ARBORICULTURAL IMPACT ASSESSMENT REPORT

Centre of Excellence

Address: 27 Vines Drive, Richmond

Prepared for: NBRS Architecture

DOC No: ARB-2106-001
JOB No: 2106
REV: F
DATE: 07.10.2021

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1.0 INTRODUCTION

1.1 Purpose of this Report

Sturt Noble Arboriculture was engaged by NBRS Architecture to assess existing trees, prepare an Aboricultural Impact Assessment Report and Tree Protection Recommendations in relation to the proposed construction of the buildings and carparks at the Centre for Excellence in Richmond.

The purpose of this report is to address the Secretary's Educational Assessment Requirements (SEARs) for the project, dated 19th March 2021. Specifically, to:

- Identify the number and location of existing trees on site
- Detail the size and percentage canopy density of each tree
- To assess and review the condition of 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 works proposed.
- Provide recommendations for tree removal, retention and protection
- Provide detailed justification for each tree to be removed or retained and protected
- 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:

- Hawkesbury City Council DCP 2013
- Australian Standard AS4970-2009 *Protection of Trees on Development Sites*
- Australian Standard AS4373-2007 *Pruning of Amenity Trees*
- Australian Standard AS2303-2015 *Tree Stock for Landscape Use*

It has also taken into consideration advice from the following reports:

- Arboricultural Impact Assessment Report prepared by Urban Arbor 10/10/2017
- Biodiversity Development Assessment Report prepared by Narla Environmental Pty Ltd 01/10/2021 Final Version 3.0.

1.3 The Proposal

This impact assessment has been prepared based on the following plans:

- 79528_REV-A, PLAN SHOWING DETAIL AND LEVELS OVER PART LOT 2 D.P.1051798 & PART LOT 3 D.P.1105163 WESTERN SYDNEY UNIVERSITY HAWKESBURY CAMPUS, 11/02/2021 prepared by Rygate Surveyors
- 20417-NBRS-A—SD-0102, Proposed Site Plan prepared by NBRS Architecture

Refer to plans in **Appendix 2**

The proposed works to the site include:

- Construction of three academic blocks (Block B, C and D)
- Short term dormitory site accommodation with capacity for 62 patrons (Block F)
- Dining hall, conference space and canteen (Block E)
- Administrative building (Block A)
- Support facilities for management and maintenance of site
- External works to accommodate circulation and covered walkways between buildings
- Pedestrian walkways
- Student and staff amenities
- Covered outdoor learning areas
- Staff car parking area and mini-bus drop off and pick up area. The parking located in front of Block A is for visitors
- Short-term accommodation car parking area. The parking near Block F is for staff
- Green house
- Demolition of existing fences
- Construction of several new administration, educational and accommodation buildings
- Construction of two new carparking areas
- Installation of associated landscape hardscapes and softscapes
- Nominated planting areas
- Associated works
- Remediation of contaminated soil
- Excavation for Basins

1.4 Foreseeable Construction Impacts

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

- Excavations for new buildings
- Excavations for new carparking areas
- Excavations for new hardscape areas

- Remediation/ removal of contaminated soil
- Ripping or cultivation of soil for landscaped areas.
- Soil level changes including the placement of fill material for the footings and to make up grades to landscape areas.
- Laying impermeable paving to paths, carparks and slabs.
- Movement and storage of plant, equipment & vehicles;
- Erection of site sheds;
- Storage of building materials, waste and waste receptacles.

In addition; excavation of a number of basins and associated site clearance will occur across the greater site. Impacts to bushland vegetation including tree in these areas is subject to Biodiversity Development Assessment Report prepared by Narla Environmental Pty Ltd.

2.0 PLANNING CONTROLS

2.1 Council Consent

Hawkesbury City Council's DCP notes the following trees and vegetation are prescribed (protected):

- Any tree with a height greater than 4 metres, or a branch spread greater than 3m, or a trunk circumference greater than 500mm at 1m above ground level
- Native trees or vegetation on land zoned SP1 Special Activities
- Trees within 40m of a watercourse

Hawkesbury City Council's DCP notes the following matters for consideration. Is the tree or vegetation:

- Significant as a single specimen or as part of a group
- Of historic or cultural significance
- Registered on Council's Significant Tree Register
- Prominent due to its height, size, position or age
- Endemic, rare or threatened

Hawkesbury City Council's DCP notes the following shall not generally be considered as valid reasons to ringbark, cut down, top, lop, remove, injure, slash poison or wilfully destroy trees or vegetation:

- To construct a building when the structure could be relocated away from the tree or vegetation

Under these planning controls, the following should be noted:

- Trees 12 – 23A (*Lagerstroemia indica*) are exempt from the TPO due to their low height and small DBH

3.0 THE EXISTING SITE

3.1 The Site

The site is located at 27 Vines Drive, Richmond on part Lot 2 D.P.1051798. The site is currently occupied by grassy fields and grazing land, with Western Sydney University Village to the north-west, Western Sydney University recreational buildings to the north-east, and grassy fields and grazing land to all other sides. The site is almost flat with a creekline to the south-western boundary, a concrete drain to the north-western boundary and a grassed swale to the eastern boundary.

There are some small areas of uncleared bushland located between small farms and quarries. This soil type has high erodibility and generally low fertility. It can be a flood hazard, become seasonally waterlogged or be a water erosion hazard.

It is noted contaminated soil from past Agricultural activity has been identified on a The site currently contains a mix of endemic and exotic trees.

Area of Investigation – 24,000m2

3.2 Topography, Geology and Soils

The site soil is made up of heavy clays and clayey sands with some large boulders throughout. This type of soil covers a wide area between the lower terraces of the Hawkesbury/Nepean River system and west of South Creek. The soil lies overs the Londonderry Clay formation and the landscape is generally flat terraces with some gently undulating low rises.

Narla Environmental states *"The Subject Land is generally flat with an elevation ranging between 23m and 25m above sea level (Google Earth 2021). The Subject Land is mapped as occurring on the Berkshire Park soil landscape, which is the result of three depositional phases of Tertiary alluvial/colluvial origin. The lowest deposit is the St Marys formation. This is overlain by the Rickerby's Creek gravel formation, which is of varying thickness and in turn is topped by the Londonderry Clay formation. All of these*

formations are derived from sandstone and clay. Erosion of the surface has led to exposure of all three formations in different locations.

The Subject Land did not contain any areas of geological significance, such as karsts, caves, cliffs or crevices. The Subject Land and wider locality (1500m buffer) are not mapped as occurring on acid sulfate soils nor mapped as having risk/probability of exhibiting occurrence of acid sulfate soils."

3.3 Vegetation

Narla Environmental also assesses "*The Subject Land occurs within the 'Hawkesbury – Nepean Terrace Gravels' Mitchell Landscape Ecosystem (Figure 5). This landscape is characterised by three levels of river terrace dating into the Tertiary. General elevation 20 to 45m, local relief 10m. Planar, poorly drained terraces with harsh texture-contrast soils and heavy clays in swamps and cut-off meanders. In places deep sands of crevasse splays support scribbly gum (Eucalyptus sclerophylla), narrow-leaved apple (Angophora bakeri) and old man banksia (Banksia serrata) on podsols with adjacent sedgelands. Most clay-based soils (harsh texture-contrast profiles) are very gravelly and carry broad-leaved ironbark (Eucalyptus fibrosa ssp. fibrosa) and narrow-leaved ironbark (Eucalyptus crebra), grey box (Eucalyptus moluccana), paperbarks (Melaleuca sp.) and drooping red gum (Eucalyptus parramattensis). Several vegetation communities are now rare especially that on the Pliocene/Pleistocene sand body with podsol soil profiles at Agnes Banks."*

3.4 The Trees

The purposes of this report are confined to assessment of impacts to those trees within the development footprint of the new facilities as noted in the figure above.

Twenty-eight (28) trees located within the area of investigation have been surveyed as part of this assessment. The trees consist of a mix of eleven (11) Australian endemic trees and seventeen (17) exotic trees. Refer to **Appendix 2** for tree locations

Each of the trees assessed has been allocated a Sustainable Retention Index Value (SRIV) that is based on their health, vigour, structure and age class. The SRIV does not take into account the impact of the proposed development.

7 trees outside of the main site area have been identified in vicinity of the remediation area but will be retained and protected.

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

The Biodiversity Development Assessment Report prepared by Narla Environmental notes;-

The proposed development has been divided into three components, which are collectively referred to as the 'Subject Land': the operational footprint (3.67ha); the construction footprint (5.01ha); and the retained vegetation to be managed as an APZ (2.30ha).

Most vegetation within the Subject Land will require removal to accommodate the proposed development, with the exception of the vegetation marked for retention (which will be managed as an Asset Protection Zone).

The proposed development is expected to impact one (1) Plant Community Type (PCT) 835: Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion".
" …. ecosystem credits are required to be offset in order to mitigate the impacts upon biodiversity as a result of the proposed development".

Mapping prepared for these areas by Narla Environmental is included for reference in **Appendix 4**.

4.0 ABORICULTURE IMPACT ASSESSMENT

4.1 Construction Assumptions

It is assumed for this report that excavation for buildings will not extend greater than 500mm from the building envelopes and this limit can be considered to be the extent of disturbance to the root zones with the exception of service lines.

Further detail of site works are required particularly details of excavation extent of services (water, telecoms and electrical) and level changes particularly within the TPZ of any trees proposed for retention. This should be provided prior to construction so any additional impacts can be assessed.

4.2 Trees to be removed

The plans show that seven trees (7) will need to be removed to accommodate the proposed development. A further five (5) juvenile street trees can either be removed or transplanted.

Table 1: Trees to be removed

Development footprint critical to the following trees	Other (poor condition, other studies, etc)	Dead / Weed species to be removed (exempt and can be removed without consent)
5, 6, 7, 8, 9, 26, 27		

Trees 5 – 9 are native trees of moderate landscape significance. Trees 5, 6, 8 and 9 are in fair condition with short – medium term retention potential. Tree 7 is suppressed with short-term retention potential. All five trees are required to be removed to allow for the proposed development footprint.

Trees 26 and 27 are non-native trees in poor condition. They are required to be removed to allow excavation of an OSD dam on site and should be replaced with trees endemic to the area.

Table 2: Trees to be removed or transplanted

Development footprint critical to the following trees	Other (poor condition, other studies, etc)	Dead / Weed species to be removed (exempt and can be removed without consent)
15, 16, 21, 22, 23		

Trees 15, 16, 21, 22 and 23 are newly planted street trees and are required to be removed to accommodate the proposed development. They have high potential to be transplanted due to their youth and high quality.

The SSD should seek approval for the removal of Tree Nos. 5, 6, 7, 8, 9, 26 and 27.

4.3 Bushland to be removed

Narla Environmental reports :-

"The proposed development will require the removal of approximately 4.76ha of PCT 835 across the following condition zones:
- *8.42ha of PCT 835 – Grassland with exotic trees;*
- *0.04ha of PCT 835 – Grassland with planted Casuarina glauca's; and*
- *0.22ha of PCT 835 – Remnant Canopy.*

The vegetation proposed for removal within the Subject Land is deemed of low quality, having been subject to extensive periods of clearing, as well as being overrun with exotic species."

The discussion of this removal and mitigation measures proposed to mitigate the impacts to this vegetation community are found in the Biodiversity Development Assessment Report prepared by Narla Environmental Pty Ltd 01/10/2021 Final Version 3.0.

4.4 Trees to be retained

With implementation of the tree protection measures it should be possible to retain all other trees on the developed site. The plans show that fourteen (14) trees are proposed to be retained.

Table 2: Trees to be retained

Clear of all works	Minor Encroachment	Major Encroachment
1-4, 10-14, 17-20, 24		

Proposed site design and Construction of the development and associated infrastructure/ facilities should consider the Tree Protection Zones as discussed in the following sections to minimise any adverse impact.

7 trees outside of the main site area have been identified in vicinity of the remediation area but will be retained and protected.

4.5 Works within Tree Protection Zones

- 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.
- It is noted little major demolition is required on this site.

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.

4.6 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.

4.7 Ongoing management of trees to be retained

A number of the trees identified to be retained have structural defects and/or deadwood at the time of assessment. Ongoing monitoring and maintenance should be undertaken especially for trees located in areas of high use and activity.

5.0 MITIGATION MEASURES

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;
- Excavation within soil remediation areas
- 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 together 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.

Where remediation of contaminated soil can not be carried out within TPZs it is noted permanent fencing will be installed to limit access to these areas.

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 coarse, 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.

Further detail of foundation/footing systems is required prior to construction so any additional impacts can be assessed.

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 (eg 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.

Further detail of site services is required prior to construction so any additional impacts can be assessed.

5.8 Grading and Level Changes

Further detail of level changes, particularly within the TPZ of any trees proposed for retention is required prior to construction so any additional impacts can be assessed.

5.9 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).

5.10 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 hand held 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.

5.11 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.

5.12 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

Twenty eight (28) trees have been considered on the site as part of this assessment and their locations are shown in **Appendix 1**. The trees consist of a mix of eleven (11) Australian endemic trees and seventeen (17) exotic trees. Refer to **Appendix 2** for tree locations

The proposed development is a Centre for Excellence Secondary School, known as the Hawkesbury and is located within the WSU Richmond Campus.

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The plans show that seven trees (7) will need to be removed to accommodate the proposed development. A further five (5) juvenile street trees can either be removed or transplanted.

Table 1: Trees to be removed

Development footprint critical to the following trees	Other (poor condition, other studies, etc)	Dead / Weed species to be removed (exempt and can be removed without consent)
5, 6, 7, 8, 9, 26, 27		

Trees 5, 6 and 7 are native trees of moderate landscape significance. Trees 5, 6, 8 and 9 are in fair condition with short – medium term retention potential. Tree 7 is suppressed with short-term retention potential. All five trees are required to be removed to allow for the proposed development footprint.

Trees 26 and 27 are non-native trees in poor condition. They are required to be removed to allow excavation of an OSD dam on site and should be replaced with trees endemic to the area.

Table 2: Trees to be removed or transplanted

Development footprint critical to the following trees	Other (poor condition, other studies, etc)	Dead / Weed species to be removed (exempt and can be removed without consent)
15, 16, 21, 22, 23		

Trees 15, 16, 21, 22 and 23 are newly planted street trees and should be removed to accommodate the proposed development. They have high potential to be transplanted due to their youth and high quality.

Consent for the removal of Tree Nos. 5, 6, 7, 8, 9, 26 and 27 will be sought as part of the SSDA.

With implementation of the tree protection/mitigation measures set out in Section 5 of this report, it should be possible to retain other trees noted on the subject site. The plans show that fourteen (14) trees are proposed to be retained in the site area.

Trees on site that are to be retained as part of the approved development must be protected from potential damage caused by construction activities. Refer to section 5.0 for tree protection recommendations/mitigation measures.

7 trees outside of the main site area have been identified in vicinity of the remediation area but will be retained and protected. Where remediation of contaminated soil cannot be carried out within TPZs it is noted permanent fencing will be installed to limit access to these areas.

Further detail of site works is required particularly details of foundation/footing systems, site services, drainage works and level changes particularly within the TPZ of trees proposed for retention. This 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

Chapman, G. A & Murphy, C. L, 1989 Soil landscapes of the Sydney 1:100,000 sheet (9130) Pub. NSW Govt.

Draper, D.B and Richards, P.A (2009) Dictionary for managing Trees in Urban Environments, (IACA) Institute of Australian Consulting Arboriculturists ©. Pub. CSIRO Publishing, Melbourne.

IACA, 2010, Sustainable Retention Index Value Matrix (SRIV) Version 4, A visual method of objectively rating the viability of urban trees for development sites and management, based on general tree and landscape assessment criteria, Institute of Australian Consulting Arborculturists, Australia, www.iaca.org.au.

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Narla Environmental Pty Ltd, 2021 Biodiversity Development Assessment Report Final Version 3.0.

Standards Australia (2007) Australian Standard AS4373-2007 *Pruning of Amenity Trees,* Pub. Standards Australia, Sydney.

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

Urban Arbor 10/10/2017 Arboricultural Impact Assessment Report

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 10th March 2021. This assessment is summarised in **Appendix 1**.

A1.2 Tree Locations

The location of the subject trees are based on the site survey, 79528_REV-A, 11/02/2021. Additional trees found on site that are not represented on the survey, have been shown in approximate locations only.

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.

A1.5 Landscape Significance Assessment

Landscape Significance is an essential criterion to establish the importance that a particular tree may have on a site. Each tree has been given a Tree Significance in landscape rating based on the 'IACA Significance of a Tree, Assessment Rating

System'. A tree is to have a minimum of three criteria in a category to be applicable for that rating.

Tree Significance in the landscape ratings:

High	**Medium**	**Low**
▪ The tree is in good condition and good vigour; ▪ The tree has a form typical for the species; ▪ 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; ▪ The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register; ▪ 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; ▪ The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values; ▪ 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.	▪ The tree is in fair-good condition and good or low vigour; ▪ The tree has form typical or atypical of the species; ▪ The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area ▪ The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street, ▪ The tree provides a fair contribution to the visual character and amenity of the local area, ▪ The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ.	▪ The tree is in fair-poor condition and good or low vigour; ▪ The tree has form atypical of the species; ▪ The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings, ▪ The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area, ▪ The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen, ▪ 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, ▪ The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms, ▪ The tree has a wound or defect that has potential to become structurally unsound. ▪ Environmental Pest / Noxious Weed Species ▪ The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties, ▪ The tree is a declared noxious weed by legislation. ▪ Hazardous/Irreversible Decline ▪ The tree is structurally unsound and/or unstable and is considered potentially dangerous, - The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

A1.6 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.

A1.7 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 major encroachment is 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.

A1.8 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

APPENDIX 2: ARBORIST PLANS

LEGEND

PROPERTY BOUNDARY

EXISTING TREE
Refer to Tree Impact Assessment Schedule

TREE PROTECTION ZONE

ISSUE	DESCRIPTION	DATE
B	IMPACT ASSESSMENT REPORT REV E	07.07.2021
A	IMPACT ASSESSMENT REPORT	18.03.2021

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CENTRE OF EXCELLENCE

CLIENT

NBRS ARCHITECTURE

DRAWING

TREE LOCATION PLAN

DRAWING NUMBER: ARB-2106-101

ISSUE: A

SCALE: 1:1000 @ A1
1:2000 @ A3

DRAWN: gh
CHECKED: gs
DIRECTOR: gs

0 10 20 50 m

ACN: 164 245 514 ABN: 99 164 245 514

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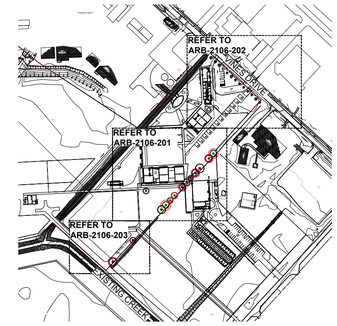
KEY PLAN



LEGEND

PROPERTY BOUNDARY

EX — EXISTING TREE
Refer to Tree Impact Assessment Schedule

TREES TO BE RETAINED
Refer to Tree Impact Assessment Schedule

TREES TO BE REMOVED
Refer to Tree Impact Assessment Schedule

TREES TO BE REMOVED OR TRANSPLANTED
Refer to Tree Impact Assessment Schedule

TREE PROTECTION ZONE

ISSUE	DESCRIPTION	DATE
C	IMPACT ASSESSMENT REPORT REV E	07.07.2021
B	IMPACT ASSESSMENT REPORT REV D	28.06.2021
A	IMPACT ASSESSMENT REPORT	18.03.2021

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NBRS ARCHITECTURE

DRAWING
IMPACT ASSESSMENT PLAN 01

DRAWING NUMBER: ARB-2106-201
ISSUE: C

SCALE: 1:200 @ A1
1:400 @ A3

DRAWN: gh
CHECKED: gs
DIRECTOR: gs

0 2 4 10 m

ACN: 164 245 514
ABN: 99 164 245 514

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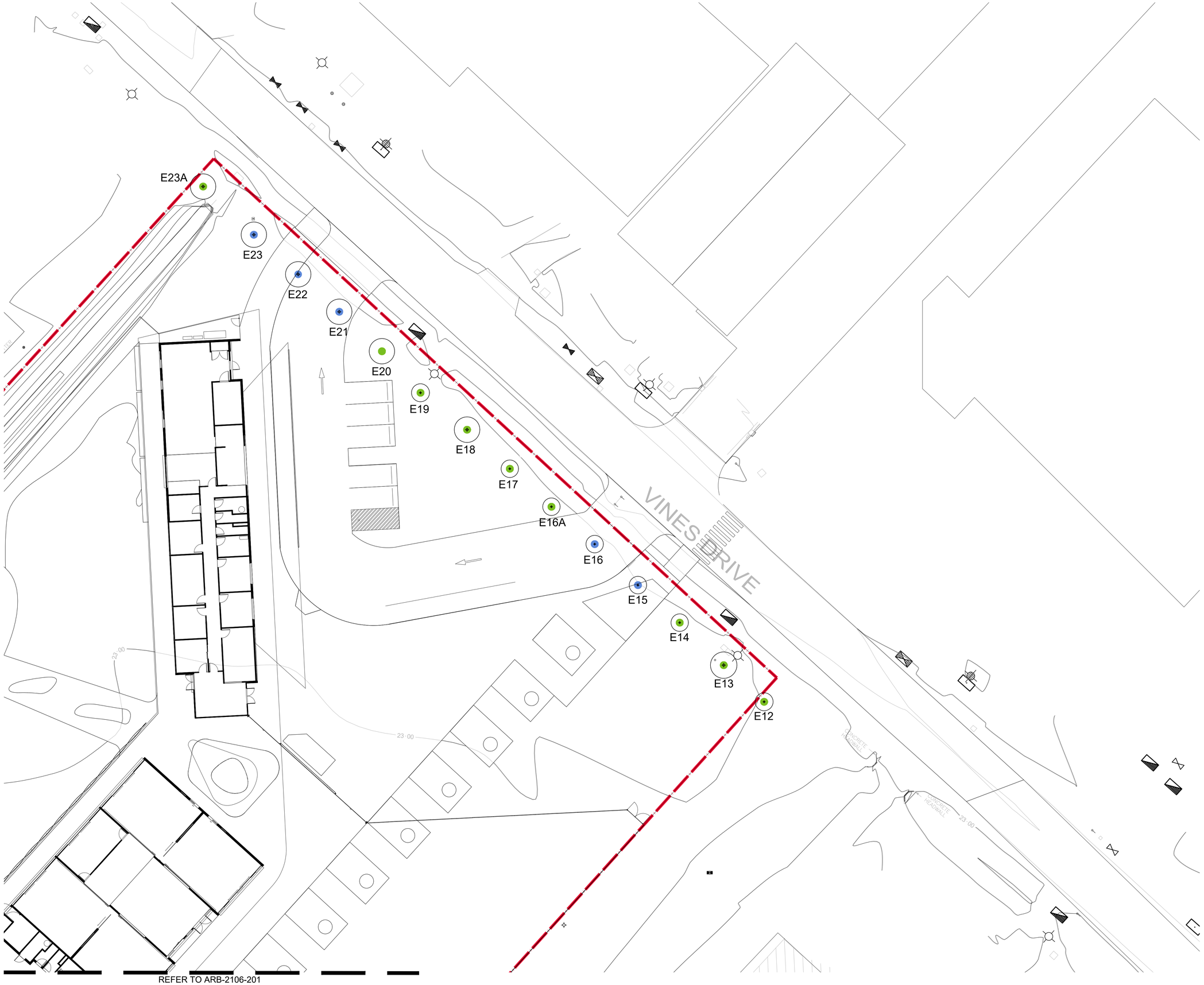

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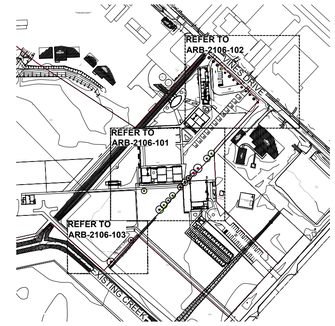

LEGEND

- PROPERTY BOUNDARY
- EX — EXISTING TREE. Refer to Tree Impact Assessment Schedule
- TREES TO BE RETAINED. Refer to Tree Impact Assessment Schedule
- TREES TO BE REMOVED. Refer to Tree Impact Assessment Schedule
- TREES TO BE REMOVED OR TRANSPLANTED. Refer to Tree Impact Assessment Schedule
- TREE PROTECTION ZONE

ISSUE	DESCRIPTION	DATE
C	IMPACT ASSESSMENT REPORT REV E	07.07.2021
B	IMPACT ASSESSMENT REPORT REV D	28.06.2021
A	IMPACT ASSESSMENT REPORT	18.03.2021

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DRAWING
IMPACT ASSESSMENT PLAN 02

DRAWING NUMBER: ARB-2106-202
ISSUE: C

SCALE: 1:200 @ A1, 1:400 @ A3
DRAWN: gh
CHECKED: gs
DIRECTOR: gs

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ACN: 164 245 514 ABN: 99 164 245 514

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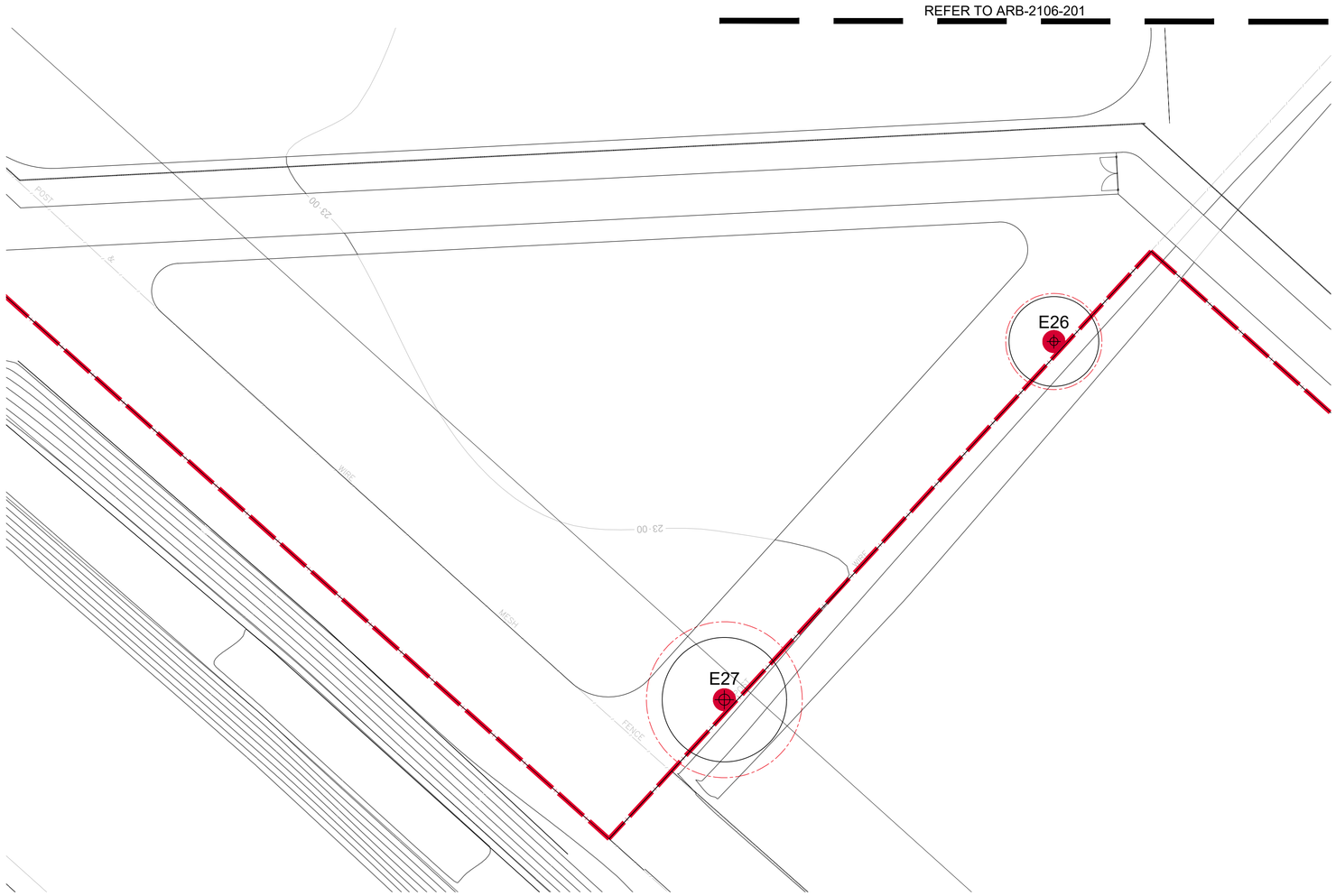

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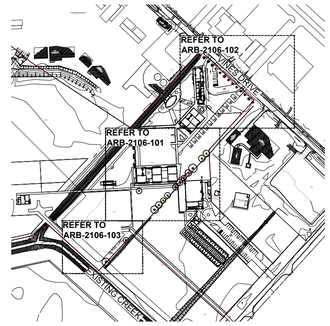

LEGEND

- PROPERTY BOUNDARY
- EX — EXISTING TREE Refer to Tree Impact Assessment Schedule
- TREES TO BE RETAINED Refer to Tree Impact Assessment Schedule
- TREES TO BE REMOVED Refer to Tree Impact Assessment Schedule
- TREES TO BE REMOVED OR TRANSPLANTED Refer to Tree Impact Assessment Schedule
- TREE PROTECTION ZONE

ISSUE	DESCRIPTION	DATE
B	IMPACT ASSESSMENT REPORT REV D	28.06.2021
A	IMPACT ASSESSMENT REPORT	18.03.2021

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DRAWING
IMPACT ASSESSMENT PLAN 03

DRAWING NUMBER
ARB-2106-203

ISSUE
B

SCALE
1:200 @ A1
1:400 @ A3

DRAWN gh | CHECKED gs | DIRECTOR gs

0 2 4 10 m

ACN: 164 245 514 ABN: 99 164 245 514

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LEGEND

Existing Trees Removed
Refer to arborist report

Existing Trees Retained
Refer to arborist report

Proposed Trees
Refer to Planting Plan and Schedule

Propagation Fields by School
Soil, irrigation and other infrastructure needed

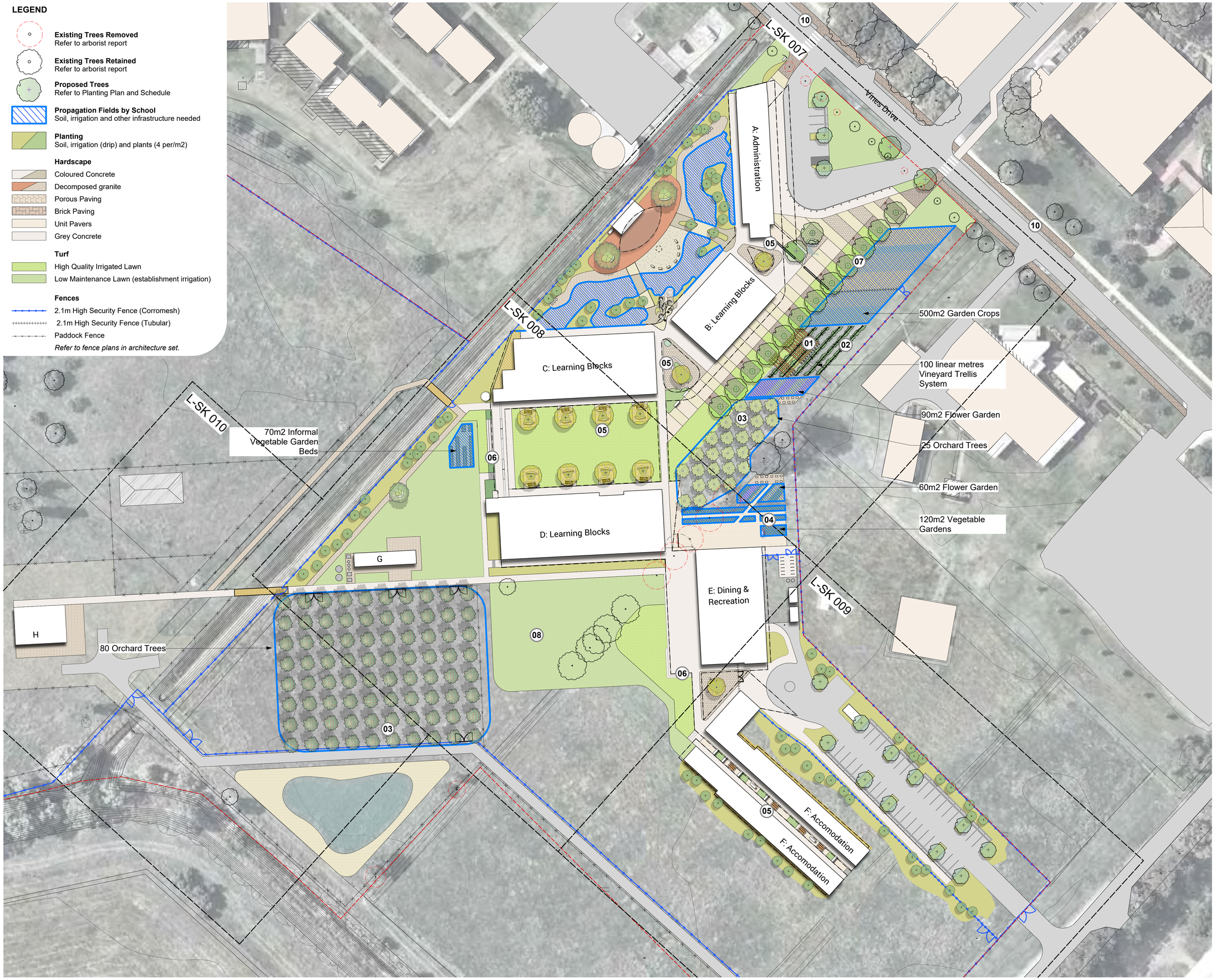
Planting
Soil, irrigation (drip) and plants (4 per/m2)

Hardscape
- Coloured Concrete
- Decomposed granite
- Porous Paving
- Brick Paving
- Unit Pavers
- Grey Concrete

Turf
- High Quality Irrigated Lawn
- Low Maintenance Lawn (establishment irrigation)

Fences
- 2.1m High Security Fence (Corromesh)
- 2.1m High Security Fence (Tubular)
- Paddock Fence

Refer to fence plans in architecture set.



NBRSARCHITECTURE. LANDSCAPE

RICHARD CROOKES CONSTRUCTIONS

LANDSCAPE ELEMENTS

01: **Pergola** - Timber structure with cables to allow grape vine to grow over. Australian hardwood.

02: **Vineyard Trellis** - Timber posts and cabling. Irrigation infrastructure required.

03: **Orchard** - Provide soil, ground preparation and water supply points. Tree specimens installed by school.

04: **Kitchen Gardens** - Raised garden beds constructed from Australian Hardwood (400 High). Water supply points, mulch, soil, compost bins and trellis structures required.

05: **Outdoor Seating Elements** - Bespoke / proprietary outdoor seating furniture. Concrete and mod wood materials to be used.

06: **Seating Steps** - Concrete seating steps (600W x 300H).

07: **Plaques / Educational Installation** - Allow costing to supply / install elements inset into pavement TBC by school.

08: **Kick About Lawn** - Allow costing to grade / level landform and provide drainage to prevent water from pooling.

09: **Bike Racks** - 24 secure bike parking locations undercover. Hooped stainless steel bike racks.

10: **External Foot Paths** - External foot paths extent to be confirmed

NOTE:
This drawing illustrates **works to be tendered on**. Highlighted/noted areas to be realised as apart of schools curriculum.

Issue

No.	Date	Description	Chkd
A	24/02/2021	DRAFT CONCEPT	AL
B	01/04/2021	SCHEMATIC ISSUE	AL
C	28/04/2021	SSDA ISSUE	AL
D	28/06/2021	SSDA ISSUE	JK

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ABN 16 002 247 565

Project
Centre of Excellence in Agricultural Education

at
Vine Dr, Richmond NSW 2753

for
Department of Education

Drawing Title
Overall Tender Plan

Date 06/07/2021

Scale 1:500 @ A1 1:1000 @ A3

0 5 10 15 20 25 30m

Drawing Reference
20417-NBRS-L-SK 005

Rev
D

Proposed new crossing to WSU campus. Bus parking to be relocated in campus to allow for foot path.

Existing Swale

+RL 23.44

+EX 22.94

+RL 22.95

+EX 23.08

TF01

+RL 22.90

+RL 22.45

Retention Basin

Flush kerbs

+RL 23.18

+TK 23.33

MP04

+RL 22.90

+RL 23.465

PV03

PV02B

PV04

BL

Lighting and signage.

+EX 23.00

SWALE

CONCRETE HEADWALL

DRAIN

Bus Parking

PV01

Administration
FFL 23.500

+RL 23.70

BL

HT

PV02B

TF02

PV04

PV03

Brick paving to be laser cut with graphics / text. Allow for bricks to be removed and retrofitted in areas. These can become 'Language Bricks' educating the language of the Darug People.

GT02

MC01

ROOF LINE

PV06

Welcome to country acknowledgement acompanied with large sculpture and educational plaque.

MC02

+RL 23.465

PV02B

TF02

HT

WS01

GT01

MP01

GT01

Garden crops planted and mainted by school. Soil, edging and irrigation to be maintained.

MC01

+EX 23.03

MP03

WS02

MP01

+RL 23.44

Maintenance vehicle access and overland flow.

PV06

PV03

HT

PV02

TS01

+RL 23.46

GRASSED

MP03

WS01

PV02

PV02B

Vineyard trellis system and irrigation to be provided and installed. Grape vines installed and maintained by school.

RL 23.45+

+EX 21.87

PV05B

+EX 23.05

TP01

+EX 22.93

A

B

TF02

'Cut Flower Gardens'

Learning
FFL 23.500

Garden beds maintained and planted with Indigenous Bush Foods by school.

B

Yarning / Dance Circle with B Grade Sandstone Logs and potiential movable fire pit location.

MP03

Sydney River Sand

Bee Hive locations to be supplied and maintained by school.

HT

PV02B

RWT01

CONCRETE

Fish trap inspired water play feature with two water pumps. To be developed at later stage with consulting indigenous artists/elders. Sandstone boulders, exposed aggregate concrete, bonded gravel and sandstone channels compose water feature design.

PV03

HT

+RL 23.10

WS01

MP03

+EX 22.88

PV02

PV02B

PV01

+RL 23.46

POST

Orchard planted and maintained by school. Irrigation and soil to be provided.

+EX 22.95

HT

+RL 23.35

PV04

WS01

Bee Hive locations to be supplied and maintained by school.

MP01

WS02

WS04

'Cut Flower Gardens'. Include edible flowers and bee attracting species.

TF02

Native plant mix with 75L tree planting.

Learning
FFL 23.500

+RL 23.45

Native bee hives to be located under shade.

HT

PV01

+EX 23.03

ROOF LINE

+EX 22.90

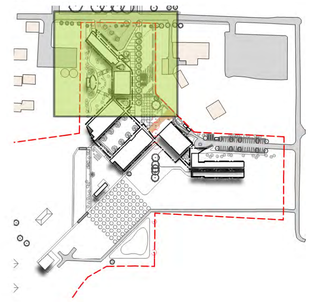
HT

REFER TO L-SK 008

NBRSARCHITECTURE. LANDSCAPE

RICHARD CROOKES CONSTRUCTIONS

KEY PLAN



Issue

No.	Date	Description	Chkd
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B	28/04/2021	SSDA ISSUE	AL
C	28/06/2021	SSDA ISSUE	JK

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Project
Centre of Excellence in Agricultural Education
at
Vine Dr, Richmond NSW 2753
for
Department of Education

Drawing Title
Arrangement Plan 01

Date 06/07/2021

Scale 1:200 @ A1 1:400 @ A3

0 1 2 3 4 5 6m

Drawing Reference
20417-NBRS-L-SK 007

Rev
C

REFER TO L-SK 007

+EX 23.03

+EX 22.90

ROOF LINE

HT

GB01

RWT01

+RL 23.45

TF02

+RL 23.10

PV04

+RL 23.25

GB01

ROOF LINE

Kitchen Gardens planted and maintained by school. Raised Timber garden beds to be installed including soil, irrigation and trellis structures.

MP02

Double leaf steel gate, refer to architects drawings.

+RL 23.45

Dining and Recreation
FFL 23.500

RWT02

RL 23.47+

Learning
FFL 23.500

+RL 23.40

PV01

+RL 23.500

TB01

GT03

+RL 23.45

+RL 23.50

HT

+RL 22.60

+EX 22.96

ROOF LINE

Informal vegetable gardens to be developed / built by school.

+RL 23.475

+RL 23.32

RL 23.02+

WS02

RL 23.32+

MP02

SS01

+EX 23.00

TF02

RL 22.72+

+RL 22.72

TF01

+RL 23.450

+RL 23.00

+RL 22.75

TF01

+EX 22.97

TF01

+EX 22.98

+EX 22.79

MP02

Green House
FFL 23.230

+RL 23.20

Composting zone apart of school curriculum. Infrastructure to be provided.

GT03

FENCE

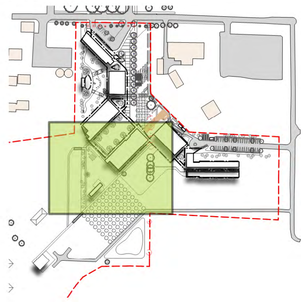
FENCE

REFER TO L-SK 009

NBRSARCHITECTURE.
LANDSCAPE

RICHARD CROOKES
CONSTRUCTIONS

KEY PLAN



Issue

No.	Date	Description	Chkd
A	01/04/2021	SCHEMATIC ISSUE	AL
B	28/04/2021	SSDA ISSUE	AL
C	28/06/2021	SSDA ISSUE	JK

Disclaimer

These plans are for tender use only. Not intended for construction purpose unless specifically noted. The contractor intending to use these documents shall check and verify all works on site and report any discrepency to the Landscape Architect prior to commencement. Failure to do so shall not be the responsibility of the Client or Landscape Architect.

Landscape Architect

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LANDSCAPE

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Project
Centre of Excellence in Agricultural Education

at
Vine Dr, Richmond NSW 2753

for
Department of Education

Drawing Title
Arrangement Plan 02

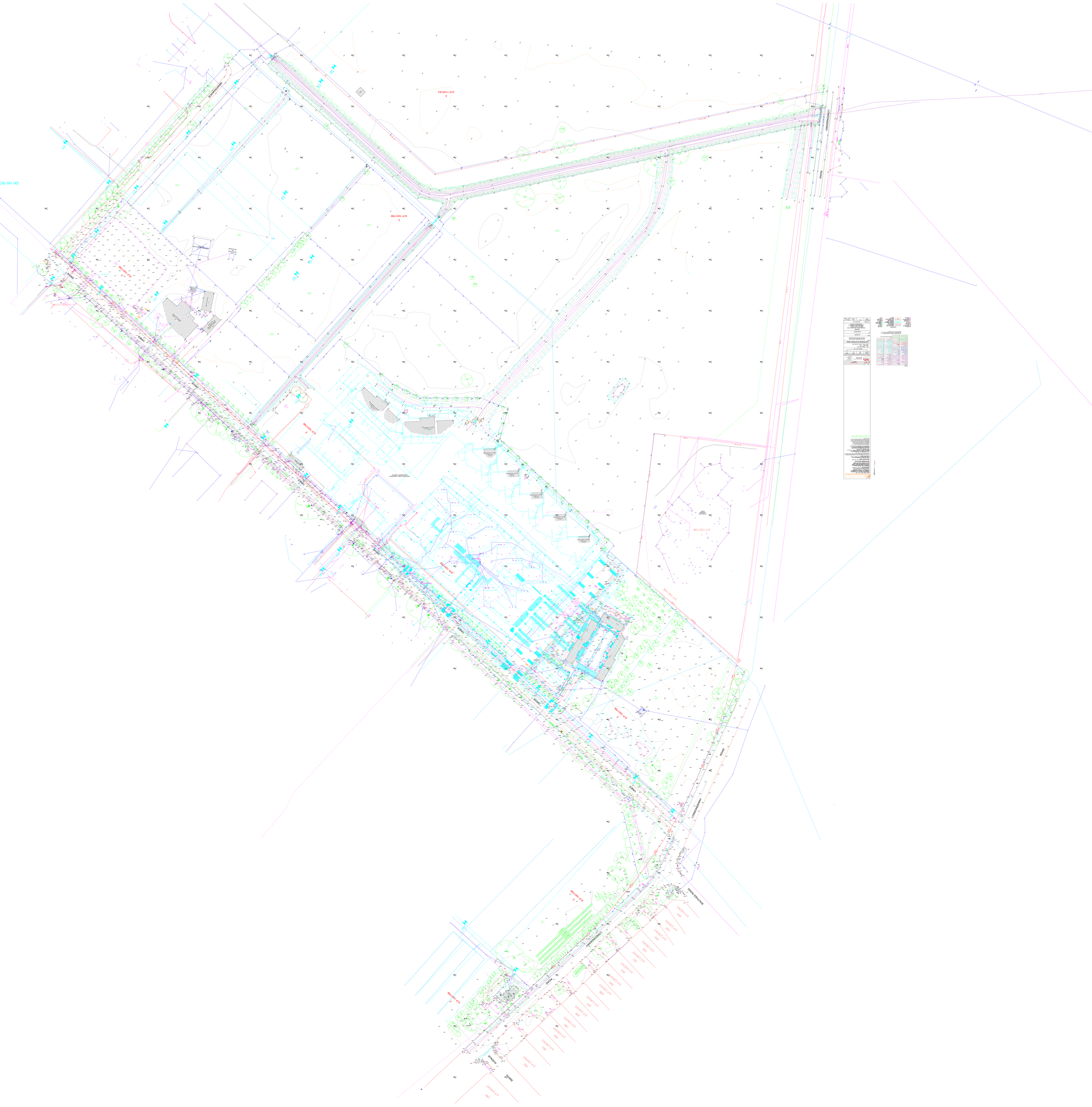
Date 06/07/2021

Scale 1:200 @ A1 1:400 @ A3

0 1 2 3 4 5 6m

Drawing Reference
20417-NBRS-L-SK 008

Rev
C


LONDONDERRY
ROAD
AVENUE
STREET
SPRINGE ROAD
DRIVE
LANE
D.P. 1051798
DN 150 ISC

APPENDIX 3: TREE ASSESSMENT SCHEDULE

Tree Assessment Sheet	
Location:	Centre of Excellence
Client:	NBRS Architecture
Date:	10.03.2021

Tree No.	Botanical Name / **Common Name**	Dimensions							Health				Vigour				Structure					Age Class					**Landscape Significance**	**Retention Value SRIV**	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			
1	*Casuarina glauca* **Swamp Sheoak**	4.92	2.61	410	570	15	8	10	MIN	-	-	-	80	G	G	Y	-	-	-	-	-		M				M	**MGVF9**	Retain
2	*Casuarina glauca* **Swamp Sheoak**	6.00	2.73	500	630	15	8	7	Y				70										M				M	**MGVF9**	Co-dominant. Retain
3	*Casuarina glauca* **Swamp Sheoak**	3.60	2.25	300	400	15	6	6					70										M				M	**MLVG5**	Retain
4	*Casuarina glauca* **Swamp Sheoak**	3.96	2.30	330	420	15	7	7	Y		Y		70										M				M	**MLVF4**	Mistletoe. Retain
5	*Casuarina glauca* **Swamp Sheoak**	4.80	2.59	400	560	15	6	7					70										M				M	**MGVF9**	Remove
6	*Casuarina glauca* **Swamp Sheoak**	4.20	2.47	350	500	15							60										M				M	**MLVG5**	Remove
7	*Casuarina glauca* **Swamp Sheoak**	2.28	2.00	190	300	7	5	7	-	-	-	-	80										Y				M	**YGVF8**	Suppressed. Co-dominant. Remove
8	*Casuarina glauca* **Swamp Sheoak**	5.16	2.73	430	630	14																					M	**MLVG5**	Mistletoe. Remove
9	*Casuarina glauca* **Swamp Sheoak**	5.16	2.67	430	600		9	11	Y				50										M				M	**MLVG5**	Remove
10	*Casuarina glauca* **Swamp Sheoak**	5.04	2.63	420	580																						M	**MGVF9**	Retain
11	*Casuarina glauca* **Swamp Sheoak**	5.76	2.71	480	620																						M	**MGVF9**	Retain
12	*Lagerstroemia indica* **Crepe Myrtle**	0.90	1.26	75	100	L							90												Y		L	**YGVG9**	(S) Small: recently planted. 2m high. 30mm - 40mm diameter. YGVG9. Retain. (L) Large: 3m high. 50mm - 75mm diameter. 400L. YGVG9. Retain
13	*Lagerstroemia indica* **Crepe Myrtle**	0.90	1.26	75	100	L							90												Y		L	**YGVG9**	
14	*Lagerstroemia indica* **Crepe Myrtle**	0.48	1.11	40	75	S							90												Y		L	**YGVG9**	
15	*Lagerstroemia indica* **Crepe Myrtle**	0.48	1.11	40	75	S							90												Y		L	**YGVG9**	(L) Large: 3m high. 50mm - 75mm diameter. 400L. YGVG9. Remove or transplant
16	*Lagerstroemia indica* **Crepe Myrtle**	0.90	1.26	75	100	L							90												Y		L	**YGVG9**	(L) Large: 3m high. 50mm - 75mm diameter. 400L. YGVG9. Remove or transplant
16A	*Lagerstroemia indica* **Crepe Myrtle**	0.48	1.11	40	75	S							90												Y		L	**YGVG9**	(S) Small: recently planted. 2m high. 30mm - 40mm diameter. YGVG9. Retain. (L) Large: 3m high. 50mm - 75mm diameter. 400L. YGVG9. Retain
17	*Lagerstroemia indica* **Crepe Myrtle**	0.90	1.26	75	100	L							90												Y		L	**YGVG9**	
18	*Lagerstroemia indica* **Crepe Myrtle**	0.48	1.11	40	75	S							90												Y		L	**YGVG9**	

Tree Assessment Sheet	
Location:	Centre of Excellence
Client:	NBRS Architecture
Date:	10.03.2021

Tree No.	Botanical Name / **Common Name**	Dimensions							Health				Vigour				Structure					Age Class					**Landscape Significance**	**Retention Value SRIV**	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			
19	*Lagerstroemia indica* **Crepe Myrtle**	0.48	1.11	40	75	S							90												Y		L	**YGVG9**	(S) Small: recently planted. 2m high. 30mm - 40mm diameter. YGVG9. Retain.
20	*Lagerstroemia indica* **Crepe Myrtle**	0.90	1.26	75	100	L							90												Y		L	**YGVG9**	(L) Large: 3m high. 50mm - 75mm diameter. 400L. YGVG9. Retain
21	*Lagerstroemia indica* **Crepe Myrtle**	0.90	1.26	75	100	L							90												Y		L	**YGVG9**	(L) Large: 3m high. 50mm - 75mm diameter. 400L. YGVG9. Remove or transplant
22	*Lagerstroemia indica* **Crepe Myrtle**	0.90	1.26	75	100	L							90												Y		L	**YGVG9**	(L) Large: 3m high. 50mm - 75mm diameter. 400L. YGVG9. Remove or transplant
23	*Lagerstroemia indica* **Crepe Myrtle**	0.90	1.26	75	100	L							90												Y		L	**YGVG9**	(L) Large: 3m high. 50mm - 75mm diameter. 400L. YGVG9. Remove or transplant
23A	*Lagerstroemia indica* **Crepe Myrtle**	0.90	1.26	75	100	L							90												Y		L	**YGVG9**	(L) Large: 3m high. 50mm - 75mm diameter. 400L. YGVG9. Retain
24	*Pyrus ussuriensis* **Manchurian Pear**	3.48	2.37	0.35	450	4	3	3	-	-	-		90	G	G	G											L	**YGVP5**	Multi-trunk
26	*Pyrus ussuriensis* **Manchurian Pear**	3.48	2.18	0.29	370	5	6	7	Y	-	-	-	80	G	G	G											L	**OLVP0**	Multi-trunk. Poor form. Remove
27	*Pyrus ussuriensis* **Manchurian Pear**	5.64	2.55	0.47	540	9	10	8	Y	-	-	-	80	G	G	Y	Y	Y					M					L	**MGVP6**	Multi-trunk. Remove

Legend

Tree to be retained and protected
Tree to be removed due to Construction
Tree to be removed due to other reason
Dead tree or weed species (exempt and can be removed without consent)

APPENDIX 4: ECOLOGICAL PLANS

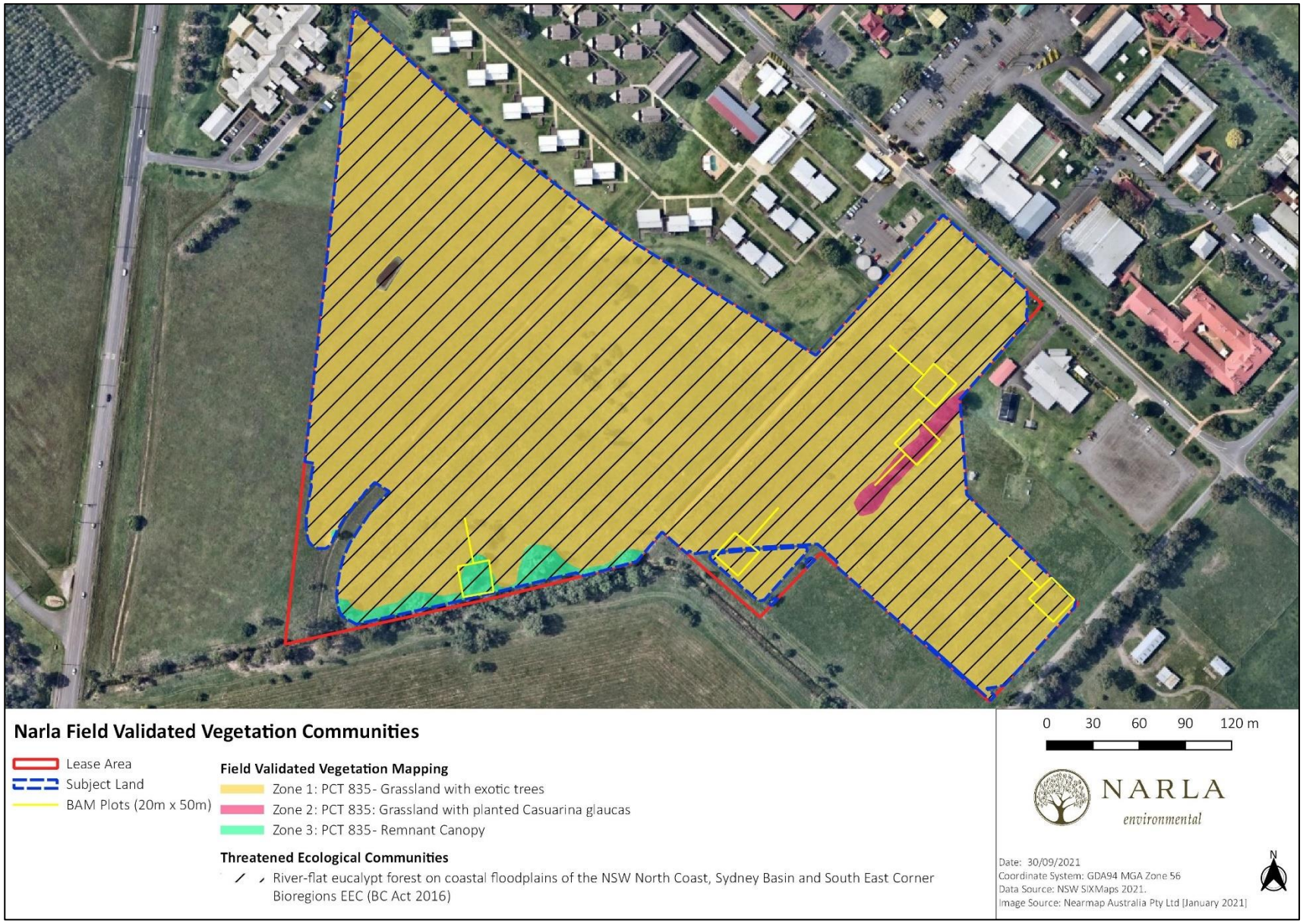
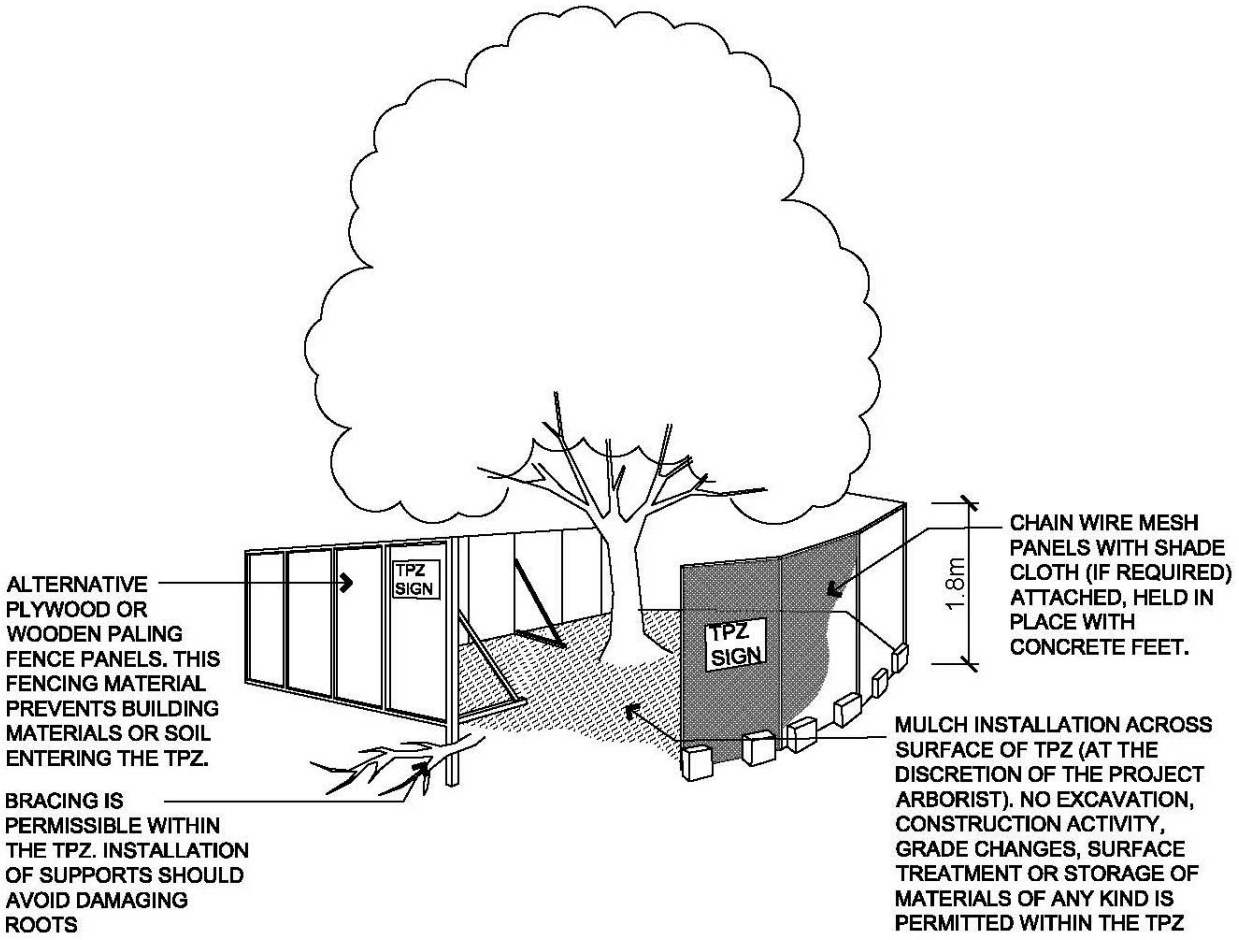


Figure 10. Narla field validated vegetation mapping and location of BAM plots within the Subject Land.

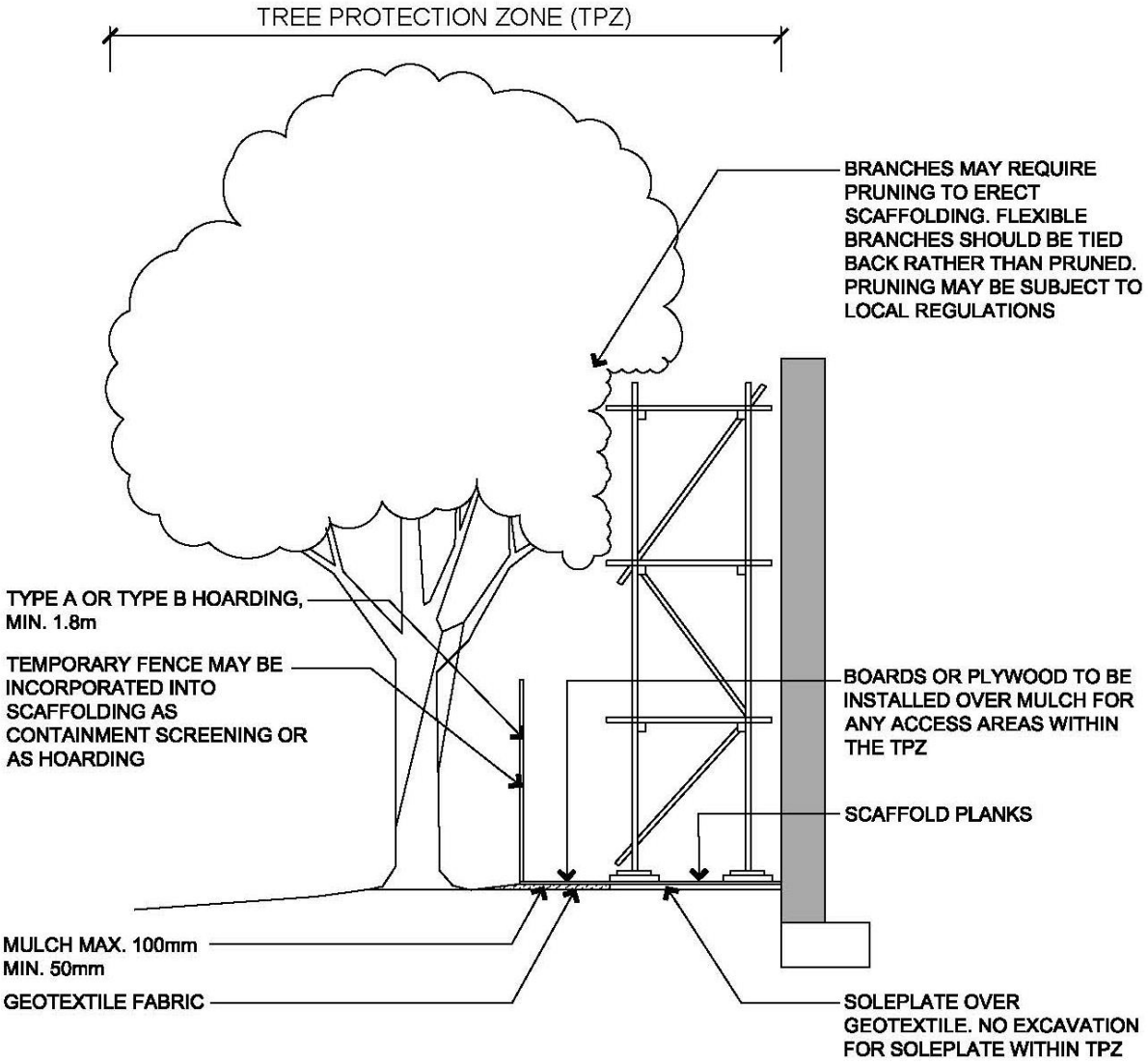
Figure 12. Management zones within the Subject Land.

APPENDIX 5: TYPICAL TREE PROTECTION DETAILS



PROTECTIVE FENCING

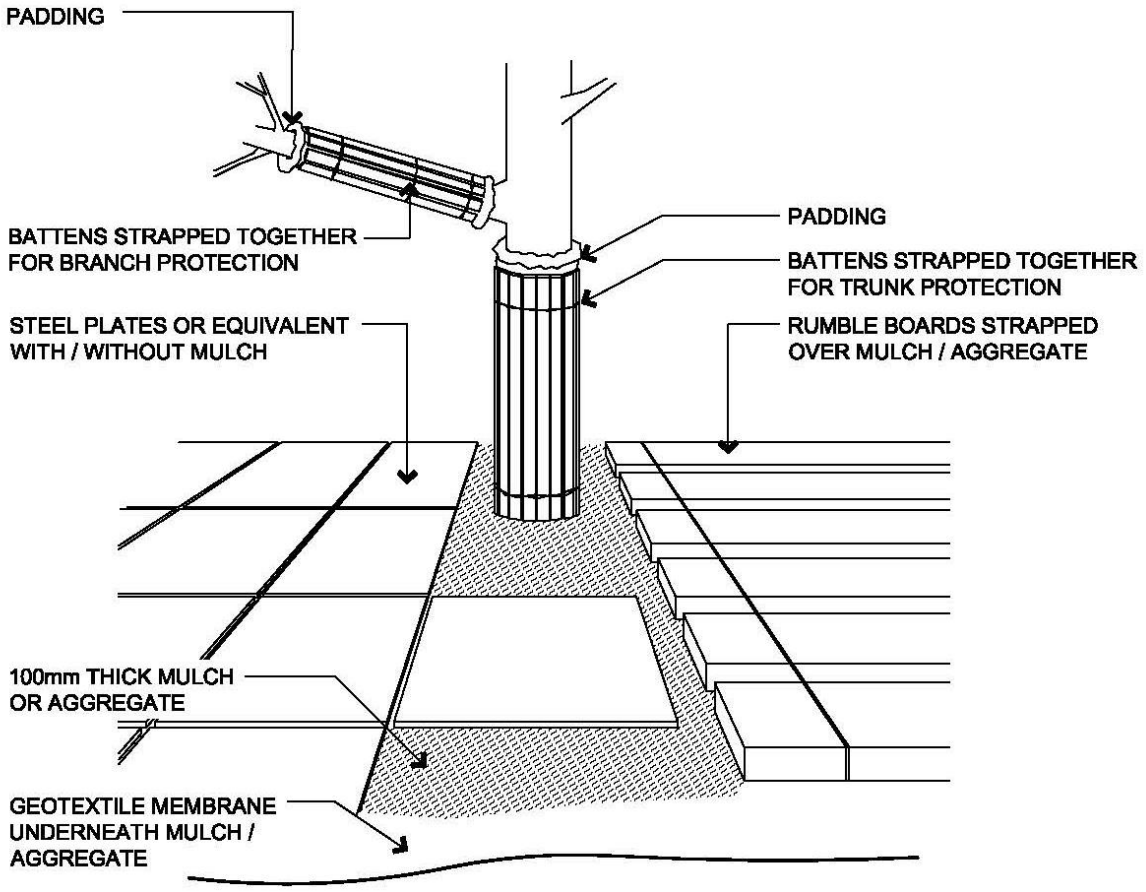
Based on AS4970-2009 NOT TO SCALE



NOTE: Excavation required for the insertion of support posts for tree protection fencing should not involve the severance of any roots greater than 20mm in diameter, without the prior approval of the project arborist.

INDICATIVE SCAFFOLDING WITHIN A TPZ

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