CONSTRUCTION MANAGEMENT PLAN

FINAL – REV 06

ALDI 810 Pacific Highway Gordon

Mixed Use Residential Development

INNOVATING SINCE 1971

NOVATI CONSTRUCTIONS

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1 PROJECT DESCRIPTION AND CONSTRUCTION ACTIVITIES

1.1 Introduction

This CONSTRUCTION MANAGEMENT PLAN (CMP) has been prepared for the ALDI Mixed Use Residential at 810 Pacific Highway Gordon. This CMP describes Novati's understanding of the project, the Detailed Site Establishment and the Construction Methodology that we have developed for the Project.

This document describes our Proposal to work with ALDI, their PM and stakeholders as your Design and Construct Contractor to deliver a successful project at Gordon that meets their aspiration and fulfil their needs.

We believe that our collective experience in commercial and multistorey residential projects puts Novati in an ideal position to deliver your Vision the project at Gordon.

Novati fully understands the complexity of working within restricted site access and on sites is also by Council Offices and commercial properties on a commercial street frontage. We have been established as a residential, and commercial builder for nearly 50 years.

We are passionate about delivering quality successful projects for our clients and the community. To that effect we assembled a highly skilled Team of Internal managers and support staff, quality contractors, and a Design Team with experience in Residential Apartments. We will ensure the delivery of a well-managed and a successful project.

1.2 Project Details

This CONSTRUCTION MANAGEMENT PLAN (CMP) has been prepared in relation to the Design and Construction of ALDI Mixed Use Residential at 810 Pacific Highway Gordon.

Project Address:	810 Pacific Highway Gordon
Client:	ALDI
Project Managers:	Mr Paul Di Cristo, Cerno Project Management
Principal Contractor:	Novati Constructions Pty Ltd
Principal Contractors Address:	Level 1 99 Alexander St, Crows Nest 2065
Principal Contractors Phone:	(02) 8436 9000
General Manager Construction:	Albert Novati
Principal Contractors	
Projects Operations Manager:	Lenny Pugliese
Principal Contractors	
Senior Project Manager:	Andrew Khoudeir
Design Manager:	Luigi Staiano
Project Site Manager:	Enrico Cazolli
WH&S Safety Manager	Adrian Novati

1.3 Project - Scope of Works

The proposed works include:

- Fulfil the Client's full **Vision** to provide quality Commercial and Residential Apartments.
- Deliver a completed project for ALDI supermarkets and residential apartment with 3 levels of below ground parking, commercial areas loading docks and external landscape areas
- Complete and finalise the detailed design, incorporating any adjustments and changes required under the DA Approvals, ensuring compliance with the Principal Project Requirements (PPR) and compliance with codes, Council requirements, BCA/NCC and legislative requirements.
- New external landscaping and road /paths adjustments.
- New courtyards, balconies, roof terraces and landscaping.

This CMP relates to the DA0610/17 for the demolition of existing structure and construction of a mixed-use development containing 56 apartments, commercial space for ALDI Supermarket at ground level, and basement carparking.

1.4 Site Location

1.5 Purpose

The purpose of this CMP is to provide details of the Construction Methodology proposed for the new ALDI mixed-use Development at 810 Pacific Highway.

The CMP is to demonstrate how the existing building structures are to be demolished, including site establishment, entry and exit points to the construction site, location of site offices and material storage, tree protection zones, protection fencing and safety/traffic control measures.

The CMP is to demonstrate the measures of controls and works activities that addressed the DA Consent and the following stages of works:

- Demolition
- Excavation
- Concrete Pours
- Construction of vehicular crossing and reinstatement of footpath
- Traffic control for vehicles reversing into or out of the site.

This CMP addresses the construction activities and appropriate measures to be put in place for the ongoing safety and protection of people and surrounding areas.

1.6 Objectives

The key objectives of this CMP are:

- To demonstrate adherence with DA Consent,
- To ensure that no one is injured on the project and there is no property damage,
- To demonstrate that construction activities will be carried in a safe manner,
- To minimise any delays and impacts on local traffic
- To demonstrate that no vehicular access to be carried out from Pacific Highway, and
- Maintain public access through Radford Place.

1.7 Key Construction Issues to be Addressed

The key Construction Issues that need to be addressed:

- Demolition Staging and working on tight site constraints adjacent to the major Pacific Highway and Council Administration Building.
- Construction methodology and traffic management in such a constrained site.
- Resolution of DA conditions as they affect the early works commencement.
- Approvals required under the DA conditions as they affect construction works commencement.
- Any ground conditions that may be found through additional investigations during excavation.
- Construction works adjacent to residential properties that require careful management and negotiating of any conflicts.
- Early resolution of methodology and works sequences.
- Delivering a solid, well designed project, eliminating any conflicts and ensuring a robust construction and materials are in place, inspected, corrected and delivered to meet the Client and Cerno's aspirations for low maintenance and defect free delivery.

1.8 Stage 1 - Site Establishment

Site Establishment and Traffic Control

Following site possession, the Contractor will set up fencing and hoarding to allow commencement of demolition of the existing 7 storey building located on the site. The site will be fully fenced, and Type B hoarding will be installed along the Dumaresq Street section for the length of the building to be demolished.

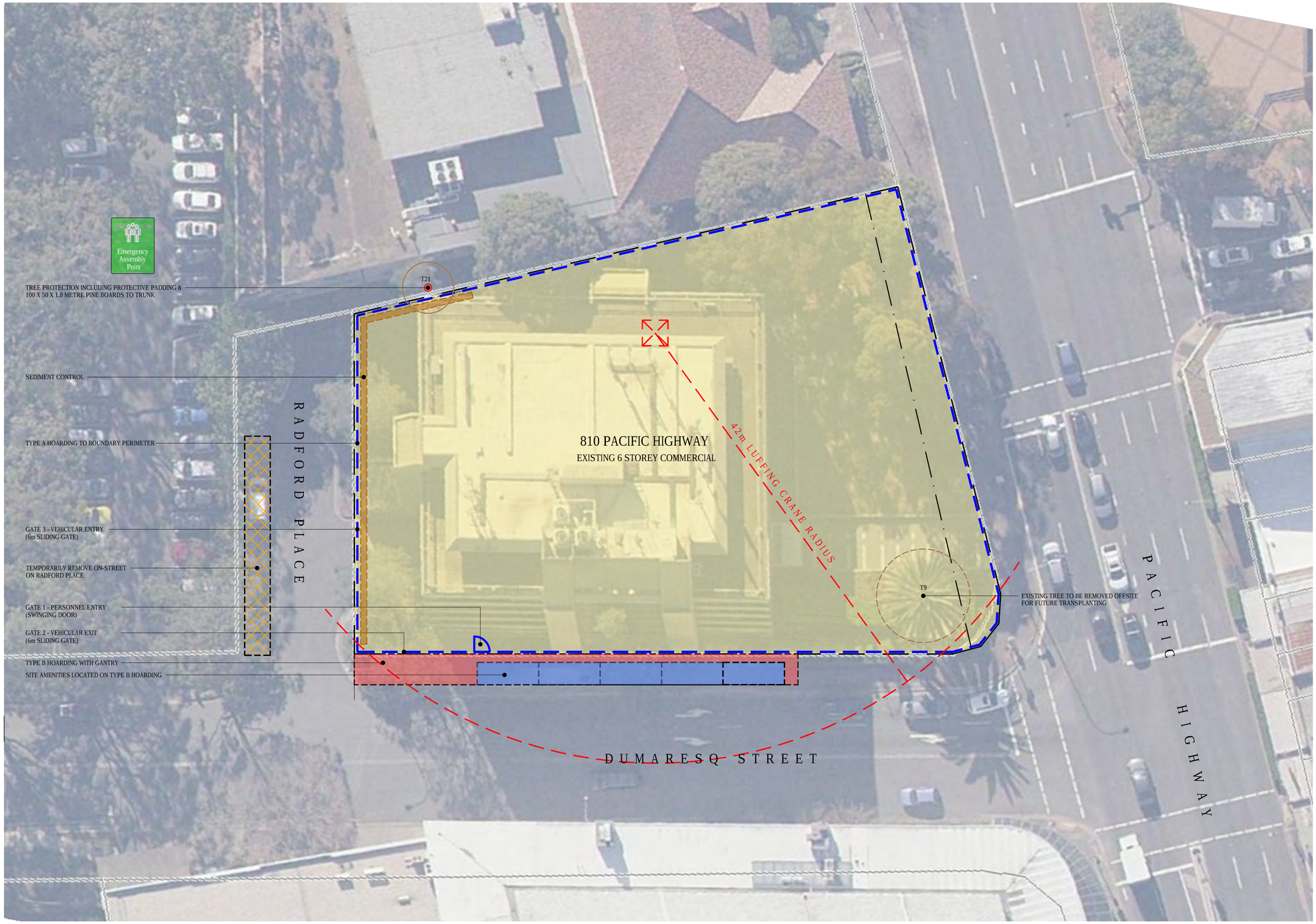
The primary access in from Radford Place & out from Dumaresq Street.

The following measures and methodology will be adopted for the site establishment and traffic control:

- Type B hoarding set up along existing building face on Dumaresq Street,
- Set up site offices and amenities on top of part of the hoarding,
- Set up scaffolding to the existing building ready to commence demolition,
- Carry out all necessary pre demolition and construction investigations, including services disconnection
- Establish requirements for early removal of existing substation kiosk at the corner of Radford Place and Dumaresq Street,
- Entry gate from Radford Place & exit gate from Dumaresq Street,
- Level part of the site at the corner of Radford Place and Dumaresq Street to allow the installation of 12.5 m vehicle turntable which will be in place for the duration of the demolition, excavation, piling and basements and construction works,
- Set up tree protection zone (TPZ) to trees to be retained at Pacific Highway, specifically T21 in accordance with *Condition 13* and *"Arboricultural Assessment Report, dated 10 October 2017, Revision A" (refer to Annexure A).*
- Set up tree protection to trees to be retained along Dumaresq Street,
- Set up traffic warning and control signage along Dumaresq Street and Radford Place,
- Set up traffic and movement safety controllers at each end of in and out gates and as per requirements of the CTMP.
- All vehicles to enter the site in a forward direction onto the turntable and exit in a forward direction
- Work Zone permits will be put in place along Dumaresq Street as required.
- Transplanting of existing tree *(T9-Phoenix Canariensis)* offsite in accordance with *Condition 56* and *"Arboricultural Assessment & Tree Transplanting Methodology, Ref No: TTA/GPDS211117" (refer to Annexure B).*

Site Establishment and Traffic Control CMP Plan

Refer overleaf for **CMP, Stage 1, Site Establishment**



Construction Management Plan - Stage 1
scale 1:200

North Point

Legend

- Type 'B' Modular Hoarding
- Site Amenties
- Material Delivery & Loading Zone
- Construction Vehicle Route - Ingress *(From Pacific Highway)*
- Construction Vehicle Route - Egress *(To Pacific Highway)*
- Timber Hoarding Perimeter Fence & Access Gates
- Emergency Assembly Point *(Ku-ring-gai Council Chamber Carpark)*

Project
ALDI
Mixed Use Development

810 Pacific Highway
GORDON, NSW 2140

Title
Construction Management Plan (Stage 1 - Site Establishment)

Drawn By	Checked	Scale
AK	AK	1:200

Number	Issue
SK001	E

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1.9 Stage 2 - Demolition Activities

Please refer to CMP Plan below.

Demolition Activities

The demolition works will follow the Site Establishment and the installation of the 12.5 m turntable at the corner of Dumaresq Street and Radford Place. In order to set up the turntable, partial demolition of the existing building on Dumaresq Street is required. This will form part of the early demolition works, utilising smaller trucks to remove demolished materials.

Structural investigations will be carried out to determine the most efficient and safe methodology to demolish this part of the existing building. Any required propping of floors will be put in place as recommended by the structural engineering reports.

The following measures and methodology will be adopted for the existing building structures and traffic control:

- The existing building will be fully stripped of partitions, loose materials, ceilings, cabling and the like that can be salvaged and all recycled,
- All services will be disconnected and isolated,
- Any identified hazardous material will be removed first under the strict requirements and guidelines to be put in place for the removal of such materials
- The demolition of the existing building will be undertaken from top to bottom and from west to east.
- For these works the use of mobile cranes will be adopted to load demolished materials onto 12.5 m long vehicle which will access the site and be turned around on the turntable and positioned for exiting safely in a forward direction.
- As material is demolished and trucks are filled, the contractor will ensure vehicles are not queued up, and will use mobile apps to control the sequencing of truck arrivals and departures.

The Contractor will ensure that the following means of control are implemented throughout the duration of the demolition works:

- Control the hours of construction work.
- Control the size of construction vehicles.
- Ensure that trucks travel to and from the site along designated truck routes.
- Carefully manage and control all on-site construction activity, including the any “Works Zone" and the construction access driveways.
- Coordinate and manage "just in time deliveries".

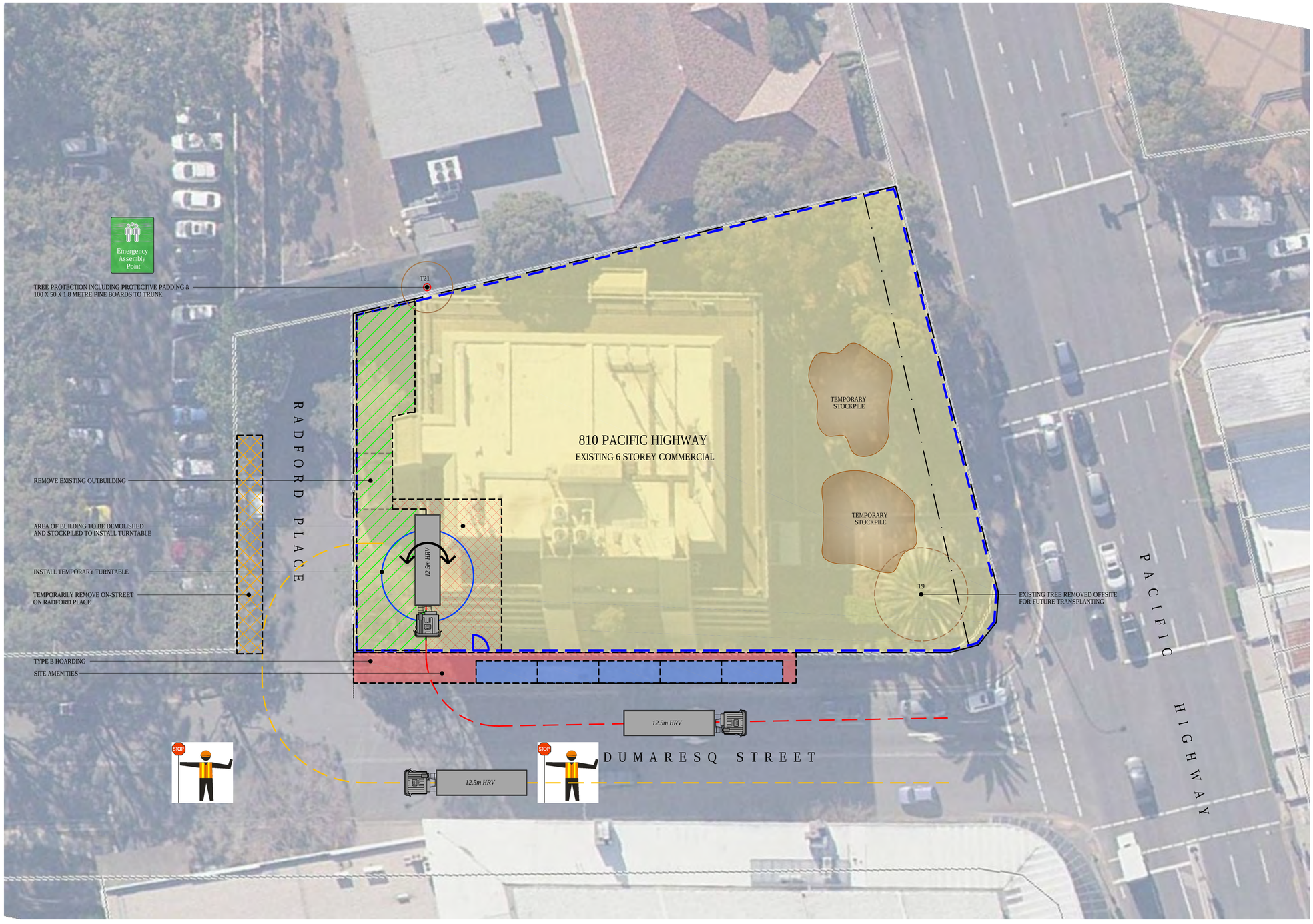
The duration of the demolition of the existing structures is anticipated to take 16 weeks.

The following are the anticipated vehicle movements during demolition:

- Plant & Equipment Float x 4 (delivery & remove)
- Demolition Material Haulage x 10/week

Demolition Activities CMP Plan

Refer overleaf for **CMP, Stage 2 – Demolition**



Construction Management Plan - Stage 2

scale 1:200

North Point

Legend

- Type 'B' Modular Hoarding
- Site Amenties
- Material Delivery & Loading Zone
- Construction Vehicle Route - Ingress *(From Pacific Highway)*
- Construction Vehicle Route - Egress *(To Pacific Highway)*
- Timber Hoarding Perimeter Fence & Access Gates
- Emergency Assembly Point *(Ku-ring-gai Council Chamber Carpark)*
- Truck Movement *(max. size 12.5m HRV)*
- Traffic Control

Project
ALDI
Mixed Use Development

810 Pacific Highway
GORDON, NSW 2140

Title
Construction Management Plan (Stage 2 - Demolition)

Drawn By	Checked	Scale
AK	AK	1:200

Number	Issue
SK002	E

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1.10 Stage 3 – Piling and Excavation Activities

Piling and Excavation Activities

Piling and excavation will follow demolition. The vehicle turntable will remain in place for the duration of these works

In order for the vehicle turntable to remain in place for the piling and excavation period, the areas where the turntable sits will be fully shored/piled on the sides where the excavation works are to take place.

The following measures and methodology will be adopted for the piling and excavation:

- Demolished site will be stripped ready for piling,
- Additional geotech investigations will be carried out as required to the excavated areas to reconfirm footings and piling, retaining walls and structure design,
- All redundant services will be removed,
- The site will be checked with additional investigations to reconfirm the nature of the excavation material, and determine appropriate removal and disposal,
- For these works the use of mobile cranes and piling/excavation machinery will be adopted and brought to the site using the turntable,
- Shoring at the turntable will be carried out first to allow piling and excavation,
- The site will commence with perimeter piling on the eastern, northern and southern sides and progress towards the turntable location, with staged sections at two ends (east /west)
- Following piling, excavation will commence progressively from east to west, and a ramped section will be constructed towards the turntable to allow movement of machinery to load excavated materials onto trucks to take materials away,
- As excavated materials are loaded on trucks, the contractor will ensure vehicles are not queued up, and will use mobile apps to control the sequencing of truck arrivals and departures.
- Set up traffic warning and control signage along Dumaresq Street and Radford Place,
- Set up traffic and movement safety controllers at each end of in and out gates and as per requirements of the CTMP.
- All vehicles to enter the site in a forward direction onto the turntable and exit in a forward direction
- Work Zone permits will be put in place along Dumaresq Street as required.

The anticipated duration of these work:

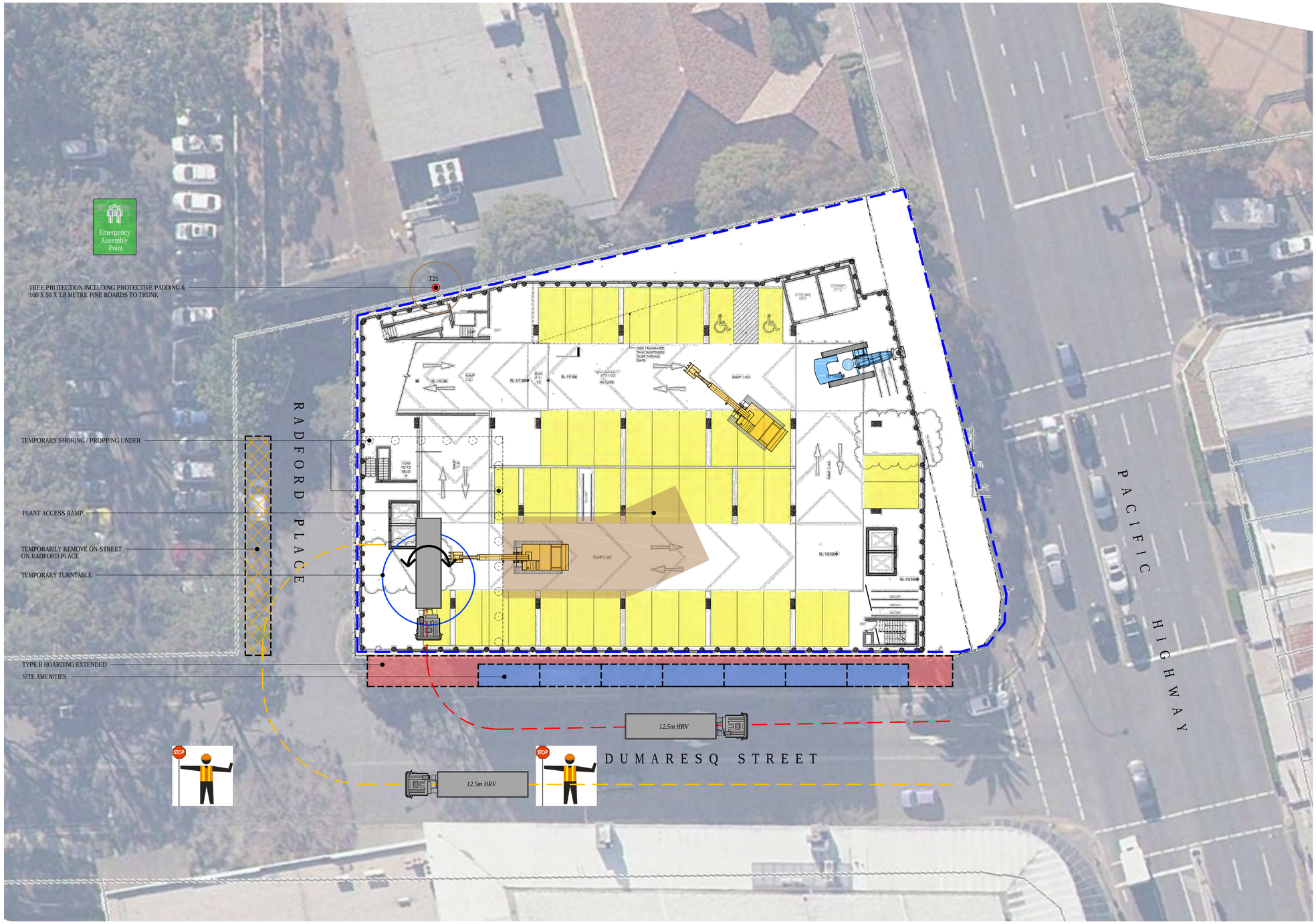
- Piling Works: **8 Weeks**
- Excavation and shoring: **12 Weeks**

The following are the anticipated vehicle movements during Piling and Excavation:

- During Piling:
  - Plant & Equipment Float x 2 (delivery & Remove)
- During Excavation:
  - Plant & Equipment Float x 10 (delivery & remove)
  - Excavation Material Haulage x 23/day (12.5m HRV)

Piling and Excavation Activities CMP Plan

Refer overleaf for **CMP, Stage 3, Shoring & Excavation**



Construction Management Plan - Stage 3
scale 1:200

North Point

Legend

- Type 'B' Modular Hoarding
- Site Amenties
- Material Delivery & Loading Zone
- Construction Vehicle Route - Ingress *(From Pacific Highway)*
- Construction Vehicle Route - Egress *(To Pacific Highway)*
- Timber Hoarding Perimeter Fence & Access Gates
- Emergency Assembly Point *(Ku-ring-gai Council Chamber Carpark)*
- Truck Movement *(max. size 12.5m HRV)*
- Traffic Control

Project
ALDI
Mixed Use Development

810 Pacific Highway
GORDON, NSW 2140

Title
Construction Management Plan
(Stage 3 - Shoring/Excavation)

Drawn By	Checked	Scale
AK	AK	N.T.S

Number	Issue
SK003	E

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1.11 Stage 3a – Removal of Ramp- Basement Construction

Removal of Ramp - Basement Construction

As excavation from east to west progresses, commencement of detailed footing excavation will take place, including in ground drainage and basement drainage.

As part of the detailed footing, the crane pad and crane will be installed in the northeast section of the level 3 carpark in the parking bays adjacent to the two goods lift shafts.

The methodology that will be followed is based on retaining the ramp section up to the turntable as needed and progressively build the carpark levels P3 and P2 building these up to the turning table.

The following will be maintained:

- Set up traffic warning and control signage along Dumaresq Street and Radford Place,
- Set up traffic and movement safety controllers at each end of in and out gates and as per requirements of the CTMP.
- All vehicles to enter the site in a forward direction onto the turntable and exit in a forward direction
- Work Zone permits will be put in place along Dumaresq Street as required.

The anticipated duration of these work:

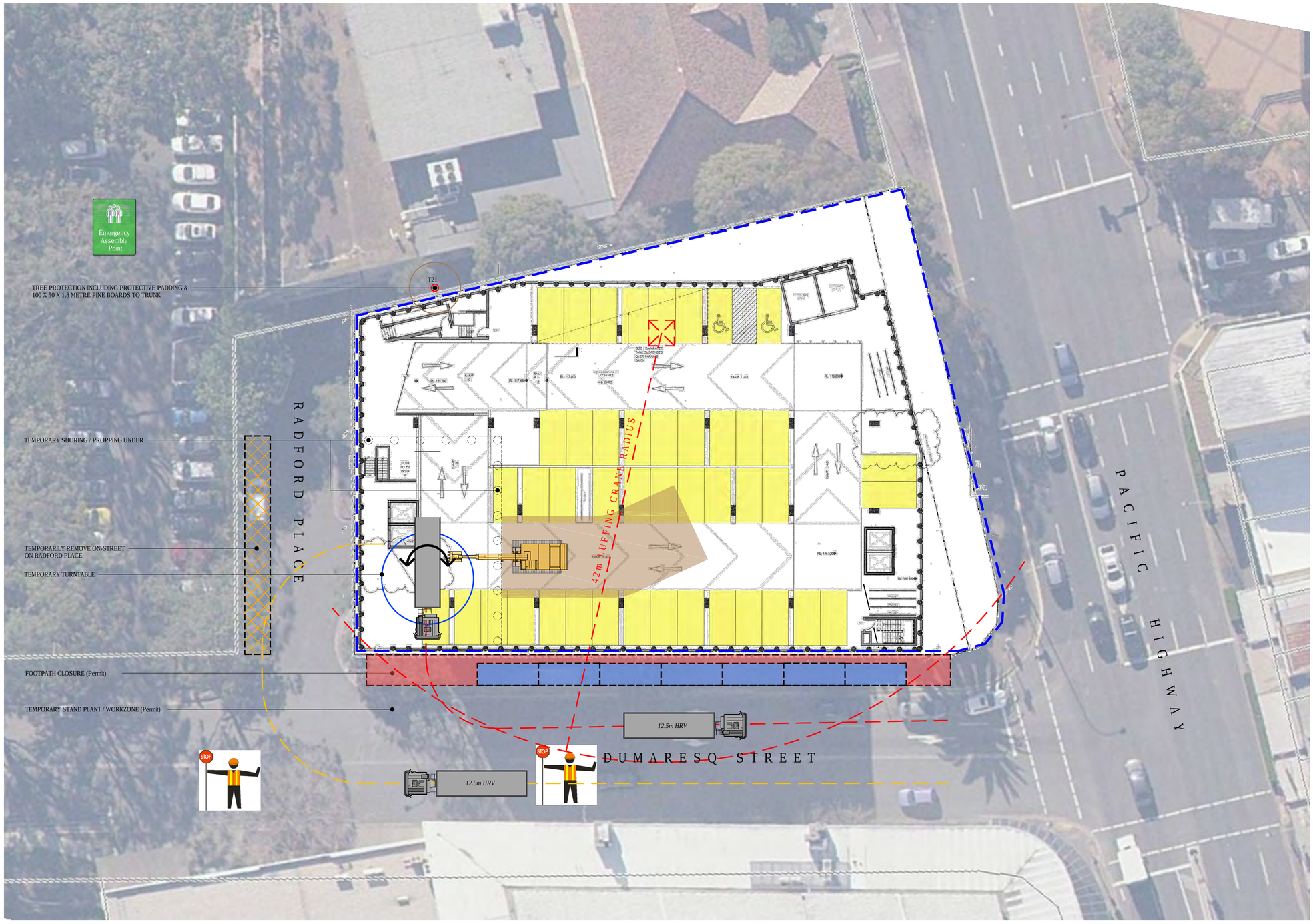
- Piling Works: **8 Weeks**
- Excavation and shoring: **12 Weeks**

The following are the anticipated vehicle movements during Piling and Excavation:

- During Piling:
    - Plant & Equipment Float x 2 (delivery & Remove)
- During Excavation:
    - Plant & Equipment Float x 10 (delivery & remove)
    - Excavation Material Haulage x 15/day (12.5m HRV)

Removal of Ramp - Basement Construction CMP Plan

Refer overleaf for **CMP, Stage 3a, Removal of Ramp**



Construction Management Plan - Stage 3a

scale 1:200

North Point

Legend

- Type 'B' Modular Hoarding
  - 2.2m wide to Parramatta Rd
- Site Amenties
- Material Delivery & Loading Zone
- Construction Vehicle Route - Ingress
  (From Pacific Highway)
- Construction Vehicle Route - Egress
  (To Pacific Highway)
- Timber Hoarding Perimeter Fence & Access Gates
- Emergency Assembly Point
  (Ku-ring-gai Council Chamber Carpark)
- Truck Movement
  (max. size 12.5m HRV)
- Traffic Control

Project
ALDI
Mixed Use Development

810 Pacific Highway
GORDON, NSW 2140

Title
Construction Management Plan
(Stage 3a - Ramp Removal)

Drawn By	Checked	Scale
AK	AK	N.T.S

Number	Issue
SK004	D

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1.12 Stage 4 – Construction of Basement Levels Excluding Turntable Zone

Please refer to CMP Plan below.

Construction of Basement Levels Activities

The methodology that will be followed for the construction of the basement levels and loading dock level is based on retaining the ramp section up to the turntable as needed and progressively building the carpark levels P3 and P2 build these up to the turning table.

The construction of the loading docks level will continue to the point of allowing for the turntable to be removed. Piling to the turntable zone will be carried out and progressive excavation, detailed footing and slab infills will be completed in this corner of the site.

At this point the construction of the basement levels including the loading dock level will be completed and will allow for vehicles to come up to the loading dock level for the delivery of materials.

The loading dock level will be used to allow vehicle movements in and out.

The following will be maintained:

- Set up traffic warning and control signage along Dumaresq Street and Radford Place,
- Set up traffic and movement safety controllers at each end of in and out gates and as per requirements of the CTMP.
- All vehicles to enter the site in a forward direction onto the turntable and exit in a forward direction
- Work Zone permits will be put in place along Dumaresq Street as required.

The anticipated duration of these work:

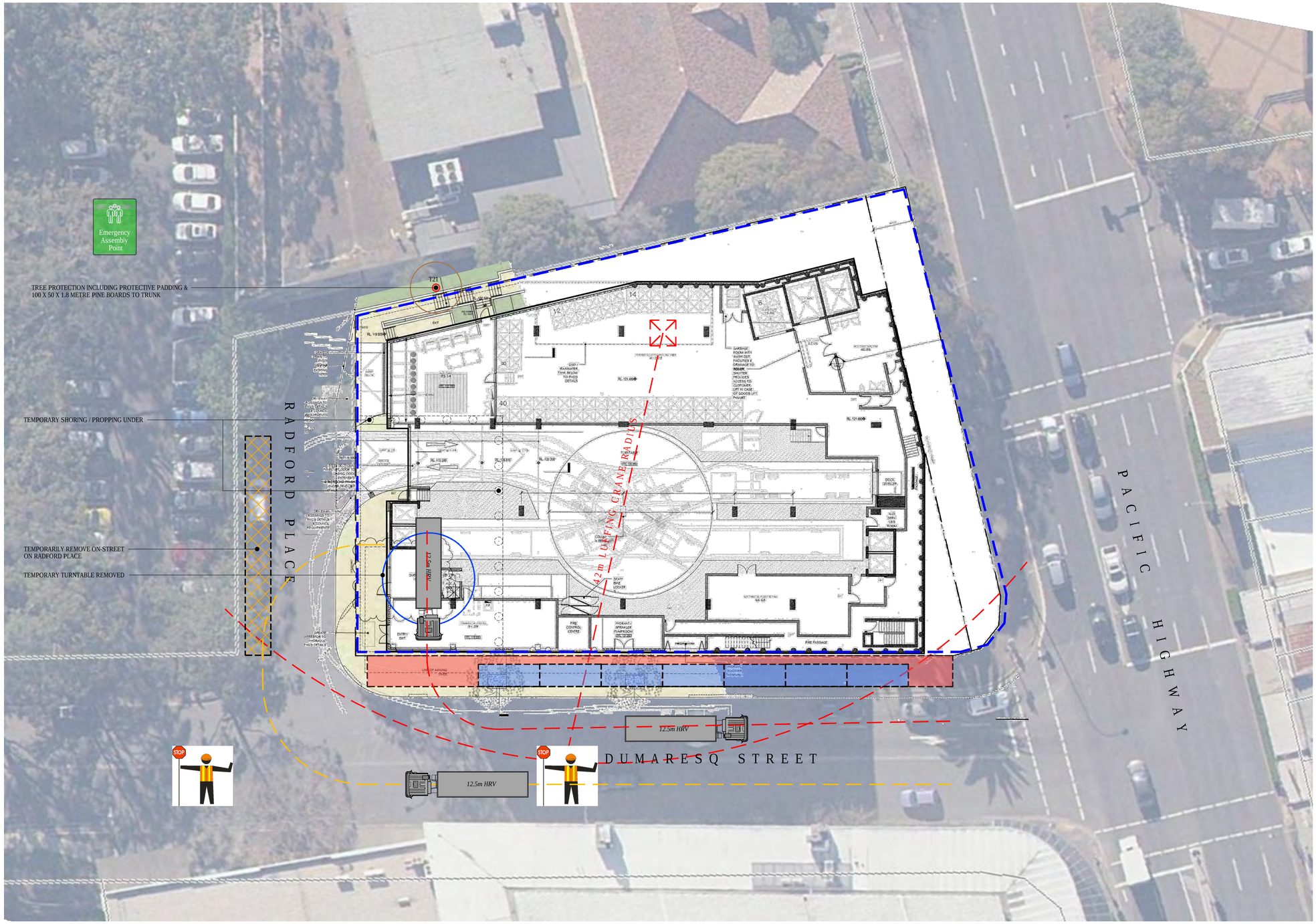
- Basement and Ground Floor: **12 Weeks**.

The following are the anticipated vehicle movements during the construction of basement levels and ground floor:

  - Material: 2-3/week (12.5 HRV)
  - Slabs: Concrete Pour: 40 concrete trucks /pour

Construction of Basement Levels and Ground CMP Plan

Refer overleaf for **CMP, Stage 4, Construction Basement Levels and Ground**



Construction Management Plan - Stage 4
scale 1:200

North Point

Legend

- Type 'B' Modular Hoarding
  - 2.2m wide to Parramatta Rd
- Site Amenties
- Material Delivery & Loading Zone
- Construction Vehicle Route - Ingress
  (From Pacific Highway)
- Construction Vehicle Route - Egress
  (To Pacific Highway)
- Timber Hoarding Perimeter Fence & Access Gates
- Emergency Assembly Point
  (Ku-ring-gai Council Chamber Carpark)
- Truck Movement
  (12.5m HRV)
- Traffic Control

Project
ALDI
Mixed Use Development

810 Pacific Highway
GORDON, NSW 2140

Title
Construction Management Plan
(Stage 4 - Construction)

Drawn By	Checked	Scale
AK	AK	N.T.S

Number	Issue
SK005	E

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1.13 Stage 4a – Construction of Balance of Site

Levels 1 to 7 Structure

Stage 4a follows the basements and ground level works and includes:

- Construction of the super structure for levels 1 to 7 in parallel with all concrete pours from Dumaresq Street, using inline pumps on each level as the works progress,
- Concrete pours are likely to be split into two for each level,
- For the duration of construction, an external scaffolding system will be implemented. This will provide not only the height safety and egress systems necessary during the construction phase but will also provide an external screening system to protect the surrounding buildings from falling objects and dust escape. As a dust control measure, chain wire and shade cloth will be applied to the face of all external scaffold,
- Sequential completion to facades and internal fitouts will progress as works to floors are completed. At an agreed point a display suite may be set up on one of the floors for Client sign off,
- Concrete pours will be managed from with a work permit zone on Dumaresq Street. Concrete trucks will approach works zone and connected to the in line pumps that will be located on each level,
- External works and completion will follow, including preparation of area allocated onsite and transplanting of 'T9' *(T9-Phoenix Canariensis)* in accordance with *Condition 56, "Arboricultural Assessment Report, dated 10 October 2017, Revision A" (refer to Annexure A)* and *"Arboricultural Assessment & Tree Transplanting Methodology, Ref No: TTA/GPDS211117" (refer to Annexure B).*
- Commissioning and handover, following dismantling of scaffold, and completion of all service connections, including new substation works,
- Necessary works to the public domain on Dumaresq and Radford Place will be completed, inspected and handed over to Council.
- All project scaffold to carry out the works will be erected, signed off and maintained to all relevant standards
- Visual checks and sign off documentation will be provided monthly from our accredited scaffold subcontractor to ensure a safe working environment

The following will be maintained:

- Set up traffic warning and control signage along Dumaresq Street and Radford Place,
- Set up traffic and movement safety controllers at each end of in and out gates and as per requirements of the CTMP.
- Extension of Right Hand Turning Bay in accordance with DA Condition 126.
- All vehicles to enter the site in a forward direction onto the turntable and exit in a forward direction
- Work Zone permits will be put in place along Dumaresq Street as required.

The anticipated duration of these work:

- Levels 1 to 7: **18 Weeks**
- Fitout, Finishes and Completion: **40 weeks**

The following are the anticipated vehicle movements during the construction of basement levels and ground floor:

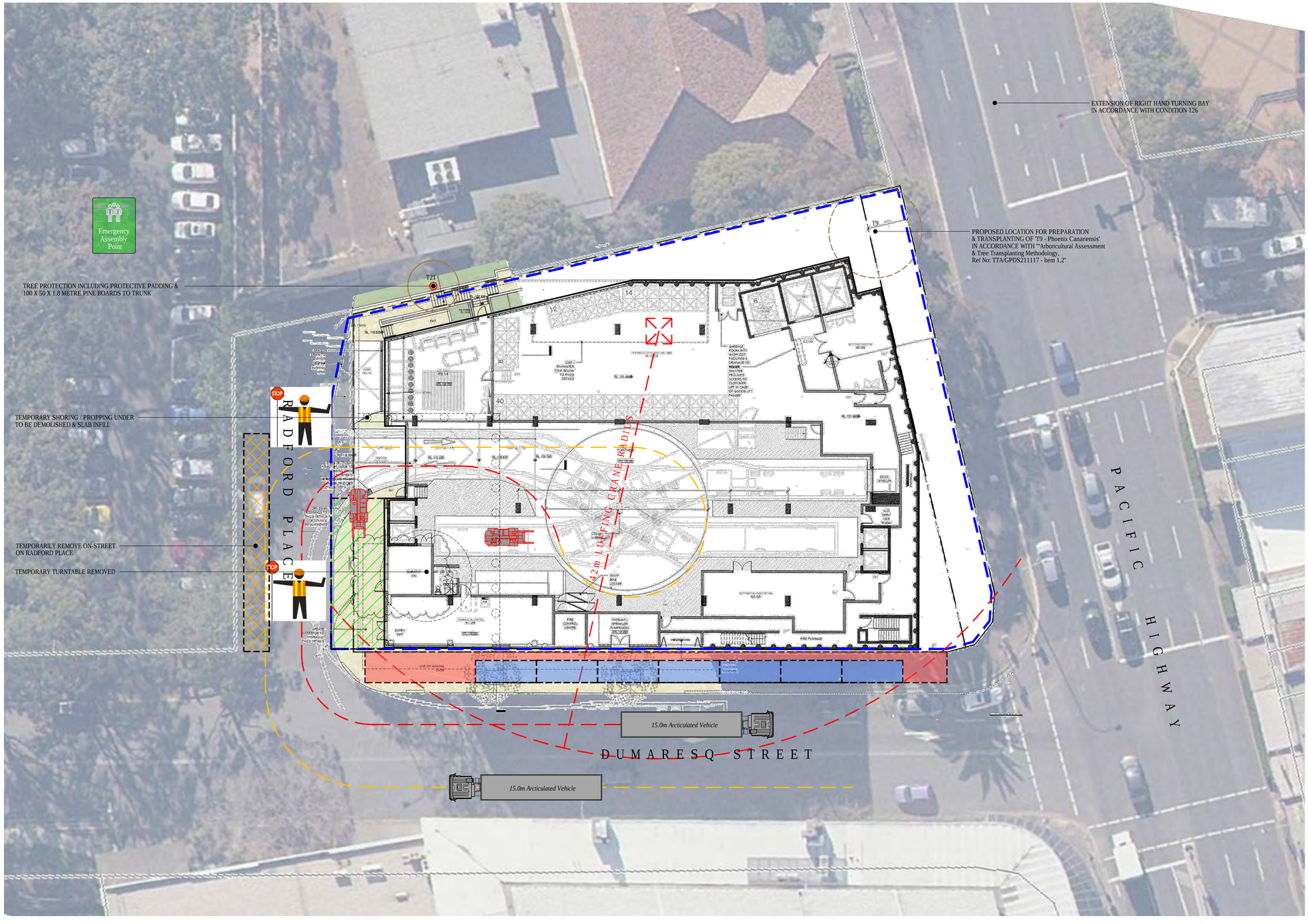
- Structure Erection:
    - Material: 2-3/week (12.5 HRV)
    - Slabs: Concrete Pour: 40 concrete trucks /pour
        - Total of 14 Concrete Pours

  - Columns / Verticals:
    - Concrete Pour: 4 concrete trucks / pour
    - Total of 14 Concrete Pours

- Finishes:
  - Waste Bins: 3 / week
  - Material: 10-12 / week

Levels 1 to 7 Structure and Completion CMP Plan

Refer overleaf for **CMP, Stage 4a - Construction (L1-L7)**



North Point

Legend

- Type 'B' Modular Hoarding
  - 2.2m wide to Parramatta Rd
- Site Amenties
- Crane Material Pick Up / Drop Zone
- Construction Vehicle Route - Ingress
  (From Pacific Highway)
- Construction Vehicle Route - Egress
  (To Pacific Highway)
- Timber Hoarding Perimeter Fence & Access Gates
- Emergency Assembly Point
  (Ku-ring-gai Council Chamber Carpark)
- Truck Movement
  (max. size 15.0m Articulated Vehicle)
- Traffic Control
- Forklift / Telehandler

Construction Management Plan - Stage 4a

scale 1:200

Project
ALDI
Mixed Use Development

810 Pacific Highway
GORDON, NSW 2140

Title
Construction Management Plan (Stage 4a - Construction)

Drawn By	Checked	Scale
AK	AK	N.T.S

Number	Issue
SK006	D

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1.14 Anticipated Staging Timing

The initial site establishment period will include a full strip out of the existing building. This will include removal of any hazardous materials, removal and segregation of material for salvage recycling and/or to be sent to spoil/landfill.

The following time frames have been anticipated for the major activities:

1. Demolition: **16 Weeks**
2. Piling Works: **8 Weeks**
3. Excavation and shoring: **12 Weeks**
4. Structure:
    a. Basement and Ground Floor: **12 Weeks**
    b. Levels 1 to 7: **18 Weeks**
    c. Fitouts, Finishes and Completion: **40 weeks.**

1.15 Anticipated Materials Movements and Vehicle Movements

Novati will work to the time periods and restriction stipulated in the DA Consent.

We understand that this includes the following restrictions:

- No heavy vehicle /works movement between the hours of 8 am to 9.30 am, and between 3 pm and 5 pm weekdays.

We understand these requirements and we will schedule the activities to work with these restrictions and continually monitor these to ensure these conditions are met.

We note the area is not subject to school zones and through a traffic analysis it is antiparade that the restriction could be relaxed by Council.

The following are the anticipated vehicle movements:

- During Demolition:
    - Plant & Equipment Float x 4 (delivery & remove)
    - Demolition Material Haulage x 10/week
- During Piling:
    - Plant & Equipment Float x 2 (delivery & Remove)
- During Excavation:
    - Plant & Equipment Float x 10 (delivery & remove
    - Excavation Material Haulage x 23/day (12.5m HRV)
- Structure Erection:
    - Material: 2-3/week (12.5 HRV)
    - Slabs: Concrete Pour: 40 concrete trucks /pour
        - Total of 14 Concrete Pours
    - Columns / Verticals:
        - Concrete Pour: 4 concrete trucks / pour
        - Total of 14 Concrete Pours
- Finishes:

- Waste Bins: 3 / week
- Material: 4-5 / week

1.16 Anticipated Workforce/Personnel

Novati anticipates the following workforce numbers can be expected to be on site at different stages of work:

- During Demolition:
  - Average: 20
  - Maximum: 35
- During Piling:
  - Average: 15
  - Maximum: 25
- During Excavation:
  - Average: 15
  - Maximum: 25
- Structure Erection:
  - Average: 40
  - Maximum: 60 (concrete pours)
- Finishes:
  - Average: 75
  - Maximum: 100 (concrete pours)

1.17 Anticipated Hoarding Types

Novati anticipates the following hoarding types to be used on site:

- Radford Place: Type A hoarding,
- Dumaresq Street: Type B hoarding,
- Pacific Highway: Type A hoarding.
- Northern Boundary: Type A hoarding.

2 GENERAL CONSTRUCTION METHODOLOGY

2.1 General Construction Methodology

At commencement a solid hoarding will be erected to all elevations adjoining within the site areas. It will be painted and kept in a clean and tidy condition throughout the works. Fencing surrounding the site adjoining council footpaths and neighbouring yards will be screened with security mesh. All hoardings/fencing will be regularly checked and maintained in a clean and tidy condition and signage will be positioned so it is clearly visible to warn neighbouring residents and members of the public of any potential hazards surrounding the site.

2.2 Traffic Management

Traffic Management Guidelines and Principals

The Contractor will ensure that the guidelines for traffic/pedestrian's management that will be in effect over the entire duration of the constructions and development works are in full accordance with the following principles:

- Provision of a convenient and appropriate environment for pedestrians.
- Minimise effects on pedestrian movements and amenity.
- Manage and control all construction traffic movements on the adjacent road network and vehicle movements to and from the construction site.
- Maintain existing on-street parking in the vicinity of the site.
- Maintain access to residential properties adjacent to the site.
- Restrict heavy vehicle activity to designated truck routes through the area.
- Fastidiously maintain the utmost safety for all residents and workers directly affected by the works;
- Provide appropriate access to the site for construction traffic.
- Construction vehicles, associated with the construction process, will be accommodated on-site within the site where possible to reduce disruption on the public roads.
- Construction access driveways and the on-street "Works Zone" to be managed and controlled by qualified site personnel.
- Pedestrian movements adjacent to the construction activity to be protected with the erection of temporary Fencing.
- Pedestrian movements across the construction access driveway to be managed and controlled by qualified site personnel when the driveway is in use.
- Construction activity to be carried out in accordance with DA approved hours of work

2.3 Vehicle movements upon arrival/Exit

The Contractor will be responsible for the communication and general control of sub-contractors and visitors associated with the works.

To facilitate an efficient program, the arrival and departure of trucks associated with construction works will be regulated and onsite works will be carefully managed and controlled by site personnel. Trucks

will be in radio communication with the on-site contractor and trucks will be called onto the site when required. Trucks will not be permitted to park on-street (other than within the designated on-street "Works Zone') or within other local streets in the vicinity of the site.

During construction, trucks transporting material to/from the site will be accommodated on site or within the designated on-street "Works Zone". These areas will be managed and controlled by traffic controllers.

A construction access driveway and Works Zone will be provided on Dumaresq Street when needed, but primarily demolition work will progress with establishment access on site.

2.4 Site Personnel and Pedestrians

It is estimated that over the duration of the construction works, there will be on average, around 40 but up to 100 construction personnel onsite at any one time. Given the restrictions and limitations for parking within the local area, all site personnel and employees of the contractor will be encouraged to use the local public transport infrastructure.

During the period of construction, pedestrian movements in the vicinity of the site will be maintained. Pedestrian activity adjacent to boundary properties will be protected with selected fencing.

Pedestrian activity across the site access driveway on Dumaresq Street and Radford Place will be managed and controlled by appropriately qualified traffic controllers. Pedestrian warning signs and containment barriers will be located adjacent to the driveway.

2.5 Temporary Services

During construction all existing site services will be isolated and/or maintained in a safe manner. The possibility of temporary supply of Power, water, comms and emergency egress and access may be adapted to site as required during demolition and construction stages.

Access routes currently highlighted on the images are subject to final review and approval from the Principle and stakeholders.

2.6 Waste Management

Throughout the construction works, the Contractor will implement a comprehensive waste management and waste removal process. Rubbish and trade waste will be removed from each floor prior to the end of each working day and placed into either the Recycling and Sorting Station, or into the General Waste Station, each of which are located within the construction Compound and emptied as required.

A dedicated rubbish removal contractor will remove skip bins from site as required and taken to their yard for further sorting/ recycling of concrete, metals, bricks, timber, gyprock and soil.

All rubbish bins trucks will be directed into the site via traffic control to ensure the safety of neighbouring residents, commercial residents and members of the public.

2.7 Cranage and Materials Handling

Consideration has been given to the types of plant and equipment that are likely to be used during the demolition and construction works.

The use of a specified crane boom will be setup in the nominated position to allow for minimum interference with neighbouring airspace during the site works.

To facilitate site materials handling, a licenced operator will carry this out via the use of a manitou. Truck deliveries will be directed into the site gates via traffic controllers to then be unloaded by the manitou.

2.8 Scaffolding and Fall Prevention

For the duration of construction, an external scaffolding system will be implemented. This will provide not only the necessary height safety and egress systems necessary during the construction phase but will also provide an external screening system to protect the surrounding students and staff from falling objects and dust escape. As a dust control measure, chain wire and shade cloth will be applied to the face of all external scaffolds.

All project scaffolds to carry out the works will be erected, signed off and maintained to all relevant standards.

Visual checks and sign off documentation will be provided monthly from our accredited subcontractor to ensure a safe working environment.

3 CONSTRUCTION WORKS- ENVIRONMENTAL

3.1 Site industrial relations

In the event of any industrial issues, all queries/concerns will be handled by the Site Manager on site in the first instance. All attempts will be made to resolve issues as quickly as possible. A site delegate will also be present on the project to assist in resolving issues.

3.2 Working hours, shift, overtime plan

Construction may only be carried out during approved construction hours.

Works may be undertaken outside these hours where they do not create any nuisance to neighbouring properties in terms of dust, noise, vibration etc. and do not entail the use of power tools, hammers etc. This may include but is not limited to painting.

3.3 Noise Control

The main concern regarding noise will be during the detailed excavation stage of the project and during concrete pours. All other works will fall into general fit out works. There are two neighbouring properties to the site. As part of the noise control the Contractor will ensure neighbours are constantly made aware of the contractor's works and howany potential impacts are to be mitigated.

The following procedures and controls shall be strictly enforced on site;

- Noise & vibration monitoring to be carried out prior to commencing works.
- Work shall only be carried out between council approved times.
- Perform noisy work during less sensitive time periods outlined below.
- Perform noisy work at less sensitive areas on site.
- Select low-noise plant & equipment.
- Ensure equipment has mufflers installed
- Use quieter and less vibration emitting construction methods where possible.
- Regulations limiting the noise that machines and accessories can lawfully emit shall be enforced.
- Plant and Machinery that is noisy shall be stopped and replaced or maintained.

3.4 Erosion, sediment and Dust Control

The following procedures and controls shall be strictly enforced on site;

- Exposed ground surfaces affected by heavy vehicle movements will be wetted down to suppress the excess generation of dust with excess run-off from wetting and/or wash-downs directed to the sediment control system to not create excessive run-off from the site.
- A wash-down area using manual sprayers will be provided at the site entry / exit to facilitate removing loose material from vehicles before leaving the site.
- All heavy vehicles involved in removing demolition, site clearing or excavated material from site will be loaded to their prescribed weight limits and loads covered at all times during transportation.

- The surrounds of the site will have either type A solid hoarding or shade cloth wrapped onto fencing where applicable.
- Gates shall be fitted with shade cloth and closed between vehicle movements.
- Pedestrian footpaths; roadways and crossovers shall be cleaned daily.

3.5 Air Quality

The following procedures and controls shall be strictly enforced on site;

- Cover materials and stockpiles.
- Fit dust catchers to equipment.
- Placement of sweeps in a bag or cardboard box before putting into skips to prevent dust from becoming airborne.
- When excavating into rock, we shall keep the surface moist to minimize dust.
- Put up dust screens around the edges of the site.
- Wear Facemasks and respirators to protect health.
- Use wet, hydro or vacuum blasting as an alternative to dry blasting when possible.
- No burning is permitted on site.
- Welding shall be carried out in well-ventilated spaces.

4 SITE SAFETY AND ENVIRONMENTAL MANAGEMENT

4.1 SWMS

A *Safe Work Method Statement (SWMS)* breaks a work activity into logical steps and lists the typical hazards and risks associated with each of these job steps and outlines how these will be eliminated or controlled to protect the workers and public safety.

Subcontractors will produce SWMS's for the activities they are involved with on this project, prior to commencing work.

SWMS will be reviewed when submitted by subcontractors prior to allowing them to commence work on site using our SWMS Review Checklist.

The Site Manager or Site Foreman records receipt of any *SWMS* in the *SWMS Register*.

In addition to being recorded in the *SWMS Register*, a copy of all completed SWMSs, from subcontractors as well as for the Contractor's workers, will be kept with the Site IMP documentation.

Any non-complying *SWMS* are required to be amended by the Subcontractor and then resubmitted to for review prior to commencing work on site.

When reviewing *SWMS*, the Controls identified should be as high as practical in the "Hierarchy of Risk Controls" guide:

How LIKELY is it to be that bad?

Note: If a hazard or risk is rated High, action must be taken immediately

CONSEQUENCE What damage could it cause?	VERY LIKELY *Could happen anytime*	LIKELY *Could happen sometimes*	UNLIKELY *Could happen, but only rarely*	VERY UNLIKELY *Could happen, but probably never will*
Death or permanent disability *Not contained, significant long-term environmental harm*	H	H	H	M
Long term illness or serious injury *Moderate remediation required, short-term environmental harm*	H	H	M	M
Medical attention or several days off work *Minor remediation required, Short-term environmental harm*	H	M	M	L
First Aid needed *Minor level clean up with no short-term environmental harm*	M	M	L	L

4.2 Monitoring of SWMS

The Site Manager is responsible for ensuring that all workers and subcontractors have read and understood their relevant *SWMS* prior to commencing work on site. The Site Manager is also responsible for conducting weekly reviews of *SWMSs* by task observation whilst work takes place on site to ensure that subcontractors are monitoring adherence to the risk controls identified in their respective WMS. During each weekly *SWMS* review on site, the Site Manager checks for compliance with the listed control measures and records these checks using *SWMS Monitoring Systems.*

4.3 Environmental Aspects

The Contractor will identify the elements of activities, products and services that interact with the surrounding environment and may produce either a beneficial or harmful impact. These are referred to as *Environmental Aspects*. An *Environmental Impact* is the change that occurs to the environment as a result of the Aspect. Priorities will be set for managing and reducing the harmful Environmental Impacts.

The purpose of this is to ensure that aspects and impacts are systematically identified and assessed, an action plan is implemented for controlling impacts and the effectiveness of controls is measured and reported to provide feedback for continuous improvement.

Each of the identified Environmental Aspects is evaluated for normal operating conditions, abnormal conditions such as start-up shutdown and maintenance, and potential emergency conditions or incidents. In addition, a life cycle perspective will be taken when identified an aspect as the Contractor may be able to influence the control of aspects by other organisations such as external providers.

Once the aspects have been identified each will be assigned a risk rating for each actual or potential impact. A ***WHS and Environmental Risk Register*** is maintained for recording the Environmental Aspects and impacts and the risk and significance.

The relative importance/significance of each Environmental Aspect is then determined by significance rating in accordance with the methodology highlighted in the ***WHS and Environmental Risk Register.*** These ratings enable the setting of priorities with objectives for improvement and/or reduction of risk.

5 INFORMATION AND DOCUMENTATION CONTROL

5.1 Design Information, Document Control and QA compliance

The Design Information will be managed through a Project Delivery Plan which the Contractor prepares for the project.

The Project Delivery Plan which includes:

- Document and information Control through a documents management system.
- All design and Consultation meetings are minuted and issued to relevant parties and through the documents management system.
- Action and deliverables are tracked internally from all parries by our managing staff and support staff.
- Programs, Project Plans and Project deliverable are confirmed with all the consultant team and actioned during the workflow process.
- Conformity with the design briefs and compliance with EFSG, authorities, BCA/NCC, Standards and legislation required are checked and monitored by our internal design managers. Any non-conformity is addressed promptly, which issue of checklist and verification, with final resolution and instruction formalised.
- Systems have checks and gateways that need to be met before proceeding to next phase or actions.
- All authority approval and gateways for design approvals with the Client will be fully listed in the Project Delivery Plan, which will be finalised and presented at commencement to all stakeholders.
- The Project Delivery Plan is a live document managed in the document management system. The Plan is managed and updated regularly as activities vary. All parties are instantly kept informed of changes, risks and actions. Any time, any place with any electronic device the work team can access and respond as necessary.

5.2 Site communication

The document management system will allow staff and managers to program, action and disseminate required communication to staff, stakeholders, contractors and consultants.

The construction management team is responsible to maintain, monitor and instigate actions and any risk controls as soon as they are required.

All staff are fully trained and conversant in using the internal procedures allowing them to control:

- Meetings and safety controls
- Management of construction activities, at all time ensuring no impact on school community
- Risks timing and deliverables.
- Work Activities
- Communication with internal and external parties
- Informing the community of any impact and mitigation measures.

ANNEXURE A

Arboricultural Assessment Report, dated 10 October 2017, Revision A

ARBORICULTURAL IMPACT ASSESSMENT REPORT

810 PACIFIC HIGHWAY
GORDON NSW 2072

Prepared for ALDI Stores (A Limited Partnership) and/or
Associated Entities within ALDI Foods Pty Ltd
10 October 2017
Revision A

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MANAGING URBAN TREES™

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APPENDICES

1. INTRODUCTION

1.1 This report was commissioned by ALDI Stores (A Limited Partnership) and/or Associated Entities within ALDI Foods Pty Ltd to provide an Arboricultural Impact Assessment (AIA) report relating to the proposed development of 810 Pacific Highway, Gordon and the existing trees located on the site or on an adjacent site and within close proximity to the proposed works.

1.2 A Preliminary Arboricultural Assessment report (dated 30 May 2016) was prepared by the author to assess the health and condition of the trees located on or near the site, and provide tree retention values that could be used to understand the constraints on site relating to the trees. The original tree data collected in May 2016 has been used as a basis for this impact assessmnet report.

1.3 This report shall form part of the documentation for submission to Ku-ring-gai Council under a development application to carry out a mixed use development of the site. The purpose of this report is to determine the impact of the proposed development upon the existing trees located on the site or on an adjacent site and within close proximity to the development.

1.4 Generally, a tree is protected in accordance with Ku-ring-gai Council's *Tree and Vegetation Preservation* (Part 13 of Council's Development Control Plan - Local Centres), if it is a height of five (5) metres or greater or with a trunk diameter of 150mm or greater. In some cases a tree may meet this criteria, however may not be protected for other reasons such as it being located within 3 metres of an existing building.

1.5 This report shall reflect the expert opinion of the Arborist. The Arborist is acting independently of and not as the advocate for the owner. The Arborist shall not receive any commission to prune or remove the tree/s which is the subject of this report.

1.6 This report has been prepared in accordance with guidelines set out in the Australian Standard "*Protection of Trees on Development Sites*" (AS 4970:2009).

1.7 The following plans were reviewed in this assessment:

Title	Author	Dwg. No.	Date
Architectural drawings	Leffler Simes Architects	Job No. 4148 DA04 (rev.6), DA05 (rev. 5), DA06 (rev. 5), DA13 (rev. 5), DA14 (rev. 5)	27.4.16
Topographical Survey Plan	Chadwick Chen Consulting Surveyors	36023/D-MGA-2d	11.8.06

1.8 Key Definitions and Abbreviations used in this report.

- TPZ = Tree Protection Zone. This is the area as defined by AS 4970 – "*Protection of trees on development sites*" and means the typical minimum area above and below ground at a given distance from the trunk to provide for protection of the tree. Most importantly it represents the root zone required to be kept uninjured to maintain a healthy and viable tree. Note, roots will usually extend well beyond this zone, so this represents the minimum remaining root zone required, assuming all others are lost or damaged due to construction. It is typically calculated as a circle centred on the trunk unless existing site conditions can be assessed and indicate otherwise. According to the Australian Standard, a minor encroachment of 10% of the TPZ is allowable, provided the 10% is compensated for elsewhere and contiguous to the TPZ.
- SRZ = Structural Root Zone. This is the area as defined by AS 4970 – "*Protection of trees on development sites*" and means the area immediately around the base of the tree at a given distance from the trunk. The woody roots and soil cohesion in this area are considered vital to the structural stability of the tree. Damage or removal of soil and roots from this area will typically render the tree unstable and require its removal. It is typically calculated as a circle, centred on the trunk, unless existing site conditions can be assessed and indicate otherwise.

2. METHODOLOGY

2.1 Health and Condition Assessment

A site inspection was undertaken on the 27 May 2016 to visually assess the trees in view from the ground. This report is limited to the methods of assessment listed below (and outlined in **Appendix 1**), and does not include any internal probing, compaction testing, drilling, root mapping, aerial inspection or diagnostic testing.

- Tree Species (botanical and common name).
- Tree height and age was estimated.
- Canopy spread was estimated.
- Diameter at Breast Height (DBH) and Diameter at Ground Level (DGL) was measured (or estimated if inaccessible).
- Health and vigour, including foliage size, colour, extension growth, presence of disease or pest infestation, canopy density, presence of deadwood, dieback, epicormic growth as indicators.
- Condition, using visible evidence of structural defects, instability, evidence of previous pruning and physical damage as indicators.
- Suitability of the tree to the site and its existing location.
- The photographs included in this report were taken at the time of inspection.
- Assessment was carried out visually from ground level.
- The comments and recommendations in this report are based on findings from the site inspection.

2.2 Landscape Significance

The significance of a tree in the landscape is a combination of its environmental, heritage and amenity values. A criteria for the assessment of landscape significance as devised by Andrew Morton (2003) and shown in **Appendix 2** have been applied. Whilst it may be somewhat subjective to assess these values consistently, it is appropriate to assign some measure to assist in determining the overall retention value of each tree.

The rating system which has been applied to each tree and to assist in determining priorities for retention, includes the following categories:

1. Significant
2. Very High
3. High
4. Moderate
5. Low
6. Very Low
7. Insignificant

2.3 Tree Retention Value

The retention value shown in the Tree Assessment Schedule in **Appendix 4** has been determined on the basis of the estimated longevity of the tree and its landscape significance rating, in accordance with Table 1 below. These retention values are also indicated on the Tree Retention Value Plan in **Appendix 3**. These retention values can help determine the most appropriate position of any future building footprints and/or structures within the site, to minimise the impact on trees considered worthy of preservation.

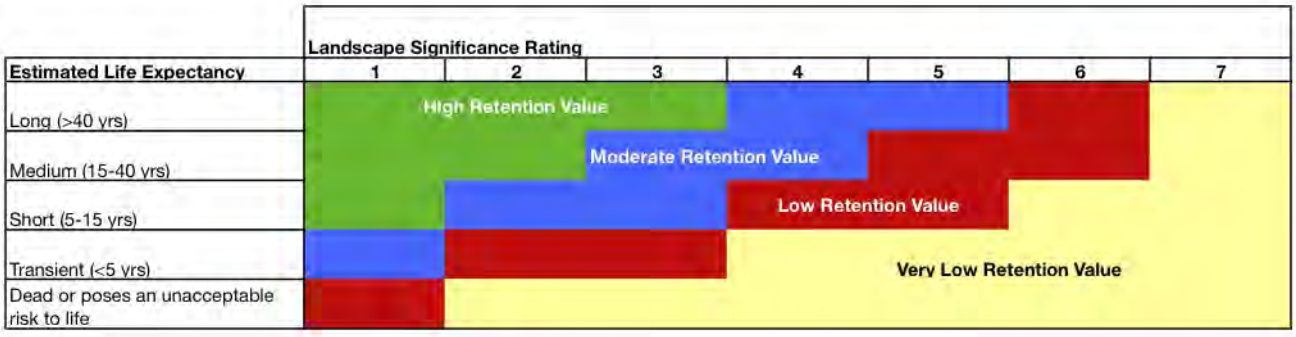


Table 1: Tree Retention Values - assessment methodology (Ref:- Morton, Andrew 2006 modified from Couston, Mark & Howden, Melanie (2001) Footprint Green Pty Ltd, Sydney, Australia)

3. OBSERVATIONS

3.1 The Site

The site is a corner allotment that is located on the western side of the Pacific Highway and the northern side of Dumaresq Street. The western boundary adjoins a lane way identified as Radford Place which provides access to the car parking area beneath the Ku-ring-gai Council chambers. Formally identified as Lot 12 in D.P. 631351 the site is irregular in shape, measuring a total area of 2,357 square metres. The northern boundary adjoins the Ku-ring-gai Council chambers which is a heritage building. A through site pedestrian link extends along the northern boundary, providing pedestrian access from the Pacific Highway down a series of steps to Radford Place. The perimeter of the site is well treed, with the majority of trees located to the north, and in particular to the northeastern corner (refer to Figure 1).

In accordance with Council mapping, the site is zoned as B2 Local Centres in which the current multiple storey building on the site serves as a business establishment. The Ku-ring-gai Council chambers located to the north and carpark area located to the west are identified as a Heritage Item in accordance with Council's *Local Environment Plan* (LEP) 2015. An area to the west of the site is also identified as an area of biodiversity significance (in accordance with Council's LEP). The site itself is not considered to hold any heritage or ecological significance.

Figure 1: An aerial image of the site with the boundary highlighted red (accessed from http://maps.six.nsw.gov.au/ on 30/5/16).

3.2 The Trees

A total of twenty one (21) trees are included in this assessment. Nineteen (19) trees are located on the site and two (2) trees are located on the adjoining site to the north, being Ku-ring-gai Council chambers at 818 Pacific Highway. The tree identification numbers for reference purposes are denoted on the Tree Retention Value Plan in **Appendix 3** and Proposed Site Plan in **Appendix 5**. The numbers on these plans correlate with the Tree Assessment Schedule in **Appendix 4**. Site context photographs can be found in **Appendix 5**.

3.3 Exempt Trees

Under the provisions of Council's *Tree and Vegetation Preservation* (Part 13.2 of DCP - Local Centres), eight (8) trees included in this assessment and located within the subject site are exempt (not protected) and therefore may be removed without requiring permission from Council. One of the criteria that a tree may be exempt is if it is located within three (3) metres of an existing building. The trees identified as exempt are listed below and will be removed as part of the future development of the site:

Tree No.	Tree Species	Exemption
1	*Casuarina glauca* (Swamp She-Oak)	Located within 3 metres of existing building (refer to 13.2.4 of DCP)
5, 7, 8	*Casuarina cunninghamiana* (River She-Oak)	Located within 3 metres of existing building (refer to 13.2.4 of DCP)
4	*Casuarina cunninghamiana* (River She-Oak)	Dead (refer to 13.2.6 of DCP)
18, 19, 20	*Syzygium luehmannii (Riberry)*	Located within 3 metres of existing building (refer to 13.2.4 of DCP)

4. IMPACT ASSESSMENT

4.1 The Proposed Site Plan found in **Appendix 5** shows an overlay of the existing trees relative to the proposed building envelope. Where an existing tree is located within the new building envelope or proposed excavation exceeds acceptable thresholds and render the tree unviable, the Proposed Site Plan indicates the tree to be removed. The Proposed Site Plan also delineates the trees for removal that are exempt under Council's tree policy, and those trees proposed for removal that are protected trees under Council's tree policy. The following criteria have been examined as part of this assessment:-

- Existing Relative Levels (RL)
- Tree Protection Zone (TPZ)
- Structural Root Zone (SRZ)
- Footprint of the proposed development and any temporary structures (such as scaffolding)
- Incursions to the TPZ & SRZ, including excavation, filling, and potential above ground impacts to tree canopy; and
- Assessment of the likely impact of the works on the existing trees.

4.2 The proposed development will necessitate the removal of sixteen (16) trees located on the site. Of these trees to be removed, eight (8) trees are exempt species and therefore may be removed without requiring permission from Council (including T1, T4, T5, T7, T8, T18, T19 and T20) - refer to Section 3.3 of this report. The remaining eight (8) trees proposed for removal are protected species and will therefore require permission from Council to remove these trees. Of these protected trees:

(i) Three (3) trees are low or very low retention value trees - including T2 (Blueberry Ash), T3 (River She-Oak) and T6 (Blueberry Ash). None of these trees are considered significant or worthy of being a constraint to any future development on the site;
(ii) Two (2) trees are moderate retention value trees - including T11 and T14 (both Wallangarra White Gums). Whilst these trees hold no ecological or heritage significance they do provide canopy coverage and amenity value due to their size, health and condition. Compensatory planting should be considered as part of the removal of these trees; and
(iii) Three (3) trees are high retention value trees - including T10, T12 and T17 (all Tallowoods). These trees are mature specimens that exhibit signs of good vigour and are in good condition. They are considered to have a high retention value due to their size and long estimated life expectancy. It is of paramount importance that compensatory planting is addressed as part of the removal of these trees.

4.3 The first floor plan (DA06 rev. 5) indicates a paved access path extending through the TPZ of T13 (Wallangarra White Gum) and T15 (Tallowood). The proposed levels indicate that the path is raised above existing ground levels in the TPZ of the two trees. It is in the author's opinion that it is possible to retain the trees as part of the development and construct the access path as an elevated structure on isolated piers in order to minimise any root disturbance. Footings in the TPZ of the two trees should be piers or bridged over any structural roots if required. The use of continuous strip footings in the TPZ of the two trees should be avoided.

4.4 T9 (Canary Island Date Palm) is a mature specimen that is visually prominent from the intersection of the Pacific Highway and Dumaresq Street. The palm is generally in good condition with an estimated life expectancy in excess of 40 years. The proposed building envelope will necessitate the removal of the palm. The architectural drawings indicate the palm to be transplanted to the northeastern part of the site.

Palms are arborescent monocots which have a root system much simpler in form than that of a tree. Specimen palms are relatively easy to transplant compared to broad-leaved and coniferous trees. The palm root system is adventitious and composed of numerous, small to medium sized non-woody roots (that form a root mass) and arise independently from the Root Initiation Zone (RIZ) at the base of the trunk. Research has shown that when transplanting palms, most species require a minimum rootball radius of 300mm to transplant successfully, as this is sufficient to preserve the RIZ. Palms need active root and shoot growth to establish quickly after transplanting (Hodel et al, 2005).

With consideration to this research, and given the access available for a crane or similar machinery, it is considered viable that the palm be transplanted to the vicinity indicated on the architectural drawings. A tree transplant contractor will need to be engaged as part of the development works to provide a transplant specification and ensure the transplant successfully transplanted to the new location.

4.5 T16 (Riberry) and T21 (River She-Oak) are located on the adjoining site to the north (on the Ku-ring-gai Council chambers at 818 Pacific Highway). The upgrade of the through site pedestrian link that extends along the northern boundary is located in the TPZ of these two adjacent trees. Tree protection measures will need to be considered to ensure the protection of these two trees and to avoid any inadvertent damage during construction activities.

5. CONCLUSION | RECOMMENDATIONS

5.1 A total of twenty-one (21) trees are included in this assessment that are located either on the site or on an adjoining site and within close proximity to the proposed development. Of the total number of trees assessed, four (4) trees are considered to have a high retention value due to their size and long estimated life expectancy; five (5) trees are considered to have a moderate retention value; and twelve (12) trees are considered to have a low or very low retention value.

5.2 A total of eight (8) trees are exempt from Council protection and therefore will be removed as part of the future development works (including T1, T4, T5, T7, T8, T18, T19 and T20). It is proposed to remove an additional eight (8) trees that are protected trees and as such require permission from Council for their removal. These trees include three (3) low retention value trees (including T2, T3 and T6); two (2) moderate retention value trees (including T11 and T14) and three (3) high retention value trees (including T10, T12 and T17).

5.3 It is proposed to transplant T9 (Canary Island Date Palm) as part of the future works. It is in the author's opinion it is viable to transplant the palm, providing an experienced tree transplant contractor is engaged by the applicant to undertake the works and ensure the palm is successfully transplanted to the northeastern corner of the site. A transplant specification should be provided to Council prior to any commencement of works.

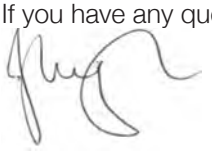
5.4 The paved access path extends through the TPZ of T13 (Wallangarra White Gum) and T15 (Tallowood). To ensure minimal impact upon the two trees, consideration should be given to constructing the path as an elevated platform above existing levels to avoid root disturbance in the TPZ of the trees. Footings in the TPZ should be isolated piers rather than the strip footings. Providing tree protection measures are undertaken relating to T13 and T15, the proposed works should not result in an adverse impact upon the trees (refer to the Proposed Site Plan including Tree Protection in **Appendix 5**).

5.5 The neighbouring trees, identified as T16 (Riberry) and T21 (River She-Oak) must be protected during the course of the upgrade works associated with the through site pedestrian link located along the northern boundary. Refer to the Proposed Site Plan including Tree Protection in **Appendix 5**.

5.6 Consideration should be given to compensatory tree planting on the site to ensure the canopy coverage and amenity value of the site and locality is not compromised or diminished in the medium to long term. Replacement trees should be able to reach a canopy size at maturity that matches those trees being removed, to ensure the urban forest canopy is being replenished.

5.7 Prior to any demolition, excavation or construction activities occurring on the site it is recommended a project arborist with a minimum qualification AQF Level 5 in Arboriculture is engaged to oversee all works located in the tree protection zone of the retained trees.

If you have any questions regarding this report please do not hesitate to contact the undersigned.



Joanne Leigh
Consultant Arboriculturalist (AQF 5)
Member of I.A.C.A. (Institute of Australian Consulting Arborists)
Member of I.S.A (International Society of Arboriculture)

Assumptions

Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible. However Joanne Leigh – Consulting Arborist can neither guarantee nor be responsible for the accuracy of information provided by others.
Unless stated otherwise:
- Information contained in this report covers only the tree that was examined and reflects the condition of the tree at the time of inspection: and
- The inspection was limited to visual examination of the subject tree without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject tree may not arise in the future.

6. REFERENCES

- Draper, Danny B. and Richards, Peter A (2009) “Dictionary for Managing Trees in Urban Environments”. CSIRO Publishing, Collingwood, VIC Australia
- Harris, R.W; Clark, J.R; & Matheny, N.P (2004) Arboriculture; Integrated Management of Landscape Trees, Shrubs & Vines 4th Edition, Prentice Hall, New Jersey.
- Hodal, D.R (2009) “Biology of Palms and Implication for Management in the Landscape”, HortTechnology October-December 2009 vol. 19 no. 4.
- Mattheck, Claus (2007) “Updated Field Guide for Visual Tree Assessment”. Karlsruhe Research Centre, Germany.
- Standards Australia (2009) AS2970-2009 “Protection of Trees on Development Sites”, Sydney.
- Council’s relevant planning documents

APPENDIX 1: TREE INSPECTION INVENTORY NOTES

The values for terminology provided below are sourced from SRIV© Sustainable Retention Index Value © From Draper BD and Richards PA 2009, Dictionary for Managing Trees in Urban Environments, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Age: Most trees have a stable biomass for the major proportion of their life. The estimation of the age of a tree is based on the knowledge of the expected lifespan of the taxa in situ divided into three distinct stages of measurable biomass, when the exact age of the tree from its date of cultivation or planting is unknown and can be categorized as Young, Mature and Over-mature.
Young - Tree aged less 20% of life expectancy, in situ.
Mature - Tree aged 20-80% of life expectancy, in situ.
Over-mature - Tree aged greater than >80% of life expectancy, in situ, or senescent with or without reduced vigour, and declining gradually or rapidly but irreversibly to death.

Height: In metres (estimated)

Spread: Average diameter of canopy in metres (estimated)

Crown class:
(D) Dominant (crown extends above general canopy; not restricted by other trees)
(C) Co-dominant (crown forms the bulk of the general canopy but crowded by other trees)
(I) Intermediate (crown extends into dominant/codominant canopy but quite crowded on all sides)
(S) Supressed (crown development restricted from overgrowing trees)

Vigour: Ability of a tree to sustain its life processes. This is independent of the condition of a tree but may impact upon it. Vigour can appear to alter rapidly with change of seasons (seasonality) e.g. dormant, deciduous or semi-deciduous trees. Vigour can be categorized as:
Normal Vigour Ability of a tree to maintain and sustain its life processes. This may be evident by the typical growth of leaves, crown cover and crown density, branches, roots and trunk and resistance to predation. This is independent of the condition of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.
High Vigour Accelerated growth of a tree due to incidental or deliberate artificial changes to its growing environment that are seemingly beneficial, but may result in premature aging or failure if the favourable conditions cease, or promote prolonged senescence if the favourable conditions remain, e.g. water from a leaking pipe; water and nutrients from a leaking or disrupted sewer pipe; nutrients from animal waste, a tree growing next to a chicken coop, or a stock feed lot, or a regularly used stockyard; a tree subject to a stringent watering and fertilising program; or some trees may achieve an extended lifespan from continuous pollarding practices over the life of the tree.
Low Vigour Reduced ability of a tree to sustain its life processes. This may be evident by the atypical growth of leaves, reduced crown cover and reduced crown density, branches, roots and trunk, and a deterioration of their functions with reduced resistance to predation. This is independent of the condition of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.
Dormant Tree Vigour Determined by existing turgidity in lowest order branches in the outer extremity of the crown, with good bud set and formation, and where the last extension growth is distinct from those most recently preceding it, evident by bud scale scars. Normal vigour during dormancy is achieved when such growth is evident on a majority of branches throughout the crown.

Useful Life Expectancy: The life span of a tree in the urban environment may often be reduced by the influences of encroachment and the dynamics of the environment and can be categorized as Immediate, Short Term, Medium Term and Long Term.
Short Term - Period of time less than 15 years.
Medium Term - Period of time 15 - 40 years.
Long Term - Period of time greater than >40 years.

Condition: A tree's crown form and growth habit, as modified by its environment (aspect, suppression by other trees, soils), the stability and viability of the root plate, trunk and structural branches (first (1st) and possibly second (2nd) order branches), including structural defects such as wounds, cavities or hollows, crooked trunk or weak trunk/branch junctions and the effects of predation by pests and diseases. These may not be directly connected with vigour and it is possible for a tree to be of normal vigour but in poor condition. Condition can be categorized as:
Good Condition - Tree is of good habit, with crown form not severely restricted for space and light, physically free from the adverse effects of predation by pests and diseases, obvious instability or structural weaknesses, fungal, bacterial or insect infestation and is expected to continue to live in much the same condition as at the time of inspection provided conditions around it for its basic survival do not alter greatly. This may be independent from, or contributed to by vigour.
Fair Condition - Tree is of good habit or misshapen, a form not severely restricted for space and light, has some physical indication of decline due to the early effects of predation by pests and diseases, fungal, bacterial, or insect infestation, or has suffered physical injury to itself that may be contributing to instability or structural weaknesses, or is faltering due to the modification of the environment essential for its basic survival. Such a tree may recover with remedial works where appropriate, or without intervention may stabilise or improve over time, or in response to the implementation of beneficial changes to its local environment. This may be independent from, or contributed to by vigour.
Poor Condition - Tree is of good habit or misshapen, a form that may be severely restricted for space and light, exhibits symptoms of advanced and irreversible decline such as fungal, or bacterial infestation, major die-back in the branch and foliage crown, structural deterioration from insect damage e.g. termite infestation, or storm damage or lightning strike, ring barking from borer activity in the trunk, root damage or instability of the tree, or damage from physical wounding impacts or abrasion, or from altered local environmental conditions and has been unable to adapt to such changes and may decline further to death regardless of remedial works or other modifications to the local environment that would normally be sufficient to provide for its basic survival if in good to fair condition. Deterioration physically, often characterised by a gradual and continuous reduction in vigour but may be independent of a change in vigour, but characterised by a proportionate increase in susceptibility to, and predation by pests and diseases against which the tree cannot be sustained. Such conditions may also be evident in trees of advanced senescence due to normal phenological processes, without modifications to the growing environment or physical damage having been inflicted upon the tree. This may be independent from, or contributed to by vigour.

APPENDIX 2: CRITERIA FOR ASSESSMENT OF LANDSCAPE SIGNIFICANCE

The level of landscape significance has been determined using the following key criteria as a guide:

1. SIGNIFICANT
• The subject tree is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance; or
• The subject tree forms part of the curtilage of a Heritage Item (building /structure /artifact as defined under the LEP) and has a known or documented association with that item; or
• The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event;
• The subject tree is scheduled as a Threatened Species or is a key indicator species of an Endangered Ecological Community as defined under the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999; or
• The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species; or
• The subject tree is a Remnant Tree, being a tree in existence prior to development of the area; or
• The subject tree has a very large live crown size exceeding 300m2 with normal to dense foliage cover, is located in a visually prominent in the landscape, exhibits very good form and habit typical of the species and makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity; or
• The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.

2. VERY HIGH
• The tree has a strong historical association with a heritage item (building/structure/artifact/garden etc) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site; or
• The subject tree is listed on Council's Significant Tree Register; or
• The tree is a locally-indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link / Wildlife Corridor or has known wildlife habitat value;
• The subject tree has a very large live crown size exceeding 200m2; a crown density exceeding 70% Crown Cover (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area.

3. HIGH
• The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence; or
• The tree is a locally-indigenous species and representative of the original vegetation of the area; or
• The subject tree has a large live crown size exceeding 100m2; and
• The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (eg crown distortion/suppression) with a crown density of at least 70% Crown Cover (normal); and
• The subject tree is visible from the street and surrounding properties and makes a positive contribution to the visual character and the amenity of the area.

4. MODERATE
• The subject tree has a medium live crown size exceeding 40m2; and
• The tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crown density of more than 50% Crown Cover (thinning to normal); and
• The tree makes a fair contribution to the visual character and amenity of the area; and
• The tree is visible from surrounding properties, but is not visually prominent – view may be partially obscured by other vegetation or built forms.
• The tree has no known or suspected historical association

5. LOW
• The subject tree has a small live crown size of less than 40m2 and can be replaced within the short term with new tree planting; or
• The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% Crown Cover (sparse); and
• The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area.

6. VERY LOW
• The subject tree is listed as an Environment Weed Species in the relevant Local Government Area, being invasive, or a nuisance species.
• The subject tree is scheduled as exempt (not protected) under the provisions of the local Council's Tree Preservation Order due to its species, nuisance or position relative to buildings or other structures.

7. INSIGNIFICANT
• The tree is a declared Noxious Weed under the Noxious Weeds Act (NSW) 1993

Ref:- Morton, Andrew (2003) Criteria for Assessment of Landscape Significance Earthscape Horticultural Services. Sydney, Australia

APPENDIX 3: TREE RETENTION VALUES (on following page - A3 papersize)

TREE RETENTION VALUE PLAN

SCALE: 1:200 (A3 PAPER)

TREE RETENTION VALUE LEGEND

- High Retention value
- Moderate Retention value
- Low Retention value
- Very Low Retention value (should remove)
- Nominal Tree Protection Zone (TPZ)
- Approximate extent of canopy
- 12 — Tree identification number

RADFORD PLACE

DUMARESQ STREET

PACIFIC HIGHWAY

ENTRANCE TO COUNCIL CHAMBERS

FLOOR LEVEL CARPARK LOW BASEMENT RL 117.55

FLOOR LEVEL CARPARK UPPER BASEMENT RL 118.81

FLOOR LEVEL CARPARK RL 123.78

BM DRILL HOLE & WING RL 128.64 (AHD)

BM DRILL HOLE & WING RL 117.43 (AHD)

BM SSM 166471 RL 125.64 (AHD)

APPENDIX 4: TREE ASSESSMENT SCHEDULE

Tree No.	Plant Name (Species/Common Name)	Age	Tree Height (m)	Average Canopy spread (m)	DBH (m)	DGL (m)	Crown class D/C/I/S	Vigour	Condition	Useful Life Expectancy	Landscape Significance	Tree Retention Value	Observations/comments	Tree Protection Zone (TPZ) radius in metres	Structural Root Zone (TPZ) radius in metres	Plan status	Impact / Incursion
1	*Casuarina glauca* (Swamp She-Oak)	M	19.0	8 (bias to west)	0.52	0.43	D	normal	fair	medium (15-40yrs)	very low	low	Exempt - located within 3m of existing building. Growing away from building, included branch junctions, main junction included at 1.5m above ground level, some twig dieback	6.2	2.3	exempt / remove	Tree located within building new footprint
2	*Elaeocarpus reticulatus* (Blueberry Ash)	M	10.5	6.0	0.14	0.21	S	normal	good	medium (15-40yrs)	low	low	Suppressed canopy.	2.0	1.7	remove	New building footprint will necessitate removal of tree
3	*Casuarina cunninghamiana* (River She-Oak)	M	20.0	6 (bias to west)	0.34	0.55	C	normal	fair	medium (15-40yrs)	low	low	Asymmetric crown with bias to north and east	4.1	2.6	remove	Tree located within building new footprint
4	*Casuarina cunninghamiana* (River She-Oak)	M	19.0	6.0	0.41	0.58	C	n/a	dead	transient (<5yrs)	insignificant	very low	Dead tree - should be removed.	4.9	2.6	exempt / remove	New building footprint will necessitate removal of tree
5	*Casuarina cunninghamiana* (River She-Oak)	M	15.0	9 (asymetric crown)	0.3	0.44	S	normal	fair	medium (15-40yrs)	low	low	Exempt - located within 3m of existing building. Asymmetric crown .	3.6	2.3	exempt / remove	New building footprint will necessitate removal of tree
6	*Elaeocarpus reticulatus* (Blueberry Ash)	M	5.5	5.0	0.13	0.19	S	normal	fair	medium (15-40yrs)	low	low	Suppressed canopy.	2.0	1.6	remove	New building footprint will necessitate removal of tree
7	*Casuarina cunninghamiana* (River She-Oak)	M	20.0	4.0	0.37	0.5	C	normal	fair	medium (15-40yrs)	very low	low	Exempt - located within 3m of existing building. Asymmetric crown, twig dieback - minor.	4.4	2.5	exempt / remove	New building footprint will necessitate removal of tree
8	*Casuarina cunninghamiana* (River She-Oak)	M	18.0	7 (severe bias to south)	0.37	0.65	C	normal	fair	medium (15-40yrs)	very low	low	Exempt - located within 3m of existing building. Asymmetric crown, deadwood - minor.	4.4	2.8	exempt / remove	New building footprint will necessitate removal of tree
9	*Phoenix canariensis* (Canary Island Date Palm)	M	11.5	8.0	0.67	n/a	D	normal	good	long (>40yrs)	moderate	moderate	Good representation for the species. May be possible to transplant the species as part of the future development of the site.	8.0	n/a	transplant	Proposed transplant palm to northeastern corner of site
10	*Eucalytpus microcorys* (Tallowwood)	M	18.0	9.0	0.44	0.57	D/C	high	good	long (>40yrs)	high	high	Excellent representation for the species. A prominent specimen from the street.	5.3	2.6	remove	Located within line of new basement
11	*Eucalytpus scoparia* (Wallangarra white gum)	M	14.0	11.0	0.4	0.54	C	normal	fair	medium (15-40yrs)	moderate	moderate	Asymmetric crown over Pacific Highway, twig dieback and deadwood, past pruning cuts for clearance over road, approx. 500mm off boundary.	4.8	2.6	remove	Excavation for basement located in SRZ, will necessitate removal of tree.
12	*Eucalytpus microcorys* (Tallowwood)	M	18.0	11.0	0.6	0.76	C	high	good	long (>40yrs)	high	high	Approx. 2m from side boundary, co-dominant in form with main branch junction 2m above ground level, minor twig dieback.	7.2	2.9	remove	Excavation for basement located in SRZ, will necessitate removal of tree.
13	*Eucalytpus scoparia* (Wallangarra white gum)	M	15.0	10.0	0.46	0.63	C/S	normal	good	medium (15-40yrs)	moderate-high	moderate	Canopy bias to NE, partially suppressed, deadwood - minor, some epicormic growth	5.5	2.7	retain	Excavation for basement located outside TPZ of tree. It may be possible to retain tree and incorporate into new open space area.
14	*Eucalytpus scoparia* (Wallangarra white gum)	M	13.0	7.5	0.45	0.62	C	normal	good	medium (15-40yrs)	moderate	moderate	Canopy bias to south and west.	5.4	2.7	remove	Excavation represents major encroachment in SRZ and TPZ of 26%. Tree located in line of new access pathway.
15	*Eucalytpus microcorys* (Tallowwood)	M	15.0	10.0	0.44	0.58	C	normal	good	long (>40yrs)	moderate-high	high	Located close to side adjoining boundary	5.3	2.6	retain	Excavation for basement located outside TPZ of tree. It may be possible to retain tree and incorporate into new open space area.
16	*Syzygium luehmannii* (Riberry)*	M	11.0	7.0	0.26	0.32	S	normal	good	medium (15-40yrs)	moderate	moderate	Located directly next to Council chambers in adjoining property.	3.1	2.1	retain	Pedestrian link upgrade located in TPZ of tree

Tree No.	Plant Name (Species/Common Name)	Age	Tree Height (m)	Average Canopy spread (m)	DBH (m)	DGL (m)	Crown class D/C/I/S	Vigour	Condition	Useful Life Expectancy	Landscape Significance	Tree Retention Value	Observations/comments	Tree Protection Zone (TPZ) radius in metres	Structural Root Zone (TPZ) radius in metres	Plan status	Impact / Incursion
17	*Eucalytpus microcorys* (Tallowwood)	M	20.0	12.0	0.65	0.98	D	normal	good	long (>40yrs)	high	high	Growing up and over existing buildings, minor twig dieback. Excellent representation for the species.	7.8	3.3	remove	Proposed building works will necessitate removal of tree
18	*Syzygium luehmannii* (Riberry)	S	7	4	0.09	0.12	S	low	fair	medium (15-40yrs)	very low	low	Exempt - located within 3m of existing building. Suppressed canopy.	2.0	1.5	exempt / remove	Proposed building works will necessitate removal of tree
19	*Syzygium luehmannii* (Riberry)	S	7.5	4.5	0.1	0.12	S	low	fair	medium (15-40yrs)	very low	low	Exempt - located within 3m of existing building. Suppressed canopy.	2.0	1.5	exempt / remove	Proposed building works will necessitate removal of tree
20	*Syzygium luehmannii* (Riberry)	S	7	4	0.12	0.16	S	low	fair	medium (15-40yrs)	very low	low	Exempt - located within 3m of existing building. Suppressed canopy.	2.0	1.5	exempt / remove	Proposed building works will necessitate removal of tree
21	*Casuarina cunninghamiana* (River She-Oak)*	M	9	3	0.23	0.31	S	low	poor	short (5-15yrs)	low	low	Limited crown volume, located 1.5m from Council Chambers on adjoining property.	2.8	2.0	retain	Pedestrian link upgrade located in TPZ of tree

* Trees located on neighbouring property shaded

APPENDIX 5: PROPOSED SITE PLAN INCLUDING TREE PROTECTION (on following page - A3 papersize)

TREE PROTECTION MEASURES

1. Tree Protection Zones (TPZ): TPZs are recommended for all trees to be retained and shall be equivalent to the distances specified in the tree assessment table. This is a radial distance measured from the centre on the trunk unless existing site conditions indicate otherwise.
The following activities should be avoided within specified the TPZ:
Excavations and trenching;
Ripping or cultivation of soil;
Modification of existing soil levels;
Mechanical removal of vegetation;
Soil disturbance or movement of natural rock;
Temporary or permanent location of services, or the works required for their installation;
Movement and storage of plant, equipment & vehicles;
Erection of site sheds;
Affixing of signage or hoardings to trees;
Storage of building materials, waste and waste receptacles;
Disposal of waste materials and chemicals including paint, solvents, cement slurry, fuel, oil and other toxic liquids;
Other physical damage to the trunk or root system; and
Any other activity likely to cause damage to the tree.

2. Tree Protection Fencing: All trees indicated to be retained shall be protected prior to and during construction from all activities that may result in detrimental impact by erecting a suitable protective fence beneath the canopy to the full extent of the TPZ (excluding the footprint of the proposed works and areas within adjoining properties). As a minimum the fence should consist of temporary chain wire panels 1.8 metres in height, supported by steel stakes as required and fastened together and supported to prevent sideways movement. The fence shall be erected prior to the commencement of any work on-site and shall be maintained in good condition for the duration of construction. Where more than one TPZ merge together a single fence encompassing the area is deemed to be adequate.

3. Signage: Signage is to be attached to the nominated TPZ and displayed in a prominent location and the sign repeated at 10 metre intervals or closer where the fence changes direction. The lettering for each sign is to be a minimum of 72 point font size. The signs are to be a minimum size of 600 x 500mm. Each sign shall include the wording "Tree Protection Zone - access is restricted", and include the name and contact number of the developer.

4. Mulching / Ground Protection: Where specified, a minimum 50mm and maximum 100mm depth woodchip mulch shall be installed to the full extent of the TPZ and spread by hand to avoid soil disturbance and compaction within the root zone. Mulch shall be installed prior to any site works and maintained in good condition for the duration of the construction period. On completion of the works, ground protection shall be removed without damage or disturbance to the underlying soil profile.

5. Trunk Protection: Where specified, trunk protection shall be erected around the tree to avoid accidental damage. As a minimum, the trunk protection shall consist of 1.8 metre lengths of pine board timbers (90 x 45mm) spaced at 100-150mm centres secured together with perforated metal straps. These shall be strapped around the trunk (not fixed in any way) to avoid mechanical injury or damage. Trunk protection should be installed prior to any site works and maintained in good condition for the duration of the construction period.

6. Accidental Tree Damage: Should a tree be accidentally damaged, the Project Arborist shall be immediately notified immediately to inspect and provide advice on any remedial action to minimise any adverse impacts. Such remedial action shall be implemented as soon as practicable and certified by the Project Arborist.

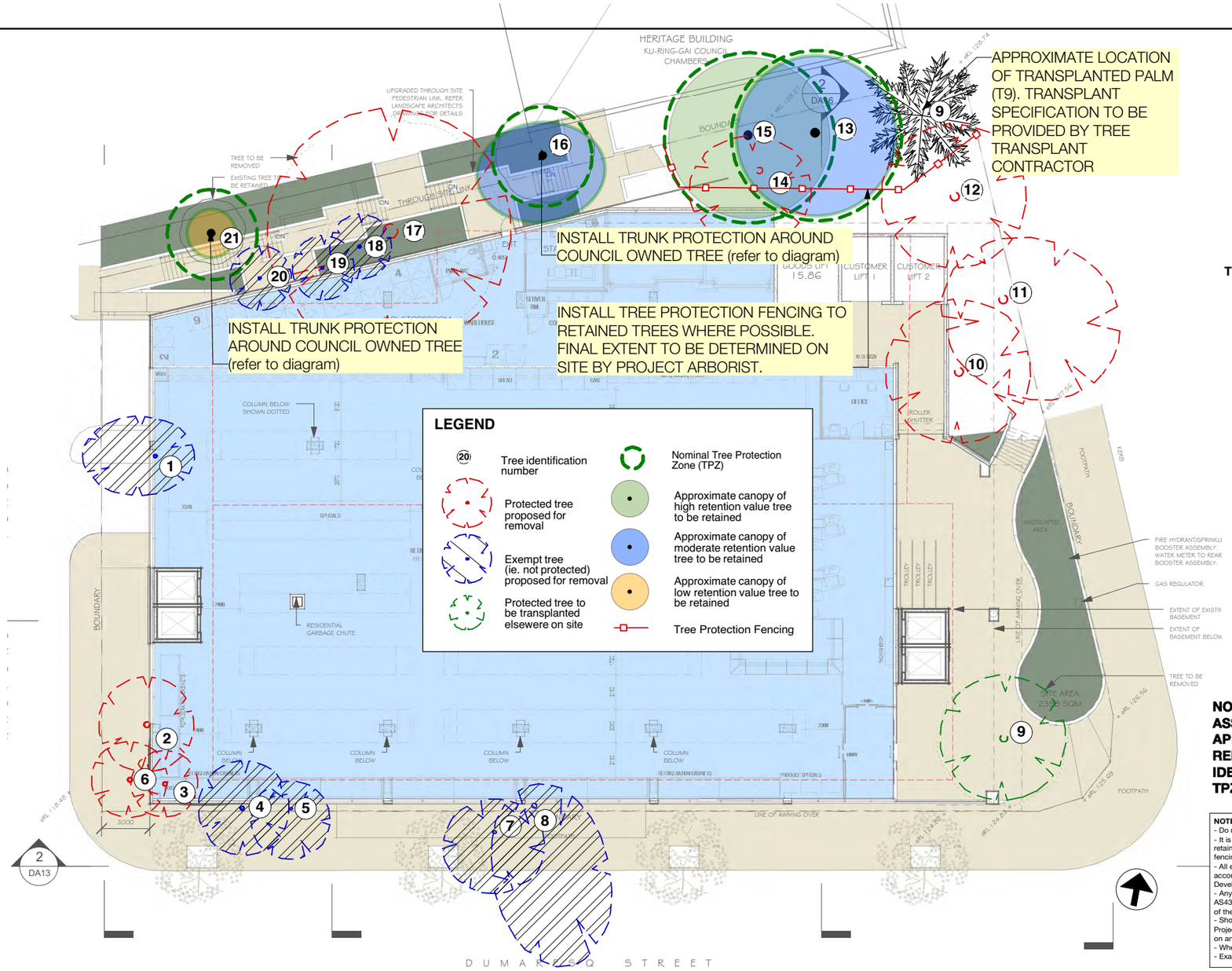
7. Demolition works within the Tree Protection Zone: Demolition of any buildings, paved areas or structures within the TPZ of trees to be retained shall be undertaken under the supervision of the Project Arborist. The nominated tree protection measures should be installed prior to any demolition works to avoid any damage to the trees for retention. The pavement surface and sub-base shall be tripped off in layers of no greater than 50mm thick using a small rubber tracked excavator or alternative approved method to avoid damage to underlying roots and minimise soil disturbance. The machine shall work within the footprint of the existing pathway to avoid compaction of the adjacent soil. The final layer of sub-base material shall be removed using hand tools where required to avoid compaction of the underlying soil profile and damage to woody roots. Following removal of pavement surface and sub-base, clean friable topsoil shall be used to fill in the excavated area to meet flush with surrounding levels. Soil shall be imported and spread when the underlying soil conditions are dry to avoid compaction of the soil profile.

8. Excavations within the Tree Protection Zone: Excavations within the TPZ of the trees to be retained shall be avoided wherever possible. Any necessary excavations and root pruning within the TPZ shall be supervised by the Project Arborist and undertaken by hand to protect tree roots.

9. Underground Services: All stormwater lines and underground services should be located as far away as practicable to avoid excavation within the TPZ of trees to be retained. Excavations required for underground services within the Structural Root Zone of any tree to be retained should only be undertaken by sub-surface boring. The invert level of the pipe, plus the pipe diameter, must be lower than the estimated root zone depth. This will depend on soil conditions at the site. Where this is not practical and root pruning is the only alternative, root pruning should be assessed by the Project Arborist to determine continued health and stability of the tree.

10. Root & Canopy Pruning: All pruning work required shall be carried out in accordance with Australian Standard No 4373-2007 – Pruning of Amenity Trees. Written approval from Council may be required to undertake this work. All pruning work shall be carried out by a qualified and experienced arborist or tree surgeon in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998). Care shall be taken when operating cranes, drilling rigs and similar equipment near trees to avoid damage to the tree canopy (foliage and branches). Under no circumstances shall branches be torn-off by construction equipment. Where there is potential conflict between tree canopy and construction activities, the advice of the Project Arborist must be sought. Where root pruning is required, roots shall be severed with clean, sharp pruning implements and retained in a moist condition during the construction phase using Hessian material or mulch where practical. Severed roots shall be treated with a suitable root growth hormone containing the active constituents Indol-3-yl-Butric Acid (IBA) and 1-Naphthylacetic Acid (NAA) to stimulate rapid regeneration of the root system.

11. Tree Removal: The approval from the local government authority shall be obtained prior to the removal or pruning of any tree protected under the Tree Preservation Order. Tree removal work shall be carried out by an experienced tree surgeon in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998). Care shall be taken to avoid damage to other trees during the felling operation. Stumps shall be grubbed-out where required using a mechanical stump grinder without damage to the root system of other trees. Where trees to be removed are in close proximity to trees to be retained, consideration should be given to cutting the stump close to ground level and retaining the root crown intact. Stumps within the TPZ of other trees to be retained should not be removed using excavation equipment or similar.

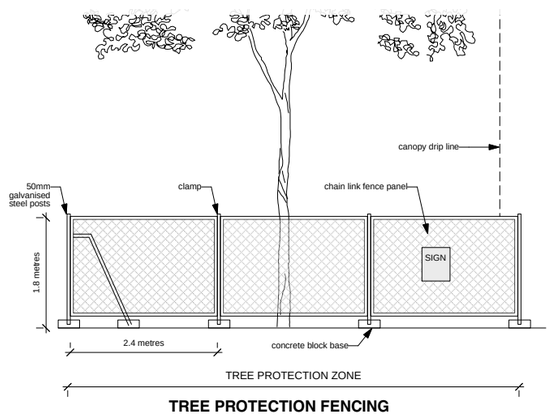


TREE PROTECTION ZONE
NO ACCESS
CONTACT:

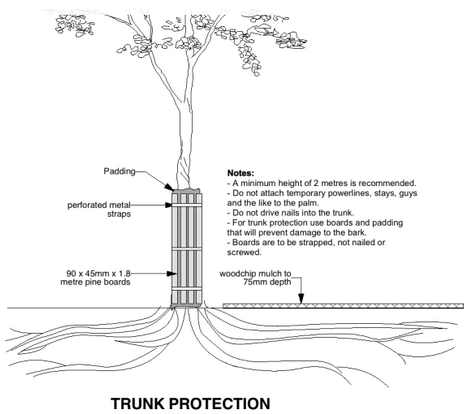
TREE PROTECTION SIGNAGE

NOTE: REFER TO TREE ASSESSMENT SCHEDULE IN APPENDIX 4 OF ARBORIST REPORT FOR TREE IDENTIFICATION AND TPZ/SRZ DISTANCES.

NOTES:
- Do not scale from drawings.
- It is assumed the existing boundary fencing will be retained for the duration of the works. If the boundary fencing is removed please contact the Project Arborist.
- All existing trees to be retained shall be protected in accordance with AS 2970-2009 Protection of Trees on Development Sites.
- Any pruning work shall be carried out in accordance with AS4374 Pruning of Amenity Trees and under the supervision of the Project Arborist.
- Should a tree be accidentally damaged, contact the Project Arborist immediately to inspect and provide advice on any remedial action to minimise any adverse impacts.
- When in doubt contact the Project Arborist.
- Exact positioning of trees shall be verified on site.



TREE PROTECTION FENCING



TRUNK PROTECTION

Rev:	Description:	Date:

Contractors to check and verify all dimensions, levels and boundaries prior to commencement of any work on site. Check location of all underground services prior to excavations or drilling. All workmanship to be in accordance with current trade practice, new standards, specifications and local authority bylaws. Seek resource and building consents as required.

810 PACIFIC HIGHWAY
GORDON
NSW 2072

SITE PLAN & TREE PROTECTION

Date: 10/10/17 Scale: 1:300@A3 (site plan)

Drawing Number: 1/1
Revision: A

TREE CONSULTING BY JO
Consulting Arborist & Landscape Design
PO Box 7 Manly NSW 2095 www.treeconsultingbyjo.com.au
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APPENDIX 6: SITE PHOTOGRAPHS

Photograph 1: Viewing the western facade of the existing building and existing trees located to the western side of the site from Radford Place.

Photograph 2: Viewing east along Dumaresq Street to the south western corner of the site.

Photograph 3: Viewing west along Dumaresq Street with the canopies of T7 and T8 (River She-Oak) visible.

Photograph 4: Viewing north across the site at the existing large Eucalytps located to the north eastern corner of the site.

Photograph 5: Viewing north across the front of the site with T10 (Tallowwood) in the foreground.

Photograph 6: Viewing east along the northern boundary at the existing large Eucalytps located towards the north eastern portion of the site.

Photograph 7: Viewing the canopy of T17 (Tallowwood) which extends up and over the existing buildings.

ANNEXURE B

Arboricultural Assessment & Tree Transplanting Methodology,

Ref No: TTA/GPDS21111

TREE TRANSPLANTERS AUSTRALIA PTY LIMITED
ACN 052 941 741 **ABN 86 052 941 741**
Telephone: 0410696537 **PO Box 1028**
Email: info@treetransplanters.com.au **MONA VALE NSW 1660**

ARBORICULTURAL ASSESSMENT
&
TREE TRANSPLANTING METHODOLOGY

Ref N°: TTA/GPDS211117

Mature Date Palm

Gordon,
NSW

November, 2017

Prepared For:

Paterson Design Studio Pty Ltd
Landscape Architects / Urban Designers
16a 1-15 Tramore Place,
Killarney Heights NSW 2087

TREE TRANSPLANTING & ARBORICULTURAL SERVICES

Limiting Conditions

The information provided in this report covers the subject tree and site only and is provided in relation to the observations made at the time of the inspection.

No responsibility can be accepted regarding the safety of persons or property resulting from injury or damage in respect to the subject tree, now or in the future.

This report is provided as a whole document. No separate items from within this document may be used or referred to in relation to the subject tree or other trees unless the original report and the author is referred to in its entirety.

REFERENCE LIST

Harris, R.W., Clark, J.R. and Matheny, N.P. (2004) *Arboriculture: Integrated Management of Landscape Trees, Shrubs and Vines*.4th Edition. Prentice Hall, New Jersey.

Handreck, K. and Black. N. (2002) *Growing Media for Ornamental Plants and Turf*. 3rd Edition. University of NSW Press, Sydney.

Jones, D.L (1984) *Palms in Australia.* French's Forest, NSW

Mattheck, C. & Breloer, H. (1994). *The body language of trees: A handbook of failure analysis.* Research for amenity tree No 4: The Stationery Office, London.

Muirhead, D. 1961. *Palms.* Globe, AZ: D. S. King.

Yours sincerely
TREE TRANSPLANTERS AUSTRALIA PTY LTD

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INTRODUCTION

The purpose of this report is to provide an assessment of the current health and condition of a mature Date Palm currently growing within the boundaries of the site on the corner of Pacific Highway and Dumaresq Street, Gordon in the Ku-ring-gai municipality.

The site is situated on the western side of the Pacific Highway and is bounded by Radford place to the west and Ku-ring-gai Municipal Council Chambers to the north. It is my understanding the existing building and adjacent gardens are to be demolished to make way for the construction of a new multi-level apartment building with an Aldi Supermarket.

This report was commissioned at the request of Mr. G Paterson (Senior Landscape Architect) of Paterson Design Studio Pty Ltd on behalf of their client Aldi Australia and shall be provided to Ku-ring-gai Municipal Council as a condition of the development consent of this property.

The tree has been recognized for local historical significance with indications it existed on this site when it was utilised as a petrol station in the 1960's. The value of the subject tree as an asset to the amenity of the site's landscape is recognised and therefore the feasibility to transplant and relocate the tree as an option is to be explored. The intention of this report therefore is to assess the current health and condition of the subject tree and provide an appraisal in regard to the potential impact of transplanting and relocating this tree to an alternative position on site as well as provide a budget estimate.

If the option to retain the tree by means of transplanting is selected, a transplantation methodology has been devised for the purposes of providing a guide to be adhered to for the relocation process. This methodology is appended to this report as Attachment B.

The site was visited, in regards to assessment, on Monday 20 January, 2017. Upon this inspection, visual examinations from ground level of the above ground sections of the tree was made, in accordance with the visual tree assessment (VTA) procedure (as defined by Mattheck *the Body Language of Trees,* 2003) as well as a limited visual inspection of the root zone. No aerial inspection or destructive testing was performed within this assessment.

Tree assessment survey forms were used to log additional details of the trees, such as height, spread, trunk diameter (at breast height) and the general habit of the trees. Additional data such as the maturity of the tree, life expectancy in its current location, and the presence of any damage to the tree were also recorded, as well as the presence of any pests or diseases. A Copy of this assessment sheet is appended to this report as Attachment A

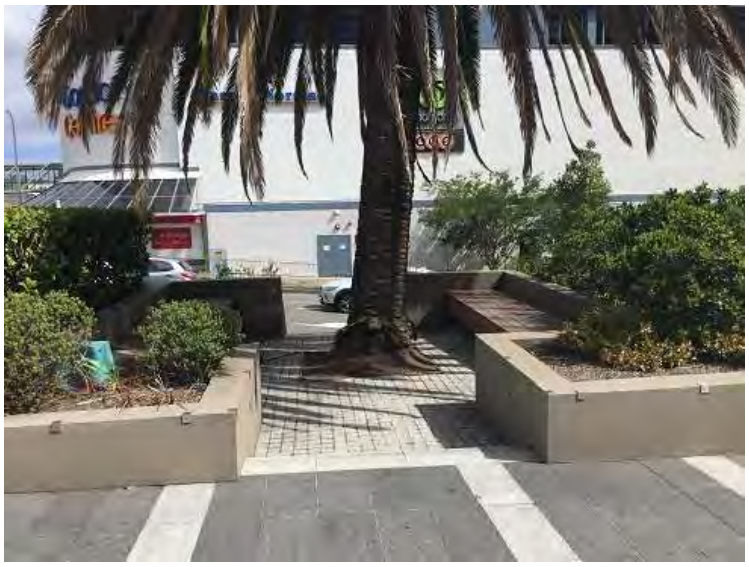
Photographic records were also taken of the current state of the tree including evidence of any previous damage.

THE TREE

The subject of the report is a 9 metre tall *Phoenix canariensis* (Canary Island Date Palm) with a spread of approximately 7 metres.

The general appearance of the tree is considered favourable with evidence of satisfactory vigour. The foliage colour and size is typical of this species. The density and shape of the canopy is also typical of a Canary Island Date Palm that is actively growing with reasonable vitality. The tree is a female and is currently initiating the flowering and fruiting process as displayed in the following photograph.

Due to the existence of hard pavement and solid infrastructure around the tree there was limited accessibility to inspect the root zone or determine the soil type the tree is growing within.



The tree is not exhibiting any indicative signs of Fusarium Palm Wilt (*Fusarium oxysporum* f. sp. Canariensis) which is a widespread fungal pathogen known to fatally affect this particular species. There is no evidence of any other pests or disease which indicates the cultural conditions are at a satisfactory level, effectively providing the tree with enough strength to repel any pathogens. Although the necrotic lower fronds signify the affects of a hot dry autumn, this Canary Island Date Palm is exhibiting all the signs of being healthy and vigorous with no detrimental defects that could pose a risk during or after the relocation process.

The condition of the tree is not classified as optimum however, due to the prominent lean of the trunk to the west and a narrowing of the trunk at approximately four metres from ground level (as shown in the previous and following image.

DISCUSSION

It is my supposition that this tree has been previously transplanted some years ago at which point it began to lean to the west in its new location. The narrowing of the trunk is an indication of poor vigour or deterioration in health from a detrimental impact such as water deficiency or similar for a period of time. This period could have been a post transplant period if the tree was relocated inadequately or provided little or insufficient aftercare at the time. The increase in trunk diameter past this point and the distinctive tilt to the east to rectify a natural upright growing habit signifies the tree has since improved its vitality back to an optimum level.

The size of the tree's existing root system would most likely be found to extend well beyond the drip line (canopy spread) of the tree. However, the proposed root plate upon transplanting would be considerably smaller, closer in dimension to the critical root zone, (approximately 2.5-3.0 metres in diameter for this size tree). The depth of the proposed root plate would be determined by evaluating the depth at which root density markedly decreases, estimated to be approximately 1200-1500mm for this species in the type of soils typically found in this locale.

The proposed new location would need to provide adequate drainage for the relocated tree. Although the environmental and physical properties of the new location should emulate the existing conditions, the tree will be in a transplanted state with a reduced root volume and therefore reduced capacity for moisture uptake. It will therefore require adequate drainage to ensure an ample accessibility for gaseous exchange and not suffer from complications arising from anoxic conditions due to insufficient drainage.

The new location will need to provide enough room for the transplanted root plate as well as a break out zone for the tree's roots to re-establish within. As a guide the new position shall need to be prepared at a width of no less than 1.5 times the prepared root plate diameter and no deeper than the depth of the prepared root plate. Aftercare maintenance with supplementary irrigation, following the transplant procedure, will be essential to the tree's successful re-establishment.

The existing infrastructure surrounding the tree such as the existing retaining walls, gardens, seating, and steps and hard paving as well as any underground services would need to be demolished or dismantled to assist the transplanting process. It is my understanding; this infrastructure would be removed as a part of the upgrade works.

The likelihood of a successful transplant in relation to this tree is considered as high, provided the soil profile is suitable and there are no underground obstructions. There is always a potential for the discovery of obstructions within the root zone that are not expected or recorded such as underground services, redundant or old foundations or tanks. These obstructions have the potential to minimise the extent of the root plate to be taken and thus reduce the likelihood of a successful transplant. It is not always possible to determine this situation, prior to preparation of the tree for relocating; however, a decision could be made at the time of detection as to whether a commitment to the transplant procedure should be continued.

The existence of any underground services and pipes running beneath the trunk of the subject tree may impact on the proposed transplanted root plate; however, if no other obstructions or incursions are discovered, their presence should not adversely affect the ability to successfully relocate the tree. It would be advisable to leave the services and pipes intact within the transplanted root plate and sever them at each side of the root plate rather than remove them which may damage valuable root volume.

According to Handreck, 'good soils will continuously supply plant roots with water, air and nutrient elements in balanced proportions'(Handreck & Black, 2002). As indicated by Harris, 'trees with well developed root systems have a higher potential for success than those with poorly structured roots. Therefore plants growing in fertile well aerated soils where roots are compact and fibrous may be more successfully transplanted than those in inferior soils' (Harris et al, 2004).

It would be advisable to undertake exploratory excavations at the proposed new location to check for a suitable soil profile, with sufficiently drained depth and suitable texture.

According to Jones '*Palms in Australia*' this species has the potential to reach heights of 20 metres or more. They are a solitary palm and are quite variable in form. 'They are especially adaptable since it can be grown in temperate, sub-tropical and tropical regions and in coastal as well as inland areas. It is very frost hardy and will thrive in quite poor soils although it does not succeed where drainage is poor.' (*Jones, 1984*)

They are considered to be very tolerant of root disturbance and therefore respond well to transplanting, provided they are planted in a well drained position and receive adequate aftercare.

According to Muirhead, palms should be moved in late spring and summer, when root growth is usually at a maximum. (Muirhead, D. 1961) and Jones maintains that 'in temperate regions palms make very slow growth over winter and should not be transplanted in late Summer autumn or winter'.

The transplanting procedure is essentially an operation that requires the tree's root zone to be reduced to a size that is physically able to be lifted and transported. Therefore there will always be a period of re-establishment during which the tree shall exhibit the stress related effects of the relocation. This is effectively due to root loss and subsequently limited capability of moisture uptake and gaseous exchange.

RECOMMENDATIONS

It is advisable to consider the following points when translocating the tree.

- Ensure the tree is at field capacity moisture content prior to the initiation of any transplant works.

- Remove excess fronds to minimise moisture loss through transpiration and facilitate ease of handling and transporting. This must be carried out in accordance with the Australian Standard No 4373- 2007 – 'Pruning of Amenity Trees'.

- Prepare an adequate root plate size to ensure stability as well as sustaining a quick re-establishment. (Approx. 2500mm in diameter & 1500mm deep for a tree of this size)

- Utilize appropriate root cutting equipment as well as suitable extraction, manoeuvring and rigging equipment.

- The orientation of the tree must remain as it was in its original position and the vertical alignment must also be duplicated in the new position.

- The root zone of the tree must be planted to correspond with the finished levels of the proposed landscape to ensure the tree's root zone is not suppressed with excess media which would disrupt the level of gaseous exchange and moisture infiltration.

- Once relocated the tree should be backfilled with a mix of the original growing material and an imported transplanting media and consolidated to ensure stability.

- Once the tree is relocated it must be maintained as per the Re-establishment Maintenance Program which is appended as Attachment C.

If the tree was not able to be relocated directly to its final location on site it may require storage in a temporary storage location on site. However, to ensure the subject tree is preserved and protected as suitably as possible and to maximize the area on site for the construction works, it is feasible to relocate the tree off site to a tree storage facility for the duration of the construction program.

BUDGET ESTIMATE

The precise costs to relocate this tree shall be contingent to the following factors:

- The accessibility to the tree's root zone for preparation to relocate at the time.
- The accessibility to the tree's new location and the relocation route at the time which shall determine the size of crane and other necessary equipment required.
- Whether the tree can be relocated directly to its final location. (approx. $10,000-12,000)
- If the tree is to be stored on site for the duration of the construction program (approx. $10,000-12,000 plus maintenance charges of approx. $300 per month plus re-installation costs of $5000-$6000)
- If the tree is to be stored off site at a tree storage facility where maintenance and storage charges will be attracted. (approx. $14,000-$15,000 plus maintenance and storage charges of approx. $500 per month plus re-installation costs of $8000-$9000)

CONCLUSION

This species is renowned for its ability to withstand a transplant procedure. Together with the Livistona and Howea species, it is one of the most popular varieties of palm to be chosen for relocating in the Sydney region. Trees of this species and size have been successfully relocated on numerous occasions by professional tree transplanting contractors.

As of this date, I can confirm the subject tree is in very good health and although its condition is considered compromised due to the irregularities of the trunk; it is exhibiting all indications of being capable of withstanding the stresses of a transplanting procedure provided the recommendations of this report are adhered to.

Attachment A:

TREE ASSESSMENT SURVEY FORM

GORDON DATE PALM – ALDI DEVT.

Tree ID No.	1	Species	Phoenix canariensis			
Height	9m	Spread	7m	Trunk DBH		700mm
Maturity	(Mature)	Semi-mature	Immature	Senescent	Live Crown Ht	
Trunk	(Single)	Twin	@	Multi	@	
Trunk Lean	Nil	Slight	(Prominent)	V. Prominent	(Direction)	N E S (W)
Form/Crown Shape	Elevated	Broad	Upright	Spreading	Irregular	Stunted
	Conical	Elliptical	Columnar	(Round)	Vase	Mallee
Branching Habit	Ascending	(Pendulous)	Horizontal	(Excurrent)	Deliquescent	Extend. Lateral
Crown Distribution	(Balanced)	N E S W		Approx Age	c. 60 – 70	
Distortion due:	O/shadowing	Crowding	Building	Prev.Pruning	Supressed	

Condition						
Stability	(Stable)	Suspect	Unstable	Termites	Evidence of Instability	
Branching Structure	(Sound)	Fair	Poor	Lrg /Med/ Sm	Soil heaving	Soil Cracking
Pruning History	No Evid.	(Crown Lifted)	Topped @	Lopped @	P/Line Clearnce	Prev. Cut to GL
Defects	Nil	BB Inclusion @	m	Cavity	Evid. Decay	Elite Epic.Sprouts
Damage	Nil	Partially	Occluded	Wound	Fracture	Storm
Damage ✓	Nil	Lightning	Mech. Injury	Root sev/dam.	TRU NARROWING	Branch loss

Health						
Overall Health & Vigour	Dead	Poor	Fair	Good	(V. Good)	Excellent
Canopy Density	None	Sparse	Thinning	(Normal)	Dense	Deciduous
Foliage size/colour/ext	Chlorotic	Dieback	Small	(Normal)	Mistletoe	MID CROWN
Deadwood	< 5%	(5%) –	(10%)	15%	20%	%
Pest Infestation	(No Evid)	Termites	Foliar Insect	Borer	Psyllids	L M H S
Disease	(No Evid.)	Armillaria	Phellinus	Canker		L M H S
Epicormic Growth	(Nil)	< 5%	5%	10%	15%	%
Life Expectancy	(>40 Years)	15-40 Years	5-15 Years	< 5 Years	Replanting	
Env. & Landsc. Sig.	Threatened sp.	(V. High)	High	Moderate	Low	Enviro Pest Sp.
Recommendation	(Priority Ret.)	Consider Ret	Consider Rem	Priority Rem	Exempt	Hazardous

NARROWING OF TRUNK AT APPROX 4m FROM GROUND LEVEL
THERE IS A DISTINCTIVE LEAN TO THE WEST AND THE
TRUNK HAS A DISTINCTIVE TILT OR CURVE AT
APPROX. 4½ – 5m WHICH TILTS TO THE EAST
CROSSING AN OVERALL STRAIGHT CANOPY

TREE SURVEY FORMAT SOURCE: A. MORTON – EARTHSCAPE 2006

Attachment B:
TREE TRANSPLANTING METHODOLOGY STATEMENT

Canary Island Date Palm
(*Phoenix canariensis*)
Aldi Development Site
Gordon

November, 2017

NOTE:
The following methodology is based on the option to relocate the tree to a storage facility off site.

1.0 Pre-transplant Preparation

1.1 Pre-transplantation Considerations

1.1.1 Identify any obstructions to transplanting works, for example:

- Services (underground and overhead)

- Rock or other impervious layers within the vicinity of the root zone of the tree to be transplanted.
- Other plant material on site that is to remain which could be affected by the transplanting process.
- Adjacent properties and public areas which may be affected by the transplanting works.

1.1.2 Determine size of the root plate to be dug (approximately 2500mm in diameter and 1500 mm deep for this particular species at this size is recommended).

1.1.3 Determine weight of the tree once dug.

1.1.4 Plan the required transplanting procedure including the method of lifting and size of crane required. Consideration will need to be given to the access for the equipment required to prepare as well as relocate the trees.

1.1.5 Plan to carry out transplanting procedure in the most suitable period for nominated species (late winter to early spring is considered an optimum period of the year).

1.1.6 It is recommended that the tree is hand watered on a daily basis for the week prior to the commencement of the relocation works contract.

1.1.7 A meeting on site is held between the transplanting contractor and the project manager to discuss the transplanting procedure and determine any factors that may compromise the process, as well as the requirements to ensure a successful re-establishment.

1.2 Preparation of Transplanting Site

1.2.1 Temporary site fencing utilizing high vision barrier mesh and capped star pickets is set up around the perimeter of the existing location of the tree and its proposed location to create a work compound, preventing entry from other contractors.

1.2.1 All transplanting equipment and materials are delivered to site.

1.2.3 Site inductions are attended by all personnel involved in the relocation of the tree. Pre-start equipment inspections and operational checks are carried out.

1.2.4 Any necessary site signage shall be affixed to the temporary fencing.

1.2.5 Heavy watering and application of soil wetting agent, liquid organic fertilizer, preventative fungicide treatment (phosphoric Acid) and root growth stimulant is applied to the root zone of the tree.

1.2.6 The tree is marked to identify its northerly aspect for correct orientation purposes.

1.2.7 The extent of excavations around the perimeter of the tree's root plate and the perimeter of the proposed location is marked out.

1.2.8 Electronic underground service detection is performed to identify any potential utilities.

1.3 Preparation of the Tree's Canopy

1.3.1 An elevated work platform tower is utilized to gain access to the canopy of the tree which is reduced by removing the lowest and oldest fronds in accordance with the Australian Standard No 4373-2007 (Pruning of Amenity Trees).

1.3.2 The remaining foliage is treated with an anti-transpirant to reduce transpiration.

2.0 Transplantation Schedule

2.1 Excavation and Root Balling

2.1.1 The root zone of the tree is cut out vertically using a high-pressure water laser and any services running through the root zone of the tree are exposed and identified.

2.1.2 Bulk excavation around the root zone is carried out with the use of the excavation machinery, allowing access to the base of the root zone, to cut out the root plate horizontally with the water laser and thus severing the tree from the sub-soil.

2.1.3 The root plate of the tree is wrapped with a moisture retaining material which shall be kept moist for the duration of the relocation.

2.2 Preparation of New Position

2.2.1 The storage container (approximately 1.5 times the diameter of the root plate) is prepared at the temporary storage location for the tree (either on site or at a professional tree storage facility).

2.2.2 The soil mixes are placed in readiness for backfilling.

2.3 Lifting and Relocation

2.3.1 An all terrain slew crane of adequate size is set up on site, alongside the tree, Rubber padding is used to protect the trunk from damage, and a webbed sling is used to connect the lifting chains to the palm.

2.3.2 The crane is used to lift the tree by the webbed sling and lay over into a horizontal position.

2.3.3 The canopy of the tree is tied up in a manner to avoid damage whilst transporting.

2.3.4 The tree is rigged to facilitate lifting horizontally and loaded onto an awaiting low load transporter.

2.3.5 Once the tree is secured to the transporter it is delivered to the temporary storage location.

2.4 Planting in New Position

2.4.1 The tree being handled by the protective webbed sling is positioned in its storage container, in the identical orientation and vertical alignment to its original position.

2.4.2 The lifting slings and any trunk protection are removed.

2.5 Completion and Tree Protection Works

2.5.1 The base of the tree's root zone is backfilled with the prepared mix of subsoil. The remainder of the root zone is backfilled with a transplanting soil mix, up to the top of the root plate.

2.5.2 A watering basin is formed around the root zone using the top soil to facilitate ease of watering and prevent run off.

2.5.3 Heavy watering and application of soil wetting agent, fungicide treatment and root growth stimulant is carried out upon the root zone of the relocated tree.

2.5.4 A DC controlled irrigation system is installed upon the root zone of the tree which is then covered with leaf mulch to a depth of 75mm.

Attachment B:
Re-establishment Aftercare Maintenance Program
(Minimum Recommended Period: 52 Weeks)

1.0 Pruning of any damaged or unhealthy foliage as in accordance with the Australian Standard No 4373-2007 (Pruning of Amenity Trees).

2.0 Application of anti-transpirant to the canopy of the tree to reduce transpiration and stress.

3.0 Application of preventable fungicide treatment (Phosphonate) to the canopy of the tree to prevent any fungal activity (if deemed necessary).

4.0 Application of soil wetting agent to the root zone of the tree to aid the water holding capacity of the soil and aid in the retention of the other transplanting chemicals applied to the soil.

5.0 Application of rooting hormone to stimulate the initiation of new root growth.

6.0 Monitoring of watering procedure to maintain satisfactory moisture content throughout the root zone of the tree.

7.0 Topping up organic mulch over the soil within the drip area of the tree to aid in the retention of moisture and a constant temperature throughout the root zone and to promote microbial activity.

8.0 Application of slow release organic fertilizer to each tree, once the trees have recovered from the initial shock of the transplant operation.

9.0 Monitoring of each tree and carrying out the correct horticultural practices to alleviate any cultural problems or pest and disease attack.

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