Construction Management Plan & Methodology Report

1112-1116 Barrenjoey Road, Palm Beach

September 2023

Investment • Projects • Management

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1 BACKGROUND

This Construction Management Plan (CMP) has been prepared by IPM Constructions Pty Ltd for submission in support of the development application proposing demolition of the existing site structures and the construction of a shoptop housing development incorporating 7 apartments above 2 retail tenancies and basement car parking for 23 vehicles accessed from Barrenjoey Road.

1.1 Purpose

The purpose of this report is to demonstrate how construction will occur without unreasonable impacts upon adjoining properties, the road reserve and traffic closures to Barrenjoey Road.

1.2 Site

The site is located at 1112-1116 Barrenjoey Road, Palm Beach and is legally described as Lot 21 in DP 571298.

1.3 Proposed Works

The proposed works subject to this CMP comprise the following:

- Demolition of existing dwelling (NB: existing shops already demolished under DA N0102/10)
    - Approx. 1 week duration
- Shoring and Excavation (single level basement):
    - Approx. 20 weeks duration
- Construction of a shoptop housing including 7 apartments:
    - Approx. 40 weeks duration
- Landscape and external works:
    - Approx. 4 weeks duration
- Total duration:
    - 65 weeks (excluding weather delays).

2 CONSTRUCTION MANAGEMENT MEASURES

2.1 Site Management

2.1.1 Site Fencing

Temporary site construction fences will be erected around the site perimeter to form a barrier between the general public and site works. The fencing will be erected within the site boundary to minimise disruption to neighbouring properties.

A-Class hoarding will be erected along the street boundary in accordance with council and NSW SafeWork requirements.

The hoarding will be positioned within the boundary where possible. If the hoarding (or fencing) needs to be placed on the footpath, a permit application will be submitted to Council prior to installation.

Double gates at the existing driveway entrance will control access to the site. The gates will be positioned to swing inwards (towards the site).

2.1.2 Signage

Signage is to be placed adjacent to the site entrance, ensuring it can be easily read from the public road or other public place adjacent to the. Site signage will contain the following details:

a) name, address, contractor licence number and telephone number of the principal contractor, including a telephone number at which the person may be contacted,
b) name, address and telephone number of the Principal Certifier,
c) a statement stating that "unauthorised entry to the work site is prohibited".

Any such sign is to be maintained while work is being carried out and removed on satisfactory completion of the works.

2.1.3 Hours of Work

To minimise the noise impact on the surrounding environment, construction work is proposed to be carried out in accordance with the following requirements:

Activity	Permitted working hours
All building, demolition and site work, including site deliveries (except as detailed below)	• Monday to Friday - 7.00am to 5.00pm • Saturday - 8.00am to 5.00pm • Sunday & public holidays - No work permitted
Excavating or sawing of rock, use of jackhammers, pile-drivers, vibratory rollers/compactors or the like	• Monday to Friday - 7.00am to 5.00pm • Saturday - 8.00am to 1.00pm • Sunday & public holidays - No work Permitted

2.1.4 Noise and Vibration

Noise from the site will be managed by way of hours of work (as outlined above).

Vibration is to be managed via implementation of a Vibration Management Plan, which will be prepared prior to construction commencement.

2.1.5 Facilities

Site sheds are expected to be located within the site boundaries.

Toilet facilities shall be provided at or in the vicinity of the work site on which work involved in the demolition or erection of a building is being carried out at the rate of one toilet for every 20 workers on site.

An excerpt of the Site Management Plan is shown in Figure 1 below (refer **Appendix A**).

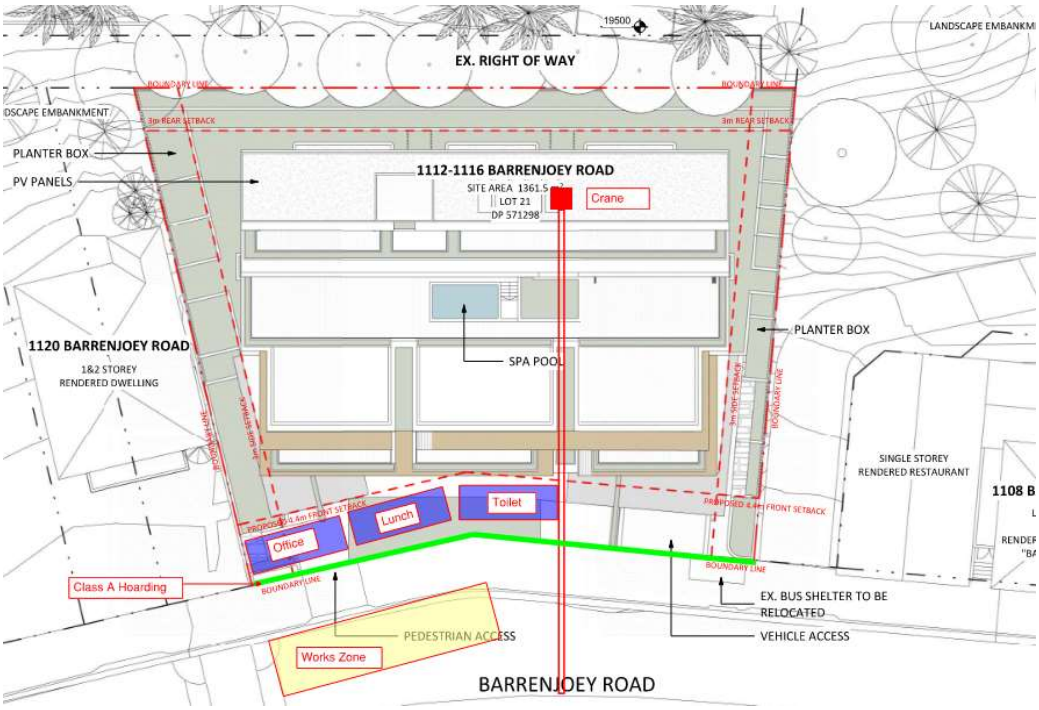


Figure 1- Site Management Plan

2.1.6 Transport & Parking

Public transport for workers to and from site is available via 199 bus service, which operates 7 days/week between Manly and Palm Beach via Mona Vale and Dee Why. The nearest bus stop is located at the southern boundary of the site.

Although workers will be encouraged to utilise public transport where possible, there is also a paid public car park at Pittwater Park, directly opposite the development site.

Once the basement level is complete, this can be used for worker parking.

2.1.7 Traffic Control

A Traffic Management Plan (TMP) for demolition and excavation has been prepared by CJP Consulting Engineers (refer **Appendix B**).

A Construction Traffic Management Plan (CTMP) will be prepared prior to construction commencement.

2.1.8 Materials storage

All materials will be stored within the boundaries of the site.

No materials will be stored on public land adjacent to the development site without approval being granted by Council under the Roads Act 1993 and/or the Local Government Act 1993.

Waste containers will be stored within the site and a site telehandler/forklift will be utilised to move the containers throughout the site.

2.1.9 Loading and unloading

Where possible all loading and unloading associated with construction work will be accommodated within the boundaries of the site. Where deliveries are not possible to be made on site, a street works zone will be utilised. Traffic control for pedestrians and vehicles will be put into place when required for deliveries from the street works zone.

All oversized vehicles proposed to operate on Council property (including Council approved works zone) will obtain a Permit to Stand Plant on each occasion as per council requirements.

Material handling will be via mobile cranes, manitous, fixed crane and manual labour.

2.2 Erosion and Site Sediment Control

Erosion and sediment control measures will be implemented in accordance with the Erosion and Sediment Control Plan prepared by Taylor Consulting (refer **Appendix C**).

2.3 Tree protection

Tree protection measures are to be implemented per the recommendations outlined in the Arboricultural Impact Assessment prepared by Tree Management Services (refer **Appendix D**).

3 CONCLUSION

This report has been prepared to demonstrate how construction will occur without unreasonable impacts upon adjoining lands, the road reserve and traffic closures to Barrenjoey Road.

During construction, the plan will be regularly reviewed for compliance as part of the site quality monitoring procedures and, should any changes be required to address additional site-specific issues, a revised version of this plan will be prepared.

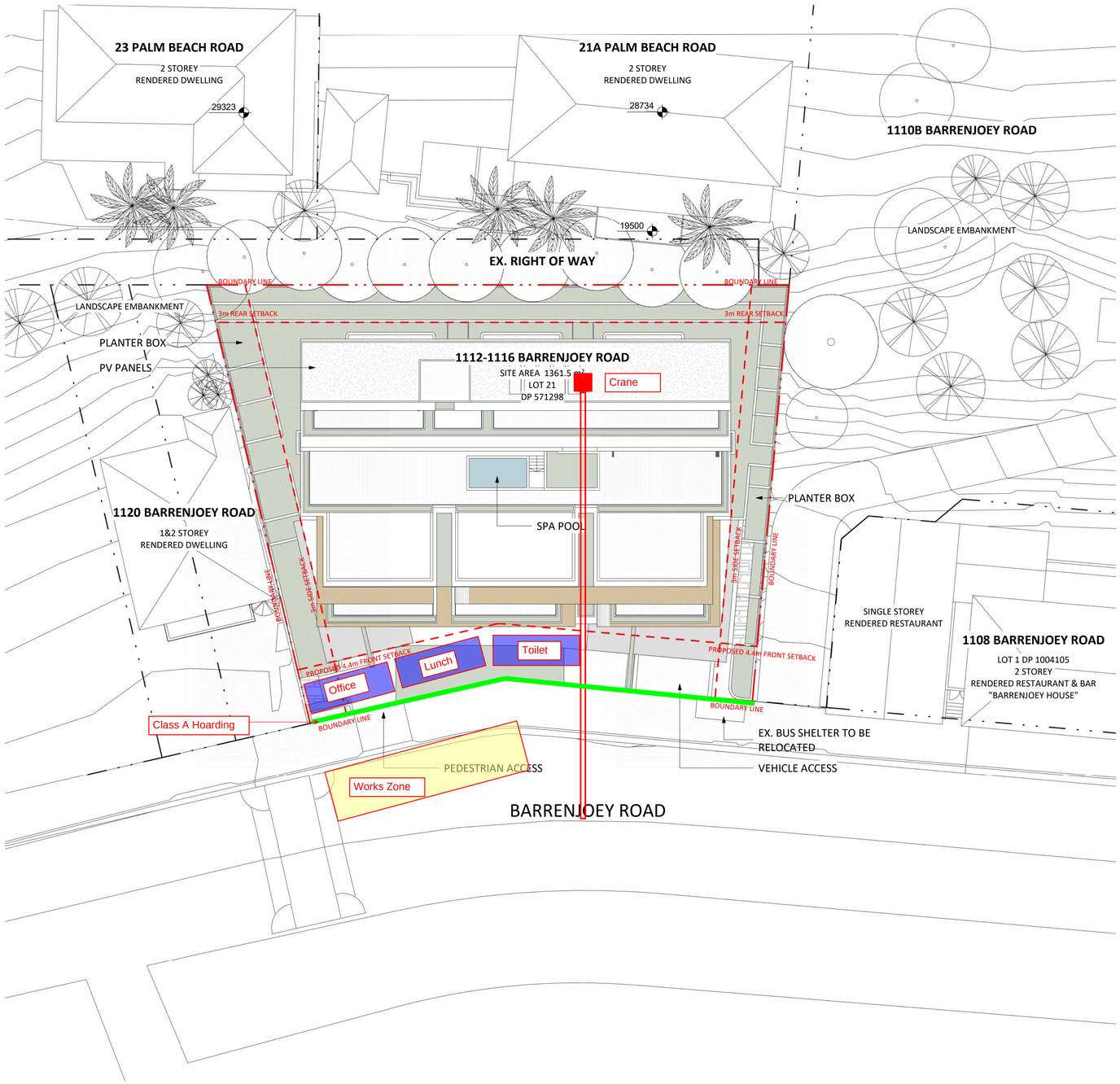
4 APPENDICES

4.1 Appendix A – Site Management Plan

4.2 Appendix B – Traffic Management Plan

4.3 Appendix C – Erosion and Sediment Control Plan

4.4 Appendix D – Arboricultural Impact Assessment



NO.	REVISION	BY	CHK	DATE
A	FOR DA SUBMISSION	DK	GW	16.12.21
B	FOR AMENDED DA SUBMISSION	DK	RPW	25.07.23
C	FOR AMENDED DA SUBMISSION	DK	SL	24.08.23

REVISION NOTES:

KEY PLAN

CLOUD LEGEND

REVISION ON HOLD

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PROJECT
1112-1116 BARRENJOEY RD
1112 - 1116 BARRENJOEY ROAD, PALM BEACH

DWG TITLE
SITE PLAN

STATUS
DEVELOPMENT APPLICATION

DWG NO.
A0012

REVISION
C

0 10 m

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

DATE
24.08.23

Early Works Traffic Management Plan

DA N0102/10

1112-1118 Barrenjoey Road, Palm Beach

Proposed Demolition of Existing Buildings and Initial Excavation Works

Ref 23109

30th June 2023

CJP CONSULTING ENGINEERS

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Document Control

Project Number	23109			
Project Address	1112-1118 Barrenjoey Road, Palm Beach			
Revision	**Date**	**Details**	**Author**	**Approved By**
Draft	30.06.23	First draft	C. Palmer	C. Palmer

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1. Introduction

1.1 Project Summary

CJP has been engaged by IPM Property to prepare an Early Works Traffic Management Plan (TMP) for submission to Northern Beaches Council, to address **consent condition 16 (Part D)** of Development Application **N0102/10**, relating to 1112-1118 Barrenjoey Road, Palm Beach.

In summary, development consent has been granted for the demolition of the existing buildings on the site and the construction of a new shop-top housing building over a single-level basement parking area, associated site works and landscaping. Vehicular access to the site is approved via a new entry/exit driveway located at the northern end of the Barrenjoey Road site frontage.

A copy of the Development Application (DA) stamped approved plans prepared by Lesiuk Architects are reproduced in Appendix A.

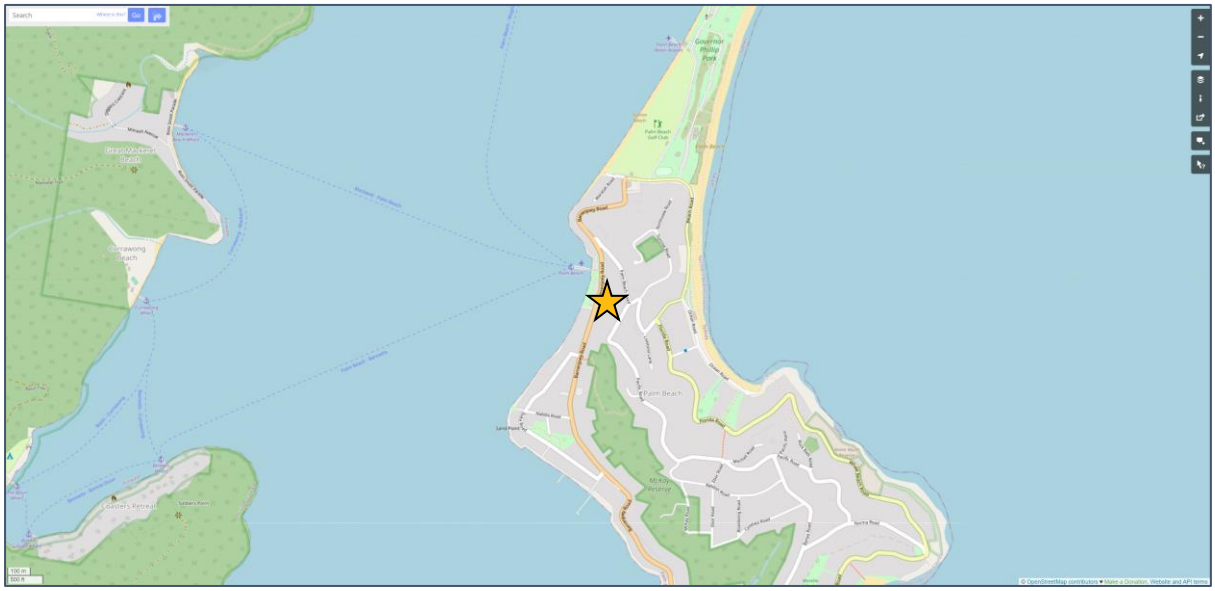

Figure 1.1 – Site Location (Source: Open Street Map)

It should be noted that whilst CJP is responsible for the preparation of this Early Works TMP, it is not responsible for its implementation which is the responsibility of others (e.g. project manager and/or builder).

1.2 Purpose of this Report

The purpose of this Early Works TMP is to outline the traffic management principles and procedures that should be implemented during demolition works, in order to minimise impacts on the surrounding road network, ensure the safety and efficiency of everyone in the vicinity, and provide information on the heavy vehicle access route to/from the site.

This Early Works TMP is intended to provide procedural information on regular day-to-day activities during the construction programme, including:

- ensuring the safety of workers, members of the public and road users in the vicinity of the site
- details on the loading and unloading arrangements during demolition works

- details on the heavy vehicle route between the arterial road network and the subject site
- estimates of truck movements during the demolition stage
- maintaining vehicular and pedestrian access to neighbouring properties
- ensuring all works are carried out in accordance with Northern Beaches Council's approved working hours, outlined in consent condition 6(a)

Information on infrequent/one-off activities such as tower crane/hoarding erection/dismantling, mobile crane set-up, public domain works, oversized deliveries etc, are not covered in this report. These activities require separate permits from Council, along with task-specific Traffic Control Plans which are typically provided by the respective contractor under separate cover.

In addition, this Early Works TMP provides information on, but not limited to, the following:

- description of the existing site and its location
- existing road network and traffic conditions
- construction programme
- heavy vehicle access route
- works zone details
- public and active transport infrastructure
- demolition traffic generation estimates and its impacts on the surrounding road network
- hoarding
- site amenities
- sediment control
- neighbour notification
- contractor parking
- site inductions

1.3 Relevant Policies & Guidelines

In preparing this Early Works TMP, reference has been made to the following policies and guidelines:

- TfNSW Traffic Control at Work Sites Technical Manual (Issue 6.1 – 28 February 2022)
- Australian Standards AS1742.3: Traffic Control Devices for Works Sites on Road
- The former Pittwater Council's DA N0102/10 consent conditions

Traffic management procedures and systems must be in place and practised during the course of the project to ensure safety and minimise the effect on adjoining pedestrian and vehicular systems. These procedures and systems must be in accordance with AS1742.3:2009 Manual of Uniform Traffic Control Devices and Council's Development Control Plans.

This Early Works TMP has been prepared and reviewed by engineers who hold the Prepare a Works Zone Traffic Management Plan accreditation.

2. Existing Conditions

2.1 Site Location & Description

The development site is located on the eastern side of Barrenjoey Road, just south of Palm Beach Wharf. The site has a street frontage of approximately 36m in length to Barrenjoey Road and occupies a total area of approximately 1,362m^2.

A copy of the survey plan prepared by Beveridge Williams is reproduced below and in Appendix B.

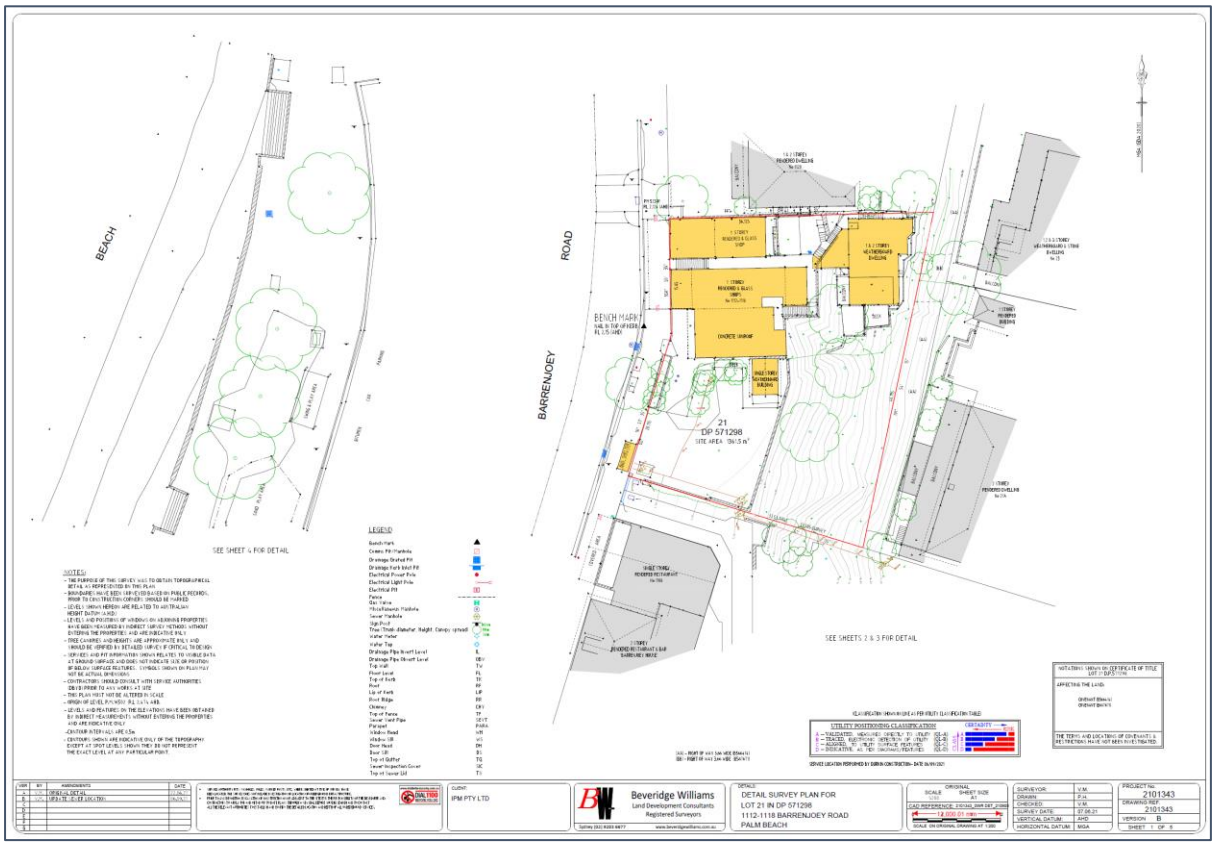

Figure 2.1 – Survey plan (Source: IPM Property)

The site is currently occupied by a single weatherboard dwelling house which is located behind a small number of shops fronting Barrenjoey Road. These shops include a general store/takeaway shop, a beautician, a clothing store and a café.

Informal off-street parking is provided for 6 cars in an open at-grade area located in the south-western corner of the site.

Vehicular access to the site is currently provided via an entry/exit driveway located towards the southern end of the Barrenjoey Road site frontage.

A recent aerial image of the site and its surroundings, along with a series of Streetview images, are reproduced on the following page.

Figure 2.2 – Aerial Site Location (Source: Nearmap)

Figure 2.3 – Streetview of Barrenjoey Road site frontage looking north (Source: Google Maps)

Figure 2.4 – Streetview of Barrenjoey Road site frontage looking south (Source: Google Maps)

2.2 Road Network

The Transport for NSW (TfNSW) road hierarchy comprises the following road classifications:

- State Roads: Freeways, Motorways and Primary Arterial Roads (TfNSW managed)
- Regional Roads: Secondary or Sub-Arterial (Council managed, partly funded by the State)
- Local Roads: Collector and Local Access Roads (Council managed)

The road hierarchy in the vicinity of the site is shown in the figure on the following page, whilst the key roads are summarised below:

- Barrenjoey Road is classified as a State Road which provides the key north-south road link on the Northern Beaches Peninsula, linking Mona Vale to Palm Beach. In the vicinity of the site it carries one traffic lane in each direction, with kerbside parking permitted at selected locations only.

- Beach Road and Ocean Road (north of Palm Beach Road) are also classified as State Roads which provide an extension of Barrenjoey Road. They also carry one traffic lane in each direction, with kerbside parking permitted at selected locations only.

- Whale Beach Road is a local, unclassified road which performs the function of a collector route along the eastern side of the peninsula, and provides vehicular and pedestrian access to frontage properties. It also carries one traffic lane in each direction, with kerbside parking permitted at selected locations only.

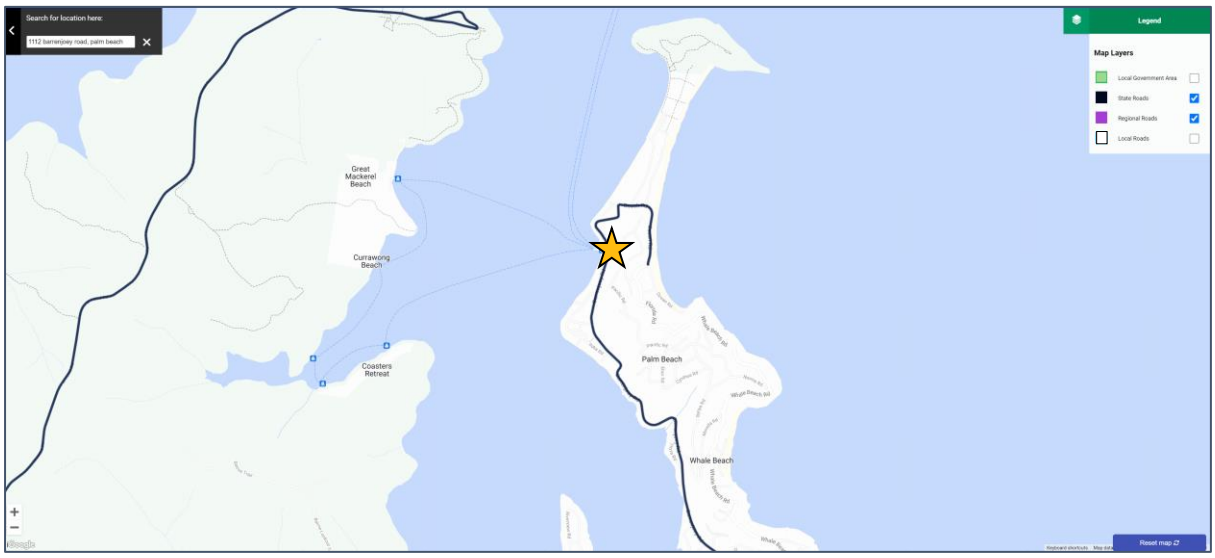

Figure 2.5 – Road Hierarchy Map (Source: Transport for NSW)

2.3 Public Transport

The nearby public transport services are shown in the figure on the following page. The nearest southbound bus stop is located directly outside the site whilst the nearest northbound bus stop is located just 50m north of the site.

These bus stops are serviced by the 199 service, operating 7 days per week between Palm Beach & Manly via Mona Vale & Dee Why. Services operate approximately every 10 minutes.

In addition, the site is located approximately 100m to/from Palm Beach Wharf, operating between Palm Beach, Bennetts, Bonnie Doon, Basin, Currawong and Mackerel. Service times are limited.

Research suggests that proximity to public transport influence the travel mode choice for areas within 400 (approximately 5-10 minutes) of transport nodes (e.g. a bus stop). As such, the proposed development has potential for construction contractors to also utilise bus for key journeys.

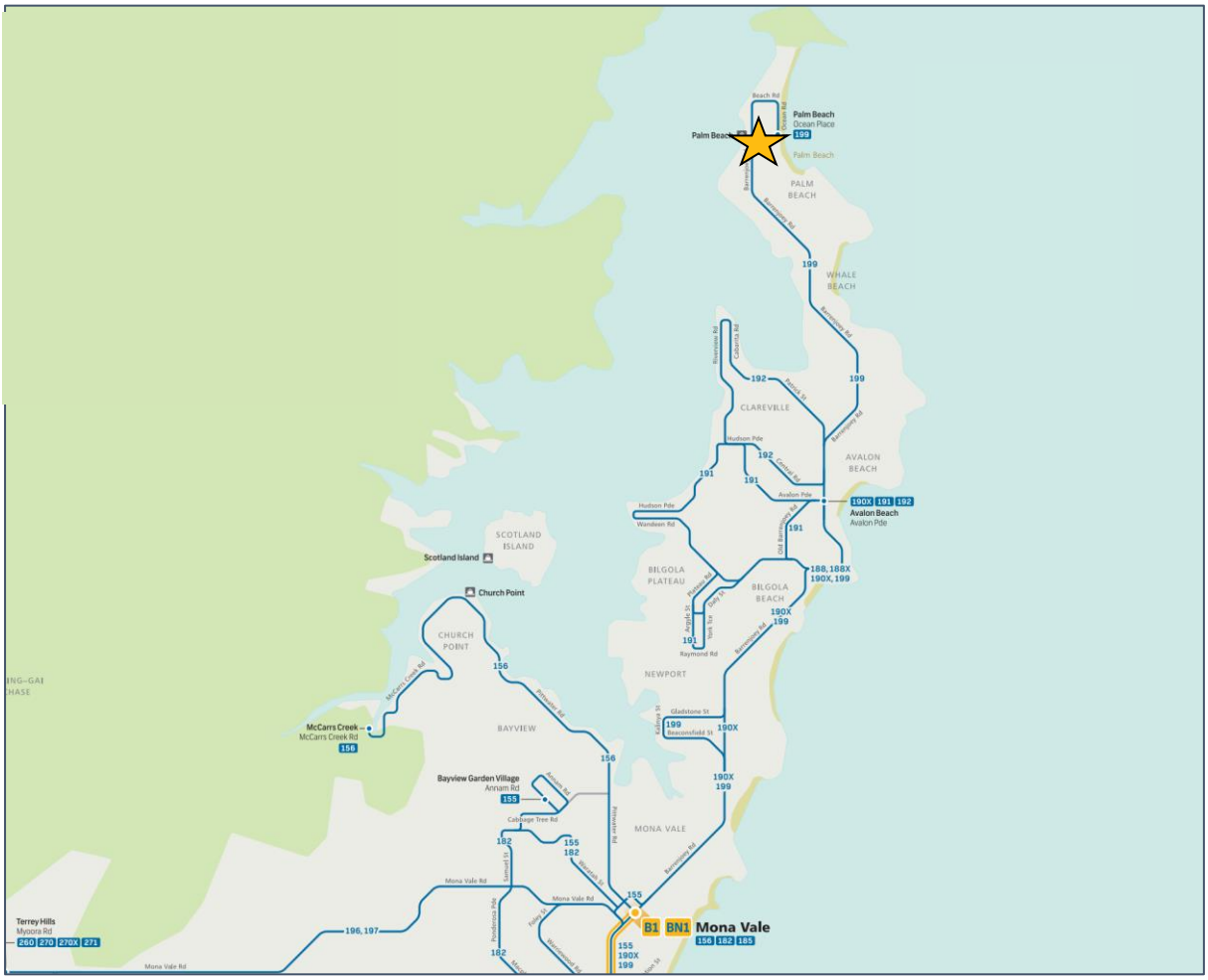

Figure 2.6 – Existing Public Transport Map (Source: Transport for NSW)

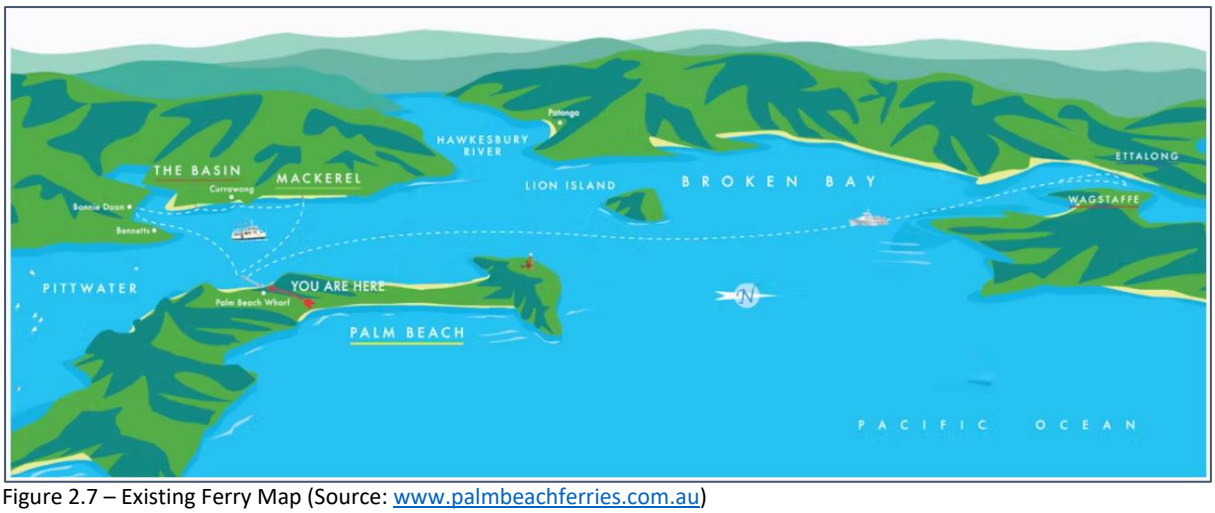

Figure 2.7 – Existing Ferry Map (Source: www.palmbeachferries.com.au)

In addition to the public transport services available in the vicinity of the site, there is also a good level of pedestrian connectivity, including safe and convenient footpaths to the abovementioned bus stops and ferry wharf. All existing footpaths in the surrounding area are of good quality, with appropriate widths and pram ramps provided at most intersections.

2.4 Existing Surrounding Traffic Controls

The existing traffic controls in the vicinity of the site comprise:

- a 60km/h speed limit which applies to Barrenjoey Road
- a 40km/h speed limit which applies to Beach Road, Ocean Road and most other local roads in the area
- a pedestrian crossing in Barrenjoey Road just south of the subject site

2.5 Existing Surrounding Parking Restrictions

The existing parking restrictions in the vicinity of the site comprise:

- No Stopping/No Parking restrictions in Barrenjoey Road north of Palm Beach Road
- No Stopping/No Parking restrictions in Barrenjoey Road in the vicinity of the raised pedestrian crossing, including along the northern portion of the site frontage
- 1P parking restrictions along both sides of Barrenjoey Road to the south of the site
- Ticketed parking in both of the Palm Beach Wharf car parking areas
- Bus Zones located at regular intervals along both sides of Barrenjoey Road, including outside the site frontage

Existing public parking restrictions in the vicinity of the site must be maintained at all times during works. The placement of any barriers, traffic cones, obstructions or other device in the road shoulder or kerbside lane is prohibited without the prior written consent of Council. Changes to existing public parking facilities/restrictions must be approved by the Northern Beaches Local Traffic Committee.

3. Approved Development

3.1 Development Description

Development consent has been granted for the demolition of the existing buildings on the site and the construction of a new four-storey shop-top housing building, comprising 5 apartments over 6 ground floor commercial suites. A copy of the DA approved site plan is reproduced below.

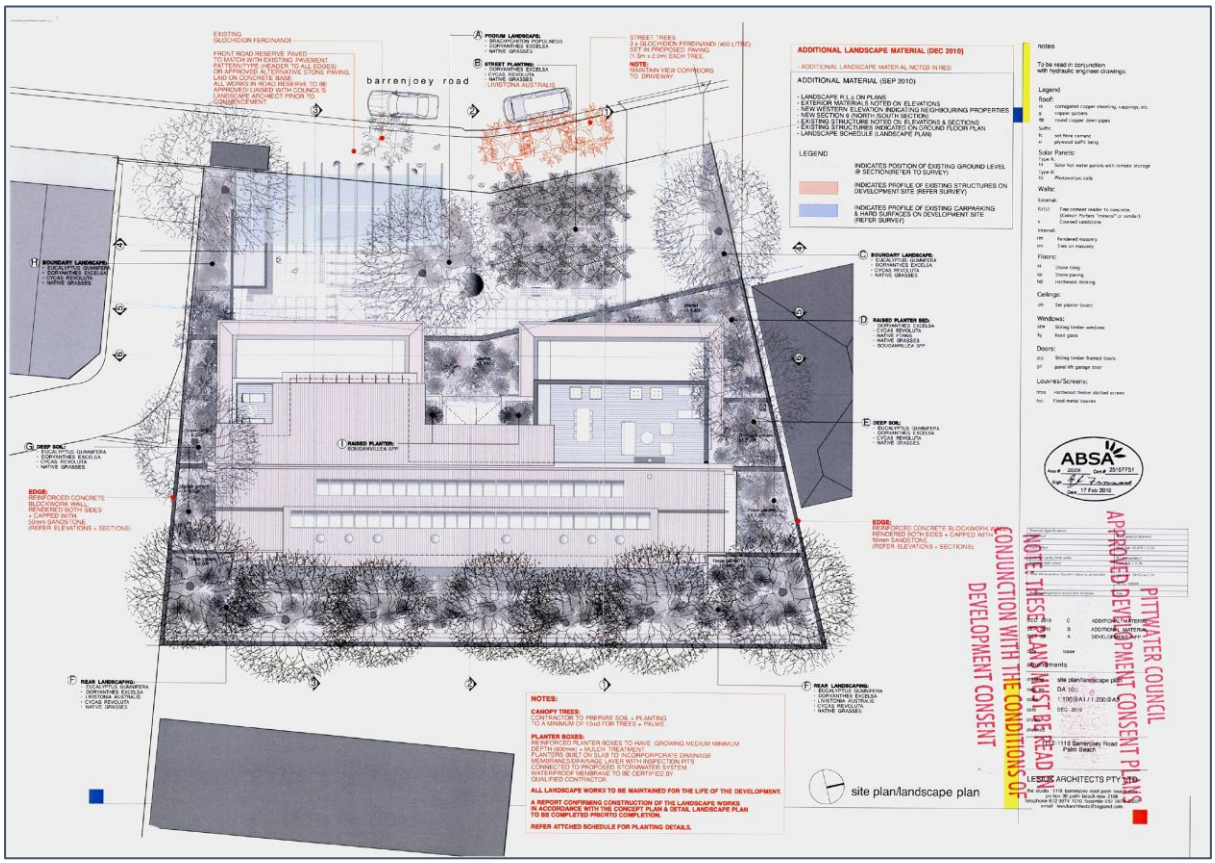

Figure 3.1 – DA approved site plan (Source: Northern Beaches Council DA tracker)

3.2 Parking Arrangements

Off-street parking is approved for a total of 22 cars within a new single-level basement parking area beneath the building, comprising 10 residential spaces, 3 visitor spaces and 9 commercial spaces.

3.3 Vehicular Access

Vehicular access to the site is approved via a new entry/exit driveway located at the northern end of the Barrenjoey Road site frontage.

4. Overview of Construction Works

4.1 Construction Programme & Duration of Works

The construction programme is expected to commence in mid-2023 and require approximately 76 weeks to complete, with practical completion expected in late 2024. The following are the estimated durations of the various activities:

- Site establishment & demolition works: 4 weeks
- Excavation & retention works: 12 weeks
- Structure & finishes: 60 weeks

4.2 Approved Hours of Work

In accordance with DA consent condition 5 (Part A), unless authorised by Council, early works activities are restricted to:

- 7:00am to 5:00pm Monday to Friday
- 7:00am to 1:00pm Saturdays
- No work permitted on Sundays or Public Holidays

An application to vary the abovementioned hours may be submitted to Council for consideration, and approval to vary the specified hours may be granted in exceptional circumstances and for limited occasions (e.g. for public safety, traffic management or road safety reasons). Any applications are to be made on the standard application form and include payment of the relevant fees and supporting information. Applications must be made at least 10 days prior to the date of the proposed work and the prior written approval of Council must be obtained to vary the standard permitted working hours.

4.3 Vehicle Types

There are expected to be a range of construction vehicles visit the site during the early works stage, with the largest truck up to 18.5m in length, including:

- mini-tippers and utilities (standard B99 design vehicle)
- semi-trailers (up to approximately 14m in length)
- 10-wheeler bogey trucks (up to approximately 9.5m in length)

It should be noted that for the use of any oversized vehicles (defined as vehicles longer than 7.5m or heavier than 4.5T) required to operate on public land (e.g. the kerbside area), Council requires the Contractor to attain a “Permit To Stand Plant” on each occasion, including within Council-approved Works Zones.

4.4 Heavy Vehicle Construction Route

All heavy vehicles involved in the early works will approach the site from the south along Barrenjoey Road, before reversing into the site. Upon departure, the trucks will turn left out of the site and head back to the south along Barrenjoey Road. The route represents the shortest travel distance to/from the arterial road network, noting Barrenjoey Road is a State Road, thereby minimising any impacts to local streets. A heavy vehicle route map is provided in Appendix C.

The site manager will ensure that the route map is prominently displayed on site and that all contractors, employees, suppliers and truck drivers are given a copy and understand their obligations as part of their site induction procedure.

Light traffic roads and those subject to load or height limits will be avoided, as well as minimising heavy vehicle movements during school peak periods.

4.5 Heavy Vehicle Movement Summary

Heavy vehicle construction movements will vary depending on the stage of the early works. An estimation of the truck movements during the early works stages is set out in the table below.

Table 4.1 – Estimates of Heavy Vehicle Movements

Stage	Description	Frequency of Trucks (Apx)	Frequency of Movements (Apx)*
Pre-construction	Installation of fencing, hoarding, site sheds and amenities	Average 2 trucks per day	Average 4 truck movements per day
Demolition	Demolition	Average 10 trucks per day	Average 20 truck movements per day
Excavation	Early excavation	Average 10 trucks per day	Average 20 truck movements per day

* 2 movements = 1 vehicle

4.6 Traffic Impacts

Once operational, the new residential apartment development containing 5 apartments and 6 commercial suites will generate in the order of 10 vehicle movements during the weekday AM/PM peak hours, and approximately 100 vehicle movements per day.

By way of comparison, the anticipated peak during the early works programme will be in the order of 20 truck movements per day, as set out in the table above.

As such, the traffic impact on the surrounding local and broader arterial road network associated with early works vehicles will be minimal.

On its own, it is not expected that the approved development on the site will result in any unacceptable impacts to the surrounding road network capacity during its construction. Should future developments within the locality contribute additional traffic generation, the Contractor must co-ordinate with the nominated Project Managers of those construction sites in a manner which minimises disruption to the construction operation.

4.7 Hoarding

In order to protect public space and the general public, secure chainwire fencing with suitable mesh cover will be installed along the front boundary of the site, prior to the commencement of works. The site must be fenced prior to the commencement of demolition and throughout construction and must comply with Safework NSW requirements and be a minimum of 1.8m in height. Furthermore, hoarding must be installed and removed as follows:

- a hoarding or fence must be erected between the work site and any adjoining public space
- any hoarding, fence or awning erected pursuant to this consent is to be removed when the work has been completed

In this regard, A-Class hoarding will be installed along the full frontage of the site, including the northern half of the frontage which will sit 1350mm off the boundary in order to demolish the existing buildings. Given there are no existing buildings on the southern portion of the site, the A-Class hoarding will be installed along the boundary.

Given the existing buildings are low-rise, B-Class hoarding is not considered necessary.

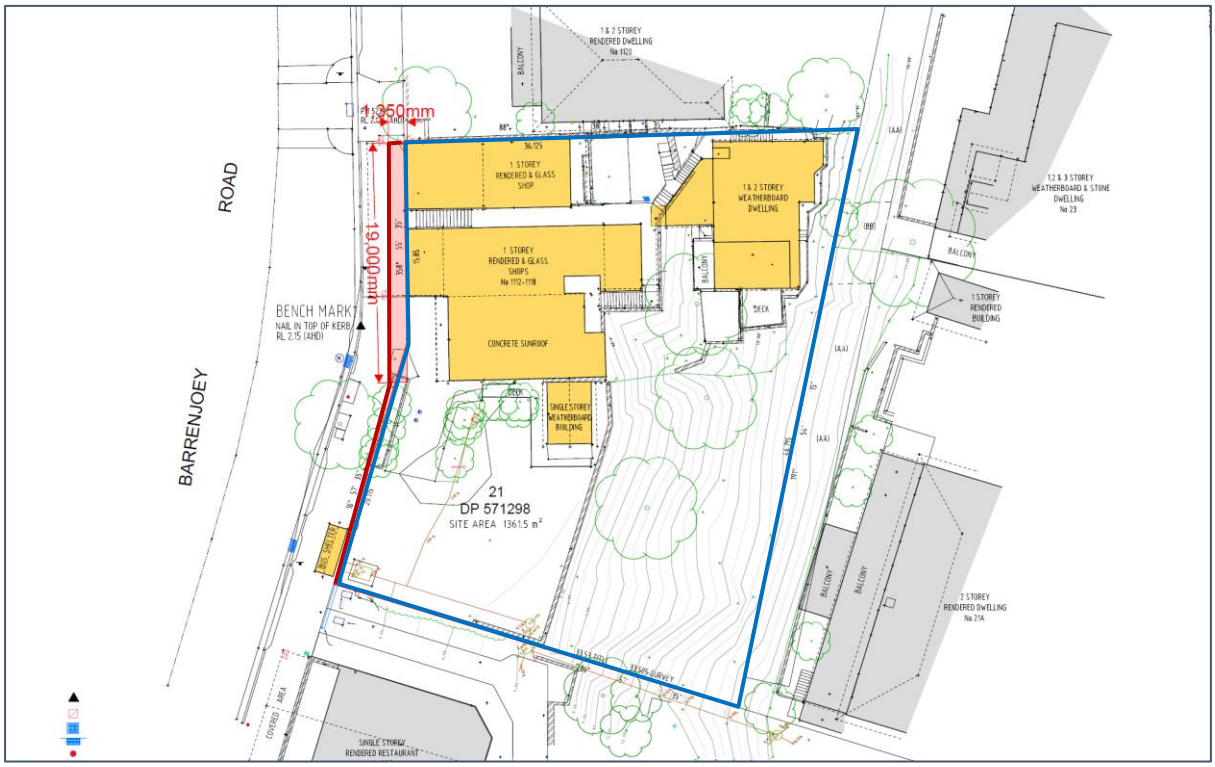

Figure 4.1 – Proposed A-Class hoarding plan (Source: IPM Property)

4.8 Protection of Trees

In accordance with consent condition 17 (Part D), as there are existing trees to be retained within 5m of proposed development works, all recommendations as outlined in the supplied arborist report by Urban Forestry Australia dated June 2009 are required to be complied with before and throughout the development period, particularly with regard to the following:

> Works, erection/demolition of structures, excavation or changes to soil levels within 5m of existing trees are not permitted unless part of the development as approved, and the storage of spoil, building materials, soil or the driving and parking of any vehicle or machinery within 5m of the trunk of a tree to be retained is not permitted;

i. Where specified, tree guards are to be provided to all trees as indicated in the report, and are to be installed prior to the commencement of any work on the site. Tree guard materials and dimensions are specified in the arborist report;

ii. All works within 5m of existing trees including demolition, excavation, civil works, fencing and the like must be carried out by hand and under the supervision of an experienced and suitably qualified arborist. In the event that major structural or feeder roots are encountered, the arborist is to advise the builder to carry out appropriate action to ensure the retention of the tree.

iii. Signage is to be erected advising all contractors and visitors to the site that no works or storage are to take place within the dripline of existing trees.

Any changes or alterations made to the tree management recommendations as outlined by the arborist report due to the discovery of new structural roots or underground services during development works must be reported to the Principal Certifying Authority prior to works recommencing. An extract of the assessed trees in the Urban Forestry Australia arborist report is reproduced below.

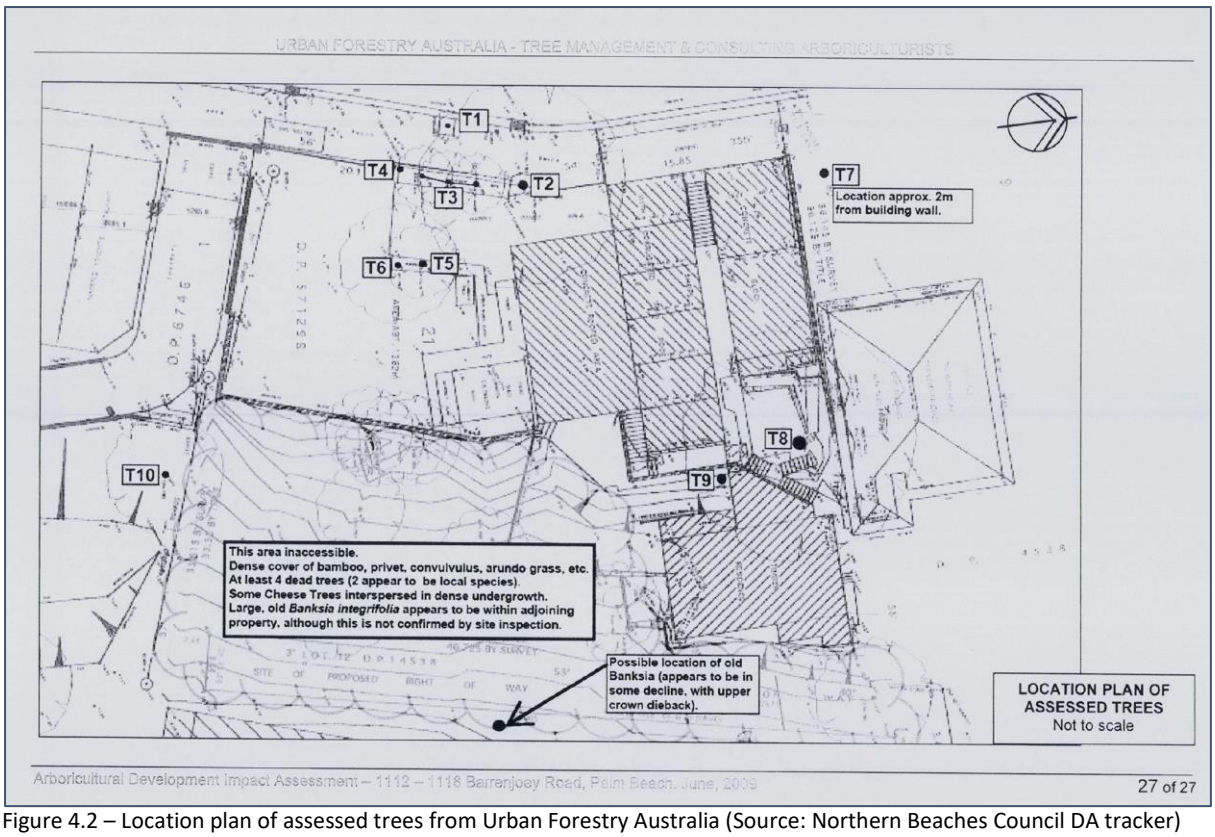

Figure 4.2 – Location plan of assessed trees from Urban Forestry Australia (Source: Northern Beaches Council DA tracker)

No trees on public property (footpaths, roads, reserves etc), or private property (the subject site or neighbouring sites) shall be removed or damaged during construction, unless specifically approved by this consent, including for the erection of any fences, hoardings or other temporary works.

4.9 Sediment & Dust Control

During any on-site demolition and excavation works, the site should be maintained in accordance with "The Blue Book – Managing Urban Stormwater (MUS): Soils and Construction".

In managing the site, provision shall be made throughout the period of works to prevent transmission of soil to the public road, drainage system, any riparian lands or off-site in any manner. Upon completion of the development, any measures to prevent the transition of soil off-site to remain in place until the site is stabilised.

All practicable measures will be taken to ensure that vehicles leaving the site do not deposit mud or soil on the road. If any mud or soil does end up accidently on the road, the road must be cleaned up immediately in a manner that does not pollute the waterway (e.g. sweeping or vacuuming).

Similarly, all vehicles transporting loose materials will have their entire load covered and secured to prevent any large items, excess dust or dirt particles depositing onto the road during travel to/from the site.

A failure to prevent the transmission of silt and sediment and/or causing, water pollution, air pollution, noise pollution or land pollution may result in a breach of the Protection of the Environment Operations Act and orders, penalties and prosecutions may occur.

4.10 Neighbouring Properties

All neighbouring properties are to have their pedestrian and vehicular access maintained at all times. All adjacent residents will be advised by way of letterbox drop of the intention to commence works. A minimum 48 hours notification should be provided to adjoining property owners prior to the implementation of any traffic control measures.

Furthermore, the site manager must liaise with site managers of other construction sites located within a 250m radius of the site to ensure that appropriate measures are in place to prevent the cumulative impact of construction activities.

As of 1st May 2023, there were no major construction sites within the 250m radius, as indicated in the aerial image on the following page.

Figure 4.5 – 250m radius of the subject site (Source: Nearmap)

4.11 Queuing

It is expected that a schedule of demolition and excavation trucks will be established prior to the commencement of a new day, with traffic controllers maintaining radio contact with construction vehicles at all times. All trucks will be co-ordinated such that their arrival is staggered, and truck idling is not permitted, nor is any queuing permitted on the public road network.

4.12 Site Access & Materials Handling Arrangements

During the early works stages, trucks will stand within the site to be loaded with material. These trucks will range from mini-tippers and 10-wheeler bogeys up to and including small semi-trailers which are approximately 14m in length.

Due to site constraints, spoil trucks will need to reverse onto the site via the existing driveway crossover located at the southern end of the Barrenjoey Road site frontage where they will be loaded with material. Once loaded, the trucks will be able to exit the site in a forward direction.

The footpath area outside the site frontage is to remain open to pedestrians unless appropriate traffic control measures are in place.

Equipment, materials and waste will be kept within the construction site's boundaries. No building materials, plant or the like are to be stored on the road or footpath without written approval being obtained from Council beforehand.

The site manager will also ensure that two spoil trucks do not occur at the same time unless they can both be accommodated on site.

Truck movements at the site access will be managed by traffic controllers to ensure the safe and efficient movement of all passing pedestrians and cyclists. All truck movements will be undertaken with the assistance of traffic controllers with appropriate TfNSW/Safework NSW accreditation. Traffic controllers shall not stop traffic to allow trucks to exit. Truck drivers shall wait for a suitable gap in traffic flow before exiting.

In addition to the traffic controllers, a spotter shall also be in place outside the site during truck movements to assist pedestrians, as required.

Swept turn paths of the above trucks accessing the site have been undertaken, demonstrating that the anticipated trucks will be able to do so without difficulty. The swept turn paths are provided in Appendix D.

4.13 Works Zone

As noted in the foregoing, all trucks will load/unload entirely within the site, such that there is no intention to apply for a formal Works Zone during the early works programme.

4.14 Special Permits

Unless otherwise specifically approved in writing by Council, all works, processes, storage of materials, loading and unloading associated with the development must occur entirely on the property.

The developer, owner or builder may apply for specific permits available from Council's Customer Service Centre for the following activities on Council's property:

- on-street mobile plant
- hoardings
- storage of materials and building waste containers (skips) on Council's property
- kerbside restrictions, construction zones

A minimum of forty-eight (48) hours notice is required for any permit.

4.15 Construction Staff

The number of construction staff on site during the demolition stage is expected to be no more than 10, as set out in the table below.

Table 4.2 – Estimate of Construction Personnel On-Site	
Stage	**Description**
Pre-Construction	<10
Demolition & Excavation	Up to 10

4.16 Contractor Parking

During the early works stage, no on-site parking for site personnel will be possible. Staff and sub-contractors will therefore be encouraged to utilise nearby public transport for their commute to/from work, as far as practicable. For staff and sub-contractors that must drive to the site and cannot park on site, they must be advised to avoid parking in local streets.

Such information is to be provided to employees through their contract engagement and Toolbox Talks. The following measures must also be implemented to encourage staff to utilise public transport:

- provision of an on-site tool storage facility to allow tradespeople to safely store tools required for the project

- during site inductions and regular management meetings, staff are to be reminded to use public transport when commuting to/from work and be provided with public transport timetables, if requested

4.17 Site Office & Amenities

During the early works stage of the construction programme, the site office and amenities will be located within the front setback of the site, including toilets, lunch area, first aid etc. As the structure of the building progresses however, the site office and amenities will move to within the building, likely within the basement car park, as this area has the least impact to works progressing on site.

4.18 Pedestrian & Cyclist Impacts

Pedestrian movements along the footpath area outside the site frontage will be maintained at all times. Traffic controllers will manage the interaction between pedestrians and construction vehicles into/out of the site, with pedestrians having right of way at all times, as far as reasonably possible.

The general public will not be authorised to access the site. Access to the site will require authorisation from the site manager.

Given the relatively modest level of early works-related traffic, it is considered that cyclists in the vicinity of the site will not be impacted by the construction activities.

4.19 Emergency Vehicles

As part of Safework NSW requirement, a site-specific Emergency Management Plan will be prepared by the Head Contractor outlining the procedures to be followed in the event of an emergency. An evacuation plan with emergency contact details will be posted in relevant locations throughout the site.

Access to the subject site and neighbouring properties will not be affected by day-to-day early works activities, as no works are proposed outside the site boundary on Barrenjoey Road. Emergency procedures on site will include a requirement for suitably accredited site personnel to assist with emergency access from the street.

Communication will be maintained with the police and emergency services throughout the duration of the early works programme, and a 24-hour contact will be made available for out-of-hours emergencies and site access.

4.20 Waste Management

Council's standard Waste Management Plan template has been completed and is provided under separate cover. The Waste Management Plan describes the waste that is expected to be generated during the demolition, excavation and construction stages of the project, including estimated quantities, and the subsequent separation, storage, disposal of those materials.

5. Construction Traffic Management

5.1 Traffic Control Plan

TfNSW's Traffic Control at Work Sites Technical Manual (Issue 6.1 – 28 February 2022) contains standard Traffic Control Plans (TCPs) for a range of work activities. The manual's objective is to maximise safety by ensuring traffic control at worksites complies with best practice.

A site-specific TCP has therefore been prepared to illustrate the traffic arrangements and signage to be implemented throughout the early works stage, and is provided in Appendix E. A brief description of the TCP is provided below:

- advisory road signage alerting approaching drivers and cyclists along Barrenjoey Road in the vicinity of the site of a speed reduction to 40km/h and possible road works ahead
- warning signs alerting pedestrians to watch their step as they walk along the site frontage
- two traffic controllers located outside the site with appropriate TfNSW/Safework NSW accreditation, who will manage local traffic movements and assist trucks to reverse onto the site to load/unload material, ensuring the safety of pedestrians and prioritising their movements at all times
- a spotter on the footpath outside the site frontage to assist with pedestrian movements.

5.2 Implementation of Early Works Traffic Management Plan

All early works are to be undertaken in accordance with the approved Early Works TMP. All controls within the Early Works TMP must be maintained at all times and all traffic management control must be undertaken by personnel have appropriate TfNSW/Safework NSW accreditation.

A copy of the approved Early Works TMP must be kept on site at all times and made available to the accredited certifier or Council on request.

5.3 Site Inductions

All staff working on the site, including demolition and excavation contractors, builders, owners and sub-contractors, will be required to undergo a site induction. The induction is to include standard environmental, WH&S, driver code of conduct and emergency procedures, as well as notification of the permitted access route to/from the site for staff and delivery vehicles.

5.4 Road Reserve Safety

All public footways and roadways fronting and adjacent to the site must be maintained in a safe condition at all times during the course of the development works, with no obstructions caused to the said footways and roadways. Demolition materials and plant must not be stored in the road reserve without approval of Council.

A safe pedestrian circulation route and a pavement/route free of trip hazards must be maintained at all times on or adjacent to any public access ways fronting the construction site.

At all time work is being undertaken within a public road, adequate precautions shall be taken to warn, instruct and guide road users safely around the work site. Traffic control devices shall satisfy the minimum standards outlined in Australian Standard AS1742.3:1996 “Traffic Control Devices for Work on Roads”.

5.5 Monitoring Program

Early works operations will be monitored to ensure that it proceeds in accordance with the CMP. A daily inspection will be carried out prior to the start of work to ensure that conditions accord with those detailed in the CMP and prevent potential hazards. Any potential issues will be recorded and dealt with if they occur.

In addition, the Head Contractor will develop a program to monitor this Early Works TMP to ensure its effectiveness. The DTMP shall be subject to regular reviews and updated if necessary. Key considerations when reviewing the Early Works TMP include, but not limited to:

- tracking actual truck movements against the forecasted figures
- identify any parking, loading/unloading and site access issues and develop an action plan to address those issues that may arise
- to ensure the TCP is suitable for the works and update if necessary
- ensure regular monitoring of trucks leaving the site with their loads fully covered

6. Conclusion

This report has been prepared to document the traffic management, cyclist and pedestrian measures to be implemented during the demolition of the existing buildings at 1112-118 Barrenjoey Road, Palm Beach, and subsequent initial excavation works. The report takes into account TfNSW's Traffic Control at Work Sites Technical Manual, AS1742.3: Traffic Control Devices for Works Sites on Road, and the former Pittwater Council DA N0102/10 consent conditions. Minor variations to these policies and standards are considered acceptable given the site constraints and proposed works.

Based on the findings contained within this report, the following conclusions are made, along with the following measures which are to be implemented:

- traffic activity during the early works stage will be minimal and less than the future mixed use development upon completion and occupation
- early works vehicle movements to/from the site can be satisfactorily accommodated on the surrounding road network, in terms of spatially and capacity
- all early works vehicles are to approach and depart the site from the south via Barrenjoey Road
- all loading of materials will occur wholly within the nominated area on site
- during the early works stage, spoil trucks will need to reverse onto the site via the existing driveway crossover off Barrenjoey Road, thereby allowing them to exit in a forward direction via the same driveway
- traffic controllers with TfNSW/Safework NSW accreditation will be required to manage and regulate early works vehicle movements into and out of the site, however, will not be required during periods of zero heavy vehicle activity
- during early works vehicle movements, the traffic controllers, along with a spotter, will also ensure the safe and efficient movement of pedestrians and cyclists
- all vehicles are to exit the site in a forward direction
- all vehicles transporting loose material will have their loads covered and/or secured in order to prevent any items depositing onto the road on approach/departure to/from the site
- contractors will be encouraged to utilise nearby public transport for their commute to/from work
- a number of driver protocols will be established as part of the site induction process to ensure the safety of all road users.

In summary, the traffic management measures contained within this Early Works TMP are considered acceptable for this scale of project.

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Appendix A

DA Approved Plans

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Appendix B

Survey Plan

CJP | CONSULTING ENGINEERS

Appendix C

Heavy Vehicle Route Map

LEGEND:

HEAVY VEHICLE APPROACH ROUTE

HEAVY VEHICLE DEPARTURE ROUTE

WORK SITE: 1112-1118 BARRENJOEY ROAD, PALM BEACH

Barrenjoey Rd

Iluka Rd

Nabilla Rd

Woorak Rd

Pacific Rd

Palm Beach Rd

Sunrise Rd

Livistona Ln

Canara Pl

N

Plotted by SY

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PRELIMINARY PLAN

FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING

THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY. THE EXACT LOCATIONS SHALL BE PROVEN ON SITE. ALL EXISTING SERVICES SHOWN ARE NOT GUARANTEED.

1112-1118 BARRENJOEY ROAD, PALM BEACH
CONSTRUCTION TRAFFIC MANAGEMENT PLAN
HEAVY VEHICLE ACCESS ROUTE (DEMOLITION & EXCAVATION)

DRAWN BY Z.CHEN REVIEWED BY C.PALMER	ISSUE DATE 27 June 2023	SCALE 0 NTS NTS NOT TO SCALE	DRAWING NO. 23109-FIG1-V1	SHEET NO. 01 OF 01

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Appendix D

Swept Turn Paths

GENERAL NOTES

1. CJP IS RESPONSIBLE FOR VEHICLE SWEPT PATH DIAGRAMS AND/OR DRAWING MARK-UPS ONLY. BASE DRAWING IS PREPARED BY OTHERS.
2. VEHICLE SWEPT PATH DIAGRAMS PREPARED USING COMPUTER GENERATED TURNING PATH SOFTWARE AND ASSOCIATED CAD DRAWING PLATFORMS. VEHICLE DATA BASED UP ON RELEVANT AUSTRALIAN STANDARDS
3. AS 2890.2:2018 (PARKING FACILITIES - OFF STREET COMMERCIAL VEHICLE FACILITIES). THESE STANDARDS EMBODY A DEGREE OF TOLERANCE, HOWEVER THE VEHICLE CHARACTERISTICS IN THESE STANDARDS REPRESENT A SUITABLE DESIGN VEHICLE AND DO NOT ACCOUNT FOR ALL VARIATIONS IN VEHICLES DIMENSIONS/SPECIFICATIONS AND/OR DRIVER ABILITY AND BEHAVIOURS

BARRENJOEY ROAD

EXISTING NO STOPPING ZONE

WORK SITE
1112-1118 BARRENJOEY ROAD,
PALM BEACH

14m Semi-Trailer CUSTOM

14m Semi-Trailer CUSTOM

14m Semi-Trailer CUSTOM

APPROACHING THE SITE

BARRENJOEY ROAD

WORK SITE
1112-1118 BARRENJOEY ROAD,
PALM BEACH

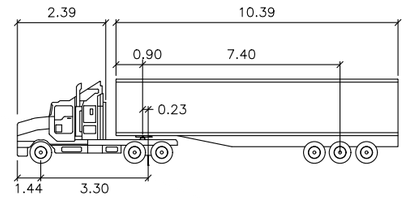
14m Semi-Trailer CUSTOM

14m Semi-Trailer CUSTOM

DEPARTURE THE SITE

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY



14m Semi-Trailer

meters			
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 32.4
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

LEGEND:

- WORK SITE (A CLASS FENCING)
- A CLASS HOARDING EXTENSION

Plotted by SY

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FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
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1112-1118 BARRENJOEY ROAD, PALM BEACH
DEMOLITION AND EXCAVATION STAGES
TRAFFIC GUIDANCE SCHEME

N

SCALE 0 4.0 8.0 1:400 @ A3

DRAWING NO. 23109-D02-V1 | SHEET NO. 02 OF 03

ISSUE DATE 27 June 2023 | DRAWN BY Z.CHEN | REVIEWED BY C.PALMER

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BARRENJOEY ROAD

EXISTING NO STOPPING ZONE

WORK SITE
1112-1118 BARRENJOEY ROAD,
PALM BEACH

9.5m Bogie 10-wheeler CUSTOM

APPROACHING THE SITE

BARRENJOEY ROAD

WORK SITE
1112-1118 BARRENJOEY ROAD,
PALM BEACH

9.5m Bogie 10-wheeler CUSTOM

DEPARTURE THE SITE

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

9.5m Bogie 10-wheeler CUSTOM

9.5

LEGEND:

- WORK SITE (A CLASS FENCING)
- A CLASS HOARDING EXTENSION

Plotted by SY

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DEMOLITION AND EXCAVATION STAGES
TRAFFIC GUIDANCE SCHEME

N

SCALE 0 4.0 8.0 1:400 @ A3

DRAWING NO. 23109-D02-V1 | SHEET NO. 03 OF 03

ISSUE DATE 27 June 2023 | DRAWN BY Z.CHEN | REVIEWED BY C.PALMER

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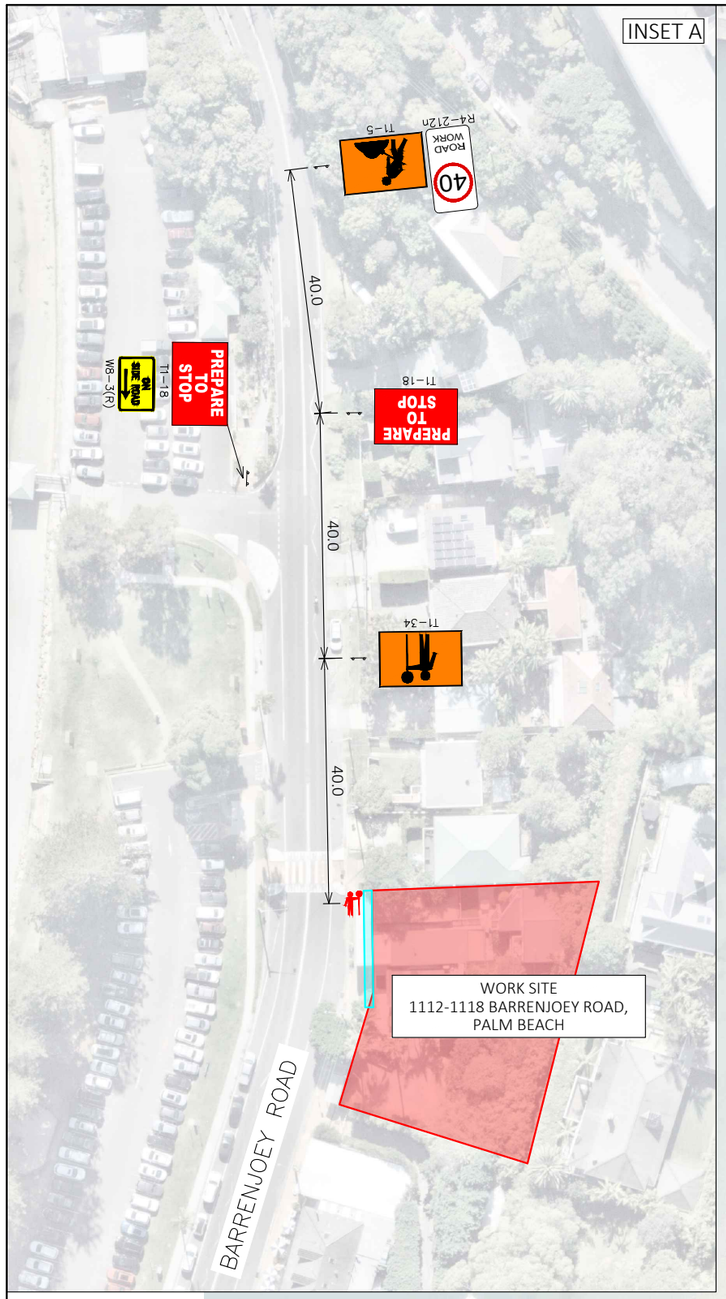
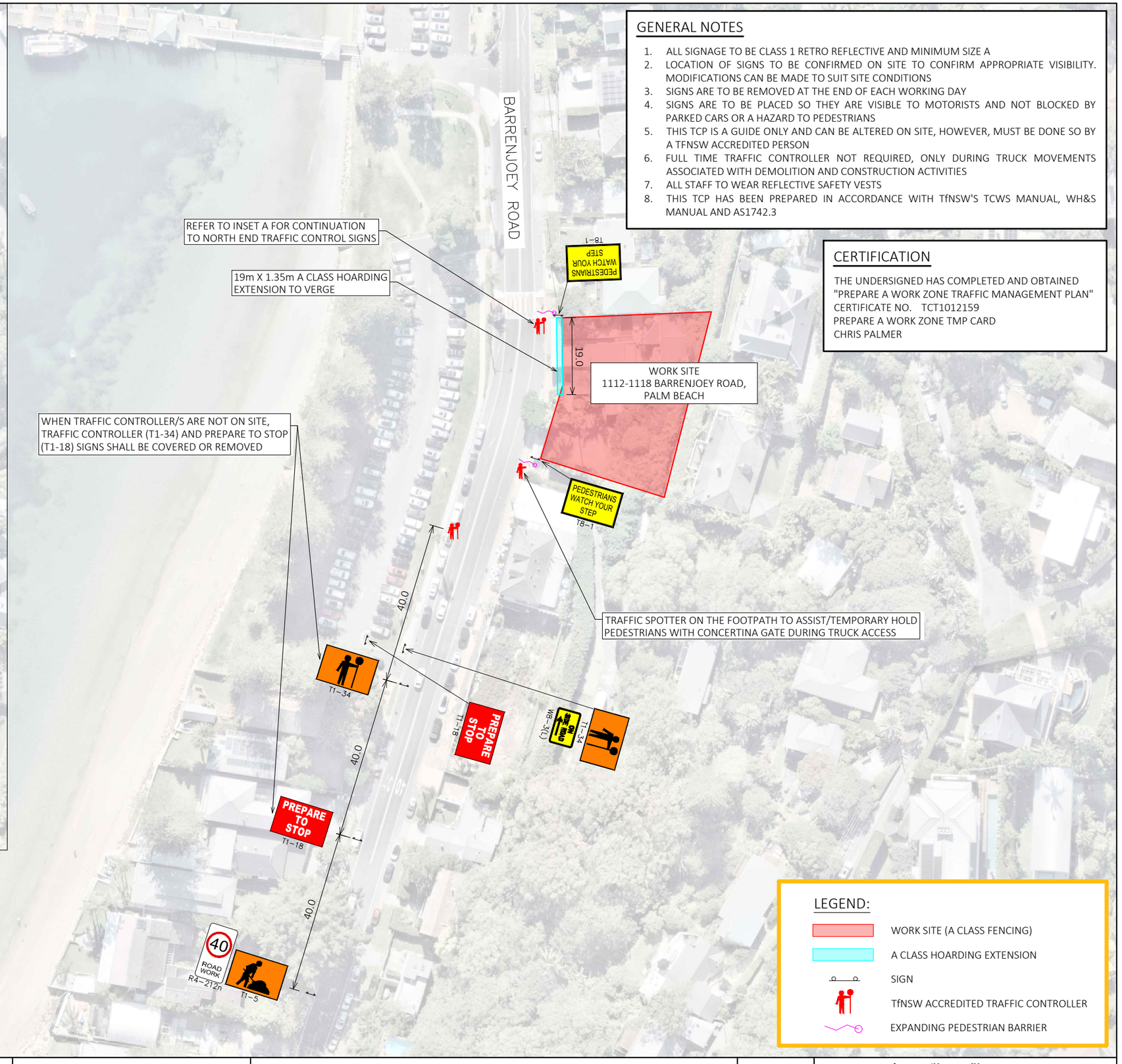
Appendix E

Traffic Control Plan

INSET A





GENERAL NOTES

1. ALL SIGNAGE TO BE CLASS 1 RETRO REFLECTIVE AND MINIMUM SIZE A
2. LOCATION OF SIGNS TO BE CONFIRMED ON SITE TO CONFIRM APPROPRIATE VISIBILITY. MODIFICATIONS CAN BE MADE TO SUIT SITE CONDITIONS
3. SIGNS ARE TO BE REMOVED AT THE END OF EACH WORKING DAY
4. SIGNS ARE TO BE PLACED SO THEY ARE VISIBLE TO MOTORISTS AND NOT BLOCKED BY PARKED CARS OR A HAZARD TO PEDESTRIANS
5. THIS TCP IS A GUIDE ONLY AND CAN BE ALTERED ON SITE, HOWEVER, MUST BE DONE SO BY A TFNSW ACCREDITED PERSON
6. FULL TIME TRAFFIC CONTROLLER NOT REQUIRED, ONLY DURING TRUCK MOVEMENTS ASSOCIATED WITH DEMOLITION AND CONSTRUCTION ACTIVITIES
7. ALL STAFF TO WEAR REFLECTIVE SAFETY VESTS
8. THIS TCP HAS BEEN PREPARED IN ACCORDANCE WITH TfNSW'S TCWS MANUAL, WH&S MANUAL AND AS1742.3

CERTIFICATION

THE UNDERSIGNED HAS COMPLETED AND OBTAINED
"PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN"
CERTIFICATE NO. TCT1012159
PREPARE A WORK ZONE TMP CARD
CHRIS PALMER

LEGEND:

- WORK SITE (A CLASS FENCING)
- A CLASS HOARDING EXTENSION
- SIGN
- TfNSW ACCREDITED TRAFFIC CONTROLLER
- EXPANDING PEDESTRIAN BARRIER

Plotted by SY

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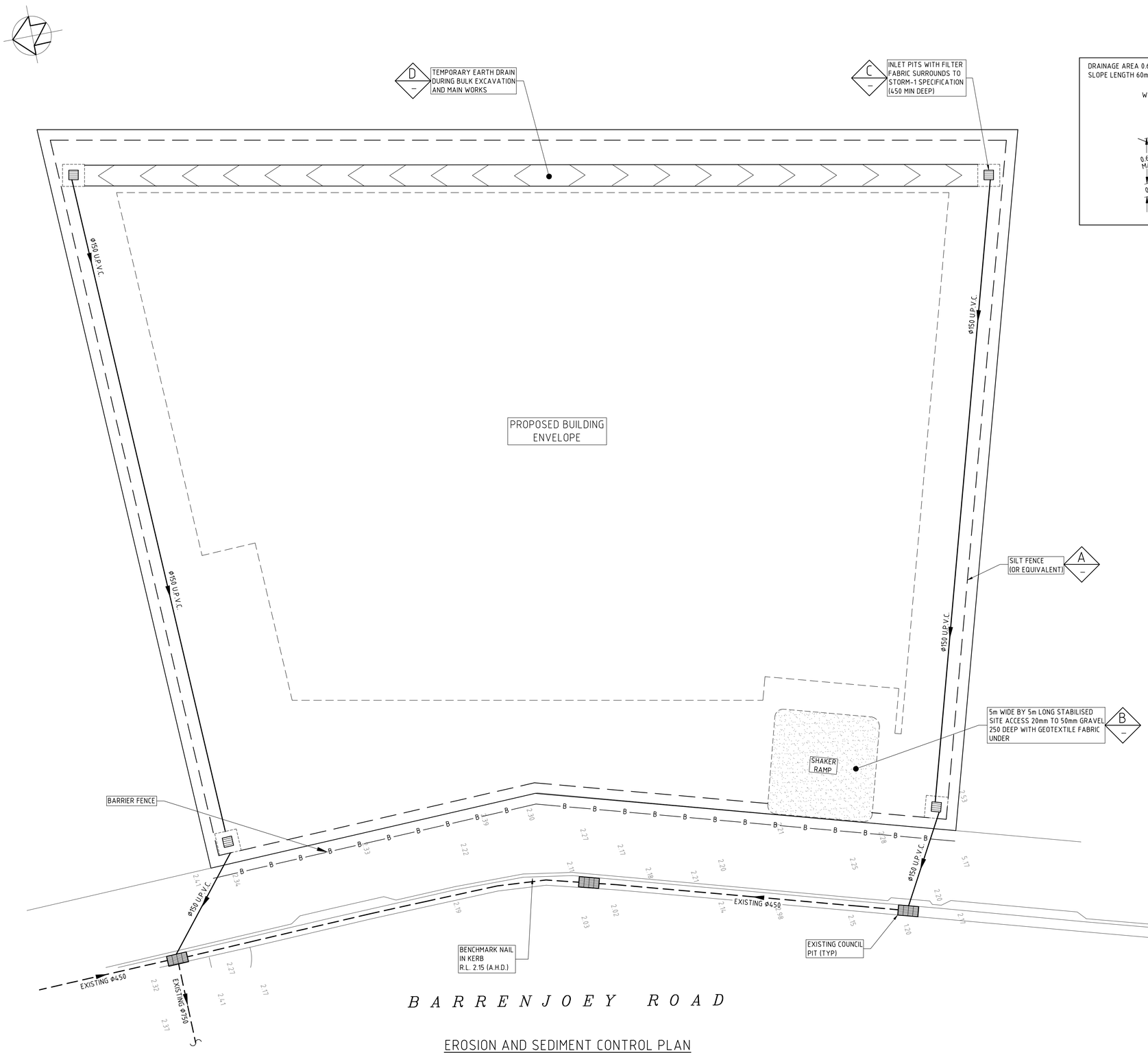
DEMOLITION AND EXCAVATION STAGES
TRAFFIC GUIDANCE SCHEME

N

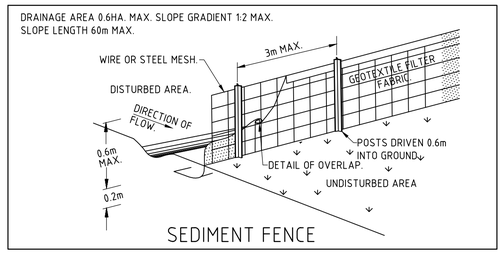
SCALE 0 10.0 20.0 1:1000 @ A3

DRAWING NO. 23109-D02-V1 | SHEET NO. 01 OF 03
ISSUE DATE 27 June 2023 | DRAWN BY Z.CHEN | REVIEWED BY C.PALMER



EROSION AND SEDIMENT CONTROL PLAN

SCALE 1:100



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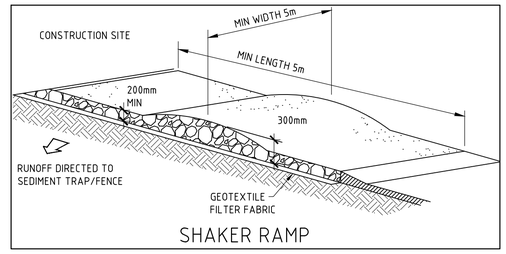

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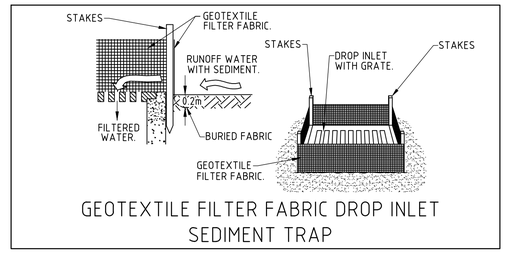

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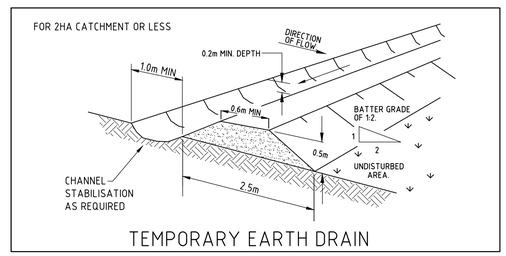

DETAIL D
NOT TO SCALE

SCHEDULE OF WORKS

DESCRIPTION
THE PROJECT IS THE PROVISION OF A NEW RESIDENTIAL DWELLING. THE TOTAL SITE AREA IS APPROXIMATELY 1361.5 m^2.

EROSION
NO AREA IS TO BE DISTURBED OTHER THEN THAT DIRECTLY AFFECTED BY ACCESS, SITE REGRADING, SERVICING, ROAD WORKS AND DRAINAGE WORKS. FOR ALL OTHER AREAS ENTRY IS PROHIBITED AND IS TO BE CLEARLY DEFINED WITH THE INSTALLATION OF BARRIER FENCING. UPSTREAM WATER IS TO BE DIRECTED AROUND THE SITE WITHOUT CONTAMINATION.

SEDIMENT CONTROL
CONTROL WILL BE VIA THE INSTALLATION OF SILT FENCES AS SHOWN ON PLAN. STOCK PILES ARE TO BE LOCATED IN AREAS SHOWN ON THE PLAN (CLEAR OF SERVICING, WATERCOURSES, ROAD AND DRAINAGE WORKS) AND PROVIDED WITH SILT FENCES ON THEIR DOWNSTREAM SIDE.

PHASING OF WORKS
1. INSTALL ALL BARRIER AND SILT FENCING. BARRIER FENCING MAY BE ERECTED AND REMOVED AS NECESSARY TO SUIT STAGING OF WORKS.
2. INSTALL ALL TEMPORARY DRAINAGE STRUCTURES AS NECESSARY.
3. STRIP & STOCKPILE TOPSOIL.
4. UNDERTAKE SITE DEVELOPMENT.
5. AS EARTHWORKS ARE COMPLETED THESE AREAS ARE TO BE TOPSOILED, SEEDED AND MULCHED OR PAVED WITHIN 20 WORKING DAYS.
6. ONLY AT THE COMPLETION OF WORKS AND STABILIZATION OF AREAS UPSTREAM ANY CONTROL DEVICES TO BE REMOVED.

ISSUE	DATE	REVISION

TITLE
EROSION AND SEDIMENT CONTROL PLAN
1112–1116 BARRENJOEY ROAD, PALM BEACH

DRAWN	DATE	CHECKED	SCALE @ A1
MDB	8 SEPTEMBER 2023	BE Civil (Hons) MIE Aust.	1:100

TAYLOR CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING NO. STORM–4

"Seascape" Suite 7 22-26 Fisher Rd Dee Why NSW 2099 | T 02 9982 7092 | F 02 9982 5898 | enquire@taylorconsulting.net.au | www.taylorconsulting.net.au

Tree Management Strategies

Arboricultural Impact Assessment

1112-1116 Barrenjoey Road,
Palm Beach
20-12-21

Leigh Brennan
Tree Management Strategies

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0447 356 059
leigh@treemanagementstrategies.com.au

Dip Horticulture
Dip Arboriculture
Cert IV Business Management

ABN 504 8330 4596

Arboriculture Australia Member
2018 Registered Consulting Arborist

Contents

Summary

Tree Management Strategies have been commissioned by Palmdev Pty Ltd to provide an Arboricultural Impact Assessment (AIA) at 1112-1116 Barrenjoey Road, Palm Beach (Figure 1) as part of a proposed Development Application (DA). The assessment takes into consideration a total of 24 trees on the subject site and neighboring properties.

This report aims to:

- Assess the Health, Condition and Retention Value of twenty-four trees on the subject site.
- Calculate the impact the proposed development will have on all trees assessed.
- Suggest sensitive construction methods to retain high to medium value trees on the subject site.
- Recommend the retention or removal of trees on the subject site.

The Health, Condition, Retention values and photographs of twenty-four trees are recorded in the Tree Data Schedule (Appendix 1) and shown in the Tree Impact Plan (Appendix 2).
The developmental Impacts are explored in Developmental Impact and Observations (Section 2) of this report.

Conclusion

The site is highly disturbed with a mixture of native, exotic and weed species that provide a minor contribution or have a negative impact on the visual character and amenity of the local area.
Tree 1 has a minor incursion to its TPZ of 2.5 %. No negative impact is expected by this minor impact.
Trees 13, 14, 15, 16, 17, 18 and 19 are suitable for removal without consent under the Northern Beaches Councils Exempt Tree Species list and have total incursions to their TPZ's that requires their removal.
Tree 7 within the subject site is given a low retention value and has a total incursion to its TPZ's by the proposed boundary retaining wall alignment that requires its removal.
Tree 9, 10, 11 and 20 within the subject site are given a low retention value and have a total incursion to their TPZ's by the proposed basement alignment that requires their removal.
Trees 2, 3, 4, 5, 6, 8, 12, 21, 22, 23 and 24 are unaffected by the development.
Tree 12 is unaffected by the proposed development, however, will require a Tree Protection Plan following the developments approval. The conditions of consent should ensure a Tree Protection Plan is prepared. The Tree Protection Plan should outline the protection measures required to safeguard Tree 12 throughout construction.

Recommendation

1. Remove Tree 7, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19 and 20. Tree removal work to be undertaken in accordance with *AS 4373 Pruning of Amenity Trees*, using a qualified Arborist (minimum Australian Qualification Framework (AQF3) Level Arborist).

2. Retain Tree 1, 2, 3, 4, 5, 6, 8, 12, 21, 22, 23 and 24.

3. A Tree Protection Plan should be conditioned following the development approval that outlines the protection measures required to safeguard Tree 12.

1. Introduction

Tree Management Strategies have been commissioned by Palmdev Pty Ltd to provide an Arboricultural Impact Assessment (AIA) at 1112-1118 Barrenjoey Road, Palm Beach (Figure 1) as part of a proposed Development Application (DA). The assessment takes into consideration a total of 24 trees on the subject site and neighboring properties.

The proposed development consists of the demolition of existing dwellings and construction of a shop top housing development consisting of seven apartments and two ground floor retail shops.

Northern Beaches Council are the consenting authority for the development.

1.1 Aim

This report aims to:

- Assess the Health, Condition and Retention Value of twenty-four trees on the subject site.
- Calculate the impact the proposed development will have on all trees assessed.
- Suggest sensitive construction methods to retain high to medium value trees on the subject site.
- Recommend the retention or removal of trees on the subject site.

Figure 1: Subject Site

Figure 1: Locality map of the subject site, highlighted in red.

2. Developmental Impacts/Observations

2.1 General observations

A site inspection was conducted on the 1st of July 2021, to assess the health and condition of twenty-four trees potentially affected by the proposed development. The trees are plotted onto the Tree Impact Plan (Appendix 2).

The subject trees are a mixture of native and exotic species of varying age, health and vitality. The majority of trees are given a low retention value due their position in the landscape, species or poor health and vitality.

The area to the southeast of the site is overgrown with the majority of species being noxious weeds including privet and Rhizomatous bamboo, refer to (Figure 2).

Figure 2: Weed Species

Figure 2: Southeast view of the subject site and weed species highlighted in red.

2.2 Developmental Impacts

The Health, Condition, Retention Value, General data and photographs of twenty-four trees is displayed in the Tree Data Schedule (Appendix 1).

All tree retention values are in accordance with IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010) ©.

The tree impacts detailed below are based on the plans referenced in (Section 3) of this document.

The below ground incursions impacting the Tree Preservation Zones (TPZ) of the subject trees assessed are shown on the Tree Impact Plan (Appendix 2).

Tree 1 located in the neighbouring site is given a medium retention value. The current boundary retaining wall and shop location creates a root barrier and unhospitable growing environment for tree roots, for this reason the TPZ of Tree 1 is shown as modified and is deemed unaffected by the developments footprint, refer to the Tree Impact Plan (Appendix 2). The proposed stormwater line impacts the theoretical TPZ of Tree 1 by a minor 2.5 %. The quantity of roots growing under the concrete footpath is also considered to be reduced. No negative impact is expected by this minor impact.

Trees 13, 14, 15, 16, 17, 18 and 19 are suitable for removal without consent under the Northern Beaches Councils Exempt Tree Species list and have total incursions to their TPZ's that requires their removal, refer to the Tree Impact Plan (Appendix 2).

Tree 7 within the subject site is given a low retention value and has a total incursion to its TPZ's by the proposed boundary retaining wall alignment that requires its removal, refer to the Tree Impact Plan (Appendix 2).

Tree 9, 10, 11 and 20 within the subject site are given a low retention value and have a total incursion to their TPZ's by the proposed basement alignment that requires their removal, refer to the Tree Impact Plan (Appendix 2).

Trees 2, 3, 4, 5, 6, 8, 12, 21, 22, 23 and 24 are unaffected by the development.

Tree 12 is unaffected by the proposed development, however, will require a Tree Protection Plan following the developments approval. The conditions of consent should ensure a Tree Protection Plan is prepared. The Tree Protection Plan should outline the protection measures required to safeguard Tree 12 throughout construction.

3. Referenced Documents

Plans that were used in the calculation and mapping of tree impacts for this report include:

Plan Title	Drawing Number	Consultant	Revision	Job/Project Number
Architectural Plans	DA000-DA500	Koichi Takada Architects	16-12-21	
Survey	1 of 5	BW Surveyors	7-6-21	2101343
Site Drainage Plan	Sheet 1	Taylor Consulting	10-12-21	
Tree Impact Plan		IEMA	14-9-78	

4. Conclusions & Recommendations

4.1 Conclusion

The site is highly disturbed with a mixture of native, exotic and weed species that provide a minor contribution or have a negative impact on the visual character and amenity of the local area.

Tree 1 has a minor incursion to its TPZ of 2.5 %. No negative impact is expected by this minor impact.

Trees 13, 14, 15, 16, 17, 18 and 19 are suitable for removal without consent under the Northern Beaches Councils Exempt Tree Species list and have total incursions to their TPZ's that requires their removal.

Tree 7 within the subject site is given a low retention value and has a total incursion to its TPZ's by the proposed boundary retaining wall alignment that requires its removal.

Tree 9, 10, 11 and 20 within the subject site are given a low retention value and have a total incursion to their TPZ's by the proposed basement alignment that requires their removal.

Trees 2, 3, 4, 5, 6, 8, 12, 21, 22, 23 and 24 are unaffected by the development.

Tree 12 is unaffected by the proposed development, however, will require a Tree Protection Plan following the developments approval. The conditions of consent should ensure a Tree Protection Plan is prepared. The Tree Protection Plan should outline the protection measures required to safeguard Tree 12 throughout construction.

4.2 Recommendations

1. Remove Tree 7, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19 and 20. Tree removal work to be undertaken in accordance with *AS 4373 Pruning of Amenity Trees*, using a qualified Arborist (minimum Australian Qualification Framework (AQF3) Level Arborist).

2. Retain Tree 1, 2, 3, 4, 5, 6, 8, 12, 21, 22, 23 and 24.

3. A Tree Protection Plan should be conditioned following the developments approval that outlines the protection measures required to safeguard Tree 12.

5. References

Shigo, A., 1986, A New Tree Biology and Dictionary: facts, photos, and philosophies on trees and their problems and proper care, Snohomish, WA

Council of Standards Australia (August 2009)
The Australian Standard for the Protection of Trees on Development Sites (AS 4970 – 2009).

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Lonsdale, D. (1999). *Principles of Tree Hazard Assessment and Management*. Forestry Commission, London.

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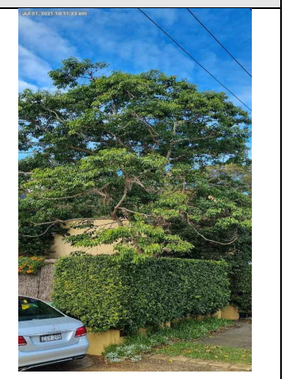
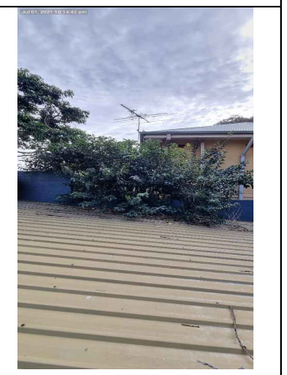
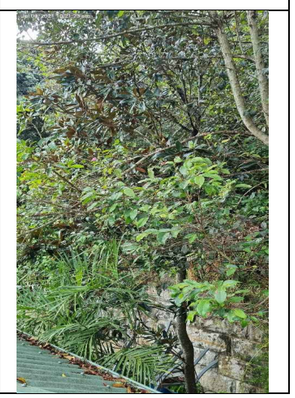
6. Appendices

Appendix 1: Tree Data Schedule

Tree Management Strategies

APPENDIX 1 – TREE DATA SCHEDULE

No	Genus-species	Common Name	DAB metres (radius) Above Buttress	DBH metres (radius) Breast Ht	SRZ (radius) Metres	TPZ (radius) Metres	Height Metres	Age Young, Semi-Mature, Mature Over Mature	Canopy Spread (Metres) (radius)	Health Good Fair Fair/Poor Poor Failed	Condition Good Fair Fair/Poor Poor Failed	Useful Life Expectancy High Medium Low	Landscape significance High Medium Low	Retention value High Medium Low	Notes	Photo
1	Melicope elleryana	Pink Flowered Doughwood	0.50	0.40	2.5	4.80	14.00	Mature	5.00	Fair	Fair/Poor	Medium	Medium	Medium	Neighbouring Tree	
2	Ficus pumila	Climbing Fig	0.20	0.15	1.7	1.80	6.00	Mature	2.00	Fair/Poor	Fair/Poor	Low	Low	Low	Neighbouring Climbing Vine	
3	Magnolia ‘Little Gem’	Little Gem Magnolia	0.12	0.09	1.5	1.5	5.00	Young	1.00	Fair/Poor	Fair/Poor	Medium	Low	Low	Neighbouring Tree	

Tree Management Strategies

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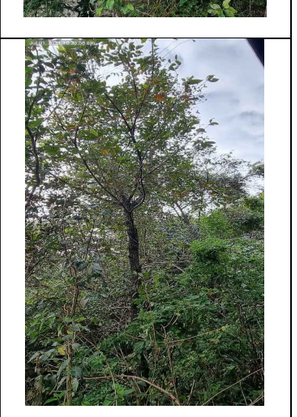
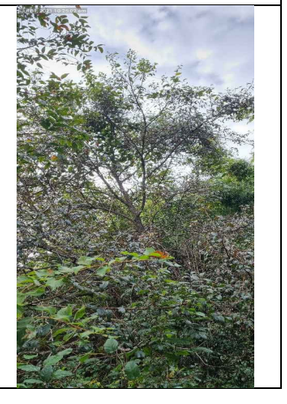
4	Glochidion ferdinandii	Cheese Tree	0.12	0.09	1.4	1.5	5.00	Semi Mature	1.00	Poor	Poor	Low	Low	Low	Neighbouring Tree	
5	Glochidion ferdinandii	Cheese Tree	0.12	0.10	1.4	1.5	7.00	Semi Mature	1.00	Fair/Poor	Fair/Poor	Low	Low	Low	Neighbouring Tree	
6	Glochidion ferdinandii	Cheese Tree	0.22	0.18	1.8	2.2	7.00	Semi Mature	2.00	Fair/Poor	Fair/Poor	Medium	Low	Low	Neighbouring Tree	

Tree Management Strategies

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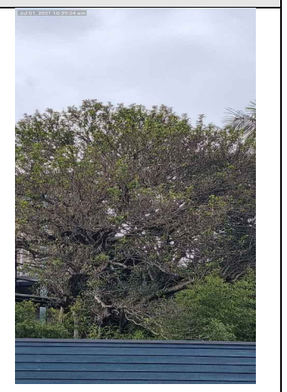
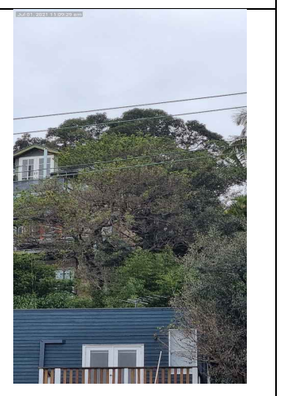
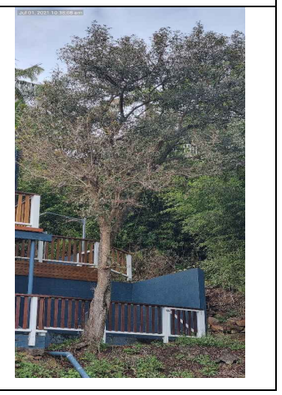
7	Glochidion ferdinandii	Cheese Tree	0.20	0.15	1.7	1.80	6.00	Semi Mature	2.00	**Poor**	Poor	Low	Low	Low		
8	Glochidion ferdinandii	Cheese Tree	0.25	0.20	1.8	2.40	8.00	Mature	3.00	Fair/Poor	Fair/Poor	Medium	Low	Low	Neighbouring Tree	
9	Glochidion ferdinandii	Cheese Tree	0.25	0.20	1.8	2.40	8.00	Mature	2.00	Fair/Poor	Poor	Low	Low	Low		

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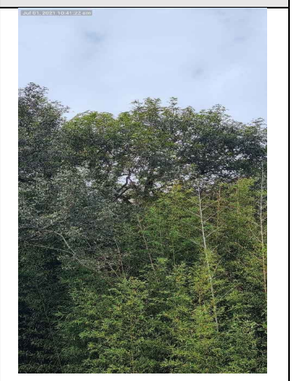
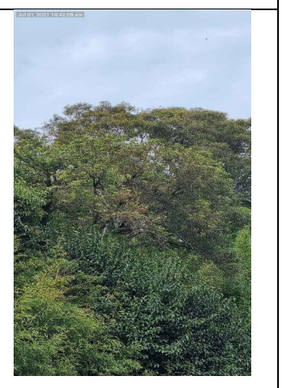
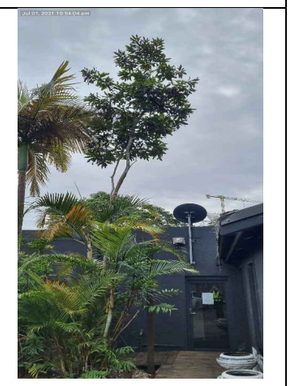
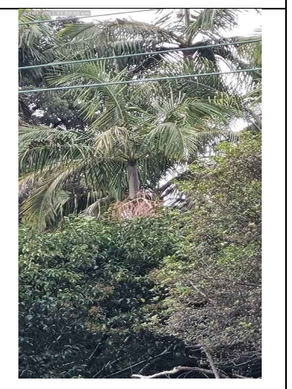
No	Genus-species	Common Name	DAB metres (radius) Above Buttress	DBH metres (radius) Breast Ht	SRZ (radius) Metres	TPZ (radius) Metres	Height Metres	Age Young, Semi-Mature, Mature Over Mature	Canopy Spread (Metres) (radius)	Health Good Fair Fair/Poor Poor Failed	Condition Good Fair Fair/Poor Poor Failed	Useful Life Expectancy High Medium Low	Landscape significance High Medium Low	Retention value High Medium Low	Notes	Photo
10	Glochidion ferdinandii	Cheese Tree	0.20	0.18	1.6	2.1	7.00	Mature	2.00	Fair/Poor	Poor	Medium	Low	Low		
11	Glochidion ferdinandii	Cheese Tree	0.25	0.20	1.8	2.40	8.00	Mature	3.00	Fair/Poor	Fair/Poor	Poor	Low	Low		
12	Cupaniopsis anacardiodes	Tuckaroo	0.38	0.30	2.20	3.60	9.00	Mature	4.00	Fair	Fair/Poor	Medium	Medium	Medium		

APPENDIX 1 – TREE DATA SCHEDULE

No	Genus-species	Common Name	DAB metres (radius) Above Buttress	DBH metres (radius) Breast Ht	SRZ (radius) Metres	TPZ (radius) Metres	Height Metres	Age Young, Semi-Mature, Mature Over Mature	Canopy Spread (Metres) (radius)	Health Good Fair Fair/Poor Poor Failed	Condition Good Fair Fair/Poor Poor Failed	Useful Life Expectancy High Medium Low	Landscape significance High Medium Low	Retention value High Medium Low	Notes	Photo
Tree 13, 14 and 15	Archontopheonix cunninghamiana	Bangalow Palm				1.5	10.00	Mature	2.00	Fair/Poor	Fair/Poor	Medium	Low	Low	Tree 13 to 15 are grouped together. Exempt Species	
16	Washingtonia robusta	Mexican fan palm				1.5	14.00	Mature	2.00	Fair/Poor	Fair/Poor	Medium	Medium	Medium	Exempt Species	
17	Washingtonia robusta	Mexican fan palm				1.5	14.00	Mature	2.00	Fair/Poor	Fair/Poor	Medium	Medium	Medium	Exempt Species	

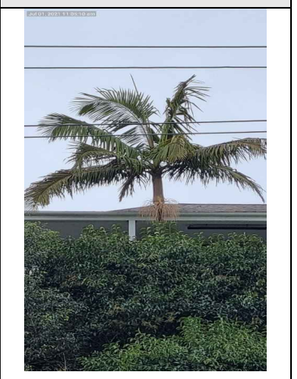
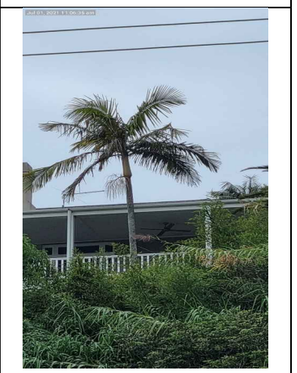
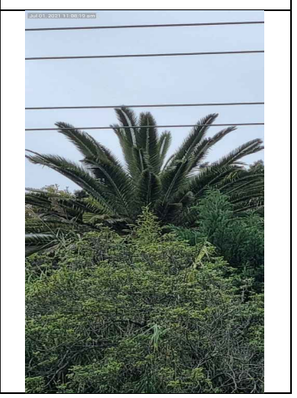
Tree Management Strategies

APPENDIX 1 – TREE DATA SCHEDULE

No	Genus-species	Common Name	DAB metres (radius) Above Buttress	DBH metres (radius) Breast Ht	SRZ (radius) Metres	TPZ (radius) Metres	Height Metres	Age Young, Semi-Mature, Mature Over Mature	Canopy Spread (Metres) (radius)	Health Good Fair Fair/Poor Poor Failed	Condition Good Fair Fair/Poor Poor Failed	Useful Life Expectancy High Medium Low	Landscape significance High Medium Low	Retention value High Medium Low	Notes	Photo
Tree 18 and 19	Archontopheonix cunninghamiana	Bangalow Palm				1.5	6.00	Semi Mature	1.00	Fair/Poor	Fair/Poor	Medium	Low	Low	Exempt Species	
20	Xanthostemon chrysanthus	Golden penda Tree			1.5	1.5	8.00	Semi Mature	1.00	Poor	Poor	Low	Low	Low		
21	Archontopheonix cunninghamiana	Bangalow Palm				1.5	6.00	Semi Mature	1.00	Fair	Fair	Medium	Low	Low	Exempt Species	

Tree Management Strategies

APPENDIX 1 – TREE DATA SCHEDULE

No	Genus-species	Common Name	DAB metres (radius) Above Buttress	DBH metres (radius) Breast Ht	SRZ (radius) Metres	TPZ (radius) Metres	Height Metres	Age Young, Semi-Mature, Mature Over Mature	Canopy Spread (Metres) (radius)	Health Good Fair Fair/Poor Poor Failed	Condition Good Fair Fair/Poor Poor Failed	Useful Life Expectancy High Medium Low	Landscape significance High Medium Low	Retention value High Medium Low	Notes	Photo
22	Archontopheonix cunninghamiana	Bangalow Palm				1.5	8.00	Mature	2.00	Fair	Fair	Medium	Low	Low	Neighbouring Tree	
23	Archontopheonix cunninghamiana	Bangalow Palm				1.5	10.00	Young	2.00	Fair	Fair	Medium	Low	Low	Neighbouring Tree	
24	Phoenix cunninghamiana	Date Palm				1.5	8.00	Mature	3.00	Fair	Fair	Medium	Low	Low	Neighbouring Tree	

Appendix 2: Tree Impact Plan

Lot 1
DP12979

Lot 10
DP14538

Lot 9
DP14538

Lot 2
DP12979

Lot 8
DP14538

Lot 7
DP14538

Lot 71
DP620515

Retaining wall to boundary line

Lot 3
DP12979

Lot 12
DP14538

Lot 4
DP12979

Lot 21
DP571298

Lot 5
DP12979

Lot 72
DP620515

Lot 7B
DP13374

Lot 103
DP1256016

Lot 102
DP1256016

Lot 2
DP1004105

Lot 101
DP1256016

Lot 8B
DP13374

3m SIDE SETBACK
4.5m SIDE SETBACK
6m REAR SETBACK

LEGEND

- Site Boundary

Retention Value

- Low - 20 Trees
- Medium - 4 Trees
- Exempt Species
- TPZ - Tree Protection Zone

Proposed Development Incursions

- Proposed Basement Disturbance
- Overall Development Footprint
- Total Impact
- Stormwater Pit Incursion = 2.5%
- Stormwater Impact

0 2 4 6 8 m
Scale: 1:300

Sheet Size : A3

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Removal Schedule	Tree No.s
Building Footprint:	7, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20

GDA 1994 MGA Zone 56
2/12/2021

Tree Management Strategies

1112-1116 Barrenjoey Road, Palm Beach

Tree Impact Plan
Design 3
APPENDIX 2

I:\01 Clients_GIS\TMS - Tree Management Services\TMS00-010_1112_1116 Barrenjoey Rd, PalmBeach\TMS00_010_PalmBeach_TreeImpactPlan_04.mxd

Appendix 3: Method

3.1 Site Assessment

From the ground, the following information was recorded and displayed in the Tree Data Schedule (Appendix 1).

- Tree genus and species.
- Approximate height spread if deemed applicable.
- Trunk diameter at breast height and above the buttress.
- Age class: young, semi mature, mature, over mature.
- Health.
- Condition.

Observations were recorded and trees photographed.

3.2 Research

The following legislation, documents or websites were reviewed:

- Northern Beaches Local Environmental Plan (LEP) 2011.
- Northern Beaches Development Control Plan (DCP) 2011.

3.3 Tree Data Schedule Method

The Health and Condition of twenty-four trees are shown in the Tree Data Schedule (Appendix 1) with the methods explained below:

Tree Health

Overall Health (Vigour/Vitality)	Tree vigour is exhibited by crown density, crown cover, leaf colour, leaf size, leaf texture, presence of epicormic growth, ability to withstand predation by pest and disease, resistance and degree of dieback.
Good (Excellent)	Good tree vigour exhibited by no decline in overall health and vigour, height and shape. The specimen is observed to be of excellent condition displaying characteristics that is known for that particular species (what would be the expected condition for that particular species of that age in that location), 0% dieback, full crown density, leaf health, no pest or disease present.
Fair	Fair tree vigour exhibited by moderate decline in overall health and vigour, height and shape. The specimen is observed to be of moderate condition by not displaying characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), less than 10% dieback, 90% of crown foliage density, more than 90% leaf health, acceptable level of pest or disease is evident for the assessing arborist (where it is considered the tree's overall health or condition will not be affected or lead to irreversible decline from pest or disease).
Fair/Poor	Fair to poor tree vigour exhibited by considerable decline in overall health and vigour, height and shape. The specimen is observed to be of less than acceptable condition by not displaying characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), 10-20% dieback, considerable foliage deficiencies, 70-90% foliage density, 70-90% leaf health, pest or disease infestation at acceptable thresholds for the assessing arborist (where it is considered the tree's overall health or condition will not be affected or lead to irreversible decline from pest or disease).
Poor	Poor vigour exhibited by substantial decline in overall health and vigour, height and shape. The specimen is observed to be of poor condition by not displaying characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), 20-30% dieback, considerable foliage deficiencies, 50-70% leaf health, pest or disease infestation at unacceptable infestation level that exceeds thresholds for the assessing arborist (where

	it is considered the tree's overall health or condition will be affected or lead to irreversible decline from pest or disease).
Very Poor	Very poor vigour exhibited by irreversible decline in overall health and vigour, height and shape. The specimen is observed to be of less than acceptable condition by not displaying characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), 15-50% dieback; severe foliage deficiencies; 30-50% density; 30-50% leaf health; pest or disease infestation at severe infestation level that exceeds thresholds for the assessing arborist (where it is considered the tree's overall health or condition will be affected or lead to irreversible decline from pest or disease).
Dead	Dead tree vigour exhibited by complete decline in overall health and vigour, height and shape. The specimen is observed to be dead by not displaying any characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), tree holds less than 15% foliage; branching is dead throughout canopy, pest or disease infestation at severe infestation level that exceeds thresholds for the assessing arborist (where it is considered the tree's overall health or condition will be affected or lead to irreversible decline from pest or disease).

Tree Condition

Overall Condition (Structure/Stability)	The tree condition as identified by the arborist in regard to defects in structure and stability.
Good (Exceptional specimen)	No damage or decay observed to the root plate, visible basal and /or root flare, stable in ground, well tapered branches with sound open unions. All characteristics within thresholds for the assessing arborist.
Fair (Standard tree – no observable major defects to suggest that there is an increased likelihood of tree or part of tree failure)	Minor damage or decay observed to root plate, trunk or primary branches or branch unions (1st or 2nd branch order or scaffolding branch), well-formed branch unions, minor branch end weight or over-extensions within thresholds for the assessing arborist.
Fair/Poor	Moderate damage or decay observed to root plate, trunk or primary branches or branch unions (1st or 2nd branch order or scaffolding branch); minimal basal/root flare; acute branch; past branch failure(s); moderate branch end-weight or over-extension approaching thresholds for the assessing arborist.
Poor	Major damage or decay observed to root plate, trunk or primary branches or branch unions (1st or 2nd branch order or scaffolding branch) no observable basal and /or root flare; acute branch unions starting to include bark; major branch end-weight or over-extension at or exceeds thresholds for the assessing arborist.
Very Poor	Excessive damage or decay observed to root plate, trunk, primary branch or branch unions (1st or 2nd branch order or scaffolding branch), excessive decay or hollows compromising the structural integrity, unstable in ground, excessive branch end-weight, included-bark unions, exceeding thresholds for assessing arborist. Failure probable.
Failed	Failure of root plate or trunk or primary branch or branch unions (1st or 2nd branch order or scaffolding branch) or active split between branch unions or severe damage to primary tree structure.

3.4 Tree Retention Value Method

IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010) ©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the Tree Significance - Assessment Criteria and Tree Retention Value - Priority Matrix, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of High, Medium and Low significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined.

Tree Significance - Assessment Criteria

High Significance in landscape

- The tree is in good condition and good vigour. The tree has a form typical for the species.
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age.
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered Ecological Community or listed on a council's Significant Tree Register.
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity.
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values.
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ - tree is appropriate to the site conditions.

Medium Significance in landscape

- The tree is in fair to good condition and good or low vigour.
- The tree has form typical or atypical of the species.
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area.
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street.
- The tree provides a fair contribution to the visual character and amenity of the local area.
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ.

Low Significance in landscape

- The tree is in fair to poor condition and good or low vigour.
- The tree has form atypical of the species.
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings.
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area.
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen.
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa in situ - tree is inappropriate to the site conditions.
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms.
- The tree has a wound or defect that has potential to become structurally unsound.
- Environmental Pest/Noxious Weed Species.
- The tree is an Environmental Pest Species due to its invasiveness or poisonous/allergenic properties.
- The tree is a declared noxious weed by legislation.
- Hazardous and or Irreversible Decline.
- The tree is structurally unsound and/or unstable and is considered potentially dangerous.
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a mono-cultural stand in entirety.

Useful Life Expectancy (ULE)

Useful life expectancy (ULE) is a measure of a trees remaining lifespan regarding its health, condition and locality ULE categories were measured as:

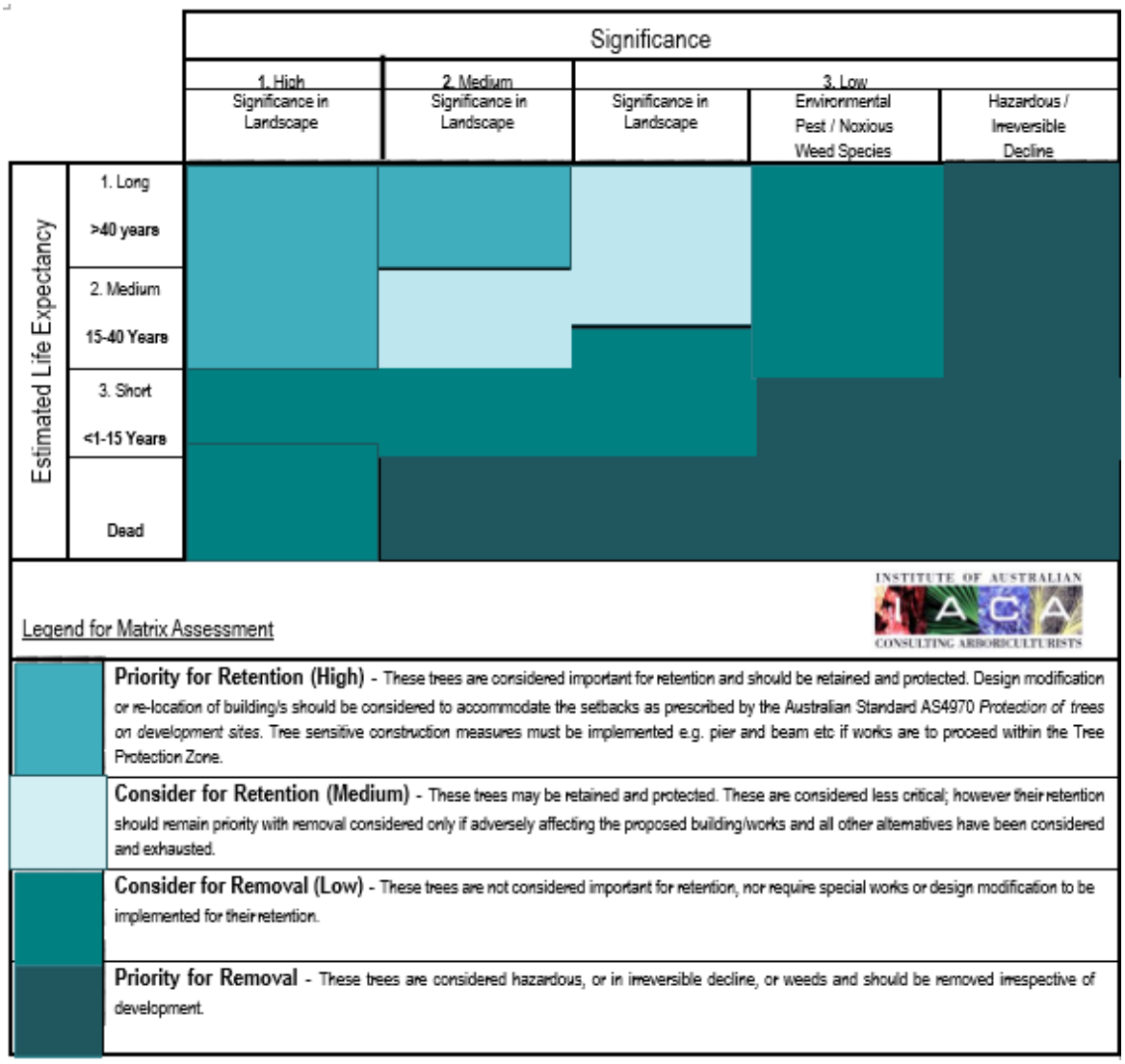
a) Long (greater than 40 years)

b) Medium (between 15 and 40 years)

c) Short (between 1 and 15 years)

d) Dead

Tree Retention Value - Priority Matrix



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Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia

Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturist (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au

3.5 Tree Protection Zone and Structural Root Zone Method

Following the VTA, The Tree Preservation Zones and Structural Root zones were calculated and added to the Tree Data Schedule (Appendix 1) and the Tree Impact Plan (Appendix 2) with the methods explained below:

The Structural Root Zone (SRZ) is the area around the base of a tree required for its stability. The woody root growth and soil cohesion in this area are necessary to hold the tree upright; therefore, there are no variations to its size. The SRZ is normally circular with the trunk at its centre and is expressed by its radius in metres (AS – 4970). Due to the potential of causing instability of a tree, it is highly recommended that no roots within its SRZ are pruned or removed. SRZ, which is the area required for tree stability, was calculated as follows: SRZ radius = (D x 50) 0.42 x 0.64.

The Tree Protection Zone (TPZ) is the principle means of protecting trees on development sites. The TPZ is a combination of the root area and crown area that requires protection. It is an area isolated from construction disturbance, so that the tree remains viable (AS – 4970). The radius of the TPZ is calculated for each tree by multiplying its DBH x 12. TPZ = DBH x 12 (DBH = trunk diameter measured at 1.4m above ground level). The radius of the TPZ is measured from COT (Centre of the trunk).

Variations to the Tree Protection Zone (TPZ)

General

It may be possible to encroach into or make variations to the standard TPZ. Encroachment Includes excavation, compacted fill and machine trenching.

Minor encroachment

If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. Variations must be made by the project arborist considering relevant factors. (Figure 3) demonstrates some examples of possible encroachment into the TPZ up to 10% of the area.

Major encroachment

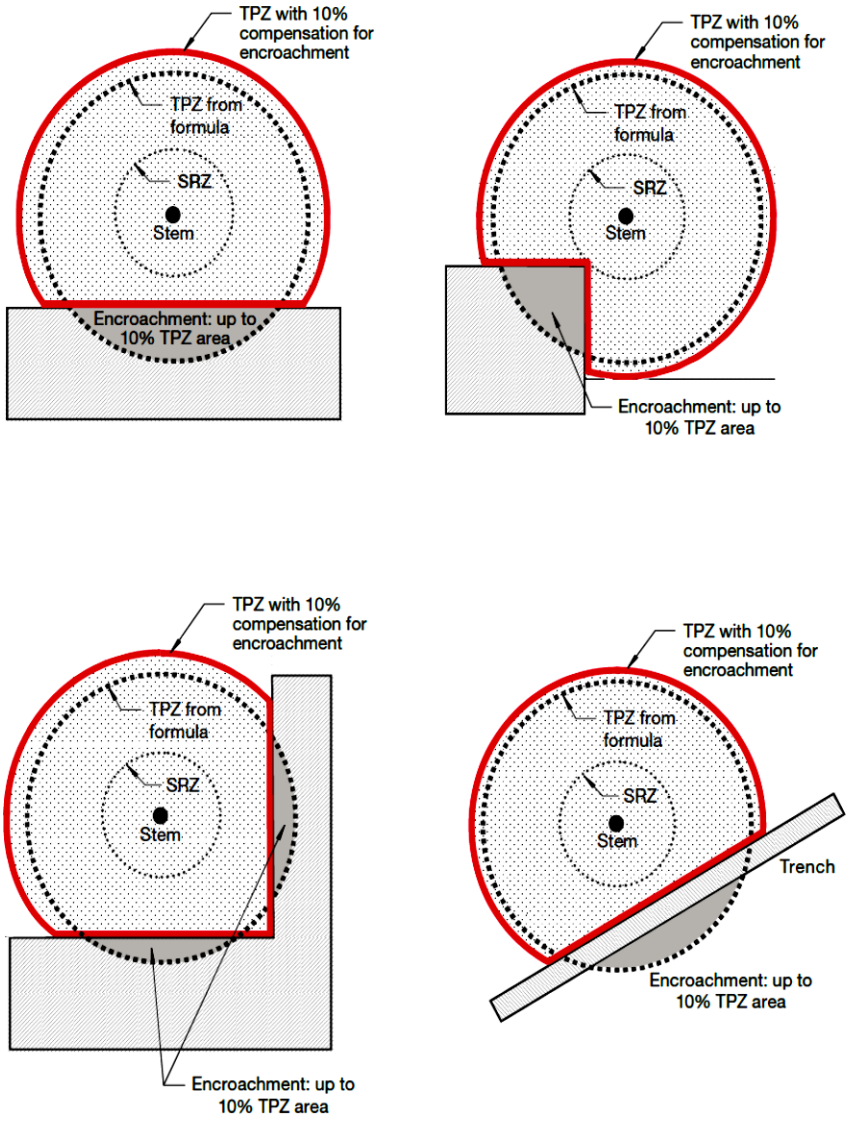
If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ the project arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods and consideration of relevant factors listed in the Clause.

Figure 3

ENCROACHMENT INTO TREE PROTECTION ZONE

(Informative)

Encroachment into the tree protection zone (TPZ) is sometimes unavoidable. Figure D1 provides examples of TPZ encroachment by area, to assist in reducing the impact of such incursions.



NOTE: Less than 10% TPZ area and outside SRZ. Any loss of TPZ compensated for elsewhere.