Appendix D. Arboriculturist Assessment

ARBORICULTURAL IMPACT ASSESSMENT REPORT

REGENT STREET RESERVE, RIVERSTONE

Prepared for:

Blacktown City Council

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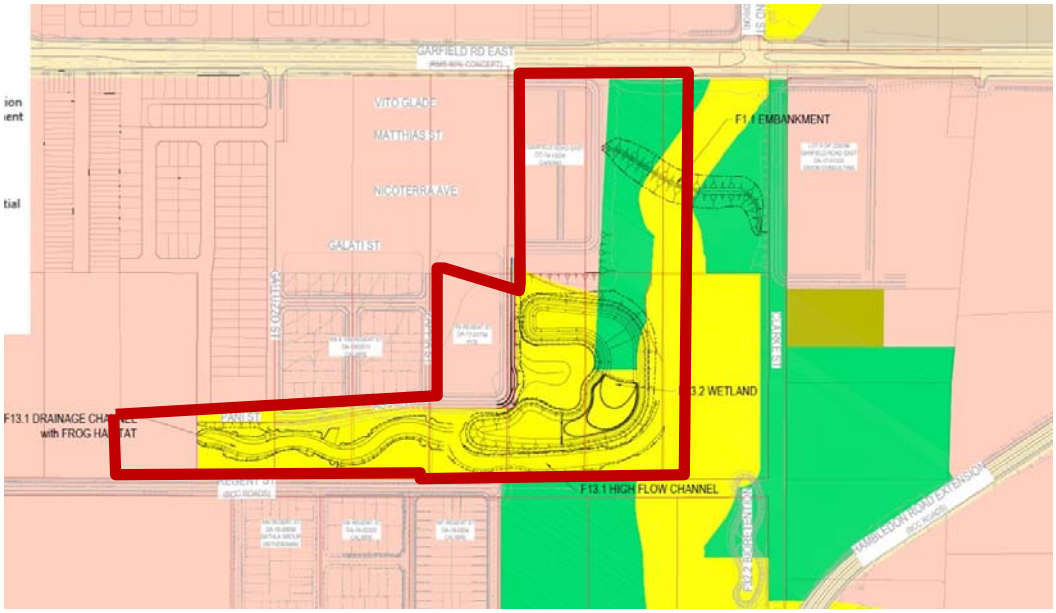
CONTENTS

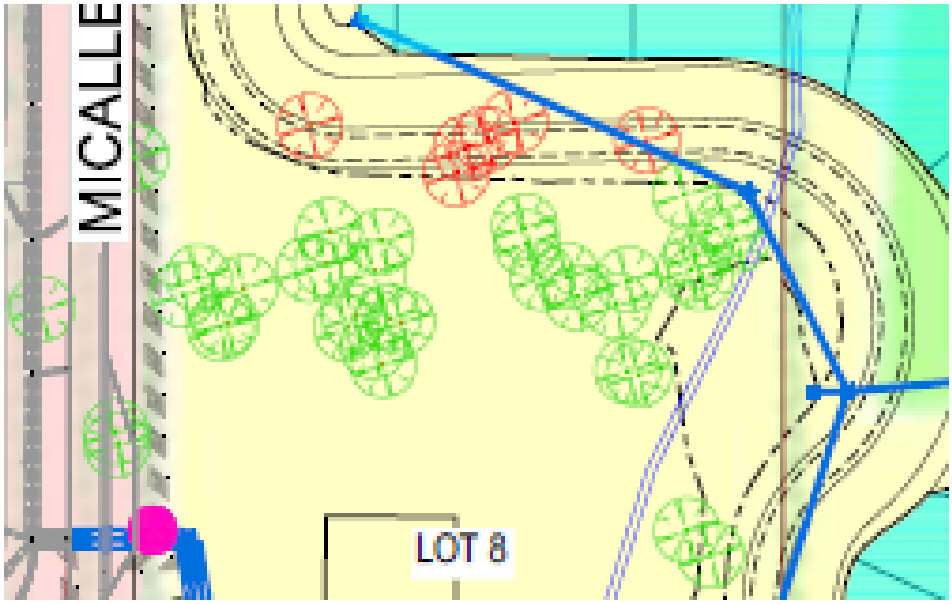
1.0 INTRODUCTION

1.1 Purpose of this Report

Sturt Noble Arboriculture was engaged by Blacktown Council to prepare an Arboricultural Impact Assessment Report and Tree Protection Recommendations in relation to the proposed wetland, embankment and channel works associated with the CP20 Regent Street Basin and Reserve 917 project. The extent of works is shown in the red ringed zone below:



36 trees surrounded by the new wetland are potentially enabled to be retained (trees shown in green below).



This report deals with those trees in the Reserve likely to be able to be retained after earthworks are completed.

The purpose of this report is to:

- Assess and review the condition of these existing trees by undertaking a Visual Tree Assessment.
- Assess each individual tree's suitability to be retained as a sustainable part of the proposed development in the long term, considering the likely impacts of the works proposed.
- Provide recommendations for tree removal, retention, and protection.
- Provide recommendations where appropriate to enable trees to be retained or have better long-term health outcomes and minimize potentials for hazard.
- To provide information on appropriate tree protection measures, appropriate setbacks, constraints, and tree management procedures during site works.

This report has been carried out as per the Methodology outlined in **Appendix 1**

1.2 Background

The preparation of this report has been prepared in awareness and consideration of the following standards, controls, and guidelines:

- Australian Standard AS4970-2009 Protection of Trees on Development Sites
- Australian Standard AS4373-2007 Pruning of Amenity Trees

1.3 The Proposal

This impact assessment has been prepared based on the engineering and drainage plans prepared by J W Prince:

Refer to plans **Appendix 2**

The proposed works to the site include:

- Bulk Earthworks.
- Grading and construction of wetlands, creek line channels and associated drainage,
- Excavation for services and utilities.
- Installation of Landscaping.
- Installation of footpaths.

1.4 Foreseeable Construction Impacts

Foreseeable impacts noted from the proposed development, construction type and anticipated methodology include:

- Excavations and filling for Bulk Earthworks.
- Excavations and trenching for underground services.
- Ripping or cultivation of soil for landscaped areas.
- Soil level changes including the placement of fill material for berms and make up grades to landscape areas.
- Laying impermeable paving to paths and slabs.
- Movement and storage of plant, equipment & vehicles.
- Erection of site sheds.
- Storage of building materials, stockpiles, waste, and waste receptacles.

2.0 PLANNING CONTROLS

2.1 Planning Definitions

The State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 sets out how Blacktown Council preserves trees and vegetation in the local area.

Blacktown Council regulates tree and vegetation preservation to control clearing in urban areas with the aim of protecting trees and prohibiting, without consent, the:

- cutting down, felling, uprooting, killing, poisoning, ringbarking, or burning of a tree
- destruction of vegetation, lopping or otherwise remove of a substantial part of the vegetation

Vegetation means a tree or other vegetation, whether or not it is native vegetation.
The definition of a tree (a prescribed tree) in Development Control Plan 2015 is:

A perennial plant with a self-supporting stem which has a:

- height of more than 3 metres and/or
- a trunk diameter of more than 200mm or more measured 1.0 metre above ground level.

Works to prune or remove a tree, including any work on tree roots, will require Council approval.

2.2 Exemptions

There are some exemptions from having to obtain Council approval.

A permit or approval is not required to remove a tree that is classified as:

- 'Dead' - means a tree that is no longer alive and is not a habitat tree (means a tree which contain hollows used by forest fauna)

- 'Dying tree' - means a tree that is in such an advanced state of decline due to damage or disease—where an insufficient amount of live tissue, green leaves, limbs or branches exists to sustain life—that death is unavoidable. Evidence is required.

- 'Dangerous tree' - means it is in imminent danger from falling and the action is necessary to protect human life, buildings or other property

- Where development approval has been given, trees within 3m of the perimeter of a building located on the same property as the tree

- Pruning of less than 10% of the canopy or root system up to once every growing season and only of branches less than 100 millimetres in diameter

- Inserting of root barriers, when this will result in less than 10% of the root system being removed and up to once every growing season

- The removal or pruning is an action required or allowed to be carried out by or under the Rural Fires Act 1997 without development consent

- Vegetation which does not meet the definition of tree as outlined in section 4.3 of our development control plan

- Any topping, lopping, or removing of trees required to comply with a direction under the Electricity Supply Act 1995, any other Act of Parliament or complying with a direction from any emergency service including the State Emergency Service

- The removal of torn limbs or dead wood, such as individual branches, but does not include whole trees

- Excavation in accordance with the conditions in the AS 4970-2009 Protection of Trees on development sites.

3.0 THE EXISTING SITE

3.1 The Site

The site is located in Riverstone and is bounded by Garfield Road East to north, Clarke Street to the east and Riverstone Road to the south.

The works proposed within the site include the construction of:

- A wetland
- A channel with a diversion channel
- An embankment
- A sediment forebay with maintenance access
- A bio retention system
- Revegetation planting
- New pedestrian and shared paths

In addition to the above the following works are proposed in the future to further enhance the Reserve:

- Viewing deck
- Picnic areas and facilities
- Additional pedestrian and shared paths
- Nature playground

3.2 Topography, drainage, soils

First Ponds Creek at the site is a 3rd order watercourse that enters the northern boundary of the study area through a road culvert under Garfield Road East. First Ponds Creek flows in a south easterly direction through the study area and exits through a road culvert under Riverstone Road. The channel of First Ponds Creek is narrow in the northern and central portions of the study area prior to flowing into several small – moderately sized farm dams. First Ponds Creek widens and becomes more defined to the south of Regent Street. A 1st order watercourse runs parallel with Regent Street and flows into the constructed farm dams, where it joins with First Ponds Creek.

Regional scale soil landscape mapping (OEH 2017) maps the eastern and western perimeter of the study area within the Blacktown (bt) Residual (z) soil landscape. Soils of the Blacktown soil landscape are derived from Wianamatta Group shales, which occur extensively on the Cumberland Lowlands around Blacktown, Mount Druitt, and Leppington. Land adjacent to First Ponds Creek is mapped under the South Creek (sc) Alluvial soil landscape. This soil landscape comprises the active floodplain and drainage networks of the Cumberland Plain, including the South Creek, Eastern Creek, Ricabys Creek and Prospect Creek systems. The South Creek soil landscape consists of Quaternary Alluvium derived from Wianamatta Group shales and Hawkesbury Sandstone.

3.3 Vegetation Communities

Review of previous vegetation mapping (OEH 2015 after NPWS 2002) identified three Plant Community Types (PCTs) in the study area. These communities are:

- Grey-Box Forest Red Gum Grassy Woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (PCT 849)
- Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion (PCT 835)
- Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion (PCT 724)

Forest Red Gum - Rough-barked Apple grassy woodland is mapped adjacent to First Ponds Creek, the watercourse and in low-lying areas of the site. Grey-Box Forest Red Gum Grassy Woodland is mapped with increasing distance from First Ponds Creek along the eastern and western perimeters of the study area. Two small patches of Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest have been mapped along the western perimeter of the study area.

The vegetation has been mapped in a high (condition classes A, B, C, Cmi) and low (condition classes TX, TXR and Tx) condition. For the vast majority of the study area, no native vegetation community was identified as being present by OEH (2015).
The three vegetation communities mapped in the study area comprise TECs listed under the BC Act and/or EPBC Act.

Given the group of trees surveyed are all *Eucalyptus tereticornis* the specific native vegetation community would be classified as **Forest Red Gum - Rough-barked Apple grassy woodland** on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion.

3.4 The Trees

Thirty six (36) trees have been surveyed as part of this assessment constituting a scattered grove. The trees are all endemic *Eucalyptus tereticornis* trees. Refer to **Appendix 2** for tree locations and numbers.

A complete and detailed tree assessment schedule was prepared and is included in **Appendix 3**.

It is noted that a number of trees will be located in the footprint of the project earthworks and will require to be removed.

4.0 ABORICULTURE IMPACT ASSESSMENT

4.1 Construction Assumptions

It is assumed for this report that the following activities will impact on existing trees.

- Excavations and filling for Bulk Earthworks.
- Ripping or cultivation of soil for landscaped areas.
- Laying impermeable paving to paths and slabs.
- Movement and storage of plant, equipment & vehicles.
- Erection of site sheds.
- Soil level changes including the placement of fill material for berms and make up grades to landscape areas.
- Storage of building materials, waste, and waste receptacles

Any changes to the works should be provided prior to construction so any additional impacts can be assessed.

4.2 Trees to be removed

The plans show that eight (8) trees will need to be removed to accommodate the proposed development.

Table 1: Trees to be removed

Site filling/ construction works critical to the following trees	Other (poor condition, other studies, etc)	Tree species to be removed (exempt and can be removed without consent)
3, 10, 17, 19	14, 15, 18, 20	

- Tree 3 to be removed as the proposed path is located within its structural root zone
- Tree 10 and 19 are proposed to be removed as earthworks occur within their structural root zones
- Tree 17 is proposed to be removed due to significant encroachment into its TPZ (33%) from the wetland embankment bulk earthworks and the proposed footpath
- Trees 14, 15, 18 and 20 are proposed to be removed due to their poor condition

Application required for the removal of these trees should be sought as part of the project.

4.3 Trees to be retained

The plans show that twenty-eight (28) trees are proposed to be retained.

- However we note that the regrading and filling in of an existing dam in close proximity to trees 22-26 may adversely affected these trees, as *Eucalyptus tereticornis* species have sensitive root systems. It is recommended that an assessment in 6 months and 12 months time is carried out on these trees to determine their ongoing health and if they need to be removed.

With implementation of the tree protection measures it should be possible to retain all other trees on the developed site.

Table 2: Trees to be retained

Clear of all works	Minor Encroachment from bulk earthworks	Major Encroachment from bulk earthworks
1, 2, 4 – 8, 11 – 13, 22, 24, 27 - 36	9, 16, 23, 25	21, 26

- Proposed site design and Construction of the wetland and associated infrastructure/ facilities should consider the Tree Protection Zones as discussed in the following sections to minimise any adverse impact.
- Careful consideration should be taken to ensure impacts to the existing trees are minimised. This shall include the works themselves, their location and construction methodology.

4.4 Works within Tree Protection Zones

Encroachment to trees

- Tree no. 21 has an encroachment greater than 10% to its TPZ. It is proposed that non-invasive exploratory trenching (Refer 5.9 Root investigation) is carried out as indicated on the plan.

  The Site arborist shall review any large roots uncovered (above 50mm in diameter) and provide advice on removal or mitigation by design changes. Where possible large roots should be retained.

- Tree Nos. 9 and 16 have minor encroachments to less than 10% of their TPZ's caused by the construction of a new path. Subject to tree protection measures in this report being followed, this minor impact will be acceptable in our opinion.

- Tree Nos. 23 and 25 have minor encroachments to less than 10% of their TPZ's and tree No. 26 has a major encroachment of 17.2% resulting from the installation of fill within their TPZ's to infill an existing dam. These works may adversely affect these trees and trees 22 and 24 that are in close proximity to them. It is recommended that an assessment in 6 months and 12 months time is carried out on these trees to determine their ongoing health and if they need to be removed.

Other works

- Any disturbance to soils within TPZ's could destabilise the trees or impact on long term health. Should any changes to soil within the TPZ/ SRZ be proposed further discussion and assessment must be undertaken.

- The plan in **Appendix 2** indicates trees TPZ's and SRZ's and should be used to inform later design decisions and temporary tree protection fences.

4.5 Pruning works

In addition to Tree Protection Zones, the extent of the canopy (canopy dripline) should also be considered, particularly in relation to construction activities and along access points.

Significant pruning of trees to accommodate digging machinery is generally not acceptable. Trees may not be pruned by more than 10% without consent.

Branches should be temporarily pushed or tied where possible to minimise the amount of pruning works.

4.6 Ongoing management of trees to be retained

Ongoing monitoring and maintenance should be undertaken for the twenty-eight (28) trees identified to be retained and irrigation of impacted trees should be considered depending on rainfall patterns and time of year.

All of the trees identified to be retained have pest infestation at the time of assessment. Further investigation and the preparation of a pest eradication program is recommended.

5.0 TREE PROTECTION RECOMMENDATIONS

5.1 Tree Protection Measures

It is recommended that a site-specific Tree Protection Plan (TPP) is prepared to guide the construction process to ensure all trees designated for retention remain as a sustainable part of the landscape in the long term.

The plan shall be prepared by a consulting arborist (AQF Level 5) and should at a minimum include a detailed plan of the locations of, and specifications for, tree protection measures.

The TPP shall include a monitoring schedule relating to critical points during the works (hold points) where the Project Arborist is required to visit the site and confirm that works are being undertaken as conditioned by Council/as required.

The following tree protection measures shall be implemented prior to the commencement of any site works and shall remain in place for the duration of the development.

5.2 Tree Protection Zones

The Tree Protection Zones recommended for all trees within the site are to be retained and shall be equivalent to the Tree Protection Zone as specified in this report. This is a radial distance measured from the centre of the trunk of the subject trees.

The following activities are prohibited within the specified Tree Protection Zones:-

- Excavations and trenching (with exception of the approved foundations and underground services);
- Ripping or cultivation of soil;
- Mechanical removal of vegetation;
- Soil disturbance or movement of natural rock;
- Soil level changes including the placement of fill material (excluding any suspended floor or slab);
- Movement and storage of plant, equipment & vehicles;
- Erection of site sheds;
- Affixing of signage or hoardings to trees;
- Storage of building materials, waste and waste receptacles;
- Disposal of waste materials and chemicals including paint, solvents, cement slurry, fuel, oil and other toxic liquids;
- Other physical damage to the trunk or root system; and
- Any other activity likely to cause damage to the tree.

Place a 50-75mm layer of coarse organic mulch over the entire surface of the TPZ. Where the TPZ is adjacent to construction activities first lay down geotextile fabric beneath the mulch to facilitate easy removal of the mulch at completion and any accidental spillage of construction materials.

Install drip irrigation around the root zone if required by the Project Arborist.

5.3 Tree Protection Fencing

All trees within the site to be retained shall be protected prior to and during construction from all activities that may result in detrimental impact by erecting a suitable protective fence beneath the canopy to the full extent of the Tree Protection Zone (excluding the footprint of the proposed works and areas within adjoining properties).

As a minimum the fence should consist of temporary chain wire panels 1.8 metres in height, supported by steel stakes as required and fastened together and supported to prevent sideways movement. The fence shall be erected prior to the commencement of any work on-site and shall be maintained in good condition for the duration of construction. Where tree protection zones merge a single fence encompassing the area is deemed to be adequate.

Appropriate signage shall be installed on the fencing to prevent unauthorised movement of plant and equipment or entry to the Tree Protection Zone.

Refer to **Appendix 4** for examples of protective fencing and signage.

5.4 Trunk, Branch & Ground Protection

Where provision of tree protection fencing is in impractical due to its proximity to the proposed building envelope, trunk protection shall be erected around the tree to avoid accidental damage. As a minimum, the trunk protection shall consist of two metre (2m) lengths of hardwood timbers (100 x 50mm) spaced at 100-150mm centres secured together with 2mm galvanised wire. These shall be strapped around the trunk (not fixed in any way) to avoid mechanical injury or damage. Trunk protection should be installed prior to any site works and maintained in good condition for the duration of the construction period.

Pavements should be avoided within the Tree Protection Zone of trees to be retained where possible. Proposed paved areas within the Tree Protection Zone of trees to be retained should be placed above grade to minimise excavations within the root zone and avoid root severance and damage.

Placement of fill material within the Tree Protection Zone of trees to be retained should be avoided where possible. Where placement of fill cannot be avoided, the material should be a course, gap-graded material such as 20 – 50mm crushed basalt (Blue Metal) or equivalent to provide some aeration to the root zone. Note that Roadbase or crushed sandstone or other material containing a high percentage of fines is unacceptable for this purpose. The fill material should be consolidated with a non-vibrating roller to minimise compaction of the underlying soil. A permeable geotextile may be used beneath the sub-base to prevent migration of the stone into the sub-grade. No fill material should be placed in direct contact with the trunk.

Refer to **Appendix 4** for examples of trunk, branch, and ground protection.

5.5 Demolition Works within Tree Protection Zones

Where demolition of structures and pavements is required within the Tree Protection Zones of trees to be retained it is to be carried out to avoid disturbance to existing soils, damage to existing roots or potential root growth.

Machinery shall work within the footprint of existing pavements where possible to avoid compaction of the adjacent soil and Tree Protection Zones.

When removing hard surfaces, it shall be stripped-off in thick layers using a small rubber tracked excavator or alternative approved method to avoid damage to underlying roots and minimise soil disturbance. The final layer of sub-base material shall be removed using hand tools where required to avoid compaction of the underlying soil profile and damage to woody roots.

If any concentrations of roots or roots with diameters equal to or greater than 50mm are encountered, they must be retained in an undamaged condition for assessment by the Project Arborist. If the Project Arborist deems surrounding underground elements such as footing and pipes are providing support, these elements shall be left in-situ.

5.6 Excavations within Tree Protection Zones

The excavator shall work within the footprint of existing pavements where possible to avoid compaction of the adjacent soil and Tree Protection Zones.

5.7 Underground Services

All proposed underground services should be located as far away as practicable from existing trees to be retained to avoid excavation within the Tree Protection Zone.

For underground services, where the incursion to the Root Zone is less than 10% of the total TPZ (i.e. beyond the Minimum Setback Distance), a chain trenching device may be used. A backhoe or skid steer loader (bobcat) is unacceptable due to the potential for excessive compaction and root damage. Where large woody roots (greater than 50mm in diameter) are encountered during excavation or trenching, these shall be retained intact wherever possible (e.g. by sub-surface boring beneath roots or re-routing the service etc).

Excavations required for underground services within the Structural Root Zone of any tree to be retained should only be undertaken by sub-surface boring. The Invert Level of the pipe, plus the pipe diameter, must be lower than the estimated root zone depth as specified at a minimum depth of 600mm. This will depend on the soil conditions at the site. Where this is not practical and root pruning is the only alternative, proposed root pruning should be assessed by the Project Arborist to determine continued health and stability of the subject tree.

5.8 Canopy pruning

Care shall be taken when operating backhoes, excavators, and similar equipment near trees to avoid damage to tree canopies (foliage and branches). Under no circumstances shall branches be torn-off by construction equipment. Where there is potential conflict between tree canopy and construction activities, the advice of the Project Arborist must be sought.

All pruning works shall be directed by the Project Arborist and shall be carried out by an AQF Level 3 Arborist. All pruning works shall be in accordance with the Australian Standard *(AS) 4373:2007 Pruning of amenity trees.* This standard outlines appropriate pruning practices and procedures that reduce the risk of damage and injury to trees. Correct pruning practices respect the natural form and branching habit of a tree and

work with the trees natural defence mechanisms against disease to avoid damage and injury to trees.

Pruning should always be limited to the minimum amount necessary to achieve the desired aim. Significant loss of foliage created by excessive pruning may weaken the tree, leading to premature decline or predisposition to branch failure or disease, creating potential hazards.

Council consent will be required prior to commencement of the work. Pruning must be performed in accordance with *Australian Standard (AS) 4373:2007 Pruning of amenity trees* (Standards Australia 2007).

5.9 Root Investigation

Exploratory excavation may be required where the proposed excavation created by the development works exceeds 10% of the Tree Protection Zone of any Prescribed Tree; or service trenches are required within the TPZ; to determine the impact of the development on the tree. The purpose of the investigation is to verify the quantity, size, type, depth and orientation of tree roots along the perimeter of the proposed encroachment in order to make an informed judgement in relation to the potential impact on the tree.

Exploratory excavation shall only be carried out using non-destructive or non-injurious techniques, such as careful digging using handheld implements, using compressed air (Airspade®), water pressure, or suction (vacuum device) or a combination of these techniques, to carefully remove soil without damaging roots. The work shall be undertaken by an arborist with a minimum qualification of AQF Level 3. Once roots are exposed, a visual examination can be carried out with the Project Arborist to evaluate the potential impact of the proposed root loss on the health and stability of the tree.

The results of the root investigation together with the Development Impact Assessment must be documented in the report and submitted together with the DA. The report shall contain information that demonstrates that the trees will remain viable in conjunction with the works.

5.10 Root Pruning

Where root pruning is required, roots shall be severed with sterile, clean, sharp pruning implements resulting in a clean cut. Any excavated root zones shall be retained in a moist condition during the construction phase using Hessian material or mulch where practical. Trees that have roots removed shall have drip irrigation installed around the root zone to ensure they receive an adequate supply of water.

5.11 Tree Damage/ Decline

If trees show signs of stress or deterioration, remedial action shall be taken to improve the health and vigour of the subject tree(s) in accordance with best practice arboricultural principles. Advice must be sought from the Project Arborist.

In the event of any tree becoming damaged for any reason during the construction period the Project Arborist must be engaged to inspect and provide advice on any remedial action to minimise any adverse impact. Such remedial action shall be implemented as soon as practicable and certified by the arborist.

6.0 CONCLUSION

36 trees have been considered as part of this assessment and their locations are shown in **Appendix 1**, all of which are on the site.

The supplied plans and assessment show that:

- Eight (8) trees will need to be removed to accommodate the proposed works. These trees are Nos. 3, 10, 14, 15, 17, 18, 19, 20. Refer to the tree encroachment and retention plan in **Appendix 2.**
- Twenty-eight (28) trees are to be retained as part of the proposed development. These trees are Nos. 1, 2, 4 – 9, 11 – 13, 16 and 21 – 36. Trees to be retained as part of the approved works must be protected from potential damage caused by construction activities. Refer to section 5.0 for tree protection recommendations and to the tree encroachment and retention plan in **Appendix 2.**
- Tree no. 21 has an encroachment greater than 10% to its TPZ. It is proposed non-invasive exploratory trenching (Refer 5.10 Root investigation) is carried out as indicated on the plan.

  The Site arborist shall review any large roots uncovered (above 50mm in diameter) and provide advice on removal or mitigation by design changes. Where possible large roots should be retained.
- Tree Nos. 23 and 25 have minor encroachments to less than 10% of their TPZ's and tree No. 26 has a major encroachment of 17.2% resulting from the installation of fill within their TPZ's to infill an existing dam. These works may adversely affect these trees and trees 22 and 24 that are in close proximity to them. It is recommended that an assessment in 6 months and 12 months time is carried out on these trees to determine their ongoing health and if they need to be removed.
- Ongoing monitoring and maintenance should be undertaken for the twenty-eight (28) trees identified to be retained and irrigation of impacted trees should be considered depending on rainfall patterns and time of year.
- All of the trees identified to be retained have pest infestation at the time of assessment. Further investigation and the preparation of a pest eradication program is recommended.
- Any changes to the works should be provided prior to construction so any additional impacts can be assessed.
- Where recommended work processes and tree protection measures cannot be adhered to further advice should be sought from the Project Arborist.

7.0 DISCLAIMER

The author and Sturt Noble Arboricultural Consulting take no responsibility for actions taken and their consequences, contrary to those expert and professional instructions given as recommendations.

This is not a hazard assessment report, and it should be noted that trees are always inherently dangerous. This assessment was carried out from the ground and covers what was reasonably able to be assessed and available to the assessor at the time of inspection. No aerial or subterranean inspections were carried out and structural weakness may exist within roots, trunk, or branches.

Any protection or preservation methods recommended are not a guarantee of tree survival or safety but are designed to improve vigour and reduce risk. Timely inspections and reports are necessary to monitor the trees' condition. No responsibility is accepted for damage or injury caused by the trees and no responsibility is accepted if the recommendations in this report are not followed.

Limitations on the use of this report: Trees are dynamic living structures, growing and adapting to conditions around them. Tree condition will change and vary over time depending on weather, environmental factors and mechanical or human interaction.

This report is to be utilised in its entirety only. Any written or verbal submission, report or presentation that includes statements taken from the findings, discussions, conclusions, or recommendations made in this report, may only be used where the whole of the original report (or a copy) is referenced in, and directly attached to that submission, report, or presentation.

Assumptions: Care has been taken to obtain information from reliable resources. All data have been verified insofar as possible; however, Sturt Noble Arboricultural Consulting can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise: Information contained in this report covers only the trees that were examined and reflects the condition of the trees at the time of inspection.

Assessment is limited to the conditions at the time of the inspection and only trees discussed in the report have been assessed.

Where access to the base of the tree is limited, such as difficult site access due to site conditions, only general comments can be made. Assessment of tree health and structure is limited to that visible from the site of proposed works and may not reflect the true condition of the tree. Assessment of tree health and structure is limited to that visible from the site of proposed works and may not reflect the true condition of the tree.

Plans used to assess likely impact are those appended/ referenced.

Ongoing monitoring of all trees is advised and where significant changes are observed, further advice should be requested. Unusual developments or sudden changes in a tree's condition should be addressed immediately.

8.0 REFERENCES

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Standards Australia (2009) Australian Standard AS4970-2009 *Protection of Trees on Development Sites*, Pub. Standards Australia, Sydney.

Standards Australia (2015) Australian Standard AS2303-2015 *Tree Stock for Landscape Use*, Pub. Standards Australia, Sydney

APPENDIX 1: METHODOLOGY

A1.1 Site Inspection

This report, its comments and recommendations have been prepared based on the information gathered during a detailed site inspection carried out on the on the 3rd of August 2022. This assessment methodology is summarised in this Appendix.

A1.2 Tree Locations

The location of the subject trees is based on the site survey prepared by Blacktown City Councils Surveyors Dwg. Ref. 2022D-1Regent dtl & tree info GDA2020.

A1.3 Visual Tree Assessment

The trees were assessed from the ground by the Visual Tree Assessment (VTA) method as described in Mattheck & Breloer (1994), using non-invasive tools such as binoculars and acoustic mallet. No digging or exposing of the root zones occurred in this inspection and no aerial inspection by climbing was performed. No aerial inspection or diagnostic testing was undertaken as part of this assessment.

The following data was collected for each tree:

- Botanical and common name.
- Tree dimensions (approximate only).
- Canopy density (approximate only).
- Overall health and vitality, including epicormic growth, deadwood and predation by pests and diseases.
- Structural condition including evident faults such as Bark Inclusions or poor branch attachments, decay, cavities and mechanical or biological damage.
- Stability of the tree including excessive trunk lean, stability of the soil, soil cracking, soil heaving, exposed roots and root damage.

A1.4 Retention Value

Each tree has been given a Sustainable Retention Index Value (SRIV) according to the rating system set out in the Sustainable Retention Index Value Matrix (refer to the table in section A1.8). The SRIV for each tree is based on its health, vigour, structure and age class as established in the Visual Tree Assessment. The SRIV does not take into account the impact of the proposed development.

A1.1 SRIV Table

	Vigour Class and Condition Class					
Age Class	Good Vigour & Good Condition (GVG)	Good Vigour & Fair Condition (GVF)	Good Vigour & Poor Condition (GVP)	Low Vigour & Good Condition (LVG)	Low Vigour & Fair Condition (LVF)	Low Vigour & Poor Condition (LVP)
	Able to be retained if sufficient space available above and below ground for future growth. No remedial work or improvement to growing environment required. May be subject to high vigour. Retention potential - Medium - Long Term.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work may be required or improvement to growing environment may assist. Retention potential - Medium Term. Potential for longer with remediation or favourable environmental conditions	Able to be retained if sufficient space available above and below ground for future growth. Remedial work unlikely to assist condition, improvement to growing environment may assist. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. No remedial work required, but improvement to growing environment may assist vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment may assist condition and vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	Unlikely to be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment unlikely to assist condition or vigour. Retention potential - Likely to be removed immediately or retained for Short Term. Potential for longer with remediation or favourable environmental conditions
Young (Y)	**YGVG - 9** Index Value 9 Retention potential - Long Term. Likely to provide minimal contribution to local amenity if height Retain, move or replace	**YGVF - 8** Index Value 8 Retention potential - Short - Medium Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height Medium-high potential for future growth and adaptability. Retain, move or replace.	**YGVP - 5** Index Value 5 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height Low-medium potential for future growth and adaptability. Retain, move or replace	**YLVG - 4** Index Value 4 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height Medium potential for future growth and adaptability. Retain, move or replace	**YLVF - 3** Index Value 3 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Low-medium potential for future growth and adaptability. Retain, move or replace	**YLVP - 1** Index Value 1 Retention potential - Likely to be removed immediately or retained for Short Term. Likely to provide minimal contribution to local amenity if height
Mature (M)	**MGVG - 10** Index Value 10 Retention potential - Medium - Long Term	**MGVF - 9** Index Value 9 Retention potential - Medium Term. Potential for longer with improved growing conditions.	**MGVP - 6** Index Value 6 Retention potential - Short Term. Potential for longer with improved growing conditions	**MLVG - 5** Index Value 5 Retention potential - Short Term. Potential for longer with improved growing conditions	**MLVF - 4** Index Value 4 Retention potential - Short Term. Potential for longer with improved growing conditions	**MLVP - 2** Index Value 2 Retention potential - Likely to be removed immediately or retained for Short Term.
Over-mature (O)	**OGVG - 6** Index Value 6 Retention potential - Medium - Long Term.	**OGVF - 5** Index Value 5 Retention potential - Medium Term.	**OGVP - 4** Index Value 4 Retention potential - Short Term.	**OLVG - 3** Index Value 3 Retention potential - Short Term. Potential for longer with improved growing conditions.	**OLVF - 2** Index Value 2 Retention potential - Short Term.	**OLVP - 0** Index Value 0 Retention potential - Likely to be removed immediately or retained for Short Term

A1.2 Tree Protection Zones (TPZ) and Structural Root Zones (SRZ)

The intention of the TPZ is to ensure protection of the root system and canopy from the potential damage from construction works and ensure the long-term health and stability of each tree to be retained.

The Structural Root Zone (SRZ) is located within the TPZ around the base of a tree and provides the bulk of mechanical support and anchorage for a tree.

The Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) have been arrived at using methods as detailed in Australian Standard AS 4970– 2009. Specific site factors are also considered that may influence the location of the TPZ and/or structural tree roots.

A1.3 Encroachment and Development Impacts

Encroachments and development impacts to tree TPZ's and SRZ's include;

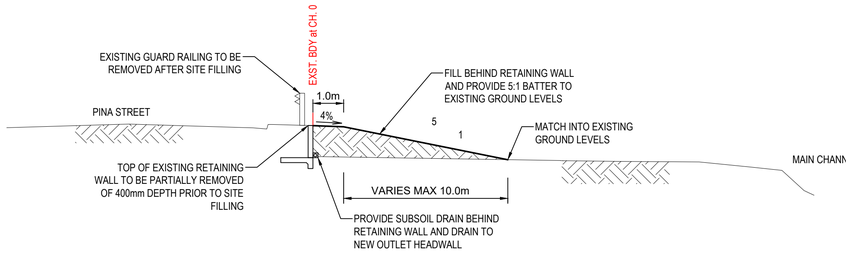
- Excavation
- Filling
- Changes to existing soil levels
- Placing items and elements within the zones even if only temporarily
- Soil disturbance
- Any other physical damage to the trunk or root system or any other activity likely to cause damage to the tree.

Under *AS 4970:2009 Protection of trees on development sites*, a minor encroachment of up to 10% of the area of the TPZ is considered acceptable, provided that there is no encroachment to the SRZ. The area lost to this encroachment should be compensated for elsewhere in a contiguous area to the TPZ.

Major encroachments are greater than 10% of the area of the TPZ and the Project Arborist must determine and demonstrate that the tree would remain viable. More detailed investigations, such as exploratory excavations and root investigation to enable an informed evaluation of the potential impact of the proposed works may be required.

Encroachments into the SRZ are not likely to be supported unless the Project Arborist has undertaken exploratory investigation and can demonstrate that there will be minimal impact to the tree.

APPENDIX 2: PLANS



LOCALISED SITE FILLING ALONG PINA STREET RETAINING WALL

LEGEND

PEDESTRIAN BALUSTRADE SAFETY FENCE

LOT 3

LOT 166

PROVIDE FILLING ALONG EXISTING RETAINING WALL TO FORM BATTER ALONG BOUNDARY. PROVIDE SUBSOIL DRAINAGE AND CONNECT INTO NEW OUTLET HEADWALL. REFER TO DETAIL ABOVE

MATCH BATTER INTO EXISTING

155 & 159 REGENT ST.
DA-1802511
CALIBRE

LOT 56

ZAPPIA STREET

EXISTING TWIN Ø600 RCP CROSSING TO TEMPORARY DETENTION BASIN TO REMAIN UNTIL BASIN IS DECOMMISSIONED

ASSUNTI STREET

INTERIM ARRANGEMENT OF CHANNEL TO BE CONSTRUCTED AND USED UNTIL TWIN Ø600 RCP CROSSING IS REMOVED

PROVIDE TEMPORARY WEIR OVER TEMPORARY TWIN 600Ø RCP CROSSING

CONCRETE ENCASED SEWER

CONCRETE ENCASED SEWER

PINA STREET

CONSTRUCT PIT AT END OF EXISTING OUTLET AND EXTEND DRAINAGE TO NEW HEADWALL

OPEN CHANNEL F13.1

NO WORKS TO EXTEND INTO LOT 3

FILL IN EXISTING CREEK INVERT TO TOP OF BANKS

PROVIDE PEDESTRIAN SAFETY FENCE ON HEADWALLS

LOT 100

CHANNEL

CHANNEL

TAILOUT 2 FROM ROAD TO MATCH INTO CHANNEL

LOCALIZED GRADING TO SUIT CHANNEL

INSTALL TEMPORARY SUMP PITS 32/01 AND 32/03 AND TRIPLE Ø375 RCP UNDER TEMPORARY BUND

CHANNEL BATTER TIE INTO BASIN BATTER

CHANNEL 01 INTERIM MATCH TO EXISTING

TAILOUT FROM DEVELOPMENT TO CHANNEL

DROP STRUCTURE REFER DETAIL DWG651

DROP STRUCTURE 2 REFER DETAIL DWG651

PROVIDE PEDESTRIAN SAFETY FENCE ON HEADWALLS

EXISTING TEMPORARY DETENTION BASIN TO REMAIN UNTIL DECOMMISSIONED

EXISTING TEMPORARY BASIN

DROP STRUCTURE 3 REFER DETAILS DWG 651

TAILOUT FROM DEVELOPMENT TO MATCHING CHANNEL

TAILOUT FROM DEVELOPMENT TO MATCH INTO CHANNEL

FILL IN TAILOUT DRAIN FORMED AS PART OF ROADWROKS AND RE-ALIGN TAILOUT AS SHOWN

PROPOSED REGENT STREET ROAD WORKS BY OTHERS

OUTLET HEADWALL TO BE CONSTRUCTED AS PART OF ROADWORKS BY OTHERS

REFER TO DRAWING DD051 FOR CONTINUATION

1:500 (AT A1)
1:1000 (AT A3)

10 0 10 20 30 40 50
METRES

NOTE:

1. EXISTING TREES REMOVAL REFER TO LANDSCAPE PLAN
2. CONTRACTOR TO COORDINATE WORKS WITH ADJACENT DEVELOPMENT & REGENT STREET

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DESIGNED	J.C.	
DRAWN	E.J.	
CHECKED	P.I.	

ACCEPTED - BCC CPEng NER Certified

GLOBAL COMPLIANCE CERTIFICATION GCC ISO 9001 Certified
Lic No.QAC/R61/0103
ASSET DESIGN

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PROJECT: CP20 REGENT STREET, RIVERSTONE PUBLIC BASIN

TITLE: ENGINEERING PLAN SHEET 1

A1 | SHEET 16 OF 73

CAD FILE: DD050 | FILE No. F18/688 | PLAN No. E33-05V-050 | REV C

REFER TO DRAWING DD052 FOR CONTINUATION

REFER TO DRAWING DD050 FOR CONTINUATION

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CONNECTION TO EXISTING DRAINAGE
MAINTENANCE ACCESS TRACK 01 MATCH TO ASSUNTI ROAD
VEHICULAR ACCESS CROSSING TO COUNCIL'S REQUIREMENTS
PROVIDE SINGLE REMOVABLE BOLLARD IN CENTRE OF RAMP IN ACCORDANCE WITH COUNCIL REQUIREMENTS
EXTEND DRAINAGE FROM EXISTING NETWORK TO DISCHARGE POINT INTO FIRST PONDS CREEK LINE 23
163 REGENT ST
DA-17-01754
PCB
WORKS TEMPORARILY RESTRICTED IN ADJACENT PROPERTY
FUTURE ROAD WORKS
EXTEND DRAINAGE FROM EXISTING NETWORK TO NEW GPT AND DISCHARGE TO SEDIMENT FOREBAY
PROPOSED FOOTPATH REFER TO LANDSCAPE FOR DETAILS
BLOCK OFF DRAINAGE TO ONE OF THE 900DIA PIPES
PROVIDE SINGLE REMOVABLE BOLLARD IN CENTRE OF RAMP IN ACCORDANCE WITH COUNCIL REQUIREMENTS
EXISTING TEMPORARY OUTLET TO BE REMOVED
ACCESS SEDIMENT PLAN MATCH TO ASSUNTI ROAD
ASSUNTI ROAD
VEHICULAR ACCESS CROSSING TO COUNCIL'S REQUIREMENTS
ACCESS SEDIMENT POND
HEADWALL WITH SCOUR PROTECTION
LOT 31
INLET CULVERT LINE 20 REFER DETAIL DWG 654
REGENT STREET
MICALLEF STREET
LOT 8
LOT 9
LOT 10
12KL TRANSFER TANK AND OFFTAKE PUMP TO EXTRACT WATER FROM WETLAND TWIN CHAMBER OUTFALL TO IRRIGATION STORAGE TANK
TWIN 825Ø
SUBMERGED OFFTAKE PIT
TWIN CHAMBER OUTFALL PIT
WETLAND OUTLET LINE 21
DEEP MARSH
SHALLOW MARSH
TOP OF WETLAND EMBANKMENT RL27.25
WETLAND BALANCE PIPE
LOCALISED SITE FILLING
EXISTING DAM TO BE DEWATERED & DESILTED PRIOR TO FILLING
GPT F13.3 CDS2018
BLOCK EDGE
TWIN Ø750
SEPARATION WEIR RL 27.25
WETLAND NWL 26.00 EDD26.50
STEPPING STONES REFER TO DRG 662 FOR DETAILS
SEDIMENT FOREBAY F13.2
TWIN 750Ø
WETLAND INLET TRANSFER PIPE LINE 24
SEDIMENT FOREBAY OVERFLOW WEIR RL 27.0
DIVERSION CHANNEL
DIVERSION OVERFLOW WEIR
TAILOUT 4
TAILOUT 5
SEWER ENCASEMENT
REINFORCED TURF
IRRIGATION TRANSFER PIPE FROM STORAGE TANK TO PLAYING FIELDS
PROVIDE CONNECTION FROM EXISTING ELECTRICITY FOR EXTENSION TO STORAGE TANK FOR OFFTAKE + IRRIGATION PUMP SYSTEM
CONSTRUCT RETAINING WALL REFER DETAILS DWG600
PROVIDE LOCALISED FILLING OVER DEWATERING LINE
TEMPORARY DEWATERING LINE FROM BEHIND WALLED AREA TO FIRST PONDS CREEK LINE28
VIEWING DECK REFER TO LANDSCAPE PLAN
CONSTRUCT WETLAND EMBANKMENT RL27.25
CLAY LINER UNDER VIEWING PLATFORM
FUTURE VIEWING DECK 25.65
INTERMEDIATE POOL
DEEP MARSH
SHALLOW MARSH
BLOCK EDGE
CONSTRUCT WETLAND F13.2
FILL IN EXISTING LOW AREA TO MATCH SURROUNDING GROUND LEVELS
FIRST PONDS CREEK
CREEK
FIRST PONDS CREEK LOW FLOW CHANNEL REALIGNMENT
EXISTING DAM TO BE DEWATERED & DESILTED PRIOR TO FILLING
FILL IN EXISTING FARM DAM AND CONSTRUCT LOW FLOW CHANNEL TO FORM INVERT OF FIRST PONDS CREEK
SMOOTH TRANSITION TO EXISTING CHANNEL
WETLAND EMERGENCY OVERFLOW SPILLWAY 50m LONG AT RL 27.05
EXISTING FIRST PONDS CREEK CHANNEL
MAPPED HYDROLINE NOT MATCHING WITH WATERCOURSE
DIVERSION CHANNEL SMOOTH TRANSITION TO EXISTING FPC CHANNEL
CLARKE STREET
FUTURE RESERVE 917 WORKS

LEGEND
PEDESTRIAN BALUSTRADE SAFETY FENCE
REMOVABLE BOLLARD

1:500 (AT A1)
1:1000 (AT A3)
10 0 10 20 30 40 50
METRES

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DRAWINGS VERIFIED BY

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DESIGNED	J.C.	
DRAWN	E.J.	
CHECKED	P.I.	

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GCC ISO 9001 Certified
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PROJECT
CP20 REGENT STREET, RIVERSTONE PUBLIC BASIN

TITLE
ENGINEERING PLAN SHEET 2

A1
SHEET 17 OF 73

CAD FILE	FILE No	PLAN No	REV
DD051	F18/688	E33-05V-051	C

LEGEND

PEDESTRIAN BALUSTRADE SAFETY FENCE

GARFIELD ROAD EAST

218 GARFIELD ROAD EAST
CC-19-15234
CARDNO

CRUIKSHANK CRESCENT

MICALLEF STRET

CLARKE STREET

LOT 122

LOT 11

LOT 6

CREEK

FIRST PONDS

PROPOSED FOOTPATH REFER TO LANDSCAPE FOR DETAILS

RIPARIAN OFFSET 12:1 BATTERS

EXISTING SEWER CARRIER

EXISTING FIRST PONDS CREEK CHANNEL

SMOOTH TRANSITION TO CRUIKSHANK CRESCENT EMBANKMENT

CONSTRUCT EARTH EMBANKMENT TO FORM ON-LINE DETENTION BASIN TOP RL 28.0

TAIL- OUT DRAIN FROM BIORETENTION OUTLET TO FIRST PONDS CK CHANNEL

BIORETENTION OUTLET DISCHARGING TO DOWNSTREAM SIDE OF EMBANKMENT LINE 29

EXISTING CULVERT TO BE DECOMMISSIONED AND REMOVED

CULVERT OUTLET TAPERED TO MATCH EXISTING CREEK CHANNEL

HEADWALL

REINFORCED TURF EMBANKMENT EXTEND MIN 1m FROM DOWNSTREAM TAILOUT

BIORETENTION DISCHARGE CONTROL PIT

EXTENT OF INTERIM EMBANKMENT SPILLWAY TO RL26.5 TO BE CONSTRUCTED AS PART OF THIS CONTRACT

LOW FLOW DRAINAGE LINE 31 FROM GPT F13.7 TO BIORETENTION SYSTEM F13.6

BED RL 26.1

MAINTENANCE ACCESS RAMP

EXISTING SEWER CARRIER CONCRETE ENCASED

CULVERT HEADWALL REFER TO DRG505 FOR DETAILS

PROVIDE STANDARD BCC VEHICLE CROSSING A(BS)103S

EXISTING TEMPORARY DEWATER PIPE TO BE DISUSED

MAIN BASIN OUTLET CONTROL CULVERT LINE 22 2X2.1X2.1 RCBC REFER DETAIL DWG653

BIORETENTION F13.6 BED RL 26.1 REFER DETAIL DWG 655

TIE INTO EXISTING

GPT F13.7 (CDS 1012) CONSTRUCTED OVER EXISTING OUTLET PIPE

EXISTING DAM TO BE DEWATERED & DESILTED PRIOR TO FILLING

EXISTING DAM TO BE DEWATERED & DESILTED PRIOR TO FILLING

FUTURE RESERVE 917 FOOTPATH

FILL IN EXISTING FARM DAMS AND CONSTRUCT CHANNEL T FORM INVERT OF FIRST PONDS CREEK

RETAINING WALL 01 REFER TO DRG600 FOR DETAILS

REALIGNMENT OF FIRST PONDS CREEK CHANNEL

FLOODWAY

1:500 (AT A1)
1:1000 (AT A3)

10 0 10 20 30 40 50
METRES

REFER TO DRAWING DD051 FOR CONTINUATION

NOTE:
EXISTING TREES REMOVAL REFER TO LANDSCAPE PLAN

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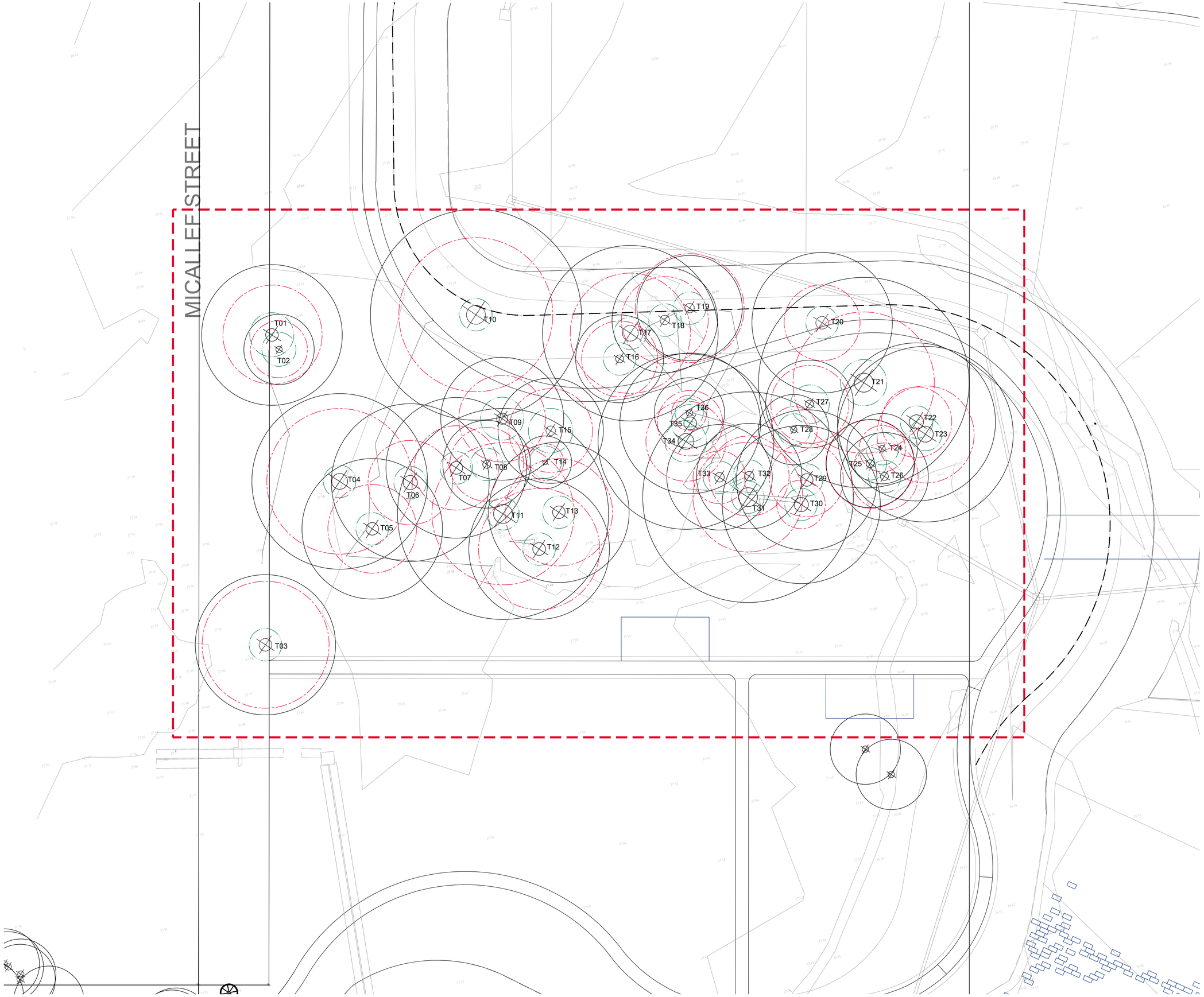
PROJECT
CP20 REGENT STREET, RIVERSTONE PUBLIC BASIN

TITLE
ENGINEERING PLAN SHEET 3

A1
SHEET 18 OF 73

CAD FILE	FILE No.	PLAN No.	REV
DD052	F18/688	E33-05V-052	C



LEGEND

- EXTENT OF WORKS
- EXISTING SURVEY
- EXISTING TREE. TREE NUMBERS RELATE TO ASSESSED TREES
- STRUCTURAL ROOT ZONE (SRZ)
- TREE PROTECTION ZONE (TPZ)
- EXTENT OF DISTURBANCE

ISSUE	DESCRIPTION	DATE
B	ISSUE FOR REVIEW	05.09.2022
A	ISSUE FOR REVIEW	27.07.2022

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PROJECT
REGENT ST BASIN AND RESERVE 917

CLIENT
BLACKTOWN CITY COUNCIL

DRAWING
EXISTING TREE PLAN

DRAWING NUMBER
ARB-2221-001

ISSUE
B

SCALE
1:200 @ A1
1:400 @ A3

DRAWN	CHECKED	DIRECTOR
hw	gs	gs

0 2 4 10 m

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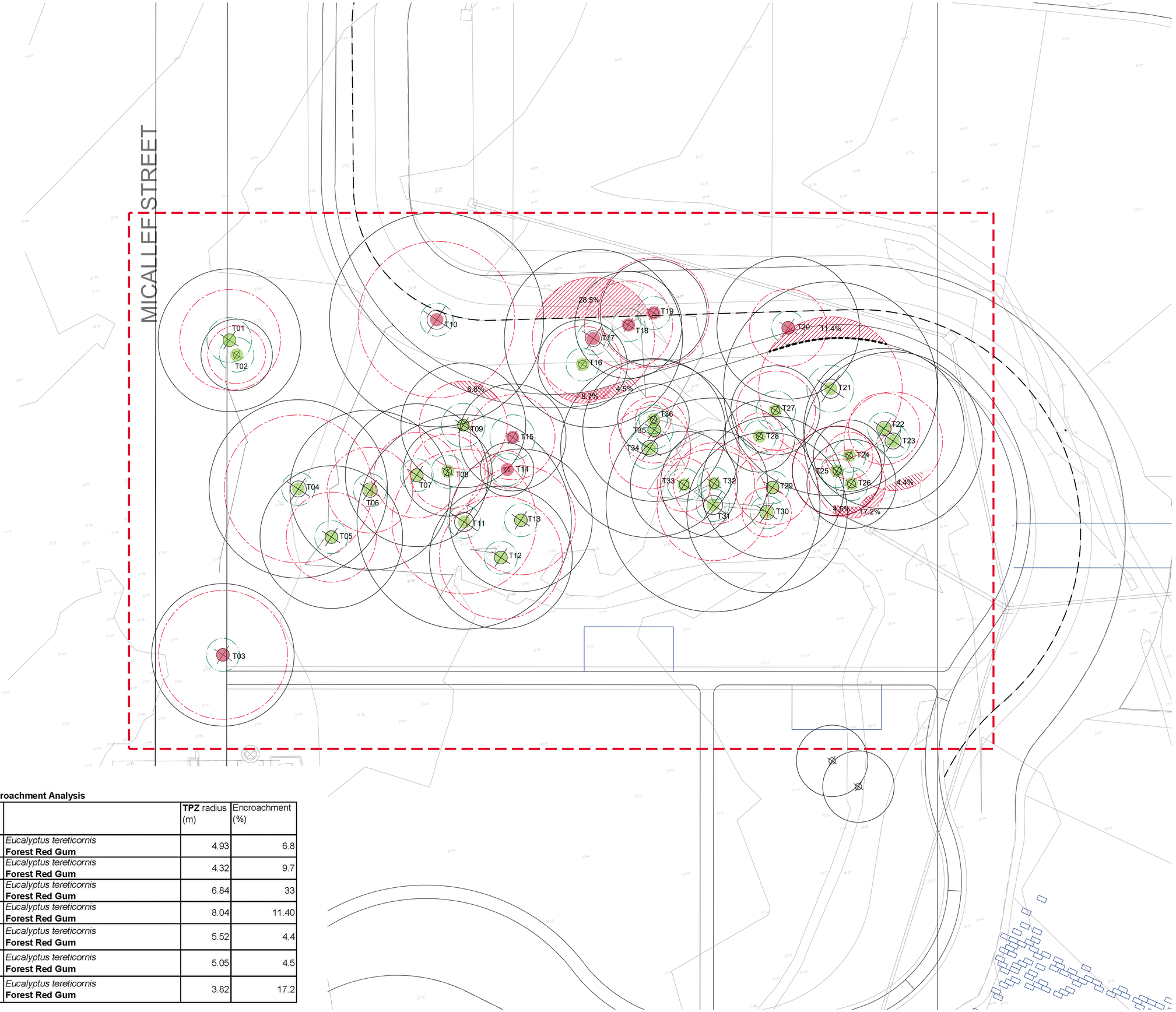

Encroachment Analysis

		TPZ radius (m)	Encroachment (%)
9	*Eucalyptus tereticornis* **Forest Red Gum**	4.93	6.8
16	*Eucalyptus tereticornis* **Forest Red Gum**	4.32	9.7
17	*Eucalyptus tereticornis* **Forest Red Gum**	6.84	33
21	*Eucalyptus tereticornis* **Forest Red Gum**	8.04	11.40
23	*Eucalyptus tereticornis* **Forest Red Gum**	5.52	4.4
25	*Eucalyptus tereticornis* **Forest Red Gum**	5.05	4.5
26	*Eucalyptus tereticornis* **Forest Red Gum**	3.82	17.2

LEGEND

- EXTENT OF WORKS
- EXISTING SURVEY
- EXISTING TREE. TREE NUMBERS RELATE TO ASSESSED TREES
- STRUCTURAL ROOT ZONE (SRZ)
- TREE PROTECTION ZONE (TPZ)
- TREES TO BE RETAINED
- TREES TO BE REMOVED
- EXTENT OF DISTURBANCE
- TPZ INCURSION
- EXPLORATORY TRENCHING FOR EXISTING TREE ROOTS. REFER TO ARBORIST REPORT FOR DETAILS

ISSUE	DESCRIPTION	DATE
A	ISSUE FOR REVIEW	05.09.2022

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PROJECT
REGENT ST BASIN AND RESERVE 917

CLIENT
BLACKTOWN CITY COUNCIL

DRAWING
ENCROACHMENT & RETENTION PLAN

DRAWING NUMBER
ARB-2221-002

ISSUE
A

SCALE
1:200 @ A1
1:400 @ A3

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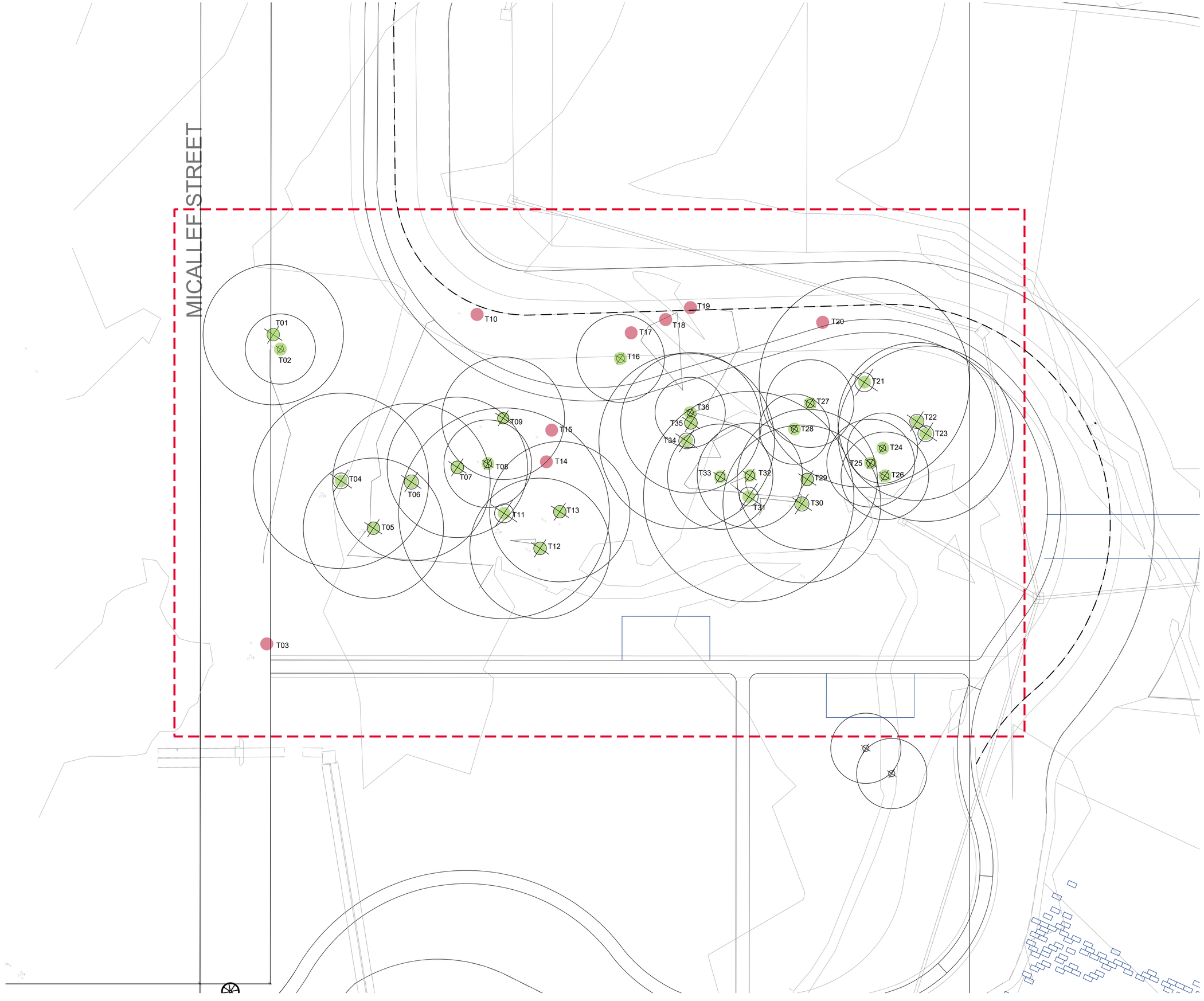
hw	gs	gs

0 2 4 10 m

ACN: 164 245 514 ABN: 99 164 245 514



LEGEND

- EXTENT OF WORKS
- EXISTING SURVEY
- EXISTING TREE. TREE NUMBERS RELATE TO ASSESSED TREES
- STRUCTURAL ROOT ZONE (SRZ)
- TREE PROTECTION ZONE (TPZ)
- TREES TO BE RETAINED
- TREES TO BE REMOVED

ISSUE	DESCRIPTION	DATE
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PROJECT
REGENT ST BASIN AND RESERVE 917

CLIENT
BLACKTOWN CITY COUNCIL

DRAWING
ENCROACHMENT & RETENTION PLAN

DRAWING NUMBER
ARB-2221-003

ISSUE
A

SCALE
1:200 @ A1
1:400 @ A3

DRAWN	CHECKED	DIRECTOR
hw	gs	gs

0 2 4 10 m

ACN: 164 245 514 ABN: 99 164 245 514

APPENDIX 3: TREE ASSESSMENT SCHEDULE

Tree Assessment Sheet

Location:	REGENT ST BASIN AND RESERVE 917
Client:	BLACKTOWN CITY COUNCIL
Date:	04.08.2022

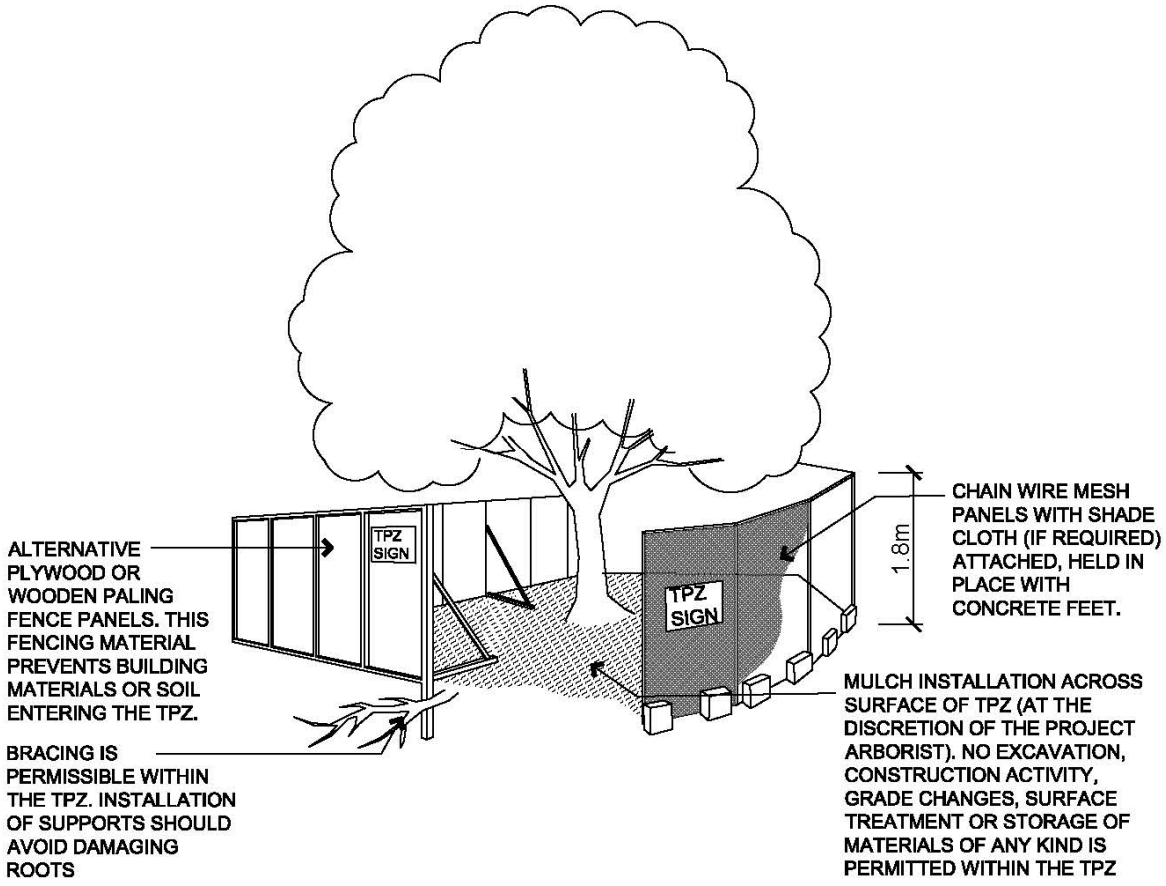
Tree No.	Botanical Name / **Common Name**	Dimensions							Health				Vigour				Structure					Age Class					**Retention Value SRIV**	**Landscape Significance**	Comments
		TPZ radius (m)	**SRZ** radius (m)	DBH (mm)	DAB (mm)	Height (m)	Spread EW (m)	Spread NS (m)	Deadwood	Dieback	Pests*	Diseases	Canopy density %	Foliage size	Foliage colour	Extension growth	Inclusions	Fractures	Wounds	Cavities	Decay	Senescent	Mature	Semi Mature	Young	New planting			
																													Pests *
1	*Eucalyptus tereticornis* **Forest Red Gum**	5.64	2.51	470	520	18	8	8	Min		Yes		70%	Good	Good	No							M				MLVG5	Medium	* Pests: Leaf damage to most trees in the group. Possible it is damage from red gum lerp psyllid, *Glycaspis brimblecombei*
2	*Eucalyptus tereticornis* **Forest Red Gum**	3.24	1.94	270	280	15	5E	5N	Min		Yes		60%	Good	Good	No							M				MLVP2	Medium	* Pests. Suppressed to west
3	*Eucalyptus tereticornis* **Forest Red Gum**	7.22	2.97	601	770	17	8	8	Min		Yes		50%	Good	Good	No							M				MLVP2	Medium	* Pests. Co-Dominant
4	*Eucalyptus tereticornis* **Forest Red Gum**	8.28	2.85	690	700	18	10	12	Min		Yes		60%	Good	Good	No							M				MLVG5	Medium	* Pests
5	*Eucalyptus tereticornis* **Forest Red Gum**	5.04	2.41	420	470	16	6	6	Min		Yes		60%	Good	Good	No							M				MLVG5	Medium	* Pests
6	*Eucalyptus tereticornis* **Forest Red Gum**	4.80	2.37	400	450	17	7	8	Min		Yes		60%	Good	Good	No							M				MLVG5	Medium	* Pests
7	*Eucalyptus tereticornis* **Forest Red Gum**	4.80	2.51	400	520	19	6	6	Min		Yes		50%	Good	Good	No							M				MLVG5	Medium	* Pests
8	*Eucalyptus tereticornis* **Forest Red Gum**	4.20	2.20	350	380	17	5	5	Min		Yes		60%	Good	Good	No							M				MLVG5	Medium	* Pests. Co-Dominant at 1.8M
9	*Eucalyptus tereticornis* **Forest Red Gum**	4.93	2.45	411	490	16	7	7	Min		Yes		60%	Good	Good	No							M				MLVG5	Medium	* Pests.Co-Dominant
10	*Eucalyptus tereticornis* **Forest Red Gum**	8.76	3.21	730	930	18	12	12	Min		Yes		60%	Good	Good	No							M				MLVG5	Medium	* Pests. Multi-trunk (3)
11	*Eucalyptus tereticornis* **Forest Red Gum**	8.09	2.80	674	670	20	15	12	Min		Yes		40%	Good	Good	No							M				MLVG5	Medium	* Pests.Co-Dominant. Large well occluded wound at base
12	*Eucalyptus tereticornis* **Forest Red Gum**	6.89	2.92	575	740	18	8	8	Min		Yes		65%										M				MLVG5	Medium	* Pests. Co-Dominant
13	*Eucalyptus tereticornis* **Forest Red Gum**	6.11	2.92	509	740	18	7	7	Min		Yes		70%										M				MLVG5	Medium	* Pests.Co-Dominant
14	*Eucalyptus tereticornis* **Forest Red Gum**	2.10	1.88	175	260	14	3	3	Min		Yes		40%											SM			YLVP1	Low	* Pests.Co-Dominant. Epicormic leaf growth. REMOVE
15	*Eucalyptus tereticornis* **Forest Red Gum**	4.76	2.53	397	530	16	5	5	Min		Yes		30%										M				MLVP2	Low	* Pests.Co-Dominant. Epicormic leaf growth. REMOVE
16	*Eucalyptus tereticornis* **Forest Red Gum**	4.32	2.34	360	440	18	5	5	Min		Yes		50%										M				MLVP2	Medium	* Pests
17	*Eucalyptus tereticornis* **Forest Red Gum**	6.84	2.63	570	580	20	8	10	Min		Yes		60%										M				MLVF4	Medium	* Pests. Longicorn larvae damage at base
18	*Eucalyptus tereticornis* **Forest Red Gum**	4.94	2.71	412	620	17	6	6	Min		Yes		50%											SM			YLVP1	Low	* Pests.Co-Dominant. Epicormic leaf growth. REMOVE
19	*Eucalyptus tereticornis* **Forest Red Gum**	6.19	2.83	516	690	18	8	8	Min		Yes		50%										M				MLVF4	Medium	* Pests.Co-Dominant

Tree Assessment Sheet

Location:	REGENT ST BASIN AND RESERVE 917
Client:	BLACKTOWN CITY COUNCIL
Date:	04.08.2022

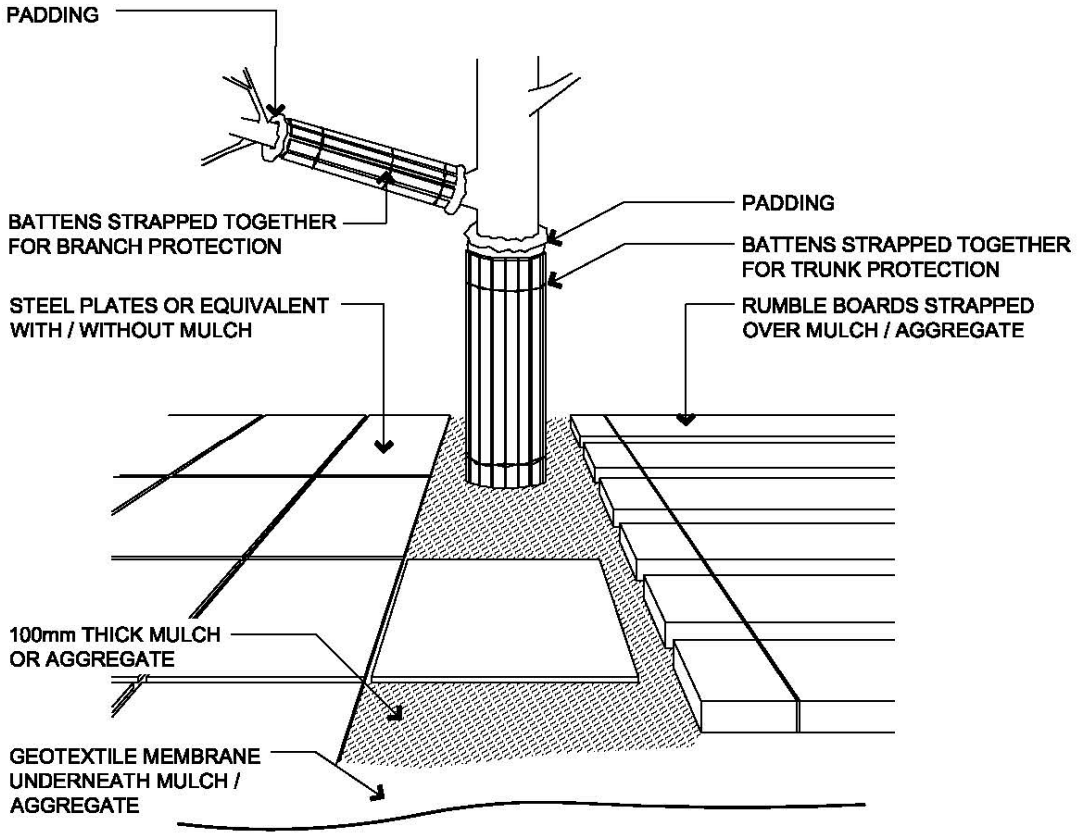
Tree No.	Botanical Name / **Common Name**	Dimensions							Health				Vigour				Structure					Age Class					**Retention Value SRIV**	**Landscape Significance**	Comments
		TPZ radius (m)	**SRZ** radius (m)	DBH (mm)	DAB (mm)	Height (m)	Spread EW (m)	Spread NS (m)	Deadwood	Dieback	Pests*	Diseases	Canopy density %	Foliage size	Foliage colour	Extension growth	Inclusions	Fractures	Wounds	Cavities	Decay	Senescent	Mature	Semi Mature	Young	New planting			
20	*Eucalyptus tereticornis* **Forest Red Gum**	4.32	2.39	360	460	18	8	8	Min		Yes		40%										M				MLVP2	Medium	* Pests.Co-Dominant. Epicormic leaf growth. REMOVE
21	*Eucalyptus tereticornis* **Forest Red Gum**	8.04	2.63	670	580	20	10	10	Min		Yes		50%										M				MLVF4	Medium	* Pests
22	*Eucalyptus tereticornis* **Forest Red Gum**	4.01	2.18	334	370	16	8	8	Min		Yes		50%										M				MLVF4	Medium	* Pests.Co-Dominant. Suppressed by 25.
23	*Eucalyptus tereticornis* **Forest Red Gum**	5.52	2.51	460	520	20	12	12	Min		Yes		75%										M				MGVF9	Medium	* Pests
24	*Eucalyptus tereticornis* **Forest Red Gum**	2.64	1.88	220	260	18	3	3	Min		Yes		30%											SM			YLVP1	Medium	* Pests
25	*Eucalyptus tereticornis* **Forest Red Gum**	5.05	2.61	421	570	18	5	5	Min		Yes		40%										M				MLVP2	Medium	* Pests. Multi-trunk (3).Suppressed by 26.
26	*Eucalyptus tereticornis* **Forest Red Gum**	3.82	2.25	318	400	19	6	6	Min		Yes		60%										M				MLVF4	Medium	* Pests.Co-Dominant
27	*Eucalyptus tereticornis* **Forest Red Gum**	4.44	2.20	370	380	18	5	5	Min		Yes		70%										M				MLVP2	Medium	* Pests
28	*Eucalyptus tereticornis* **Forest Red Gum**	2.64	2.00	220	300	18	6	6	Min		Yes		50%										M				MLVF4	Medium	* Pests
29	*Eucalyptus tereticornis* **Forest Red Gum**	4.20	2.32	350	430	18	8	8	Min		Yes		60%										M				MLVF4	Medium	* Pests
30	*Eucalyptus tereticornis* **Forest Red Gum**	5.76	2.49	480	510	18	8	8	Min		Yes		70%										M				MGVF9	Medium	* Pests
31	*Eucalyptus tereticornis* **Forest Red Gum**	6.24	2.74	520	640	20	10	10	Min		Yes		80%										M				MGVF9	Medium	* Pests
32	*Eucalyptus sp.* **Gum**	4.56	2.25	380	400	18	8	8	Min		Yes		60%										M				MLVF4	Medium	* Pests
33	*Eucalyptus sp.* **Gum**	3.00	2.15	250	360	16	7	7	Min		Yes		70%										M				MGVF9	Medium	* Pests
34	*Eucalyptus tereticornis* **Forest Red Gum**	4.56	2.37	380	450	18	10	10	Min		Yes		70%										M				MGVF9	Medium	* Pests
35	*Eucalyptus tereticornis* **Forest Red Gum**	3.72	2.13	310	350	17	6	6	Min		Yes		40%										M				MLVF4	Medium	* Pests
36	*Eucalyptus tereticornis* **Forest Red Gum**	2.00	1.61	130	180	14	3	3	Min		Yes		60%											SM			YLVF3	Medium	* Pests

APPENDIX 4: TYPICAL TREE PROTECTION DETAILS



PROTECTIVE FENCING

Based on AS4970-2009 NOT TO SCALE



NOTE:
1. For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
2. Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

EXAMPLES OF TRUNK, BRANCH AND GROUND PROTECTION

Based on AS4970-2009 NOT TO SCALE

TREE PROTECTION ZONE SIGN

Based on AS4970-2009 NOT TO SCALE