State heritage significance of the item, and would not result in a material effect on the SHR values or local heritage values. However, this is only if all of the mitigation measures and recommendations of this report are implemented.



## 8 Mitigation recommendations

A number of mitigation measures are recommended in order to reduce or minimise the impacts of the proposed Stage 1 civil concept design on the heritage elements within and surrounding the Stage 1 study area. For the purpose of summarising the recommendations, these are presented in Table 10. They have been developed with reference to the policies of the CMP, the Arboricultural Impact Assessment, and controls of the GDCP, as well as best practice and the Burra Charter.<sup>115</sup> Regarding heritage plantings, the recommended mitigation measures have been taken from the Arboricultural Impact Assessment (Appendix 3), which should be referred to concurrently with this report.

**Table 10 Recommended mitigation measures to reduce or minimise impacts to heritage elements within and in the vicinity of the Stage 1 study area**

Heritage element	Mitigation measure
<b>Landscape items</b>	
<b>L2: Scribbly Gum group (high value)</b>	Use of tree sensitive design for roads and paths as per the Arboricultural Impact Assessment. This may include: <ul style="list-style-type: none"> <li>• Tree transplanting.</li> <li>• Screw Piling.</li> <li>• Cantilevers.</li> <li>• Structural Confinement Cells.</li> <li>• Raised paths (build-overs).</li> <li>• Porous paving.</li> </ul> Detail regarding the above options is provided in the Arboricultural Impact Assessment (Appendix 3).
	Undertake non-destructive root exploration for heritage planting trees likely to be impacted by works. This activity will determine the foreseeable tree viability and if tree sensitive design will suffice or if tree removal will be required. This work is to be undertaken by an appropriately qualified and experienced Arborist. Detail regarding non-destructive root exploration is provided in the Arboricultural Impact Assessment (Appendix 3).
	Develop and adopt a Tree Protection Plan in accordance with Australian Standard 4970 <i>Protection of trees on development sites</i> . <sup>116</sup> This document will guide earthworks associated with the works for Parklands Road through the establishment and implementation of best practice tree protection methods. An appropriately qualified and experienced Arborist should be engaged to complete this work.
	Retain current kerb alignment on Parklands Road and McCabe Road to limit damage to root systems for trees immediately adjacent to these roads.
<b>L3: Poplar &amp; Brushbox Avenue (moderate value)</b>	Use of tree sensitive design for roads and paths as per the Arboricultural Impact Assessment. This may include: <ul style="list-style-type: none"> <li>• Tree transplanting.</li> <li>• Screw Piling.</li> </ul>

<sup>115</sup> (TKD Architects 2020, Active Green Services 2022, Australia ICOMOS 2013)

<sup>116</sup> (Standards Australia 2009)

Heritage element	Mitigation measure
	<ul style="list-style-type: none"> <li>• Cantilevers.</li> <li>• Structural Confinement Cells.</li> <li>• Raised paths (build-overs).</li> <li>• Porous paving.</li> </ul> <p>Detail regarding the above options is provided in the Aboricultural Impact Assessment (Appendix 3).</p> <p>Undertake non-destructive root exploration for heritage planting trees likely to be impacted by works. This activity will determine the foreseeable tree viability and if tree sensitive design will suffice or if tree removal will be required. This work is to be undertaken by an appropriately qualified and experienced Arborist. Detail regarding non-destructive root exploration is provided in the Aboricultural Impact Assessment (Appendix 3).</p> <p>Use of horizontal directional drilling / underboring for services which would enter heritage tree planting TPZs. This method will significantly reduce the damage that would otherwise be caused to root systems from open trenching for services. This work should be supervised by an appropriately qualified and experienced Arborist. Detail regarding the methodology of this process is provided in the Aboricultural Impact Assessment (Appendix 3).</p> <p>Develop and adopt a Tree Protection Plan in accordance with Australian Standard 4970 <i>Protection of trees on development sites</i>.<sup>117</sup> This document will guide earthworks associated with the works for Parklands Road through the establishment and implementation of best practice tree protection methods. An appropriately qualified and experienced Arborist should be engaged to complete this work.</p>
<b>L5: Mature cultural plantings along western edge of school (high value)</b>	<p>Use of tree sensitive design for roads and paths as per the Arboricultural Impact Assessment. This may include:</p> <ul style="list-style-type: none"> <li>• Tree transplanting.</li> <li>• Screw Piling.</li> <li>• Cantilevers.</li> <li>• Structural Confinement Cells.</li> <li>• Raised paths (build-overs).</li> <li>• Porous paving.</li> </ul> <p>Detail regarding the above options is provided in the Aboricultural Impact Assessment (Appendix 3).</p> <p>Undertake non-destructive root exploration for heritage planting trees likely to be impacted by works. This activity will determine the foreseeable tree viability and if tree sensitive design will suffice or if tree removal will be required. This work is to be undertaken by an appropriately qualified and experienced Arborist. Detail regarding non-destructive root exploration is provided in the Aboricultural Impact Assessment (Appendix 3).</p> <p>Develop and adopt a Tree Protection Plan in accordance with Australian Standard 4970 <i>Protection of trees on development sites</i>.<sup>118</sup> This document will guide earthworks associated with the works for Parklands Road through the establishment and implementation of best practice tree protection methods. An appropriately qualified and experienced Arborist should be engaged to complete this work.</p>

<sup>117</sup> (Standards Australia 2009)

<sup>118</sup> (Standards Australia 2009)

Heritage element	Mitigation measure
<b>Landscape precincts</b>	
<b>Heritage Precinct</b>	<p>Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works. The photographic archival recording must be undertaken in accordance with the following Heritage NSW guidelines:</p> <ul style="list-style-type: none"> <li>• <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i><sup>119</sup></li> <li>• <i>How to Prepare Archival Records of Heritage Items</i><sup>120</sup></li> </ul> <p>Include sensitive and complementary materials, elements and colours as part of landscape design. These may include (but are not excluded to) the following:</p> <ul style="list-style-type: none"> <li>• Use of grass swales adjacent to Parklands Road, McCabe Road and parking/shared path areas.</li> <li>• Use of flush concrete exposed aggregate kerbing, as exposed aggregate material is already in use at the southern end of Parklands Road. This would assist in retaining the rural character of the Heritage Precinct. Avoid use of standard extruded kerb and gutter.</li> <li>• Use of WSUD to assist with natural drainage and retain the rural character of the Heritage Precinct.</li> <li>• Use of differing materials for perpendicular and parallel parking spaces adjacent to Parklands Road to reduce the visual effect of the road widening works. For example, timber borders for parking spaces and wood chip as a surface would retain the rural character of the item. This method would also assist with drainage and avoid washing away of other materials types such as gravel.</li> <li>• Use of native plantings which complement the existing native and exotic vegetation in the study area and vicinity.</li> <li>• Use of simple and minimal street and pedestrian lighting which does not distract from the landscape and retains the rural character of the item. For example, bollard lighting could be utilised to maintain safety but also remain visually unobtrusive.</li> <li>• Trees used in the planters between parking spaces should provide shade and reflect the current trees which line Parklands Road. The planter boxes should be made of suitable material that is consistent with the rural nature of the site.</li> <li>• Traffic signage should be minimal, limited to essential signage for safety and vehicle management.</li> <li>• Use of unit paving and accent paving for the shared path as per the GDCP.</li> <li>• Street furniture should be simple and reflect the materials, colours and forms of the current suite of street furniture.</li> <li>• Information and directional signage should be simple, accessible and consistent with the existing signage within the site.</li> <li>• Heritage interpretation should be incorporated with any new signage, and should be consistent across the site.</li> </ul>
<b>Festivals / Gardens Precinct</b>	<p>Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works. The photographic archival recording must be undertaken in accordance with the following Heritage NSW guidelines:</p> <ul style="list-style-type: none"> <li>• <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i><sup>121</sup></li> <li>• <i>How to Prepare Archival Records of Heritage Items</i><sup>122</sup></li> </ul>

<sup>119</sup> (Heritage Office 2006)

<sup>120</sup> (Heritage Office 1998)

<sup>121</sup> (Heritage Office 2006)

<sup>122</sup> (Heritage Office 1998)

Heritage element	Mitigation measure
	<p>Include sensitive and complementary materials, elements and colours as part of landscape design. These may include (but are not excluded to) the following:</p> <ul style="list-style-type: none"> <li>• Use of grass swales adjacent to Parklands Road, McCabe Road and parking/shared path areas.</li> <li>• Use of flush concrete exposed aggregate kerbing, as exposed aggregate material is already in use at the southern end of Parklands Road. This would assist in retaining the rural character of the Festival / Gardens Precinct. Avoid use of standard extruded kerb and gutter.</li> <li>• Use of WSUD to assist with natural drainage and retain the rural character of the Festival / Gardens Precinct.</li> <li>• Use of differing materials for perpendicular and parallel parking spaces adjacent to Parklands Road to reduce the visual effect of the road widening works. For example, timber borders for parking spaces and wood chip as a surface would retain the rural character of the item. This method would also assist with drainage and avoid washing away of other materials types such as gravel.</li> <li>• Use of native plantings which complement the existing native and exotic vegetation in the study area and vicinity.</li> <li>• Use of simple and minimal street and pedestrian lighting which does not distract from the landscape and retains the rural character of the item. For example, bollard lighting could be utilised to maintain safety but also remain visually unobtrusive.</li> <li>• Trees used in the planters between parking spaces should provide shade and reflect the current trees which line Parklands Road. The planter boxes should be made of suitable material that is consistent with the rural nature of the site.</li> <li>• Use low level vegetation as screening so as to partially obscure parked vehicles from views within the Festival / Gardens Precinct towards Parklands Road.</li> <li>• Traffic signage should be minimal, limited to essential signage for safety and vehicle management.</li> <li>• Use of unit paving and accent paving for the shared path as per the GDCP.</li> <li>• Street furniture should be simple and reflect the materials, colours and forms of the current suite of street furniture.</li> <li>• Information and directional signage should be simple, accessible and consistent with the existing signage within the site.</li> <li>• Heritage interpretation should be incorporated with any new signage, and should be consistent across the site.</li> </ul>
<b>Baxter's Track Mixed-use Precinct</b>	<p>Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works. The photographic archival recording must be undertaken in accordance with the following Heritage NSW guidelines:</p> <ul style="list-style-type: none"> <li>• <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i><sup>123</sup></li> <li>• <i>How to Prepare Archival Records of Heritage Items</i><sup>124</sup></li> </ul> <p>Include sensitive and complementary materials, elements and colours as part of landscape design. These may include (but are not excluded to) the following:</p> <ul style="list-style-type: none"> <li>• Use of grass swales adjacent to Parklands Road, McCabe Road and parking/shared path areas.</li> <li>• Use of flush concrete exposed aggregate kerbing, as exposed aggregate material is already in use at the southern end of Parklands Road. This would assist in retaining the rural</li> </ul>

<sup>123</sup> (Heritage Office 2006)

<sup>124</sup> (Heritage Office 1998)



Heritage element	Mitigation measure
	<p>character of the Baxter's Track Mixed-use Precinct. Avoid use of standard extruded kerb and gutter.</p> <ul style="list-style-type: none"> <li>• Use of WSUD to assist with natural drainage and retain the rural character of the Baxter's Track Mixed-use Precinct.</li> <li>• Use of differing materials for perpendicular and parallel parking spaces adjacent to Parklands Road to reduce the visual effect of the road widening works. For example, timber borders for parking spaces and wood chip as a surface would retain the rural character of the item. This method would also assist with drainage and avoid washing away of other materials types such as gravel.</li> <li>• Use of native plantings which complement the existing native and exotic vegetation in the study area and vicinity.</li> <li>• Use of simple and minimal street and pedestrian lighting which does not distract from the landscape and retains the rural character of the item. For example, bollard lighting could be utilised to maintain safety but also remain visually unobtrusive.</li> <li>• Trees used in the planters between parking spaces should provide shade and reflect the current trees which line Parklands Road. The planter boxes should be made of suitable material that is consistent with the rural nature of the site.</li> <li>• Use low level vegetation as screening so as to partially obscure parked vehicles from views within the Festival / Gardens Precinct towards Parklands Road.</li> <li>• Traffic signage should be minimal, limited to essential signage for safety and vehicle management.</li> <li>• Use of unit paving and accent paving for the shared path as per the GDCP.</li> <li>• Street furniture should be simple and reflect the materials, colours and forms of the current suite of street furniture.</li> <li>• Information and directional signage should be simple, accessible and consistent with the existing signage within the site.</li> </ul>

## 9 Recommendations

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These recommendations have been formulated to respond to client requirements and the significance of the site. They are guided by the ICOMOS *Burra Charter* with the aim of doing as much as necessary to care for the place and make it useable and as little as possible to retain its cultural significance.<sup>125</sup>

### **Recommendation 1 Apply for approval for the works under Section 60 of the Heritage Act**

The proposed civil concept design does not meet the standard or item-specific exemptions under Section 57 of the Heritage Act. Therefore, approval will be required to undertake the works under Section 60 of the Heritage Act. This SoHI and appendices, along with a copy of the CMP including appendices, the proposed plans, and landscape designs should be included in the application to Heritage NSW.

### **Recommendation 2 Reduce or minimise impacts to heritage significance**

The mitigation measures presented in Section 8 should be investigated and implemented in order to reduce impacts of the proposed works to heritage elements within and heritage significance of the item. In summary, these include:

- Use of tree sensitive design for roads and paths as per the Arboricultural Impact Assessment.
- Undertake non-destructive root exploration for heritage planting trees likely to be impacted by works.
- Develop and adopt a Tree Protection Plan in accordance with Australian Standard 4970 *Protection of trees on development sites*.<sup>126</sup>
- Where possible, retain current kerb alignment on Parklands Road and McCabe Road to limit damage to root systems for trees immediately adjacent to these roads.
- Use of horizontal directional drilling/underboring for services which would enter heritage tree planting TPZs.
- Undertake a photographic archival recording of the area of proposed works prior to, during and following completion of works.
- Include sensitive and complementary materials, elements and colours as part of landscape design.

### **Recommendation 3 Heritage interpretation as part of Place Vision works**

Heritage interpretation, which includes information on the Aboriginal cultural landscape and non-Aboriginal use of Mount Penang Parklands, should be part of the Place Vision works being undertaken for the wider Mount Penang Parklands site. Any heritage interpretation should be done in a consistent manner across the site including the Heritage Precinct, Festivals / Gardens Precinct, and Baxter's Track mix-use Precinct. Given the nature of the infrastructure works, the development of interpretation for the site could take place following completion of works, but it must be considered as part of any detailed landscape plans.

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<sup>125</sup> (Australia ICOMOS 2013)

<sup>126</sup> (Standards Australia 2009)

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**Recommendation 4 Heritage induction**

All site workers involved in the proposed works should undertake a heritage induction to ensure they are aware of the heritage values of the study area and legislative requirements and implications for non-compliance.

**Recommendation 5 Unexpected finds procedure**

While the study area has been assessed as holding low archaeological potential for significant remains and relics, an unexpected finds procedure should be developed and adopted to ensure that any unexpected archaeological remains are managed appropriately.

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## Appendices

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## Appendix 1 Heritage inventory sheets

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## Item Details

### Name

Mount Penang Parklands

### Other/Former Names

The Farm Home for Boys, Girrakool , Kariong Juvenile Dentention Centre, Mt Penang Parklands

### Address

Pacific Highway SOMERSBY NSW 2250

### Local Govt Area

Central Coast

### Item Classification

#### Item Type

Landscape

#### Statement Of Significance

### Group Name

#### Item Group

Landscape - Cultural



#### Item Category

Historic Landscape

The Mount Penang Juvenile Justice Centre has been the most important juvenile detention centre in NSW for most of the twentieth century and is a direct continuation of the nineteenth-century system of reformatory training ships. The design of the early buildings, their configuration and the layout of the site itself, as well as its agricultural and pastoral features, its remnant dairy and its landscaping collectively and individually illustrate juvenile penal philosophies and practices of the period and their subsequent evolution over eighty-five years of operation. The location of the Centre is a feature in the historical expansion of the city of Sydney into its rural hinterland and its operations are an element in the development of Gosford and the Central Coast.

Mount Penang also has significance for the local Aboriginal people both pre and post-contact, and during the time when Mt Penang as used as a juvenile detention centre and accommodated a number of Aboriginal detainees for whom the site would have profound associations.

The Centre has notable aesthetic qualities associated with its site and the available views, and layout of the low-scale buildings and the landscaping. The earlier buildings are attractive, human-scaled structures, which, while of an institutional character, utilise colonial homestead architecture appropriate to their setting and construction techniques of particular interest. The earlier buildings reproduce these forms to reinforce the characteristic appearance of the complex, whilst the McCabe Cottages group is an excellent example of the Inter-War Functionalist architectural style.

The siting and relationship of buildings to each other and to the sports fields, paddocks and vistas are all components of the operational requirements and practices of the Centre. These provide technical information regarding juvenile detention and reformatory practices. Mount Penang is very important to the many boys and young men who were detained there over the course of nearly a century. For most detainees, Mt Penang is a place where the unforgettable occurred - experiences that strongly influenced the course of their lives. The place is significant to the many men and women who lived and worked at the former detention centre. For many of these people, it is a place of substantial personal and professional achievement. Mt Penang is also important to the local community as a landmark of historical and aesthetic importance. The place has functioned as a community meeting point, with many links between the wider community and the detainees and staff.

(Source: Mount Penang CMP 2001. Goddan Mackay Logan)

Assessed Significance Type	Endorsed Significance	Date Significance Updated
State	State	6/11/2014

Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	21/0/2000					391
Heritage study		Gosford Heritage Review 1997	65			
Heritage Act - State Heritage Register	19/0/2003		01667	1928	9471	145

Heritage Item ID	Source
5053898	Heritage NSW

Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Pacific Highway	SOMERSBY/NSW/2250	Central Coast	Darkinjung	Gosford	Northumberland	GOSFORD	Primary Address

Description

<b>Designer</b>	<b>Builder/Maker</b>	
Mr James Nangle	Department of Public Works and Services	
<b>Construction Year Start &amp; End</b>	<b>Circa</b>	<b>Period</b>
1912	N0	1901 to 1950
<b>Physical Description</b>	<b>Updated</b>	
<p>Mount Penang Parklands is located west of the sandstone plateau of Penang Mountain. The area and surrounding Central Coast are the traditional lands of the Darkinjung language group of Aboriginal people. 'Kariong' is said to be an Aboriginal word meaning 'meeting place'. Archaeological excavations on Mt.Penang have revealed evidence of cultural Aboriginal sites associated with Hawkesbury sandstone plateaux, such as rock engravings, grinding groove sites and shelters. Common motifs found at rock engraving sites include kangaroos, whales, fish and eels.</p> <p>The Kariong area features temperate rainforest. Trees in the Mt.Penang Parklands vicinity support hollow-dependent native fauna species including nocturnal mammals such as possums and gliders, microbats and some bird species such as parrots, cockatoos and wood ducks. Mature native trees would have been logged in the area in the19th century.</p> <p>For most of the 20th century, the site of the Mt.Penang Parklands was part of a much larger area that accomodated ann institution for the care, control and rehabilitation of delinquent and destitute boys (Government Architect's Office, Heritage Group, 12/2009).</p> <p>The Mt Penang Parklands is made up of 156 hectares of magnificently located land that is being redeveloped by the NSW Government to provide a place for people to work, have fun, or relax. Mt Penang Parklands, a division of the Festival Development Corporation is located on the NSW Central Coast mid-way between Sydney and Newcastle. It is minutes from the Gosford F3 freeway exit.</p> <p>The Parklands are made up of six key areas: Event Park, Retail/Commercial Park, Mt Penang Gardens, Sports Park, Future Business Park and Bushland.</p>		



The Landscape Characteristics of the Site Derive from its bushland setting, originally separated from suburban development; its location on a broad, ridgetop plateau with gentle slopes suitable for farming; availability of water supply through its central drainage swale and underground stream; the curving configuration of the eastern side of the ridge, with its steep rock benches downslope, creating a broad, amphitheatre effect; the excellent views outwards from the site from northeast, through east, to southwest; the diverse but pleasant views across and within the site created by the curving roadway, the spines of old buildings, the man-made dam and the grazing paddocks; the pastoral, almost Arcadian, rural landscape with old buildings and mature trees; direct access to an almost intact Hawkesbury sandstone plant community, with a good range of shrubs and herbaceous plants as understorey; the boundary or perimeter plantings of mature pines, poplars, coral trees and brush box; the remnant stands or scattered specimens of ancient scribbly gums; the unexpected, but pleasant, informal 'courtyards' created by the progressive placement of buildings over time; and the spaciousness around the buildings created by the numerous playing fields.

The original buildings and most of the buildings that followed have been designed by the Government Architect, operating through the Department of Public Works and Services. A member of the original building committee was the prominent architect, Mr Nangle, who also proved influential during the design and construction of the buildings.

The first buildings were designed so that the inmates could build them under the supervision of skilled artisans and tradesmen. The steep escarpment made the transport of building materials very expensive and Mr Nangle chose site-mixed concrete, using cement, sand and crushed sandstone as an economy measure (the sand may have been made from finely crushed sandstone). The concrete does not appear to have been reinforced and was poured in shallow timber forms, lifted in stages. Other materials used were timber and corrugated iron, with the majority of the early staff cottages null of weatherboard.

The first dormitories and administrative buildings were constructed in the colonial era, with wide verandas, steeply pitched roofs and regular punctuation of windows and door openings. Plan forms were simple rectangles. The houses were bungalows with a similar character.

The later houses are of mass concrete and show a superimposed Federation influence. These were introduced between the Colonial houses so that the styles alternated.

Later buildings used brick as the principal building material, but continued to utilise the same simple shapes and motifs and, even though built over several decades, were very consistent within themselves and blended with the earlier structures. The 1980s buildings, which are located between the residences and the dormitories, utilised the same elements as the original Colonial buildings and serve as an important visual and physical link between the dormitories running along the ridge and the 'Carinya' dormitory and the maintenance building further to the west.

Whilst many of the education buildings, which are standard Department of Education demountable classrooms, depart from the themes outlined above, they are generally placed in discrete groups which are screened from the main buildings by vegetation.

All buildings are single-storeyed, giving the site a low and spread out appearance. Ornamentation is almost totally lacking on all the buildings, which therefore rely on form and play of light and shade for total effect. Further unity is provided by the grouping of buildings by function, which is both an operational characteristic and a response to the topography.

The McCabe Cottage complex is an architectural departure from the other buildings on the site. It is seated on the opposite side of the site and both the main building and the two detached cottages are excellent examples of 1940s Functionalist architecture. The contrast of this highly contrived architectural style with the main complex is dramatic but is moderated by its remote location, such that it stands as a separate entity.

The farm buildings are also departures from the mainstream buildings. Of these, the barn is an excellent example of organic vernacular architecture, utilising the same characteristic mass concrete material as the main buildings. The others are utilitarian structures that follow modular construction patterns. The siting of the buildings in their farm paddock setting gives them considerable importance in the landscape.

Dating of items is difficult, firstly because of the lack of accurately dated site plans showing the built elements at any given point in time and, secondly, because of the lack of adherence to recognised architectural styles of the various periods (with the exception of the McCabe Cottage complex). It appears that construction on the site was not an ongoing continuous process but, rather, several buildings were constructed at a time and were separated from previous and following periods of construction by many years. This pattern could be explained by availability of funding.

(Source: Mount Penang CMP 2001. Goddan Mackay Logan).

#### **Physical Condition**

**Updated** 01/14/2003

Archaeological information regarding the early years of the Schools occupation of the site is characterised largely by the initial stages of the site in regards to the clearance of vegetation and the construction of basic infrastructure such as access roads and water supply. This certainly suggests the site was largely undeveloped prior to the School's occupation.

The first phase of physical development of the site was characterised by specific landscape alteration, mainly restricted to the western half of the site, to make the site habitable.

The construction of the mile long drain, the access road and the well, represent examples of constructions with the potential for survival to the present day. The construction of the cottages and dormitories has also produced structures which represent an archaeological resource.

Quarrying of sandstone rather than the importation of brick aided the construction of the buildings on the site. The methods of construction of the structures suggest that good building freestone, largely unweathered, to be used as dressed stone, was not the type of stone used. The use of stone in construction is represented by a rubble and concrete shuttering method.

It is likely, therefore, that a specific quarry site, found to produce good quality stone, is not present on the site but that quarrying activities took place in a number of locations, the positions of which were quite likely dictated by their proximity to the respective building sites.

The operations of the School at the end of the initial building phase have also resulted in an archaeological resource. The operations of the dairy and the gardens and the buildings with these activities represent a resource of some significance in the development of the site.

The potential archaeological resource is represented by subsurface features such as the drain, the well (and any other wells not otherwise noted), rubbish/cesspits and building footings foundations is also represented by surface alterations to the landscape such as the road construction, activities, terracing and levelling of bedrock for building platforms. The built elements on the site represent an archaeological resource and fall within the definition of a 'relic' in the NSW Heritage Act.

During 1999 Australian Museum Business Services conducted a two stage management study and site survey of Aboriginal archaeological sites within the Mt Penang study area.

During previous archaeological survey work within the study area ten sites had been identified (nine of which were registered with NSW National Parks and Wildlife Service). Of these ten sites 9 are engraving sites and one is an engraving and midden site.

During the most recent survey work an additional two engraving sites, one series of grinding grooves and a rock shelter with Potential Archaeological Deposit (PAD) were also identified.

Only one of these 13 identified sites is situated within the cleared western half of the site, which comprises the Juvenile Justice Centre and buildings, fields, ovals etc of the former Mt Penang Juvenile Justice Centre. The position for this site was given as 100m east of the expressway and 50m south of Gindurra Road.

The remainder of the identified sites are sited in the eastern half of the study area which generally comprises heavily wooded east facing slopes with occasional rock outcrops. (Source: Mount Penang CMP 2001. Goddan Mackay Logan)

### **Modifications And Dates**

The Centre comprises buildings of several common types dating from 1912, with additions and modifications made during the 1930s through to the 1980s.

2009 - arson led to the loss of the former Paint Shop in the western precinct. Other buildings in this precinct neglected.

This report was produced using the State Heritage Inventory managed by Heritage NSW. Check with your relevant local council or NSW government agency for the most up-to-date information. This report does not replace a Section 167 certificate or a Section 10.7 Certificate (formerly Section 149).

History

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Historical Notes or Provenance

Updated

Mount Penang Parklands is located west of the sandstone plateau of Penang Mountain. The area features temperate rainforest. Trees in the Mt.Penang Parklands vicinity support hollow-dependent native fauna species including nocturnal mammals such as possums and gliders, microbats and some bird species such as parrots, cockatoos and wood ducks. Mature native trees would have been logged in the area in the 19th century.

The area and surrounding Central Coast are the traditional lands of the Darkinjung language group of Aboriginal people. 'Kariong' is said to be an Aboriginal word meaning 'meeting place' (Government Architect's Office, Heritage Group, 12/2009).

An Aboriginal sites study in 1994 was carried out for Gosford City Council area by NPWS Aboriginal Sites Officer, Brad Welsh, where he relocated sites listed on the NPWS Aboriginal Sites Register as well as recording previously unregistered sites. Welsh's study included the Mount Penang Parklands study area and he re-recorded some of the sites previously recorded to be within and around the study area. Evidence of pre-European sites found are associated with the Hawkesbury Sandstone formations, being rock engravings, grinding groove sites and shelters with both art and occupation deposit. Common motifs found at rock engraving sites include, what appear to be kangaroos and marine animals such as whales, fish and eels (Vinnicombe 1980). Human forms have also been recorded throughout the region (Lough 1980). Some rock platforms contain many motifs, while other sites may only a small number of engraved figures (Godden Mackay Logan, 2001).

European settlement of the Gosford district began in the 1820s, with the main points of entry being Brisbane Water in the east and Mangrove Creek (a tributary of the Hawkesbury River) in the west. Most of the development subsequently occurred in the eastern or coastal sector.

Early settlement of the district can be divided into two phases:  
1) the pioneering era, 1821-31, when the district's resources were exploited and little development took place; and  
2) the developing era, 1832-43, when considerable growth occurred in population and industry.

At the head of Brisbane Water, on land between Erina and Narara Creeks, a government township was laid out in the 1830s. It was described as the township at Port Frederick in honour of Frederick Hely, who was Superintendent of Convicts and had a large property on Narara Creek. But when the survey plan was sent to Governor Gipps for approval, it was returned with the notation 'to be called Gosford'.

Early industry include timber getters (forest oak, ironbark and red cedar), lime burners (from shells from the many Aboriginal middens or large natural deposits around the shores) and ship builders of Brisbane Water (this activity continued into the 20th century). Early economic activity also included small farms and grazing properties. Citrus orchards were planted on farms from 1880 where timber getters had cleared the land, and climate and soils were suitable. As roads were developed, farming spread to Somersby Plateau. In 1897 the district produced 3% of NSW's citrus crop, increasing to 21% by 1921 and 34% by 1928. Market gardens and passionfruit were also increasing in popularity.

Other early townships in the district were at East Gosford, Kincumber and Blackwall (near Woy Woy), where the main shipbuilding yard was located. Until the 1880s the district's timber and other produce went to Sydney by boat, since few land routes were available.



The railway, which was completed in 1887, provided opportunities for commencement of tourist activities in the area. Large numbers of tourists used trains to travel to Woy Woy and Gosford for fishing, hunting and sight seeing trips. Guest houses were developed to accommodate this rising demand for overnight or holiday accommodation. Railway access encouraged other industries, including dairying in the districts around Wyong (Biosys, 2009, 12).

The Mount Penang Juvenile Justice Centre was the largest centre of its type in the Southern Hemisphere, accommodating 170 male juvenile offenders. The Centre was set out on an open plan, with the detainees housed in dormitories and attending schooling and vocational technical training on site during the week. The principle of rehabilitation through the combination of education and physical labour is a doctrine that the centre had adopted throughout its history. Indeed, the initial building phase between 1912 and 1922 relied on the physical labour of the inmates for the construction of the Centre's major buildings, many of which are still in use today.

The site maintains a link with the earliest days of juvenile reform in NSW when male offenders were housed on retired navy ships in Sydney Harbour and on work farms in the Sydney district. Some of the earliest buildings were designed to resemble lighthouse cottages, in keeping with the nautical background of the school. The centre also provides a tangible marker of the reform system for boys spanning most of the twentieth century.

#### The Nautical School Ships, 1866 -1911

In 1866, the Industrial Schools Act was passed through the NSW Parliament in an effort to control wayward or destitute children. The Act was initiated following the findings of an 1859 Select Committee on the condition of the working classes in Sydney. The committee estimated that there was up to 1,000 destitute children in Sydney alone, and recommended the establishment of reformatory schools to get them off the streets. The schools were designed on Industrial Schools in England which would remove children who were homeless, involved in crime or neglected in some way and place them in reformatories, separating them from the bad influences that they were under. Once 'saved', the children could then be given a rudimentary education, taught the basics of a trade and be apprenticed out to start their lives as useful citizens.

One response to the 1866 Act was the establishment of the Nautical School Ships, the first of which was the Vernon. Encouraged by Henry Parkes, the then Premier of NSW, the ex-navy sailing ship was converted into a training ship to house up to 500 boys. The ships combined a system of education and military-style discipline, based on a reformist vision. Social philanthropists supported the principle of removing a child from a bad family environment in order to ensure the child's moral reform. Military-style drills were introduced under the guidance of the Superintendent (from 1878-1895), Frederick William Neitenstein.

The days on board were divided in two, with lessons taking up one half of the day and drill taking up the other half. The boys were under constant supervision, with inspections being a means to ensure they stayed on the right path. The boys were further controlled through a class system of seven grades, with each grade carrying privileges and work routines. Boys worked on a marks system to advance to higher grades, receiving the extra privileges that went with them. By encouraging advancement, the system was designed to maintain discipline and ensure self-reliance, both seen as being essential to reform.

The Sobraon, a second training ship that had been built in 1866, replaced the Vernon in 1890. Both ships were anchored off Cockatoo Island in Sydney Harbour, the Sobraon remaining there until 1911. Whilst moored off Cockatoo Island, the boys of the Vernon and the Sobraon maintained a small farm to supply themselves with fresh food, a tradition that would be carried on at Mount Penang.

#### The Establishment of Mount Penang, 1912

In 1905, the Neglected Children and Juvenile Offenders Act was passed to replace the former Industrial and Reformatory Schools Acts of 1866. The Gosford Farm Home for Boys was built under this new Act. In the early 1900s, the Government Surveyor recommended the Mount Penang site as possible location for a Government sanatorium; however, this was never acted upon. In the same period, the Government also looked for a site to construct a new centre for juvenile delinquents. The new centre would be based on similar principles as Brush Farm in Eastwood, where hard physical work and a basic education would combine to assist in rehabilitation of delinquent boys. The centre would also take boys from the nautical training ships, which had become outdated and expensive to operate by the early 1900s.

On 1 July 1912, a party of approximately 100 boys aged between ten and sixteen began clearing a site at Mount Penang in order to build a new State-controlled farm for wayward boys. This was to replace the former Nautical School Ships and the small Brush Farm facility. All the boys in the working party were formerly of the Sobraon, and supervised by the former probation officer of the Nautical School Ship, Herbert Charles Wood.

The site was situated on the lip of a reasonably flat summit of a sharp escarpment, three miles west of the town of Gosford. It was isolated from main population centres, a requirement that worked against the Brush Farm site at Eastwood which had been encroached upon by residential development. It was the combination of these factors of inaccessibility and isolation that led the committee appointed to locate a new site for the training of male juvenile delinquents to choose Mount Penang. The chosen location was on the track to Sydney, which went via Mangrove Mountain and Wiseman's Ferry. Although remoteness worked in favour of the site for the farm, it did create serious problems during construction of the complex.

#### The Construction Phase, 1912-22

Access to the proposed site provided the first obstacle to overcome. The only access was via a steep track, with gradients of between 1:8 and 1:11. With all the equipment and stores being bought in by bullock, bricks were ruled out as the main building material, due to the difficulties of transportation and costs. From the inception, a building committee was established to oversee construction to work through any difficulties. As an alternative to bricks, the Committee recommended use of local hardwood and sandstone, the latter quarried on site. The committee architect, James Nangle, recommended use of concrete for buildings, which would reduce cost and overcome the problem of transport.

Nangle had worked as an architect in Sydney since 1891, being employed in the design of residential, commercial and industrial projects. His work with the Department of Public Instruction\* on the design of portable classrooms made him well qualified to sit on the Building Committee for Mount Penang. Nangle's association with the Department was further strengthened through his teaching in the technical education branch from 1890 to the late 1930s. From 1913, he was the Superintendent of the Branch, being instrumental in its move towards a more vocationally orientated approach.

Walter Liberty Vernon (1846-1914) was both architect and soldier. Born in England, he ran successful practices in Hastings and London and had estimable connections in artistic and architectural circles. In 1883 he had a recurrence of bronchitic asthma and was advised to leave the damp of England. He and his wife sailed to New South Wales. Before leaving, he gained a commission to build new premises for Merris David Jones and Co., in Sydney's George Street. In 1890 he was appointed Government Architect - the first to hold that title - in the newly reorganised branch of the Public Works Department. He saw his role as building 'monuments to art'. His major buildings, such as the Art Gallery of New South Wales (1904-6) are large in scale, finely wrought in sandstone, and maintaining the classical tradition. Among others are the Mitchell Wing of the State Library, Fisher Library at the University of Sydney and Central Railway Station. He also added to a number of buildings designed by his predecessors, including Customs House, the GPO and Chief Secretary's Building - with changes which did not meet with the approval of his immediate predecessor, James Barnet who, nine years after his resignation, denounced Vernon's additions in an essay and documentation of his own works. In England, Vernon had delighted his clients with buildings in the fashionable Queen Anne style. In NSW, a number of British trained architects who were proponents of the Arts and Crafts style joined his office and under their influence, Vernon changed his approach to suburban projects. Buildings such as the Darlinghurst First Station (Federation Free style, 1910) took on the scale and character of their surroundings. Under Vernon's leadership, an impressive array of buildings was produced which were distinguished by interesting brickwork and careful climatic considerations, by shady verandahs, sheltered courtyards and provision for cross-flow ventilation. Examples are courthouses in Parkes (1904), Wellington (1912) and Bourke, Lands Offices in Dubbo (1897) and Orange (1904) and the Post Office in Wellington (1904)(Le Sueur, 2016, 7).

The Minister for Public Instruction approved the plans, with a budget set at (Pounds)12,000 for the main structures. Work commenced on the first day of July 1912, with the boys providing the labour; another cost-cutting measure. To begin with, the boys were accommodated in military-style bell tents while they worked on the construction of their own dormitories. The boys were split into work parties under the supervision of tradesmen who could provide assistance and guidance to the boys. The first buildings to be constructed were the ones that were the most essential to the institution: dormitories, a dining room, staff quarters, offices, a kitchen, store rooms for supplies and equipment, and accommodation for the tradesmen and Clerk of Works. The Minister for Public Instruction laid the foundation stone of No. 1 Dormitory by December 1912. By September 1913, No. 1 Dormitory had been completed, as had the Assistant Superintendent's residence and four weatherboard cottages for the married staff members. These cottages still stand along the

entrance road to the complex.

The first schoolmaster at Mount Penang, George Walpole, kept a diary of his time there, which included the construction phase in 1912. Walpole noted that the concrete mix for the works was made up of three portions of crushed stone, two portions sand and one portion cement mixture, all of which was mixed by the boys before being tipped into prepared boxing or formwork to create the walls. As two groups mixed the concrete, another would convey it to the site, while a fourth team lifted the boxing from the day before up the scaffolding for the next day's operation. In their spare time, mainly on Sundays when no construction work was undertaken, the boys developed a sports ground under Walpole's supervision, which was dedicated in 1912. The ground was developed adjacent to the building site, at the front of the dormitories but at a lower level. To the north of the building site, a team of boys also opened up a mile-long drain using a road plough, and sank a well 3.65m (12ft) deep to tap an underground stream for fresh water. By 1914, Mount Penang was dealing with all boy delinquents institutionalised in NSW through the Children's Courts. In the Superintendent of Gosford Farm Home's Report to the Minister for Public year 1915, he set out the principle of the Farms' work ethic thus:

"Habits of steady industry are acquired, which are carried outside the boundaries of the institution and characterise the future conduct of many lads who, before, were inclined to settle down to any form of work and herein lies the secret of reformation in many cases. Boys frequently are bad, or delinquent, not from natural bent, but simply because they are lazy and have never been forced to work steadily at any occupation requiring the expenditure of a certain amount of energy."

In the same year, the Superintendent reported that a second dormitory of concrete, a concrete reservoir, a store and office had all been completed. The two dormitories were built either side of the Household block, with the officers' dwelling behind. This arrangement allowed for a suitable system in which to classify the inmates as well as providing constant supervision. Other works on the site during this period included: the construction of a windmill to pump water from a fresh water stream below the escarpment; five galvanised tanks for water storage; a carpentry workshop, a 300 yard trolley line for transporting the sandstone from the quarry to the site; and a bullock team and wagon, two horses, two spring carts and one dray. The buildings were all roofed with corrugated iron. Also during this period a permanent dam and concrete reservoir completed, supplying the site with constant fresh water. Construction continued at the site until 1922 (Godden Mackay Logan, 2001).

The northern, curved part of The Avenue, along which several of Mt. Penang Boys Home's main buildings are located, is thought to have been laid out c.1912 as part of the initial detention centre development. The southern, straight part of The Avenue is thought to have been laid out slightly later, when attention turned to site landscaping. A row of brush box trees (*Lophostemon confertus*) was planted on each side. It appears that the road had been constructed and the trees planted by 1938. It functioned as one of two main entry ways into the site off what is now the Central Coast highway. The Avenue is now the site's main entry drive (Biosys, 2009, 1).

The Superintendent at Mount Penang during its formative years was Frederick Stayner. Stayner began teaching in 1884, and had been appointed to the Sobraon by the Department of Public Instruction in March 1894. From the Sobraon he had been transferred to the Carpentarian Reformatory at Brush Farm, Eastwood, before moving with the boys to Mount Penang in 1912. His experience and training from the two former institutions was instrumental in the development of Mount Penang.

Under Stayner's leadership, a number of significant administrative operations were implemented at the farm. The first major change was the introduction of an honour system, where extra privileges were awarded to the boys if they behaved within the guidelines set by the centre. As an incentive the boys could shorten their time at the centre by advancing to probation based on the centre's honour system. Stayner organised the disciplinary system along a military line and teachers to carry or use canes without the direct authority of the Superintendent. The emphasis of the centre was to be on the character development of the boys as opposed to an unnecessarily harsh regime. Competitive sports were also introduced, giving the inmates a sense of teamwork as well as providing them with a regular exercise program.

Schooling was also provided to the inmates. On arrival at the centre, boys were assessed to determine what level of education they had achieved. Each boy was required to reach a fourth class standard of primary school, regardless of age. Initially, the school operated in any building, or verandas, available to them. In the first years, schooling was conducted in the converted end of the new dormitory until a school building was erected behind the main complex. The syllabus was based on the 1905 Primary Syllabus, which was supplemented after 1935 with visits from lecturers by Sydney University.

#### Consolidation, 1923-40

In 1923, the State Government passed the Child Welfare Act, repealing and consolidating a variety of provisions that existed in legislation relating to the care and management of children under State protection. The Act was designed to place a much greater emphasis on children's health, welfare and rehabilitation under the direction of the newly created Child Welfare Department, with Walter Bethal, who had been instrumental in setting up Mount Penang, as secretary. The new Act dealt with juvenile offenders who had come through the Children's Courts up to the age of sixteen, or those between sixteen and eighteen on minor charges in the adult system. The distinction reflected the Government's recognition of the need for more lenient treatment of young people under State care, away from the harsh environment of the NSW criminal justice system. Under the new system, the Gosford Farm Home was classified as an Industrial School with the schooling component being controlled by the Department of Education.

Between 1923 and 1940, the living conditions and amenities at the centre gradually improved. An ongoing building program ensured that the boys continued to get building experience that could be used on their release, while at the same time upgrading their present conditions. In 1936, electric lighting and a hot water system were installed, which was followed in 1937 by a refrigeration service. By the end of 1937, the centre comprised four dormitories, a recreation hall that catered for concerts and movies, a dining and kitchen block, a hospital, a bathing and sanitary block, as well as a variety of outbuildings including a dairy and accommodation for single and married staff. Due to the relatively poor quality of the soil at Mount Penang, a farm was established on Government land at Narara, about 16km from the centre. Here, thirty-one boys were transferred to clear the land and prepare it for cultivation. A vegetable garden at Narara provided for the requirements of both the Narara and Gosford centres. However, the Narara farm was closed in April 1934 following the opening of a much larger institution at Berry in the same year. All the while, pasture improvement was being undertaken at Gosford, with sufficient milk being produced for the centre's purpose. However, as farm training was now offered elsewhere, more emphasis was made on vocational training at Gosford from this time.

As part of this program, further interaction with the local community in Gosford was encouraged. The institution wanted to make the local community more aware of the Farm Home, thereby gaining a level of acceptance. This was to be achieved through a number of initiatives. For example, sporting teams were organised at the centre to play in the local competitions, including football, cricket and athletics, which helped promote a positive self-image in the boys and improved relations with the local community. Further involvement came through the public use of the Recreation Hall to view the latest movies on the Centre's own screen. The boys were also employed on community projects in and around Gosford. Maintenance, gardening and small construction jobs could be carried out by the boys, which helped develop a sense of civic pride and responsibility amongst the inmates.

Despite these initiatives, some problems were inevitable considering the nature of the institution. As early as 1923, an inquiry was conducted by the Children's Court into allegations of mistreatment of the boys at Mount Penang. Part of the findings of the 1923 report was that there had been undue severity in some punishments at Mount Penang and it recommended a lessening of the use of the cane by officers working there. A second inquiry in 1934 investigated the punishment regime more closely, and found that it was common practice for more senior boys to administer punishment on junior inmates. Until 1934, this type of punishment often went unsupervised by staff and was open to serious abuse. One example of these forms of punishment had the offender being required to fight up to five other boys, with or without gloves. The fight continued until it was deemed that offender had received sufficient punishment (Godden Mackay Logan, 2001).

In 1925 the newly formed Main Roads Board began construction of the Pacific Highway. This work, completed in 1930, made road travel to the Gosford area much easier than previously. Further improvements, such as replacement of the Hawkesbury River car ferries with a new road bridge in 1945, led to a rapid increase in the numbers of day trippers to the Central Coast (Biosys, 2009, 12).

#### Mount Penang Training School for Boys, 1944 - 1960

In May 1944, a new sub-institution was opened at Mount Penang by the then Minister for Education and Child Welfare, Clive Evatt. Built at an initial cost of (Pounds) 25,000, it was originally designed as a maximum-security sub-institution for unresponsive boys, but after 1948 it became a privilege cottage, representing a shift in Governmental policy in child welfare policies. The changes in government policies generally sought to move away from the authoritarian structures and harsh discipline that was associated with reform schools, towards a more open, family-style environment. It was an earlier example of the same kind of thinking that had led to the establishment of the Gosford Farm Home for Boys, establishing a smaller scale, more personalised type of institution.



Also in 1944, a new Superintendent, Vincent Heffernan, was appointed. Heffernan had been an executive officer of the National Emergency Service during the war years and brought with him a new sense of purpose for the centre. Heffernan noticed that by the mid-1940s the Centre was in a dilapidated state, both physically and ideologically. The honour system that had been introduced under Stayner had deteriorated, and discipline had become more and more rigid. In addition to this, the pastures were in poor condition as were both the pigs and cattle. Of further concern was the state of the various workshops and the schoolhouse.

Between 1944 and 1947, Heffernan set about reinvigorating the Institution; buying new equipment for the trade rooms, establishing a bootshop to supply shoes, upgrading the pastures, and raising the pigs and cows to stud standard. A new dairy and stock shed were also constructed as part of the upgrade. The construction of new recreational facilities, including new playing fields, bowling greens and a tennis court, as well as extensive landscaping and planting were also begun during this period. From the 1940s, Mount Penang began to show their livestock, winning a number of prizes at local events and the Royal Easter Show in Sydney.

In May 1948, the new Minister for Education, RJ Heffron, opened the converted detention cottage as a privilege cottage (renamed McCabe Cottage in 1976), in line with the new government thinking. The building was redecorated internally, and boys were allowed their own room. Although still supervised, the atmosphere was more relaxed than in the main centre. Adjacent to the cottage, two residences were also built to house visiting families, further reinforcing the reformation ideal.

McCabe Cottage represented a new level of privilege at the centre. From the opening of Mount Penang, boys had had an opportunity to improve their position at the centre by showing that they could be trusted. The remote location of McCabe Cottage from the main centre at Mount Penang reinforced the trust that the boys had gained from the Institution. A survey of the former inmates of McCabe Cottage, conducted in the 1950s, found that of sixty-two boys who had passed through it, seven had been returned to the main institution, thirty-eight had been discharged and fourteen were still in residence. Only one of the discharged boys had been readmitted and one had absconded. It seemed that the Cottage was working in the rehabilitation of the boys and helping them make a successful adjustment to life in the community. In 1976, McCabe cottage became a Pre-discharge Unit for the Justice Centre.

In 1946, the name of the Institution was changed from The Farm Home for Boys, Gosford, to Mount Penang Training School for Boys, Gosford. The reason behind the name change was that the new name more clearly represented the idea that a varied program of planned training was required for the re-education and rehabilitation of delinquent youth. The application of the name 'Mount Penang' was favoured over some of the other established names for the area, such as Kariong, as it had not been applied to any other institution or building (Godden Mackay Logan, 2001).

Since the 1940s the greatest development in Gosford has been the growth of urbanisation in the eastern sector, brought about by road and rail improvements, an upsurge in secondary industries and State planning policies which see Gosford as part of an expanding Sydney region. In recent times, the expansion of metropolitan Sydney, the availability of private and public transport and improved road systems have combined to change the development of Gosford from a rural community prior to World War II, to that of a city containing some secondary and service industries related to the tourist trade. Agriculture and horticulture continue in the mountain areas but, in declining importance to employment and production (Biosys, 2009, 13)..

#### 1960 - 2000

During the 1960s, five new buildings were erected behind the administration building and a new sports ground was built. The new buildings housed an assembly hall, a gymnasium, a new kitchen/dining room, a laundry and boiler house and a storeroom. The sports ground was defined on its northern boundary by this new collection of buildings (Godden Mackay Logan, 2001).

After 1970 gaps with deaths or removed trees have not been filled in the avenue. Several trees have been removed in the avenue's south, with road widening, creation of the link road to Old Mount Penang Road to the east, driveways for the fire station etc (Biosys, 2009, 1).

In 1975, the new Superintendent of Mount Penang, Laurie Maher, implemented a building program aimed at improving the centre itself as well as the morale of the boys and staff. The first project in 1975 was internal modifications to the dormitories, with new and upgraded bathroom and toilet facilities being installed, providing more privacy for the boys. During the same year, a storeroom within the administration block was converted into a holding room.

As well as renovations, a number of new buildings were constructed on the site during the late 1970s and early 1980s: a new Officer's Dining Room was built in 1976 adjacent to the boys' dining rooms; and a new office block, which included offices for the Superintendent, Deputy Superintendents, Salary Officer, a police interview room, a conference room and general office, was erected in 1978. A new hospital block and nurses quarters (to replace the original 1920s hospital) was also built during this phase, as was a new store and amenities building to the north of the gymnasium. In 1978, a 50m swimming pool was added to the recreational facilities at Mount Penang, constructed on the site of a disused bowling green. The former clubhouse associated with the bowling green then converted to a teacher's staffroom.

In 1980, the school program was returned to the Education Department after having been controlled by the Child Welfare Department since 1953. A number of new programs were introduced into the school at this time, including a new program for boys who rebelled against the traditional methods and a remedial program for one-on-one teaching. In 1991, the school program was updated to a secondary level, having operated at a primary level since its beginning. Further to these changes, the school's name was changed to 'Girrakool'. It had been found previously that former inmates were reluctant to use certificates which had Mount Penang inscribed on them due to the attached stigma. The new name eliminated this concern. The school itself was now a collection of demountable schoolrooms, with the two original buildings serving as a library and cultural centre.

A large proportion of the detainees at Mount Penang, often the majority, were men and boys of Aboriginal identity. This is not always clear in the documentary evidence of the history of the place, but it remains a vivid recollection of former detainees and their families. The Centre was also often used as a place for immediately housing Aboriginal children removed from their families before they were assigned and relocated to other institutions. Because of this Mount Penang has close associations with the Kinchega Boys Home. The distinctively Aboriginal history of the Centre reflects the changing methods used to try and control the state's Aboriginal population, the very limited socio-economic roles allowed to Aboriginal people within the broader community, and the changing philosophies of 'managing' a dispossessed people during the course of the 20th century. (evidence from consultation by Heritage Office with Aboriginal communities having associations with the Centre, 2003).

In 1990, the centre's Vocational Training Unit was relocated to a former RTA depot on the Western extreme of the site. In 1991, the last major building program was completed with the opening of the Frank Baxter Kariong Juvenile Justice Centre in 1999. This Juvenile Justice Centre is a purpose-built high security centre for those detainees with a history of escape or who had proved to be difficult to control in other centres, as well as those who had committed more serious offences (Godden Mackay Logan, 2001) on one edge of the former site (Biosys, 2009, 1).

Since 2000:

Mount Penang Gardens (2003)

12 themed gardens opened in 2003, becoming a popular oasis and tourism asset on the Central Coast. Designed by Anton James of JMD (James, Mather Delaney) landscape architects (Stuart Read, pers.comm., 1/10/2015). The gardens comprise 12 themed gardens feature a variety of permanent and changeable garden areas modelled around a cascading water fountain, bottle trees (*Brachychiton rupestris*) from Queensland, an obelisk water feature and an outdoor amphitheatre. The amphitheatre is an event space. Around it are the Bottle Tree Garden, Puddle Garden, Rock Garden and Display Garden, which are available for hire for events ([http://www.ccrdc.nsw.gov.au/Portals/4/documents/2014-files/Event%20Park%20Brochure\\_A4\\_LR\\_a.pdf](http://www.ccrdc.nsw.gov.au/Portals/4/documents/2014-files/Event%20Park%20Brochure_A4_LR_a.pdf)).

Themed gardens include the Pond Garden; Entry Garden; Heath Mounds; Misty Mountains; Bamboo/Grass Gardens; Colour Field Garden; Bottle Tree Garden; Display Garden; Gondwana Garden; Rock Garden; Drylands/Arid Garden; Dragon Garden; Little Oasis; Grass/Sedge Garden; Cascade Garden and Puddle Garden. Fissure gardens feature specialised plants: Pandanus or screw pines; rainforest; lithophytes (rock-dwellers) and epiphytes (tree-dwellers); Barefoot/fissure and Wind fissure. Water Gardens including the Lower Pond and the water cascades feeding it. Landmarks include an Obelisk, Queensland bottle trees and Wondabyne sculptures (see below)(ibid).

Sculpture installations in Mt.Penang Gardens (2004):

Wondabyne Quarry was the source of a fine-grained Hawkesbury sandstone used to create some 20 sculptures in the Wondabyne 1 and Wondabyne 2 international sculpture symposia conducted on the banks of the Hawkesbury River in 1986. 12 of these sculptures since 2004 have stood in the sculpture garden on the banks of Mt Penang Parklands' upper lake while the others are towards the Baxter and Kariong Detention Centres on the Parklands' northeast boundary. The sculptures were positioned as per the plan of artist, Bruce Copping, above the upper lake in the Botanic Gardens.

The International Sculpture Symposium movement was spearheaded by Karl Prantl in Austria in 1959. The first international sculpture symposium took place in an abandoned stone quarry in St. Margarethan, Austria. Sculptors from around the world joined together to produce a permanent public artwork from local stone, a dynamic which would provide the model for many symposia to follow. Since then international sculpture symposia have been held in numerous towns and cities around the world, including Lindabrunn, Austria and Hagi, Japan (a town known for its pottery).

The first Sculpture Symposium in Australia was held at Wondabyne near Gosford in 1986. This area is well known for its history of stone quarrying. The Wondabyne rail stop was named after Mt Wondabyne, adjacent to the station across the bay, known as Mullet River or Mullet Creek. It was originally built in 1889 for quarry use only and known as Mullet Creek Station. It was later renamed Hawkesbury Cabin station, then finally Wondabyne. The stone for the Wondabyne Sculptures was sourced from the Wondabyne Quarry which is now owned by Gosford Quarries.

The Wondabyne Sculpture Symposium held in 1986, featured sandstone sculptures by Bruce Copping and 11 other sculptors from 6 nations. The symposia was undertaken along the foreshore area near the railway stop at Wondabyne. However, in 1994 Gosford Council decided that it was in the best interest of public to relocate these sculptures due to access and liability issues at the original site. It was then decided the more desirable and accessible site was the new Mt Penang Parklands. The cache is hidden in the bushland area of the park and is a stone's throw from the Wondabyne Stone Sculptures (Ken Phelan, pers.comm., 16/12/2009).

National Aboriginal and Islander Dance Association HQ (2007):

2/2007: NAISDA, the National Indigenous Dance College, make their new home at Mt.Penang Festival Parklands site. (Managing New South Wales Government Heritage, Issue 6, 9/2007). That year approval was given to build a Parklands Post Office, Family Tavern, Brewery & Hunter Wines Promotion Centre on The Avenue.

Kariong High School (2008):

In 2008 approval was given for construction of a new Kariong High School and landscaping in the parkland's south, facing the Pacific Highway. With approval for the high school on the former Events Park site, the Festival Development Corporation needs to re-establish the events function elsewhere on the site. In 2009 approval was given for two event park stages proposed (1) for the 2009 Flora Festival in September; (2) for a permanent events park layout further north and inside the Parklands site, away from the highway.

Mount Penant Event Park:

Central Coast Region Development Corporation (CCRDC) owns the Mount Penang Parklands and is charged with securing ongoing management of public open spaces and community facilities at Mt.Penang, protecting and enhancing the broad Mt.Penang Parkland precinct including its remnant bushland and habitat areas. CCRDC gained a \$45,000 grant from the NSW Government, through the Destination NSW 2011/12 'Regional Tourism Product Development Program' to electrify the Mount Penang Event Park. The total infrastructure project cost \$61,000 and will enable new business opportunities, support and enhance regional tourism. Installation of permanent electrical services was effected between March and September 2013. The Corporation expects to attract a variety of new major events, and provide enhanced services to existing event organisers. Capable of accommodating up to 25,000 people, the Mount Penang Event Park is a prime location for events on the Central Coast.

In January 2021 plans for three popular fast food restaurants and a tyre shop in Mount Penang Parklands have been shut down. The Central Coast Local Planning Panel has unanimously refused the \$8.5 million scaled-down version of a the Highway Commercial Precinct development at the parklands in Kariong. The DA, lodged by Parklands Kariong Development, was for a six-lot subdivision to include fast food outlets McDonalds, Oporto and Taco Bell, as well as a Bridgestone tyre outlet. It also included 'left in/left out' access

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onto Central Coast Highway. The planning panel's reasons included refusal of the proposed access driveway by Transport for NSW along with refusal from the Heritage Council of NSW. The panel also indicated the DA did not comply with local planning instruments. In a report to the panel, Transport for NSW stated "the creation of a new access point to the Central Coast Highway will compromise the effective and ongoing operation and function of the Central Coast Highway"... A similar application for the highway commercial precinct, which included an eight-lot subdivision for the 5.7ha site, received fierce community backlash and was refused by Central Coast Council in May 2019. (Killman, 2021).

## Historic Themes

Records Retrieved: 42

National Theme	State Theme	Local Theme
Developing cultural institutions and ways of life	Environment	Living in a Juvenile Dentention Centre
Developing cultural institutions and ways of life	Defence	Landscaping - Federation period
Developing cultural institutions and ways of life	Defence	Landscaping - 20th century interwar
Developing cultural institutions and ways of life	Defence	Building in response to climate - verandahs
Marking the phases of life	Social institutions	Associations with James Nangle, architect
Governing	Land tenure	State government
Governing	Land tenure	Developing roles for government - providing education
Governing	Land tenure	Developing roles for government - parks and open spaces
Governing	Land tenure	Developing roles for government - facilitating agriculture
Governing	Land tenure	Developing roles for government - conserving cultural and natural heritage
Governing	Land tenure	Developing roles for government - building and operating public infrastructure
Governing	Land tenure	Developing roles for government - administration of land
Governing	Labour	Detaining young offenders
Educating	Ethnic influences	Public Education
Educating	Ethnic influences	Education associated with Welfare institutions
Working	Migration	Working with plants
Working	Migration	Working with animals
Working	Migration	Working on public infrastructure projects
Working	Migration	Working independently on the land
Working	Migration	Working in the public service



Working	Migration	Vocational training as a form of social rehabilitation
Working	Migration	Vocational training as a form of social rehabilitation
Working	Migration	Providing job training and placement services
Developing local, regional and national economies	Science	Agisting and fattening stock for slaughter
Developing local, regional and national economies	Events	Developing local, regional and national economies
Developing local, regional and national economies	Commerce	Farming by detainees and prisoners
Developing local, regional and national economies	Commerce	Clearing land for farming
Developing local, regional and national economies	Commerce	Attempting to transplant European farming practices to Australian environments
Developing local, regional and national economies	Commerce	Ancillary structures fencing
Developing local, regional and national economies	Commerce	Ancillary structures - sheds, crop storage
Peopling the continent	Aboriginal post-contact	Darkinjung Nation - sites evidencing occupation
Peopling the continent	Aboriginal post-contact	Darkinjung Nation - performing and creating artistic endeavours
Peopling the continent	Aboriginal post-contact	All nations - the stolen generations
Peopling the continent	Aboriginal post-contact	All nations - places of battle or other early interactions between Aboriginal and non-Aboriginal peoples
Peopling the continent	Aboriginal post-contact	All nations - living under the Aborigines Protection Act 1909-1969
Peopling the continent	Aboriginal post-contact	All nations - imprisoning and detaining Aboriginal peoples
Tracing the evolution of a continent's special environments	Exploration	Using natural features for human security
Tracing the evolution of a continent's special environments	Exploration	Parks
Tracing the evolution of a continent's special environments	Exploration	Other open space
Tracing the evolution of a continent's special environments	Exploration	Introduce cultural planting
Tracing the evolution of a continent's special environments	Exploration	Gardens
Tracing the evolution of a continent's special environments	Exploration	Changing the environment

# Assessment

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Criteria a)

Historical Significance

Include

Exclude

Mt Penang has an associational link to the nineteenth-century system of training ships Vernon and Sobraon -of which it was the immediate successor. These links are preserved in the growing of fresh produce, which the training ships had utilised on cockatoo Island and was continued at Mt Penang, The colonial character of the early dormitory buildings and their later naming after various ships from that period also contribute.

Various changes in the juvenile penal philosophies and practices over the course of the twentieth century, are reflected in the development of the site and its features.

The buildings and their arrangements are representative of the designs for government institutions, such as asylums and orphanages, fashionable at the time.

The particular character of the place has evolved as a result of the ongoing and changing requirements of the Centre and reflects the use of the labour and skills available within the Centre.

The rural location, its agricultural and pastoral features, its remnant dairy and the landscaping undertaken at the Centre demonstrate the work and recreational activities undertaken by the juveniles at the Centre over eighty-five years of operation.

The location of the institution reflects the expansion of the city of Sydney into its rural hinterland following the improvements in transportation of the late nineteenth and early twentieth centuries.

The location of the institution reflects the increasing urbanisation of the city area leading to space pressures upon institutions of this type.

The complex has local significance in the development of the Gosford and Central Coast region as a place of employment and as a land use over more than eighty years of operation. (GML)

Mount Penang is very significant in the Aboriginal history of NSW during the 20th century, being a major place of incarceration and detention of Aboriginal boys and men from all over the state, and a place for temporarily housing removed Aboriginal children before their relocation to other institutions such as Kinchega Boys Home (HO)

Criteria b)

Historical Association Significance

Include

Exclude

The design and construction of the early dormitories was supervised by the prominent architect James Nangle, OBE, an early supporter of the use of concrete and steel in building. He was the secretary and testing architect of the Institute of Architects and was a member of the Mount Penang Building Committee.

Criteria c)

Aesthetic/Technical Significance	Include	Exclude
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The complex has positive aesthetic qualities associated with its site, the available views, the layout of the low-scale buildings and the landscaping undertaken for the Centre.

The early surviving buildings are attractive, human-scaled structures which, while of an institutional character, utilise a number of features derived from colonial homestead architecture appropriate to their setting.

The colonial character of the interiors of the early dormitory reflects the desire to impart a particular aesthetic character to the facility.

The architectural character of the buildings reflects a range of administrative objectives, such as the desire to minimise the prison character of the facility and to create the character of a rural colonial homestead in keeping with the reformatory aspirations of the institution.

The siting and topography have been utilised in the design and evolving development of the Centre to create a particular character appropriate to its operation. The sense of open space created by views out from within the Centre, the enclosure provided by the uncleared surrounding bushland and the unfolding of vistas along the curving entrance road into the Centre are essential elements of the institutional character of the Centre.

The McCabe Cottage complex is an excellent example of the Inter-War Functionalist architectural style. Its physical isolation from the main complex allows this building and the architectural character of the main complex to coexist without visual inconsistencies.

Later buildings, particularly the most recent, reproduce the predominant architectural character of the older buildings to create a uniform appearance across the complex.

Criteria d)

Social/Cultural Significance	Include	Exclude
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Mt Penang is of profound significance to the people who were detained there over its long history. For these people, Mt Penang is a place that reflects formative life experiences - both positive and painful. It is a place where the detention of thousands of boys and young men can be acknowledged.

The place is of very strong significance to the many people who worked there over many decades. For these people, Mt Penang is a place of personal and professional growth and achievement, as well as experiences that have strongly influenced their lives and outlooks.

The site is a significant and recognised physical, social; and historical landmark for the communities of Gosford, Kariong and Somersby. In a wide variety of ways, it has functioned as a community meeting place and a resource that has supported local community needs.

Mt Penang is a symbol of the experiences of many individuals detained over the course of nearly a century and of the staff who worked with them. It is a place where the many stories about these experiences are validated and told, and a place that many former detainees and staff want to visit.

It is a symbol of the substantial historical and social influence of the detention centre on the development of local communities.

Mt Penang is a place where many progressive innovations were introduced into the operation of juvenile detention services. It is, therefore, a place of personal pride and achievement for members.

Mt Penang is a place where many staff lived, raised their families, socialised, and for long friendships and tight-knit communities. It is a place where some interaction between detainees, the families of staff and the wider community was possible.

Mt Penang is significant to local Aboriginal people both pre and post-contact, and during the time that Mt Penang as used as a juvenile detention centre, when it accommodated a number of Aboriginal detainees for whom the site would have also profound associations.

Criteria e)		
Research Potential	Include	Exclude

The complex is a component in the overall system and practice of justice in NSW and has comparative relationships with female juvenile and both male and female adult detention centres.

The design of the buildings and their layout and relationship to each other is representative of the operational requirements of low-security juvenile detention and the comparison of this to other penal institutions provides technical information in this respect.

The siting and relationship of buildings to each other and to the sports fields, paddocks and vistas are all components of the operational requirements and practices of the Centre. These relationships demonstrate these requirements.

The grouping of buildings which house similar or related functions into discrete areas is representative of the typical design of large institutions and, at Mount Penang, demonstrates the presence of the centralised design and planning associated with this government facility.

Whilst centrally designed initially, Mount Penang was mostly self-sufficient in the supply of building skills and labour. Following its establishment, the Centre has typically provided the new facilities and alterations to existing facilities that have been required based upon its own day -today needs. In this regard, the layout and operation of the Centre today reflects the modifications to the centralised plan that are the result of continued evolution and experience in the operation of a juvenile detention and reformatory facility. The body of experience reflected in today's facility provides information that is not obtainable from other sources.

The archaeological resource at Mt Penang has some technical resource significance through its potential to provide information relating to the development and operations of the school not available from other sources.

**Criteria f)**

Rarity	Include	Exclude
There are few, if any, comparable surviving juvenile detention centres of this period in Australia and Mount Penang has rarity value in this respect.		
It has been the most important juvenile detention centre for NSW for most of the twentieth century and has no close comparison in this respect.		

Mount Penang was the largest centre of its type in the Southern Hemisphere, accommodating 170 male juvenile offenders.

**Criteria g)**

Representative	Include	Exclude
The design of the early buildings, their configuration and the layout of the site itself illustrate range of juvenile penal philosophies and practices of the period, including the wholesomeness of the agrarian lifestyle, social isolation as a means of moderating negative influences, the influence of sporting activities and the use of communal dormitories for positive social reinforcement.		



Mount Penang remains intact enough to demonstrate the evolution of juvenile justice systems in 20th century NSW.

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Title	Author	Year	Link	Type
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Government Architects - part 2	Le Sueur, Angela	2016		Written
Photographic Recording of The Avenue, Central Coast Highway/Woy Woy Road Intersection Upgrade - Mount Penang Parklands - Exemption under section 57(2)	Roads & Traffic Authority (NSW)	2010		Written
Roudabout construction, The Avenue, Mount Penang Parklands, Kariong - Statement of Heritage Impact	Biosys Research	2009		Written
Mount Penang Parklands	Central Coast Australia	2007	<a href="http://www.centralcoastaustralia.com.au/3714/mt-penang-parklands/">http://www.centralcoastaustralia.com.au/3714/mt-penang-parklands/</a>	Tourism

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Penang listed for heritage (Central Coast Herald 10/9/03)	Scott Tucker	2003		Written
Sent to the Mountain: a history of Mount Penang Juvenile Justice Centre	Rubie, Valerie	2002		Written
Mount Penang Conservation Plan	Godden Mackay Logan	2001		Management Plan

## Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

## Procedures / Workflows / Notes

Records Retrieved: 2

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
33035	57(2)	Exemption to allow work	Standard Exemptions	Minister Cowied	11/09/2020		
70859	57(2)	Exemption to allow work	Heritage Act - Site Specific Exemptions	Minister hinderg	03/30/2018		

## Management

Management

Records Retrieved: 3

Management Category	Management Name	Date Updated
Recommended Management	Review a Conservation Management Plan (CMP)	
Recommended Management	Prepare a maintenance schedule or guidelines	
Recommended Management	Carry out interpretation, promotion and/or education	

Management Summary



Caption: Plan No. 1928

Photographer: Heritage Division

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Copyright Owner: No Credit

Date: 10/7/2003 12:00:00 AM



Caption: NULL

Photographer: Robyn Conroy

Copyright Owner: No Credit

Date: 6/1/2005 12:00:00 AM



Caption: NULL

Photographer: Robyn Conroy

Copyright Owner: No Credit

Date: 6/1/2005 12:00:00 AM





Caption: NULL

Photographer: Robyn Conroy

Copyright Owner: No Credit

Date: 6/1/2005 12:00:00 AM



Caption: NULL

Photographer: Robyn Conroy

Copyright Owner: No Credit

Date: 6/1/2005 12:00:00 AM



Caption: NULL

Photographer: Robyn Conroy

Copyright Owner: No Credit

Date: 6/1/2005 12:00:00 AM



Caption: NULL

Photographer: Robyn Conroy

Copyright Owner: No Credit

Date: 6/1/2005 12:00:00 AM

## Item Details

### Name

Built landscape elements-gazebo, stone walls, sculpture park

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

Mount Penang Parklands

### Item Classification

#### Item Type

Complex / Group

#### Item Group

Landscape - Cultural

#### Item Category

Cultural Feature

### Statement Of Significance

#### Assessed Significance Type

Local

#### Endorsed Significance

Local

#### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	68			

### Heritage Item ID

1620659

### Source

Local Government

## Location



Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
--------------------------------	---------

## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

# Assessment

---

Criteria a)			
Historical Significance		Include	Exclude
Criteria b)			
Historical Association Significance		Include	Exclude
Criteria c)			
Aesthetic/Technical Significance		Include	Exclude
Criteria d)			
Social/Cultural Significance		Include	Exclude
Criteria e)			
Research Potential		Include	Exclude
Criteria f)			
Rarity		Include	Exclude
Criteria g)			
Representative		Include	Exclude
Integrity/Intactness			Updated

# References

---

## References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

## Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

## Procedures / Workflows / Notes

---

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

## Management

---

### Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

### Management Summary





# State Heritage Inventory Report

## Item Details

### Name

Dam

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

Mount Penang Parklands

### Item Classification

#### Item Type

Built

#### Item Group

Utilities - Water

#### Item Category

Water Supply Reservoir/ Dam

### Statement Of Significance

### Assessed Significance Type

Local

### Endorsed Significance

Local

### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	70			

### Heritage Item ID

1620660

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
--------------------------------	---------

## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

# Assessment

---

Criteria a)		
Historical Significance	Include	Exclude
Criteria b)		
Historical Association Significance	Include	Exclude
Criteria c)		
Aesthetic/Technical Significance	Include	Exclude
Criteria d)		
Social/Cultural Significance	Include	Exclude
Criteria e)		
Research Potential	Include	Exclude
Criteria f)		
Rarity	Include	Exclude
Criteria g)		
Representative	Include	Exclude
Integrity/Intactness		Updated

# References

---

## References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

## Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

## Procedures / Workflows / Notes

---

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

## Management

---

### Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

### Management Summary





## Item Details

### Name

Dormitories - "Carinya", "Sobraon", "Walpole", "Vernon" and "The Wood Building"

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

### Item Classification

#### Item Type

Built

#### Item Group

Law Enforcement

#### Item Category

Reformatory/Remand Home

### Statement Of Significance

### Assessed Significance Type

State

### Endorsed Significance

State

### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	62			

### Heritage Item ID

1620634

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
--------------------------------	---------

## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

## Assessment

---

Criteria a)			
Historical Significance		Include	Exclude
Criteria b)			
Historical Association Significance		Include	Exclude
Criteria c)			
Aesthetic/Technical Significance		Include	Exclude
Criteria d)			
Social/Cultural Significance		Include	Exclude
Criteria e)			
Research Potential		Include	Exclude
Criteria f)			
Rarity		Include	Exclude
Criteria g)			
Representative		Include	Exclude
Integrity/Intactness			Updated

## References

---



References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

Procedures / Workflows / Notes

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

Management

Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

Management Summary



## Item Details

### Name

Eastern bushland

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Item Classification

#### Item Type

Landscape

#### Item Group

Landscape - Natural

#### Item Category

Flora species site or area

### Statement Of Significance

### Assessed Significance Type

Local

### Endorsed Significance

Local

### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	76			

### Heritage Item ID

1620635

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
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## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		



# Assessment

---

Criteria a)		
Historical Significance	Include	Exclude
Criteria b)		
Historical Association Significance	Include	Exclude
Criteria c)		
Aesthetic/Technical Significance	Include	Exclude
Criteria d)		
Social/Cultural Significance	Include	Exclude
Criteria e)		
Research Potential	Include	Exclude
Criteria f)		
Rarity	Include	Exclude
Criteria g)		
Representative	Include	Exclude
Integrity/Intactness		Updated

# References

---

## References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

## Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

## Procedures / Workflows / Notes

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

## Management

### Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

### Management Summary



## Item Details

### Name

Entry drive with perimeter brush box and eucalypt plantings

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

Mount Penang Parklands

### Item Classification

#### Item Type

Built

#### Item Group

Transport - Land

#### Item Category

Other - Transport - Road

### Statement Of Significance

#### Assessed Significance Type

State

#### Endorsed Significance

State

#### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	77			

### Heritage Item ID

1620636

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
--------------------------------	---------



## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

## Assessment

---

Criteria a)			
Historical Significance		Include	Exclude
Criteria b)			
Historical Association Significance		Include	Exclude
Criteria c)			
Aesthetic/Technical Significance		Include	Exclude
Criteria d)			
Social/Cultural Significance		Include	Exclude
Criteria e)			
Research Potential		Include	Exclude
Criteria f)			
Rarity		Include	Exclude
Criteria g)			
Representative		Include	Exclude
Integrity/Intactness			Updated

## References

---

## References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

## Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

## Procedures / Workflows / Notes

---

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

## Management

---

### Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

### Management Summary



## Item Details

### Name

Mature cultural plantings

### Other/Former Names

### Address

Central Coast Highway (along northern end of riding school) KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

### Item Classification

#### Item Type

Landscape

#### Item Group

Parks, Gardens and Trees

#### Item Category

Trees of social, historic or special significance

### Statement Of Significance

### Assessed Significance Type

Local

### Endorsed Significance

Local

### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	72			

### Heritage Item ID

1620657

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway (along northern end of riding school)	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa	Period						
	N0	Unknown						
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History



## Historical Notes or Provenance

Updated

## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

# Assessment

---

Criteria a)		
Historical Significance	Include	Exclude
Criteria b)		
Historical Association Significance	Include	Exclude
Criteria c)		
Aesthetic/Technical Significance	Include	Exclude
Criteria d)		
Social/Cultural Significance	Include	Exclude
Criteria e)		
Research Potential	Include	Exclude
Criteria f)		
Rarity	Include	Exclude
Criteria g)		
Representative	Include	Exclude
Integrity/Intactness		Updated

# References

---

## References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

## Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

## Procedures / Workflows / Notes

---

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

## Management

---

### Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

### Management Summary



## Item Details

### Name

Mature cultural plantings, including coral trees, brush box, camphor laurels, white polars, hoop pines, an oak and a larch

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

Mount Penang Parklands

### Item Classification

#### Item Type

Landscape

#### Item Group

Parks, Gardens and Trees

#### Item Category

Other - Parks, Gardens & Trees

### Statement Of Significance

#### Assessed Significance Type

Local

#### Endorsed Significance

Local

#### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	73			

### Heritage Item ID

1620637

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
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## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

# Assessment

---

Criteria a)		
Historical Significance	Include	Exclude
Criteria b)		
Historical Association Significance	Include	Exclude
Criteria c)		
Aesthetic/Technical Significance	Include	Exclude
Criteria d)		
Social/Cultural Significance	Include	Exclude
Criteria e)		
Research Potential	Include	Exclude
Criteria f)		
Rarity	Include	Exclude
Criteria g)		
Representative	Include	Exclude
Integrity/Intactness		Updated

# References

---

## References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

## Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

## Procedures / Workflows / Notes

---

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

## Management

---

### Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

### Management Summary



# State Heritage Inventory Report

## Item Details

### Name

McCabe Complex - two cottages, McCabe Conference Centre

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

Mount Penang Parklands

### Item Classification

#### Item Type

Complex / Group

#### Item Group

Law Enforcement

#### Item Category

Detention Centre

### Statement Of Significance

#### Assessed Significance Type

State

#### Endorsed Significance

State

#### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	66			

### Heritage Item ID

1620638

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
--------------------------------	---------



## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

## Assessment

---

Criteria a)			
Historical Significance		Include	Exclude
Criteria b)			
Historical Association Significance		Include	Exclude
Criteria c)			
Aesthetic/Technical Significance		Include	Exclude
Criteria d)			
Social/Cultural Significance		Include	Exclude
Criteria e)			
Research Potential		Include	Exclude
Criteria f)			
Rarity		Include	Exclude
Criteria g)			
Representative		Include	Exclude
Integrity/Intactness			Updated

## References

---

References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

Procedures / Workflows / Notes

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

Management

Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

Management Summary



# State Heritage Inventory Report

## Item Details

### Name

Old pine tree group

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

Mount Penang Parklands

### Item Classification

#### Item Type

Landscape

#### Item Group

Parks, Gardens and Trees

#### Item Category

Other - Parks, Gardens & Trees

### Statement Of Significance

### Assessed Significance Type

Local

### Endorsed Significance

Local

### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	69			

### Heritage Item ID

1620639

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
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## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

## Assessment

---

Criteria a)			
Historical Significance		Include	Exclude
Criteria b)			
Historical Association Significance		Include	Exclude
Criteria c)			
Aesthetic/Technical Significance		Include	Exclude
Criteria d)			
Social/Cultural Significance		Include	Exclude
Criteria e)			
Research Potential		Include	Exclude
Criteria f)			
Rarity		Include	Exclude
Criteria g)			
Representative		Include	Exclude
Integrity/Intactness			Updated

## References

---

## References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

## Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

## Procedures / Workflows / Notes

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

## Management

### Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

### Management Summary



## Item Details

### Name

Remnant farm buildings - the barn, storage shed and dairy

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

Mount Penang Parklands

### Item Classification

#### Item Type

Built

#### Item Group

Farming and Grazing

#### Item Category

Farm

### Statement Of Significance

#### Assessed Significance Type

Local

#### Endorsed Significance

Local

#### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	61			

### Heritage Item ID

1620640

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
--------------------------------	---------



## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

## Assessment

---

Criteria a)			
Historical Significance		Include	Exclude
Criteria b)			
Historical Association Significance		Include	Exclude
Criteria c)			
Aesthetic/Technical Significance		Include	Exclude
Criteria d)			
Social/Cultural Significance		Include	Exclude
Criteria e)			
Research Potential		Include	Exclude
Criteria f)			
Rarity		Include	Exclude
Criteria g)			
Representative		Include	Exclude
Integrity/Intactness			Updated

## References

---

References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

Procedures / Workflows / Notes

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

Management

Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

Management Summary



## Item Details

### Name

Residential buildings-six residential cottages, deputy superintendent's cottage

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

Mount Penang Parklands

### Item Classification

#### Item Type

Built

#### Item Group

Law Enforcement

#### Item Category

Detention Centre

### Statement Of Significance

### Assessed Significance Type

State

### Endorsed Significance

State

### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	64			

### Heritage Item ID

1620641

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description						Updated		
Physical Condition						Updated		
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
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## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

## Assessment

---

Criteria a)			
Historical Significance		Include	Exclude
Criteria b)			
Historical Association Significance		Include	Exclude
Criteria c)			
Aesthetic/Technical Significance		Include	Exclude
Criteria d)			
Social/Cultural Significance		Include	Exclude
Criteria e)			
Research Potential		Include	Exclude
Criteria f)			
Rarity		Include	Exclude
Criteria g)			
Representative		Include	Exclude
Integrity/Intactness			Updated

## References

---

References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

Procedures / Workflows / Notes

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

Management

Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

Management Summary



## Item Details

### Name

Service and amenity buildings-art room and ablutions block, former officers' dining room, dining room, main kitchen and laundry

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

Mount Penang Parklands

### Item Classification

#### Item Type

Built

#### Item Group

Law Enforcement

#### Item Category

Detention Centre

### Statement Of Significance

#### Assessed Significance Type

Local

#### Endorsed Significance

Local

#### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	65			

### Heritage Item ID

1620642

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
--------------------------------	---------

## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		



## Assessment

---

Criteria a)			
Historical Significance		Include	Exclude
Criteria b)			
Historical Association Significance		Include	Exclude
Criteria c)			
Aesthetic/Technical Significance		Include	Exclude
Criteria d)			
Social/Cultural Significance		Include	Exclude
Criteria e)			
Research Potential		Include	Exclude
Criteria f)			
Rarity		Include	Exclude
Criteria g)			
Representative		Include	Exclude
Integrity/Intactness			Updated

## References

---

## References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

## Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

## Procedures / Workflows / Notes

---

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

## Management

---

### Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

### Management Summary



## Item Details

### Name

Sports field perimeter brush box and eucalypt plantings

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

Mount Penang Parklands

### Item Classification

#### Item Type

Landscape

#### Item Group

Landscape - Natural

#### Item Category

Flora species site or area

### Statement Of Significance

#### Assessed Significance Type

Local

#### Endorsed Significance

Local

#### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	75			

### Heritage Item ID

1620643

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
--------------------------------	---------

## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

# Assessment

---

Criteria a)			
Historical Significance		Include	Exclude
Criteria b)			
Historical Association Significance		Include	Exclude
Criteria c)			
Aesthetic/Technical Significance		Include	Exclude
Criteria d)			
Social/Cultural Significance		Include	Exclude
Criteria e)			
Research Potential		Include	Exclude
Criteria f)			
Rarity		Include	Exclude
Criteria g)			
Representative		Include	Exclude
Integrity/Intactness			Updated

# References

---



## References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

## Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

## Procedures / Workflows / Notes

---

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

## Management

---

### Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

### Management Summary



## Item Details

### Name

Sports fields - three sports fields, sports oval

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

Mount Penang Parklands

### Item Classification

#### Item Type

Built

#### Item Group

Recreation and Entertainment

#### Item Category

Cricket Pitch/ Ground

### Statement Of Significance

### Assessed Significance Type

State

### Endorsed Significance

State

### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	67			

### Heritage Item ID

1620644

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
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Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
--------------------------------	---------

## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

# Assessment

---

Criteria a)			
Historical Significance		Include	Exclude
Criteria b)			
Historical Association Significance		Include	Exclude
Criteria c)			
Aesthetic/Technical Significance		Include	Exclude
Criteria d)			
Social/Cultural Significance		Include	Exclude
Criteria e)			
Research Potential		Include	Exclude
Criteria f)			
Rarity		Include	Exclude
Criteria g)			
Representative		Include	Exclude
Integrity/Intactness			Updated

# References

---

## References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

## Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

## Procedures / Workflows / Notes

---

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

## Management

---

### Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

### Management Summary





## Item Details

### Name

Two groups of scribbly gums

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Group Name

Mount Penang Parklands

### Item Classification

#### Item Type

Landscape

#### Item Group

Landscape - Natural

#### Item Category

Flora species site or area

### Statement Of Significance

### Assessed Significance Type

Local

### Endorsed Significance

Local

### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	74			

### Heritage Item ID

1620645

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description						Updated		
Physical Condition						Updated		
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
--------------------------------	---------

## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

## Assessment

---

Criteria a)			
Historical Significance		Include	Exclude
Criteria b)			
Historical Association Significance		Include	Exclude
Criteria c)			
Aesthetic/Technical Significance		Include	Exclude
Criteria d)			
Social/Cultural Significance		Include	Exclude
Criteria e)			
Research Potential		Include	Exclude
Criteria f)			
Rarity		Include	Exclude
Criteria g)			
Representative		Include	Exclude
Integrity/Intactness			Updated

## References

---

References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

Procedures / Workflows / Notes

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

Management

Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

Management Summary





## Item Details

### Name

White poplar avenue

### Other/Former Names

### Address

Central Coast Highway KARIONG NSW 2250

### Local Govt Area

Central Coast

### Item Classification

#### Item Type

Landscape

#### Item Group

Parks, Gardens and Trees

#### Item Category

Tree groups - street

### Statement Of Significance

### Assessed Significance Type

### Endorsed Significance

Local

### Date Significance Updated

### Listings

Listing Name	Listing Date	Instrument Name	Instrument No.	Plan No.	Gazette Page	Gazette Number
Local Environmental Plan	11/0/2014	Gosford Local Environmental Plan 2014	71			

### Heritage Item ID

1620646

### Source

Local Government

## Location

Addresses

Records Retrieved: 1

Street No	Street Name	Suburb/Town/Postcode	Local Govt. Area	LALC	Parish	County	Electorate	Address Type
	Central Coast Highway	KARIONG/NSW/2250	Central Coast	Unknown			Unknown	Primary Address

Description

Designer	Builder/Maker							
Construction Year Start & End	Circa		Period					
	NO		Unknown					
Physical Description							Updated	
Physical Condition							Updated	
Modifications And Dates								
Further Comments								

History

Historical Notes or Provenance	Updated
--------------------------------	---------

## Historic Themes

Records Retrieved: 0

National Theme	State Theme	Local Theme
No Results Found		

## Assessment

---

Criteria a)			
Historical Significance		Include	Exclude
Criteria b)			
Historical Association Significance		Include	Exclude
Criteria c)			
Aesthetic/Technical Significance		Include	Exclude
Criteria d)			
Social/Cultural Significance		Include	Exclude
Criteria e)			
Research Potential		Include	Exclude
Criteria f)			
Rarity		Include	Exclude
Criteria g)			
Representative		Include	Exclude
Integrity/Intactness			Updated

## References

---

## References

Records Retrieved: 0

Title	Author	Year	Link	Type
No Results Found				

## Heritage Studies

Records Retrieved: 0

Title	Year	Item Number	Author	Inspected By	Guidelines Used
No Results Found					

## Procedures / Workflows / Notes

Records Retrieved: 0

Application ID / Procedure ID	Section of Act	Description	Title	Officer	Date Received	Status	Outcome
No Results Found							

## Management

### Management

Records Retrieved: 0

Management Category	Management Name	Date Updated
No Results Found		

### Management Summary

This report was produced using the State Heritage Inventory managed by Heritage NSW. Check with your relevant local council or NSW government agency for the most up-to-date information. This report does not replace a Section 167 certificate or a Section 10.7 Certificate (formerly Section 149).

11/02/2022 01:14 PM 5 of 6



## Appendix 2 Proposed works

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# PARKLANDS ROAD UPGRADE CIVIL ENGINEERING PACKAGE





APPROXIMATE LOCATION  
OF SITE WORKS



DWG No.	DRAWING TITLE
CD-07-C1.01	COVER SHEET
CD-07-C1.10	SITE PLAN
CD-07-C10.01	PARKLANDS ROAD UPGRADES - SHEET 1
CD-07-C10.02	PARKLANDS ROAD UPGRADES - SHEET 2
CD-07-C10.03	PARKLANDS ROAD UPGRADES - SHEET 3
CD-07-C10.04	PARKLANDS ROAD UPGRADES - SHEET 4

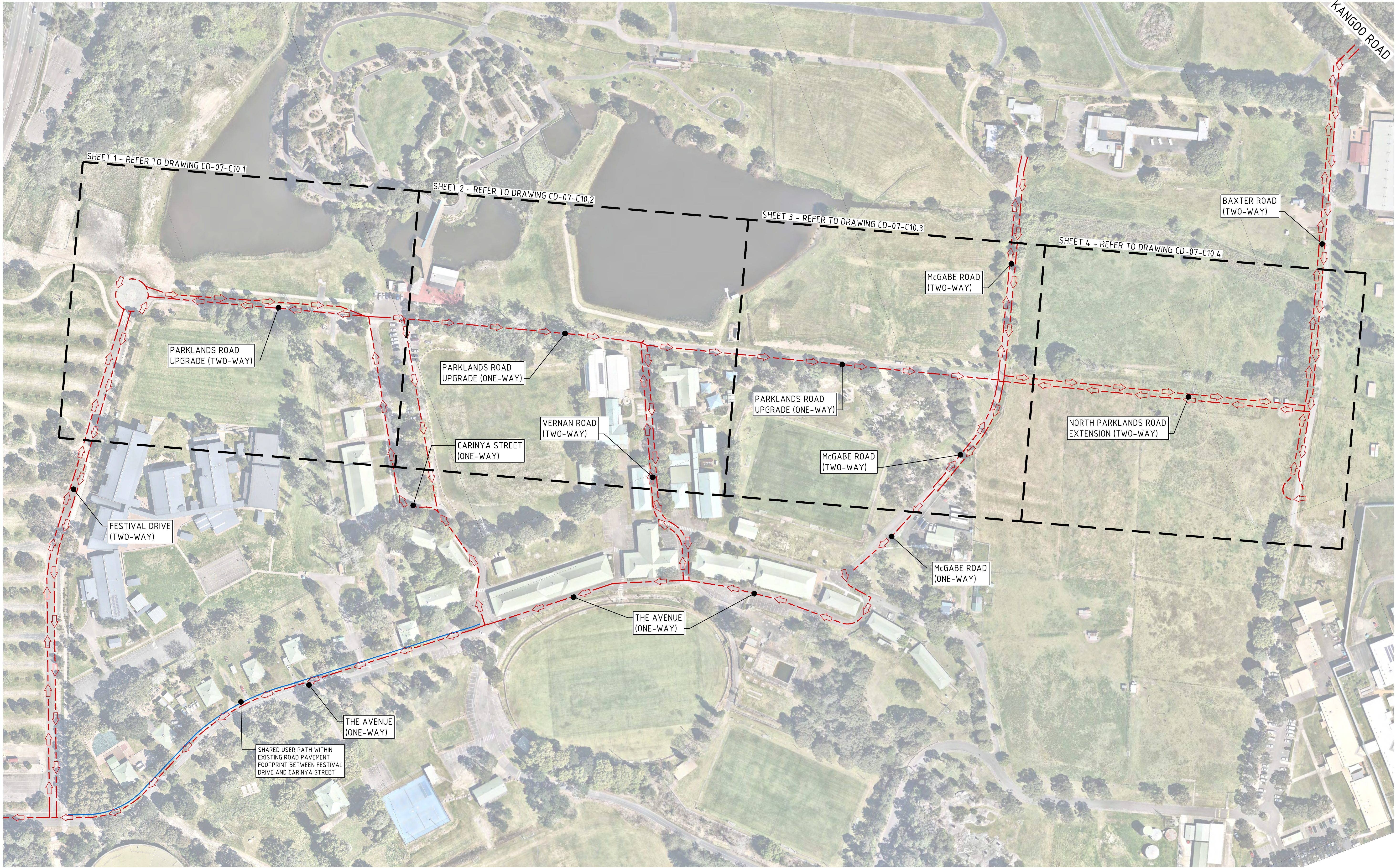
DRAWN: K.TURTON	DESIGNED: K.BARRETT	JOB MANAGER: B.CLARK	VERIFIER:
-----------------	---------------------	----------------------	-----------

**NOT FOR CONSTRUCTION**

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE	CLIENT	ARCHITECT		PROJECT	DRAWING TITLE	JOB NUMBER	
1	ISSUED FOR INFORMATION	KT			14.03.22	 <b>Hunter &amp; Central Coast Development Corporation</b>	 Newcastle Level 1, 215 Pacific Hwy, Charlestown NSW 2290 Ph (02) 4943 1777 Email newcastle@northrop.com.au ABN 81 094 433 100	ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY. THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK & WHITE.	<b>MT PENANG PARKLANDS, KARIONG, NSW 2250</b>  <b>PARKLANDS ROAD UPGRADE</b>	<b>CIVIL ENGINEERING PACKAGE</b>  <b>COVER SHEET</b>	<b>NL191249</b>  <b>CD-07-C1.01</b>  DRAWING SHEET SIZE - A1	REVISION  <b>2</b>
2	ISSUED FOR INFORMATION	KT		2103.22								
DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED						THE COPYRIGHT OF THIS DRAWING REMAINS WITH NORTHROP CONSULTING ENGINEERS PTY LTD						



DRAWN: K. TURTON  
DESIGNED: K. BARRETT  
JOB MANAGER: B. CLARK  
VERIFIER:



[NOTE THAT ORIGINAL DRAWING IS IN COLOUR]

**NOT FOR CONSTRUCTION**

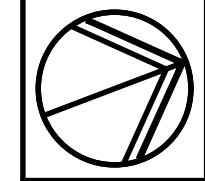
REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	ISSUED FOR INFORMATION	KT			11.03.22
2	ISSUED FOR INFORMATION	KT			14.03.22



**Hunter & Central Coast  
Development  
Corporation**

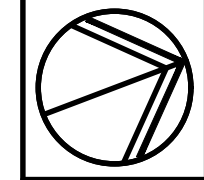
DRAWING NOT TO BE USED FOR CONSTRUCTION  
UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT



**NORTHROP**  
Newcastle

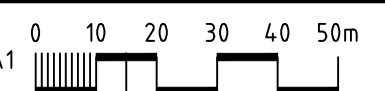
THE COPYRIGHT OF THIS DRAWING REMAINS WITH  
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**NORTHROP**  
Newcastle

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SCALE 1:1250 @ A1





**NORTHROP**  
Newcastle

Level 1, 215 Pacific Hwy, Charlestown NSW 2290  
Ph (02) 4943 1777 Email [newcastle@northrop.com.au](mailto:newcastle@northrop.com.au)  
ABN 81 094 433 100

PROJECT

**MT PENANG PARKLANDS,  
KARIONG, NSW 2250**

**PARKLANDS ROAD  
UPGRADE**

DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**SITE PLAN**

JOB NUMBER

**NL191249**

DRAWING NUMBER

**CD-07-C1.10**

REVISION

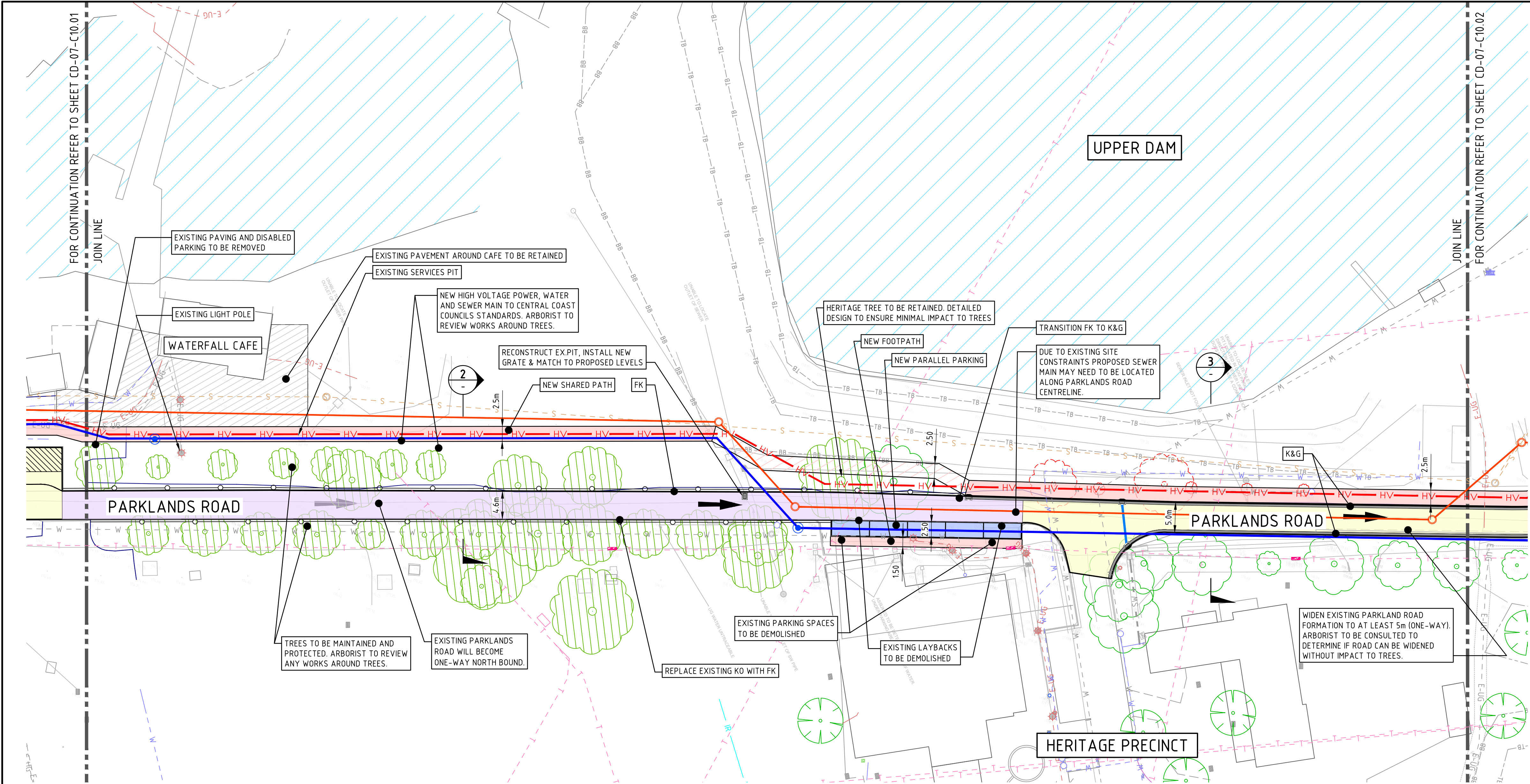
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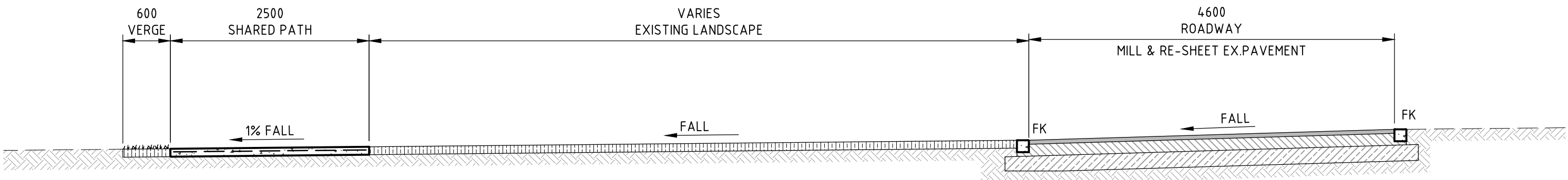




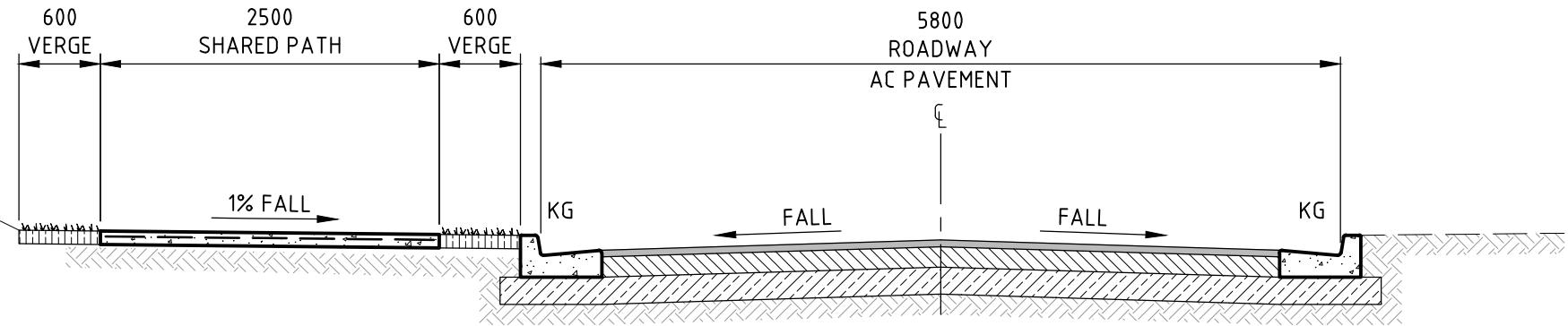
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	PROPOSED BOUNDARY LINE
	EXISTING BOUNDARY LINE
	EASEMENT LINE
	EXISTING ELECTRICITY
	EXISTING ELECTRICITY (OVERHEAD)
	EXISTING ELECTRICITY (UNDERGROUND)
	EXISTING GAS
	EXISTING TELECOMMUNICATIONS
	EXISTING TELSTRA
	EXISTING OPTIC FIBRE
	EXISTING WATER SERVICE
	EXISTING STORMWATER
	EXISTING SEWER SERVICE
	PROPOSED SEWER MAIN
	EXISTING SEWER MAIN
	PROPOSED WATER MAIN
	EXISTING CONTOURS

LEGEND	
	DENOTES TRAFFICABLE AC PAVEMENT
	DENOTES TRAFFICABLE HYDROSTON PERMEABLE PAVEMENT
	DENOTES TRAFFICABLE PAVEMENT (FINISH T.A.D.)
	DENOTES SHARED PATH / FOOTPATH PAVEMENT
	DENOTES ELEVATED BOARDWALK
	DENOTES PLANTERS WITH TREES, REFER TO LANDSCAPE/ARCHITECTS DRAWINGS FOR DETAILS
	DENOTES EXISTING KERB TO BE RETAINED
	DENOTES PROPOSED KERB ONLY / FLUSH KERB
	DENOTES KERB RAMP
	DENOTES BARRIER KERB & CHANNEL
	DENOTES STORMWATER PIT (NEW / EXISTING).
	DENOTES KERB INLET PIT (NEW / EXISTING)
	DENOTES STORMWATER LINE & SIZE
	DENOTES BARRIER/BOLLARDS TO RESTRICT VEHICLE ACCESS, TO URBAN/LANDSCAPE SPECIFICATION
	DENOTES PROPOSED BOLLARD
	DENOTES PAVEMENT MARKING - PARKING BAYS (DISABLED) IN ACCORDANCE WITH AS2890.6
	DENOTES PAVEMENT MARKING - PARKING BAYS (SHARED ZONE WITH BOLLARD)
	L2 DENOTES PAINTED UNBROKEN LINE 80mm WIDE (YELLOW WITH SLIP RESISTANT SURFACE)
	DENOTES PAVEMENT MARKING - PARKING BAYS
	L1 DENOTES PAINTED UNBROKEN LINE 80mm WIDE (WHITE WITH SLIP RESISTANT SURFACE)
NOTE: ALL LINE MARKING TO BE IN ACCORDANCE WITH AS2890.1 & AS2890.6	
- ALL LINE MARKING TO BE THERMOPLASTIC LINE MARKING	
NOTE: ALL EXISTING SIGNS AND LINE MARKING TO BE RETAINED UNLESS OTHERWISE NOTED ON PLAN. REMOVED SIGNS MAY BE REUSED IF THEY ARE DEEMED IN GOOD CONDITION BY SUPERINTENDENT.	

LEGEND	
	DENOTES EXISTING TREES TO BE RETAINED (SURVEYED BY DEWITT CONSULTING 10.09.21). REFER TO ARBORIST / HERITAGE CONSULTANT FOR DETAILS / CONFIRMATION.
	DENOTES EXISTING TREES TO BE RETAINED. REFER TO ARBORIST / HERITAGE CONSULTANT FOR DETAILS / CONFIRMATION.
	DENOTES EXISTING HERITAGE TREES TO BE RETAINED (SURVEYED BY DEWITT CONSULTING 10.09.21). REFER TO ARBORIST / HERITAGE CONSULTANT FOR DETAILS / CONFIRMATION.
	DENOTES EXISTING HERITAGE TREES TO BE RETAINED. REFER TO ARBORIST / HERITAGE CONSULTANT FOR DETAILS / CONFIRMATION.
	DENOTES EXISTING TREES TO BE REMOVED (SURVEYED BY DEWITT CONSULTING 10.09.21). REFER TO ARBORIST / HERITAGE CONSULTANT FOR DETAILS / CONFIRMATION.
	DENOTES EXISTING TREES TO BE REMOVED. REFER TO ARBORIST / HERITAGE CONSULTANT FOR DETAILS / CONFIRMATION.



PARKLANDS ROAD  
SECTION 2  
SCALE 1:50



PARKLAND ROAD  
SECTION 3  
SCALE 1:50

VERIFIER: B. CLARK  
JOB MANAGER: K. BARRETT  
DESIGNED: K. BARRETT  
DRAWN: K. TURTON

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
5	ISSUED FOR INFORMATION	KT			11.03.22
6	ISSUED FOR INFORMATION	KT			14.03.22
7	ISSUED FOR INFORMATION	KT			21.03.22
8	ISSUED FOR INFORMATION	KT			22.03.22
9	ISSUED FOR INFORMATION	KT			30.03.22
10	ISSUED FOR INFORMATION	KT			06.04.22



Hunter & Central Coast  
Development  
Corporation

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SCALE 1:400 @ A1  
0 4 8 12 16 20m

**NORTHROP**  
Newcastle  
Level 1, 215 Pacific Hwy, Charlestown NSW 2290  
Ph (02) 4943 1777 Email newcastle@northrop.com.au  
ABN 81 094 433 100

PROJECT

MT PENANG PARKLANDS,  
KARIONG, NSW 2250  
PARKLANDS ROAD  
UPGRADE

DRAWING TITLE

CIVIL ENGINEERING PACKAGE  
PARKLANDS ROAD  
UPGRADES - SHEET 2

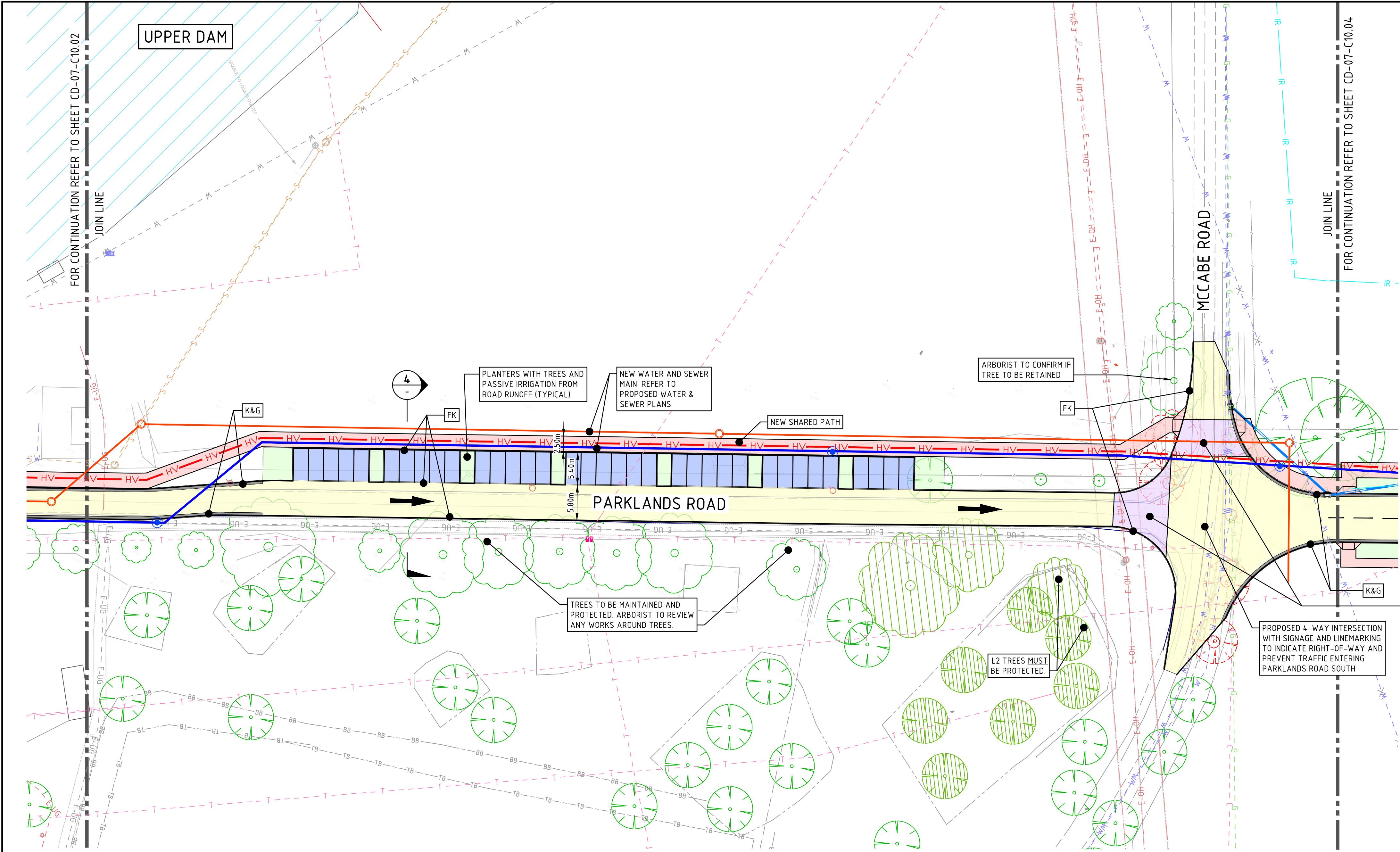
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REVISION  
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NOTE THAT ORIGINAL DRAWING IS IN COLOUR  
**NOT FOR CONSTRUCTION**

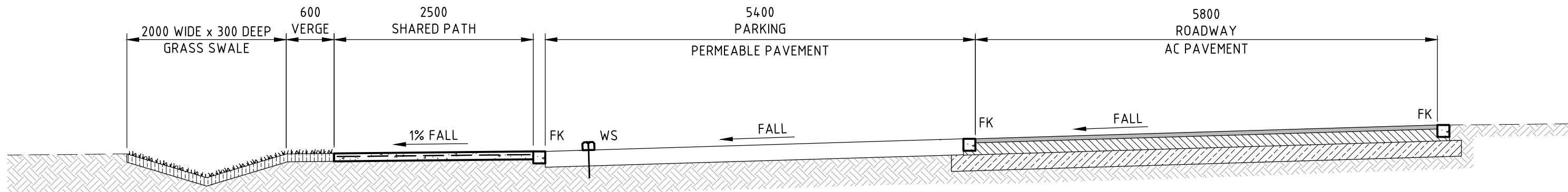




LEGEND	
	PROPOSED BOUNDARY LINE
	EXISTING BOUNDARY LINE
	EASEMENT LINE
	EXISTING ELECTRICITY
	EXISTING ELECTRICITY (OVERHEAD)
	EXISTING ELECTRICITY (UNDERGROUND)
	EXISTING GAS
	EXISTING TELECOMMUNICATIONS
	EXISTING TELSTRA
	EXISTING OPTIC FIBRE
	EXISTING WATER SERVICE
	EXISTING STORMWATER
	EXISTING SEWER SERVICE
	PROPOSED SEWER MAIN
	EXISTING SEWER MAIN
	PROPOSED WATER MAIN
	EXISTING CONTOURS

LEGEND	
	DENOTES TRAFFICABLE AC PAVEMENT
	DENOTES TRAFFICABLE HYDROSTON PERMEABLE PAVEMENT
	DENOTES TRAFFICABLE PAVEMENT (FINISH T.A.D.)
	DENOTES SHARED PATH / FOOTPATH PAVEMENT
	DENOTES ELEVATED BOARDWALK
	DENOTES PLANTERS WITH TREES, REFER TO LANDSCAPE/ARCHITECTS DRAWINGS FOR DETAILS
	DENOTES EXISTING KERB TO BE RETAINED
	DENOTES PROPOSED KERB ONLY / FLUSH KERB
	DENOTES KERB RAMP
	DENOTES BARRIER KERB & CHANNEL
	DENOTES STORMWATER PIT (NEW / EXISTING)
	DENOTES KERB INLET PIT (NEW / EXISTING)
	DENOTES STORMWATER LINE & SIZE
	DENOTES BARRIER/BOLLARDS TO RESTRICT VEHICLE ACCESS, TO URBAN/LANDSCAPE SPECIFICATION
	DENOTES PROPOSED BOLLARD
	DENOTES PAVEMENT MARKING - PARKING BAYS (DISABLED) IN ACCORDANCE WITH AS2890.6
	DENOTES PAVEMENT MARKING - PARKING BAYS (SHARED ZONE WITH BOLLARD)
	L2 DENOTES PAINTED UNBROKEN LINE 80mm WIDE (YELLOW WITH SLIP RESISTANT SURFACE)
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PARKLANDS ROAD  
SECTION 4  
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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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5	ISSUED FOR INFORMATION	KT			11.03.22
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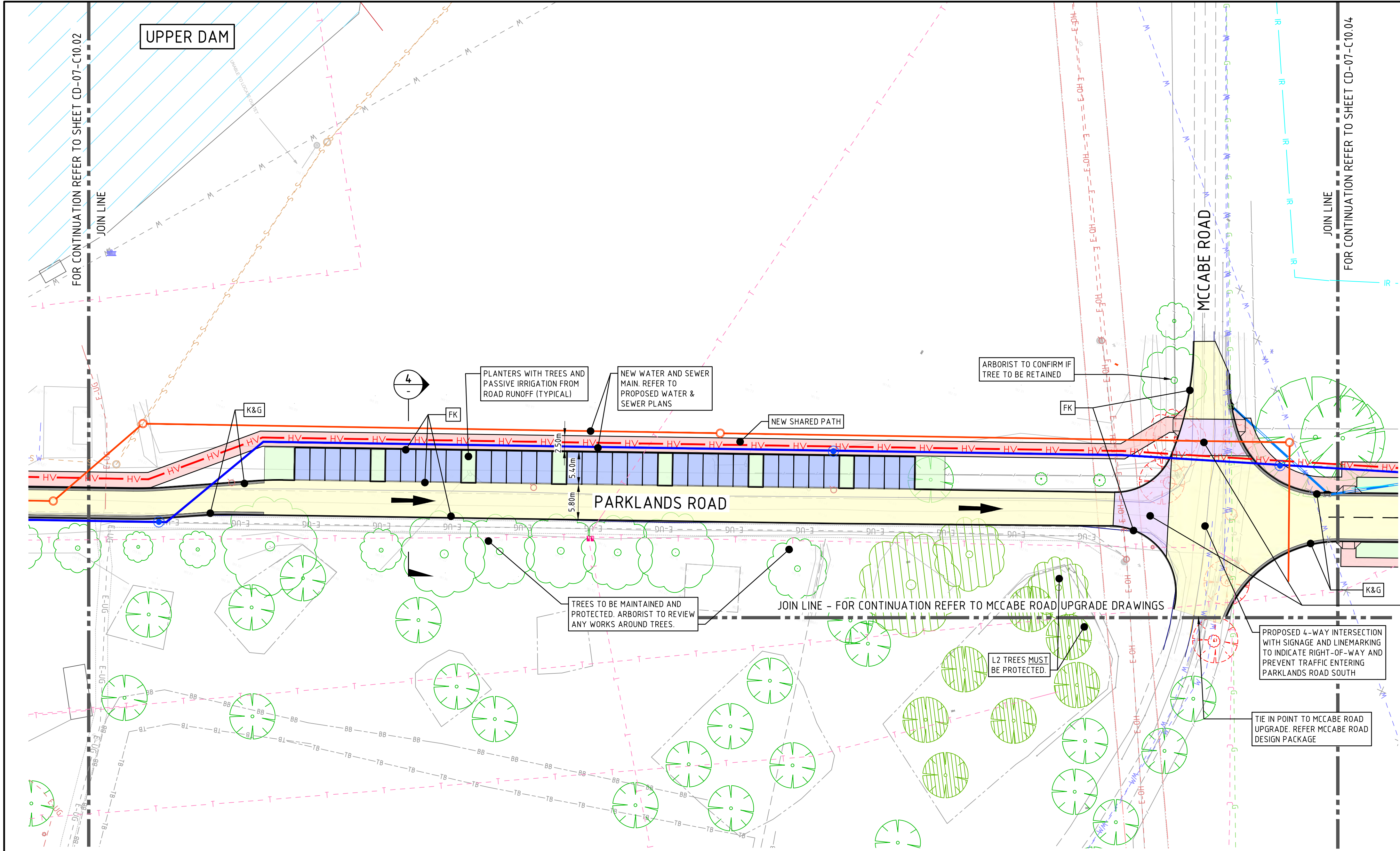
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**MT PENANG PARKLANDS, KARIOUNG, NSW 2250**  
**PARKLANDS ROAD UPGRADE**

DRAWING TITLE  
**CIVIL ENGINEERING PACKAGE**  
**PARKLANDS ROAD UPGRADES - SHEET 3**

JOB NUMBER  
**NL191249**  
DRAWING NUMBER  
**CD-07-C10.03**  
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- EXISTING TELECOMMUNICATIONS
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- EXISTING OPTIC FIBRE
- EXISTING WATER SERVICE
- EXISTING STORMWATER
- EXISTING SEWER SERVICE
- PROPOSED SEWER MAIN
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- PROPOSED WATER MAIN
- EXISTING CONTOURS

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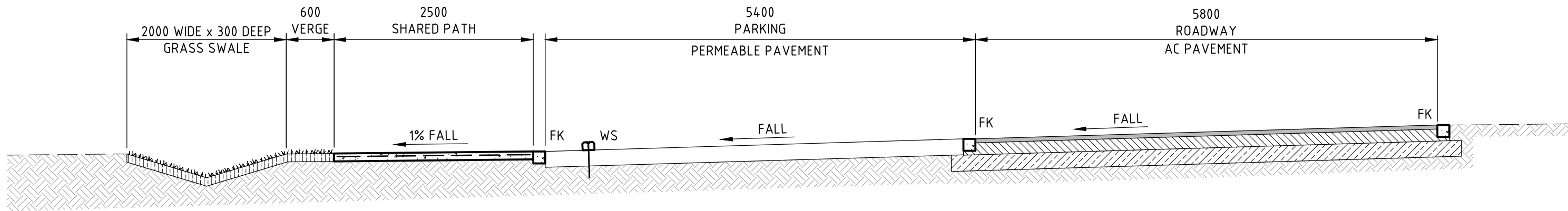
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**PARKLANDS ROAD UPGRADES - SHEET 3**

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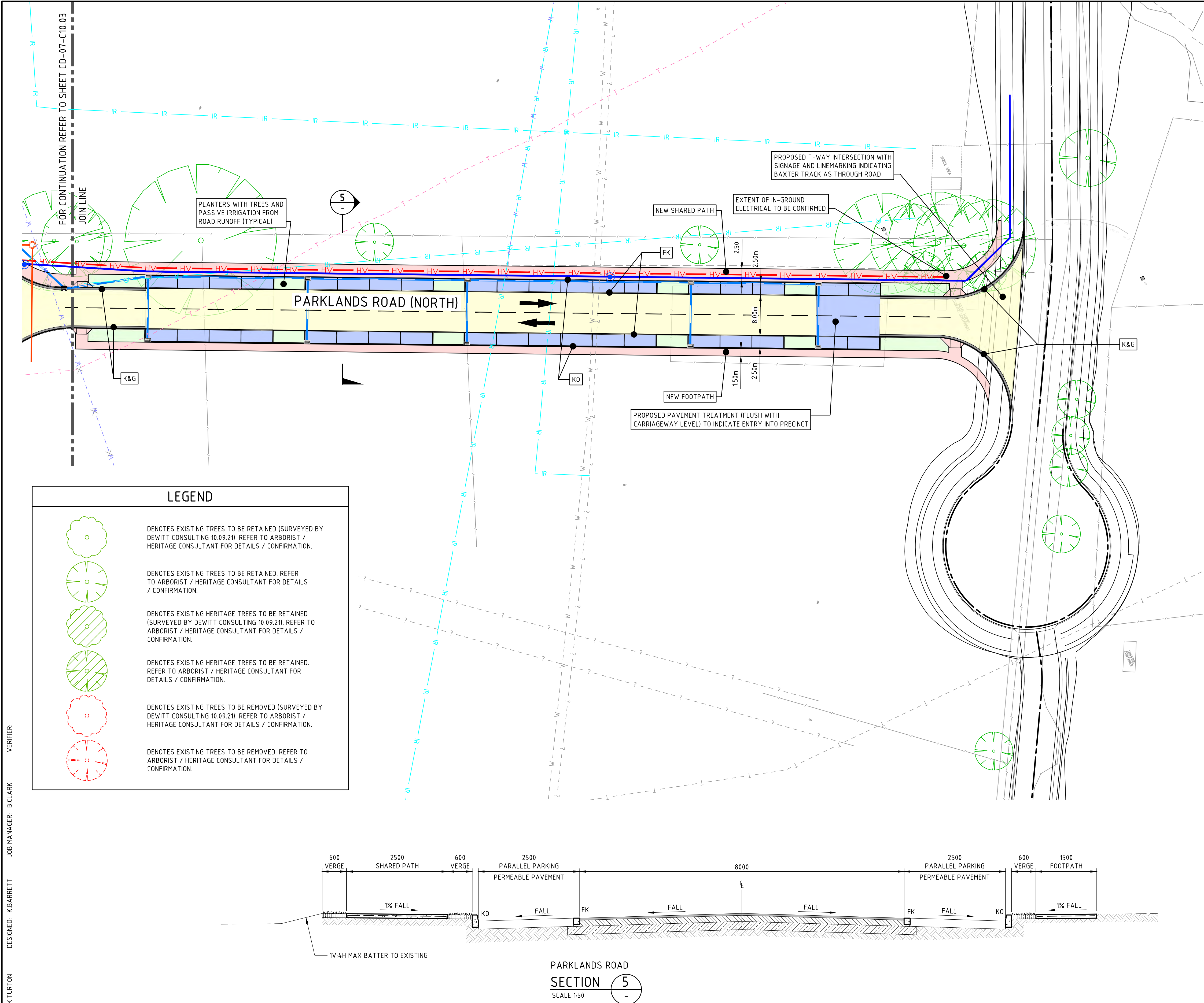
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JOB MANAGER: K. BARRETT  
DESIGNED: K. BARRETT  
DRAWN: K. TURTON

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PROJECT

**MT PENANG PARKLANDS, KARIONG, NSW 2250**

**PARKLANDS ROAD UPGRADE**

DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**PARKLANDS ROAD UPGRADES - SHEET 4**

JOB NUMBER

**NL191249**

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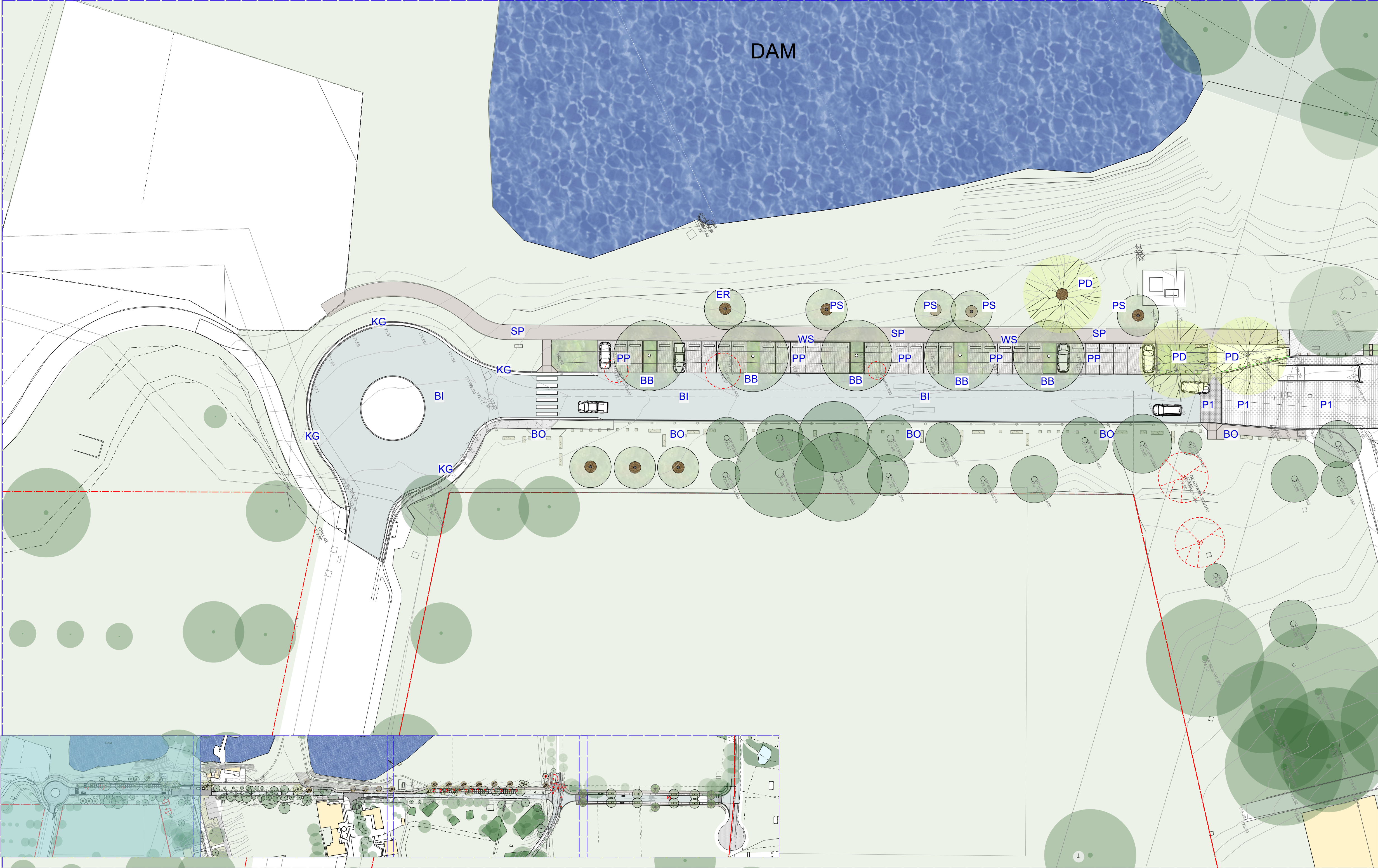
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TREE SCHEDULE

Annotation	Species	Common Name	Size	Heritage and CMP Consistency
BB	LOPHOSTEMON CONFERTUS	BRUSHBOX	SIZE 200L	very prevalent in the parklands avenue tree group used throughout the parklands as a specimen tree (indigenous) to supplement the senescent trees existing. to compliment the lombardy poplars, it has the same for as the existng lombardy poplars however does not sucker.
ER	EUCALYPTUS ROBUSTA	SWAMP MAHOGONY	SIZE 100L	
PD	POPULUS DELTOIDES	COTTONWOOD	SIZE 200L	
PS	POPULUS SIMONII	SIMONII POPLAR	SIZE 200L	

STREET AND PARKLAND TREES



Flindersia schottiana



Populus simonii



Populus deltoides



Pinus pinea



Lophostemon confertus

No.

B

22/04/2022

2

UPDATED PLANS WITH TREE PLANTING AND SCHEDULE FOR REVIEW

DD

SP

No.

5/4/2022

REVISION

By

No.

Date

ISSUE

By

Design Team

IMOGEN MILLER

URBAN DESIGN

(+61) 0419 462 943

LOCI

DESIGN COLLECTIVE

(+61) 0401 271 241

Engineer

NORTHROP

Newcastle

Client

NSW GOVERNMENT

Hunter & Central Coast Development Corporation

Project

PARKLANDS ROAD

Project Address

Mt Penang Parklands  
Karing NSW 2250

Status

DESIGN DEVELOPMENT

Project No.

22002

Drawn By

KB / SP

Checked By

IM/DD

Scale

1:1000 @A1

Drawing No.

300 B

Rev #





TREES



Populus deltoides



Populus simonii

TREE SCHEDULE

Annotation	Species	Common Name	Size	Heritage and CMP Consistency
PD	POPULUS DELTOIDES	COTTONWOOD	SIZE 200L	to suppliment the senescent trees existing.
PS	POPULUS SIMONII	SIMONII POPLAR	SIZE 200L	to compliment the lombardy poplars, it has the same for as the existing lombardy poplars however does not sucker.

										<div>Design Team</div> <div></div> <div>(+61) 0419 462 943</div>		<div>LOCIDESIGN COLLECTIVE</div> <div>(+61) 0401 271 241</div>		<div>Engineer</div> <div></div> <div>Newcastle</div>		<div>Project</div> <div>1</div> <div>PARKLANDS ROAD</div>		<div>Drawing Title</div> <div>PARKLANDS RD MATERIALS &amp; TREES 02</div>					
B	22/04/2022	UPDATED PLANS WITH TREE PLANTING FOR REVIEW	DD											<div>Client</div> <div></div> <div>Hunter &amp; Central Coast Development Corporation</div>		<div>Project Address</div> <div>Mt Penang Parklands Kariong NSW 2250</div>		<div>Status</div> <div>DESIGN DEVELOPMENT</div>		<div>Project No.</div> <div>22002</div>		<div>Drawing No.</div> <div>Rev #</div>	
A	5/4/2022	FOR REVIEW	SP	By	No.	Date	ISSUE	By													301 B		





TREES



Populus deltoides



Populus simonii

TREE SCHEDULE

Annotation	Species	Common Name	Size	Heritage and CMP Consistency
PD	POPULUS DELTOIDES	COTTONWOOD	SIZE 200L	to suppliment the senescent trees existing.
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TREE SCHEDULE

Annotation	Species	Common Name	Size	Heritage and CMP Consistency
BB	LOPHOSTEMON CONFERTUS	BRUSHBOX	SIZE 200L	very prevalent in the parklands avenue tree group throughout the parklands as a remnant specimen tree and close to heritage listed group to supplant the senescent trees existing. to compliment the lombardy poplars, it has the same for as the existing lombardy poplars however does not sucker.
EH	EUCALYPTUS HAEMASTOMA	SCRIBBLY GUM	SIZE 100L	
PD	POPULUS DELTOIDES	COTTONWOOD	SIZE 200L	
PS	POPULUS SIMONII	SIMONII POPLAR	SIZE 200L	

TREES



BB-Lophostemon confertus



EH-Eucalyptus haemastoma



PD-Populus deltoides



PS-Populus simonii

										<div>Design Team</div> <div></div> <div>(+61) 0419 462 943</div>		<div></div> <div>(+61) 0401 271 241</div>		<div>Engineer</div> <div></div> <div>Newcastle</div>		<div>Project</div> <div>PARKLANDS ROAD</div>		<div>Drawing Title</div> <div>PARKLANDS RD MATERIALS &amp; TREES 03 sheet 3</div>			
B	22/04/2022	UPDATED PLANS WITH TREE SCHEDULE		DD																	
A	5/4/2022	FOR REVIEW		SP																	
No.	Date	REVISION		By	No.	Date	ISSUE		By												











LEGEND + SELECTION SCHEDULE: PARKLANDS ROAD

project: Mount Penang  
status:  
revision:

MATERIALS + FIXTURES

code	description	specification and finish	Precedence
PV1	Bitumen Location: Roadways to civil engineer.	to civil engineers.	
PV2	Bitumen Location: Footpaths and shared paths on Parklands, The Avenue and Carinya Street.	Finish and size: AC10 over AC 30. Thickened sawn edge, galvanised steel edge in steeper cross falls.	
PV2A	Porous Bitumen Location: Footpaths on The Avenue beneath existing tree canopies.	Finish and size: No fines gap graded bitumen. Thickened sawn edge, galvanised steel edge in steeper cross falls.	
PV4	Shared Zone (Pedestrian Priority)	Product: Interlocking pavers (heavy hehicle loading). Colour: 60% natural grey/ 35% charcoal grey and 5% Almond. Pattern: Basketweave pattern, with colour distributed as a random salt and pepper pattern. Size: 230 x 110 x 80mm Supplier: Boral or similar	
PV5	Porous Unit Pavers Location: Carpark bays	Finish and size: 80mm thick x 206 x 136mm Pattern: Basketweave Colour: Charcoal	

KB2	Flush Concrete kerb with exposed aggregate finish to match kerbs.	Size: To civil engineers standard Finish: Washed exposed aggregate to match existing ( in The Avenue) Colour: Natural portland cement with heavy basalt aggegate.	
BO1	Timber Bollard 1- Light weight In plaza areas and those with limited space.	Size: 200 x 200 x 1200mm Finish: Sawn finish, tapered top Colour: Sawn finish, natural- left to weather. Fixing: 650mm post hole with gap graded free draining concrete. Supplier: TKO or other.	
BO2	Timber Bollard 2- Heavy Weight Parkland Drive and Carinya Street	Size: 290 NB x 1200mm Finish: Sawn finish, stainless steel brace plate. Colour: Sawn finish, natural- left to weather. Fixing: 650mm post hole with gap graded free draining concrete. Supplier: Outdoor Structures	
BO3	Sandstone- Heavy Weight Parkland Drive and Carinya Street	Sizes: sandstone logs 1850 x 500x 500, Random squares 500 x 500 x 500 Finish: Gang sawn Colour: Mt White or Other Fixing: Mass footing Setout: Reconfigured as shown on drawings. Existing logs to be reconfigured.If site splitting is possible this may allow repurposing of existing.	
F1	Sandstone- Custom Seat Ideas	Sizes: Use typical sandstone logs. Finish: Class A diamond sawn finish. Colour: Mt White or other, natural- left to weather. Fixing: Pad fitting to future detail Supplier:Gosford Quarry or similar. Fabrication, Fleetwood Engineering or similar.	
L1	Post Top Lights	Type: Selux Astro 2 LED Luminaires Sizes: For Road lighting on Parklands Road, The Avenue and Carinya Street. Finish: Dulux weathermax or Fereko. Colour: Dark grey. Fixing: SRunning bond. Grount to match existing, unreinforced concrete strip footing (depending on height and determined by engineer). Supplier:Gosford Quarry or similar.	



---

## Appendix 3 Arboricultural Impact Assessment

---

# ARBORICULTURAL IMPACT ASSESSMENT REPORT

Prepared for

**BIOSIS PTY LTD**

Site Address

**MOUNT PENANG GARDENS, KARIONG, NSW 2250**

Project

**Mount Penang Essential Infrastructure Works Review of Environmental Factors**

Prepared by

**Owen Meekins**

Graduate Certificate of Arboriculture (AQF Level 8), LLB.





## ***Preface***

*Trees are now regarded as critical infrastructure and community assets with their benefits spanning environmental, economic, cultural and political domains alike.*

*Trees grow in a delicate balance with their environment and any changes to that balance must be minimized if the tree is to remain healthy and fulfil its potential. It is rarely possible to repair stressed and injured trees, so damage needs to be avoided during all stages of development construction.*

*A tree's roots are critical supply lines for water and minerals and are essential for both carbohydrate storage and hormonal signalling, congruent with physically anchoring the tree to the ground.*

*The aim of this Arboricultural Impact Assessment is to guide earthworks around retained trees located on the proposed development site through the formulation and implementation of best management practice tree protection methodologies. Thereby ensuring the trees long-term, integrity, vitality, and viability.*



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*Mount Penang Gardens, Kariong NSW*

## 1 Executive Summary

Active Green Services Pty Ltd (AGS) has been engaged by Biosis Pty Ltd (Biosis) to prepare an Arboricultural Impact Assessment (AIA) with regards to trees and proposed infrastructure works within a specified survey area of Mount Penang Gardens, Kariong NSW. Hence, from the 14<sup>th</sup> - 18<sup>th</sup> of March 2022, two hundred and forty-one (241) individual Visual Tree Assessments (VTA) pursuant to *Standards Australia AS 4970-2009 Protection of trees on development sites* were carried out on the subject tree population by a suitably qualified (AQF Level 5) AGS arborist.

The abovementioned site-specific tree assessment data includes tree maturity, dimensions, estimated life expectancy, vitality, ecophysiology, biomechanics, pedology, root morphology, landscape significance, and retention value *in situ*. This tree data provides the necessary arboricultural fundamentals required for calculating foreseeable arboricultural impact, its pragmatic mitigation and tree viability pre and post development. For ease of identification all of the assessed trees have been GPS located, aerial mapped, photographed and individually numbered with a physical tree tag.

Of the tree assessment data collected (241 trees), one hundred and fifty (150) trees were further assessed with regards to foreseeable development encroachment and impact per the supplied Northrop Design Plans. On review of this tree data, it was calculated that the proposed infrastructural works will encroach on the Tree Protection Zones<sup>1</sup> (TPZ) of one hundred and fifteen (115) trees. Nineteen (19) of these TPZ encroachments are calculated as 'Minor'<sup>2</sup>; and ninety-six (96) TPZ encroachments being calculated as 'Major'<sup>3</sup>. Of arboricultural concern is that seventy-five (75) of the 'Major' encroachments are calculated to be within the Structural Root Zone<sup>4</sup> (SRZ).

With regards to the abovementioned 'Major' encroachments and the current design plans provided, on the balance of probabilities it is of a reasonable arboricultural belief that a high percentage of the subject trees will not remain viable and therefore will need to be pragmatically removed concurrent with recommended Compensatory Replanting to offset canopy loss. However, if initial Non-Destructive Root Exploration (Root Mapping) is utilised in combination with pragmatic Tree Sensitive Design modifications the impact level on a number of trees can be foreseeably reduced and therefore tree retention numbers will be increased.

The detail supporting this summary follows.

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<sup>1</sup> AS 4970-2009 – *Protection of trees on development sites* s1.4.7, Tree Protection Zone (TPZ): A specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

<sup>2</sup> AS 4970-2009: *Minor encroachment (<10%)*: If the proposed encroachment is less than 10% (total area) of the TPZ, and outside of the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and be contiguous with the TPZ.

<sup>3</sup> AS 4970-2009: *Major- Viable encroachment (>10%)*: If the proposed encroachment is greater than 10% (total area) of the TPZ, the project arborist must demonstrate that the tree(s) remain viable. The area lost to this encroachment should be compensated for elsewhere and be contiguous with the TPZ. Tree sensitive construction techniques may be used for minor works within this area providing no structural roots are likely to be impacted, and the project arborist can demonstrate that the tree(s) remain viable. Root investigation by non-destructive methods may be required for proposed works within this area. All work within the TPZ must be carried out under the supervision of the project arborist.

<sup>4</sup> AS 4970-2009: The SRZ is the area of the root system used for stability, mechanical support, and anchorage of the tree. Severance of structural roots (>50 mm in diameter) within the SRZ is not recommended as it may lead to the destabilisation and/or serious decline of the tree.



## 2 Introduction

- i. AGS has been commissioned by Biosis to prepare an AIA with regards to trees and the proposed infrastructure works at Mount Penang Gardens, Kariong. This AIA will:
  - Identify trees within the development site that are likely to be impacted upon by any of the proposed works per the supplied Design Plans.
  - Assess the vitality and retention value of these foreseeably impacted trees *in situ*.
  - Assess, calculate and discuss the impacts with regards to tree retention and foreseeable viability.
  - Put forward best practice management recommendations as to effective tree protection and development impact pursuant to *Standards Australia AS 4970-2009 Protection of trees on development sites*.

### 2.1 Objective

- i. The purpose of this AIA is to provide all parties with standing an objective and unbiased arboricultural assessment of the tree population within the designated survey area with regards to tree viability and the ensuing impacts of the proposed infrastructural works per the supplied Design Plans.

### 2.2 Limitations

- i. All arboricultural reasonings that have been discussed and provided are based on extensive empirical arboricultural knowledge, the internationally recognised Visual Tree Assessment (VTA) methodology (Mattheck and Breloer, 1994), (Matheny and Clark, 1998), the recognised Institute of Australian Consulting Arboriculturists (IACA) Significance of a Tree, Assessment Rating System (STARS), and Australian Standards *AS 4970-2009 Protection of trees on development sites*.
- ii. Whilst this arboricultural assessment is thorough it should be noted that trees are dynamic living organisms exposed to both unforeseeable biotic and abiotic variables which on occasion can be harsh and severe. Therefore, this arboricultural assessment will consider on the balance of probabilities the most likely outcome(s) as opposed to those which could, may or fancifully occur.

### 2.3 Report References

- i. As a progressive arboricultural company AGS keeps abreast of research data relating to all aspects of arboriculture and urban forestry. Hence the following arboricultural observations, reasonings, conclusions and recommendations are founded on industry standards and extensive empirical arboricultural knowledge. The science-based arboricultural survey methodologies and references used can be found in the Appendix.
- ii. Please note that additional educational material has been appended to promote the urban forest through understanding and knowledge.





## 2.6 Mapping Methodology

- i. With regards to assessing and calculating arboricultural impact the subject tree population within the abovementioned survey area has been mapped, divided into twelve (12) sub-map areas and numbered as per the satellite Master-map provided below.
- ii. All trees within the twelve (12) sub-maps which were identified as being of particular interest and/or relevance regarding the development works were GPS located using the Collector Esri Application and given a unique physical tree tag number.
- iii. A CSV File and/or Shape File can be provided with the following tree data upon request.

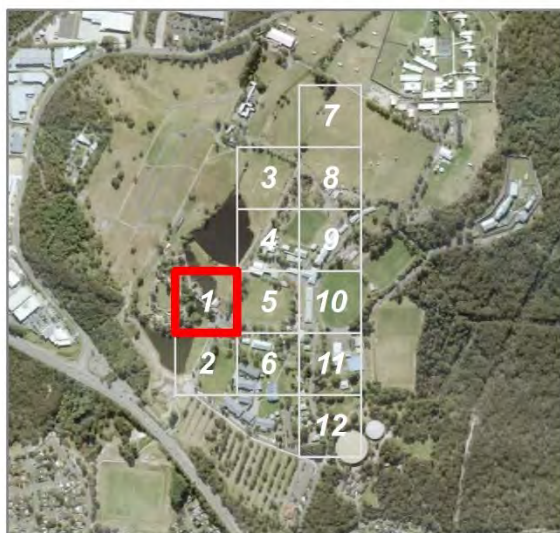
## 2.7 Tree Locations

- i. Please find below a Master-map and Sub-maps with the indicative locations of the assessed trees.
- ii. For convenience the calculated Retention Values of the subject trees are colour-coded per the (STARS) *Tree Retention Value - Priority Matrix* which can be found in the Appendix.



Image 2: Master Map for the Mt Penang Gardens Project





0 10 20 m

### Legend

#### Retention Value

- High
- Medium
- Low
- Remove

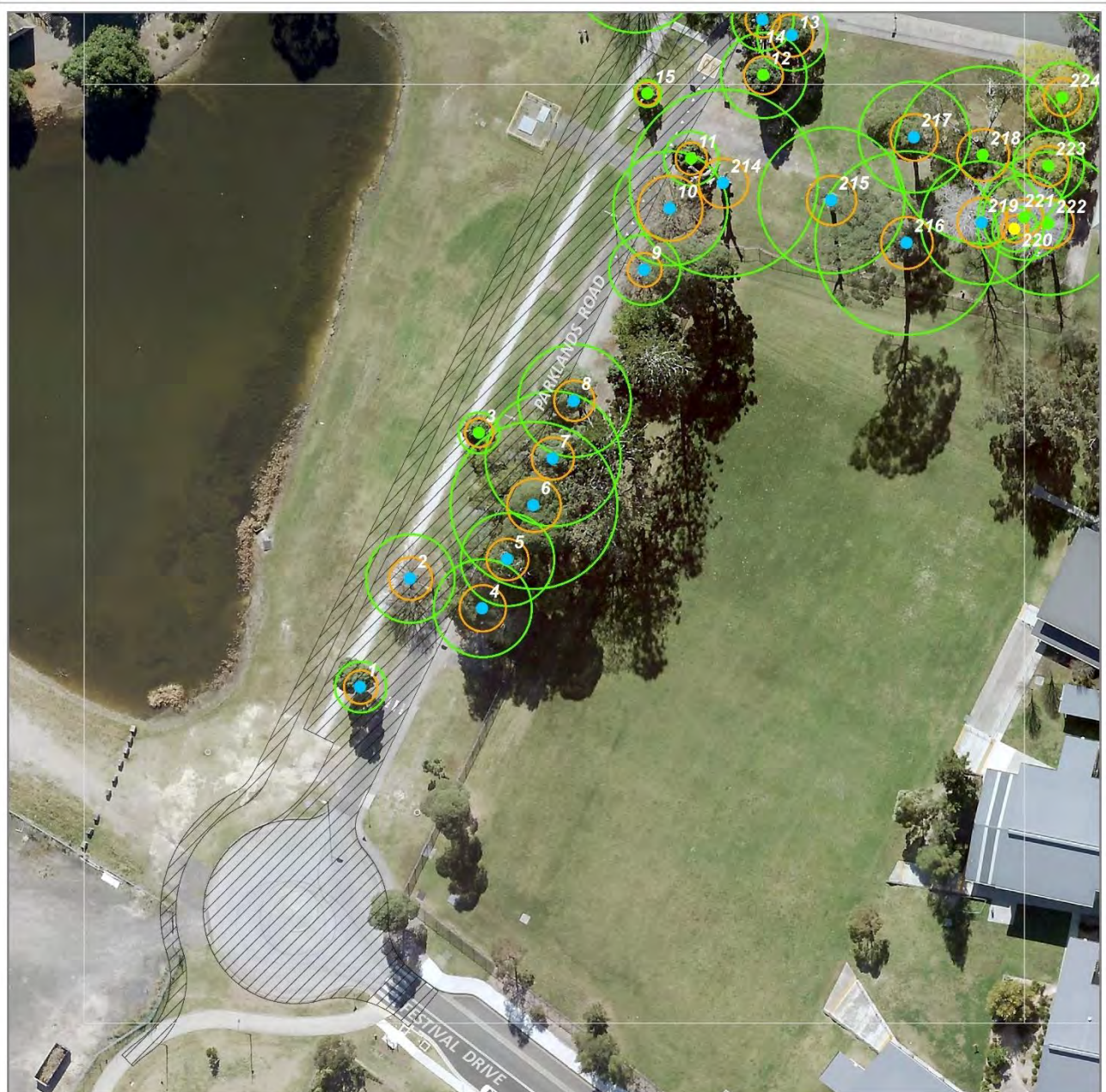
- SRZ
- TPZ

  Proposed New Infrastructure

Mt Penang Gardens, Kariong 2250

Submap 1/12





0 10 20 m

### Legend

#### Retention Value

- High
- Medium
- Low
- Remove

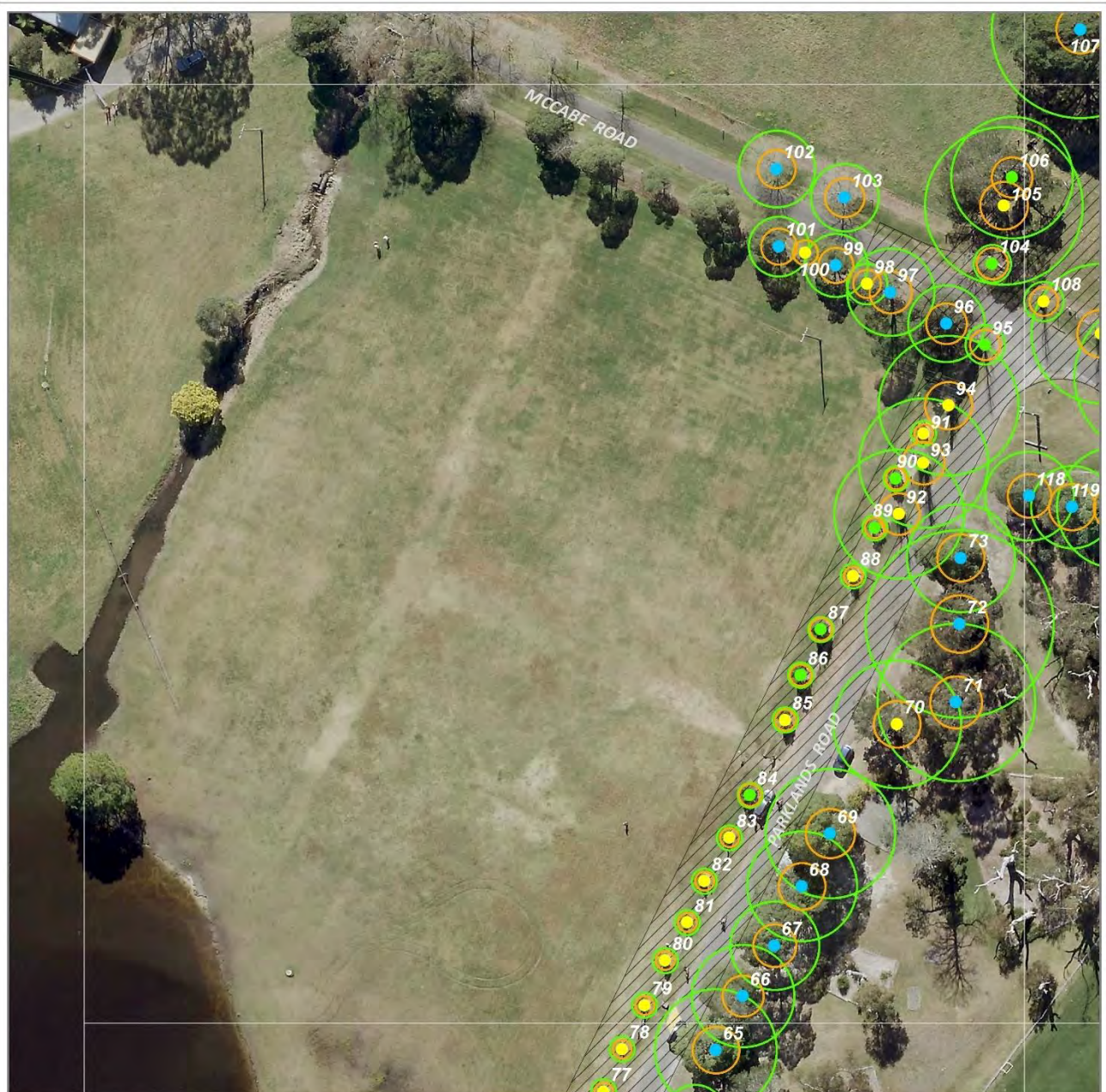
- SRZ
- TPZ

  Proposed New Infrastructure

Mt Penang Gardens, Kariong 2250

Submap 2/12





0 10 20 m

### Legend

#### Retention Value

- High
- Medium
- Low
- Remove

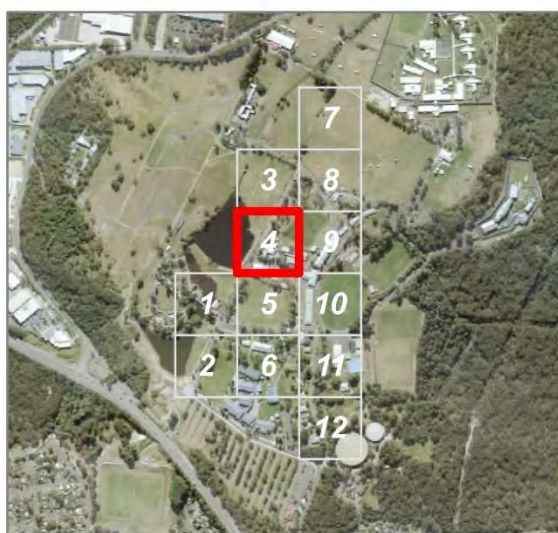
- SRZ
- TPZ

  Proposed New Infrastructure

Mt Penang Gardens, Kariong 2250

Submap 3/12





0 10 20 m

### Legend

#### Retention Value

- High
- Medium
- Low
- Remove

- SRZ
- TPZ

  Proposed New Infrastructure

Mt Penang Gardens, Kariong 2250

Submap 4/12





0 10 20 m

### Legend

#### Retention Value

- High
- Medium
- Low
- Remove

- SRZ
- TPZ

  Proposed New Infrastructure

Mt Penang Gardens, Kariong 2250

Submap 5/12





0 10 20 m

### Legend

#### Retention Value

- High
- Medium
- Low
- Remove

- SRZ
- TPZ

  Proposed New Infrastructure

Mt Penang Gardens, Kariong 2250

Submap 6/12





0 10 20 m

### Legend

#### Retention Value

- High
- Medium
- Low
- Remove

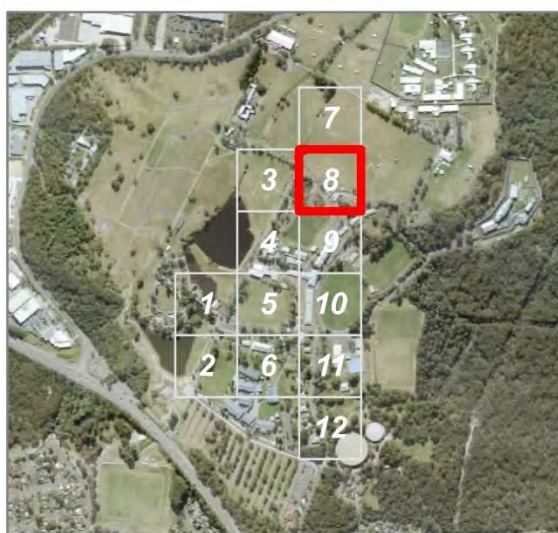
- SRZ
- TPZ

  Proposed New Infrastructure

Mt Penang Gardens, Kariong 2250

Submap 7/12





0 10 20 m

### Legend

#### Retention Value

- High
- Medium
- Low
- Remove

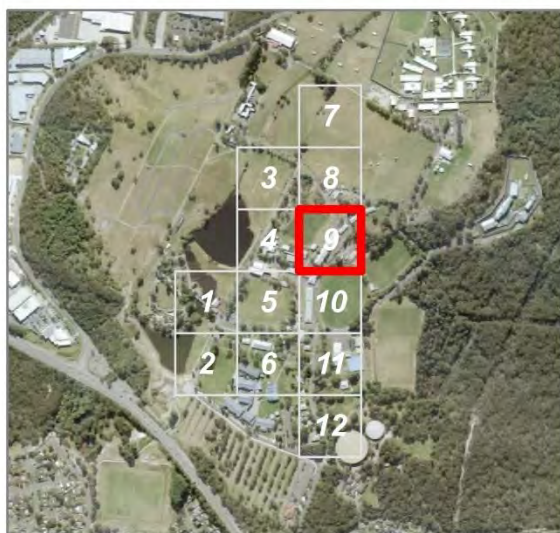
- SRZ
- TPZ

▨ Proposed New Infrastructure

Mt Penang Gardens, Kariong 2250

Submap 8/12





0 10 20 m

### Legend

#### Retention Value

- High
- Medium
- Low
- Remove

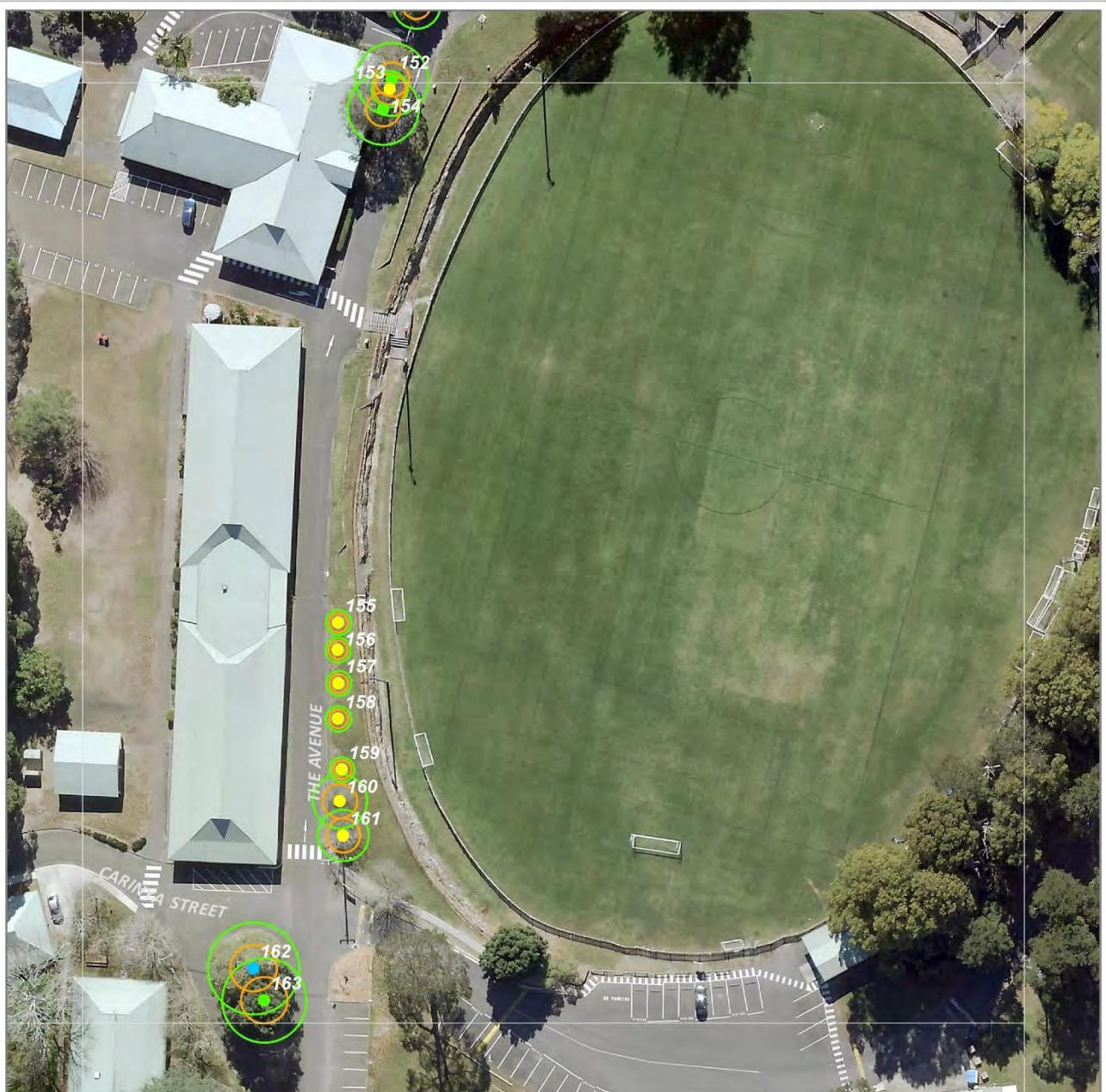
- SRZ
- TPZ

Proposed New Infrastructure

Mt Penang Gardens, Kariong 2250

Submap 9/12





0 10 20 m

### Legend

#### Retention Value

- High
- Medium
- Low
- Remove

- SRZ
- TPZ

▨ Proposed New Infrastructure

Mt Penang Gardens, Kariong 2250

Submap 10/12





0 10 20 m

### Legend

#### Retention Value

- High
- Medium
- Low
- Remove

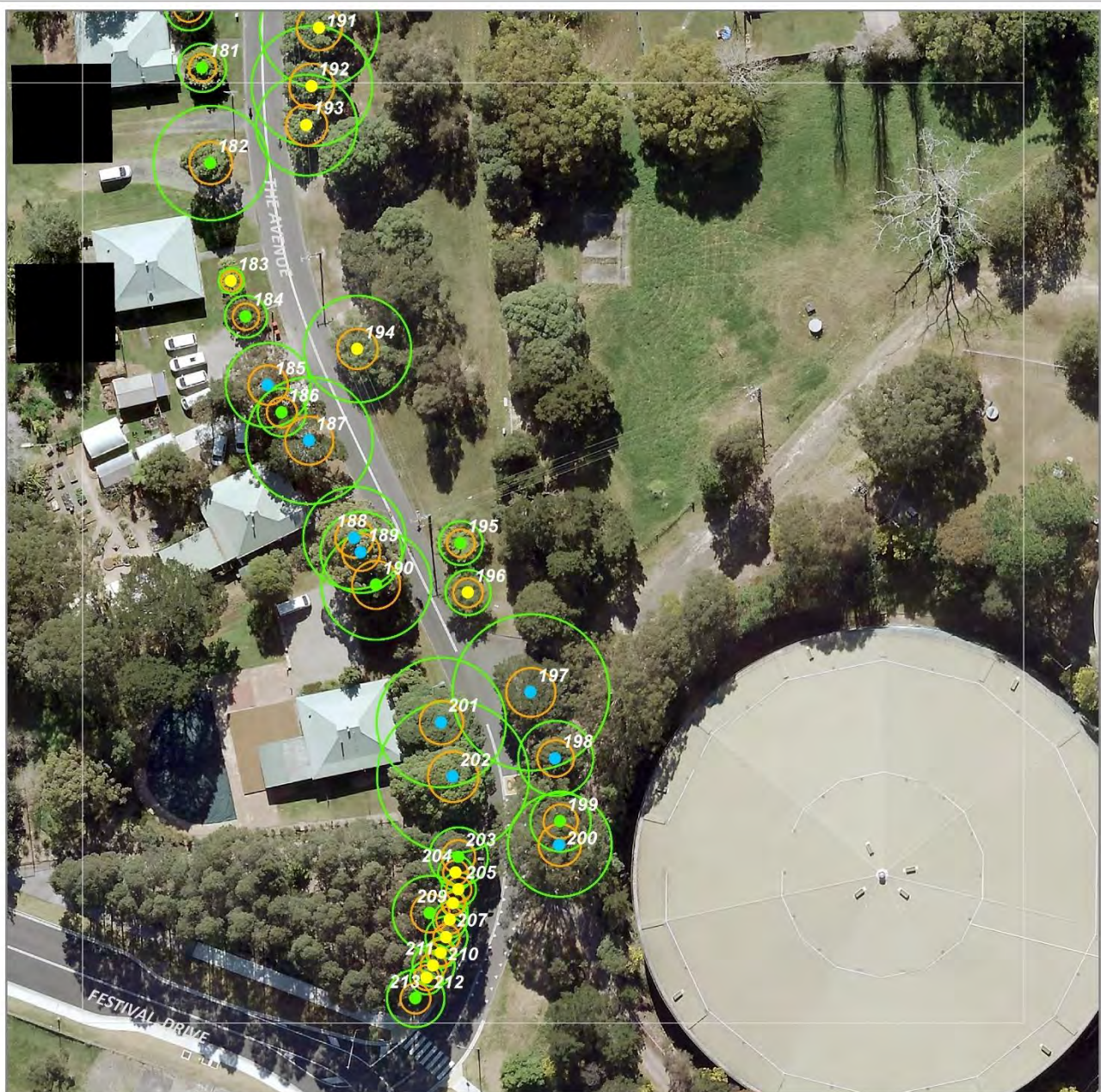
- SRZ
- TPZ

▨ Proposed New Infrastructure

Mt Penang Gardens, Kariong 2250

Submap 11/12





0 10 20 m

### Legend

#### Retention Value

- High
- Medium
- Low
- Remove

- SRZ
- TPZ

  Proposed New Infrastructure

Mt Penang Gardens, Kariong 2250

Submap 12/12

### 3 Arboricultural Methodology

#### 3.1 Visual Tree Assessment

- i. A Visual Tree Assessment (VTA) consistent with modern arboricultural practices (Mattheck and Breloer, 1994) was conducted by a suitably qualified and experienced (AQF Level 8) AGS arborist on the subject tree on the 11<sup>th</sup> of January 2022. This assessment was carried out at ground level and therefore classified as *Level 2: Basic Assessment* (Dunster et al., 2013). The VTA method is an internationally used and acknowledged method for tree inspection. Hazard symptoms are construed, defects are confirmed, measured and criteria of failure are assessed. A VTA provides science-based information about the body language and the biomechanics of a tree and if deemed necessary can recommend further dendrological diagnostic testing.
- ii. The tools used onsite to gather the necessary VTA data were a nylon percussion hammer, mobile phone, and an I-pad. The total tree height(s) and canopy spread(s) were recorded using a digital laser range finder (Nikon Forestry Pro). The trunk diameter and DBH height measurements were made by using a forestry DBH measuring tape.
- iii. For ease of identification all of the subject trees that will be foreseeably impacted upon have been mapped, photographed and individually tree tagged. No soil analysis, tissue sampling and/or geological investigations were carried out at that time.

#### 3.2 Visual Tree Assessment Parameters

- i. The following information outlines the basic parameters used to assess the subject trees. These parameters relate to the Tree Assessment data in *Table 1* below. Comprehensive definitions of the following descriptors are in the Appendix.

**Tree Vitality** is categorised through a visual determination using:

- leaf, twig or needle size, shape, and colour
- seasonal growth rates
- reaction wood development
- foliage density
- foliage coverage throughout the crown
- branch-tip dieback
- typical branch senescence.

For example, a tree assessed to have an average or fair vitality rating would generally have irregular [minor] leaf or needle shape and/or colour and/or size; and/or irregular [minor] foliage density, distribution and/or average growth indicators and/or some tip dieback.

**Tree Form** is an indication of crown shape. Crown shapes are influenced by their surroundings, light availability and branch loss, which can have varying impacts on their symmetry. The trees have generally been assessed on their individual crown shape, however, as the tree may be growing within a group environment, this could lead to the individual shape being assessed further down the scale. Although a poor rating may be attributed to the tree, the tree's contribution to the setting may be high



through association within the group canopy. This can be generally recognised through the Crown Class rating.

**Crown Class** rating provides an indication on the tree's relationship with the surrounding tree environment. The categories used include Dominant, Codominant, Intermediate, Suppressed and Open grown, as shown in the below diagram.

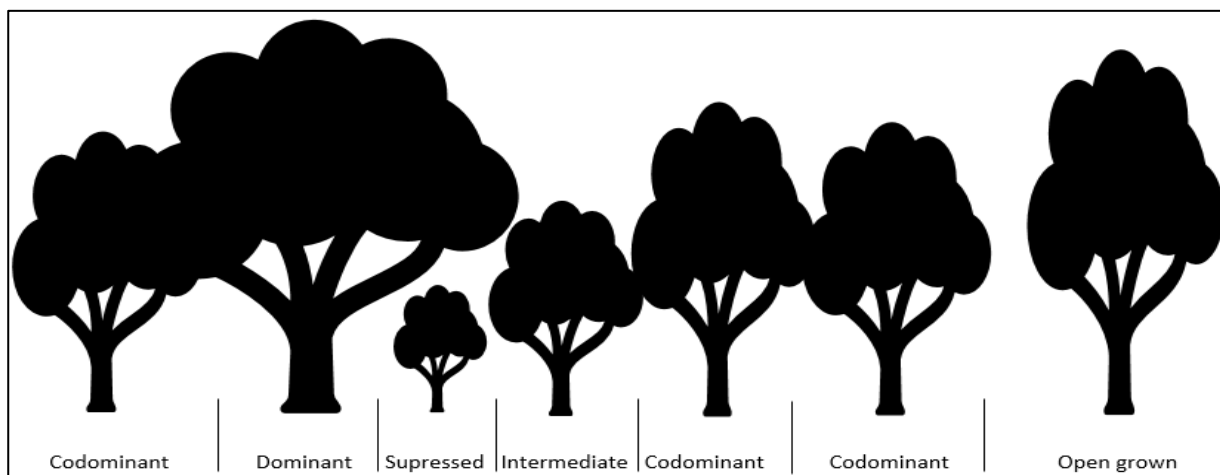


Image 2: Indicative Crown Class

**Limb Structure:** is a general evaluation on the branch union formation, weight balance, growth formation and foliage loss (that may affect branch weight and/or mass damping). This assessment is derived on typical structure of the species and its typical branch formation.

**Trunk Form:** assesses the flare at the base, taper, decay and cavities, formation of multi-stems that develop near or at ground level, girdling roots and growing angles.

**Rootzone:** visually assesses the general soil health, soil compaction and growth impediments. For example, growing environments with a high percentage of impervious seal or compaction are likely to be categorised as poor, notwithstanding the health of the tree.

**Amenity Value:** considers the appropriateness and value of the tree in the setting, any cultural and/or heritage significance and general ornamental value. In a group setting, it assesses the tree's value to the group and the adverse effects to the amenity of the group if the tree were to be removed. For example, the removal of a small, suppressed tree from a group setting may have a negligible adverse effect on the group's amenity value, therefore it is likely to be assessed as 'Little value' (*Very Poor*).

**Function:** of the tree assesses the usefulness of the tree in its setting. For example, does the tree contribute to soil retention on the side of a bank? The provision of stormwater attenuation? The amenity of the site, the provisions of microclimates/cooling during summer months and contribution to wildlife (roosting, perching and habitat). This is weighed up against any negative issues the trees may be causing, for example: conflict and damage to structures, the value of the structure is considered, the tree's growing location – is it the correct tree for the setting's use, etc.

**Impediments:** (rootzone and canopy) are structures that impede or suppress normal tree development and/or function. This can include hard impervious surfaces within the rootzone or powerlines and other structures within or adjacent to the canopy.

**Estimated Life Expectancy:** An Estimated Life Expectancy (ELE) rating was determined by using the adapted Safe Useful Life Expectancy (SULE) and Tree AZ methodologies (Barrell. 1996, 2000). The aim of these two systems is to convert what amounts to a relatively complex Arboricultural assessment into a few broad categories that are more logically understood. An ELE rating provides an estimate of a tree's expected remaining lifespan after considering the current condition, vigour, and vitality of the subject tree(s) *in situ*. Ultimately the main aim is the establishment of a tree Retention Value. The objective of a ELE assessment is to contribute to the relative value of individual trees for the purpose of informing future management options. This calculated ELE rating will be inserted into the above-mentioned STARS Matrix (please refer to the Appendix section for further information).

**Retention Value:** Significance of a Tree, Assessment Rating System (STARS) provides the Retention Value of a tree and/or group of trees by balancing a combination of environmental, cultural, physical, amenity and social values. The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the Retention Value for a tree. A tree retention assessment has been undertaken in accordance with the *Institute of Australian Consulting Arboriculturalists (IACA) Significance of a Tree, Assessment Rating System (STARS)*. The system uses a scale of High, Medium, and Low significance in the landscape. Once the landscape significance of a tree has been defined, the Retention Value can be determined congruent with the trees' abovementioned Estimated Life Expectancy (ELE). Further details and the assessment criteria are in the Appendix.

- ❖ **Low:** These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
- ❖ **Medium:** These trees are moderately important for retention. Their removal should only be considered if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
- ❖ **High:** These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed per *Standards Australia AS 4970 Protection of trees on development sites*.

### 3.3 Root Zone Encroachment

- i. Root depth and extension can be severely limited and highly irregular in urban settings. When root restrictions are minimal, root spread shows a strong relationship with trunk diameter, which is a more reliable predictor than canopy diameter ('drip-line') or tree height (Day et al., 2010). Therefore, all arboricultural recommendations and conclusions contained in this AIA with regards to tree root protection/retention were based upon and determined in accordance with the Australian Standards AS 4970-2009 *Protection of Trees on Development Sites*.
- ii. A diagram indicative of a calculated TPZ and SRZ with regards to encroachment is included below to aid in the visualisation of the 'No-Dig' zones and where initial Non-Destructive Root Exploration must be carried out under the direct supervision of a Project Arborist. This diagram can be used to indicatively



portray a SRZ and TPZ of any tree within close proximity to works and thus the necessary 'stair-step' tree protection methodology can be adopted per the Construction Encroachment Descriptors & Categories Table below.

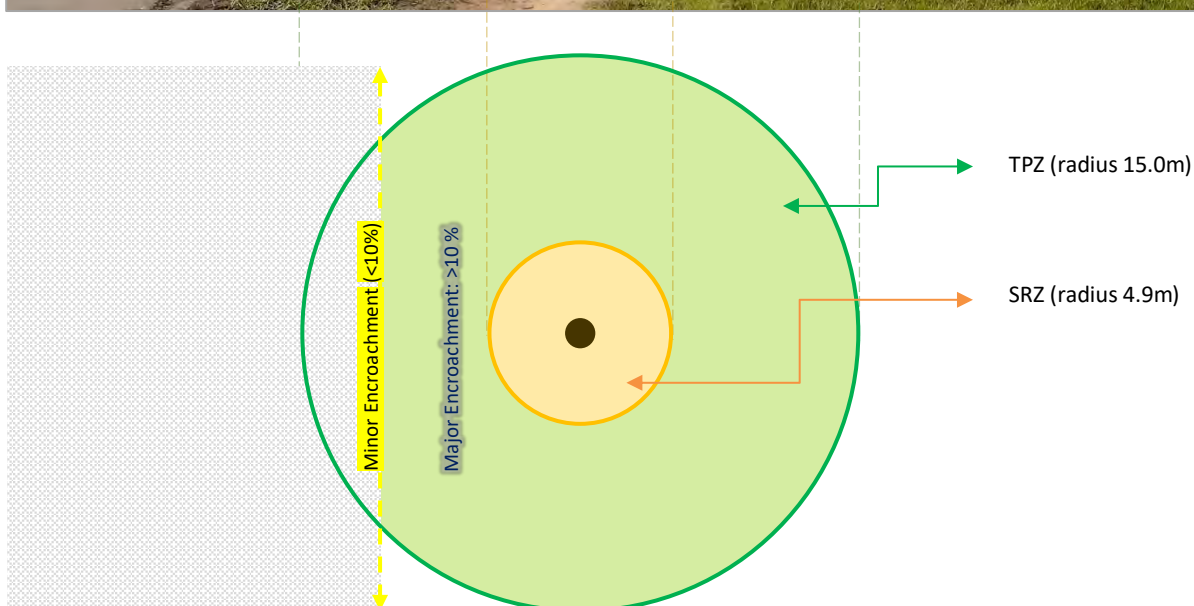


Diagram 1: McCabe Road (Tree 125) *Eucalyptus haemastoma* – Diagrammatical calculated zones











Please note that whilst working within the Tree Protection Zone (TPZ) of any tree all 'Major' encroachments must be undertaken by initial Non-Destructive Root Exploration through the use of Hand-digging and/or Air -Spade under the guidance of the onsite Project Arborist.















**Construction Encroachment Descriptors & Categories Table: A Stair-step Approach**

LEVEL	IMPACT CATEGORY	DESCRIPTION
1	<i>Removal</i>	The design and tree encroach each other to a point either the design must be modified, or the tree removed.
2	<i>Major: Non- Viable</i>	<p>The construction proposal design has an encroachment of greater than 10% of Tree Protection Zone or impacts the Structural Root Zone.</p> <p>The tree does require immediate removal, though under the current design proposal, the works are expected to impact the tree significantly enough that it is expected to die or fail in the future due to resultant works.</p> <p>In order to retain the tree, designs modifications are required to reduce construction footprint on tree to an acceptable level. Unless non-destructive root exploration can identify minimal root distribution in area.</p>
3	<i>Major: Viable under design constraints</i>	<p>The construction proposal designs have an encroachment of greater of 10% of Tree Protection Zone or impacts the Structural Root Zone. These trees can remain viable if the following is applied:</p> <ul style="list-style-type: none"> <li>• Tree sensitive construction methods are utilised.</li> <li>• Any works in SRZ are undertaken after non-invasive root exploration.</li> <li>• Exploratory root excavation findings are documented and made available to necessary parties for review.</li> <li>• Pre / during/ post inspections are carried out by Project Arborist, on all trees onsite and adjoining properties.</li> <li>• All underground services are diverted around TPZ, with the exception of underground boring.</li> </ul>
4	<i>Major: Viable</i>	<p>The construction proposal designs have an encroachment of greater than 10% of Tree Protection Zone and outside the Structural Root Zone. These trees can remain viable if the following applies:</p> <ul style="list-style-type: none"> <li>• Alternative tree sensitive design methods are implored.</li> <li>• Site conditions have limited root growth in specific area.</li> <li>• The species is tolerant to development impacts.</li> <li>• Non-destructive root exploration is undertaken and demonstrates minimal root area in TPZ.</li> </ul> <p>The tree requires a TPZ erected prior to construction or demolition phase of works. Compensation for lost TPZ area should be added.</p>
5	<i>Minor</i>	The construction proposal designs have an encroachment of less than 10% of Tree Protection Zone. The tree is expected to remain viable. A TPZ is be erected prior to construction or demolition phase.















## 4 Visual Tree Assessment Data















Table 1: Visual Tree Assessment Data (14-18/03/2022). Full details of the abovementioned descriptors and arboricultural methodologies used can be found in the Appendix section of this document.

Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
1	<i>Lophostemon confertus</i> Queensland Box	Mature	9	EW:6 NS:6	0.34	0.59	4.08	2.65	Good	Good	Long	 High	Yes	Yes	100%	MAJOR
2	<i>Ficus superba</i> Cedar Fig	Mature	7	EW:9 NS:11	0.59	1.09	7.08	3.43	Fair	Good	Long	 High	Yes	Yes	92%	MAJOR
3	<i>Syzygium smithii</i> Lilly Pilly	Semi Mature	5	EW:4 NS:4	0.27	0.41	3.24	2.28	Fair	Good	Medium	 Medium	Yes	Yes	100%	MAJOR
4	<i>Lophostemon confertus</i> Queensland Box	Mature	15	EW:8 NS:8	0.65	1.29	7.80	3.68	Good	Good	Long	 High	Yes	Yes	21%	MAJOR
5	<i>Lophostemon confertus</i> Queensland Box	Mature	19	EW:9 NS:8	0.62	1.01	7.44	3.32	Good	Fair	Long	 High	No	Yes	19%	MAJOR
6	<i>Cinnamomum camphora</i> Camphor Laurel	Mature	16	EW:10 NS:11	1.11	1.84	13.32	4.28	Good	Good	Long	 High	Yes	Yes	32%	MAJOR
7	<i>Cinnamomum camphora</i> Camphor Laurel	Mature	16	EW:10 NS:8	0.90	1.05	10.80	3.38	Fair	Fair	Long	 High	Yes	Yes	31%	MAJOR
8	<i>Lophostemon confertus</i> Queensland Box	Mature	17	EW:8 NS:9	0.75	0.93	9.00	3.21	Good	Good	Long	 High	Yes	Yes	33%	MAJOR
9	<i>Ficus superba</i> Cedar Fig	Mature	7	EW:9 NS:10	0.47	0.61	5.64	2.69	Fair	Good	Long	 High	No	Yes	14%	MAJOR
10	<i>Ficus superba</i> Cedar Fig	Mature	8	EW:10 NS:11	0.76	2.90	9.12	5.18	Fair	Good	Long	 High	Yes	Yes	31%	MAJOR
11	<i>Syzygium leuhmannii</i> Small-leaved Lilly Pilly	Semi Mature	6	EW:5 NS:5	0.36	0.53	4.32	2.53	Fair	Good	Medium	Medium	Yes	Yes	19%	MAJOR
12	<i>Lophostemon confertus</i> Queensland Box	Mature	7	EW:7 NS:7	0.57	0.83	6.84	3.06	Poor	Good	Medium	Medium	No	Yes	3%	MINOR















Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
13	<i>Lophostemon confertus</i> Queensland Box	Mature	9	EW:6 NS:7	0.47	1.05	5.64	3.38	Good	Good	Long	 High	No	No	0%	N/A
14	<i>Castanospermum australe</i> Black Bean	Mature	10	EW:8 NS:9	0.41	0.66	4.92	2.78	Fair	Good	Long	 High	Yes	Yes	24%	MAJOR
15	<i>Syzygium smithii</i> Lilly Pilly	Mature	5	EW:4 NS:4	0.18	0.26	2.16	1.88	Fair	Good	Medium	 Medium	Yes	Yes	100%	MAJOR
16	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	8	EW:7 NS:7	0.45	0.71	5.40	2.87	Fair	Good	Long	 Medium	Yes	Yes	38%	MAJOR
17	<i>Populus alba</i> White Poplar	Mature	15	EW:16 NS:14	0.89	1.70	10.68	4.14	Poor	Good	Medium	 Medium	Yes	Yes	15%	MAJOR
18	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	8	EW:7 NS:7	0.38	0.49	4.56	2.45	Fair	Good	Long	 High	No	Yes	3%	MINOR
19	<i>Corymbia ficifolia</i> Red Flowering Gum	Mature	4	EW:5 NS:5	0.20	0.24	2.40	1.82	Fair	Fair	Medium	 Medium	No	No	0%	N/A
20	<i>Corymbia ficifolia</i> Red Flowering Gum	Mature	4	EW:5 NS:5	0.20	0.24	2.40	1.82	Fair	Fair	Medium	 Medium	No	No	0%	N/A
21	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	8	EW:7 NS:7	0.31	0.40	3.72	2.25	Good	Good	Long	 High	No	Yes	2%	MINOR
22	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	8	EW:7 NS:6	0.30	0.35	3.60	2.13	Fair	Good	Long	 Medium	No	Yes	1%	MINOR
23	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	6	EW:7 NS:7	0.28	0.35	3.36	2.13	Fair	Good	Long	 Medium	No	No	0%	N/A
24	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	8	EW:7 NS:6	0.25	0.31	3.00	2.02	Fair	Good	Long	 Medium	No	No	0%	N/A
25	<i>Populus deltoides</i> Cottonwood	Mature	28	EW:17 NS:20	1.20	2.26	14.40	4.66	Good	Fair	Long	 High	Yes	Yes	30%	MAJOR
26	<i>Populus deltoides</i> Cottonwood	Mature	28	EW:18 NS:15	1.01	1.73	12.12	4.17	Good	Fair	Long	 High	Yes	Yes	34%	MAJOR

















Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
27	<i>Eucalyptus robusta</i> Swamp Mahogany	Mature	23	EW:9 NS:10	0.63	1.52	7.56	3.95	Fair	Good	Long	 High	Yes	Yes	36%	MAJOR
28	<i>Populus deltoides</i> Cottonwood	Mature	26	EW:10 NS:9	0.82	1.78	9.84	4.22	Fair	Fair	Long	 High	Yes	Yes	44%	MAJOR
29	<i>Platanus x acerifolia</i> London Plane	Mature	10	EW:8 NS:8	0.73	0.98	8.76	3.28	Poor	Fair	Medium	 Low	Yes	Yes	46%	MAJOR
30	<i>Lophostemon confertus</i> Queensland Box	Mature	14	EW:8 NS:9	0.78	1.70	9.36	4.14	Fair	Fair	Long	 High	Yes	Yes	29%	MAJOR
31	<i>Lophostemon confertus</i> Queensland Box	Mature	18	EW:9 NS:12	0.92	1.65	11.04	4.08	Good	Good	Long	 High	Yes	Yes	26%	MAJOR
32	<i>Lophostemon confertus</i> Queensland Box	Mature	13	EW:7 NS:6	0.74	1.29	8.88	3.68	Good	Good	Long	 High	Yes	Yes	28%	MAJOR
33	<i>Lophostemon confertus</i> Queensland Box	Mature	15	EW:8 NS:8	0.75	1.32	9.00	3.72	Good	Good	Long	 High	Yes	Yes	28%	MAJOR
34	<i>Lophostemon confertus</i> Queensland Box	Mature	18	EW:9 NS:8	0.57	1.04	6.84	3.36	Fair	Fair	Long	 High	Yes	Yes	29%	MAJOR
35	<i>Lophostemon confertus</i> Queensland Box	Mature	13	EW:10 NS:9	0.84	1.60	10.08	4.03	Good	Good	Long	 High	Yes	Yes	27%	MAJOR
36	<i>Lophostemon confertus</i> Queensland Box	Mature	15	EW:8 NS:8	0.60	1.30	7.20	3.69	Good	Good	Long	 High	Yes	Yes	35%	MAJOR
37	<i>Populus deltoides</i> Cottonwood	Mature	23	EW:21 NS:19	1.27	1.70	15.00	4.14	Fair	Good	Long	 High	No	Yes	18%	MAJOR
38	<i>Lophostemon confertus</i> Queensland Box	Mature	15	EW:9 NS:8	0.87	1.20	10.44	3.57	Fair	Good	Long	 High	Yes	Yes	27%	MAJOR
39	<i>Lophostemon confertus</i> Queensland Box	Mature	12	EW:8 NS:8	0.83	1.78	9.96	4.22	Good	Good	Long	 High	Yes	Yes	28%	MAJOR
40	<i>Lophostemon confertus</i> Queensland Box	Mature	13	EW:8 NS:8	0.87	1.60	10.44	4.03	Fair	Good	Long	 High	Yes	Yes	27%	MAJOR















Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
41	<i>Lophostemon confertus</i> Queensland Box	Mature	10	EW:8 NS:8	0.71	1.70	8.52	4.14	Fair	Fair	Long	 High	Yes	Yes	30%	MAJOR
42	<i>Lophostemon confertus</i> Queensland Box	Mature	17	EW:8 NS:10	0.70	1.68	8.40	4.12	Fair	Fair	Long	 High	Yes	Yes	34%	MAJOR
43	<i>Populus deltoides</i> Cottonwood	Mature	26	EW:30 NS:27	1.35	2.40	15.00	4.78	Fair	Fair	Long	 High	Yes	Yes	21%	MAJOR
44	<i>Lophostemon confertus</i> Queensland Box	Semi Mature	5	EW:3 NS:3	0.09	0.21	2.00	1.72	Fair	Fair	Long	 Medium	No	Yes	1%	MINOR
45	<i>Lophostemon confertus</i> Queensland Box	Semi Mature	5	EW:4 NS:4	0.14	0.23	2.00	1.79	Fair	Fair	Long	 Medium	No	Yes	1%	MINOR
46	<i>Eucalyptus robusta</i> Swamp Mahogany	Mature	9	EW:7 NS:8	0.40	0.86	4.80	3.11	Fair	Fair	Medium	 Medium	Yes	Yes	51%	MAJOR
47	<i>Populus nigra</i> Lombardy Poplar	Mature	11	EW:5 NS:5	0.86	1.18	10.32	3.55	Fair	Fair	Medium	 Medium	Yes	Yes	55%	MAJOR
48	<i>Ulmus parvifolia</i> Chinese Elm	Mature	5	EW:7 NS:7	0.33	0.38	3.96	2.20	Fair	Good	Medium	 Medium	Yes	Yes	63%	MAJOR
49	<i>Populus nigra</i> Lombardy Poplar	Mature	10	EW:5 NS:5	0.87	0.91	10.44	3.18	Poor	Fair	Short	 Low	Yes	Yes	44%	MAJOR
50	<i>Populus nigra</i> Lombardy Poplar	Mature	8	EW:5 NS:5	0.80	0.90	9.60	3.17	Poor	Fair	Short	 Low	Yes	Yes	46%	MAJOR
51	<i>Populus nigra</i> Lombardy Poplar	Mature	10	EW:5 NS:5	0.87	1.16	10.44	3.52	Poor	Fair	Short	 Low	Yes	Yes	43%	MAJOR
52	<i>Lophostemon confertus</i> Queensland Box	Mature	9	EW:7 NS:7	0.45	0.72	5.40	2.88	Fair	Fair	Long	 High	Yes	Yes	24%	MAJOR
53	<i>Lophostemon confertus</i> Queensland Box	Mature	9	EW:7 NS:7	0.40	0.69	4.80	2.83	Fair	Fair	Long	 High	No	Yes	16%	MAJOR
54	<i>Lophostemon confertus</i> Queensland Box	Mature	10	EW:8 NS:8	0.65	0.90	7.80	3.17	Good	Good	Long	 High	No	Yes	14%	MAJOR















Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
55	<i>Lophostemon confertus</i> Queensland Box	Mature	5	EW:4 NS:4	0.19	0.28	2.28	1.94	Fair	Poor	Medium	Medium	No	No	0%	N/A
56	<i>Lophostemon confertus</i> Queensland Box	Mature	9	EW:8 NS:8	0.51	0.78	6.12	2.98	Good	Good	Long	High	No	Yes	7%	MINOR
57	<i>Lophostemon confertus</i> Queensland Box	Mature	9	EW:8 NS:8	0.48	0.69	5.76	2.83	Fair	Good	Long	High	No	Yes	5%	MINOR
58	<i>Lophostemon confertus</i> Queensland Box	Mature	7	EW:7 NS:6	0.36	0.42	4.32	2.30	Fair	Fair	Medium	Medium	No	Yes	0%	MINOR
59	<i>Lophostemon confertus</i> Queensland Box	Mature	6	EW:7 NS:6	0.35	0.43	4.20	2.32	Fair	Poor	Short	Low	No	No	0%	N/A
60	<i>Lophostemon confertus</i> Queensland Box	Mature	9	EW:7 NS:7	0.40	0.48	4.80	2.43	Fair	Dead	Dead	Remove	No	No	0%	N/A
61	<i>Pinus radiata</i> Monterey Pine	Mature	16	EW:11 NS:13	1.19	1.60	14.28	4.03	Fair	Good	Long	High	No	Yes	25%	MAJOR
62	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	10	EW:18 NS:20	1.80	2.60	15.00	4.94	Fair	Fair	Long	High	No	Yes	0%	MINOR
63	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	10	EW:10 NS:9	1.02	1.52	12.24	3.95	Poor	Fair	Long	High	No	Yes	5%	MINOR
64	<i>Lophostemon confertus</i> Queensland Box	Mature	7	EW:7 NS:6	0.39	0.66	4.68	2.78	Fair	Poor	Short	Low	No	No	0%	N/A
65	<i>Lophostemon confertus</i> Queensland Box	Mature	16	EW:9 NS:9	0.81	1.32	9.72	3.72	Good	Fair	Long	High	No	Yes	22%	MAJOR
66	<i>Lophostemon confertus</i> Queensland Box	Mature	14	EW:12 NS:8	0.68	0.97	8.16	3.27	Good	Poor	Medium	High	No	Yes	17%	MAJOR
67	<i>Lophostemon confertus</i> Queensland Box	Mature	16	EW:9 NS:9	0.59	1.08	7.08	3.42	Fair	Fair	Long	High	No	Yes	7%	MINOR
68	<i>Lophostemon confertus</i> Queensland Box	Mature	14	EW:10 NS:9	0.73	1.32	8.76	3.72	Fair	Poor	Long	High	No	Yes	16%	MAJOR















Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
69	<i>Lophostemon confertus</i> Queensland Box	Mature	17	EW:10 NS:10	0.86	1.50	10.32	3.92	Fair	Fair	Medium	 High	No	Yes	19%	MAJOR
70	<i>Pinus radiata</i> Monterey Pine	Mature	18	EW:9 NS:8	0.85	1.33	10.20	3.73	Fair	Very Poor	Short	 Low	No	Yes	10%	MINOR
71	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	14	EW:21 NS:18	1.05	1.70	12.60	4.14	Poor	Fair	Long	 High	No	No	0%	N/A
72	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	17	EW:18 NS:15	1.63	2.15	15.00	4.56	Poor	Fair	Long	 High	No	Yes	15%	MAJOR
73	<i>Lophostemon confertus</i> Queensland Box	Mature	16	EW:9 NS:10	0.72	1.35	8.64	3.75	Good	Good	Long	 High	No	Yes	19%	MAJOR
74	<i>Lophostemon confertus</i> Queensland Box	Immature	2	EW:1 NS:1	0.05	0.07	2.00	1.50	Good	Good	Long	 Low	Yes	Yes	72%	MAJOR
75	<i>Lophostemon confertus</i> Queensland Box	Immature	2	EW:1 NS:1	0.05	0.07	2.00	1.50	Good	Good	Long	 Low	No	No	0%	N/A
76	<i>Lophostemon confertus</i> Queensland Box	Immature	2	EW:1 NS:1	0.05	0.07	2.00	1.50	Fair	Good	Long	 Low	Yes	Yes	100%	MAJOR
77	<i>Lophostemon confertus</i> Queensland Box	Immature	2	EW:1 NS:1	0.05	0.07	2.00	1.50	Fair	Good	Long	 Low	Yes	Yes	100%	MAJOR
78	<i>Lophostemon confertus</i> Queensland Box	Immature	2	EW:1 NS:1	0.05	0.06	2.00	1.50	Good	Good	Long	 Low	Yes	Yes	100%	MAJOR
79	<i>Lophostemon confertus</i> Queensland Box	Immature	2	EW:1 NS:1	0.05	0.07	2.00	1.50	Good	Good	Long	 Low	Yes	Yes	100%	MAJOR
80	<i>Lophostemon confertus</i> Queensland Box	Immature	2	EW:2 NS:2	0.11	0.12	2.00	1.50	Good	Good	Long	 Low	Yes	Yes	100%	MAJOR
81	<i>Lophostemon confertus</i> Queensland Box	Immature	2	EW:1 NS:1	0.05	0.07	2.00	1.50	Fair	Good	Long	 Low	Yes	Yes	100%	MAJOR
82	<i>Lophostemon confertus</i> Queensland Box	Immature	2	EW:1 NS:1	0.08	0.10	2.00	1.50	Good	Good	Long	 Low	Yes	Yes	100%	MAJOR

















Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
83	<i>Lophostemon confertus</i> Queensland Box	Immature	2	EW:1 NS:1	0.05	0.07	2.00	1.50	Good	Very Poor	Long	 Low	Yes	Yes	100%	MAJOR
84	<i>Lophostemon confertus</i> Queensland Box	Semi Mature	4	EW:1 NS:1	0.13	0.23	2.00	1.79	Good	Good	Long	 Medium	Yes	Yes	100%	MAJOR
85	<i>Lophostemon confertus</i> Queensland Box	Semi Mature	4	EW:1 NS:1	0.13	0.19	2.00	1.65	Good	Good	Long	 Low	Yes	Yes	100%	MAJOR
86	<i>Lophostemon confertus</i> Queensland Box	Semi Mature	5	EW:3 NS:3	0.15	0.21	2.00	1.72	Good	Good	Long	 Medium	Yes	Yes	100%	MAJOR
87	<i>Lophostemon confertus</i> Queensland Box	Semi Mature	5	EW:3 NS:3	0.14	0.22	2.00	1.75	Good	Good	Long	 Medium	Yes	Yes	100%	MAJOR
88	<i>Lophostemon confertus</i> Queensland Box	Immature	2	EW:2 NS:2	0.07	0.12	2.00	1.50	Good	Good	Long	 Low	Yes	Yes	74%	MAJOR
89	<i>Lophostemon confertus</i> Queensland Box	Semi Mature	4	EW:2 NS:2	0.10	0.18	2.00	1.61	Good	Good	Long	 Medium	Yes	Yes	11%	MAJOR
90	<i>Lophostemon confertus</i> Queensland Box	Semi Mature	4	EW:2 NS:2	0.10	0.20	2.00	1.68	Good	Good	Long	 Medium	Yes	Yes	24%	MAJOR
91	<i>Lophostemon confertus</i> Queensland Box	Immature	2	EW:1 NS:1	0.07	0.11	2.00	1.50	Fair	Good	Long	 Low	No	Yes	5%	MINOR
92	<i>Populus nigra</i> Lombardy Poplar	Mature	8	EW:5 NS:5	0.86	0.98	10.32	3.28	Very Poor	Poor	Short	 Low	Yes	Yes	46%	MAJOR
93	<i>Populus nigra</i> Lombardy Poplar	Mature	10	EW:5 NS:5	0.86	1.07	10.32	3.40	Very Poor	Poor	Short	 Low	Yes	Yes	45%	MAJOR
94	<i>Populus nigra</i> Lombardy Poplar	Mature	6	EW:5 NS:5	0.93	1.36	11.16	3.77	Very Poor	Poor	Short	 Low	Yes	Yes	45%	MAJOR
95	<i>Populus nigra</i> Lombardy Poplar	Mature	10	EW:2 NS:2	0.26	0.48	3.12	2.43	Very Poor	Poor	Medium	 Medium	Yes	Yes	93%	MAJOR
96	<i>Lophostemon confertus</i> Queensland Box	Mature	10	EW:10 NS:9	0.51	0.96	6.12	3.25	Good	Good	Long	 High	Yes	Yes	61%	MAJOR















Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
97	<i>Lophostemon confertus</i> Queensland Box	Mature	13	EW:8 NS:8	0.58	1.06	6.96	3.39	Fair	Fair	Long	 High	Yes	Yes	29%	MAJOR
98	<i>Platanus x acerifolia</i> London Plane	Mature	2	EW:2 NS:2	0.27	0.38	3.24	2.20	Very Poor	Poor	Short	 Low	No	No	0%	N/A
99	<i>Lophostemon confertus</i> Queensland Box	Mature	7	EW:7 NS:7	0.42	0.67	5.04	2.80	Fair	Fair	Long	 High	No	Yes	0%	MINOR
100	<i>Platanus x acerifolia</i> London Plane	Mature	4	EW:2 NS:2	0.13	0.29	2.00	1.97	Fair	Fair	Medium	 Low	No	No	0%	N/A
101	<i>Lophostemon confertus</i> Queensland Box	Mature	7	EW:7 NS:7	0.40	0.70	4.80	2.85	Good	Fair	Long	 High	No	No	0%	N/A
102	<i>Platanus x acerifolia</i> London Plane	Mature	7	EW:7 NS:7	0.51	0.80	6.12	3.01	Fair	Good	Long	 High	No	No	0%	N/A
103	<i>Platanus x acerifolia</i> London Plane	Mature	10	EW:9 NS:7	0.45	0.87	5.40	3.12	Fair	Good	Long	 High	No	No	0%	N/A
104	<i>Acer negundo</i> Box Elder Maple	Mature	5	EW:7 NS:7	0.25	0.53	3.00	2.53	Fair	Fair	Medium	 Medium	Yes	Yes	81%	MAJOR
105	<i>Pinus radiata</i> Monterey Pine	Mature	17	EW:13 NS:8	1.05	1.40	12.60	3.81	Poor	Poor	Short	 Low	Yes	Yes	37%	MAJOR
106	<i>Pinus radiata</i> Monterey Pine	Mature	15	EW:14 NS:7	0.81	0.94	9.72	3.22	Fair	Poor	Medium	 Medium	Yes	Yes	18%	MAJOR
107	<i>Pinus radiata</i> Monterey Pine	Mature	16	EW:20 NS:20	1.18	1.42	14.16	3.83	Good	Good	Long	 High	No	Yes	29%	MAJOR
108	<i>Populus nigra</i> Lombardy Poplar	Semi Mature	8	EW:2 NS:2	0.26	0.41	3.12	2.28	Fair	Fair	Medium	 Low	Yes	Yes	100%	MAJOR
109	<i>Populus nigra</i> Lombardy Poplar	Mature	8	EW:3 NS:3	0.93	1.42	11.16	3.83	Very Poor	Poor	Short	 Low	Yes	Yes	67%	MAJOR
110	<i>Populus nigra</i> Lombardy Poplar	Mature	8	EW:4 NS:4	1.04	1.40	12.48	3.81	Very Poor	Poor	Short	 Low	Yes	Yes	42%	MAJOR















Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
111	<i>Populus nigra</i> Lombardy Poplar	Mature	6	EW:4 NS:4	1.05	1.60	12.60	4.03	Very Poor	Poor	Short	 Low	Yes	Yes	37%	MAJOR
112	<i>Populus nigra</i> Lombardy Poplar	Mature	14	EW:4 NS:4	0.85	1.12	10.20	3.47	Very Poor	Poor	Short	 Low	Yes	Yes	46%	MAJOR
113	<i>Populus nigra</i> Lombardy Poplar	Mature	16	EW:5 NS:5	1.15	1.45	13.80	3.87	Very Poor	Poor	Short	 Low	Yes	Yes	34%	MAJOR
114	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	15	EW:9 NS:10	0.99	1.80	11.88	4.24	Poor	Fair	Long	 High	Yes	Yes	37%	MAJOR
115	<i>Eucalyptus haemastoma</i> Scribbly Gum	Semi Mature	6	EW:4 NS:4	0.13	0.21	2.00	1.72	Fair	Fair	Medium	 Medium	No	No	0%	N/A
116	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	8	EW:6 NS:6	0.38	0.45	4.56	2.37	Fair	Good	Medium	 Medium	No	Yes	7%	MINOR
117	<i>Eucalyptus haemastoma</i> Scribbly Gum	Overmature	9	EW:7 NS:7	1.14	1.80	13.68	4.24	Poor	Dead	Dead	 High	Yes	Yes	25%	MAJOR
118	<i>Lophostemon confertus</i> Queensland Box	Mature	17	EW:9 NS:9	0.59	1.12	7.08	3.47	Good	Fair	Long	 High	No	No	0%	N/A
119	<i>Lophostemon confertus</i> Queensland Box	Mature	17	EW:8 NS:9	0.55	1.30	6.60	3.69	Good	Fair	Long	 High	No	No	0%	N/A
120	<i>Lophostemon confertus</i> Queensland Box	Mature	18	EW:11 NS:10	0.81	1.46	9.72	3.88	Fair	Good	Long	 High	No	No	0%	N/A
121	<i>Lophostemon confertus</i> Queensland Box	Mature	17	EW:9 NS:9	0.76	1.34	9.12	3.74	Good	Fair	Long	 High	No	Yes	19%	MAJOR
122	<i>Populus nigra</i> Lombardy Poplar	Mature	15	EW:5 NS:5	0.53	0.80	6.36	3.01	Fair	Fair	Medium	 Medium	No	Yes	19%	MAJOR
123	<i>Eucalyptus haemastoma</i> Scribbly Gum	Overmature	6	EW:7 NS:7	1.11	1.82	13.32	4.26	Poor	Dead	Dead	 High	Yes	Yes	28%	MAJOR
124	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	16	EW:12 NS:10	0.99	1.58	11.88	4.01	Fair	Good	Long	 High	No	Yes	21%	MAJOR















Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
125	<i>Eucalyptus haemastoma</i> Scribbly Gum	Mature	17	EW:23 NS:26	1.68	2.53	15.00	4.89	Fair	Fair	Long	 High	No	No	0%	N/A
126	<i>Cupressus sp.</i> Cypress	Mature	8	EW:5 NS:5	0.57	0.78	6.84	2.98	Fair	Poor	Medium	 Low	No	No	0%	N/A
127	<i>Liquidamber styraciflua</i> Sweet Gum	Mature	8	EW:7 NS:8	0.48	0.64	5.76	2.74	Fair	Good	Medium	 Medium	No	Yes	23%	MAJOR
128	<i>Grevillea robusta</i> Silky Oak	Mature	7	EW:7 NS:7	0.50	0.77	6.00	2.97	Poor	Poor	Short	 Low	No	No	0%	N/A
129	<i>Liquidamber styraciflua</i> Sweet Gum	Mature	17	EW:15 NS:12	0.81	1.48	9.72	3.90	Fair	Fair	Long	 High	No	No	0%	N/A
130	<i>Araucaria cunninghamii</i> Hoop Pine	Mature	23	EW:6 NS:8	0.66	0.89	7.92	3.15	Good	Fair	Long	 High	No	Yes	6%	MINOR
131	<i>Araucaria cunninghamii</i> Hoop Pine	Mature	25	EW:8 NS:8	0.79	1.52	9.48	3.95	Good	Fair	Long	 High	No	No	0%	N/A
132	<i>Araucaria cunninghamii</i> Hoop Pine	Mature	22	EW:8 NS:8	0.76	1.02	9.12	3.34	Good	Fair	Long	 High	No	No	0%	N/A
133	<i>Araucaria cunninghamii</i> Hoop Pine	Mature	23	EW:9 NS:9	0.87	1.07	10.44	3.40	Good	Fair	Long	 High	No	No	0%	N/A
134	<i>Populus nigra</i> Lombardy Poplar	Mature	17	EW:7 NS:7	0.89	1.34	10.68	3.74	Poor	Fair	Medium	 Medium	No	No	0%	N/A
135	<i>Cedrus atlantica</i> Atlas Cedar	Mature	12	EW:7 NS:6	0.27	0.35	3.24	2.13	Good	Fair	Medium	 Medium	No	No	0%	N/A
136	<i>Liquidamber styraciflua</i> Sweet Gum	Mature	15	EW:10 NS:10	0.58	0.94	6.96	3.22	Fair	Good	Long	 High	No	No	0%	N/A
137	<i>Cedrus atlantica</i> Atlas Cedar	Mature	11	EW:8 NS:8	0.39	0.51	4.68	2.49	Fair	Fair	Medium	 Medium	No	No	0%	N/A
138	<i>Cupressus sp.</i> Cypress	Mature	7	EW:6 NS:6	0.28	0.36	3.36	2.15	Fair	Fair	Medium	 Medium	No	No	0%	N/A



Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
139	<i>Cedrus atlantica</i> Atlas Cedar	Mature	9	EW:7 NS:6	0.35	0.38	4.20	2.20	Fair	Fair	Medium	 Medium	No	No	0%	N/A
140	<i>Liquidamber styraciflua</i> Sweet Gum	Mature	17	EW:12 NS:15	0.75	1.30	9.00	3.69	Fair	Good	Long	 High	No	No	0%	N/A
141	<i>Eucalyptus botryoides</i> Southern Mahogany	Mature	24	EW:12 NS:13	0.81	1.70	9.72	4.14	Good	Fair	Long	 High	No	No	0%	N/A
142	<i>Melaleuca linariifolia</i> Snow in Summer	Mature	7	EW:8 NS:8	0.80	0.86	9.60	3.11	Fair	Fair	Medium	 Medium	No	Yes	7%	MINOR
143	<i>Acer negundo</i> Box Elder Maple	Semi Mature	4	EW:3 NS:2	0.12	0.23	2.00	1.79	Poor	Fair	Short	 Low	TBA	TBA	TBA	TBA
144	<i>Archontophoenix alexandrae</i> Alexandra Palm	Mature	7	EW:4 NS:4	0.38	0.59	4.56	2.65	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
145	<i>Melaleuca styphelioides</i> Prickly-leaved Paperbark	Mature	6	EW:7 NS:7	0.40	0.52	4.80	2.51	Fair	Fair	Medium	 Medium	TBA	TBA	TBA	TBA
146	<i>Callistemon viminalis</i> Weeping Bottlebrush	Mature	7	EW:7 NS:7	0.44	0.51	5.28	2.49	Fair	Fair	Medium	 Medium	TBA	TBA	TBA	TBA
147	<i>Melaleuca quinquenervia</i> Broad-leaved Paperbark	Mature	8	EW:7 NS:7	0.50	0.92	6.00	3.20	Fair	Fair	Medium	 Medium	TBA	TBA	TBA	TBA
148	<i>Melaleuca styphelioides</i> Prickly-leaved Paperbark	Mature	7	EW:4 NS:4	0.22	0.40	2.64	2.25	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
149	<i>Melaleuca styphelioides</i> Prickly-leaved Paperbark	Mature	7	EW:4 NS:4	0.36	0.47	4.32	2.41	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
150	<i>Melaleuca styphelioides</i> Prickly-leaved Paperbark	Mature	7	EW:4 NS:4	0.22	0.24	2.64	1.82	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
151	<i>Melaleuca styphelioides</i> Prickly-leaved Paperbark	Mature	7	EW:4 NS:4	0.32	0.40	3.84	2.25	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
152	<i>Corymbia eximia</i> Yellow Bloodwood	Mature	8	EW:8 NS:7	0.48	0.63	5.76	2.73	Good	Good	Long	 Medium	TBA	TBA	TBA	TBA















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153	<i>Corymbia eximia</i> Yellow Bloodwood	Mature	7	EW:6 NS:2	0.24	0.52	2.88	2.51	Fair	Good	Medium	 Low	TBA	TBA	TBA	TBA
154	<i>Corymbia eximia</i> Yellow Bloodwood	Mature	9	EW:8 NS:7	0.47	0.62	5.64	2.71	Good	Good	Long	 Medium	TBA	TBA	TBA	TBA
155	<i>Lagerstroemia indica</i> Crepe Myrtle	Semi Mature	2	EW:3 NS:3	0.06	0.08	2.00	1.50	Fair	Good	Medium	 Low	TBA	TBA	TBA	TBA
156	<i>Lagerstroemia indica</i> Crepe Myrtle	Semi Mature	2	EW:3 NS:3	0.06	0.08	2.00	1.50	Fair	Good	Medium	 Low	TBA	TBA	TBA	TBA
157	<i>Lagerstroemia indica</i> Crepe Myrtle	Semi Mature	2	EW:2 NS:2	0.06	0.08	2.00	1.50	Fair	Good	Medium	 Low	TBA	TBA	TBA	TBA
158	<i>Lagerstroemia indica</i> Crepe Myrtle	Semi Mature	2	EW:2 NS:2	0.06	0.08	2.00	1.50	Fair	Good	Medium	 Low	TBA	TBA	TBA	TBA
159	<i>Lagerstroemia indica</i> Crepe Myrtle	Semi Mature	2	EW:2 NS:2	0.04	0.06	2.00	1.50	Fair	Good	Medium	 Low	TBA	TBA	TBA	TBA
160	<i>Lagerstroemia indica</i> Crepe Myrtle	Mature	5	EW:6 NS:5	0.36	0.65	4.32	2.76	Poor	Fair	Medium	 Low	TBA	TBA	TBA	TBA
161	<i>Lagerstroemia indica</i> Crepe Myrtle	Mature	5	EW:6 NS:5	0.34	0.62	4.08	2.71	Poor	Fair	Medium	 Low	TBA	TBA	TBA	TBA
162	<i>Acacia melanoxylon</i> Blackwood	Mature	10	EW:10 NS:8	0.61	1.30	7.32	3.69	Fair	Good	Long	 High	TBA	TBA	TBA	TBA
163	<i>Syzygium smithii</i> Lilly Pilly	Mature	10	EW:9 NS:9	0.56	1.30	6.72	3.69	Fair	Good	Long	 Medium	TBA	TBA	TBA	TBA
164	<i>Lagerstroemia indica</i> Crepe Myrtle	Mature	5	EW:6 NS:5	0.34	0.62	4.08	2.71	Poor	Fair	Medium	 Low	TBA	TBA	TBA	TBA
165	<i>Bauhinia variegata</i> Orchid Tree	Mature	5	EW:7 NS:7	0.38	0.43	4.56	2.32	Poor	Fair	Medium	 Low	TBA	TBA	TBA	TBA
166	<i>Acer negundo</i> Box Elder Maple	Mature	7	EW:7 NS:7	0.32	0.39	3.84	2.23	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA














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167	<i>Acer negundo</i> Box Elder Maple	Mature	7	EW:7 NS:7	0.32	0.39	3.84	2.23	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
168	<i>Grevillea sp.</i> Grevillea	Semi Mature	3	EW:3 NS:3	0.12	0.16	2.00	1.53	Fair	Fair	Medium	 Low	TBA	TBA	TBA	TBA
169	<i>Pinus radiata</i> Monterey Pine	Mature	21	EW:13 NS:13	1.16	1.40	13.92	3.81	Fair	Fair	Long	 High	TBA	TBA	TBA	TBA
170	<i>Cedrus atlantica</i> Atlas Cedar	Mature	12	EW:7 NS:7	0.36	0.42	4.32	2.30	Good	Fair	Medium	 Medium	TBA	TBA	TBA	TBA
171	<i>Syzygium sp.</i> Lilly Pilly	Semi Mature	5	EW:6 NS:6	0.12	0.32	2.00	2.05	Poor	Fair	Medium	 Low	TBA	TBA	TBA	TBA
172	<i>Syzygium sp.</i> Lilly Pilly	Semi Mature	5	EW:7 NS:7	0.27	0.56	3.24	2.59	Poor	Fair	Medium	 Low	TBA	TBA	TBA	TBA
173	<i>Pinus radiata</i> Monterey Pine	Mature	8	EW:4 NS:5	0.39	0.50	4.68	2.47	Poor	Poor	Short	 Low	TBA	TBA	TBA	TBA
174	<i>Pinus radiata</i> Monterey Pine	Mature	18	EW:7 NS:5	0.49	0.57	5.88	2.61	Poor	Poor	Short	 Low	TBA	TBA	TBA	TBA
175	<i>Pinus radiata</i> Monterey Pine	Mature	18	EW:7 NS:5	0.63	0.84	7.56	3.08	Fair	Poor	Medium	 Medium	TBA	TBA	TBA	TBA
176	<i>Pinus radiata</i> Monterey Pine	Mature	21	EW:8 NS:8	0.78	1.10	9.36	3.44	Fair	Fair	Medium	 High	TBA	TBA	TBA	TBA
177	<i>Acacia decurrens</i> Green Wattle	Mature	4	EW:4 NS:4	0.23	0.32	2.76	2.05	Poor	Fair	Medium	 Low	TBA	TBA	TBA	TBA
178	<i>Lophostemon confertus</i> Queensland Box	Mature	18	EW:10 NS:9	0.84	1.60	10.08	4.03	Fair	Good	Long	 High	TBA	TBA	TBA	TBA
179	<i>Cupressus sp.</i> Cypress	Mature	10	EW:5 NS:5	0.52	0.63	6.24	2.73	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
180	<i>Callistemon viminalis</i> Weeping Bottlebrush	Mature	7	EW:8 NS:8	0.32	0.49	3.84	2.45	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA






Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
181	<i>Syzigium leuhmannii</i> Small-leaved Lilly Pilly	Mature	5	EW:8 NS:8	0.32	0.36	3.84	2.15	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
182	<i>Lophostemon confertus</i> Queensland Box	Mature	11	EW:8 NS:8	0.76	1.04	9.12	3.36	Poor	Good	Medium	 Medium	TBA	TBA	TBA	TBA
183	<i>Syzigium leuhmannii</i> Small-leaved Lilly Pilly	Semi Mature	3	EW:4 NS:4	0.12	0.18	2.00	1.61	Fair	Fair	Medium	 Low	TBA	TBA	TBA	TBA
184	<i>Corymbia ficifolia</i> Red Flowering Gum	Mature	4	EW:7 NS:7	0.28	0.33	3.36	2.08	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
185	<i>Eucalyptus sideroxylon</i> Red Ironbark	Mature	23	EW:13 NS:12	0.56	0.87	6.72	3.12	Fair	Good	Long	 High	TBA	TBA	TBA	TBA
186	<i>Betula sp.</i> Birch	Mature	7	EW:8 NS:8	0.32	0.45	3.84	2.37	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
187	<i>Pinus radiata</i> Monterey Pine	Mature	17	EW:12 NS:15	0.84	1.40	10.08	3.81	Fair	Fair	Long	 High	TBA	TBA	TBA	TBA
188	<i>Eucalyptus microcorys</i> Tallowwood	Mature	21	EW:12 NS:9	0.68	0.83	8.16	3.06	Fair	Good	Long	 High	TBA	TBA	TBA	TBA
189	<i>Eucalyptus microcorys</i> Tallowwood	Mature	21	EW:10 NS:9	0.54	0.78	6.48	2.98	Fair	Good	Long	 High	TBA	TBA	TBA	TBA
190	<i>Leptospermum petersonii</i> Lemon-scented Tea Tree	Mature	7	EW:8 NS:9	0.73	1.40	8.76	3.81	Poor	Good	Medium	 Medium	TBA	TBA	TBA	TBA
191	<i>Lophostemon confertus</i> Queensland Box	Mature	7	EW:8 NS:8	0.79	1.20	9.48	3.57	Poor	Good	Medium	 Low	TBA	TBA	TBA	TBA
192	<i>Lophostemon confertus</i> Queensland Box	Mature	7	EW:8 NS:8	0.80	1.20	9.60	3.57	Poor	Good	Medium	 Low	TBA	TBA	TBA	TBA
193	<i>Lophostemon confertus</i> Queensland Box	Mature	7	EW:7 NS:7	0.67	0.97	8.04	3.27	Poor	Good	Medium	 Low	TBA	TBA	TBA	TBA
194	<i>Lophostemon confertus</i> Queensland Box	Mature	7	EW:8 NS:8	0.71	0.93	8.52	3.21	Poor	Good	Medium	 Low	TBA	TBA	TBA	TBA



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195	<i>Betula sp.</i> Birch	Mature	7	EW:6 NS:6	0.29	0.38	3.48	2.20	Fair	Good	Medium	Medium	TBA	TBA	TBA	TBA
196	<i>Leptospermum petersonii</i> Lemon-scented Tea Tree	Mature	5	EW:7 NS:7	0.30	0.43	3.60	2.32	Poor	Good	Medium	Low	TBA	TBA	TBA	TBA
197	<i>Pinus radiata</i> Monterey Pine	Mature	17	EW:10 NS:11	1.04	1.49	12.48	3.91	Fair	Fair	Medium	High	TBA	TBA	TBA	TBA
198	<i>Angophora costata</i> Smooth-barked Apple Myrtle	Mature	11	EW:8 NS:7	0.50	0.73	6.00	2.90	Fair	Good	Long	High	TBA	TBA	TBA	TBA
199	<i>Eucalyptus botryoides</i> Southern Mahogany	Mature	14	EW:7 NS:10	0.40	0.62	4.80	2.71	Fair	Good	Long	Medium	TBA	TBA	TBA	TBA
200	<i>Eucalyptus botryoides</i> Southern Mahogany	Mature	16	EW:15 NS:15	0.69	1.03	8.28	3.35	Good	Good	Long	High	TBA	TBA	TBA	TBA
201	<i>Lophostemon confertus</i> Queensland Box	Mature	10	EW:9 NS:9	0.86	1.12	10.32	3.47	Good	Good	Long	High	TBA	TBA	TBA	TBA
202	<i>Lophostemon confertus</i> Queensland Box	Mature	17	EW:16 NS:14	1.01	1.60	12.12	4.03	Fair	Good	Long	High	TBA	TBA	TBA	TBA
203	<i>Corymbia maculata</i> Spotted Gum	Mature	17	EW:7 NS:7	0.39	0.59	4.68	2.65	Fair	Good	Medium	Medium	TBA	TBA	TBA	TBA
204	<i>Corymbia maculata</i> Spotted Gum	Mature	10	EW:4 NS:4	0.23	0.30	2.76	2.00	Fair	Good	Medium	Low	TBA	TBA	TBA	TBA
205	<i>Corymbia maculata</i> Spotted Gum	Mature	14	EW:5 NS:3	0.23	0.30	2.76	2.00	Fair	Good	Medium	Low	TBA	TBA	TBA	TBA
206	<i>Corymbia maculata</i> Spotted Gum	Mature	14	EW:4 NS:2	0.16	0.23	2.00	1.79	Poor	Good	Medium	Low	TBA	TBA	TBA	TBA
207	<i>Corymbia maculata</i> Spotted Gum	Mature	14	EW:5 NS:3	0.23	0.37	2.76	2.18	Fair	Good	Medium	Low	TBA	TBA	TBA	TBA
208	<i>Corymbia maculata</i> Spotted Gum	Mature	14	EW:6 NS:4	0.28	0.33	3.36	2.08	Fair	Good	Medium	Low	TBA	TBA	TBA	TBA

Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
209	<i>Lophostemon confertus</i> Queensland Box	Mature	16	EW:8 NS:8	0.50	0.83	6.00	3.06	Good	Good	Long	 Medium	TBA	TBA	TBA	TBA
210	<i>Corymbia maculata</i> Spotted Gum	Mature	11	EW:5 NS:4	0.20	0.33	2.40	2.08	Fair	Good	Medium	 Low	TBA	TBA	TBA	TBA
211	<i>Corymbia maculata</i> Spotted Gum	Mature	14	EW:6 NS:4	0.28	0.33	3.36	2.08	Fair	Good	Medium	 Low	TBA	TBA	TBA	TBA
212	<i>Corymbia maculata</i> Spotted Gum	Mature	14	EW:6 NS:4	0.22	0.30	2.64	2.00	Fair	Good	Medium	 Low	TBA	TBA	TBA	TBA
213	<i>Corymbia maculata</i> Spotted Gum	Mature	15	EW:6 NS:4	0.38	0.46	4.56	2.39	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
214	<i>Lophostemon confertus</i> Queensland Box	Mature	14	EW:7 NS:7	1.29	1.50	15.00	3.92	Fair	Dead	Dead	 High	No	Yes	16%	MAJOR
215	<i>Lophostemon confertus</i> Queensland Box	Mature	11	EW:2 NS:2	0.97	1.50	11.64	3.92	Fair	Dead	Dead	 High	TBA	TBA	TBA	TBA
216	<i>Eucalyptus robusta</i> Swamp Mahogany	Mature	30	EW:17 NS:20	1.22	1.70	14.64	4.14	Fair	Good	Long	 High	TBA	TBA	TBA	TBA
217	<i>Lophostemon confertus</i> Queensland Box	Mature	24	EW:7 NS:8	0.74	1.34	8.88	3.74	Fair	Good	Long	 High	TBA	TBA	TBA	TBA
218	<i>Pinus radiata</i> Monterey Pine	Mature	9	EW:13 NS:14	1.18	1.69	14.16	4.13	Poor	Fair	Medium	 Medium	TBA	TBA	TBA	TBA
219	<i>Populus alba</i> White Poplar	Mature	23	EW:9 NS:9	0.82	1.52	9.84	3.95	Good	Good	Long	 High	TBA	TBA	TBA	TBA
220	<i>Populus alba</i> White Poplar	Mature	10	EW:7 NS:6	0.30	0.36	3.60	2.15	Fair	Fair	Medium	 Low	TBA	TBA	TBA	TBA
221	<i>Jacaranda mimosifolia</i> Jacaranda	Mature	8	EW:5 NS:10	0.56	0.72	6.72	2.88	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
222	<i>Populus alba</i> White Poplar	Mature	24	EW:10 NS:11	0.95	1.53	11.40	3.96	Poor	Good	Long	 Medium	TBA	TBA	TBA	TBA

Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
223	<i>Jacaranda mimosifolia</i> Jacaranda	Mature	7	EW:8 NS:10	0.47	0.92	5.64	3.20	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
224	<i>Jacaranda mimosifolia</i> Jacaranda	Mature	8	EW:9 NS:9	0.47	0.77	5.64	2.97	Fair	Good	Medium	 Medium	TBA	TBA	TBA	TBA
225	<i>Cinnamomum camphora</i> Camphor Laurel	Overmature	16	EW:9 NS:9	0.96	1.70	11.52	4.14	Fair	Fair	Long	 High	TBA	TBA	TBA	TBA
226	<i>Pinus radiata</i> Monterey Pine	Mature	11	EW:8 NS:8	0.60	0.74	7.20	2.92	Fair	Fair	Long	 High	TBA	TBA	TBA	TBA
227	<i>Cinnamomum camphora</i> Camphor Laurel	Mature	17	EW:10 NS:15	1.38	2.15	15.00	4.56	Poor	Good	Long	 High	TBA	TBA	TBA	TBA
228	<i>Cinnamomum camphora</i> Camphor Laurel	Mature	15	EW:18 NS:16	0.99	1.98	11.88	4.41	Fair	Good	Long	 High	TBA	TBA	TBA	TBA
229	<i>Pinus radiata</i> Monterey Pine	Mature	15	EW:7 NS:9	0.75	0.99	9.00	3.30	Fair	Fair	Long	 High	TBA	TBA	TBA	TBA
230	<i>Pinus radiata</i> Monterey Pine	Mature	8	EW:4 NS:5	0.38	0.40	4.56	2.25	Fair	Fair	Medium	 Low	TBA	TBA	TBA	TBA
231	<i>Pinus radiata</i> Monterey Pine	Mature	16	EW:7 NS:7	0.64	0.93	7.68	3.21	Good	Fair	Long	 High	TBA	TBA	TBA	TBA
232	<i>Pinus radiata</i> Monterey Pine	Mature	15	EW:13 NS:14	0.95	1.17	11.40	3.53	Good	Fair	Medium	 High	TBA	TBA	TBA	TBA
233	<i>Pinus radiata</i> Monterey Pine	Mature	16	EW:7 NS:7	0.55	0.73	6.60	2.90	Fair	Poor	Medium	 Medium	TBA	TBA	TBA	TBA
234	<i>Cinnamomum camphora</i> Camphor Laurel	Mature	14	EW:19 NS:10	1.02	2.20	12.24	4.61	Good	Good	Long	 High	TBA	TBA	TBA	TBA
235	<i>Pinus elliottii</i> Slash Pine	Mature	14	EW:18 NS:8	0.87	1.03	10.44	3.35	Poor	Good	Long	 High	No	Yes	12%	MAJOR
236	<i>Pinus elliottii</i> Slash Pine	Mature	14	EW:9 NS:8	0.73	0.96	8.76	3.25	Fair	Good	Long	 High	No	Yes	7%	MINOR

Tree Tag	Botanical & Common Name	Age Class	Height (m)	Canopy Spread (m)	DBH (m)	DRC (m)	TPZ (m)	SRZ (m)	Structure	Vitality	ELE	Retention Value	SRZ Enc	TPZ Enc	Enc%	Impact Level
237	<i>Pinus elliottii</i> Slash Pine	Mature	14	EW:11 NS:8	0.87	1.13	10.44	3.48	Fair	Good	Long	 Medium	No	Yes	15%	MAJOR
238	<i>Pinus elliottii</i> Slash Pine	Mature	14	EW:18 NS:7	0.93	1.09	11.16	3.43	Fair	Good	Long	 High	No	Yes	16%	MAJOR
239	<i>Pinus elliottii</i> Slash Pine	Mature	14	EW:16 NS:5	0.83	1.03	9.96	3.35	Poor	Poor	Short	 Low	Yes	Yes	16%	MAJOR
240	<i>Pinus elliottii</i> Slash Pine	Semi Mature	7	EW:7 NS:7	0.32	0.39	3.84	2.23	Good	Good	Long	 Medium	Yes	Yes	65%	MAJOR
241	<i>Cinnamomum camphora</i> Camphor Laurel	Semi Mature	6	EW:7 NS:7	0.38	0.48	4.56	2.43	Fair	Good	Medium	 Low	Yes	Yes	37%	MAJOR

**KEY**

- **DBH (Diameter at Breast Height) & DRC (Diameter above Root Collar), TPZ, SRZ & Encroachment %** calculated per *Qld Arboricultural Association & ProofSafe Calculators*.
- **Impact Level:** per *Standards Australia AS4970-2009 Protection of trees on development sites*
- **Structure & Vitality** per *International Society of Arboriculture (ISA) Tree Condition Rating System (2015) descriptors & (Coder, 2021)*
- **Canopy Spread:** estimation of canopy spread to the four (4) cardinal points. (North-South) & (East-West).
- **Estimated Life Expectancy (ELE):** adapted per *(Barrell, 1996) & (Barrell, 2000)*.
- **Retention Value:** *Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia (2010)*.
  - ❖ **Low:** These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
  - ❖ **Medium:** These trees are moderately important for retention. Their removal should only be considered if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
  - ❖ **High:** These trees are considered important for retention and should be retained and protected. Initial Non-Destructive Root Exploration (Root Mapping) should be implemented. Tree Sensitive Design modification and/or re-location of building/s should be considered to accommodate the setbacks as prescribed per *Standards Australia AS 4970 Protection of trees on development sites*.



## 5 Arboricultural Discussion

### 5.1 Arboricultural Impact

- i. With regards to the calculated arboricultural impact, it was calculated that:
  - Nineteen (19) trees have encroachments less than 10% (*Minor*) - Pursuant to AS 4970-2009 *Minor encroachments* - If the proposed encroachment is less than 10% (total area) of the TPZ, and outside of the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and be contiguous with the TPZ).
  - Ninety-six (96) trees have encroachments greater than 10% (*Major*). These trees do not require immediate removal. However, as per AS 4970-2009 *Major encroachments* - it must be demonstrated that the trees will remain viable. Therefore, initial Non-Destructive Root Exploration<sup>5</sup> (hand-digging and/or Air-Vac) will need to be carried out under the supervision of an appointed Project Arborist.

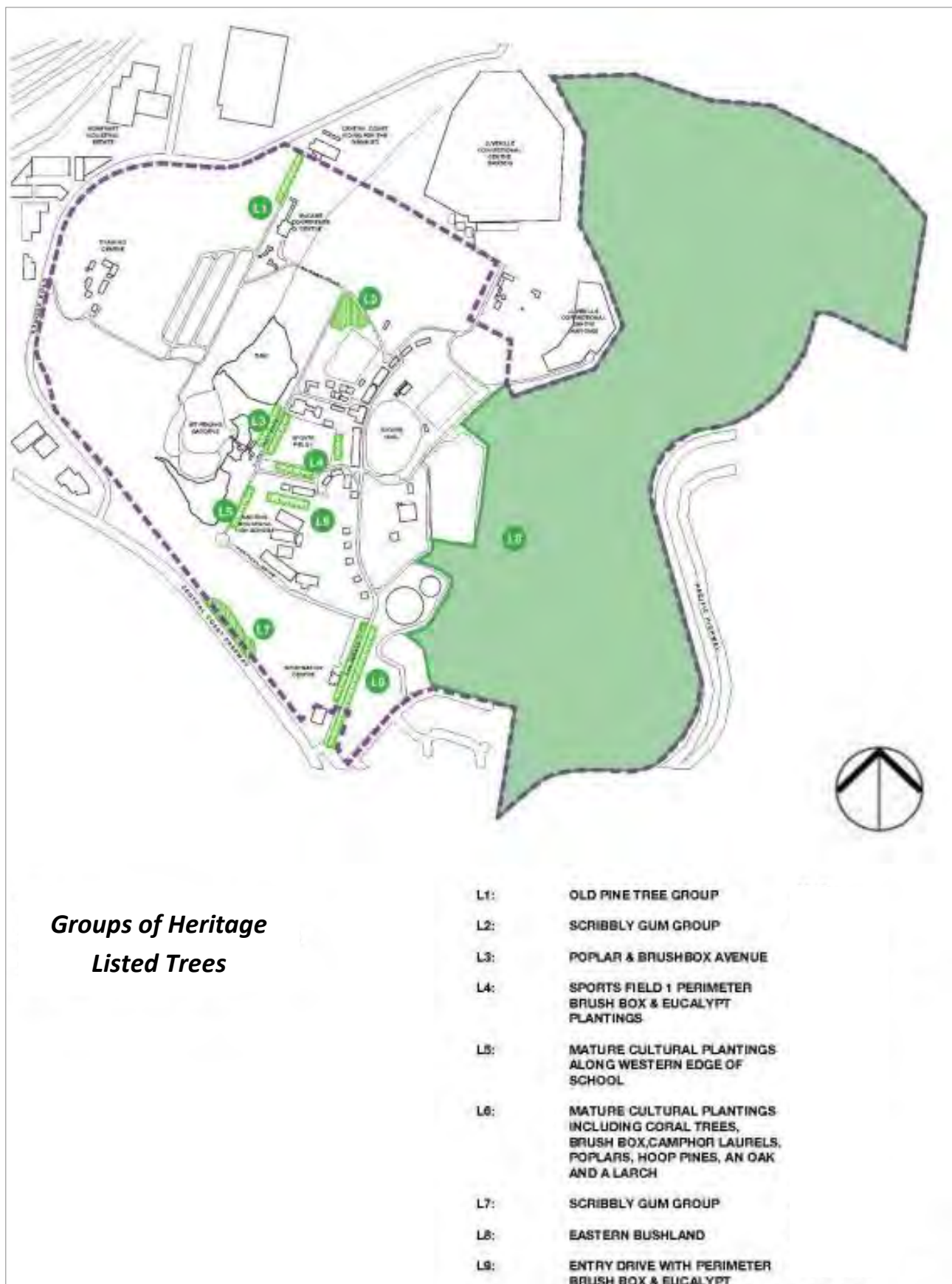
### 5.2 Tree Retention Value

- i. A tree with a calculated '*High*' Retention Value per the above-mentioned STARS criteria is desirable for retention. This even more as a number of the assessed subject trees have '*Heritage Status*' availed and the increased Urban Heat Island<sup>6</sup> footprint associated with this Project.
- ii. As aforementioned initial Non-Destructive Root Exploration (Root Mapping) is the most reliable way to locate tree roots pre-development and therefore should be implemented where a tree is to be retained. Therefore, all excavations that are calculated as a '*Major*' Encroachment within the TPZ of a *High Retention* tree should initially be undertaken by Non-Destructive Root Exploration through the use of Hand-digging and/or Air -Spade under the guidance of the Project Arborist.
- iii. Root Mappings will provide an accurate root location and cogent morphological data, which in turn will provide the opportunity to explore and/or implement tree sensitive modifications with regards to Plant Health Care (PHC), tree viability and pragmatic tree retention.

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<sup>5</sup> Initial Non-Destructive Root Exploration (NDRE) is the most reliable way to locate tree roots post development (Matheny and Clark, 1998). To err on the side of caution, all excavations that are calculated as a '*Major*' Encroachment within the TPZ must initially be undertaken by Hand-digging, Hydro-Vac, and/or Air -Spade under the guidance of the Project Arborist concurrent with strict adherence to a site-specific Tree Protection Plan. Further machine excavations should only be permitted within the TPZ if and when the Project Arborist is satisfied that the excavation envelope is free of any significant root biomass.

<sup>6</sup> *Urban Heat islands are urbanized areas that experience higher temperatures than outlying areas. As opposed to natural landscapes such as forests and water bodies, hard surfaces in the urban environment such as concrete, brick, glass, asphalt and roofing, have a high thermal mass, collecting the sun's heat during the day and re-radiating it slowly back into the atmosphere. This contributes to a rise in ambient temperature in cities, creating large, stable masses of hot air (urban heat islands), especially during periods of calm, still weather. This increase in heat particularly if combined with low soil moisture contributes to the decline of certain tree species and trees already 'stressed' (McPherson et. al. 2006).*



*Groups of Heritage Listed Trees (courtesy of Taylor Brammer)*

Summary Data Table: Tree Retention Value (18/03/2022)

Retention Value	Trees	Description
 <b>High</b>	100	These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard <i>AS 4970 Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented (i.e., pier and beam cantilever, porous paving, Directional drilling, Structural Confinement Cells) if works are to proceed within the TPZ and the tree is to remain viable.
 <b>Medium</b>	71	These trees may be retained and protected. These are considered less critical; however, their retention should remain a priority, with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
 <b>Low</b>	69	These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
 <b>Remove</b>	1	These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.
<b>Total</b>	<b>241</b>	

### 5.3 Tree Sensitive Design Options

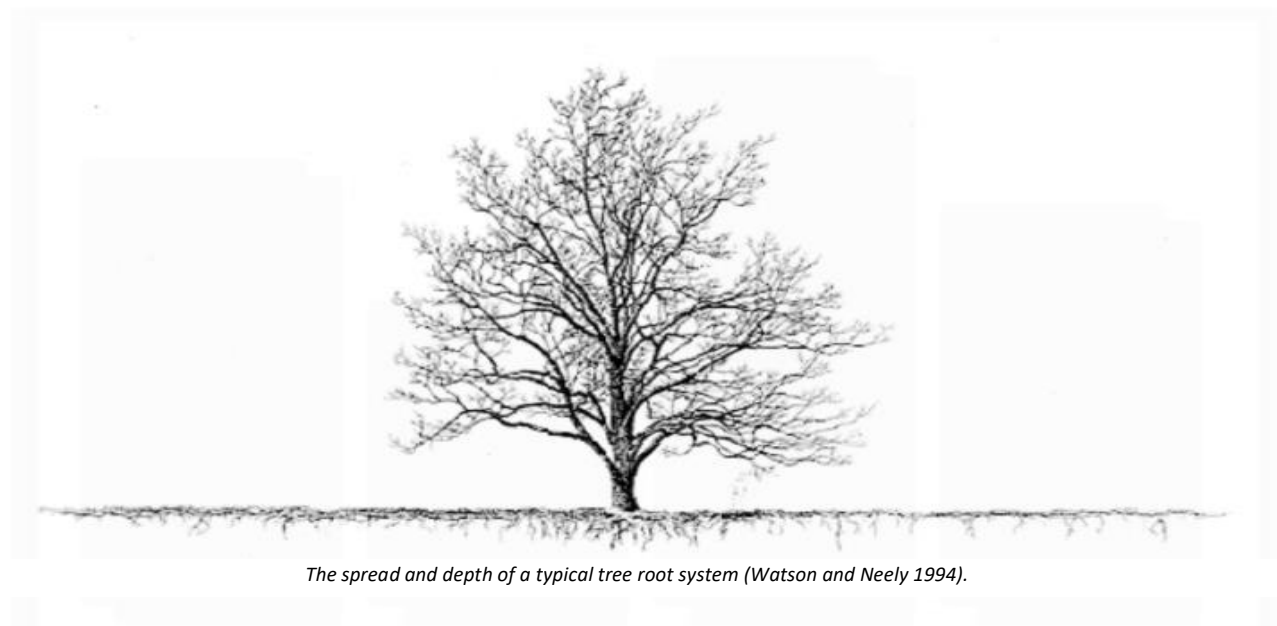
- i. As is the scenario here, tree rooting depths in urban situations are frequently restricted by impenetrable surfaces, inhospitable soil layers and/or underground infrastructure. Lateral root extent is likewise subject to these restrictions congruent with low soil porosity under hardscapes and/or by the absence of 'free-water' and oxygen (Day and Bassuk 1994). Thereby roading, concrete slabs and footpaths have shown to provide adverse conditions for root growth and development (Day and Bassuk 1994) (Watson et al 2014), and a tree's root system spread may be halted within approximately 10cm after penetrating beneath such mediums (Gerhold and Johnson. 2003). Therefore, in keeping with this rationale it is recommended that the location of the new utilities (water, electricity and sewage) be amended to 'as far as reasonably practicable' from the base of the trees and under the existing roading where a lesser root biomass is anticipated. Another 'tree sensitive design' option for the installation of these utilities is the use of Directional Drilling or Boring. Please refer to the Appendix for further information regarding this option.
- ii. With regards to the roading upgrades and the shared footpath, Tree Sensitive Design options such as tree transplanting, Screw Piling, Cantilevers, Structural Confinement Cells, raised paths (build-overs) and

Porous Paving may be incorporated with regards to reducing arboricultural impact. Please refer to the Appendix for further information.

- iii. Please note that the abovementioned Root Mapping findings will ultimately determine foreseeable tree viability and whether tree sensitive design modifications and/or tree removal will need to be undertaken on this Project. All findings will be documented by the appointed Project Arborist and made available to all parties with *locus standii* upon request.

## 5.4 Future Development

- i. Trees grow in a delicate balance with their environment and any changes to that balance must be minimized if the tree is to remain healthy and fulfil its potential. It is rarely possible to repair stressed and injured trees, so damage needs to be avoided during all stages of development and construction.
- ii. Recent research both clinical and empirical has shown that healthy trees such as these usually remain in good health when best management practice guidelines and arboricultural standards are adhered to on development sites per *AS4970-2009 Protection of trees on development sites* whilst under the guidance of a suitably qualified arborist. Thus, for trees to be retained and their requirements met, procedures must be in place to protect trees at every stage of the development process. This should be considered at the earliest planning stage of any outdoor event and/or design of a development project where trees are involved.
- iii. Therefore, it is recommended that a Tree Protection Plan pursuant to *AS4970-2009 Protection of trees on development sites* is formulated and adopted pre-development for this Project moving forward. This will guide earthworks around retained trees located within the proposed work zone through the formulation and implementation of best management practice tree protection methodologies.



*The spread and depth of a typical tree root system (Watson and Neely 1994).*

***“A tree without roots is just a piece of wood.”***

*- Marco Pierre White*



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## 7 Glossary

The following definitions are stated in the Glossary of Arboricultural Terms, International Society of Arboriculture 2011, unless otherwise stated.

**Abiotic:** plant ailment caused by non-living, environmental, or man-made agents

**Adaptive Growth:** or Response Growth is new wood produced in response to damage or loads, which compensates for higher strain (deformation) in marginal fibres; it includes reaction wood (compression & tension) and wound wood.

**Age class:** Described as Young, Semi-Mature, Mature, Over Mature or Veteran. All these dimensions should be determined by species and site factors.

**Barrier Zone:** chemically defended tissue formed by the still living cambium, after a tree is wounded or invaded by pathogens to inhibit the spread of decay into new annual growth rings. Wall 4 in CODIT model. Contrast with reaction zone

**Bifurcation:** Natural division of a branch or stem into two or more stems or parts

**Biotic:** pertaining to non-human living organism/ biotic agent: a living organism capable of causing disease/ biotic disorder: disorder caused by a living organism.

**Bracket:** British English term for fruiting body of a decay fungus. See *Conk*.

**Codominant Structure:** Stems or trunks of about the same size originating from the same position from the main stem<sup>52</sup>. When the stem bark ridge turns upward the union is strong; when the ridge turns inward the union is weak, a likely point of failure in storm or windy weather conditions or where increasing weight causes undue stress on the defective union.

**CODIT:** acronym for Compartmentalisation of Decay/Disease In Trees (refer Compartmentalisation).

**Compartmentalisation:** Dynamic tree defence process involving protection features that resist the spread of pathogens and decay causing organisms. Natural defence process in trees by which chemical and physical boundaries are created that act to limit the spread of disease and decay organisms.

**Compaction:** Results from loads or stress forces applied to the soil as well as shear forces. Both foot traffic and vehicle traffic exert both forces on soils. Vehicle traffic may cause significant compaction at depths of 150–200 mm (the area in which most absorbing roots are located). The degree of compaction will depend on weight of vehicles, number of movements, soil moisture levels and clay content. Soil handling, stockpiling, and transporting also tend to lead to the breakdown of soil structure and thus to compaction. Vibration as a result of frequent traffic or adjacent construction activities will also compact soils.

**Compression wood:** (1) in mechanics, the action of forces to squeeze, crush or push together any material (s) or substance(s): contrast with tension. (2) the ability of an internal combustion engine to contain or pressurized a combustible fuel - air mixture.

**Conk:** Fruiting body or non-fruiting body (sterile conk) of a fungus. Often associated with decay.

**Crown:** Portion of the tree consisting of branches and leaves and any part of the trunk from which branches arise.

**Crown/Canopy:** The main foliage bearing section of the tree, these terms are interchangeable.

**Crown damage:** The canopy of trees can be directly or indirectly damaged. Incorrect techniques of pruning such as lopping or flush cutting may produce wounds that are susceptible to infection by wood decay organisms. Similarly, mechanical damage to branches by machinery, etc. will also create wounds. Trees automatically respond to wounding and in doing so use stored sugars. Any wound places an additional load on trees that will inevitably be stressed during construction.

**Damping:** Damping occurs where energy is dissipated. In trees, damping occurs naturally in three main ways with aerodynamic damping of the leaves, internal damping in the wood and root zones, and with mass damping of the branches.

**Deadwood:** Dead branches within the canopy of tree. Deadwood is a naturally occurring feature of most tree species and comprises dead or decaying branches within the canopy of a tree. Deadwood may have habitat value and require removal only according to the considered risk of its location, i.e. high use pedestrian area or damage to adjacent infrastructure.

Removal of deadwood is generally recommended only where it represents an unacceptable level of hazard. Consideration of the need for deadwood removal should take into account the occupancy of the target zone, i.e. high use pedestrian area or

presence of infrastructure, possible damage to the tree during its removal as well as its conservation for habitat value. In some instances, retention of a reduced tree structure for habitat purposes maybe considered appropriate, especially when hollows are present.

Further reference: *Principles of Tree Hazard Assessment. Lonsdale, David. TSO, (2009).*

**Dead wooding: (Crown cleaning):** The removal of dead branches<sup>60</sup>. Recommendation to remove deadwood is for removal of all dead branches within tree canopy > 30mm diameter in trees which overhang pedestrian or vehicular areas and removal of all dead branches within tree canopy > 50mm diameter if trees are located in a Parkland or similar area.

**Decay:** The process of degradation of woody tissues by micro-organisms.

**Desiccation:** Severe drying out. Dehydration.

**Drip Line:** Is the imaginary perimeter line at soil surface level which is directly below the outermost edge of the tree's foliage or canopy.

**Estimated Life Expectancy (ELE):** Assessed on trees of particular species in the urban environment, including health and structural conditions which may exist.

**Epicormic bud:** Latent or adventitious bud located at the cambium and concealed by the bark.

**Epicormic shoots:** Shoots produced from epicormic buds at the cambium of trunks or branches.

**Field Capacity:** Maximum soil moisture content following the drainage of water due to the force of gravity.

**Hollow:** is a semi-enclosed cavity which has naturally formed in the trunk or branch of a tree.

**Included bark:** Inwardly formed bark within the junction of branches or codominant stems.

**Kino:** Dark red to brown resin-like substance produced by trees in the genera Eucalyptus, Pterocarpus and Butea and related genera. Kino forms in the barrier zones. Large kino veins form in some tree in response to injury and infection.

**Leaves:** The main function of leaves is photosynthesis, that is, the production of sugars and oxygen. The sugars produced by the leaves (and any other green tissue) are the source of chemical energy for all living cells in the entire plant and as such are essential for the normal functioning and survival of the tree. Anything that directly or indirectly damages the leaves will interfere with photosynthesis.

**Non-woody part of tree:** 'organs that increase the surface area of vascular plants, thereby capturing more solar energy for photosynthesis'. ... maybe classified as microphylls (usually spine-shaped leaves with a single vein) or megaphylls (leaves with a highly branched vascular system). Needles and leaves are major energy trapping organs of a tree. Flowers are modified leaves .... as they fit the definition of an organ (*Shigo.2003*).

**Macropore:** Relatively larger space between soil particles that is usually air-filled and allows for water movement and root penetration. Contrast with micropore.

**Mature:** Trees are close to their full height and crown size.

**Micropore:** Space between soil particles that is relatively small and likely to be water filled.

**Mortality Spiral:** Sequence of stressful events or conditions causing the decline and eventual death of a tree. Once in a mortality spiral trees are more likely to succumb to any further or additional stress factors such as drought, pest infestation or disease. (See definition Stress)

**Necrosis:** Localised death of tissue in a living organism.

**Occlusion** (See wound): Shut in or out. Occlusion is the process of trees forming callus and clear wood over wounds.

**Over Mature:** Associated with crown retrenchment.

**Pathogen:** A disease-causing organism.

**Pipe:** Mud filled channel extending upwards from root/ stem zone of tree.

**Phototropism:** Influence of light on the direction of plant growth. Tendency of plants to grow towards light.

**Phloem:** Plant vascular tissue that transports photosynthates and growth regulators. Situated on the inside of the bark, just

outside the cambium. Is bidirectional (transports up and down). Contrast with xylem.

**Photosynthesis:** Process in green plants (and in algae and some bacteria) by which light energy is used to form glucose (chemical energy) from water and carbon dioxide.

**Reaction wood:** Wood forming in leaning or crooked stems or on lower or upper sides of branches as a means of counteracting the effects of gravity. See compression wood and tension wood.

**Semi-mature:** Trees are between 1/3 and 2/3 of expected mature height.

**Shrub:** A woody plant similar to a tree except it is usually several-stemmed and smaller than a tree.

**Significance:** The quality of being worthy of attention; importance.

**Stem / Trunk:** Organ which supports branches, leaves, flowers and fruit; may also be referred to as 'the trunk'.

**Stress:** In Plant Health Care, (1) a factor that negatively affects the health of a plant; a factor that stimulates a response. (2) mechanics, a force per unit area.

**Stress – acute:** Disorder or disease that occurs suddenly and over a short period of time.

**Stress – chronic:** Disorder or disease occurring over a longer time.

**Tree:** Long lived woody perennial plant greater than (or usually greater than) 3 m in height with one or relatively few main stems or trunks. A tree has 3 major organs – roots, stem and leaves.

**Vigour:** Ability of a tree to sustain its life processes. The term 'vigour' in this document is synonymous with commonly used terms such as 'health' and 'vitality'. Inherent genetic capacity of a plant to deal with stress. Physical strength and health. A tree with good vigour has the ability to sustain life processes and synonymous with good health.

**Visual Tree Inspection (VTA):** Is a detailed visual inspection of a tree and surrounding site.

**Vitality:** Ability of plant to deal effectively with stress.

**Watersprouts/ Epicormic growth** (Usually multiple shoots): Shoots produced from epicormic buds at the cambium of trunks or branches. Grows 'from the stub ends and only grows from the outermost living tissue layer of that year's growth. They are weakly attached and prone to falling out or being blown off with the risk increasing markedly as they increase in size. When epicormic shoots arise from stub ends that are decaying, the chances of them falling out are significantly greater'.

**Wound:** An opening that is created when the bark is cut, removed, or injured.

NOTE: Pruning a live branch always creates a wound, even when the cut is properly made.

**Xylem:** Main water and mineral-conducting (unidirectional, up only) tissue in trees and other plants. Provides structural support. Arises (inward) from the cambium and becomes wood after lignifying. Contrasted with phloem.

**Young:** Trees have not yet reached 1/3 of their expected mature height. They are generally growing vigorously and have high apical dominance.

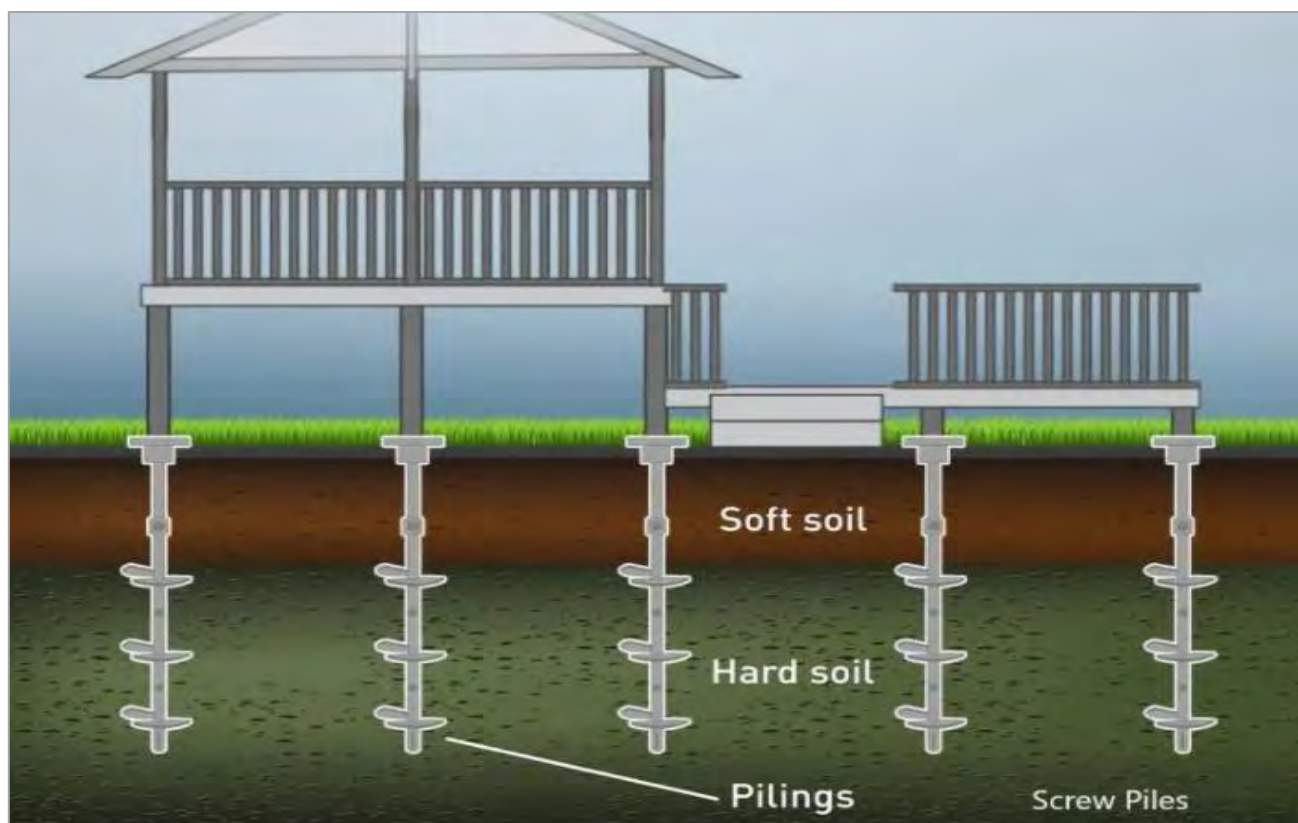
**Zone of Rapid Taper:** The area within 1–2m of the trunk on larger trees is frequently referred to as the '*Zone of Rapid Taper*' because structural roots found there often exhibit considerable secondary thickening- not present on roots farther from the trunk (*Wilson 1964*). *Wilson (1964)* additionally reviews the development of this zone and its relation to mechanical stability.



## 8 Appendix

### 8.1 Tree Sensitive Design

- i. Unlike a dug-out or excavated continuous cement foundation, a pier foundation through the use of Screw Piles has proven to be the least damaging to soil and tree root biomass during and after the installation process (Whitcomb, 1991; Harris, Clark and Matheny, 2004).
- ii. This Screw Pile construction methodology could be utilised in this project. The combination of initial Non-Destructive Root Exploration (Root Mapping) and Screw Piling make it possible to construct new buildings near trees, without adversely affecting their health, when all due care is taken in the design and installation. After initial Root Mapping, Screw Piles can either be drilled or banged into the soil with very little disturbance to the existing roots and root biomass. The Screw Piles then support the base of the building just above ground level with a framework of narrow diameter piles. Hence why Screw Piling is a preferred tree sensitive method as the buildings base is then constructed above ground level. This avails air and water to the roots which in turn promotes tree vitality and tree viability.
- iii. Other benefits of Screw Piling include the prevention of macropore collapse and the proliferation of micropores in the soil profile due to compaction. Compaction of soil containing tree roots by traditional foundations has been shown to have a detrimental effect on the continued health of the tree. Compaction of soil reduces the passage of oxygen to roots during wet weather and can cause the soil to become so dense that roots are no longer able to penetrate through it (Craul, 1999). Screw piles overcome this by supporting load directly on their constituent helices. These are placed well below the tree roots to ensure the root ball does not experience any loading influence or disturbance.



### **Structural Confinement Cells**

- i. Where designs proposals encroach on the TPZ and/or the SRZ of trees, tree sensitive methods must be considered and utilised. Driveways and roadways should consist of permeable layers which allow water to penetrate freely. These designs should consist of:
  - Sub-base (existing sub grade)
  - An optional layer of geotextile material to stop the movement of the sub-base.
  - A drainage system to provide sub surface irrigation.
  - Porous concrete
  - Permeable paving
  - Geo-cells / Structural Confinement Cell installation (please refer to; The Use of Cellular Confinement Systems Near Trees: A Guide to Good Practice 2020).
- ii. Where tree roots exist, roadways should be built with a granitic sand base to fill in and around root systems. Geogrid reinforcing is installed over the root systems which allows root development concurrent with the permeable system abovementioned.
- iii. Weight distributing porous membranes are utilised for footpath designs. These layers can include large aggregate materials which allows water to pass through or a permeable paving system.

*Types of Structural Confinement Cell alternatives include:*

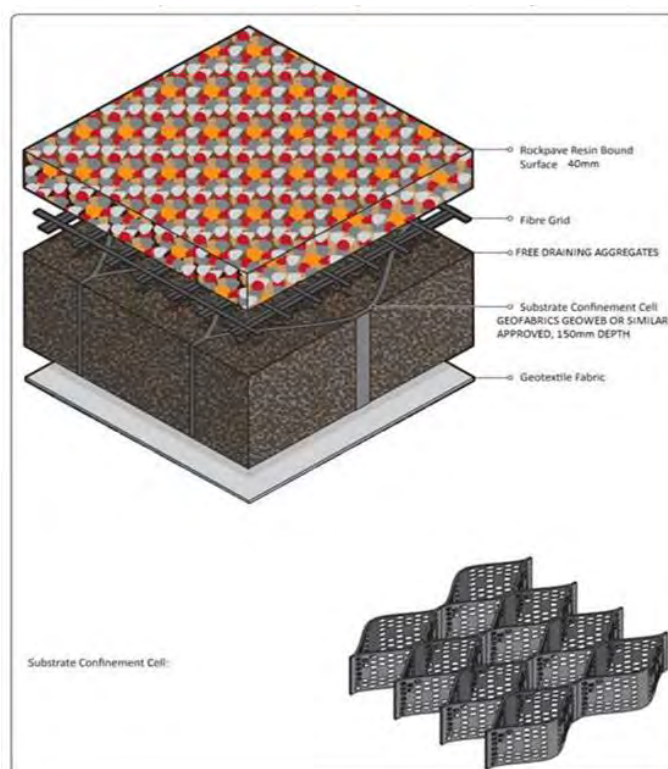


Figure 1: indicative Substrate Confinement Cell (Geo-cell).

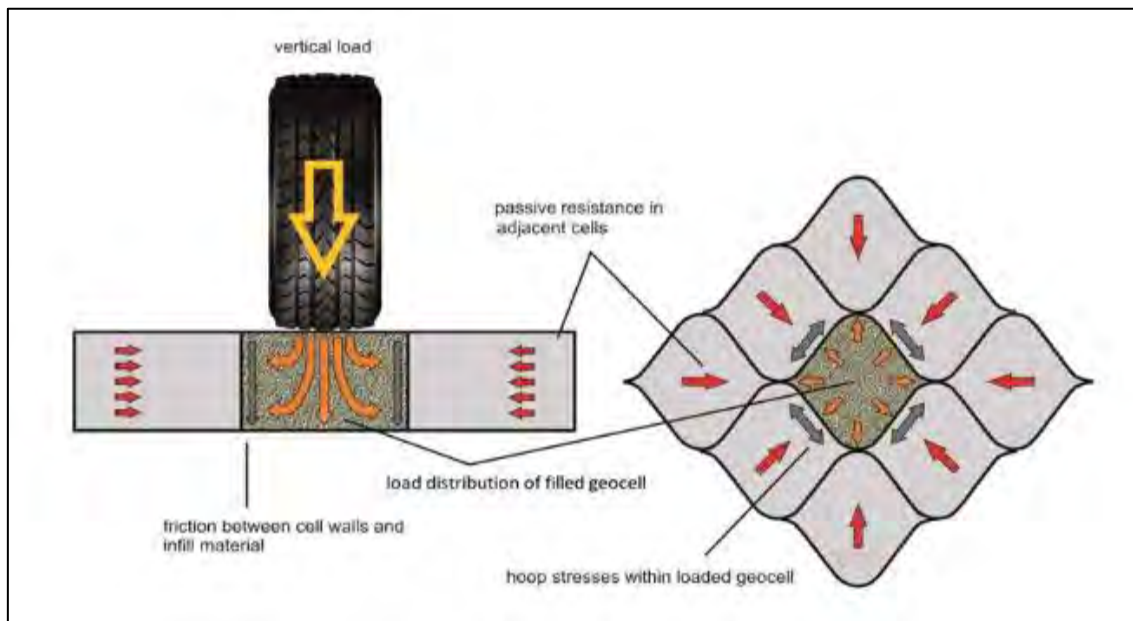


Figure2: This diagram illustrates how loads are spread when a vertical load is applied to a cellular confinement system.

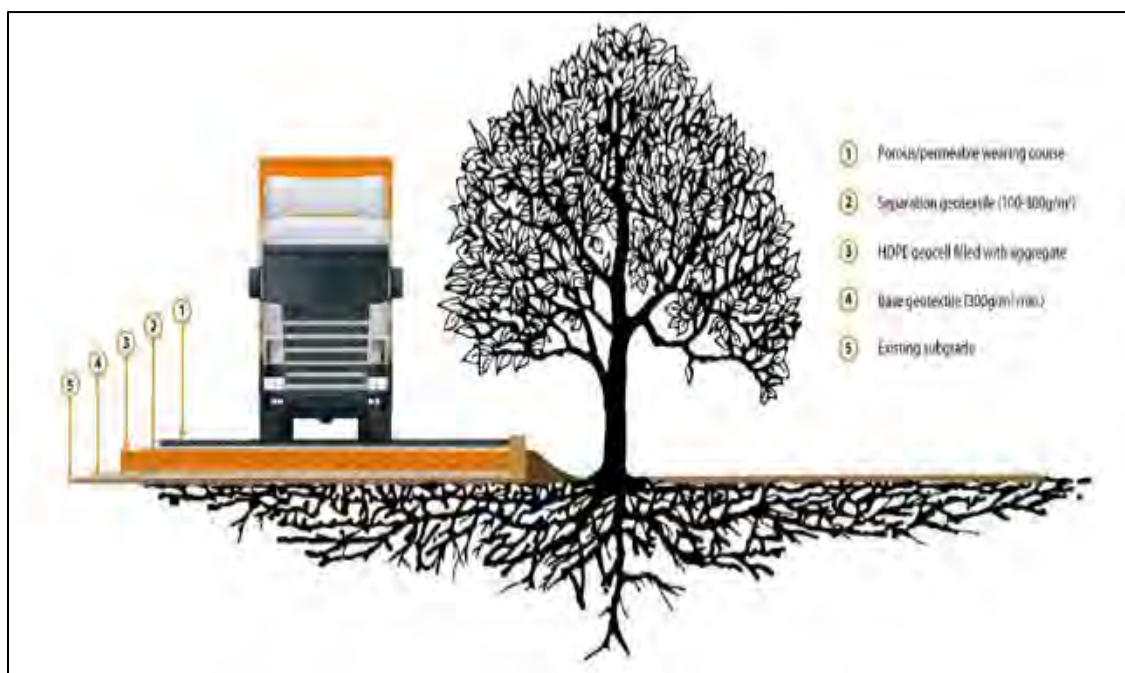
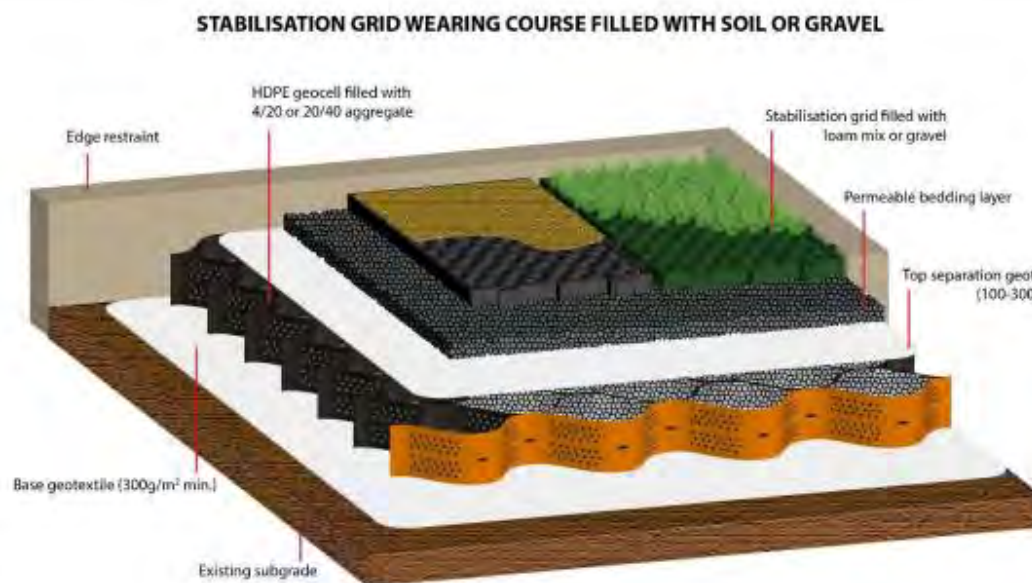
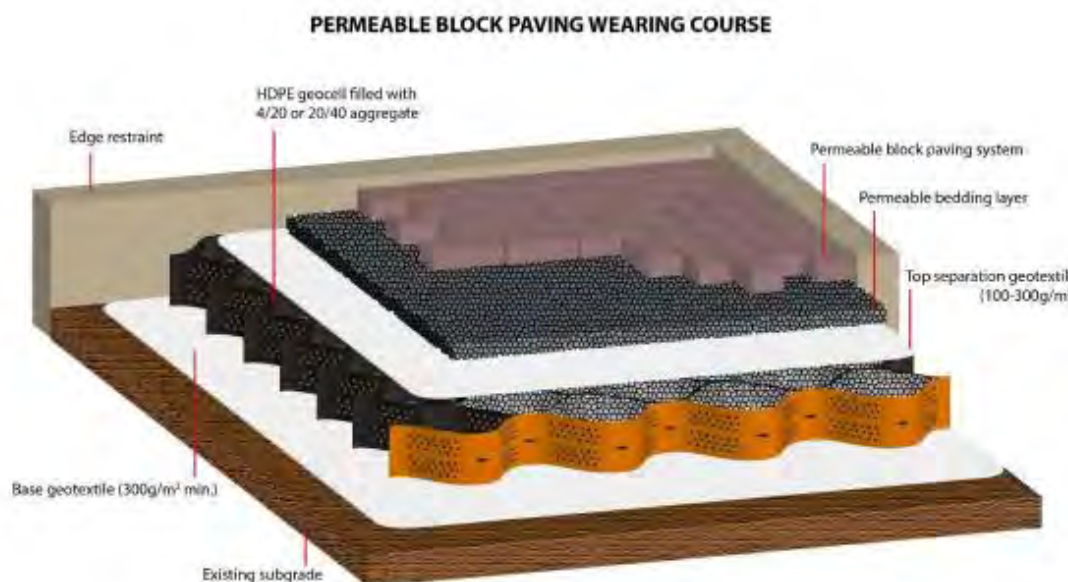


Figure 3: indicative representation of the use of a cellular confinement system over tree root zones.





**Figure 4** The sub-base configuration required for gravel or grass surfacing [image courtesy of Core LP].

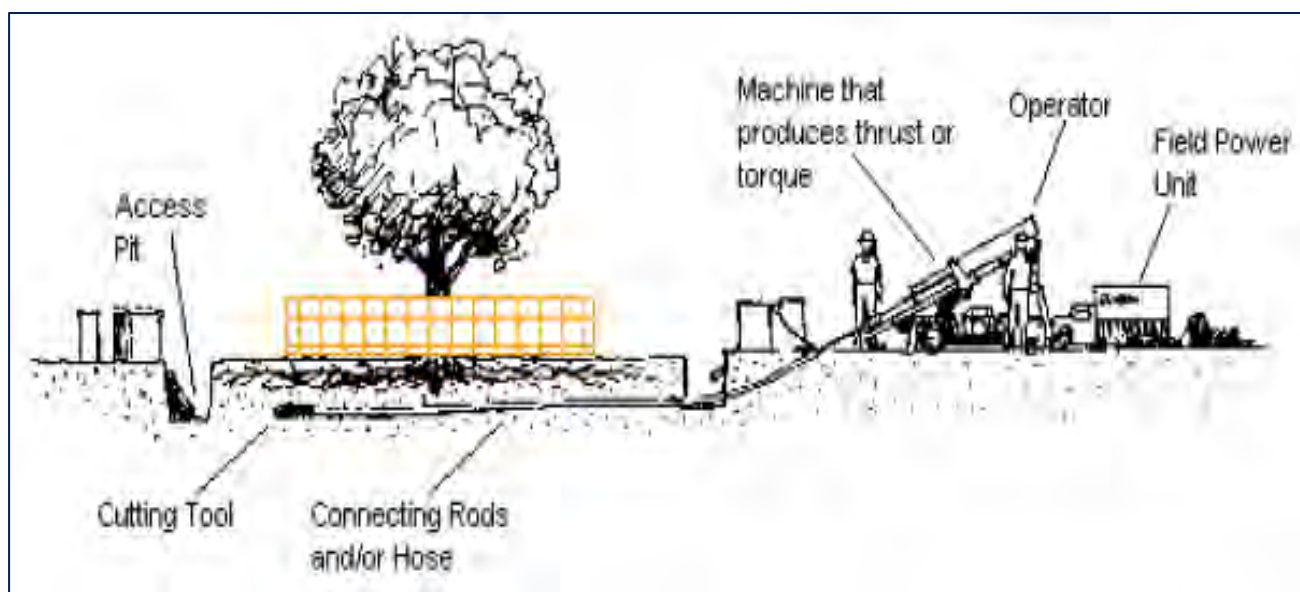


**Figure 5** The recommended specification when installing permeable block paving above a cellular confinement system [image courtesy of Core LP].



### **Directional Drilling or Boring**

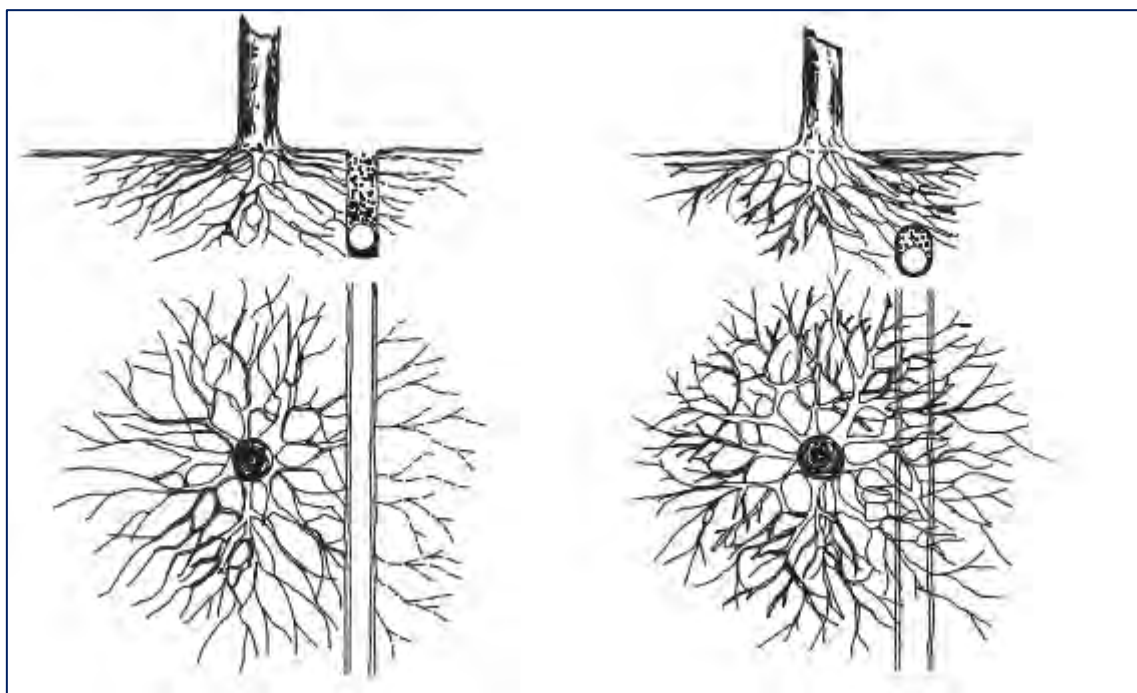
- i. The benefits provided by trees to open space and their contribution to micro-climates are immeasurable, so extreme care must be taken not to harm their root systems. Thus, horizontal Directional drilling has become an essential method for installing utilities and infrastructure near trees.
- ii. *Directional drilling / Boring*; Traditional methods of service establishment (open cut trenching) can cause unnecessary root damage and/or soil disturbance. The action of 'thrusting' or 'directional drilling' is the most preferred method of service establishment within the Tree Protection Zone of trees. When Directional Drilling or the 'boring' method is used, the 'change of environment' around the tree is minimised. All machinery and starting pits associated with the action of thrusting or directional drilling must remain outside the TPZ of any trees. This is to minimise any root loss or ground compaction that may arise from the works. If the thrusting rod or directional drill-head becomes stuck underneath the dripline of a tree, then the arborist responsible for the trees on the site should be contacted prior to the retrieval process. Any retrieval of a thrusting rod or directional drill-head under the dripline of a tree should be undertaken with hand tools unless otherwise stated by the arborist responsible for the trees on the site.



*Indicative Directional Drilling diagram.*

*Key Points for Directional Drilling:*

- Entry and exit pits will be positioned outside the designated/calculated TPZ of any tree under the guidance/supervision of the appointed onsite Supervising Arborist. This requirement will apply unless root sympathetic exploratory investigations (root mapping) have been undertaken and it has been determined by the Supervising Arborist that access within the TPZ will not significantly affect the tree per AS 4970-2009 Construction Encroachment Descriptors & Categories.
- The extent or length of boring in the vicinity of trees will be determined by the TPZ.
- Pursuant to AS 4970-2009 the depth of the boring/directional drilling must be at least 600mm deep. The Supervising Arborist will assess the likely impacts of boring and bore pits on the retained trees.
- Where boring is unavailable, excavation shall be by hand and/or Air-Spade/Air-Vac.



*(Left) Trenching causes major damage, whilst (Right) Thrusting minimizes damage.*

### **Permeable Porous Paving**

- i. Permeable Porous Paving (P3) is a paving product that allows water to filter through into the surrounding ground surfaces providing water to feeder tree roots. Within an urban environment tree pit, this allows effective capture and use of natural water which has many benefits.
- ii. P3 helps maximises tree establishment and health, reduces environmental washout of loose material from tree pits, adds to the aesthetics of the surrounding streetscape and reduces trip hazards.
  - *Improves tree health* - Increased rainfall penetrating to tree roots
  - *Reduces impact of the Urban Heat Island effect* - Environmentally conscious product
  - *Reduces water run-off and loss* – reduces the volume of storm water
  - *High penetrability* – Maximises permeability
  - *Reduces infrastructure costs* - Utilising natural water run-off
  - *Environmentally friendly use of recyclable materials* - Reducing waste
  - *Non-slip* - Improves pedestrian safety
  - *Flexible and durable* - Reduces trip hazards while allowing for healthy root growth
  - *Fast setting time* – Reduces installation time and costs
  - *Hard wearing and low maintenance* - Designed for large volume traffic movement
  - *Dual layer combination of permeable paving* - Allows for optimal performance



## Surface Openings Around Trees

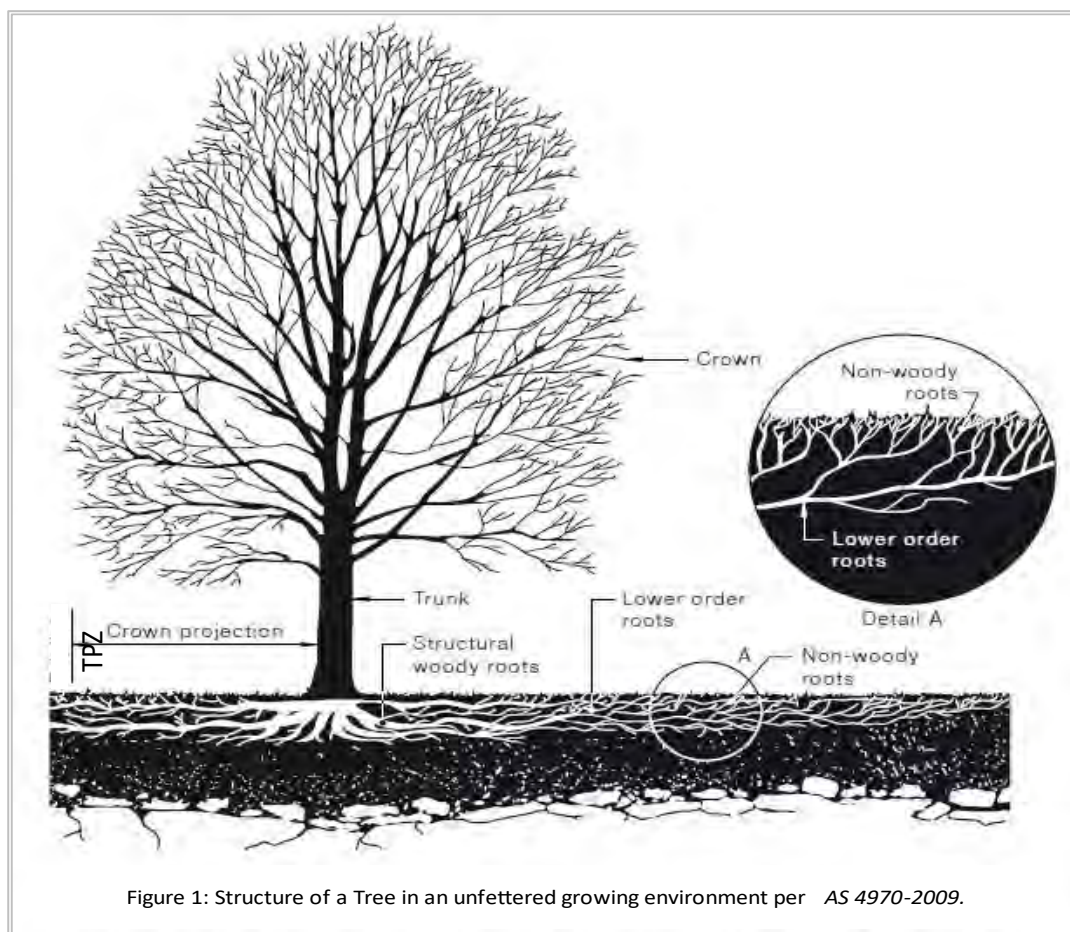


Indicative tree root growth

Surface opening treatment options			
	Suitable context	Maintenance	Cost
<b>Organic mulch</b>	Where space is available for open planters. Where footfall is very low, in wide footways and hard surfaced areas. Underneath other systems (eg tree grates).	Mulch will need to be replenished from time to time. Unsuitable for mechanical sweeping.	Very low
<b>Loose aggregate</b>	Wide footways and hard surfaced areas, where the tree surface opening will only be expected to accommodate low/occasional footfall.	Aggregate will need refilling from time to time. A ring of mulch should be included (and regularly refilled) immediately around the tree trunk. Unsuitable for mechanical sweeping.	Low
<b>Porous paving self-binding aggregate</b>	Wide footways and hard surfaced areas, where the tree surface opening will only be expected to accommodate low to medium footfall.	Aggregate will need refilling and loosening from time to time. A ring of mulch should be included (and regularly refilled) immediately around the tree trunk. Unsuitable for mechanical sweeping.	Low
<b>Flexible permeable rubber surfacing</b>	Footways and hard surfaced areas where the tree surface opening will be expected to accommodate medium to high footfall.	A ring of mulch should be included (and regularly refilled) immediately around the tree trunk.	Medium
<b>Porous paving resin-bound aggregate</b>	Footways and hard surfaced areas where the tree surface opening will be expected to accommodate medium to high footfall.	Subject to cracking under the pressure of buttress roots. Subject to clogging – particularly if subject to mechanical sweeping. A ring of mulch should be included (and regularly refilled) immediately around the tree trunk.	High



## 8.2 Root Morphology Considerations



*Drawing 1: Indicative Root System and Rhizosphere of a Healthy Tree.*

- i. The main functions of roots include the uptake of water and nutrients, anchorage, storage of sugar reserves and the production of some plant hormones required by the shoots. For roots to function, they must be supplied with oxygen from the soil. The root system of trees consists of several 'types' of roots found in different parts of the soil and is generally much more extensive than commonly thought. The importance of roots is easily overlooked because they are not visible, that is 'out of sight, out of mind'. Damage to the root system is a common cause of tree decline and death and is the most common form of damage associated with development sites (Matheny et. al, 1998).
- ii. Root systems consist of three main parts: (Sutton and Tinus, 1983).
  - The structural woody roots (anchorage, storage and transport);
  - Lower order roots (anchorage, storage and transport); and
  - Non-woody roots (absorption of water and nutrients, extension, synthesis of amino acids and growth regulators) (please refer to Drawing 1 above).
- iii. In addition to lateral root spread being underestimated, root depth in trees has also been grossly exaggerated. Deep root systems or taproots are the exception rather than the rule (Perry, 1982)

(Watson and Neely, 1994).

- iv. Most roots of most trees are found in the very top of the soil. The vast majority of these roots are small non-woody absorbing roots which grow upward into the very surface layers of the soil and leaf litter. This delicate, non-woody system, because of its proximity to the surface, is very vulnerable to injury (Watson et. al, 2014).

### 8.3 Encroachment Descriptors

#### ***Tree Protection Zone (TPZ):***

The TPZ is the optimal combination of crown and root area (as defined by AS 4970-2009) that requires protection during the construction process so that the tree can remain viable. The TPZ is an area that is isolated from the work zone to ensure no disturbance or encroachment occurs into this zone. Tree sensitive construction measures must be implemented if work is to proceed within the Tree Protection Zone.

Diameter at Breast Height (DBH) measured at 1.4m above ground level. DBH is the circumference divided by  $\pi$ . \* Measurement taken by Standard issue DBH Tape.

Tree Protection Zone (TPZ) = DBH x 12 (The radius of the TPZ is calculated for each tree by multiplying its DBH x 12) Note: TPZ - minimum area is 2.0m / maximum area is 15m.

Please Note: The TPZ figure is expressed as a radius measurement which is to be taken from the centre of the stem at ground level and applied in an outwards direction towards the extremities of the branches for the entire circumference of the tree/s.

#### ***Structural Root Zone (SRZ):***

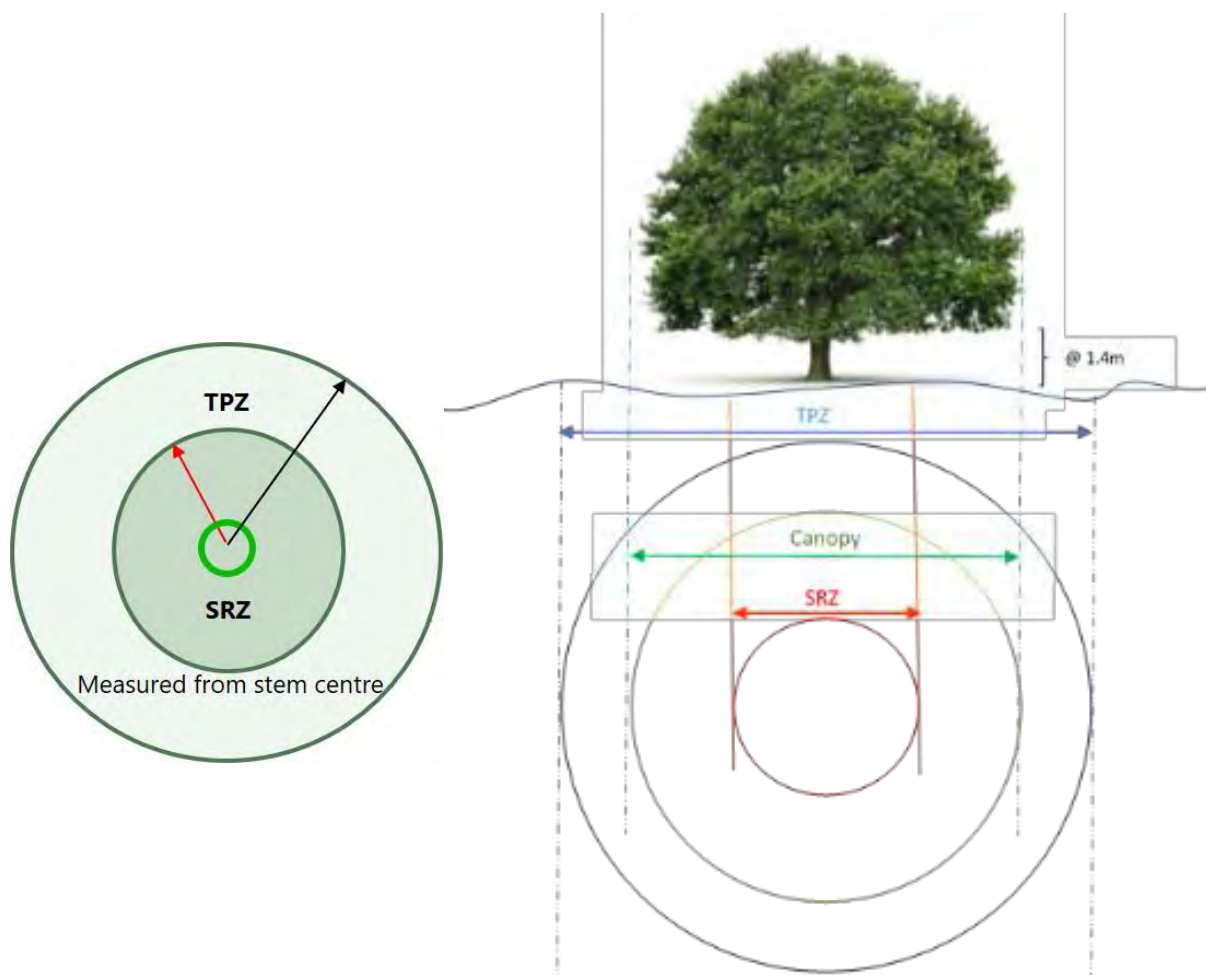
The SRZ is the area of the root system (as defined by AS 4970-2009) used for stability, mechanical support and anchorage of the tree. Severance of structural roots (>50 mm in diameter) within the SRZ is not recommended as it may lead to the destabilisation and/or serious decline of the tree.

#### ***Root Investigation:***

When assessing the potential impacts of encroachment within the TPZ, consideration will need to be given to the location and distribution of the roots, including above or below ground restrictions affecting root growth. Location and distribution of roots may be determined through non-destructive excavation (NDE) methods such as air spade and manual excavation. Root investigation is used to determine the extent and location of roots within the zone of conflict. Root investigation does not guarantee the retention of the tree.

#### 8.4 Tree Protection Zone (TPZ) & Structural Root Zone (SRZ).

The Australian Standard *AS 4970-2009 - Protection of trees on development sites* is used for the allocation of tree protection zones. This method provides a TPZ that addresses both tree stability and growth requirements. TPZ distances are measured as a radius from the centre of the trunk at ground level.

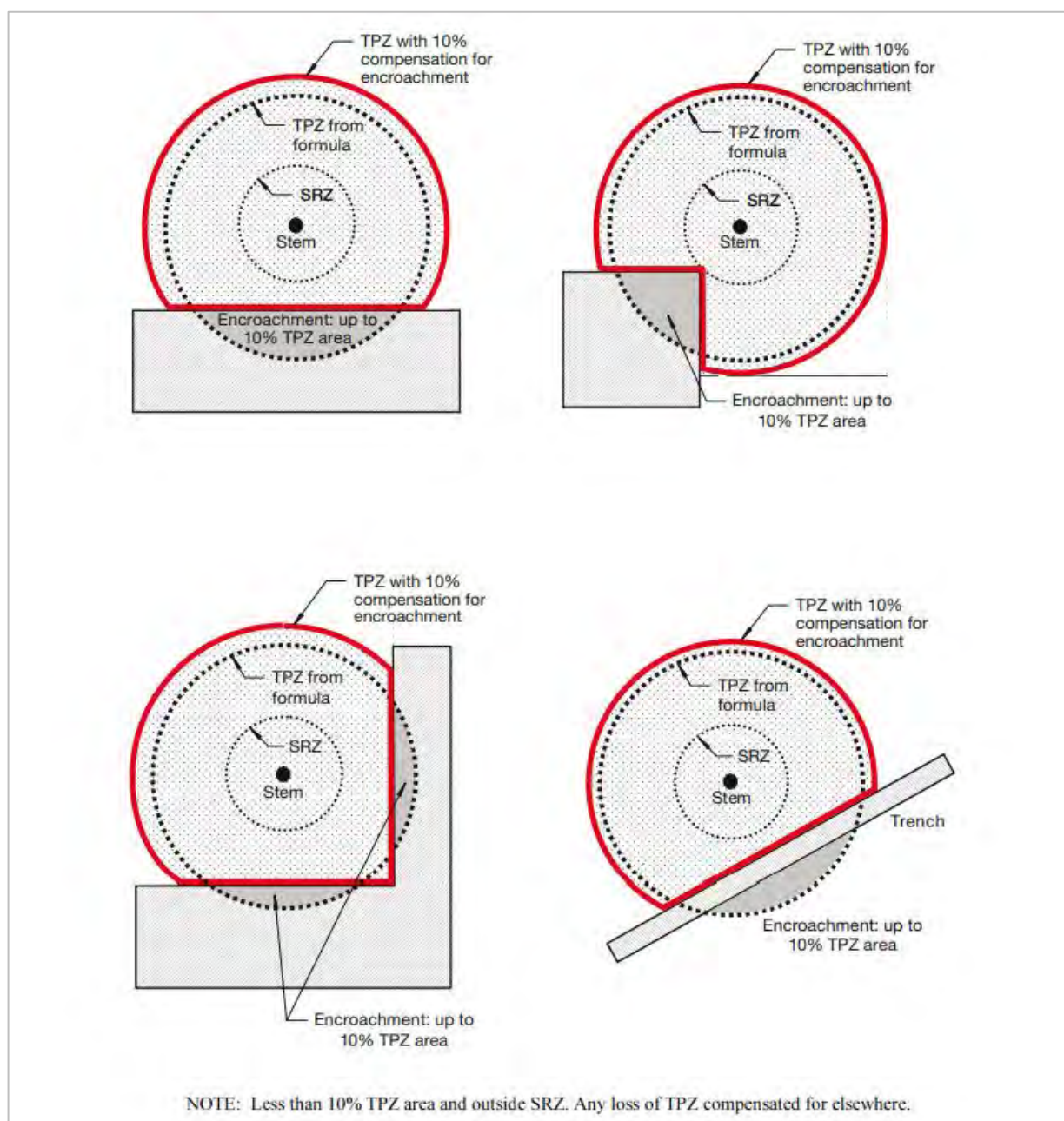


- AS4970-2009, s3: The radius of the TPZ is calculated for each tree by multiplying its Diameter @ Breast Height measured @ 1.4m from ground level ( $DBH \times 12 = TPZ$ ). ( $DBH = \text{Trunk Girth @ 1.4m} \div \pi$ ).
- To calculate the SRZ: Radius SRZ = Diameter Above Root Crown ( $DRC \times 50$ )  $^{0.42} \times 0.64$ . If the DRC is less than 0.15m the SRZ will be 1.5m.
- Note: A TPZ should not be less than 2m or more than 15m from the tree stem.

You do not need to calculate the TPZ of palms, cycads and tree ferns. For these plants, the TPZ should not be less than 1m outside the crown.

## 8.5 Compensation for Tree Protection Zone Encroachment

Encroachment into the Tree Protection Zone (TPZ) is sometimes unavoidable. The images above are analogous to the abovementioned works scenario and indicate how encroachment within the tree protection zone can be compensated for elsewhere per *AS 4970-2009 Protection of Trees on Development Sites*.





## 8.6 Descriptors: Age, Vitality & Structure

(Per International Society of Arboriculture guidelines)

### TREE AGE CLASS

<b>Young</b> Juvenile or recently planted approximately 1-7 years.
<b>Semi-mature</b> Tree actively growing in size and yet to achieve the expected size <i>in situ</i> .
<b>Maturing</b> Tree is approaching the expected size or has reached the expected size <i>in situ</i> .
<b>Senescent</b> Tree is over mature and has started to decline.

### TREE VITALITY

<b>Excellent:</b> The tree is demonstrating excellent or exceptional growth. The tree should exhibit a full canopy of foliage and be free of pest and disease problems.
<b>Good:</b> Foliage of tree is entire, with good colour, very little sign of pathogens and of good density. Growth indicators are good i.e. Extension growth of twigs and wound wood development. Minimal or no canopy dieback (deadwood).
<b>Fair:</b> Tree is showing one or more of the following symptoms: <25% dead wood, minor canopy dieback, foliage generally with good colour though some imperfections may be present. Minor pathogen damage present, with growth indicators such as leaf size, canopy density and twig extension growth typical for the species in this location.
<b>Poor:</b> Tree is showing one or more of the following symptoms of decline; >25% deadwood, canopy dieback is observable, discoloured or distorted leaves. Pathogens present, stress symptoms are observable as reduced leaf size, extension growth and canopy density.
<b>Very Poor:</b> The tree appears to be in a state of decline. The tree is not growing to its full capacity. The canopy may be very thin and sparse. A significant volume of deadwood may be present in the canopy and/or pest and disease problems may be causing a severe decline in tree vitality.
<b>Dead or dying:</b> Tree is in severe decline; >55% deadwood, very little foliage, possibly Epicormic shoots and minimal extension growth.
<b>Dead:</b> The tree is completely dead and exhibits no new growth or live tissue.

*\*Please note that tree vitality cannot be measured directly, hence growth and physiological parameters that indicate tree vitality are used. Health or Vitality of a tree is evidenced by the general appearance of crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion including pathogens and presence of dieback in crown at the time of inspection. Vigour may vary according to seasonal weather patterns and rainfall received (Dobbertin, 2005).*

*\*\*Tree Condition: The assessment of a tree(s) condition evaluates factors of tree vitality, form and structure. These descriptors of vitality, form and structure attributed to a tree evaluate the individual specimen to what could be reasonably considered by the arborist as typical for that species growing in situ. It is well documented that specific tree species can display inherently poor biomechanics, such as acute branch attachments with included bark, co-dominant leaders and other poor branch and root architecture. Whilst these 'structural defects' may be deemed arboriculturally flawed, they are typical for the species and may not constitute a foreseeable increased risk. These trees may be assigned a 'structural rating' of 'fair-poor' (as opposed to poor) at the arborist's discretion.*

## TREE STRUCTURE

**Good:** Trunk and scaffold branches show good taper and attachment with minor or no structural defects. Tree is a good example of species with well-developed form showing no obvious root problems or pests and diseases.

**Fair/Fair-Poor:** Tree shows minor structural defects or minor damage to trunk e.g. bark missing, there could be cavities present. Minimal damage to structural roots. Tree could be seen as typical for this species.

**Poor/Very Poor:** There are major structural defects, damage to trunk or bark missing. Co-dominant stems could be present with likely points of failure. Girdling or damaged roots obvious. Tree is structurally problematic.

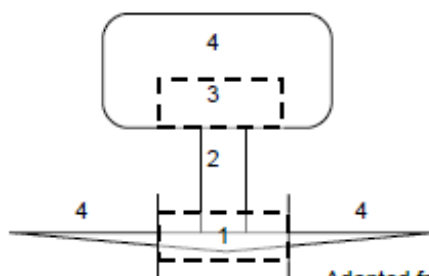
**Hazardous:** Tree is immediate hazard with potential to fail, this should be rectified as soon as possible.

Tree Structure Matrix

Descriptor	Zone 1 - Root plate & lower stem	Zone 2 - Trunk	Zone 3 - Primary branch support	Zone 4 - Outer crown and roots
Good	No damage, disease or decay; obvious basal flare / stable in ground	No damage, disease or decay; well tapered	Well formed, attached, spaced and tapered	No damage, disease, decay or structural defect
Fair	Minor damage or decay. Basal flare present.	Minor damage or decay	Typically formed, attached, spaced and tapered	Minor damage, disease or decay; minor branch end-weight or over-extension
Fair to Poor	Moderate damage or decay; minimal basal flare	Moderate damage or decay; approaching recognised thresholds	Weak, decayed or with acute branch attachments; previous branch failure evidence	Moderate damage, disease or decay; moderate branch end-weight or over-extension
Poor	Major damage, disease or decay; fungal fruiting bodies present. Excessive lean placing pressure on root plate	Major damage, disease or decay; exceeds recognised thresholds; fungal fruiting bodies present. Acute lean. Stump resprout	Decayed, cavities or has acute branch attachments with included bark; excessive compression flaring; failure likely	Major damage, disease or decay; fungal fruiting bodies present; major branch end-weight or over-extension
Very Poor	Excessive damage, disease or decay; unstable / loose in ground; altered exposure; failure probable	Excessive damage, disease or decay; cavities. Excessive lean. Stump resprout	Decayed, cavities or branch attachments with active split; failure imminent	Excessive damage, disease or decay; excessive branch end-weight or over-extension

Diagram 2: Tree structure zones

1. Root plate & lower stem
2. Trunk
3. Primary branch support
4. Outer crown & roots



Structure ratings will also take into account general tree architecture which considers aspects of stem taper, live crown ratio, branch distribution or crown bias and position such as a tree being suppressed amongst more dominant trees.

## 8.7 Descriptors: Estimated Life Expectancy (ELE)

The ELE is adapted from (*Barrell, 2001*). The objective of a ELE assessment is to determine the relative value of individual trees for the purpose of informing future management options.

Estimated Life Expectancy – Assessment Criteria			
Dead	Short	Medium	Long
<p>Trees with a high level of risk that would need removing within the next 5 years.</p> <p>Dead trees.</p> <p>Trees that should be removed within the next 5 years.</p> <p>Dying or suppressed or declining trees through disease or inhospitable conditions.</p> <p>Dangerous trees through instability or recent loss of adjacent trees.</p> <p>Dangerous trees through structural defects including cavities, decay, included bark, wounds or poor form.</p> <p>Damaged trees that considered unsafe to retain.</p> <p>Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.</p> <p>Trees that will become dangerous after removal of other trees for the reasons.</p>	<p>Trees that appear to be retainable with an acceptable level of risk for 5-15 years.</p> <p>Trees that may only live between 5 and 15 more years.</p> <p>Trees that may live for more than 15 years but would be removed to allow the safe development of more suitable individuals.</p> <p>Trees that may live for more than 15 years but would be removed during the course of normal management for safety or nuisance reasons.</p> <p>Storm damaged or defective trees that require substantial remedial work to make safe and are only suitable for retention in the short term.</p>	<p>Trees that appear to be retainable with an acceptable level of risk for 15-40 years.</p> <p>Trees that may only live between 15 and 40 more years.</p> <p>Trees that may live for more than 40 years but would be removed to allow the safe development of more suitable individuals.</p> <p>Trees that may live for more than 40 years but would be removed during the course of normal management for safety or nuisance reasons.</p> <p>Storm damaged or defective trees that require substantial remedial work to make safe and are only suitable for retention in the short term.</p>	<p>Trees that appear to be retainable with an acceptable level of risk for more than 40 years.</p> <p>Structurally sound trees located in positions that can accommodate future growth.</p> <p>Storm damaged or defective trees that could be made suitable for retention in the long term by remedial tree surgery.</p> <p>Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention</p>

## 8.8 IACA Significance of Tree, Assessment Rating System (STARS)

<b>Institute of Australian Consulting Arboriculturists (IACA) Significance of a Tree, Assessment Rating System (STARS)</b>  <i>The tree is to have a minimum of 3 criteria in a category to be classified in that group</i>		
Low	Medium	High
<p>The tree is in fair-poor condition and good or low vigour.</p> <p>The tree has form atypical of the species.</p> <p>The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings.</p> <p>The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area.</p> <p>The tree is a young specimen which may or may not have reached dimensions to be protected by local Tree Preservation Orders or similar protection mechanisms and can easily be replaced with a suitable specimen.</p> <p>The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa in situ – tree is inappropriate to the site conditions.</p> <p>The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms.</p> <p>The tree has a wound or defect that has the potential to become structurally unsound.</p> <p><b><u>ENVIRONMENTAL PEST/NOXIOUS WEED</u></b></p> <p>The tree is an environmental pest species due to its invasiveness and/or poisonous/allergenic, properties/declared noxious weed.</p> <p><b><u>HAZARDOUS / IRREVERSIBLE DECLINE</u></b></p> <p>The tree is structurally unsound unstable and considered potentially dangerous.</p> <p>The tree is dead or in irreversible decline with the potential to fail/collapse.</p>	<p>The tree is in fair to good condition.</p> <p>The tree has form typical or atypical of the species.</p> <p>The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area.</p> <p>The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street.</p> <p>The tree provides a fair contribution to the visual character and amenity of the local area.</p> <p>The tree's growth is Mediumly restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ.</p>	<p>The tree is in good condition and good vigour.</p> <p>The tree has a form typical for the species.</p> <p>The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age.</p> <p>The tree is listed as a heritage item, threatened species or part of an endangered ecological community or listed on councils' significant/notable tree register.</p> <p>The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity.</p> <p>The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values.</p> <p>The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ – tree is appropriate to the site conditions.</p>



### (STARS) Tree Retention Value - Priority Matrix

IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia, ([www.iaca.org.au](http://www.iaca.org.au)).

		Significance				
		1.High	2.Medium	3.Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest/Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1.Long >40 Years					
	2.Medium 15-40 Years					
	3.Short <1-15 Years					
	Dead					
	<b>Priority for Retention (High)</b> - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard <i>AS 4970 Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented (pier and beam cantilever, Structural Confinement Cells etc if works are to proceed within the TPZ).					
	<b>Consider for Retention (Medium)</b> - These trees may be retained and protected. These are considered less critical; however, their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.					
	<b>Consider for Removal (Low)</b> - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.					
	<b>Priority for Removal</b> - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.					

## **8.9 Assumptions and Limiting Conditions**

- 1) Active Green Services Pty Ltd (herein after referred to as AGS) contracts with you on the basis that you promise that all legal information which you provide, including land title and ownership of other property, are correct. AGS is not responsible for verifying or ascertaining any of these issues.
- 2) AGS contracts with you on the basis that your promise that all affected property complies with all applicable statutes and subordinate legislation.
- 3) AGS will take all reasonable care to obtain necessary information from reliable sources and to verify data. However, AGS neither guarantees nor is responsible for the accuracy of information provided by others.
- 4) If, after delivery of this report, you later require a representative of AGS to attend court to give evidence or to assist in the preparation for a hearing because of this report, you must pay an additional hourly fee at our then current rate for expert evidence.
- 5) Alteration of this report invalidates the entire report.
- 6) AGS retains the copyright in this report. Possession of the original or a copy of this report does not give you or anyone else any right of reproduction, publication or use without the written permission of AGS.
- 7) The contents of this report represent the professional opinion of the consultant. AGS consultancy fee for the preparation of this report is in no way contingent upon the consultant reporting a particular conclusion of fact, nor upon the occurrence of a subsequent event.
- 8) Sketches, diagrams, graphs and photographs in this report are intended as visual aids, are not to scale unless stated to be so, and must not be construed as engineering or architectural reports or as surveys.
- 9) Unless expressly stated otherwise:
  - a. The information in this report covers only those items which were examined and reflects the condition of those items at the time of the inspection.
  - b. Our inspection is limited to visual examination of accessible components without dissection, excavation or probing. There is no warranty or guarantee, express or implied, that even if they were not present during our inspection, problems or defects in plants or property examined may not arise in the future.
- 10) This Report supersedes all prior discussions and representations between AGS and the client on the subject.

## 8.10 AGS Quality Control

### Document control

File reference	File type	Modifications	Date
JN 83857	AR	Original document	25/03/2022

### Documents reviewed

Date	Title	Author	Company
N/A	N/A	N/A	N/A

### Communication register

Date	Type	From	To	Description
N/A	N/A	N/A	N/A	N/A

### Review register

Date	File reference	Reviewer	Qualification	Company
28/03/2022	JN 83857 Arboricultural Impact Assessment Report	I. Dunsmuir	Arborist (AQF 5)	Active Green Services