Independent
Arboricultural
Services

Arboricultural Impact Assessment

Prepared For: Brookfield Portside East Pty Ltd

11-23 Macarthur Avenue
Hamilton QLD 4007

3 April 2023

IAS11653

Independent Arboricultural Services - Disclaimer

The material contained in this document has been prepared on an independent basis free of any bias and represents the honest opinion of the consulting arborist.

Tissue or soil samples have not been collected nor submitted for testing unless otherwise stated. Excavation is limited to minor earthworks and we submit this assessment on the basis that all data is based on visual inspection of the tree/s and its/their location, species, health and condition at the time of writing unless otherwise stated. Measurements and tree locations noted in this report are approximate and have not been determined by survey unless information and analysis has been provided by the consultant or such information is otherwise noted. Please request a more detailed arborist report if further information and analysis is required. Depending on site requirements, specific alternate specialist advice including engineering consultancy and certification maybe required in combination with this assessment. This assessment contains arborist advice and associated general information only and does not purport to provide other site-specific specialist advice such as engineering certification unless arrangement to source such advice for inclusion in this assessment has been requested and authorised.

This report containing opinions, advice and recommendations based on information and data gathered from site inspections carried out by personnel from Independent Arboricultural Services as well as information provided by the client and/or its representatives, is to be relied on by the client in that context. It is assumed that all such information provided to Independent Arboricultural Services is correct. All recommended arboricultural works detailed in this assessment including pruning of tree canopy or roots, tree removal, tree transplantation or other associated works including stump grinding or the application of any prescribed treatment shall be carried out in accordance with applicable standards including Australian Standards AS 4373-2007 Pruning of amenity trees and AS 4970-2009 Protection of trees on development sites.

 The consultant shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements have been made including payment of additional fees for such services.

The invoice for this report will be issued to the person or entity as per the address advised at the time of confirmation of appointment. Assessment in this report is based on plans provided at the time of confirmation of engagement and report preparation. Additional time required for re-assessment of report detail due to subsequent re-issue of plans after report preparation will be subject to an additional fee which will be charged at our hourly rate. This report shall not be conveyed to any third party including regulatory authority/s until full payment of this invoice is received by Independent Arboricultural Services and a finalised report has been issued unless agreement to do so has been granted.

Factors including the absence of historical records or local knowledge, recognition of the variability of the integrity of a tree as a naturally living organism as well as the impact of conditions within its surrounds to which it maybe subject including the impacts of mechanical force and the occurrence of weather events, do not allow an arborist to guarantee the age of a tree, or the length of time a tree/s may live or such time as it /they may fail. There is no warranty or guarantee, expressed or implied that the problems or deficiencies of the plants or property in question may not arise in the future.

Executive Summary

Independent Arboricultural Services have been engaged by Brookfield Portside East Pty Ltd to assess potential impacts to the nominated vegetation resulting from the proposed residential development at 11-23 Macarthur Avenue, Hamilton QLD 4007 (The *Subject Site)*. Sam Gilbey (AQF Level 5) and Roger Rankine (AQF Level 5) attended the *Subject Site* on 3 April 2023 to undertake the assessment of the impact of the works. A follow up meeting was held with representatives of Brisbane City Council PPI, Brookfield Portside East Pty Ltd and Independent Arboricultural Services on the 31st July 2023.

The assessment of the impacts of proposed development on the identified trees in and around the development envelope, roads and services has been undertaken. Advice on both specific and general tree protection measures and Project Arborist Requirements have been detailed in this report. It is important as the design is refined, further reviews are undertaken by the Project Arborist and protection measures are further specified as required.

Further detailed designed will be assessed as available during the project. Protection measures and assessment of incursion has been based on the available information provided.

As part of the design process and operational works it is recommended that the following is undertaken,

- Ensure all approvals and permits are in place before works commence, including all required regulatory permissions including Brisbane City Council PPI NALL permissions.
- Undertake a pre-start meeting with contractors before works commence.
- Existing concrete hardstand within the property boundary and within TPZ of Trees 1, 2, & 3 to be broken/cut into pieces and removed in an outwards direction away from the stem of the tree. No below ground incursion within the TPZ is permitted during demolition.
- Proposed concrete footpath within the TPZ to be constructed above current grade where possible using slab on ground of floating slab construction methodology. Where required, additional excavation to achieve desired levels prior to concrete pour are to be vacuum excavated or hand excavated under the supervision of the Project Arborist (AQF Level 5).
- A bed of pea gravel, rough river sand, or level 2 structural soil to be used to create a level base.
- Black builders' plastic to line the surface to prevent leaching of chemicals into the surrounding soil.
- Chairs and reinforced mesh to be laid (if required) and concrete poured on top. Care is to be take not to have laydown or overpour within the TPZ of the *Subject Trees*.
- Existing chain link fence within the TPZ of Trees 1, 2, & 3 is to be removed under the supervision of the Project Arborist. The chain mesh is to be removed, followed by the poles. The poles are to be grabbed and pulled directly upwards (using an excavator/Posi-track of similar). Should roots be identified around the existing footing, review by the Project Arborist will be required. This may require pruning of small roots, or use of vacuum excavation to minimise impacts to large roots.
- Alignment of concrete demolition and proposed garden bed extension within the TPZ of Trees 4, 19, & 20 to be saw cut and removed to minimise likelihood of damage to below roots during demolition. Proposed garden bed to be constructed above current grade – no excavation is permitted prior to installation.
- Alignment of required cut (Boundary) to be vacuum excavated under the supervision of the Project Arborist (AQF Level 5) to determine the level of root activity within then project footprint. Roots encountered less than 50mm diameter to be cut cleanly by the Project Arborist. Roots encountered over 50mm diameter to be inspected and managed accordingly.
- Directional pruning of Trees 1 & 2 will be required to facilitate construction and required deflection from the proposed building. Level of pruning was calculated at approximately 20-

25% of the live crown. All pruning works are to be conducted by a minimum AQF Level 3 Arborist under the supervision of the Project Arborist.

- Directional pruning/crown lift of Tree 3 may be required to facilitate basement/building construction and required deflection. Level of pruning to be determined via consultation with the construction contractor to determine required level of clearance.
- The area external to the site (pathways, landscaping) is to be left in situ with the exception of the widening of the footpath towards the property boundary and a realignment of a concrete area near to Tree 3 (please see Tree Protection Plan).
- Movement of construction machinery limited to existing hard stand within the TPZ. Should access be required within the TPZ, ground protection in the form of 100mm depth aged forest mulch, rumble boards, or track matts will be required to reduce the likelihood of mechanical damage and soil compaction.
- All proposed services are to be routed within the *Subject Site*, or outside the TPZ of the retained trees.
- Retention status of Tree 10 pending Project Arborist review of detailed landscape plans. Should Tree 10 be required to be removed, ensure all relevant permits and approvals including tree owner's permission is in place.
- Tree Protection Fencing and stem/branch protection is to be erected before works commence and audited by the Project Arborist (Min AQF Level 5).
- Supervision by a Project Arborist (Min AQF Level 5) and Fauna Spotter/Catcher of the approved tree removals.
- Any works proposed within the TPZ of retained trees requires supervision of a minimum AQF5 Project Arborist.
- Laydown areas and site shed/office locations are to be identified/finalised and excluded from the Tree Protection Zones of retained trees and minimise public impact.
- Construction materials, spoil, stockpiles, tools and equipment are not permitted within the TPZs of retained trees.

Table of Contents

Document Tracking & Information

Project Name	Arboricultural Impact Assessment		
Project Arborist	Sam Gilbey (AQF Level 5) & Roger Rankine (AQF Level 8)		
Client	Brookfield Portside East Pty Ltd		
Address	11-23 Macarthur Avenue, Hamilton QLD 4007		
IAS Reference	IAS11653		
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Checked By	Roger Rankine (AQF Level 8)	**Date**	6th October 2023
Revision	3		
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Stephen Catchpoole ***Consulting Arborist*** Mobile: 0400 473 500	• Diploma Arb. (AQF Level 5) • QTRA (Qualified) • Doctor of Philosophy in Forestry (PhD)	• TRAQ (Qualified) • Bachelor of Science Forestry • Bachelor of Science (Hons Botany) • QAA Qualified Member	
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Abbreviations

QSG	Queensland State Government	**RPA**	Root Protection Area
DA	Development Application	**TMP**	Tree Management Plan
VPO	Vegetation Protection Order	**CMP**	Construction Management Plan
ULE	Useful Life Expectancy	**VMP**	Vegetation Management Plan
BLF	Building Location Footprint	**AS**	Australian Standard
BLE	Building Location Envelope	**AS 4373: 2007**	Pruning of amenity trees
TPZ	Tree Protection Zone	**AS 4970: 2009**	Protection of trees on development sites
SRZ	Structural Root Zone	**DBH**	Diameter at Breast Height

All comments and recommendations in this report have been determined in accordance with Australian Standards AS 4373-2007 Pruning of amenity trees and AS 4970-2009 Protection of trees on development sites. All recommended tree work should be carried out in accordance with these standards.

Sam Gilbey

Consulting Arborist

Map

Figure 1: *Subject Site* (NearMap 2023)

Response to RFI / Report Review

Following from the further issue email and report peer review, a list of the itemised responses has been detailed below and the relevant location within the report noted.

Item	Response
8. Further clarification is required on the extent of pruning required for the fig trees immediately adjoining the development – marked up images and noted distances should be provided to demonstrate as to what point the trees are to be cut back to and that the replacement surface between the units and the trees will be suitable for the use of elevated work platforms for access to the trees for ongoing maintenance pruning. Details of scaffolding locations during construction with respect to these trees is to be provided.	*Please see pages 15-23 for detailed extent of required pruning for Trees 1, 2, and 3. Reference has been made to the proposed footpath upgrade and requirements for EWP access for future pruning works.*
9. A revised arboricultural impact assessment is to be provided to EDQ which clarifies whether the existing chain-link fence that is located on the northern boundary of the site is to be retained or removed and how the trees will be protected from harm.	*Please refer to the Tree Protection Plan on page 28 and the Tree Retention Recommendations table on pages 35-37 for methodology of chain-link fence removal within the TPZ of Trees 1, 2, and 3.*
10. All of the other park and street trees that are adjacent to the site should be incorporated into the arboricultural impact assessment and the revised assessment submitted to EDQ.	*Twenty-one (21) additional trees have been included in this report from Revision 2. This includes Trees located within the park to the north, Wharf Street trees to the east, garden bed trees to the south east, garden bed trees to the west of the western laneway, and within the development site.* *Please refer to the Tree Protection Plan on page 28, Tree Retention Recommendations table on pages 35-40, and the Tree Removal Recommendations table on page 41 for impacts and amended construction methodologies for the proposed works.*
11. A qualified and experienced arborist is to be consulted on the development of all detailed designs that have the potential to impact ANY of the park and street trees that are adjacent to the proposed development site. Any amendments must be incorporated into a revised arboricultural impact assessment and tree management plan.	*The Project Arborist (AQF Level 5) with a minimum 5 years' experience is to be consulted during all stages of detailed design to determine additional impacts to retained trees. Any amendments will be incorporated into a revised Arboricultural Impact Assessment.*

Introduction

This report is based on a visual inspection carried out from the ground on 3 April 2023. No soil or tissue sampling has been conducted. Tree assessment and Qualitative Visual Tree Analysis has been carried out in accordance with TRAQ ISA guidelines. Data and information provided to the client by others has been incorporated into this report as appropriate.

All Arboricultural recommendations contained in this report have been determined in accordance with Australian Standards AS 4373-2007 Pruning of amenity trees and AS 4970-2009 Protection of trees on development sites.

For the purposes of this report reference to a Consulting or Project Arborist is held to mean an Arboricultural specialist who holds minimum Arboricultural qualifications of Dip Arb/AQF 5, appropriate professional insurances and has appropriate experience in the protection of trees on construction sites. Where tree work is specified, all recommended tree work is to be carried out in accordance with the above-mentioned standards by an appropriately trained and AQF qualified arborist practitioner/s with an up-to-date record of training and membership of a recognised Australian Arboricultural association, e.g. Qld Arboricultural Association (QAA), Arboriculture Australia (AA), or a recognised international Arboricultural association. No climbing spikes are to be used if pruning is to be carried out on live trees except in the instance of an emergency.

Qualifications of the report authors include Diploma of Arboriculture/AQF Level 5 and ISA Certified Arborist accreditation. Report authors hold current insurances and memberships including qualified memberships of Queensland Arboricultural Association (QAA), and Arboriculture Australia (AA) as well as current accreditation and membership of International Society of Arboriculture (ISA).

Independent Arboricultural Services is a qualified registrant on the QAA Register of Consulting Arborists.

Arborist Comment

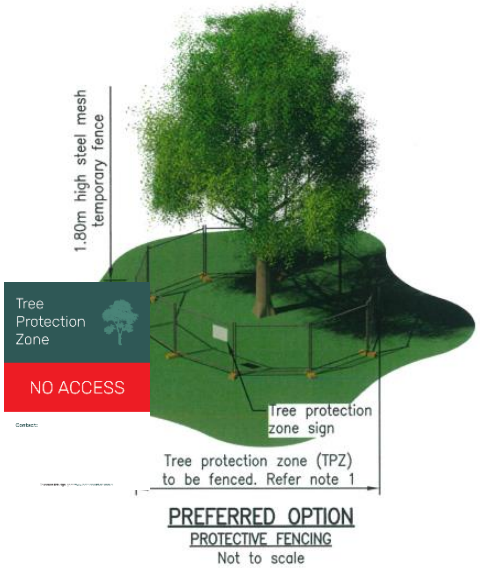
- **Protection of retained trees during construction works**
- **Impact of the proposed works on nominated trees**
- **Lining of concrete areas**
- **Plant Health Care**
- **Ground Penetrating Radar findings**
- **Pruning plan**

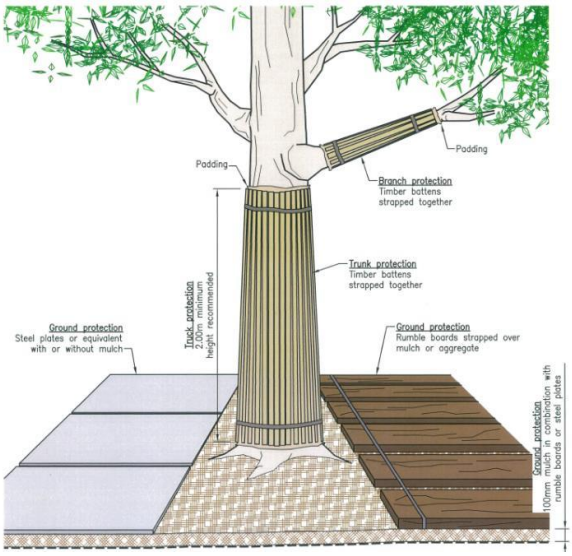
Protection of Retained Trees During Construction Works

An exclusion zone is to be established along the perimeters of retained trees and cordoned off with a physical barrier of wire mesh fence, 1.8m in height, which is securely anchored. The role of these fences is to prevent any damage to the complete tree including root system (SRZ & TPZ), stem and branch structure as well as the crown or canopy. Alternatively, and on approval of a minimum AQF5 Project Arborist, plastic mesh fencing, 1.2m in height, secured with star pickets and caps with straining wire can be utilised. All TPZ fencing will require appropriate signage to signify the relevant protection zones. This will require audit and sign off prior to operational works onsite. Stem and branch protection for the three (3) *Subject Trees* is to be installed and audited by the Project Arborist prior to works commencing.

Impact of The Proposed Works on Nominated Trees

On review of the current plans, it is determined there is capacity to retain twenty-two (22) of the twenty four (24) assessed trees/tree groups based on nil/minor or supervised major incursion in the TPZ. Tree group 9 is required to be removed based on planned major incursion inside the TPZ. The Project Arborist is to review the detailed landscape plans prior to final retention/ removal recommendation for Tree 10. All below ground incursion into the TPZ of the *Subject trees* is to be conducted via vacuum excavation under the supervision of the Project Arborist (AQF Level 5). All required pruning works are to be conducted by a minimum AQF Level 3 Arborist under the supervision of the Project Arborist. All proposed services are to be routed within the *Subject Site,* or outside the TPZ of the retained trees. All neighbouring public and private trees will be required to be retained and protected in accordance with AS4970:2009 Protection of trees on development sites. Any required landscaping external to the property boundary is to be reviewed and supervised by the Project Arborist (AQF Level 5).



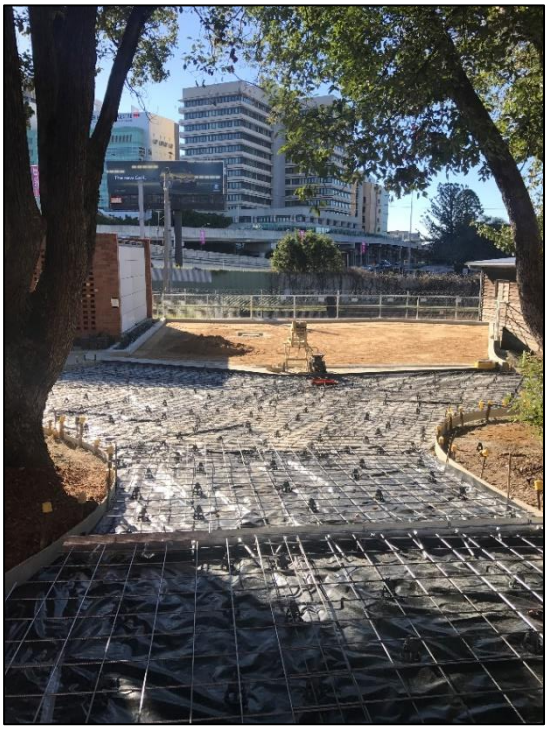


Tree Protection Fencing to be utilised. Where works will be undertaken close to and within Tree Protection Zones specific tree protection measures to be utilised a directed by the project Arborist.

All below ground incursion into the TPZ of retained trees is to be conducted via vacuum excavation under the supervision of the Project Arborist.

Lining of any concreted areas

It is recommended that all new concrete required within the Tree Protection Zone is lined with builders' black plastic to prevent any leaching of chemicals into the surrounding soil.



Example of site prior to the concrete pour

Example of the completed work

Plant Health Care

A plant health care program has been devised for the duration of the works. It is important that soil and leaf testing is undertaken before works commence to provide a baseline reading of the current levels and to guide the final plant health care program and levels of additives. A watering program to be established and maintained for the duration of the works with a log of watering to be kept on site. It is recommended that the Plant Health Care Program is implement for the duration of the works and follow up testing is undertaken every six (6) months to assess if any changes are required to the program.

Pruning Program

In order to facilitate the required clearances for the building balconies (including scaffolding required to complete the works a proposed pruning program has been documented on page 14. It is important that the work is undertaken by a minimum AQF level 3 Arborist under the direct supervision of the Project Arborist (AQF Level 5). Where possible branches are to be tied back and all pruning is to be undertaken in accordance with AS4373-2007 Pruning of Amenity Trees.

Ground Penetrating Radar findings

Ground penetrating radar was utilised between the property boundary and the existing building structure to determine of any root activity was observable within the property boundary. Work was undertaken on the 13th July 2023. In summary, it is the authors opinion that limited root activity was observed within the *Subject area.* Numerous services were observed within the property. Externally it was also observed that power and communications are running close to the property boundary. Please see page 23 for results.

Key Specifications:

- GPR Utilised: MALA EL core 450 MHZ
- Job Specifications: To undertake ground penetrating radar to identify underground root systems within the survey area.
- Depth Achieved: Maximum depth penetration achieved with the 450Mhz GPR appeared to be approximately 2000mm. This was based on the signal velocity applied to the dataset, obtained from hyperbola fitting methods
- Weather Conditions: Fair and sunny, no instances of rainfall.
- GPR Area: Parallel transects with 500mm spacing were utilised.
- Instruments Used: Mala EL core 450 MHZ
- Software: MalaVision was utilised for the interpretation of the results.

Pruning Program

A proposed pruning program has been developed and provided below. It is recommended that the pruning is undertaken in conjunction with the scaffolding and pilling installation. I.e The pruning is undertaken as scaffold and / or pilling machinery is on site and mobilised therefore to allow for targeted pruning. All pruning is to be strictly to AS4373-2007 Pruning of Amenity Trees and undertaken by a minimum AQF level 3 Arborist under the supervision of the Project Arborist (AQF Level 5). The writer has been informed that pruning of Tree 1, 2, and 3 to the boundary will allow sufficient space inside the property for the erection and use of scaffolding during construction.

The proposed pruning will require select branches to be removed close to the property boundary. Numerous branches under 50mm diameter are present within the property boundary and will require select removal. Branches required to be pruned greater than 50mm diameter have been identified below. All diameters are estimation only due to ground-based assessment. Nominated pruning is indicative only, and specific pruning locations will be identified during aerial works. All pruning works are to be conducted by a minimum AQF Level 3 Arborist under the supervision of the Project Arborist (AQF Level 5 minimum). Distance from the centre of the stem of each tree to the boundary (line of pruning) are as follows:

- Tree 1 – 4.3m
- Tree 2 – 4.2m
- Tree 3 – 4.4m

The area of footpath to be reinstated on the northern side of the boundary (adjacent to Trees 1, 2, & 3) is to be structurally sound enough to support periodical pruning of the above trees using an EWP. Additional EWP access may be suitable from the east of Tree 3/4, and the west of Tree 1/5 within the park area.

Crown lift and directional pruning is required to facilitate the piling machinery and scaffolding (close to boundary)

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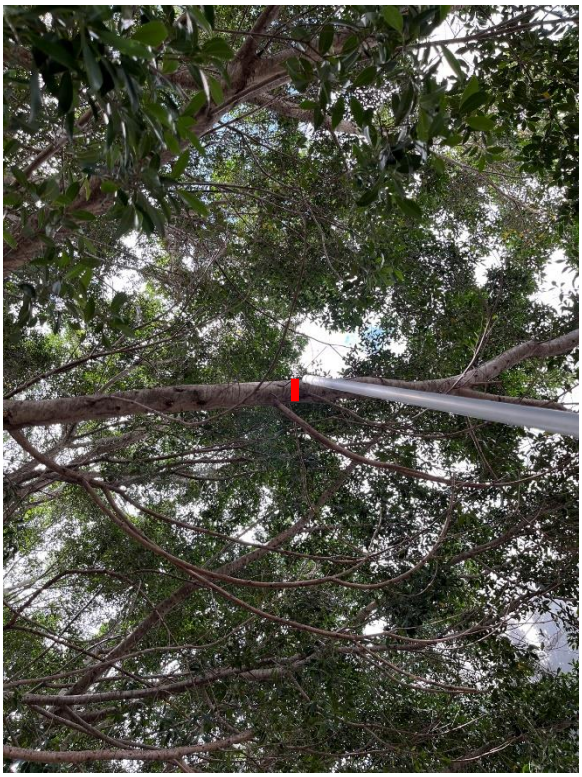
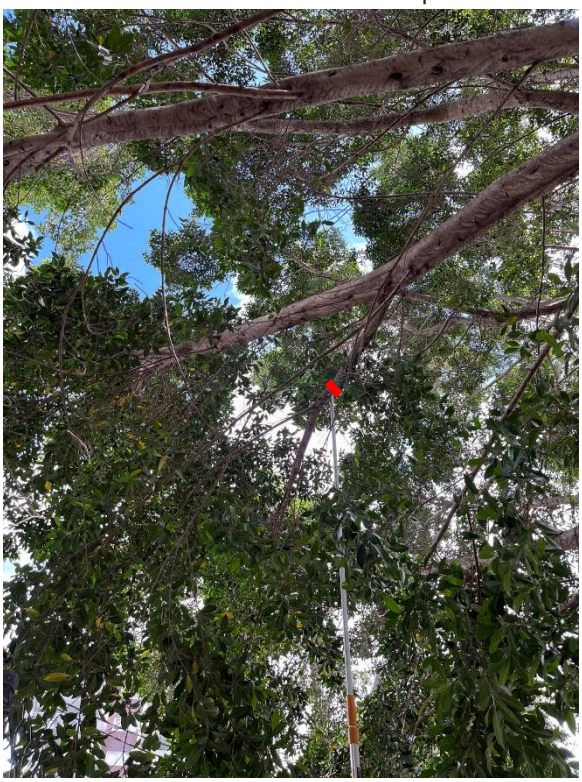
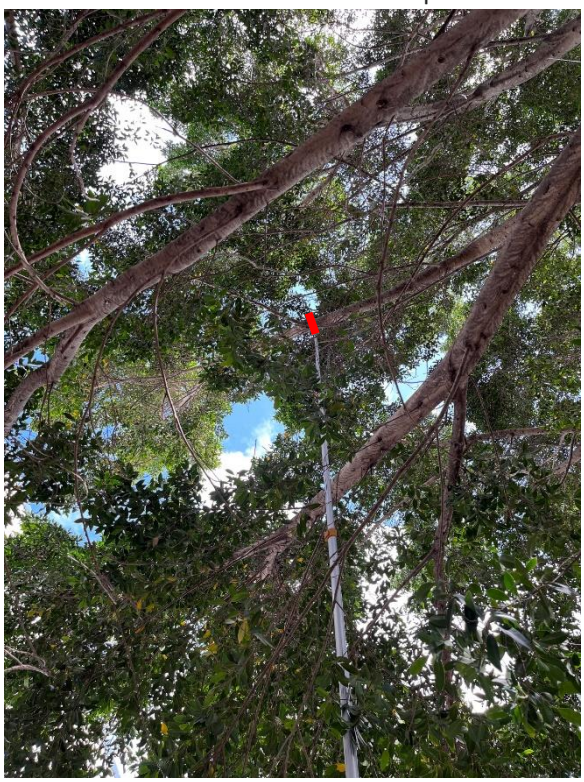


Tree 1 – 140mm branch to be pruned

Tree 1 – 100mm branch to be pruned



Tree 1 – 50mm branch to be pruned



Tree 1 – 150mm branch to be pruned

Tree 1 – 100mm branch to be pruned

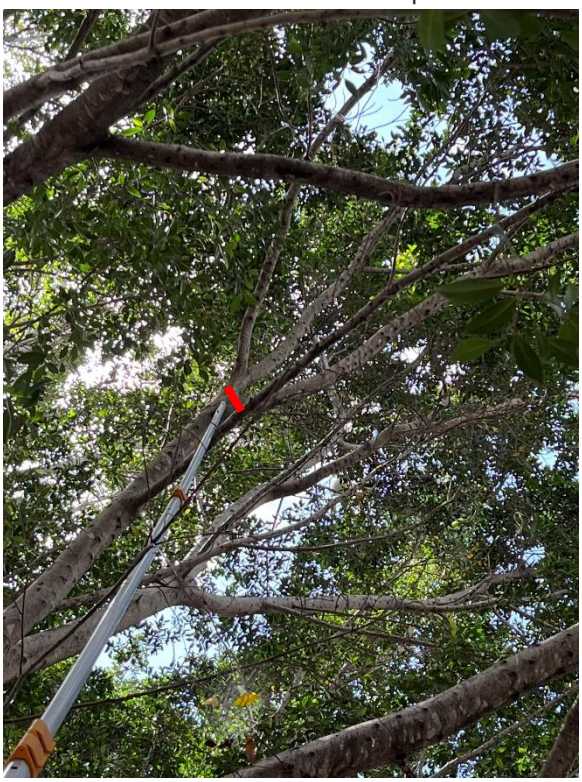
Tree 1 - 2 x 80 and 2 x 40mm branches to be pruned

Tree 1 - 3 x 100 branches to be pruned

Tree 2 - 100mm branch to be pruned

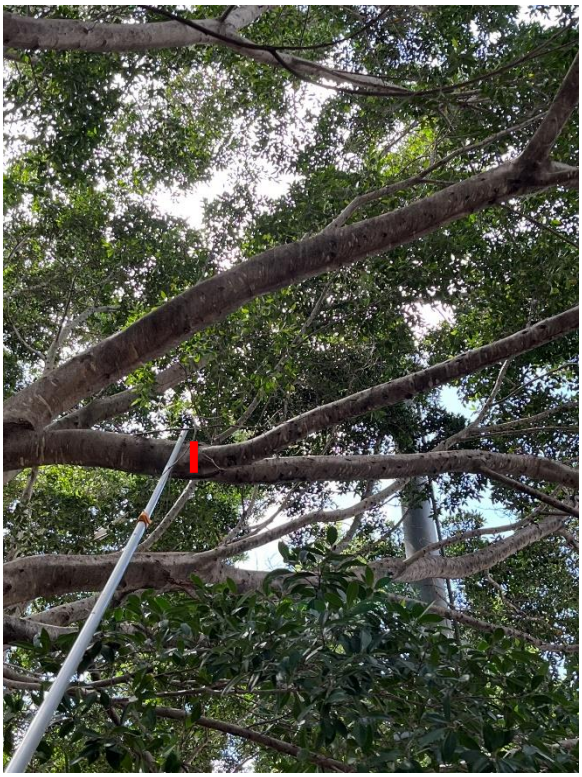
Tree 2 - 80mm branch to be pruned

Tree 2 - 80mm branch to be pruned



Tree 2 - 150mm branch to be pruned

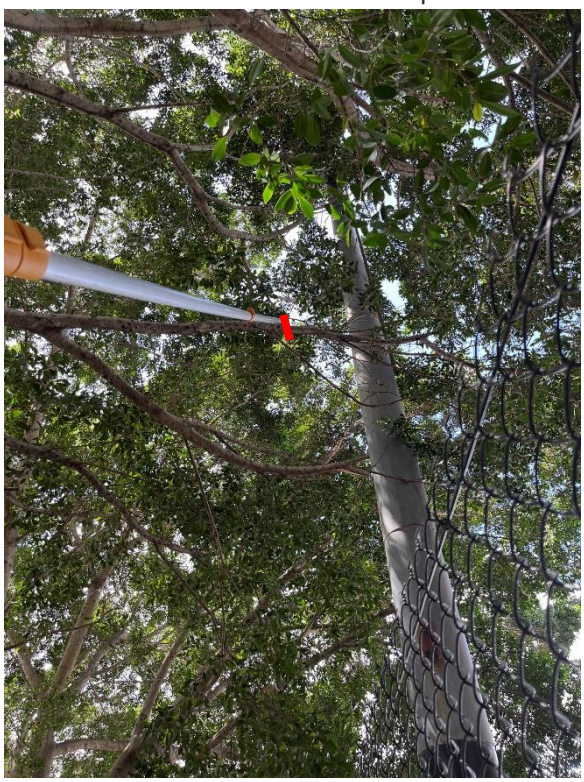
Tree 2 – 100mm and 80mm branch to be pruned



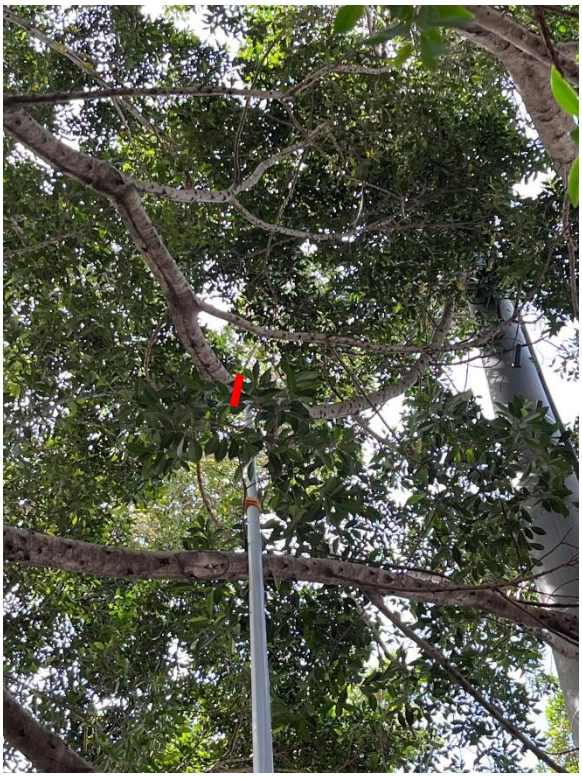
Tree 2 - 200mm branch to be pruned

Tree 2 - 250mm branch to be pruned

Tree 2 – 100mm and 150mm branch to be pruned



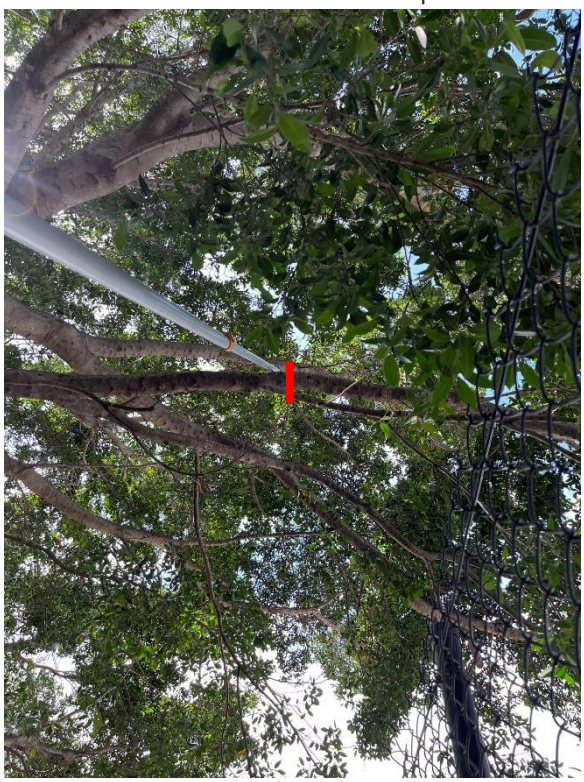
Tree 2 - 80mm branch to be pruned



Tree 2 - 100mm branch to be pruned

Tree 3 - 150mm branch to be pruned

Tree 3 - 2x 150mm and 80mm branches to be pruned



Tree 3 - 100mm branch to be pruned

Tree 3 – 100mm and 80 mm branches to be pruned

Tree 3 - 150mm branch to be pruned

Tree 3 - 100mm branch to be pruned

Tree 3 - 2x 50mm branches to be pruned

Tree 3 - 100 mm branch to be pruned

Ground Penetrating Radar

Plant Health Care Program

To mitigate any negative impacts to the *Subject Trees* as a result of the proposed development, the below plant health care program is to be incorporated into the works and commenced before works are started continued until 12 months post completion.

Table 1: Plant Health Care methodology

1. Detailed soil and leaf testing to be undertaken before works commence and six (6) monthly during the project. Soil and leaf samples are to be provided to an independent laboratory for testing with results interpreted by a suitably qualified agronomist. At a minimum the testing is to be undertaken to record the following parameters *pH and EC (1:5 water); Available Calcium, Magnesium, Potassium, Ammonium, Nitrate, Phosphate, Sulfur; Exchangeable Sodium, Potassium, Calcium, Magnesium, Hydrogen, Aluminium, Cation Exchange Capacity; Bray I and II Phosphorus; Colwell Phosphorus; Available Micronutrients Zinc, Manganese, Iron, Copper, Boron, Silicon; Total Carbon (TC), Total Nitrogen (TN), Organic Matter, TC/TN Ratio; Basic Colour, Basic Texture.*
2. A soil conditioner program including to be developed based on the soil and leaf testing results. Proposed soil condition to include as a minimum, a. Nutritec Black Gold™ (or similar) b. Nutritec Life Force Gold Pellets (or similar) c. Nutritec BAM (or similar) d. Mycogold Mycorrhizal fungi. (or similar) Application of the above amendments is to be strictly applied in accordance with the manufacturers recommendations and documented by the Project Arborist. Application is to be undertaken quarterly for the first 12 months immediately following construction by the Project Arborist.
3. Installation of irrigation system to be undertaken throughout the proposed works. A log of watering to be maintained and watering adjusted as directed by the Project Arborist (AQF Level 5).
4. Minimum monthly auditing of the trees by the Project Arborist with audit reports to be compiled and submitted as part of plan sealing (outside of the supervision of specified works).
5. Mulch to be reapply every 6 months or more frequently as specified by the Project Arborist. Plant Health Care Program to be applied on completion of the works and 12 months post completion.

Project Hold Points

Engage an AQF5 minimum Project Arborist during the project life;

- Once tree protection fencing and signage has been established and finalised. Project Arborist (minimum AQF Level 5) to audit and sign off.
- Supervision of approved tree removals in conjunction with a fauna spotter.
- Any works within the TPZ of retained trees is required.
- If tree roots are encountered over 50mm in diameter outside of TPZs of retained trees.
- Changes to the plans occur.
- On completion of the project to conduct a final audit and summary.

(Site audits/summary reports will be conducted at each hold point interval by the Project Arborist)

Project Arborist Requirements
1. Pre-Start Inspection and Audit of Tree Protection Fencing Before Works Commence
2. Any required Tree Works to be undertaken by a minimum AQF Level 3 Arborist under the Supervision of the Project Arborist (Min AQF Level 5). Tree Services Company to be a member of Queensland Arboricultural Association or Arboriculture Australia.
3. All works within the Tree Protection Zones of the retained vegetation to be supervised by the Project Arborist (Min AQF Level 5). Audit Reports to be completed and submitted by the Project Arborist. Any below ground incursion to be water excavated under low pressure, under the supervision of the Project Arborist.
4. All works to be excluded from the Structural Root Zone (SRZ) and supervised if located within Tree Protection Zone.
5. The Project Arborist to be consulted if changes to plans are made that affect any retained vegetation.
6. At the Completion of works, Project Arborist to undertake a site assessment and an audit report compile of any further remedial actions required.

Conclusion

For all retained trees, with due care, implementation of appropriate work methodology as noted in this report and isolation of all TPZs of retained trees from construction works, the potential for ill-effect to retained/affected trees can be minimised in accordance with guidelines of AS4970:2009 – Protection of trees on development sites.

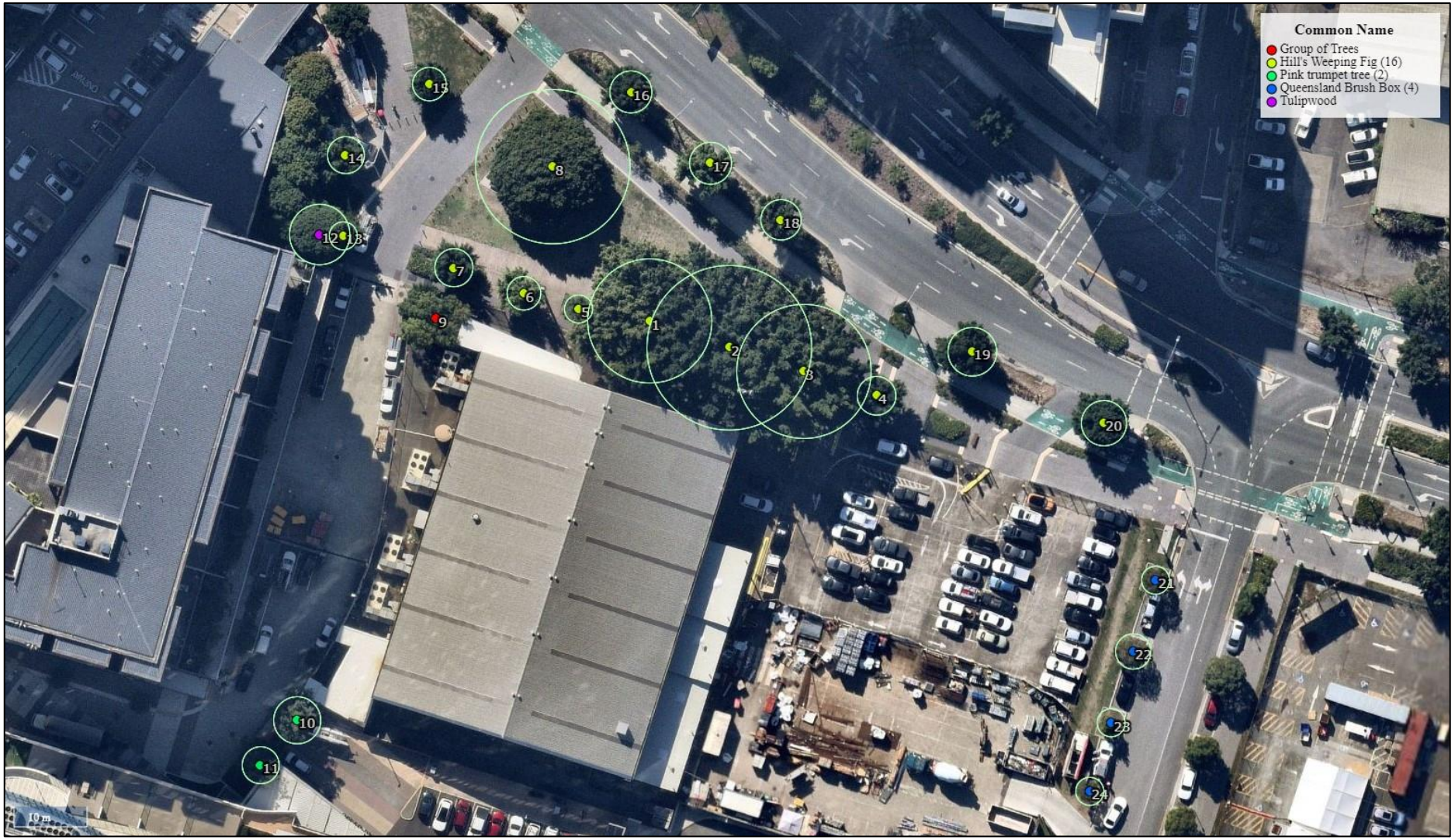
The following must occur:

BCC / QSG approvals must be in place prior to the commencement of any tree work for future construction work. Approvals are required should the Project Arborist prescribe pruning such as crown clean, canopy lift and/or directional pruning.

- Project Arborist must be appointed and engaged to guide the protection of protected trees from project commencement, i.e. during Design Planning and during the construction period until its completion.
- **All Arboricultural reports, TMPs, VMPs & approvals must be included in the CMP**
- Design Plans must be drafted to incorporate the utility alignment
- Arborist briefing of all engaged persons on their commencement as well as diligent work practice must occur during all approved future construction work.
- Root disturbance must be minimised to prevent accidental injury, compression and the creation of exposure points to allow future entry of pests and pathogens.
- **All work within any TPZ must be supervised by the Project Arborist.**

Reactionary processes, such as the emergence of deadwood, dieback etc. are likely to occur as a result of disturbance and/or injury to any retained tree on a construction site. Amended design plans and construction methodology can serve to avoid or minimise the likely emergence of such issues and therefore their associated future OH&S issues to the future occupants of the new dwellings and or pedestrian or vehicular traffic within the vicinity of retained tree/s. Any required pruning is to be undertaken by a minimum AQF Level 3 Arborist under the supervision of the Project Arborist (AQF Level 5).

Tree Locations



Please Note: Tree Locations are an approximate only (circles indicate the Tree Protection Zones as defined under AS4970-2009).

Tree Protection Plan

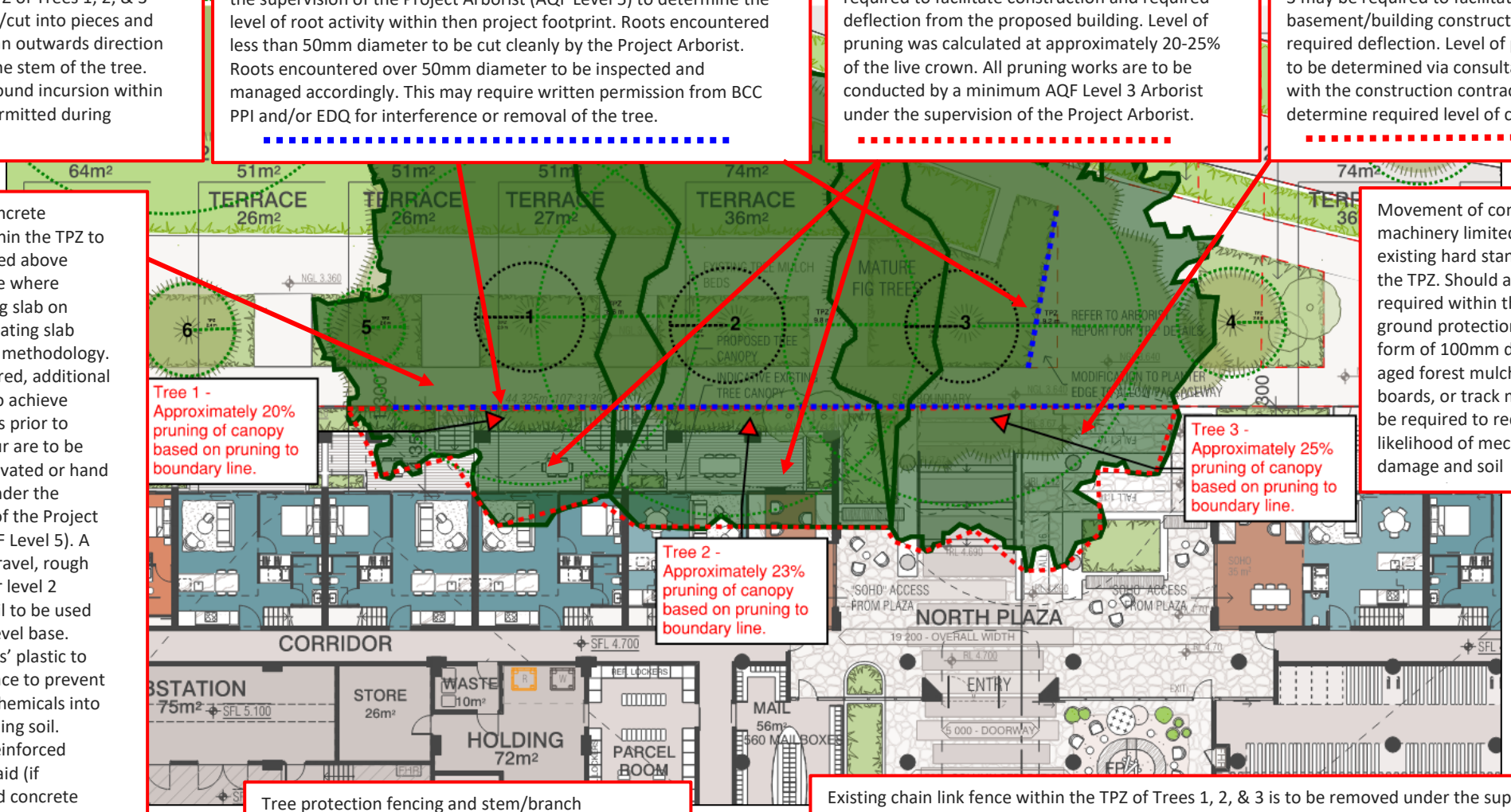
Existing concrete hardstand within the TPZ of Trees 1, 2, & 3 to be broken/cut into pieces and removed in an outwards direction away from the stem of the tree. No below ground incursion within the TPZ is permitted during demolition.

Alignment of required cut (Boundary) to be vacuum excavated under the supervision of the Project Arborist (AQF Level 5) to determine the level of root activity within then project footprint. Roots encountered less than 50mm diameter to be cut cleanly by the Project Arborist. Roots encountered over 50mm diameter to be inspected and managed accordingly. This may require written permission from BCC PPI and/or EDQ for interference or removal of the tree.

Directional pruning of Trees 1 & 2 will be required to facilitate construction and required deflection from the proposed building. Level of pruning was calculated at approximately 20-25% of the live crown. All pruning works are to be conducted by a minimum AQF Level 3 Arborist under the supervision of the Project Arborist.

Directional pruning/crown lift of Tree 3 may be required to facilitate basement/building construction and required deflection. Level of pruning to be determined via consultation with the construction contractor to determine required level of clearance.

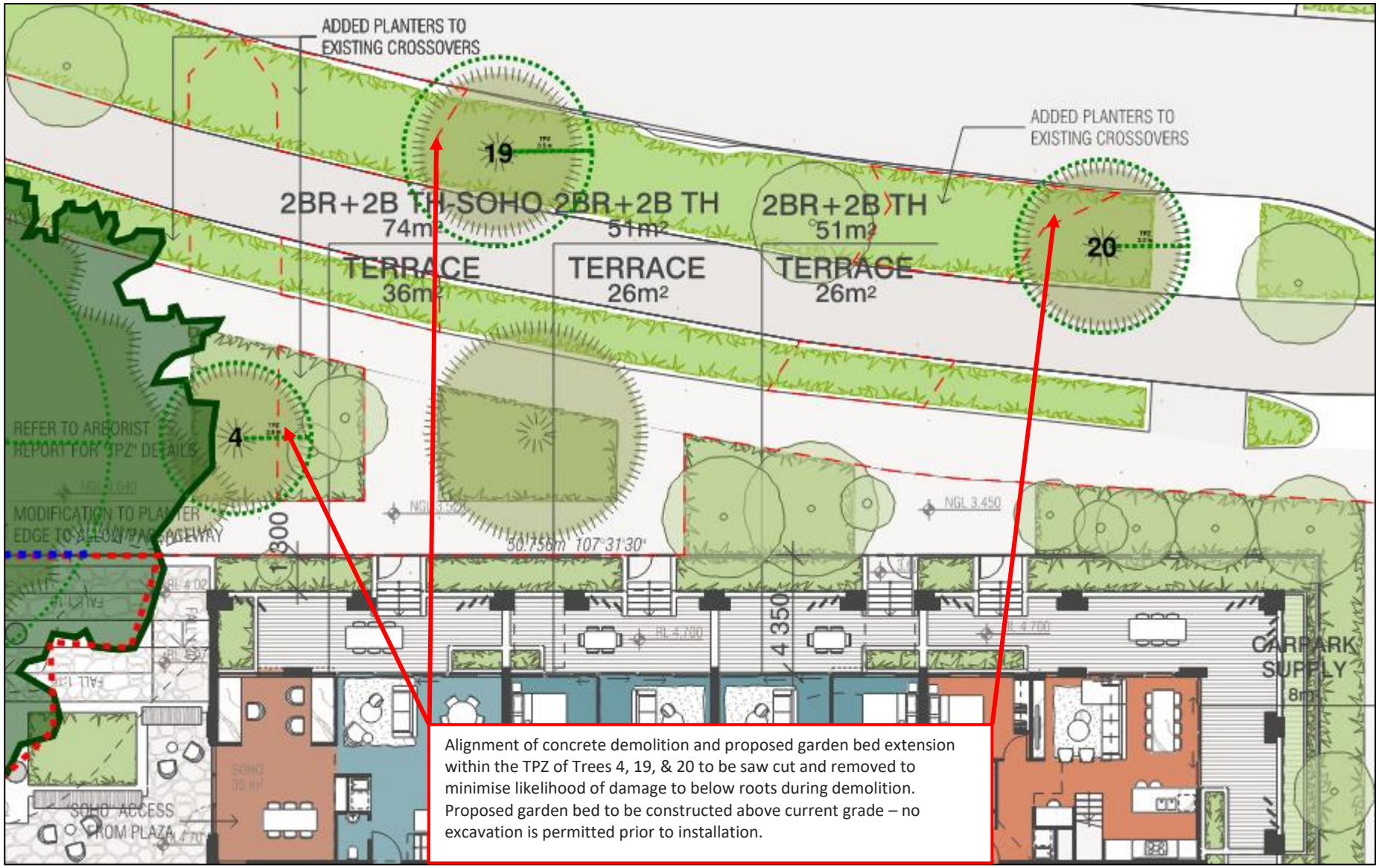
Proposed concrete footpath within the TPZ to be constructed above current grade where possible using slab on ground of floating slab construction methodology. Where required, additional excavation to achieve desired levels prior to concrete pour are to be vacuum excavated or hand excavated under the supervision of the Project Arborist (AQF Level 5). A bed of pea gravel, rough river sand, or level 2 structural soil to be used to create a level base. Black builders' plastic to line the surface to prevent leaching of chemicals into the surrounding soil. Chairs and reinforced mesh to be laid (if required) and concrete poured on top. Care is to be take not to have laydown or overpour within the TPZ.



Movement of construction machinery limited to existing hard stand within the TPZ. Should access be required within the TPZ, ground protection in the form of 100mm depth aged forest mulch, rumble boards, or track matts will be required to reduce the likelihood of mechanical damage and soil

Tree protection fencing and stem/branch protection to be installed and audited by the Project Arborist prior to works commencing. BCC PPI and NALL permission and/or EDQ permissions to be in place prior to works commencing.

Existing chain link fence within the TPZ of Trees 1, 2, & 3 is to be removed under the supervision of the Project Arborist. The chain mesh is to be removed, followed by the poles. The poles are to be grabbed and pulled directly upwards (using an excavator/Posi-track of similar). Should roots be identified around the existing footing, review by the Project Arborist will be required. This may require pruning of small roots, or use of vacuum excavation to minimise impacts to large roots.


ADDED PLANTERS TO EXISTING CROSSOVERS
19
2BR+2B TH-SOHO 74m²
2BR+2B TH 51m²
2BR+2B TH 51m²
TERRACE 36m²
TERRACE 26m²
TERRACE 26m²
ADDED PLANTERS TO EXISTING CROSSOVERS
20
4
REFER TO ARBORIST REPORT FOR TPZ DETAILS
MODIFICATION TO PLANTER EDGE TO ALLOW FOR DRIVEWAY
NGL 3.450
50.756m 107°31'30"
4.350
CARPARK SUPPLY
8m
SOHO ACCESS FROM PLAZA
Alignment of concrete demolition and proposed garden bed extension within the TPZ of Trees 4, 19, & 20 to be saw cut and removed to minimise likelihood of damage to below roots during demolition. Proposed garden bed to be constructed above current grade – no excavation is permitted prior to installation.

Subset (Basement) Plan

Tree Detail

Tree no.	Botanical Name	Common Name	DBH (cm)	TPZ (m)	Height (m)	Spread (m)	Location Descriptors (L)	Form and Vigour Descriptors (FV)	Useful Life Expectancy Ranges (E)	Comment
1	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	74	8.9	15	13	Could be better located but no problems	Good form with good vigour	50 Years	Deadwood under 50mm, Encroaching on structure / utilities
2	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	85	10.2	16	14	Could be better located but no problems	Good form with good vigour	50 Years	Deadwood under 50mm, Encroaching on structure / utilities
3	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	80	9.6	15	13	Could be better located but no problems	Good form with good vigour	50 Years	Deadwood under 50mm, Encroaching on structure / utilities
4	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	23	2.8	7	7	Could be better located but no problems	Good form with good vigour	50 years	
5	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	16	2.0	7	6	Could be better located but no problems	Good vigour with average form	50 years	Phototropic
6	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	20	2.4	7	8	Minor problems, e.g. lifting paving	Poor form with average vigour	30-39 years	Encroaching on structure / utilities, Head died out, Vine growth
7	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	23	2.7	8	9	Could be better located but no problems	Bifurcation of trunk and good vigour	50 years	Co-dominant Limbs

Tree no.	Botanical Name	Common Name	DBH (cm)	TPZ (m)	Height (m)	Spread (m)	Location Descriptors (L)	Form and Vigour Descriptors (FV)	Useful Life Expectancy Ranges (E)	Comment
8	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	92	11.0	11	15	Perfect suitability	Good form with good vigour	50 years	Deadwood under 50mm, Epicormic Growth
9	*Various spp.*	Group of Trees								Group of 12 *Syzygium luehmannii*
10	*Tabebuia rosea*	Pink trumpet tree	28	3.4	11	6	Could be better located but no problems	Good vigour with average form	30-39 years	Encroaching on structure / utilities, Epicormic Growth, Previously Lopped
11	*Tabebuia rosea*	Pink trumpet tree	22	2.6	8	5	Could be better located but no problems	Poor form with average vigour	30-39 years	Deadwood under 50mm, Epicormic Growth, Previously Lopped
12	*Harpullia pendula*	Tulipwood	36	4.3	14	9	Could be better located but no problems	Good form with good vigour	30-39 years	Encroaching on structure / utilities
13	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	16	2.0	9	4	Could be better located but no problems	Good vigour with poor form	50 years	Epicormic Growth, Phototropic, Previously Lopped
14	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	22	2.6	7	7	Could be better located but no problems	Poor form with average vigour	20-29 years	
15	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	20	2.4	7	7	Could be better located but no problems	Good form with good vigour	50 years	

Tree no.	Botanical Name	Common Name	DBH (cm)	TPZ (m)	Height (m)	Spread (m)	Location Descriptors (L)	Form and Vigour Descriptors (FV)	Useful Life Expectancy Ranges (E)	Comment
16	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	25	3.0	9	9	Could be better located but no problems	Good form with good vigour	50 years	
17	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	25	3.0	11	10	Could be better located but no problems	Good form with good vigour	50 years	
18	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	24	2.9	11	9	Could be better located but no problems	Good form with good vigour	50 years	
19	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	29	3.5	10	11	Could be better located but no problems	Good form with good vigour	50 years	
20	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	27	3.2	8	9	Could be better located but no problems	Good form with good vigour	50 years	
21	*Lophostemon confertus*	Queensland Brush Box	16	2.0	6	4	Could be better located but no problems	Poor vigour with average form	10-19 years	Dieback, Epicormic Growth, Girdling Roots, Poor crown density
22	*Lophostemon confertus*	Queensland Brush Box	21	2.5	7	5	Could be better located but no problems	Poor vigour with average form	10-19 years	Dieback, Epicormic Growth, Girdling Roots, Poor crown density
23	*Lophostemon confertus*	Queensland Brush Box	10	2.0	5	2	Could be better located but no problems	Good vigour with average form	40-49 years	Broken Limbs

Tree no.	Botanical Name	Common Name	DBH (cm)	TPZ (m)	Height (m)	Spread (m)	Location Descriptors (L)	Form and Vigour Descriptors (FV)	Useful Life Expectancy Ranges (E)	Comment
24	*Lophostemon confertus*	Queensland Brush Box	11	2.0	4	3	Could be better located but no problems	Poor form and poor vigour	< 10 years	Broken Limbs, Epicormic Growth

Table Legend:					
BCC Modifier Calculations					
LOCATION DESCRIPTORS	**MODIFIERS (L)**	**FORM AND VIGOUR DESCRIPTORS**	**MODIFIERS (FV)**	**USEFUL LIFE EXPECTANCY RANGES**	**MODIFIER VALUE (E)**
Perfect suitability	1	Perfect form and excellent vigour	1	50 Years	1
Could be better located but no problems	0.9	Slight imperfections in form	0.9	40-49 Years	0.9
Minor problems, e.g. lifting paving	0.8	Slightly reduced vigour	0.9	30-39 Years	0.8
Species unsuited or causes problems	0.7	Slight imperfections and slightly reduced vigour	0.8	20-29 Years	0.7
Species unsuited and causes problems	0.6	Good form with good vigour	0.75	10-19 Years	0.6
Species unsuited and causes major problems	0.5	Good form with average vigour	0.7	< 10 Years	0.5
Species unsuitable	0.4	Good vigour with average form	0.7		
		Good form with poor vigour	0.65		
		Good vigour with poor form	0.65		
		Bifurcation of trunk and excellent vigour	0.6		
		Bifurcation of trunk and good vigour	0.55		
		Bifurcation of trunk and average vigour	0.5		
		Bifurcation of trunk and poor vigour	0.4		
		Poor form with average vigour	0.3		
		Poor vigour with average form	0.3		
		Poor form and poor vigour	0.2		
		Excessive deadwood, cavities and poor form	0.1		
		Dead	0		

Tree Retention Recommendations

Tree No.	Botanical Name	Common Name	DBH (cm)	TPZ (m)	Impact	Recommendation
1	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	74	8.9	Major incursion into the TPZ (≈16.8%) from proposed above and below ground construction. Approximately 20% of live crown will require pruning.	Retain & protect • Existing concrete hardstand within the TPZ to be broken/cut into pieces and removed in an outwards direction away from the stem of the tree. No below ground incursion within the TPZ is permitted during demolition. • Proposed concrete footpath within the TPZ to be constructed above current grade where possible using slab on ground of floating slab construction methodology. Where required, additional excavation to achieve desired levels prior to concrete pour are to be vacuum excavated or hand excavated under the supervision of the Project Arborist (AQF Level 5). • A bed of pea gravel, rough river sand, or level 2 structural soil to be used to create a level base. • Black builders' plastic to line the surface to prevent leaching of chemicals into the surrounding soil. • Chairs and reinforced mesh to be laid (if required) and concrete poured on top. Care is to be take not to have laydown or overpour within the TPZ of Tree 1. • Existing chain link fence within the TPZ is to be removed under the supervision of the Project Arborist. The chain mesh is to be removed, followed by the poles. The poles are to be grabbed and pulled directly upwards (using an excavator/Posi-track of similar). Should roots be identified around the existing footing, review by the Project Arborist will be required. This may require pruning of small roots, or use of vacuum excavation to minimise impacts to large roots. • Alignment of required cut (Boundary) to be vacuum excavated under the supervision of the Project Arborist (AQF Level 5) to determine the level of root activity within then project footprint. • Roots encountered less than 50mm diameter to be cut cleanly by the Project Arborist. Roots encountered over 50mm diameter to be inspected and managed accordingly. • Following root pruning, excavation within the *Subject Site* to be conducted using standard construction methodology. • Directional pruning will be required to facilitate construction and required deflection from the proposed building. Level of pruning was calculated at approximately 20% of the live crown. • All pruning works are to be conducted by a minimum AQF Level 3 Arborist under the supervision of the Project Arborist. • All regulatory permissions to be in place before works commence. • No excavation within garden bed (not including gentle removal of mulch) is permitted. • Any proposed services within the TPZ to be located within the *Subject Site.* • Movement of construction machinery limited to existing hard stand within the TPZ. Should access be required within the TPZ, ground protection in the form of 100mm depth aged forest mulch, rumble

Tree No.	Botanical Name	Common Name	DBH (cm)	TPZ (m)	Impact	Recommendation
						boards, or track mats will be required to reduce the likelihood of mechanical damage and soil compaction.
2	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	85	10.2	Major incursion into the TPZ (≈22.5%) from proposed above and below ground construction. Approximately 23% of live crown will require pruning.	Retain & protect • Existing concrete hardstand within the TPZ to be broken/cut into pieces and removed in an outwards direction away from the stem of the tree. No below ground incursion within the TPZ is permitted during demolition. • Proposed concrete footpath within the TPZ to be constructed above current grade where possible using slab on ground of floating slab construction methodology. Where required, additional excavation to achieve desired levels prior to concrete pour are to be vacuum excavated or hand excavated under the supervision of the Project Arborist (AQF Level 5). • A bed of pea gravel, rough river sand, or level 2 structural soil to be used to create a level base. • Black builders' plastic to line the surface to prevent leaching of chemicals into the surrounding soil. • Chairs and reinforced mesh to be laid (if required) and concrete poured on top. Care is to be take not to have laydown or overpour within the TPZ of Tree 2. • Existing chain link fence within the TPZ is to be removed under the supervision of the Project Arborist. The chain mesh is to be removed, followed by the poles. The poles are to be grabbed and pulled directly upwards (using an excavator/Posi-track of similar). Should roots be identified around the existing footing, review by the Project Arborist will be required. This may require pruning of small roots, or use of vacuum excavation to minimise impacts to large roots. • Alignment of required cut (Boundary) to be vacuum excavated under the supervision of the Project Arborist (AQF Level 5) to determine the level of root activity within then project footprint. • Roots encountered less than 50mm diameter to be cut cleanly by the Project Arborist. Roots encountered over 50mm diameter to be inspected and managed accordingly. • Following root pruning, excavation within the *Subject Site* to be conducted using standard construction methodology. • Directional pruning will be required to facilitate construction and required deflection from the proposed building. Level of pruning was calculated at approximately 23% of the live crown. • All pruning works are to be conducted by a minimum AQF Level 3 Arborist under the supervision of the Project Arborist. • All regulatory permissions to be in place before works commence. • No excavation within garden bed (not including gentle removal of mulch) is permitted. • Any proposed services within the TPZ to be located within the *Subject Site.* • Movement of construction machinery limited to existing hard stand within the TPZ. Should access be required within the TPZ, ground protection in the form of 100mm depth aged forest mulch, rumble

Tree No.	Botanical Name	Common Name	DBH (cm)	TPZ (m)	Impact	Recommendation
						boards, or track mats will be required to reduce the likelihood of mechanical damage and soil compaction.
3	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	80	9.6	Major incursion into the TPZ (≈21%) from proposed above and below ground construction. Approximately 25% of live crown will require pruning.	Retain & protect • Existing concrete hardstand within the TPZ to be broken/cut into pieces and removed in an outwards direction away from the stem of the tree. No below ground incursion within the TPZ is permitted during demolition. • Proposed concrete footpath within the TPZ to be constructed above current grade where possible using slab on ground of floating slab construction methodology. Where required, additional excavation to achieve desired levels prior to concrete pour are to be vacuum excavated or hand excavated under the supervision of the Project Arborist (AQF Level 5). • A bed of pea gravel, rough river sand, or level 2 structural soil to be used to create a level base. • Black builders' plastic to line the surface to prevent leaching of chemicals into the surrounding soil. • Chairs and reinforced mesh to be laid (if required) and concrete poured on top. Care is to be take not to have laydown or overpour within the TPZ of Tree 3. • Existing chain link fence within the TPZ is to be removed under the supervision of the Project Arborist. The chain mesh is to be removed, followed by the poles. The poles are to be grabbed and pulled directly upwards (using an excavator/Posi-track of similar). Should roots be identified around the existing footing, review by the Project Arborist will be required. This may require pruning of small roots, or use of vacuum excavation to minimise impacts to large roots. • Alignment of required cut (Boundary) to be vacuum excavated under the supervision of the Project Arborist (AQF Level 5) to determine the level of root activity within then project footprint. • Roots encountered less than 50mm diameter to be cut cleanly by the Project Arborist. Roots encountered over 50mm diameter to be inspected and managed accordingly. • Following root pruning, excavation within the *Subject Site* to be conducted using standard construction methodology. • Directional pruning will be required to facilitate construction and required deflection from the proposed building. Level of pruning was calculated at approximately 25% of the live crown (pending review of basement construction methodology). • All pruning works are to be conducted by a minimum AQF Level 3 Arborist under the supervision of the Project Arborist. • All regulatory permissions to be in place before works commence. • No excavation within garden bed (not including gentle removal of mulch) is permitted. • Any proposed services within the TPZ to be located within the *Subject Site.*

Tree No.	Botanical Name	Common Name	DBH (cm)	TPZ (m)	Impact	Recommendation
						• Movement of construction machinery limited to existing hard stand within the TPZ. Should access be required within the TPZ, ground protection in the form of 100mm depth aged forest mulch, rumble boards, or track mats will be required to reduce the likelihood of mechanical damage and soil compaction.
4	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	23	2.8	Major incursion into the TPZ (≈16%) from the proposed demolition of the adjacent concrete crossover and installation of new garden bed.	Retain & protect. • Alignment of concrete demolition and proposed garden bed extension within the TPZ to be saw cut and removed to minimise likelihood of damage to below roots during demolition. • Proposed garden bed to be constructed above current grade – no excavation is permitted prior to installation.
5	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	16	2.0	No impact from the proposed works.	Retain & protect. • Project Arborist to be consulted should roots greater than 50mm diameter be encountered during demolition and construction works outside of the TPZ.
6	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	20	2.4	Minor incursion into the TPZ (≈6%) from demolition of the existing footpath and construction of the proposed footpath.	Retain & protect. • Project Arborist to be consulted should roots greater than 50mm diameter be encountered during demolition and construction works outside of the TPZ.
7	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	23	2.7	Minor incursion into the TPZ (≈8%) from demolition of the existing footpath and construction of the proposed footpath.	Retain & protect. • Project Arborist to be consulted should roots greater than 50mm diameter be encountered during demolition and construction works outside of the TPZ.
8	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	92	11.0	No impact from the proposed works.	Retain & protect.
10	*Tabebuia rosea*	Pink trumpet tree	28	3.4	Major incursion into the TPZ (≈31%) from the proposed garden bed.	Retention status pending Project Arborist review of detailed landscape plans. Should Tree 10 be required to be removed, ensure all relevant permits and approvals including tree owner's permission is in place.

Tree No.	Botanical Name	Common Name	DBH (cm)	TPZ (m)	Impact	Recommendation
11	*Tabebuia rosea*	Pink trumpet tree	22	2.6	No impact from the proposed works.	Retain & protect.
12	*Harpullia pendula*	Tulipwood	36	4.3	No impact from the proposed works.	Retain & protect.
13	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	16	2.0	No impact from the proposed works.	Retain & protect.
14	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	22	2.6	No impact from the proposed works.	Retain & protect. BCC PPI and/or EDQ to be notified of existing damage from previous works.
15	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	20	2.4	No impact from the proposed works.	Retain & protect.
16	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	25	3.0	No impact from the proposed works.	Retain & protect.
17	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	25	3.0	No impact from the proposed works.	Retain & protect.
18	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	24	2.9	No impact from the proposed works.	Retain & protect.
19	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	29	3.5	Major incursion into the TPZ (≈12%) from the proposed demolition of the adjacent concrete crossover and installation of new garden bed.	Retain & protect. • Alignment of concrete demolition and proposed garden bed extension within the TPZ to be saw cut and removed to minimise likelihood of damage to below roots during demolition. • Proposed garden bed to be constructed above current grade – no excavation is permitted prior to installation.
20	*Ficus microcarpa var. hillii*	Hill's Weeping Fig	27	3.2	Major incursion into the TPZ (≈12%) from the proposed	Retain & protect.

Tree No.	Botanical Name	Common Name	DBH (cm)	TPZ (m)	Impact	Recommendation
					demolition of the adjacent concrete crossover and installation of new garden bed.	• Alignment of concrete demolition and proposed garden bed extension within the TPZ to be saw cut and removed to minimise likelihood of damage to below roots during demolition. • Proposed garden bed to be constructed above current grade – no excavation is permitted prior to installation.
21	*Lophostemon confertus*	Queensland Brush Box	16	2.0	Minor incursion into the TPZ (<1%) from the installation of the proposed footpath.	Retain & protect. • Project Arborist to be consulted should roots greater than 50mm diameter be encountered during demolition and construction works outside of the TPZ.
22	*Lophostemon confertus*	Queensland Brush Box	21	2.5	Minor incursion into the TPZ (≈7%) from the installation of the proposed footpath.	Retain & protect. • Project Arborist to be consulted should roots greater than 50mm diameter be encountered during demolition and construction works outside of the TPZ.
23	*Lophostemon confertus*	Queensland Brush Box	10	2.0	Minor incursion into the TPZ (<1%) from the installation of the proposed footpath.	Retain & protect. • Project Arborist to be consulted should roots greater than 50mm diameter be encountered during demolition and construction works outside of the TPZ.
24	*Lophostemon confertus*	Queensland Brush Box	11	2.0	Minor incursion into the TPZ (≈2%) from the installation of the proposed footpath.	Retain & protect. • Project Arborist to be consulted should roots greater than 50mm diameter be encountered during demolition and construction works outside of the TPZ.

Tree Removal Recommendations

Tree No.	Botanical Name	Common Name	DBH (cm)	TPZ (m)	Impact	Recommendation
9	*Various spp.*	Group of Trees			Major incursion into the TPZ from the proposed works.	Remove & replace.

Tree Protection Measures and Guidelines

Note 1: TPZ perimeter fencing should be grouped where perimeters overlap and appropriate.

Note 2: Signage is to be installed in accordance with Australian Standard AS 4970-2009 Protection of trees on development sites as illustrated below.

Protective Fencing

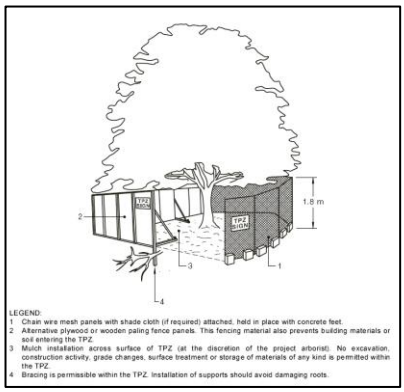


Figure 2

Examples of Trunk, Branch & Ground Protection

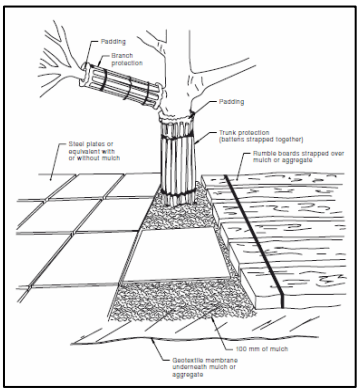


Figure 3

Tree Protection Zone Signage

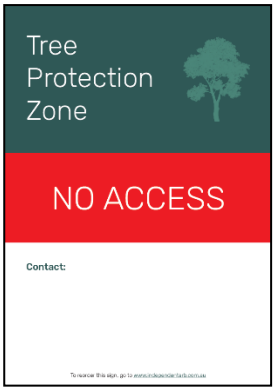


Figure 4

Low pressure Ground Excavation & Water Cutting

Figure 5

Figure 6

Figure 7

Figure 8

Example of Fauna Friendly Rigid Style Temporary Fencing

Figure 9

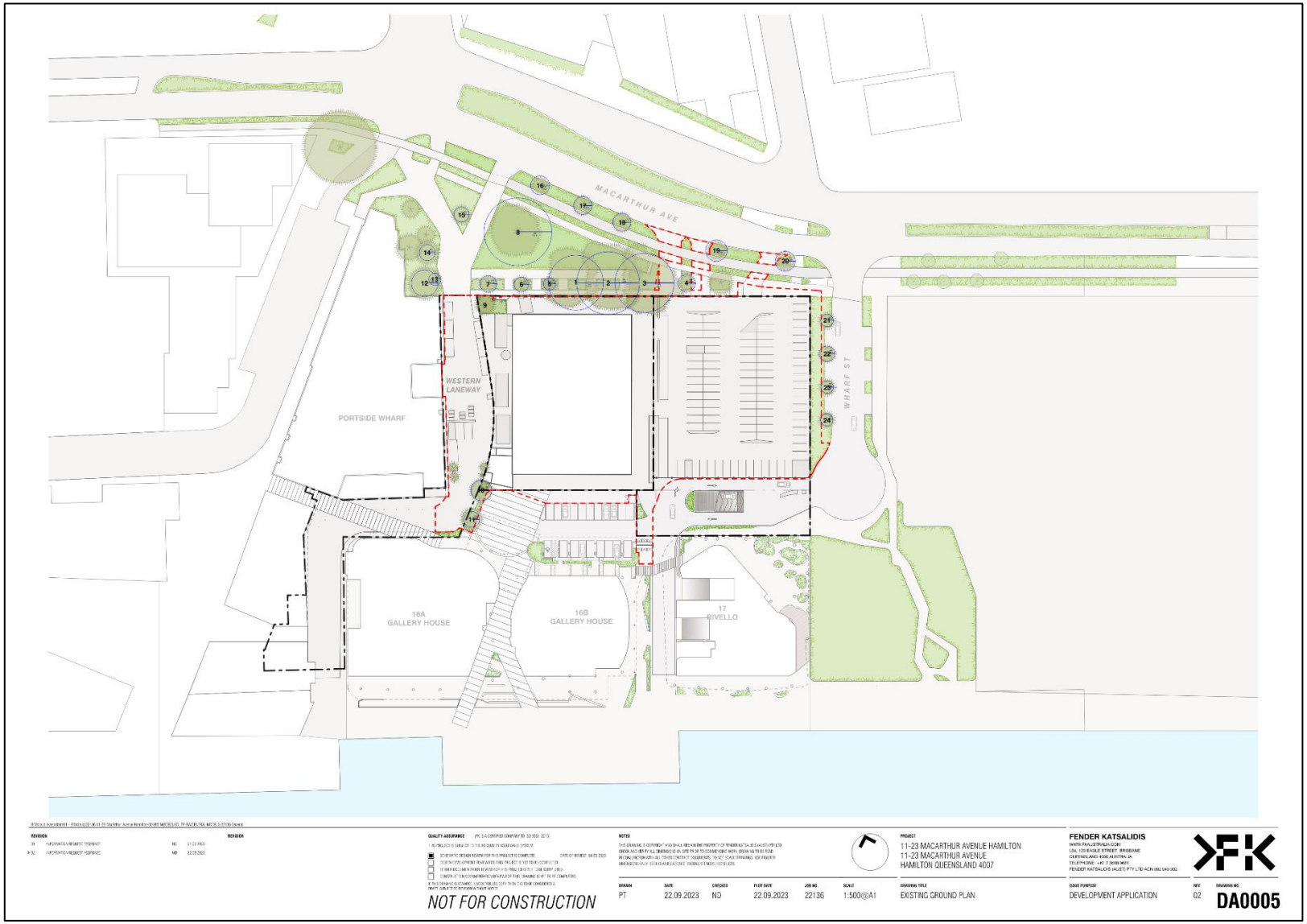
Figure 10

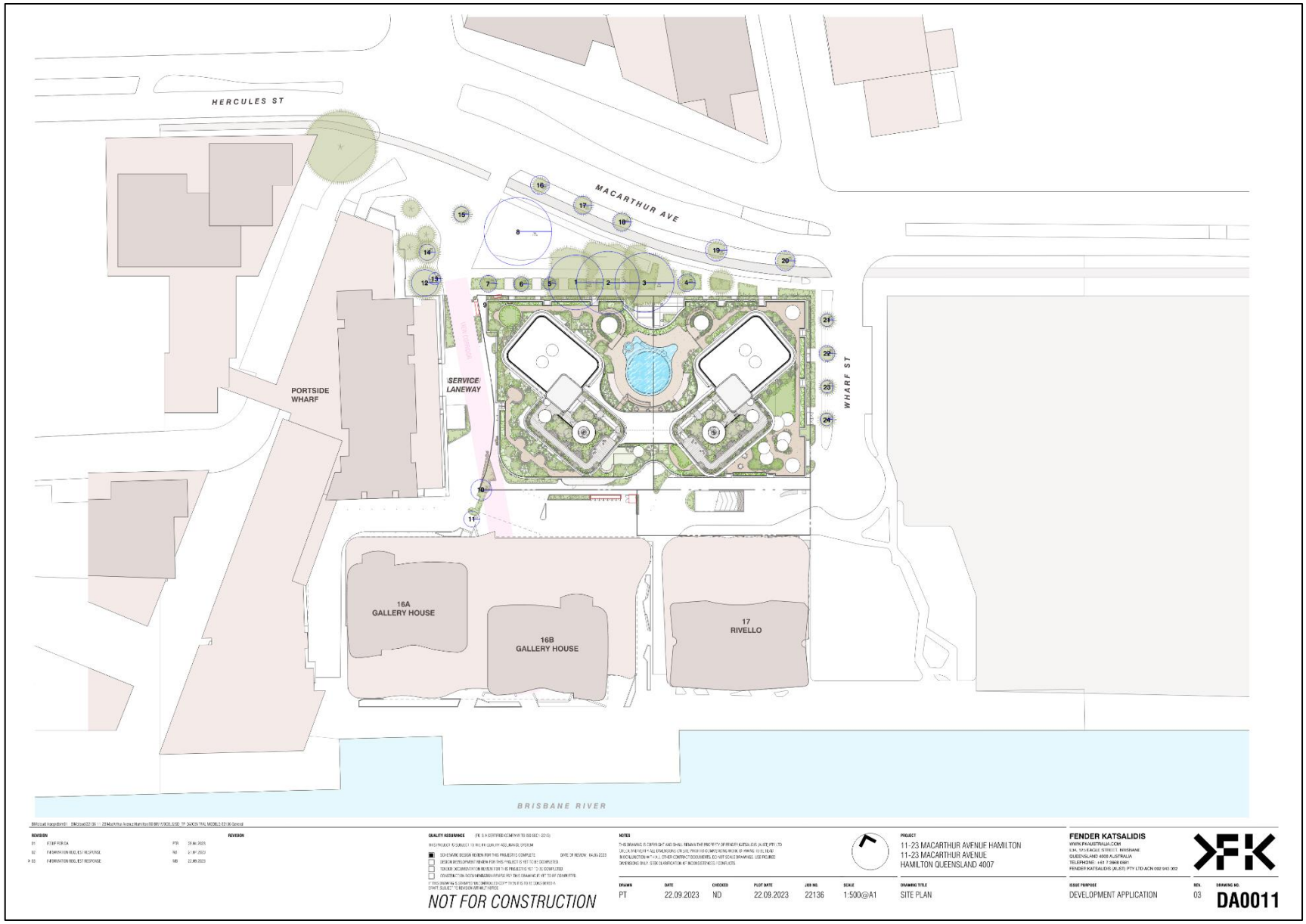
Source: AS4970-2009 Protection of Trees on Development Sites

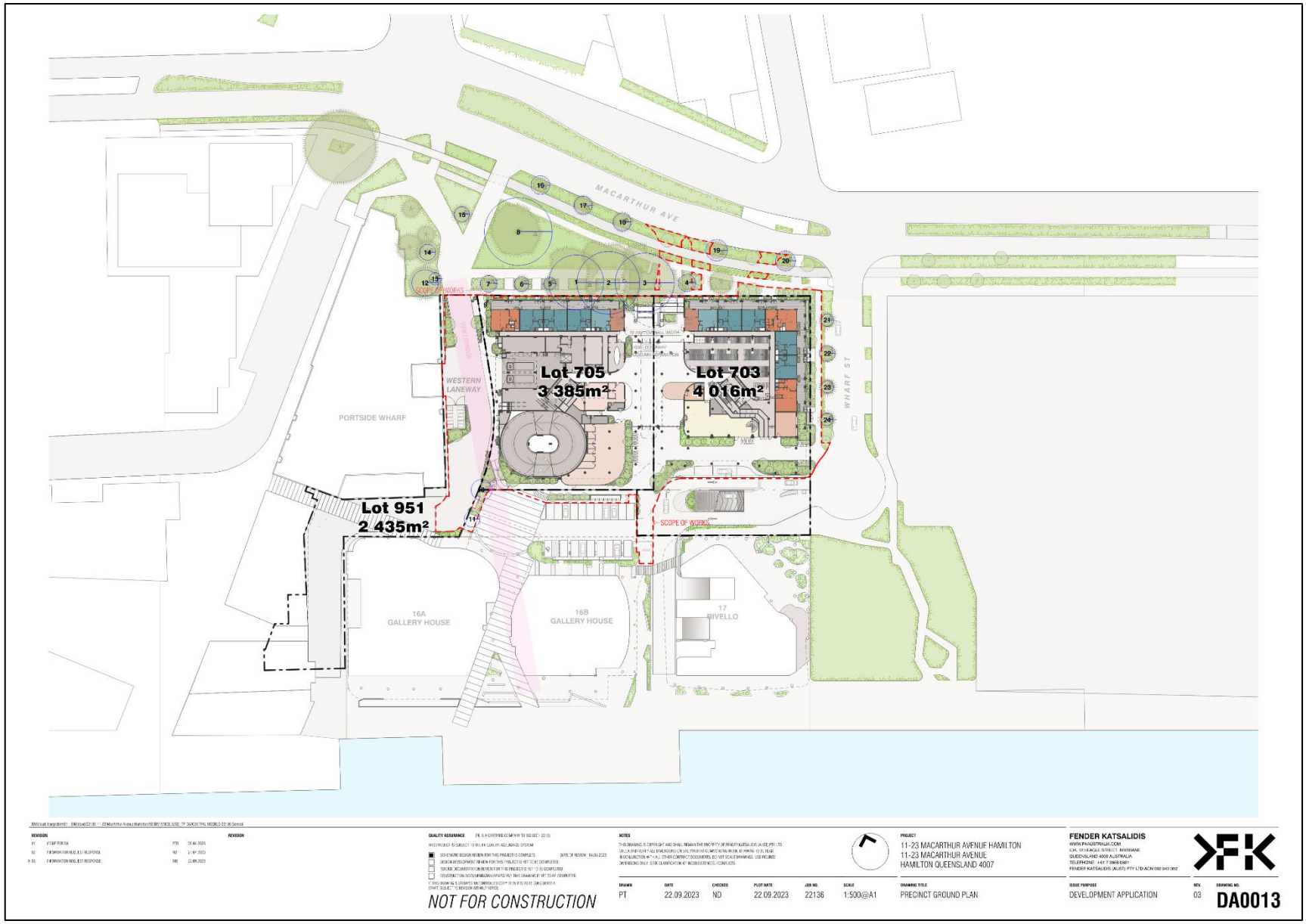
Tree Management Plan (TMP) – Works Progress: Development Phase

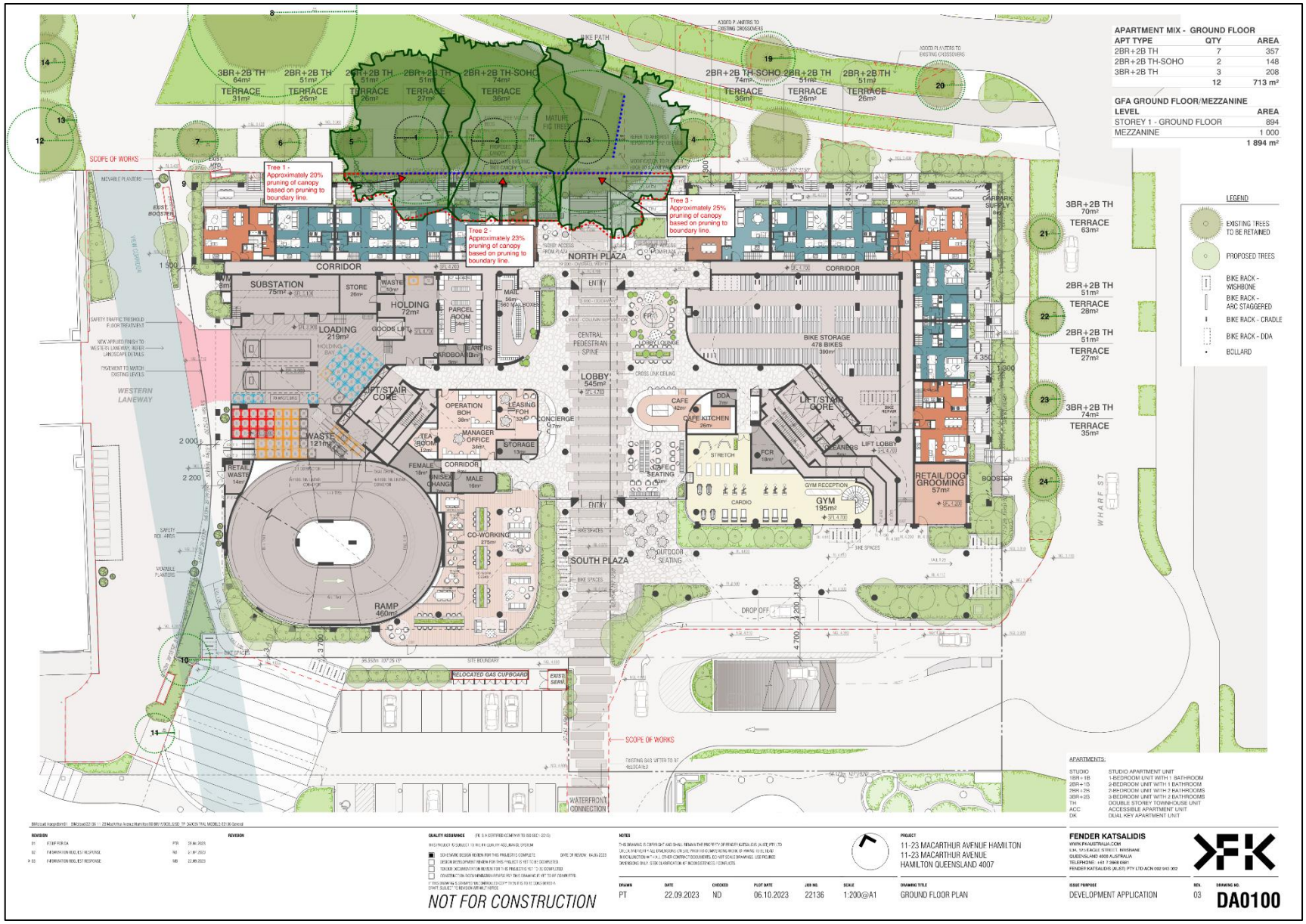
Stage	Tasks	Specific Outcomes
Pre-construction Phase		
Prepare and finalise Arboricultural Impact Assessments for submission to Council	Project Arborist to be appointed Review tree details in all approved Arboricultural reports following any new issue of plans	Submit Arboricultural reports including Arboricultural Impact Assessment for final Council Approval
Project Arborist to conduct Prestart Meeting with all representatives involved in construction	Prior to meeting: TPZ temporary protection/fencing installed **Arboricultural Report, TMP & Council approval copies to be included in CMP** and made available to onsite crews	Prestart Certification and approvals in place & available onsite with CMP
Commencement - Construction Phase		
Initial Site Preparation	Project Arborist to supervise all tree work. **Construction crew or others are not to remove any part of a tree.** Arborist prestart site inspection.	Compliance Certification of Arboricultural works for lodgement to Council Arborist certification of TPZ measures.
Prestart Toolbox Meeting	All relevant onsite crews to be briefed by Project Arborist prior to commencement of each work phase. Project Arborist must be notified and onsite at all times when construction works are within or close to TPZ. Note: Onsite attendance of Project Arborist is a condition for issue of Arboricultural Site Audit Statement/s.	Arborist Site Audit Reporting system to be in place. Copies of Arboricultural Report to be retained onsite. Arboricultural Site Audit Statement/s will not be issued retrospectively
Construction Phase		
Site Establishment	Project Arborist to monitor tree health during establishment phase including bulk earthworks, changes in hydrology etc.	Instigate remedial tree care measures if required
Construction work	Site Manager to liaise with and ensure Project Arborist is advised in time to allow them to be present for all work carried out within TPZ area including any work likely to affect identified tree/s. Any deviation/s from approved plans to be approved by Project Arborist. **Project Arborist to provide ongoing Site Audit Certification of all work within TPZ**	Any remedial tree works to be carried out by qualified arborists under supervision of Project Arborist. Project Arborist is responsible for issue of Arborist Site Audit Reports.
Practical Completion	Project Arborist to carryout review of tree health and vigour and advise on TPZ fencing.	On Project Arborist approval, carryout removal of remaining temporary tree protection measures
Post Construction Phase		
Final Arborist inspection	Carryout tree health review and provide recommendations for required tree care.	Issue of final Arborist Site Audit Compliance Statement for inclusion in final DA documentation and sealing.

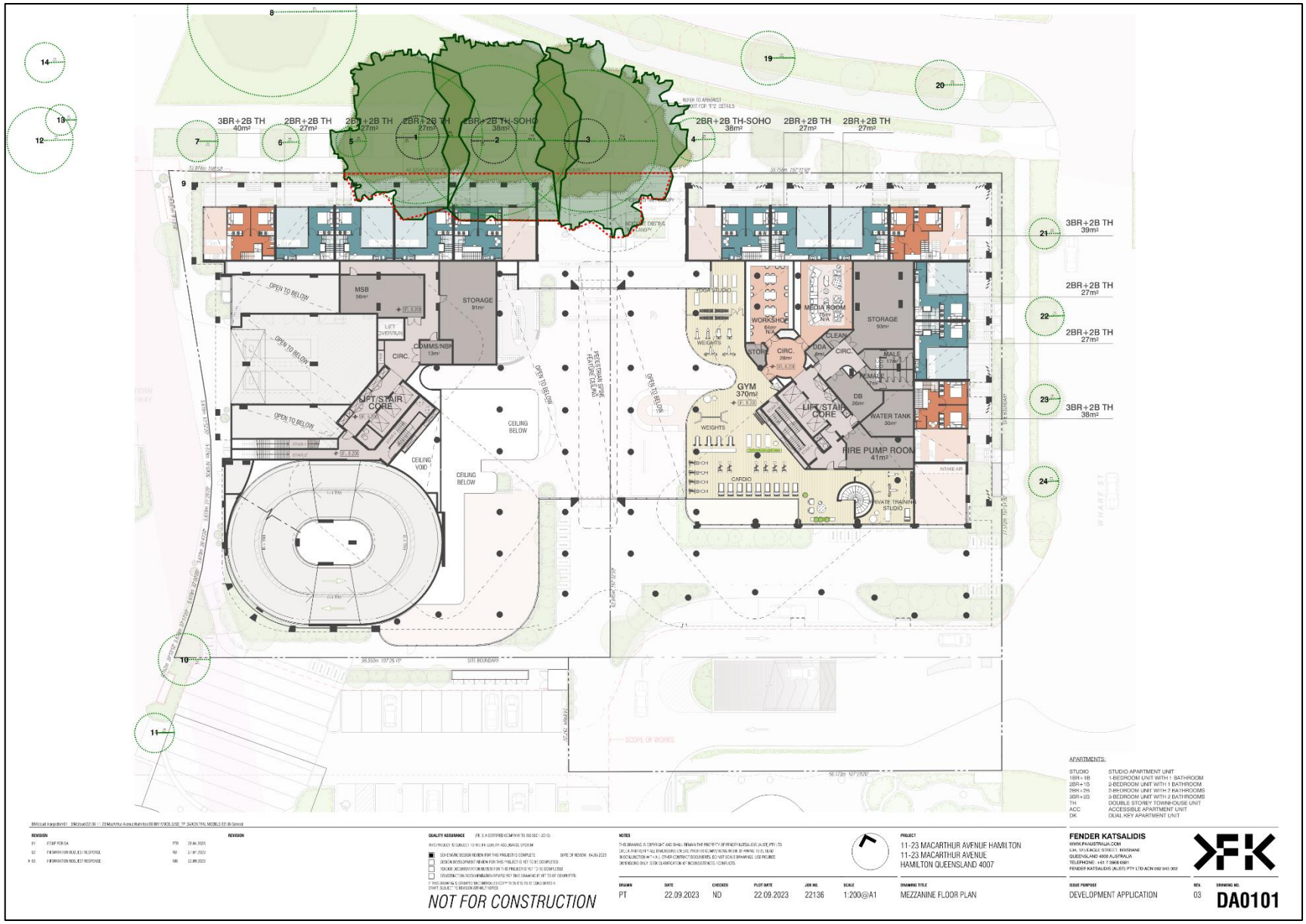
Plans

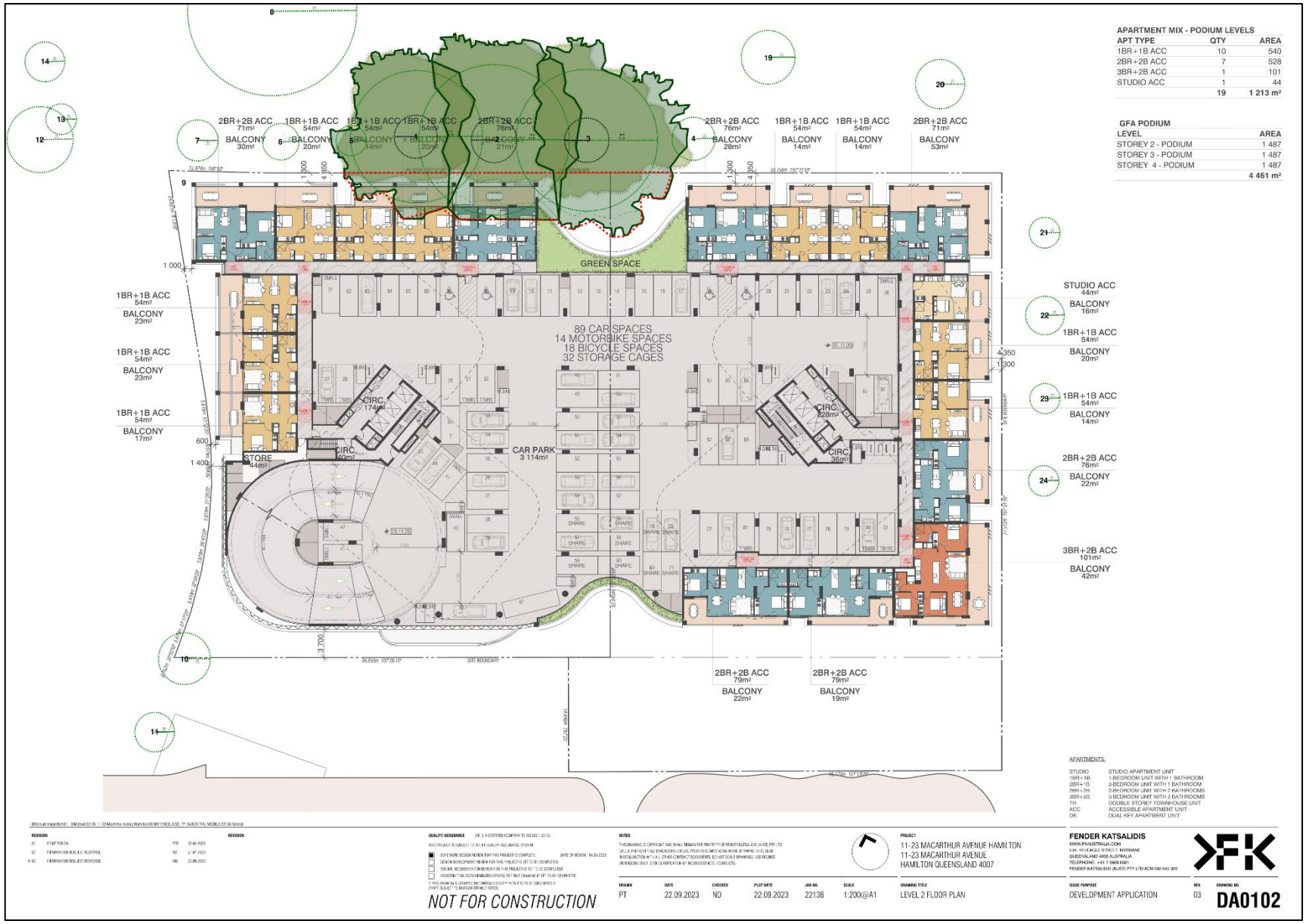

MACARTHUR AVE
WESTERN LANEWAY
PORTSIDE WHARF
WHARF ST
16A GALLERY HOUSE
16B GALLERY HOUSE
17 RIVELLO
NOT FOR CONSTRUCTION
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007
FENDER KATSALIDIS
EXISTING GROUND PLAN
DEVELOPMENT APPLICATION
DA0005

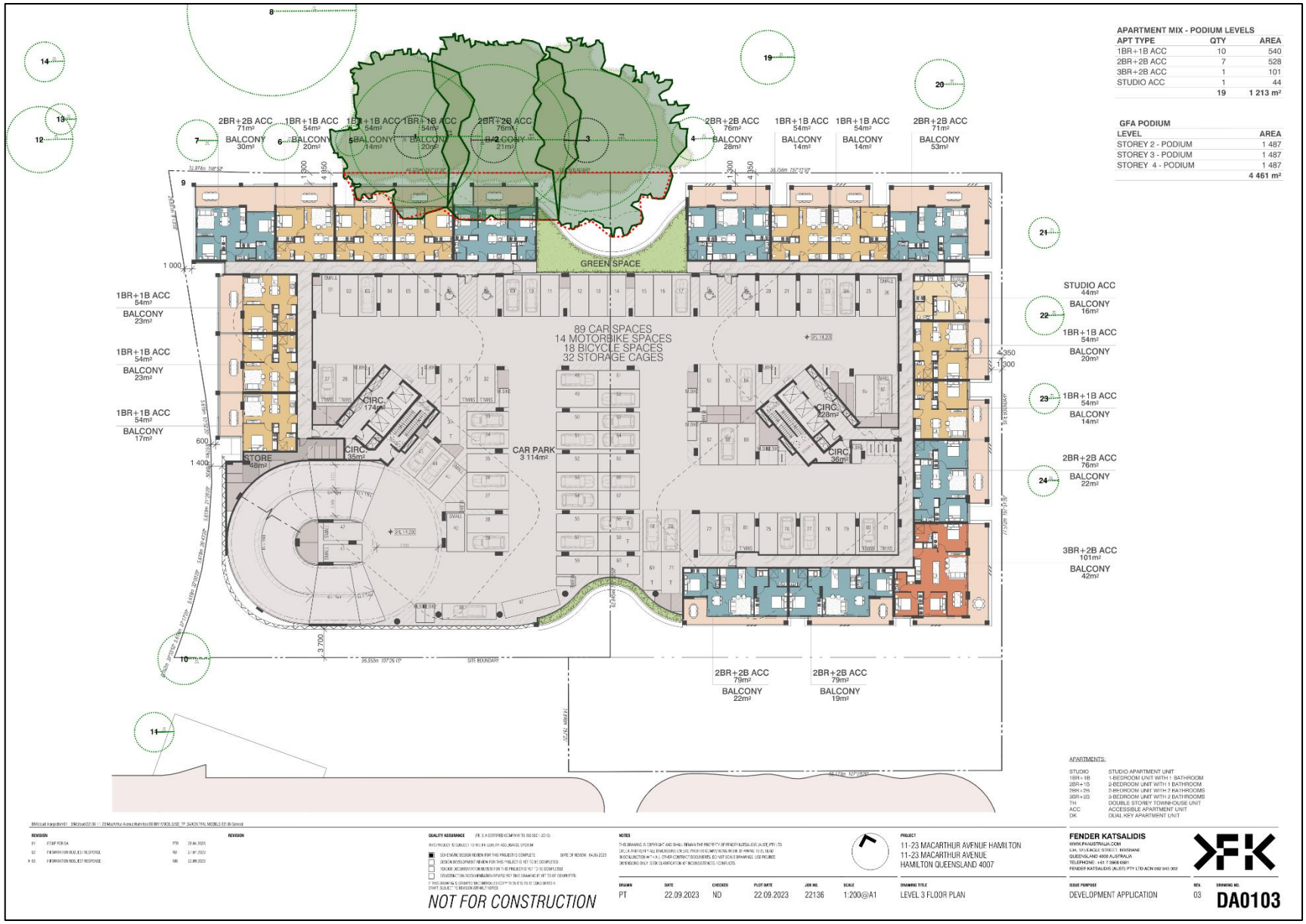

HERCULES ST
MACARTHUR AVE
WHARF ST
SERVICE LANEWAY
PORTSIDE WHARF
16A GALLERY HOUSE
16B GALLERY HOUSE
17 RIVELLO
BRISBANE RIVER
NOT FOR CONSTRUCTION
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007
SITE PLAN
DEVELOPMENT APPLICATION
DA0011

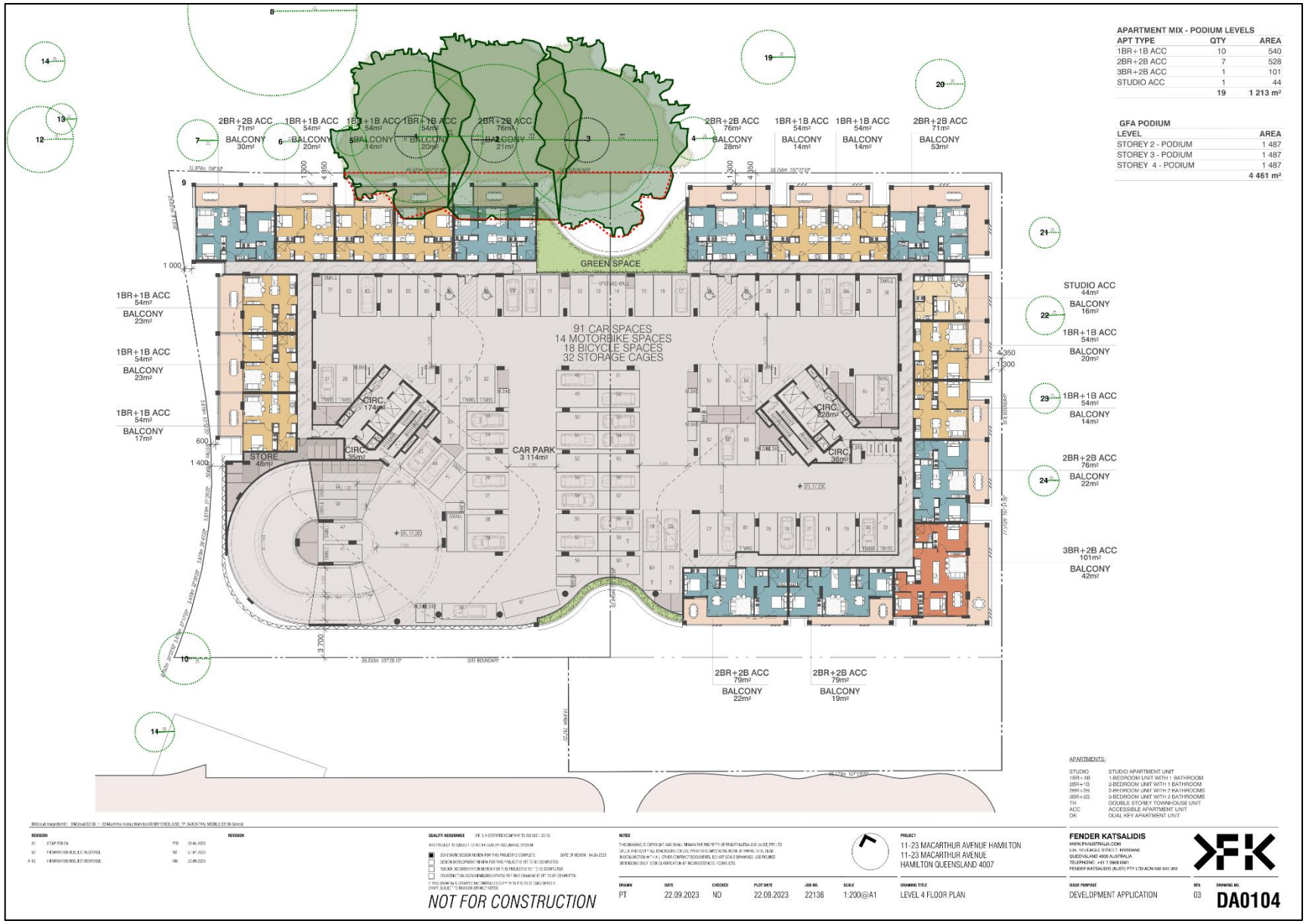

MACARTHUR AVE
WHARF ST
WESTERN LANEWAY
PORTSIDE WHARF
Lot 705
3 385m²
Lot 703
4 016m²
Lot 951
2 435m²
SCOPE OF WORKS
16A
GALLERY HOUSE
16B
GALLERY HOUSE
17
RIVELLO
NOT FOR CONSTRUCTION
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007
FENDER KATSALIDIS
PRECINCT GROUND PLAN
DEVELOPMENT APPLICATION
DA0013

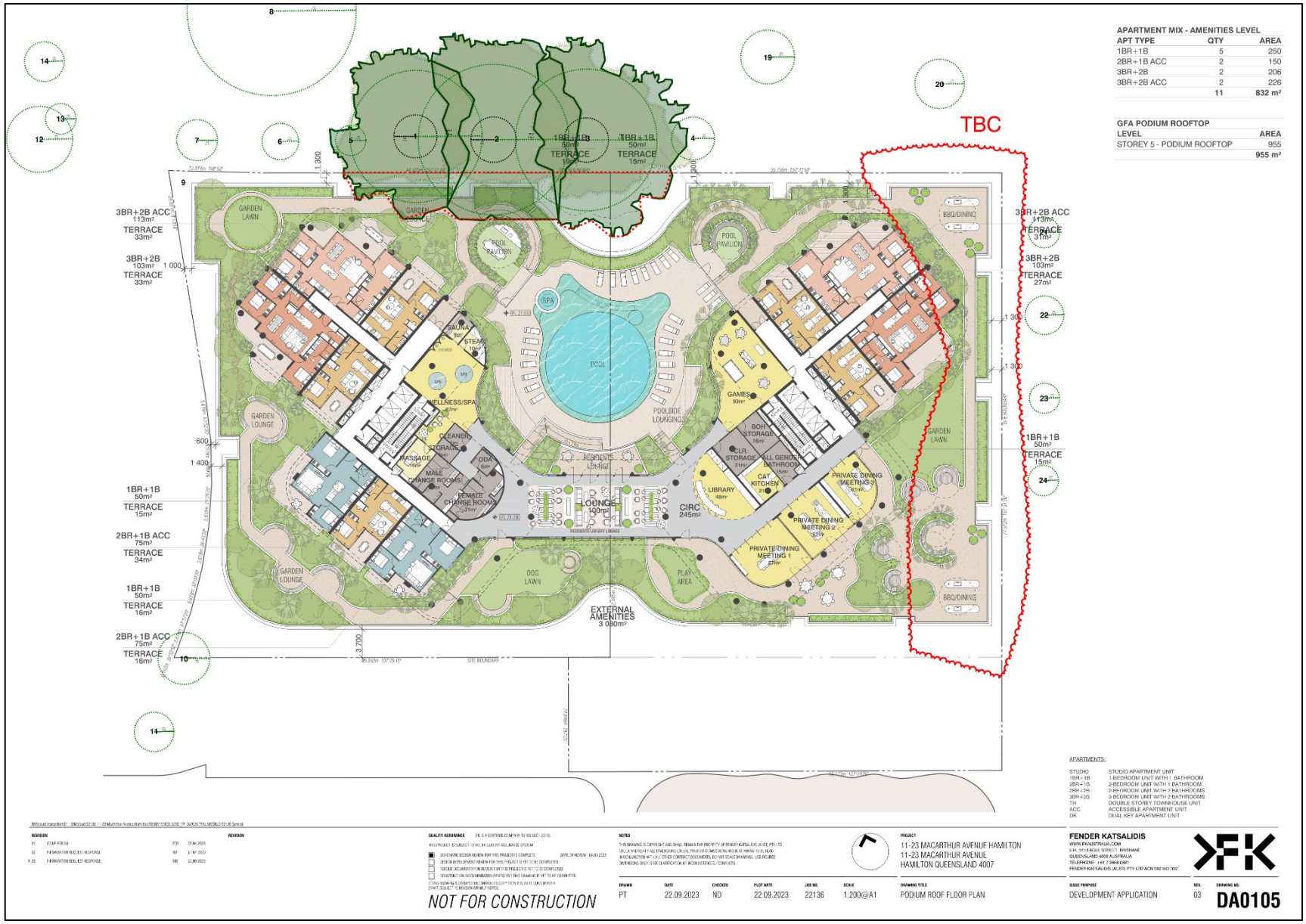

APARTMENT MIX - GROUND FLOOR
APT TYPE | QTY | AREA
2BR+2B TH | 7 | 357
2BR+2B TH-SOHO | 2 | 148
3BR+2B TH | 3 | 208
12 | 713 m²
GFA GROUND FLOOR/MEZZANINE
LEVEL | AREA
STOREY 1 - GROUND FLOOR | 894
MEZZANINE | 1 000
1 894 m²
LEGEND
EXISTING TREES TO BE RETAINED
PROPOSED TREES
BIKE RACK - WISHBONE
BIKE RACK - ARC STAGGERED
BIKE RACK - CRADLE
BIKE RACK - DDA
BOLLARD
Tree 1 - Approximately 20% pruning of canopy based on pruning to boundary line.
Tree 2 - Approximately 23% pruning of canopy based on pruning to boundary line.
Tree 3 - Approximately 25% pruning of canopy based on pruning to boundary line.
SCOPE OF WORKS
NORTH PLAZA
SOUTH PLAZA
CORRIDOR
SUBSTATION
LOADING
HOLDING
LOBBY
LIFT/STAIR CORE
BIKE STORAGE 478 BIKES
CAFE
GYM
RETAIL/DOG GROOMING
CO-WORKING
RAMP
DROP OFF
WESTERN LANEWAY
WHARF ST
WATERFRONT CONNECTION
NOT FOR CONSTRUCTION
FENDER KATSALIDIS
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007
GROUND FLOOR PLAN
DEVELOPMENT APPLICATION
DA0100


3BR+2B TH 40m²
2BR+2B TH 27m²
2BR+2B TH-SOHO 38m²
3BR+2B TH 39m²
3BR+2B TH 38m²
MSB
STORAGE
LIFT/STAIR CORE
COMMS/NBN
CIRC.
OPEN TO BELOW
CEILING BELOW
CEILING VOID
GYM 370m²
WEIGHTS
CARDIO
YOGA STUDIO
WORKSHOP
MEDIA ROOM
DDA
MALE
FEMALE
DB
WATER TANK
FIRE PUMP ROOM 41m²
PRIVATE TRAINING STUDIO
CLEAN
SITE BOUNDARY
SCOPE OF WORKS
APARTMENTS:
STUDIO STUDIO APARTMENT UNIT
1BR + 1B 1-BEDROOM UNIT WITH 1 BATHROOM
2BR+1B 2-BEDROOM UNIT WITH 1 BATHROOM
2BR+2B 2-BEDROOM UNIT WITH 2 BATHROOMS
3BR+2B 3-BEDROOM UNIT WITH 2 BATHROOMS
TH DOUBLE STOREY TOWNHOUSE UNIT
ACC ACCESSIBLE APARTMENT UNIT
DK DUAL KEY APARTMENT UNIT
NOT FOR CONSTRUCTION
FENDER KATSALIDIS
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007
DRAWN PT
DATE 22.09.2023
CHECKED ND
PLOT DATE 22.09.2023
JOB NO. 22136
SCALE 1:200@A1
DRAWING TITLE MEZZANINE FLOOR PLAN
ISSUE PURPOSE DEVELOPMENT APPLICATION
REV. 03
DRAWING NO. DA0101


APARTMENT MIX - PODIUM LEVELS
APT TYPE QTY AREA
1BR+1B ACC 10 540
2BR+2B ACC 7 528
3BR+2B ACC 1 101
STUDIO ACC 1 44
19 1 213 m²
GFA PODIUM
LEVEL AREA
STOREY 2 - PODIUM 1 487
STOREY 3 - PODIUM 1 487
STOREY 4 - PODIUM 1 487
4 461 m²
GREEN SPACE
89 CAR SPACES
14 MOTORBIKE SPACES
18 BICYCLE SPACES
32 STORAGE CAGES
CAR PARK
3 114m²
STORE
44m²
CIRC.
174m²
CIRC.
228m²
CIRC.
36m²
CIRC.
40m²
1BR+1B ACC
54m²
BALCONY
23m²
1BR+1B ACC
54m²
BALCONY
23m²
1BR+1B ACC
54m²
BALCONY
17m²
STUDIO ACC
44m²
BALCONY
16m²
1BR+1B ACC
54m²
BALCONY
20m²
1BR+1B ACC
54m²
BALCONY
14m²
2BR+2B ACC
76m²
BALCONY
22m²
3BR+2B ACC
101m²
BALCONY
42m²
2BR+2B ACC
79m²
BALCONY
22m²
2BR+2B ACC
79m²
BALCONY
19m²
APARTMENTS:
STUDIO STUDIO APARTMENT UNIT
1BR+1B 1-BEDROOM UNIT WITH 1 BATHROOM
2BR+1B 2-BEDROOM UNIT WITH 1 BATHROOM
2BR+2B 2-BEDROOM UNIT WITH 2 BATHROOMS
3BR+2B 3-BEDROOM UNIT WITH 2 BATHROOMS
TH DOUBLE STOREY TOWNHOUSE UNIT
ACC ACCESSIBLE APARTMENT UNIT
DK DUAL KEY APARTMENT UNIT
NOT FOR CONSTRUCTION
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007
FENDER KATSALIDIS
DRAWN PT
DATE 22.09.2023
CHECKED ND
PLOT DATE 22.09.2023
JOB NO. 22136
SCALE 1:200@A1
LEVEL 2 FLOOR PLAN
ISSUE PURPOSE DEVELOPMENT APPLICATION
REV. 03
DRAWING NO. DA0102


APARTMENT MIX - PODIUM LEVELS
APT TYPE | QTY | AREA
1BR+1B ACC | 10 | 540
2BR+2B ACC | 7 | 528
3BR+2B ACC | 1 | 101
STUDIO ACC | 1 | 44
19 | 1 213 m²
GFA PODIUM
LEVEL | AREA
STOREY 2 - PODIUM | 1 487
STOREY 3 - PODIUM | 1 487
STOREY 4 - PODIUM | 1 487
4 461 m²
GREEN SPACE
89 CAR SPACES
14 MOTORBIKE SPACES
18 BICYCLE SPACES
32 STORAGE CAGES
CAR PARK
3 114m²
CIRC.
174m²
CIRC.
35m²
CIRC.
228m²
CIRC.
36m²
STORE
48m²
SITE BOUNDARY
1BR+1B ACC 54m² BALCONY 23m²
1BR+1B ACC 54m² BALCONY 23m²
1BR+1B ACC 54m² BALCONY 17m²
STUDIO ACC 44m² BALCONY 16m²
1BR+1B ACC 54m² BALCONY 20m²
1BR+1B ACC 54m² BALCONY 14m²
2BR+2B ACC 76m² BALCONY 22m²
3BR+2B ACC 101m² BALCONY 42m²
2BR+2B ACC 79m² BALCONY 22m²
2BR+2B ACC 79m² BALCONY 19m²
APARTMENTS:
STUDIO STUDIO APARTMENT UNIT
1BR+1B 1-BEDROOM UNIT WITH 1 BATHROOM
2BR+1B 2-BEDROOM UNIT WITH 1 BATHROOM
2BR+2B 2-BEDROOM UNIT WITH 2 BATHROOMS
3BR+2B 3 BEDROOM UNIT WITH 2 BATHROOMS
TH DOUBLE STOREY TOWNHOUSE UNIT
ACC ACCESSIBLE APARTMENT UNIT
DK DUAL KEY APARTMENT UNIT
NOT FOR CONSTRUCTION
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007
FENDER KATSALIDIS
DRAWN PT
DATE 22.09.2023
CHECKED ND
PLOT DATE 22.09.2023
JOB NO. 22136
SCALE 1:200@A1
DRAWING TITLE LEVEL 3 FLOOR PLAN
ISSUE PURPOSE DEVELOPMENT APPLICATION
REV. 03
DRAWING NO. DA0103


APARTMENT MIX - PODIUM LEVELS
APT TYPE | QTY | AREA
1BR+1B ACC | 10 | 540
2BR+2B ACC | 7 | 528
3BR+2B ACC | 1 | 101
STUDIO ACC | 1 | 44
19 | 1 213 m²
GFA PODIUM
LEVEL | AREA
STOREY 2 - PODIUM | 1 487
STOREY 3 - PODIUM | 1 487
STOREY 4 - PODIUM | 1 487
4 461 m²
GREEN SPACE
91 CAR SPACES
14 MOTORBIKE SPACES
18 BICYCLE SPACES
32 STORAGE CAGES
CAR PARK
3 114m²
STORE
48m²
CIRC.
174m²
CIRC.
35m²
CIRC.
228m²
CIRC.
36m²
SITE BOUNDARY
1BR+1B ACC 54m² BALCONY 23m²
1BR+1B ACC 54m² BALCONY 23m²
1BR+1B ACC 54m² BALCONY 17m²
STUDIO ACC 44m² BALCONY 16m²
1BR+1B ACC 54m² BALCONY 20m²
1BR+1B ACC 54m² BALCONY 14m²
2BR+2B ACC 76m² BALCONY 22m²
3BR+2B ACC 101m² BALCONY 42m²
2BR+2B ACC 79m² BALCONY 22m²
2BR+2B ACC 79m² BALCONY 19m²
APARTMENTS:
STUDIO STUDIO APARTMENT UNIT
1BR+1B 1-BEDROOM UNIT WITH 1 BATHROOM
2BR+1B 2-BEDROOM UNIT WITH 1 BATHROOM
2BR+2B 2-BEDROOM UNIT WITH 2 BATHROOMS
3BR+2B 3-BEDROOM UNIT WITH 2 BATHROOMS
TH DOUBLE STOREY TOWNHOUSE UNIT
ACC ACCESSIBLE APARTMENT UNIT
DK DUAL KEY APARTMENT UNIT
NOT FOR CONSTRUCTION
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007
FENDER KATSALIDIS
DRAWN PT
DATE 22.09.2023
CHECKED ND
PLOT DATE 22.09.2023
JOB NO. 22136
SCALE 1:200@A1
LEVEL 4 FLOOR PLAN
DEVELOPMENT APPLICATION
03
DA0104


TBC
APARTMENT MIX - AMENITIES LEVEL
APT TYPE QTY AREA
1BR+1B 5 250
2BR+1B ACC 2 150
3BR+2B 2 206
3BR+2B ACC 2 226
11 832 m²
GFA PODIUM ROOFTOP
LEVEL AREA
STOREY 5 - PODIUM ROOFTOP 955
955 m²
POOL
SPA
LOUNGE 100m²
CIRC 245m²
EXTERNAL AMENITIES 3 080m²
NOT FOR CONSTRUCTION
FENDER KATSALIDIS
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007
PODIUM ROOF FLOOR PLAN
DEVELOPMENT APPLICATION
DA0105


PLANT
SOLAR PANEL ZONE
CONDENSER ZONE
DDA
ROOFTOP AMENITIES 508m²
PLANT
SOLAR PANEL ZONE
CONDENSER ZONE
DDA
ROOFTOP AMENITIES 508m²
SITE BOUNDARY
SITE BOUNDARY
5 000
6 000
5 000
5 000
6 000
6 000
9 000
5 000
NOT FOR CONSTRUCTION
PROJECT
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007
FENDER KATSALIDIS
DRAWN PT
DATE 22.09.2023
CHECKED ND
PLOT DATE 22.09.2023
JOB NO. 22136
SCALE 1:200@A1
DRAWING TITLE ROOF TERRACE/PLANT FLOOR PLAN
ISSUE PURPOSE DEVELOPMENT APPLICATION
REV. 03
DRAWING NO. DA0124

SUMMARY

SITE AREA	**9 836 m²**
RESIDENTIAL PLOT RATIO	**3.93 : 1**
AMENITIES PLOT RATIO	**0.25 : 1**
TOWER SITE COVER	**2231 m²**

GFA RESIDENTIAL		
LEVEL		**GFA**
STOREY 1 - GROUND FLOOR		894
MEZZANINE		380
STOREY 2 - PODIUM		1 487
STOREY 3 - PODIUM		1 487
STOREY 4 - PODIUM		1 487
STOREY 5 - PODIUM ROOFTOP		955
STOREY 6 - TOWER	LOWER TOWER	1 784
STOREY 7 - TOWER		1 784
STOREY 8 - TOWER		1 784
STOREY 9 - TOWER		1 784
STOREY 10 - TOWER		1 784
STOREY 11 - TOWER		1 784
STOREY 12 - TOWER		1 784
STOREY 13 - TOWER		1 784
STOREY 14 - TOWER		1 784
STOREY 15 - TOWER		1 784
STOREY 16 - TOWER		1 784
STOREY 17 - TOWER		1 784
STOREY 18 - TOWER		1 778
STOREY 19 - TOWER	UPPER TOWER	1 778
STOREY 20 - TOWER		1 778
STOREY 21 - TOWER		1 778
STOREY 22 - TOWER		1 778
STOREY 23 - TOWER		1 778
ROOF TERRACE/PLANT		50
		38 816 m²

GFA AMENITIES	
LEVEL	**GFA**
STOREY 1 - GROUND FLOOR	837
MEZZANINE	620
STOREY 5 - PODIUM ROOFTOP	901
	2 358 m²

TOTAL GFA	**41 174 m²**

GFA/APARTMENT MIX

GFA - APARTMENT MIX SCHEDULE				**APARTMENT GFA**
APT TYPE	**QTY MIX**	**AREA MIX**	**QTY**	**GFA**
STUDIO ACC			3	132
STUDIO DK			48	1 920
STUDIO TOTAL	9%	6%	**51**	**2 052 m²**
1BR+1B			221	11 050
1BR+1B ACC			30	1 620
1-BED APT TOTAL	45%	37%	**251**	**12 670 m²**
2BR+1B ACC			2	150
2BR+1B DK			48	3 120
2BR+2B			144	10 440
2BR+2B ACC			21	1 584
2BR+2B TH			7	546
2BR+2B TH-SOHO			2	224
2-BED APT TOTAL	40%	47%	**224**	**16 064 m²**
3BR+2B			26	2 678
3BR+2B ACC			5	529
3BR+2B TH			3	325
3-BED APT TOTAL	6%	10%	**34**	**3 532 m²**
			560	**34 318 m²**

APARTMENT MIX ACCESSIBLE UNITS				**APARTMENT GFA**
APT TYPE	**QTY MIX**	**AREA MIX**	**QTY**	**GFA**
1BR+1B ACC			30	1 620
2BR+1B ACC			2	150
2BR+2B ACC			21	1 584
3BR+2B ACC			5	529
STUDIO ACC			3	132
ACCESSIBLE TOTAL	11%	12%	**61**	**4 015 m²**

APARTMENT MIX QTY NON-ACCESSIBLE				**APARTMENT GFA**
APT TYPE	**QTY MIX**	**AREA MIX**	**QTY**	**GFA**
1BR+1B			221	11 050
2BR+1B DK			48	3 120
2BR+2B			144	10 440
2BR+2B TH			7	546
2BR+2B TH-SOHO			2	224
3BR+2B			26	2 678
3BR+2B TH			3	325
STUDIO DK			48	1 920
NON-ACCESSIBLE TOTAL	89%	88%	**499**	**30 303 m²**

OTHER AREAS

NON-RESIDENTIAL GFA	
ZONE NAME	**AREA**
STOREY 1 - GROUND FLOOR	
CAFE	42
CAFE KITCHEN	26
CAFE_SEATING	63
CO-WORKING	275
GYM	195
RETAIL/DOG_GROOMING	57
	658 m²
MEZZANINE	
GYM	370
	370 m²
	1 028 m²

COMMUNAL OPEN SPACE	
STORY NAME	**AREA**
STOREY 1 - GROUND FLOOR	1 930
MEZZANINE	168
STOREY 5 - PODIUM ROOFTOP	3 930
ROOF TERRACE/PLANT	972
	7 000 m²

BIKE PARKING

BICYCLE PARKING SCHEDULE		
LEVEL	**TYPE**	**QTY**
BASEMENT		
	CRADLE	34
	WISHBONE	20
STOREY 1 - GROUND FLOOR		
	ARC STAGGERED	453
	CRADLE	9
	DDA	4
	WISHBONE	10
	WISHBONE OUTSIDE	56
STOREY 2 - PODIUM		
	WISHBONE	18
STOREY 3 - PODIUM		
	WISHBONE	18
STOREY 4 - PODIUM		
	WISHBONE	18
		640

CAR/MOTORBIKE PARKING

CARPARKING SCHEDULE		
Carpark Type	**LEVEL**	**QTY**
AusStd 90 Degree		
	BASEMENT	135
	STOREY 2 - PODIUM	63
	STOREY 3 - PODIUM	63
	STOREY 4 - PODIUM	63
		324
AusStd Parallel		
	STOREY 2 - PODIUM	2
	STOREY 3 - PODIUM	2
	STOREY 4 - PODIUM	2
		6
AusStd Public (2.7m wide)		
	BASEMENT	9
		9
AusStd Small		
	BASEMENT	14
	STOREY 2 - PODIUM	14
	STOREY 3 - PODIUM	14
	STOREY 4 - PODIUM	16
		58
Disabled Space		
	BASEMENT	4
	STOREY 2 - PODIUM	4
	STOREY 3 - PODIUM	4
	STOREY 4 - PODIUM	4
		16
Tandem 90 Degrees		
	BASEMENT	5
	STOREY 2 - PODIUM	6
	STOREY 3 - PODIUM	6
	STOREY 4 - PODIUM	6
		23
		436

MOTORBIKE PARKING		
Carpark Type	**LEVEL**	**QTY**
AusStd Motorbike		
	BASEMENT	23
	STOREY 2 - PODIUM	14
	STOREY 3 - PODIUM	14
	STOREY 4 - PODIUM	14
		65

REVISION			
01	ISSUE FOR DA	FTI	28.04.2023
02	INFORMATION REQUEST RESPONSE	NG	21.07.2023
03	INFORMATION REQUEST RESPONSE	MB	22.09.2023

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DRAWN	DATE	CHECKED	PLOT DATE	JOB NO.	SCALE
PT	22.09.2023	ND	22.09.2023	22136	N.T.S.@A3

PROJECT: 11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007

DRAWING TITLE: DEVELOPMENT SUMMARY

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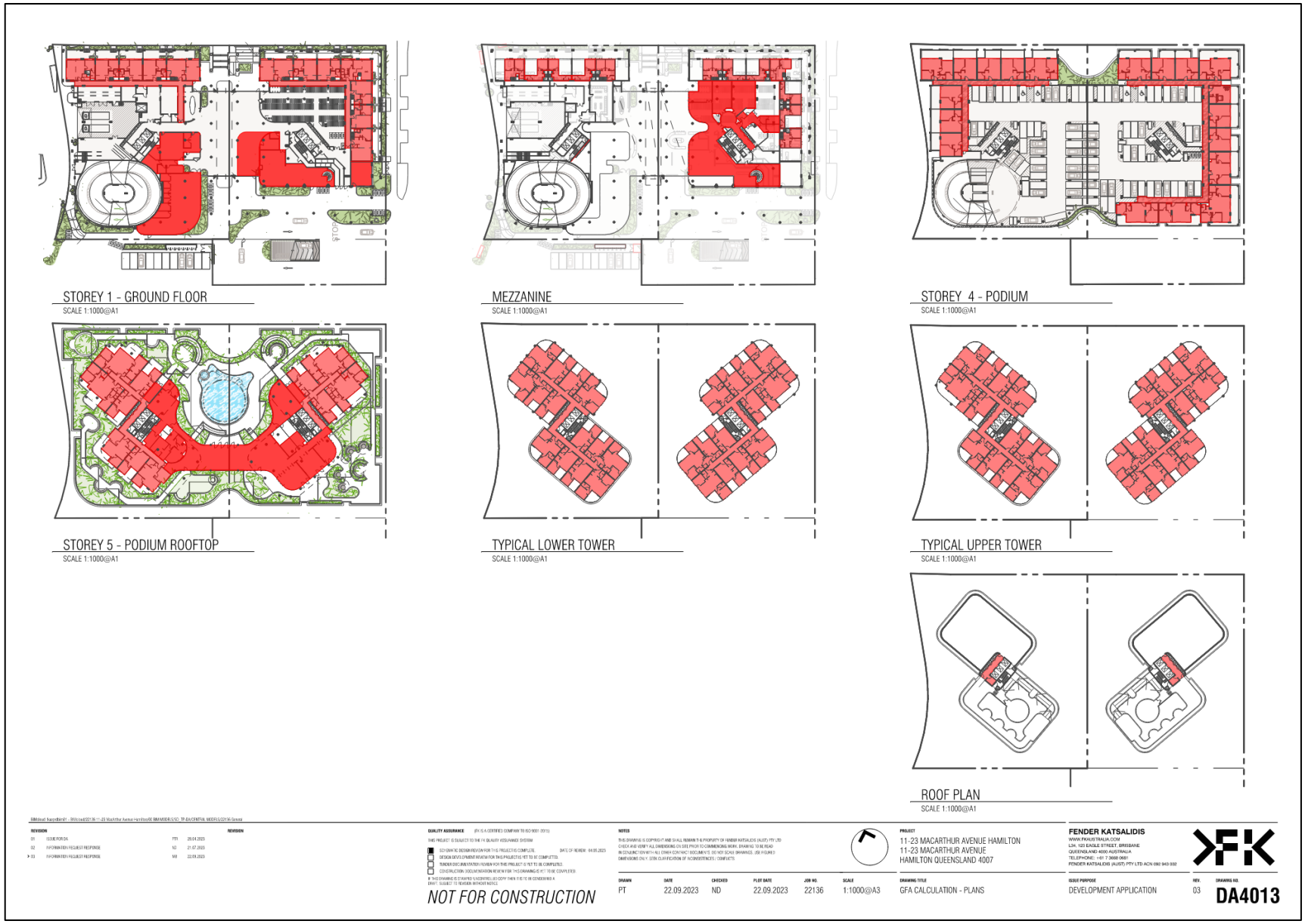
FENDER KATSALIDIS (AUST) PTY LTD ACN 090 943 032

ISSUE PURPOSE: DEVELOPMENT APPLICATION

REV.: 03

DRAWING NO.: **DA4010**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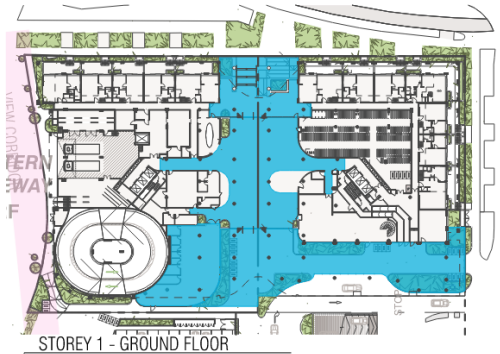
SCALE 1:1000@A1
MEZZANINE
SCALE 1:1000@A1
STOREY 4 - PODIUM
SCALE 1:1000@A1
STOREY 5 - PODIUM ROOFTOP
SCALE 1:1000@A1
TYPICAL LOWER TOWER
SCALE 1:1000@A1
TYPICAL UPPER TOWER
SCALE 1:1000@A1
ROOF PLAN
SCALE 1:1000@A1
NOT FOR CONSTRUCTION
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007
GFA CALCULATION - PLANS
DEVELOPMENT APPLICATION
DA4013



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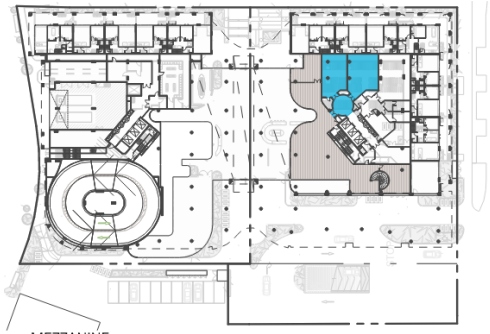

MEZZANINE
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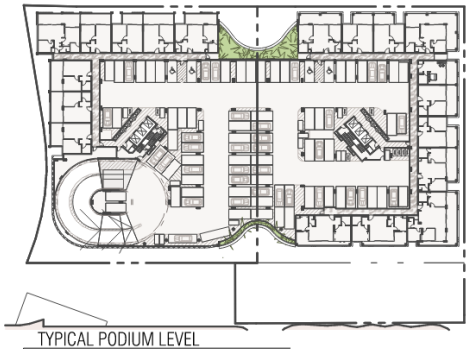

TYPICAL PODIUM LEVEL
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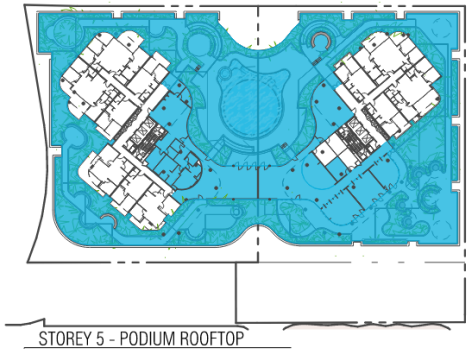

STOREY 5 - PODIUM ROOFTOP
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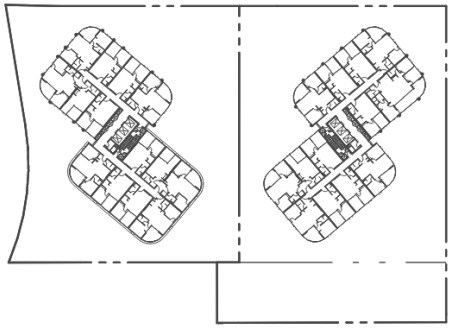

TYPICAL LOWER TOWER
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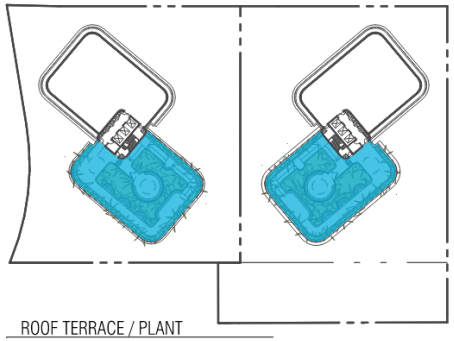

ROOF TERRACE / PLANT
SCALE 1:1000@A1

COMMUNAL OPEN SPACE	
STORY NAME	**AREA**
STOREY 1 - GROUND FLOOR	1 930
MEZZANINE	168
STOREY 5 - PODIUM ROOFTOP	3 930
ROOF TERRACE/PLANT	972
	7 000 m²

REVISION

01	ISSUE FOR DA	02	12.05.2023
02	INFORMATION REQUEST RESPONSE	02	21.07.2023
03	INFORMATION REQUEST RESPONSE	03	22.09.2023

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DRAWN	DATE	CHECKED	PLOT DATE	JOB NO.	SCALE
PT	22.09.2023	ND	22.09.2023	22136	1:1000@A3

PROJECT
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007

DRAWING TITLE
COMMUNAL OPEN SPACE

FENDER KATSALIDIS
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FENDER KATSALIDIS (AUST) PTY LTD ACN 090 943 032

ISSUE PURPOSE
DEVELOPMENT APPLICATION

REV. 03

DRAWING NO.
DA4014

Photos

Tree 1

Tree 1

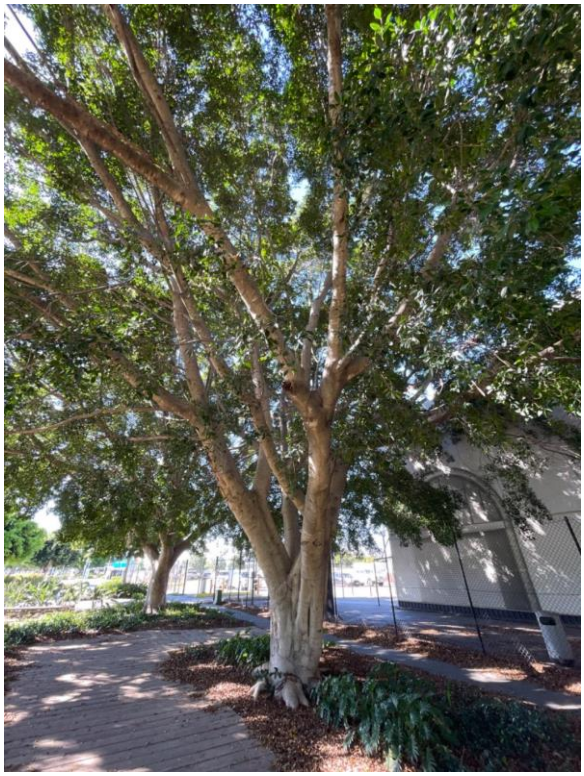
Tree 1

Tree 1 - Base

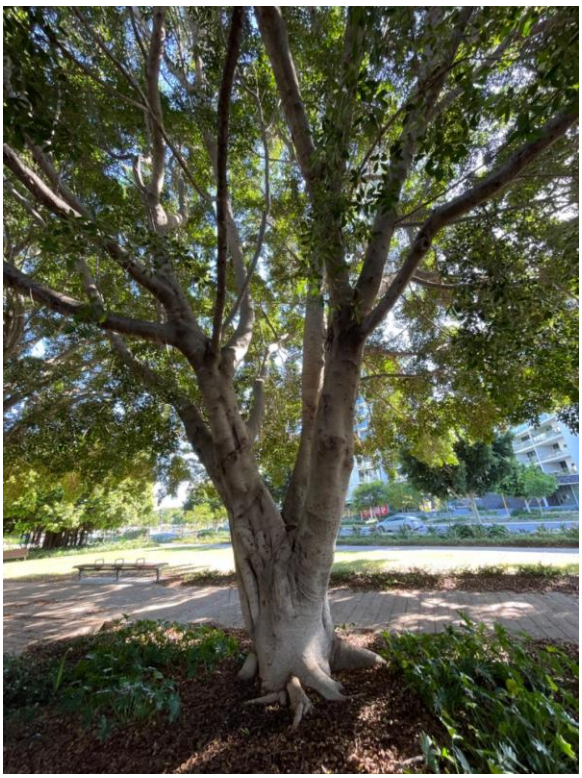
Tree 1 – Clearance to existing structure within the *Subject Site.*

Tree 2

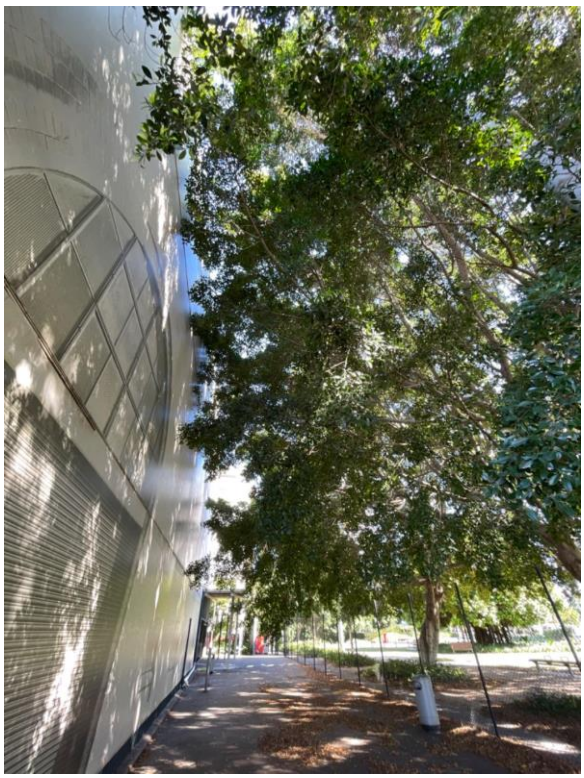
Tree 2



Tree 2



Tree 2 – Base

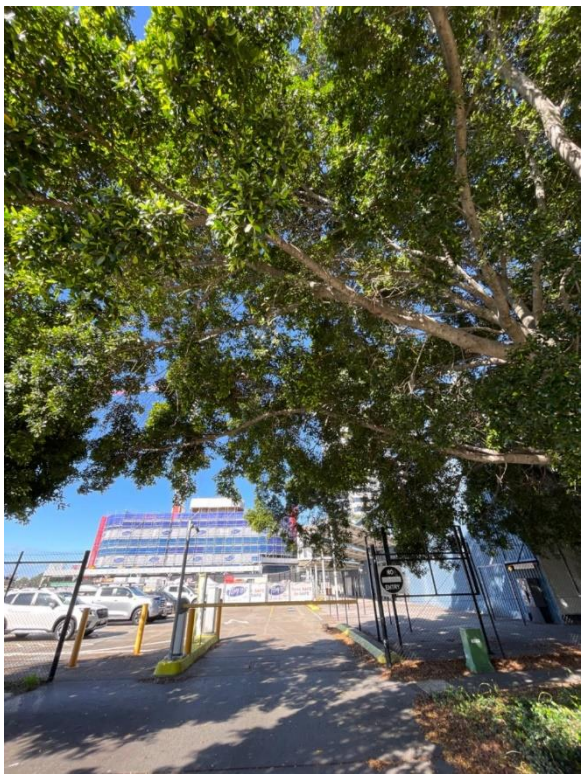


Tree 2 – Clearance to existing structure within the *Subject Site.*

Tree 3

Tree 3

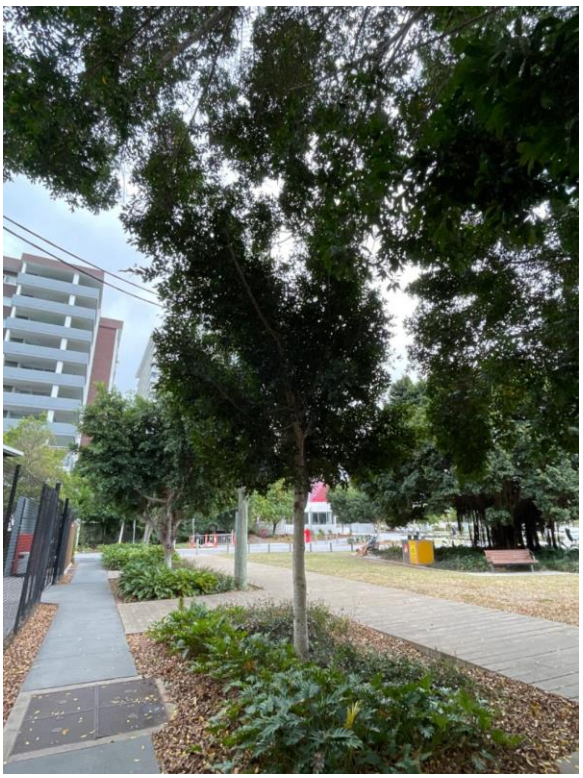
Tree 3 - Base



Tree 3 – Clearance over existing vehicle access

Tree 3 - Clearance to existing structure within the *Subject Site.*

Tree 4



Tree 5

Tree 6

Tree 6

Tree 6

Tree 7

Tree 8

Tree Group 9

Tree 10

Tree 11

Tree 12

Tree 13

Tree 14

Tree 14 - Wound

Tree 15

Tree 16

Tree 17

Tree 18

Tree 19

Tree 20

Tree 21

Tree 22

Tree 23

Tree 24

Reference Page

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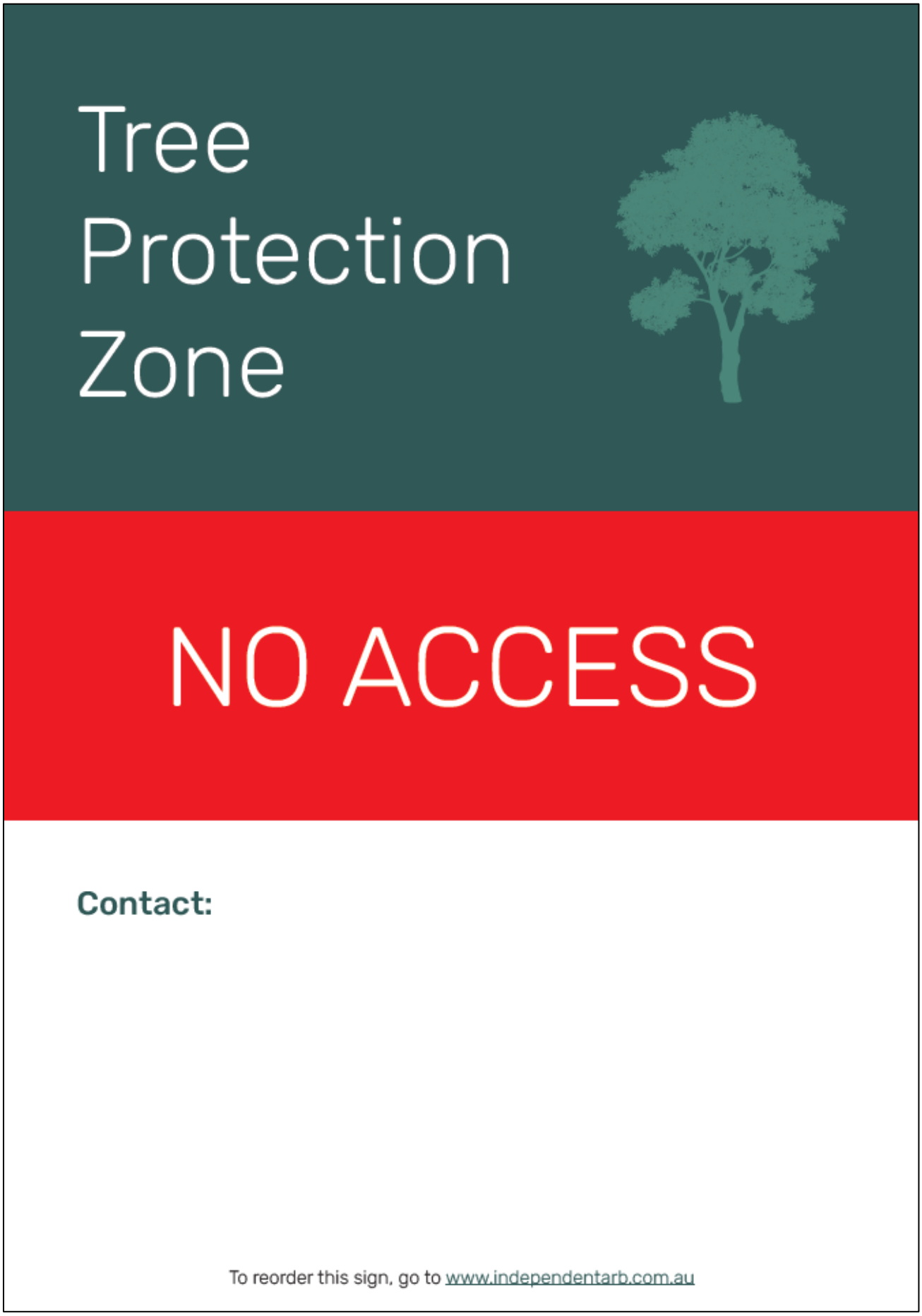
Appendix 1


Tree
Protection
Zone
NO ACCESS
Contact:
To reorder this sign, go to www.independentarb.com.au

Appendix 2: Ground Penetrating Radar

Ground Penetrating Radar (GPR) employs techniques that utilise high-frequency pulsed radio waves, usually between 10 - 2000MHz, to acquire subsurface information, to map metallic/non-metallic structures/features buried in the ground or within man-made structures. Buried objects or boundaries with an abrupt change in electrical properties create a reflection from the EM signals. Reflected signals are received by the receiver and recorded digitally in a storage device.

The purpose of the GPR is to identify anomalies also known as hyperbolas. These anomalies relate to potential underground objects such as tree roots. (Mala Australia) There are limitations to Ground Penetrating Radar and the presented results which included but not limited to

- Soil conditions and moisture conditions. The type and composition of the soil.
- Current and redundant services
- Fill placed within the working area

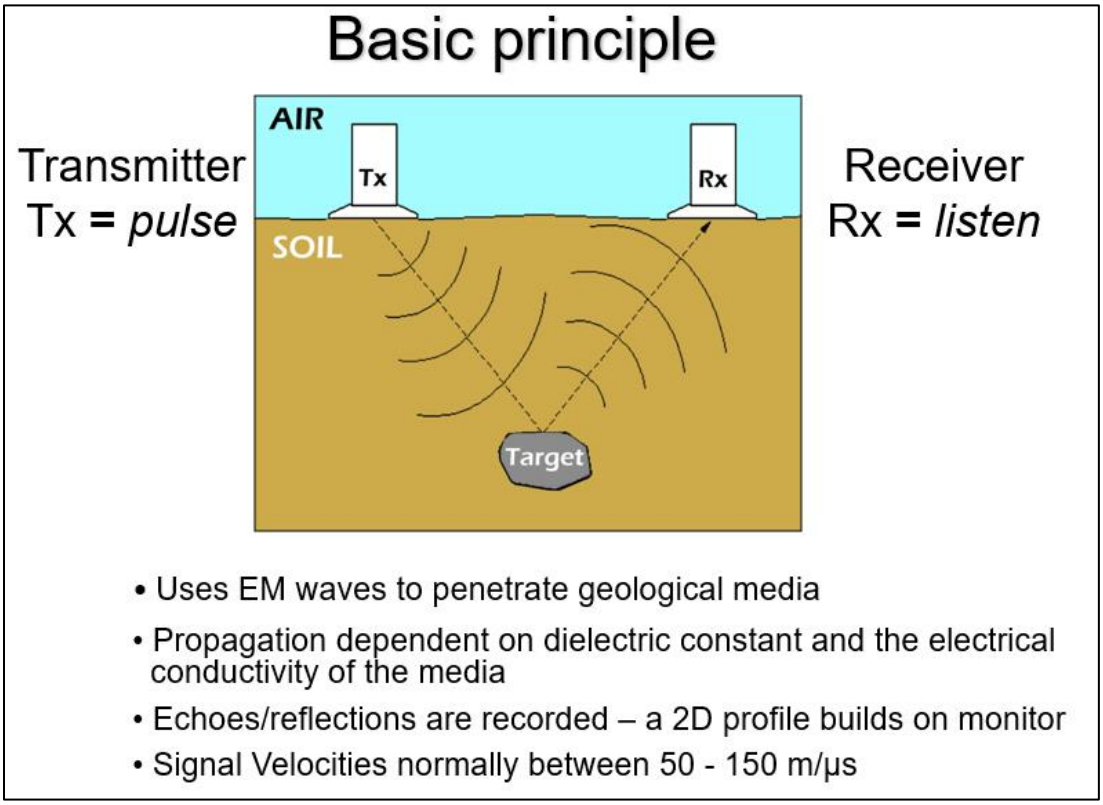


Figure 11: (Source: MALA Australia)

An example of hyperbolas is enclosed below, showing the result of testing different materials and sizes at a range of depths from a controlled test undertaken by MALA Australia.

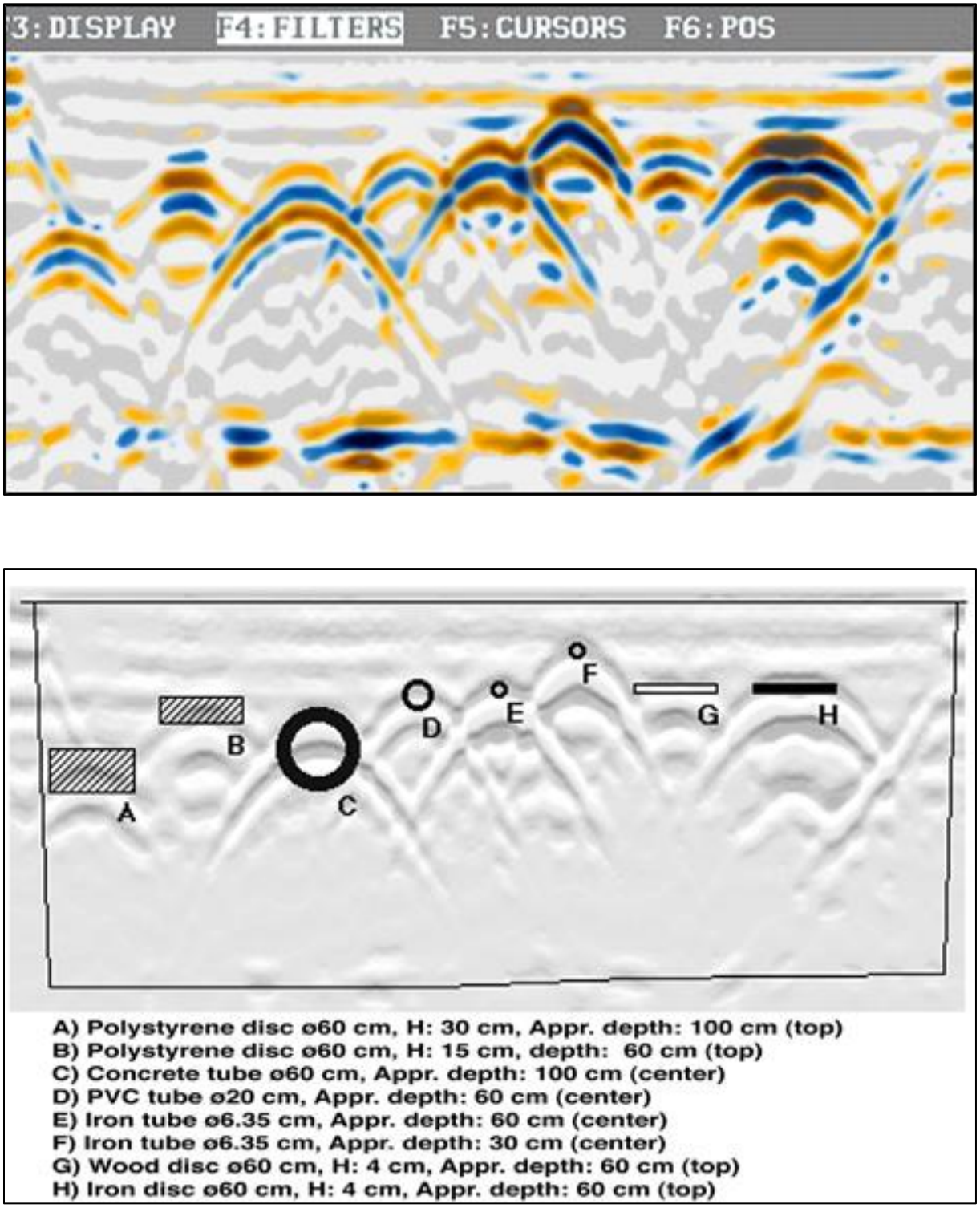


Figure 12: (Source MALA Australia)

Appendix 3: Explanation of Terminology

Definition	Process Description
Removal	Complete tree removal leaving stump as close as possible to ground level. Recommended process will include chipping of all foliage limbs and timber and reinstatement of work site. Recommendation typically based on tree being assessed as representing a health and safety concern [Dead, dying, structurally unsound, unstable, poor form]
Remove and grind	Complete tree removal to include grinding of stump to a depth of 75 millimetres unless otherwise specified. Recommended process will include chipping of all foliage limbs and timber and reinstatement of work site. Stump site will be cleaned of all grinding debris and sawdust and backfilled with premium topsoil free from weeds.
Crown Clean (Deadwood)	Removal of all major/significant deadwood and dead branches up to [and including] 30 millimetres in diameter in trees overhanging pedestrian or vehicular areas or removal of dead branches > 50mm diameter in canopy of trees located in parkland or similar area unless otherwise specified.
Crown Clean (General pruning)	Recommended pruning process will include removal of broken, crossing, rubbing, diseased, stressed or dying branches or limbs with poor attachment. Additional work process may include pruning to define leaders, balance the crown, reduce weight load, or clear the tree from obstructions. In summary, to rectify, as far as is possible, any structural defects and eliminate undesirable growth or deadwood.
Crown Reduction (Canopy reduction)	Recommended pruning process may include light and general pruning typically to encompass removal of up to 15% but no more than 20% of the leaf-bearing crown. By definition the unique shape and form of the tree will not be altered or compromised by the pruning process. Typically, the consulting arborist will nominate the reduction percentage [%] appropriate to species, condition and assessment.
Crown Raising (Canopy lift)	Pruning processes maybe involve the raising of the tree's lower canopy to a height specified in metres. Typically, the process is performed to provide for pedestrian and or vehicular clearance and unless otherwise specified the default parameters will be to provide 2 metres clearance from ground level or as specified by local or state government regulation. From time to time pruning requirements may be altered to accommodate various site-specific requirements as advised by the consulting arborist accordingly.
Crown Restoration	Pruning process will encompass crown restoration and remedial works where the tree has been previously lopped or otherwise damaged. Not feasible when tree has extensive decay and should only be considered when there is evidence of healthy re- growth. When performed correctly the process of remedial pruning will most likely take several years to complete.
Hanger Limb / Unattached branch	Pruning process may be restricted to the removal of any hanger/s or dangerous/dead/dying limbs and will typically involve the removal of a single limb. In some instances, removal of an individual limb may be necessary to accommodate an obstruction and the consulting arborist will advise accordingly.
Directional Pruning	Pruning process will be restricted to pruning canopy away from buildings/service wires/property boundary and will typically be performed to avoid future growth in these areas. Where appropriate future growth will be directed away from obstruction by selected pruning so as to encourage the development of the growth of new leaders.

Habitat Pruning	When pruning deadwood from trees, simple techniques and methods can be employed to achieve hazard reduction whilst leaving food and habitat for tree dwelling fauna. Long pieces of deadwood can be reduced in length to limit potential hazard but still retain food for the insects and microorganisms. Stubs that have been left by old pruning or previous branch failure can be retained, and with the use of a hole-saw or chainsaw they may also be bored out to create a nesting hollow for native birds or small mammals. Source: Mosman Council
Deadwood	Dead branches within canopy of tree59F. Deadwood is a naturally occurring feature of most tree species and comprises dead or decaying branches within the canopy of a tree. Deadwood may have habitat value and require removal only according to the considered risk of its location, i.e. high use pedestrian area or damage to adjacent infrastructure.
Decay	The process of degradation of woody tissues by micro-organisms61F
Compaction	Results from loads or stress forces applied to the soil as well as shear forces. Both foot traffic and vehicle traffic exert both forces on soils. Vehicle traffic may cause significant compaction at depths of 150–200 mm (the area in which most absorbing roots are located). The degree of compaction will depend on weight of vehicles, number of movements, soil moisture levels and clay content. Soil handling, stockpiling and transporting also tend to lead to the breakdown of soil structure and thus to compaction. Vibration as a result of frequent traffic or adjacent construction activities will also compact soils55F
Codominant Structure:	Stems or trunks of about the same size originating from the same position from the main stem52F. When the stem bark ridge turns upward the union is strong; when the ridge turns inward the union is weak, a likely point of failure in storm or windy weather conditions or where increasing weight causes undue stress on the defective union53F

Source: AS4373-2003 Pruning of Amenity Trees & AS 4970-2009 Protection of Tree on Development Sites & Habitat Creation By Kieran O'Neill, Mosman Council.

Appendix 3: Normal Function of a Tree

Background Note: The following diagrams and explanatory notes are useful to illustrate the structure of a tree in a normal growing environment. This information is taken from AS4970-2009 Protection of trees on development sites which has been released subsequently to AS4373-2007 Pruning of amenity trees.

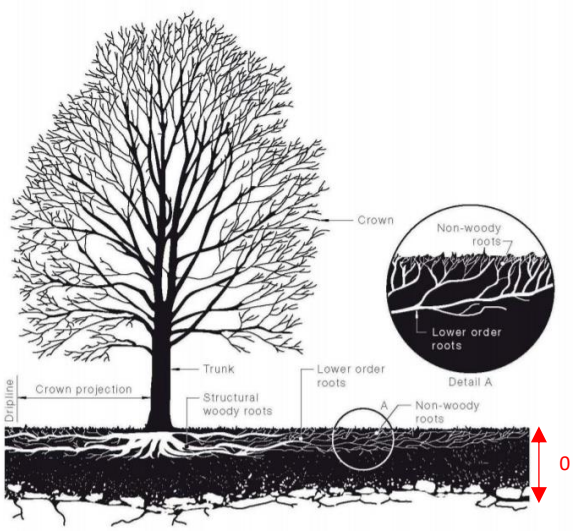


Figure 13: Structure of a tree in a normal growing environment

Leaves
The main function of leaves is photosynthesis, that is, the production of sugars. The sugars produced by the leaves (and any other green tissue) are the source of chemical energy for all living cells in the entire plant and as such are essential for the normal functioning and survival of the tree. Anything that directly or indirectly damages the leaves will interfere with photosynthesis.

Trunks and branches
Branches and trunks are composed of many tissues with specialized functions including the bark (protection), phloem (transport of sugars from the leaves), vascular cambium (growth of new transport tissues), sapwood (transport of water and nutrients from the roots), heartwood (strength and structural support) and rays (internal transport and storage of sugars). Damage to branches or trunks may allow infection by plant pathogens (disease causing organisms), disrupt the movement of vital materials and structurally weaken the tree.

Roots
The main functions of roots include the uptake of water and nutrients, anchorage, storage of sugar reserves and the production of some plant hormones required by the shoots. For roots to function, they must be supplied with oxygen from the soil. The root system of trees consists of several 'types' of roots found in different parts of the soil and is generally much more extensive than commonly thought. The importance of roots is easily overlooked because they are not visible, that is 'out of sight, out of mind'. Damage to the root system is a common cause of tree decline and death and is the most common form of damage associated with development sites.

Root systems consist of three main parts:

1. The structural woody roots (anchorage, storage and transport);
2. Lower order roots (anchorage, storage and transport); and
3. Non-woody roots (absorption of water and nutrients, extension, synthesis of amino acids and growth regulators) (see Figure).

In addition to lateral root spread being underestimated, root depth in trees has also been grossly exaggerated. Deep root systems or taproots are the exception rather than the rule. Most roots of most trees are found in the very top of the soil. The vast majority of these roots are small non-woody absorbing roots which grow upward into the very surface layers of the soil and leaf litter. This delicate, non-woody system, because of its proximity to the surface, is very vulnerable to injury."

Explanatory Note: The importance of gas exchange in soils

The fact that tree roots require oxygen to function is often misunderstood. Accessibility to available oxygen and water within the soil structure is dependent on the integrity of soil structure within their surrounds; when soils are compacted there is little space between soil aggregates with soil volume and total pore space, especially macropore space diminished. In turn, good soil oxygenation and gas exchange (Lonsdale) levels allow for successful function of tree roots. Oxygen levels in soils will typically decrease as soil depth increases and /or soils are heavily compacted.

Macropore is the term used to describe the relatively large space between soil particles that is usually air filled and allows for water movement and root penetration. Micropore is the term used to describe the space between soil particles that is relatively small and likely to be water filled.

Compaction results from loads or stress forces applied to the soil as well as shear forces. When soil within the root zone of a plant, including a tree, is compacted through either pedestrian or vehicular traffic, or by the heavy weight of stored materials or machinery, the ability of water and oxygen to penetrate the soil around the roots of living plants is compromised. Whilst tree roots are typically found in the top 600mm of the soil horizon, vehicle traffic, in particular may cause significant compaction at depths of 150–200 mm (the area in which most absorbing roots are located). (Refer Tree Function Note above).

The degree of soil compaction will depend on weight of vehicles, number of movements, soil moisture levels and clay content. Soil handling, stockpiling and transporting also tend to lead to the breakdown of soil structure and thus to soil compaction. Vibration, as a result of frequent traffic or adjacent construction activities, will also cause compaction of soil.

Contrary to the commonly held myth that all trees have tap roots, tree roots are typically located within the top 600mm of soil. Just as leaves perform the vital function of photosynthesis, tree roots are vital for the primary functions of anchorage, storage, absorption and conduction. Larger tree roots fulfil the main functions of anchorage, storage and conduction and smaller more fibrous tree roots, which grow primarily at the end of the main woody roots, fulfil a vital role in absorbing oxygen, essential mineral elements and moisture from the soil, often through a symbiotic relationship with soil borne fungi referred to as Mycorrhizae; the extent of root loss has the potential to jeopardise any or all of these main functions and most importantly may compromise the structural integrity of an established tree and its associated potential OH&S risk of failure occurring; any OH&S risk of potential failure in a high use area such as public roads, is noteworthy for all the wrong reasons and should be of major concern and avoided at all times. (Refer Appendix 2, Tree Function Note).

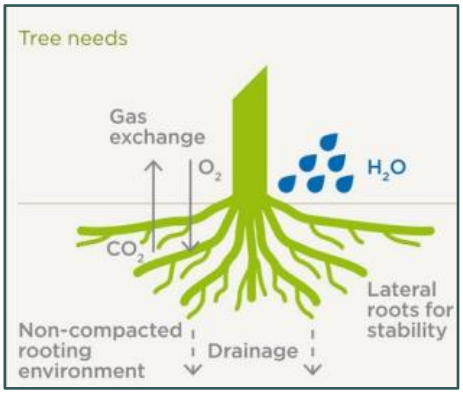


Figure 14: Gas exchange in woody tissues: the diffusion of gases into and out of a particular region (Jaluzot)

Company Details

Independent Arboricultural Services

Independent Arboricultural Services, incorporated in May 2007, offers a completely independent arborist consulting and reporting service. Its directors and associated consultants bring extensive arboricultural knowledge gained over many years to this company. All consulting staff hold AQF Level 5 (Diploma of Arboriculture). Specialised advice when required, such as provision of survey mapping or engineering advice and certification is sourced from reputable professional providers according to site requirements as per Australian Standard 4970-2009.

Statement of Goal

To deliver continual improvement through the use of world's best arboricultural practices, supported by ongoing education and exposure to leading industry experts and research throughout the world.

Mission Statement

To provide timely, relevant and actionable consulting advice and practice based on the latest available and best scientific arboricultural knowledge.

Environmental Statement

Independent Arboricultural Services supports long term environmental sustainability sustainable sourced paper and ensuring all inks cartridges are recycled where possible.

Independent Arboricultural Services actively seeks to maintain a positive carbon footprint status and to that end is committed to protecting and preserving the environment, continuing to carry out tree planting, transplanting and replacement planting where practical, having planted in excess of 4000 trees in the first 2 years after its inception in May 2007 alone. Arboricultural recommendations involving the removal of tree/s will include replanting at a minimum ratio of 2 trees for any tree removed where possible. All arboricultural recommendations are made in accordance with world's best arboricultural practice and within the Australian Standards AS 4373-2007 Pruning of amenity trees and AS 4970-2009 – Protection of trees on development sites so as to ensure optimal outcomes for all living trees.

Independent Arboricultural Services acknowledges the benefits of healthy trees with good vigour and vitality and actively promotes better understanding in the general community of the contribution that trees make to reducing greenhouse gasses, the contribution of trees to better water retention and the prevention of soil erosion, the ability of trees to provide protection to infrastructure by diffusing strong winds in weather events and the contribution of trees to general liveability within the urban environment.

It is an acknowledged fact that air temperature beneath a tree canopy can be in excess of 5^{o} Celsius lower than the surrounding ambient air temperature thereby reducing reliance on greenhouse gas producing air conditioners and coal fired power sources.