

Integrated Design Management Plan (IDMP) Miramar South Area Designation

Wellington International Airport Ltd.

Isthmus.



06 March
2023



Land.
People.
Culture.

Photo by Mark Tantrum - 19/04/21. Wellington International Airport

Contents.

Introduction.	3
<hr/>	
i. Site Context.	4
<hr/>	
i.i Designation Location.	5
i.ii Designation Area.	6
i.iii Street Character.	8
i.iv Site Photos.	10
iv Indicative Designation Staging	12
<hr/>	
1. Landscape Design Guidance.	14
<hr/>	
1.1 Boundary Treatments.	15
1.2 Planting Palette.	20
1.3 Stormwater Attenuation.	23
1.4 Lighting.	24
1.5 Public Safety.	25
1.6 Carparking, Access & Loading.	26
<hr/>	
2. Building Design Guidance.	27
<hr/>	
2.1 Building Character	28
2.2 Building Massing.	30
<hr/>	
3. Signage & Material Palettes.	34
<hr/>	
3.1 Signage Integration & Sensitivity.	35
3.2 Colour Palette.	36
3.3 Landscape Material Palette.	37
3.4 Building Material Palette.	38
<hr/>	
4. Appendices.	40
<hr/>	
4.1 Designation Conditions.	41
4.2 Tree Survey.	49

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Introduction.

Purpose

Wellington International Airport Ltd has recently been successful in securing a designation over the former Miramar School site in South Miramar, Wellington. The purpose of the designation is for WIAL to undertake airport related activities, including (but not limited to):

- Flight catering
- Rental car storage, maintenance and grooming
- Freight reception, storage and transfer to/from air
- Ground Service Equipment (GSE) storage; and
- Associated car parking, signage service infrastructure and landscaping.

Aircraft operations, runways, traffic control structures, aircraft hangars, and Large Format Retail are not permitted within the Designated Area.

WIAL is required to prepare an Integrated Design Management Plan (IDMP) as per condition 1 of the designation. The IDMP shall be referred to and relied upon when making any future decisions regarding the development of the Designation Area. The IDMP aims to provide sufficient flexibility for the Airport's changing needs while still meeting the conditions of the Designation Area.

Application of the IDMP

The IDMP required by Condition 1 shall show potential configuration of buildings and structures to be erected, site access points, roading and parking layouts, measures for providing storm water attenuation, signage and areas of landscaping on the Site.

Best practice design guidance and an evaluation of the sites surrounding character and context has informed the IDMP.

With the exception of explicit conditions placed on the designation, the design guidance found within the IDMP seeks to enable sympathetic design on the site that is appropriate for its generally residential setting. The IDMP is set out in four chapters:

1. Context
2. Landscape
3. Building Design
4. Signage & Palettes

The IDMP should be used to inform design decisions in conjunction with existing best practice guidance and national and regional policy.

Objectives of the IDMP

The overall objective of the IDMP is to provide guidance for Wellington International Airport and their design consultants on matters relating to development on the designated area. The IDMP aims to:

- Provide best practice guidance to enable quality design outcomes suitable for a residential setting.
- Allow sufficient flexibility to enable the Site to respond to the Airport's changing needs over time.
- To meet conditions 1 and 37-42 of the Designation Area.

Supportive Documents

National and regional guidelines exist for some of the topics explored in this document. This document does not aim to replace those guidelines, instead suggesting they be read in conjunction with IDMP.

The following may be referred to for additional detail:

- **Water Sensitive Design for Stormwater: Treatment Device Design Guideline**, Wellington Water.
- **National Guidelines for Crime Prevention through Environmental Design in New Zealand**, Ministry of Justice.
- **WIAL Designation Planning, Miramar South Site**, Warren and Mahoney, Mitchell Daysh
- **Wellington Airport's Kaitiakitanga Principles**



i. Site Context.

Designation Area

Site Context.

i.i Designation Location.

Surrounding Area

The Designation Area (the Site) is situated to the south of Miramar and is in close proximity to Wellington International Airport. The Site sits at the end of State Highway 1 and connects into Broadway which is the main thoroughfare through to the eastern neighbourhoods of Seatoun and Strathmore Park.

The Site was once occupied by the former Miramar South School and Aoga Amata Childcare Centre. The Site is located in a residential setting with businesses and airport activities in close proximity. It has street frontage on all four sides and the surrounding residential area is characterised by detached single or two storey dwellings with pitched roofs.



Site Context.

i.ii Designation Area.











Existing site

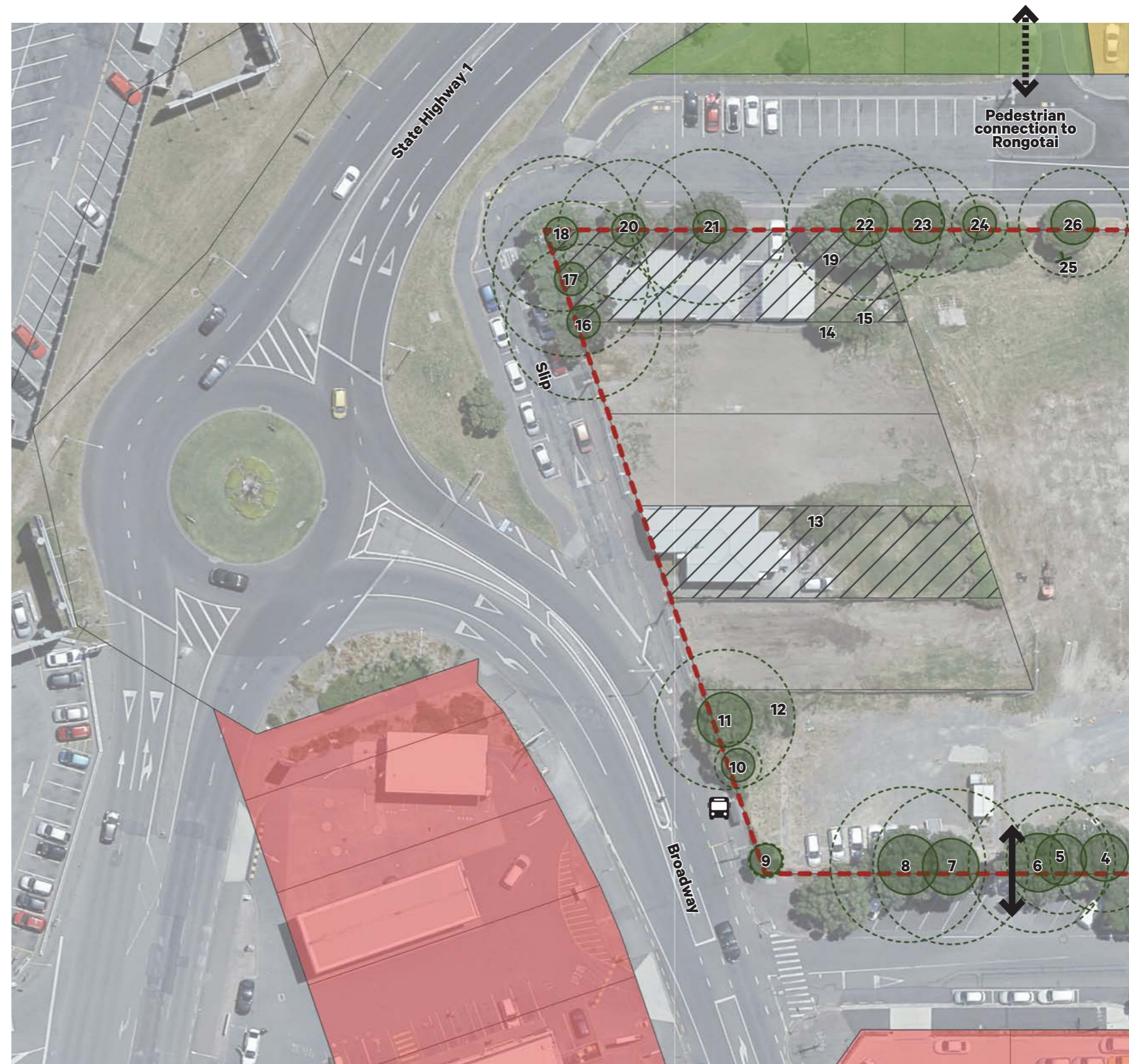
The Site is predominantly permeable openspace that was once used as the field for the former Miramar South School and Aoga Amata Childcare Centre. Five residential houses were located within the designation area to the south. All of these residences have either recently, or are about to be demolished. The former Aoga Amata Childcare Centre building remains.

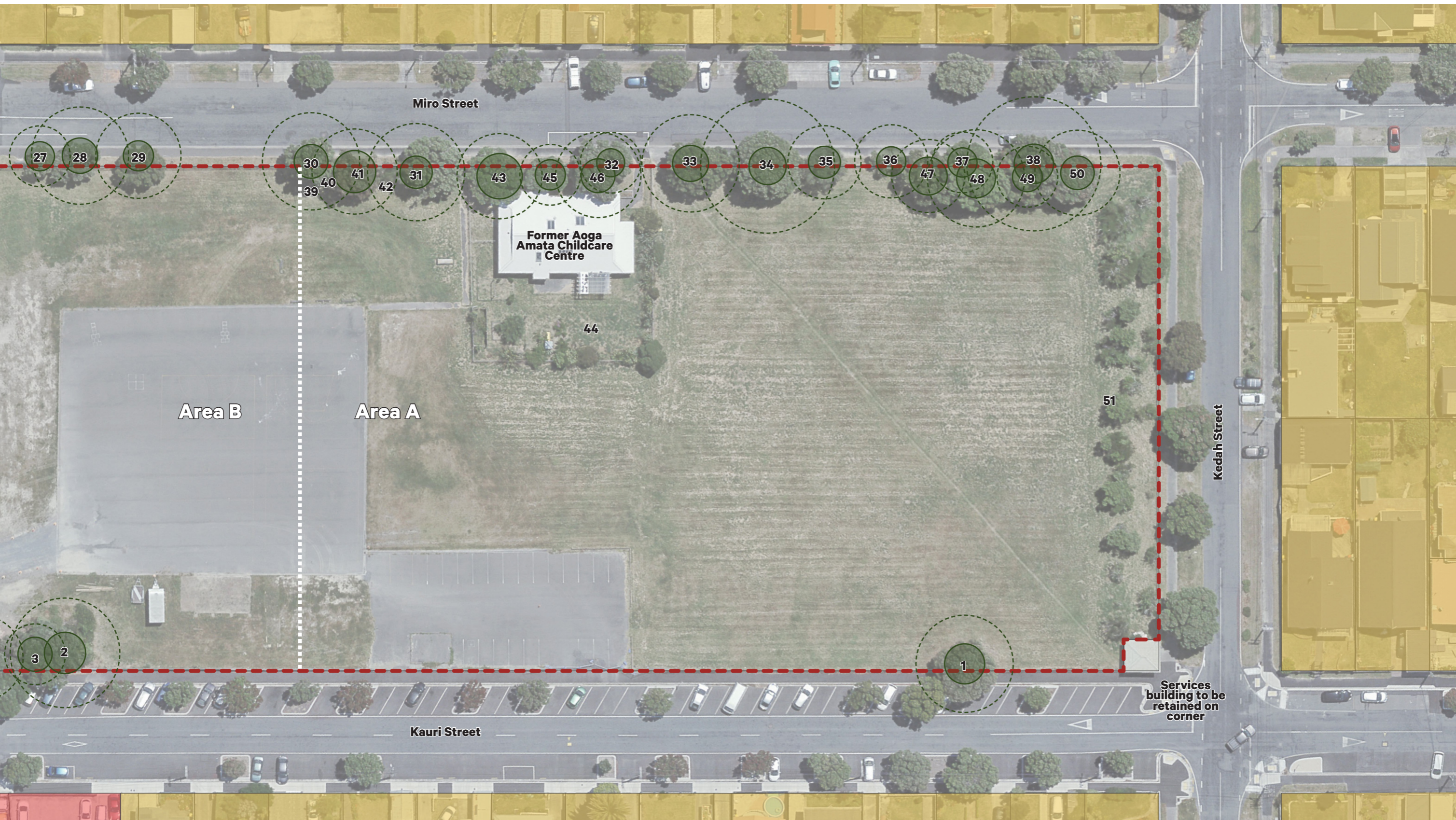
The Site has numerous mature pohutukawa trees along its perimeter with low a chain-link fence separating the streets with the Site. Because of this there is a high degree of visual permeability from local residences into the Site. To the south-east of Miro Street there is an existing pedestrian tunnel underneath the Airport's runway that connects the Site with Rongotai and large format retail.

Southern parts of the site are within the Airport Precinct as per the District Plan.

The southern round-about intersection of SH1 and Broadway pushes traffic to the south-eastern corner of the Site where a local bus stop is provided.

Legend.	
<i>Site features.</i>	
	Designation Area
	Property Boundaries
	Existing entry to site
	Existing bus stop
	Buildings to be demolished
<i>Surrounding land use (not zoning).</i>	
	Residential
	Business
	Open space
<i>Tree Survey</i>	
	SRZ (Structural Root Zone)
	TPZ (Tree Protection Zone)
Refer to Tree Survey in Appendix for further information on each tree	





Site Context.

i.iii Street Character.

Street Character

Kauri, Miro and Kedah Streets are distinctly residential in character, and are perceived as quiet and safe. They are generous in width and provide ample on street parking (a large proportion of which has time restrictions due to proximity to the airport).

Upgrades to Kauri Street and Kedah Street have been recently undertaken, with angle parking and trees in kerbed planters along Kauri Street. Along Miro, it is less structured with trees set in lawn at grade, and parallel parking on the east side. Many residents park their cars across driveways and in the grass berm on the western side, assume due to parking restrictions and a lack of off street parking. Some lawn areas are becoming tired, and in general, this street appears less well kept in contrast to the recent upgrades nearby.

To the south along Broadway and the slip lane, the character changes to be busier in nature and of a more industrial setting. The proximity to the roundabout that connects to State Highway 1 and the associated petrol station influences the character on the southern edge of the Site. There is however, a generous grass berm and amenity planting to help soften the interface between southern residential sites and the Airport Precinct.

Vegetation

Mature pohutukawa trees contribute to the character and amenity of Kauri, Miro and Kedah Streets. They are on both sides of Kauri and Miro streets, and the southern side on Kedah Street. Mature pohutukawa trees also line much of the Site's boundary, resulting in a grove like feel at the northern end of Miro Street. They contribute to the character and identity of the residential setting. The berms are grassed and there is no low amenity planting at the time of the site visit.

Built Form

Miramar was formed in 1904, and much of the original fabric from this era is retained. The built form is largely consistent, dominated by villas with detached garages. These structures interface with the street, with no or low, visually permeable fences that create a sense of openness.

Toward the south of the site there is a distinct change as open lots and larger commercial use buildings sit adjacent the residential fabric.

Legibility

The surrounding context is a consistent and legible residential setting, reinforced by quiet suburban streets and fairly consistent architecture that directly interfaces with the street. In its current state, the site contributes to this residential setting and creates a sense of openness and park-like quality due to the high visual permeability and low permeable fencing.

To the south, there is a character change to a more commercial/industrial use, however this change is legible and reinforced by the nature of Broadway and its business.

Visibility

In general the site and surrounds have high permeability, with clear and direct sightlines to properties and across the Site. Existing vegetation can obscure sightlines but this can be easily remedied with maintenance.

Slip/Broadway



Existing bus stop



Pocket of residential housing

Kauri Street



Existing boundary treatments to Kauri Street

Miro Street



Pedestrian tunnel under Airport runway connecting Miro Street with Rongotai

Kedah Street



Recently completed berm upgrade with existing boundary treatment



Recently completed street upgrade



Mature trees along site boundary with overhang.



Existing electrical station with mature street within berm

Site Context.

i.iv Site Photos.



Open greenspace shown from Kauri Street



Grove of pohutukawa trees along Miro Street



Mixed planting along Kedah Street



Former carparking area adjacent Kauri Street



Aoga Amata Childcare Centre.



Existing trees in poor condition

Site Context.

i.v Indicative Designation Staging

We will keep the surrounding neighbours informed of our plans at each development stage.

Stage One

We are currently working on plans to establish an electric bus stabling/depot area for the new electric Airport Bus, and associated activities (charging, washbay, and driver facilities) and rental car storage area at the southern (Broadway) end of the site. The northern half of the site will remain grassed and accessible to the public

Stage Two

Stage Two involves moving the rental car stand from Stage One to the north of the site to accommodate development in the south. The rental car and bus facilities will remain in the same location. The south end of the site will be prepared for further commercial land uses.

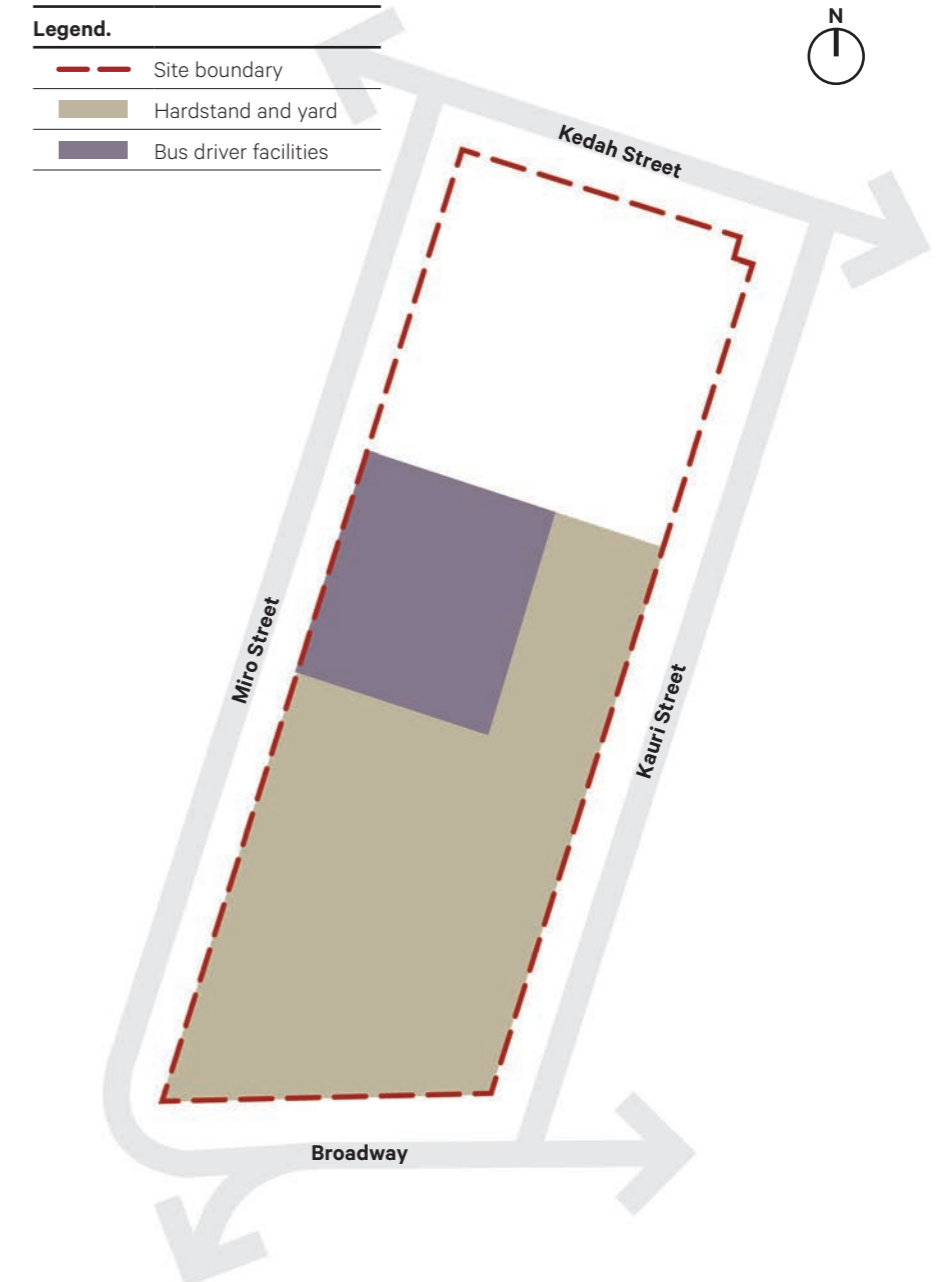
Stage Three

In Stage Three we will develop the south end of the site for aviation support, such as flight catering and logistics warehousing. These will be located toward the southern end as Broadway has a more commercial context, with the northern context being residential.

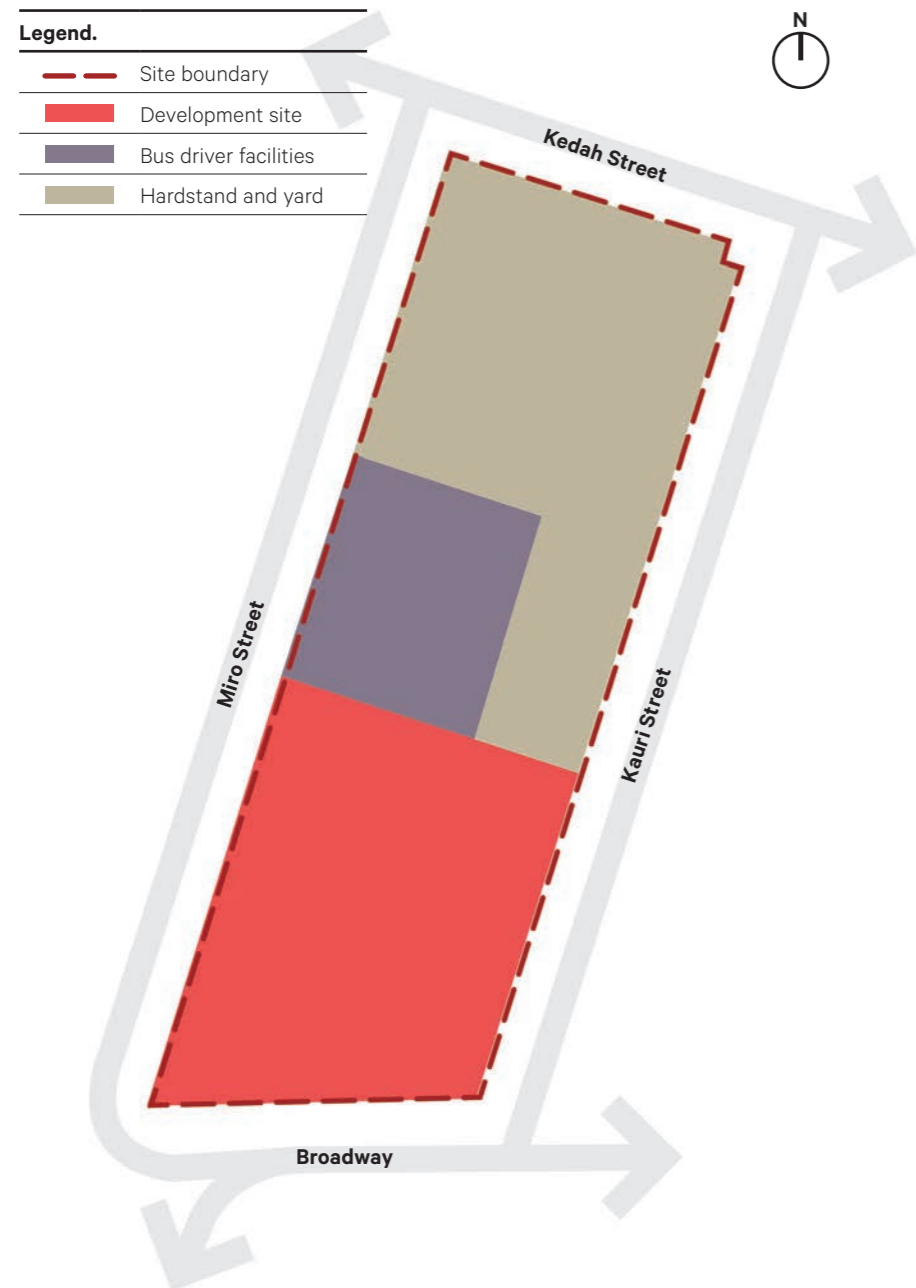
Stage Four

We will ultimately use three quarters of the site for aviation support and the remaining quarter for rental car storage and staff parking. This is a long-term scenario.

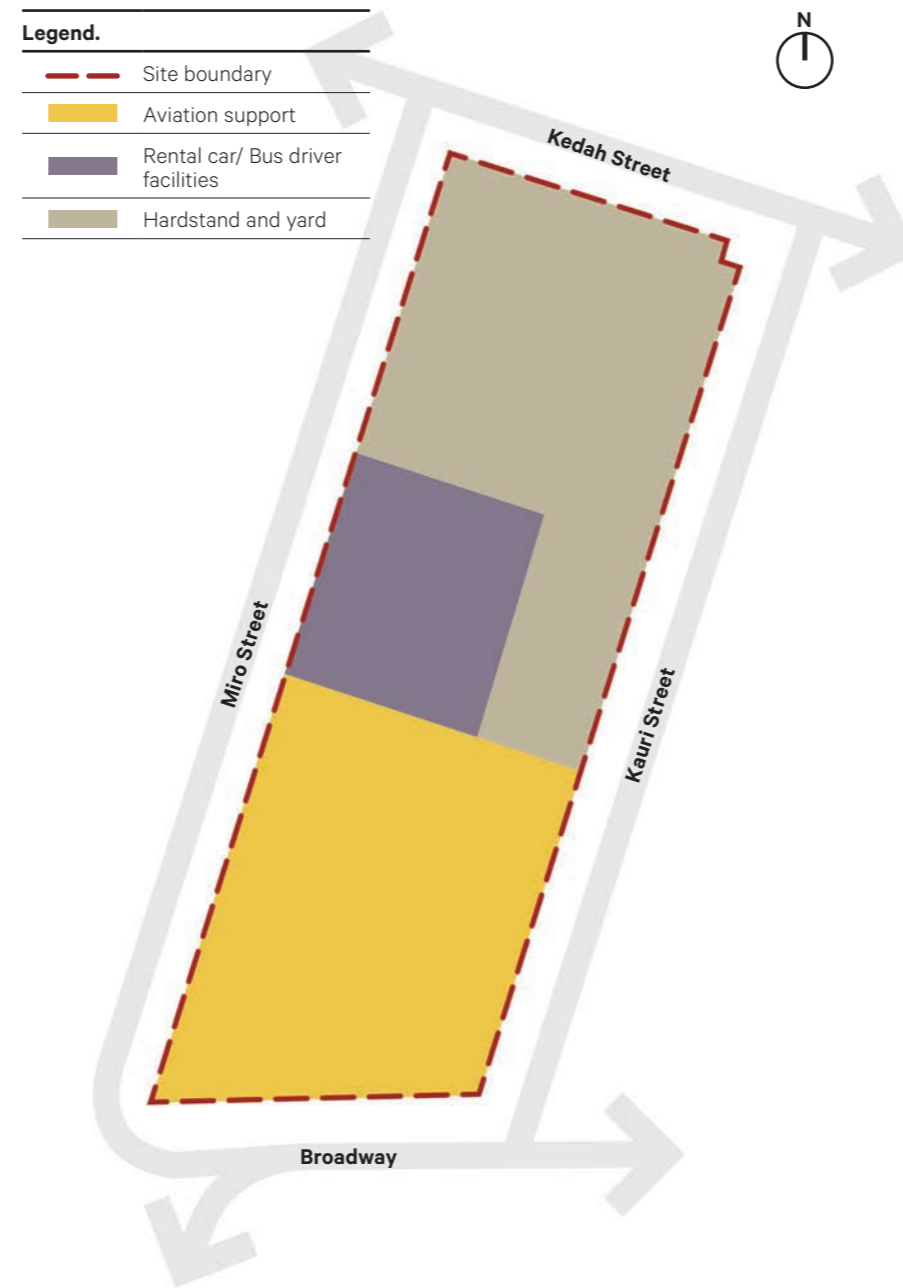
Stage One: Bus depot facilities



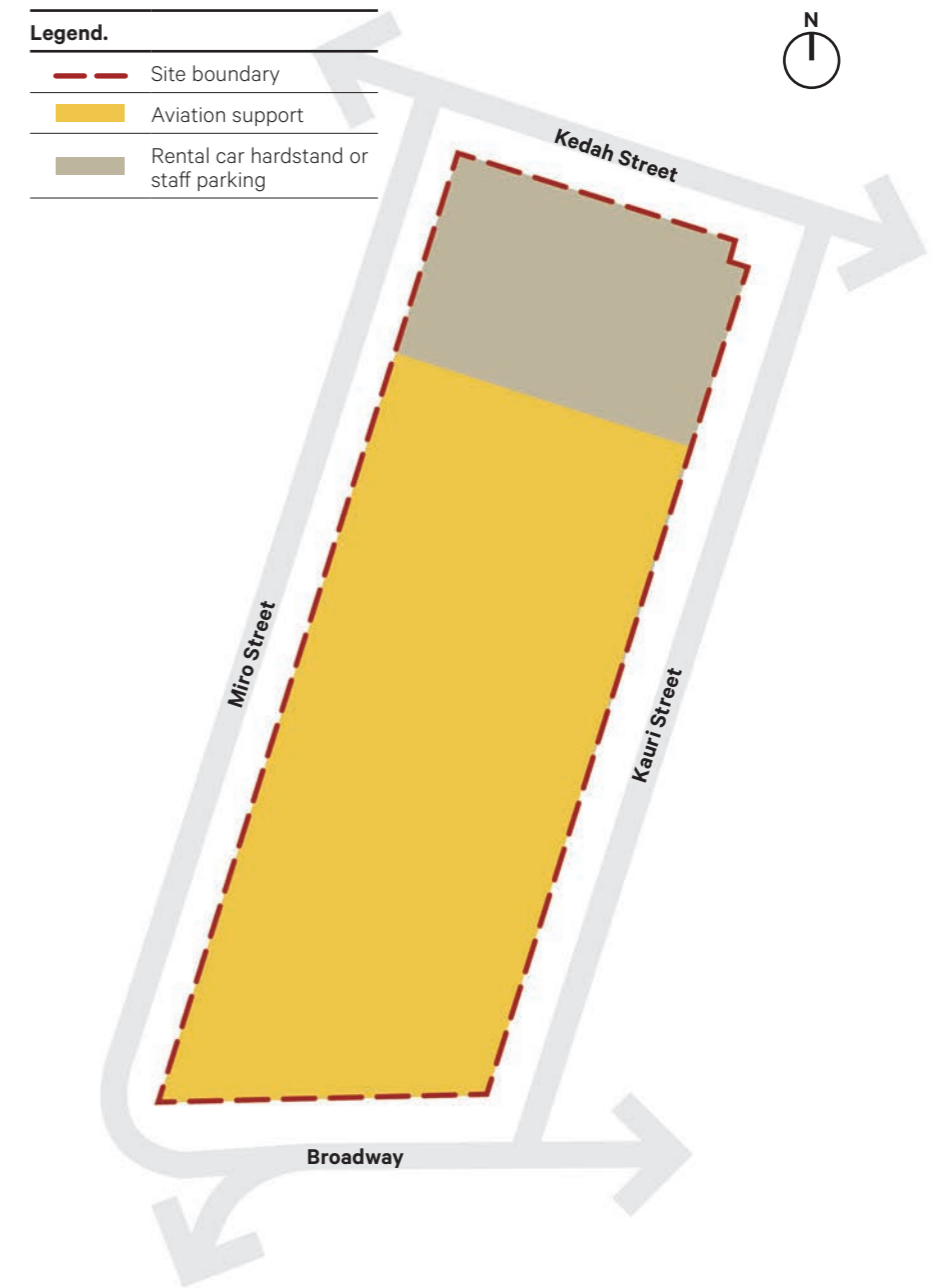
Stage Two: On-site relocation of rental car parking



Stage Three: Aviation Support



Stage Four: Increased Aviation Support



1. Landscape Design Guidance.



Landscape Design Guidance.

1.1 Boundary Treatments.

Boundary Treatments

The Site requires a boundary treatment that presents a green edge and a high level of amenity to the surrounding streets because of its residential context. The boundary treatment also needs to provide visual mitigation, noise mitigation, and appropriate considerations for site access and lighting levels.

The Sites boundary will need to consider pedestrian and vehicle access - both internally and externally. Boundary treatments next to driveways/ access points should be designed to ensure drivers entering and exiting the property (including the potential of reversing onto the street) are able to see and be seen clearly by pedestrians. Moreover any entrance ways are to avoid the possibility of concealment and/or entrapment of workers or visitors to the site.

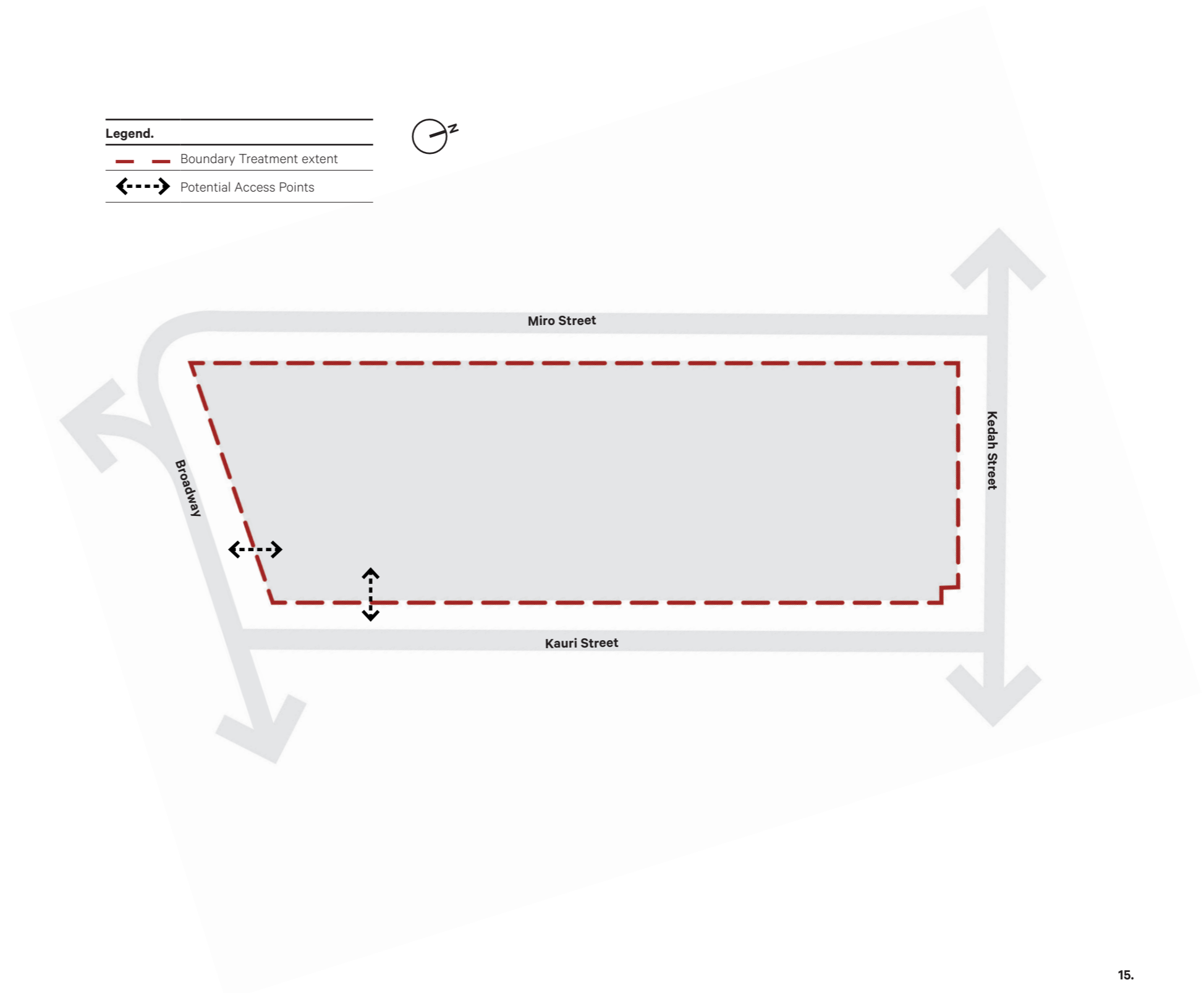
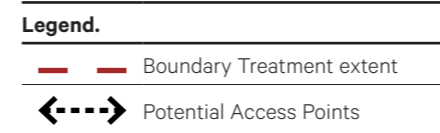
The treatment of the Site's boundary is broken into three parts;

- Visual Mitigation
- Acoustic fence
- Planting/ screening

Location of Boundary Treatments

The boundary treatment is to be applied to all sides of the Site (excluding required access points). Consideration should be made for existing mature tree locations and their interface with adjacent streets. The existing boundary condition of Miro Street is different to other streets due to the placement of tree clusters and the boundary alignment running through them. The former Aoga Amata Childcare Centre building is also to remain with staff pedestrian access from Miro Street. The design of the boundary treatment along Miro Street will need to consider this in order to achieve a positive outcome.

It is likely that the proposed boundary treatment will surround each stage of development as shown in the indicative staging diagrams, rather than being applied to the whole site boundary in the first instance.



Landscape Design Guidance.

Visual Mitigation.

Relevant Designation Requirements

(Condition 36) Boundary screen planting required to screen the acoustic fence necessary to meet the requirements of condition 16 shall grow to a height not less than 2 metres at maturity. The planting shall be undertaken within 3 months of the construction of the acoustic fence.

(Condition 37a) Landscaping within the Site achieves a high level of off-site amenity and ensures that any adverse effects on neighbouring land arising from the development of the designated area are appropriately mitigated. This may be achieved by:

- **(Condition 37a-i)** Landscaping that softens and where practicable screens built form when viewed from neighbouring land;
- **(Condition 37a-ii)** Site boundary treatment to ensure that carparking and storage activities are effectively screened and adverse visual effects are internalised;
- **(Condition 37a-iii)** A boundary landscape treatment that includes use of layered boundary planting and the acoustic fence referred to in condition 16, which presents a green edge and a high level of amenity to the surrounding streets. This boundary landscape treatment shall be consistent with the Isthmus Group plan in the appendix.
- **(Condition 37a-iv)** A planting palette that includes a boundary hedge planted with hardy fast growing species, and a tree framework reflecting the surrounding street tree environment
- **(Condition 37a-v)** Use of advanced grade plants to ensure meaningful visual mitigation is provided within two to three years of planting; and
- **(Condition 37a-vi)** After undertaking a tree survey by a technician arborist or suitably qualified and experienced landscape architect, retaining where practicable, or otherwise replacing, existing mature trees located on the Site within 5 metres of the Site boundary, including pohutukawa.

Design Objectives

Typical Boundary Arrangement

Option A has been taken directly from the designation conditions, and provides a typical solution for a proposed boundary arrangement.

The acoustic fence is located in a 2m wide planting bed with a hedge presenting to the street and berm condition. The acoustic fence is effectively screened by planting when facing the street but is visible from the Sites interior due to low planting. The proposed tree and hedge is provided to help ensure meaningful visual mitigation of the site and its buildings from the surrounding neighbourhood. Option A is fairly typical for Kedah Street and Kauri Street, albeit some minor differences in footpath and kerb location.

Boundary Arrangement Options

The alignment of existing trees and the Site's boundary provides a different situation to Miro Street and Broadway where Option A is not regarded as suitable.

Option A:

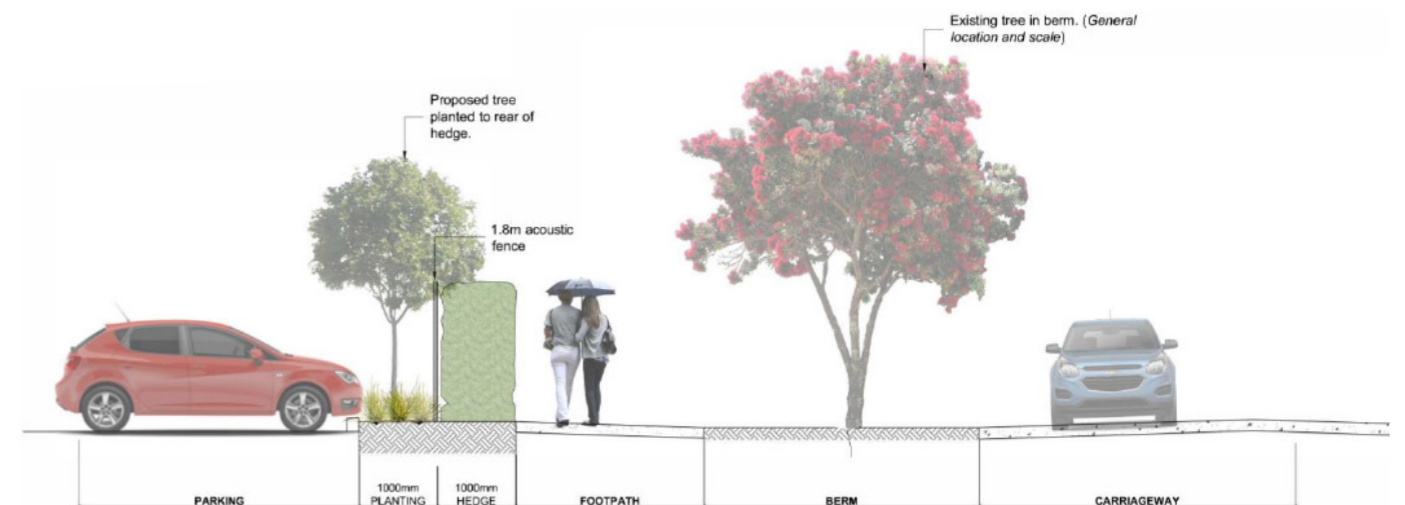
Taken from the designation conditions, applicable to Keddah and Kauri Streets.

The trees down Miro Street are not planted within a berm and in some locations flank both sides of the property boundary. Consideration should be given to the alignment of the boundary treatment along Miro Street to reduce impact on existing trees and to ensure the required boundary treatment to the Site is upheld.

Furthermore, with the retrofitting of the former Aoga Amata Childcare building consideration should be given to the buildings street frontage. Retaining the existing trees with increased planting would provide a positive street frontage. Returning of the fence towards the building would allow this.

In order to provide some stormwater mitigation, a swale option is also included for the boundary treatment. Design consideration should be given to the position of any proposed swale to ensure there is minimal impact on tree health and maintenance. Further advice from an arborist should be sought when a swale or built structure is in close proximity to existing trees and their associated root ball areas.

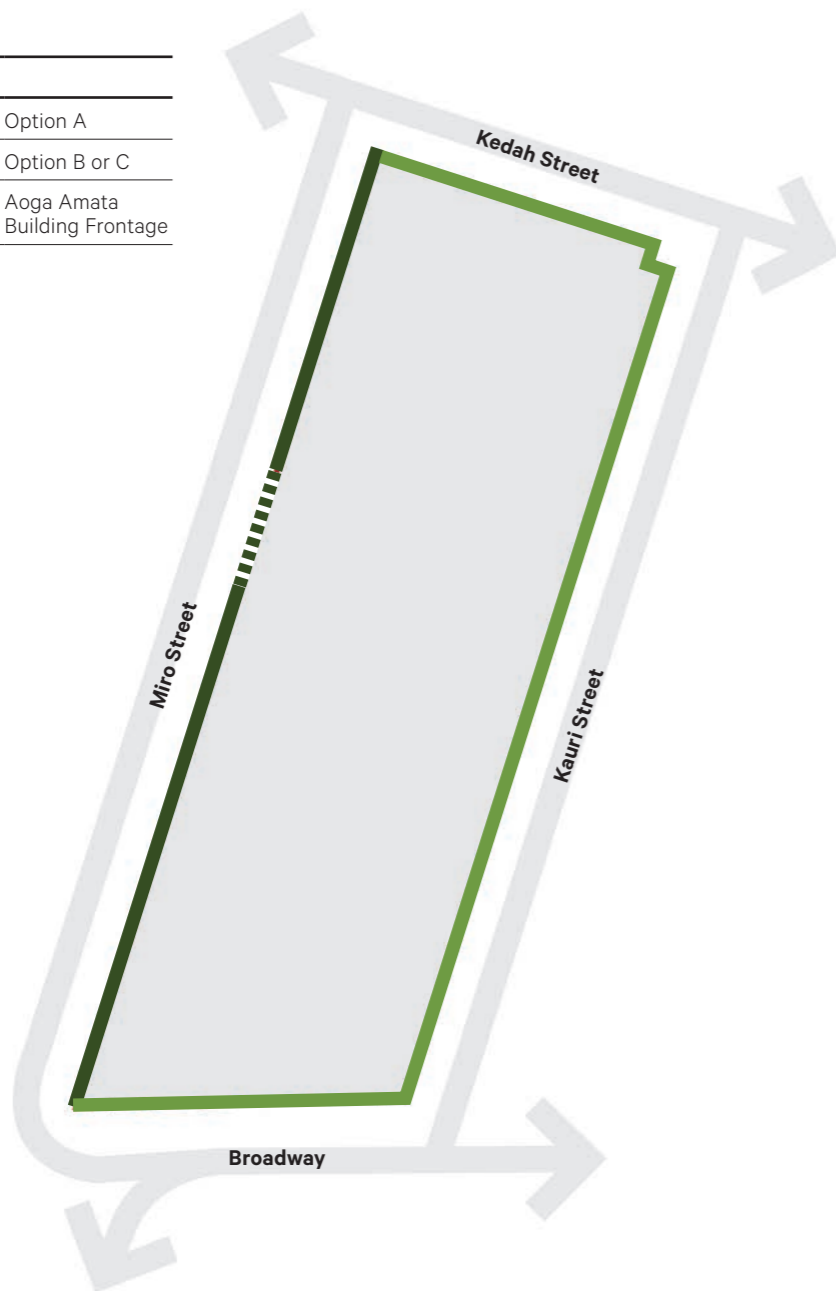
The exact location and size of swales will need to be determined through detailed design.



Option Locations

Legend.

- Option A
- Option B or C
- Aoga Amata Building Frontage



Option B:

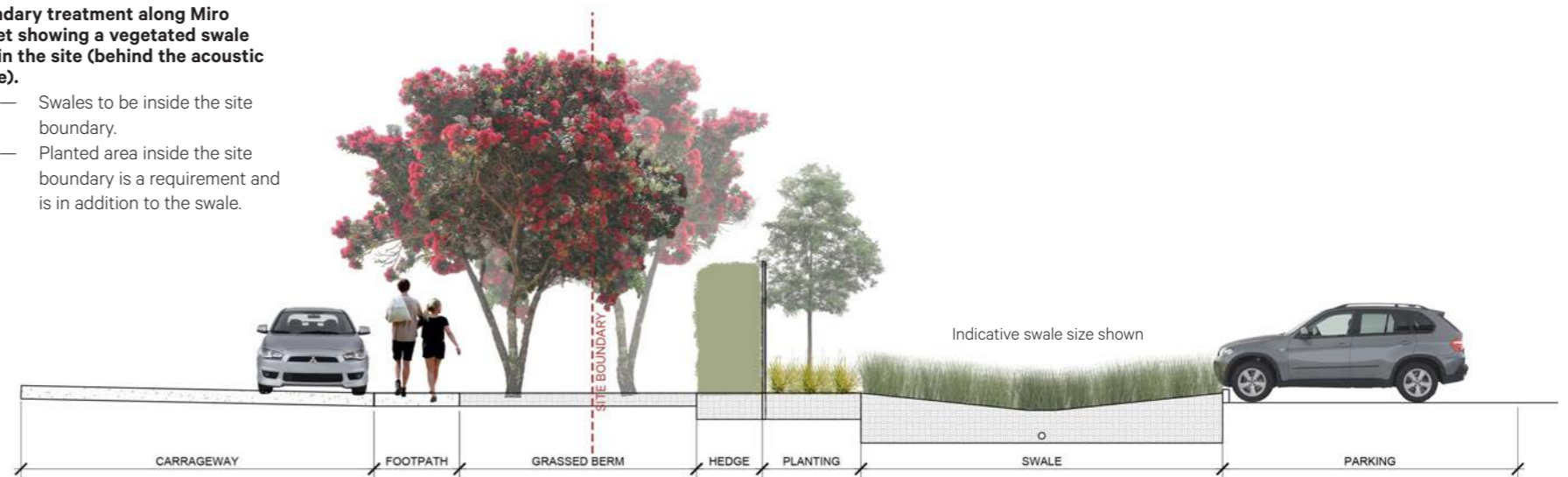
Boundary treatment along Miro Street where trees are flanking the Sites boundary.



Option C:

Boundary treatment along Miro Street showing a vegetated swale within the site (behind the acoustic fence).

- Swales to be inside the site boundary.
- Planted area inside the site boundary is a requirement and is in addition to the swale.



Landscape Design Guidance.

Acoustic Fence.

Relevant Designation Conditions

The following designation conditions are relevant to the acoustic fence and must be met to achieve the conditions of the designation area;

- **(Condition 16)** A minimum 2m high acoustic fence must be included around the boundary of the site with a density of at least 10 kg/m². (Excluding site access points)
- **(Condition 37a-ii)** Site boundary treatment to ensure that carparking and storage activities are effectively screened and adverse visual effects are internalised
- Noise emission levels must comply with **Conditions 12-22.**
- **(Condition 12)** Noise emission levels from the Site when measured on any site that includes an occupied residence in the Outer Residential Area beyond the Site shall not exceed:
 - Monday-Sunday 7am-10pm: 55dB LAEQ(15min)
 - Monday-Sunday 1am-6am: 40dB LAEQ(15min)
 - At all other times: 45dB LAEQ(15min)
 - All days 10pm-7am: 75dB LAFmax
- **(Condition 13)** Noise emission levels from the Site when measured on any in the Centre Zone shall not exceed:
 - At all times: 60dB LAEQ(15min)
 - At all times: 85dB LAFmax
- **(Condition 22)** The first outline plan of works the requiring authority submits to the WCC under condition 2 shall include an acoustic assessment prepared by a suitably qualified person for all noise-producing activities on the Site which sets out how conditions 12 and 13 will be achieved.

Design Objectives

The acoustic fence must contribute to amenity and ensure that any adverse effects on neighbouring properties is appropriately mitigated. The Acoustic fence design should follow the guidance below to ensure a quality outcome that is appropriate to the site's context.

Material & finishes

The surrounding residential fence treatment in the area is general timber with variations of brick and steel options. With a strong residential setting timber is seen to be the most appropriate fence material for the Site. Combinations of other fencing materials could be investigated to break-up the general look and feel of the fence. Any fencing option will need to be investigated to ensure compliance with noise mitigation levels by a suitably qualified person.

The use of a timber fence in a prominent or highly visible place should be stain and appropriately maintained to ensure longevity and continued contribution to the streets amenity. Although substantial planting is proposed in front of the fence, anti graffiti measures should be considered to ensure a clean and presentable frontage to the street.

The design should ensure the boundary fencing is not climbable to minimise security risks and potential damage to the fence. To accommodate staging of the sites uses, the design of the acoustic fence should allow for easy replacement or relocation of fence sections to reduce material waste. This could be achieved through modular design or alternative footing details that avoid concrete and are more sensitive to tree roots locations.

Noise Mitigation

The design of the fence must achieve the acoustic density set out in Condition 16 and be assessed by a suitably qualified person for all noise-producing activities on the Site. The design of the fence should also provide a suitable aesthetic when considering noise mitigation, particularly around the location, size, and orientation of any timber battens that could provide further visual amenity through texture and scale.

Visual Effects

The way the fence is perceived from the Site's interior will be different to how the general public perceive the fence from its exterior. A 2m high perimeter fence will be a distinct change from the openness and visual permeability of the site's current state. Consideration should be given to its design so that it does not read as an industrial compound and is more aligned to a neighbours fence. This could be achieved through varying batten size, materiality, layout, chamfering at street corners to mitigate blind pedestrian corners.

Particular attention should be paid to breaking up the continuous mass and creating interest through elements such as alternating batten detailing and changing planting species through a layered approach.

A darker stain to a timber fence would help recede the fence behind planting and reduce the dominance of the fence.

Ensure fence locations and heights at vehicle entry and exits can maintain line of sight and safety.

Alignment

The alignment the acoustic fence should seek to avoid existing mature trees and their low hanging branches. Footings will need to be sensitively designed to avoid existing root zones where it is practical to do so.

Where water run-off can be impeded with standard fencing, use an over-land flow-path fence designed in co-ordination with the civil engineer to determine minimum clearance above ground level. Where the acoustic fence approaches the existing building it should tie into the sides of the building to allow and open positive street frontage.

Sustainability

Any timber used in the construction of the acoustic fence should endeavour to be sustainably sourced in line with Wellington International Airport's sustainability policies. Where practical avoid substantial amounts of concrete.



Example of a timber acoustic fence with vertical timber battens



Example of a timber acoustic fence stained black

Landscape Design Guidance.

1.2 Planting Palette.

Relevant Designation Conditions

Landscaping within the Site must achieve a high level of off-site amenity and ensure that any adverse effects on neighbouring land arising from the development of the designated area are appropriately mitigated. The following design requirements for the site's boundary treatments and planting strategy must be met to achieve the conditions of the designation area;

- **(Condition 36)** Boundary planting shall grow to a height not less than 2 metres at maturity. The planting shall be undertaken within 3 months of the construction of the acoustic fence.
- **(Condition 37a-i)** Landscaping that softens and where practicable screens built form when viewed from neighbouring land.
- **(Condition 37a-iii)** A boundary landscape treatment that includes use of layered boundary planting and the acoustic fence referred to in condition 16, which presents a green edge and a high level of amenity to the surrounding streets. This boundary landscape treatment shall be consistent with the Isthmus Group plan.
- **(Condition 37a-iv)** A planting palette that includes a boundary hedge planted with hardy fast growing species, and a tree framework reflecting the surrounding street tree environment.
- **(Condition 37a-v)** Use of advanced grade plants to ensure meaningful visual mitigation is provided within two to three years of planting.
- **(Condition 37a-vi)** After undertaking a tree survey by a technician arborist or suitably qualified and experienced landscape architect, retaining where practicable, or otherwise replacing, existing mature trees located on the Site within 5 metres of the Site boundary, including pohutukawa.

Plant Palette Design Intent

Tree species options:

- Native trees are preferred over the use of exotics, however the palette includes a variety of evergreen native and deciduous exotic tree species to provide options to facilitate a balance of light in the streetscape in winter as well as the required screening.
- A variety of species with different forms and scales are provided to give flexibility of options as design detail progresses and planting and swale details are further refined. The intent is that the final planting scheme will only select a few of the species from the list shown.
- If new pohutukawa are proposed they should be of the same variety/species as the existing row of pohutukawa adjacent.
- All tree species options are suited to windy coastal environments.
- Root barriers should be used near swales
- If kowhai are to be used, they should be in clusters rather than as individual specimen trees.

Shrub/screening plant species options:

- Predominantly native plants found locally within the Wellington Region.
- Hardy, fast growing species which grow to at least 2m to screen the boundary fence.
- Plants which are suited to the harsh coastal environment.
- Species which can be clipped/maintained as hedging and are commonly found in (and suited to) a residential streetscape context.

Low/amenity ground cover plant species options:

- Predominantly native plants found locally within the Wellington Region.
- Plants which are suited to the harsh coastal environment, some with proven performance at nearby Cobham Drive.
- Species suited to amenity use in residential streetscape context.
- Low growing species where required to maintain sightlines.
- Raingarden suitable species have been identified should raingardens be used in place of vegetated swales.

Vegetated swale plant species options:

- Predominantly native plants, most found locally within the Wellington Region.
- Plants which are suited to the harsh coastal environment, some with proven performance at nearby Cobham Drive.
- Most plants within this palette are found in the Vegetated Swale Plant List within Wellington Water's Water-Sensitive Design for Stormwater Treatment Device Design Guideline 2019.
- Species suited to amenity use in residential streetscape context.
- Low growing species where required to maintain sightlines.
- Phormium cookianum is included in the palette as a larger growing plant to provide variety of scale to the swale planting should the final swale design be large/wide and not require sightlines across.

Trees



Cordyline australis
tī kōuka



Metrosideros sp.
pohutukawa



Ulmus parvifolia
Chinese elm



Myoporum laetum
ngaio



Podocarpus totara
tōtara



Ulmus 'Frontier'
hybrid Chinese elm



Sophora chathamica
Chatham Island kōwhai



Dysoxylum spectabile
kohekohe



Ulmus hollandica 'Lobel'
upright elm

Shrubs / Screening Plants



Dodonaea viscosa
akeake (green form)



Griselinia littoralis
kāpuka



Corokia sp.



Muehlenbeckia astonii
shrubby tororaro



Olearia paniculata
akiraho



Olearia solandri
coastal tree daisy

Landscape Design Guidance.

Planting Palette.

Amenity Groundcovers



Pimelea prostrata ●
pinātoro



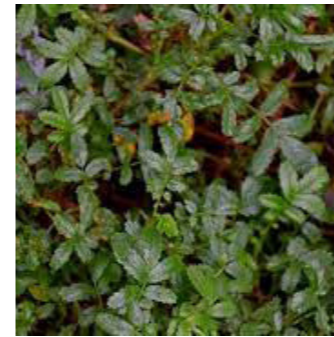
Coprosma acerosa ●
tātaraheke



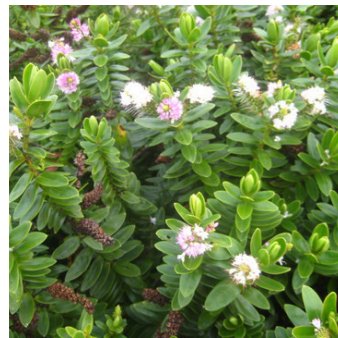
Carex sp. ●



Leptinella squalida
creeping button daisy



Acaena pallida ● ●
piripiri



Hebe sp. ●
hebe



Disphyma australe ●
horokaka



Apodasmia similis ● ●
oioi



Euphorbia glauca ●
waiū-atua



Libertia sp. ●
mikoikoi



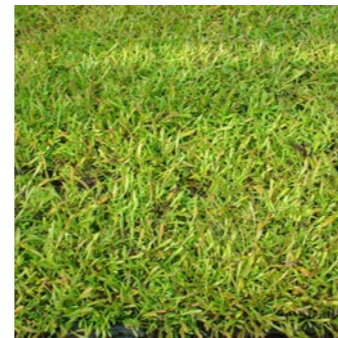
Brachyglottis greyi
yellow flowered shrub daisy



Poa cita ● ●
wī



Ficinia nodosa ● ●
wīwī



Selliera radicans ●
remuremu



Arthropodium sp.
rengarenga

Vegetated Swale



Apodasmia similis ●
oioi



Carex virgata
pūrei



Cyperus ustulatus
toetoe



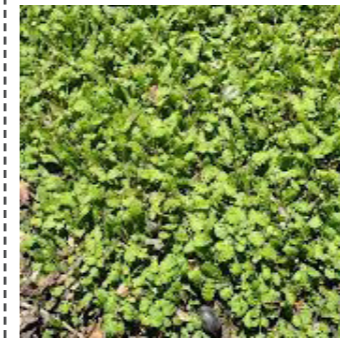
Ficinia nodosa ●
wīwī



Libertia ixiodes
mikoikoi



***Phormium cookianum* or
'Green Dwarf'** ●



Leptinella dioica
shore cotula



Lobelia angulata
pānakenake



Muehlenbeckia axillaris
pōhuehue

Legend.

- Proven performance at nearby site (Cobham Drive)
- Suitable for use in raingarden if used in place of vegetated swale

1.3 Stormwater Attenuation.

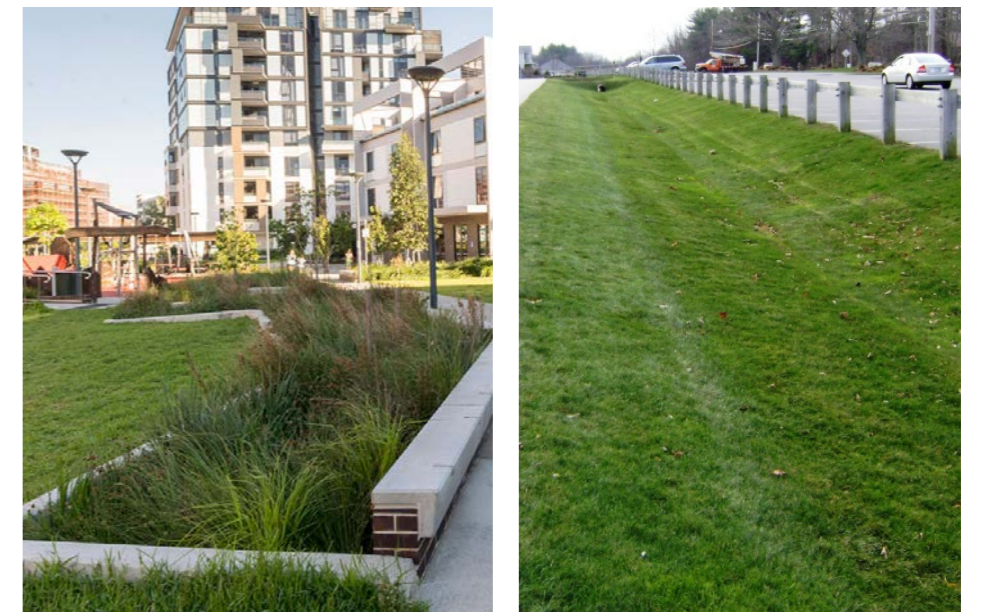
Relevant Designation Conditions

- **(Condition 26).** The first outline plan submitted by the requiring authority to the WCC under condition 2 shall include a design statement endorsed by a chartered professional engineer which demonstrates how stormwater, wastewater and water supply will be connected to and accommodated by the municipal system. It shall include:
 - **(Condition 26a).** An analysis of the impact of the proposed development on the existing water supply, and stormwater and wastewater network capacity;
 - **(Condition 26b).** Details of any upgrades to existing infrastructure required for it to accommodate the proposed development;
 - **(Condition 26c).** Evidence of consultation with Wellington Water in respect of (a) and (b), comments received from Wellington Water on (a) and (b), and details on how any comments made by Wellington Water have been addressed; and
 - **(Condition 26d).** An analysis which demonstrates that development of the Site will be undertaken to provide adequate on-Site storage and/or detention capacity to achieve storm water neutrality for all events up to the 10% AEP event (1 in 10 year event). This design statement shall be prepared to be consistent with the Integrated Design Management Plan required by condition 37.

Design Considerations

Stormwater attenuation is an important consideration in any new development, but especially within this site as there is a need for large areas of hardscape. Development on the site will need to provide onsite storage and/or detention capacity to achieve 'stormwater neutrality' for all events up to the 10% AEP event (1 in 10 year event). These requirements are intended to reduce downstream flooding risk and impact on existing infrastructure. Hydraulic neutrality could be achieved through several methods;

- Include water detention tanks with capacity to manage 10% AEP events on the site.
- Reduce or avoid non-permeable landscape areas.
- Consider permeable paving for hardscape areas.
- Improve soil infiltration (the ability of the ground to absorb water) through well maintained planted and grassed areas, avoiding areas where bare dirt is exposed to the elements and allowed to dry out over time.
- Install swales into which water can flow and slowly infiltrate into the soil as it is moved to the stormwater system. Swales may be grassed or planted with consideration given to amenity, maintenance and up-front costs. Swales may be rock lined at the base to prevent scouring.
- Consider integrating swales or raingardens into the boundary treatments.
- Install raingardens to catch and filter water before discharging it slowly to the stormwater system. Consider as a preferred option adjacent areas where contaminants such as vehicle runoff are present.
- Where possible, locate swales to the exterior of the site to capitalise on the amenity value that can be added to the street.
- Minimise time period of any standing water in swales or raingardens to avoid risk of mosquito breeding in standing water.



Rain Garden

Grass Swale

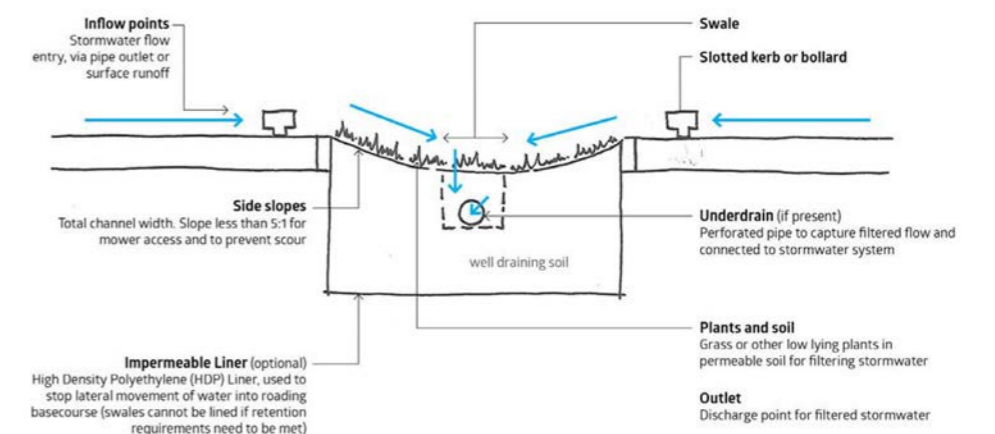


Image from Water Sensitive Design for Stormwater: Treatment Device Design Guideline, Wellington Water, 2019

Landscape Design Guidance.

1.4 Lighting.

Relevant Designation Conditions

- **(Condition 23).** All direct or indirect illumination from within the Site shall be controlled such that direct or indirect illumination does not exceed 8 lux at the windows of residential buildings in any nearby Residential Area.
- **(Condition 24).** All artificial lighting within the Site, including internal and external light sources shall comply with: AS 4282:1997: Control of the Obtrusive Effects of Outdoor Lighting.
- **(Condition 25).** The lighting of publicly accessible pedestrian and vehicle movement areas shall comply with: AS/NZS 1158.31:2005 Part 3.1 Pedestrian Area (Category P) Lighting.

Design Objectives

Sensitive and well designed lighting will play a key role in the integration of the site within its residential context. Lighting should facilitate safety and enable tasks to be carried out, but should not be overpowering.

Light will inevitably be spilled outside the property boundaries, either directly or by reflection as it is fairly impossible to contain within any given area. Design considerations for how the site is illuminated is especially important given the residential setting and building design should actively limit the effects of outdoor lighting.

The Site should aim to reduce excessive light emissions where practical. The use of up - lights to emphasis building structure or signage should be avoided as it contributes to light pollution and indirect illumination beyond the site. Lighting should be positioned so that beams are directed downward. LED lighting should be considered over sodium lamps to reduce energy consumption

Carpark Lighting

Car park lighting should aim to provide adequate light for users to undertake tasks safely and in a visible manner, but this must consider a level of lighting appropriate to the residential setting. Care needs to be taken with overhead lighting to minimise the risk of light pollution to neighbouring residents. Bright floodlights are not recommended in this context. A warm white (3000k/2700k) should be used in preference to cool white.

Access and Circulation

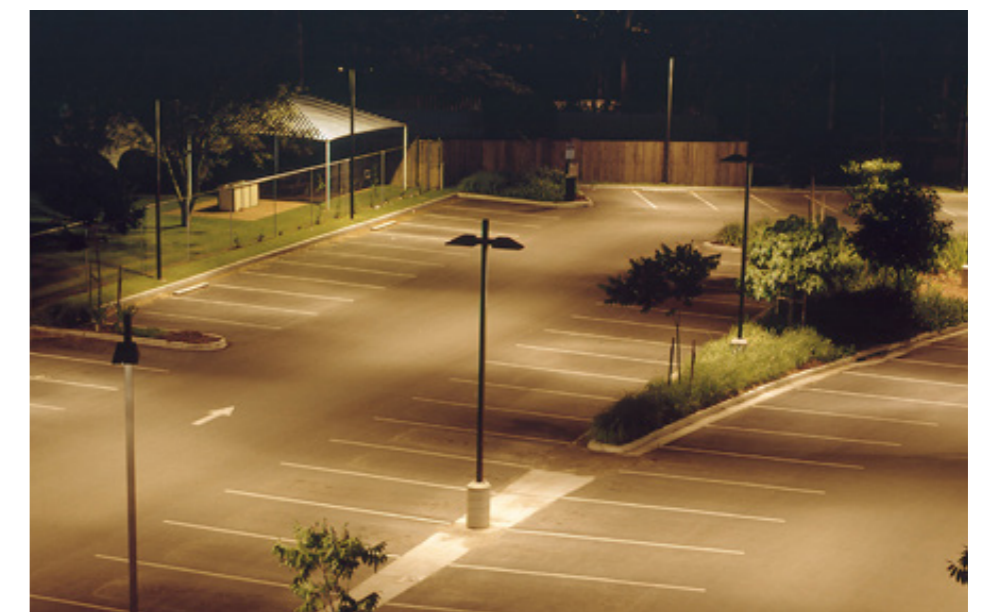
Main entrances into the site and to any proposed building should be visible, safe, well-lit, and provide good physical and visual connections between adjacent buildings and the access points. Internal pathways should be adequately lit to facilitate a safe environment for staff working after dark and movement networks should be designed to offer alternative routes for pedestrians. As such this avoids the creation of isolated internal areas and creates a clear logic of movement patterns.

Boundary Lighting

Additional lighting to the exterior perimeter is not considered necessary because of the existing street lighting. Pedestrian footpaths are next to or near the street kerb with little to no lighting obstruction from trees.

On balance between CPTED principles, security, and designation conditions 23-25, should street lighting be insufficient for the boundary treatment, further consideration should be given to appropriate pedestrian lighting through the Outline Plan.

Specific lighting locations and types of fixtures should be considered through detailed design with relevant specialists.



Well-lit carparking with ambient lighting

1.5 Public Safety.

During development on the site and changes in use it is important that risks are identified and appropriately mitigated throughout the project phases. In general, public safety is maintained through CPTED principles, creating legibility, and mitigating conflicts.

CPTED (Crime Prevention Through Environmental Design)

Lighting plays an important role in the perception of safety. Well lit spaces achieve a balance that makes people feel comfortable moving through or staying in the space, but is not over done, harsh or creates glare. Lighting should be consistent, avoiding dead spots or areas of high contrast where users are moving between very bright and very dim lighting conditions to deter anti-social behaviours and foster positive interaction amongst site users.

Natural surveillance and clear sightlines between internal buildings and the Sites access points should be provided to ensure pedestrian safety and the safety of those working within the site. This includes the ability to see and be seen when approaching or leaving the Site and its buildings.

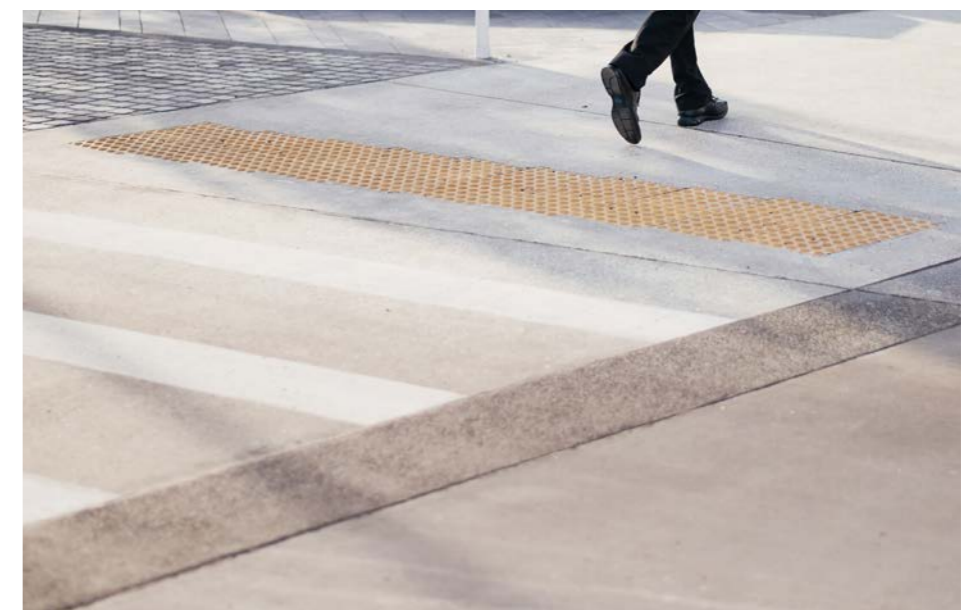
Ensure the acoustic fence location and heights at vehicle entry and exits can maintain sightlines and safety.

Design Objectives

- Eliminate entrapment spots through careful placement of built elements and vegetation
- Keep a well maintained site; limb trees, maintain sightlines, establish a 'cared-for' aesthetic
- Keep pathways free from obstructions
- Clearly demarcate and mitigate conflict in areas such as entryways where vehicles will be crossing pedestrian and cycle paths, and create legible pathways for each mode of travel
- Create clear definition between the public realm and the private site. Areas on site that deal with the public interface (such as site reception) should be well located with clear and safe access from the site entry to the front door
- Create a safe environment for staff working late through appropriate lighting and access to nearby car/bike parking
- Provide well designed, suitable lighting
- Surface finished should comprise a slip resistant finish. Consider exposed aggregate or other means of apply surface texture.



Pedestrian and cycle movements will be common near and around the Site



Clearly demarcated pedestrian movement areas near site access points

Landscape Design Guidance.

1.6 Carparking, Access & Loading.

Relevant Designation Conditions

A Traffic Management Plan is required as part of the consent conditions (Condition 1a), and is not covered in this document. However, design considerations have been included and should be referred to during development of the Traffic Management Plan to ensure outcomes meet the relevant conditions and are appropriate to the setting.

- **(Condition 9a)** Site access is to be provided and maintained in accordance with Section 3 of AS/NZ2890.1:2004.
- **(Condition 9b)** Subject to condition 9(c) below no vehicle access shall be situated closer to an intersection than the following distances: arterial and principal streets (20m), collector streets (15m), other streets (10m).
- **(Condition 9c)** Only one vehicle access shall be permitted onto Broadway and only one onto Kauri Street. No vehicle access (aside from provision for emergency access if necessary) shall be permitted onto Miro and Kedah Streets.
- **(Condition 9d)** The width of any vehicle crossing to the Site is not to exceed 8m.
- **(Condition 9e)** Any access to the Site shall be designed to permit a free flow of traffic so that vehicles are not required to queue on the street.
- **(Condition 10a)** Except for rental car storage parking, all parking is to be provided and maintained in accordance with Sections 1, 2 and 5 of AS/NZ2890.1:2004.
- **(Condition 10b)** Where parking is located within a building, a minimum height clearance of 2.2m is required.
- **(Condition 10c)** The gradient for carparking circulation routes shall be not more than 1:8.
- **(Condition 10d)** All vehicles associated with servicing activities which take place within the Site, shall be able to be accommodated wholly within the Site. This is to include visiting tradespersons and courier vehicles. Additionally, appropriate staff and visitor parking shall be able to be accommodated on Site.
- **(Condition 11a -i)** where loading areas are located within a building, a minimum height clearance of 4.25m is required;
- **(Condition 11a -ii)** for buildings serviced by lifts, all levels shall have access to a loading area by way of a lift;

- **(Condition 11a -iii)** the loading area shall be located no further than 15m from a lift and there shall be level access between them; and
- **(Condition 11a -iv)** turning paths shall be based on the standard for the maximum sized truck which will service the site.
- **(Condition 11b)** For loading areas located outdoors, the minimum width shall be 3m and the minimum length 9m.
- **(Condition 11c)** For loading areas located within a building, the minimum width shall be 4m and the minimum length 9m.
- **(Condition 17)** Subject to the limitations set out in condition 9(c) entry / egress for trucks shall not be located opposite residential activities. Trucks shall not drive along the Residential zoned parts of Miro Street, Kedah Street or Kauri Street except where there are specific circumstances where this is necessary.

Design Objectives

The Traffic Management Plan should be consulted when making design decisions about the Sites carparking, access and loading.

The Airport's operational needs will change over time and so the configuration of the Sites interior will need to adapt to changing needs. Generally speaking the Site is intended to have large areas of carparking or handstand so it is critical that careful consideration is given to safety, function, materiality, constructibility, and amenity through the design process.

The design of the hardstand/ carparking areas will need to be provided flexibly in material and construction so configurations can adapt to ongoing change. The ability to reusing or recycling material through changing operational needs should be considered throughout the design process and staging.

Carparking

Carparking doesn't need to be a purely hardscape condition. Integrating low maintenance planting to the design of carparking configurations can both increase amenity, reduce stormwater runoff, and clearly distinguish areas of different operations.

Maintaining legibility within the site by establishing a distinction between modes i.e. heavy vs standard vehicles, pedestrian movements, and visitors, should be encouraged.

Any staff and visitor parking should be located on-site and near reception areas where direct pedestrian access routes can be established between car to building. Staff and visitor parking should be clearly labelled and easy to find.

Site Access & Loading

Any entry points into the Site need to be clearly recognisable and visible to approaching vehicles and pedestrians. Entryways must allow vehicles freely into the site, with sufficient room to avoid vehicles backing up along the street or idling over the entryways.

The staff-only entry/exit through the former Aoga Amata building to/from Miro Street should be clearly visible and well maintained.

Where possible, create circulation systems to avoid 'dead ends' and the need for heavy vehicles to reverse. Conflict between vehicles entering and exiting the site and cyclists and pedestrians travelling along the street needs to be carefully managed. This can be achieved through clear sightlines, appropriate signage to demarcate the site entry, and a clear threshold delineating the public/private interface by using paving or line marking.

2. Building Design Guidance.



Building Design Guidance.

2.1 Building Character

It is important that any new or retained buildings on site respond to the residential context. The neighbourhood is visually cohesive to the north of the Site, however there is a distinct change toward the south of the Site where land use changes from residential to commercial on Broadway.

An integrated design approach is required to maintain a best practice relationship between the suburb of Miramar and the needs of Wellington International Airport.

The residential buildings surrounding the Site are generally oriented to the street in a regular pattern that is reinforced with street tree planting down Miro, Kauri, and Kedah streets. The buildings have a fairly consistent architectural fabric; houses are mainly one, sometimes two levels with simple forms and gable rooflines, typical of 1920s bungalows.

The north part of the Site has a higher sensitivity to its context than the south as it has a residential fabric on three sides.

Legibility

The majority of surrounding houses are clad in weatherboard, and a large number retain their character features such as timber bay windows. Garage structures are often detached and directly in front of the dwelling rather than behind. The detached garages present to the street and reinforce the legibility of the street. This consistency contributes to overall character and legibility of the neighbourhood.

In keeping with the character of the site there is a diverse makeup of fencing typologies that front the Site on adjacent streets. Fences are generally low and accommodate a driveway and/or separate pathway. Dwellings in closer proximity to the street tend to have higher fences for screening.

Materiality

Materials used on surrounding residential buildings are largely consistent throughout with many dwellings using weatherboard cladding. The use of brick cladding and long-run iron cladding is also present but used to a lesser extent.

Similarities are drawn in the materiality of fencing too with timber, both in vertical or horizontal batten styles, as well as brick or masonry blocks largely being used. Almost no use of metal fencing is present.

Visibility

The surrounding residential housing largely have clear and direct sightlines across the street into the Site when not obscured by planting or fencing. In general the Site itself creates a high degree of permeability within the area, allowing clear sightlines from one street to another.

Existing Building Character



Building Design Guidance.

2.2 Building Massing.

Relevant Designation Conditions

- **(Condition 29)** No new building shall be closer than 5 metres from the Site boundary.
- **(Condition 30)**. Maximum site coverage by buildings is 35%
- **(Condition 31)** No building shall have a wall height greater than 8 metres from existing ground level.
- **(Condition 32)**. No building located within Area A as shown in Attachment 2 may have a roof height greater than 9 metres from existing ground level.
- **(Condition 33)**. No building located within Area B as shown in Attachment 2 may have a roof height greater than 10 metres from existing ground level.
- **(Condition 34)**. No building shall have continuous walls longer than 10 metres without a step in the profile of the wall of at least one metre in depth, or via the use of another architectural device or change in materials or colour.
- **(Condition 37b-i)**. Use of rooflines which reflect the scale and context of the surrounding residential area particularly in Area A and building design which reflects the fine grain of the outer residential area, to integrate visually and to maintain character, scale and context
- **(Condition 37b-ii)**. Ensuring variation in the bulk, form and scale of buildings.
- **(Condition 37b-iii)**. Limiting the lighting of roof structures to minimise night time visibility of those structures from residential locations outside the Site.

Design Objectives

New buildings should be designed and located so they are of a scale suited to the surrounding area and are set back from boundary edges, whilst recognising and providing for the building's function and use. Existing buildings should be in keeping with their residential appearance and character. Ensuring a tidy, positive and coherent street frontage.

Anti-glare

Glare from buildings that have high reflectivity is a significant concern for pilots landing in and taking off from Wellington International Airport. The roof of any building within the designation area needs to ensure roof reflectivity is minimized through appropriate material finishes and colours.

Set Backs

A minimum setback of 5m from the boundary will position new buildings so they maintain the sense of openness and character to the street edge. 5m will generally accommodate positions of existing trees, however, a greater setback distance may be required to avoid tree roots or the alignment of required boundary treatments. Any proposed boundary treatments will need to be positioned with future staging of buildings in mind to achieve positive outcomes.

Indicative staging for the Site suggests proposed buildings will generally be aligned near Miro Street or to the southern area of the Site (Area B).

Consideration should also be paid to any access or proximity requirements of the existing service building in the north-east corner of the Site.

Site Coverage & Building Height

As per Condition 30 of the designation, site coverage must not exceed 35%. With an area of 20,843m², 35% of the site is calculated to be 7,295m². On average the Site's surrounding residential buildings have a street frontage

of 9m. The articulation of proposed buildings should look to relate to this frontage dimension as it is typical of the surrounding built fabric. Consistency of the built fabrics style will create a valued and visually coherent language of buildings that will fit with the character of the area.

Height of proposed buildings can create a significant character issues for the immediate area. The Site is broken into two areas - Area A and Area B - each requiring a different response to building heights. The design of any building should look to decrease the perception of its height at the street edge to reduce visual bulk.

With this in mind, Area B should accommodate the majority of the sites building coverage as it is located furthest away from residential character.

Form, Scale, and Articulation

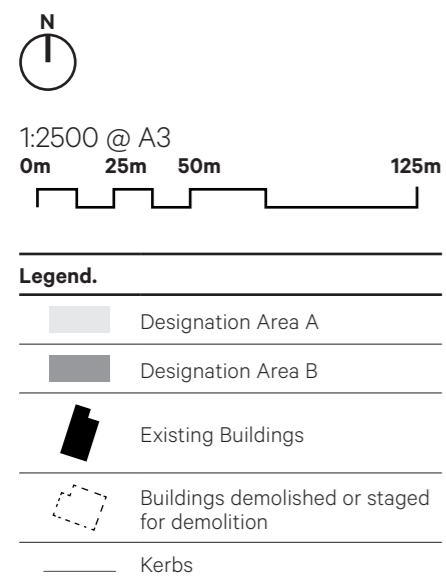
Any proposed buildings need to ensure variation in their form and scale. This is also directly relevant to the site coverage and height restrictions within the Site's two areas.

Building edges that front streets will still show a significant area of 'wall' when placed behind boundary treatments and when located between gaps of existing mature trees. Buildings should have a positive contribution to the adjacent street aesthetic and look to provide a softer residential feel than that of large blank walls. The design of the buildings should ensure gaps are placed between them to break down their bulk and allow visual separation and appropriate scale towards the existing built fabric.

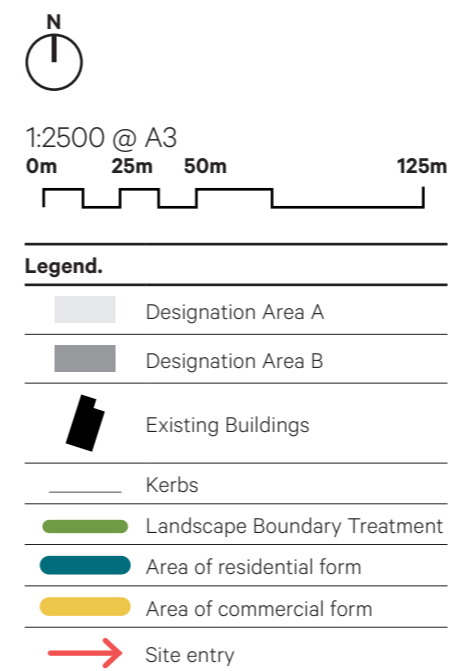
Variation of roof heights, cladding and fenestrations should reflect the existing character and pattern of the surrounding neighbourhood. Expressing the form of each building with a separate roof, and/or varying colour and materials will help achieve a complementary visual appearance and quality of detail.

The use of transitional building forms and volumes to achieve a positive relationship between a larger building and a smaller one should be considered given the differences between areas A+B.

Existing Figure Ground



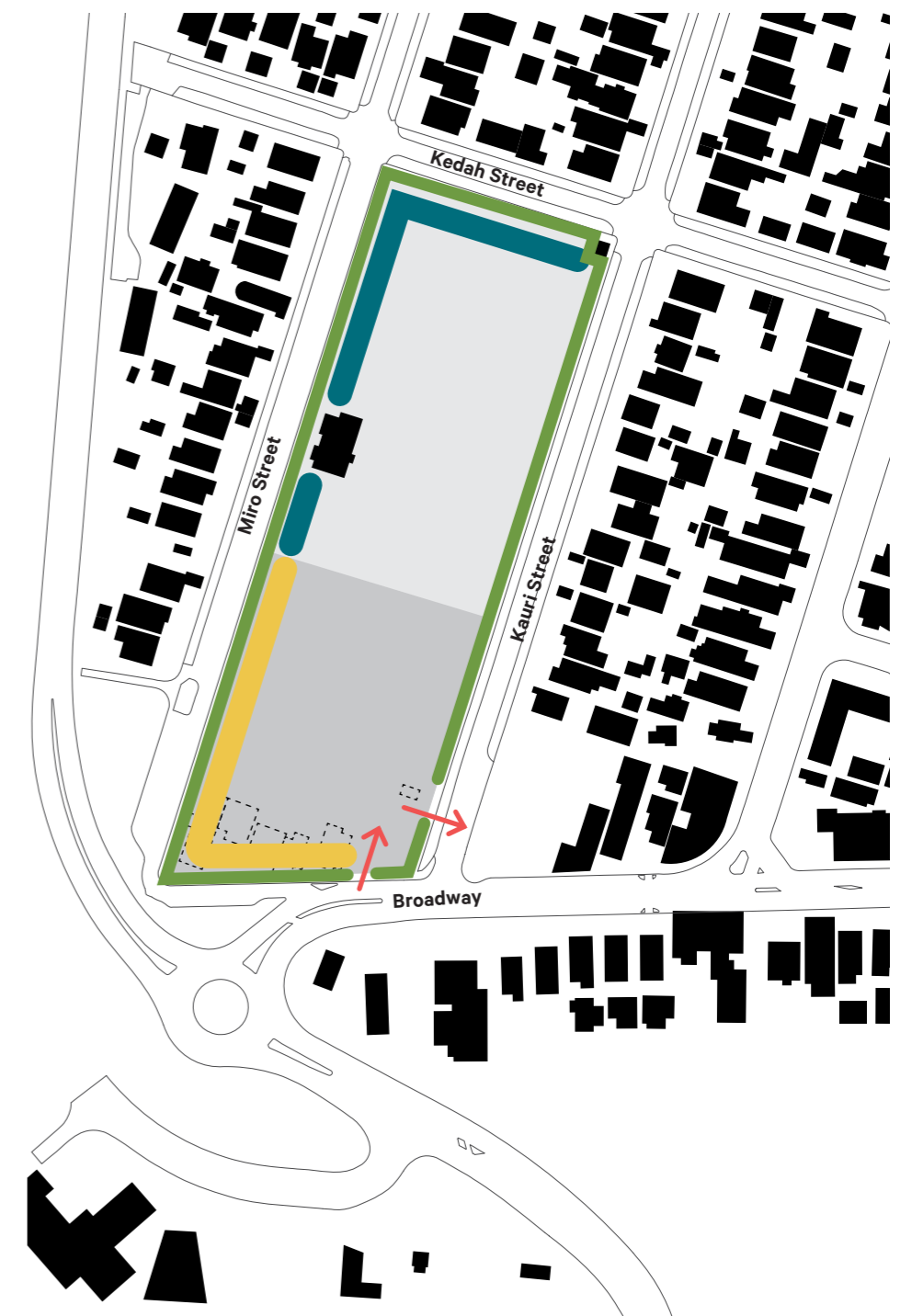
Proposed Built Form



Buildings with a more commercial bulk and purpose are situated to the south of the Site, in Area B, with more residential form in Area A to the north.

In general, buildings should be orientated to the North, face the street, and consideration should be given to bulk and placement so the built form holds the southwest corner.

Landscape boundary treatments surrounds the site, with more of a focus along Kauri Street while the Miro Street edge accommodates the built form to avoid shading Kauri Street and residences.

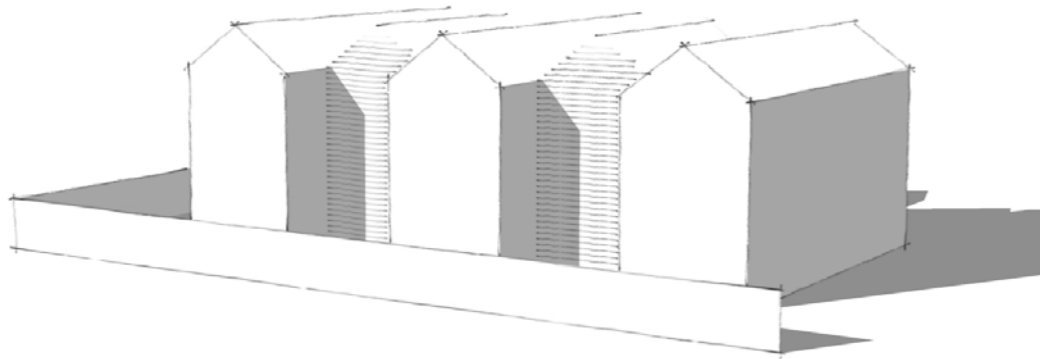


Building Design Guidance.

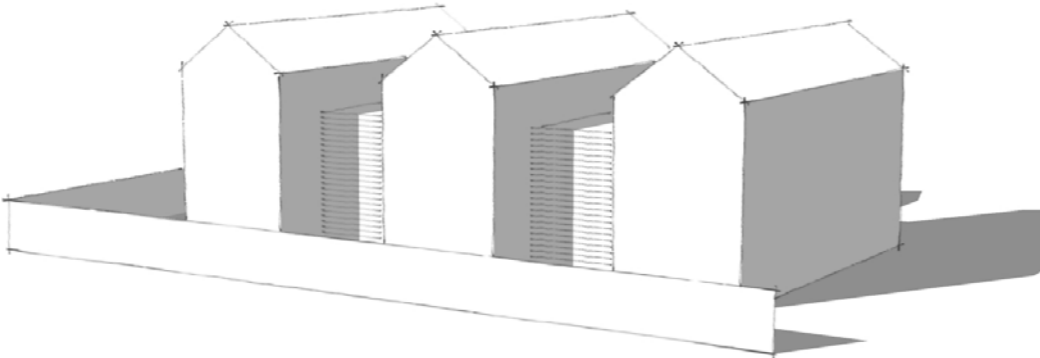
Building Massing.

Indicative massing for Area A

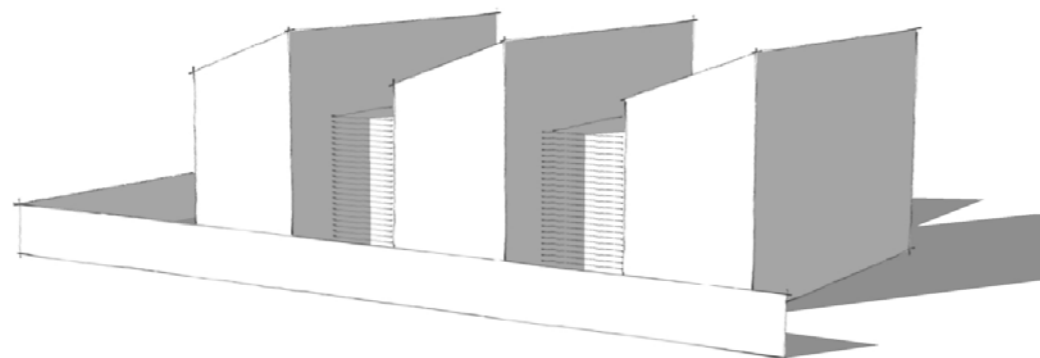
Option A:
Grouping of gable forms that respond to the existing built fabric, including material changes to step back volumes.



Option B:
Grouping of gable and flat top roof forms with transitional lower volumes presenting a change in cladding to address scale and form.

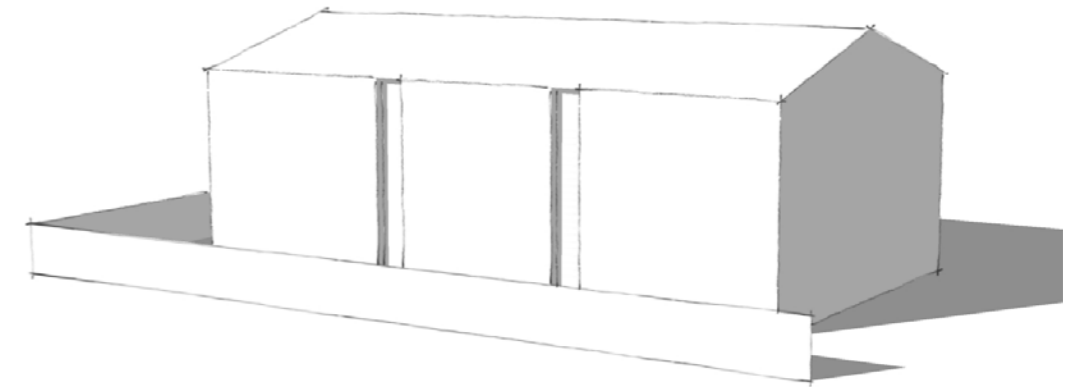


Option C:
Grouping of mono-pitch rooflines with transitional lower volumes with change in cladding to address scale and form.

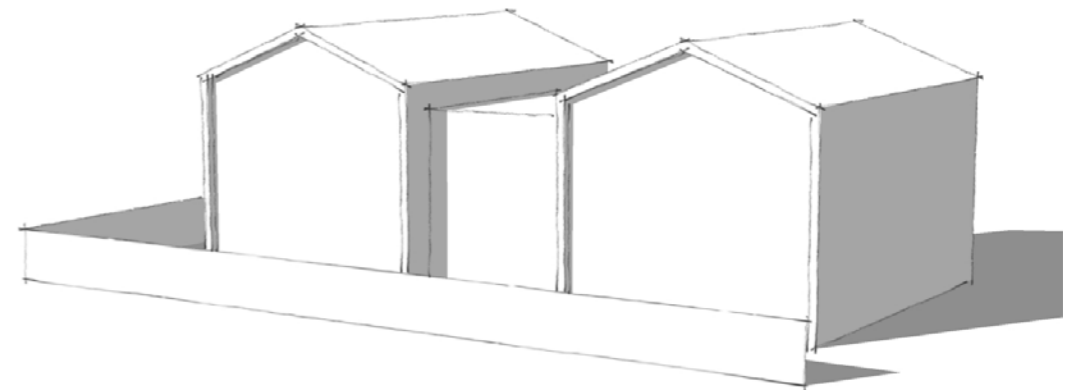


Indicative massing for Area B

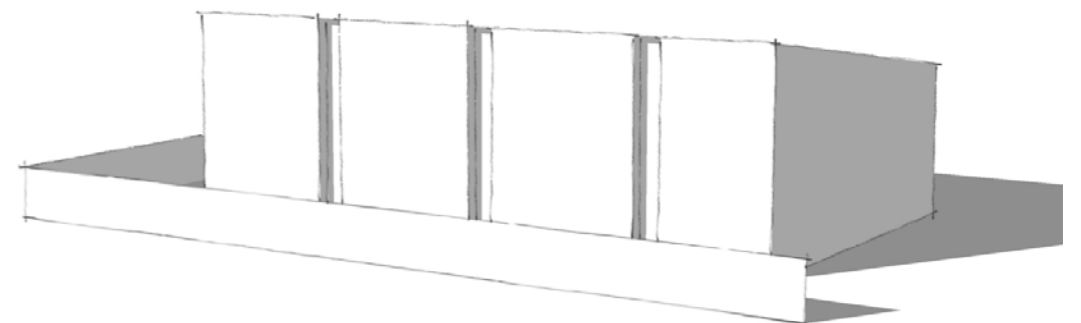
Option A:
Singular massing with regular recesses along the wall facing the street



Option B:
Two larger gable volumes connected via a recessed transition.



Option C:
Singular massing with mono-pitched roofline



Visual Mitigation

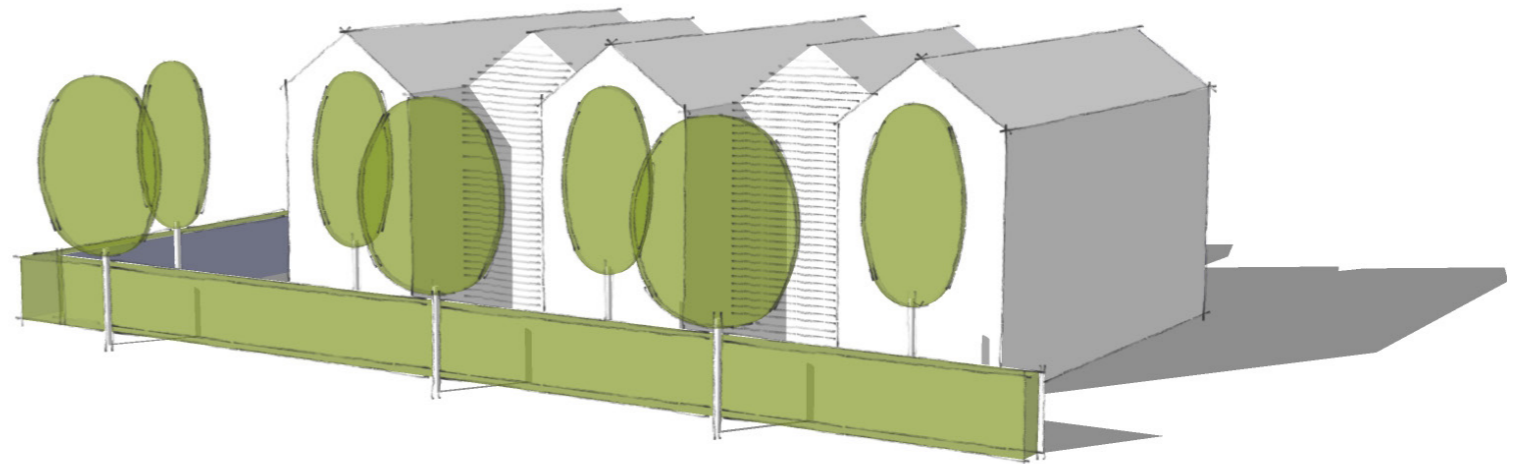
The proposed building roof heights of 10m (in Area B) and 9m (in Area A) will create buildings that are generally higher than the existing surrounding building fabric. A key design consideration for any built structure within the Site is to reduce its visual presence from the street.

To achieve this the existing mature trees on the Sites boundary should be retained where possible so they can contribute to the future screening and visual mitigation of structures as they appear over time, while continuing to provide amenity and street character. Some trees are established in clusters providing greater depth and extent of screening and with an average height of 8-10m they will help to provide further visual mitigation.

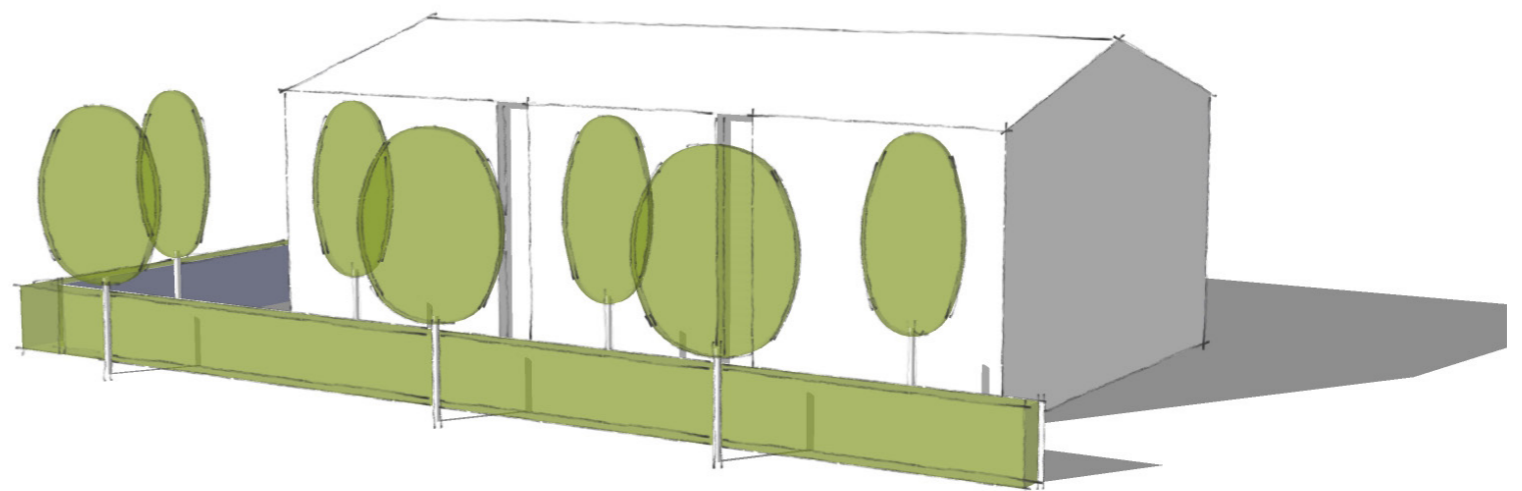
Where gaps of mature trees are present along the boundary, new trees should be considered to provide more coverage and visual mitigation. Relocating mature trees on site should be considered where appropriate.

The visual quality of proposed buildings should be considered for the site when the structures are viewed from the street. Buildings should be clad in materials that reflect the character of the area and enhance the development overall. This also applies to existing buildings. The former Aoga Amata Childcare Centre should retain the character of the area and any retrofitting of the building should be in keeping with the local residential aesthetic.

Area A:
Example of more refined massing with vegetative screening to reduce visual dominance.



Area B:
Example of larger building mass volumes with screening to reduce visual dominance.



3. Signage & Material Palettes.

Signage & Material Palettes.

3.1 Signage Integration & Sensitivity.

Relevant Designation Conditions

- **(Condition 35).** Any sign which is erected on the Site and which is visible from the road reserve or immediately adjacent land:
- **(Condition 35a).** shall not contain moving images, moving text or moving lights, and
- **(Condition 35b).** shall not be for the purpose of third-party advertising.
- **(Condition 37c).** Signage is well integrated with and sensitive to the receiving environment, and maintains public safety.

Design Considerations

- The entry is clearly recognisable and visible to approaching vehicles.
- Signage should contribute to positively to the street scape through design that carefully considers the receiving environment.
- Signage is of an appropriate scale for its context.
- Signage must be legible for users approaching by vehicle, cycle or on foot.
- Signage must be legible day and night, achieved through static lighting. This may be backlit or in ground uplighting.
- Signage is in keeping with overall design and wayfinding strategy
- Avoid multiple signs in the same location that add to visual clutter, combine information onto one sign
- Signage and surrounding planting maintained to ensure ongoing legibility and to avoid any visual obstruction
- Appropriate materials should be chosen to ensure signage is well integrated with surroundings. Consider integrating signage into the boundary treatment



Signage & Material Palettes.

3.2 Colour Palette.



Deep red



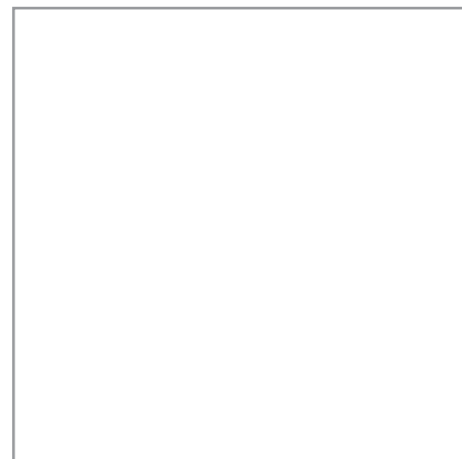
Yellow



Blue



Black



White



Light grey



Dark grey

Colours

Any colour or combination of colours used on buildings within the designation area should be in keeping with the residential setting. Muted colours are more appropriate than vibrant or fluorescent choices. Key design considerations are:

- Ensures glare is minimized through material finishes and colour on any roof.
- Colour choices should ensure a residential scale and aesthetic.
- Use colour to reduce visual building bulk from long lengths of building and balance dark colours.

Colour choices should be made in conjunction with material choices and accommodate supplier constraints.

3.3 Landscape Material Palette.

Permeable Paving



Permeable paving or gobi blocks could be used in parking areas to decrease water runoff. Not suitable for heavy loading vehicles

Concrete



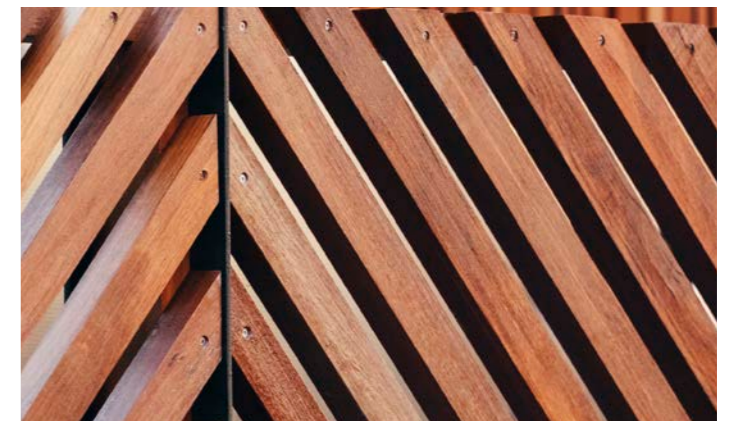
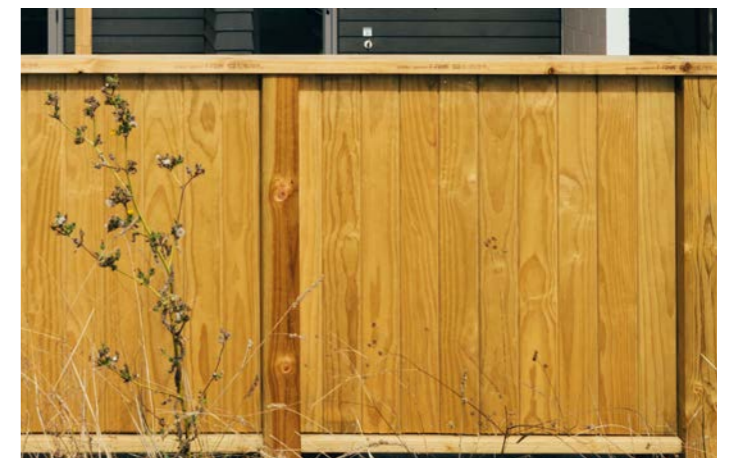
Concrete used for pathways or hardstand. Potential use of a shell mix to reflect coastal area.

Asphalt



Asphalt for large areas of hardstand.

Timber



Timber used for the acoustic fence could have batten detailing to add interest and break up the large form.

Signage & Material Palettes.

3.4 Area A - Building Material Palette.

Timber Cladding



Timber cladding can be used in recessions in the building form or on the upper stories to create interest and break up building bulk. Could also assist with noise mitigation from the surrounding area.

Panels/ Boards



Vertical cladding to the upper stories rather than full height adds interest and breaks up building form.

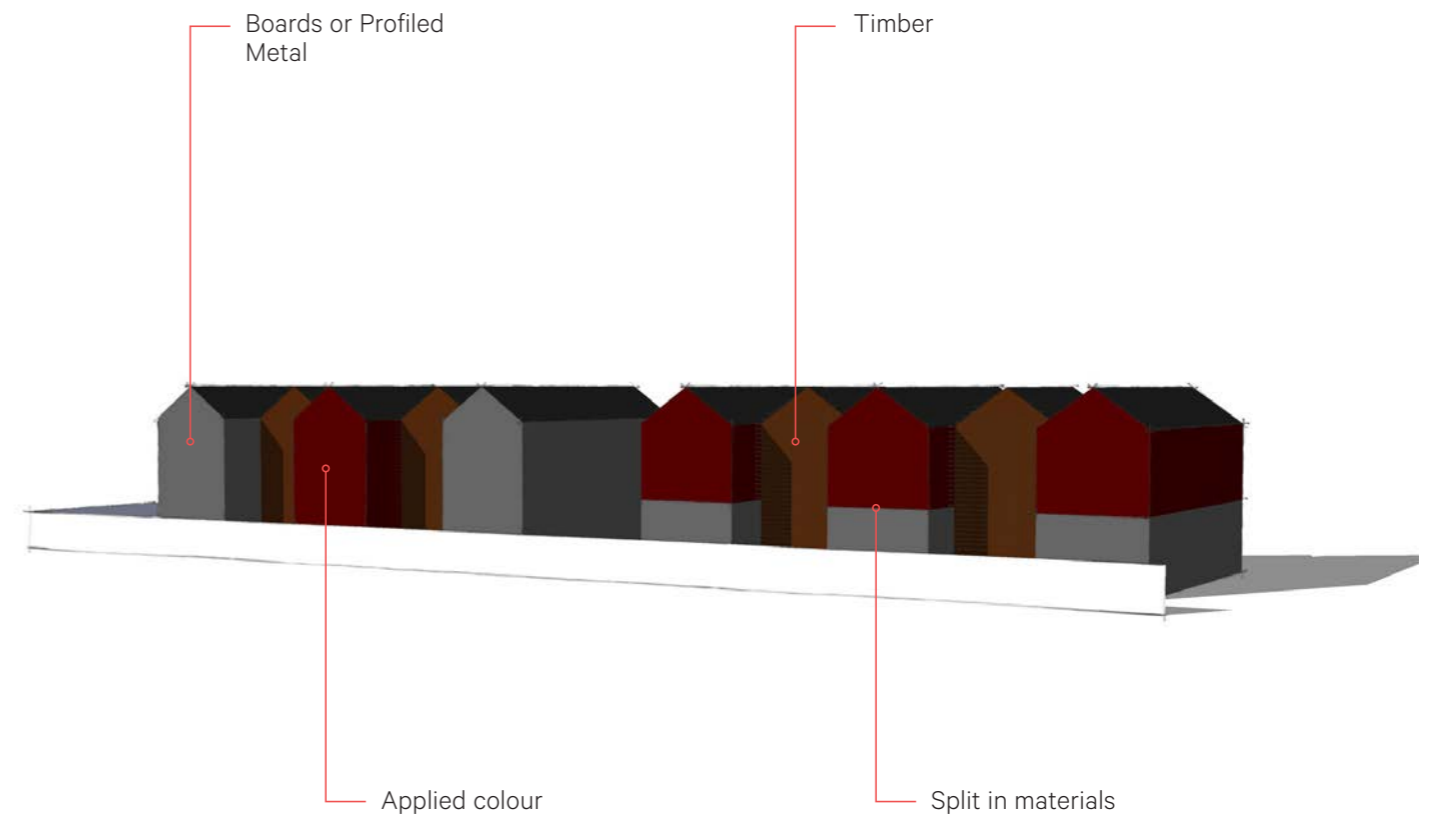
Profiled Metal



Vertical cladding to the upper stories rather than full height adds interest and breaks up building form.

Example:

Vary colour and material between horizontal forms, or create delineation between storeys by using different cladding.



3.5 Area B - Building Material Palette.

Timber Cladding



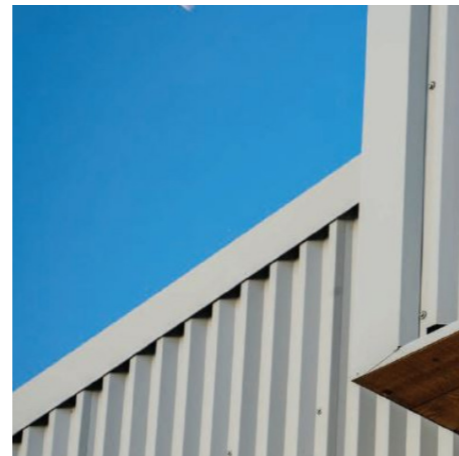
Timber cladding can be used in recessions in the building form or on the upper stories to create interest and break up building bulk. Could also assist with noise mitigation from the surrounding area.

Concrete



Limit concrete to lower stories, and provide relief to the form to avoid blank looking faces.

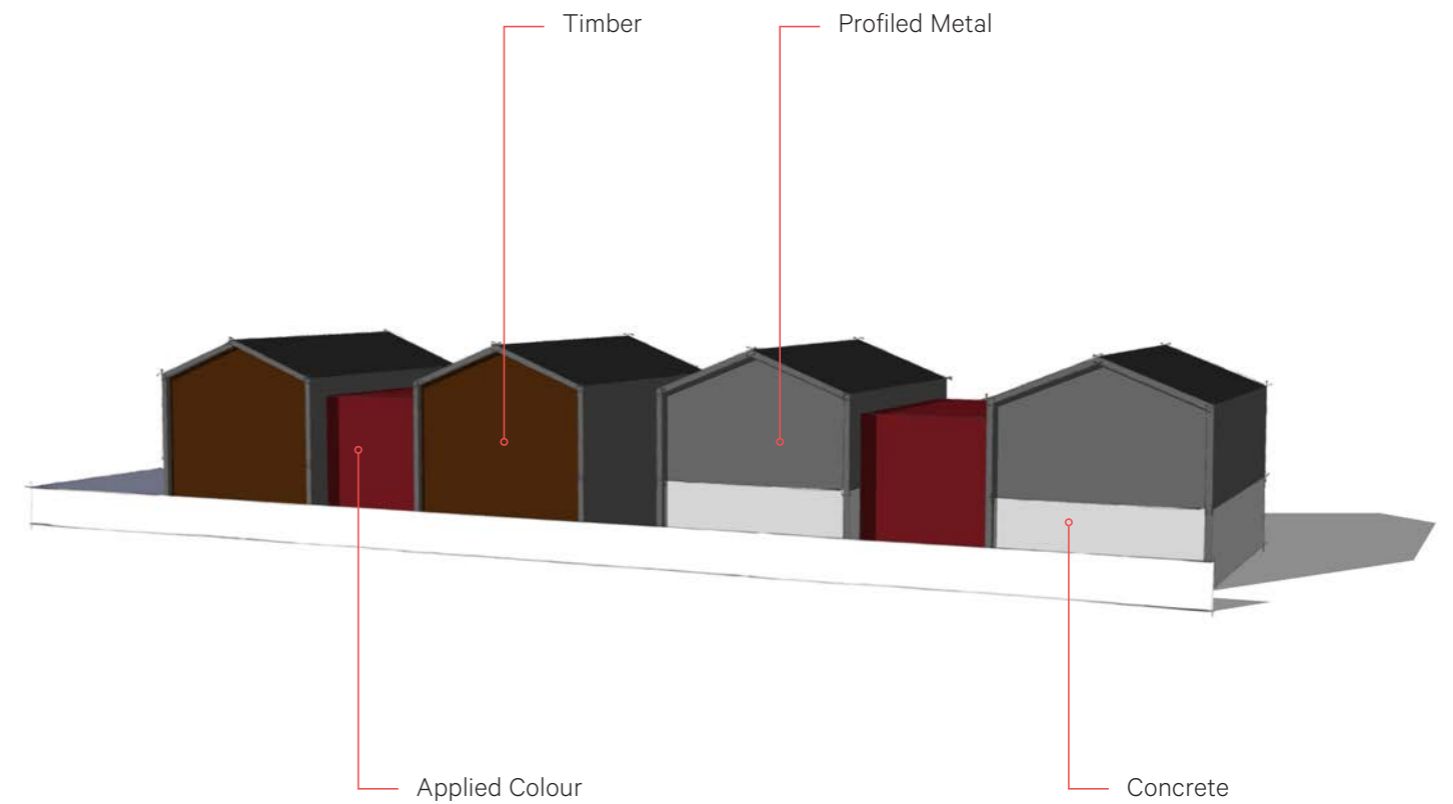
Profiled Metal



Vertical cladding to the upper stories rather than full height adds interest and breaks up building form.

Example:

Vary colour and material between horizontal forms, or create delineation between storeys by using different cladding.



4. Appendices.



4.1 Designation Conditions.

Wellington International Airport Limited

Airport Purposes Designation – Miramar south Area

Designation

The land to which this designation applies (“the Designated Area” or “the Site”) may be used for activities for the operation of Wellington International Airport (“the Airport”) including:

- Flight catering;
- Rental car storage, maintenance and grooming;
- Freight reception, storage and transfer to/from air;
- Ground Service Equipment (GSE) storage; and
- Associated carparking, signage, service infrastructure and landscaping.

For the avoidance of doubt Aircraft Operations, runways, traffic control structures, aircraft hangars, and Large Format Retail shall not be permitted within the Designated Area.

The Designated Area shall cover the area shown in Attachment 1 and is subject to the conditions set out in the Conditions section below.

Glossary:

Aircraft Operations

Means the engine runup, taxiing, take off or landing at the Airport of an aircraft, and “operate” has a corresponding meaning.

Large Format Retail:

means any individual retail activity exceeding 450 square metres gross floor area

Conditions

Outline Plan

1. Not less than three (3) months prior to the first outline plan for the Site being submitted to the Wellington City Council (“WCC”) under condition 2, and subject to the consultation requirements set out within condition 4 and 38, the requiring authority shall prepare and submit to the WCC for certification:
 - (a) A Traffic Management Plan in accordance with conditions 4 – 8; and
 - (b) An Integrated Design Management Plan in accordance with conditions 37 - 42.
2. Where the requiring authority seeks to rely on the provisions of the designation for any works within the Designated Area, an outline plan of any work to be constructed on the Designated Area shall be submitted to the WCC pursuant to section 176A of the Resource Management Act 1991

("RMA") unless the works have been otherwise approved under the RMA, or WCC waives the requirement for an outline plan.

3. For any staged development of the Site, the outline plan associated with that stage shall demonstrate how the limits set out in these conditions to manage the effects of development at the Site will be achieved.

Traffic

4. The Traffic Management Plan required by condition 1 shall be prepared following consultation with the owner of the service station at 362 – 368 Broadway, and shall show the general configuration of on-Site and off-Site traffic management measures to be employed to achieve the following objectives:
 - (a) Effectively manage traffic generated during the operation of the Site so that traffic volumes are safely accommodated within the existing road network;
 - (b) So far as is reasonably practicable, avoid congestion or traffic delays on the adjacent local roading network and manage effects on pedestrian access and cycling on this network that are caused by operations at the Site; and
 - (c) Maintain safe and convenient access to the service station located at 362 – 368 Broadway for vehicles travelling in either direction on Broadway, entering the service station from Broadway and tankers exiting the service station onto Broadway.

The Traffic Management Plan shall describe, where appropriate:

- (d) Site access arrangements on Broadway and Kauri Street which meet the requirements of condition 9;
- (e) Provision of carparking spaces, loading and manoeuvring areas which meet the requirements of conditions 10 and 11;
- (f) How pedestrian and cycle access to and past the Site would be accommodated;
- (g) Any off-Site measures required, including, if necessary, an upgrade of the intersection of Kauri Street and Broadway with either a roundabout or traffic signalisation and the likely timing of any necessary upgrade;
- (h) Consideration of other modes of transportation and pedestrian access in the design of any off-Site measures required by (g) above;
- (i) Details about consultation undertaken with the relevant road controlling authorities to enable any off-Site measures identified in (g) and (h) above to be implemented;
- (j) Methods to provide route travel for trucks so as to avoid the need to drive along the Residential zoned parts of Miro Street, Kedah Street or Kauri Street except where there are specific circumstances where this is necessary.

No outline plan shall be submitted by the requiring authority until such time as the WCC has certified that the Traffic Management Plan achieves the objectives set out in (a), (b) and (c) of this condition.

Advice Note: all intersections and roading improvements shall be designed and constructed to WCC standards and be subject to WCC approval as road controlling authority.

5. Traffic Management Plan required by condition 4 may allow for staged implementation of development within the Site. If staged development is provided for then an overall plan showing the likely stages and method(s) for ensuring the objectives set out in condition 4 (a), (b) and (c) are to be met at each development stage shall be included.
6. The requiring authority shall ensure that any outline plan submitted to WCC under condition 2 demonstrates that the works subject to it are to be developed in a manner that achieves the objectives of the Traffic Management Plan. Any outline plan shall contain detailed traffic management provisions to achieve the objectives set out in condition 4 (a), (b) and (c) and include details of buildings, signage, parking, and other built infrastructure, including any necessary roading, cycling and pedestrian infrastructure to be provided on the roading network. Any Outline plan shall be accompanied by a report from a suitably qualified and experienced traffic engineer addressing how the outline plan achieves the objectives of the Traffic Management Plan. Where works are required on the roading network the outline plan shall include details of this work and timeframes for implementing the work. These timeframes and the method for implementing any necessary work are to be agreed with the road controlling authority at least three months prior to construction.
7. The requiring authority may amend the Traffic Management Plan provided that any amendment does not result in changing the purpose, or derogate from the purpose and the objectives of the Traffic Management Plan set out in condition 4. Any amendment shall be certified by the WCC as being consistent with the objectives set out in condition 4.
8. If a review of the Traffic Management Plan is undertaken by the requiring authority then that review shall be undertaken in consultation with WCC.
9. Site access:
 - (a) Site access is to be provided and maintained in accordance with Section 3 of AS/NZ2890.1:2004.
 - (b) Subject to condition 9(c) below no vehicle access shall be situated closer to an intersection than the following distances: arterial and principal streets (20m), collector streets (15m), other streets (10m).
 - (c) Only one vehicle access shall be permitted onto Broadway and only one onto Kauri Street. No vehicle access (aside from provision for emergency access if necessary) shall be permitted onto Miro and Kedah Streets.
 - (d) The width of any vehicle crossing to the Site is not to exceed 8m¹.
 - (e) Any access to the Site shall be designed to permit a free flow of traffic so that vehicles are not required to queue on the street.
10. Carparking:

¹ Altered under s181(3) 13/06/2022 (SR514637)

- (a) Except for rental car storage parking, all parking is to be provided and maintained in accordance with Sections 1, 2 and 5 of AS/NZ2890.1:2004.
- (b) Where parking is located within a building, a minimum height clearance of 2.2m is required.
- (c) The gradient for carparking circulation routes shall be not more than 1:8.
- (d) All vehicles associated with servicing activities which take place within the Site, shall be able to be accommodated wholly within the Site. This is to include visiting tradespersons and courier vehicles. Additionally, appropriate staff and visitor parking shall be able to be accommodated on Site.

11. Loading:

- (a) At least one loading area shall be provided as follows:
 - (i) where loading areas are located within a building, a minimum height clearance of 4.25m is required;
 - (ii) for buildings serviced by lifts, all levels shall have access to a loading area by way of a lift;
 - (iii) the loading area shall be located no further than 15m from a lift and there shall be level access between them; and
 - (iv) turning paths shall be based on the standard for the maximum sized truck which will service the site.
- (b) For loading areas located outdoors, the minimum width shall be 3m and the minimum length 9m.
- (c) For loading areas located within a building, the minimum width shall be 4m and the minimum length 9m.

Noise

12. Noise emission levels from the Site when measured on any site that includes an occupied residence in the Outer Residential Area beyond the Site shall not exceed:

<i>Monday to Sunday 7am to 10pm</i>	<i>55 dB LAeq(15min)</i>
<i>Monday to Sunday 1am to 6am</i>	<i>40 dB LAeq(15min)</i>
<i>At all other times</i>	<i>45 dB LAeq(15min)</i>
<i>All days 10pm to 7am</i>	<i>75 dB LAFmax</i>

13. Noise emission levels from the Site when measured on any in the Centre Zone shall not exceed:

<i>At all times</i>	<i>60 dB LAeq(15min)</i>
<i>At all times</i>	<i>85 dB LAFmax</i>

14. Noise during construction activities shall comply with the requirements of *NZS 6803:1999 Acoustics – Construction Noise*.

15. The first outline plan the requiring authority submits to the WCC under condition 2 shall include a Construction Noise Management Plan (CNMP) which sets out how condition 14 will be achieved.

If development of the site is to be staged, then the CNMP shall set out the required methods to manage the effects of construction noise for that stage to achieve compliance with condition 14. An outline plan of works for subsequent stages shall also include a CNMP.

- 16. As part of the landscape boundary treatment required by condition 36 a close-boarded fence (or other acoustically effective barrier) with a density of at least 10 kg/m² and a height of two metres shall be installed around the perimeter of the site excluding site access points. This shall be inspected regularly and maintained to ensure its continued acoustic effectiveness.
- 17. Subject to the limitations set out in condition 9(c) entry / egress for trucks shall not be located opposite residential activities². Trucks shall not drive along the Residential zoned parts of Miro Street, Kedah Street or Kauri Street except where there are specific circumstances where this is necessary.
- 18. Truck engines shall not be left to idle on the Site and signage shall be placed in appropriate locations within the Site to advise drivers of this requirement. The requiring authority or its agents shall actively monitor this requirement.
- 19. Building services shall be designed such that noise levels from this source at the Site boundary are at least 10 dB lower than the limits set out in condition 12.
- 20. All warehouse doors shall be fast closing and shall remain closed at night-time unless in use.
- 21. There shall be no servicing or maintenance of equipment outdoors at night.
- 22. The first outline plan of works the requiring authority submits to the WCC under condition 2 shall include an acoustic assessment prepared by a suitably qualified person for all noise-producing activities on the Site which sets out how conditions 12 and 13 will be achieved. Activities taking place within buildings shall be assessed with doors open as applicable. If development of the Site is to be staged, then the requiring authority shall demonstrate how it will employ suitable noise attenuation which is effective for that development stage to meet the operational noise limits set out in condition 12 and 13.

Lighting

- 23. All direct or indirect illumination from within the Site shall be controlled such that direct or indirect illumination does not exceed 8 lux at the windows of residential buildings in any nearby Residential Area.
- 24. All artificial lighting within the Site, including internal and external light sources shall comply with: AS 4282:1997: Control of the Obtrusive Effects of Outdoor Lighting.
- 25. The lighting of publicly accessible pedestrian and vehicle movement areas shall comply with: AS/NZS 1158.3.1:2005 Part 3.1 Pedestrian Area (Category P) Lighting.

Servicing

- 26. The first outline plan submitted by the requiring authority to the WCC under condition 2 shall include a design statement endorsed by a chartered professional engineer which demonstrates how stormwater, wastewater and water supply will be connected to and

² Altered under s181(3) 13/06/2022 (SR514637)

accommodated by the municipal system. It shall include:

- (a) An analysis of the impact of the proposed development on the existing water supply, and stormwater and wastewater network capacity;
- (b) Details of any upgrades to existing infrastructure required for it to accommodate the proposed development;
- (c) Evidence of consultation with Wellington Water in respect of (a) and (b), comments received from Wellington Water on (a) and (b), and details on how any comments made by Wellington Water have been addressed; and
- (d) An analysis which demonstrates that development of the Site will be undertaken to provide adequate on-Site storage and/or detention capacity to achieve storm water neutrality for all events up to the 10% AEP event (1 in 10 year event). This design statement shall be prepared to be consistent with the Integrated Design Management Plan required by condition 37.

Earthworks

- 27. All earthworks on-Site are to be undertaken in accordance with an Erosion and Sediment Control Plan prepared in accordance with the Erosion and Sediment Control Guidelines for the Wellington Region (or equivalent).
- 28. The first outline plan submitted by the requiring authority to the WCC under condition 2 shall include an Erosion and Sediment Control Plan which sets out how condition 27 will be achieved.

Landscape and Visual

- 29. No new building shall be closer than 5 metres from the Site boundary³.
- 30. The maximum site coverage by buildings is 35%.
- 31. No building shall have a wall height greater than 8 metres from existing ground level.
- 32. No building located within Area A as shown in Attachment 2 may have a roof height greater than 9 metres from existing ground level.
- 33. No building located within Area B as shown in Attachment 2 may have a roof height greater than 10 metres from existing ground level.
- 34. No building shall have continuous walls longer than 10 metres without a step in the profile of the wall of at least one metre in depth, or via the use of another architectural device or change in materials or colour.
- 35. Any sign which is erected on the Site and which is visible from the road reserve or immediately adjacent land:
 - (a) shall not contain moving images, moving text or moving lights, and
 - (b) shall not be for the purpose of third party advertising.
- 36. Boundary screen planting required to screen the acoustic fence necessary to meet the requirements

of condition 16 shall grow to a height not less than 2 metres at maturity. The planting shall be undertaken within 3 months of the construction of the acoustic fence.

- 37. The Integrated Design Management Plan required by Condition 1 shall show the general configuration of buildings and structures to be erected on the Site, access, roading and parking layouts consistent with the TMP required by condition 1, measures for providing storm water attenuation, signage and areas of landscaping on the Site. No outline plan shall be submitted by the requiring authority under condition 2 until such time as the WCC has certified that the Integrated Design Management Plan achieves the following objectives:

(a) Landscaping

Landscaping within the Site achieves a high level of offsite amenity and ensures that any adverse effects on neighbouring land arising from the development of the designated area are appropriately mitigated. This may be achieved by:

- (i) Landscaping that softens and where practicable screens built form when viewed from neighbouring land;
- (ii) Site boundary treatment to ensure that carparking and storage activities are effectively screened and adverse visual effects are internalised;
- (iii) A boundary landscape treatment that includes use of layered boundary planting and the acoustic fence referred to in condition 16, which presents a green edge and a high level of amenity to the surrounding streets. This boundary landscape treatment shall be consistent with the Isthmus Group plan **attached** to these conditions as **Attachment 4**;
- (iv) A planting palette that includes a boundary hedge planted with hardy fast growing species, and a tree framework reflecting the surrounding street tree environment;
- (v) Use of advanced grade plants to ensure meaningful visual mitigation is provided within two to three years of planting; and
- (vi) After undertaking a tree survey by a technician arborist or suitably qualified and experienced landscape architect, retaining where practicable, or otherwise replacing, existing mature trees located on the Site within 5 metres of the Site boundary, including pohutukawa.

(b) Buildings

Buildings are designed and located so they are of a scale suited to the surrounding area and are set back from boundary edges, whilst recognising and providing for the building's function and use. In addition to compliance with the bulk and location requirements in condition 29 – 34 this may be achieved by:

- (i) Use of rooflines which reflect the scale and context of the surrounding residential area particularly in Area A and building design which reflects the fine grain of the outer residential area, to integrate visually and to maintain character, scale and context;
- (ii) Ensuring variation in the bulk, form and scale of buildings;

³ Altered under s181(3) 13/02/2023 (SR52469)

- (iii) Limiting the lighting of roof structures to minimise night time visibility of those structures from residential locations outside the Site.

(c) Signage

Signage is well integrated with and sensitive to the receiving environment, and maintains public safety.

- 38. Prior to submitting the Integrated Design Management Plan to the WCC for certification in accordance with condition 1 the requiring authority shall provide the owners and occupiers of the properties listed in Attachment 3 with a copy of the Integrated Design Management Plan, and invite those persons to meet and discuss its content. The requiring authority shall cover the cost of the meeting venue. Meeting minutes shall be taken and provided to WCC when the Integrated Design Management Plan is submitted for certification.
- 39. The Integrated Design Management Plan required by condition 1 may allow for staged implementation of development within the Site. If development of the site is to be staged then an overall plan showing the likely stages and methods for ensuring the objectives set out in condition 37 are met shall be included.
- 40. The requiring authority shall ensure that any outline plan submitted to WCC under condition 2 demonstrates that the works subject to it are to be developed in a manner that achieves the objectives of the Integrated Design Management Plan. Outline plans shall contain a detailed landscape design plan and include details of planting and maintenance to achieve the objective under condition 37(a) of the Integrated Design Management Plan on an ongoing basis. Any outline plan shall also contain details of buildings, signage, parking and other built infrastructure to demonstrate how the objectives under conditions 37(b) and 37(c) of the Integrated Design Management Plan are to be achieved. Any outline plan shall be accompanied by a report from a suitably qualified and experienced landscape architect and / or urban designer addressing how the outline plan achieves the objectives of the Integrated Design Management Plan.
- 41. The requiring authority may amend the Integrated Design Management Plan provided that any amendment does not result in changing the purpose, or derogate from the purpose and the objectives of the Integrated Design Management Plan set out in condition 37 and any amendment is certified by the WCC.
- 42. If a review of the Integrated Design Management Plan is undertaken by the requiring authority then that review shall be undertaken in consultation with the WCC.

Attachment 1 – The Designated Area



Attachment 2 – Area A and Area B of the Designated Area



Attachment 3 – List of Properties

10 Kauri Street, Miramar
10 Kauri Street, Miramar
12 Kauri Street, Miramar
12A Kauri Street, Miramar
12A Kauri Street, Miramar
14 Kauri Street, Miramar
14 Kauri Street, Miramar
16 Kauri Street, Miramar
18 Kauri Street, Miramar
20 Kauri Street, Miramar
20 Kauri Street, Miramar
22 Kauri Street, Miramar
24 Kauri Street, Miramar
26 Kauri Street, Miramar
28 Kauri Street, Miramar
28 Kauri Street, Miramar
28A Kauri Street, Miramar
30 Kauri Street, Miramar
32 Kauri Street, Miramar
34 Kauri Street, Miramar
34 Kauri Street, Miramar
36 Kauri Street, Miramar
37 Kauri Street, Miramar
38 Kauri Street, Miramar
38 Kauri Street, Miramar
39 Kauri Street, Miramar
40 Kauri Street, Miramar
13 Kedah Street, Miramar
17 Kedah Street, Miramar
13 Miro Street, Miramar
15 Miro Street, Miramar
17 Miro Street, Miramar
19 Miro Street, Miramar
21 Miro Street, Miramar
21 Miro Street, Miramar
23 Miro Street, Miramar
25 Miro Street, Miramar
27 Miro Street, Miramar
29 Miro Street, Miramar
31 Miro Street, Miramar
33 Miro Street, Miramar
35 Miro Street, Miramar
37 Miro Street, Miramar
39 Miro Street, Miramar
39 Miro Street, Miramar
41 Miro Street, Miramar
43 Miro Street, Miramar
43 Miro Street, Miramar
44 Miro Street, Miramar
357 Broadway, Miramar
357 Broadway, Miramar
7 Kauri Street, Miramar
362, 364, 366, 368 & 370 Broadway, Miramar
362, 364, 366, 368 & 370 Broadway, Miramar
362, 364, 366, 368 & 370 Broadway, Miramar
362, 364, 366, 368 & 370 Broadway, Miramar

Attachment 4 – Landscape Plans



Refer imageGA.2
for detail

No. Revision JOI01/11

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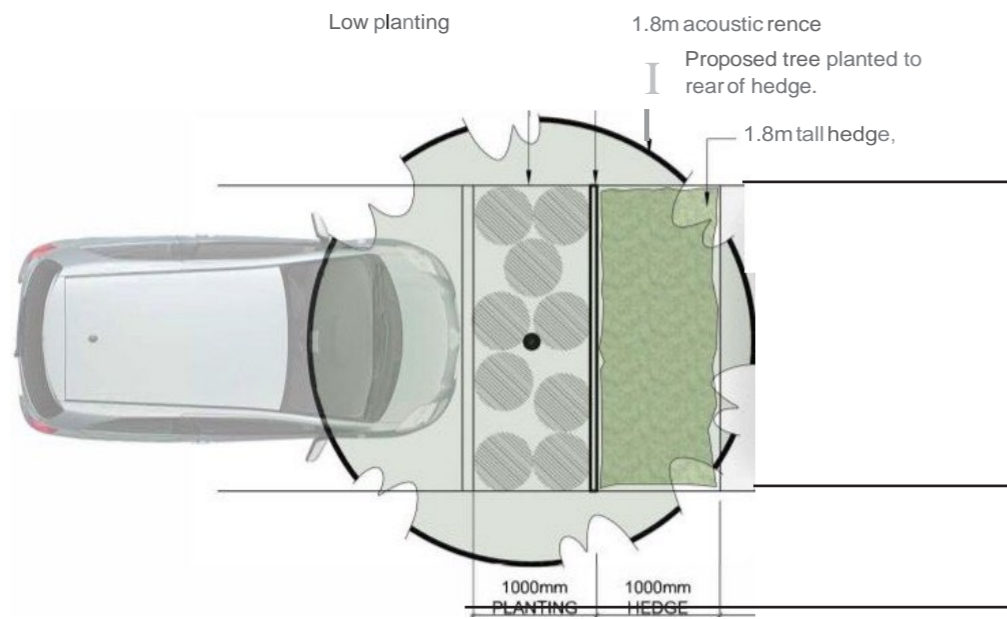
Isthmus.

Example Landscape Plan WIAL Miramar
South Airport Purposes Notice of

Requirement

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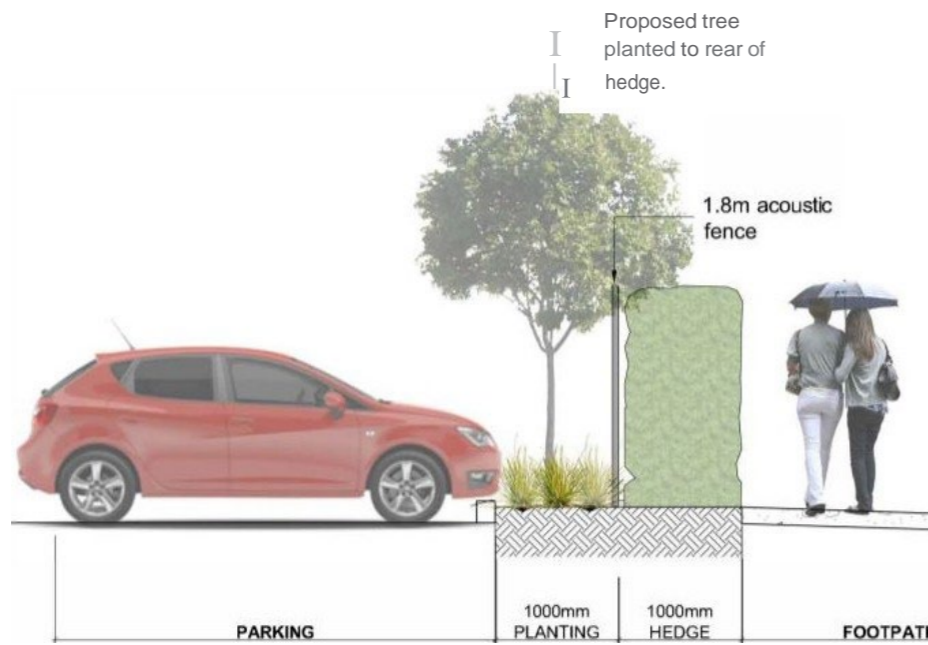
GA1



'A11-...Typical Plan - General Condition
Scale: 1:50 @ A3

I Existing tree in bem., (General location and scale)

NOTE: Fence height has changed from 1.8m to 2m as part of the designation conditions



II Typical Section - General Condition
Scale: 1:50 @ A3

G 30/01/18

Isthmus.

JooName
Exemplo Laldscapo Plan WIAL Miramar
South Airport Purposes Notice of

ReQuirement
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GA.2



4.2 Tree Survey.

Proposed Project, Wellington International Airport Ltd, Miramar

Generic Tree Protection Management Plan, Tree Assessment and Transplant Assessment.

Date:	3 August 2021
Prepared by:	David Spencer David.spencer@tendtrees.co.nz 0273223833
Client Contact:	James Pattullo james.pattullo@isthmus.co.nz
Brief:	Assess the trees within the proposed project area and identify their root protection areas. Provide a generic works methodology for working around trees and assess their feasibility for transplanting.



Contents

1. Introduction	3
2. Methodology and Limitations	3
3. Proposal	3
4. Tree Information	3
5. Arboricultural Concepts	7
6. Arboricultural Assessment	8
7. Transplant Assessment	8
8. Conclusion	9
9. Recommendations	10
10. Tree Protection Management Plan	10
11. Tree Protection Measures	13
12. Appendices	14



1. Introduction

- 1.1. Tend Trees Limited was instructed by James Pattullo of Isthmus, to inspect trees at the site proposed for development. The purpose of the inspection was to capture basic tree information and provide their root zones.
- 1.2. An assessment of the feasibility of transplanting each of the trees was carried out.
- 1.3. A generic Tree Protection Management Plan (TPMP) will be provided to enable suitable proposals to be put forward for the protection of the trees and their roots during the proposed construction at the property.
- 1.4. In addition, an assessment of the health and condition of each tree was requested to determine their suitability for retention or otherwise.
- 1.5. A generic Tree Protection Management Plan (TPMP) has been provided to help guide the design process and to ensure the arboricultural recommendations are always adhered to throughout the project.

2. Methodology and Limitations

- 2.1. The trees were inspected using the Visual Tree Assessment (VTA) method from ground level only. The root zone calculations and tree protection methodology are based on the Australian Standard (AS 4970 - 2009 Protection of Trees on Development Sites).
- 2.2. Measurement of trunk girths were taken using a conventional measuring tape. Tree height and canopy spread measurements were estimated using the surveyor’s experience.

3. Proposal

- 3.1. The proposal is in the design phase and as, yet no plans of description have been provided.

4. Tree Information

- 4.1. The following table is to be used in conjunction the arboricultural drawing in Appendix 1. The number plots in the drawing correspond to the numbering in Table 1.



Table 1: Tree Inventory.

Tree Number	Tree Species	Height (m)	CSR (m)	Form	Structure	Health	Age Class	Ownership	TPZ Radius (m)	TPZ Area (m2)	SRZ Radius (m)	SRZ Area (m2)	Comments
1	Metrosideros excelsa	7	5.5	Good	Good	Good	Mature	Private	8	202	3.28	33.8	Possible transplant requires removal of foot path
2	Metrosideros excelsa	8	6	Good	Good	Good	Mature	Private	9	255	3.4	36.32	Possible transplant requires removal of foot path. Vegetation surrounding not worthy of retention.
3	Metrosideros excelsa	8	3.5	Fair	Good	Good	Mature	Private	5	79	2.8	24.63	Tree form means unworthy of transplant.
4	Metrosideros excelsa	8	3.5	Fair	Good	Good	Mature	Private	7	154	3.04	29.03	Possible transplant requires removal of foot path.
5	Metrosideros excelsa	8	3.5	Fair	Good	Good	Mature	Private	7	154	3.29	34	Possible transplant requires removal of foot path. Power pole adjacent to tree.
6	Metrosideros excelsa	8	4	Fair	Fair	Good	Mature	Private	9	255	3.75	44.18	Possible transplant requires removal of foot path.
7	Metrosideros excelsa	8	3.5	Fair	Fair	Good	Mature	Private	10	315	3.62	41.17	Possible transplant requires removal of foot path and surface within site.
8	Metrosideros excelsa	8	4.5	Fair	Fair	Good	Mature	Private	10	315	3.85	46.57	Possible transplant requires removal of foot path and surface within site.
9	Metrosideros excelsa	3.5	1.5	Fair	Fair	Good	Mature	Private	2.22	15.48	2.04	13.07	Possible transplant requires removal of foot path.
10	Metrosideros excelsa	5	1.5	Fair	Fair	Good	Semi mature	Private	3	29	2.11	13.99	Not worth transplanting
11	Metrosideros excelsa	7	6	Fair	Fair	Good	Mature	Private	9	255	3.51	38.7	Not worth transplant due to over head services and excavation required
12	Coprosma repens	6	4	Fair	Fair	Good	Mature	Private	4	51	2.9	26.42	Not worth transplant due to species
13	Coprosma repens	4	3	Poor	Fair	Fair	Mature	Private	0	0	1.5	7.07	Group of Coprosma recommend removal
14	Corynocarpus laevigatus	5	2.5	Poor	Fair	Poor	Mature	Private	5	79	3.03	28.84	Recommend removal
15	Mixed	4	4	Poor	Fair	Poor	Mature	Private	0	0	1.5	7.07	Recommend removal of cherry, coprosma, oleanda
16	Metrosideros excelsa	8	10	Poor	Good	Good	Mature	Private	8	202	2.96	27.53	Not worth transplant due to over head services and excavation required and poor form
17	Metrosideros excelsa	10	10	Fair	Good	Good	Mature	Private	8	202	3.66	42.08	Not worth transplant due to over head services and excavation required and poor form
18	Metrosideros excelsa	10	8	Poor	Good	Good	Mature	Private	8	202	3.46	37.61	Not worth transplant due to over head services and excavation required
19	Metrosideros excelsa	10	7	Fair	Good	Good	Mature	Private	8	202	3.66	42.08	Not worth transplant
20	Metrosideros excelsa	10	7	Fair	Good	Good	Mature	Road Reserve	7	154	2.73	23.41	Not worth transplant due to excavation of road and footpath

Tree Protection Management Plan – WIAL, Designation, Miramar



Tree Number	Tree Species	Height (m)	CSR (m)	Form	Structure	Health	Age Class	Ownership	TPZ Radius (m)	TPZ Area (m2)	SRZ Radius (m)	SRZ Area (m2)	Comments
21	Metrosideros excelsa	10	6.5	Fair	Good	Good	Mature	Road Reserve	9	255	2.56	20.59	Not worth transplant due to excavation of road and footpath
22	Metrosideros excelsa	10	5.5	Fair	Good	Good	Mature	Road Reserve	10	315	3.03	28.84	Not worth transplant due to excavation of road and footpath
23	Metrosideros excelsa	10	5.5	Fair	Good	Good	Mature	Road Reserve	7.07	157.03	2.7	22.9	Not worth transplant due to excavation of road and footpath
24	Metrosideros excelsa	8	4.5	Fair	Good	Good	Mature	Road Reserve	3.6	40.72	2.13	14.25	Not worth transplant due to excavation of road and footpath
25	Coprosma repens	6	4	Fair	Fair	Good	Mature	Private	4	51	2.49	19.48	Remove due to poor health
26	Metrosideros excelsa	6	4	Fair	Good	Good	Mature	Road Reserve	7	154	2.8	24.63	Not worth transplant due to excavation of road and footpath
27	Metrosideros excelsa	6	3	Poor	Poor	Poor	Mature	Road Reserve	5	79	2.39	17.95	Not worth transplant due to excavation of road and footpath
28	Metrosideros excelsa	6	4	Fair	Fair	Fair	Mature	Road Reserve	8	202	2.9	26.42	Not worth transplant due to excavation of road and footpath
29	Metrosideros excelsa	6	4	Fair	Fair	Fair	Mature	Road Reserve	7	154	2.47	19.17	Not worth transplant due to excavation of road and footpath. Branch supported by fence.
30	Metrosideros excelsa	9	4	Fair	Fair	Fair	Mature	Road Reserve	8	202	2.78	24.28	Not worth transplant due to excavation of road and footpath.
31	Metrosideros excelsa	9	5	Fair	Fair	Fair	Mature	Road Reserve	8	202	2.66	22.23	Not worth transplant due to excavation of road and footpath.
32	Metrosideros excelsa	9	3.5	Fair	Fair	Fair	Mature	Road Reserve	5	79	2.3	16.62	Not worth transplant due to excavation of road and footpath.
33	Metrosideros excelsa	9	5	Fair	Fair	Fair	Mature	Road Reserve	8	202	2.96	27.53	Not worth transplant due to excavation of road and footpath.
34	Metrosideros excelsa	10	5	Fair	Fair	Fair	Mature	Road Reserve	11	381	3.06	29.42	Not worth transplant due to excavation of road and footpath.
35	Metrosideros excelsa	8	4	Fair	Fair	Poor	Mature	Road Reserve	6	114	2.64	21.9	Not worth transplant due to excavation of road and footpath.
36	Metrosideros excelsa	6	3	Poor	Poor	Poor	Mature	Road Reserve	6	114	2.39	17.95	Not worth transplant due to excavation of road and footpath.
37	Metrosideros excelsa	8	5	Poor	Fair	Fair	Mature	Road Reserve	5	79	2.39	17.95	Not worth transplant due to excavation of road and footpath.
38	Metrosideros excelsa	8	5	Fair	Fair	Fair	Mature	Road Reserve	11	381	3.25	33.18	Not worth transplant due to excavation of road and footpath.
39	Unidentified	4	4	Poor	Poor	Poor	Mature	Private	3	29	2.05	13.2	Remove
40	Mixed	4	4	Poor	Poor	Poor	Mature	Private	3	29	2.05	13.2	1 x ngaio and 2 x coprosma to remove.
41	Metrosideros excelsa	8	3.5	Fair	Fair	Fair	Mature	Private	7	154	3.46	37.61	Not worth transplant due to excavation of road and footpath.
42	Mixed	6.5	4	Poor	Poor	Poor	Mature	Private	0	0	1.5	7.07	2 x coprosma , 3 unidentified dead trees and 1 x Pohutukawa to remove

Tree Protection Management Plan – WIAL, Designation, Miramar



Tree Number	Tree Species	Height (m)	CSR (m)	Form	Structure	Health	Age Class	Ownership	TPZ Radius (m)	TPZ Area (m2)	SRZ Radius (m)	SRZ Area (m2)	Comments
43	Metrosideros excelsa	8	3.5	Fair	Fair	Fair	Mature	Private	7	154	3.72	43.47	Not worth transplant due to separate stems at ground level. Existing building within root zone to remove.
44	Mixed	3	1.5	Poor	Poor	Poor	Semi mature	Private	0	0	1.5	7.07	Multiple coprosma, 1 x ngaio, several flax, lucerne and 2 x kanuka to remove
45	Metrosideros excelsa	6	5	Fair	Fair	Fair	Mature	Private	5	79	2.47	19.17	Existing building within root zone to remove.
46	Metrosideros excelsa	9	5	Fair	Fair	Fair	Mature	Private	7	154	2.79	24.45	Existing building within root zone to remove.
47	Metrosideros excelsa	10	5	Fair	Fair	Fair	Mature	Private	6	114	3.1	30.19	Possible Transplant
48	Metrosideros excelsa	10	5	Fair	Fair	Fair	Mature	Private	8	202	3.18	31.77	Possible transplant, Within root zone of neighbouring tree.
49	Metrosideros excelsa	8	4	Fair	Fair	Fair	Mature	Private	5	79	2.45	18.86	Possible transplant, Within root zone of neighbouring tree.
50	Metrosideros excelsa	10	5	Fair	Fair	Fair	Mature	Private	7	154	2.75	23.76	Possible transplant, Within root zone of neighbouring tree.
51	Mixed	5	1	Fair	Fair	Fair	Semi mature	Private	0	0	1.5	7.07	Mixed group of Karo and Coprosma to remove. Not worth transplanting.

Structural Root Zone (SRZ) - The SRZ is the area of root zone required for tree stability.

Tree Protection Zone (TPZ) - The TPZ is the area of root zone required or healthy tree function.

Crown Spread Radius (CSR) – The CSR is the greatest distal branch spread out from the centre of the canopy.



5. Arboricultural Concepts

Likely root spread

- 5.1. The image in Figure 1 shows the likely root spread of a tree growing in an open field environment, with no restrictions to root growth.



Figure 1: Tree Root Zone

- 5.2. It is important to note from Figure 1 that the majority of the tree's root zone is in the upper portion of the soil and spreads well beyond the tree's canopy or 'dripline'.
- 5.3. Trees in urban environments often have their root zones restricted by hard surfaces and structures. This needs to be considered when determining the TPZ or the effects of any proposed construction. As a general example, tree roots are unlikely to grow under road surfaces but will instead grow into the berms or neighbouring gardens.
- 5.4. The most effective way to ensure retained trees are protected during construction is to measure and understand the root zones around the trees and to physically mark the area clearly. This area is then monitored and supervised by a Works Arborist to ensure that no construction activity causes detrimental effects to retained trees. The following measurements are key to establishing these protected areas.

Tree Protection Zones (TPZ)

- 5.5. The Tree Protection Zone (TPZ) is an area where restricted activities apply to all contractors working on site. An arborist would consider the trees in their current location and establish the TPZ as a maximum encroachment distance without the supervision of a Works Arborist. This is a critical measure put in place to protect the tree parts most vulnerable to damage in a development environment, the roots, trunk, and branches.



- 5.6. The TPZ would need to be clearly defined and must be communicated to all contractors working on the site.
- 5.7. Work can be carried out within the TPZ, but under strict protocols agreed with the Works Arborist.
- 5.8. Table 1 shows the TPZ for each of the trees proposed to be retained and protected.

Structural Root Zones (SRZ)

- 5.9. In addition to the TPZ, the Structural Root Zone (SRZ) should be considered. The SRZ is the area of root zone required for tree stability.
- 5.10. In general, it is only calculated when major encroachments into the TPZ are proposed.
- 5.11. Table 1 also shows the SRZ for each of the trees. No work is to be carried out within the SRZ.

6. Arboricultural Assessment

- 6.1. Overall, the trees are in good condition, with a few being of low quality and not suitable for retention as part of any development.
- 6.2. The remaining trees are at the edges of the site and provided their root zones are protected they can be worked around and retained as part of any proposed development.
- 6.3. The root zones for the trees have been provided and any work in these areas should be carried out with the trees in mind.
- 6.4. Care must still be taken during any excavation, soil grade changes and the rest of the proposed work to ensure no other construction activities have a detrimental effect of the health of the trees.

7. Transplant Assessment

- 7.1. Transplant operations are complex and require considerable investigation prior to any proposed transplant to ensure a high likelihood of success.
- 7.2. Root ball size is most likely the biggest factor when assessing the likely success of any transplant operation. A root ball of 10 to 12 times the diameter of the main stem measured at 1.4m from ground level needs to be achieved to ensure a successful transplant (Harris et al 2010). The root ball size is dependent of the tolerance of a particular species to root removal, so can be reduced to 8 times the diameter of the stems for Pohutukawa or other trees with a high degree of tolerance to root disturbance.
- 7.3. The following is a list of factors that require investigation to determine the likely success of any transplant or otherwise.



- Soil profile including quantity and type of rock in the soil.
- Species tolerance to root disturbance.
- Ground contours (flat, slight elevation, steep angle).
- Clear of services and freedom to excavate around the trees at will.
- Location of services.
- Clear access into the site and setup space with stable ground for the safe operation of excavators and other machinery required to transplant the trees.

7.4. In addition, the following post-transplant factors need to be considered.

- Underlying soil conditions for each tree in the new location.
- The final location of these trees should allow for potential growth.
- Timing and methodology.
- Handling and temporary storage (if required).
- Irrigation and aftercare strategy.

7.5. The financial cost in comparison to replanting with large grade trees should also be considered. It may be possible to plant large numbers of new large grade trees for the cost of transplanting one individual.

8. Conclusion

- 8.1. It is proposed to develop the site inclusive of new access points. There are 51 groups or individual trees at the site.
- 8.2. The trees have been assessed for both suitability of retention as part of any development and whether they are good candidates for a successful transplant.
- 8.3. Trees 12, 13, 14, 15, 25, 39, 40, 42, 44 and 51 are not suitable transplants or worthy of retention as part of any development.
- 8.4. After an initial assessment Trees 1, 2, 4, 5, 6, 7, 8, 9, 45, 46, 47, 48, 49 and 50 could be transplanted. However, further investigation as outlined in section 7 of this report needs to be carried out to determine the likely success of any transplant.
- 8.5. The remaining trees are worthy of retention as part of any development and the root zones should be considered as part of the design process.
- 8.6. The project can be carried out without detrimental effects to the retained trees providing care is taken around its root zone and any pruning is carried out to best practice.
- 8.7. The following recommendations will allow this work to be carried out without detrimental effects to the trees to be retained and should always be adhered to.



9. Recommendations

- 9.1. The successful implementation of the project, while ensuring the health of the retained trees, depends on the strict adherence to the Tree Protection Management Plan, which should be followed throughout.
- 9.2. A Works Arborist should be appointed at the beginning of the project to ensure all tree work recommendations and the Tree Protection Management Plan (TPMP) are always adhered to.
- 9.3. All physical tree work should be carried out by an arboricultural contractor that meets Wellington City Council's requirements, inclusive of health and safety, insurance and pruning standards.
- 9.4. All physical tree work should be carried out by an NZARB approved contractor. A list of these contractors can be found here:

<https://www.nzarb.org.nz/find-an-approved-contractor>

- 9.5. Pruning should be in line with current industry best practice and the Minimum Industry Standards (MIS). The following non-exhaustive list of MIS documents should be followed:
- MIS300 - Safe Tree Work
 - MIS308 - Tree Pruning
 - MIS313 - Tree Health & Maintenance
- 9.6. When carrying out tree pruning or removal, the arboricultural contractor shall take the necessary precautions to prevent injury to people and damage to property.

10. Tree Protection Management Plan

- 10.1. Several tree protection measures should be employed to ensure the survival of the trees during the construction phase of the project. These measures can generally be divided into two types:
- Activities – construction work is managed and overseen by the Project or Works Arborist
 - Structures – used to identify and isolate trees from construction activity and show the TPZ.
- 10.2. Some works within the TPZ will have already been authorised by the controlling authority, however additional encroachments or activities may arise as the works progress and will need to be reviewed by the Works Arborist and then accepted by the controlling authority.
- 10.3. To ensure changes and updates are recorded, a monthly arboricultural monitoring memorandum is required alongside an end of project arboricultural completion memorandum. This is to be provided by the Works Arborist.



10.4. The following check list should be implemented for effective tree protection during the construction phase:

- Pre-commencement meeting on-site. This should include the Works Arborist, Council’s nominated arboricultural expert, the project manager and site foreman.
- The location of the protective fencing, if required, is to be determined by the Works Arborist before the start of any construction activity.
- The required ground protection measures are to be installed within the TPZ prior to the start of any construction activity.
- Any consent should be checked and adherence to its conditions ensured.
- Works Arborist should be on site during any works within the TPZ.
- Monthly arboricultural monitoring memorandum provided.
- Arboricultural completion memorandum to be compiled at the end of the project.

Prohibited Activities within the TPZ

10.5. The below list of activities will be prohibited within the TPZ, unless approved by the Works Arborist:

- Machine access and excavation including for trenching.
- Excavation for silt fencing
- Cultivation of soil
- Storage of machinery, chemicals, or materials
- Preparation of chemicals, including concrete, cement etc.
- Parking of vehicles and machinery
- Refuelling of any kind including small machinery such as chainsaws
- Dumping of waste products
- Wash down and cleaning of equipment.
- Placement of fill
- Lighting of fires
- Soil level changes
- Temporary or permanent installation of utilities and signs
- Physical damage to the tree including its roots.

Protective Fencing

10.6. Prior to the commencement of any construction work at the site, protective fencing should be installed. This includes before machinery or materials arrive. The protective fencing must remain in place unless approval is given by the Works Arborist to allow previously agreed upon works. However, the TPZ should always be protected.

10.7. The fencing should be sufficiently robust to exclude construction activities and deter accidental encroachment into the TPZ. It should also be suitable for the task(s) being carried out.

10.8. Signs should be affixed to the tree protection fencing. These signs should clearly identify the purpose of the fence and be visible from within the construction zone. The following Figure shows examples of the types of protective fencing that are sufficient.



Legend

- 1 – Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
- 2 – Alternative plywood or wooden paling fence paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
- 3 – Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind permitted within the TPZ.
- 4 – Bracing is permissible within the TPZ. Installation of supports should not damage roots.

Figure 2. Tree protective fencing from the Australian Standard.

10.9. Sometimes it is not possible to erect a fence, so all staff on site should be made aware of the TPZ and why they are not to encroach into this area.



11. Tree Protection Measures

11.1. When protective fencing cannot be installed or is required to be removed temporarily, the following tree protection measures should be used:

Ground Protection Measures

11.2. If temporary access is required within the TPZ then the ground will need to be protected. These measures need to ensure no soil compaction and root damage can occur and be permeable to moisture and gaseous exchange within the soil. The following are some examples that could be used:

- Plywood boards over a bed of mulch 100mm thick
- Track mats or similar over a bed of mulch 100mm thick
- Rumble boards over a bed of mulch or aggregate
- Steel plates or equivalent, with or without mulch.

11.3. Each of these methods should have a geotextile membrane under the mulch or aggregate.

11.4. If there is an existing hard surface within the TPZ then machinery can operate on that surface with the approval of the Works Arborist.

Root Protection during works within the TPZ

11.5. It may be necessary to work within the TPZ for some parts of the construction project. To ensure these can be carried out without detrimental effects to the trees to be retained, the Works Arborist should be onsite supervising these activities or carrying them out.

11.6. Any excavation within the TPZ should be carried out by a careful combination of hand, hydro or air excavation.

11.7. Any roots encountered during excavations should be retained where possible or pruned under the supervision of the Works Arborist and done so cleanly back to the edge of the excavation using sharp pruning tools. Any pruned roots should be covered to prevent them drying out during the construction phase and back filled with the original material.

11.8. Any proposed pile locations should first be probed and/or excavated by hand, hydro or air to check for the presence of roots. These roots should either be pruned at the discretion of the Works Arborist or, if the roots need to be retained, the pile location should be adjusted. Any proposed pile locations should be flexible to ensure they can be relocated if roots are discovered that need to be retained.

11.9. Any retained roots that are discovered but need to remain exposed for longer than 2 hours should be protected from drying out and mechanical damage. This can be done using moisture retaining materials such as hessian in combination with a protective layer such as nova coil.



11.10. If large areas of roots are to be left exposed, then a protective layer of mulch and/or geofabric should be used to ensure the roots and surrounding soil remain moist.

11.11. If concrete is proposed to be poured adjacent to retained roots within an excavation then those roots should be protected from contact with the concrete by a protective layer, such as polythene.

11.12. If it is necessary to pour concrete or asphalt over exposed roots, a protective layer should be placed between the roots and poured material. This protective layer can be sand (no less than 80mm thick) or a geotextile sufficient to protect the roots.

Installation of services

11.13. If services are required to be installed within the TPZ, they should be installed in such a way as to minimise root disturbance. This can be done by trenchless methods such as directional drilling or thrusting, or by careful hand, hydro or air excavation of any service trench.

11.14. Trenchless methods should be at a depth of at least 1500mm, preferably deeper. Any entry and exit pits should be located outside of the TPZ and test pits or bore pit locations should be assessed for their likely effect on the roots of the trees to be retained.

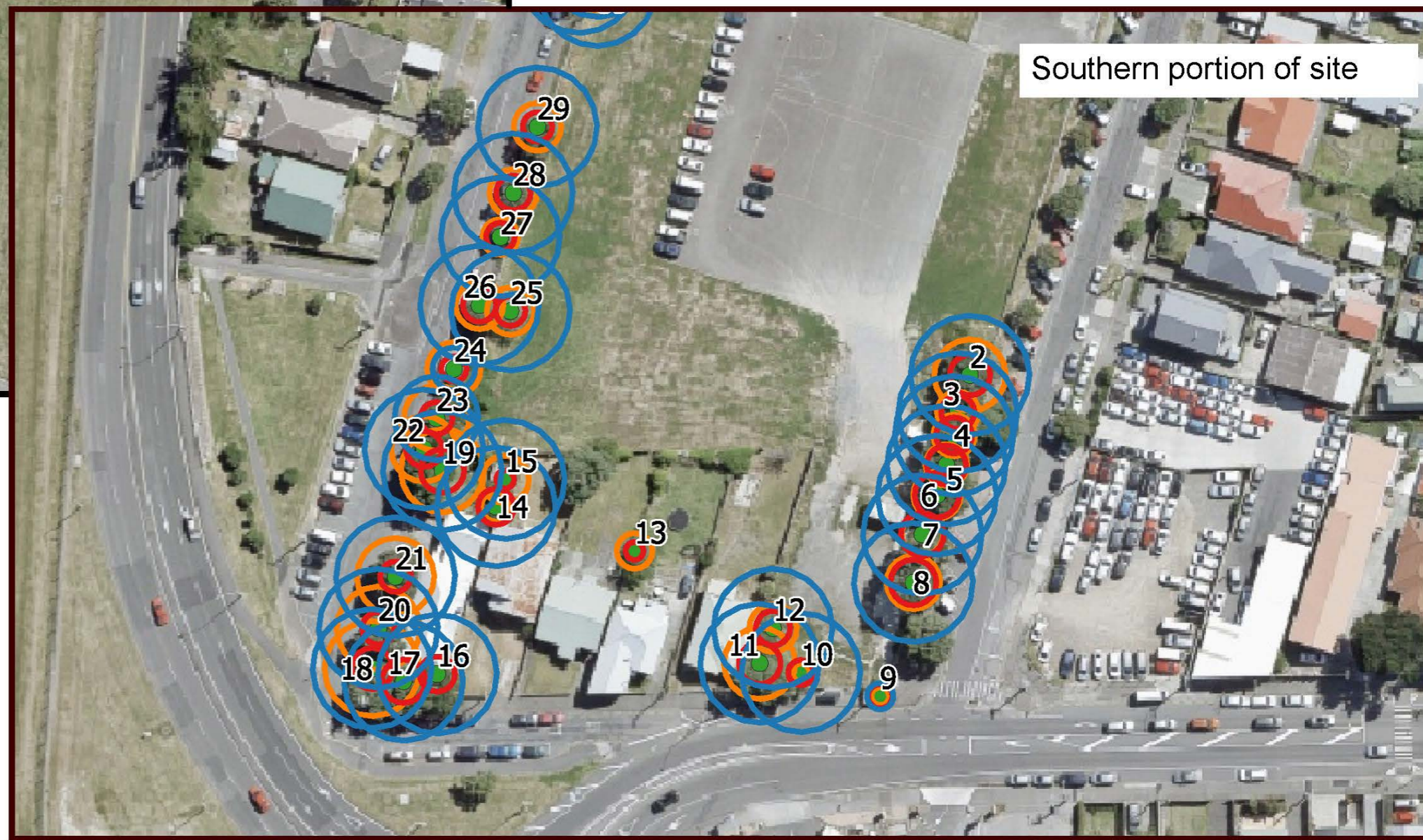
12. Appendices

Appendix 1 – Arboricultural Site Drawing

Northern portion of site






Southern portion of site



LEGEND

- CSR ○
- TPZ ○
- SRZ ○
- Tree plot ●

			Tree Inventory	Arboricultural Drawing	Plotted Date	19/07/2021
				WIAL Designation, Miramar	Plotted by	DS

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People.
Culture.
Isthmus.**

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